MHI

Manual No. '07 • KX, KXR-T-114

TECHNICAL MANUAL

Collection data

INVERTER DRIVEN MULTI-INDOOR UNIT CLIMATE CONTROL SYSTEM

Alternative refrigerant R410A use models

(OUTDOOR UNIT)

KX series **(Heat pump type)**

- **All-in-one type**
  FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R, 224HKXE4BR, 280HKXE4BR, 335HKXE4BR
- **All-in-one type (Used also for combination)**
  FDCA335HKXE4BRK, 400HKXE4BR, 450HKXE4BR, 504HKXE4BR, 560HKXE4BR, 615HKXE4BR, 680HKXE4BR
- **Combined type**
  FDCA735HKXE4BR, 800HKXE4BR, 850HKXE4BR, 900HKXE4BR, 960HKXE4BR, 1010HKXE4BR, 1065HKXE4BR, 1130HKXE4BR, 1180HKXE4BR, 1235HKXE4BR, 1300HKXE4BR, 1360HKXE4BR

KXR series **(Heat recovery type)**

- **All-in-one type**
  FDCA224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR
- **All-in-one type (Used also for combination)**
  FDCA335HKXRE4BRK, 400HKXRE4BR, 450HKXRE4BR, 504HKXRE4BR, 560HKXRE4BR, 615HKXRE4BR, 680HKXRE4BR
- **Combined type**
  FDCA735HKXRE4BR, 800HKXRE4BR, 850HKXRE4BR, 900HKXRE4BR, 960HKXRE4BR, 1010HKXRE4BR, 1065HKXRE4BR, 1130HKXRE4BR, 1180HKXRE4BR, 1235HKXRE4BR, 1300HKXRE4BR, 1360HKXRE4BR

(INDOOR UNIT) –KX, KXR series–

FDTCA22KXE4R
28KXE4R
36KXE4R
45KXE4R
56KXE4R

FDQSA22KXE5R
28KXE5R
36KXE5R
45KXE5R
56KXE5R

FDQMA22KXE4R
28KXE4R
36KXE4R

FDUA224KXE4R
280KXE4R

FDTA28KXE4R
36KXE4R
45KXE4R
56KXE4R
71KXE4R
90KXE4R
112KXE4R
140KXE4R
160KXE4R

FDUMA22KXE5R
28KXE5R
36KXE5R
45KXE5R
56KXE5R
71KXE5R
90KXE5R
112KXE5R
140KXE5R

FDTWA28KXE4BR
45KXE4BR
56KXE4BR
71KXE4R
90KXE4R
112KXE4R
140KXE4R

FDURA45KXE4R
56KXE4R
71KXE4R
90KXE4R
112KXE4R
140KXE4R

FDTQA22KXE4R
28KXE4R
36KXE4R

FDTSA22KXE4R
28KXE4R
36KXE4R
45KXE4BR
71KXE4BR

FDEA36KXE4R
45KXE4R
56KXE4R
71KXE4R
112KXE4R
140KXE4R

FDFLA28KXE4R
45KXE4R
71KXE4R

FDFUA28KXE4R
45KXE4R
56KXE4R
71KXE4R

FDKA22KXE4R
28KXE4R
36KXE4R
45KXE4R
56KXE4R
71KXE5R

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PREFACE

KX series, KXR series allowed Indoor & Outdoor unit combinations.

● Combination Table

Outdoor unit series		Connectable Indoor unit series - Series mixing is acceptable -		Non-connectable Indoor unit series	
Series name*1	Sales release date	Series name*1	Sales release date	Series name*1	Sales release date
KXE4	2004.4 ~	**KXE4**	2004.4 ~	**KXE4R** *2	2006.3 ~
		KXE4A	2004.11 ~		
KXE4A	2006.2 ~	**KXE4**	2004.4 ~	—	—
		KXE4A	2004.11 ~		
		KXE4R	2006.3 ~		
KXE4R **KXE4BR**	2006.5 ~ 2007.4 ~	**KXE4**	2004.4 ~	—	—
		KXE4A	2004.11 ~		
		KXE4R	2006.3 ~		
		KXE4BR	2007.4 ~		
		KXE5R	2007.4 ~		
KXRE4	2004.11 ~	**KXE4A**	2004.11 ~	**KXE4R** *3	2006.3 ~
KXRE4A	2006.2 ~	**KXE4A**	2004.11 ~	—	—
		KXE4R	2006.3 ~		
KXRE4R **KXRE4BR**	2006.6 ~ 2007.4 ~	**KXE4A**	2004.11 ~	—	—
		KXE4R	2006.3 ~		
		KXE4BR	2007.4 ~		
		KXE5R	2007.4 ~		

*1: Series name

Outdoor unit

e.g.

KXE4 : FDCA280HKXE4

Indoor unit

e.g.

KXE4A : FDTA71HKXE4A

*2: Possible to connect if outdoor unit PWB assy (control) is replaced to new one (KXE4A or KXE4R)
*3: Possible to connect if outdoor unit ROM is rewritten to new one (KXRE4A ~ KXRE4R)

Special Notes

1. To improve product quality and comply with RoHS, the model of indoor unit and outdoor unit may change, but the content of product specification, basic control system, installation and service chapters in this document will not change. The same applies to the KX4 series in the combination table.
2. When making the equipment plan and carrying out construction of KX4, please pay special attention to the combination type of indoor unit and outdoor unit.
3. However, some parts number changes according to the model.
   Please refer to the parts list for each model.

CONTENTS

1 GENERAL INFORMATION

1.1 Specific features

(1) The new R410A refrigerant is used

The new refrigerant R410A, with an ozone destruction coefficient of zero, is used and the CO_2 discharge volume is reduced, In addition, R410A is a pseudo-azeotropic refrigerant, so there is little change in its consistency that would cause it to divide into the gas and liquid phases, or undergo temperature slide, and it is also possible to add refrigerant on-site.

(2) Connectable indoor capacity

Capacity from 80% to 150% is possible.

Item / Model	Number of connectable	Connectable capacity
FDCA140HKXEN4R	2 to 6 units	112 ~ 210
FDCA140HKXES4R		

Capacity from 80% to 130% is possible.

Item / Model	Number of connectable	Connectable capacity
FDCA140HKXEN4R	2 to 8 units	112 ~ 182
FDCA140HKXES4R		

Capacity from 50% to 130% is possible.

(a) KX series

Item / Model	Number of connectable	Connectable capacity
FDCA160HKXES4R	2 to 8 units	128 ~ 208
FDCA224HKXE4BR	1 to 13 units	112 ~ 292
FDCA280HKXE4BR	1 to 16 units	140 ~ 364
FDCA335HKXE4BR	1 to 20 units	168 ~ 436
FDCA400HKXE4BR	1 to 23 units	200 ~ 520
FDCA450HKXE4BR	1 to 26 units	225 ~ 585
FDCA504HKXE4BR	1 to 29 units	252 ~ 656
FDCA560HKXE4BR	1 to 33 units	280 ~ 728
FDCA615HKXE4BR	2 to 36 units	307 ~ 800
FDCA680HKXE4BR	2 to 40 units	340 ~ 884
FDCA735HKXE4BR	2 to 43 units	367 ~ 956
FDCA800HKXE4BR	2 to 47 units	400 ~ 1040
FDCA850HKXE4BR	2 to 48 units	425 ~ 1105
FDCA900HKXE4BR	2 to 48 units	450 ~ 1170
FDCA960HKXE4BR	2 to 48 units	480 ~ 1248
FDCA1010HKXE4BR	2 to 48 units	505 ~ 1313
FDCA1065HKXE4BR	2 to 48 units	532 ~ 1385
FDCA1130HKXE4BR	3 to 48 units	565 ~ 1469
FDCA1180HKXE4BR	3 to 48 units	590 ~ 1534
FDCA1235HKXE4BR	3 to 48 units	617 ~ 1606
FDCA1300HKXE4BR	3 to 48 units	650 ~ 1690
FDCA1360HKXE4BR	3 to 48 units	680 ~ 1768

(b) KXR series

Item / Model	Number of connectable	Connectable capacity
FDCA224HKXRE4BR	1 to 13 units	112 ~ 292
FDCA280HKXRE4BR	1 to 16 units	140 ~ 364
FDCA335HKXRE4BR	1 to 20 units	168 ~ 436
FDCA400HKXRE4BR	1 to 23 units	200 ~ 520
FDCA450HKXRE4BR	1 to 26 units	225 ~ 585
FDCA504HKXRE4BR	1 to 29 units	252 ~ 656
FDCA560HKXRE4BR	1 to 33 units	280 ~ 728
FDCA615HKXRE4BR	2 to 36 units	307 ~ 800
FDCA680HKXRE4BR	2 to 40 units	340 ~ 884
FDCA735HKXRE4BR	2 to 43 units	367 ~ 956
FDCA800HKXRE4BR	2 to 47 units	400 ~ 1040
FDCA850HKXRE4BR	2 to 48 units	425 ~ 1105
FDCA900HKXRE4BR	2 to 48 units	450 ~ 1170
FDCA960HKXRE4BR	2 to 48 units	480 ~ 1248
FDCA1010HKXRE4BR	2 to 48 units	505 ~ 1313
FDCA1065HKXRE4BR	2 to 48 units	532 ~ 1385
FDCA1130HKXRE4BR	3 to 48 units	565 ~ 1469
FDCA1180HKXRE4BR	3 to 48 units	590 ~ 1534
FDCA1235HKXRE4BR	3 to 48 units	617 ~ 1606
FDCA1300HKXRE4BR	3 to 48 units	650 ~ 1690
FDCA1360HKXRE4BR	3 to 48 units	680 ~ 1768

(3) Indoor units are available with 12 capacities, in 14 types and 68 models.

- 12 capacities…22(0.8 HP), 28(1 HP), 36(1.25 HP), 45(1.6 HP), 56(22 HP), 71(2.5 HP), 90(3.2 HP), 112(4 HP), 140(5 HP), 160(6HP), 224(8 HP) and 280(10 HP).
- 14 types…Ceiling recessed compact type(FDTC), Ceiling recessed type(FDT), 2-way outlet ceiling recessed type(FDTW), Ceiling recessde single air supply port type (FDTQ), 1-way outlet ceiling recessed type(FDTS), Medium static pressure ducted type(FDQM), High static pressure duct type(FDU), Satellite ducted type(FDUM), Ceiling mounted duct type(FDUR), Ultra thin ducted type(FDQS) Ceiling suspension type(FDE), Wall mounted type(FDK), Floor standing exposed type(FDFL), and Floor standing hidden type (FDFU) .

(4) Long piping design offers total piping length of 510 m (Exclusion FDCA140, 160 series)

- Indoor and outdoor units can have a level difference of up to 50 m, with a one way piping length of up to 160 m. This is the top-class long piping design in the industry. A level difference of as 15 m between indoor units ensures that the system can meet a wide variety of air conditioning requirements in any building.

(5) Super link system

- Non polar 2-core signal wires for indoor, outdoor units by means of the automatic polarity selection.
- In addition, the max. 48 units can be controlled with a pair of signal wires. The high speed transmission method same as the computer network system [start up of 48 units can be completed within a few seconds by the determination of operation mode and the start of operation].
- As separate power supplies for the indoor and the outdoor units are employed, a pair of 2 signal wires only are required for the inter connecting wiring of indoor and outdoor uniits regardless of the number of units so that the installation work can be simplified, the cost of wiring work can be curtailed and causes of wiring error can be minimized.

(6) Floor layout can be changed by resetting address unit number.

- For change of floor layout, the control group can be recombined only by resetting address unit number.

(7) Installation of automatic address setting function

- The address setting method are divided into three types according to wiring method: “Automatic Address Setting,”“Remote controller Address Setting” and “Manual Address Setting,” In case of the Automatic Address Setting, no address needs be set as usual.

(8) Layout free refrigerant piping

- The branch type piping makes the system flexible enough to satisfy any layout plan on the floor or in a room.

(9) Improvement of serviceability

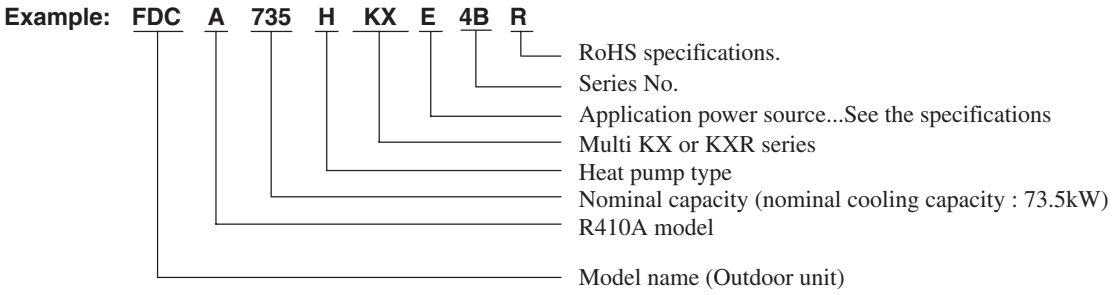
(a) Failures of indoor unit and outdoor units are shown on the liquid crystal display on the remote controller.
- Failures of indoor unit and outdoor units can be checked by remote controller.

(b) Easy checking of outdoor inspection LED.
- The LED can be checked without removing the service panel, and faulty units can be easily indentified out of several units.

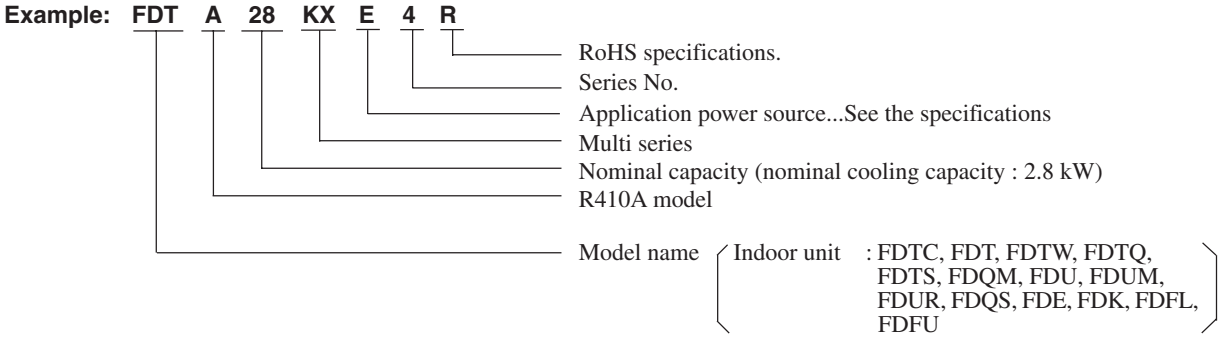
(10) For outdoor unit, EN60555-2 and EN60555-3 are not applicable as consent by the utility company or notification to the utility company is given before usage.

1.2 How to read the model name

(1) Outdoor unit



(2) Indoor unit



1.3 Table of models

Model \ Capacity		22	28	36	45	56	71	90	112	140	160	224	280
Ceiling recessed compact type (FDTC)		○	○	○	○	○							
Ceiling recessed type (FDT)			○	○	○	○	○	○	○	○	○		
2-way outlet ceiling recessed type (FDTW)			○		○	○	○	○	○	○			
Ceiling recessed single air supply port type (FDTQ)		○	○	○									
1-way outlet ceiling recessed type (FDTS)		○	○	○	○		○						
Medium static pressure ducted type (FDQM)		○	○	○									
High static pressure ducted type (FDU)(1)												○	○
Stellite ducted type (FDUM)		○	○	○	○	○	○	○	○	○			
Ceiling mounted duct type (FDUR)					○	○	○	○	○	○			
Ultrta thin ducted type (FDQS)		○	○	○	○								
Ceiling suspended type (FDE)				○	○	○	○		○	○			
Wall mounted type (FDK)		○	○	○	○	○	○						
Floor standing exposed type (FDFL)			○		○		○						
Floor standing hidden type (FDFU)			○		○	○	○						
Outdoor units to be combined FDC	K X	FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R FDCA224HKXE4BR, 280HKXE4BR, 335HKXE4BR, 335HKXE4BR-K, 400HKXE4BR, 450HKXE4BR, 504HKXE4BR, 560HKXE4BR, 615HKXE4BR, 680HKXE4BR, 735HKXE4BR, 800HKXE4BR, 850HKXE4BR, 900HKXE4BR, 960HKXE4BR, 1010HKXE4BR, 1065HKXE4BR, 1130HKXE4BR, 1180HKXE4BR, 1235HKXE4BR, 1300HKXE4BR, 1360HKXE4BR											
	K X R	FDCA224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR, 335HKXRE4BR-K, 400HKXRE4BR, 450HKXRE4BR, 504HKXRE4BR, 560HKXRE4BR, 615HKXRE4BR, 680HKXRE4BR, 735HKXRE4BR, 800HKXRE4BR, 850HKXRE4BR, 900HKXRE4BR, 960HKXRE4BR, 1010HKXRE4BR, 1065HKXRE4BR, 1130HKXRE4BR, 1180HKXRE4BR, 1235HKXRE4BR, 1300HKXRE4BR, 1360HKXRE4BR											

Note (1) The FDUA224, 280KXE4R and FDKA71KXE5R indoor units cannot be connected to the FDCA140HKXEN4R, 140HKXES4R and 160HKXES4R outdoor units.

1.4 Table of indoor units panel (Optional)

Model		Parts Model
FDTC	Capacity:22,28,36,45,56	TC-PSA-24W-ER
FDT	Capacity:28,36,45,56,71, 90,112,140,160	T-PSA-35W-ER
FDTW	Capacity:28,45,56	TW-PSA-23W-ER
	Capacity:71,90	TW-PSA-33W-ER
	Capacity:112,140	TW-PSA-43W-ER
FDTQ (Direct blow panel)	Capacity:22,28,36	TQ-PSA-14W-ER
		TQ-PSB-14W-ER
FDTQ (Duct panel)	Capacity:22,28,36	QR-PNA-14W-ER
		QR-PNB-14W-ER
FDTS	Capacity:22, 28, 36, 45	TS-PSA-28W-ER
	Capacity:71	TS-PSA-38W-ER

1.5 Outdoor units combination table

(1) KX series

(a) Models FDCA735, 800, 850, 900HKXE4BR

Item / Models	Combination outdoor unit models			Indoor unit	
	FDCA335HKXE4BRK	FDCA400HKXE4BR	FDCA450HKXE4BR	Connectable capacity	Number of connectable units
FDCA735HKXE4BR	1	1	—	367 ~ 956	2 ~ 43
FDCA800HKXE4BR	—	2	—	400 ~ 1040	2 ~ 47
FDCA850HKXE4BR	—	1	1	425 ~ 1105	2 ~ 48
FDCA900HKXE4BR	—	—	2	450 ~ 1170	

(b) Models FDCA960, 1010, 1065, 1130, 1180, 1235, 1300, 1360HKXE4BR

Item / Models	Combination outdoor unit models					Indoor unit	
	FDCA450 HKXE4BR	FDCA504 HKXE4BR	FDCA560 HKXE4BR	FDCA615 HKXE4BR	FDCA680 HKXE4BR	Connectable capacity	Number of connectable units
FDCA960HKXE4BR	1	1	—	—	—	480 ~ 1248	2 to 48 unit
FDCA1010HKXE4BR	—	2	—	—	—	505 ~ 1313	
FDCA1065HKXE4BR	—	1	1	—	—	532 ~ 1385	
FDCA1130HKXE4BR	—	—	2	—	—	565 ~ 1469	3 to 48 unit
FDCA1180HKXE4BR	—	—	1	1	—	590 ~ 1534	
FDCA1235HKXE4BR	—	—	—	2	—	617 ~ 1606	
FDCA1300HKXE4BR	—	—	—	1	1	650 ~ 1690	
FDCA1360HKXE4BR	—	—	—	—	2	680 ~ 1768	

(c) Outdoor unit side branch pipe set (Optional)

Outdoor unit	Branch pipe set
For two units (for 735 ~ 1360)	DOS-2A-1

Note (1) Be sure to use this when combining units.

(d) Branch pipe set (Optional)

Total capacity downstream	Branching pipe set
Less than 180	DIS-22-1
180 or more but less than 371	DIS-180-1
371 or more but less than 540	DIS-371-1
540 or more	DIS-540-1

(e) Header pipe set (Optional)

Total capacity downstream	Header set model type	Number of branches
Less than 180	HEAD4-22-1	4 branches at the most
180 or more but less than 371	HEAD6-180-1	6 branches at the most
371 or more but less than 540	HEAD8-371-1	8 branches at the most
540 or more	HEAD8-540-1	8 branches at the most

(2) KXR series

(a) Models FDCA735, 800, 850, 900HKXRE4BR

Item / Models	Combination outdoor unit models			Indoor unit	
	FDCA335HKXRE4BRK	FDCA400HKXRE4BR	FDCA450HKXRE4BR	Connectable capacity	Number of connectable units
FDCA735HKXRE4BR	1	1	—	367 ~ 956	2 ~ 43
FDCA800HKXRE4BR	—	2	—	400 ~ 1040	2 ~ 47
FDCA850HKXRE4BR	—	1	1	425 ~ 1105	2 ~ 48
FDCA900HKXRE4BR	—	—	2	450 ~ 1170	

(b) Models FDCA900, 1010, 1065, 1130, 1180, 1235, 1300, 1360HKXRE4BR

Item / Models	Combination outdoor unit models					Indoor unit	
	FDCA450 HKXRE4BR	FDCA504 HKXRE4BR	FDCA560 HKXRE4BR	FDCA615 HKXRE4BR	FDCA680 HKXRE4BR	Connectable capacity	Number of connectable units
FDCA960HKXRE4BR	1	1	—	—	—	480 ~ 1248	2 to 48 unit
FDCA1010HKXRE4BR	—	2	—	—	—	505 ~ 1313	
FDCA1065HKXRE4BR	—	1	1	—	—	532 ~ 1385	
FDCA1130HKXRE4BR	—	—	2	—	—	565 ~ 1469	3 to 48 unit
FDCA1180HKXRE4BR	—	—	1	1	—	590 ~ 1534	
FDCA1235HKXRE4BR	—	—	—	2	—	617 ~ 1606	
FDCA1300HKXRE4BR	—	—	—	1	1	650 ~ 1690	
FDCA1360HKXRE4BR	—	—	—	—	2	680 ~ 1768	

(c) Outdoor unit side branch pipe set (Optional)

Outdoor unit	Branch pipe set
For two units (for 735 ~ 1360)	DOS-2A-1-R

Note (1) Be sure to use this when combining units.

(d) Branch pipe set (Optional)

In the upstream of a branching controller

Total capacity downstream	Branching pipe set
Less than 180	DIS-22-1-R
180 or more but less than 371	DIS-180-1-R
371 or more but less than 540	DIS-371-1-R
540 or more	DIS-540-1-R

In the downstream of a branching controller

Total capacity downstream	Branching pipe set
Less than 180	DIS-22-1
180 or more but less than 280	DIS-180-1

(e) Branching controller model (Optional)

Total capacity downstream	Branching controller model	Number of connectable units
Less than 112	PFD112-ER	1 ~ 5
112 or more but less than 180	PFD180-ER	1 ~ 8
180 or more but less than 280	PFD280-ER	1 ~10

(f) Integrated branching controller (Optional)

Model	Total of four branches		Per branch	
	Capacity restrictions	Maximum number of units connectable	Capacity restrictions	Maximum number of units connectable
PFD112X4-ER	Less than 371	16	Less than 112	5

Note (1) An indoor unit with a capacity up to 112 can be connected. Refer to page 308 for details.

2 OUTDOOR UNIT

2.1 Specifications

(1) KX series

Models FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R

Item \ Model		FDCA140HKXEN4R	FDCA140HKXES4R	FDCA160HKXES4R
Power source		**1 Phase 220/240V 50Hz**	**3 Phase 380-415V 50Hz/380V 60Hz (3)**	
Nominal cooling capacity(1)	**kW**	**14.6**		**16.0**
Nominal heating capacity(1)	**kW**	**16.6**		**18.0**
Noise level	dB(A)	Cooling : 53, Heating : 53		
Exterior dimensions Height × Width × Depth	**mm**	**1300 × 970 × 370**		
Net weight	**kg**	**125**		
Refrigerant equipment compressor type & Q' ty		GT-C5139ND50		
Starting method		Direct line starting		
Capacity control	%	31 ~ 130		25 ~ 125
Crankcase heater	**W**	**33**		
Heat exchanger		Straight fin & inner grooved tubing		
Refrigerant control		Electronic expansion Valve +Capillary tube		
Refrigerant		**R410A**		
Quantity	**kg**	**7.5**		
Refrigerant oil	ℓ	**1.6 (M-MA32R)**		
Defrost control		Microcomputer controlled De-Icer		
Air handling equipment Fan type & Q'ty		Propeller fan × 2		
Motor	**W**	**60 ×2**		
Starting method		Direct start		
Air flow(Standard)	**CMM**	**100**		
Shock & vibration absorber		Rubber mount (for compressor)		
Safety equipment		Compressor overheat protection, overcurrent protection, power transistor overheating protection, abnormal high pressure protection		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ9.52(3/8") Gas line: ϕ15.88(5/8")**		
Connecting method		**Flare piping**		
Drain		Hole for drain(ϕ20 × 3pcs)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Edging**		
Indoor units to be combined		**FDTCA22, 28, 36, 45, 56 FDTA28, 36, 45, 56, 71, 90, 112, 140, 160 FDTWA28, 45, 56, 71, 90, 112, 140 FDTQA22, 28, 36 FDTSA22, 28, 36, 45, 71 FDQMA22, 28, 36 FDUMA22, 28, 36, 45, 56, 71, 90, 112, 140 FDURA45, 56, 71, 90, 112, 140 FDQSA22, 28, 36, 45, 56 FDEA36, 45, 56, 71, 112, 140 FDKA22, 28, 36, 45, 56 FDFLA28, 45, 71 FDFUA28, 45, 56, 71**		

Note (1) The cooling and heating capabilities imply the values when the indoor unit of rated capacity is connected under the condition specified in ISO-T1.
(2) The FDKA71KXE5R indoor unit cannot be connected.
(3) In the case of 60Hz, use specification category (T).

List of branch pipe part numbers (Select parts in accordance with the branching system used.)

Corresponding outdoor unit	Number of indoor units that can be connected	Branching system	
		Branch pipe system	Header system
FDCA140HKXEN4R FDCA140HKXES4R	2~6 units	DIS-22-1	HEAD4-22-1
	2~8 units		
FDCA160HKXES4R	2~8 units		

Models FDCA224HKXE4BR, 280HKXE4BR, 335HKXE4BR

Item \ Models		FDCA224HKXE4BR	FDCA280HKXE4BR	FDCA335HKXE4BR
Power source		**3 Phase 380-415V 50Hz/380V 60Hz**		
Nominal cooling capacity(1)	**kW**	**22.4**	**28.0**	**33.5**
Nominal heating capacity(1)	**kW**	**25.0**	**31.5**	**37.5**
Noise level	dB(A)	Cooling : 57, Heating : 57	Cooling : 57, Heating : 58	Cooling:60.5, Heating:61
Exterior dimensions Height × Width × Depth	**mm**	**1690 × 1350 × 720**		
Net weight	**kg**	**245**		
Refrigerant equipment compressor type & Q' ty		GTC5150ND75K × 1		
Starting method		Direct line starting		
Capacity control	%	27 ~ 126	20 ~ 114	19 ~ 117
Crankcase heater	**W**	**33 × 1**		
Heat exchanger		Straight fin & inner grooved tubing		
Refrigerant control		Electronic expansion valve		
Refrigerant		**R410A**		
Quantity	**kg**	**14.2**		
Refrigerant oil	ℓ	**2.1 (M-MA32R)**		
Defrost control		Microcomputer controlled De-Icer		
Air handling equipment Fan type & Q'ty		Propeller fan × 2		
Motor	**W**	**126×2**		**386×2**
Starting method		Direct start		
Air flow(Standard)	**CMM**	**Cooling: 220, Heating: 180**		**Cooling:280, Heating:260**
Shock & vibration absorber		Rubber mount (for compressor)		
Safety equipment		Compressor overheat protection, overcurrent protection, power transistor overheating protection, abnormal high pressure protection		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ9.52(3/8") Gas line: ϕ19.05(3/4")**	**Liquid line: ϕ9.52(3/8") Gas line: ϕ22.22(7/8")**	**Liquid line: ϕ12.7(1/2") Gas line: ϕ25.4(1")**
Connecting method		**Gas line:Brazing, Liquid line:Flare**		
Drain		Hole for drain(ϕ20 × 6pcs, ϕ45 × 3pcs)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		–		
Indoor units to be combined		**FDTCA22, 28, 36, 45, 56 FDTA28, 36, 45, 56, 71, 90, 112, 140, 160 FDTWA28, 45, 56, 71, 90, 112, 140 FDTQA22, 28, 36 FDTSA22, 28, 36, 45, 71 FDQMA22, 28, 36 FDUA224, 280 FDUMA22, 28, 36, 45, 56, 71, 90, 112, 140 FDURA45, 56, 71, 90, 112, 140 FDQSA22, 28, 36, 45, 56 FDEA36, 45, 56, 71, 112, 140 FDKA22, 28, 36, 45, 56, 71 FDFLA28, 45, 71 FDFUA28, 45, 56, 71**		

Notes (1) The cooling and heating capabilities imply the values when the indoor unit of rated capacity is connected under the condition specified in ISO-T1.

(2) The refrigerant quantity in the connecting pipe is not included Charge it additionally at the site.

List of branch pipe part numbers (Select parts in accordance with the branching system used.)

Corresponding outdoor unit	Number of indoor units that can be connected	Branching system	
		Branch pipe system(1) (Total capacity after each branch)	Header system
FDCA224HKXE4BR	1~13 units	• Downstream capacity less than 180 DIS-22-1 • Downstream capacity 180 to less than 371 DIS-180-1 • Downstream capacity 371 to less than 540 DIS-371-1	• Downstream capacity less than 180 HEAD-22-1 (for up to 4 units max) • Downstream capacity 180 to less than 371 HEAD-180-1 (up to 6 units max) • Downstream capacity 371 to less than 540 HEAD8-371-1 (up to 8 units max)
FDCA280HKXE4BR	1~16 units		
FDCA335HKXE4BR	1~20 units		

Note (1) In the branch piping method, the way branch piping is run needs to be in accordance with the total downstream capacity of the indoor units.

Models FDCA335HKXE4BRK, 400HKXE4BR, 450HKXE4BR

Item \ Models		FDCA335HKXE4BRK[3]	FDCA400HKXE4BR	FDCA450HKXE4BR
Power source		**3 Phase 380-415V 50Hz/380V 60Hz**		
Nominal cooling capacity[1]	**kW**	**33.5**	**40.0**	**45.0**
Nominal heating capacity[1]	**kW**	**37.5**	**45.0**	**50.0**
Noise level	dB(A)	Cooling: 56, Heating: 57	Cooling: 58.5, Heating: 59	Cooling: 61, Heating: 61
Exterior dimensions Height × Width × Depth	**mm**	**1690 × 1350 × 720**		
Net weight	**kg**	**310**		
Refrigerant equipment compressor type & Q' ty		GT-C5150ND78A × 2		
Starting method		Direct line starting		
Capacity control	%	19 ~ 130	15 ~ 114	13 ~ 112
Crankcase heater	**W**	**33 × 2**		
Heat exchanger		Straight fin & inner grooved tubing		
Refrigerant control		Electronic expansion valve		
Refrigerant		**R410A**		
Quantity	**kg**	**17**		
Refrigerant oil	ℓ	**4.2 (M-MA32R)**		
Defrost control		Microcomputer controlled De-Icer		
Air handling equipment Fan type & Q'ty		Propeller fan × 2		
Motor	**W**	**386 × 2**		
Starting method		Direct start		
Air flow(Standard)	**CMM**	**Cooling: 220, Heating: 180**	**Cooling: 250, Heating: 220**	**Cooling: 260, Heating: 240**
Shock & vibration absorber		Rubber mount (for compressor)		
Safety equipment		Compressor overheat protection, overcurrent protection, power transistor overheating protection, abnormal high pressure protection		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ12.7(1/2") Gas line: ϕ25.4(1")**		**Liquid line: ϕ12.7(1/2") Gas line: ϕ28.58(11/8")**
Connecting method		**Gas line:Brazing, Liquid line:Flare**		
Drain		Hole for drain (ϕ20 × 6pcs, ϕ45 × 3pcs)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		–		
Indoor units to be combined		**FDTCA22, 28, 36, 45, 56** **FDTA28, 36, 45, 56, 71, 90, 112, 140, 160** **FDTWA28, 45, 56, 71, 90, 112, 140** **FDTQA22, 28, 36** **FDTSA22, 28, 36, 45, 71** **FDQMA22, 28, 36** **FDUA224, 280** **FDUMA22, 28, 36, 45, 56, 71, 90, 112, 140** **FDURA45, 56, 71, 90, 112, 140** **FDQSA22, 28, 36, 45, 56** **FDEA36, 45, 56, 71, 112, 140** **FDKA22, 28, 36, 45, 56, 71** **FDFLA28, 45, 71** **FDFUA28, 45, 56, 71**		

Notes (1) The cooling and heating capabilities imply the values when the indoor unit of rated capacity is connected under the condition specified in ISO-T1.

(2) The refrigerant quantity in the connecting pipe is not included Charge it additionally at the site.

(3) The FDCA335HKXE4BRK is an exclusive combination unit.

List of branch pipe part numbers (Select parts in accordance with the branching system used.)

Corresponding outdoor unit	Number of indoor units that can be connected	Branching system	
		Branch pipe system[1] (Total capacity after each branch)	Header system
FDCA335HKXE4BRK	–	• Downstream capacity less than 180 DIS-22-1 • Downstream capacity 180 to less than 371 DIS-180-1 • Downstream capacity 371 to less than 540 DIS-371-1 • Downstream capacity 540 or more DIS-540-1	• Downstream capacity less than 180 HEAD4-22-1 (for up to 4 units max) • Downstream capacity 180 to less than 371 HEAD6-180-1 (up to 6 units max) • Downstream capacity 371 to less than 540 HEAD8-371-1 (up to 8 units max) • Downstream capacity 540 or more HEAD8-540-1 (up to 8 units max)
FDCA400HKXE4BR	1~23 units		
FDCA450HKXE4BR	1~26 units		

Note (1) In the branch piping method, the way branch piping is run needs to be in accordance with the total downstream capacity of the indoor units.

Models FDCA504HKXE4BR, 560HKXE4BR

Item	Models	FDCA504HKXE4BR	FDCA560HKXE4BR
Power source		**3 Phase 380-415V 50Hz/380V 60Hz**	
Nominal cooling capacity(1)	**kW**	**50.4**	**56.0**
Nominal heating capacity(1)	**kW**	**56.5**	**63.0**
Noise level	dB(A)	Cooling: 60, Heating: 60.5	Cooling: 60.5, Heating: 62.5
Exterior dimensions Height × Width × Depth	**mm**	**2048 × 1350 × 720**	
Net weight	**kg**	**340**	
Refrigerant equipment compressor type & Q' ty		GT-C5150ND78A × 2	
Starting method		Direct line starting	
Capacity control	%	11 ~ 100	10 ~ 113
Crankcase heater	**W**	**33 × 2**	
Heat exchanger		Straight fin & inner grooved tubing	
Refrigerant control		Electronic expansion valve	
Refrigerant		**R410A**	
Quantity	**kg**	**19.4**	
Refrigerant oil	ℓ	**4.2 (M-MA32R)**	
Defrost control		Microcomputer controlled De-Icer	
Air handling equipment Fan type & Q'ty		Propeller fan × 2	
Motor	**W**	**386 × 2**	
Starting method		Direct start	
Air flow(Standard)	**CMM**	**Cooling: 270, Heating: 250**	
Shock & vibration absorber		Rubber mount (for compressor)	
Safety equipment		Compressor overheat protection, overcurrent protection, power transistor overheating protection, abnormal high pressure protection	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ12.7(1/2") Gas line:ϕ28.58(11/8")**	
Connecting method		**Gas line:Brazing, Liquid line:Flare**	
Drain		Hole for drain (ϕ20 × 6pcs, ϕ45 × 3pcs)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		–	
Indoor units to be combined		**FDTCA22, 28, 36, 45, 56 FDTA28, 36, 45, 56, 71, 90, 112, 140, 160 FDTWA28, 45, 56, 71, 90, 112, 140 FDTQA22, 28, 36 FDTSA22, 28, 36, 45, 71 FDQMA22, 28, 36 FDUA224, 280 FDUMA22, 28, 36, 45, 56, 71, 90, 112, 140**	**FDURA45, 56, 71, 90, 112, 140 FDQSA22, 28, 36, 45, 56 FDEA36, 45, 56, 71, 112, 140 FDKA22, 28, 36, 45, 56, 71 FDFLA28, 45, 71 FDFUA28, 45, 56, 71**

Notes (1) The cooling and heating capabilities imply the values when the indoor unit of rated capacity is connected under the condition specified in ISO-T1.
(2) The refrigerant quantity in the connecting pipe is not included Charge it additionally at the site.

List of branch pipe part numbers (Select parts in accordance with the branching system used.)

Corresponding outdoor unit	Number of indoor units that can be connected	Branching system	
		Branch pipe system(1) (Total capacity after each branch)	Header system
FDCA504HKXE4BR	1~29 units	• Downstream capacity less than 180 DIS-22-1 • Downstream capacity 180 to less than 371 DIS-180-1 • Downstream capacity 371 to less than 540 DIS-371-1 • Downstream capacity 540 or more DIS-540-1	• Downstream capacity less than 180 HEAD4-22-1 (for up to 4 units max) • Downstream capacity 180 to less than 371 HEAD6-180-1 (up to 6 units max) • Downstream capacity 371 to less than 540 HEAD8-371-1 (up to 8 units max) • Downstream capacity 540 or more HEAD8-540-1 (up to 8 units max)
FDCA560HKXE4BR	1~33 units		

Note (1) In the branch piping method, the way branch piping is run needs to be in accordance with the total downstream capacity of the indoor units.

Models FDCA615HKXE4BR, 680HKXE4BR

Item \ Models		FDCA615HKXE4BR	FDCA680HKXE4BR
Power source		**3 Phase 380-415V 50Hz/380V 60Hz**	
Nominal cooling capacity(1)	**kW**	**61.5**	**68.0**
Nominal heating capacity(1)	**kW**	**69.0**	**73.0**
Noise level	dB(A)	Cooling: 63, Heating: 63	Cooling: 63.5, Heating: 63.5
Exterior dimensions Height × Width × Depth	**mm**	**2048 × 1350 × 720**	
Net weight	**kg**	**355**	
Refrigerant equipment compressor type & Q' ty		GT-C5150ND78A × 2	
Starting method		Direct line starting	
Capacity control	%	9 ~ 110	8 ~ 108
Crankcase heater	**W**	**33 × 2**	
Heat exchanger		Straight fin & inner grooved tubing	
Refrigerant control		Electronic expansion valve	
Refrigerant		**R410A**	
Quantity	**kg**	**21.2**	
Refrigerant oil	ℓ	**4.2 (M-MA32R)**	
Defrost control		Microcomputer controlled De-Icer	
Air handling equipment Fan type & Q'ty		Propeller fan × 2	
Motor	**W**	**386 × 2**	
Starting method		Direct start	
Air flow(Standard)	**CMM**	**Cooling: 270, Heating: 250**	
Shock & vibration absorber		Rubber mount (for compressor)	
Safety equipment		Compressor overheat protection, overcurrent protection, power transistor overheating protection, abnormal high pressure protection	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ 12.7(1/2") Gas line: ϕ28.58(1 1/8")**	
Connecting method		**Gas line:Brazing, Liquid line:Flare**	
Drain		Hole for drain (ϕ20 × 6pcs, ϕ45 × 3pcs)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		–	
Indoor units to be combined		**FDTCA22, 28, 36, 45, 56 FDTA28, 36, 45, 56, 71, 90, 112, 140, 160 FDTWA28, 45, 56, 71, 90, 112, 140 FDTQA22, 28, 36 FDTSA22, 28, 36, 45, 71 FDQMA22, 28, 36 FDUA224, 280 FDUMA22, 28, 36, 45, 56, 71, 90, 112, 140**	**FDURA45, 56, 71, 90, 112, 140 FDQSA22, 28, 36, 45, 56 FDEA36, 45, 56, 71, 112, 140 FDKA22, 28, 36, 45, 56, 71 FDFLA28, 45, 71 FDFUA28, 45, 56, 71**

Notes (1) The cooling and heating capabilities imply the values when the indoor unit of rated capacity is connected under the condition specified in ISO-T1.
(2) The refrigerant quantity in the connecting pipe is not included Charge it additionally at the site.

List of branch pipe part numbers (Select parts in accordance with the branching system used.)

Corresponding outdoor unit	Number of indoor units that can be connected	Branching system	
		Branch pipe system(1) (Total capacity after each branch)	Header system
FDCA615HKXE4BR	2~36 units	• Downstream capacity less than 180 DIS-22-1 • Downstream capacity 180 to less than 371 DIS-180-1	• Downstream capacity less than 180 HEAD4-22-1 (for up to 4 units max) • Downstream capacity 180 to less than 371 HEAD6-180-1 (up to 6 units max)
FDCA680HKXE4BR	2~40 units	• Downstream capacity 371 to less than 540 DIS-371-1 • Downstream capacity 540 or more DIS-540-1	• Downstream capacity 371 to less than 540 HEAD8-371-1 (up to 8 units max) • Downstream capacity 540 or more HEAD8-540-1 (up to 8 units max)

Note (1) In the branch piping method, the way branch piping is run needs to be in accordance with the total downstream capacity of the indoor units.

(2) KXR series

Models FDCA224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR

Item \ Models		FDCA224HKXRE4BR	FDCA280HKXRE4BR	FDCA335HKXRE4BR
Power source		**3 Phase 380-415V 50Hz/380V 60Hz**		
Nominal cooling capacity(1)	**kW**	**22.4**	**28.0**	**33.5**
Nominal heating capacity(1)	**kW**	**25.0**	**31.5**	**37.5**
Noise level	dB(A)	Cooling: 57, Heating: 57	Cooling: 57, Heating: 59	Cooling: 60.5, Heating: 62.5
Exterior dimensions Height × Width × Depth	**mm**	**1690 × 1350 × 720**		
Net weight	**kg**	**250**		
Refrigerant equipment compressor type & Q' ty		GTC5150ND75K × 1		
Starting method		Direct line starting		
Capacity control	%	24 ~ 114	19 ~ 109	18 ~ 103
Crankcase heater	**W**	**33 × 1**		
Heat exchanger		Straigh fin & inner grooved tubing		
Refrigerant control		Electronic expansion valve		
Refrigerant		**R410A**		
Quantity	**kg**	**14.2**		
Refrigerant oil	ℓ	**2.2 (M-MA32R)**		
Defrost control		Microcomputer controlled De-Icer		
Air handling equipment Fan type & Q'ty		Propeller fan × 2		
Motor	**W**	**126 × 2**		**386 × 2**
Starting method		Direct start		
Air flow(Standard)	**CMM**	**Cooling: 220, Heating: 180**	**Cooling: 220, Heating: 180**	**Cooling: 280, Heating: 260**
Shock & vibration absorber		Rubber mount (for compressor)		
Safety equipment		Compressor overheat protection, overcurrent protection, power transistor overheating protection, abnormal high pressure protection		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ 9.52(3/8") Suction gas line: ϕ19.05(3/4") Discharge gas line: ϕ15.88(5/8")**	**Liquid line: ϕ 9.52(3/8") Suction gas line: ϕ22.22(7/8") Discharge gas line: ϕ19.05(3/4")**	**Liquid line: ϕ12.7 (1/2") Suction gas line: ϕ22.22(7/8") Discharge gas line: ϕ19.05(3/4")**
Connecting method		**Suction or discharge line:Brazing, Liquid line:Flare**		
Drain		Hole for drain (ϕ20 × 6pcs, ϕ45 × 3pcs)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		–		
Indoor units to be combined		**FDTCA22, 28, 36, 45, 56 FDTA28, 36, 45, 56, 71, 90, 112, 140, 160 FDTWA28, 45, 56, 71, 90, 112, 140 FDTQA22, 28, 36 FDTSA22, 28, 36, 45, 71 FDQMA22, 28, 36 FDUA224, 280 FDUMA22, 28, 36, 45, 56, 71, 90, 112, 140 FDURA45, 56, 71, 90, 112, 140 FDQSA22, 28, 36, 45, 56 FDEA36, 45, 56, 71, 112, 140 FDKA22, 28, 36, 45, 56, 71 FDFLA28, 45, 71 FDFUA28, 45, 56, 71**		

Notes (1) The cooling and heating capabilities imply the values when the indoor unit of rated capacity is connected under the condition specified in ISO-T1.
(2) The refrigerant quantity in the connecting pipe is not included Charge it additionally at the site.

List of branch pipe part numbers (Select parts in accordance with the branching system used.)

Corresponding outdoor unit	Number of indoor units that can be connected	Branching system	
		In the upstream of a branching controller(1)	In the downstrean of a branching controller(1)
FDCA224HKXRE4BR	1~13 units	• Downstream Capacity less than 180 DIS-22-1-R • Downstream Capacity 180 to less than 371 DIS-180-1-R • Downstream Capacity 371 to less than 540 DIS-371-1-R	• Downstream Capacity less than 180 DIS-22-1 • Downstream Capacity 180 or more DIS-180-1
FDCA280HKXRE4BR	1~16 units		
FDCA335HKXRE4BR	1~20 units		

Note (1) In the branch piping method, the way branch piping is run needs to be in accordance with the total downstream capacity of the indoor units.

• Branching controller part numbers

Branching controller	Number of connectable units
Total capacity downstream Last than 112: PFD112-ER	1~5
Total capacity downstream Last than 180: PFD180-ER	1~8
Total capacity downstream Last than 280: PFD280-ER	1~10

• Integrated branching controller part numbers

Integrated branching controller	Number of connectable units
Total capacity downstream Last than 371: PFD112X4-ER	1~16

Note (1) An indoor unit with a capacity up to 112 can be connected.

Models FDCA335HKXRE4BRK, 400HKXRE4BR, 450HKXRE4BR

Item \ Models		FDCA335HKXRE4BRK(3)	FDCA400HKXRE4BR	FDCA450HKXRE4BR
Power source		**3 Phase 380-415V 50Hz/380V 60Hz**		
Nominal cooling capacity(1)	**kW**	**33.5**	**40.0**	**45.0**
Nominal heating capacity(1)	**kW**	**37.5**	**45.0**	**50.0**
Noise level	dB(A)	Cooling: 57, Heating: 57.5	Cooling: 59.5, Heating: 60	Cooling: 62.5, Heating: 62.5
Exterior dimensions Height × Width × Depth	**mm**	**1690 × 1350 × 720**		
Net weight	**kg**	**315**		
Refrigerant equipment compressor type & Q' ty		GT-C5150ND78A × 2		
Starting method		Direct line starting		
Capacity control	%	18 ~ 130	14 ~ 113	13 ~ 109
Crankcase heater	**W**	**33 × 2**		
Heat exchanger		Straight fin & inner grooved tubing		
Refrigerant control		Electronic expansion valve		
Refrigerant		**R410A**		
Quantity	**kg**	**14.2**	**17**	
Refrigerant oil	ℓ	**4.4 (M-MA32R)**		
Defrost control		Microcomputer controlled De-Icer		
Air handling equipment Fan type & Q'ty		Propeller fan × 2		
Motor	**W**	**386 × 2**		
Starting method		Direct start		
Air flow(Standard)	**CMM**	**Cooling: 220, Heating: 180**	**Cooling: 250, Heating: 220**	**Cooling: 260, Heating: 240**
Shock & vibration absorber		Rubber mount (for compressor)		
Safety equipment		Compressor overheat protection, overcurrent protection, power transistor overheating protection, abnormal high pressure protection		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ12.7 (1/2") Suction gas line: ϕ22.22(7/8") Discharge gas line: ϕ19.05(3/4")**	**Liquid line: ϕ12.7 (1/2") Suction gas line: ϕ28.58(11/8") Discharge gas line: ϕ22.22(7/8")**	
Connecting method		**Suction or discharge line:Brazing, Liquid line:Flare**		
Drain		Hole for drain (ϕ20 × 6pcs, ϕ45 × 3pcs)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		–		
Indoor units to be combined		**FDTCA22, 28, 36, 45, 56 FDTA28, 36, 45, 56, 71, 90, 112, 140, 160 FDTWA28, 45, 56, 71, 90, 112, 140 FDTQA22, 28, 36 FDTSA22, 28, 36, 45, 71 FDQMA22, 28, 36 FDUA224, 280 FDUMA22, 28, 36, 45, 56, 71, 90, 112, 140**	**FDURA45, 56, 71, 90, 112, 140 FDQSA22, 28, 36, 45, 56 FDEA36, 45, 56, 71, 112, 140 FDKA22, 28, 36, 45, 56, 71 FDFLA28, 45, 71 FDFUA28, 45, 56, 71**	

Notes (1) The cooling and heating capabilities imply the values when the indoor unit of rated capacity is connected under the condition specified in ISO-T1.
(2) The refrigerant quantity in the connecting pipe is not included Charge it additionally at the site.
(3) The FDCA335HKXRE4BRK is an exclusive combination unit.

List of branch pipe part numbers (Select parts in accordance with the branching system used.)

Corresponding outdoor unit	Number of indoor units that can be connected	Branching system	
		In the upstream of a branching controller(1)	In the downstrean of a branching controller(1)
FDCA335HKXRE4BRK	–	• Downstream Capacity less than 180 DIS-22-1-R • Downstream Capacity 180 to less than 371 DIS-180-1-R • Downstream Capacity 371 to less than 540 DIS-371-1-R • Downstream Capacity 540 or more DIS-540-1-R	• Downstream Capacity less than 180 DIS-22-1 • Downstream Capacity 180 or more DIS-180-1
FDCA400HKXRE4BR	1~23 units		
FDCA450HKXRE4BR	1~26 units		

Note (1) In the branch piping method, the way branch piping is run needs to be in accordance with the total downstream capacity of the indoor units.

• Branching controller part numbers

Branching controller	Number of connectable units
Total capacity downstream Last than 112: PFD112-ER	1~5
Total capacity downstream Last than 180: PFD180-ER	1~8
Total capacity downstream Last than 280: PFD280-ER	1~10

• Integrated branching controller part numbers

Integrated branching controller	Number of connectable units
Total capacity downstream Last than 371: PFD112X4-ER	1~16

Note (1) An indoor unit with a capacity up to 112 can be connected.

Models FDCA504HKXRE4BR, 560HKXRE4BR

Item \ Models		FDCA504HKXRE4BR	FDCA560HKXRE4BR
Power source		**3 Phase 380-415V 50Hz/380V 60Hz**	
Nominal cooling capacity(1)	**kW**	**50.4**	**56.0**
Nominal heating capacity(1)	**kW**	**56.5**	**63.0**
Noise level	dB(A)	Cooling: 61, Heating: 61.5	Cooling: 62, Heating: 62.5
Exterior dimensions Height × Width × Depth	**mm**	**2048 × 1350 × 720**	
Net weight	**kg**	**345**	
Refrigerant equipment compressor type & Q' ty		GT-C5150ND78A × 2	
Starting method		Direct line starting	
Capacity control	%	11 ~ 107	9 ~ 107
Crankcase heater	**W**	**33 × 2**	
Heat exchanger		Straight fin & inner grooved tubing	
Refrigerant control		Electronic expansion valve	
Refrigerant		**R410A**	
Quantity	**kg**	**19.4**	
Refrigerant oil	**ℓ**	**4.2 (M-MA32R)**	
Defrost control		Microcomputer controlled De-Icer	
Air handling equipment Fan type & Q'ty		Propeller fan × 2	
Motor	**W**	**386 × 2**	
Starting method		Direct start	
Air flow(Standard)	**CMM**	**Cooling: 270, Heating: 250**	
Shock & vibration absorber		Rubber mount (for compressor)	
Safety equipment		Compressor overheat protection, overcurrent protection, power transistor overheating protection, abnormal high pressure protection	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ø12.7(1/2") Suction gas line: ø28.58(11/8") Discharge gas line: ø22.22 (7/8")**	
Connecting method		**Gas line:Brazing, Liquid line:Flare**	
Drain		Hole for drain (ϕ20 × 6pcs, ϕ45 × 3pcs)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		–	
Indoor units to be combined		**FDTCA22, 28, 36, 45, 56 FDTA28, 36, 45, 56, 71, 90, 112, 140, 160 FDTWA28, 45, 56, 71, 90, 112, 140 FDTQA22, 28, 36 FDTSA22, 28, 36, 45, 71 FDQMA22, 28, 36 FDUA224, 280 FDUMA22, 28, 36, 45, 56, 71, 90, 112, 140 FDURA45, 56, 71, 90, 112, 140 FDQSA22, 28, 36, 45, 56 FDEA36, 45, 56, 71, 112, 140 FDKA22, 28, 36, 45, 56, 71 FDFLA28, 45, 71 FDFUA28, 45, 56, 71**	

Notes (1) The cooling and heating capabilities imply the values when the indoor unit of rated capacity is connected under the condition specified in ISO-T1.
(2) The refrigerant quantity in the connecting pipe is not included Charge it additionally at the site.

List of branch pipe part numbers (Select parts in accordance with the branching system used.)

Corresponding Outdoor Unit	Number of Indoor Units that can be Connected	Branching System	
		In the upstream of a branching controller	In the downstrean of a branching controller
FDCA504HKXRE4BR	1~29 units	• Downstream Capacity less than 180 DIS-22-1-R • Downstream Capacity 180 to less than 371 DIS-180-1-R • Downstream Capacity 371 to less than 540 DIS-371-1-R • Downstream Capacity 540 or more DIS-540-1-R	• Downstream Capacity less than 180 DIS-22-1 • Downstream Capacity 180 or more DIS-180-1
FDCA560HKXRE4BR	1~33 units		

Note (1) In the branch piping method, the way branch piping is run needs to be in accordance with the total downstream capacity of the indoor units.

• Branching controller part numbers

Branching controller	Number of connectable units
Total capacity downstream Last than 112: PFD112-ER	1~5
Total capacity downstream Last than 180: PFD180-ER	1~8
Total capacity downstream Last than 280: PFD280-ER	1~10

• Integrated branching controller part numbers

Integrated branching controller	Number of connectable units
Total capacity downstream Last than 371: PFD112X4-ER	1~16

Note (1) An indoor unit with a capacity up to 112 can be connected.

Models FDCA615HKXRE4BR, 680HKXRE4BR

Item \ Models		FDCA615HKXRE4BR	FDCA680HKXRE4BR
Power source		**3 Phase 380-415V 50Hz/380V 60Hz**	
Nominal cooling capacity(1)	**kW**	**61.5**	**68.0**
Nominal heating capacity(1)	**kW**	**69.0**	**73.0**
Noise level	dB(A)	Cooling: 64, Heating: 64	Cooling: 64.5, Heating: 64.5
Exterior dimensions Height × Width × Depth	**mm**	**2048 × 1350 × 720**	
Net weight	**kg**	**365**	
Refrigerant equipment compressor type & Q' ty		GT-C5150ND78A × 2	
Starting method		Direct line starting	
Capacity control	%	8 ~ 110	8 ~ 100
Crankcase heater	**W**	**33 × 2**	
Heat exchanger		Straight fin & inner grooved tubing	
Refrigerant control		Electronic expansion valve	
Refrigerant		**R410A**	
Quantity	**kg**	**26.2**	
Refrigerant oil	ℓ	**4.4 (M-MA32R)**	
Defrost control		Microcomputer controlled De-Icer	
Air handling equipment Fan type & Q'ty		Propeller fan × 2	
Motor	**W**	**386 × 2**	
Starting method		Direct start	
Air flow(Standard)	**CMM**	**Cooling: 270, Heating: 250**	
Shock & vibration absorber		Rubber mount (for compressor)	
Safety equipment		Compressor overheat protection, overcurrent protection, power transistor overheating protection, abnormal high pressure protection	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ø12.7(1/2") Suction gas line: ø28.58(11/8") Discharge gas line: ø25.4 (1")**	
Connecting method		**Gas line:Brazing, Liquid line:Flare**	
Drain		Hole for drain (ϕ20 × 6pcs, ϕ45 × 3pcs)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		–	
Indoor units to be combined		**FDTCA22, 28, 36, 45, 56 FDTA28, 36, 45, 56, 71, 90, 112, 140, 160 FDTWA28, 45, 56, 71, 90, 112, 140 FDTQA22, 28, 36 FDTSA22, 28, 36, 45, 71 FDQMA22, 28, 36 FDUA224, 280 FDUMA22, 28, 36, 45, 56, 71, 90, 112, 140**	**FDURA45, 56, 71, 90, 112, 140 FDQSA22, 28, 36, 45, 56 FDEA36, 45, 56, 71, 112, 140 FDKA22, 28, 36, 45, 56, 71 FDFLA28, 45, 71 FDFUA28, 45, 56, 71**

Notes (1) The cooling and heating capabilities imply the values when the indoor unit of rated capacity is connected under the condition specified in ISO-T1.
(2) The refrigerant quantity in the connecting pipe is not included Charge it additionally at the site.

List of branch pipe part numbers (Select parts in accordance with the branching system used.)

Corresponding Outdoor Unit	Number of Indoor Units that can be Connected	Branching System	
		In the upstream of a branching controller	In the downstrean of a branching controller
FDCA615HKXRE4BR	2~36 units	• Downstream Capacity less than 180 DIS-22-1-R • Downstream Capacity 180 to less than 371 DIS-180-1-R • Downstream Capacity 371 to less than 540 DIS-371-1-R • Downstream Capacity 540 or more DIS-540-1-R	• Downstream Capacity less than 180 DIS-22-1 • Downstream Capacity 180 or more DIS-180-1
FDCA680HKXRE4BR	2~40 units		

Note (1) In the branch piping method, the way branch piping is run needs to be in accordance with the total downstream capacity of the indoor units.

• Branching controller part numbers

Branching controller	Number of connectable units
Total capacity downstream Last than 112: PFD112-ER	1~5
Total capacity downstream Last than 180: PFD180-ER	1~8
Total capacity downstream Last than 280: PFD280-ER	1~10

• Integrated branching controller part numbers

Integrated branching controller	Number of connectable units
Total capacity downstream Last than 371: PFD112X4-ER	1~16

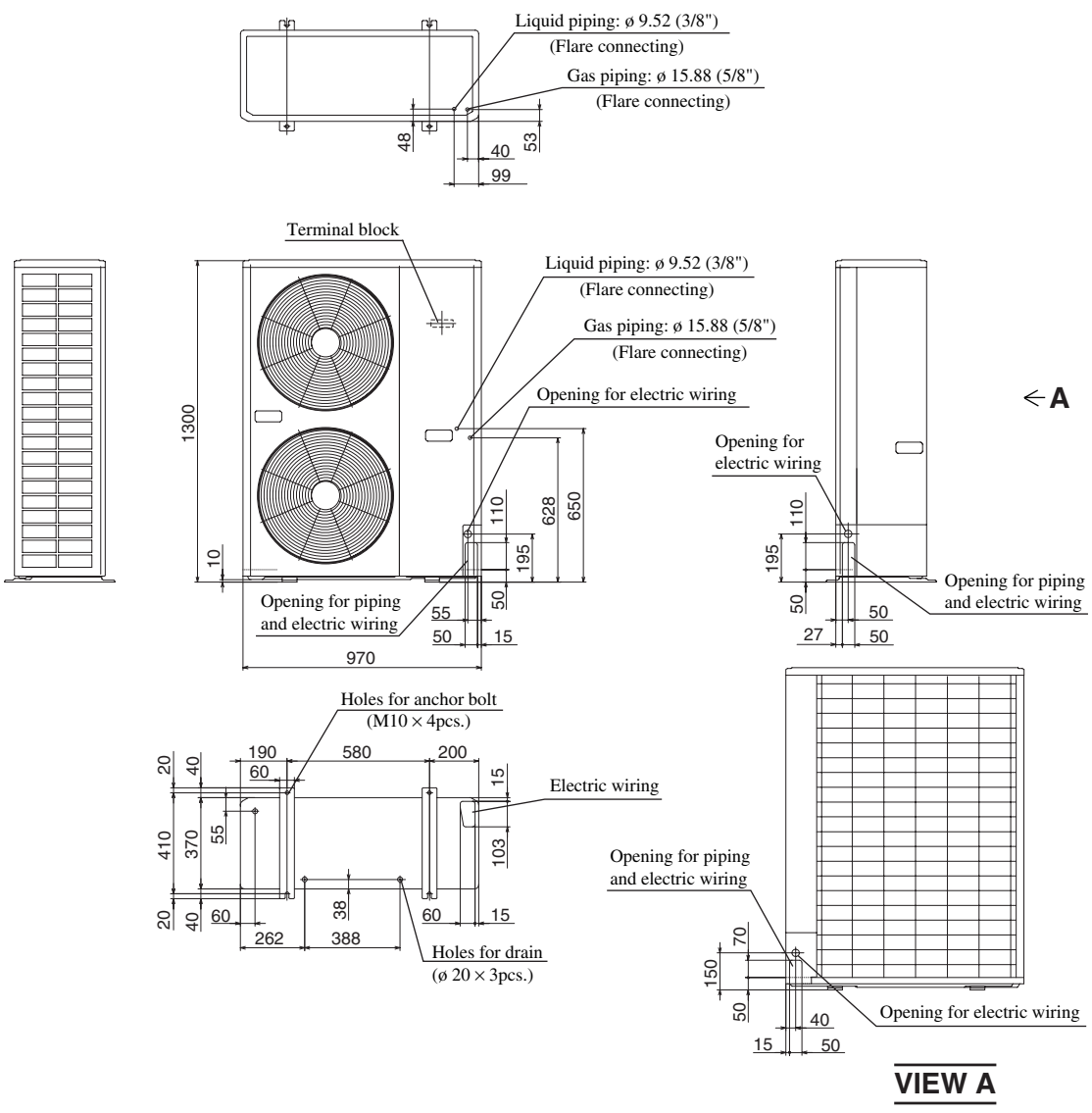
Note (1) An indoor unit with a capacity up to 112 can be connected.

2.2 Exterior dimensions

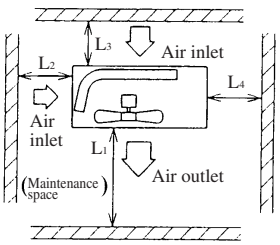
(1) KX series

Models FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R

Unit: mm



Required space for maintenance and air flow



Minimum allowable space to the obstacles

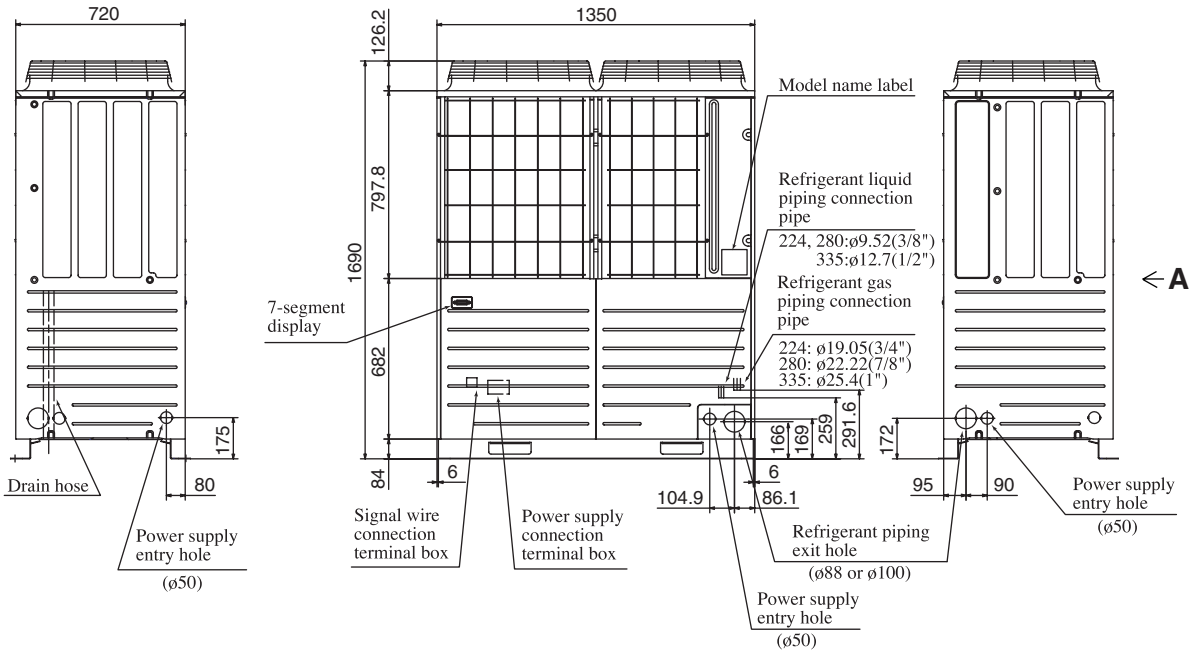
Unit:mm

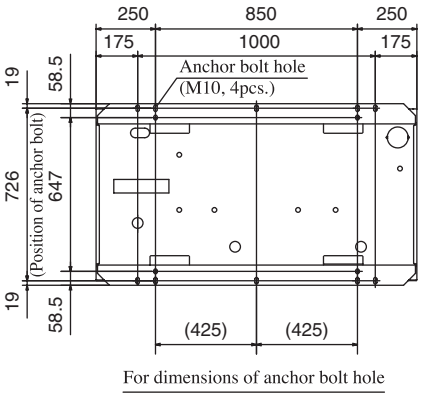
Mark \ Installation type	Ⅰ	Ⅱ	Ⅲ
L_1	Open	Open	500
L_2	300	5	Open
L_3	150	300	150
L_4	5	5	5

Notes
(1) Avoid the location where four sides are entirely surrounded by walls.
(2) Fix the unit by anchor bolts without fail. Restrict the protrusion length of anchor bolt to 15 mm and under.
(3) When strong wind blows against the unit, direct the air outlet port at a right angle to the wind direction.
(4) Secure the space of 1 m and over at the top of unit.
(5) Make the height of obstruction wall in front of air outlet port lower than the height of unit.

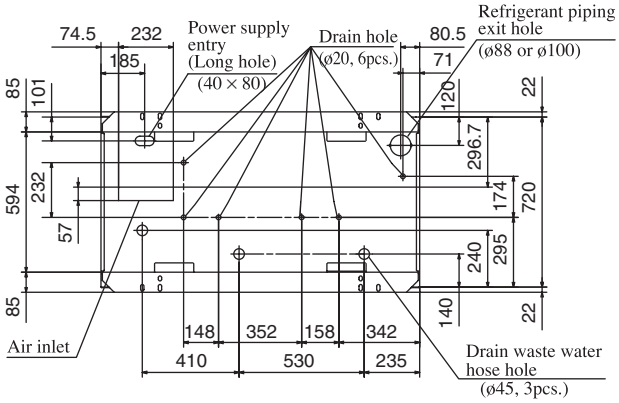
Models FDCA224HKXE4BR, 280HKXE4BR, 335HKXE4BR

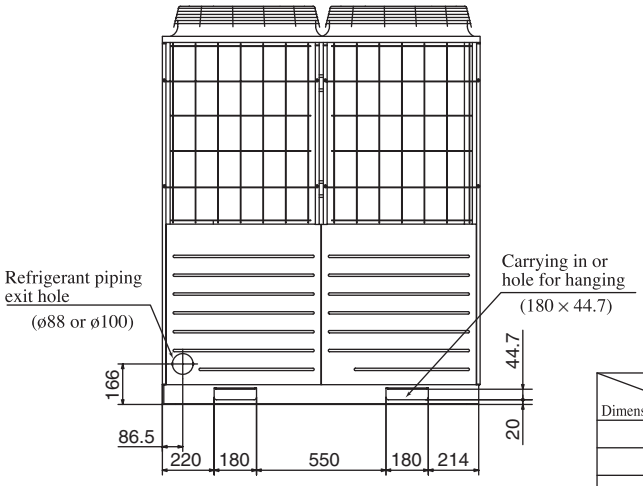
Unit : mm





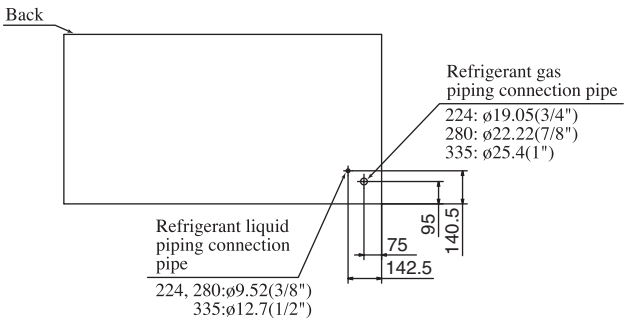
For dimensions of anchor bolt hole





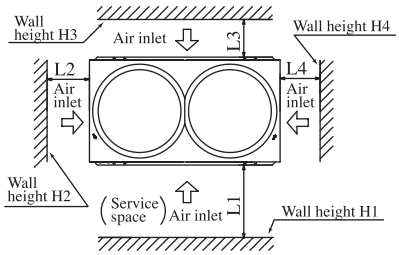
VIEW A

Dimensions after connecting included refrigerant piping (Top view)



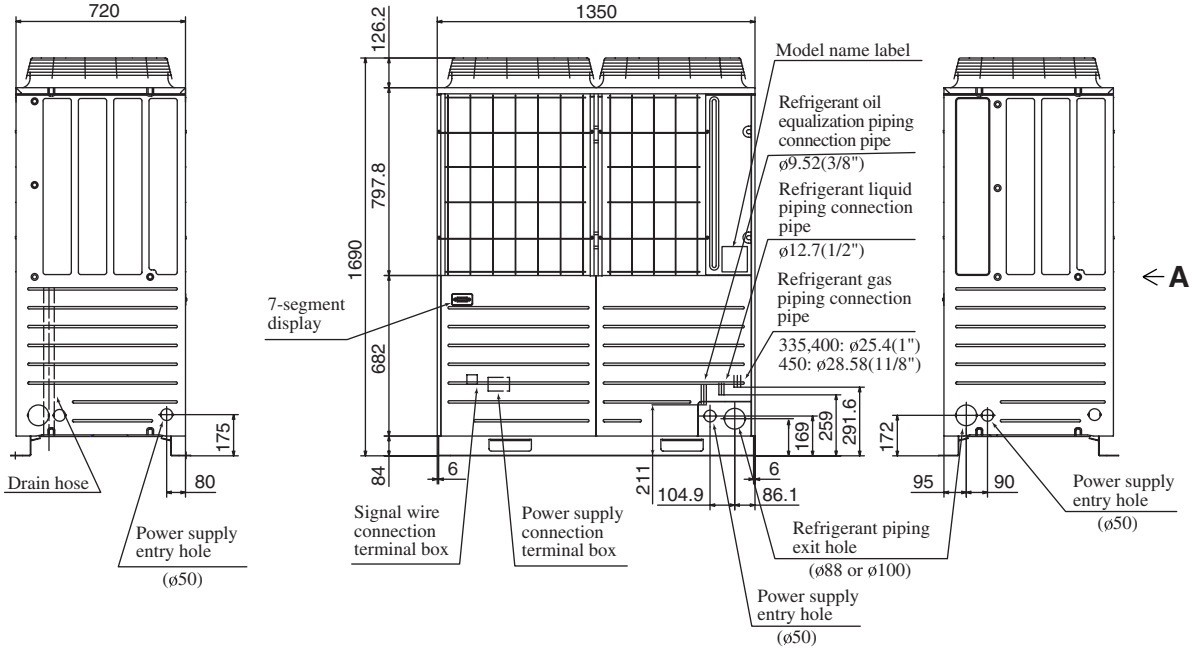
Unit:mm

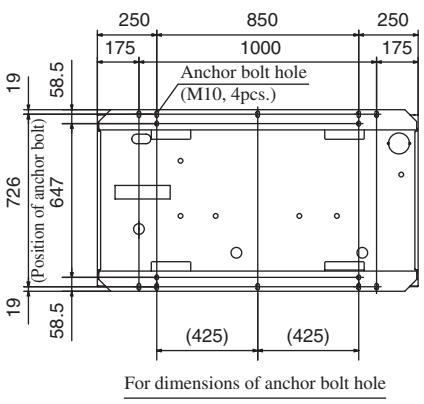
Dimensions \ Installation example	1	2
L1	500	Open
L2	10	10
L3	100	100
L4	10	Open
H1	1500	——
H2	Not limited	Not limited
H3	1000	Not limited
H4	Not limited	——



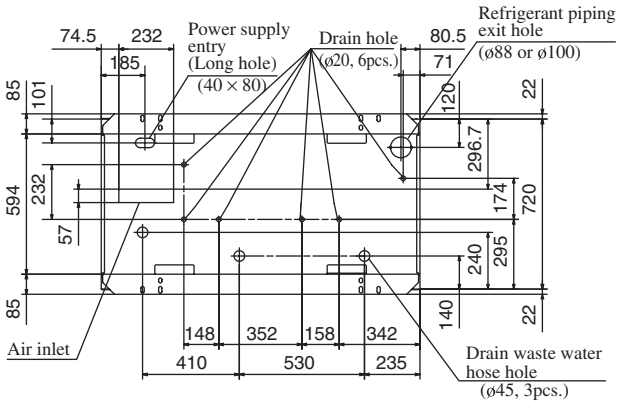
Models FDCA335HKXE4BRK, 400HKXE4BR, 450HKXE4BR

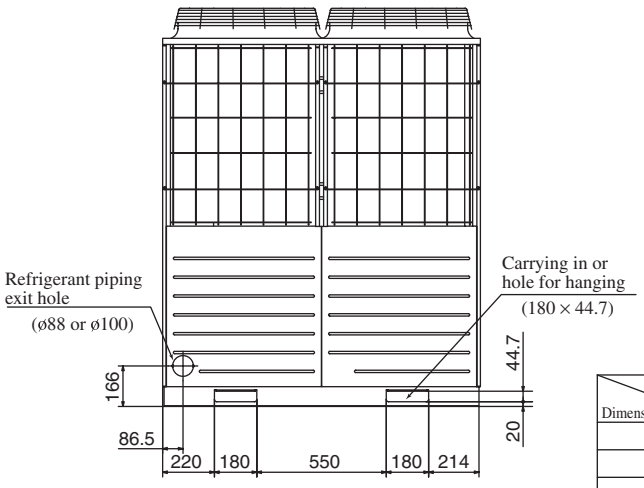
Unit : mm





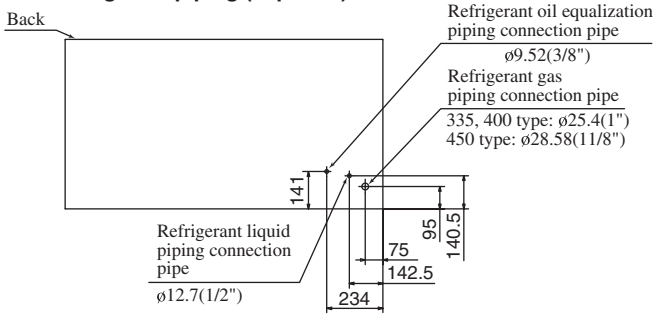
For dimensions of anchor bolt hole





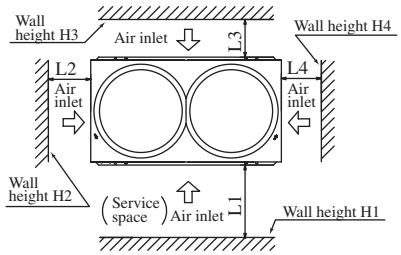
VIEW A

Dimensions after connecting included refrigerant piping (Top view)



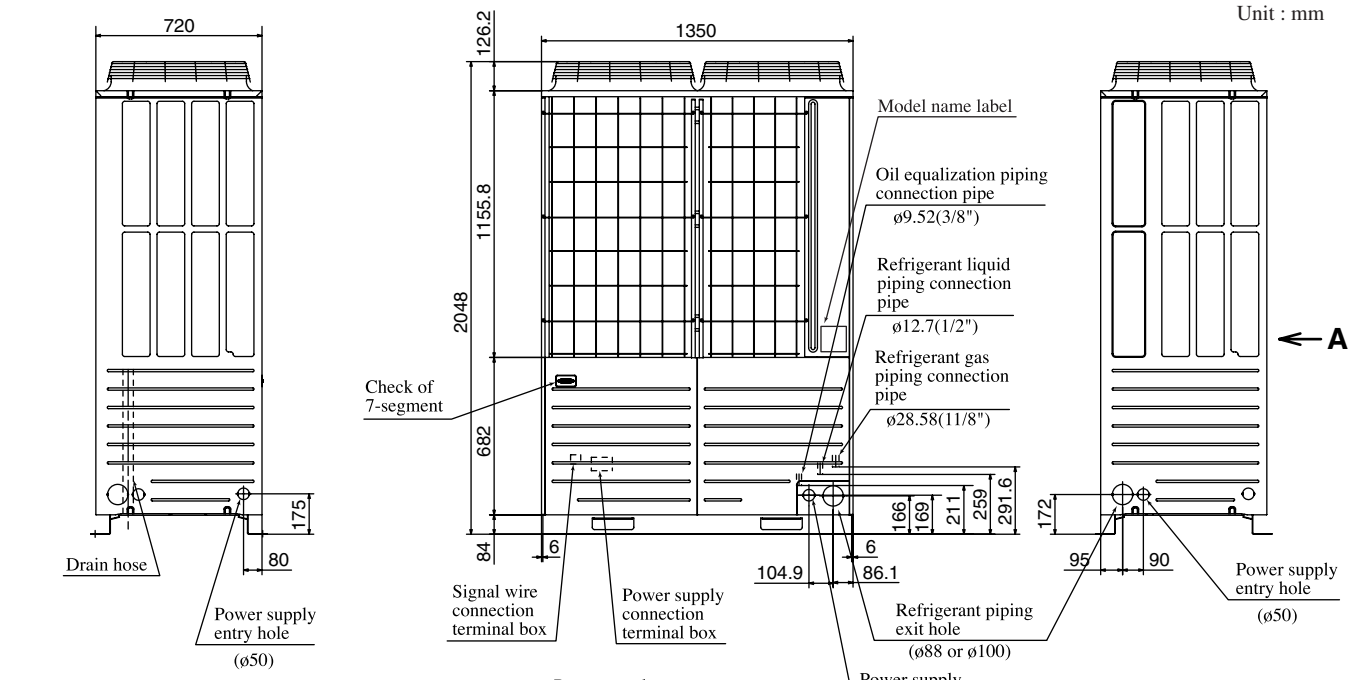
Unit:mm

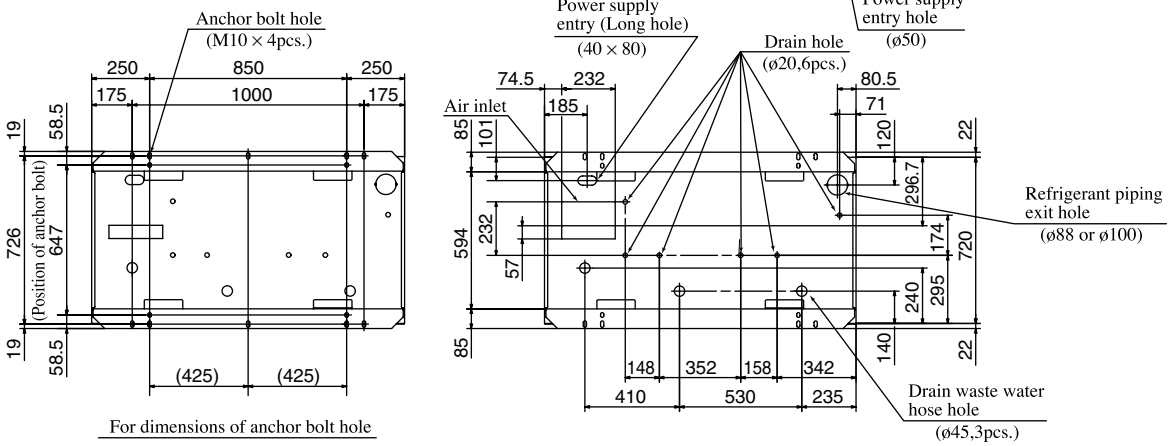
Dimensions \ Installation example	1	2
L1	500	Open
L2	10	10
L3	100	100
L4	10	Open
H1	1500	——
H2	Not limited	Not limited
H3	1000	Not limited
H4	Not limited	——

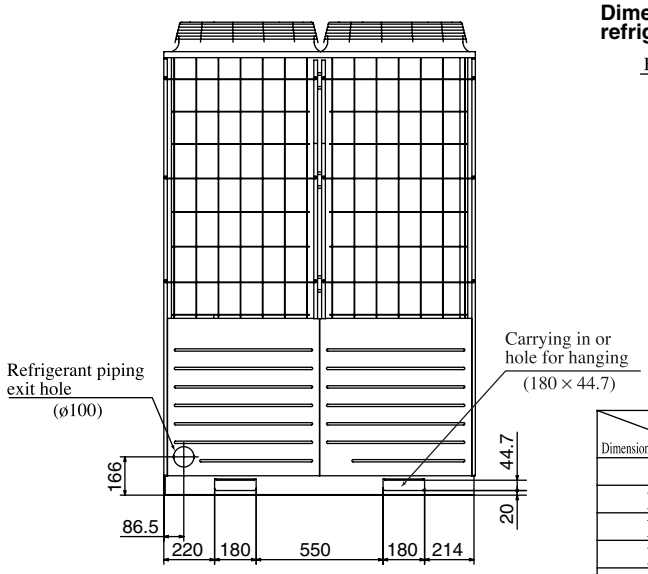


Models FDCA504HKXE4BR, 560HKXE4BR, 615HKXE4BR, 680HKXE4BR

Unit : mm

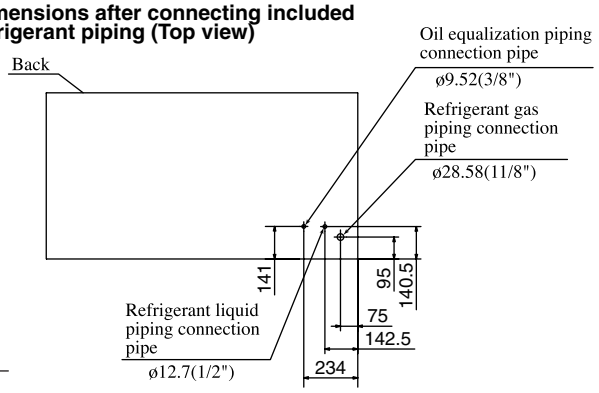






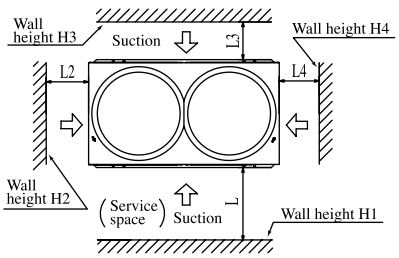
VIEW A

Dimensions after connecting included refrigerant piping (Top view)

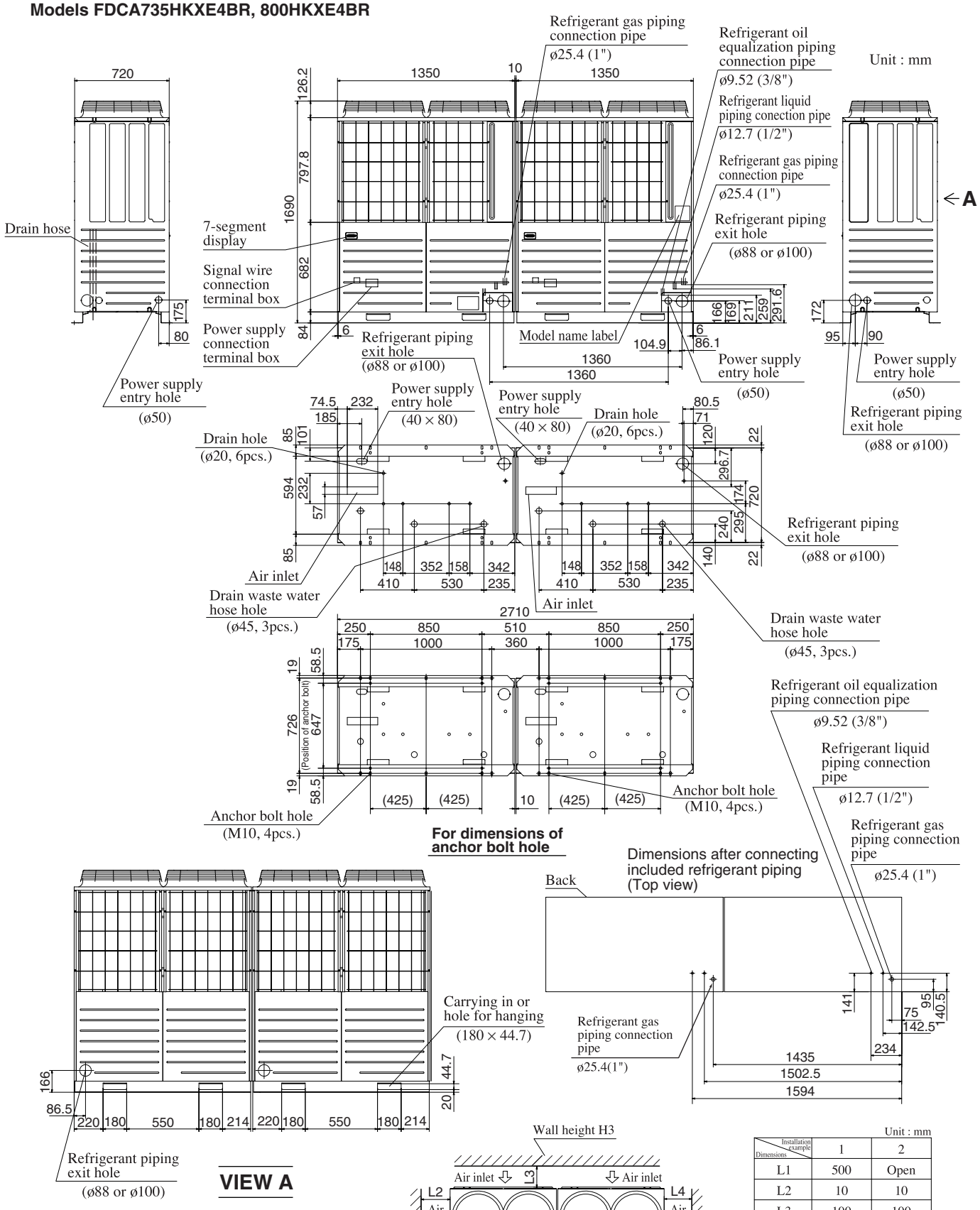


Unit:mm

Dimensions \ Installation example	1	2
L	500	Open
L2	10	10
L3	100	100
L4	10	Open
H	1500	——
H2	Not limited	Not limited
H3	1000	Not limited
H4	Not limited	——



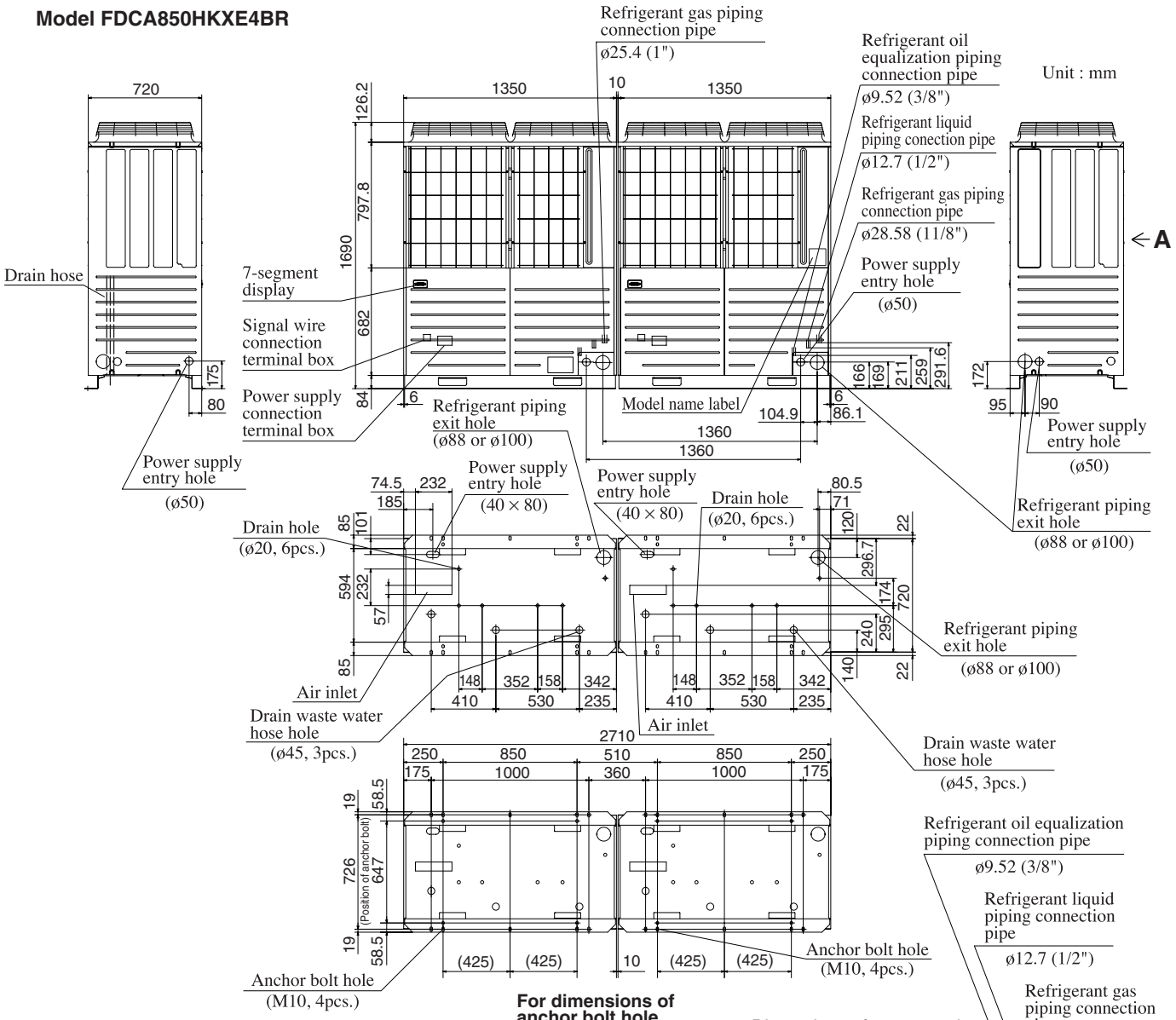
Models FDCA735HKXE4BR, 800HKXE4BR



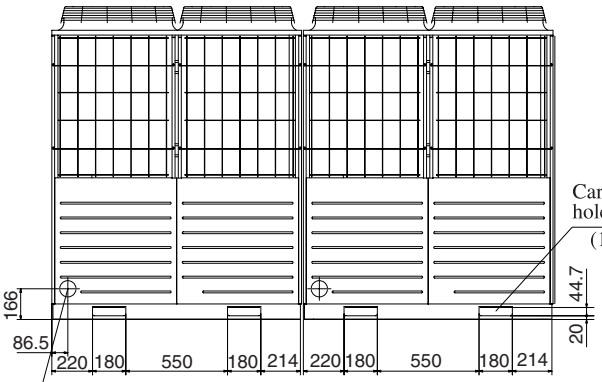
Installation example / Dimensions	1	2
L1	500	Open
L2	10	10
L3	100	100
L4	10	Open
H1	1500	–
H2	No limited	No limited
H3	1000	No limited
H4	No limited	–

Model FDCA850HKXE4BR

Unit : mm

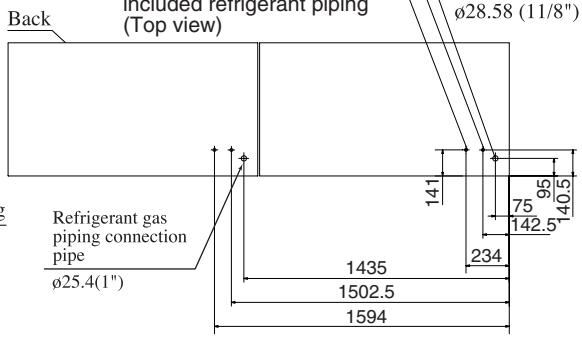


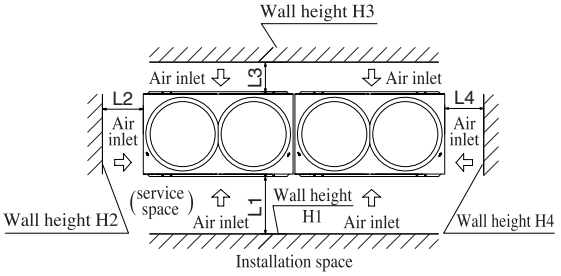
For dimensions of anchor bolt hole



VIEW A

Dimensions after connecting included refrigerant piping (Top view)

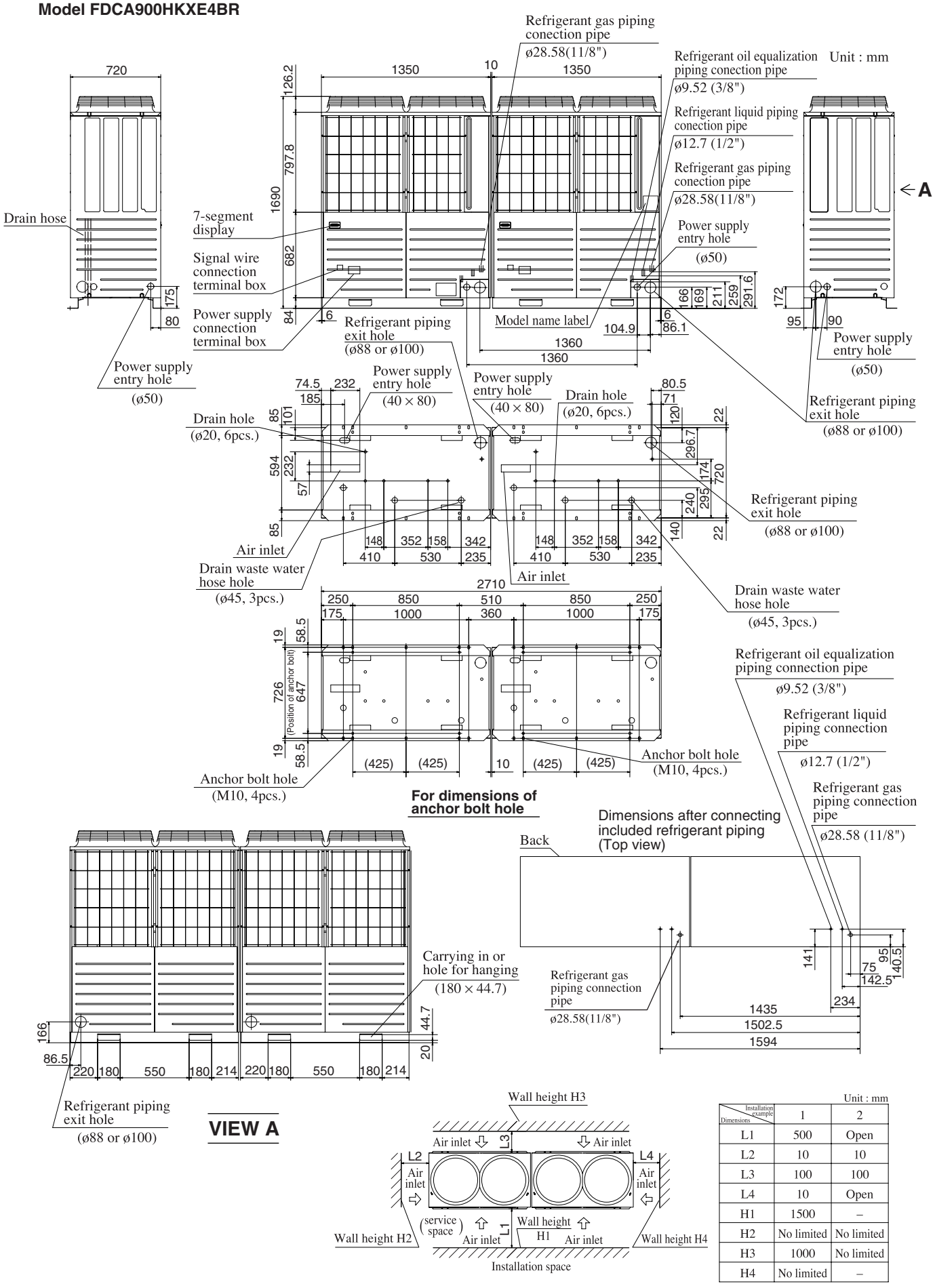




Unit : mm

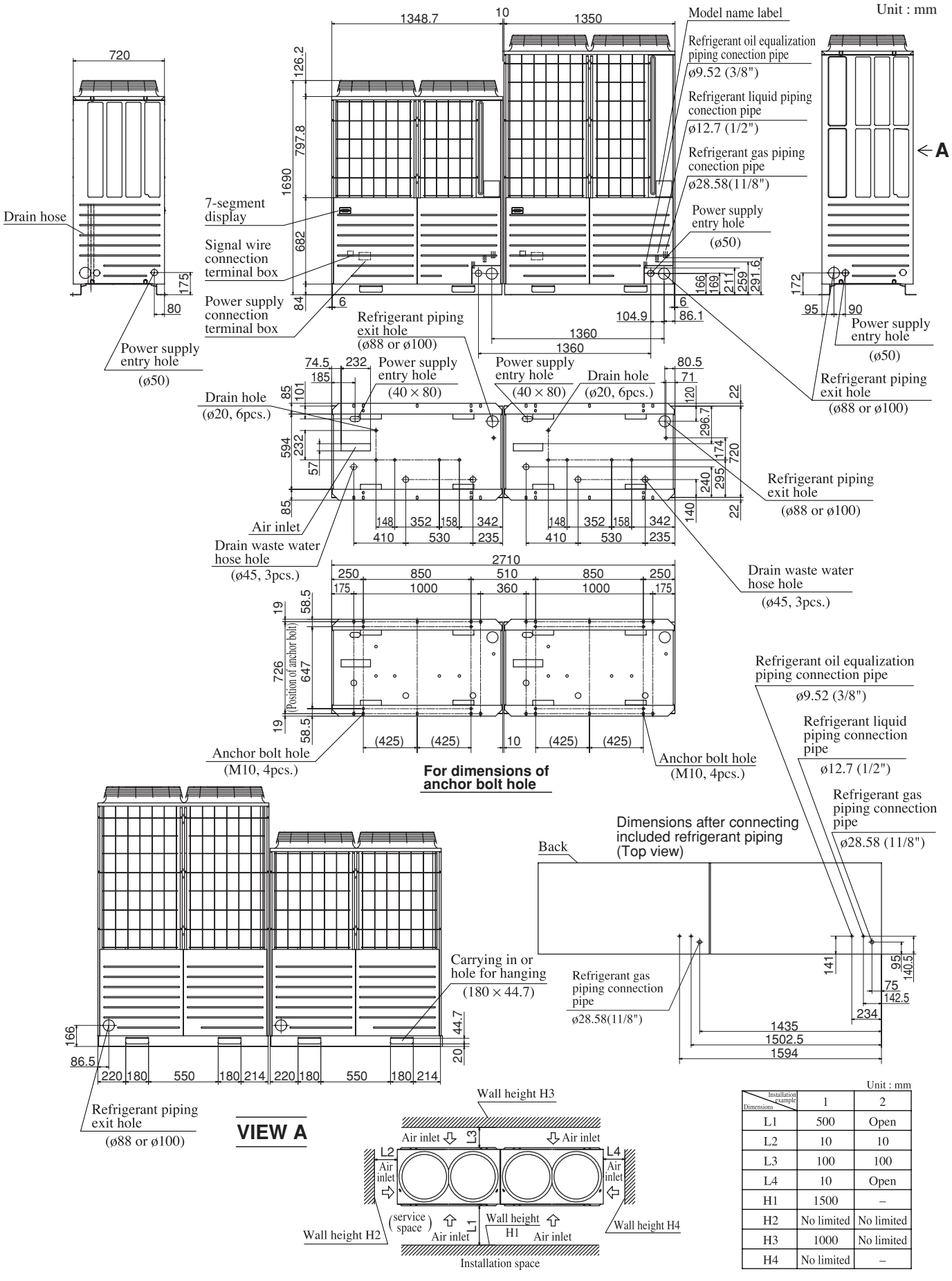
Dimensions \ Installation example	1	2
L1	500	Open
L2	10	10
L3	100	100
L4	10	Open
H1	1500	–
H2	No limited	No limited
H3	1000	No limited
H4	No limited	–

Model FDCA900HKXE4BR



Dimensions \ Installation example	1	2
L1	500	Open
L2	10	10
L3	100	100
L4	10	Open
H1	1500	–
H2	No limited	No limited
H3	1000	No limited
H4	No limited	–

Model FDCA960HKXE4BR

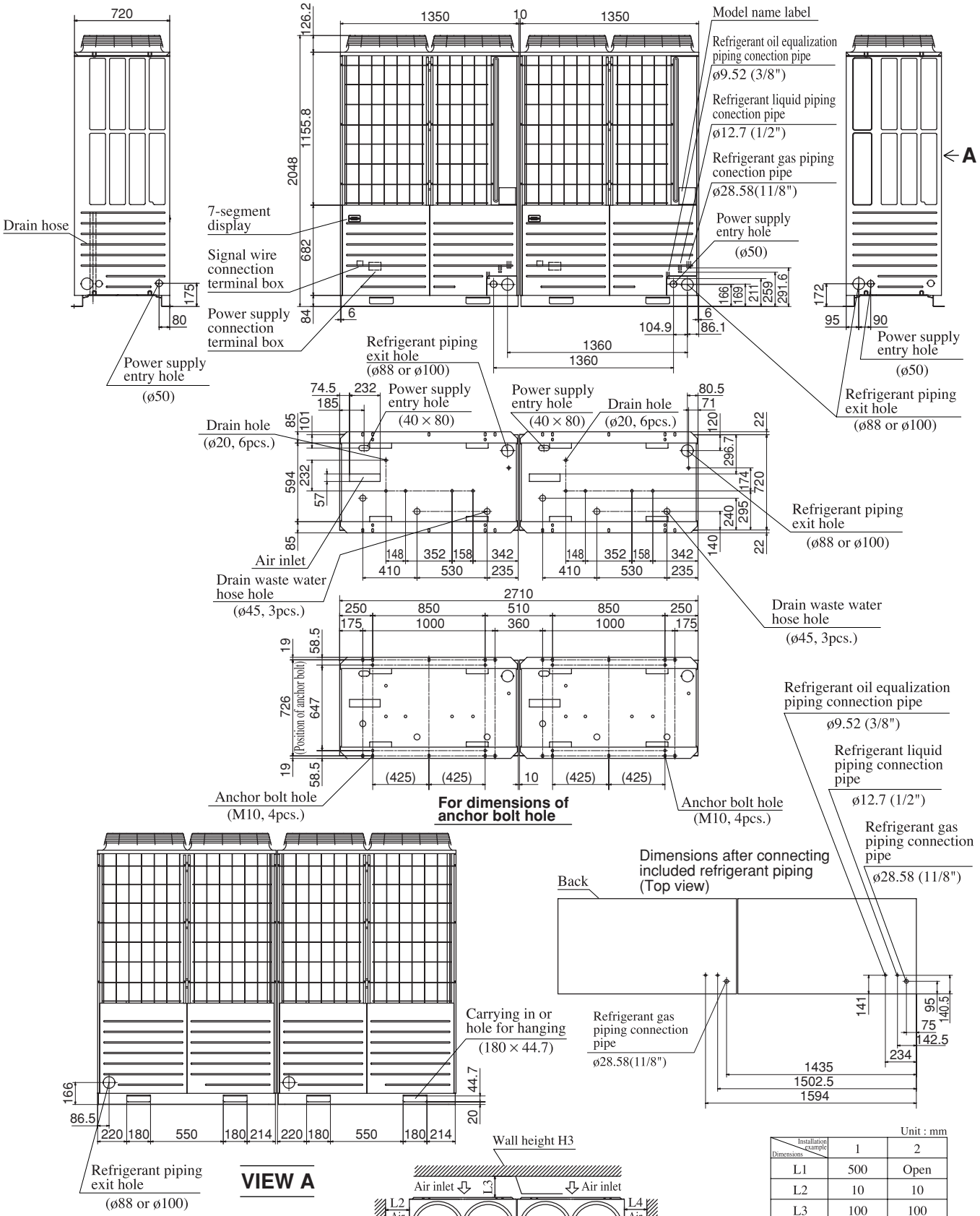


Unit : mm

Dimensions \ Installation example	1	2
L1	500	Open
L2	10	10
L3	100	100
L4	10	Open
H1	1500	–
H2	No limited	No limited
H3	1000	No limited
H4	No limited	–

Models FDCA1010HKXE4BR, 1065HKXE4BR, 1130HKXE4BR, 1180HKXE4BR
1235HKXE4BR, 1300HKXE4BR, 1360HKXE4BR

Unit : mm



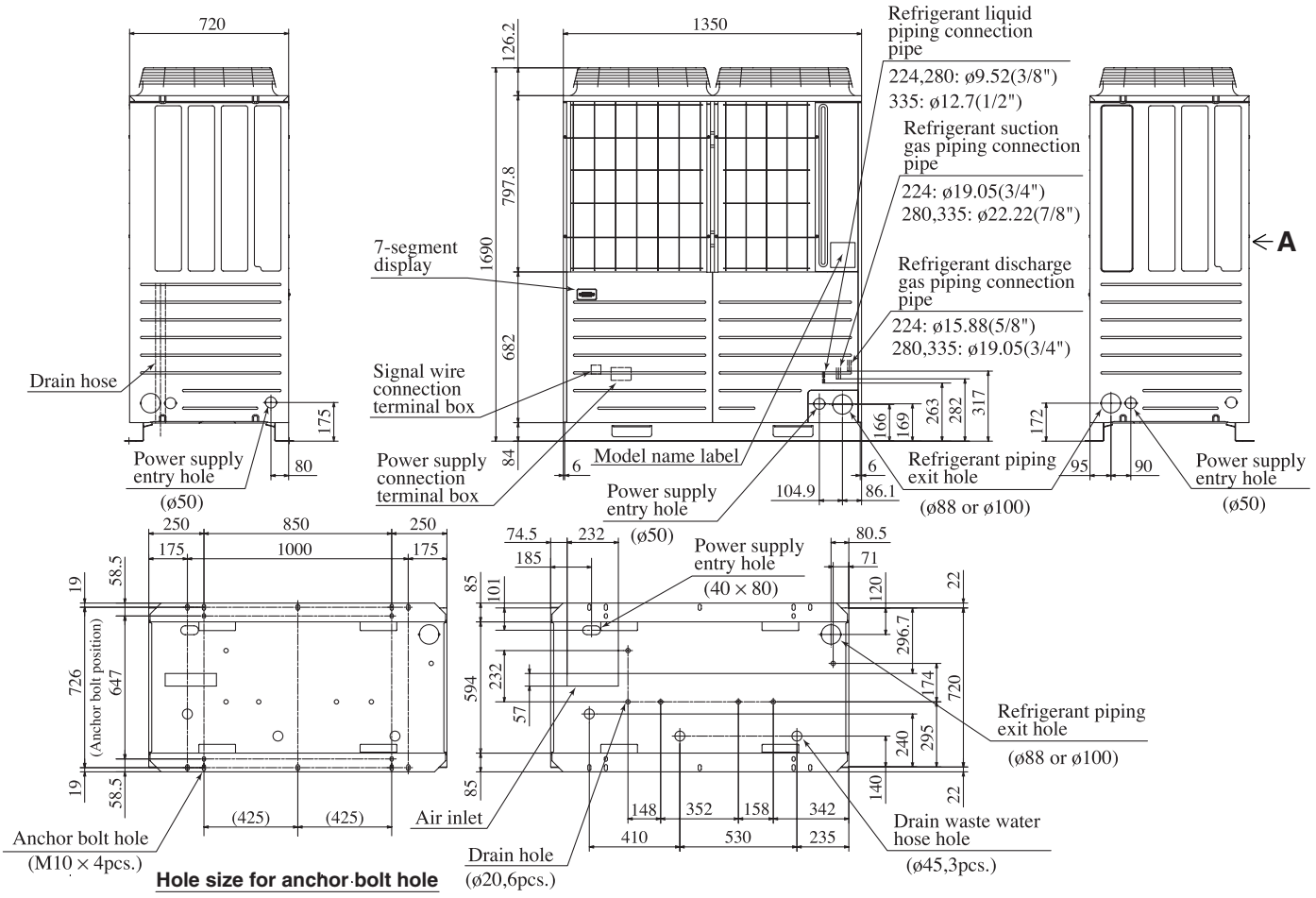
Unit : mm

Installation example / Dimensions	1	2
L1	500	Open
L2	10	10
L3	100	100
L4	10	Open
H1	1500	–
H2	No limited	No limited
H3	1000	No limited
H4	No limited	–

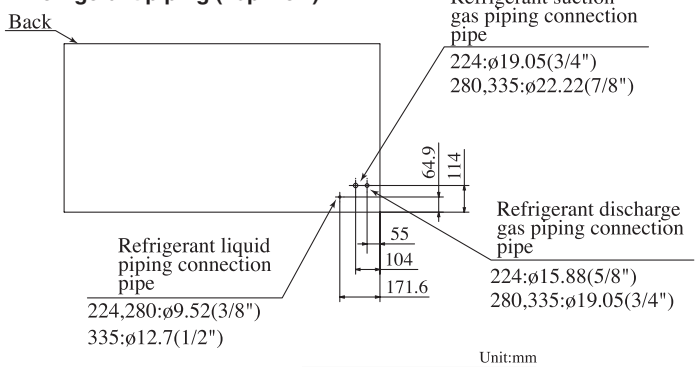
(2) KXR series

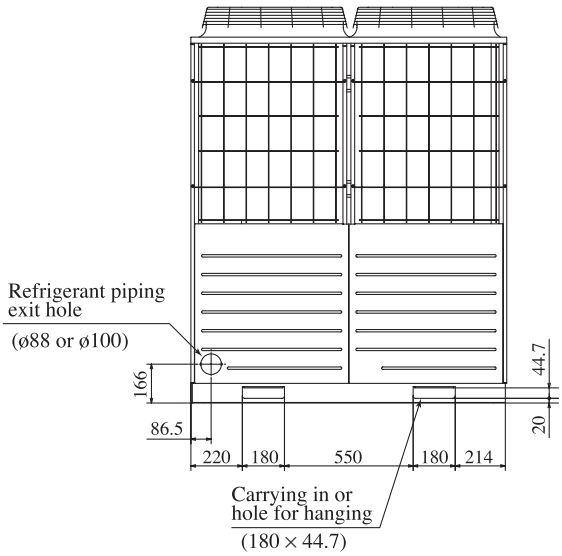
Models FDCA224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR

Unit:mm

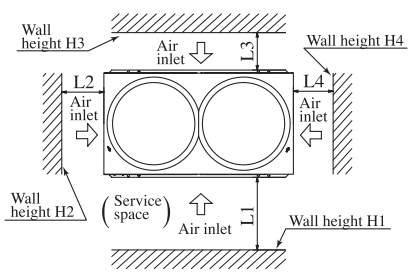


Dimensions after connecting included refrigerant piping (Top view)





VIEW A

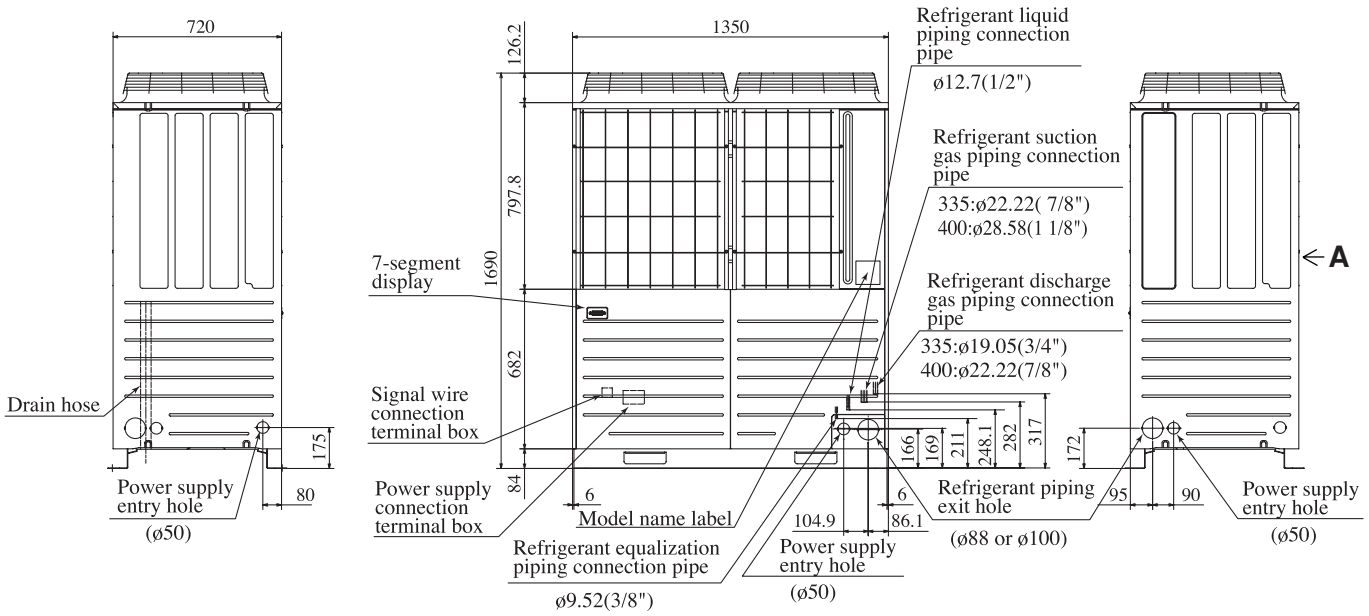


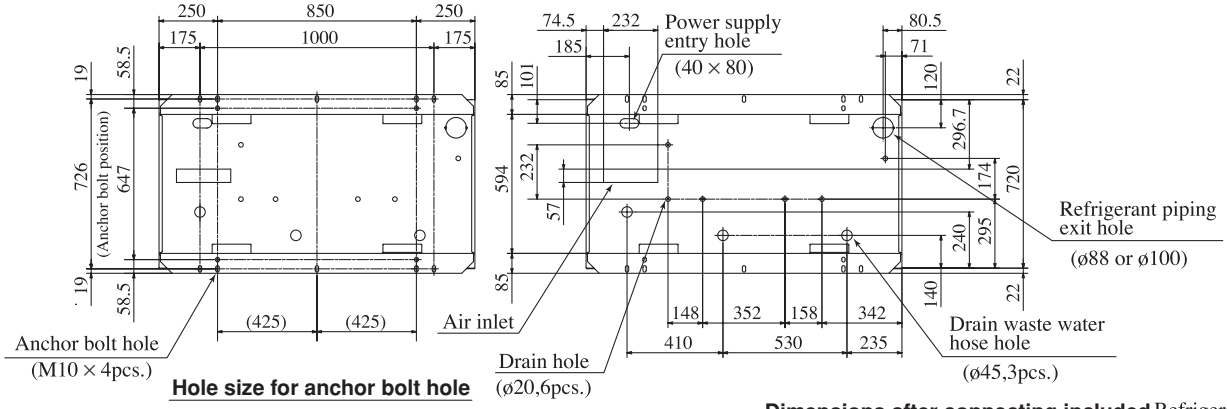
Unit:mm

Installation example / Dimensions	1	2
L	500	Open
L2	10	10
L3	100	100
L4	10	Open
H	1500	——
H2	Not limited	Not limited
H3	1000	Not limited
H4	Not limited	——

Models FDCA335HKXRE4BRK, 400HKXRE4BR

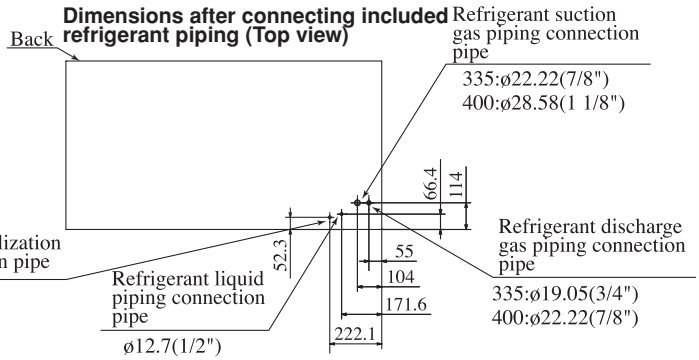
Unit:mm

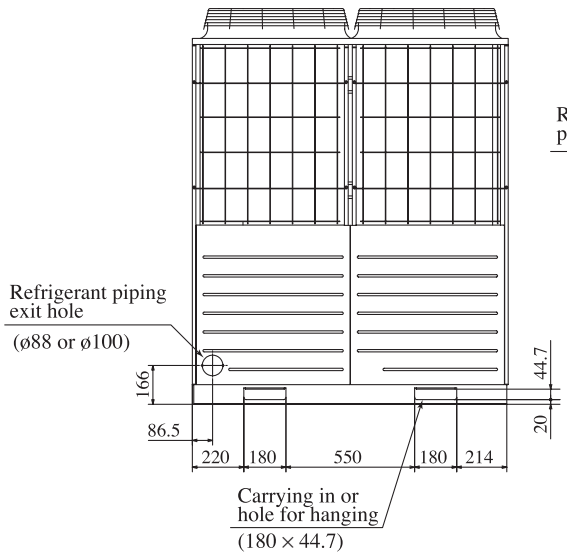


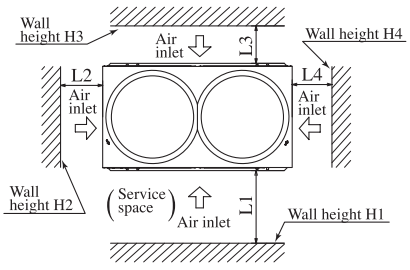


Hole size for anchor bolt hole

Dimensions after connecting included refrigerant piping (Top view)







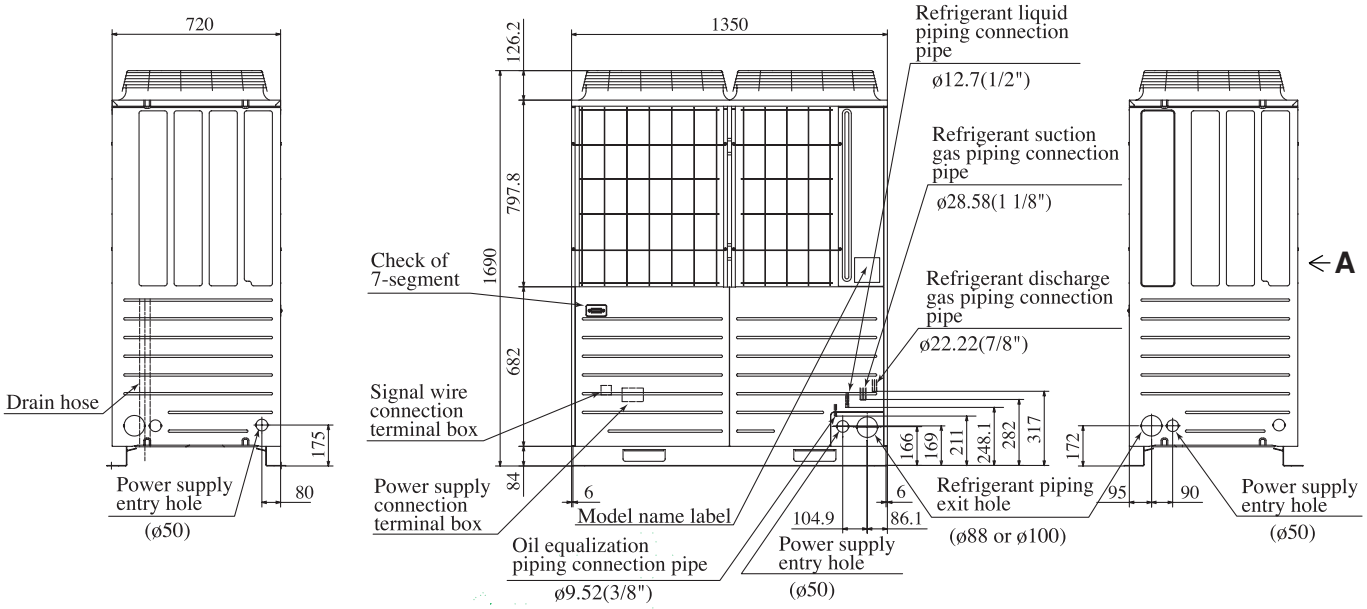
Unit:mm

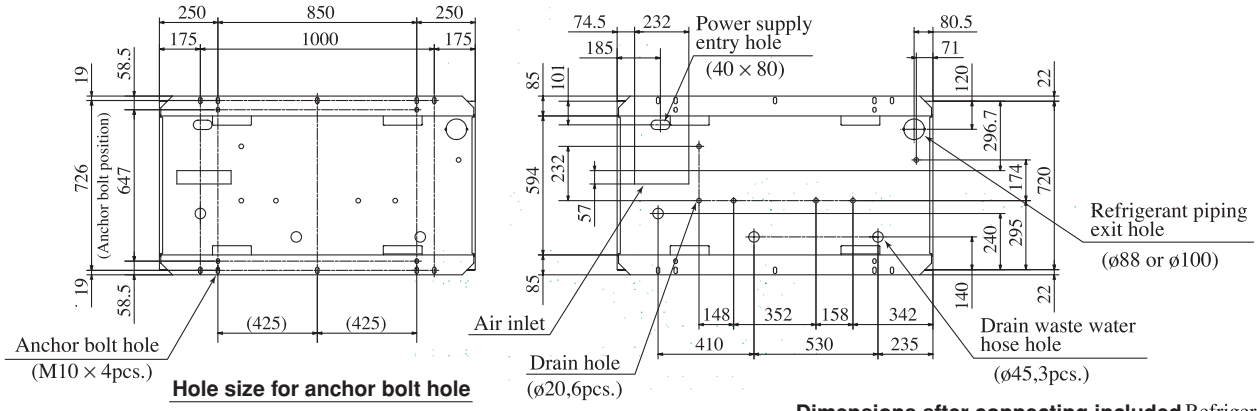
Installation example / Dimensions	1	2
L	500	Open
L2	10	10
L3	100	100
L4	10	Open
H	1500	——
H2	Not limited	Not limited
H3	1000	Not limited
H4	Not limited	——

VIEW A

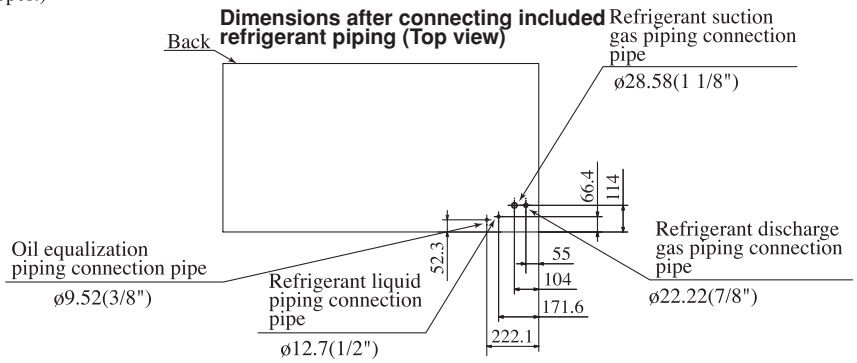
Model FDCA450HKXRE4BR

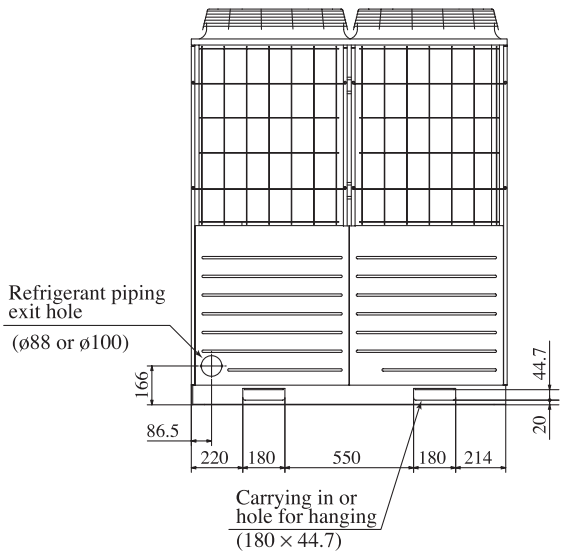
Unit:mm



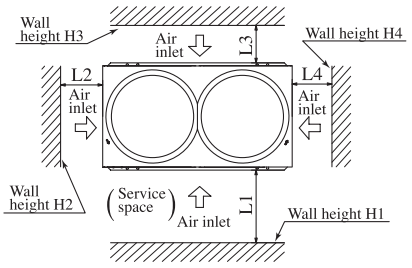


Dimensions after connecting included refrigerant piping (Top view)





VIEW A

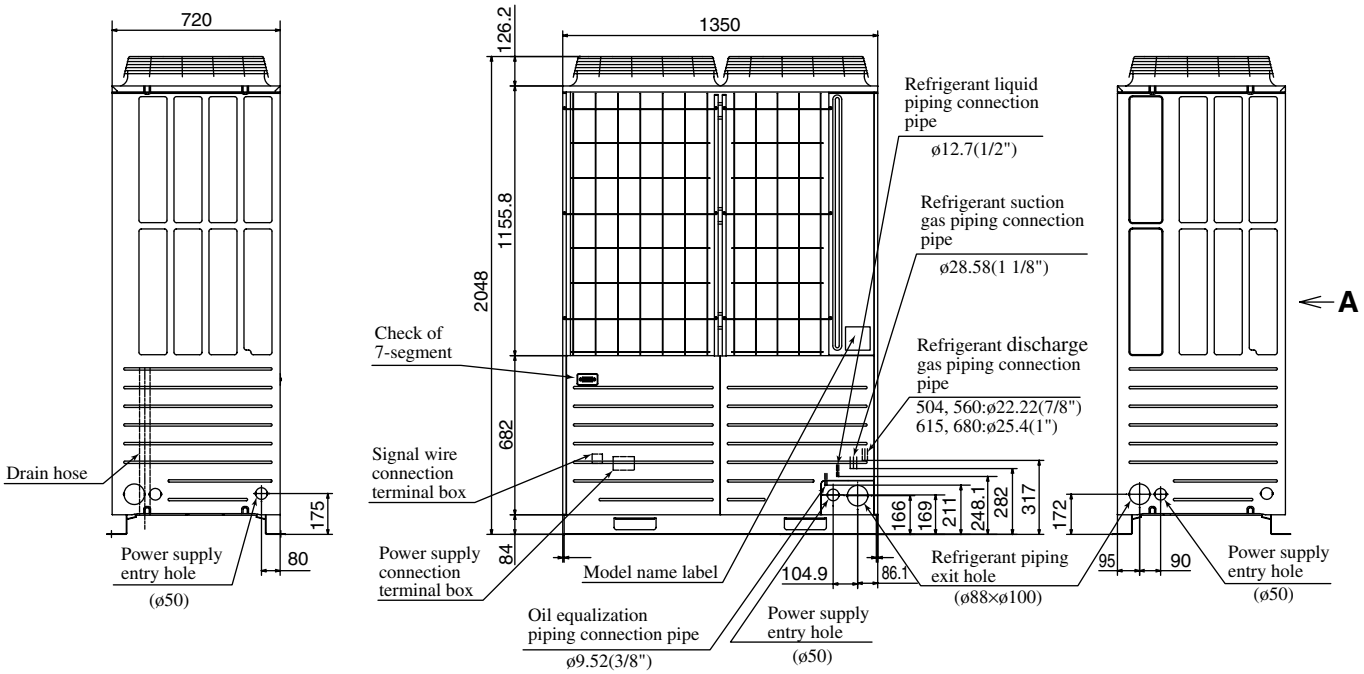


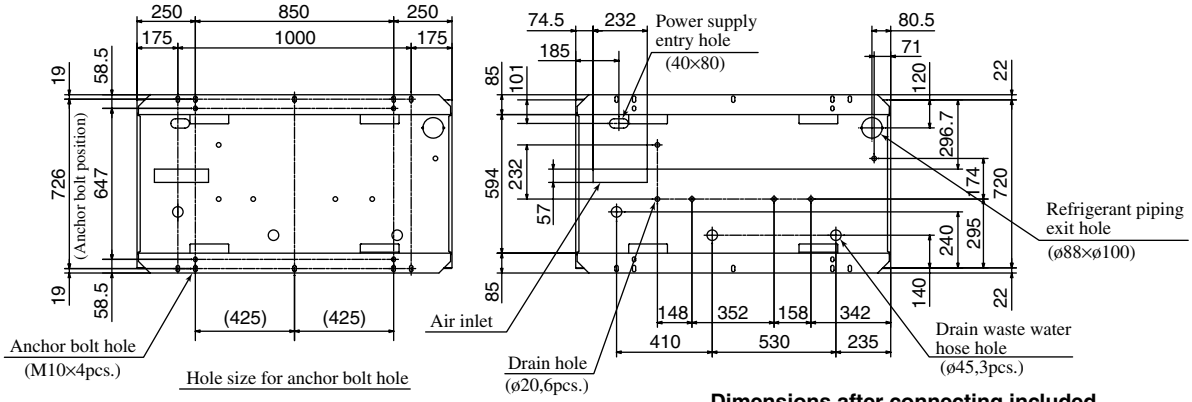
Unit:mm

Installation example / Dimensions	1	2
L	500	Open
L2	10	10
L3	100	100
L4	10	Open
H	1500	——
H2	Not limited	Not limited
H3	1000	Not limited
H4	Not limited	——

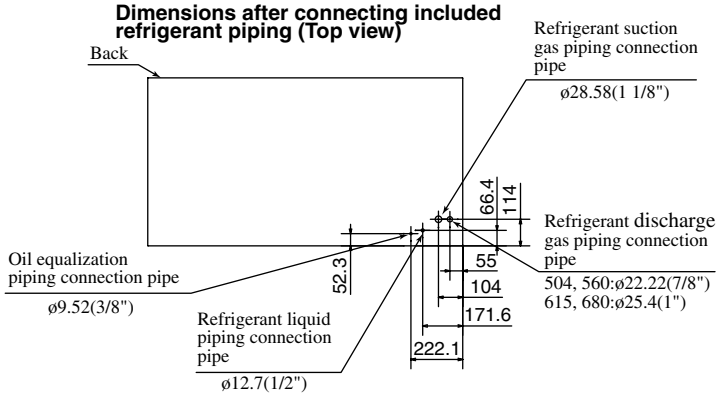
Models FDCA504HKXRE4BR, 560HKXRE4BR, 615HKXRE4BR, 680HKXRE4BR

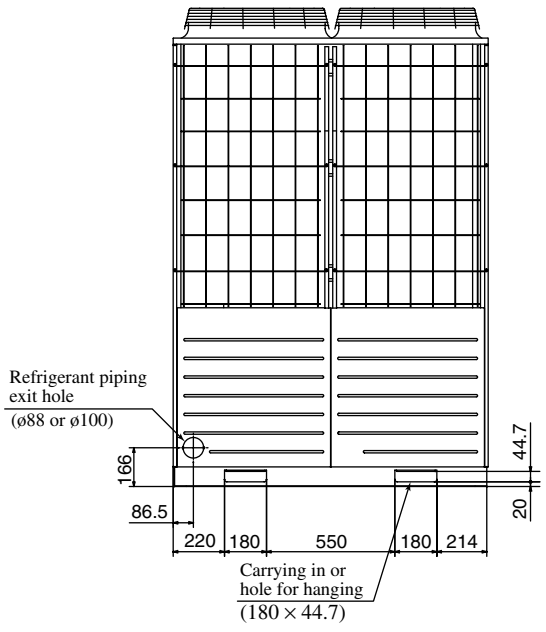
Unit : mm



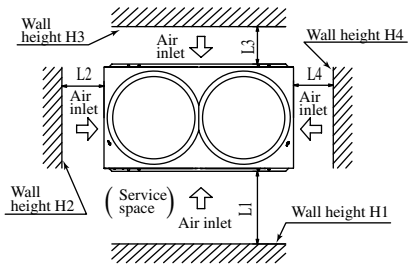


Dimensions after connecting included refrigerant piping (Top view)





VIEW A



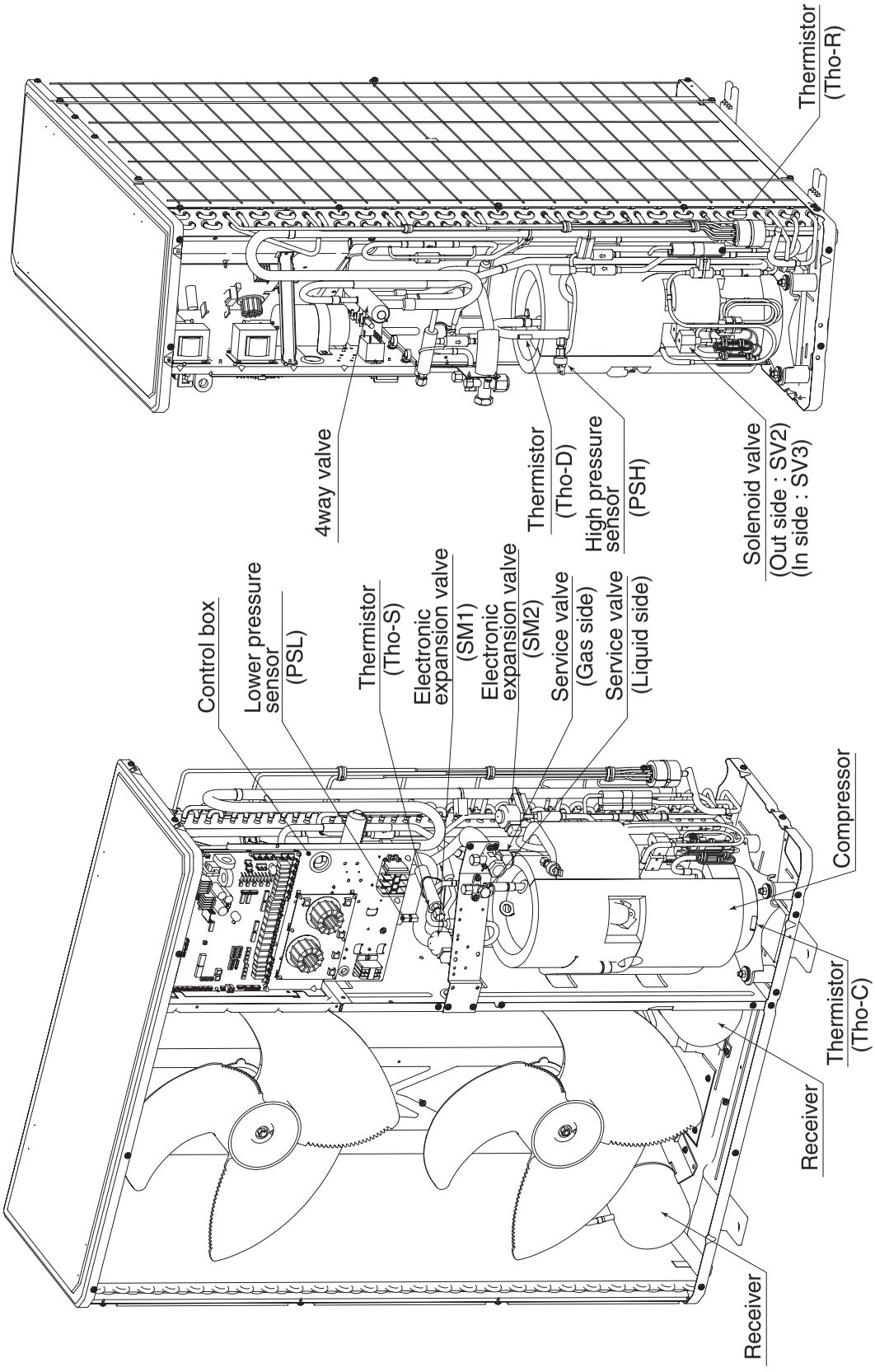
Unit:mm

Installation example / Dimensions	1	2
L	500	Open
L2	10	10
L3	100	100
L4	10	Open
H	1500	——
H2	Not limited	Not limited
H3	1000	Not limited
H4	Not limited	——

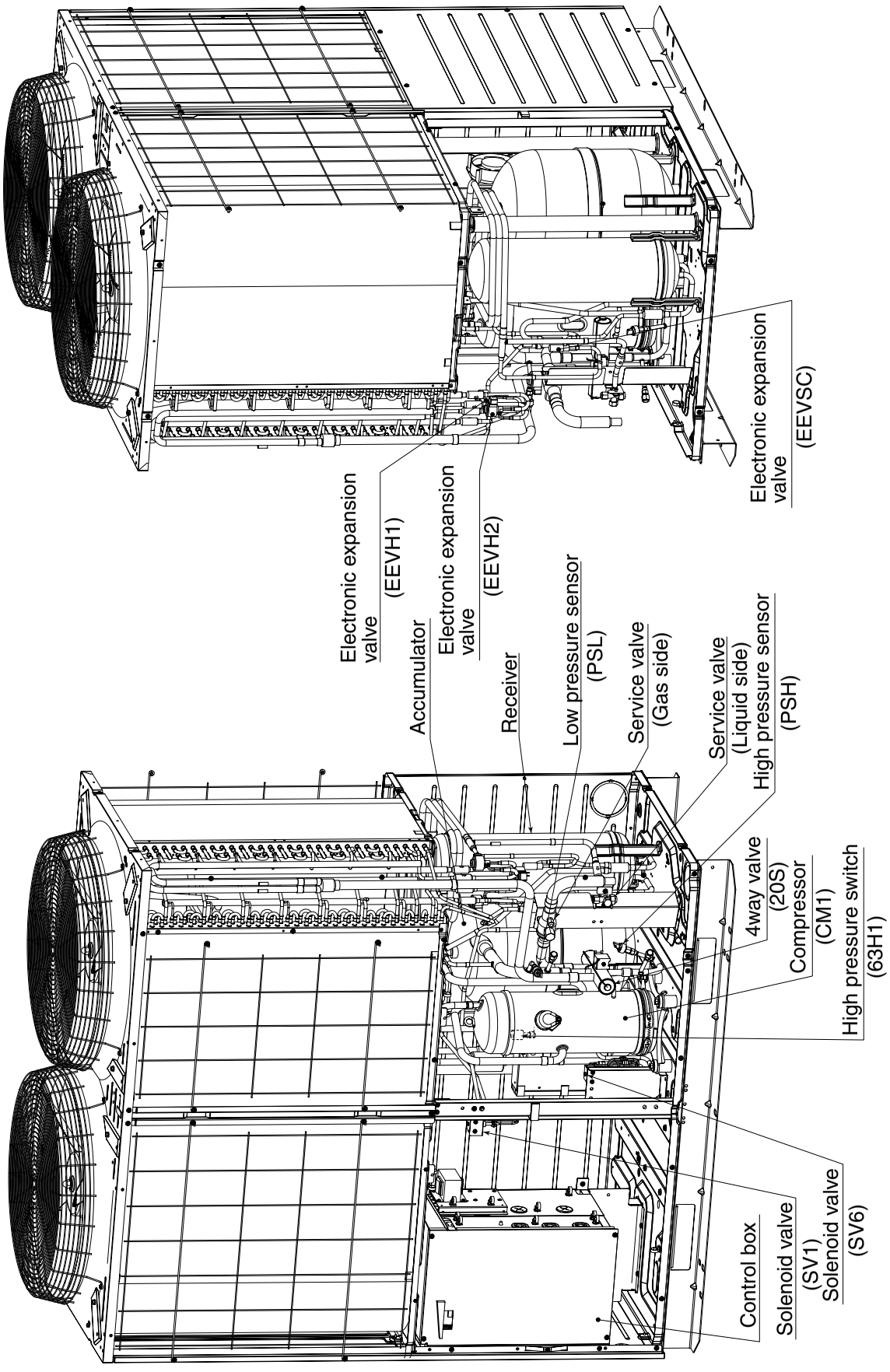
2.3 Inside view

(1) KX series

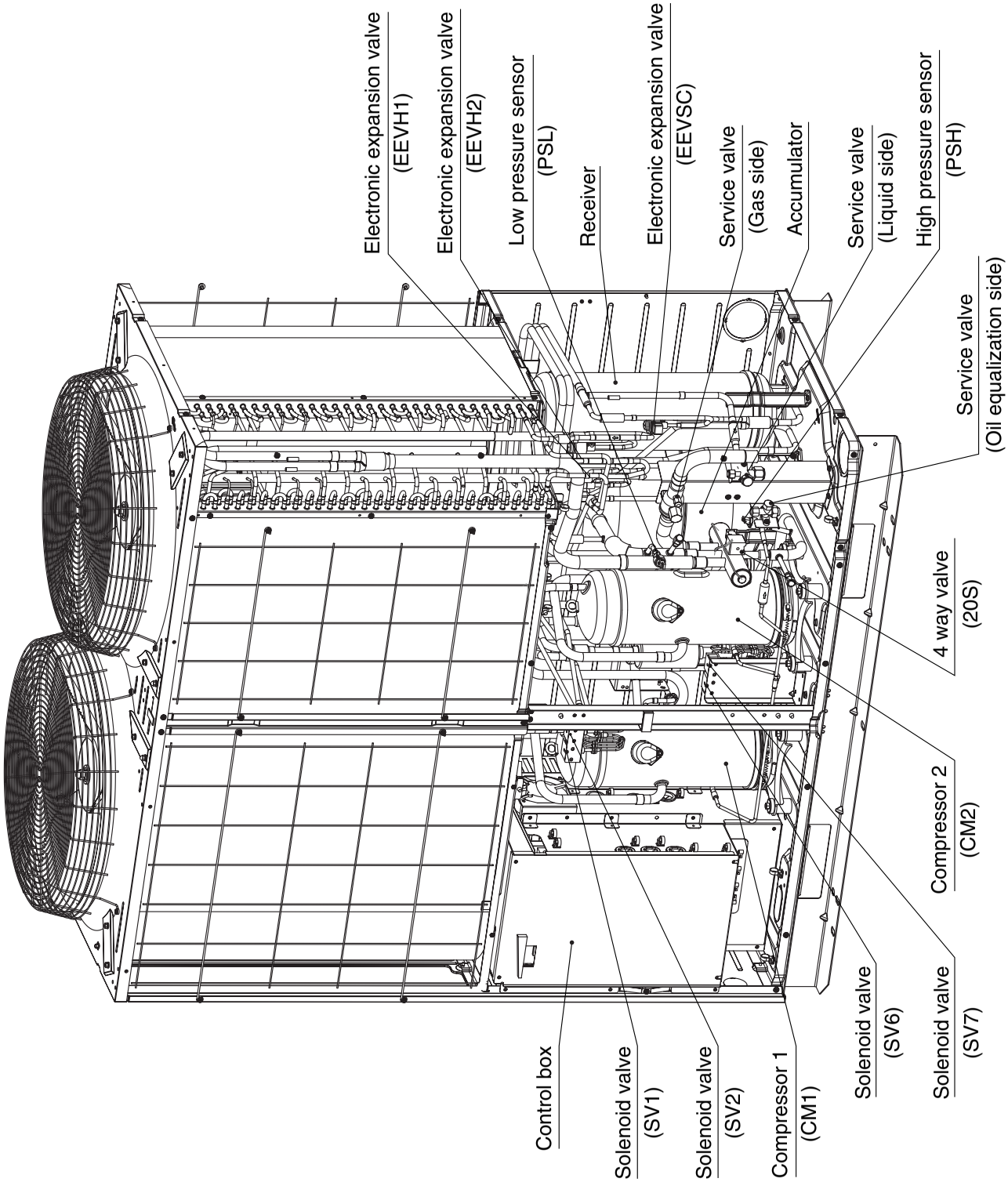
Models FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R



Models FDCA224HKXE4BR, 280HKXE4BR, 335HKXE4BR

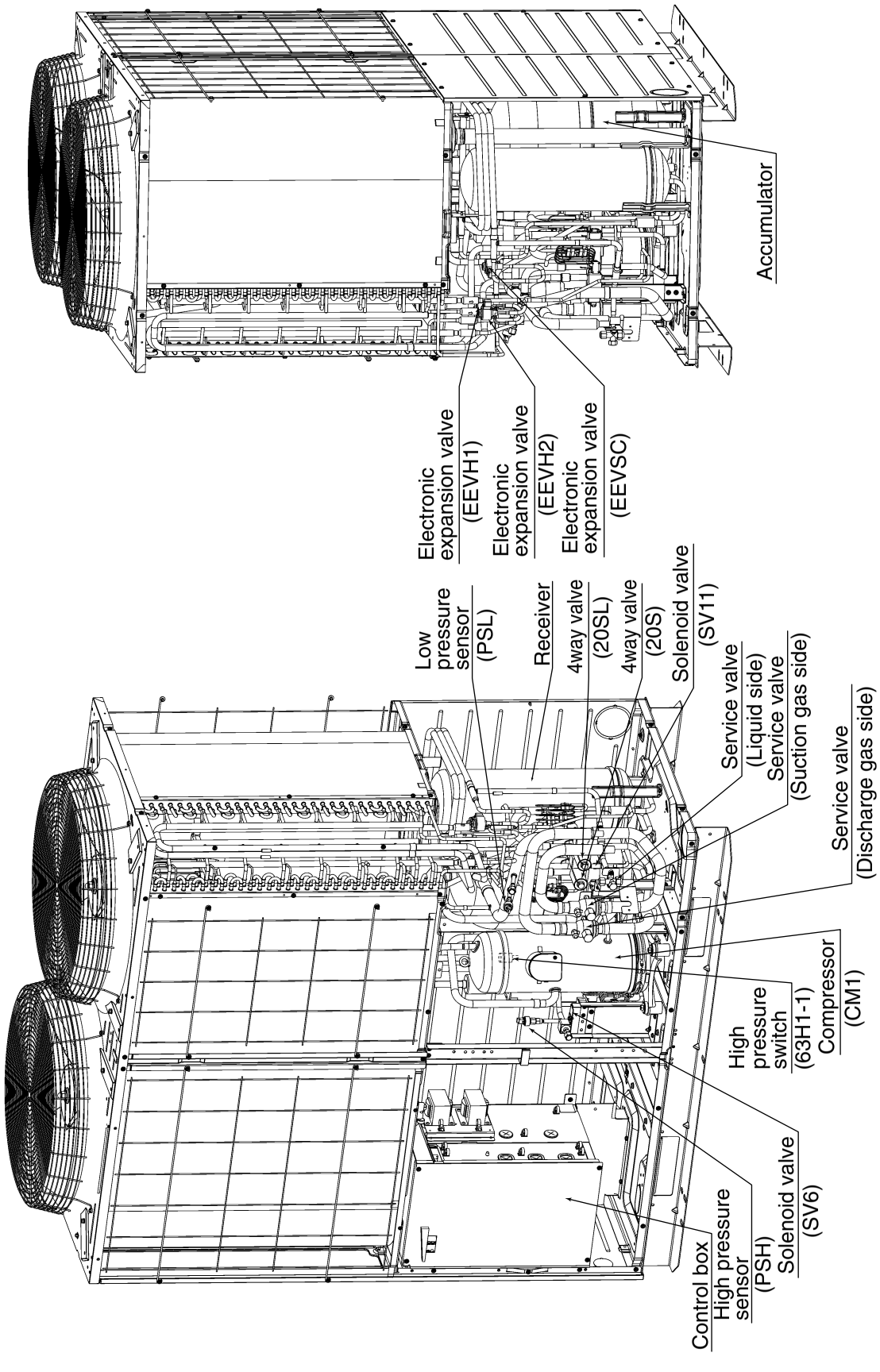


Models FDCA335HKXE4BRK, 400HKXE4BR, 450HKXE4BR, 504HKXE4BR, 560HKXE4BR, 615HKXE4BR, 680HKXE4BR

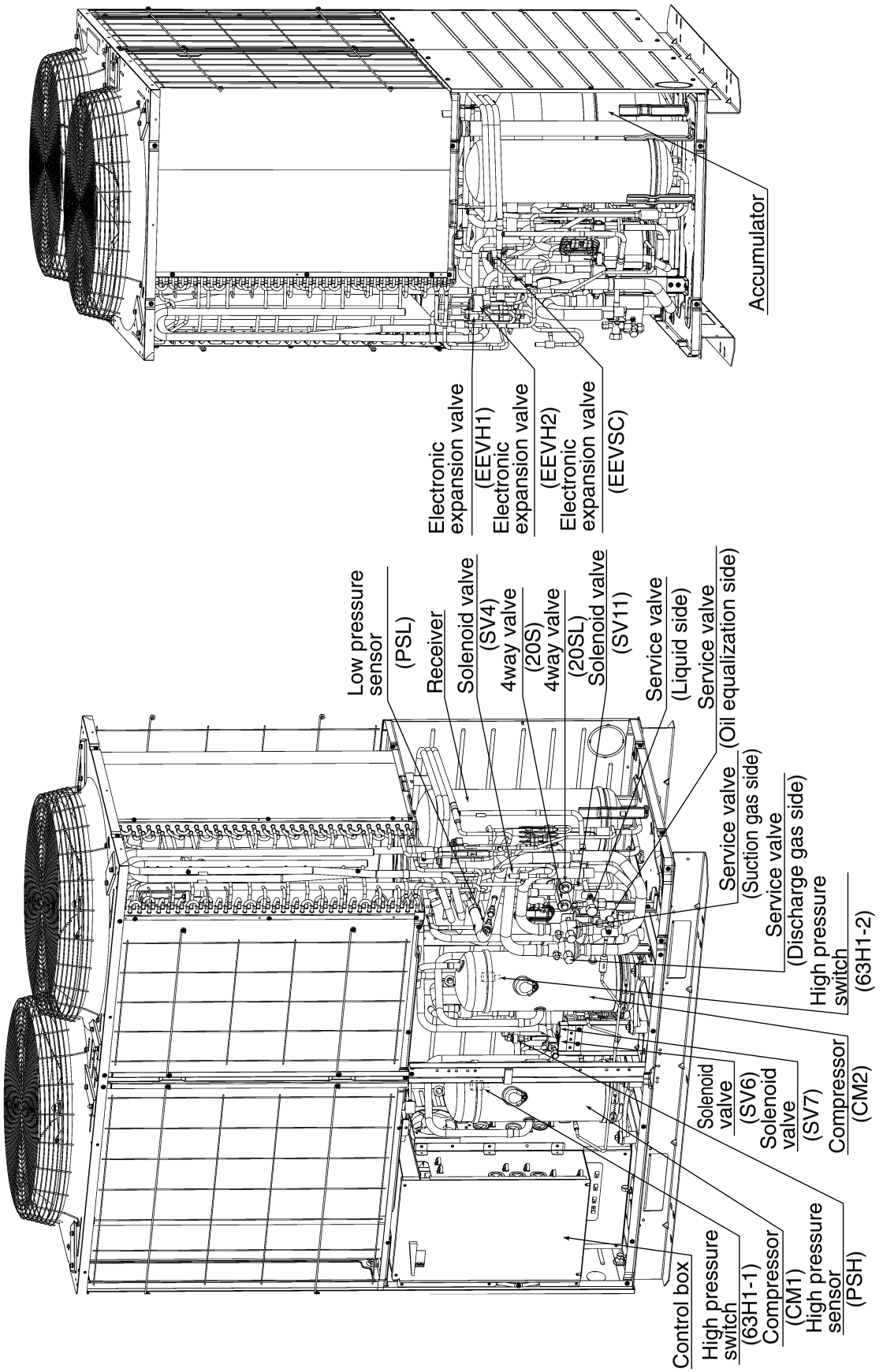


(2) KXR series

Models FDCA224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR

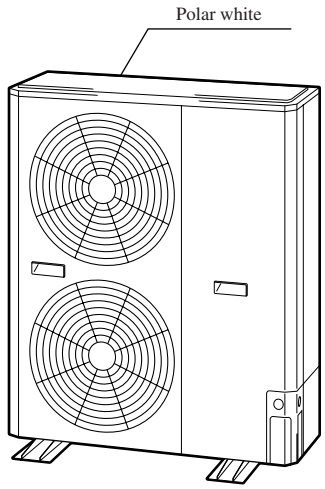


Models FDCA335HKXRE4BRK, 400HKXRE4BR, 450HKXRE4BR, 504HKXRE4BR, 560HKXRE4BR, 615HKXRE4BR, 680HKXRE4BR

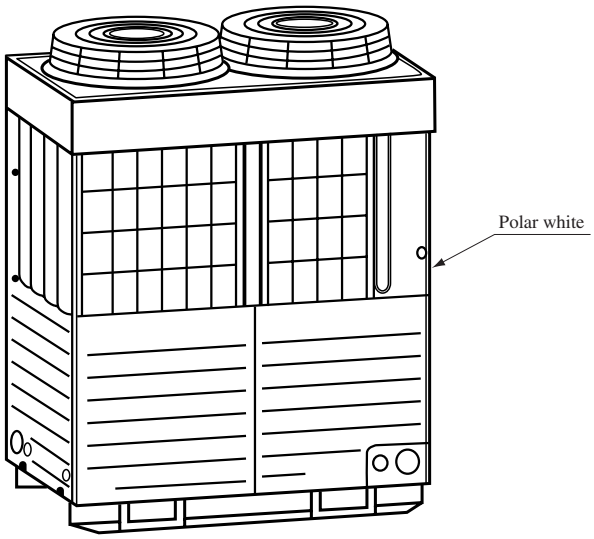


2.4 Exterior appearance

Models FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R



Models FDCA224HKXE4BR, 280HKXE4BR, 335HKXE4BR, 335HKXE4BRK, 400HKXE4BR, 450HKXE4BR
504HKXE4BR, 560HKXE4BR, 615HKXE4BR, 680HKXE4BR
224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR, 335HKXRE4BRK, 400HKXRE4BR,
450HKXRE4BR, 504HKXRE4BR, 560HKXRE4BR, 615HKXRE4BR, 680HKXRE4BR



2.5 Noise level

Measured based on JIS B 8616

Mike position as highest noise level in position as below

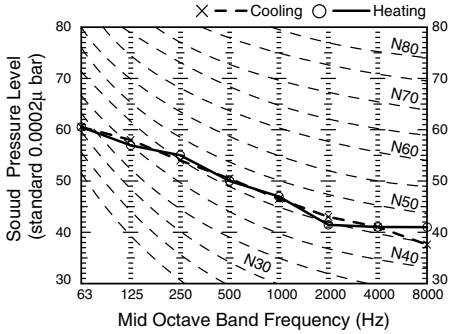
Distance from front side 1m

Height 1m

(1) KX series

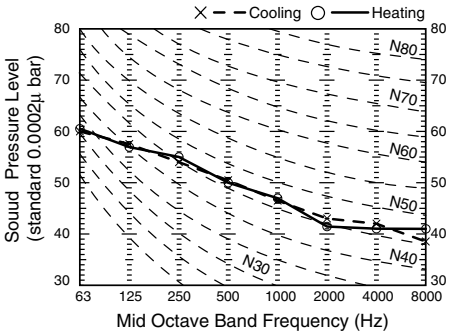
Models FDCA140HKXEN4R, 140HKXES4R

Noise level 53 dB (A) at cooling
53 dB (A) at heating



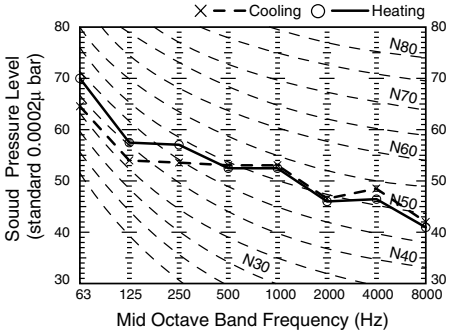
Model FDCA160HKXES4R

Noise level 53 dB (A) at cooling
53 dB (A) at heating



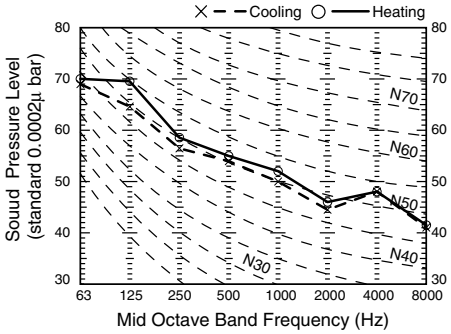
Model FDCA224HKXE4BR

Noise level 57 dB (A) at cooling
57 dB (A) at heating



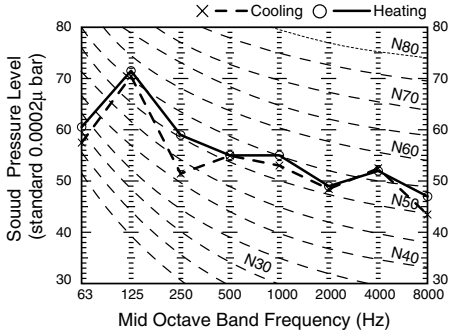
Model FDCA280HKXE4BR

Noise level 57 dB (A) at cooling
58 dB (A) at heating



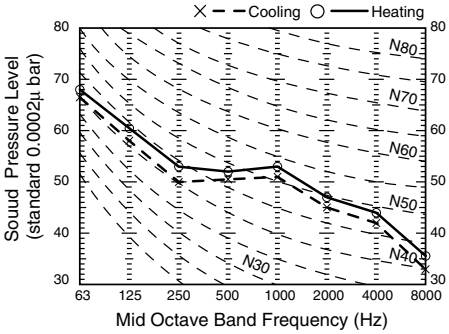
Model FDCA335HKXE4BR

Noise level 60.5 dB (A) at cooling
61 dB (A) at heating



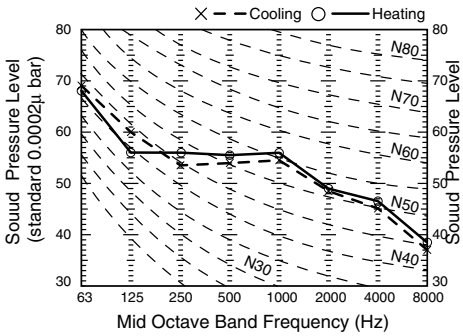
Model FDCA335HKXE4BRK

Noise level 56 dB (A) at cooling
57 dB (A) at heating



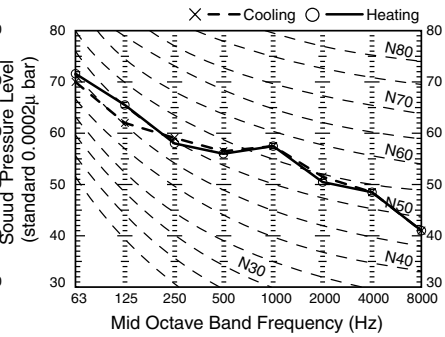
Model FDCA400HKXE4BR

Noise level 58.5 dB (A) at cooling
59 dB (A) at heating



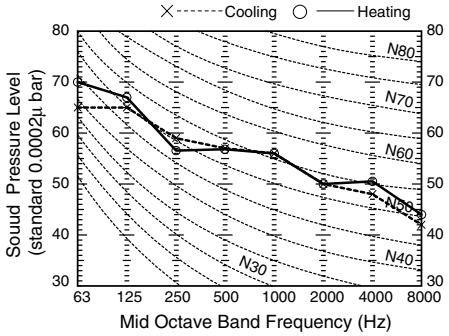
Model FDCA450HKXE4BR

Noise level 61 dB (A) at cooling
61 dB (A) at heating

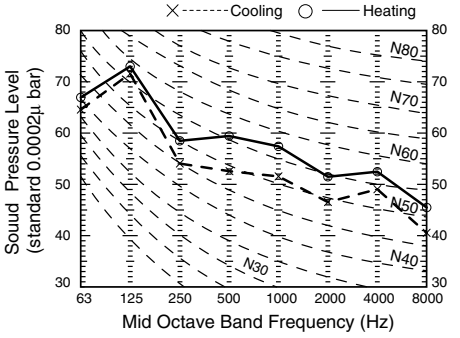


Model FDCA504HKXE4BR

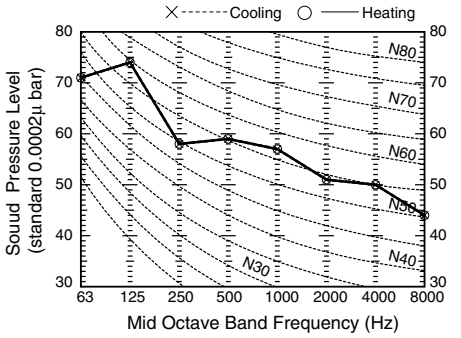
Noise level 60 dB (A) at cooling
60.5 dB (A) at heating



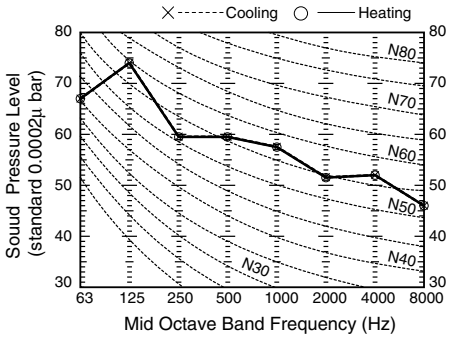
Model FDCA560HKXE4BR
Noise level 60.5 dB (A) at cooling
62.5 dB (A) at heating



Model FDCA615HKXE4BR
Noise level 63 dB (A) at cooling
63 dB (A) at heating

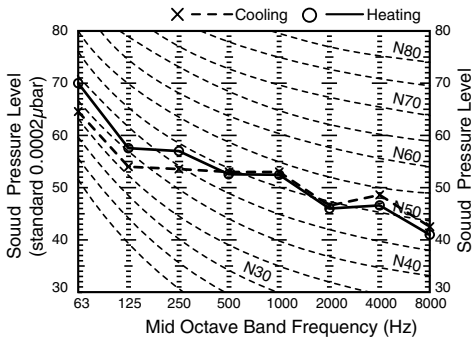


Model FDCA680HKXE4BR
Noise level 63.5 dB (A) at cooling
63.5 dB (A) at heating

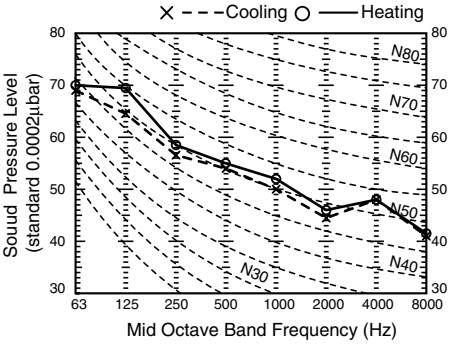


(2) KXR series

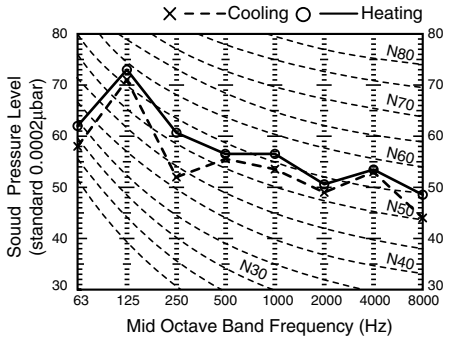
Model FDCA224HKXRE4BR
Noise level 57 dB (A) at cooling
57 dB (A) at heating



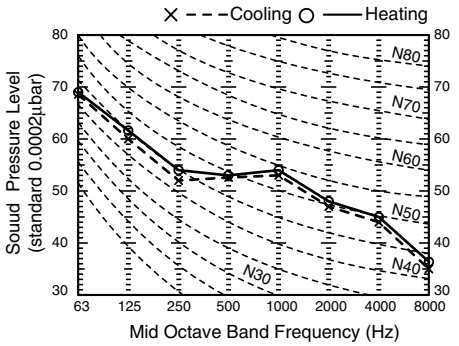
Model FDCA280HKXRE4BR
Noise level 57 dB (A) at cooling
59 dB (A) at heating



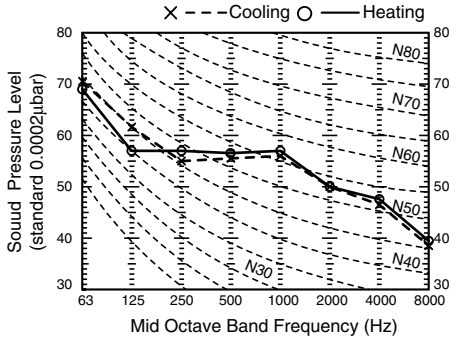
Model FDCA335HKXRE4BR
Noise level 60.5 dB (A) at cooling
62.5 dB (A) at heating



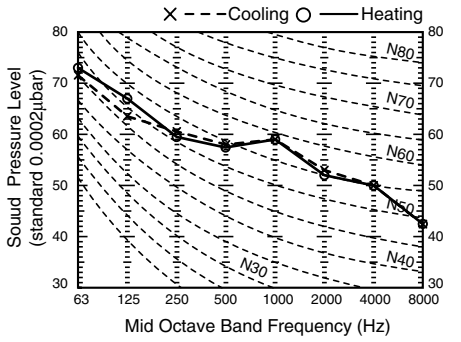
Model FDCA335HKXRE4BRK
Noise level 57 dB (A) at cooling
57.5 dB (A) at heating



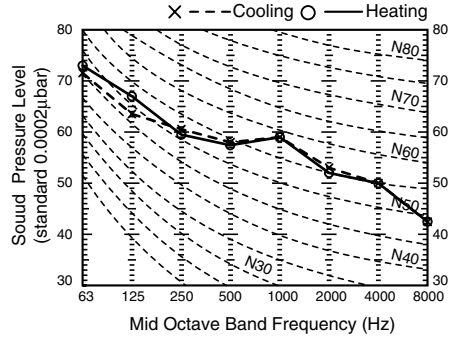
Model FDCA400HKXRE4BR
Noise level 59.5 dB (A) at cooling
60 dB (A) at heating



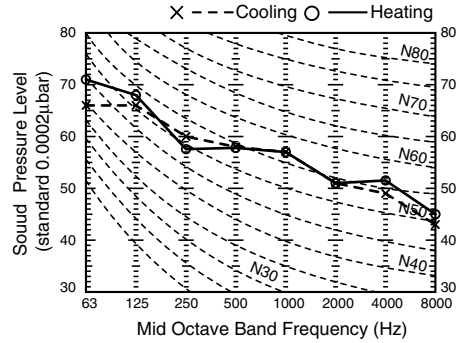
Model FDCA450HKXRE4BR
Noise level 62.5 dB (A) at cooling
62.5 dB (A) at heating



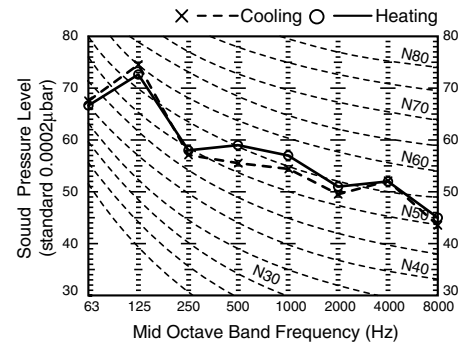
Model FDCA450HKXRE4VBR
Noise level 62.5 dB (A) at cooling
62.5 dB (A) at heating



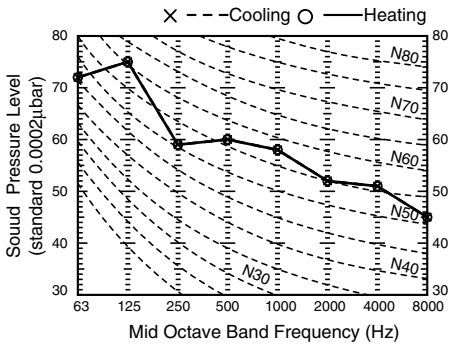
Model FDCA504HKXRE4BR
Noise level 61 dB (A) at cooling
61.5 dB (A) at heating



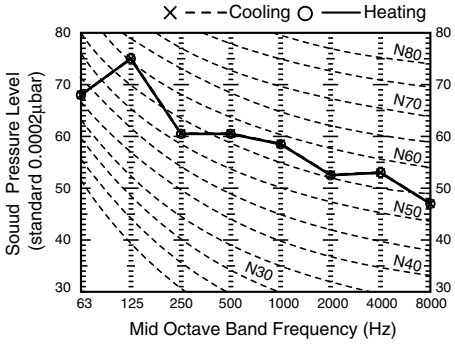
Model FDCA560HKXRE4BR
Noise level 62 dB (A) at cooling
62.5 dB (A) at heating



Model FDCA615HKXRE4BR
Noise level 64 dB (A) at cooling
64 dB (A) at heating



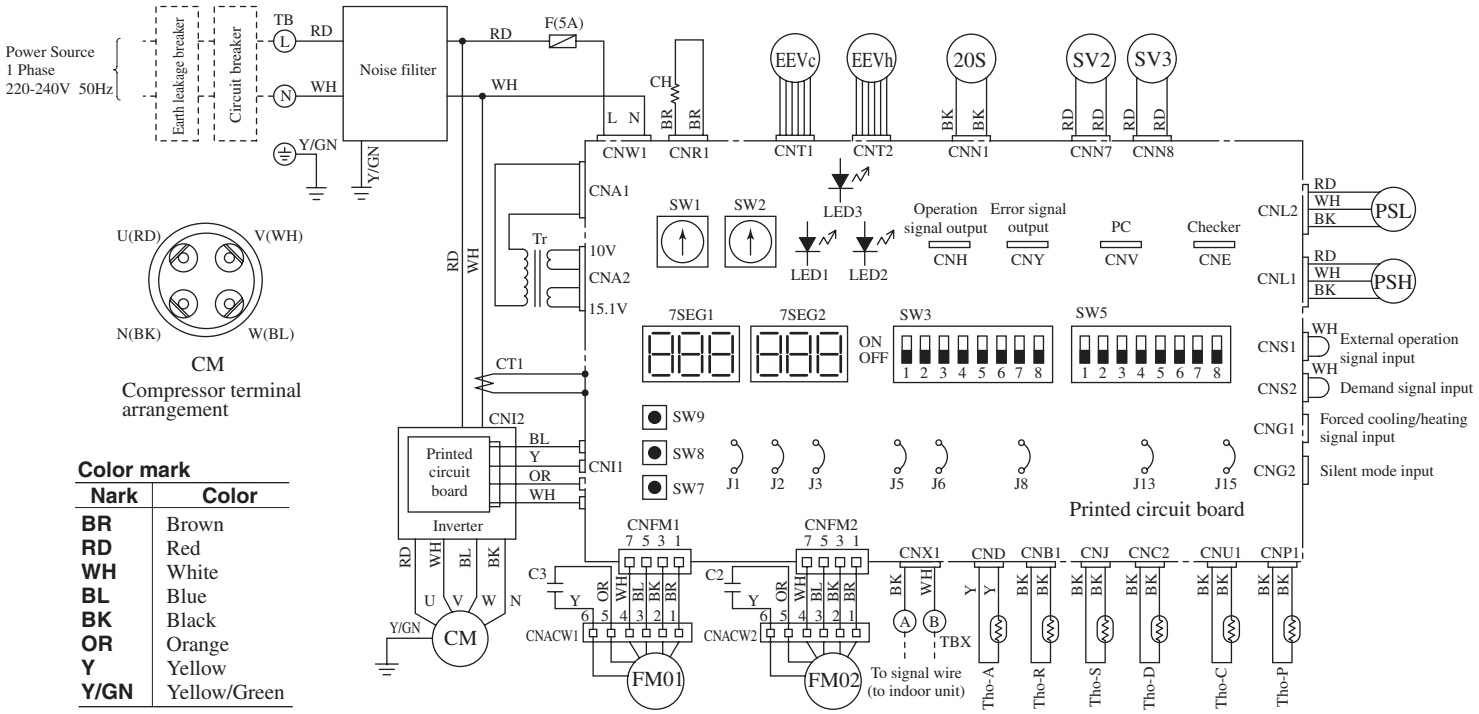
Model FDCA680HKXRE4BR
Noise level 64.5 dB (A) at cooling
64.5 dB (A) at heating



2.6 Electrical wiring

(1) KX series

Model FDCA140HKXEN4R



CM
Compressor terminal arrangement

Color mark

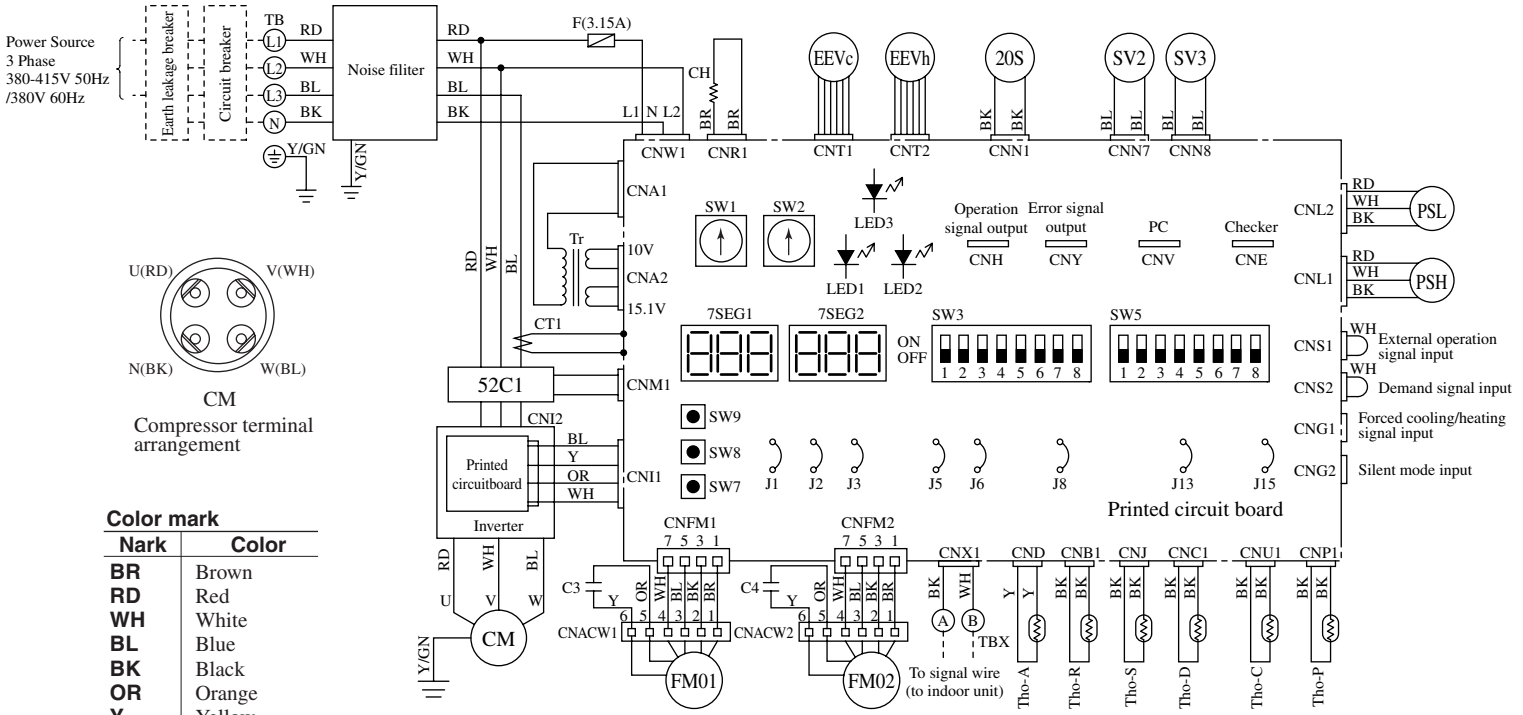
Nark	Color
BR	Brown
RD	Red
WH	White
BL	Blue
BK	Black
OR	Orange
Y	Yellow
Y/GN	Yellow/Green

Meaning of marks

Mark	Parts name	Mark	Parts name
CM	Compressor motor	**CNA~X**	Connector
FMO1,2	Fan motor	**SW1**	Address setting SW for the number of tens
CH	Crankcase heater	**SW2**	Address setting SW for the number of units
20S	Four-way valve (coil)	**SW3-1**	Inspection LED reset
SV2,3	Solenoid valve (oil separator)	**SW5-6,7,8**	Capacity measurement mode
EEVc,h	Electronic expansion valve	**SW7**	Clear deta
Tho-A	Thermistor (outdoor temp.)	**SW8**	7-segment indicate unit digit
Tho-C	Thermistor (dome bottom)	**SW9**	7-segment indicate unit digit
Tho-D	Thermistor (discharge pipe)	**J1~J3**	Unit selector
Tho-R	Thermistor (heat exchanger)	**J5,6**	Demand capacity selector
Tho-P	Thermistor (power transistor)	**J8**	Anti-snow measures
Tho-S	Thermistor (suction pipe)	**J13**	External input selector level/pulse
PSL	Low pressure sensor	**J15**	Defrost start temperature selector
PSH	High pressure sensor	**LED1**	Inspection indication (red)
CT	Current sensor	**LED2**	Inspection indication (green)
Tr	Transformer	**LED3**	Inspection indication (green)
TB,TBX	Terminal block	**7SEG1**	7-segment LED (function indication)
F	Fuse	**7SEG2**	7-segment LED (data indication)

Function of switches

Mark		Function
SW3-4	ON	For servicing use
	OFF	Normal operation
SW3-5	ON	Check operation
	OFF	Normal operation
SW3-7	ON	Forced cooling/heating mode
	OFF	Normal operation
SW3-8	ON	Test mode
	OFF	Normal operation
SW5-1	ON	Test run
	OFF	Normal operation
SW5-2	ON	Cooling during test run
	OFF	Heating during test run
SW5-3	ON	Pump down operation
	OFF	Normal operation



U(RD) V(WH) N(BK) W(BL)

CM
Compressor terminal arrangement

Color mark

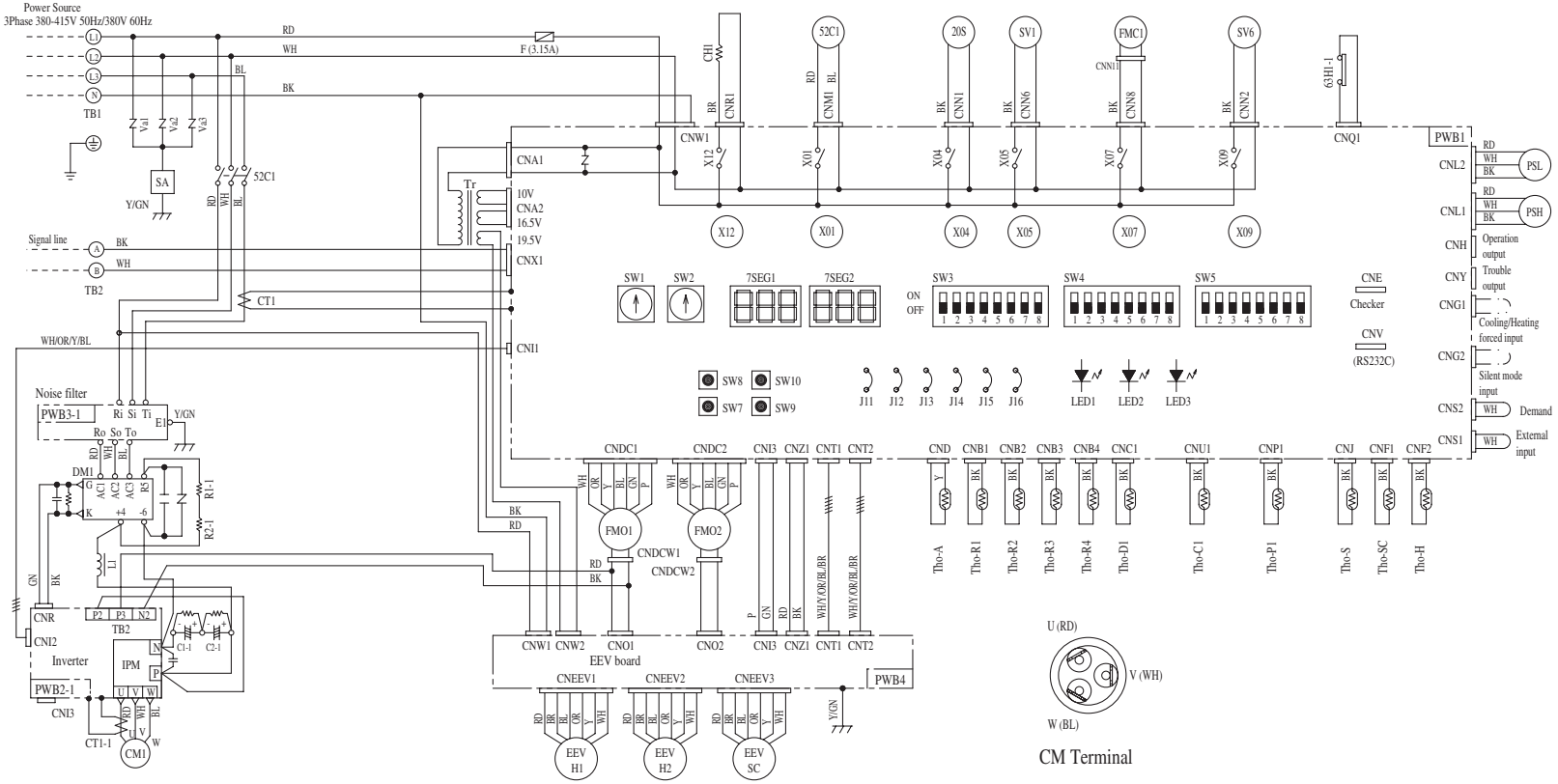
Nark	Color
BR	Brown
RD	Red
WH	White
BL	Blue
BK	Black
OR	Orange
Y	Yellow
Y/GN	Yellow/Green

Meaning of marks

Mark	Parts name	Mark	Parts name
CM	Compressor motor	**CNA~X**	Connector
FMO1,2	Fan motor	**SW1**	Address setting SW for the number of tens
52C1	Magnetic contactor for CM	**SW2**	Address setting SW for the number of units
CH	Crankcase heater	**SW3-1**	Inspection LED reset
20S	Four-way valve (coil)	**SW5-6,7,8**	Capacity measurement mode
SV2,3	Solenoid valve (oil separator)	**SW7**	Clear deta
EEVc,h	Electronic expansion valve	**SW8**	7-segment indicate unit digit
Tho-A	Thermistor (outdoor temp.)	**SW9**	7-segment indicate tens digit
Tho-C	Thermistor (dome bottom)	**J1~J3**	Unit selector
Tho-D	Thermistor (discharge pipe)	**J5,6**	Demand capacity selector
Tho-R	Thermistor (heat exchanger)	**J8**	Anti-snow measures
Tho-P	Thermistor (power transistor)	**J13**	External input selector level/pulse
Tho-S	Thermistor (suction pipe)	**J15**	Defrost start temperature selector
PSL	Low pressure sensor	**LED1**	Inspection indication (red)
PSH	High pressure sensor	**LED2**	Inspection indication (green)
CT	Current sensor	**LED3**	Inspection indication (green)
Tr	Transformer	**7SEG1**	7-segment LED (function indication)
TB, TBX	Terminal block	**7SEG2**	7-segment LED (data indication)
F	Fuse		

Function of switches

Mark		Function
SW3-4	ON	For servicing use
	OFF	Normal operation
SW3-5	ON	Check operation
	OFF	Normal operation
SW3-7	ON	Forced cooling/heating mode
	OFF	Normal operation
SW3-8	ON	Test mode
	OFF	Normal operation
SW5-1	ON	Test run
	OFF	Normal operation
SW5-2	ON	Cooling during test run
	OFF	Heating during test run
SW5-3	ON	Pump down operation
	OFF	Normal operation



CM Terminal

Meaning of marks

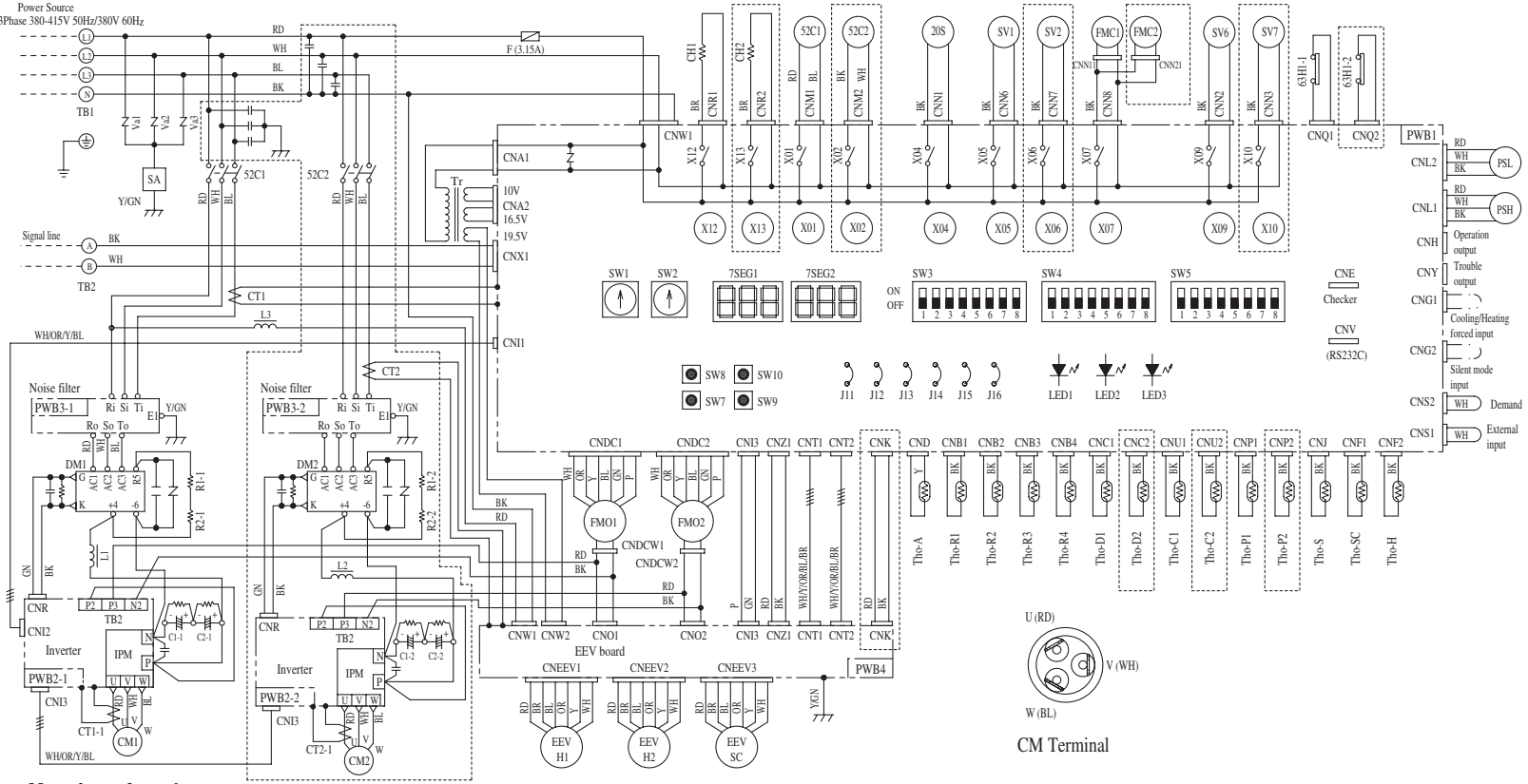
Mark	Parts name	Mark	Parts name	Mark	Parts name
CM1	Compressor motor	**Tho-R2**	Thermistor (outdoor H.X. temp outlet)	**SW7**	Data clear/insert
FMO1,2	Fan motor (outdoor unit)	**Tho-R3**	Thermistor (outdoor H.X. temp inlet)	**SW8**	7seg indicate (unit digit)
52C1	Magnetic contactor for CM	**Tho-R4**	Thermistor (outdoor H.X. temp inlet)	**SW9**	7seg indicate (tens digit)
CH1	Crankcase heater	**PSL**	Low pressure sensor	**SW10**	Reset
X01~12	Auxiliary relay	**PSH**	High pressure sensor	**J11,12**	Set up model (volt)
20S	4way valve	**CT1**	Current sensor	**J13**	External input select level/pulse
SV1	Solenoid valve (CM1:bypass)	**SA**	Arrestor	**J14**	Defrost recover temp
SV6	Solenoid valve (oil separator CM1)	**Tr**	Transformer	**J15**	Defrost start temp
EEVH1,2	Expansion valve for heating	**Va1~3**	Varistor	**J16**	Heat recovery unit
EEVSC	Expansion valve for SC	**TB1,2**	Terminal block	**LED1**	Indication lamp (red)
63H1-1	High pressure switch (for protection)	**F**	Fuse	**LED2**	Indication lamp (green)
Tho-A	Thermistor (outdoor air temp)	**CNA-Z**	Connector	**LED3**	Indication lamp (green for service)
Tho-C1	Thermistor (dome temp)	**SW1**	Outdoor unit address (tens digit)	**7SEG1**	7seg L.E.D. (function indication)
Tho-D1	Thermistor (discharge temp)	**SW2**	Outdoor unit address (unit digit)	**7SEG2**	7seg L.E.D. (data indication)
Tho-P1	Thermistor (IPM temp)	**SW3-1**	L.E.D.reset	**L1,L2**	D.C.reactor
Tho-S	Thermistor (suction temp)	**SW4-1~4**	Set up model	**C1-1,2,C2-1,2**	Condensor
Tho-SC	Thermistor (SC1 temp)	**SW4-5**	Demand	**PWB1~4**	Printed wiring board
Tho-H	Thermistor (SC2 temp)	**SW4-6**	Demand	**IPM**	Intelligent power module
Tho-R1	Thermistor (outdoor H.X. temp outlet)	**SW4-7**	Address setting switch (master·slave)	**FMC1,2**	Fan for IPM
		SW4-8	Address setting switch (master·slave)		
		SW5-4~8	Spare		

Function of switches

Mark		Function
SW3-2	ON	Auto backup operation
	OFF	Regular operation
SW3-3	ON	Set of renewal
	OFF	Regular operation
SW3-4	ON	Check mode non-available
	OFF	Check mode available
SW3-5	ON	Check of trial operation
	OFF	Regular operation
SW3-6	ON	Pipe wash mode
	OFF	Regular operation
SW3-7	ON	Forced cooling/heating
	OFF	Regular operation
SW3-8	ON	Test mode
	OFF	Regular operation
SW5-1	ON	Trial operation
	OFF	Regular operation
SW5-2	ON	Trial operation mode/cooling
	OFF	Trial operation mode/heating
SW5-3	ON	Pump down operation
	OFF	Regular operation

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brawn
GN	Green
GR	Gray
OR	Orange
RD	Red
WH	White
Y	Yellow
P	Pink
Y/GN	Yellow/Green



CM Terminal

Meaning of marks

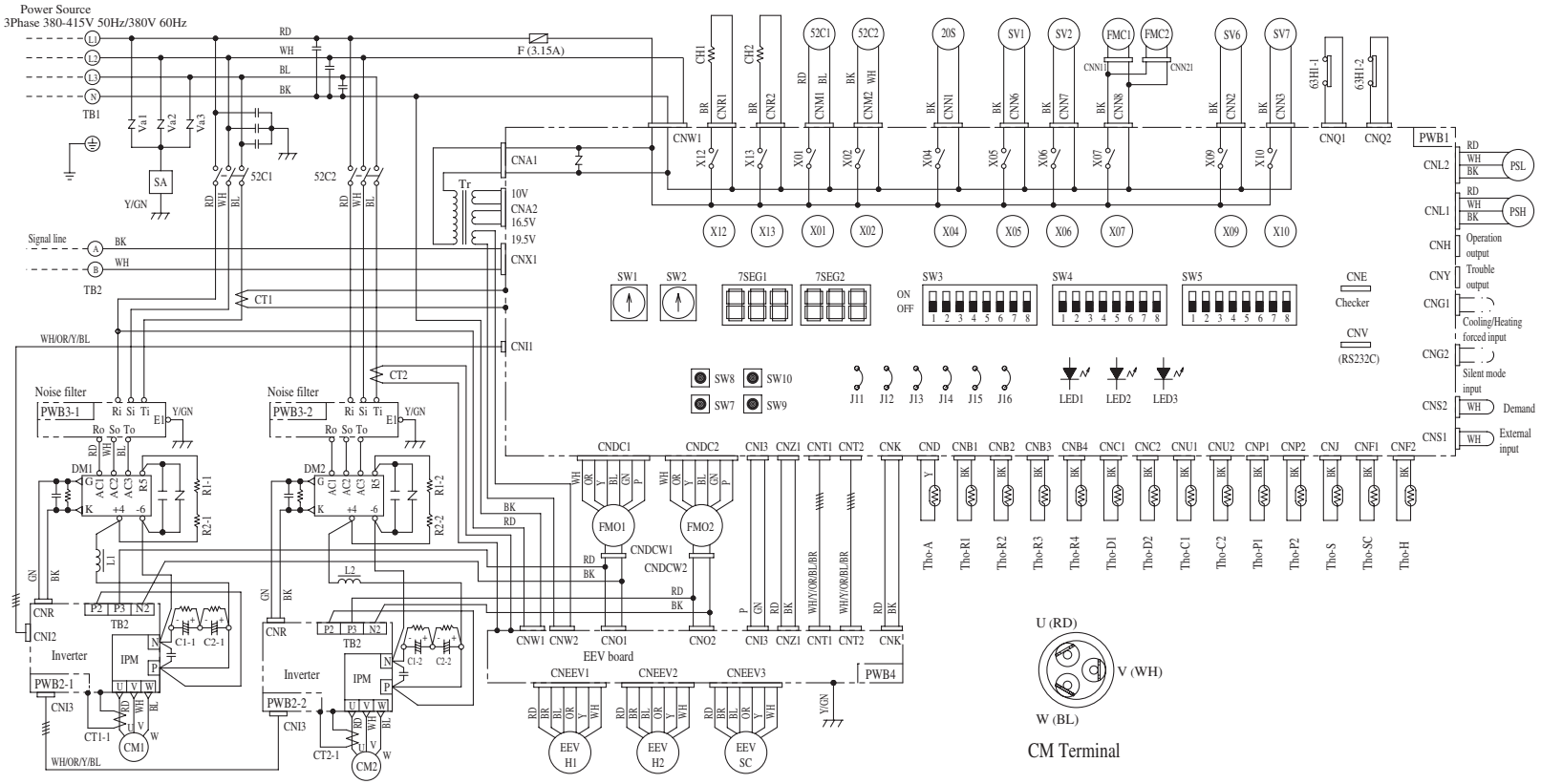
Mark	Parts name	Mark	Parts name	Mark	Parts name
CM1,2	Compressor motor	**Tho-R2**	Thermistor (outdoor H.X. temp outlet)	**SW7**	Data clear/insert
FMO1,2	Fan motor (outdoor unit)	**Tho-R3**	Thermistor (outdoor H.X. temp inlet)	**SW8**	7seg indicate (unit digit)
52C1,2	Magnetic contactor for CM	**Tho-R4**	Thermistor (outdoor H.X. temp inlet)	**SW9**	7seg indicate (tens digit)
CH1,2	Crankcase heater	**PSL**	Low pressure sensor	**SW10**	Reset
X01~13	Auxiliary relay	**PSH**	High pressure sensor	**J11,12**	Set up model (volt)
20S	4way valve	**CT1,CT2**	Current sensor	**J13**	External input select level/pulse
SV1	Solenoid valve (CM1:bypass)	**SA**	Arrestor	**J14**	Defrost recover temp
SV2	Solenoid valve (CM2:bypass)	**Tr**	Transformer	**J15**	Defrost start temp
SV6	Solenoid valve (oil separator CM1)	**Va1~3**	Varistor	**J16**	Heat recovery unit
SV7	Solenoid valve (oil separator CM2)	**TB1,2**	Terminal block	**LED1**	Indication lamp (red)
EEVH1,2	Expansion valve for heating	**F**	Fuse	**LED2**	Indication lamp (green)
EEVSC	Expansion valve for SC	**CNA-Z**	Connector	**LED3**	Indication lamp (green for service)
63H1-1,2	High pressure switch (for protection)	**SW1**	Outdoor unit address (tens digit)	**7SEG1**	7seg L.E.D. (function indication)
Tho-A	Thermistor (outdoor air temp)	**SW2**	Outdoor unit address (unit digit)	**7SEG2**	7seg L.E.D. (data indication)
Tho-C1,2	Thermistor (dome temp)	**SW3-1**	L.E.D.reset	**L1,L2,L3**	D.C.reactor
Tho-D1,2	Thermistor (discharge temp)	**SW4-1~4**	Set up model	**C1-1,2,C2-1,2**	Condensor
Tho-P1,2	Thermistor (IPM temp)	**SW4-5**	Demand	**PWB1~4**	Printed wiring board
Tho-S	Thermistor (suction temp)	**SW4-6**	Demand	**IPM**	Intelligent power module
Tho-SC	Thermistor (SC1 temp)	**SW4-7**	Address setting switch (master·slave)	**FMC1,2**	Fan for IPM
Tho-H	Thermistor (SC2 temp)	**SW4-8**	Address setting switch (master·slave)		
Tho-R1	Thermistor (outdoor H.X. temp outlet)	**SW5-4~8**	Spare		

Function of switches

Mark		Function
SW3-2	ON	Auto backup operation
	OFF	Regular operation
SW3-3	ON	Set of renewal
	OFF	Regular operation
SW3-4	ON	Check mode non-available
	OFF	Check mode available
SW3-5	ON	Check of trial operation
	OFF	Regular operation
SW3-6	ON	Pipe wash mode
	OFF	Regular operation
SW3-7	ON	Forced cooling/heating
	OFF	Regular operation
SW3-8	ON	Test mode
	OFF	Regular operation
SW5-1	ON	Trial operation
	OFF	Regular operation
SW5-2	ON	Trial operation mode/cooling
	OFF	Trial operation mode/heating
SW5-3	ON	Pump down operation
	OFF	Regular operation

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brawn
GN	Green
GR	Gray
OR	Orange
RD	Red
WH	White
Y	Yellow
P	Pink
Y/GN	Yellow/Green



CM Terminal

Meaning of marks

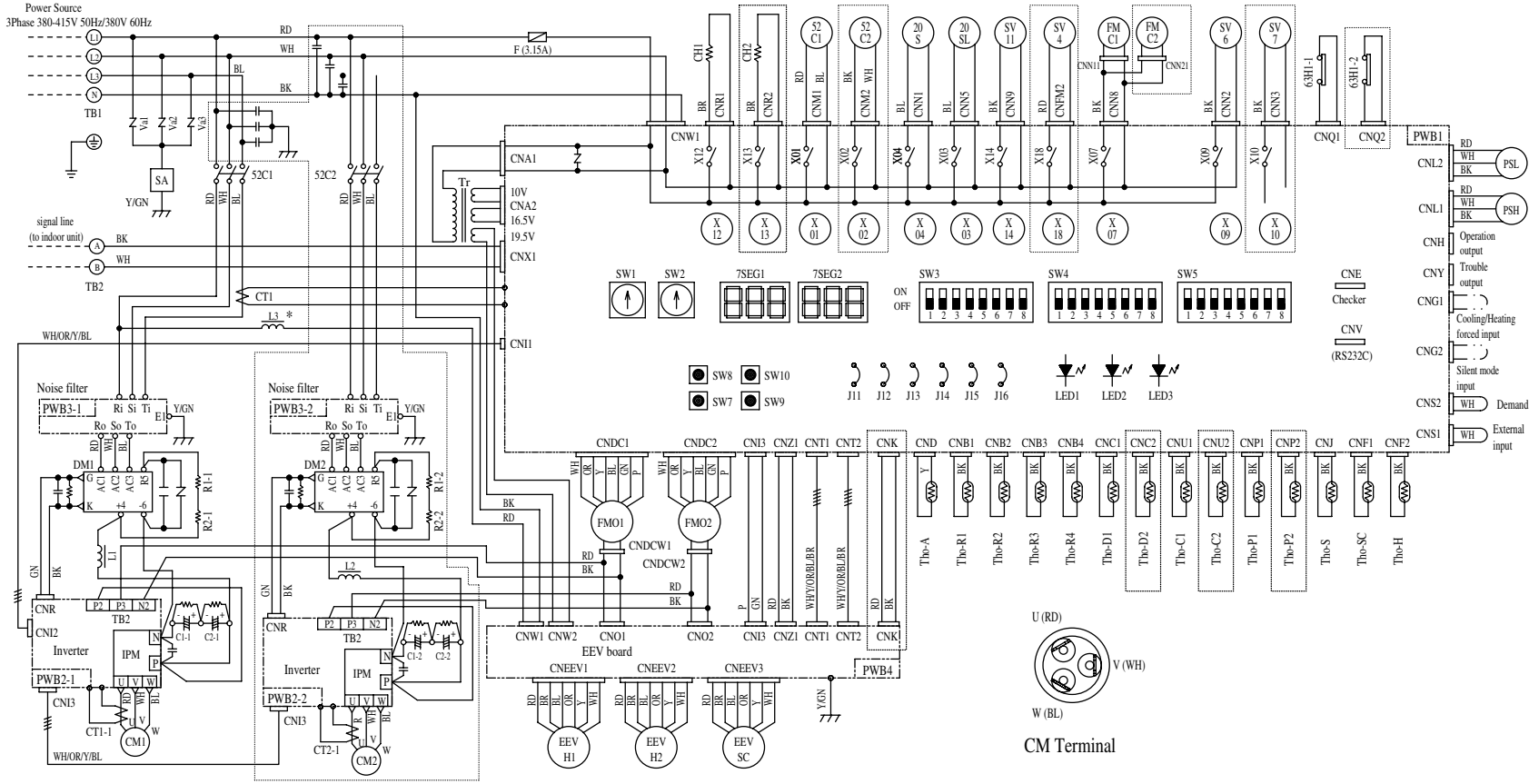
Mark	Parts name	Mark	Parts name	Mark	Parts name
CM1,2	Compressor motor	**Tho-R2**	Thermistor (outdoor H.X. temp outlet)	**SW7**	Data clear/insert
FMO1,2	Fan motor (outdoor unit)	**Tho-R3**	Thermistor (outdoor H.X. temp inlet)	**SW8**	7seg indicate (unit digit)
52C1,2	Magnetic contactor for CM	**Tho-R4**	Thermistor (outdoor H.X. temp inlet)	**SW9**	7seg indicate (tens digit)
CH1,2	Crankcase heater	**PSL**	Low pressure sensor	**SW10**	Reset
X01~13	Auxiliary relay	**PSH**	High pressure sensor	**J11,12**	Set up model (volt)
20S	4way valve	**CT1,CT2**	Current sensor	**J13**	External input select level/pulse
SV1	Solenoid valve (CM1:bypass)	**SA**	Arrestor	**J14**	Defrost recover temp
SV2	Solenoid valve (CM2:bypass)	**Tr**	Transformer	**J15**	Defrost start temp
SV6	Solenoid valve (oil separator CM1)	**Va1~3**	Varistor	**J16**	Heat recovery unit
SV7	Solenoid valve (oil separator CM2)	**TB1,2**	Terminal block	**LED1**	Indication lamp (red)
EEVH1,2	Expansion valve for heating	**F**	Fuse	**LED2**	Indication lamp (green)
EEVSC	Expansion valve for SC	**CNA-Z**	Connector	**LED3**	Indication lamp (green for service)
63H1-1,2	High pressure switch (for protection)	**SW1**	Outdoor unit address (tens digit)	**7SEG1**	7seg L.E.D. (function indication)
Tho-A	Thermistor (outdoor air temp)	**SW2**	Outdoor unit address (unit digit)	**7SEG2**	7seg L.E.D. (data indication)
Tho-C1,2	Thermistor (dome temp)	**SW3-1**	L.E.D.reset	**L1,L2**	D.C.reactor
Tho-D1,2	Thermistor (discharge temp)	**SW4-1~4**	Set up model	**C1-1,2,C2-1,2**	Condensor
Tho-P1,2	Thermistor (IPM temp)	**SW4-5**	Demand	**PWB1~4**	Printed wiring board
Tho-S	Thermistor (suction temp)	**SW4-6**	Demand	**IPM**	Intelligent power module
Tho-SC	Thermistor (SC1 temp)	**SW4-7**	Address setting switch (master·slave)	**FMC1,2**	Fan for IPM
Tho-H	Thermistor (SC2 temp)	**SW4-8**	Address setting switch (master·slave)		
Tho-R1	Thermistor (outdoor H.X. temp outlet)	**SW5-4~8**	Spare		

Function of switches

Mark		Function
SW3-2	ON	Auto backup operation
	OFF	Regular operation
SW3-3	ON	Set of renewal
	OFF	Regular operation
SW3-4	ON	Check mode non-available
	OFF	Check mode available
SW3-5	ON	Check of trial operation
	OFF	Regular operation
SW3-6	ON	Pipe wash mode
	OFF	Regular operation
SW3-7	ON	Forced cooling/heating
	OFF	Regular operation
SW3-8	ON	Test mode
	OFF	Regular operation
SW5-1	ON	Trial operation
	OFF	Regular operation
SW5-2	ON	Trial operation mode/cooling
	OFF	Trial operation mode/heating
SW5-3	ON	Pump down operation
	OFF	Regular operation

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brawn
GN	Green
GR	Gray
OR	Orange
RD	Red
WH	White
Y	Yellow
P	Pink
Y/GN	Yellow/Green



Meaning of marks

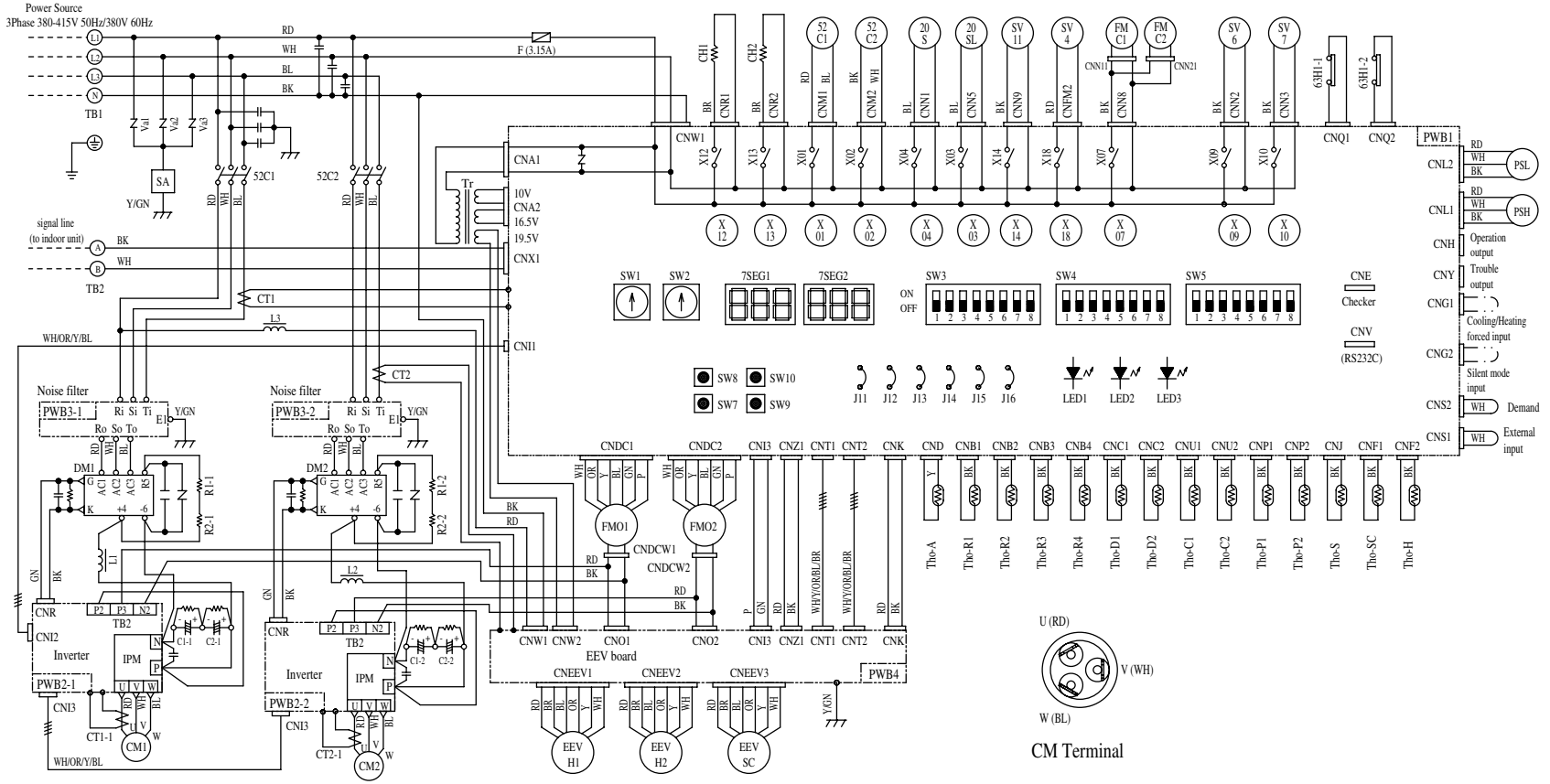
Mark	Parts name	Mark	Parts name	Mark	Parts name
CM1	Compressor motor	**Tho-R1**	Thermistor (outdoor H.X. temp outlet)	**SW7**	Data clear/insert
FMO1	Fan motor (outdoor unit)	**Tho-R2**	Thermistor (outdoor H.X. temp outlet)	**SW8**	7seg indicate (unit digit)
52C1	Magnetic contactor for CM	**Tho-R3**	Thermistor (outdoor H.X. temp inlet)	**SW9**	7seg indicate (tens digit)
CH1,2	Crankcase heater	**Tho-R4**	Thermistor (outdoor H.X. temp inlet)	**SW10**	Reset
X01~14	Auxiliary relay	**PSL**	Low pressure sensor	**J11,12**	Set up model (volt)
20S	4way valve	**PSH**	High pressure sensor	**J13**	External input select level/pulse
20SL	4way valve	**CT1**	Current sensor	**J14**	Defrost recover temp
SV6	Solenoid valve (oil separator CM1)	**SA**	Arrestor	**J15**	Defrost start temp
SV11	Solenoid valve (gas bypass)	**Tr**	Transformer	**J16**	Heat recovery unit
EEVH1,2	Expansion valve for heating	**Va1~3**	Varistor	**LED1**	Indication lamp (red)
EEVSC	Expansion valve for SC	**TB1,2**	Terminal block	**LED2**	Indication lamp (green)
63H1-1	High pressure switch (for protection)	**F**	Fuse	**LED3**	Indication lamp (green for service)
Tho-A	Thermistor (outdoor air temp)	**SW1**	Outdoor unit address (tens digit)	**7SEG1**	7seg L.E.D. (function indication)
Tho-C1	Thermistor (dome temp)	**SW2**	Outdoor unit address (unit digit)	**7SEG2**	7seg L.E.D. (data indication)
Tho-D1	Thermistor (discharge temp)	**SW3-1**	L.E.D.reset	**L1,L2**	D.C.reactor
Tho-P1	Thermistor (IPM temp)	**SW4-1~4**	Set up model	**L3**	D.C.reactor (* only 335 type)
Tho-S	Thermistor (suction temp)	**SW4-5**	Demand	**C1-1,2,C2-1,2**	Condensor
Tho-SC	Thermistor (SC1 temp)	**SW4-6**	Demand	**PWB1~4**	Printed wiring board
Tho-H	Thermistor (SC2 temp)	**SW4-7**	Address setting switch (master · slave)	**IPM**	Intelligent power module
		SW4-8	Address setting switch (master · slave)	**FMC1,2**	Fan for IPM
		SW5-4~8	Spare	**CNA~Z**	Connector

Function of switches

Mark		Function
SW3-2	ON	Auto backup operation
	OFF	Regular operation
SW3-3	ON	Set of renewal
	OFF	Regular operation
SW3-4	ON	Check mode non-available
	OFF	Check mode available
SW3-5	ON	Check of trial operation
	OFF	Regular operation
SW3-6	ON	Pipe wash mode
	OFF	Regular operation
SW3-7	ON	Forced cooling/heating
	OFF	Regular operation
SW3-8	ON	Test mode
	OFF	Regular operation
SW5-1	ON	Trial operation
	OFF	Regular operation
SW5-2	ON	Trial operation mode/cooling
	OFF	Trial operation mode/heating
SW5-3	ON	Pump down operation
	OFF	Regular operation

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brawn
GN	Green
GR	Gray
OR	Orange
RD	Red
WH	White
Y	Yellow
P	Pink
Y/GN	Yellow/Green



Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
CM1,2	Compressor motor	**Tho-R1**	Thermistor (outdoor H.X. temp outlet)	**SW7**	Data clear/insert
FMO1,2	Fan motor (outdoor unit)	**Tho-R2**	Thermistor (outdoor H.X. temp outlet)	**SW8**	7seg indicate (unit digit)
52C1,2	Magnetic contactor for CM	**Tho-R3**	Thermistor (outdoor H.X. temp inlet)	**SW9**	7seg indicate (tens digit)
CH1,2	Crankcase heater	**Tho-R4**	Thermistor (outdoor H.X. temp inlet)	**SW10**	Reset
X01~18	Auxiliary relay	**PSL**	Low pressure sensor	**J11,12**	Set up model (volt)
20S	4way valve	**PSH**	High pressure sensor	**J13**	External input select level/pulse
20SL	4way valve	**CT1,CT2**	Current sensor	**J14**	Defrost recover temp
SV4	Solenoid valve (outdoor H.X.)	**SA**	Arrestor	**J15**	Defrost start temp
SV6	Solenoid valve (oil separator CM1)	**Tr**	Transformer	**J16**	Heat recovery unit
SV7	Solenoid valve (oil separator CM2)	**Va1~3**	Varistor	**LED1**	Indication lamp (red)
SV11	Solenoid valve (gas bypass)	**TB1,2**	Terminal block	**LED2**	Indication lamp (green)
EEVH1,2	Expansion valve for heating	**F**	Fuse	**LED3**	Indication lamp (green for service)
EEVSC	Expansion valve for SC	**SW1**	Outdoor unit address (tens digit)	**7SEG1**	7seg L.E.D. (function indication)
63H1-1,2	High pressure switch (for protection)	**SW2**	Outdoor unit address (unit digit)	**7SEG2**	7seg L.E.D. (data indication)
Tho-A	Thermistor (outdoor air temp)	**SW3-1**	L.E.D.reset	**L1,L2**	D.C.reactor
Tho-C1,2	Thermistor (dome temp)	**SW4-1~4**	Set up model	**L3**	D.C.reactor
Tho-D1,2	Thermistor (discharge temp)	**SW4-5**	Demand	**C1-1,2,C2-1,2**	Condensor
Tho-P1,2	Thermistor (IPM temp)	**SW4-6**	Demand	**PWB1~4**	Printed wiring board
Tho-S	Thermistor (suction temp)	**SW4-7**	Address setting switch (master · slave)	**IPM**	Intelligent power module
Tho-SC	Thermistor (SC1 temp)	**SW4-8**	Address setting switch (master · slave)	**FMC1,2**	Fan for IPM
Tho-H	Thermistor (SC2 temp)	**SW5-4~8**	Spare	**CNA~Z**	Connector

Function of switches

Mark		Function
SW3-2	ON	Auto backup operation
	OFF	Regular operation
SW3-3	ON	Set of renewal
	OFF	Regular operation
SW3-4	ON	Check mode non-available
	OFF	Check mode available
SW3-5	ON	Check of trial operation
	OFF	Regular operation
SW3-6	ON	Pipe wash mode
	OFF	Regular operation
SW3-7	ON	Forced cooling/heating
	OFF	Regular operation
SW3-8	ON	Test mode
	OFF	Regular operation
SW5-1	ON	Trial operation
	OFF	Regular operation
SW5-2	ON	Trial operation mode/cooling
	OFF	Trial operation mode/heating
SW5-3	ON	Pump down operation
	OFF	Regular operation

Color marks

Mark	Color
BK	Black
BL	Blue
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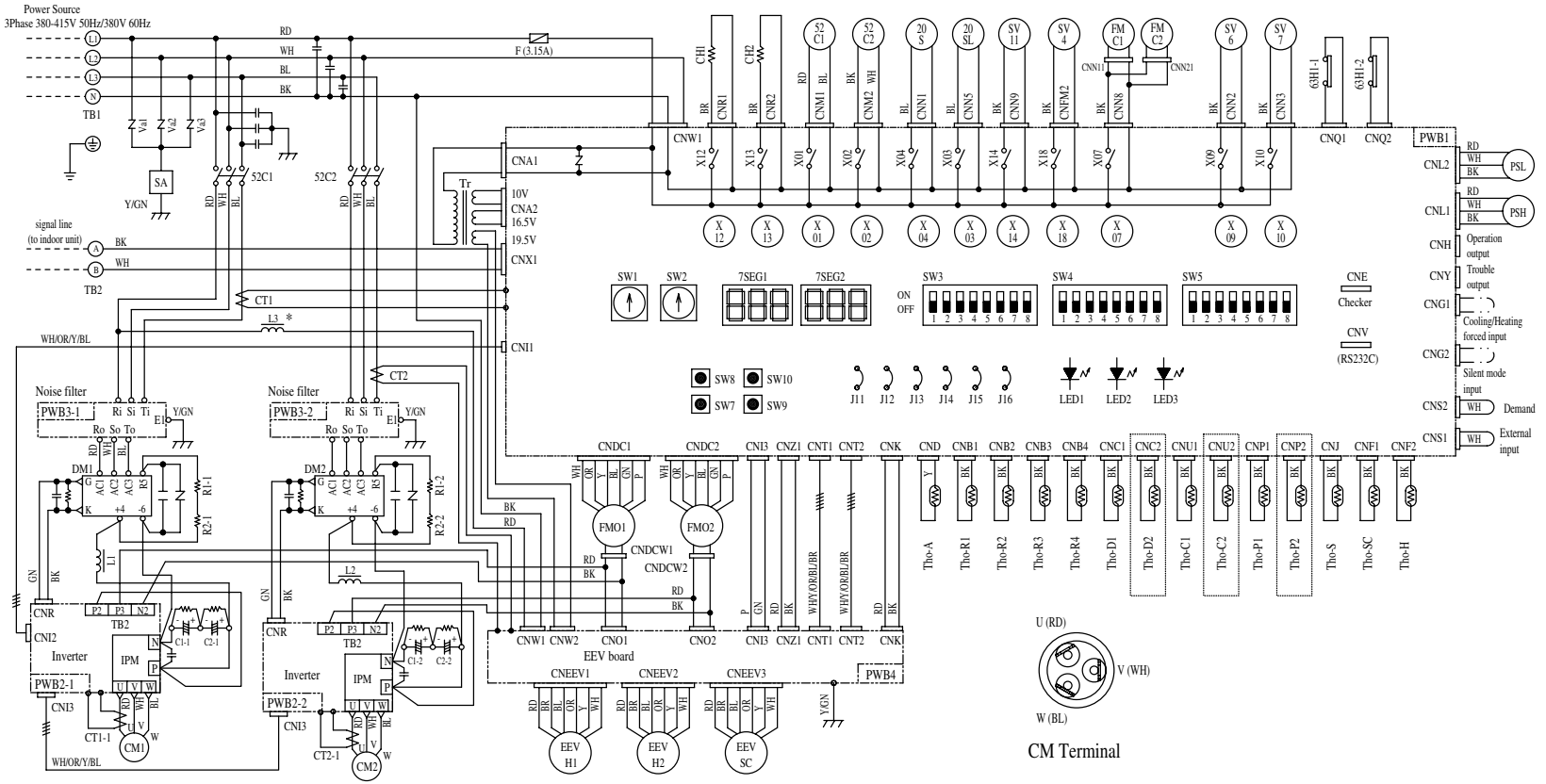
P	Pink
Y/GN	Yellow/Green



Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
CM1,2	Compressor motor	Tho-R1	Thermistor (outdoor H.X. temp outlet)	SW7	Data clear/insert
FMO1,2	Fan motor (outdoor unit)	Tho-R2	Thermistor (outdoor H.X. temp outlet)	SW8	7seg indicate (unit digit)
52C1,2	Magnetic contactor for CM	Tho-R3	Thermistor (outdoor H.X. temp inlet)	SW9	7seg indicate (tens digit)
CH1,2	Crankcase heater	Tho-R4	Thermistor (outdoor H.X. temp inlet)	SW10	Reset
X01~18	Auxiliary relay	PSL	Low pressure sensor	J11,12	Set up model (volt)
20S	4way valve	PSH	High pressure sensor	J13	External input select level/pulse
20SL	4way valve	CT1,CT2	Current sensor	J14	Defrost recover temp
SV4	Solenoid valve (outdoor H.X.)	SA	Arrestor	J15	Defrost start temp
SV6	Solenoid valve (oil separator CM1)	Tr	Transformer	J16	Heat recovery unit
SV7	Solenoid valve (oil separator CM2)	Va1~3	Varistor	LED1	Indication lamp (red)
SV11	Solenoid valve (gas bypass)	TB1,2	Terminal block	LED2	Indication lamp (green)
EEVH1,2	Expansion valve for heating	F	Fuse	LED3	Indication lamp (green for service)
EEVSC	Expansion valve for SC	SW1	Outdoor unit address (tens digit)	7SEG1	7seg L.E.D. (function indication)
63H1-1,2	High pressure switch (for protection)	SW2	Outdoor unit address (unit digit)	7SEG2	7seg L.E.D. (data indication)
Tho-A	Thermistor (outdoor air temp)	SW3-1	L.E.D.reset	L1,L2	D.C.reactor
Tho-C1,2	Thermistor (dome temp)	SW4-1~4	Set up model	L3	D.C.reactor (* only 450 type)
Tho-D1,2	Thermistor (discharge temp)	SW4-5	Demand	C1-1,2,C2-1,2	Condensor
Tho-P1,2	Thermistor (IPM temp)	SW4-6	Demand	PWB1~4	Printed wiring board
Tho-S	Thermistor (suction temp)	SW4-7	Address setting switch (master · slave)	IPM	Intelligent power module
Tho-SC	Thermistor (SC1 temp)	SW4-8	Address setting switch (master · slave)	FMC1,2	Fan for IPM
Tho-H	Thermistor (SC2 temp)	SW5-4~8	Spare	CNA~Z	Connector

Function of switches

Mark		Function
SW3-2	ON	Auto backup operation
	OFF	Regular operation
SW3-7	ON	Forced cooling/heating
	OFF	Regular operation
SW3-8	ON	Test mode
	OFF	Regular operation
SW5-1	ON	Trial operation
	OFF	Regular operation
SW5-2	ON	Trial operation mode/cooling
	OFF	Trial operation mode/heating
SW5-3	ON	Pump down operation
	OFF	Regular operation

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brawn
GN	Green
GR	Gray
OR	Orange
RD	Red
WH	White
Y	Yellow
P	Pink
Y/GN	Yellow/Green

3 INDOOR UNIT

3.1 Specifications

(a) Ceiling recessed compact type (FDTC)

Models FDTCA22KXE4R, 28KXE4R

Item \ Models		FDTCA22KXE4R	FDTCA28KXE4R
Nominal cooling capacity*1	**kW**	**2.2**	**2.8**
Nominal heating capacity*2	**kW**	**2.5**	**3.2**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**	
Noise level	dB(A)	Hi: 35 Me: 33 Lo: 32	
Exterior dimensions Height × Width × Depth	**mm**	**Unit:248 × 570 × 570 Panel:35 × 700 × 700**	
Net weight	**kg**	**Unit:15 Panel:3.5**	
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Turbo fan × 1	
Motor	**W**	**50×1**	
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 9.5 Me: 8.5 Lo: 8**	
Outside air intake		Possible	
Air filter, Q'ty		Long life filter × 1(Washable)	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ9.52(3/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas line)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Decorative Panel**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Model \ Item	Panel Part No.
FDTCA22,28 type	TC-PSA-24W-ER

Models FDTCA36KXE4R, 45KXE4R, 56KXE4R

Item \ Models		FDTCA36KXE4R	FDTCA45KXE4R	FDTCA56KXE4R
Nominal cooling capacity*1	**kW**	**3.6**	**4.5**	**5.6**
Nominal heating capacity*2	**kW**	**4.6**	**5.0**	**6.3**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**		
Noise level	dB(A)	Hi: 38 Me: 36 Lo: 34	Hi: 40 Me: 38 Lo: 36	Hi: 45 Me: 42 Lo: 39
Exterior dimensions Height × Width × Depth	**mm**	**Unit:248 × 570 × 570 Panel:35 × 700 × 700**		
Net weight	**kg**	**Unit:16 Panel:3.5**		
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Turbo fan × 1		
Motor	**W**	**50×1**		
Starting method		Direct line starting		
Air flow(Standard)	**CMM**	**Hi: 10 Me: 9 Lo: 8**	**Hi: 11 Me: 10 Lo: 9**	**Hi: 13 Me: 11.5 Lo: 10**
Outside air intake		Possible		
Air filter, Q'ty		Long life filter × 1(Washable)		
Shock & vibration isolator		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ12.7(1/2")**		
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		**Decorative Panel**		

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.
FDTCA36,45,56 type	TC-PSA-24W-ER

(b) Ceiling recessed type (FDT)

Models FDTA28KXE4R, 36KXE4R

Item \ Models		FDTA28KXE4R	FDTA36KXE4R
Nominal cooling capacity*1	**kW**	**2.8**	**3.6**
Nominal heating capacity*2	**kW**	**3.2**	**4.0**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**	
Noise level	dB(A)	Hi: 35 Me: 33 Lo: 31	
Exterior dimensions Height × Width × Depth	**mm**	**Unit:270 × 840 × 840 Panel:35 × 950 × 950**	
Net weight	**kg**	**Unit:24 Panel:7**	
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Turbo fan × 1	
Motor	**W**	**14×1**	
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 13 Me: 12 Lo: 11**	
Outside air intake		Possible	
Air filter, Q'ty		Long life filter × 1(Washable)	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R)** **Wireless remote control switch (Optional:RCN-T-35W-ER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ9.52(3/8")**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ12.7(1/2")**
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas line)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Decorative Panel**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.
FDTA28,36 type	T-PSA-35W-ER

Models FDTA45KXE4R, 56KXE4R, 71KXE4R

Item \ Models		FDTA45KXE4R	FDTA56KXE4R	FDTA71KXE4R
Nominal cooling capacity*1	**kW**	**4.5**	**5.6**	**7.1**
Nominal heating capacity*2	**kW**	**5.0**	**6.3**	**8.0**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**		
Noise level	dB(A)	Hi: 35 Me: 33 Lo: 31	Hi: 36 Me: 34 Lo: 32	Hi: 37 Me: 35 Lo: 33
Exterior dimensions Height × Width × Depth	**mm**	**Unit:270 × 840 × 840 Panel:35 × 950 × 950**		
Net weight	**kg**	**Unit:24 Panel:7**		
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Turbo fan × 1		
Motor	**W**	**14×1**		**20×1**
Starting method		Direct line starting		
Air flow(Standard)	**CMM**	**Hi: 14 Me: 12 Lo: 11**		**Hi: 15 Me: 14 Lo: 13**
Outside air intake		Possible		
Air filter, Q'ty		Long life filter × 1(Washable)		
Shock & vibration isolator		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless remote control switch (Optional:RCN-T-35W-ER)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: φ6.35(1/4") Gas line: φ12.7(1/2")**		**Liquid line: φ9.52(3/8") Gas line: φ15.88(5/8")**
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		**Decorative Panel**		

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.
FDTA45,56,71 type	T-PSA-35W-ER

Models FDTA90KXE4R, 112KXE4R, 140KXE4R, 160KXE4R

Item \ Models		FDTA90KXE4R	FDTA112KXE4R	FDTA140KXE4R	FDTA160KXE4R
Nominal cooling capacity*1	**kW**	**9.0**	**11.2**	**14.0**	**16.0**
Nominal heating capacity*2	**kW**	**10.0**	**12.5**	**16.0**	**18.0**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**			
Noise level	dB(A)	Hi: 43 Me: 35 Lo: 33	Hi: 43 Me: 42 Lo: 41	Hi: 45 Me: 43 Lo: 41	
Exterior dimensions Height × Width × Depth	**mm**	**Unit: 295 × 840 × 840 Panel:35 × 950 × 950**	**Unit: 365 × 840 × 840 Panel:35 × 950 × 950**		
Net weight	**kg**	**Unit:26 Panel:7**	**Unit:31 Panel:7**		
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Turbo fan × 1			
Motor	**W**	**40 ×1**	**120 ×1**		
Starting method		Direct line starting			
Air flow(Standard)	**CMM**	**Hi: 21 Me: 16 Lo: 14**	**Hi: 27 Me: 23 Lo: 20**	**Hi: 29 Me: 26 Lo: 23**	
Outside air intake		Possible			
Air filter, Q'ty		Long life filter × 1(Washable)			
Shock & vibration isolator		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless remote control switch (Optional:RCN-T-35W-ER)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ9.52(3/8") Gas line: ϕ15.88(5/8")**			
Connecting method		**Flare piping**			
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts		**Decorative Panel**			

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1"UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Model \ Item	Panel Part No.
FDTA90,112,140,160 type	T-PSA-35W-ER

(c) 2-way outlet ceiling recessed type (FDTW)

Models FDTWA28KXE4BR, 45KXE4BR, 56KXE4BR

Item \ Models		FDTWA28KXE4BR	FDTWA45KXE4BR	FDTWA56KXE4BR
Nominal cooling capacity*1	**kW**	**2.8**	**4.5**	**5.6**
Nominal heating capacity*2	**kW**	**3.2**	**5.0**	**6.3**
Power source		**1 phase 220-240V 50Hz**		
Noise level	dB(A)	Hi: 39 Me: 36 Lo: 33		
Exterior dimensions Height × Width × Depth	**mm**	**Unit:285 × 817 × 620 Panel:8 × 1055 × 680**		
Net weight	**kg**	**Unit:19 Panel:7**		
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Turbo fan × 1		
Motor	**W**	**30×1**		
Starting method		Direct line starting		
Air flow(Standard)	**CMM**	**Hi: 14 Me: 12 Lo: 10**		
Outside air intake		Possible		
Air filter, Q'ty		Long life filter × 1 (Washable)		
Shock & vibration isolator		Rubber sleeve (for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4") Gas line: ϕ9.52(3/8")**	**Liquid line: ϕ6.35(1/4") Gas line: ϕ12.7(1/2")**	
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		**Decorative Panel**		

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.
FDTWA28, 45, 56 type	TW-PSA-23W-ER

Models FDTWA71KXE4R, 90KXE4R

Item \ Models		FDTWA71KXE4R	FDTWA90KXE4R
Nominal cooling capacity*1	**kW**	**7.1**	**9.0**
Nominal heating capacity*2	**kW**	**8.0**	**10.0**
Power source		**1 Phase 220-240V 50Hz**	
Noise level	dB(A)	Hi: 41 Me: 38 Lo: 35	Hi: 41 Me: 39 Lo: 36
Exterior dimensions Height × Width × Depth	**mm**	**Unit:335 ×1054× 620 Panel:8 ×1300 × 680**	
Net weight	**kg**	**Unit:26 Panel:9**	
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Turbo fan × 1	
Motor	**W**	**35×1**	**40×1**
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 16 Me: 13 Lo: 11**	**Hi: 19 Me: 16 Lo: 12**
Outside air intake		Possible	
Air filter, Q'ty		Long life filter × 1(Washable)	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ9.52(3/8"),Gas line:φ15.88(5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Decorative Panel**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.
FDTWA71,90 type	TW-PSA-33W-ER

Models FDTWA112KXE4R, 140KXE4R

Item \ Models		FDTWA112KXE4R	FDTWA140KXE4R
Nominal cooling capacity*1	**kW**	**11.2**	**14.0**
Nominal heating capacity*2	**kW**	**12.5**	**16.0**
Power source		**1 Phase 220-240V 50Hz**	
Noise level	dB(A)	Hi: 44 Me: 41 Lo: 38	Hi: 45 Me: 42 Lo: 39
Exterior dimensions Height × Width × Depth	**mm**	**Unit:357 ×1524 × 620 Panel:8 ×1770 × 680**	
Net weight	**kg**	**Unit:38 Panel:11**	
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Turbo fan ×2	
Motor	**W**	**40 × 2**	**50 × 2**
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 28 Me: 25 Lo: 23**	**Hi: 32 Me: 28 Lo: 24**
Outside air intake		Possible	
Air filter, Q'ty		Long life filter × 2(Washable)	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ9.52(3/8"),Gas line:φ15.88(5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas linse)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Decorative Panel**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.
FDTWA112,140 type	TW-PSA-43W-ER

(d) Ceiling recessed single air supply port type (FDTQ)

Models FDTQA22KXE4R

Item \ Model		FDTQA22KXE4R			
Panel name		**Direct blow panel**		**Duct panel(3)**	
Panel model(Option)		**TQ-PSA-14W-ER**	**TQ-PSB-14W-ER**	**QR-PNA-14W-ER**	**QR-PNB-14W-ER**
Nominal cooling capacity*1	**kW**	**2.2**			
Nominal heating capacity*2	**kW**	**2.5**			
Power source		**1 Phase, 220-240V 50Hz/220V 60Hz**			
Noise level	dB(A)	Hi: 38 Lo: 34		Hi: 42 Lo: 39	
Exterior dimensions Height × Width × Depth	**mm**	**Unit:250×570×570 Panel:35×625×650**	**Unit:250×570×570 Panel:35×780×650**	**Unit:250×570×570 Panel:35×625×650**	**Unit:250×570×570 Panel:35×780×650**
Net weight	**kg**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan ×1			
Motor	**W**	**20 × 1**			
Starting method		Direct line starting			
Air flow(Standard)	**CMM**	**Hi: 7 Lo: 5.4**		**Hi: 7 Lo: 6.5**	
Available static pressure(at Hi)	**Pa**	—		**30**	
Outside air intake		Possible			
Air filter, Q'ty		Long life filter × 1(Washable)			
Shock & vibration isolator		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4"), Gas line: ϕ9.52(3/8")**			
Connecting method		**Flare piping**			
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts		**Decorative Panel**			

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) This is the panel to be used when modified to the Duct panel type on site. See page 608 of the 2005 Handbook.

Models FDTQA28KXE4R

Item \ Model		FDTQA28KXE4R			
Panel name		**Direct blow panel**		**Duct panel(3)**	
Panel model(Option)		**TQ-PSA-14W-ER**	**TQ-PSB-14W-ER**	**QR-PNA-14W-ER**	**QR-PNB-14W-ER**
Nominal cooling capacity*1	**kW**	**2.8**			
Nominal heating capacity*2	**kW**	**3.2**			
Power source		**1 Phase, 220-240V 50Hz/220V 60Hz**			
Noise level	dB(A)	Hi: 38 Lo: 34		Hi: 42 Lo:39	
Exterior dimensions Height × Width × Depth	**mm**	**Unit:250×570×570 Panel:35×625×650**	**Unit:250×570×570 Panel:35×780×650**	**Unit:250×570×570 Panel:35×625×650**	**Unit:250×570×570 Panel:35×780×650**
Net weight	**kg**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**
Refrigerant equipment Heat exchanger		Slit fin & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan ×1			
Motor	**W**	**20 × 1**			
Starting method		Direct line starting			
Air flow(Standard)	**CMM**	**Hi: 7 Lo: 5.4**		**Hi: 7 Lo: 6.5**	
Available static pressure(at Hi)	**Pa**	—		**30**	
Outside air intake		Possible			
Air filter, Q'ty		Long life filter × 1(Washable)			
Shock & vibration isolator		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4"), Gas line: ϕ9.52(3/8")**			
Connecting method		**Flare piping**			
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts		**Decorative Panel**			

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) This is the panel to be used when modified to the Duct panel type on site. See page 608 of the 2005 Handbook.

Models FDTQA36KXE4R

Item \ Model		FDTQA36KXE4R			
Panel name		**Direct blow panel**		**Duct panel(3)**	
Panel model(Option)		**TQ-PSA-14W-ER**	**TQ-PSB-14W-ER**	**QR-PNA-14W-ER**	**QR-PNB-14W-ER**
Nominal cooling capacity*1	**kW**	**3.6**			
Nominal heating capacity*2	**kW**	**4.0**			
Power source		**1 Phase, 220-240V 50Hz/220V 60Hz**			
Noise level	dB(A)	Hi: 38 Lo: 34		Hi: 42 Lo:39	
Exterior dimensions Height × Width × Depth	**mm**	**Unit:250×570×570 Panel:35×625×650**	**Unit:250×570×570 Panel:35×780×650**	**Unit:250×570×570 Panel:35×625×650**	**Unit:250×570×570 Panel:35×780×650**
Net weight	**kg**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**	**Unit:19 Panel:2.5**	**Unit:19 Panel:3**
Refrigerant equipment Heat exchanger		Slit fin & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan ×1			
Motor	**W**	**20 × 1**			
Starting method		Direct line starting			
Air flow(Standard)	**CMM**	**Hi: 7 Lo: 5.4**		**Hi: 7 Lo: 6.5**	
Available static pressure(at Hi)	**Pa**	—		**30**	
Outside air intake		Possible			
Air filter, Q'ty		Long life filter × 1 (Washable)			
Shock & vibration isolator		Rubber sleeve (for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4"), Gas line: ϕ12.7(1/2")**			
Connecting method		**Flare piping**			
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts		**Decorative Panel**			

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) This is the panel to be used when modified to the Duct panel type on site. See page 608 of the 2005 Handbook.

(e) 1-way outlet ceiling recessed type (FDTS)

Models FDTSA22KXE4R, 28KXE4R, 36KXE4R

Item \ Models		FDTSA22KXE4R	FDTSA28KXE4R	FDTSA36KXE4R
Nominal cooling capacity*1	**kW**	**2.2**	**2.8**	**3.6**
Nominal heating capacity*2	**kW**	**2.5**	**3.2**	**4.0**
Power source		**1 Phase 220-240V 50Hz**		
Noise level	dB(A)	Hi: 39 Lo: 38	Hi: 40 Me: 39 Lo: 38	
Exterior dimensions Height × Width × Depth	**mm**	**Unit:194 × 1040 × 650 Panel:10 × 1290 × 770**		
Net weight	**kg**	**Unit:26 Panel:6**		
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2		
Motor	**W**	**35×1**		
Starting method		Direct line starting		
Air flow(Standard)	**CMM**	**Hi: 11 Lo: 8**	**Hi: 12 Me: 11 Lo: 10**	
Outside air intake		Possible		
Air filter, Q'ty		Long life filter × 1 (Washable)		
Shock & vibration isolator		Rubber sleeve (for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ9.52(3/8")**		**Liquid line:ϕ6.35(1/4") Gas line:ϕ12.7(1/2")**
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		**Decorative Panel**		

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
JIS B8616 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.
	With Auto Swing
FDTSA22, 28, 36 type	TS-PSA-28W-ER

Models FDTSA45KXE4BR, 71KXE4BR

Item \ Models		FDTSA45KXE4BR	FDTSA71KXE4BR
Nominal cooling capacity*1	**kW**	**4.5**	**7.1**
Nominal heating capacity*2	**kW**	**5.0**	**8.0**
Power source		**1 Phase 220-240V 50Hz**	
Noise level	dB(A)	Hi: 43 Me: 40 Lo: 38	Hi: 44 Me: 40 Lo: 38
Exterior dimensions Height × Width × Depth	**mm**	**Unit:194 × 1040 ×650 Panel:10 × 1290 ×770**	**Unit:194 × 1300 ×650 Panel:10 × 1500 ×790**
Net weight	**kg**	**Unit:26 Panel:6**	**Unit:30 Panel:7**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	Centrifugal fan × 4
Motor	**W**	**40×1**	**25×2**
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 14 Me: 12 Lo: 10**	**Hi: 18 Me: 15 Lo: 12**
Outside air intake		Possible	
Air filter, Q'ty		Long life filter × 1(Washable)	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ6.35(1/4") Gas line:ϕ12.7(1/2")**	**Liquid line:ϕ9.52(3/8") Gas line:ϕ15.88(5/8")**
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Decorative Panel**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

●Decorative Panel model (Optional)

Item / Model	Panel Part No.
	With Auto Swing
FDTSA45 type	TS-PSA-28W-ER
FDTSA71 type	TS-PSA-38W-ER

(f) High static pressure duct type (FDU)

Models FDUA224KXE4R, 280KXE4R

Item \ Models		FDUA224KXE4R	FDUA280KXE4R
Nominal cooling capacity*1	**kW**	**22.4**	**28.0**
Nominal heating capacity*2	**kW**	**25.0**	**31.5**
Power source		**1 Phase 220-240V 50Hz**	
Noise level	dB(A)	Hi: 48	Hi: 49
Exterior dimensions Height × Width × Depth	**mm**	**360 × 1570 × 830**	
Net weight	**kg**	**92**	
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Multiblade centrifugal fan × 4	
Motor	**W**	**200×2**	**230×1, 270×1**
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**51**	**68**
Available static pressure	**Pa**	**Standard:100, MAX:200**	
Outside air intake		Available	
Air filter, Q'ty		Field purchased	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ9.52(3/8"),Gas line: ϕ19.05(3/4")**	**Liquid line: ϕ9.52(3/8"),Gas line: ϕ22.22(7/8")**
Connecting method		**Brazing**	
Drain hose		Connectable with VP25 (I.D. 25mm, O.D. 32mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		Mounting kit	
Optional parts		–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) The FDUA224, 280KXE4R indoor units cannot be connected to the FDCA140HKXEN4R, 140HKXES4R and 160HKXES4R outdoor units.

(g) Medium static pressure ducted type (FDQM)

Models FDQMA22KXE4R, 28KXE4R, 36KXE4R

Item \ Models		FDQMA22KXE4R	FDQMA28KXE4R	FDQMA36KXE4R
Nominal cooling capacity*[1]	**kW**	**2.2**	**2.8**	**3.6**
Nominal heating capacity*[2]	**kW**	**2.5**	**3.2**	**4.0**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**		
Noise level	dB(A)	Hi: 34 Lo: 31		
Exterior dimensions Height × Width × Depth	**mm**	**257 × 570 × 570**		
Net weight	**kg**	**21**		
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	Slit fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 1		
Motor	**W**	**20×1**		
Starting method		Direct line starting		
Air flow(Standard)	**CMM**	**Hi: 7 Lo: 6.5**		
Available static pressure (at Hi)	**Pa**	**30**		
Outside air intake		Side		
Air filter, Q'ty		–		
Shock & vibration isolator		Rubber sleeve (for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4") Gas line: ϕ9.52(3/8")**		**Liquid line: ϕ6.35(1/4") Gas line: ϕ12.7(1/2")**
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		–		

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*[1]	27℃	19℃	35℃	24℃	ISO-T1
Heating*[2]	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(h) Satellite ducted type (FDUM)

Models FDUMA22KXE5R, 28KXE5R

Item \ Models		FDUMA22KXE5R	FDUMA28KXE5R
Nominal cooling capacity*1	**kW**	**2.2**	**2.8**
Nominal heating capacity*2	**kW**	**2.5**	**3.2**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**	
Noise level	dB(A)	Hi: 33 Me: 31 Lo: 28	Hi: 34 Me: 32 Lo: 29
Exterior dimensions Height × Width × Depth	**mm**	**299 × 750 × 635**	
Net weight	**kg**	**33**	**34**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic expansion valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	
Motor	**W**	**40×1**	**50×1**
Starting method		Direct line start	
Air flow(Standard)	**CMM**	**Hi: 10 Me: 9 Lo: 8**	**Hi: 12 Me: 11 Lo: 10**
Available static pressure (at Hi)	**Pa**	**Standard:50, Hi speed:85**	
Outside air intake		–	
Air filter, Q'ty		–	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit(Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ6.35(1/4"),Gas line:φ12.7(1/2")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Filter kit(UM-FL1E)**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDUMA36KXE5R, 45KXE5R, 56KXE5R

Item \ Models		FDUMA36KXE5R	FDUMA45KXE5R	FDUMA56KXE5R
Nominal cooling capacity*1	**kW**	**3.6**	**4.5**	**5.6**
Nominal heating capacity*2	**kW**	**4.0**	**5.0**	**6.3**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**		
Noise level	dB(A)	Hi: 34 Me: 32 Lo: 29	Hi: 35 Me: 32 Lo: 29	
Exterior dimensions Height × Width × Depth	**mm**	**299 × 750 × 635**		
Net weight	**kg**	**34**		
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing		
Refrigerant control		Electronic expansion valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2		
Motor	**W**	**50×1**	**55×1**	
Starting method		Direct line start		
Air flow(Standard)	**CMM**	**Hi: 12 Me: 11 Lo: 10**	**Hi: 14 Me: 12 Lo: 11**	
Available static pressure (at Hi)	**Pa**	**Standard:50, Hi speed:85**		
Outside air intake		–		
Air filter, Q'ty		–		
Shock & vibration absorber		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ6.35(1/4"),Gas line:φ12.7(1/2")**		
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		**Filter kit(UM-FL1E)**		

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDUMA71KXE5R, 90KXE5R

Item \ Models		FDUMA71KXE5R	FDUMA90KXE5R
Nominal cooling capacity*1	**kW**	**7.1**	**9.0**
Nominal heating capacity*2	**kW**	**8.0**	**10.0**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**	
Noise level	dB(A)	Hi: 35 Me: 32 Lo: 29	Hi: 36 Me: 33 Lo: 30
Exterior dimensions Height × Width × Depth	**mm**	**299 × 950 × 635**	
Net weight	**kg**	**40**	
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic expansion valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	
Motor	**W**	**90×1**	**100×1**
Starting method		Direct line start	
Air flow(Standard)	**CMM**	**Hi: 18 Me: 16 Lo: 14**	**Hi: 20 Me: 18 Lo: 15**
Available static pressure (at Hi)	**Pa**	**Standard:50, Hi speed:85**	
Outside air intake		–	
Air filter, Q'ty		–	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ9.52(3/8"),Gas line:ϕ15.88(5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Filter kit(UM-FL2E)**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDUMA112KXE5R, 140KXE5R

Item \ Models		FDUMA112KXE5R	FDUMA140KXE5R
Nominal cooling capacity*1	**kW**	**11.2**	**14.0**
Nominal heating capacity*2	**kW**	**12.5**	**16.0**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**	
Noise level	dB(A)	Hi: 38 Me: 35 Lo: 32	Hi: 39 Me: 37 Lo: 34
Exterior dimensions Height × Width × Depth	**mm**	**350 × 1370 × 635**	
Net weight	**kg**	**59**	**59**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic expansion valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 3	
Motor	**W**	**45 × 1, 90 × 1**	**50 × 1, 100 × 1**
Starting method		Direct line start	
Air flow(Standard)	**CMM**	**Hi: 28 Me: 25 Lo: 22**	**Hi: 34 Me: 31 Lo: 27**
Available static pressure (at Hi)	**Pa**	**Standard:60, Hi speed:90**	**Standard:60, Hi speed:85**
Outside air intake		–	
Air filter, Q'ty		–	
Shock & vibration absorber		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ9.52(3/8"),Gas line:ϕ15.88(5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Filter kit(UM-FL3E)**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(i) Ceiling mounted duct type (FDUR)

Models FDURA45KXE4R, 56KXE4R

Item \ Models		FDURA45KXE4R	FDURA56KXE4R
Nominal cooling capacity*1	**kW**	**4.5**	**5.6**
Nominal heating capacity*2	**kW**	**5.0**	**6.3**
Power source		**1 Phase 220-240V 50Hz**	
Noise level	dB(A)	Hi: 40 Lo: 36	Hi: 41 Lo: 37
Exterior dimensions Height × Width × Depth	**mm**	**295 × 850 × 650**	
Net weight	**kg**	**39**	**39**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion valve	
Air handling equipment Fan type & Q'ty		Multiblade centrifugal fan × 2	
Motor	**W**	**90 × 1**	**130 × 1**
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 17 Lo: 13.5**	**Hi: 21 Lo: 17**
Available static pressure (at Hi)	**Pa**	**Standard:50, Max:85**	
Outside air intake		—	
Air filter Q'ty		Polypropylene net × 1(Washable)	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35 (1/4") Gas line: ϕ12.7 (1/2")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Silent panel, Duct joint**	

Notes (1)The data are measured at the following conditions.

Item \ Operation	Indoor air temperature DB	Indoor air temperature WB	Outdoor air temperature DB	Outdoor air temperature WB	Standards
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2)This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1"UNITARY AIR-CONDITIONERS"

Models FDURA71KXE4R, 90KXE4R

Item \ Models		FDURA71KXE4R	FDURA90KXE4R
Nominal cooling capacity*1	**kW**	**7.1**	**9.0**
Nominal heating capacity*2	**kW**	**8.0**	**10.0**
Power source		**1 Phase 220-240V 50Hz**	
Noise level	dB(A)	Hi: 41 Lo: 37	Hi: 42 Lo: 37
Exterior dimensions Height × Width × Depth	**mm**	**295 × 850 × 650**	**350 × 1370 × 650**
Net weight	**kg**	**40**	**63**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion valve	
Air handling equipment Fan type & Q'ty		Multiblade centrifugal fan × 2	
Motor	**W**	**230 × 1**	**280 × 1**
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 25 Lo: 18.5**	**Hi: 34 Lo: 27**
Available static pressure (at Hi)	**Pa**	**Standard:50, Max:130**	
Outside air intake		—	
Air filter Q'ty		Polypropylene net × 1(Washable)	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ9.52 (3/8") Gas line: ϕ15.88 (5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Silent panel, Duct Joint**	

Notes (1)The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2)This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1"UNITARY AIR-CONDITIONERS"

Models FDURA112KXE4R, 140KXE4R

Item \ Models		FDURA112KXE4R	FDURA140KXE4R
Nominal cooling capacity*1	**kW**	**11.2**	**14.0**
Nominal heating capacity*2	**kW**	**12.5**	**16.0**
Power source		**1 Phase 220-240V 50Hz**	
Noise level	dB(A)	Hi: 42 Lo: 38	Hi: 43 Lo: 39
Exterior dimensions Height × Width × Depth	**mm**	**350 × 1370 × 650**	
Net weight	**kg**	**63**	**65**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion valve	
Air handling equipment Fan type & Q'ty		Multiblade centrifugal fan × 2	
Motor	**W**	**280×1**	**460×1**
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 34 Lo: 27**	**Hi: 42 Lo: 33.5**
Available static pressure (at Hi)	**Pa**	**Standard: 50, Max: 130**	
Outside air intake		—	
Air filter, Q'ty		Polypropylene net × 1(Washable)	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ9.52 (3/8") Gas line: ϕ15.88 (5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		**Silent panel, Duct joint**	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1"UNITARY AIR-CONDITIONERS"

(j) Ultra thin ducted type (FDQS)

Models FDQSA22KXE5R, 28KXE5R, 36KXE5R

Item \ Models		FDQSA22KXE5R	FDQSA28KXE5R	FDQSA36KXE5R
Nominal cooling capacity*1	**kW**	**2.2**	**2.8**	**3.6**
Nominal heating capacity*2	**kW**	**2.5**	**3.2**	**4.0**
Power source		**1 Phase 220-240V 50Hz**		
Noise level	dB(A)	Rear air return Hi:37 Me:35 Lo:33 Bottom air return Hi:43 Me:41 Lo:39		
Exterior dimensions Height × Width × Depth	**mm**	**180 × 940 × 580**		
Net weight	**kg**	**27**		**28**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2		
Motor	**W**	**25×1**		
Starting method		Direct line starting		
Air flow(Standard)	**CMM**	**Hi:9 Me:8 Lo:7.5**		
Available static pressure (at Hi)	**Pa**	**Standard:15, Maximum:30**		
Outside air intake		—		
Air filter, Q'ty		—		
Shock & vibration isolator		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4") Gas line: ϕ9.52(3/8")**		**Liquid line: ϕ6.35(1/4") Gas line: ϕ12.7(1/2")**
Connecting method		**Flare piping**		
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		—		

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDQSA45KXE5R, 56KXE5R

Item \ Models		FDQSA45KXE5R	FDQSA56KXE5R
Nominal cooling capacity*1	**kW**	**4.5**	**5.6**
Nominal heating capacity*2	**kW**	**5.0**	**6.0**
Power source		**1 Phase 220-240V 50Hz**	
Noise level	dB(A)	Rear air return Hi:37 Me:35 Lo:33 Bottom air return Hi:43 Me:41 Lo:39	
Exterior dimensions Height × Width × Depth	**mm**	**180 × 940 × 580**	
Net weight	**kg**	**28**	
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	
Motor	**W**	**25×1**	
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi:11 Me:10 Lo:9**	
Available static pressure (at Hi)	**Pa**	**Standard:15, Maximum:30**	
Outside air intake		—	
Air filter, Q'ty		—	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ6.35(1/4") Gas line: ϕ12.7(1/2")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP25(I.D.25mm, O.D.32mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		—	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(k) Ceiling suspended type (FDE)

Models FDEA36KXE4R, 45KXE4R

Item \ Models		FDEA36KXE4R	FDEA45KXE4R
Nominal cooling capacity*1	**kW**	**3.6**	**4.5**
Nominal heating capacity*2	**kW**	**4.0**	**5.0**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**	
Noise level	dB(A)	Hi: 39 Me: 38 Lo: 36	
Exterior dimensions Height × Width × Depth	**mm**	**210 × 1070 × 690**	
Net weight	**kg**	**30**	
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	
Motor	**W**	**25×1**	
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 11 Me: 9 Lo: 7**	
Outside air intake		Not possible	
Air filter, Q'ty		Long life filter ×2 (Washable)	
Shock & vibration isolator		Rubber sleeve (for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ6.35(1/4"), Gas line:φ12.7(1/2")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP20(I.D.20mm, O.D.26mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDEA56KXE4R, 71KXE4R

Item \ Models		FDEA56KXE4R	FDEA71KXE4R
Nominal cooling capacity*1	**kW**	**5.6**	**7.1**
Nominal heating capacity*2	**kW**	**6.3**	**8.0**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**	
Noise level	dB(A)	Hi: 39 Me: 38 Lo: 36	Hi: 41 Me: 39 Lo: 37
Exterior dimensions Height × Width × Depth	**mm**	**210 × 1070 × 690**	**210 × 1320 × 690**
Net weight	**kg**	**30**	**36**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2	Centrifugal fan × 4
Motor	**W**	**25×1**	**20×2**
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 11 Me: 9 Lo: 7**	**Hi: 18 Me: 14 Lo: 12**
Outside air intake		Not possible	
Air filter, Q'ty		Long life filter × 2(Washable)	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:φ6.35(1/4"), Gas line:φ12.7(1/2")**	**Liquid line:φ9.52(3/8"), Gas line:φ15.88(5/8")**
Connecting method		**Flare piping**	
Drain hose		Connectable with VP20(I.D.20mm, O.D.26mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDEA112KXE4R, 140KXE4R

Item \ Models		FDEA112KXE4R	FDEA140KXE4R
Nominal cooling capacity*1	**kW**	**11.2**	**14.0**
Nominal heating capacity*2	**kW**	**12.5**	**16.0**
Power source		**1 Phase 220-240V 50Hz/220V 60Hz**	
Noise level	dB(A)	Hi: 44 Me: 41 Lo: 39	Hi: 46 Me: 44 Lo: 43
Exterior dimensions Height × Width × Depth	**mm**	**250 × 1620 × 690**	
Net weight	**kg**	**46**	
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Centrifugal fan × 4	
Motor	**W**	**30×2**	**38×2**
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 26 Me: 23 Lo: 21**	**Hi: 29 Me: 26 Lo: 23**
Outside air intake		Not possible	
Air filter, Q'ty		Long life filter × 2(Washable)	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R)** **Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line: ϕ9.52(3/8"), Gas line: ϕ15.88(5/8")**	
Connecting method		**Flare piping**	
Drain hose		Connectable with VP20(I.D.20mm, O.D.26mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		–	

Notes (1) The data are measured at the following conditions.

Item \ Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(I) Wall mounted type (FDK)

Models FDKA22KXE4R, 28KXE4R, 36KXE4R, 45KXE4R

Item \ Models		FDKA22KXE4R	FDKA28KXE4R	FDKA36KXE4R	FDKA45KXE4R
Nominal cooling capacity*	**kW**	**2.2**	**2.8**	**3.6**	**4.5**
Nominal heating capacity*	**kW**	**2.5**	**3.2**	**4.0**	**5.0**
Power source		**1 Phase 220-240V 50Hz**			
Noise level	dB(A)	Hi: 40 Me: 36 Lo: 32		Hi: 41 Me: 37 Lo: 33	Hi: 41 Me: 37 Lo: 32
Exterior dimensions Height × Width × Depth	**mm**	**298 × 840 × 240**			
Net weight	**kg**	**12**			**12.5**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Tangential fan ×1			
Motor	**W**	**33×1**			
Starting method		Direct line starting			
Air flow(Standard)	**CMM**	**Hi: 8 Me: 7 Lo: 6**		**Hi: 10 Me: 9 Lo: 7**	**Hi: 11 Me: 9 Lo: 7**
Outside air intake		Not possible			
Air filter, Q'ty		Long life filter × 2(Washable)			
Shock & vibration isolator		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:Φ6.35(1/4") Gas line:Φ9.52(3/8")**		**Liquid line:Φ6.35(1/4") Gas line:Φ12.7(1/2")**	
Connecting method		**Flare piping**			
Drain hose		Connectable with VP16(I.D.16mm, O.D.22mm)			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		**Mounting kit, Drain hose**			
Optional parts					

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

Models FDKA56KXE4R, 71KXE5R

Item \ Models		FDKA56KXE4R	FDKA71KXE5R
Nominal cooling capacity*1	**kW**	**5.6**	**7.1**
Nominal heating capacity*2	**kW**	**6.3**	**8.0**
Power source		**1 Phase 220-240V 50Hz**	
Noise level	dB(A)	Hi: 46 Me: 43 Lo: 39	Hi: 47 Me: 44 Lo: 40
Exterior dimensions Height × Width × Depth	**mm**	**298×840× 240**	**318×1098× 248**
Net weight	**kg**	**13**	**18**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing	
Refrigerant control		Electronic Expansion Valve	
Air handling equipment Fan type & Q'ty		Tangential fan ×1	
Motor	**W**	**33×1**	**40×1**
Starting method		Direct line starting	
Air flow(Standard)	**CMM**	**Hi: 14 Me: 12 Lo: 10**	**Hi: 21 Me: 18 Lo: 15**
Outside air intake		Not possible	
Air filter, Q'ty		Long life filter × 2(Washable)	
Shock & vibration isolator		Rubber sleeve(for fan motor)	
Insulation (noise & heat)		Polyurethane foam	
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R)** **Wireless kit (Optional:RCND-KIT-HER)**	
Room temperature control		Thermostat by electronics	
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat	
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ6.35(1/4")** **Gas line:ϕ12.7(1/2")**	**Liquid line:ϕ9.52(3/8")** **Gas line:ϕ15.88(5/8")**
Connecting method		**Flare piping**	
Drain hose		Connectable with VP16(I.D.16mm, O.D.22mm)	
Insulation for piping		Necessary (both Liquid & Gas lines)	
Accessories		**Mounting kit, Drain hose**	
Optional parts		–	

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(3) The FDKA71KXE5R indoor unit cannot be connected to the FDCA140HKXEN4R, 140HKXES4R and 160HKXES4R outdoor units.

(m) Floor standing exposed type (FDFL)

Models FDFLA28KXE4R, 45KXE4R, 71KXE4R

Item \ Models		FDFLA28KXE4R	FDFLA45KXE4R	FDFLA71KXE4R
Nominal cooling capacity*	**kW**	**2.8**	**4.5**	**7.1**
Nominal heating capacity*	**kW**	**3.2**	**5.0**	**8.0**
Power source		**1 Phase 220-240V 50Hz**		
Noise level	dB(A)	Hi: 41 Me:38 Lo: 36	Hi: 43 Me:41 Lo: 40	
Exterior dimensions Height × Width × Depth	**mm**	**630 × 1196 × 225**		**630 × 1481 × 225**
Net weight	**kg**	**32**		**40**
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing		
Refrigerant control		Electronic Expansion Valve		
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2		
Motor	**W**	**30×1**	**40×1**	
Starting method		Direct line starting		
Air flow(Standard)	**CMM**	**Hi: 12 Me: 11 Lo: 10**	**Hi: 14 Me: 12 Lo: 10**	**Hi: 18 Me: 15 Lo: 12**
Outside air intake		Not possible		
Air filter, Q'ty		Polypropylene net ×2(Washable)		
Shock & vibration isolator		Rubber sleeve(for fan motor)		
Insulation (noise & heat)		Polyurethane foam		
Operation control Operation switch		**Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)**		
Room temperature control		Thermostat by electronics		
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat		
Installation data Refrigerant piping size	**mm(in)**	**Liquid line:ϕ 6.35(1/4") Gas line:ϕ9.52(3/8")**	**Liquid line:ϕ 6.35(1/4") Gas line:ϕ12.7(1/2")**	**Liquid line:ϕ9.52(3/8") Gas line:ϕ15.88(5/8")**
Connecting method		**Flare piping**		
Drain hose		Connectable with PT20A		
Insulation for piping		Necessary (both Liquid & Gas lines)		
Accessories		**Mounting kit, Drain hose**		
Optional parts		–		

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(n) Floor standing hidden type (FDFU)

Models FDFUA28KXE4R, 45KXE4R, 56KXE4R, 71KXE4R

Item \ Models		FDFUA28KXE4R	FDFUA45KXE4R	FDFUA56KXE4R	FDFUA71KXE4R
Nominal cooling capacity*	kW	2.8	4.5	5.6	7.1
Nominal heating capacity*	kW	3.2	5.0	6.3	8.0
Power source		1 Phase 220-240V 50Hz			
Noise level	dB(A)	Hi: 41 Me:38 Lo: 36	Hi: 43 Me:41 Lo: 40		
Exterior dimensions Height × Width × Depth	mm	630 × 1077 × 225			630 × 1362 × 225
Net weight	kg	25			32
Refrigerant equipment Heat exchanger		Louver fin & inner grooved tubing			
Refrigerant control		Electronic Expansion Valve			
Air handling equipment Fan type & Q'ty		Centrifugal fan × 2			
Motor	W	30×1	40×1		
Starting method		Direct line starting			
Air flow(Standard)	CMM	Hi: 12 Me: 11 Lo: 10	Hi: 14 Me: 12 Lo: 10		Hi: 18 Me: 15 Lo: 12
Outside air intake		Not possible			
Air filter, Q'ty		Polypropylene net ×2(Washable)			
Shock & vibration isolator		Rubber sleeve(for fan motor)			
Insulation (noise & heat)		Polyurethane foam			
Operation control Operation switch		Wired remote control switch (Optional:RC-E1R) Wireless kit (Optional:RCND-KIT-HER)			
Room temperature control		Thermostat by electronics			
Safety equipment		Internal thermostat for fan motor. Frost protection thermostat			
Installation data Refrigerant piping size	mm(in)	Liquid line:ϕ6.35(1/4") Gas line:ϕ9.52(3/8")	Liquid line:ϕ6.35(1/4") Gas line:ϕ12.7(1/2")		Liquid line:ϕ9.52(3/8") Gas line:ϕ15.88(5/8")
Connecting method		Flare piping			
Drain hose		Connectable with PT20A			
Insulation for piping		Necessary (both Liquid & Gas lines)			
Accessories		Mounting kit, Drain hose			
Optional parts		–			

Notes (1) The data are measured at the following conditions.

Item / Operation	Indoor air temperature		Outdoor air temperature		Standards
	DB	WB	DB	WB	
Cooling*1	27℃	19℃	35℃	24℃	ISO-T1
Heating*2	20℃	—	7℃	6℃	

(2) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

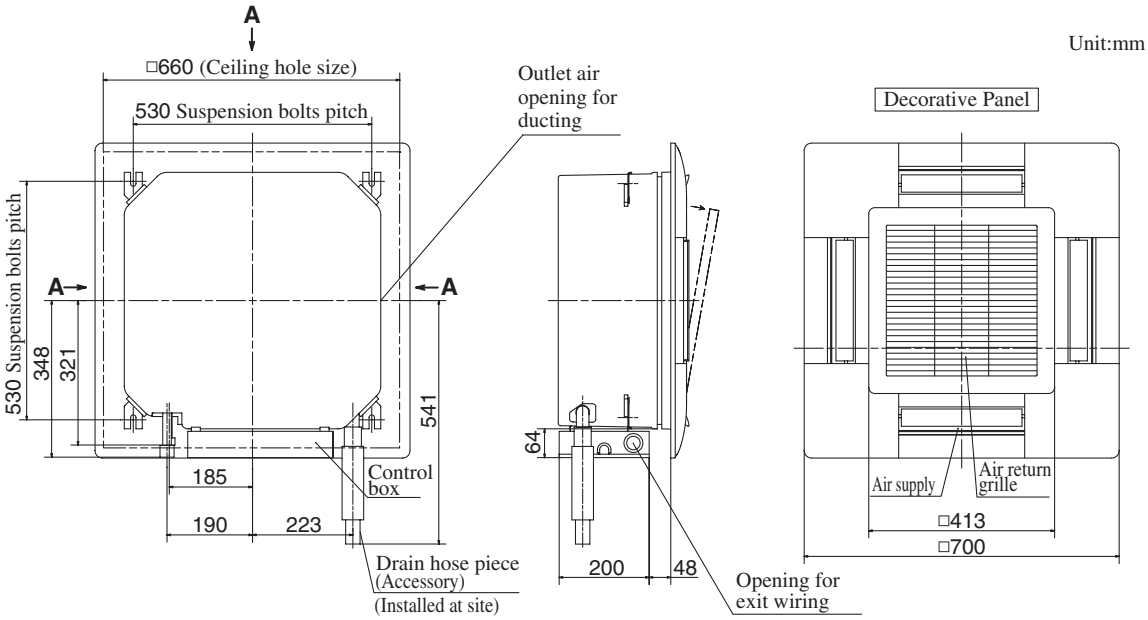
3.2 Exterior dimensions

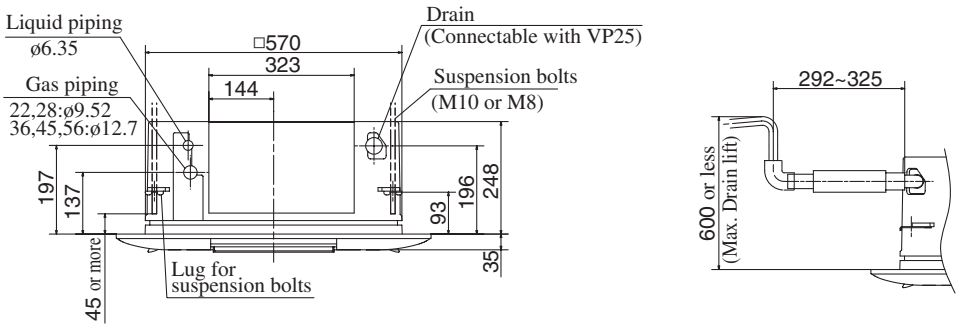
(1) Indoor unit

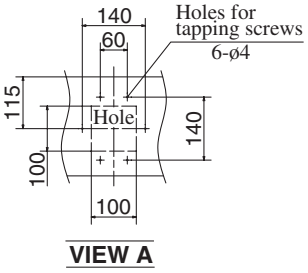
(a) Ceiling recessed compact type (FDTC)

Models FDTCA22KXE4R, 28KXE4R, 36KXE4R, 45KXE4R, 56KXE4R

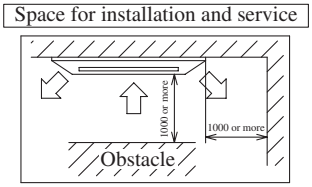
Unit:mm







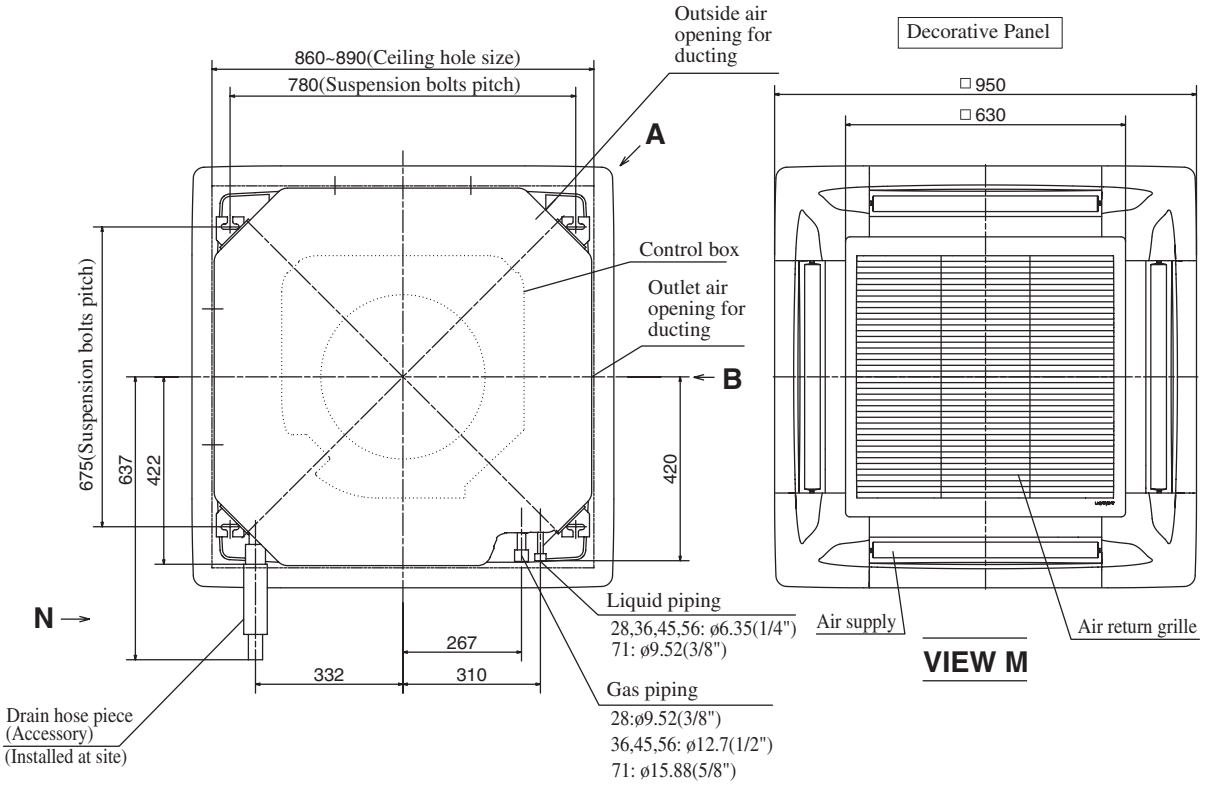
VIEW A

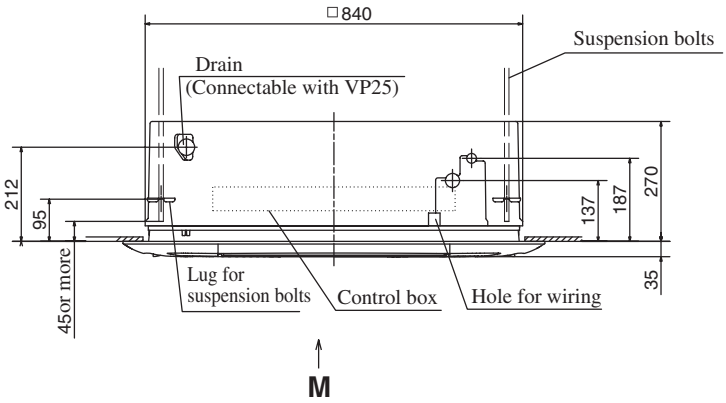


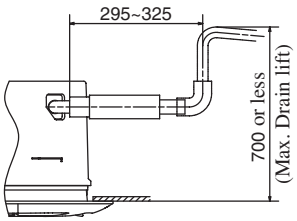
(b) Ceiling recessed compact type (FDT)

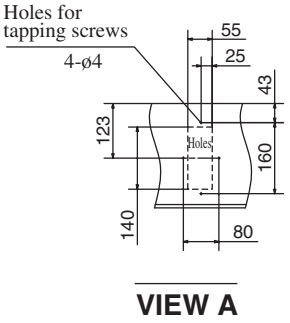
Models FDTA28KXE4R, 36KXE4R, 45KXE4R, 56KXE4R, 71KXE4R

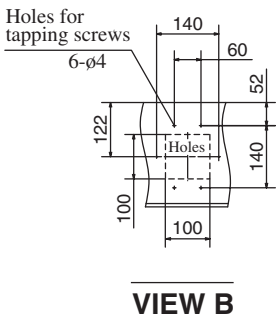
unit : mm

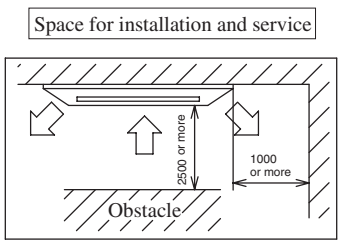




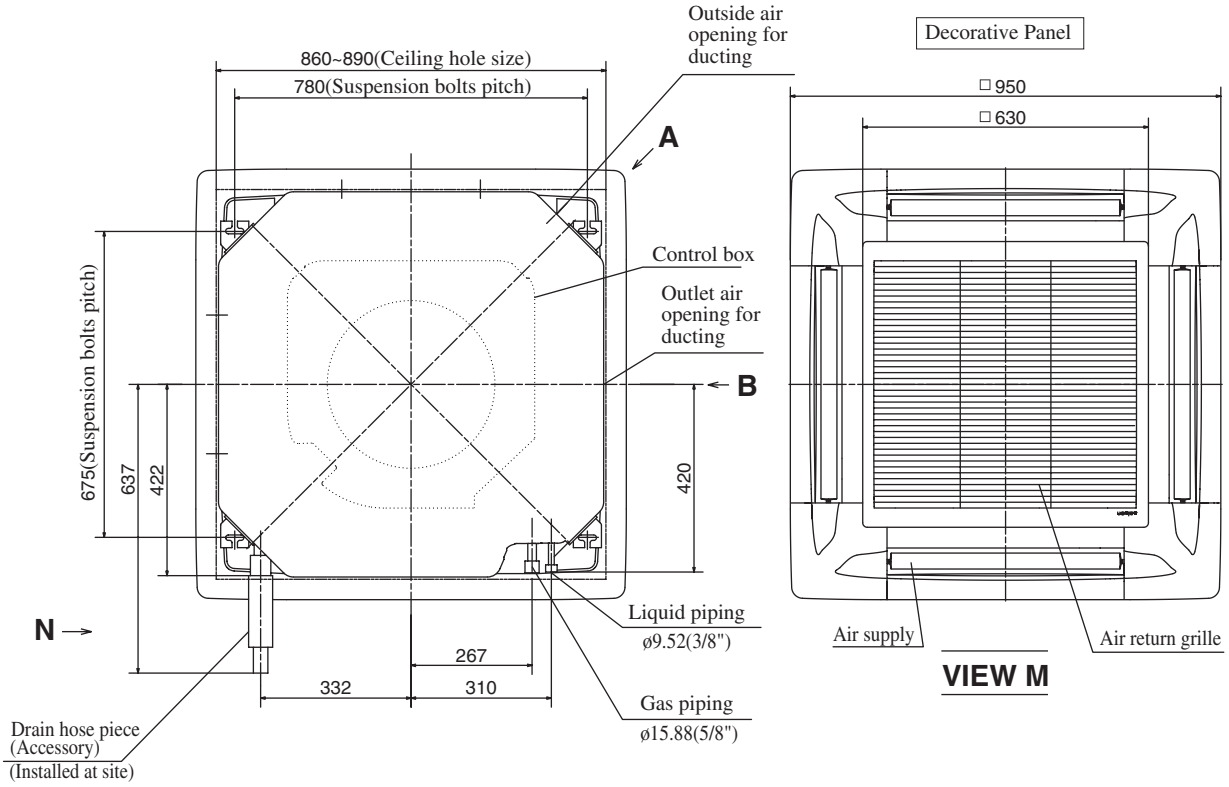


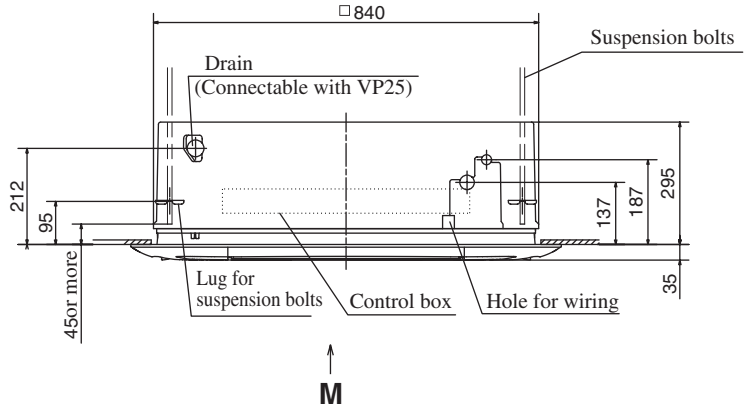


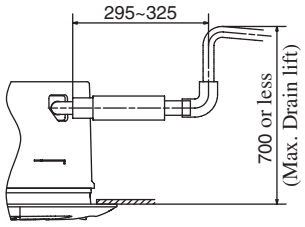


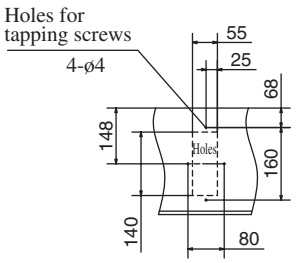


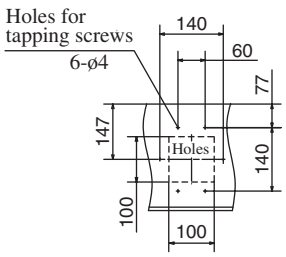
Models FDTA90KXE4R

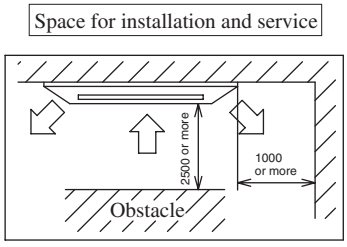






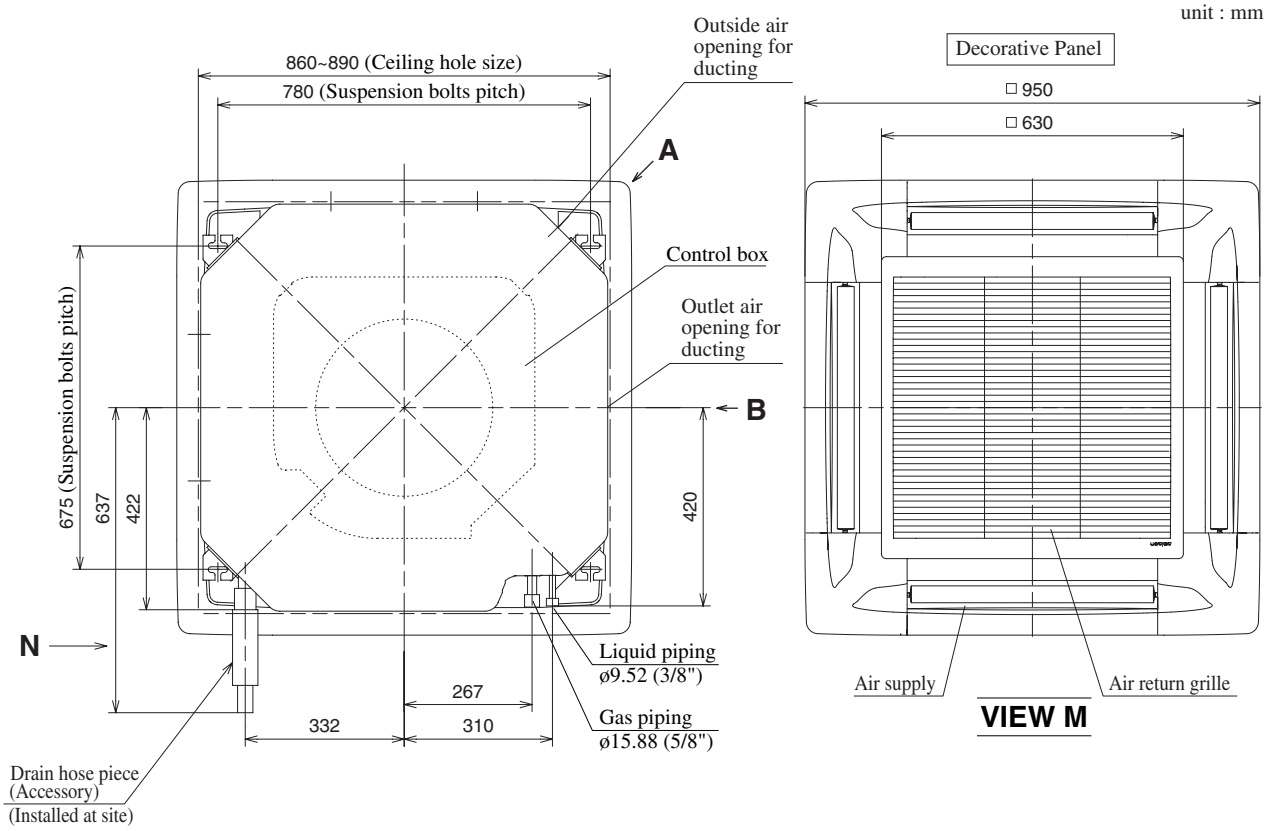


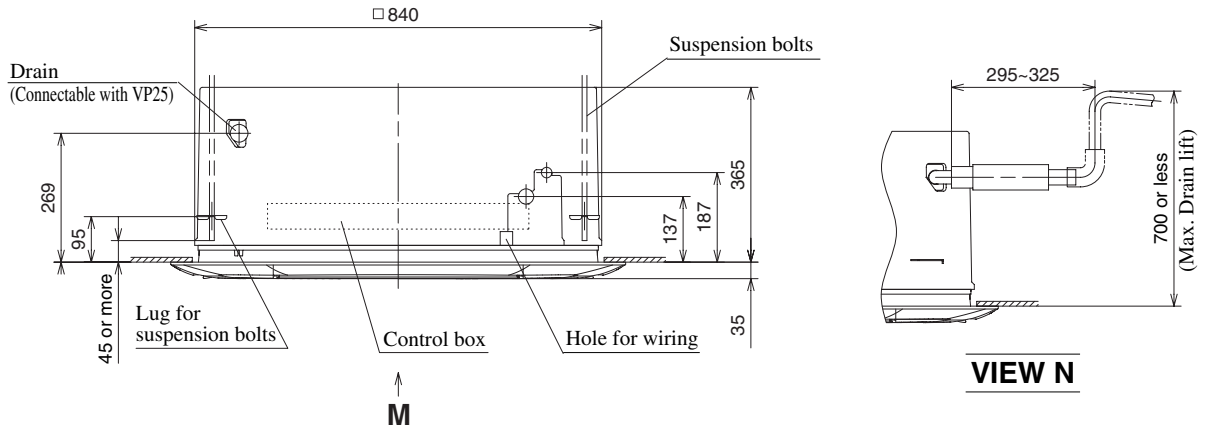


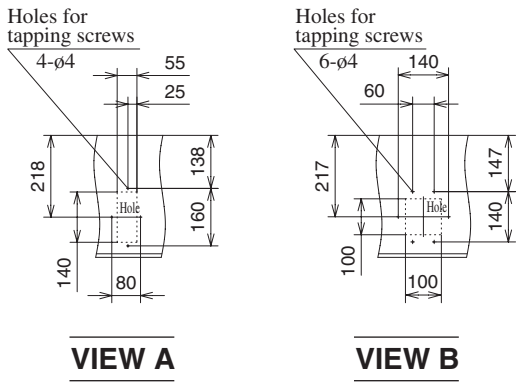


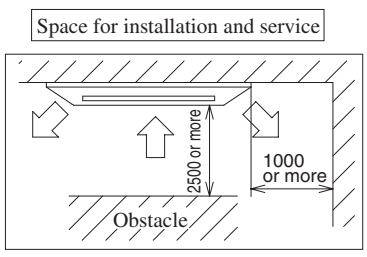
Models FDTA112KXE4R, 140KXE4R, 160KXE4R

unit : mm





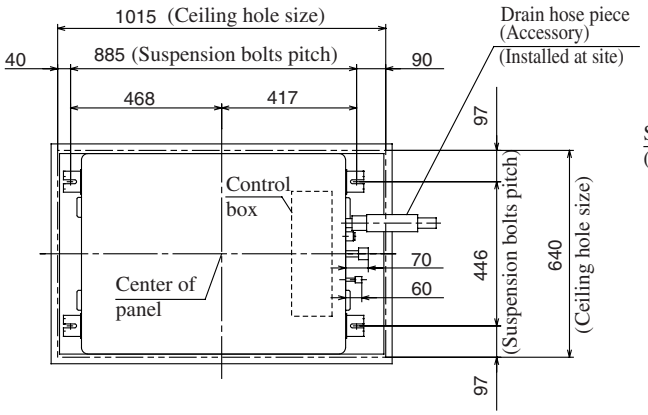


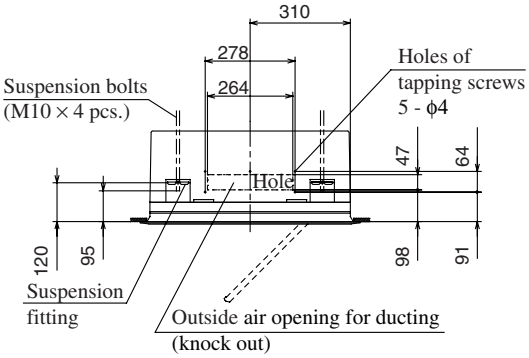


(c) 2-way outlet ceiling recessed type (FDTW)

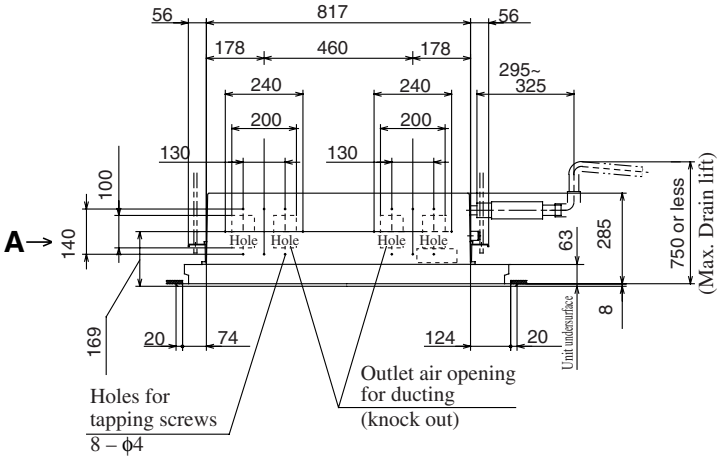
Models FDTWA28KXE4BR, 45KXE4BR, 56KXE4BR

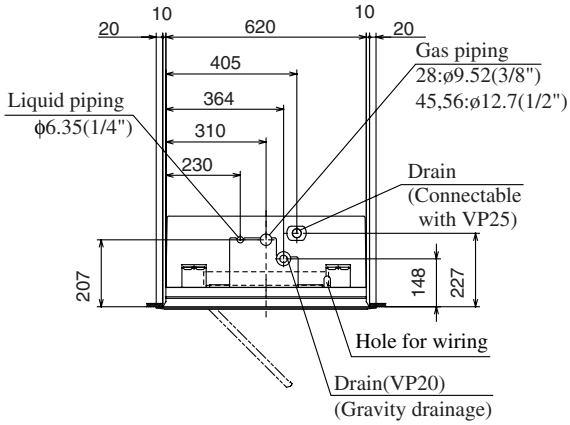
Unit : mm



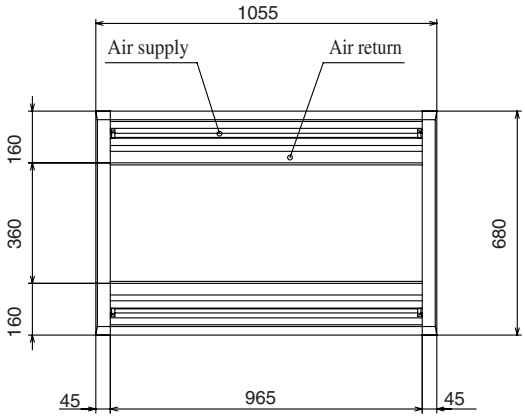


VIEW A

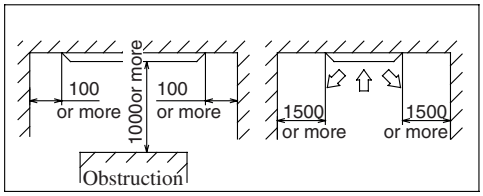




Decorative Panel

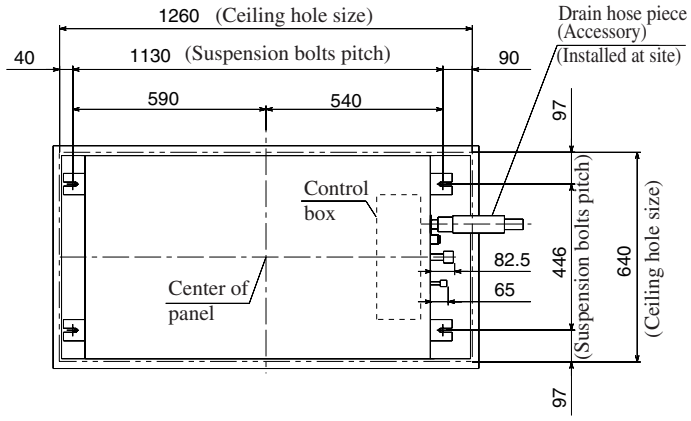


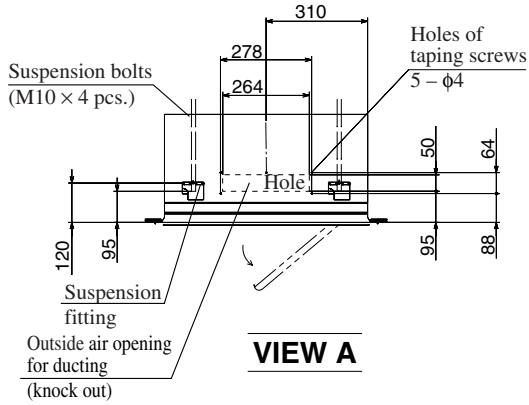
Space for installation and service

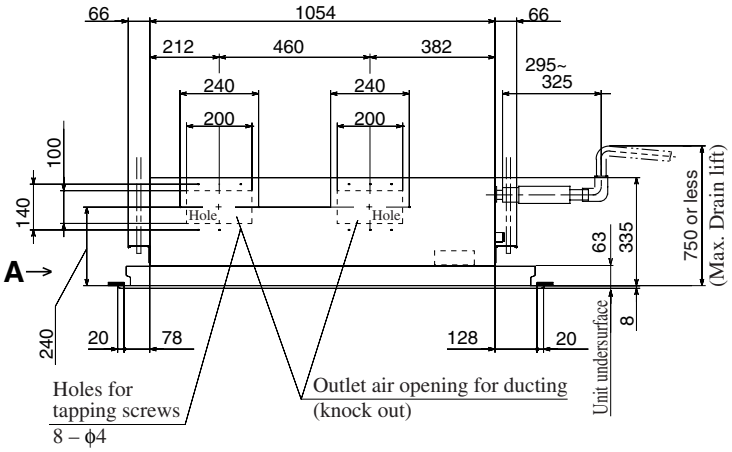


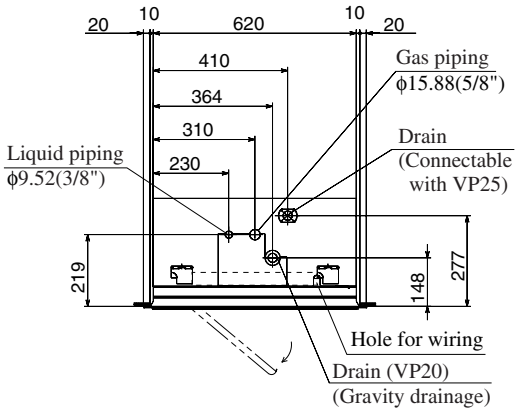
Models FDTWA71KXE4R, 90KXE4R

Unit : mm

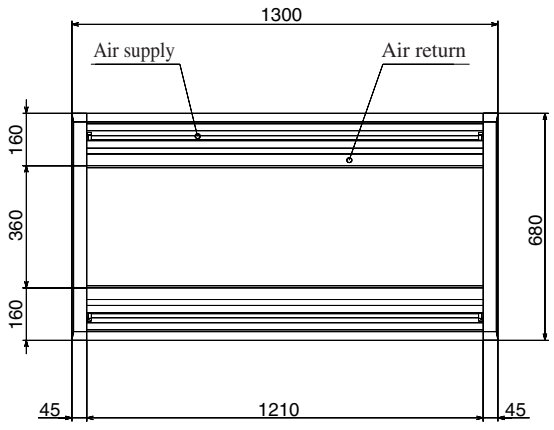




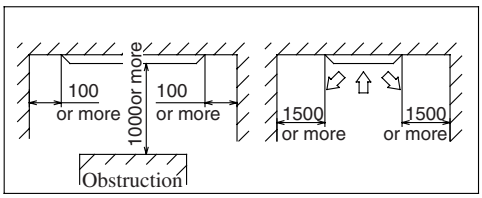




Decorative Panel

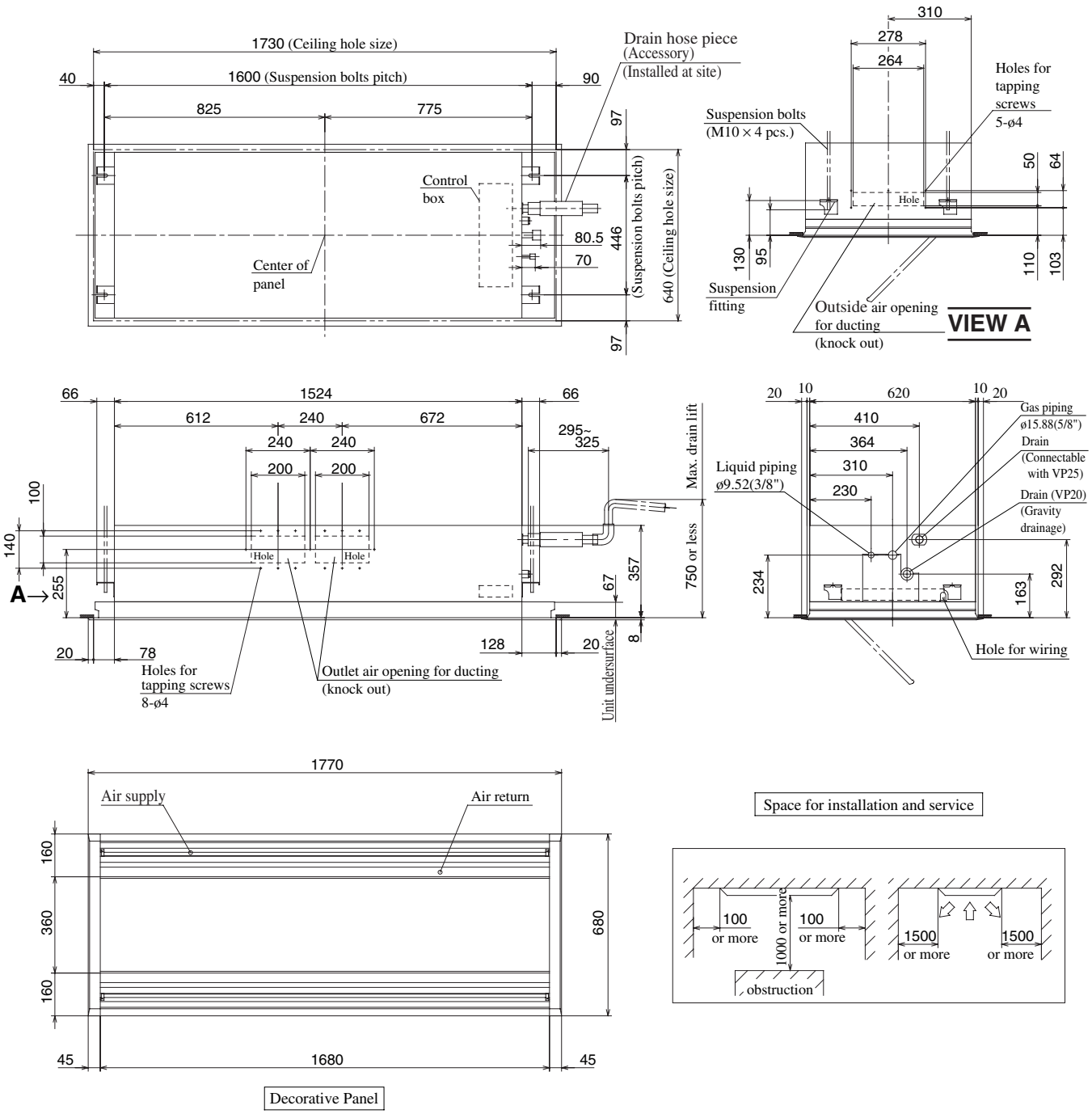


Space for installation and service



Models FDTWA112KXE4R, 140KXE4R

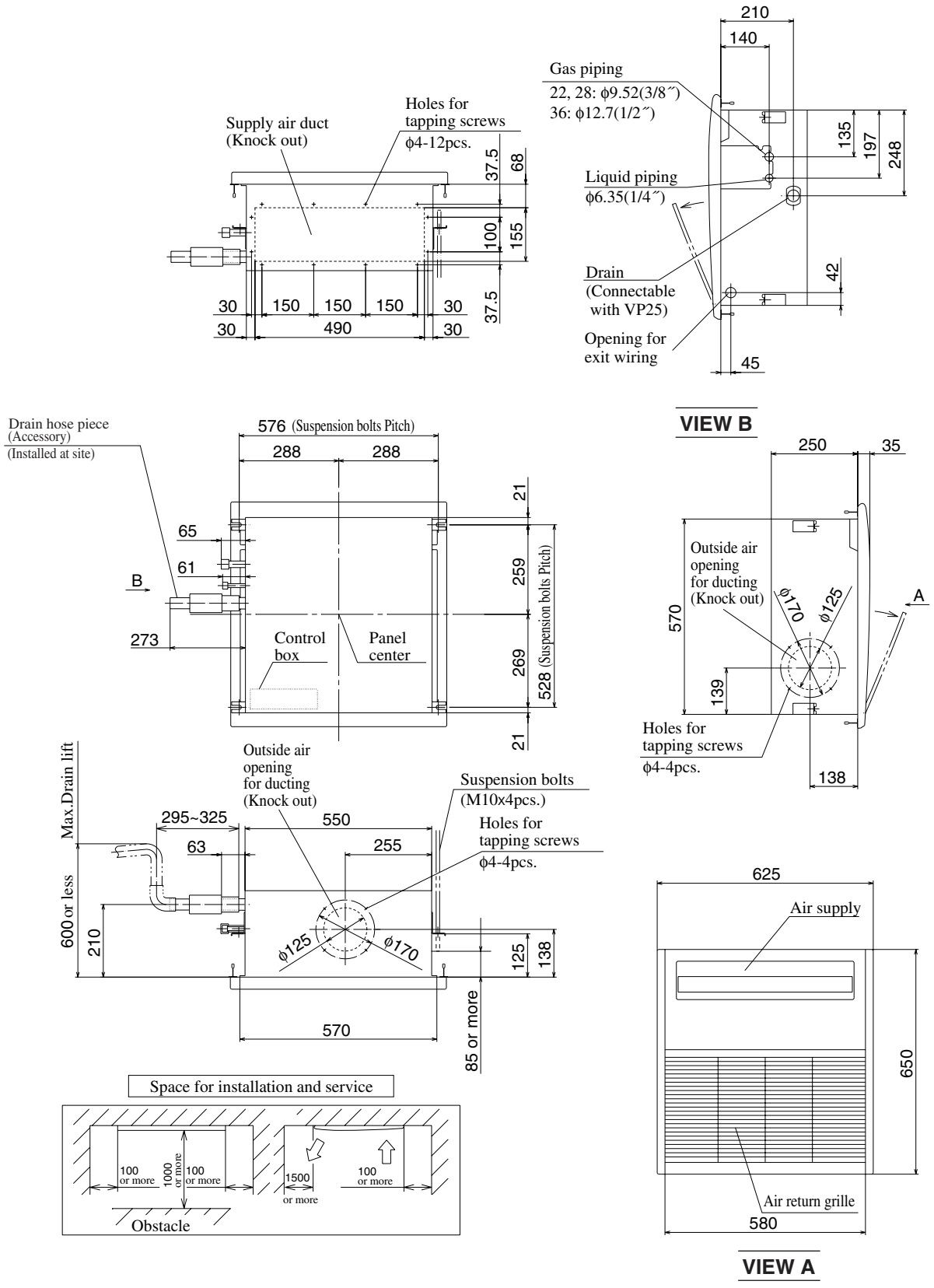
Unit: mm



(d) Ceiling recessed single air supply port type (FDTQ)

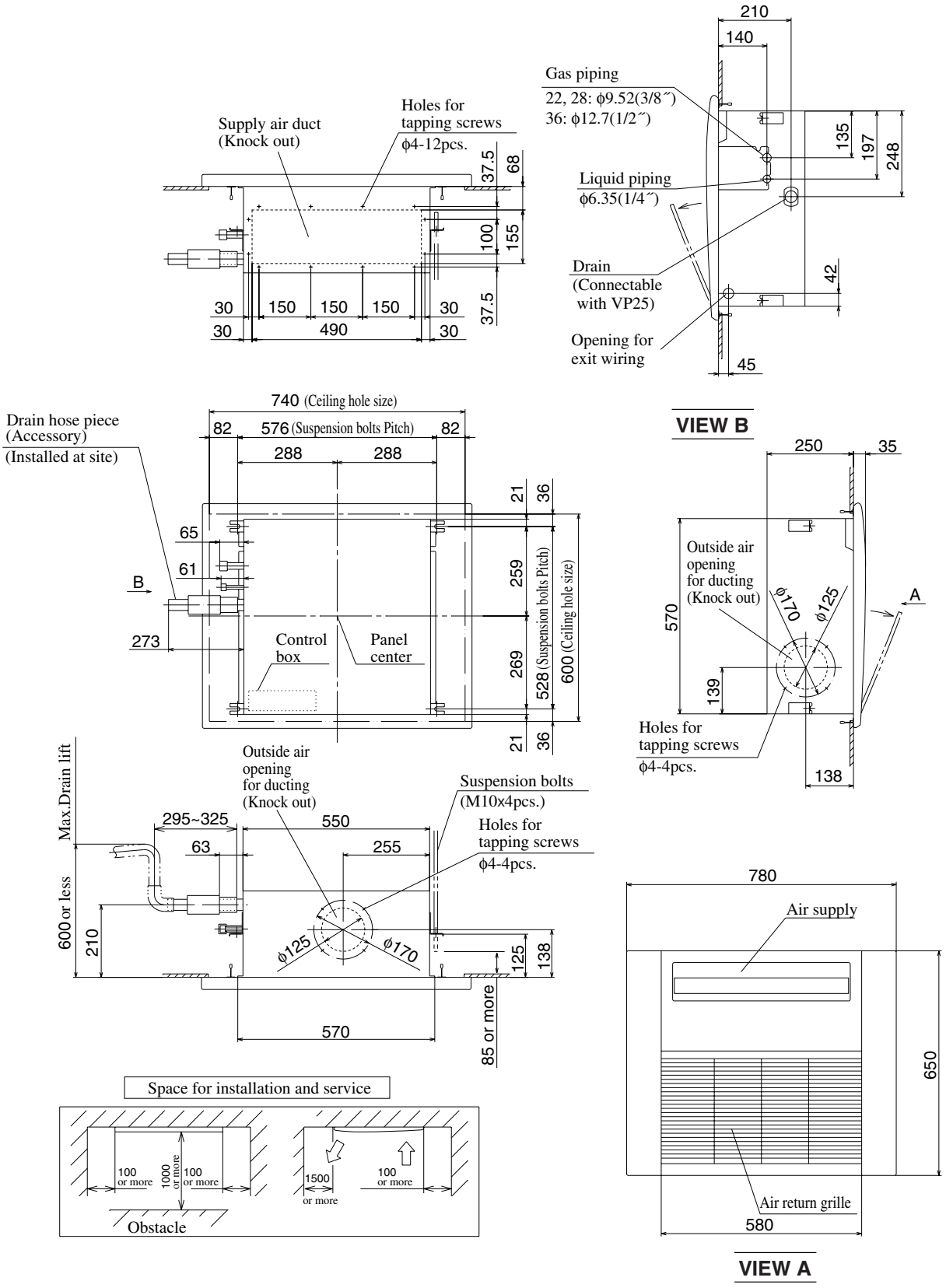
Models FDTQA22KXE4R, 28KXE4R, 36KXE4R

Direct blow panel (TQ-PSA-14W-ER)



Models FDTQA22KXE4R, 28KXE4R, 36KXE4R

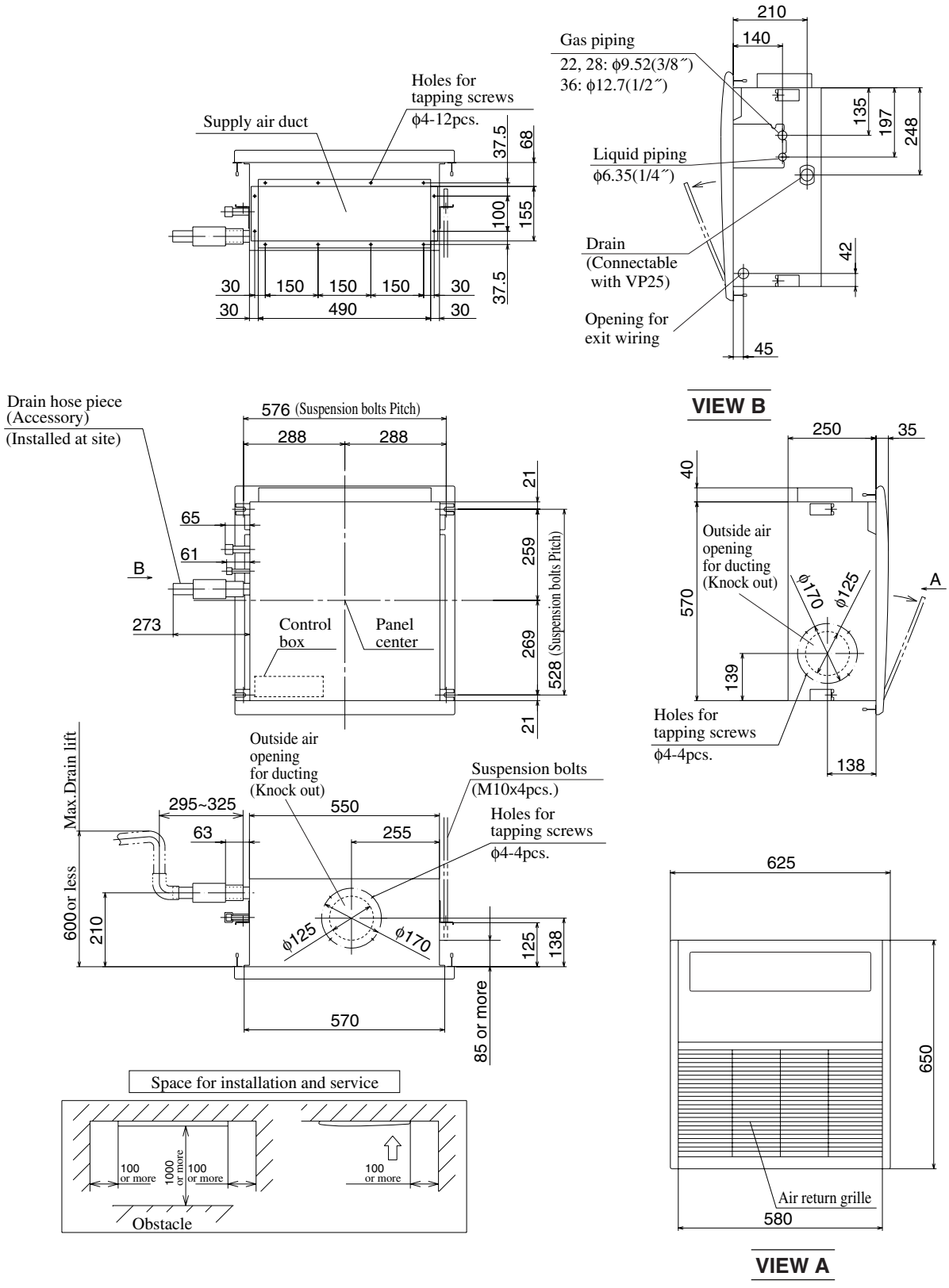
Direct blow panel (TQ-PSB-14W-ER)



- **When modified to the Duct panel type on site.**

Models FDTQA22KXE4R, 28KXE4R 36KXE4R

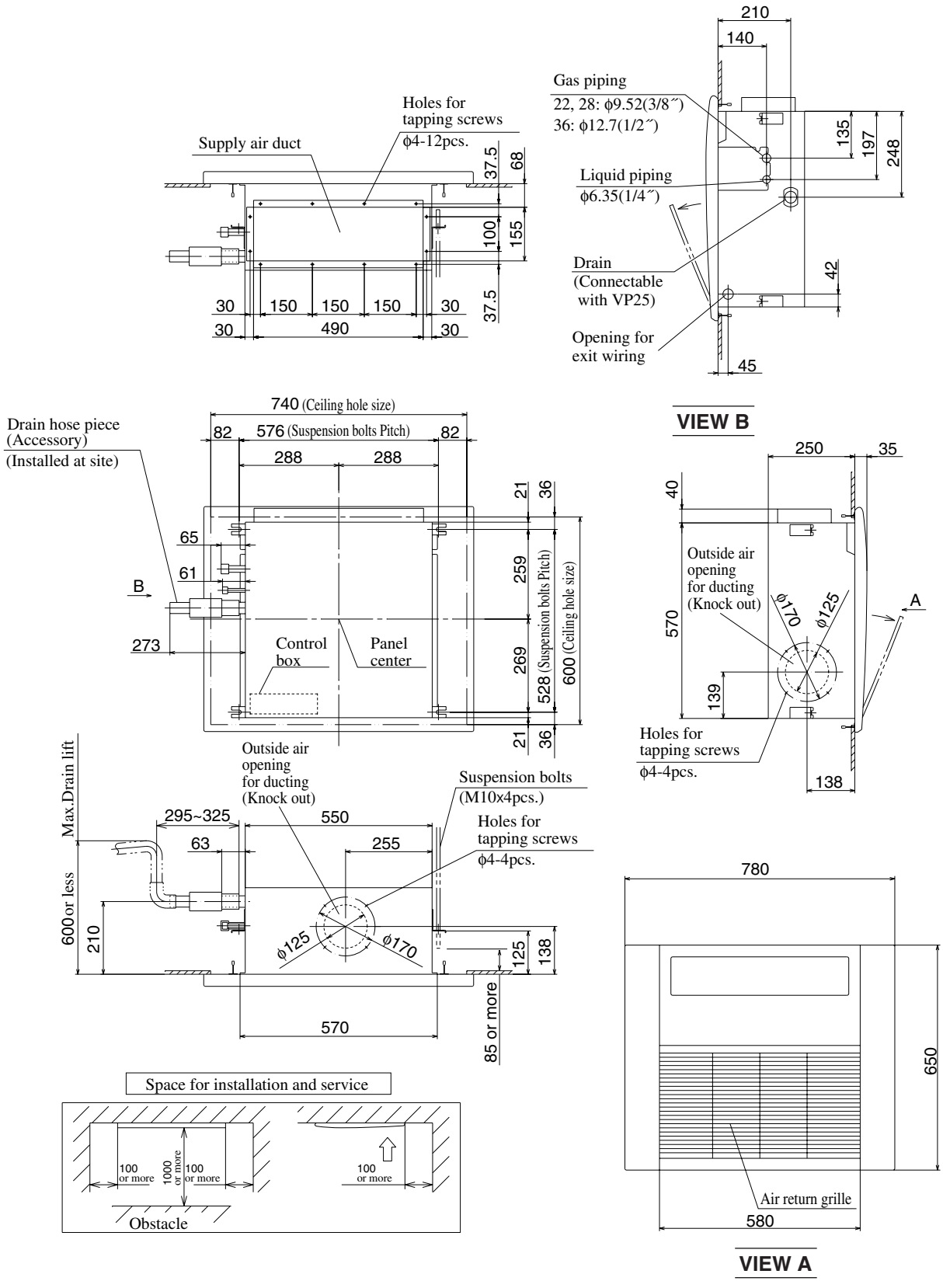
Duct panel (QR-PNA-14W-ER)



- **When modified to the Duct Cassetteria type on site.**

Models FDTQA22KXE4R, 28KXE4R, 36KXE4R

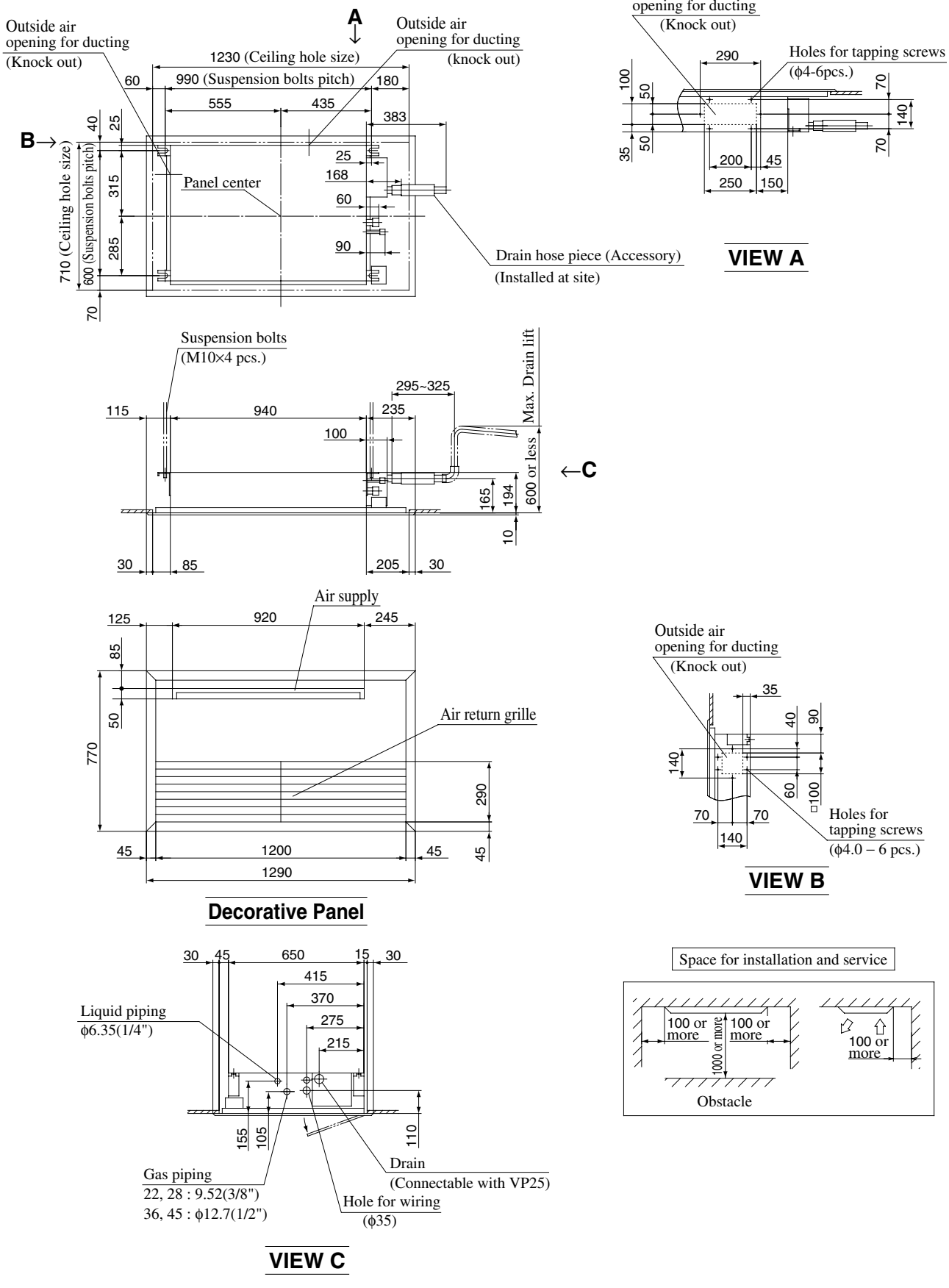
Duct panel (QR-PNB-14W-ER)



(e) 1-way outlet ceiling recessed type (FDTS)

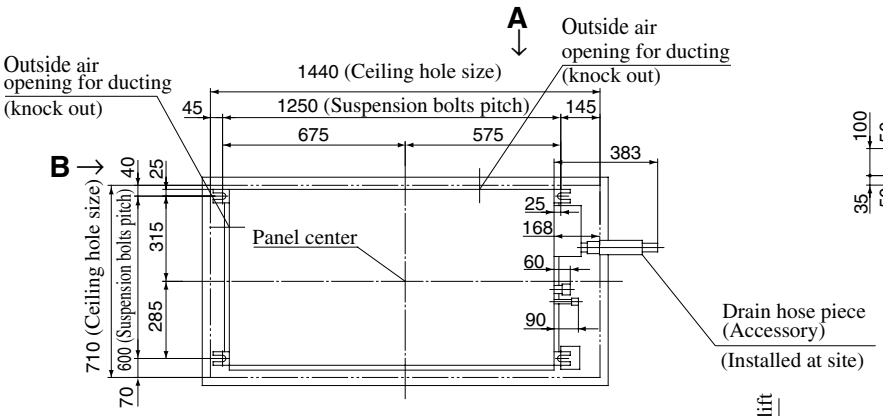
Models FDTSA22KXE4R, 28KXE4R, 36KXE4R, 45KXE4BR

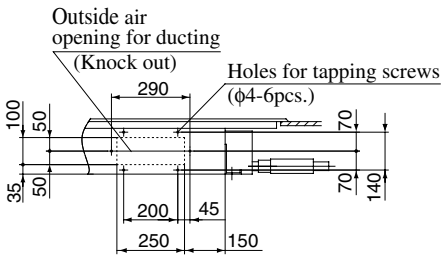
Unit : mm



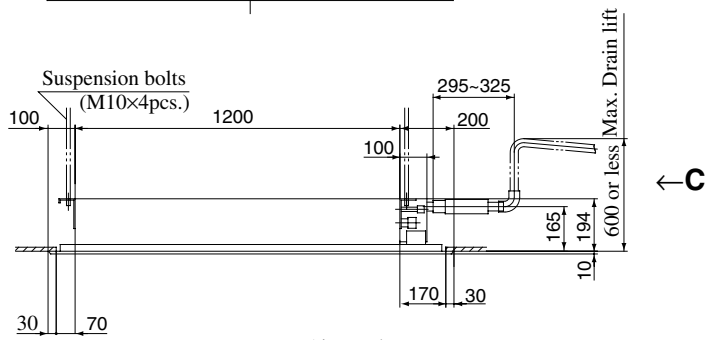
Models FDTSA71KXE4BR

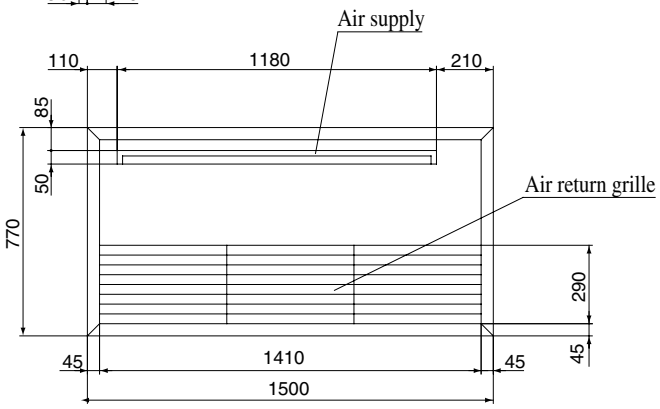
Unit : mm



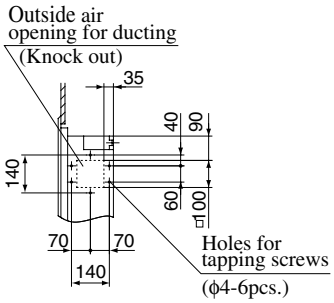


VIEW A

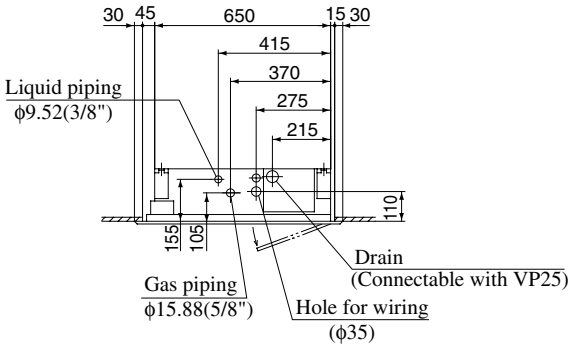




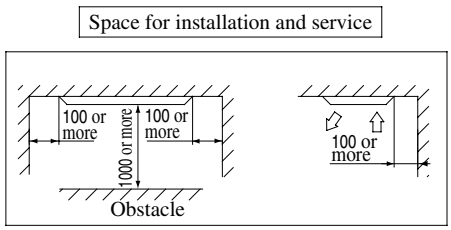
Decorative Panel



VIEW B

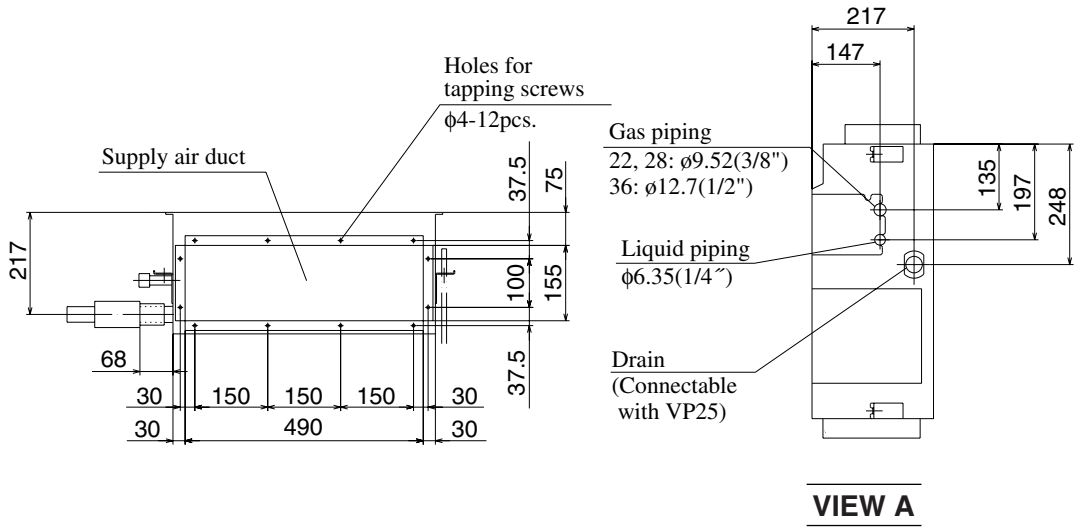


VIEW C

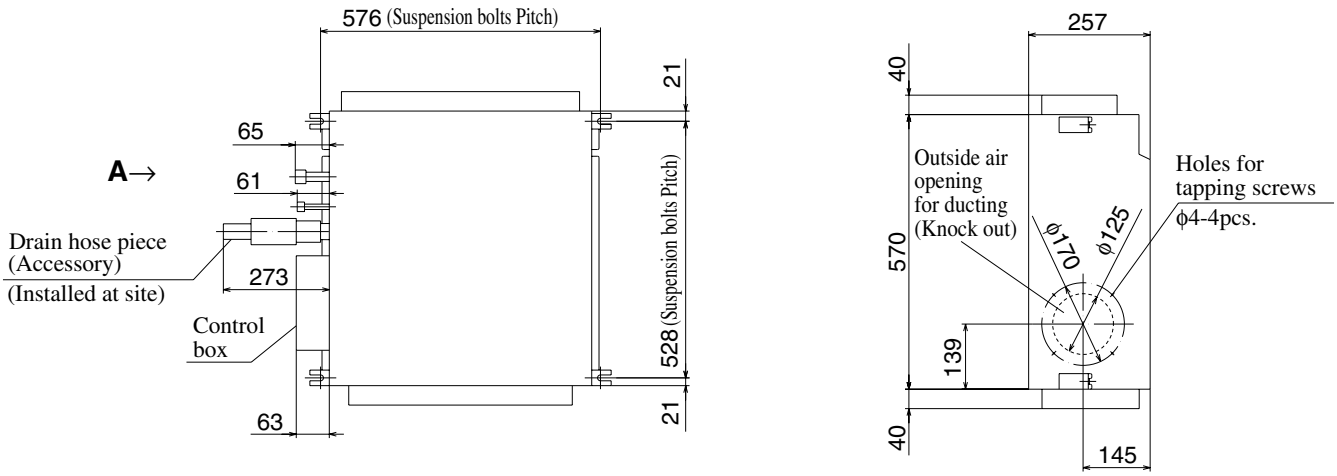


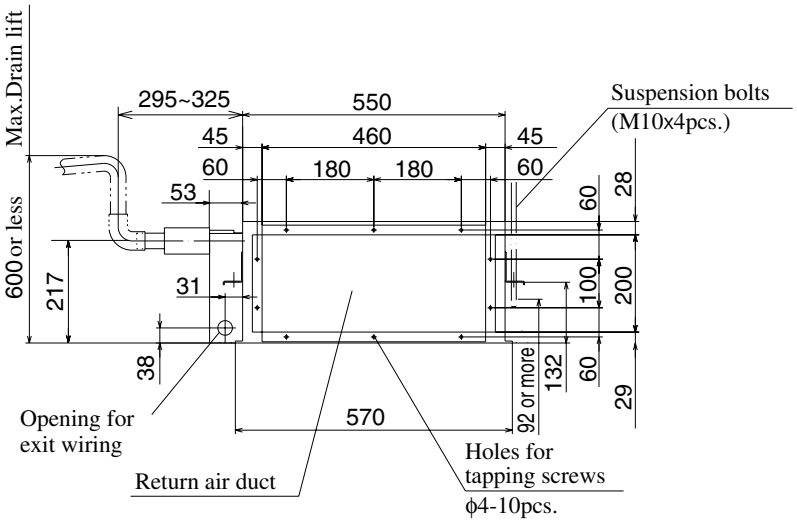
(f) Medium static pressure ducted type (FDQM)

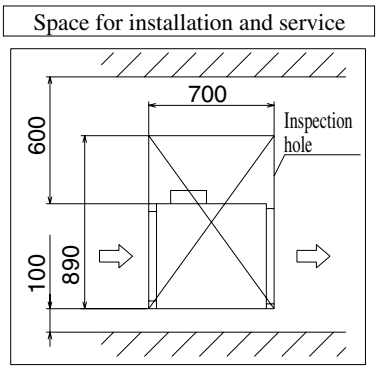
Models FDQMA22KXE4R, 28KXE4R, 36KXE4R



VIEW A

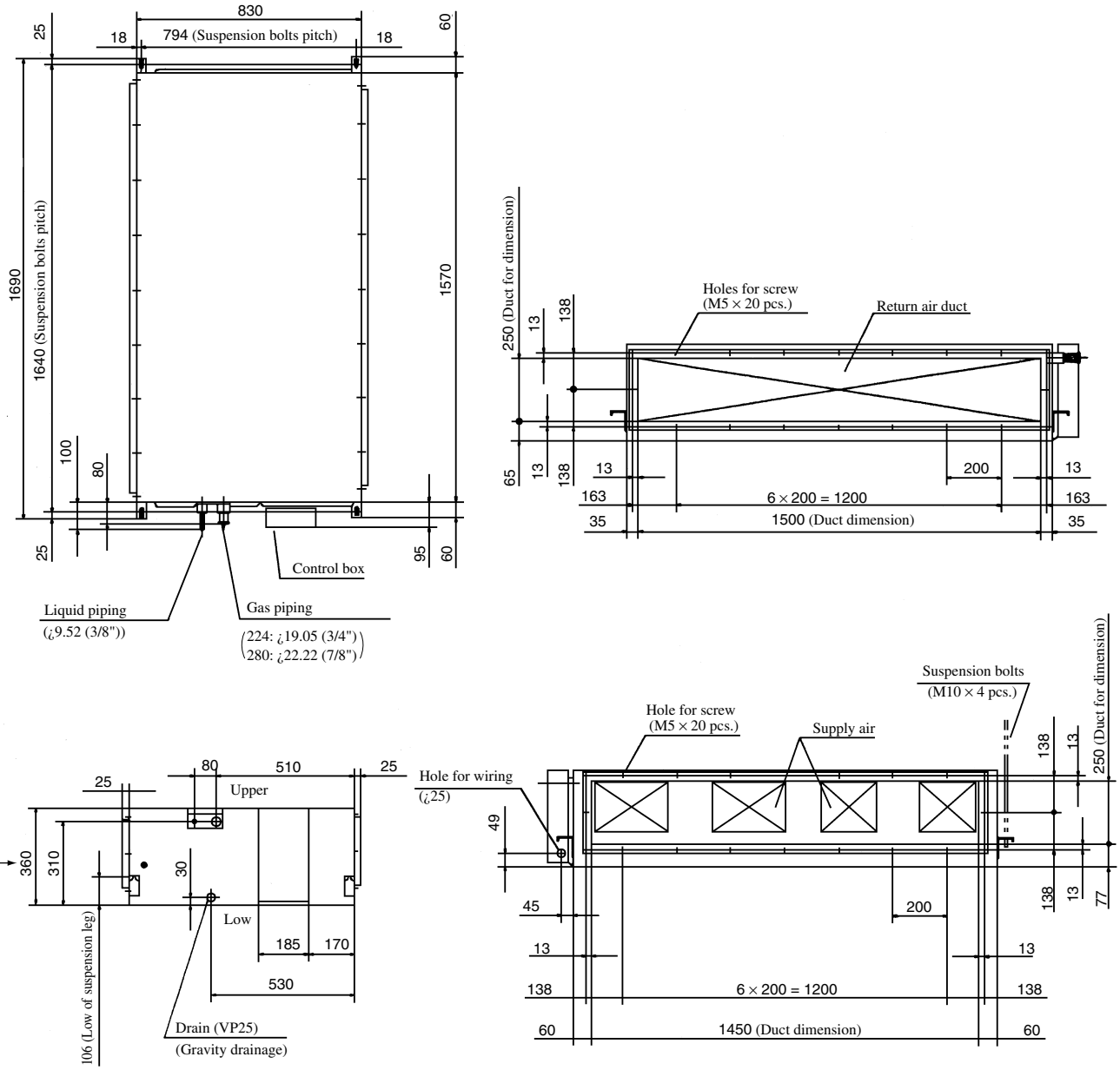




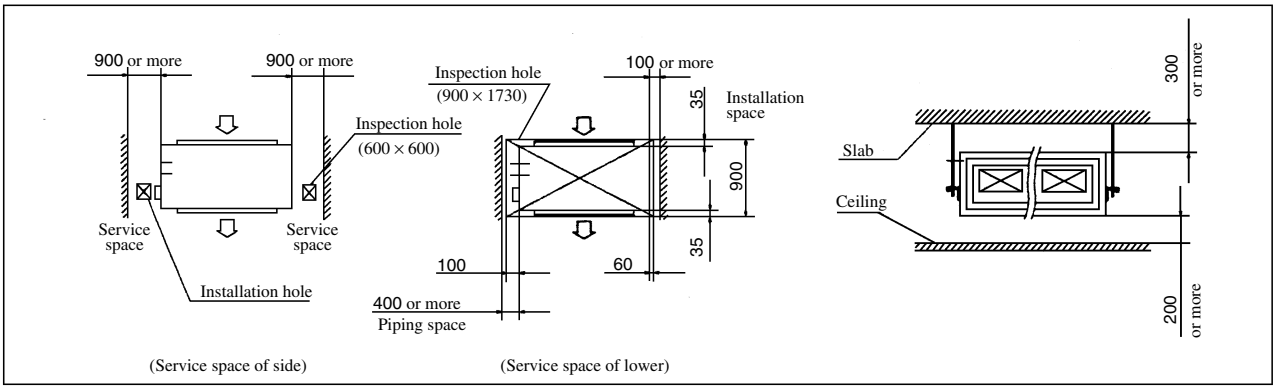


(g) High static pressure duct type (FDU)

Model FDUA224KXE4R, 280KXE4R



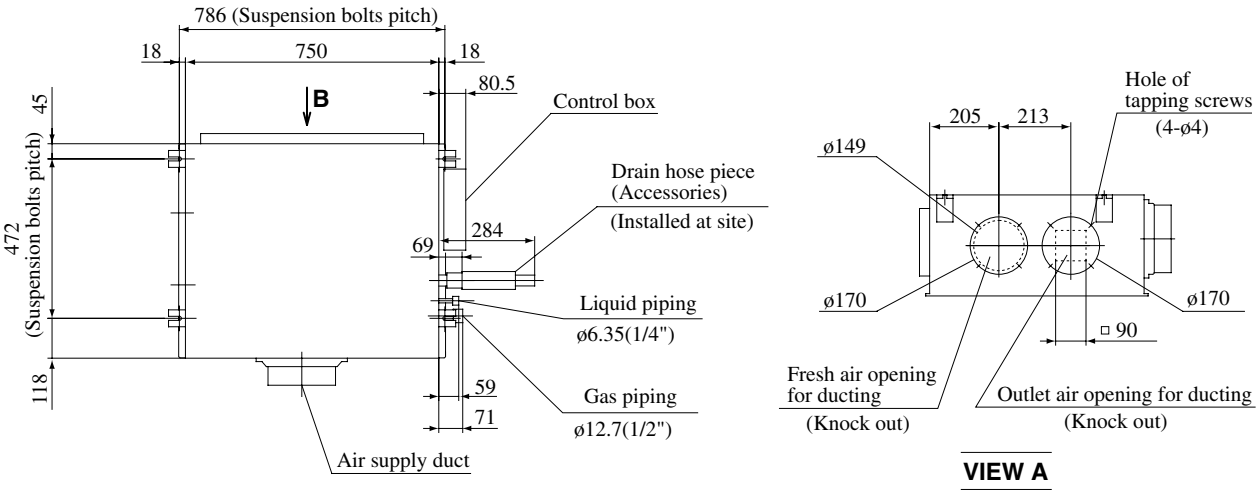
Space for installation and service

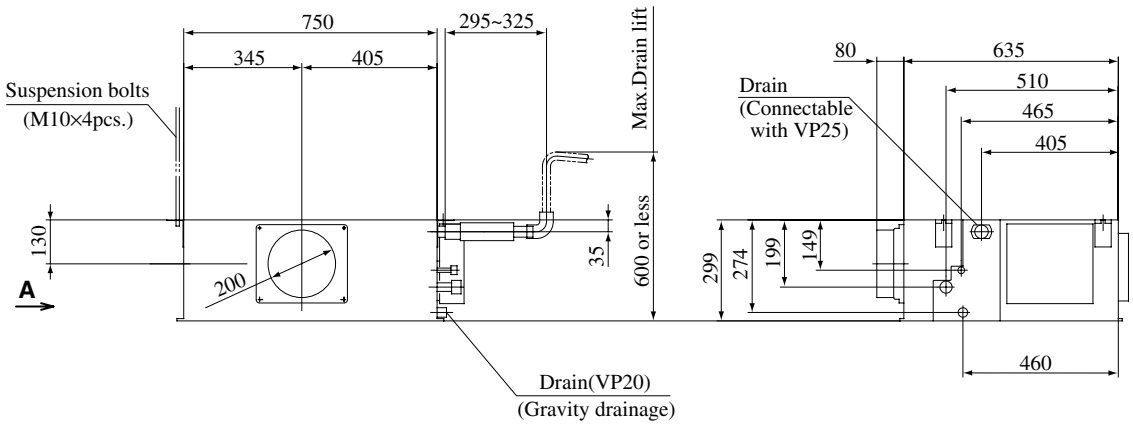


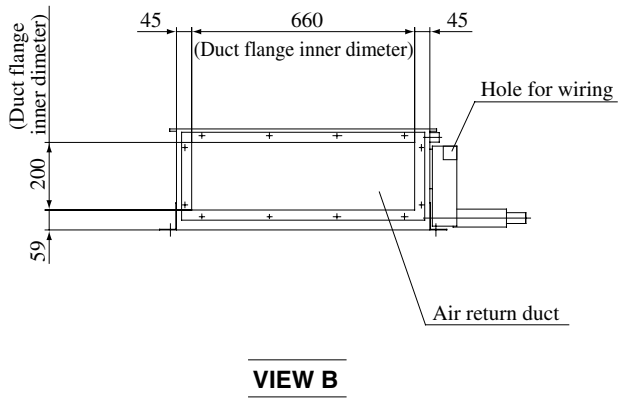
(h) Satellite ducted type (FDUM)

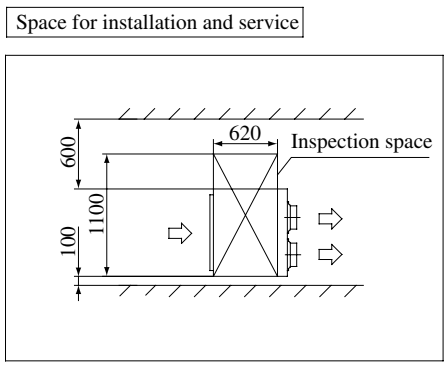
Model FDUMA22KXE5R

Unit : mm



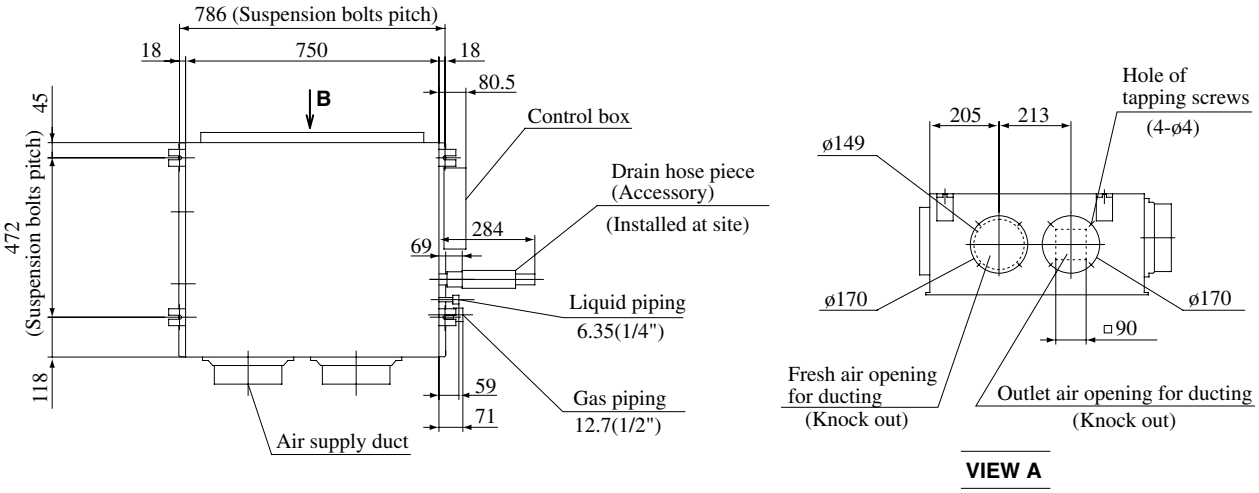


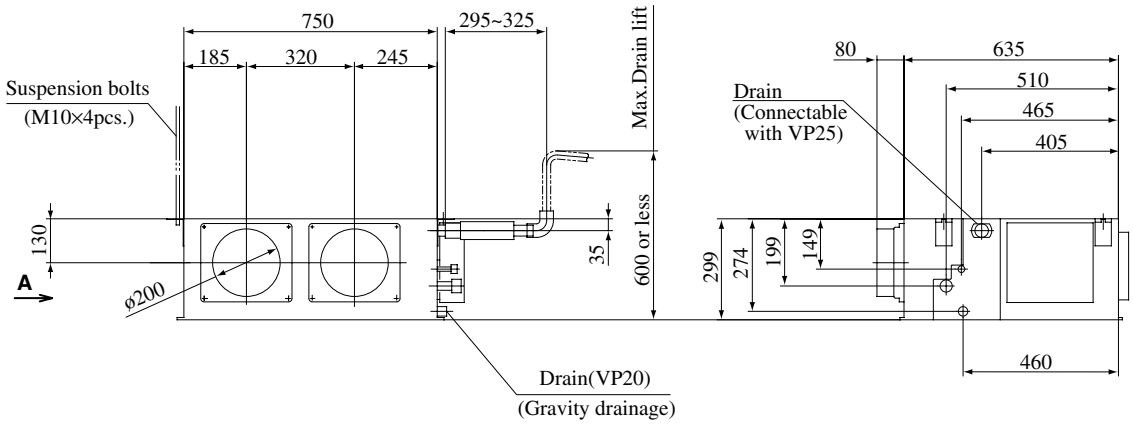


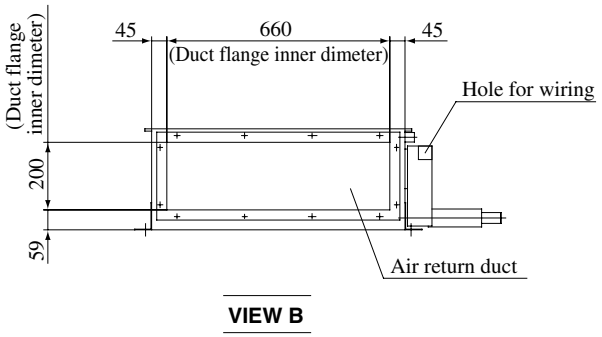


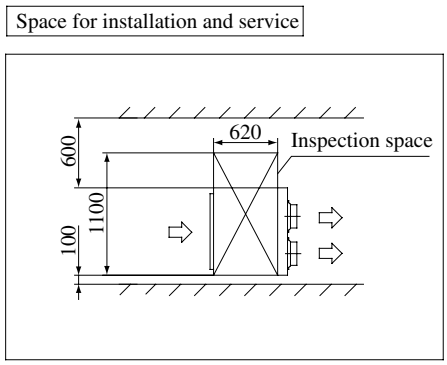
Models FDUMA28KXE5R, 36KXE5R, 45KXE5R, 56KXE5R,

Unit : mm



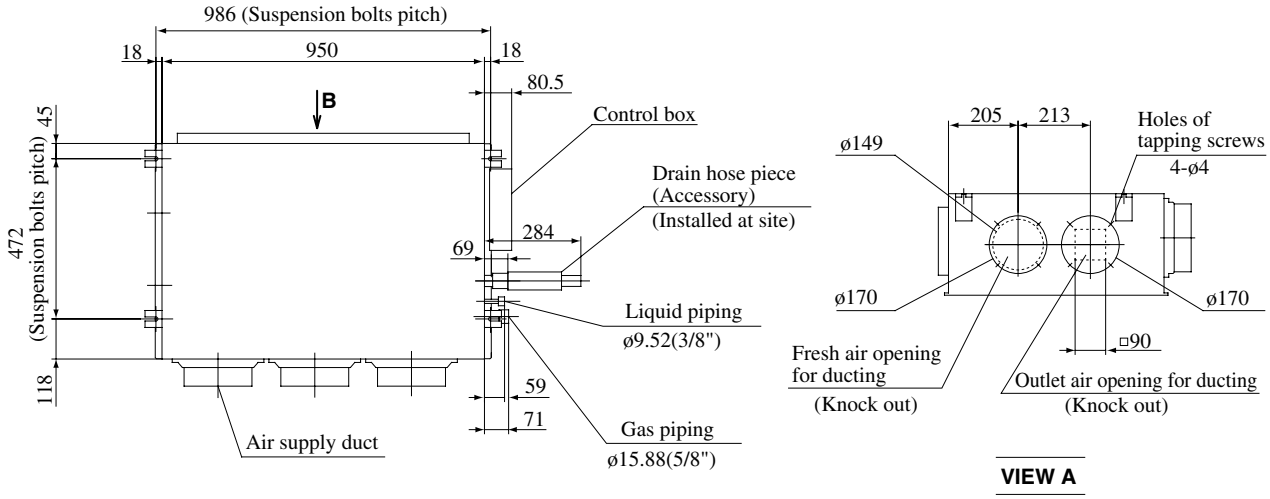


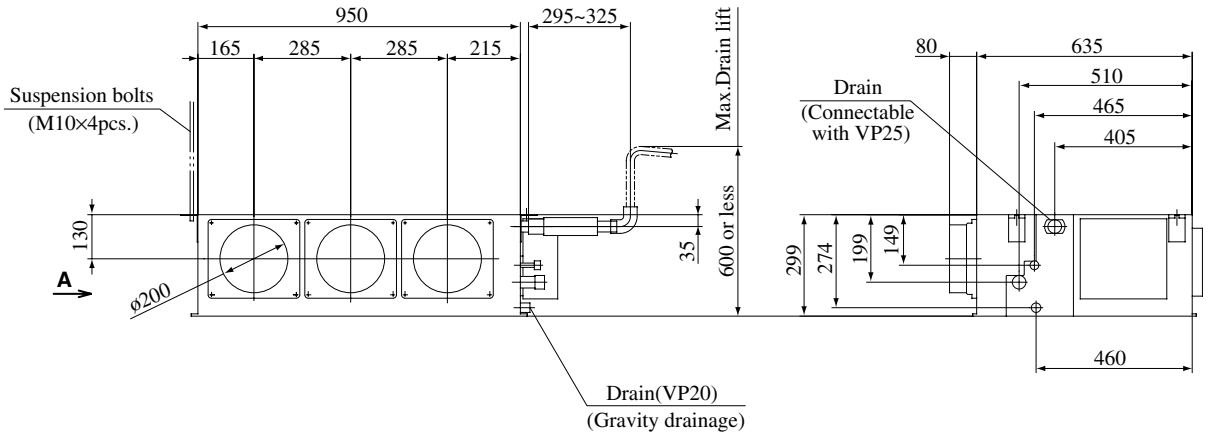


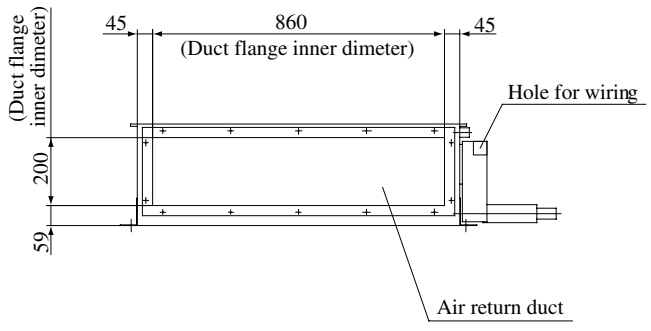


Models FDUMA71KXE5R, 90KXE5R

Unit : mm

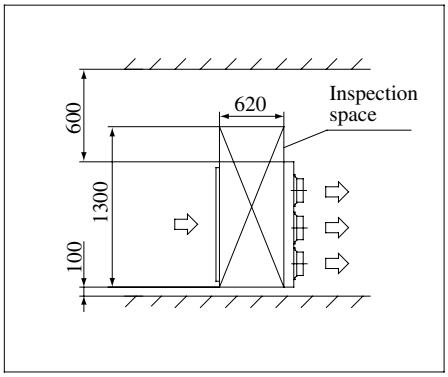






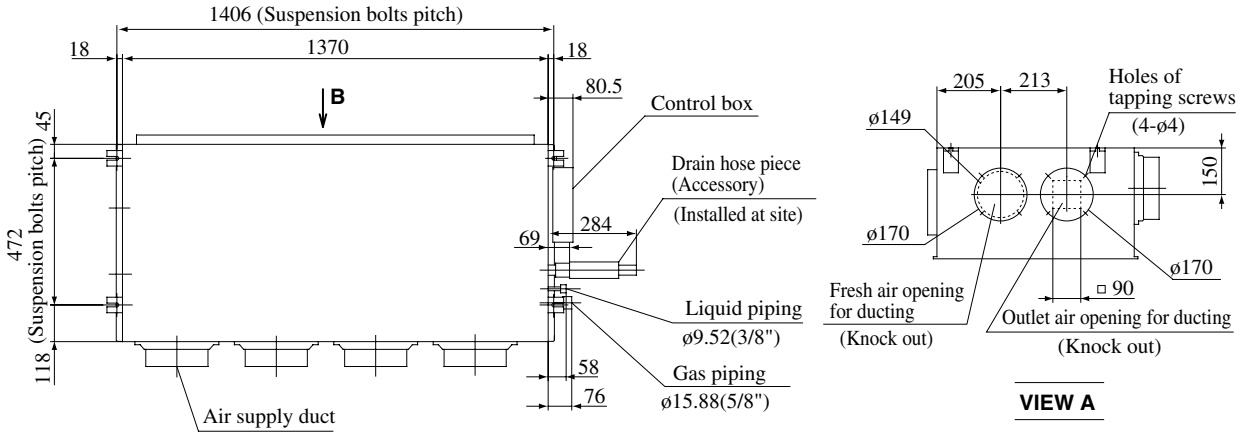
VIEW B

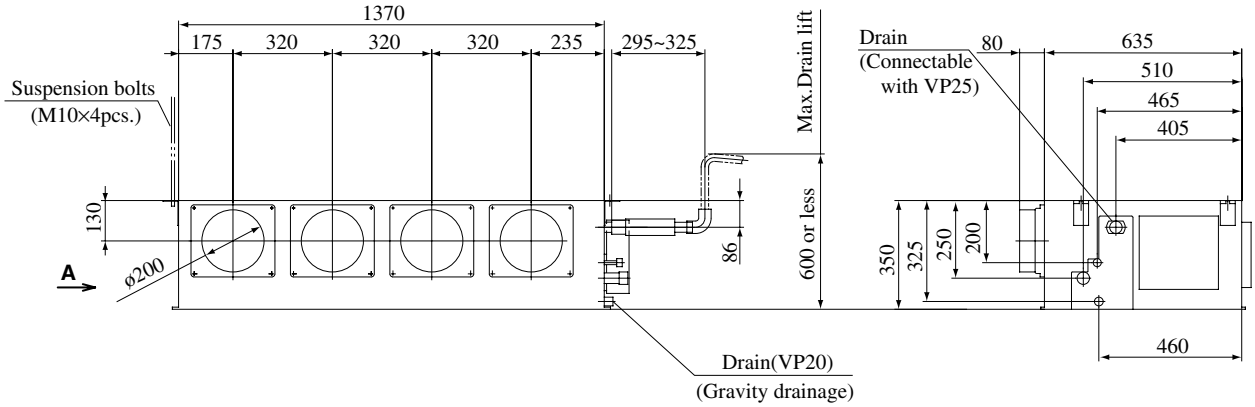
Space for installation and service

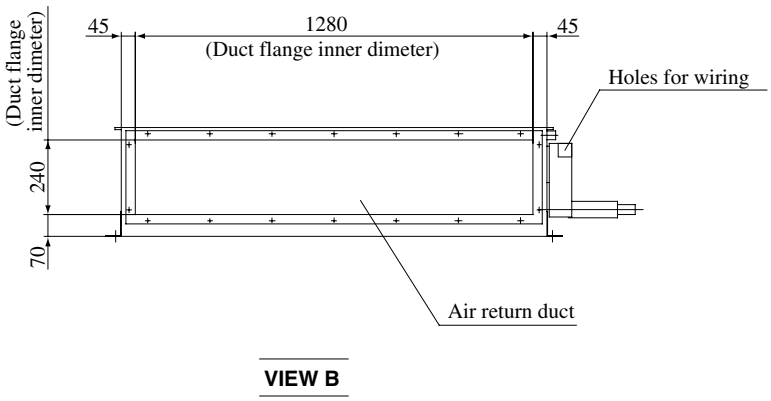


Models FDUMA112KXE5R, 140KXE5R

Unit : mm

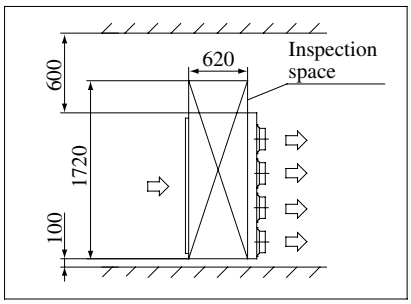






VIEW B

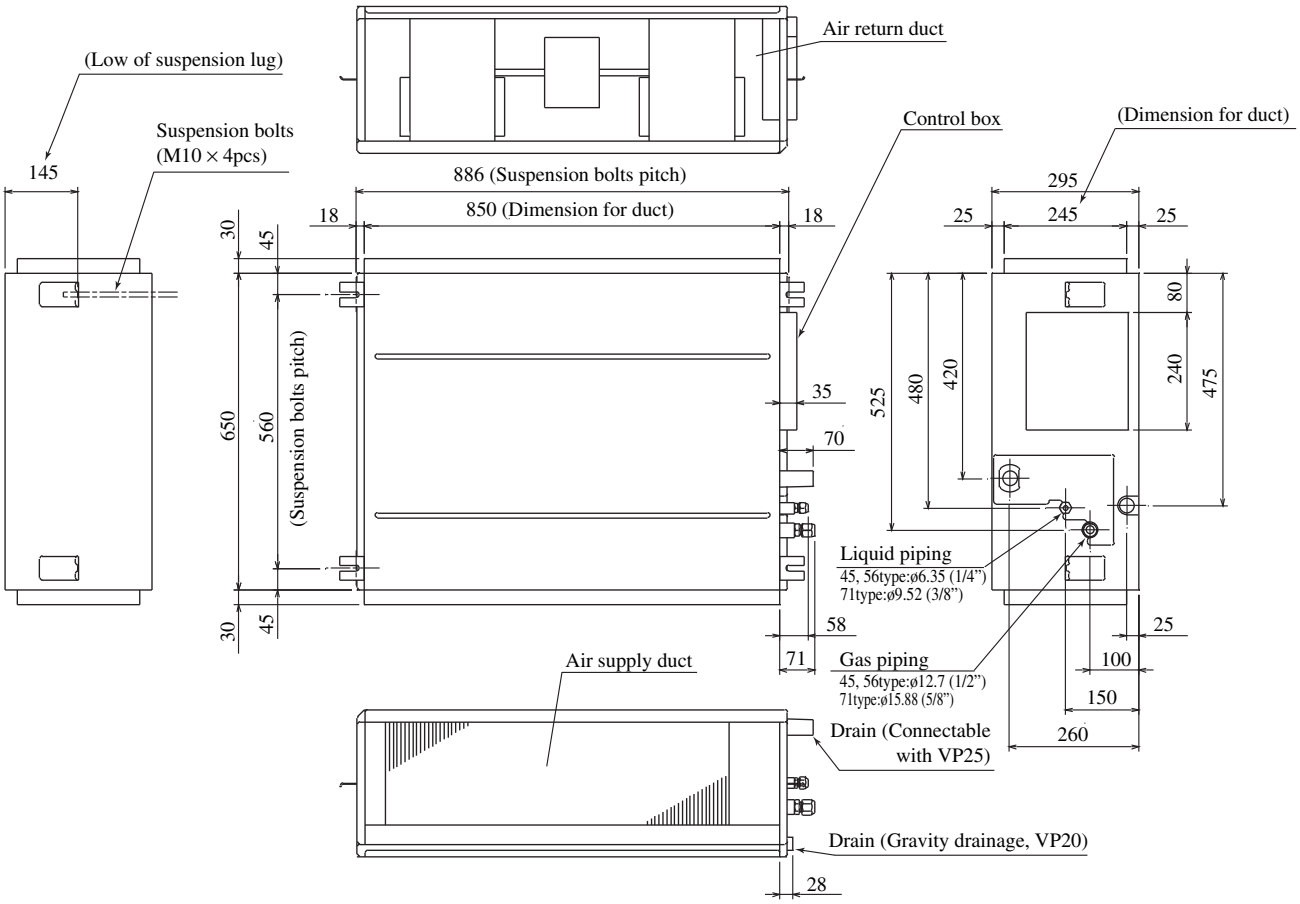
Space for installation and service



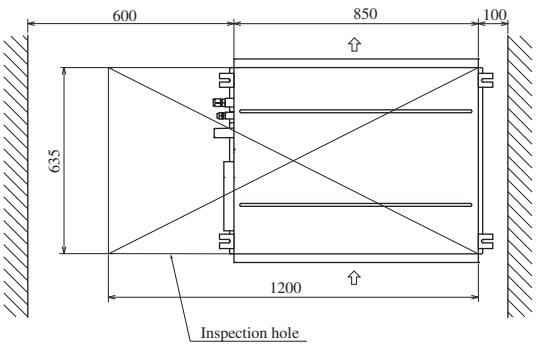
(i) Ceiling mounted duct type (FDUR)

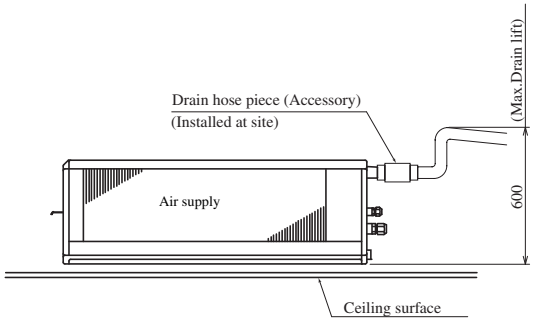
Models FDURA45KXE4R, 56KXE4R, 71KXE4R

Unit : mm



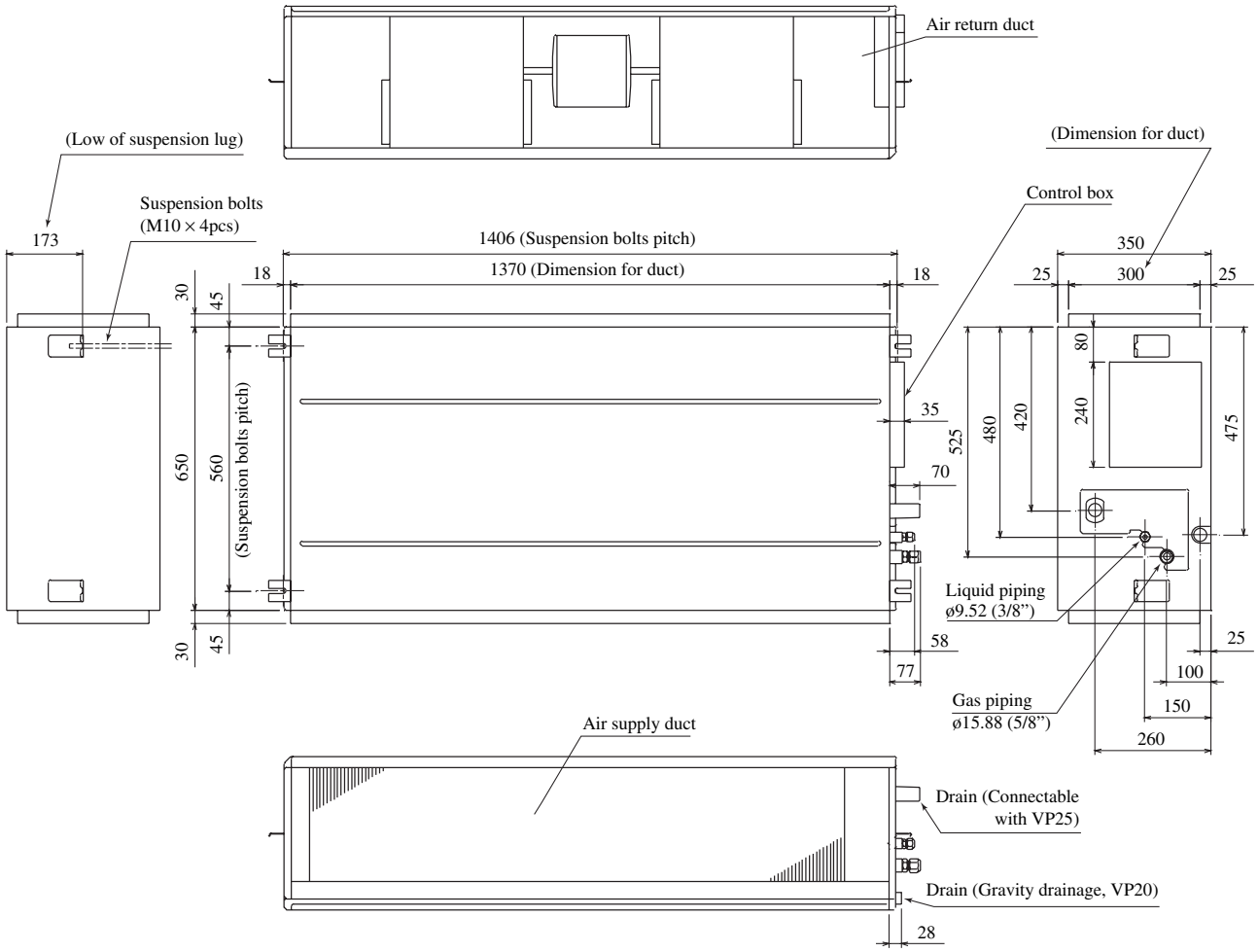
Space for installation and service



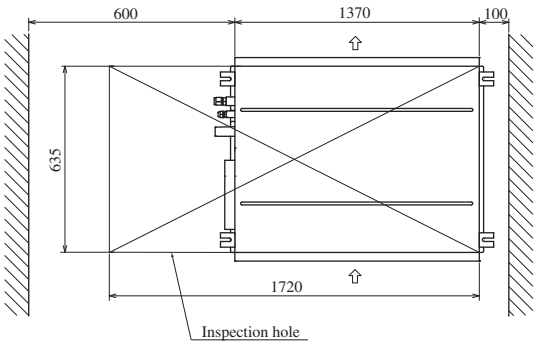


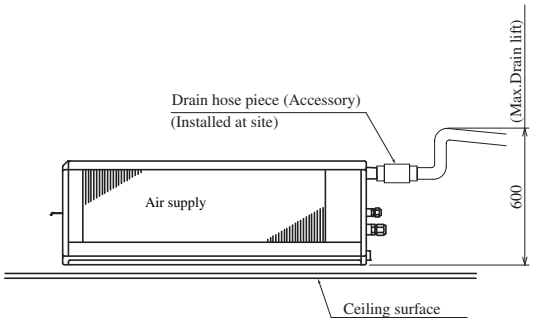
Models FDURA90KXE4R, 112KXE4R, 140KXE4R

Unit : mm



Space for installation and service

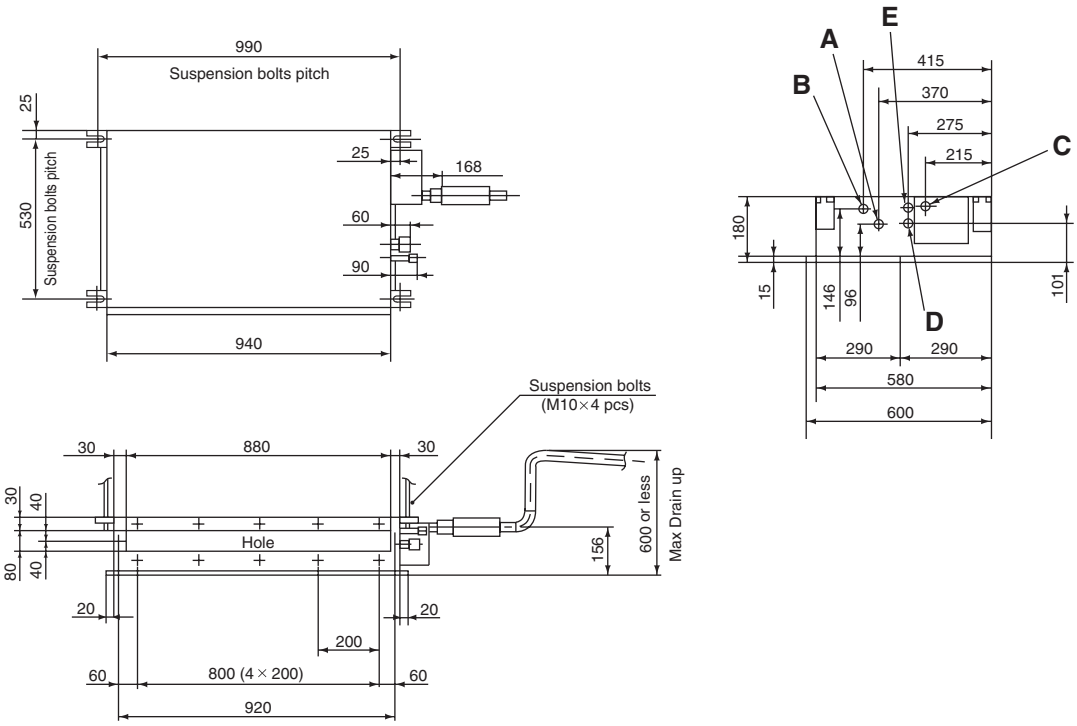




(j) Ultra ducted type (FDQS)

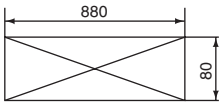
FDQSA22, 28, 36, 45, 56KXE5R

Unit : mm

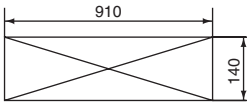


Mark	Models	
	22, 28	36, 45, 56
A	Gas piping ϕ9.52(3/8")	Gas piping ϕ12.7(1/2")
B	Liguid piping ϕ6.35(1/4")	Liguid piping ϕ6.35(1/4")
C	Drain Pipe Connection (Connectable with VP25)	
D	Power Supply Wiring Connection(ϕ35)	
E	Remote control wires and Signal wires connection(ϕ35)	

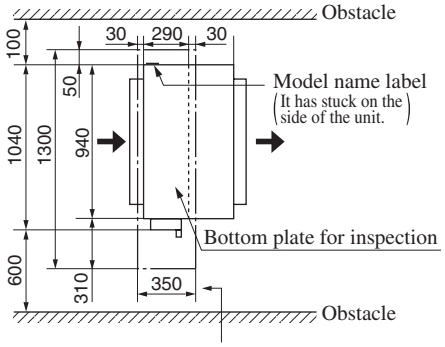
Air return port dimensions



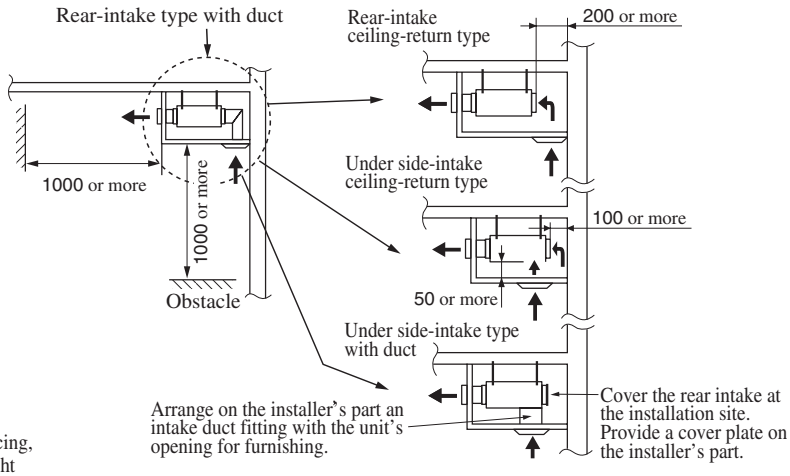
Air supply port dimensions



Space for installation and service



An access measuring 350mm × 1300mm is required for servicing, so please provide a 350mm × 1300mm inspection opening right beneath it.
(For servicing the control, fan, fan motor and drain pump)

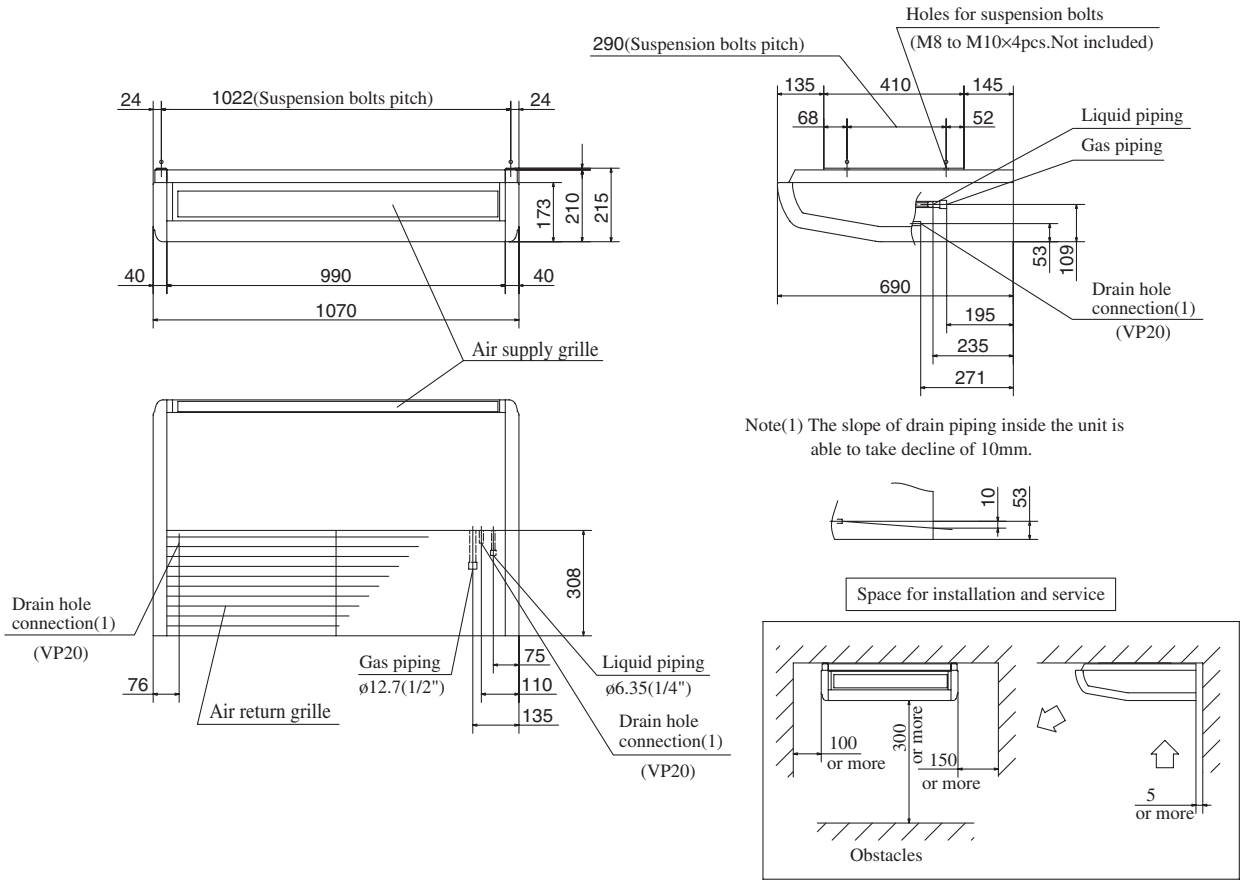


Notice Underside-intake type installation is not recommended for hotel and residential installations due to a high noise level.

(k) Ceiling suspended type (FDE)

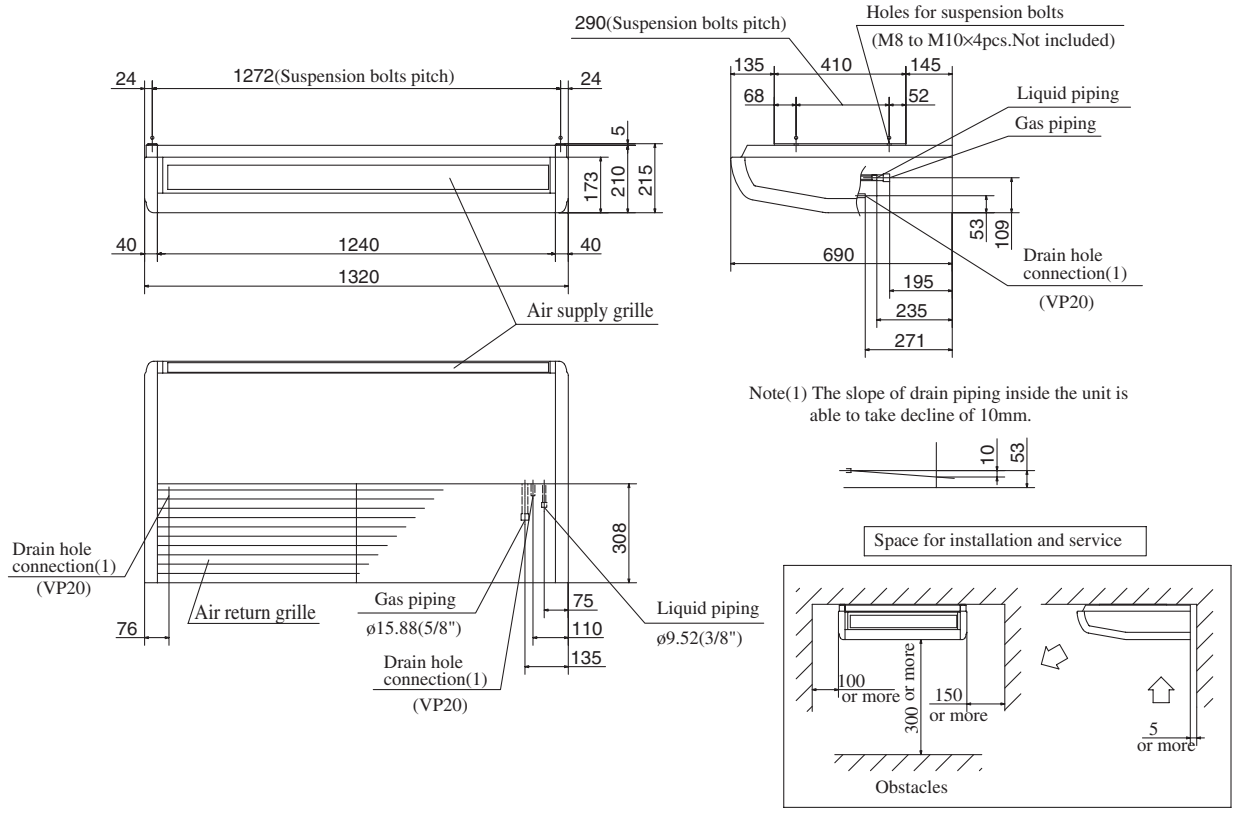
Models FDEA36KXE4R, 45KXE4R, 56KXE4R

Unit : mm



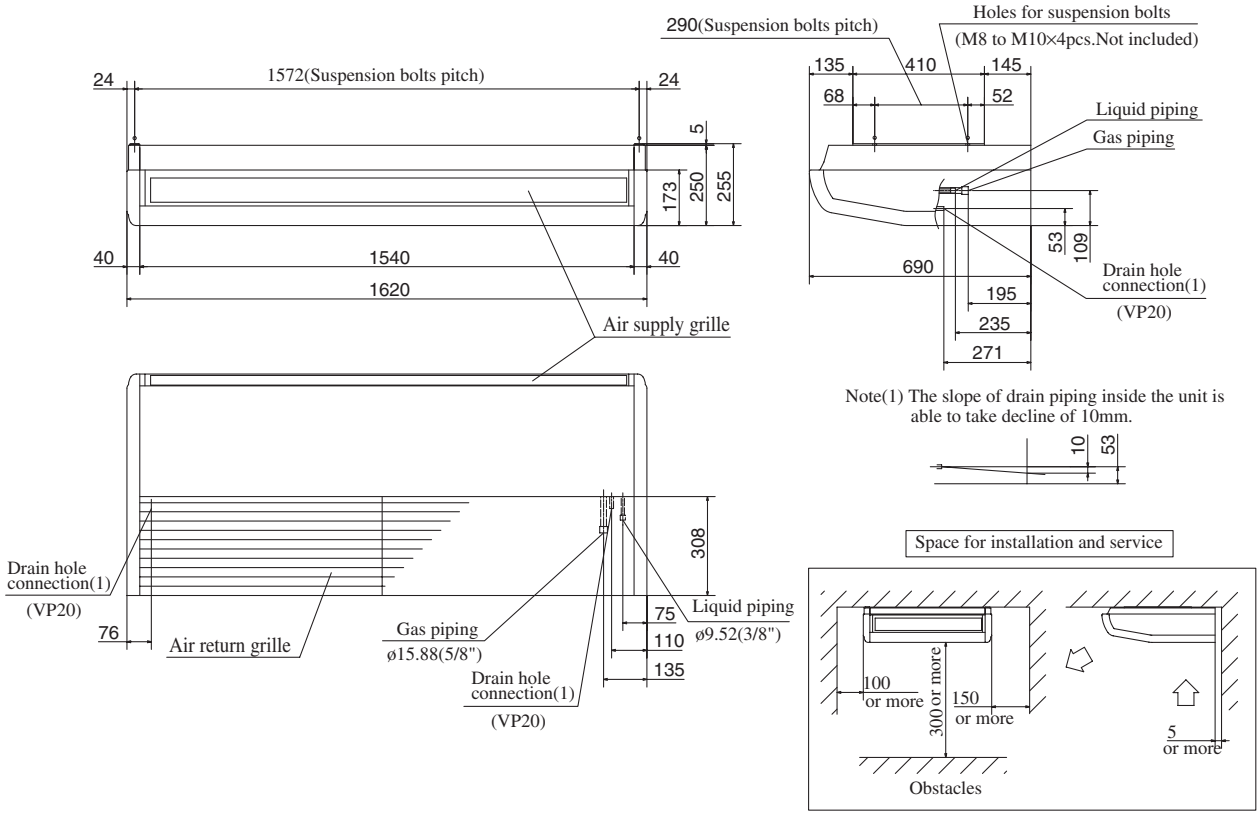
Models FDEA71KXE4R

Unit : mm



Models FDEA112KXE4R, 140KXE4R

Unit : mm

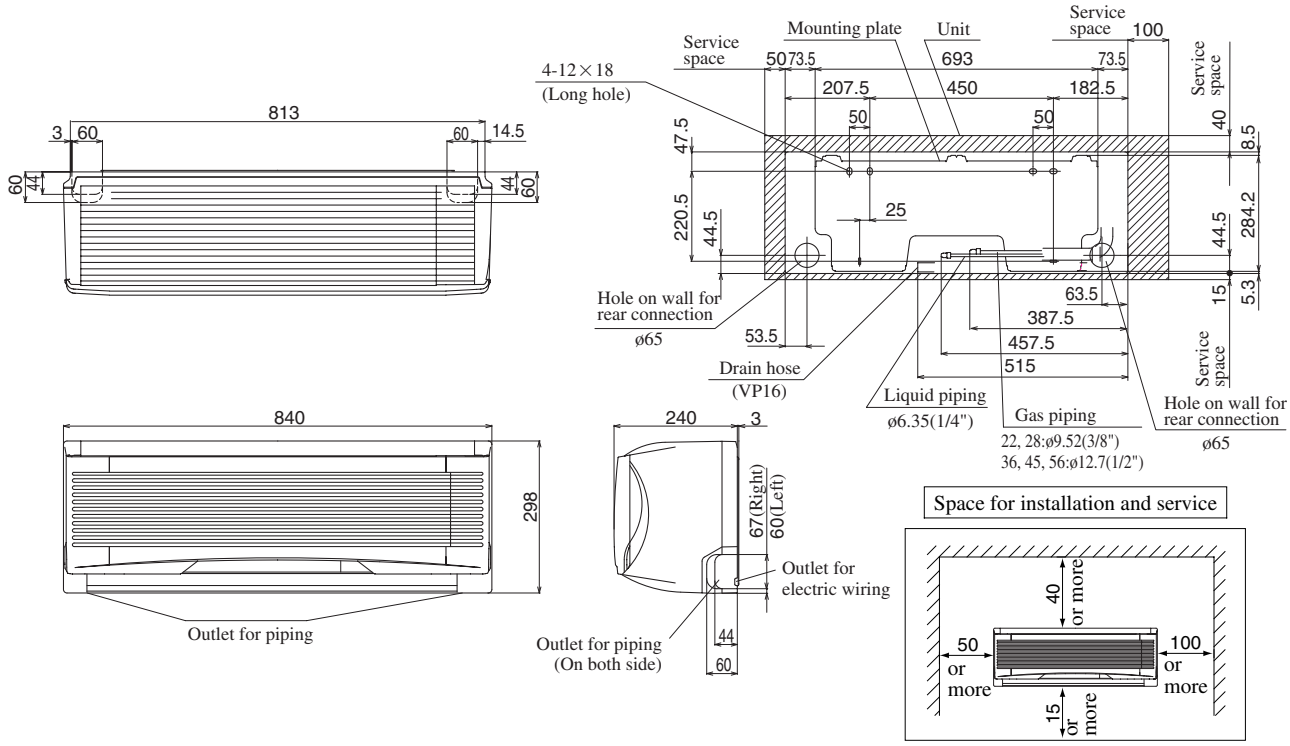


(l) Wall mounted type (FDK)

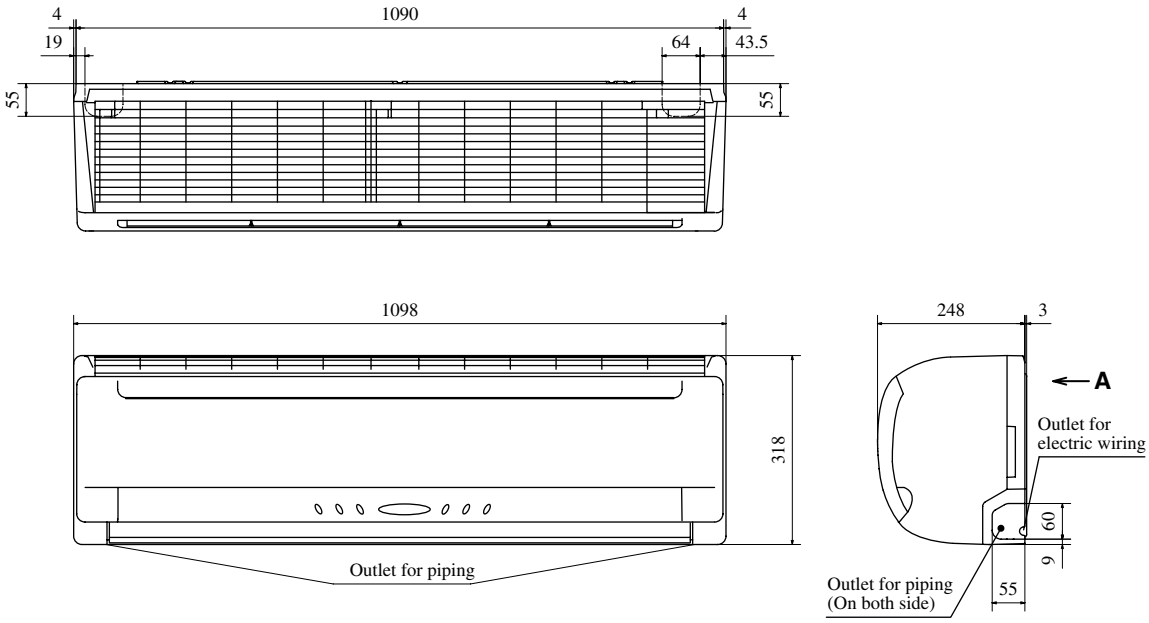
Models FDKA22KXE4R, 28KXE4R, 36KXE4R, 45KXE4R, 56KXE4R

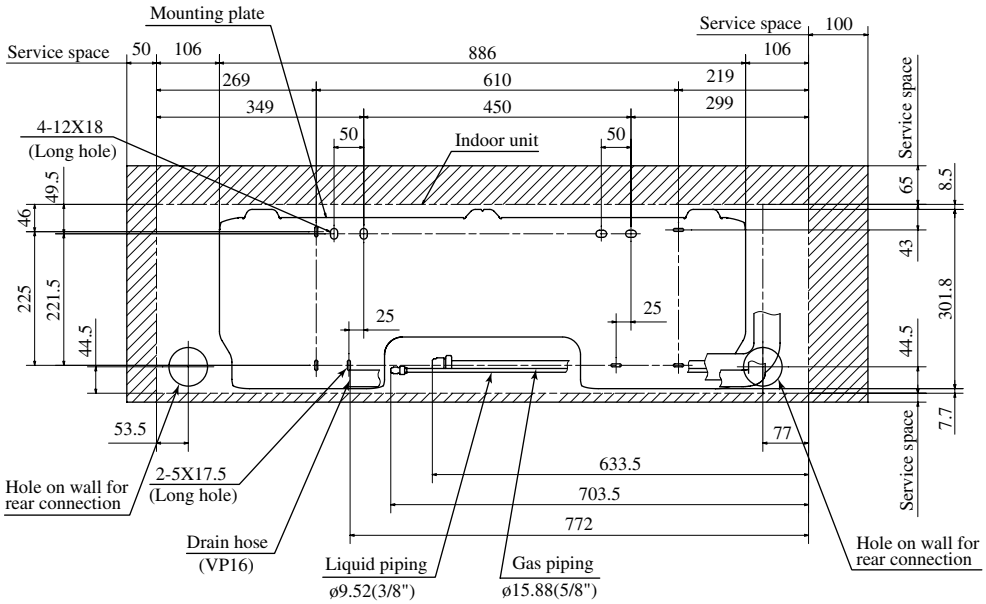
Unit : mm

Installation Position Diagram when viewed from the front and installation space.



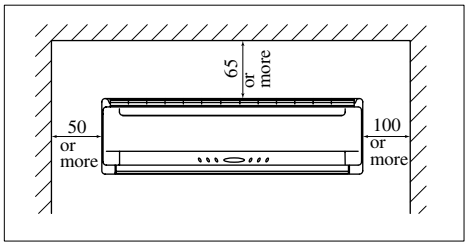
Model FDKA71KXE5R





VIEW A (Rear side)

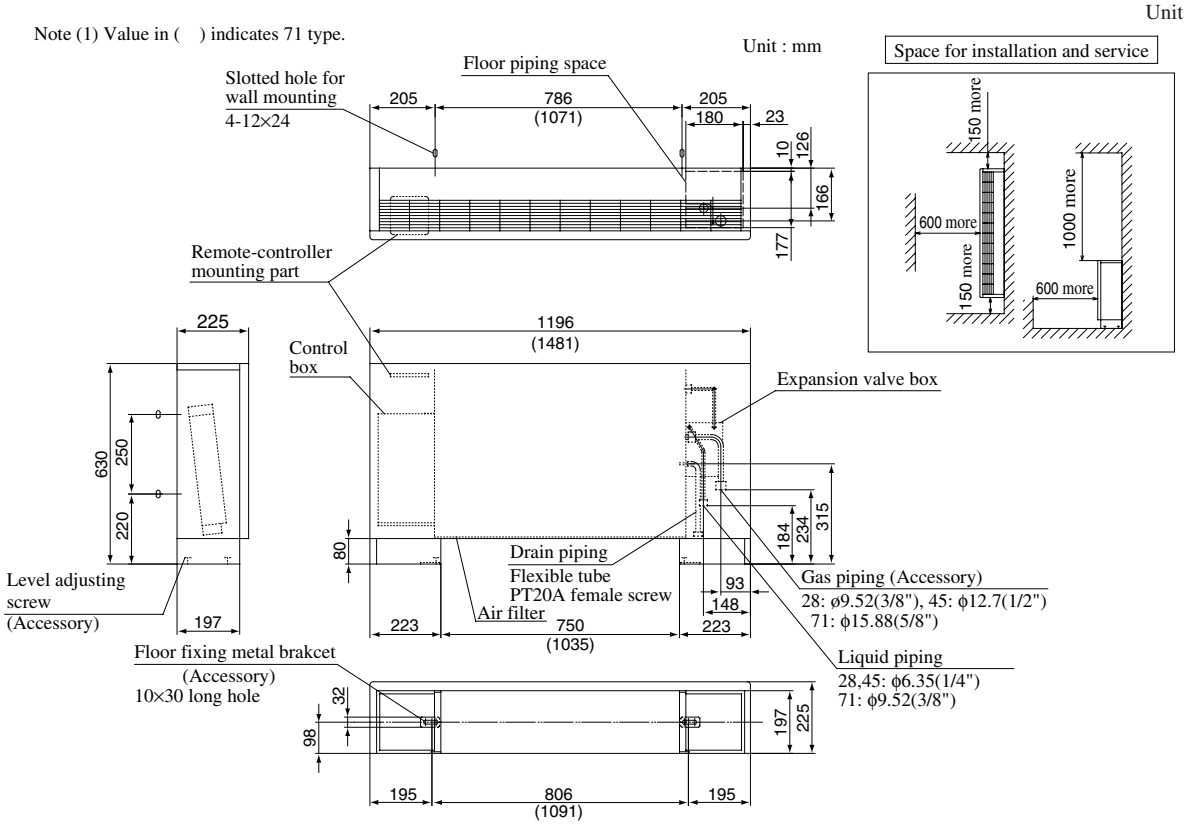
Space for installation and service



(m) Floor standing exposed type (FDFL)

Models FDFLA28KXE4R, 45KXE4R, 71KXE4R

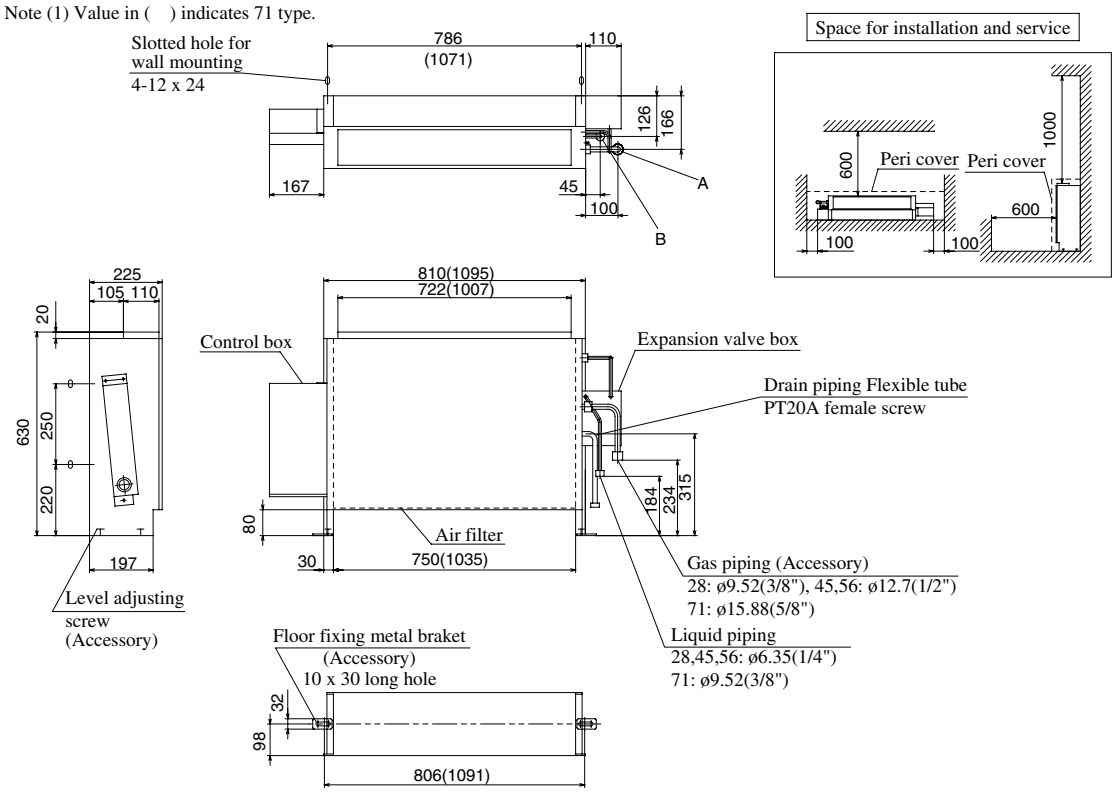
Unit : mm



(n) Floor standing hidden type (FDFU)

Models FDFUA28KXE4R, 45KXE4R, 56KXE4R, 71KXE4R

Unit : mm

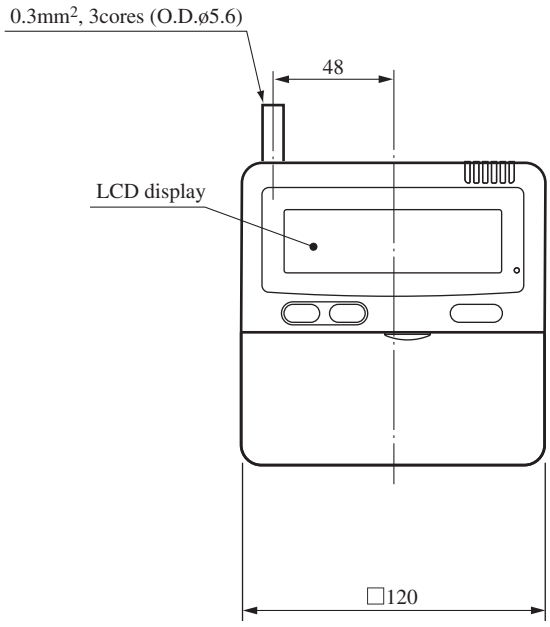


(2) Remote controller (Optional parts)

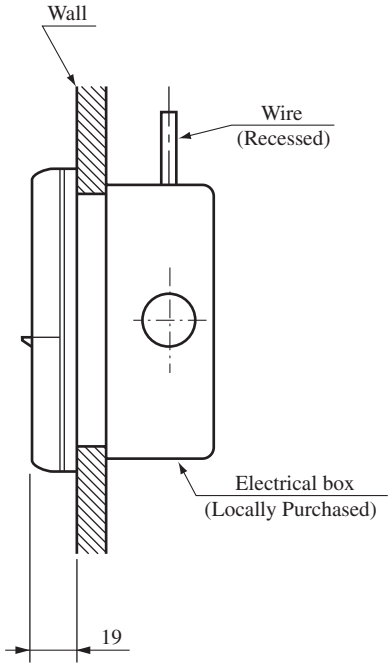
• Wired remote controller (Model: RC-E1R)

Unit : mm

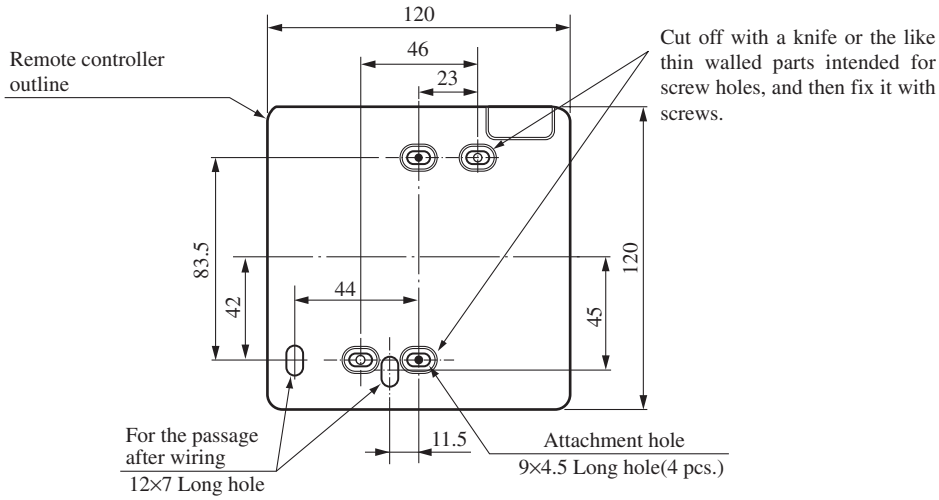
Installation with wiring exposed



Installation with wiring recessed



Remote controller mounting dimensions



Precation in extending the remote controller cord ▶ Maximum total extension 600m.

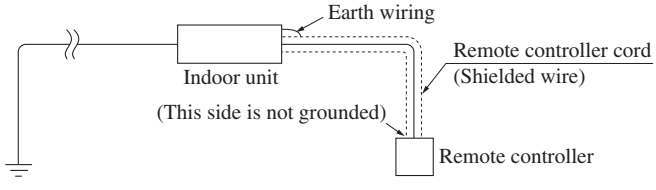
The cord should be a shielded wire.

● For all types : 0.3mm² × 3 cores

Note: (1) Use cables up to 0.5mm² (maximum) for those laid inside the remote controller casing and connect to a different size cable at a vicinity point outside the remote controller, if necessary.

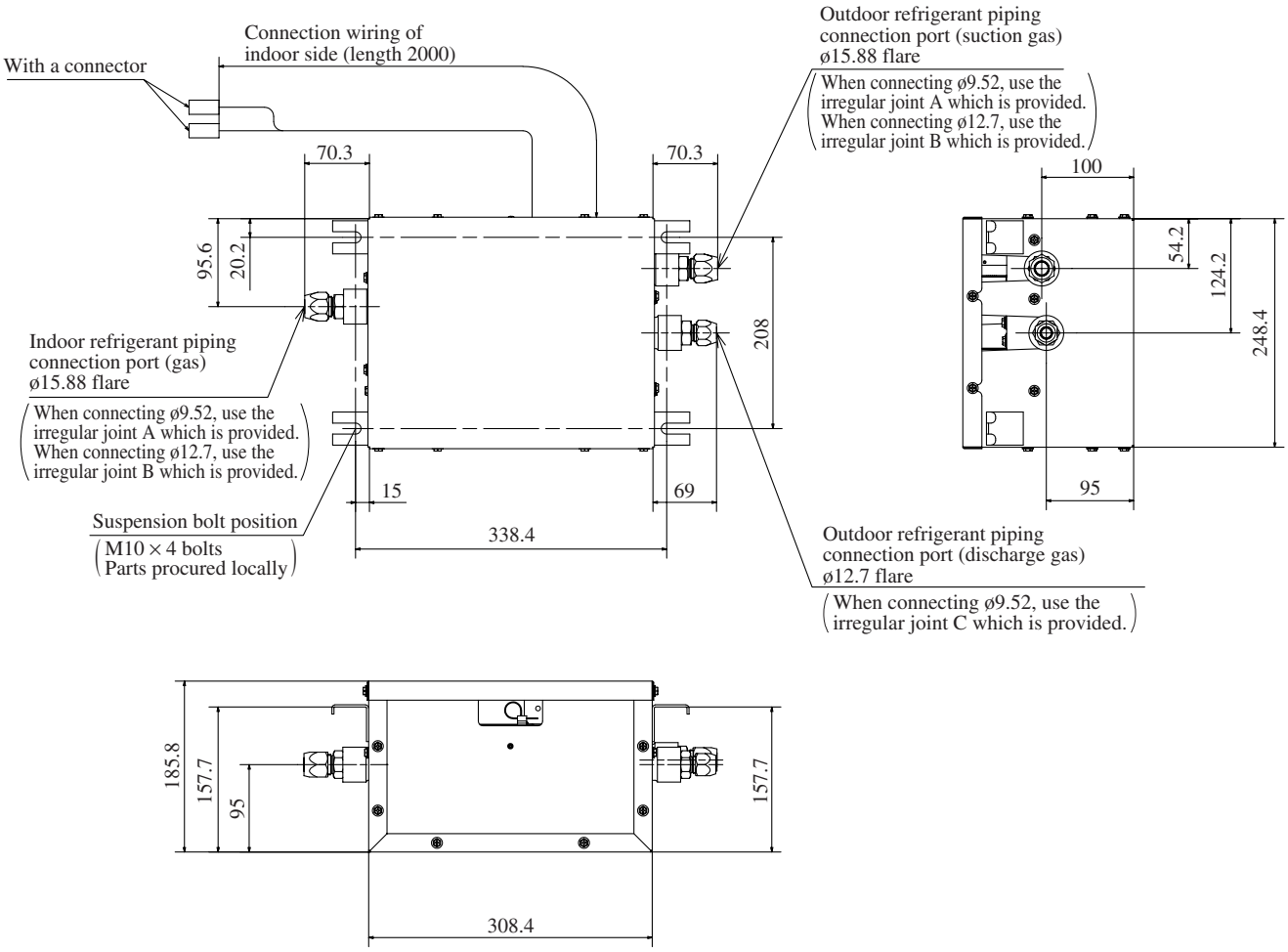
Within 100-200m····· 0.5 mm² × 3 cores
Within 300m····· 0.75 mm² × 3 cores
Within 400m····· 1.25 mm² × 3 cores
Within 600m····· 2.0 mm² × 3 cores

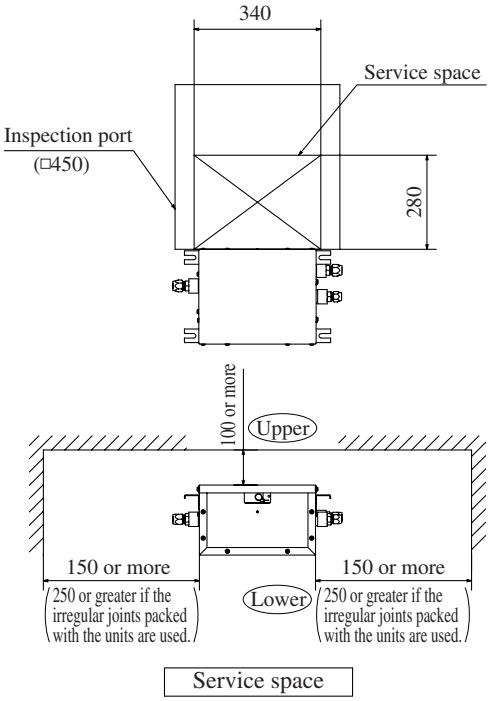
● The shielded wire should be grounded at one side only.



(3) Branching controller (Heat recovery type only)

Model PFD112-ER





Service space

Notes (1) Do not operate a unit when it is not connected to the branch controller.

(2) Branch controllers cannot be installed above and below each other. Install them so that they are level with respect to each other.

(3) Connection wires should be run from a surface facing the inspection opening.

(4) Be sure to provide the servicing space specified in the diagram at left.

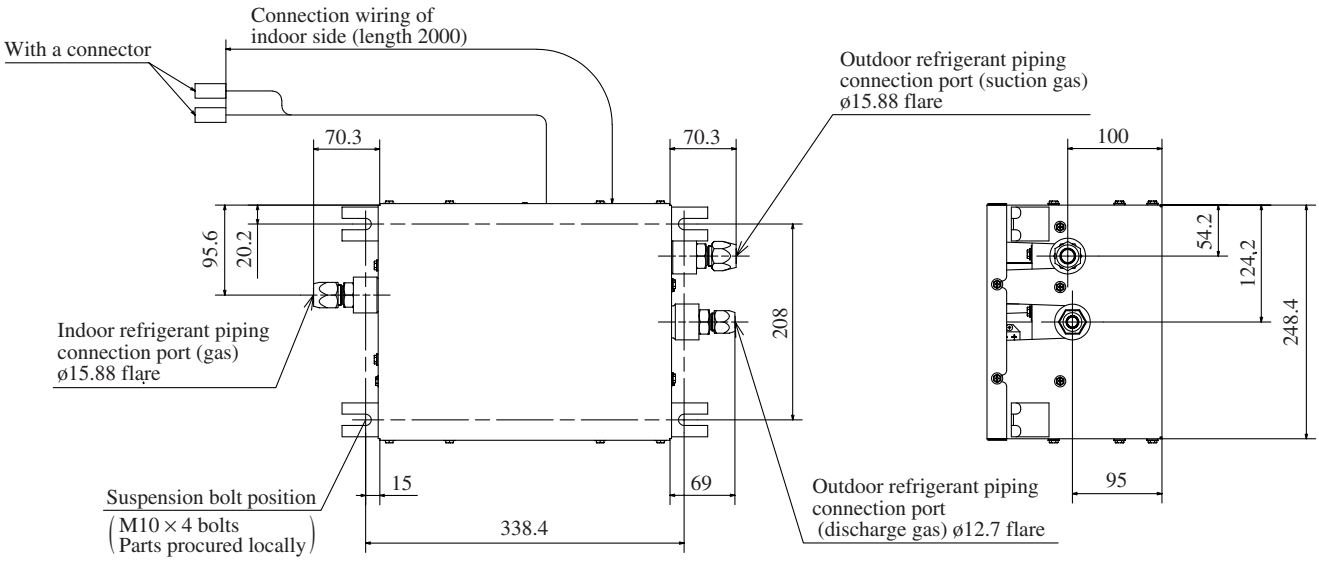
(5) If multiple indoor units are connected to a single branching controller, please control them with a single remote controller. Also activate the remote control sensor when this is done.

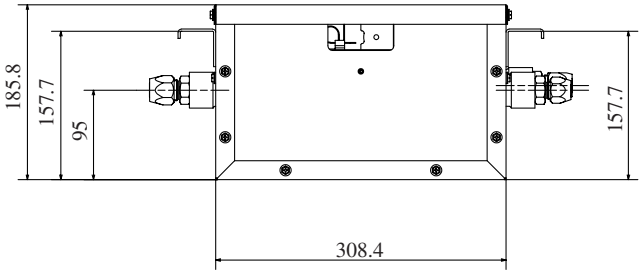
(6) Connect the irregular joints shown in the following table in accordance with the connection pipe diameter.
(Use the flare nuts provided for the branch controller.)

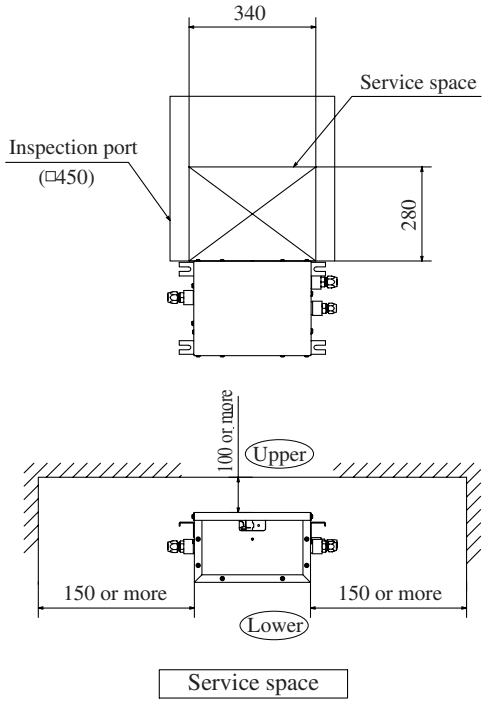
Irregular size Joints		
For outdoor unit suction gas piping For indoor unit gas piping		For outdoor unit discharge gas piping
2 pcs.	2 pcs.	1 pcs.
ID 9.52 OD 15.88 A	ID 12.7 OD 15.88 B	ID 9.52 OD 15.88 C

(7) A noise may be emitted by the branching controller as a result of control during operation or stopping of an indoor unit. If it is installed in the ceiling where it is exposed, take adequate precautions with the installation location.

Model PFD180-ER



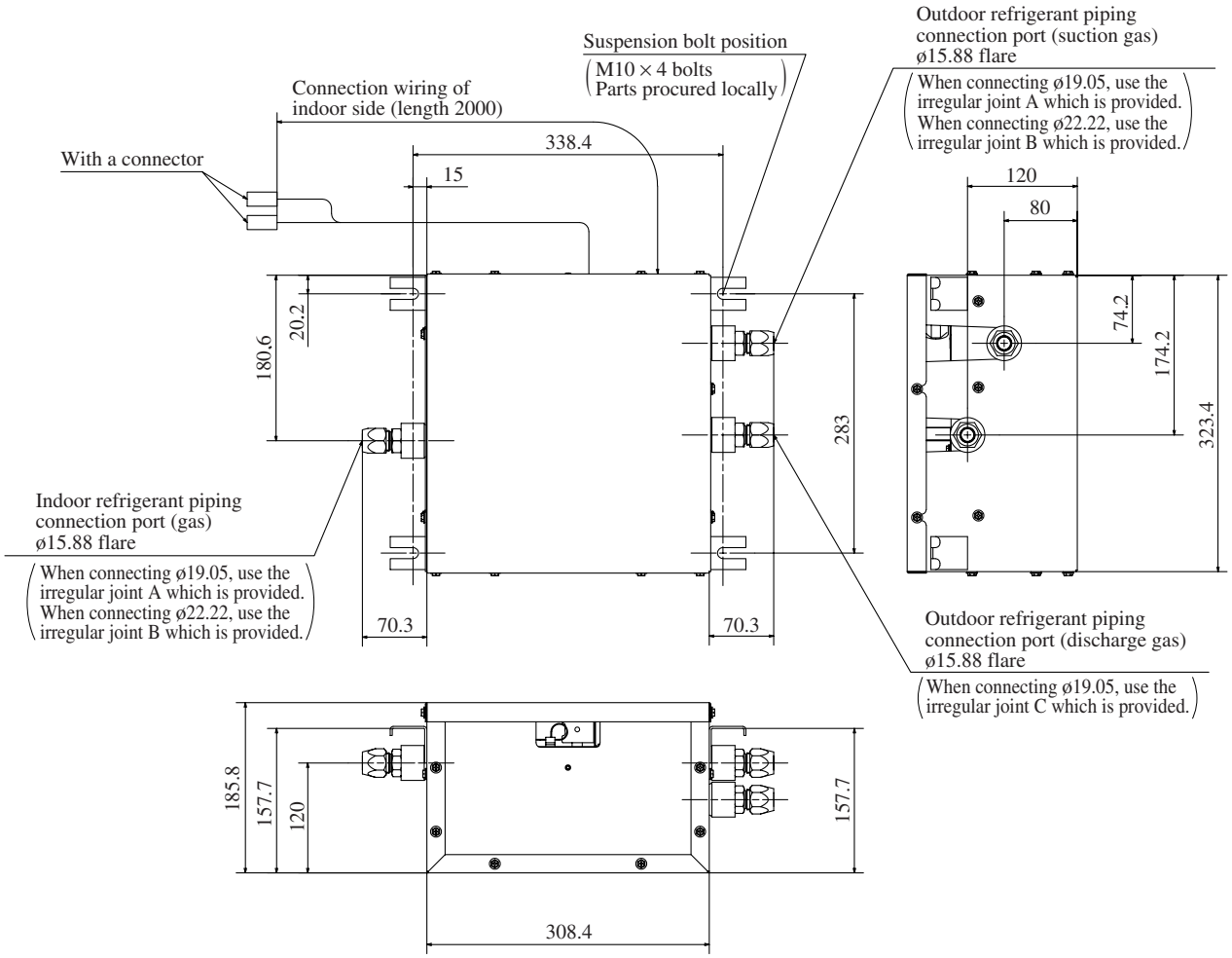


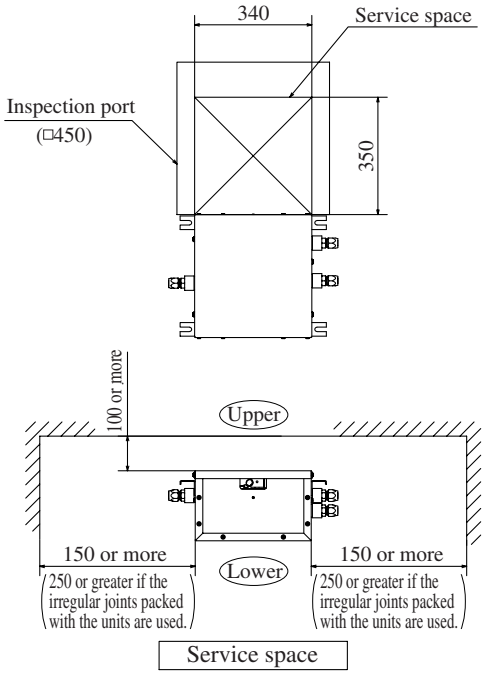


Service space

Notes (1) Do not operate a unit when it is not connected to the branch controller.
(2) Branch controllers cannot be installed above and below each other. Install them so that they are level with respect to each other.
(3) Connection wires should be run from a surface facing the inspection opening.
(4) Be sure to provide the servicing space specified in the diagram at left.
(5) If multiple indoor units are connected to a single branching controller, please control them with a single remote controller. Also activate the remote control sensor when this is done.
(6) A noise may be emitted by the branching controller as a result of control during operation or stopping of an indoor unit. If it is installed in the ceiling where it is exposed, take adequate precautions with the installation location.

Model PFD280-ER





Notes (1) Do not operate a unit when it is not connected to the branch controller.

(2) Branch controllers cannot be installed above and below each other. Install them so that they are level with respect to each other.

(3) Connection wires should be run from a surface facing the inspection opening.

(4) Be sure to provide the servicing space specified in the diagram at left.

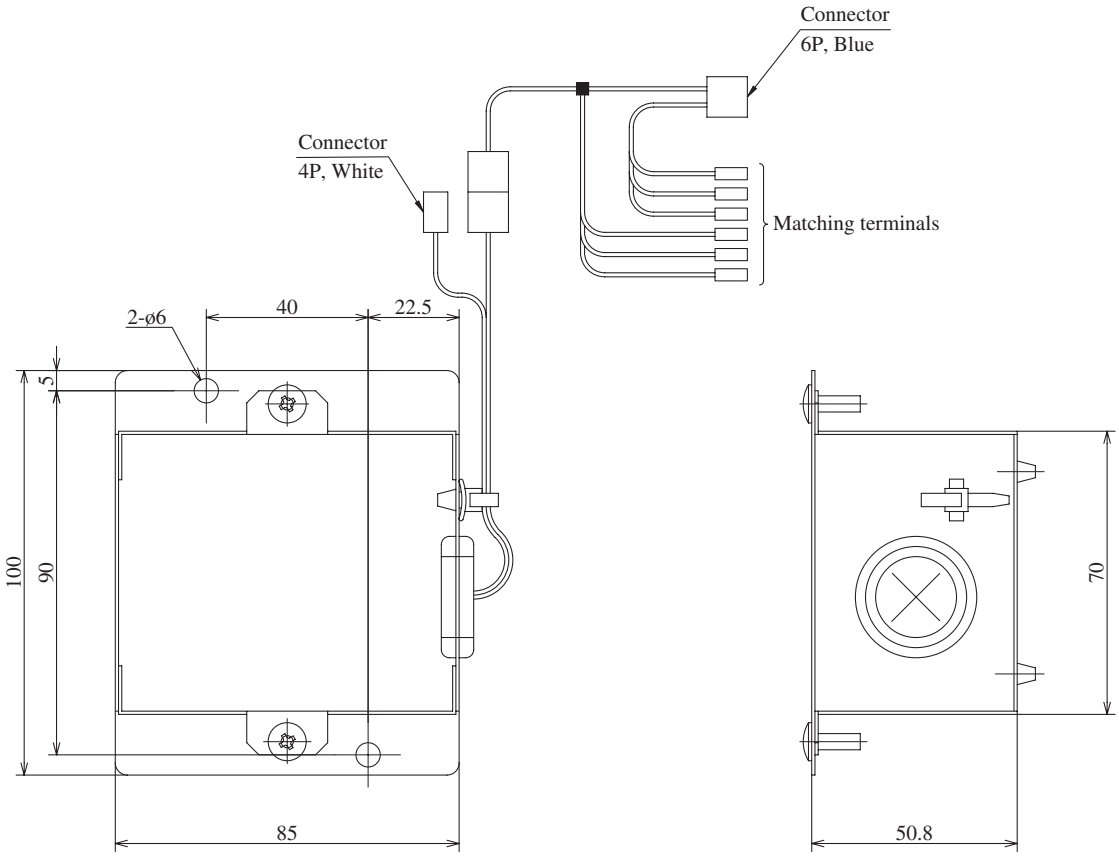
(5) If multiple indoor units are connected to a single branching controller, please control them with a single remote controller. Also activate the remote control sensor when this is done.

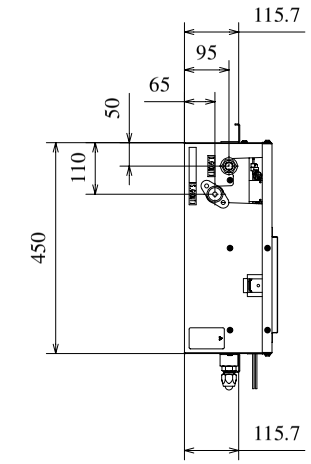
(6) Connect the irregular joints shown in the following table in accordance with the connection pipe diameter.

Irregular size Joints		
For outdoor unit suction gas piping For indoor unit gas piping		For outdoor unit discharge gas piping
2 pcs.	2 pcs.	1 pcs.
ID 19.05 ID 15.88 A	ID 22.22 ID 15.88 B	ID 19.05 ID 15.88 C

(7) A noise may be emitted by the branching controller as a result of control during operation or stopping of an indoor unit. If it is installed in the ceiling where it is exposed, take adequate precautions with the installation location.

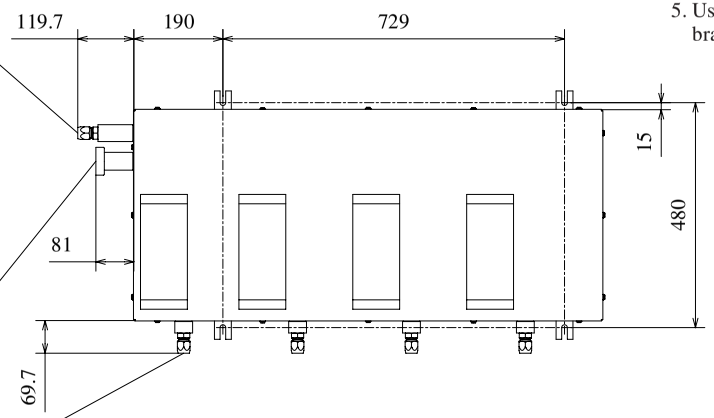
■ **Relay kit with branch controller**



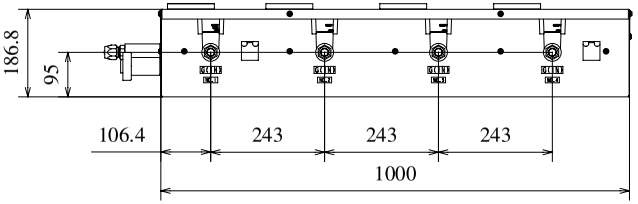


Outdoor refrigerant piping connection port (discharge gas)
ø15.88 (flare)

(When connecting ø19.05 use the irregular joint B which is provided.
When connecting with ø12.7 pipe. Cut off to connect with the irregular joint A supplied with the unit.)



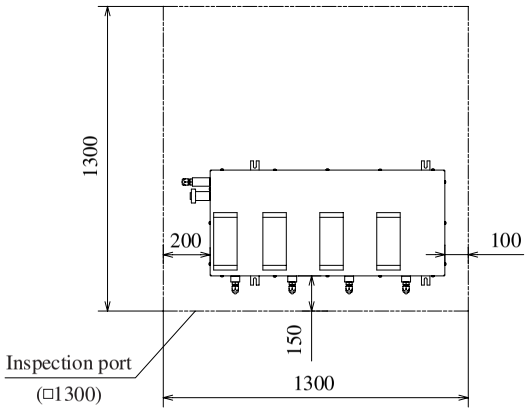
Outdoor refrigerant piping connection port (suction gas)
ø15.88 (flange)
(ø19.05, ø22.22 cut off to connect)



Indoor refrigerant piping connection port
ø15.88 (flare)

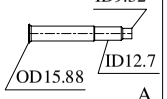
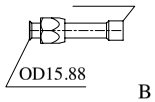
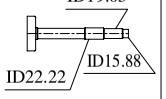
(When connecting ø9.52 use the irregular joint A which is provided.
When connecting with ø12.7 pipe. Cut off to connect with the irregular joint A supplied with the unit.)

Remarks: 1. A branching controller cannot be installed upside down. Please install it in such a manner that the main body is held levelly.
2. Be sure to set a service space as shown in the figure below.
3. When multiple indoor units are connected to one branch, use one remote controller for control, or enable the remote controller sensor.
4. Noise may arise from the branching controller during the control when the indoor unit is operated or stopped. Pay attention to the installation location when the installation is conducted from the ceiling.
5. Use the provided liquid header to connect the liquid pipe via the horizontal branch.



Service space

6. Use the joints shown in the table below for connecting pipes of different diameters. (For the flare nuts, use those provided with the branching controller.)

Irregular size joints		Flange joint
For outdoor unit gas suction pipe For indoor unit gas pipe	For outdoor unit gas discharge pipe	For outdoor unit gas suction pipe
5 pcs.	1 pc.	1 pc.
		

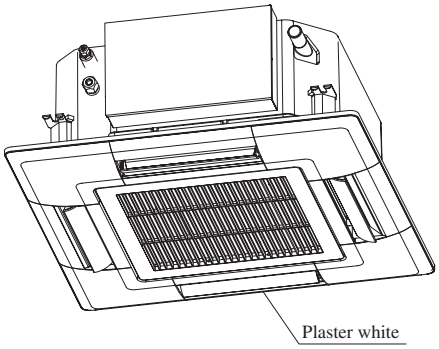
Weight
30kg

Unit : mm

3.3 Exterior appearance

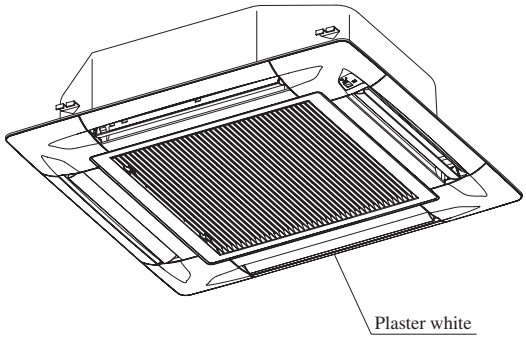
(a) Ceiling recessed compact type (FDTC)

- Decorative panel

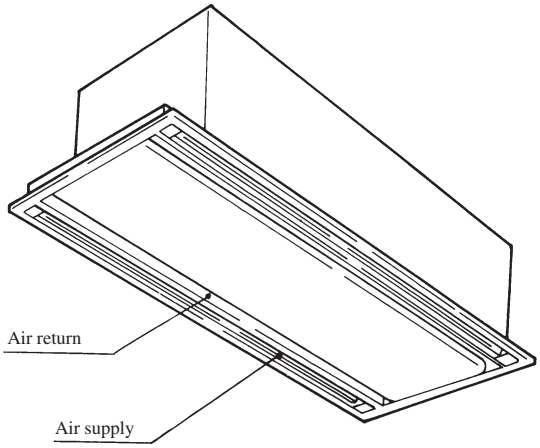


(b) Ceiling recessed type (FDT)

- Decorative panel



(c) 2-way outlet ceiling recessed type (FDTW)



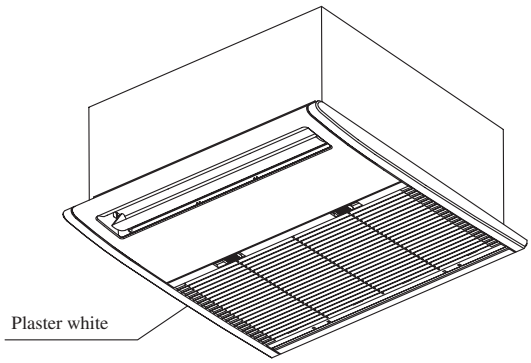
- Decorative panel

  Standard type

Panel part No.	Type	Panel color	Applicable model
TW-PSA-23W-ER	With Auto swing	Plaster white	FDTW28, 45, 56
TW-PSA-33W-ER			FDTW71, 90
TW-PSA-43W-ER			FDTW112, 140

(d) Ceiling recessed single air supply port type (FDTQ)

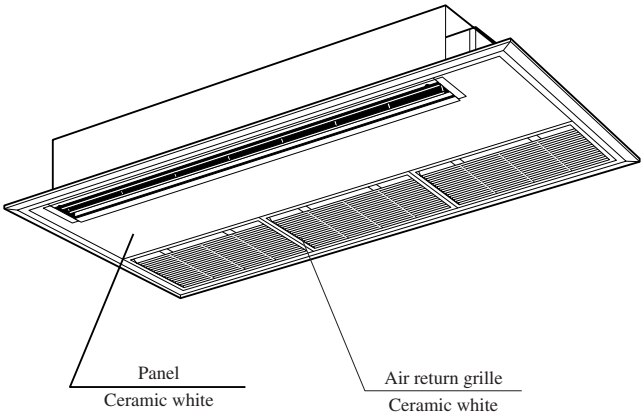
This illustration shows the direct blow panel (TQ-PSA-14W-ER). Painting color is the same for other panels.



- Decorative panel

Panel part No.		Type	Panel color	Applicable model
Direct blow panel	TQ-PSA-14W-ER	With Auto swing	Plaster white	FDTQ22, 28, 36
	TQ-PSB-14W-ER			
Duct panel	QR-PNA-14W-ER	Non Auto swing	Plaster white	FDTQ22, 28, 36
	QR-PNB-14W-ER			

(e) 1-way outlet ceiling recessed type (FDTS)



- Decorative panel

Panel part No.	Type	Panel color	Applicable model
TS-PSA-28W-ER	With Auto swing	Ceramic white	FDTS28, 36, 45
TS-PSA-38W-ER			FDTS71

(f) Medium static pressure ducted type (FDQM) .....Zinc steel plate

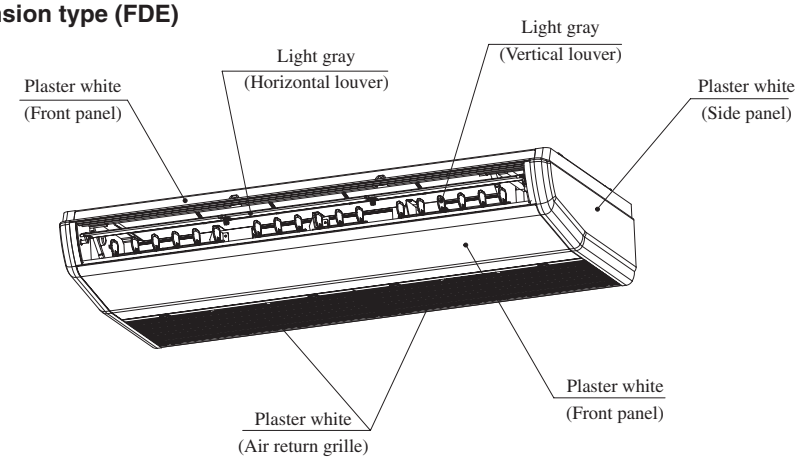
(g) High static pressure ducted type (FDU).....Zinc steel plate

(h) Ultra thin ducted type (FDQS).....Zinc steel plate

(i) Satellite ducted type (FDUM) ..... Zinc steel plate

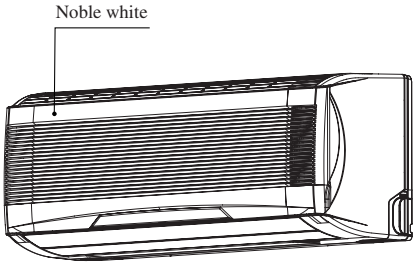
(j) Ceiling mounted duct type (FDUR) ..... Zinc steel plate

(k) Ceiling suspension type (FDE)

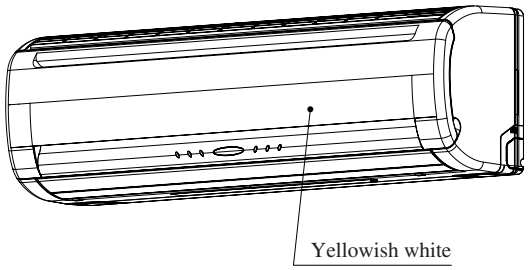


(l) Wall mounted type (FDK)

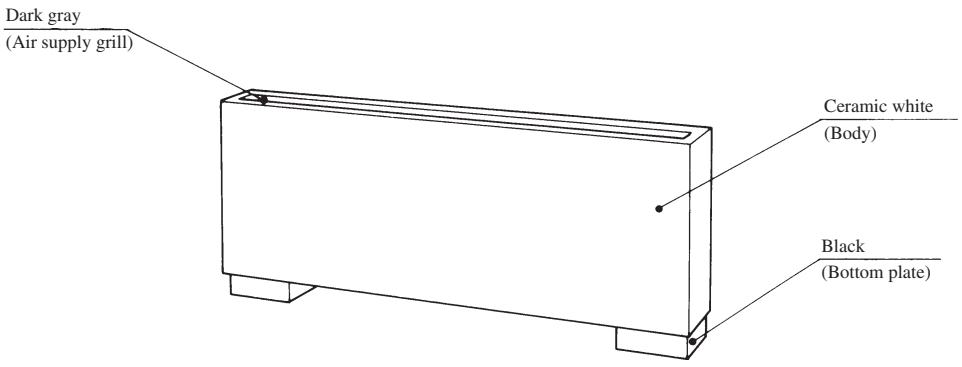
Models FDKA22, 28, 36, 45, 56KXE4R



Model FDKA71KXE5R



(m) Floor standing exposed type (FDFL)



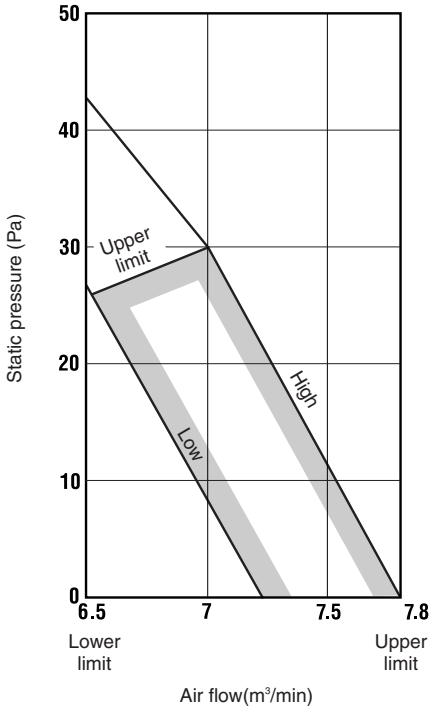
(n) Floor standing hidden type (FDFU) ..... Zinc steel plate

3.4 Characteristics of fan

(1) Ceiling recessed single air suppy port type (FDTQ)

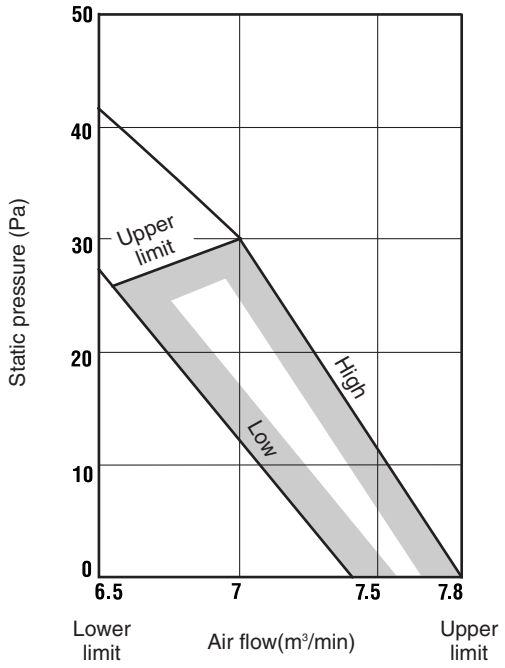
(Only when FDTQA22, 28 and 36 model are used for the Duct panel type.)

Models FDTQA22, 28 36KXE4R



(2) Medium static pressure ducted type (FDQM)

Models FDQMA22KXE4R, 28KXE4R, 36KXE4R



(3) Satellite ducted type (FDUM)

• External static pressure table

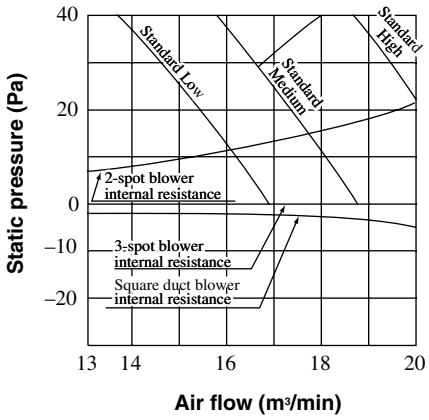
Unit : Pa

Model \ Duct specs. / Air flow (m³/min)		1 spot closing		Standard		Square duct	
		Stan-dard	High (4) speed	Stan-dard	High (4) speed	Stan-dard	High (1) speed
FDUMA22	10	-	-	50	85	50	85
FDUMA28,36	12	-	-	50	85	50	85
FDUMA45,56	14	-	-	50	85	50	90
FDUMA71	18	35	70	50	85	55	90
FDUMA90	20	30	65	50	85	55	90
FDUMA112	28	50	80	60	90	65	95
FDUMA140	34	50	75	60	85	65	95

Notes(1) 1 spot closing: Round duct flange at center is removed and shield with a special panel (option).
(2) Standard: ø200 duct are installed at all blowout holes.
(3) Square duct: All round ducts are removed and replaced with special square duct flanges (option).
(4) When using the high speed setting, turn the dip switch SW9-4 on the indoor PCB to the ON position.
(When setting from the remote controller, select "Hi CEILNG 1")

How to interpret the blower characteristics table

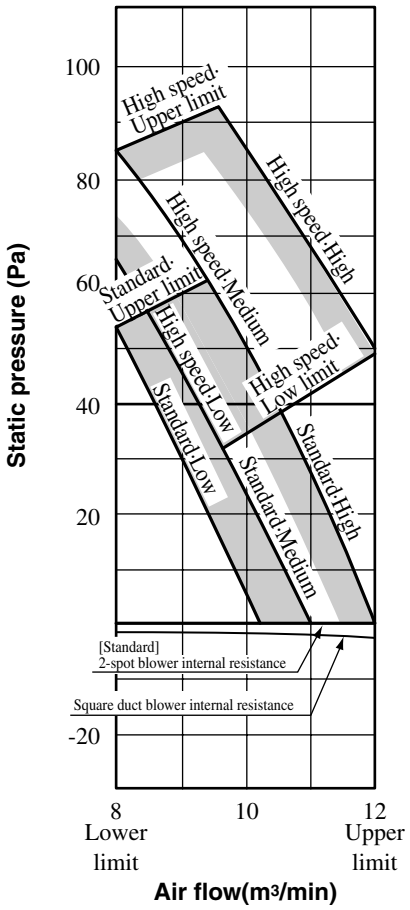
Example : Case of FDUMA71KXE5R



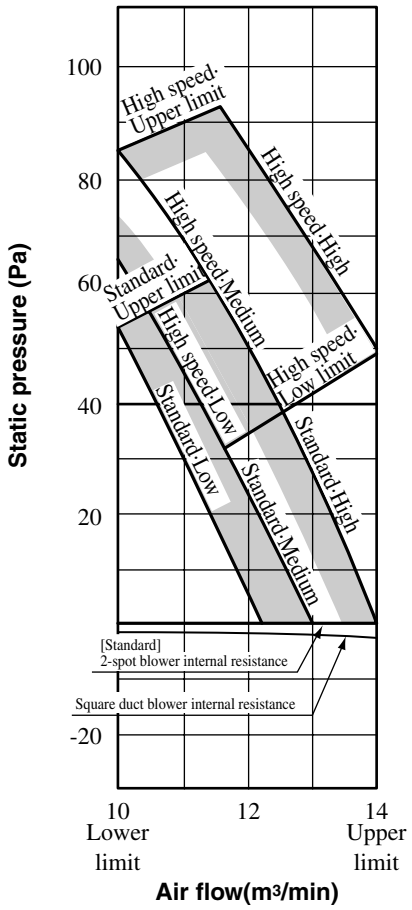
① 2-spot blowout.....
Internal resistance increases more than the standard 3-spot blowout.Approx. 14Pa at 17m³/min

② Square duct blowout.....
Internal resistance decreases more than the standard round duct (ø200 3-spot). 3Pa at 17m³/min. (External static pressure increases in reverse.)

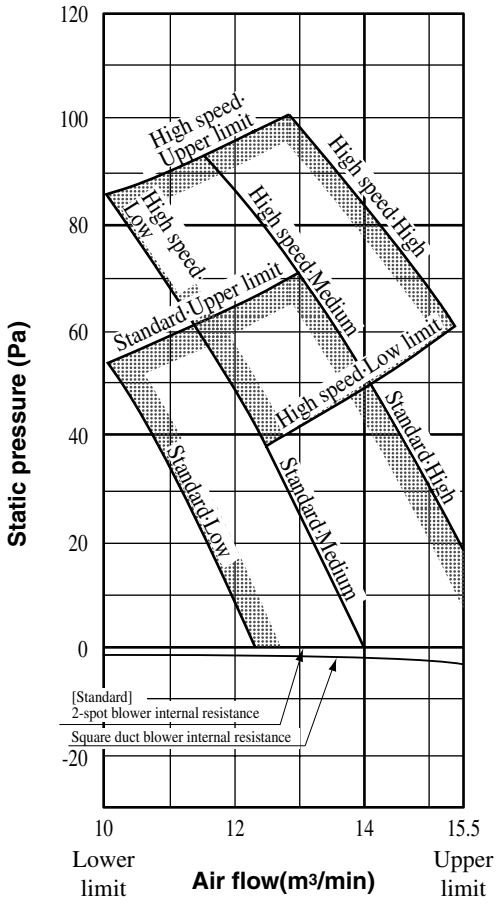
Model FDUMA22KXE5R



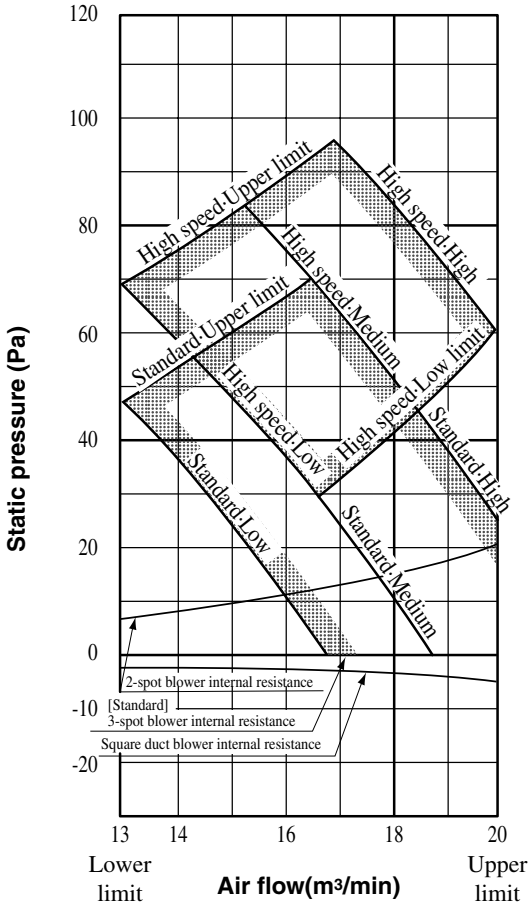
Models FDUMA28KXE5R,36KXE5R



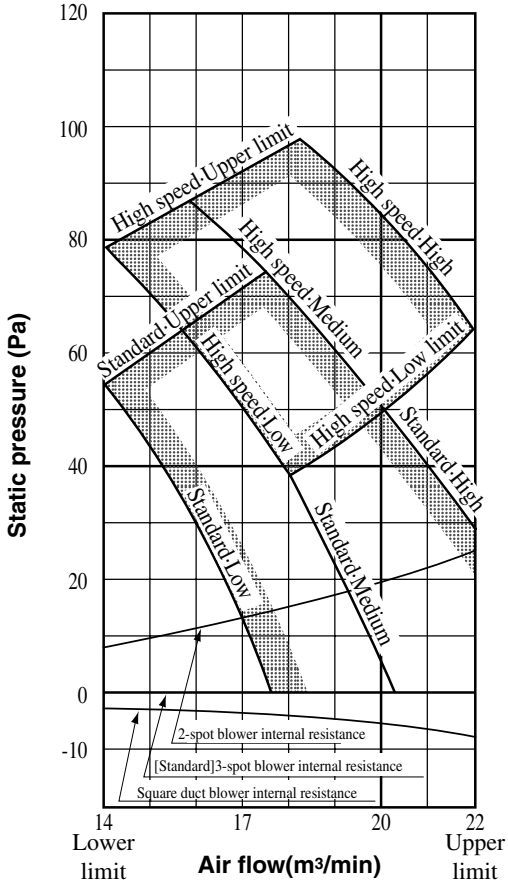
Models FDUMA45KXE5R,56KXE5R



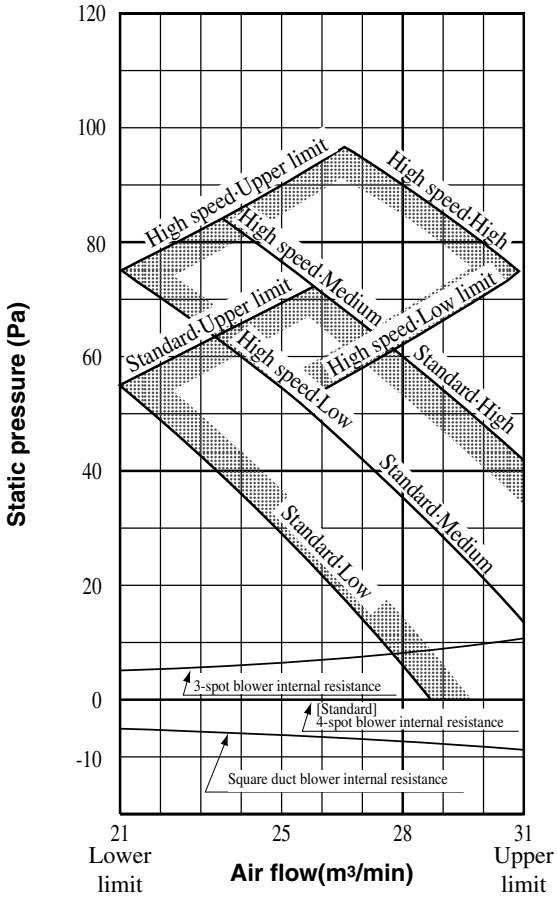
Model FDUMA71KXE5R



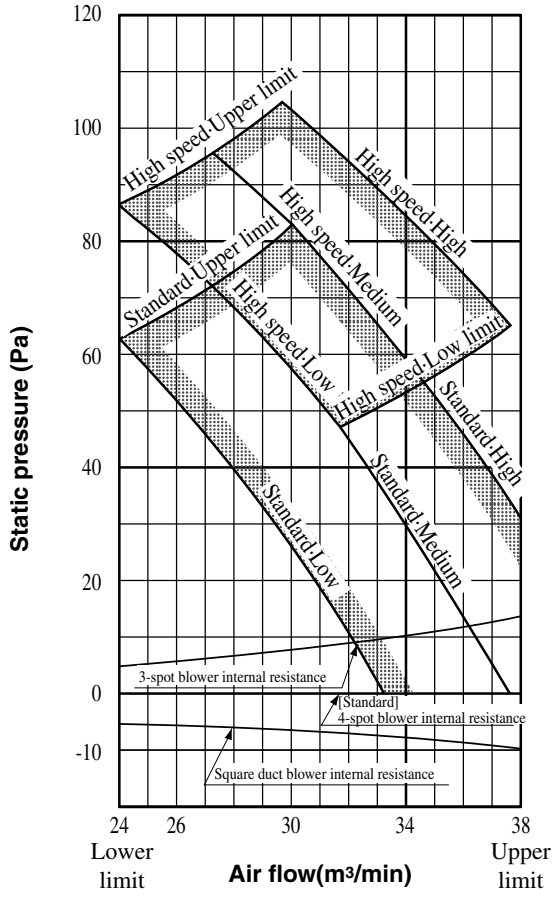
Model FDUMA90KXE5R



Model FDUMA112KXE5R

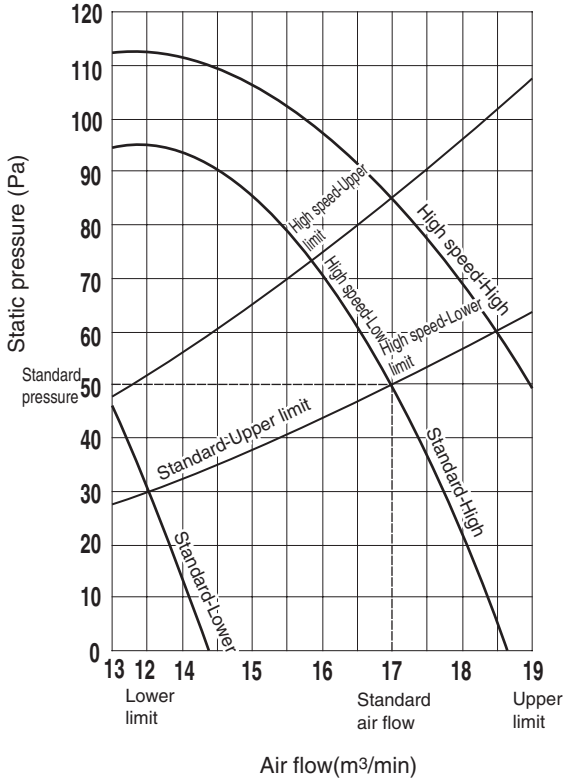


Model FDUMA140KXE5R

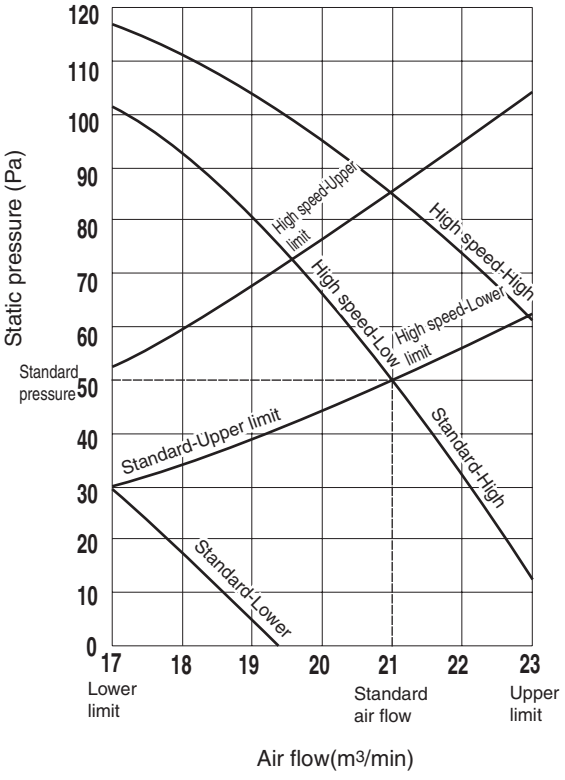


(3) Ceiling mounted dact type (FDUR)

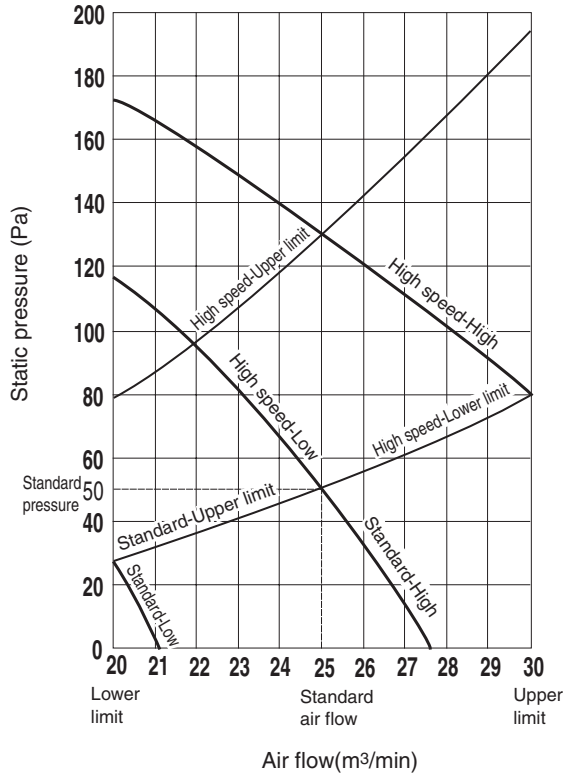
Model FDURA45KXE4R



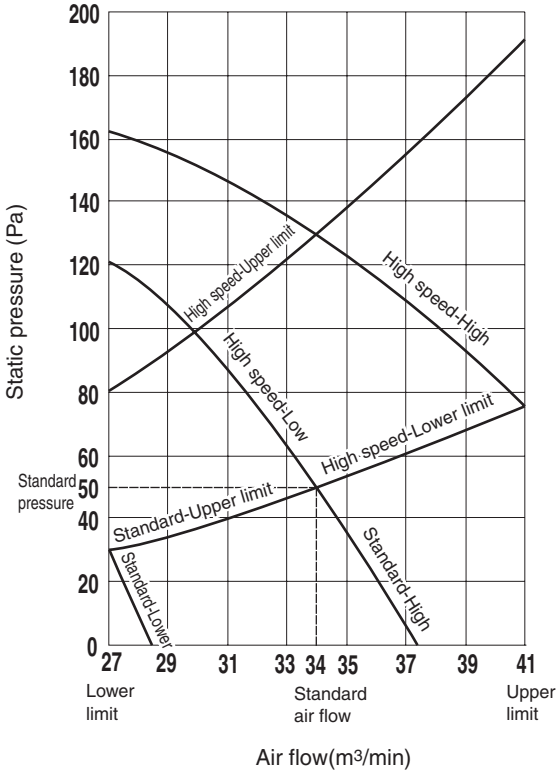
Model FDURA56KXE4R



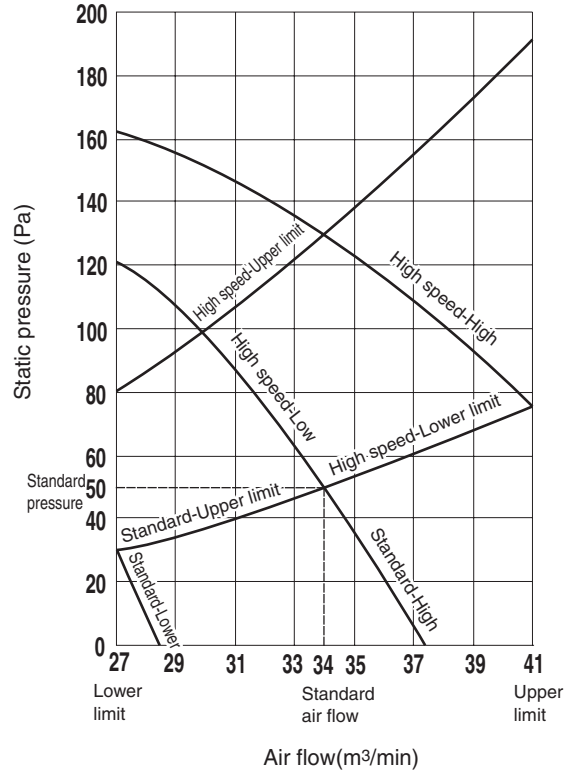
Model FDURA71KXE4R



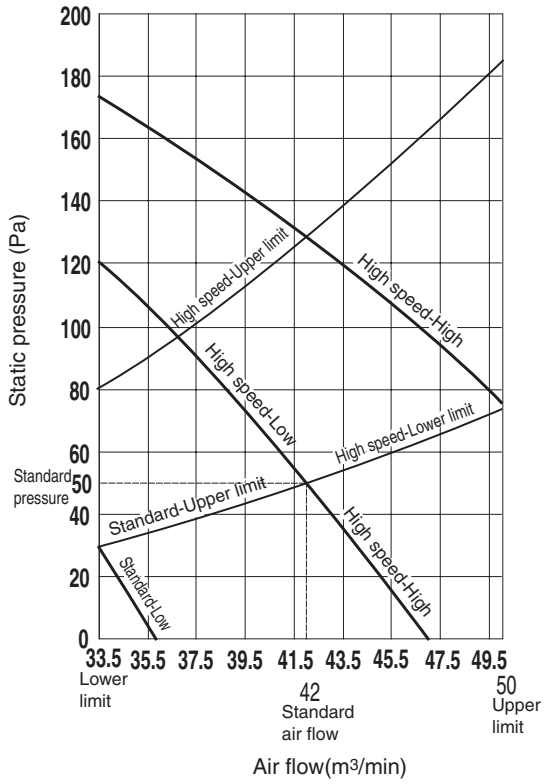
Model FDURA90KXE4R



Model FDURA112KXE4R



Model FDURA140KXE4R



(4) High static pressure ducted type (FDU)

How to interpret the blower characteristics table

Example
- What is the Fan Controller's Volume Number setting if, at the high operation speed of FDUA224KXE4R, it is required to have 120Pa outside static pressure at 56m³/min airflow volume as the operation point?

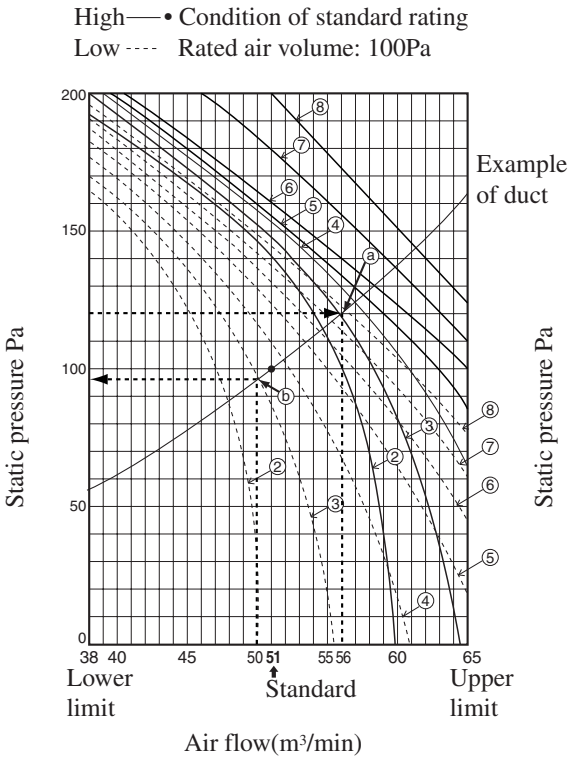
  Move the 120Pa outside static pressure point to the right as shown in the diagram below. The "ⓐ-point", i.e. where this intersects with the solid curve tracing the 56m³/min airflow volume upwards, is the appropriate Volume Number. In this example the appropriate Volume Number is "No. 3".
- In this situation, a condition of 50m³/min airflow volume at 96Pa outside static pressure can be predicated at Low Tap and it can be concluded that operation is possible.

  Always follow the procedure in "ⓑ-point" to verify that the condition at Low Tap is not outside the Feasible Operation Airflow Volume Range.

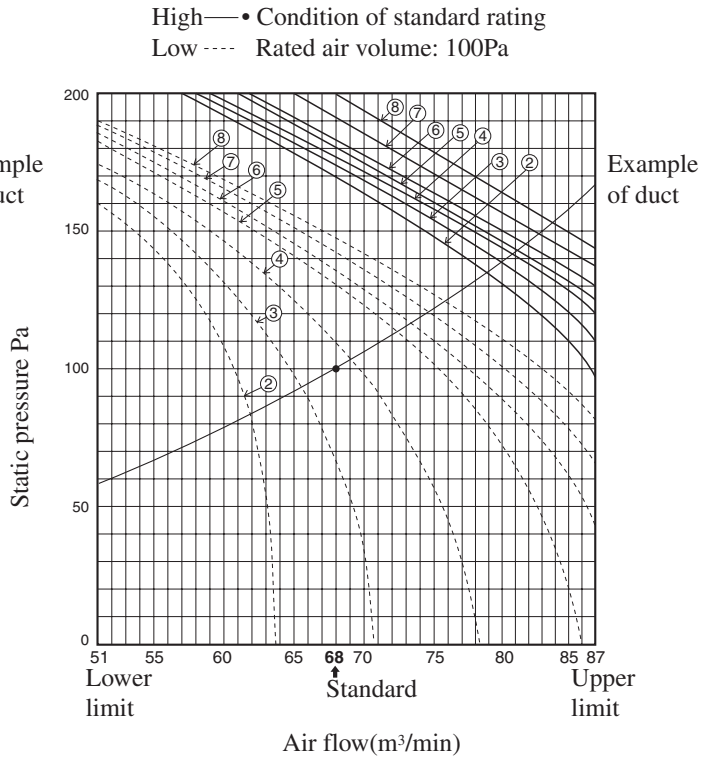
Notes (1) Circled values in the Special Feature Table indicate Fan Controller Volume Numbers. Volume Numbers with no entry are outside the Feasible Operation Airflow Volume Range and therefore operation is not possible.

(2) The Fan Controller Volume Number is set at "No.5" when shipped from the assembly plant.

Model FDUA224KXE4R

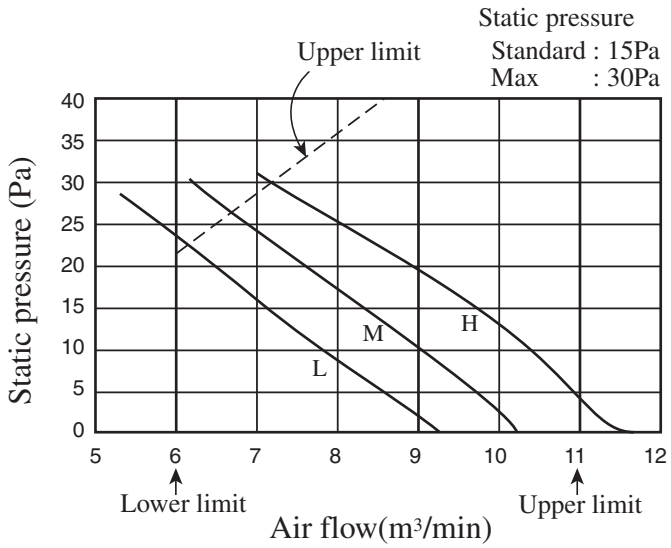


Model FDUA280KXE4R

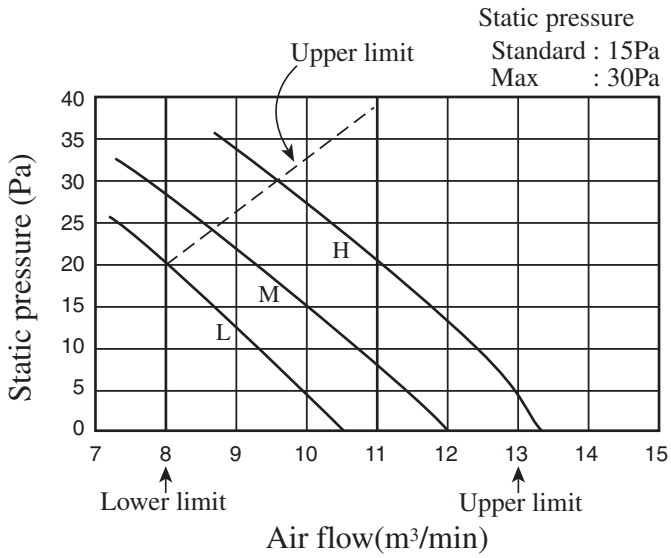


(5) Ultra thin ducted (FDQS)

Models FDQSA22, 28, 36KXE5R



Models FDQSA45, 56KXE5R

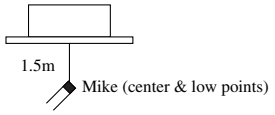


3.5 Noise level

Note (1) The data are based on the following conditions.
Ambient air tempetature: Indoor unit 27˚C DB, 19˚C WB. Outdoor unit 35˚C DB
(2) The data in the chart are measuted in an unechonic room.
(3) The noise levels measured in the field are usually higher than the data because of reflection.

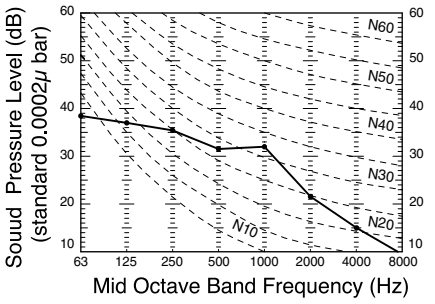
(a) Ceiling recessed compact type (FDTC)

Measured based on JIS B 8616
Mike position as right



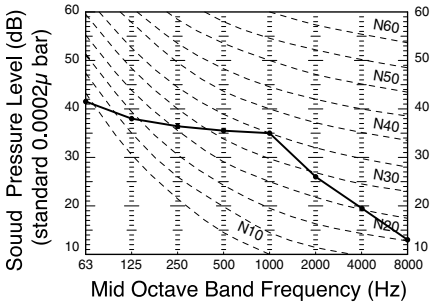
Models FDTCA22KXE4R, 28KXE4R

Noise level 35 dB (A) at HIGH
33 dB (A) at MEDIUM
32 dB (A) at LOW



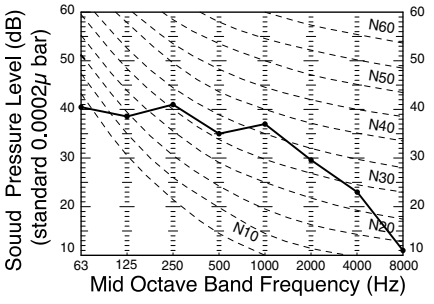
Model FDTCA36KXE4R

Noise level 38 dB (A) at HIGH
36 dB (A) at MEDIUM
34 dB (A) at LOW



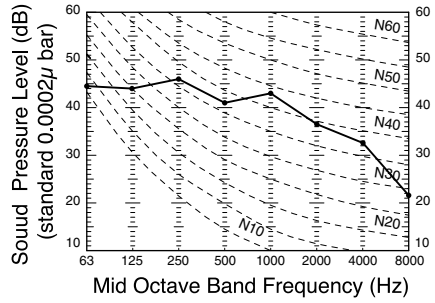
Model FDTCA45KXE4R

Noise level 40 dB (A) at HIGH
38 dB (A) at MEDIUM
36 dB (A) at LOW



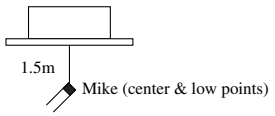
Model FDTCA56KXE4R

Noise level 45 dB (A) at HIGH
42 dB (A) at MEDIUM
39 dB (A) at LOW



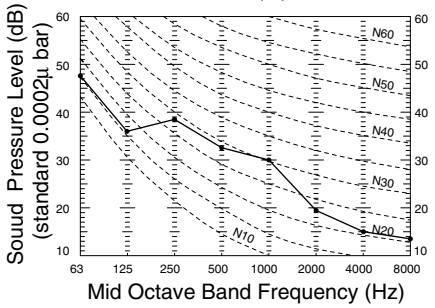
(b) Ceiling recessed type (FDT)

Measured based on JIS B 8616
Mike position as right



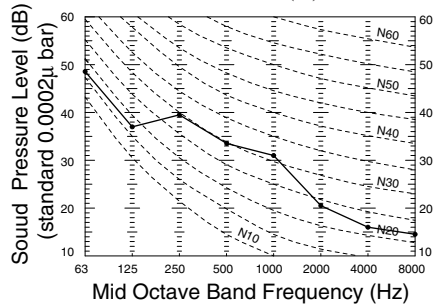
Models FDTA28KXE4R, 36KXE4R, 45KXE4R

Noise level 35 dB (A) at HIGH
33 dB (A) at MEDIUM
31 dB (A) at LOW



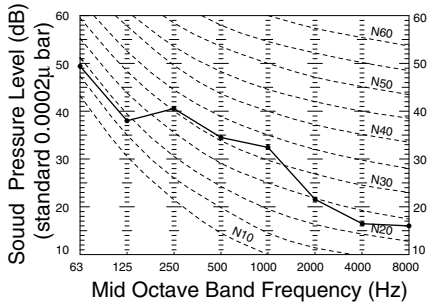
Model FDTA56KXE4R

Noise level 36 dB (A) at HIGH
34 dB (A) at MEDIUM
32 dB (A) at LOW



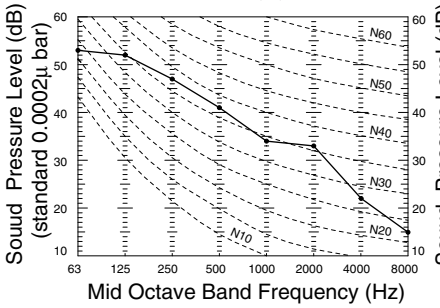
Model FDTA71KXE4R

Noise level 37 dB (A) at HIGH
35 dB (A) at MEDIUM
33 dB (A) at LOW



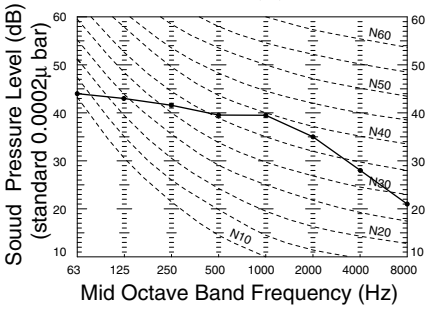
Model FDTA90KXE4R

Noise level 43 dB (A) at HIGH
41 dB (A) at MEDIUM
38 dB (A) at LOW



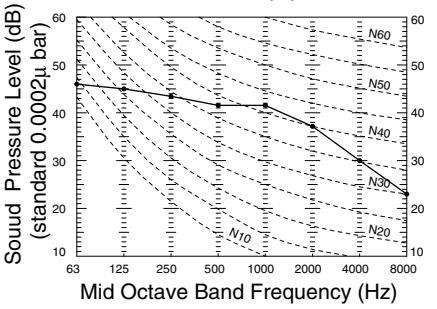
Model FDTA112KXE4R

Noise level 43 dB (A) at HIGH
41 dB (A) at MEDIUM
38 dB (A) at LOW



Model FDTA140KXE4R, 160KXE4R

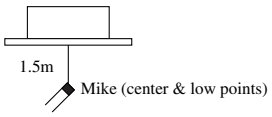
Noise level 45 dB (A) at HIGH
43 dB (A) at MEDIUM
41 dB (A) at LOW



(c) 2-way outlet ceiling recessed type (FDTW)

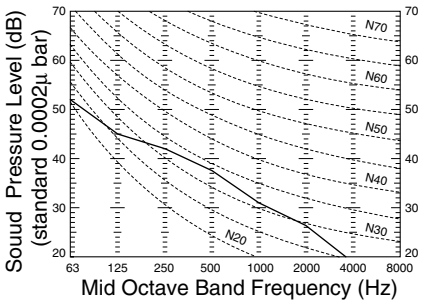
Measured based on JIS B 8616

Mike position as below



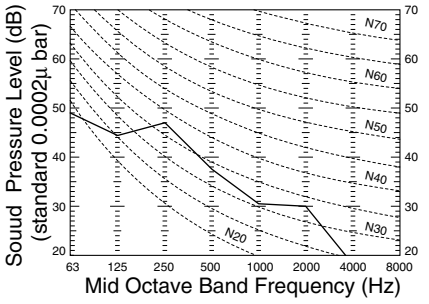
Models FDTWA28KXE4BR, 45KXE4BR, 56KXE4BR

Noise level 39 dB (A) at HIGH
36 dB (A) at MEDIUM
33 dB (A) at LOW



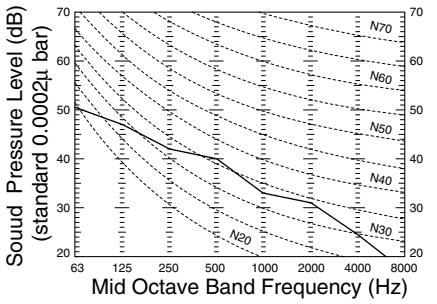
Model FDTWA71KXE4R

Noise level 41 dB (A) at HIGH
38 dB (A) at MEDIUM
35 dB (A) at LOW



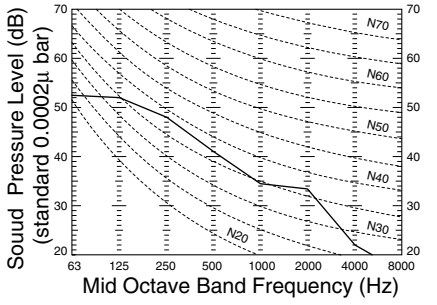
Model FDTWA90KXE4R

Noise level 41 dB (A) at HIGH
39 dB (A) at MEDIUM
36 dB (A) at LOW



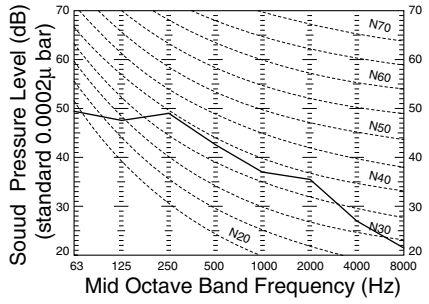
Model FDTWA112KXE4R

Noise level 44 dB (A) at HIGH
41 dB (A) at MEDIUM
38 dB (A) at LOW



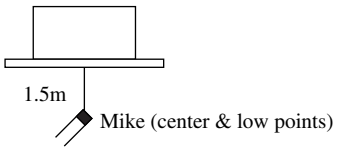
Model FDTWA140KXE4R

Noise level 45 dB (A) at HIGH
42 dB (A) at MEDIUM
39 dB (A) at LOW



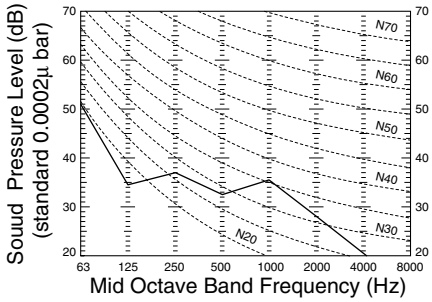
(d) Ceiling recessed single air suppy type (FDTQ)

Measured based on JIS B 8616
Mike position as below



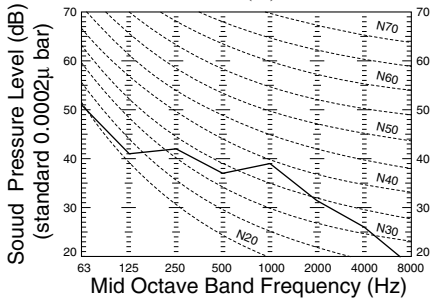
Models FDTQA22KXE4R, 28KXE4R
36KXE4R

Noise level 38 dB (A) at HIGH
34 dB (A) at LOW



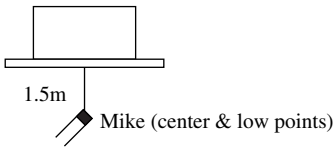
When used as the Duct panel type
Models FDTQA22KXE4R, 28KXE4R
36KXE4R

Noise level 42 dB (A) at HIGH
39 dB (A) at LOW



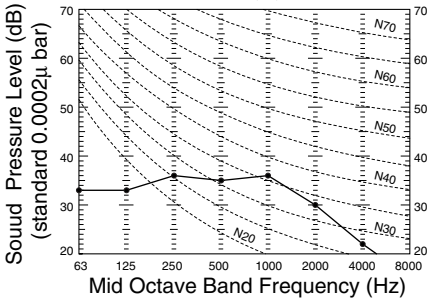
(e) 1-way outlet ceiling recessed type (FDTS)

Measured based on JIS B 8616
Mike position as below



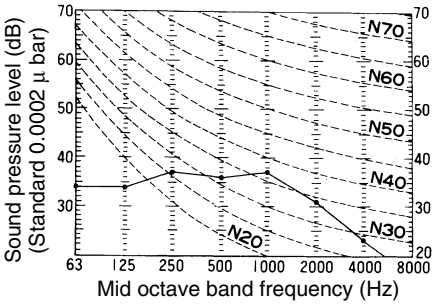
Model FDTSA22KXE4R

Noise level 39 dB (A) at HIGH
38 dB (A) at LOW



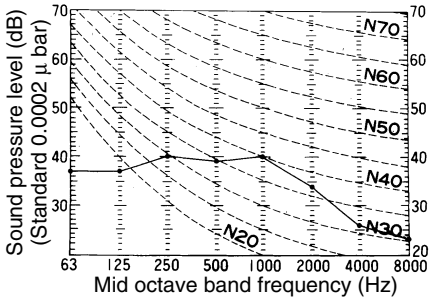
Models FDTSA28KXE4R, 36KXE4R

Noise level 40 dB (A) at HIGH
39 dB (A) at MEDIUM
38 dB (A) at LOW



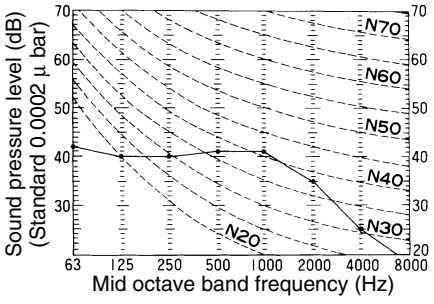
Model FDTSA45KXE4BR

Noise level 43 dB (A) at HIGH
40 dB (A) at MEDIUM
38 dB (A) at LOW



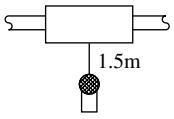
Model FDTSA71KXE4BR

Noise level 44 dB (A) at HIGH
40 dB (A) at MEDIUM
38 dB (A) at LOW



(f) High static pressure ducted type (FDU)

Measured based on JIS B 8616
Mike position as right



• Power level

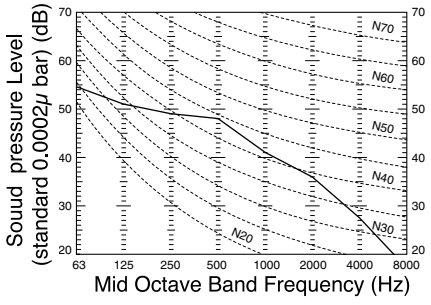
(Measurement conditions: JIS-B8616, measurement location: reverberation chamber)

(Unit: dB)

Form factor	Outlet side	Intake side
FDUA224KXE4R	74	63
FDUA280KXE4R	75	64

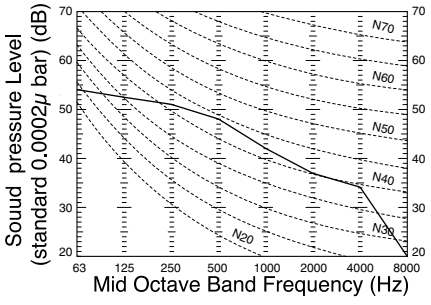
Model FDUA224KXE4R

Noise level 48 dB (A) at HIGH



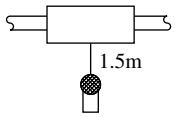
Model FDUA280KXE4R

Noise level 49 dB (A) at HIGH



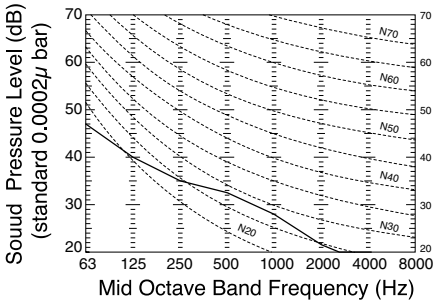
(g) Medium static pressure ducted type (FDQM)

Measured based on JIS B 8616
Mike position as right



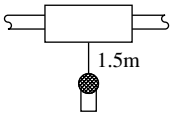
Models FDQMA22KXE4R, 28KXE4R, 36KXE4R

Noise level 34 dB (A) at HIGH
31 dB (A) at LOW



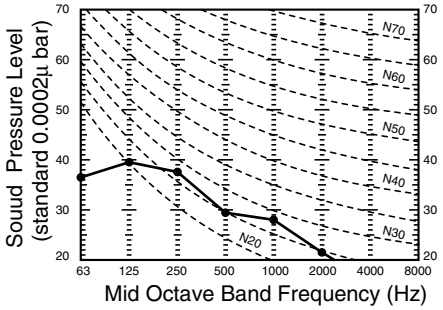
(h) Satellite ducted type (FDUM)

Measured based on JIS B 8616
Mike position as right



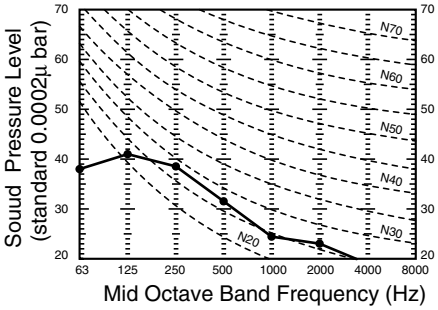
Model FDUMA22KXE5R

Noise level 33dB(A) at HIGH
31dB(A) at MEDIUM
28dB(A) at LOW



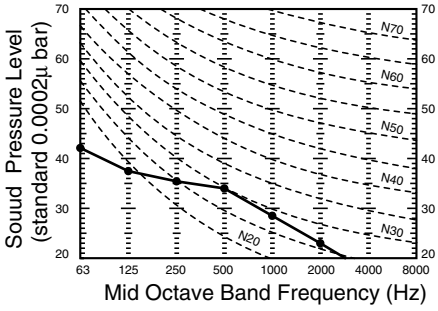
Models FDUMA28KXE5R,36KXE5R

Noise level 34dB(A) at HIGH
32dB(A) at MEDIUM
29dB(A) at LOW



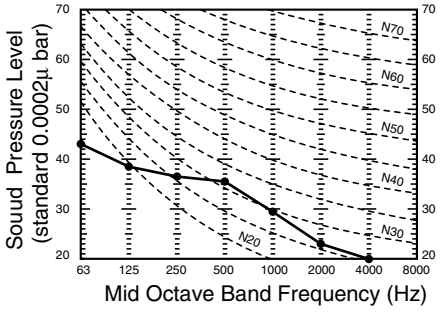
Models FDUMA45KXE5R,56KXE5R 71KXE5R

Noise level 35dB(A) at HIGH
32dB(A) at MEDIUM
29dB(A) at LOW



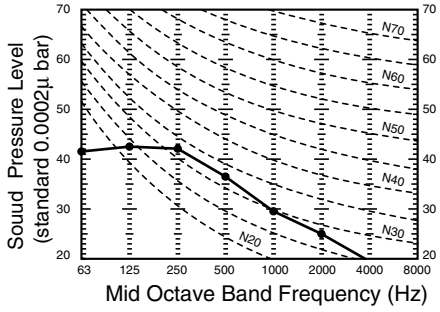
Model FDUMA90KXE5R

Noise level 36dB(A) at HIGH
33dB(A) at MEDIUM
30dB(A) at LOW



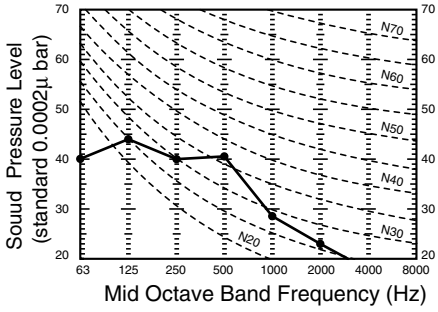
Model FDUMA112KXE5R

Noise level 38dB(A) at HIGH
35dB(A) at MEDIUM
32dB(A) at LOW



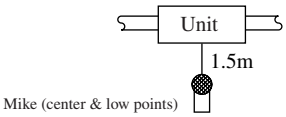
Model FDUMA140KXE5R

Noise level 39dB(A) at HIGH
37dB(A) at MEDIUM
34dB(A) at LOW

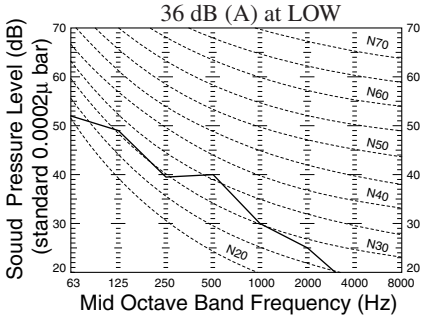


(i) Ceiling mounted duct type (FDUR)

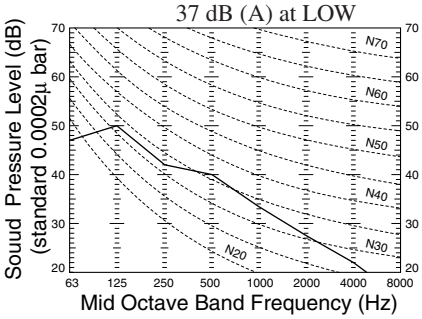
Measured based on JIS B 8616
Mike position as right



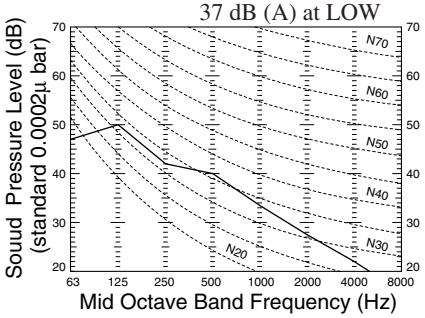
Model FDURA45KXE4R
Noise level 40 dB (A) at HIGH
36 dB (A) at LOW



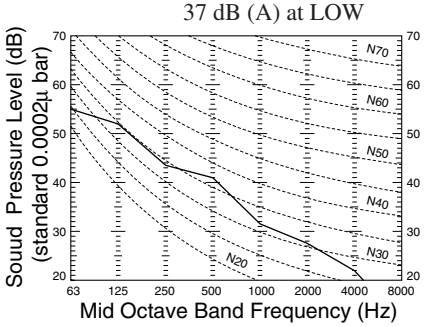
Model FDURA56KXE4R
Noise level 41 dB (A) at HIGH
37 dB (A) at LOW



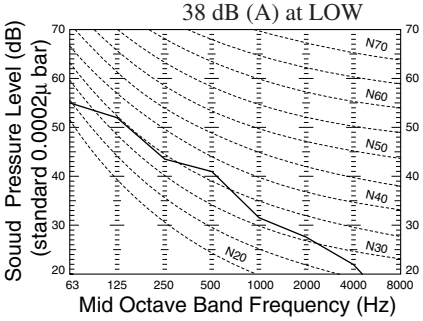
Model FDURA71KXE4R
Noise level 41 dB (A) at HIGH
37 dB (A) at LOW



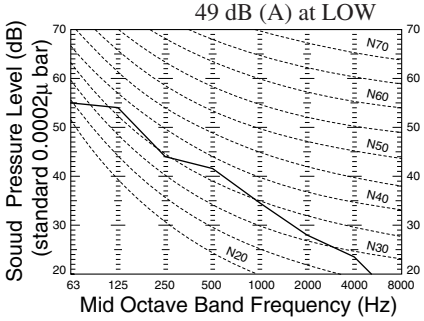
Model FDURA90KXE4R
Noise level 42 dB (A) at HIGH
37 dB (A) at LOW



Model FDURA112KXE4R
Noise level 42 dB (A) at HIGH
38 dB (A) at LOW

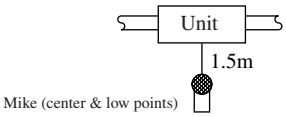


Model FDURA140KXE4R
Noise level 43 dB (A) at HIGH
49 dB (A) at LOW

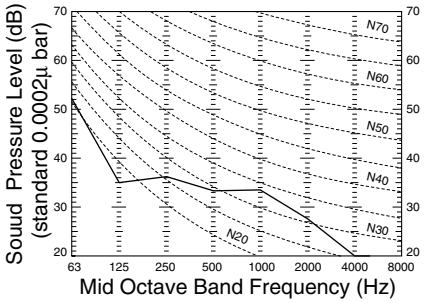


(j) Ultra thin ductid type (FDQS)

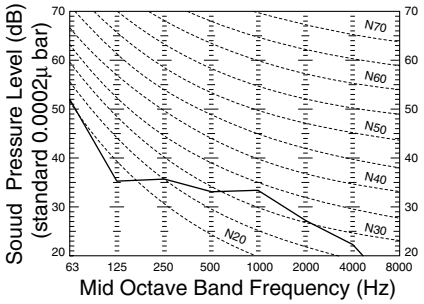
Measured based on JIS B 8616
Mike position as right



Model FDQSA22, 28, 36KXE5R
Noise level (Rear air return)
37 dB (A) at HIGH
35 dB (A) at MEDIUM
33 dB (A) at LOW

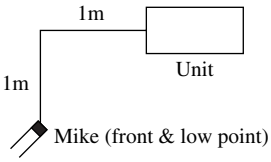


Model FDQSA45, 56KXE5R
Noise level (Rear air return)
37 dB (A) at HIGH
35 dB (A) at MEDIUM
33 dB (A) at LOW

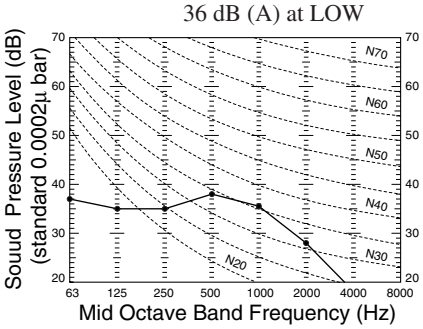


(k) Ceiling suspended type (FDE)

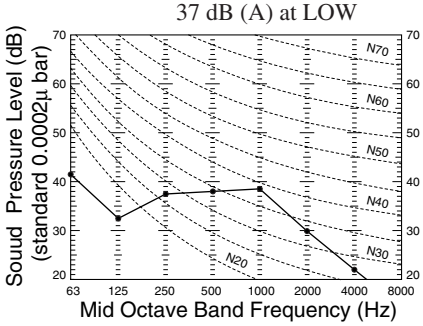
Measured based on JIS B 8616
Mike position as below



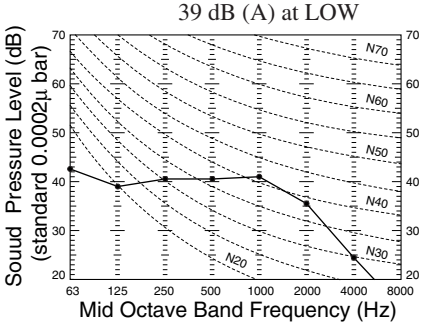
Models FDEA36KXE4R, 45KXE4R, 56KXE4R
Noise level 39 dB (A) at HIGH
38 dB (A) at MEDIUM
36 dB (A) at LOW



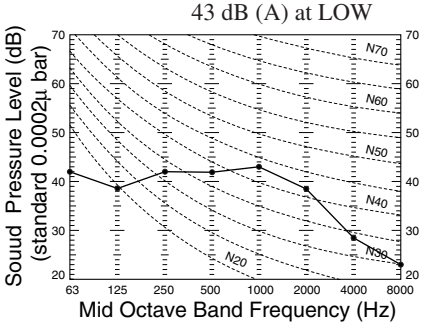
Model FDEA71KXE4R
Noise level 41 dB (A) at HIGH
39 dB (A) at MEDIUM
37 dB (A) at LOW



Model FDEA112KXE4R
Noise level 44 dB (A) at HIGH
41 dB (A) at MEDIUM
39 dB (A) at LOW

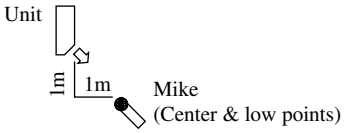


Model FDEA140KXE4R
Noise level 46 dB (A) at HIGH
44 dB (A) at MEDIUM
43 dB (A) at LOW

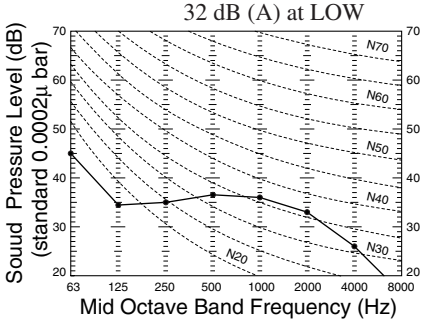


(l) Wall mounted type (FDK)

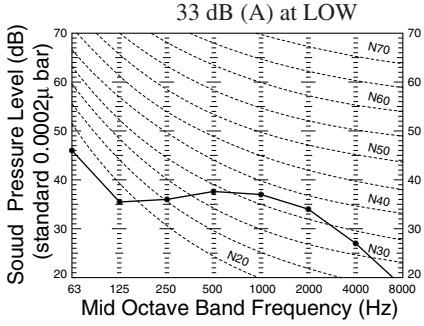
Measured based on JIS B 8616
Mike position as right



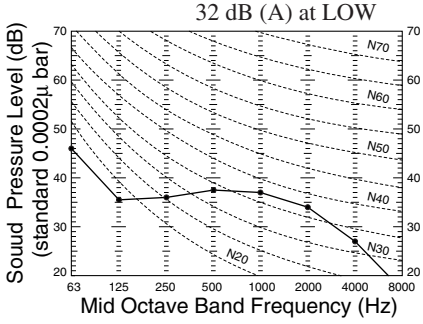
Models FDKA22KXE4R, 28KXE4R
Noise level 40 dB (A) at HIGH
36 dB (A) at MEDIUM
32 dB (A) at LOW



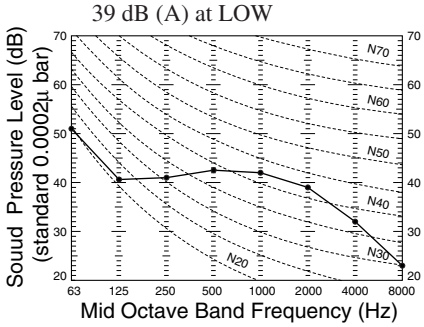
Model FDKA36KXE4R
Noise level 41 dB (A) at HIGH
37 dB (A) at MEDIUM
33 dB (A) at LOW



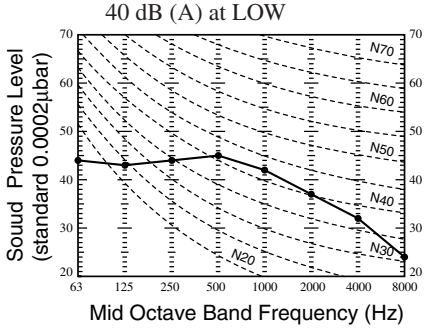
Model FDKA45KXE4R
Noise level 41 dB (A) at HIGH
37 dB (A) at MEDIUM
32 dB (A) at LOW



Model FDKA56KXE4R
Noise level 46 dB (A) at HIGH
43 dB (A) at MEDIUM
39 dB (A) at LOW

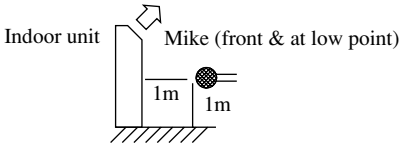


Model FDKA71KXE5R
Noise level 47 dB (A) at HIGH
44 dB (A) at MEDIUM
40 dB (A) at LOW



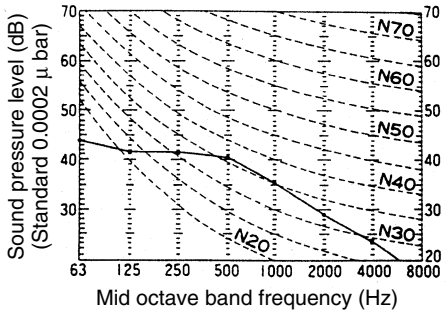
(m) Floor standing type (FDFL, FDFU))

Measured based on JIS B 8616
Mike position as right



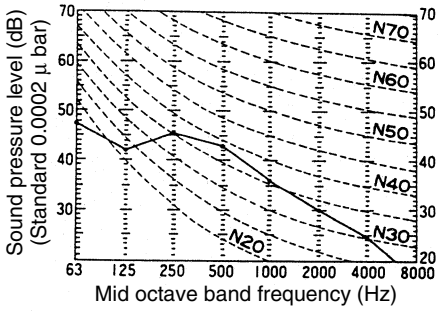
Models FDFLA28KXE4R, FDFUA28KXE4R

Noise level 41 dB (A) at HIGH
38 dB (A) at MEDIUM
36 dB (A) at LOW



Models FDFLA45KXE4R, 71KXE4R
FDFUA45KXE4R, 56KXE4R, 71KXE4R

Noise level 43 dB (A) at HIGH
41 dB (A) at MEDIUM
40 dB (A) at LOW

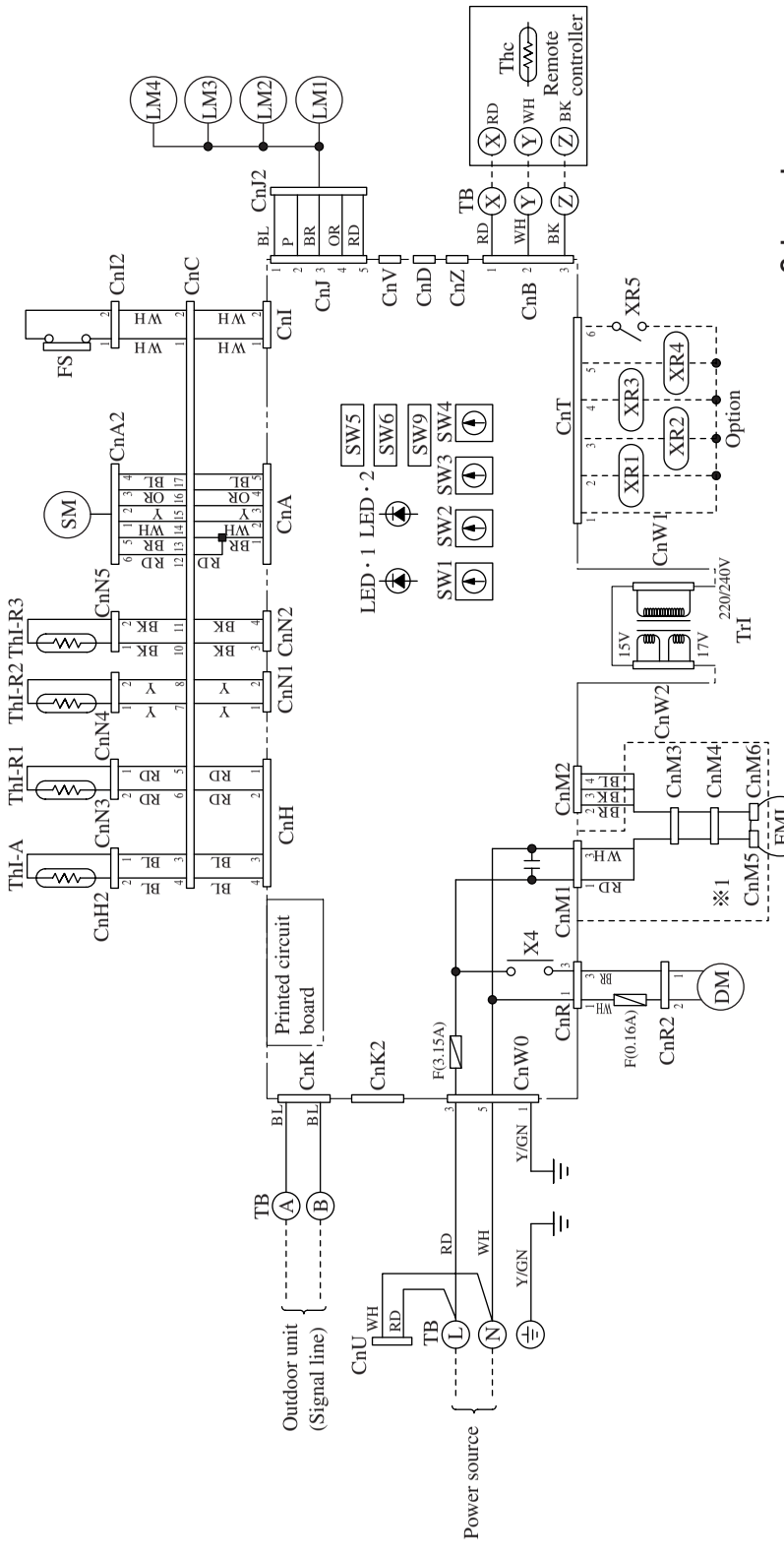


3.6 Electrical wiring

(1) Indoor unit

(a) Ceiling recessed compact type (FDTC)

Models FDTCA22KXE4R, 28KXE4R, 36KXE4R
45KXE4R, 56KXE4R



Color marks

Mark	Color	Mark	Color
BK	Black	WH	White
BL	Blue	Y	Yellow
BR	Brown	P	Pink
OR	Orange	Y/GN	Yellow/Green
RD	Red		

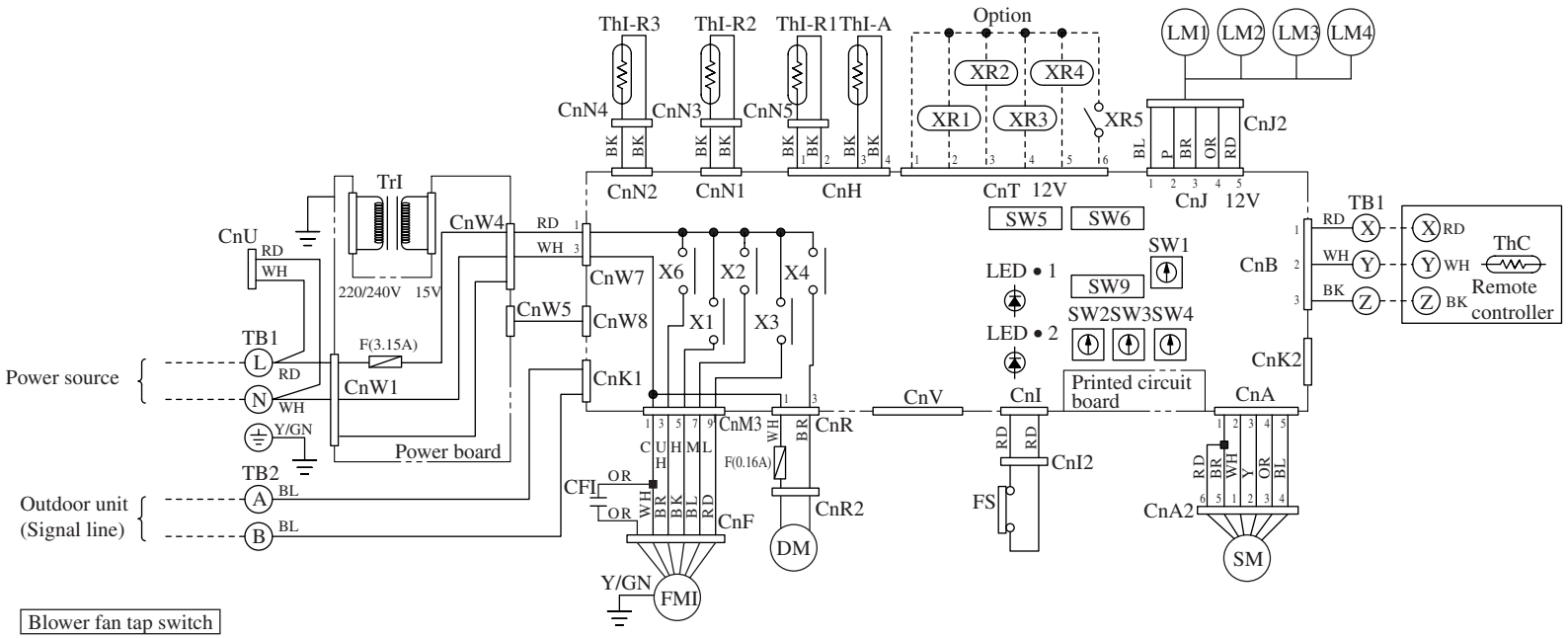
Function of switches

Mark		Function
SW5-1	ON	Testrun of condensate pump motor
	OFF	Normal
SW5-3	ON	Input Reverse Invalid
	OFF	signal Run stop
SW5-4	ON	Emergency stop signal:Invalid
	OFF	Emergency stop signal:valid
SW9-4	ON	Fan control:UH,H,M
	OFF	Fan control:H,M,L

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	SW2	Indoor unit address units digit	XR4	Inspection output(DC12V output)
DM	Drain motor	SW3	Outdoor unit address tens digit	XR5	Remote operation input(volt-free contact)
FS	Float switch	SW4	Outdoor unit address units digit	X4	Auxiliary relay(For DM)
LM1~4	Louver motor	SW6	Model capacity setting	TB	Terminal block(○ mark)
SM	Stepping motor(For Exp.v)	TrI	Transformer	CnA~Z	Connector
ThI-A	Thermistor	F	Fuse	■ mark	Closed-end connector
ThI-R1	Thermistor	LED1	Indication lamp(Red)		
ThI-R2	Thermistor	LED2	Indication lamp(Green)		
ThI-R3	Thermistor	XR1	Operation output(DC12V output)		
Thc	Thermistor	XR2	Heating output(DC12V output)		
SW1	Indoor unit address tens digit	XR3	Thermo ON output(DC12V output)		

(b) Ceiling recessed type (FDT)
Models FDTA28KXE4R, 36KXE4R, 45KXE4R, 56KXE4R, 71KXE4R, 90KXE4R



Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

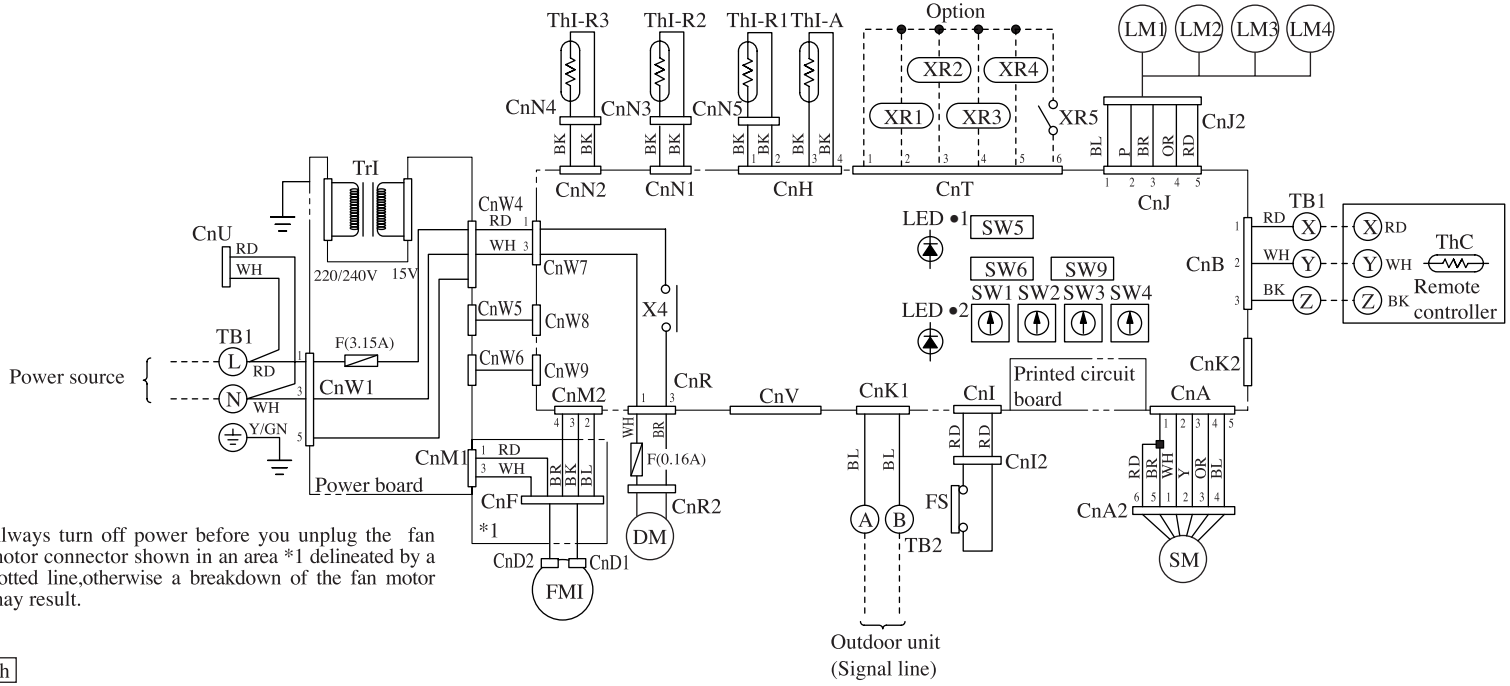
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW1**	Indoor unit address tens digit	**XR3**	Thermo ON output(DC12V output)
CFI	Capacitor for FMI	**SW2**	Indoor unit address units digit	**XR4**	Inspection output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address tens digit	**XR5**	Remote operation input(volt-free contact)
FS	Float switch	**SW4**	Outdoor unit address units digit	**X1,2,3,6**	Auxiliary relay(For FM)
LM1~4	Louver motor	**SW6**	Model capacity setting	**X4**	Auxiliary relay(For DM)
SM	Stepping motor(For Exp.v)	**TrI**	Transformer	**TB1,2**	Terminal block(○ mark)
ThI-A	Thermistor	**F**	Fuse	**CnA~Z**	Connector
ThI-R1	Thermistor	**LED1**	Indication lamp(Red)	**■mark**	Closed-end connector
ThI-R2	Thermistor	**LED2**	Indication lamp(Green)		
ThI-R3	Thermistor	**XR1**	Operation output(DC12V output)		
ThC	Thermistor	**XR2**	Heating output(DC12V output)		

Color marks

Mark	Color	Mark	Color
BK	Black	**RD**	Red
BL	Blue	**WH**	White
BR	Brown	**Y**	Yellow
BR/WH	Brown/White	**P**	Pink
OR	Orange	**Y/GN**	Yellow/Green
OR/WH	Orange/White		

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	



Note(1) Always turn off power before you unplug the fan motor connector shown in an area *1 delineated by a dotted line,otherwise a breakdown of the fan motor may result.

Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW2**	Indoor unit address units digit	**XR4**	Inspection output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address tens digit	**XR5**	Remote operation input(volt-free contact)
FS	Float switch	**SW4**	Outdoor unit address units digit	**X4**	Auxiliary relay(For DM)
LM1~4	Louver motor	**SW6**	Model capacity setting	**TB1,2**	Terminal block(○ mark)
SM	Stepping motor(For Exp.v)	**TrI**	Transformer	**CnA~Z**	Connector
ThI-A	Thermistor	**F**	Fuse	**■mark**	Closed-end connector
ThI-R1	Thermistor	**LED1**	Indication lamp(Red)		
ThI-R2	Thermistor	**LED2**	Indication lamp(Green)		
ThI-R3	Thermistor	**XR1**	Operation output(DC12V output)		
ThC	Thermistor	**XR2**	Heating output(DC12V output)		
SW1	Indoor unit address tens digit	**XR3**	Thermo ON output(DC12V output)		

Color marks

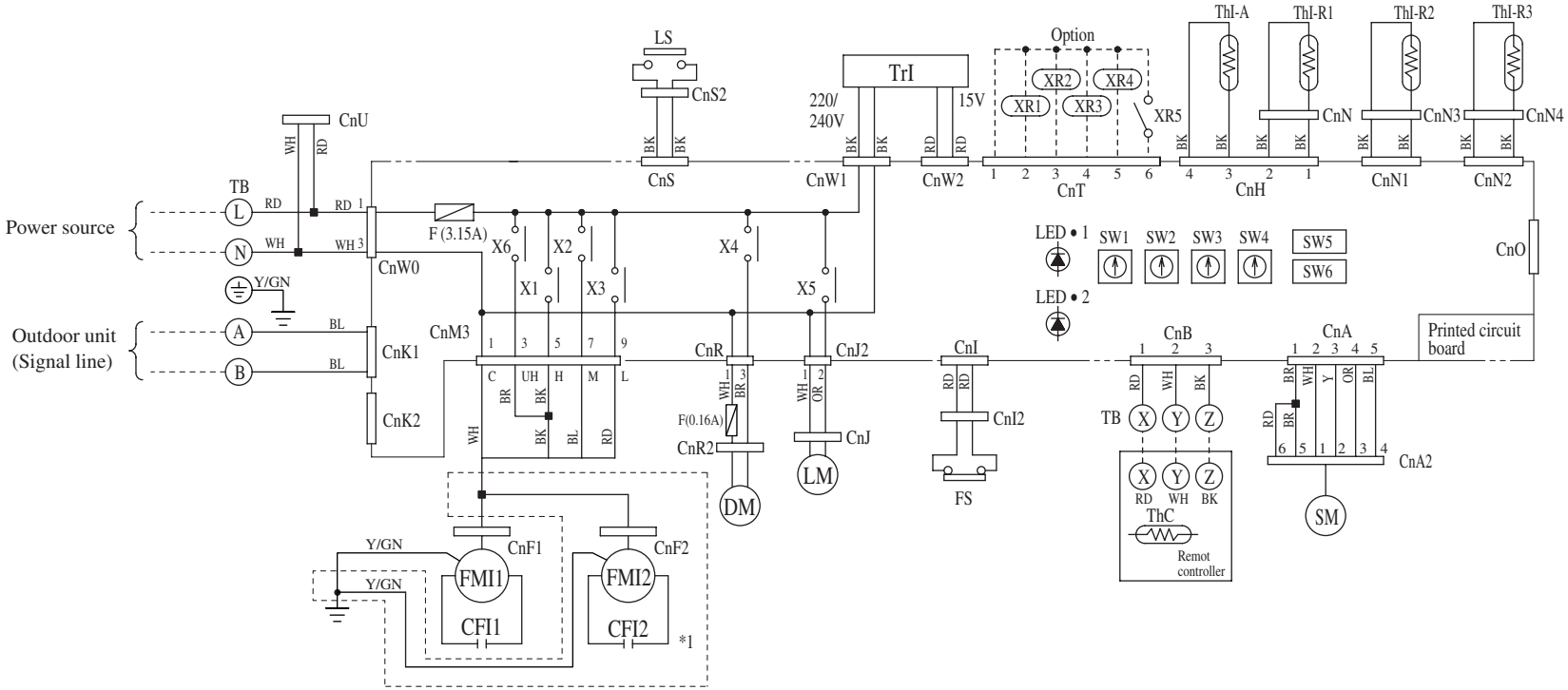
Mark	Color	Mark	Color
BK	Black	**RD**	Red
BL	Blue	**WH**	White
BR	Brown	**Y**	Yellow
BR/WH	Brown/White	**P**	Pink
OR	Orange	**Y/GN**	Yellow/Green
OR/WH	Orange/White		

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input	Reverse Invalid
	OFF	signal	Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	

(c) 2-way outlet ceiling recessed type(FDTW)

Model All models



Note(1) *1. FMI2 is equipped only for 112,140.

Meaning of marks

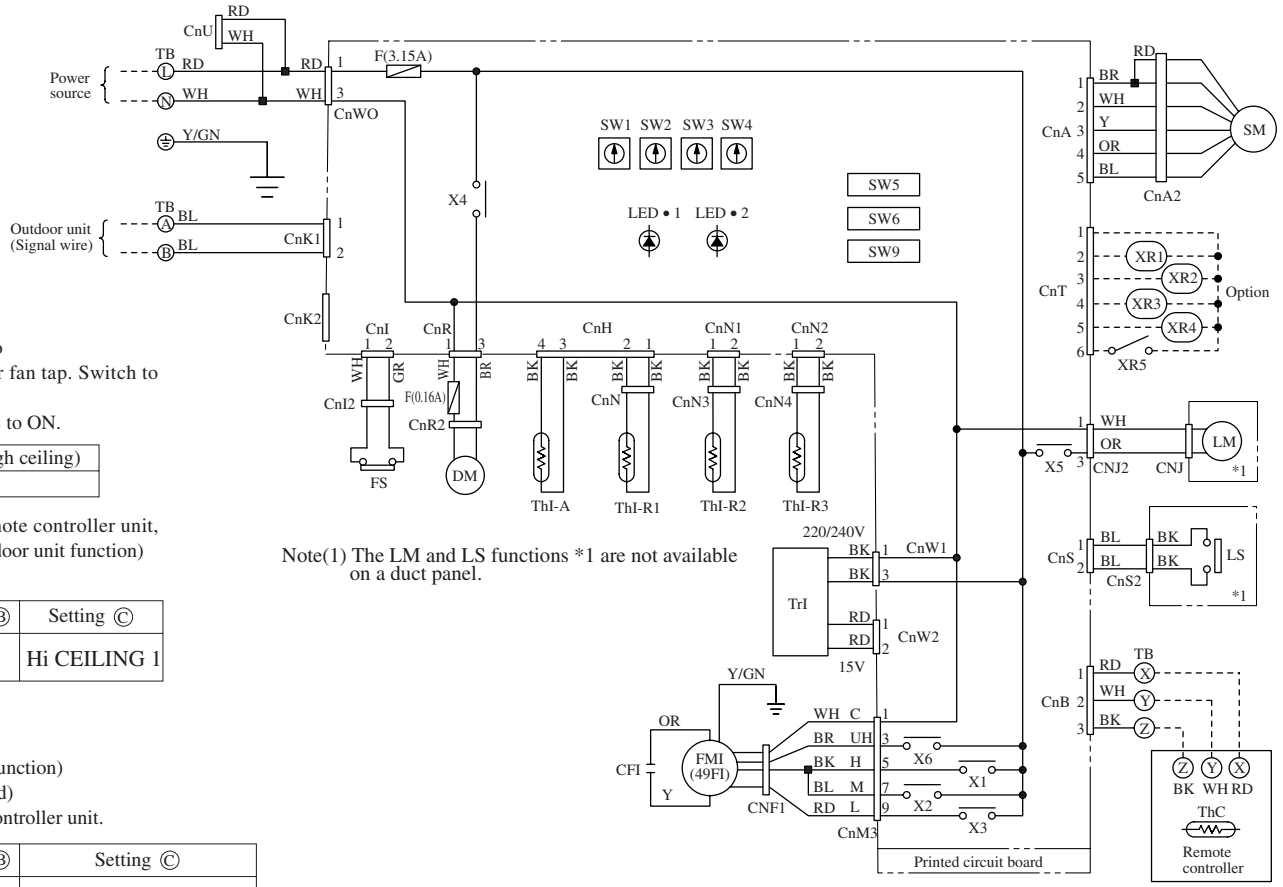
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI1,2	Fan motor	**SW1**	Indoor unit address tens digit	**XR3**	Thermo ON output(DC12V output)
CFI1,2	Capacitor for FMI	**SW2**	Indoor unit address units digit	**XR4**	Inspection output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address tens digit	**XR5**	Remote operation input(volt-free contact)
FS	Float switch	**SW4**	Outdoor unit address units digit	**X1,2,3,6**	Auxiliary relay(For FM)
LM	Louver motor	**SW6**	Model capacity setting	**X4**	Auxiliary relay(For DM)
SM	Stepping motor(For Exp.v)	**TrI**	Transformer	**X5**	Auxiliary relay(For LM)
ThI-A	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R1	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R2	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
ThI-R3	Thermistor	**XR1**	Operation output(DC12V output)		
ThC	Thermistor	**XR2**	Heating output(DC12V output)		

Color marks

Mark	Color	Mark	Color
BK	Black	**RD**	Red
BL	Blue	**WH**	White
BR	Brown	**Y**	Yellow
OR	Orange	**Y/GN**	Yellow/Green

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:Invalid	
	OFF	Emergency stop signal:valid	



Note(1) The LM and LS functions *1 are not available on a duct panel.

Blower fan tap switch

In case of using duct panel, the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

LOUVER switch disabled setting

In case of using duct panel, set the setting Ⓒ of " FUNCTION ▲" (remote control unit function) to " INVALID" (LOUVER switch disabled) by means of function setting from the remote controller unit.

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
07	LOUVER S/W	INVALID

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	ThI-R3	Thermistor	**XR1**	Operation output(DC12V output)
49FI	Internal thermostat for FMI	ThC	Thermistor	**XR2**	Heating output(DC12V output)
CFI	Capacitor for FMI	SW1	Indoor unit address tens digit	**XR3**	Thermo ON output(DC12V output)
DM	Drain motor	SW2	Indoor unit address units digit	**XR4**	Inspection output(DC12V output)
FS	Float switch	SW3	Outdoor unit address tens digit	**XR5**	Remote operation input(volt-free contact)
LM	Louver motor	SW4	Outdoor unit address units digit	**X1,2,3,6**	Auxiliary relay(For FM)
LS	Limit switch	SW6	Model capacity setting	**X4**	Auxiliary relay(For DM)
SM	Stepping motor(For Exp.v)	TrI	Transformer	**X5**	Auxiliary relay(For LM)
ThI-A	Thermistor	F	Fuse	**TB**	Terminal block(○ mark)
ThI-R1	Thermistor	LED1	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R2	Thermistor	LED2	Indication lamp(Green)	**■mark**	Closed-end connector

Color marks

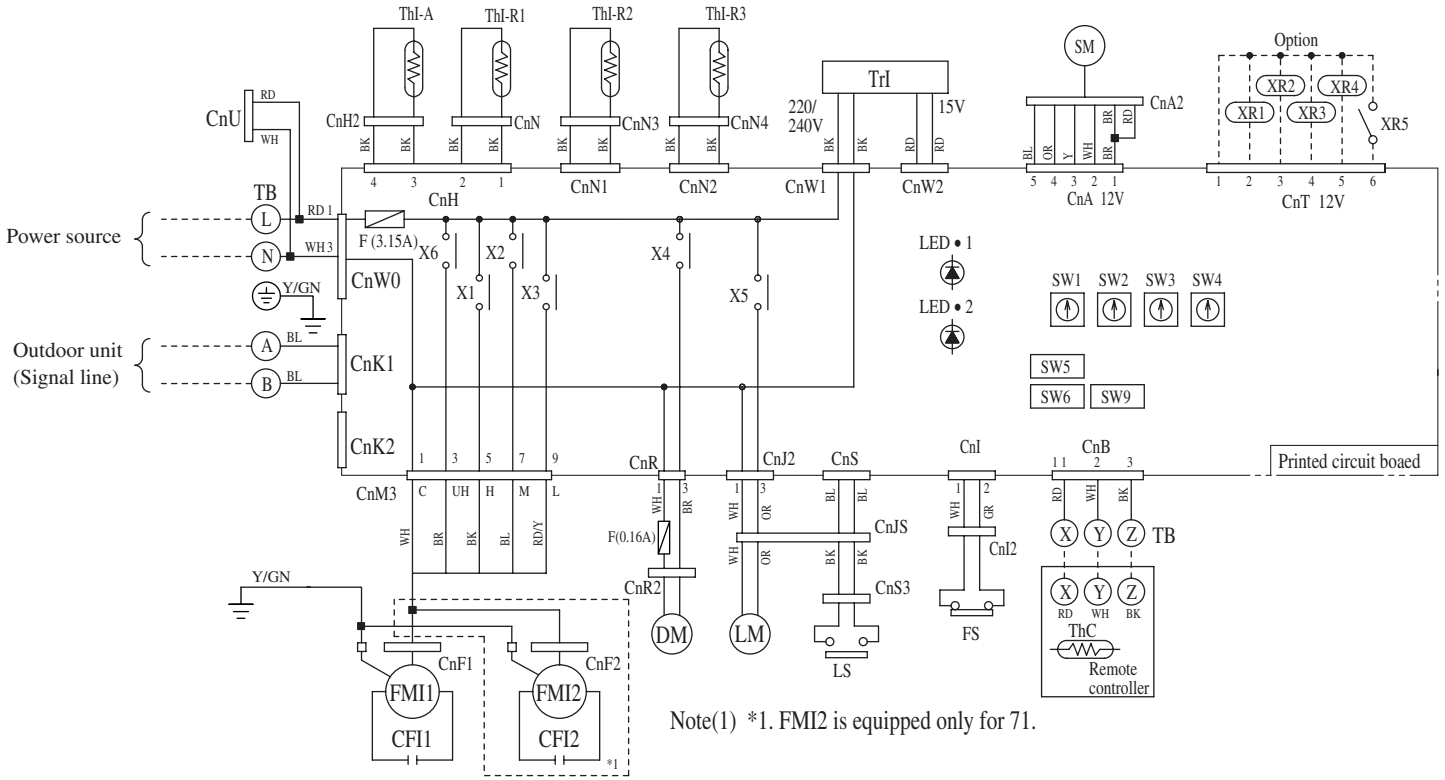
Mark	Color	Mark	Color
BK	Black	**RD**	Red
BL	Blue	**WH**	White
BR	Brown	**Y**	Yellow
GR	Gray	**Y/GN**	Yellow/Green
OR	Orange		

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	

(e) 1-way outlet ceiling recessed type(FDTS)

Model All models



Note(1) *1. FMI2 is equipped only for 71.

Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI1,2	Fan motor	**ThC**	Thermistor	**XR2**	Heating output(DC12V output)
CFI1,2	Capacitor for FMI	**SW1**	Indoor unit address tens digit	**XR3**	Thermo ON output(DC12V output)
DM	Drain motor	**SW2**	Indoor unit address units digit	**XR4**	Inspection output(DC12V output)
FS	Float switch	**SW3**	Outdoor unit address tens digit	**XR5**	Remote operation input(volt-free contact)
LM	Louver motor	**SW4**	Outdoor unit address units digit	**X1,2,3,6**	Auxiliary relay(For FM)
LS	Louver switch	**SW6**	Model capacity setting	**X4**	Auxiliary relay(For DM)
SM	Stepping motor(For Exp.v)	**TrI**	Transformer	**X5**	Auxiliary relay(For LM)
ThI-A	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R1	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R2	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
ThI-R3	Thermistor	**XR1**	Operation output(DC12V output)		

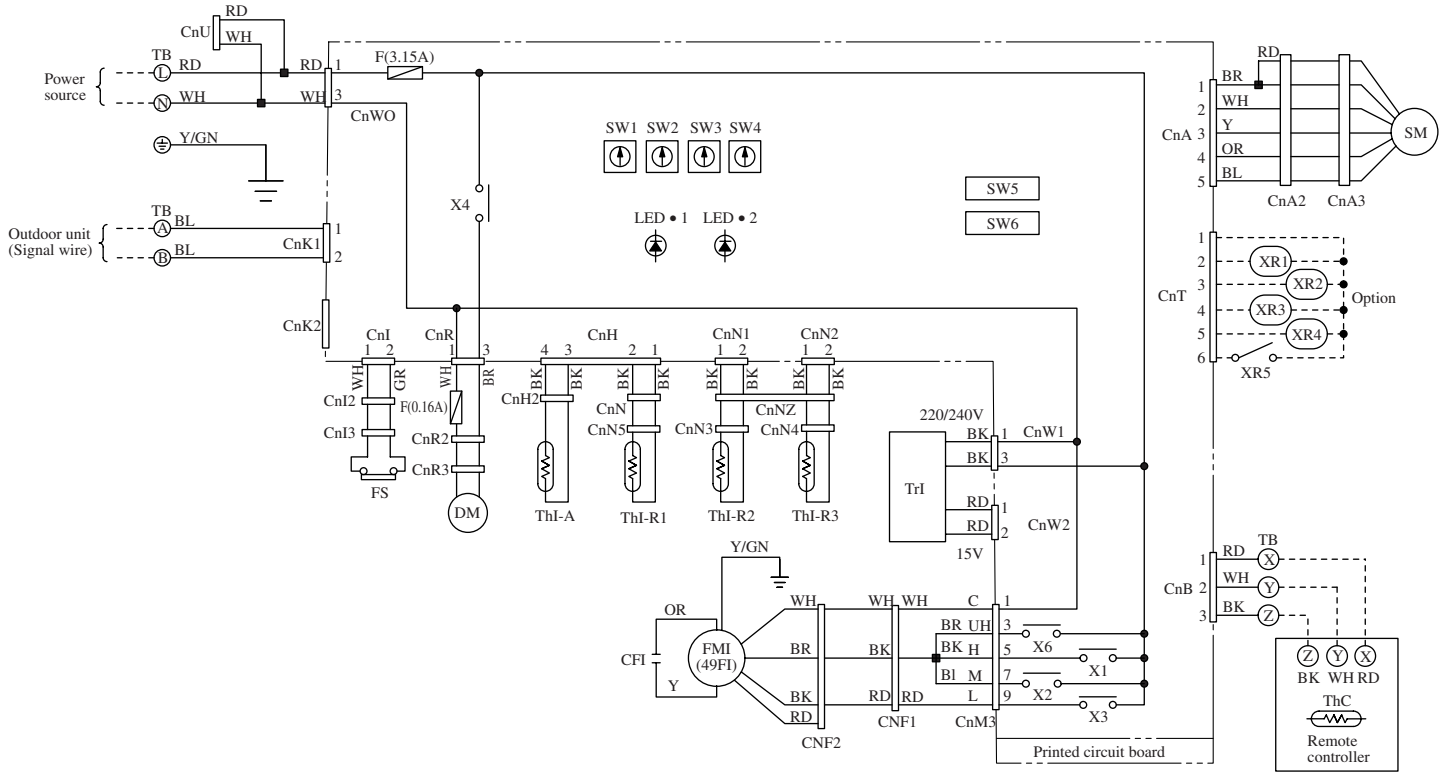
Color marks

Mark	Color	Mark	Color
BK	Black	**RD**	Red
BL	Blue	**RD/Y**	Red/Yellow
BR	Brown	**WH**	White
GR	Gray	**Y**	Yellow
OR	Orange	**Y/GN**	Yellow/Green

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	

(f) Medium static pressure type(FDQM)
Models FDQMA22KXE4R, 28KXE4R, 36KXE4R



Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**ThC**	Thermistor	**XR1**	Operation output(DC12V output)
49FI	Internal thermostat for FMI	**SW1**	Indoor unit address tens digit	**XR2**	Heating output(DC12V output)
CFI	Capacitor for FMI	**SW2**	Indoor unit address units digit	**XR3**	Thermo ON output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address tens digit	**XR4**	Inspection output(DC12V output)
FS	Float switch	**SW4**	Outdoor unit address units digit	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-A	Thermistor	**TrI**	Transformer	**X4**	Auxiliary relay(For DM)
ThI-R1	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector

Color marks

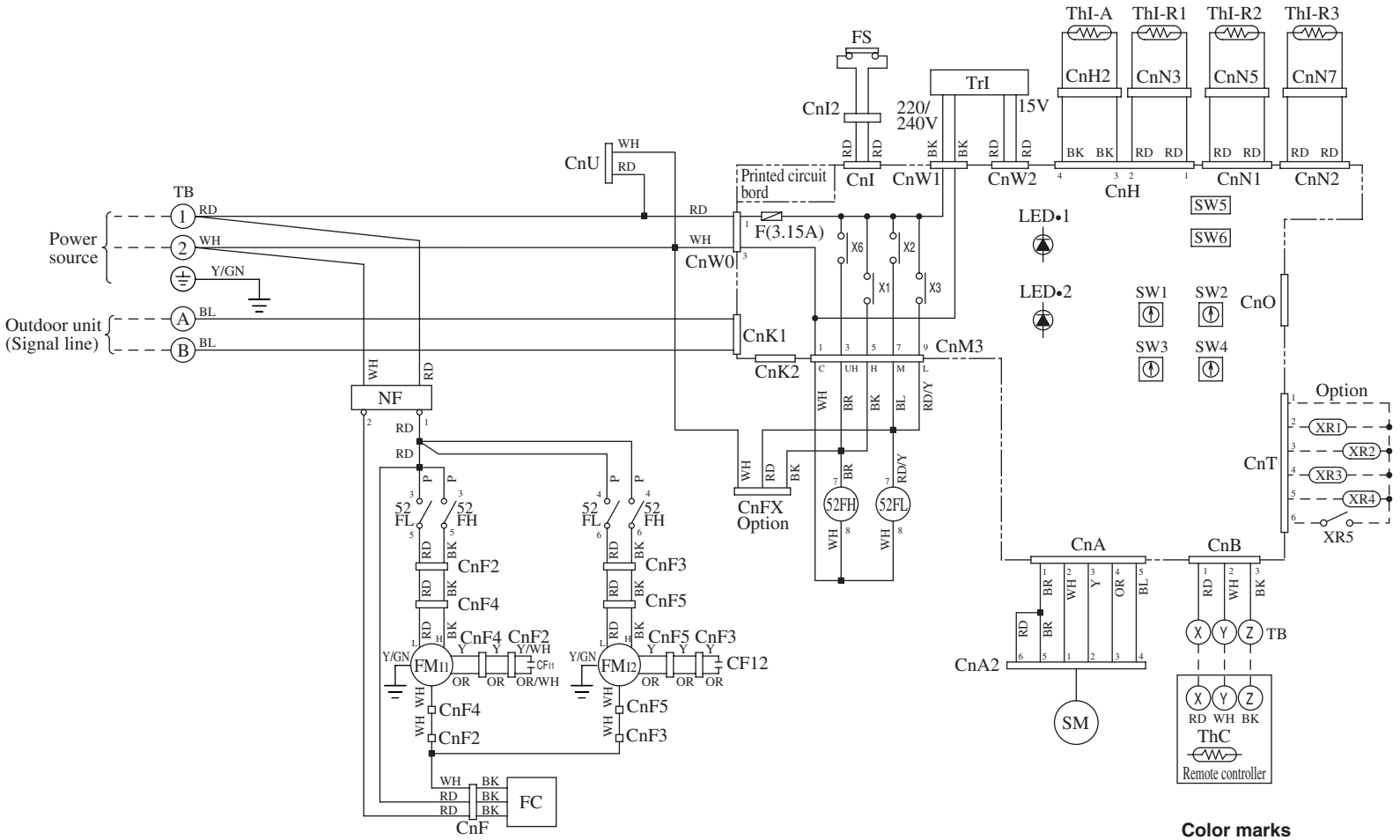
Mark	Color	Mark	Color
BK	Black	**RD**	Red
BL	Blue	**WH**	White
BR	Brown	**Y**	Yellow
GR	Gray	**Y/GN**	Yellow/Green
OR	Orange		

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input	Reverse Invalid
	OFF	signal	Run stop
SW5-4	ON	Emergency stop signal:Valid	
	OFF	Emergency stop signal:Invalid	

(g) High static pressure ducted type (FDU)

Models All models



Meaning of marks

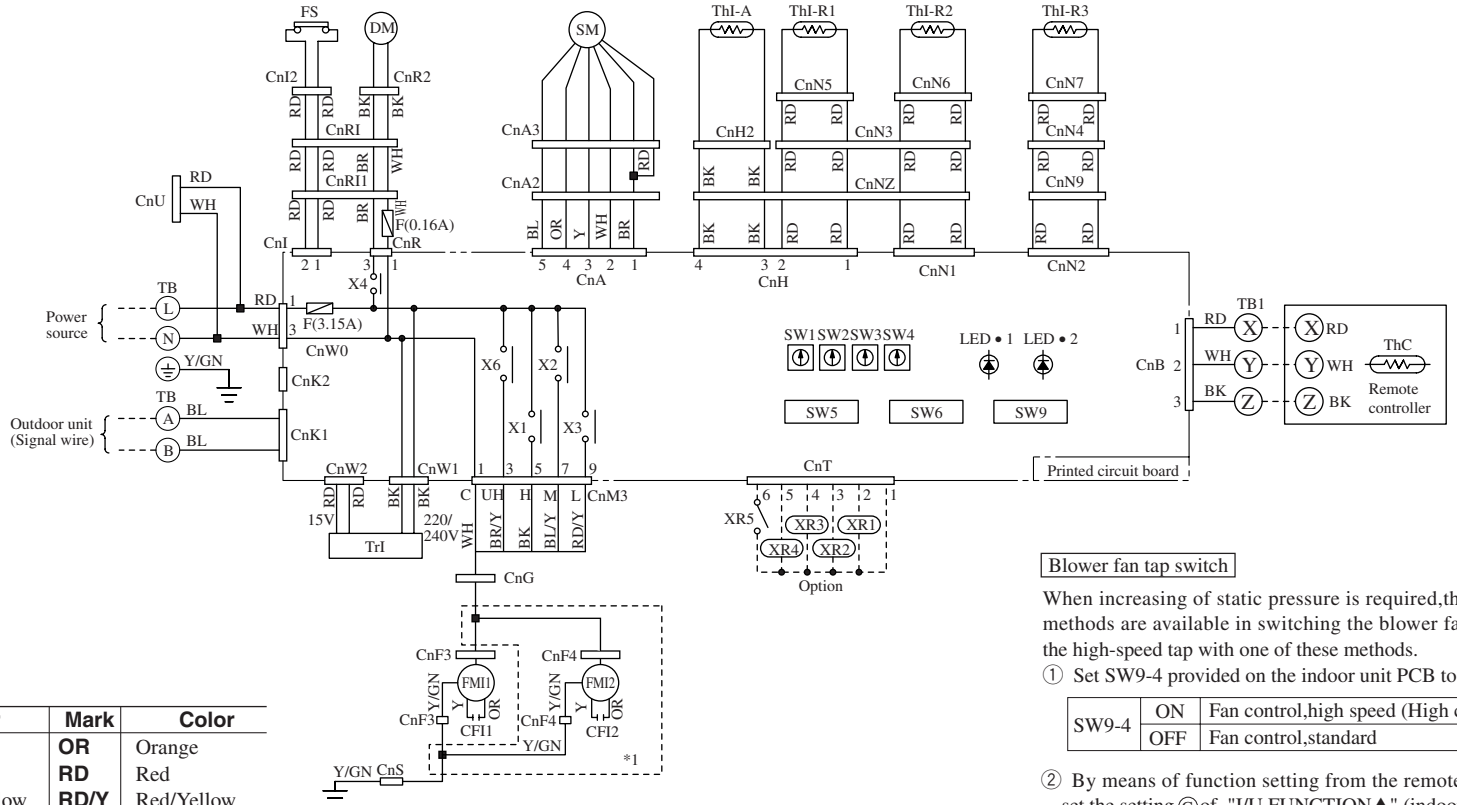
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI 1,2	Fan motor (with thermostat)	**TrI**	Transformer	**TB**	Terminal block (○ mark)
CFI 1,2	FMI condenser	**SM**	Stepping motor (For Exp.v)	**52FL,FH**	Electromagnetic contactor for FMI
FC	Fan controller	**SW1**	Indoor unit address tens digit	**X1~3,6**	Auxiliary relay (For FM)
NF	Noise filter	**SW2**	Indoor unit address units digit	**XR1**	Operation output (DC12V output)
FS	Float switch	**SW3**	Outdoor unit address tens digit	**XR2**	Heating output (DC12V output)
ThI-A	Thermistor	**SW4**	Outdoor unit address units digit	**XR3**	Thermo ON output (DC12V output)
ThI-R1	Thermistor	**SW6**	Model capacity selector	**XR4**	Inspection output (DC12V output)
ThI-R2	Thermistor	**LED1**	Indication lamp (Red)	**XR5**	Remote operation (volt-free contact)
ThI-R3	Thermistor	**LED2**	Indication lamp (Green)	**CnA~Z**	Connector
Thc	Thermistor	**F**	Fuse	**■ mark**	Closed-end connector

Color marks

Mark	Color	Mark	Color
BK	Black	RD/Y	Red/Yellow
BL	Blue	P	Pink
BR	Brown	WH	White
OR	Orange	Y	Yellow
OR/WH	Orange/White	Y/WH	Yellow/White
RD	Red	Y/GN	Yellow/Green

Function of switches

Mark		Function	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:Invalid	
	OFF	Emergency stop signal:valid	



Note(1) A one-motor type installation does not have the circuits shown in an area *1 delineated by a dotted line.

Color marks

Mark	Color	Mark	Color
BK	Black	**OR**	Orange
BL	Blue	**RD**	Red
BL/Y	Blue/yellow	**RD/Y**	Red/Yellow
BR	Brown	**WH**	White
BR/Y	Brown/yellow	**Y**	Yellow
GR	Gray	**Y/GN**	Yellow/Green

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI1,2	Fan motor	**SW1**	Indoor unit address tens digit	**XR2**	Heating output(DC12V output)
CFI1,2	Capacitor for FMI	**SW2**	Indoor unit address units digit	**XR3**	Thermo ON output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address tens digit	**XR4**	Inspection output(DC12V output)
FS	Float switch	**SW4**	Outdoor unit address units digit	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-A	Thermistor	**TrI**	Transformer	**X4**	Auxiliary relay(For DM)
ThI-R1	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
ThC	Thermistor	**XR1**	Operation output(DC12V output)		

Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

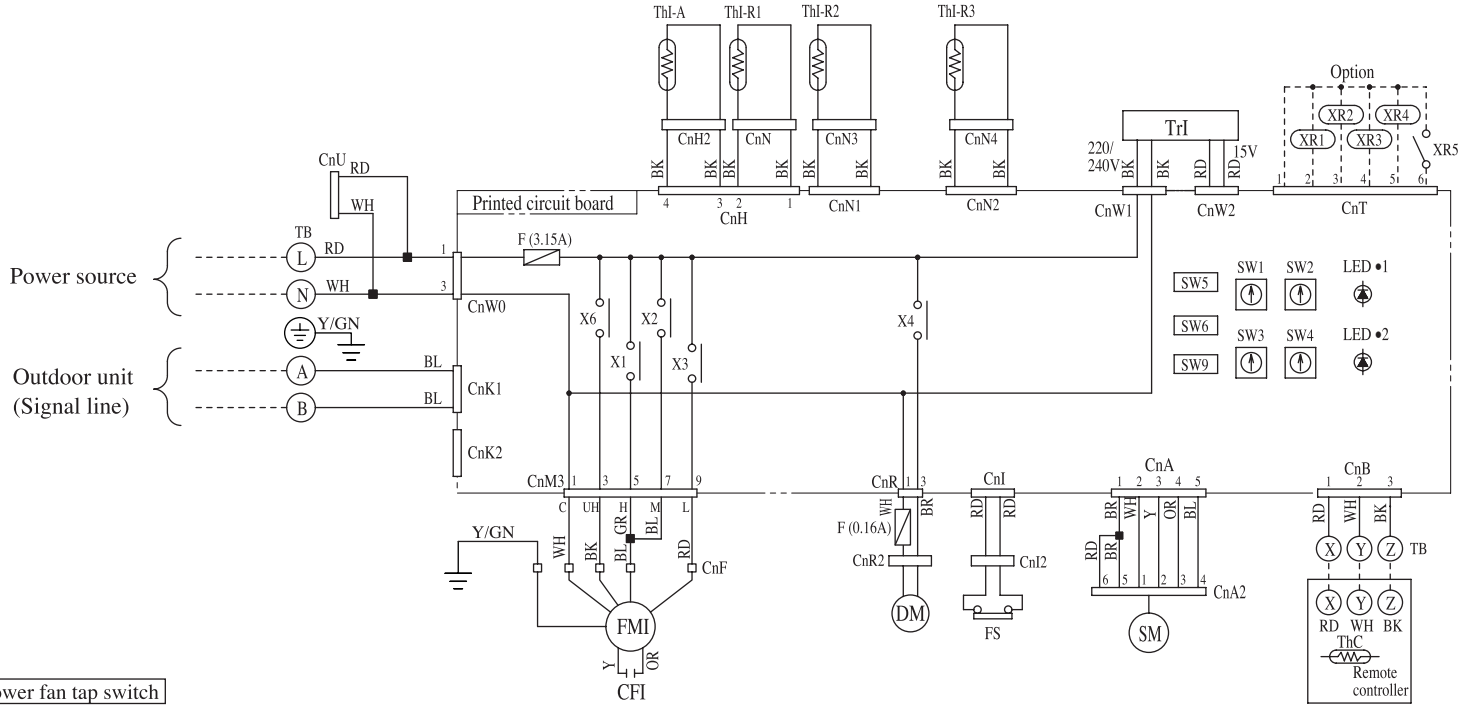
SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	



Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

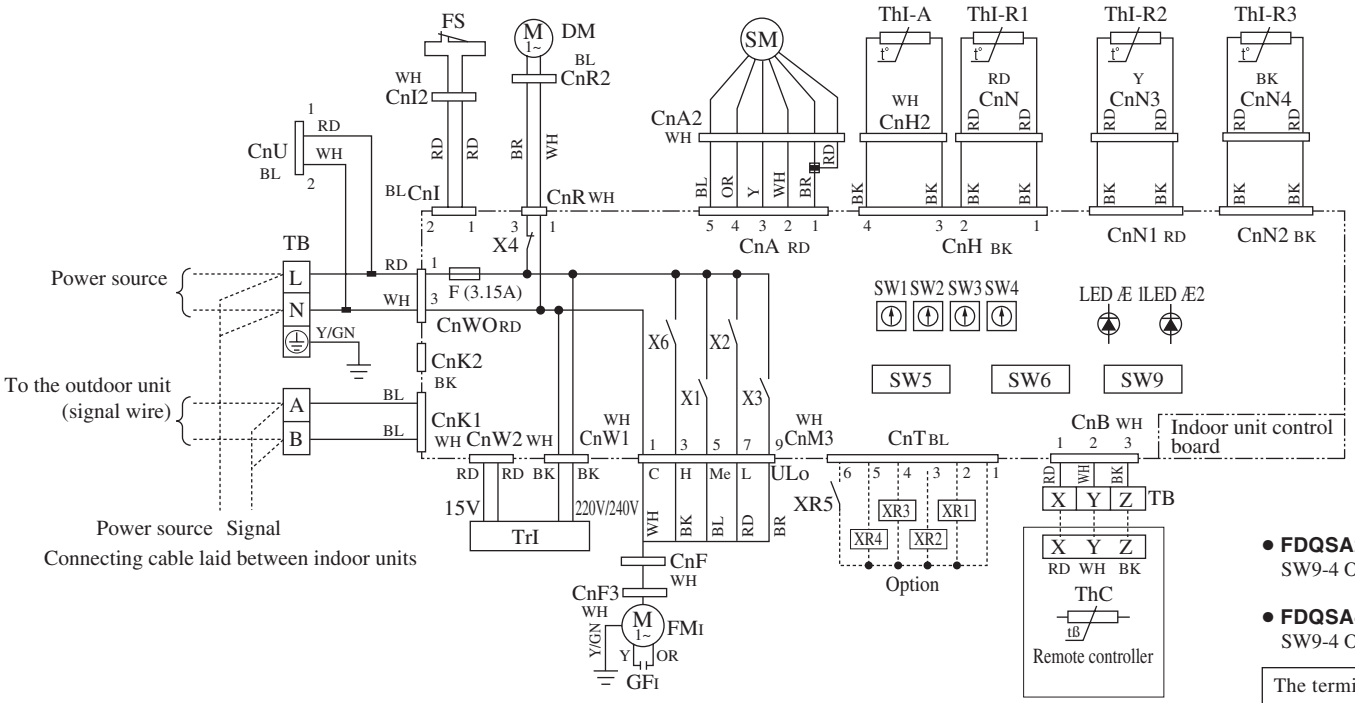
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW1**	Indoor unit address tens digit	**XR2**	Heating output(DC12V output)
CFI	Capacitor for FMI	**SW2**	Indoor unit address units digit	**XR3**	Thermo ON output(DC12V output)
DM	Drain motor	**SW3**	Outdoor unit address tens digit	**XR4**	Inspection output(DC12V output)
FS	Float switch	**SW4**	Outdoor unit address units digit	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-A	Thermistor	**TrI**	Transformer	**X4**	Auxiliary relay(For DM)
ThI-R1	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
ThC	Thermistor	**XR1**	Operation output(DC12V output)		

Color marks

Mark	Color	Mark	Color
BK	Black	**RD**	Red
BL	Blue	**WH**	White
BR	Brown	**Y**	Yellow
GR	Gray	**Y/GN**	Yellow/Green
OR	Orange		

Function of switches

Mark		Function	
SW5-1	ON	Test run of condensate pump motor	
	OFF	Normal	
SW5-3	ON	Input signal	Reverse Invalid
	OFF		Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	



- **FDQSA22, 28, 36KXESR**
  SW9-4 OFF Fan speed Me, Lo, ULo
- **FDQSA45, 56KXESR**
  SW9-4 ON Fan speed Hi, Me, Lo

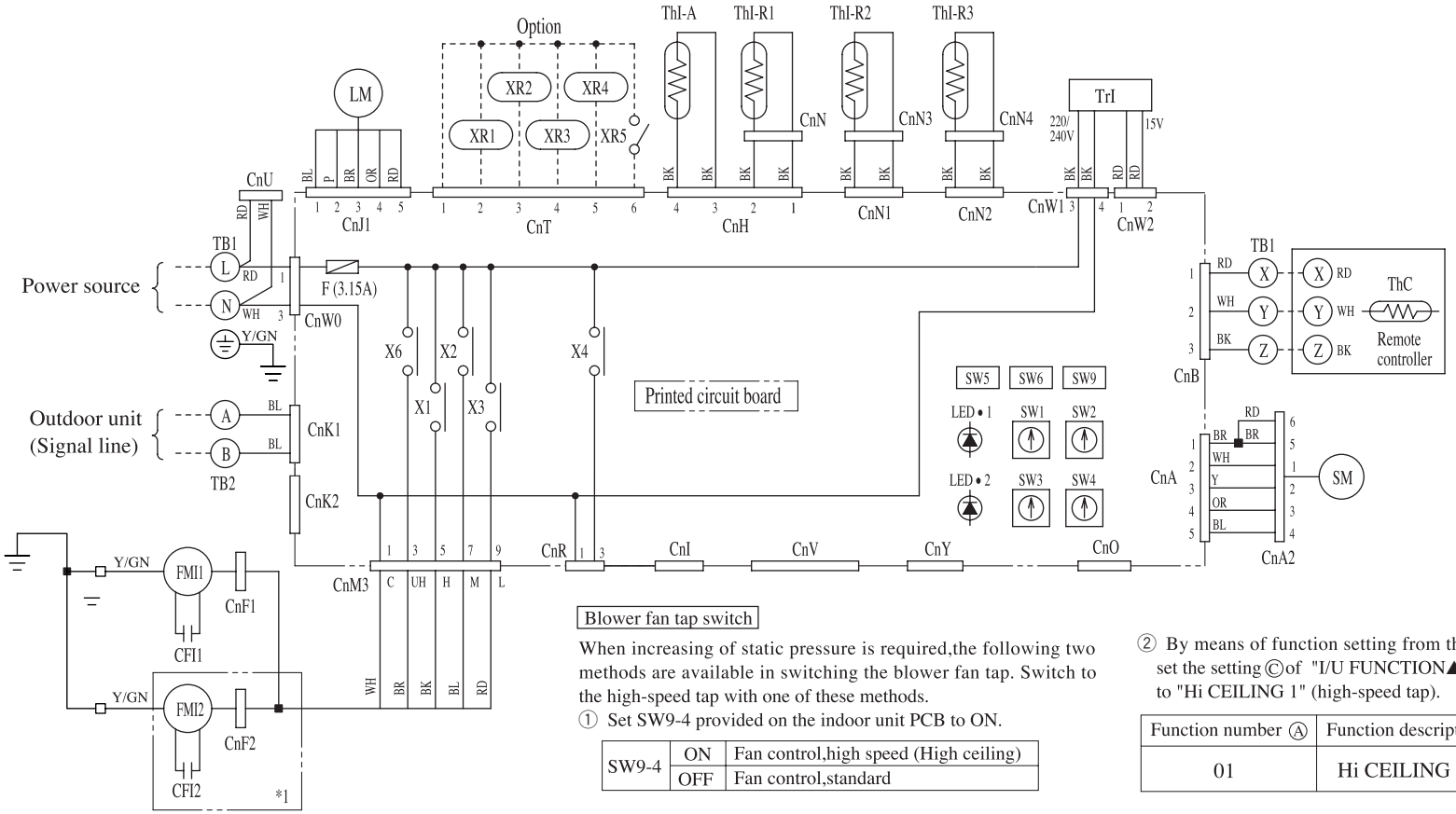
The terminal blocks, X, Y, Z, A and B, are for signal wires.
Do not connect power cables with them.

Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW3**	Outdoor unit address ten s place	**LED·1**	Indication lamp (red: inspection)
CFI	FMI condenser	**SW4**	Outdoor unit address unit s place	**LED·2**	Indication lamp (green: normal micro processor operation)
DM	Drain motor	**SW5-1**	**ON** Drain pump test run	**XR1**	Operation output (DC12V output)
FS	Float switch		**OFF** Drain pump automatic operation	**XR2**	Heating output (DC12V output)
TrI	Transformer	**SW5-3**	**ON** External input, edge input	**XR3**	Thermo ON output (DC12V output)
TrI-A	Intake air thermistor		**OFF** External input, level input	**XR4**	Inspection output (DC12V output)
TrI-R1	Heat exchanger thermistor (red, U bend)	**SW5-4**	**ON** Emergency stop signal, enabled	**XR5**	Remote operation input (volt-free contact)
TrI-R2	Heat exchanger thermistor (yellow, capillary)		**OFF** Emergency stop signal, disabled	**X1,2,3,6**	FM relay
TrI-R3	Heat exchanger thermistor (black, gas header)	**SW6-1**	Model capacity setting	**X4**	DM relay
ThC	Remote control unit thermistor	**SW6-2**	Model capacity setting	**CnA~Z**	Connector
SM	stepping motor (electronic expansion valve)	**SW6-3**	Model capacity setting	**TB**	Terminal block
SW1	Indoor unit address ten s place	**SW6-4**	Model capacity setting	**■mark**	Closed-end connector
SW2	Indoor unit address unit s place	**F**	Fuse		

Color marks

Mark	Color	Mark	Color
BK	Black	**WH**	White
BL	Blue	**Y**	Yellow
BR	Brown	**Y/GN**	Yellow/Green
OR	Orange		
RD	Red		



Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Note(1) *1. FMI2 is equipped only for 71,112,140.

Meaning of marks

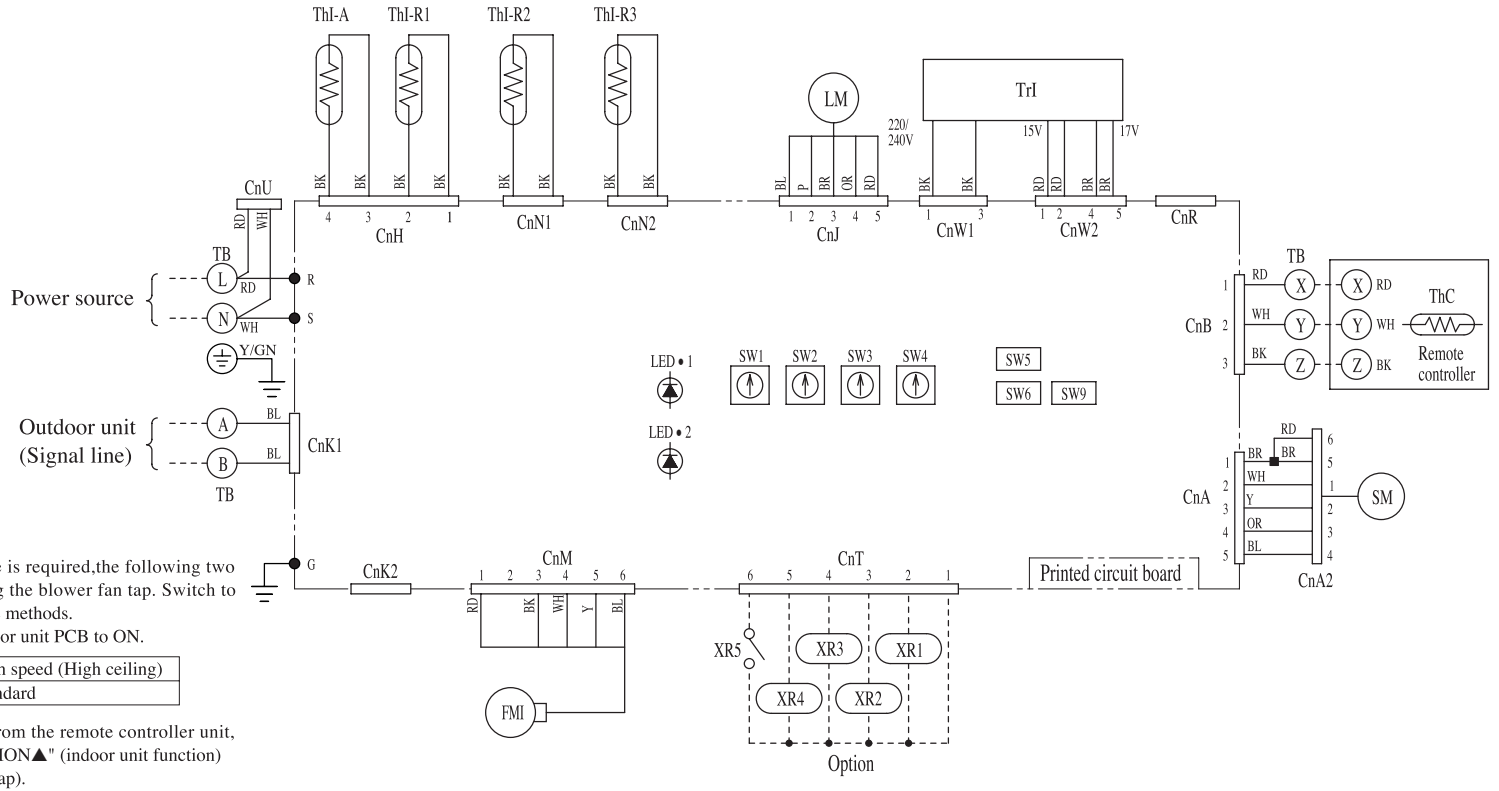
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI1,2	Fan motor	**SW2**	Indoor unit address units digit	**XR3**	Thermo ON output(DC12V output)
CFI1,2	Capacitor for FMI	**SW3**	Outdoor unit address tens digit	**XR4**	Inspection output(DC12V output)
LM	Louver motor	**SW4**	Outdoor unit address units digit	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-A	Thermistor	**TrI**	Transformer	**TB1,2**	Terminal block(○ mark)
ThI-R1	Thermistor	**F**	Fuse	**CnA~Z**	Connector
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)	**■mark**	Closed-end connector
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)		
ThC	Thermistor	**XR1**	Operation output(DC12V output)		
SW1	Indoor unit address tens digit	**XR2**	Heating output(DC12V output)		

Color marks

Mark	Color	Mark	Color
BK	Black	**WH**	White
BL	Blue	**Y**	Yellow
BR	Brown	**P**	Pink
OR	Orange	**Y/GN**	Yellow/Green
RD	Red		

Function of switches

Mark		Function	
SW5-3	ON	Input	Reverse Invalid
	OFF	signal	Run stop
SW5-4	ON	Emergency stop signal:valid	
	OFF	Emergency stop signal:Invalid	



Blower fan tap switch

When increasing of static pressure is required,the following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

② By means of function setting from the remote controller unit, set the setting Ⓒof "I/U FUNCTION▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap).

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

Meaning of marks

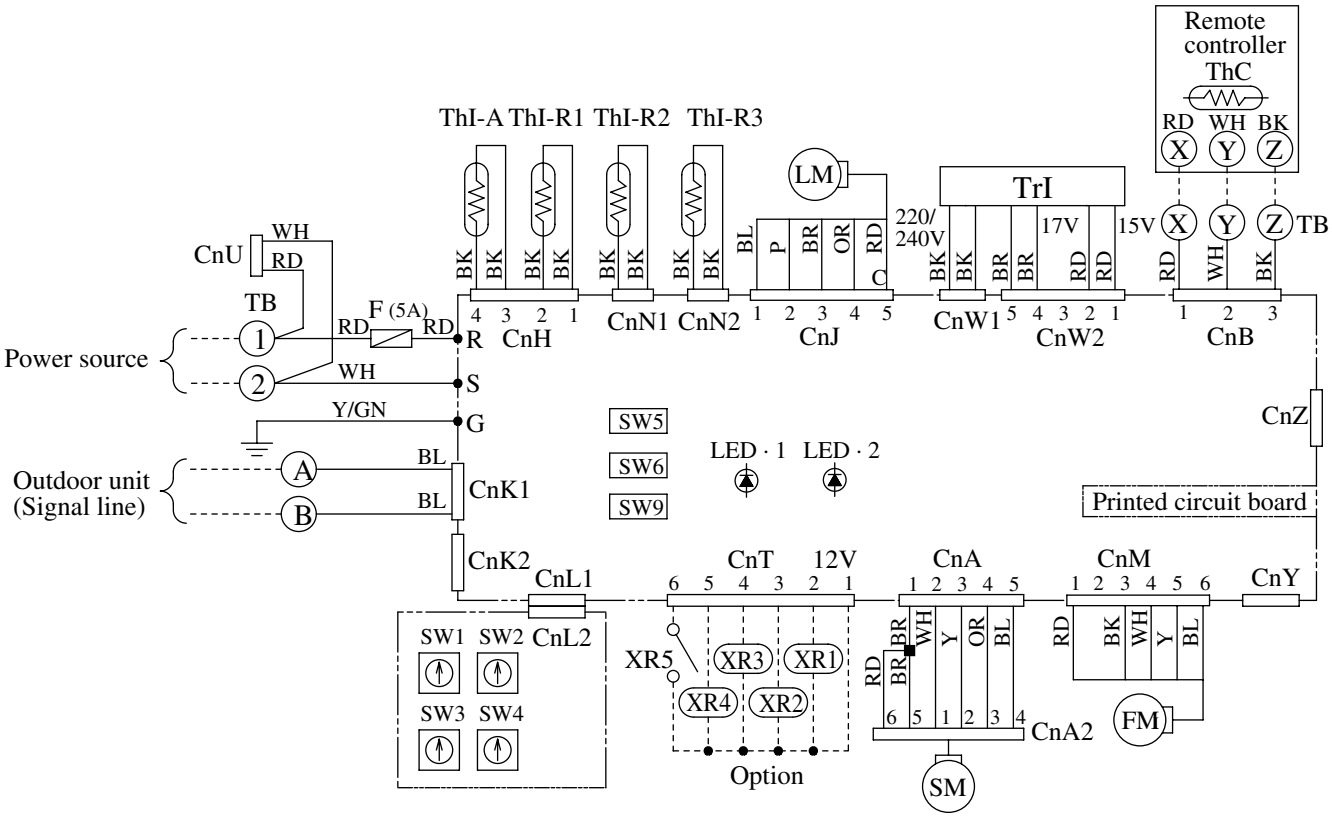
Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW3**	Outdoor unit address tens digit	**XR4**	Inspection output(DC12V output)
LM	Louver motor	**SW4**	Outdoor unit address units digit	**XR5**	Remote operation input(volt-free contact)
SM	Stepping motor(For Exp.v)	**SW6**	Model capacity setting	**TB**	Terminal block(○ mark)
ThI-A	Thermistor	**TrI**	Transformer	**CnA~Z**	Connector
ThI-R1	Thermistor	**F**	Fuse	**■mark**	Closed-end connector
ThI-R2	Thermistor	**LED1**	Indication lamp(Red)		
ThI-R3	Thermistor	**LED2**	Indication lamp(Green)		
ThC	Thermistor	**XR1**	Operation output(DC12V output)		
SW1	Indoor unit address tens digit	**XR2**	Heating output(DC12V output)		
SW2	Indoor unit address units digit	**XR3**	Thermo ON output(DC12V output)		

Color marks

Mark	Color	Mark	Color
BK	Black	**WH**	White
BL	Blue	**Y**	Yellow
BR	Brown	**P**	Pink
OR	Orange	**Y/GN**	Yellow/Green
RD	Red		

Function of switches

Mark		Function	
SW5-3	ON	Input	Reverse Invalid
	OFF	signal	Run stop
SW5-4	ON	Emergency stop signal:valid	
	OF	Emergency stop signal:Invalid	



Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FM ı	Fan motor (with themostat)	F	Fuse	XR2	Heating output (DC12V output)
LM	Louver motor	SW1	Indoor unit address tens digit	XR3	Thermo ON output (DC12V output)
TrI	Transformer	SW2	Indoor unit address units digit	XR4	Inspection output (DC12V output)
ThI-A	Thermistor	SW3	Outdoor unit address tens digit	XR5	Remote operation input (volt-free contact)
ThI-R1	Thermistor	SW4	Outdoor unit address units digit	TB	Terminal block (○mark)
ThI-R2	Thermistor	SW6	Model capacity setting	■mark	Closed-end connector
ThI-R3	Thermistor	LED · 1	Indication lamp (Red)	CnA~Z	Connector (□mack)
ThC	Thermistor	LED · 2	Indication lamp (Green)		
SM	Stepping motor (For Exp.v)	XR1	Operation output (DC12V output)		

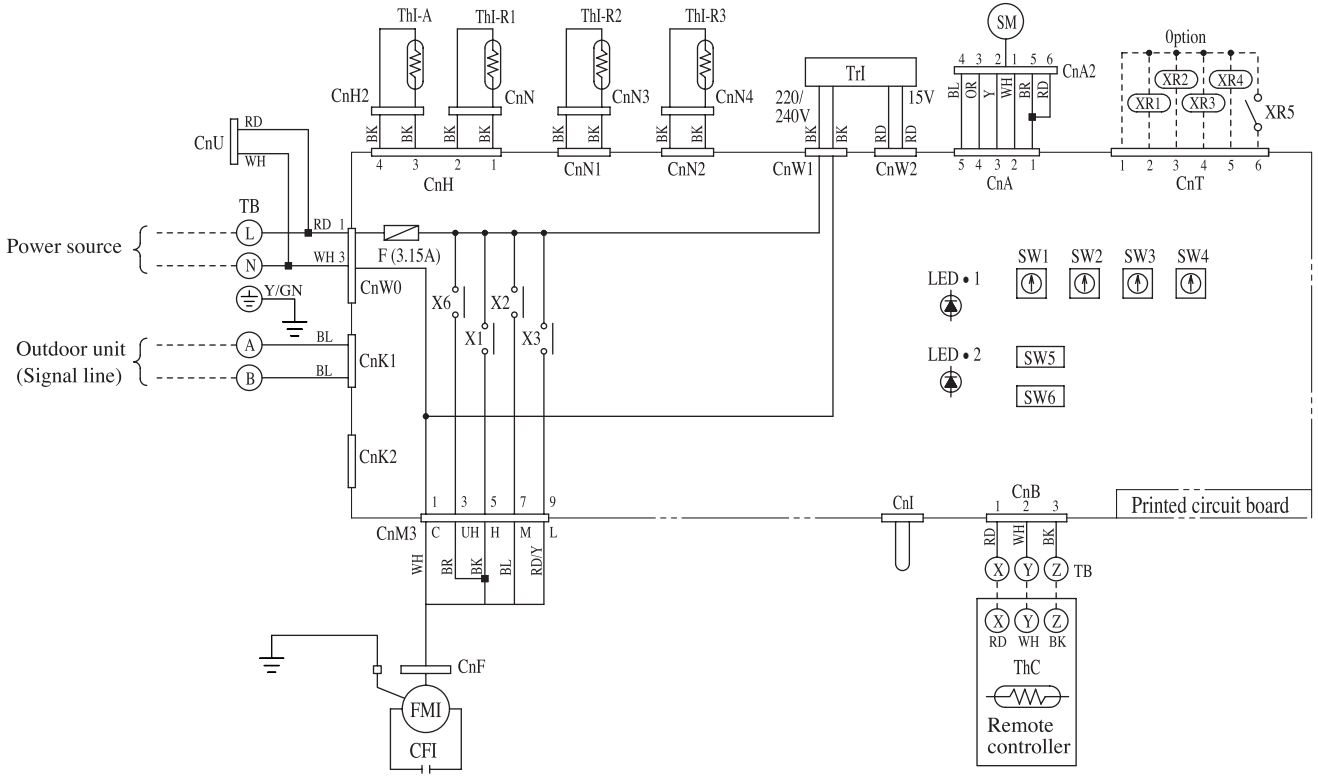
Function of switches

Mark		Function	
SW5-3	ON	Input	Reverse invalid
	OFF	Signal	Run stop
SW5-4	ON	Emergency stop signal : valid	
	OFF	Emergency stop signal : invalid	

Color marks

Mark	Color
BK	Black
BL	Blue
BR	Brown
OR	Orange
RD	Red
WH	White
Y	Yellow
P	Pink
Y/GN	Yellow/green

(m) Floor standing exposed type (FDFL)
(n) Floor standing hidden type (FDFU)
Models All models



Meaning of marks

Mark	Parts name	Mark	Parts name	Mark	Parts name
FMI	Fan motor	**SW2**	Indoor unit address units digit	**XR2**	Heating output(DC12V output)
CFI	Capacitor for FMI	**SW3**	Outdoor unit address tens digit	**XR3**	Thermo ON output(DC12V output)
SM	Stepping motor(For Exp.v)	**SW4**	Outdoor unit address units digit	**XR4**	Inspection output(DC12V output)
ThI-A	Thermistor	**SW6**	Model capacity setting	**XR5**	Remote operation input(volt-free contact)
ThI-R1	Thermistor	**TrI**	Transformer	**X1,2,3,6**	Auxiliary relay(For FM)
ThI-R2	Thermistor	**F**	Fuse	**TB**	Terminal block(○ mark)
ThI-R3	Thermistor	**LED1**	Indication lamp(Red)	**CnA~Z**	Connector
ThC	Thermistor	**LED2**	Indication lamp(Green)	**■mark**	Closed-end connector
SW1	Indoor unit address tens digit	**XR1**	Operation output(DC12V output)		

Color marks

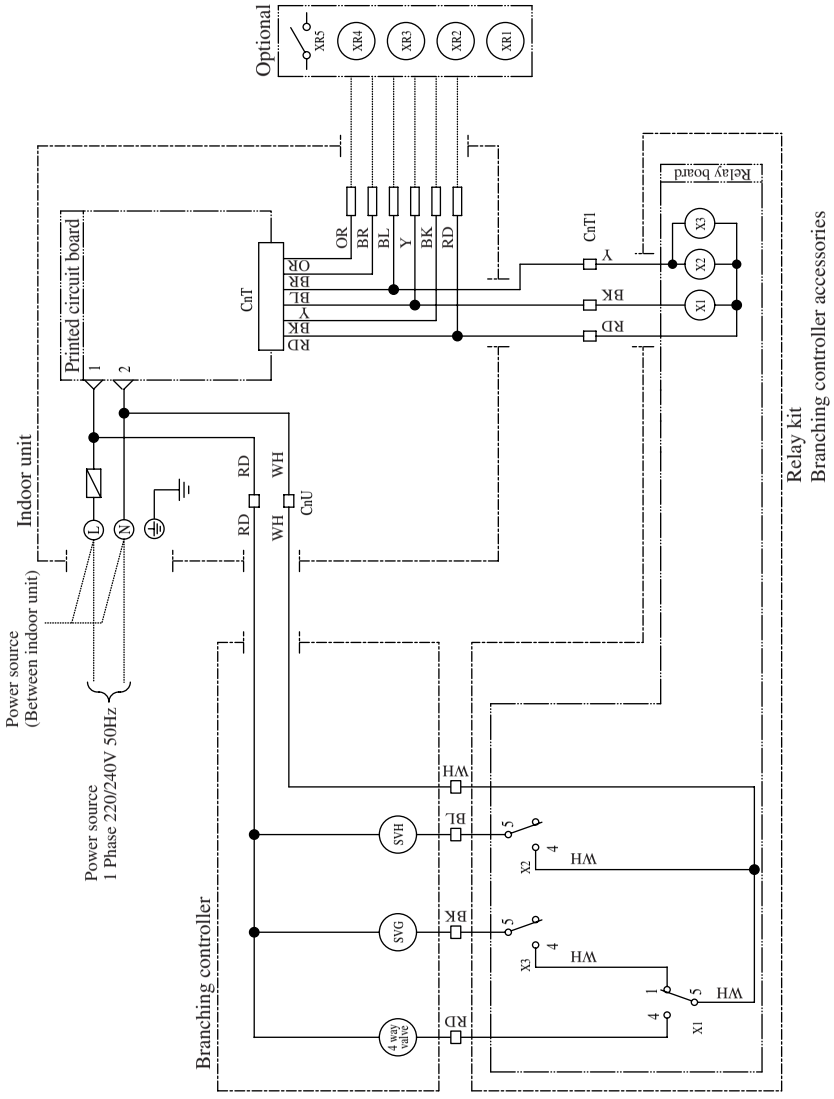
Mark	Color	Mark	Color
BK	Black	**RD/Y**	Red/Yellow
BL	Blue	**WH**	White
BR	Brown	**Y**	Yellow
OR	Orange	**Y/GN**	Yellow/Green
RD	Red		

Function of switches

Mark		Function
SW5-4	ON	Emergency stop signal : Valid
	OFF	Emergency stop signal : Invalid

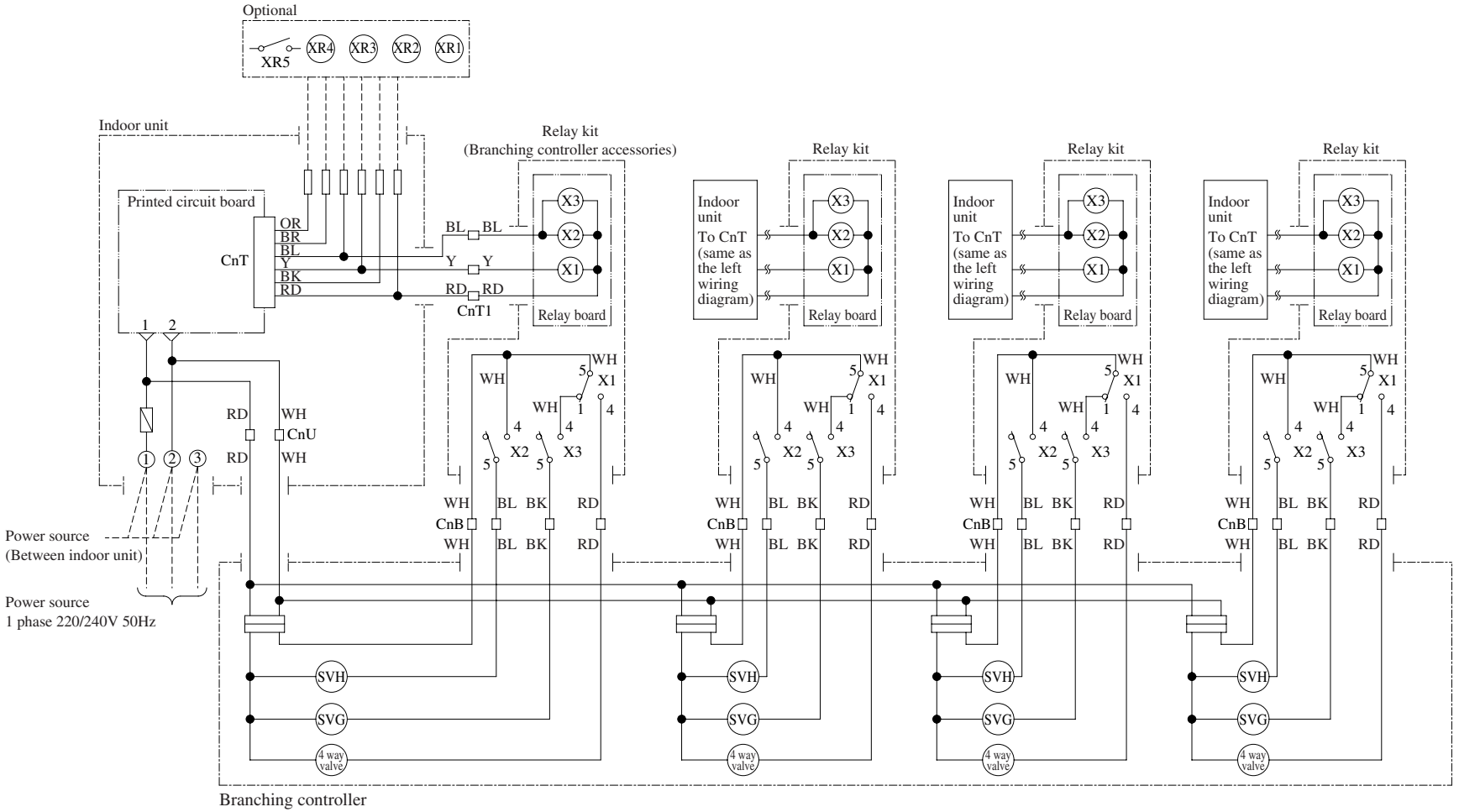
(2) Branching controller (Heat recovery type only)

Models PFD112-ER, 180-ER, 280-ER



4 way valve	4-way valve for switching between cooling and heating.
SVH	Solenoid valve for heating
SVG	Solenoid valve for oil return
XR1	Relay for operation output
X1,XR2	Relay for heating output
X2,X3,XR3	Operating mode switching
XR4	Check output
CnB~U	Connector

Notes 1. This diagram shows the circuit diagram when the branch flow controller and relay kit (product with a branching controller attached) is connected.
2. ——shows the current wiring.
3. The option shows when the remote start/stop/monitoring kit is connected.



4 way valve	4 way valve for switching between cooling and heating
SVH	Solenoid valve for heating
SVG	Solenoid valve for oil return
XR1	Relay for operation output
X1,XR2	Relay for heating output
X2,X3,XR3	Operating mode switching
XR4	Check output
CnB~U	Connector

Remarks: 1. This figure indicates the circuit diagram of connecting 4 branching controllers and 4 relay kits (branching controller accessories) respectively.
2. – – – indicates the field wiring.
3. Connect the signal line between a branching controller and an indoor unit to the connector of the corresponding refrigerant system.

4 COMMON MATTER

4.1 Operation chart

Since the Multi KX or KXR series air conditioner units are free multitype to which the indoor units of different capacity and different model can be connected, the operation characteristics of all combinations are very complicated, therefore only the individual operation characteristics of indoor and outdoor units are shown.

(a) Operating characteristic of outdoor unit

(i) KX Series

1) All-in-one type

(220-240V 50Hz) (380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA140HKXEN4R	FDCA140HKXES4R(2)
Cooling power consumption	kW	4.20-4.20	4.20-4.20/4.20
Heating power consumption		4.45-4.45	4.45-4.45/4.45
Cooling running current	A	21.2-19.4	6.87-6.29/6.87
Heating running current		22.5-20.6	7.27-6.64/7.27
Inrush current (MAX.)	A	5	
Cooling power factor	%	90-90	93-93/93
Heating power factor		90-90	93-93/93

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA160HKXES4R(2)	FDCA224HKXE4R
Cooling power consumption	kW	5.46-5.46/5.46	5.70-5.70/5.70
Heating power consumption		4.90-4.90/4.90	5.98-5.98/5.98
Cooling running current	A	8.91-8.17/8.91	9.6-8.8/9.6
Heating running current		8.00-7.33/8.00	9.6-8.8/9.6
Inrush current (MAX.)	A	5	
Cooling power factor	%	93-93/93	90-90/90
Heating power factor		93-93/93	95-95/95

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA280HKXE4BR	FDCA335HKXE4BR
Cooling power consumption	kW	8.26-8.26/8.26	9.53-9.53/9.53
Heating power consumption		8.06-8.06/8.06	9.84-9.84/9.84
Cooling running current	A	13.6-12.4/13.6	15.4-14.2/15.4
Heating running current		13.3-12.2/13.3	16.3-14.9/16.3
Inrush current (MAX.)	A	5	
Cooling power factor	%	92-93/92	93-93/93
Heating power factor		92-92/92	92-92/92

Notes (1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 UNITARY AIR-CONDITIONERS
(2) In the case of 60 Hz, use specification category (T). (FDCA140, 160HKXES4R only)

2) All-in-one type (also for combined use)

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA400HKXE4BR	FDCA450HKXE4BR
Cooling power consumption	kW	11.27-11.27/11.27	12.97-12.97/12.97
Heating power consumption		11.73-11.73/11.73	13.10-13.10/13.10
Cooling running current	A	18.4-16.9/18.4	21.1-19.3/21.1
Heating running current		19.6-17.9/19.6	21.7-19.9/21.7
Inrush current (MAX.)	A	8	
Cooling power factor	%	93-93/93	93-93/93
Heating power factor		91-91/91	92-92/92

Note (1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 UNITARY AIR-CONDITIONERS

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA504HKXE4BR	FDCA560HKXE4BR
Cooling power consumption	kW	14.73-14.73/14.73	17.21-17.21/17.21
Heating power consumption		15.15-15.15/15.15	17.07-17.07/17.07
Cooling running current	A	24.1-22.0/24.1	28.2-25.8/28.2
Heating running current		25.2-23.1/25.2	28.5-26.1/28.5
Inrush current (MAX.)	A	8	
Cooling power factor	%	93-93/93	
Heating power factor		91-91/91	

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA615HKXE4BR	FDCA680HKXE4BR
Cooling power consumption	kW	20.37-20.37/20.37	24.98-24.98/24.98
Heating power consumption		18.48-18.48/18.48	19.08-19.08/19.08
Cooling running current	A	33.1-30.3/33.1	40.3-36.9/40.3
Heating running current		30.7-28.1/30.7	31.6-29.0/31.6
Inrush current (MAX.)	A	8	
Cooling power factor	%	94-94/94	
Heating power factor		91-91/91	92-92/92

Note (1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 UNITARY AIR-CONDITIONERS

2) Combined type

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA735HKXE4BR		FDCA800HKXE4BR	
		FDCA335HKXE4BRK	FDCA400HKXE4BR	FDCA400HKXE4BR	FDCA400HKXE4BR
Nominal cooling capacity	kW	73.5		80.0	
Nominal heating capacity		82.5		90.0	
Cooling power consumption	kW	20.21-20.21/20.21		22.54-22.54/22.54	
Heating power consumption		20.66-20.66/20.66		23.46-23.46/23.46	
Cooling running current	A	32.9-30.2/32.9		36.8-33.8/36.8	
Heating running current		34.4-31.4/34.4		39.2-35.8/39.2	
Inrush current (MAX.)	A	16			
Cooling power factor	%	93-93/93		93-93/93	
Heating power factor		91-91/91		91-91/91	

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA850HKXE4BR		FDCA900HKXE4BR	
		FDCA400HKXE4BR	FDCA450HKXE4BR	FDCA450HKXE4BR	FDCA450HKXE4BR
Nominal cooling capacity	kW	85.0		90.0	
Nominal heating capacity		95.0		100.0	
Cooling power consumption	kW	24.22-24.22/24.22		25.94-25.94/25.94	
Heating power consumption		24.83-24.83/24.83		26.2-26.2/26.2	
Cooling running current	A	39.5-36.2/39.5		42.2-38.6/42.2	
Heating running current		41.3-37.8/41.3		43.4-39.8/43.8	
Inrush current (MAX.)	A	16			
Cooling power factor	%	93-93/93		94-93/94	
Heating power factor		92-92/92		92-92/92	

Note (1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 UNITARY AIR-CONDITIONERS

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA960HKXE4BR		FDCA1010HKXE4BR	
		FDCA450HKXE4BR	FDCA504HKXE4BR	FDCA504HKXE4BR	FDCA504HKXE4BR
Nominal cooling capacity	kW	96.0		101.0	
Nominal heating capacity		108.0		113.0	
Cooling power consumption	kW	27.70-27.70/27.70		29.46-29.46/29.46	
Heating power consumption		28.25-28.25/28.25		30.30-30.30/30.30	
Cooling running current	A	45.1-41.3/45.1		48.2-44.0/48.2	
Heating running current		46.9-43.0/46.9		50.4-46.2/50.4	
Inrush current (MAX.)	A	16			
Cooling power factor	%	93-93/93			
Heating power factor		92-92/92		91-91/91	

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA1065HKXE4BR		FDCA1130HKXE4BR	
		FDCA504HKXE4BR	FDCA560HKXE4BR	FDCA560HKXE4BR	FDCA560HKXE4BR
Nominal cooling capacity	kW	106.5		113.0	
Nominal heating capacity		119.5		127.0	
Cooling power consumption	kW	31.93-31.93/31.93		34.41-34.41/34.41	
Heating power consumption		32.21-32.21/32.21		34.13-34.13/34.13	
Cooling running current	A	52.3-47.8/52.3		56.4-51.6/56.4	
Heating running current		53.7-49.2/53.7		57.0-52.2/57.0	
Inrush current (MAX.)	A	16			
Cooling power factor	%	93-93/93			
Heating power factor		91-91/91			

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA1180HKXE4BR		FDCA1235HKXE4R	
		FDCA560HKXE4BR	FDCA615HKXE4BR	FDCA615HKXE4BR	FDCA615HKXE4BR
Nominal cooling capacity	kW	118.0		123.5	
Nominal heating capacity		132.0		138.0	
Cooling power consumption	kW	37.57-37.57/37.57		40.74-40.74/40.74	
Heating power consumption		35.54-35.54/35.54		36.96-36.96/36.96	
Cooling running current	A	61.3-56.1/61.3		66.2-60.6/66.2	
Heating running current		59.2-54.2/59.2		61.4-56.2/61.4	
Inrush current (MAX.)	A	16			
Cooling power factor	%	93-93/93		94-94/94	
Heating power factor		91-91/91			

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA1300HKXE4BR		FDCA1360HKXE4BR	
		FDCA615HKXE4BR	FDCA680HKXE4BR	FDCA680HKXE4BR	FDCA680HKXE4BR
Nominal cooling capacity	kW	130.0		136.0	
Nominal heating capacity		142.0		146.0	
Cooling power consumption	kW	45.35-45.35/45.35		49.96-49.96/49.96	
Heating power consumption		37.56-37.56/37.56		38.16-38.16/38.16	
Cooling running current	A	73.4-67.2/73.4		80.6-73.8/80.6	
Heating running current		62.3-57.1/62.3		63.2-58.0/63.2	
Inrush current (MAX.)	A	16			
Cooling power factor	%	94-94/94			
Heating power factor		92-92/92			

Note (1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 UNITARY AIR-CONDITIONERS

(ii) KXR Series

1) All-in-one type

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA224HKXRE4BR	FDCA280HKXRE4BR	FDCA335HKXRE4BR
Cooling power consumption	kW	5.9-5.9/5.9	8.54-8.54/8.54	10.17-10.17/10.17
Heating power consumption		5.9-5.9/5.9	8.55-8.55/8.55	9.55-9.55/9.55
Cooling running current	A	9.1-8.3/9.1	13.6-12.4/13.7	16.5-15.1/16.5
Heating running current		9.2-8.4/9.2	13.5-12.4/13.6	15.5-14.2/15.5
Inrush current (MAX.)	A	5		
Cooling power factor	%	99-99/99	95-96/95	94-94/94
Heating power factor		98-98/98	96-96/96	92-92/92

Note (1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 UNITARY AIR-CONDITIONERS

2) All-in-one type (also for combined use)

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA400HKXRE4BR	FDCA450HKXRE4BR
Cooling power consumption	kW	11.61-11.61/11.61	13.57-13.57/13.57
Heating power consumption		12.18-12.18/12.18	13.55-13.55/13.55
Cooling running current	A	19.0-17.4/19.0	21.6-19.8/21.6
Heating running current		20.3-18.6/20.3	22.4-20.5/22.4
Inrush current (MAX.)	A	8	
Cooling power factor	%	93-93/93	95-95/95
Heating power factor		91-91/91	92-92/92

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA504HKXRE4BR	FDCA560HKXRE4BR
Cooling power consumption	kW	15.69-15.69/15.69	18.76-18.76/18.76
Heating power consumption		15.62-15.62/15.62	17.69-17.69/17.69
Cooling running current	A	24.6-22.5/24.6	29.7-27.2/29.7
Heating running current		26.1-23.9/26.1	29.5-27.0/29.5
Inrush current (MAX.)	A	8	
Cooling power factor	%	97-97/97	96-96/96
Heating power factor		91-91/91	

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA615HKXRE4BR	FDCA680HKXRE4BR
Cooling power consumption	kW	21.47-21.47/21.47	25.99-25.99/25.99
Heating power consumption		19.11-19.11/19.11	19.69-19.69/19.69
Cooling running current	A	34.7-31.8/34.7	44.9-41.1/44.9
Heating running current		31.6-28.9/31.6	34.0-31.1/34.0
Inrush current (MAX.)	A	8	
Cooling power factor	%	94-94/94	88-88/88
Heating power factor		92-92/92	88-88/88

Note (1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 UNITARY AIR-CONDITIONERS

2) Combined type

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA735HKXRE4BR		FDCA800HKXRE4BR	
		FDCA335HKXRE4BRK	FDCA400HKXRE4BR	FDCA400HKXRE4BR	FDCA400HKXRE4BR
Nominal cooling capacity	kW	73.5		80.0	
Nominal heating capacity		82.5		90.0	
Cooling power consumption	kW	21.08-21.08/21.08		23.22-23.22/23.22	
Heating power consumption		21.55-21.55/21.55		24.36-24.36/24.36	
Cooling running current	A	34.4-31.5/34.4		38.0-34.8/38.0	
Heating running current		35.8-32.8/35.8		40.6-37.2/40.6	
Inrush current (MAX.)	A	16			
Cooling power factor	%	93-93/93		93-93/93	
Heating power factor		92-92/92		91-91/91	

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA850HKXRE4BR		FDCA900HKXRE4BR	
		FDCA400HKXRE4BR	FDCA450HKXRE4BR	FDCA450HKXRE4BR	FDCA450HKXRE4BR
Nominal cooling capacity	kW	85.0		90.0	
Nominal heating capacity		95.0		100.0	
Cooling input	kW	25.18-25.18/25.18		27.14-27.14/27.14	
Heating input		25.73-25.73/25.73		27.1-27.1/27.1	
Cooling running current	A	40.6-37.3/40.6		43.2-39.6/43.2	
Heating running current		42.7-39.1/42.7		44.8-41.0/44.8	
Inrush current (MAX.)	A	16			
Cooling power factor	%	94-94/94		95-95/95	
Heating power factor		92-92/92		92-92/92	

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA960HKXRE4BR		FDCA1010HKXRE4BR	
		FDCA450HKXRE4BR	FDCA504HKXRE4BR	FDCA504HKXRE4BR	FDCA504HKXRE4BR
Nominal cooling capacity	kW	96.0		101.0	
Nominal heating capacity		108.0		113.0	
Cooling power consumption	kW	29.26-29.26/29.26		31.88-31.88/31.88	
Heating power consumption		29.17-29.17/29.17		31.24-31.24/31.24	
Cooling running current	A	46.2-42.3/46.2		49.2-45.0/49.2	
Heating running current		48.5-44.4/48.5		52.2-47.8/52.2	
Inrush current (MAX.)	A	16			
Cooling power factor	%	96-96/96		98-99/98	
Heating power factor		91-91/91			

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA1065HKXRE4BR		FDCA1130HKXRE4BR	
		FDCA504HKXRE4BR	FDCA560HKXRE4BR	FDCA560HKXRE4R	FDCA560HKXRE4BR
Nominal cooling capacity	kW	106.5		113.0	
Nominal heating capacity		119.5		127.0	
Cooling power consumption	kW	34.45-34.45/34.45		37.52-37.52/37.52	
Heating power consumption		33.31-33.31/33.31		35.38-35.38/35.38	
Cooling running current	A	54.3-49.7/54.3		59.4-54.4/59.4	
Heating running current		55.6-50.9/55.6		59.0-54.0/59.0	
Inrush current (MAX.)	A	16			
Cooling power factor	%	96-96/96			
Heating power factor		91-91/91			

Note (1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 UNITARY AIR-CONDITIONERS

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA1180HKXRE4BR		FDCA1235HKXRE4BR	
		FDCA560HKXRE4BR	FDCA615HKXRE4BR	FDCA615HKXRE4BR	FDCA615HKXRE4BR
Nominal cooling capacity	kW	118.0		123.5	
Nominal heating capacity		132.0		138.0	
Cooling power consumption	kW	40.23-40.23/40.23		42.94-42.94/42.94	
Heating power consumption		36.80-36.80/36.80		38.22-38.22/38.22	
Cooling running current	A	64.4-59.0/64.4		69.4-63.6/69.4	
Heating running current		61.1-55.9/61.1		63.2-57.8/63.2	
Inrush current (MAX.)	A	16			
Cooling power factor	%	95-95/95		94-94/94	
Heating power factor		92-92/92			

(380-415V 50Hz/380V 60Hz)

Item \ Models		FDCA1300HKXRE4BR		FDCA1360HKXRE4BR	
		FDCA615HKXRE4BR	FDCA680HKXRE4BR	FDCA680HKXRE4BR	FDCA680HKXRE4BR
Nominal cooling capacity	kW	130.0		136.0	
Nominal heating capacity		142.0		146.0	
Cooling power consumption	kW	47.46-47.46/47.46		51.98-51.98/51.98	
Heating power consumption		38.80-38.80/38.80		39.38-39.38/39.38	
Cooling running current	A	79.6-72.9/79.6		89.8-82.2/89.8	
Heating running current		65.6-60.0/65.6		68.0-62.2/68.0	
Inrush current (MAX.)	A	16			
Cooling power factor	%	91-91/91		88-88/88	
Heating power factor		90-90/90		88-88/88	

Note (1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 UNITARY AIR-CONDITIONERS

(iii) Operating characteristic of indoor unit

FDTC Series

(220-240V 50Hz/220V 60Hz)

Item \ Models	FDTC Series				
	22	28	36	45	56
Power consumption (kW)	0.027-0.027/0.027		0.034-0.034/0.034	0.043-0.043/0.043	0.046-0.046/0.046
Running current (A)	0.10-0.09/0.10		0.11-0.10/0.11	0.15-0.13/0.15	0.15-0.13/0.15

FDT Series

(220-240V 50Hz/220V 60Hz)

Item \ Models	FDT Series					
	28	36	45	56	71	90
Power consumption (kW)	Cooling : 0.050-0.059/0.061 Heating : 0.046-0.054/0.056				Cooling : 0.064-0.073/0.077 Heating : 0.058-0.067/0.070	Cooling : 0.059-0.059/0.059 Heating : 0.056-0.056/0.056
Running current (A)	Cooling : 0.24-0.25/0.30 Heating : 0.22-0.23/0.28				Cooling : 0.31-0.32/0.40 Heating : 0.29-0.30/0.36	Cooling : 0.20-0.17/0.20 Heating : 0.19-0.17/0.19

(220-240V 50Hz/220V 60Hz)

Item \ Models	FDT Series	
	112	140, 160
Power consumption (kW)	Cooling : 0.081-0.081/0.081 Heating : 0.077-0.077/0.077	Cooling : 0.090-0.090/0.090 Heating : 0.086-0.086/0.086
Running current (A)	Cooling : 0.26-0.24/0.26 Heating : 0.25-0.23/0.25	Cooling : 0.29-0.26/0.29 Heating : 0.28-0.25/0.28

FDTW Series

(220-240V 50Hz)

Item \ Models	FDTW Series						
	28	45	56	71	90	112	140
Power consumption (kW)	0.09-0.10			0.10/0.11	0.12/0.13	0.18/0.20	0.20/0.24
Running current (A)	0.43-0.44			0.48/0.50	0.57/0.59	0.86/0.89	0.90/0.98

Notes (1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 UNITARY AIR-CONDITIONERS
(2) The values shown in the above table are common to both cooling and heating operations.

FDTQ Series

(220-240V 50Hz/220V 60Hz)

Item \ Models	FDTQ Series(Direct blow panel)			FDTQ Series(Duct panel)		
	22	28	36	22	28	36
Power consumption (kW)	0.045-0.050/0.047			0.050-0.055/0.053		
Running current (A)	0.21-0.22/0.22			0.23-0.24/0.26		

FDTS Series

(220-240V 50Hz)

Item \ Models	FDTS Series				
	22	28	36	45	71
Power consumption (kW)	0.07-0.08			0.09-0.11	0.12-0.15
Running current (A)	0.33-0.36			0.43-0.46	0.58-0.63

FDQM, FDUM Series

(220-240V 50Hz/220V 60Hz)

Item \ Models	FDQM Series			FDUM Series						
	22	28	36	22	28, 36	45, 56	71	90	112	140
Power consumption (kW)	0.050-0.055/0.050			0.09-0.11/0.09	0.11-0.13/0.11	0.14-0.16/0.14	0.15-0.17/0.15	0.16-0.19/0.16	0.24-0.28/0.24	0.28-0.32/0.28
Running current (A)	0.23-0.24/0.23			0.41-0.46/0.41	0.51-0.56/0.51	0.63-0.67/0.63	0.68-0.71/0.68	0.73-0.79/0.73	1.07-1.17/1.07	1.28-1.32/1.28

FDE Series

(220-240V 50Hz/220V 60Hz)

Item \ Models	FDE Series				
	36	45	56	71	112
Power consumption (kW)	Cooling : 0.043-0.049/0.049 Heating : 0.039-0.045/0.045			Cooling : 0.082-0.092/0.088 Heating : 0.074-0.084/0.081	Cooling : 0.124-0.141/0.14 Heating : 0.113-0.129/0.128
Running current (A)	Cooling : 0.19-0.20/0.23 Heating : 0.18-0.19/0.21			Cooling : 0.37-0.38/0.41 Heating : 0.34-0.35/0.37	Cooling : 0.56-0.59/0.65 Heating : 0.52-0.54/0.59

(220-240V 50Hz/220V 60Hz)

Item \ Models	FDE Series
	140
Power consumption (kW)	Cooling : 0.137-0.154/0.158 Heating : 0.125-0.141/0.145
Running current (A)	Cooling : 0.62-0.65/0.73 Heating : 0.57-0.59/0.67

FDQS Series

(220-240V 50Hz)

Item \ Models	FDQS Series
	0
Power consumption (kW)	0.06-0.07
Running current (A)	0.35-0.38

FDU Series

(220-240V 50Hz)

Item \ Models	FDU Series	
	224	280
Power consumption (kW)	Cooling : 0.46-0.56 Heating : 0.42-0.49	Cooling : 0.7-0.75 Heating : 0.64-0.66
Running current (A)	Cooling : 2.3-2.5 Heating : 2.0-2.1	Cooling : 3.5-3.4 Heating : 3.2-3.0

FDK, FDFL, FDFU Series

(220-240V 50Hz)

Item \ Models	FDK Series						FDFL, FDFU Series		
	22	28	36	45	56	71	28	45, 56	71
Power consumption (kW)	Cooling : 0.05-0.05 Heating : 0.04-0.05			0.05-0.05		0.09-0.11	0.09-0.10	0.09-0.10	0.09-0.10
Running current (A)	0.23-0.21			0.23-0.21		0.41-0.48	0.41-0.42	0.41-0.42	0.41-0.42

FDUR Series

(220-240V 50Hz)

Item \ Models	FDUR Series					
	45	56	71	90	112	140
Power consumption (kW)	Cooling : 0.15-0.17 Heating : 0.14-0.16	Cooling : 0.21-0.24 Heating : 0.20-0.23	Cooling : 0.29-0.32 Heating : 0.27-0.30	Cooling : 0.35-0.39 Heating : 0.34-0.38	Cooling : 0.39-0.45 Heating : 0.34-0.39	
Running current (A)	Cooling : 0.69-0.73 Heating : 0.67-0.70	Cooling : 0.97-1.02 Heating : 0.95-1.00	Cooling : 1.40-1.44 Heating : 1.33-1.37	Cooling : 1.65-1.79 Heating : 1.63-1.74	Cooling : 1.83-1.94 Heating : 1.65-1.76	

Notes (1) This packaged air-conditioner is manufactured and tested in conformity with the following standard.
ISO-T1 "UNITARY AIR-CONDITIONERS"

(2) The values shown in the above table are common to both cooling and heating operations.

(iv) Calculation of total operation characteristics

Since the operation characteristics of series Multi-KX or KXR depend on combination of indoor unit, calculate the total operation characteristics of the system by using the formulas below according to specifications of each indoor unit or outdoor unit.

1) Total power consumption

Total power consumption (kW) = Power consumption of outdoor unit + $\sum$ (Power consumption of indoor unit)

2) Total running current

Total running current (A) = Running current of outdoor unit + [$\sum$ (Running current of indoor unit) × 1/3]

3) Total power factor

Total power factor (%) = [Total power consumption (W) / $\sqrt{3}$ × Total running current (A) × Power source] × 100

Total operation characteristics = Operation characteristic value of outdoor unit + Operation characteristic value of indoor unit

[Example]

(Conditions) Operation Voltage ····· Indoor unit: 220 V, 50 Hz
Outdoor unit: 380 V, 50 Hz
Operation mode ····· Cooling and Heating
Unit····· Outdoor unit: FDCA735HKXRE4BR × 1 unit
Indoor unit: FDTA71KXE4R × 8 units
FDTA45KXE4R × 6 units

Operation characteristics of each unit (Cooling/Heating)

Item \ Models	FDCA735HKXRE4BR	FDTA71KXE4R	FDTA45KXE4R
Power consumption (kW)	20.21/20.66	0.064/0.058	0.05/0.046
Running current (A)	32.9/34.4	0.31/0.29	0.24/0.22

① Total power consumption (kW)

(Cooling) 20.21 + (0.064 × 8 + 0.05 × 6) ≒ 21.0 (kW)

(Heating) 20.66 + (0.058 × 8 + 0.046 × 6) = 21.4 (kW)

② Total running current (A)

(Cooling) $32.9 + (0.31 \times 8 + 0.24 \times 6) \times \frac{1}{3} \fallingdotseq 34.2$ (A)

(Heating) $34.4 + (0.29 \times 8 + 0.22 \times 6) \times \frac{1}{3} \fallingdotseq 35.6$ (A)

③ Total power factor (%)

(Cooling) $\frac{21.0 \times 1000}{\sqrt{3} \times 34.2 \times 380} \times 100 \fallingdotseq 93$ %

(Heating) $\frac{21.4 \times 1000}{\sqrt{3} \times 35.6 \times 380} \times 100 \fallingdotseq 91$ %

4.2 Range of usage & limitations

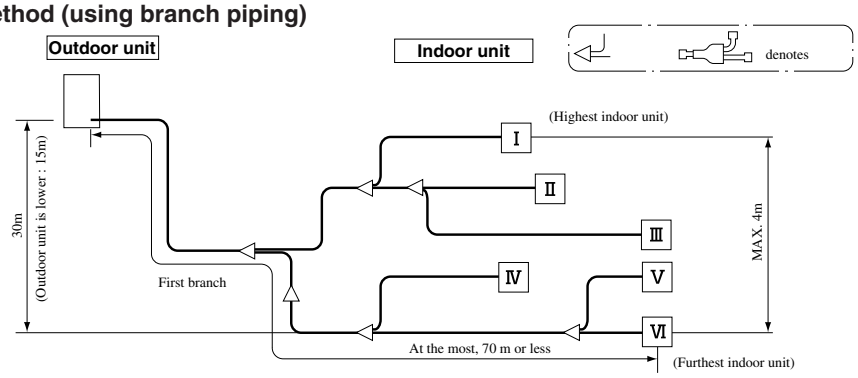
(1) KX series

(a) All-in-one type

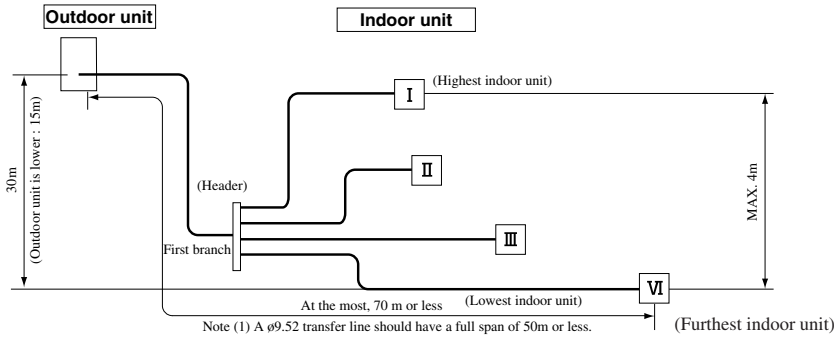
Item \ System		FDCA140HKXEN4R, 140HKXES4R		FDCA160HKXES4R
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (See page 175)		
Outdoor air temperature (Upper, lower limits)				
Indoor units that can be used in combination	Number of connected units	2 to 6 units	2 to 8 units	2 to 8 units
	Total capacity	112 ~ 210	112 ~ 182	128 ~ 208
Total Piping Length (Total of the lengths of all piping)		MAX. 100m		
Maximum Piping Distance (From outdoor unit to farthest indoor unit)		Indoor unit MAX. 70m		
Total length of ø9.52 liquid pipe		Within 50 m		
Difference in height between indoor and outdoor units	Outdoor unit is higher	MAX. 30m		
	Outdoor unit is lower	MAX. 15m		
Difference in height between indoor units		MAX. 4m		
Indoor unit atmosphere (behind ceiling) temperature and humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less		
Compressor stop/start frequency	1 cycle time	7 min or more (4 minutes or more from start to stop or 3 minutes or more from stop to start)		
	Stop time	3 min or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop during start	Within ±15% of rated voltage		
	Phase unbalance	Within ± 3% of rated voltage		

Allowable length of refrigerant piping, height difference between indoor and outdoor unit

(1) Branch pipe method (using branch piping)



(2) Header System (Header used)



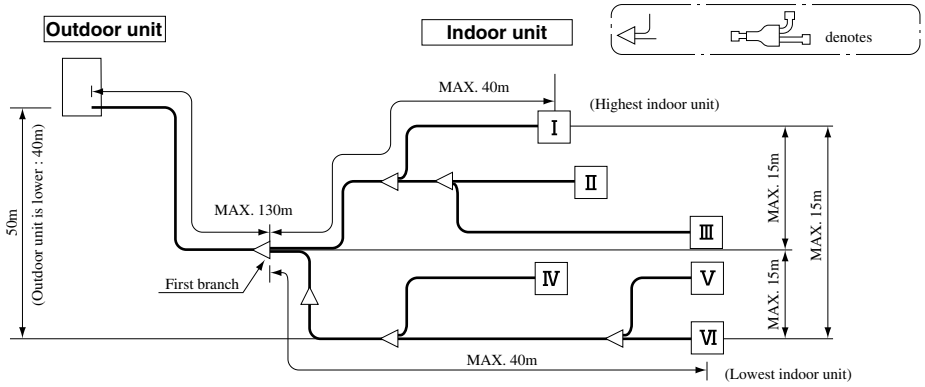
Note (1) There is no limit to the permissible piping lengths for the main pipes or other piping, but keep furthest indoor unit piping to 50 m with a diameter of ø9.52.

(2) A branch piping system cannot be connected after a header system.

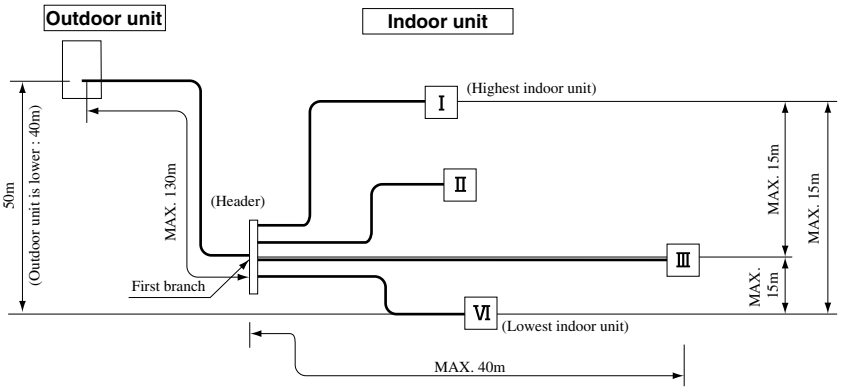
Item \ System		FDCA224HKXE4BR	FDCA280HKXE4BR	FDCA335HKXE4BR
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (See page 176)		
Outdoor air temperature (Upper, lower limits)				
Indoor units that can be used in combination	Number of connected units	1 to 13 units	1 to 16 units	1 to 20 units
	Total capacity	112 ~ 292	140 ~ 364	168 ~ 436
Total piping length		MAX. 510m		
Single direction piping length		Indoor unit MAX. 160m		
Outdoor unit to first branch (main piping)		Max. 130m		
Piping length after the first branch		Max. 40m		
Difference in height between indoor and outdoor units	Outdoor unit is higher	MAX. 50m		
	Outdoor unit is lower	MAX. 40m		
Difference in height between indoor units		MAX. 15m		
Permissible height difference between the first branch and the indoor unit				
Indoor unit atmosphere (behind ceiling) temperature and humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less		
Compressor stop/start frequency	1 cycle time	7 min or more (4 minutes or more from start to stop or 3 minutes or more from stop to start)		
	Stop time	3 min or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop during start	Within ±15% of rated voltage		
	Phase unbalance	Within ±3% of rated voltage		

Allowable length of refrigerant piping, height difference between indoor and outdoor unit

(1) Branch pipe method (using branch piping)



(2) Header System (Header used)



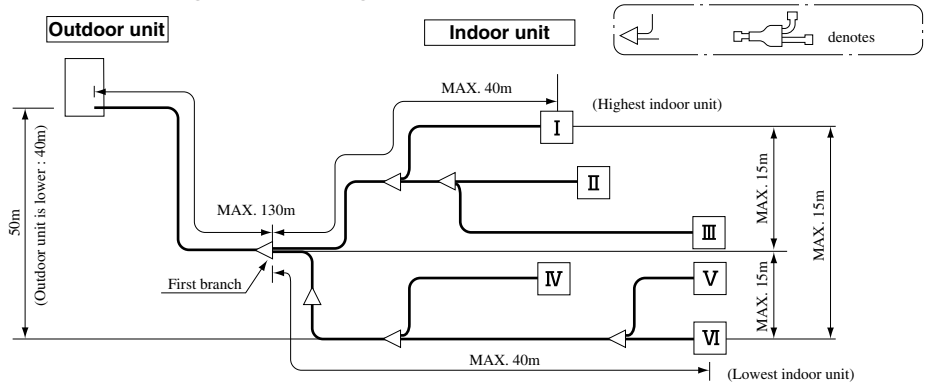
Note (1) A branch piping system cannot be connected after a header system.

(b) All-in-one type (also for combined use)

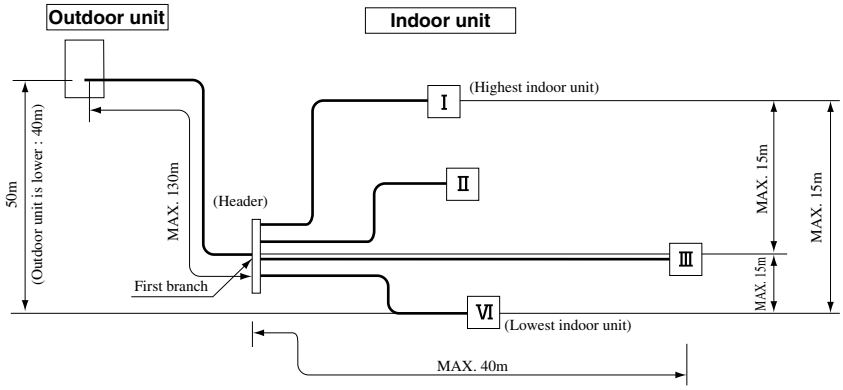
Item \ System		FDCA400HKXE4BR	FDCA450HKXE4BR	FDCA504HKXE4BR
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (See page 176)		
Outdoor air temperature (Upper, lower limits)				
Indoor units that can be used in combination	Number of connected units	1 to 23 unit	1 to 26 unit	1 to 29 unit
	Total capacity	200 ~ 520	225 ~ 585	252 ~ 656
Total piping length		MAX. 510m		
Single direction piping length		Indoor unit MAX. 160m		
Outdoor unit to first branch (main piping)		Max. 130m		
Piping length after the first branch		Max. 40m		
Permissible height difference between the first branch and the indoor unit		Max. 15m		
Difference in height between indoor and outdoor units	Outdoor unit is higher	MAX. 50m		
	Outdoor unit is lower	MAX. 40m		
Difference in height between indoor units		MAX. 15m		
Indoor unit atmosphere (behind ceiling) temperature and humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less		
Compressor stop/start frequency	1 cycle time	7 min or more (4 minutes or more from start to stop or 3 minutes or more from stop to start)		
	Stop time	3 min or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop during start	Within ±15% of rated voltage		
	Phase unbalance	Within ±3% of rated voltage		

Allowable length of refrigerant piping, height difference between indoor and outdoor unit

(1) Branch pipe method (using branch piping)



(2) Header System (Header used)

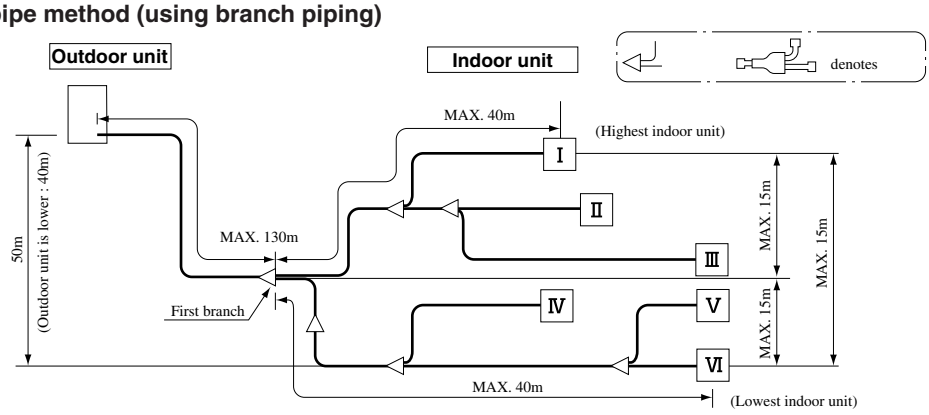


Note (1) A branch piping system cannot be connected after a header system.

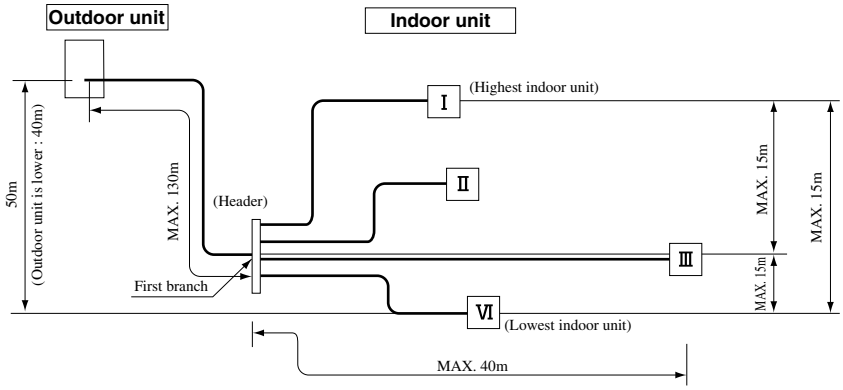
Item \ System		FDCA560HKXE4BR	FDCA615HKXE4BR	FDCA680HKXE4BR
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (See page 176)		
Outdoor air temperature (Upper, lower limits)				
Indoor units that can be used in combination	Number of connected units	1 to 33 unit	2 to 36 unit	2 to 40 unit
	Total capacity	280 ~ 728	307 ~ 800	340 ~ 884
Total piping length		MAX. 510m		
Single direction piping length		Indoor unit MAX. 160m		
Outdoor unit to first branch (main piping)		Max. 130m		
Piping length after the first branch		Max. 40m		
Permissible height difference between the first branch and the indoor unit		Max. 15m		
Difference in height between indoor and outdoor units	Outdoor unit is higher	MAX. 50m		
	Outdoor unit is lower	MAX. 40m		
Difference in height between indoor units		MAX. 15m		
Indoor unit atmosphere (behind ceiling) temperature and humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less		
Compressor stop/start frequency	1 cycle time	7 min or more (4 minutes or more from start to stop or 3 minutes or more from stop to start)		
	Stop time	3 min or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop during start	Within ±15% of rated voltage		
	Phase unbalance	Within ±3% of rated voltage		

Allowable length of refrigerant piping, height difference between indoor and outdoor unit

(1) Branch pipe method (using branch piping)



(2) Header System (Header used)



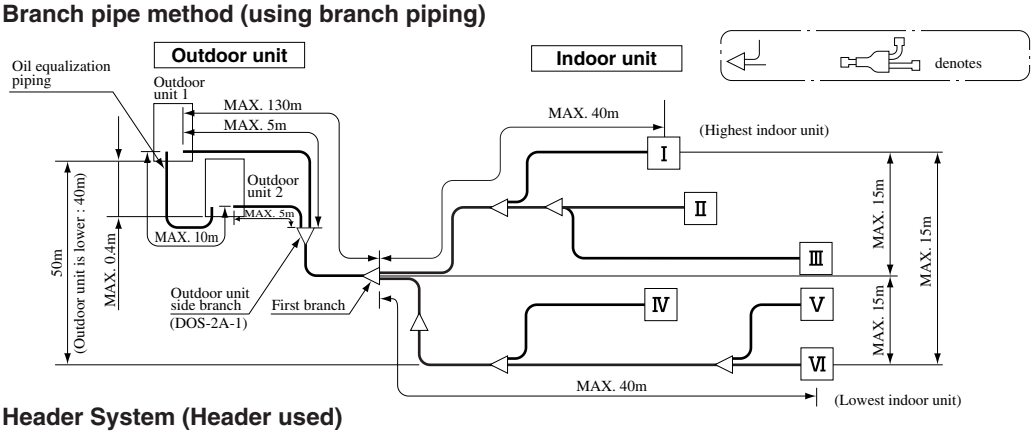
Note (1) A branch piping system cannot be connected after a header system.

(c) Combined type

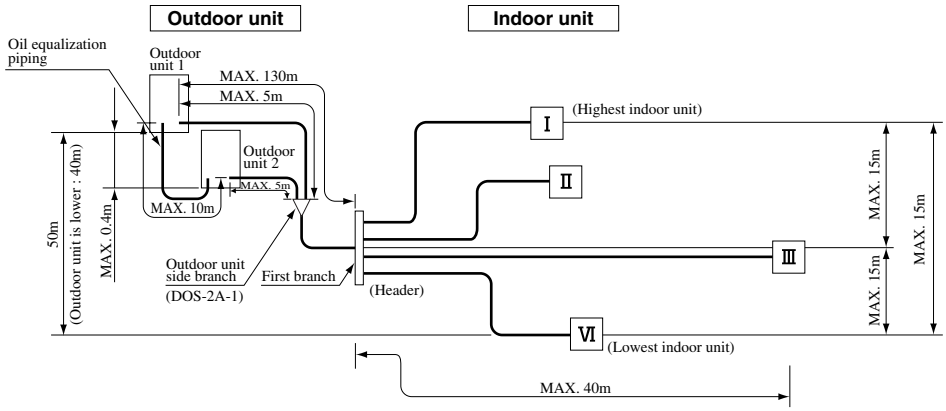
Item \ System		FDCA735HKXE4BR	FDCA800HKXE4BR	FDCA850HKXE4BR	FDCA900HKXE4BR
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (see page 176)			
Outdoor air temperature (Upper, lower limits)					
Indoor units that can be used in combination	Number of connected units	2 to 43 units	2 to 47 units	2 to 48 units	2 to 48 units
	Total capacity	367 ~ 956	400 ~ 1040	425 ~ 1105	450 ~ 1170
Total piping length		MAX. 510m			
Single direction piping length		Indoor unit MAX. 160m			
Outdoor unit to first branch (main piping)		Max. 130m			
Permissible height difference between the first branch and the indoor unit		Max. 15m			
Piping length after the first branch		Max. 40m			
Difference in height between indoor and outdoor units	Outdoor unit is higher	MAX. 50m			
	Outdoor unit is lower	MAX. 40m			
Difference in height between indoor units		MAX. 15m			
Difference in height between outdoor units (Same system)		MAX. 0.4m			
Difference between an outdoor unit and on outdoor unit side branch pipe		MAX. 5m			
Length of oil equalization piping		MAX. 10m			
Indoor unit atmosphere (behind ceiling) temperature and humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less			
Compressor stop/start frequency	1 cycle time	7 min or more (4 minutes or more from start to stop or 3 minutes or more from stop to start)			
	Stop time	3 min or more			
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage			
	Voltage drop during start	Within ±15% of rated voltage			
	Phase unbalance	Within ±3% of rated voltage			

Allowable length of refrigerant piping, height difference between indoor and outdoor unit

(1) Branch pipe method (using branch piping)



(2) Header System (Header used)

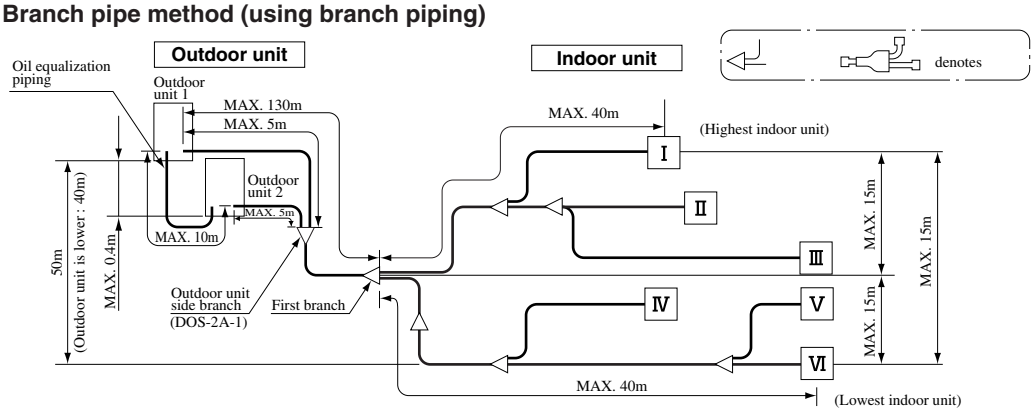


Note (1) A branch piping system cannot be connected after a header system.

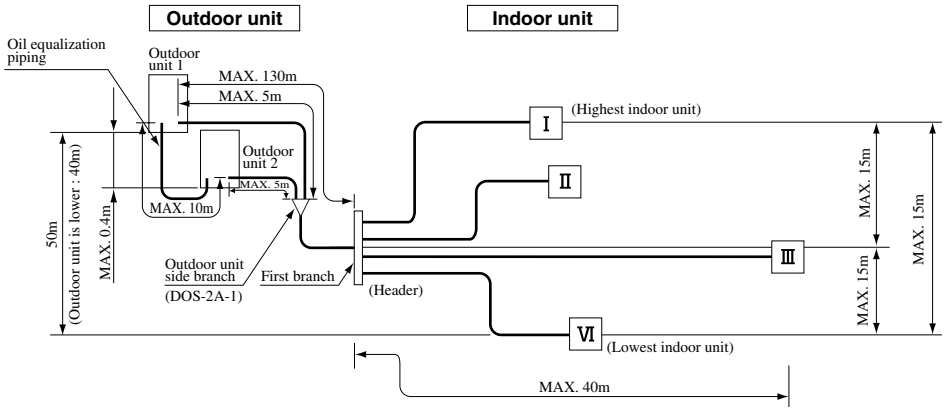
Item \ System		FDCA960 HKXE4BR	FDCA1010 HKXE4BR	FDCA1065 HKXE4BR	FDCA1130 HKXE4BR	FDCA1180 HKXE4BR	FDCA1235 HKXE4BR	FDCA1300 HKXE4BR	FDCA1360 HKXE4BR
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (see page 176)							
Outdoor air temperature (Upper, lower limits)									
Indoor units that can be used in combination	Number of connected units	2 to 48 units			3 to 48 units				
	Total capacity	480~1248	505~1313	532~1385	565~1469	590~1534	617~1606	650~1690	680~1768
Total piping length		MAX. 510m							
Single direction piping length		Indoor unit MAX. 160m							
Outdoor unit to first branch (main piping)		Max. 130m							
Piping length after the first branch		Max. 40m							
Permissible height difference between the first branch and the indoor unit		Max. 15m							
Difference in height between indoor and outdoor units	Outdoor unit is higher	MAX. 50m							
	Outdoor unit is lower	MAX. 40m							
Difference in height between indoor units		MAX. 15m							
Difference in height between outdoor units (Same system)		MAX. 0.4m							
Difference between an outdoor unit and on outdoor unit side branch pipe		MAX. 5m							
Length of oil equalization piping		MAX. 10m							
Indoor unit atmosphere (behind ceiling) temperature and humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less							
Compressor stop/start frequency	1 cycle time	7 min or more (4 minutes or more from start to stop or 3 minutes or more from stop to start)							
	Stop time	3 min or more							
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage							
	Voltage drop during start	Within ±15% of rated voltage							
	Phase unbalance	Within ±3% of rated voltage							

Allowable length of refrigerant piping, height difference between indoor and outdoor unit

(1) Branch pipe method (using branch piping)



(2) Header System (Header used)



Note (1) A branch piping system cannot be connected after a header system.

(2) KXR series

(a) All-in-one type

Item \ System		FDCA224HKXRE4BR	FDCA280HKXRE4BR	FDCA335HKXRE4BR
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (See page 176)		
Outdoor air temperature (Upper, lower limits)				
Indoor units that can be used in combination	Number of connected units	1 to 13 units	1 to 16 units	1 to 20 units
	Total capacity	112 ~ 292	140 ~ 364	168 ~ 436
Total piping length		MAX. 510m		
Single direction piping length		Indoor unit MAX. 160m		
Outdoor unit to first branch (main piping)		Max. 130m		
Piping length after the first branch		Max. 40m (The flow distribution controller can be set to any value in this range.)		
Difference in height between indoor and outdoor unit	Outdoor unit is higher	MAX. 50m		
	Outdoor unit is lower	MAX. 40m		
Difference in height between indoor unit in the system and branching controller		MAX. 15m		
Permissible height difference between the first branch and the indoor unit		MAX. 15m		
Height difference between branching controller and indoor unit	Indoor unit is higher	MAX. 1m		
	Indoor unit is lower	MAX. 4m		
Indoor unit and flow distribution controller (indoor) air temperature · humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less		
Compressor stop/start frequency	1 cycle time	7 min or more (4 minutes or more from start to stop or 3 minutes or more from stop to start)		
	Stop time	3 min or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop during start	Within ±15% of rated voltage		
	Phae unbalance	Within ±3% of rated voltage		

Note (1) For details, see page 164 (Refrigerant piping length and height restrictions).

(b) All-in-one type (also for combined use)

Item \ System		FDCA400HKXRE4BR	FDCA450HKXRE4BR	FDCA504HKXRE4BR
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (See page 176)		
Outdoor air temperature (Upper, lower limits)				
Indoor units that can be used in combination	Number of connected units	1 to 23 units	1 to 26 units	1 to 29 units
	Total capacity	200 ~ 520	225 ~ 585	252 ~ 656
Total piping length		MAX. 510m		
Single direction piping length		Indoor unit MAX. 160m		
Outdoor unit to first branch (main piping)		Max. 130m		
Piping length after the first branch		Max. 40m (The flow distribution controller can be set to any value in this range)		
Difference in height between indoor and outdoor unit	Outdoor unit is higher	MAX. 50m		
	Outdoor unit is lower	MAX. 40m		
Difference in height between indoor unit in the system and branching controller		MAX. 15m		
Permissible height difference between the first branch and the indoor unit		MAX. 15m		
Height difference between branching controller and indoor unit	Indoor unit is higher	MAX. 1m		
	Indoor unit is lower	MAX. 4m		
Indoor unit and flow distribution controller (indoor) air temperature · humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less		
Compressor stop/start frequency	1 cycle time	7 min or more (4 minutes or more from start to stop or 3 minutes or more from stop to start)		
	Stop time	3 min or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop during start	Within ±15% of rated voltage		
	Phase unbalance	Within ± 3% of rated voltage		

Note (1) For details, see page 164 (Refrigerant piping length and height restrictions).

Item \ System		FDCA560HKXRE4BR	FDCA615HKXRE4BR	FDCA680HKXRE4BR
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (See page 176)		
Outdoor air temperature (Upper, lower limits)				
Indoor units that can be used in combination	Number of connected units	1 to 33 units	2 to 36 units	2 to 40 units
	Total capacity	280 ~ 728	307 ~ 800	340 ~ 884
Total piping length		MAX. 510m		
Single direction piping length		MAX. 160m		
Outdoor unit to first branch (main piping)		Max. 130m		
Piping length after the first branch		Max. 40m (The flow distribution controller can be set to any value in this range)		
Difference in height between indoor and outdoor unit	Outdoor unit is higher	MAX. 50m		
	Outdoor unit is lower	MAX. 40m		
Difference in height between indoor unit in the system and branching controller		MAX. 15m		
Permissible height difference between the first branch and the indoor unit		MAX. 15m		
Height difference between branching controller and indoor unit	Indoor unit is higher	MAX. 1m		
	Indoor unit is lower	MAX. 4m		
Indoor unit and flow distribution controller (indoor) air temperature · humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less		
Compressor stop/start frequency	1 cycle time	7 min or more (4 minutes or more from start to stop or 3 minutes or more from stop to start)		
	Stop time	3 min or more		
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage		
	Voltage drop during start	Within ±15% of rated voltage		
	Phase unbalance	Within ± 3% of rated voltage		

Note (1) For details, see page 164 (Refrigerant piping length and height restrictions).

(c) Combined type

Item \ System		FDCA735HKXRE4BR	FDCA800HKXRE4BR	FDCA850HKXRE4BR	FDCA900HKXRE4BR
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (see page 176)			
Outdoor air temperature (Upper, lower limits)					
Indoor units that can be used in combination	Number of connected units	2 to 43 units	2 to 47 units	2 to 48 units	2 to 48 units
	Total capacity	367 ~ 956	400 ~ 1040	425 ~ 1105	450 ~ 1170
Total piping length		MAX. 510m			
Single direction piping length		Indoor unit MAX. 160m			
Outdoor unit to first branch (main piping)		Max. 130m			
Piping length after the first branch		Max. 40m (The flow distribution controller can be set to any value in this range)			
Difference in height between indoor and outdoor unit	Outdoor unit is higher	MAX. 50m			
	Outdoor unit is lower	MAX. 40m			
Difference in height between indoor unit in the system and branching controller		MAX. 15m			
Difference in height between outdoor units (Same system)		MAX. 0.4m			
Difference between an outdoor unit and an outdoor unit side branching pipe		MAX. 5m			
Length of oil equalization piping		MAX. 10m			
Permissible height difference between the first branch and the indoor unit		MAX. 15m			
Height difference between branching controller and indoor unit	Indoor unit is higher	MAX. 1m			
	Indoor unit is lower	MAX. 4m			
Indoor unit and flow distribution controller (indoor) air temperature · humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less			
Compressor stop/start frequency	1 cycle time	7 min or more (4 minutes or more from start to stop or 3 minutes or more from stop to start)			
	Stop time	3 min or more			
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage			
	Voltage drop during start	Within ±15% of rated voltage			
	Phase unbalance	Within ±3% of rated voltage			

Note (1) For details, see page 164 (Refrigerant piping length and height restrictions).

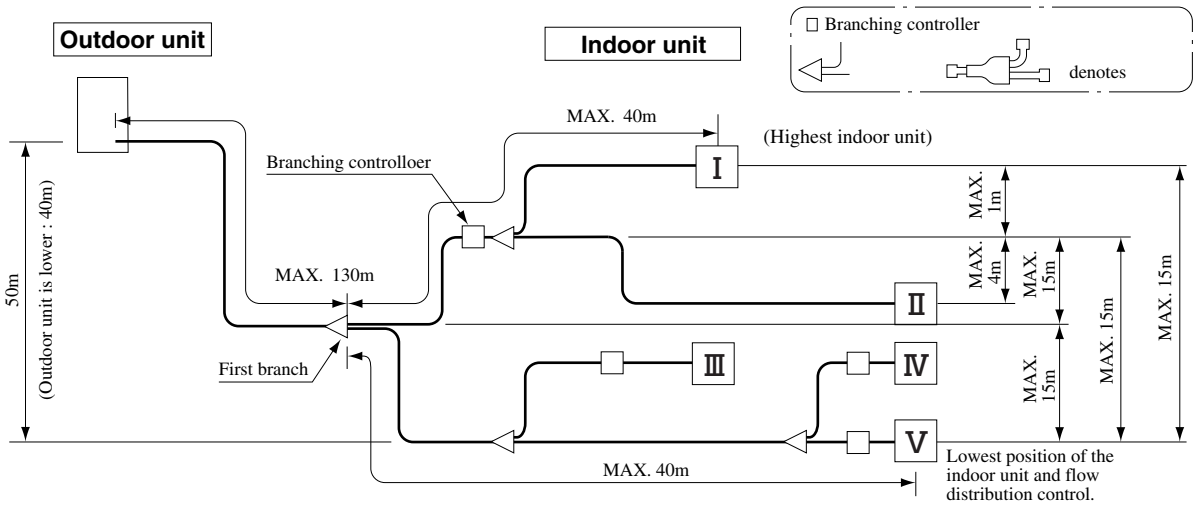
Item \ System		FDCA960 HKXRE4BR	FDCA1010 HKXRE4BR	FDCA1065 HKXRE4BR	FDCA1130 HKXRE4BR	FDCA1180 HKXRE4BR	FDCA1235 HKXRE4BR	FDCA1300 HKXRE4BR	FDCA1360 HKXRE4BR
Indoor intake air temperature (Upper, lower limits)		Refer to the Selection chart. (see page 176)							
Outdoor air temperature (Upper, lower limits)									
Indoor units that can be used in combination	Number of connected units	2 to 48 units			3 to 48 units				
	Total capacity	480 ~ 1248	505 ~ 1313	532 ~ 1385	565 ~ 1469	590 ~ 1534	617 ~ 1606	650 ~ 1690	680 ~ 1768
Total piping length		MAX. 510m							
Single direction piping length		MAX. 160m							
Outdoor unit to first branch (main piping)		Max. 130m							
Piping length after the first branch		Max. 40m (The flow distribution controller can be set to any value in this range)							
Difference in height between indoor and outdoor unit	Outdoor unit is higher	MAX. 50m							
	Outdoor unit is lower	MAX. 40m							
Difference in height between indoor unit in the system and branching controller		MAX. 15m							
Difference in height between outdoor units (Same system)		MAX. 0.4m							
Difference between an outdoor unit and an outdoor unit side branching pipe		MAX. 5m							
Length of oil equalization piping		MAX. 10m							
Permissible height difference between the first branch and the indoor unit		MAX. 15m							
Height difference between branching controller and indoor unit	Indoor unit is higher	MAX. 1m							
	Indoor unit is lower	MAX. 4m							
Indoor unit and flow distribution controller (indoor) air temperature · humidity		Dew point temperature 28 ℃ or less, relative humidity 80% or less							
Compressor stop/start frequency	1 cycle time	7 min or more (4 minutes or more from start to stop or 3 minutes or more from stop to start)							
	Stop time	3 min or more							
Power source voltage	Voltage fluctuation	Within ±10% of rated voltage							
	Voltage drop during start	Within ±15% of rated voltage							
	Phase unbalance	Within ±3% of rated voltage							

Note (1) For details, see page 164 (Refrigerant piping length and height restrictions).

Allowable length of refrigerant piping, height difference between indoor and outdoor unit

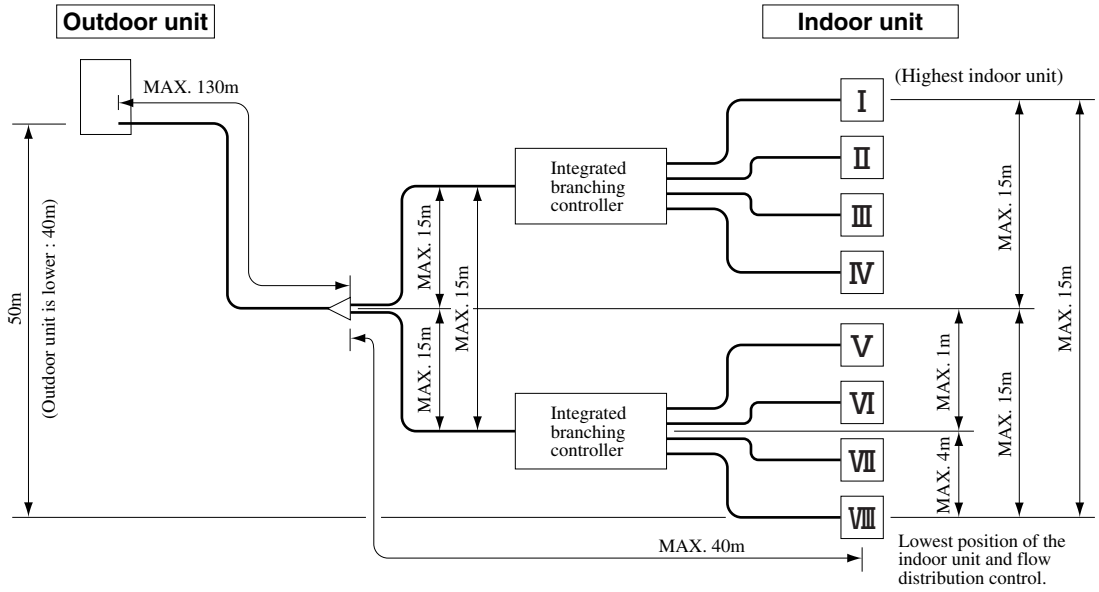
(a) FDCA224HKXRE4BR ~ FDCA680HKXRE4BR (All-in-one type)

1) Branching system



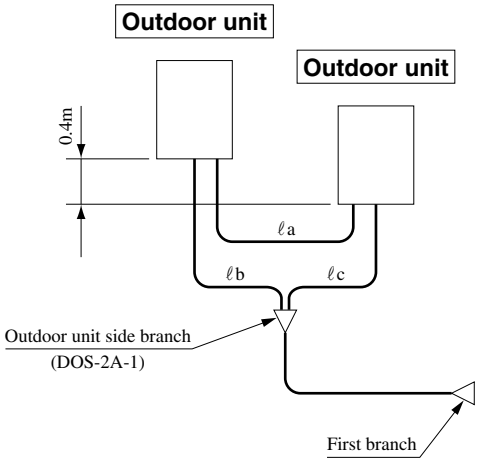
Note (1) Please do not attach large traps or dirdhouses behind to the hose behind the first joint (acceptable only if higher than 500mm.)

2) Integrated branching system



Note (1) Please do not attach large traps or dirdhouses behind to the hose behind the first joint (acceptable only if higher than 500mm.)

(b) FDCA735HKXRE4BR ~ FDCA1360HKXRE4BR (Combined type)



Permissible piping length

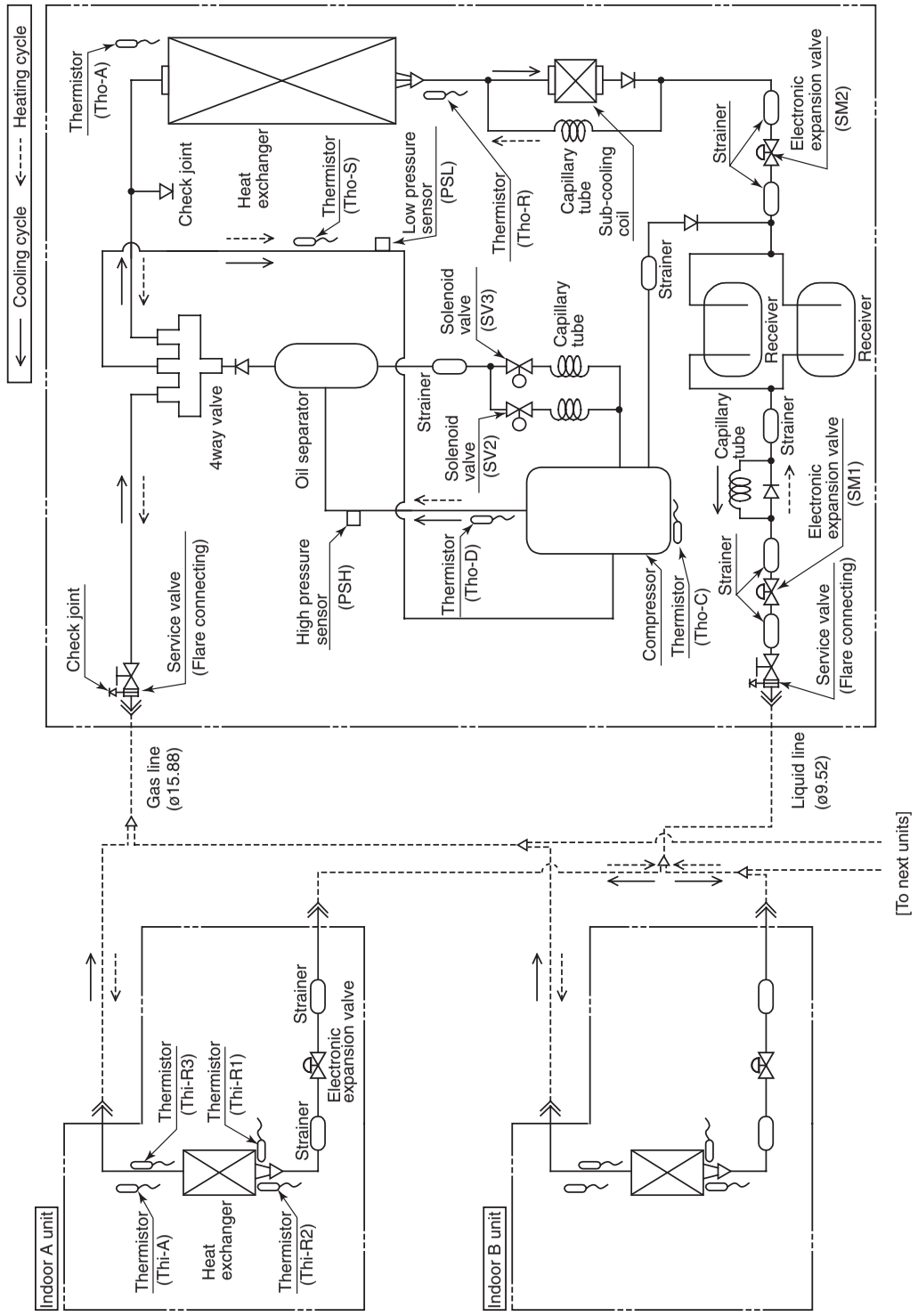
- Equalizing oil pipe ℓa ± 10 m
- Refrigerant piping ℓb ± 5 m
- Refrigerant piping ℓc ± 5 m

Note (1) Use limitations other than the above are the same as for the All-in-one type.

4.3 Piping system

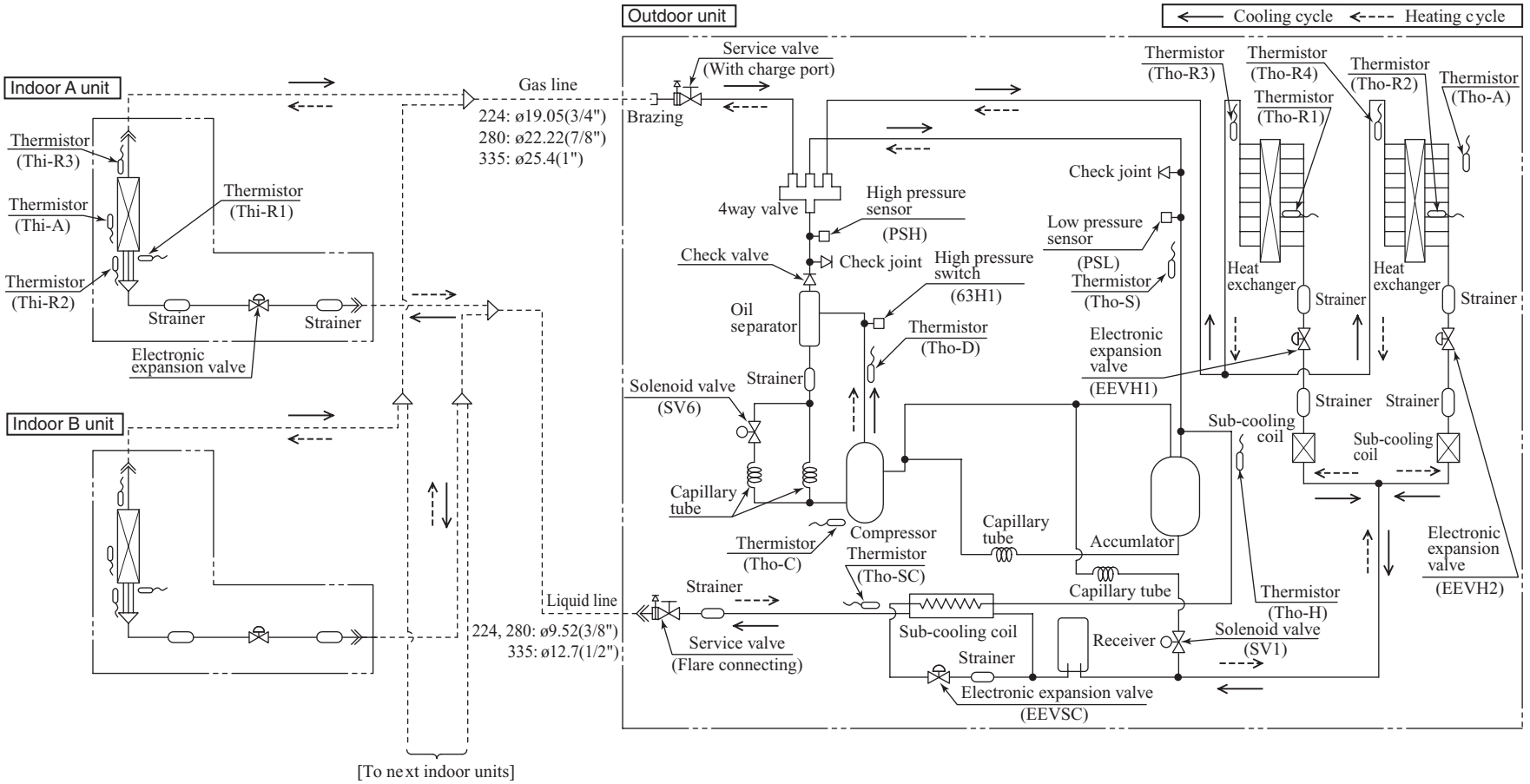
(1) KX Series

Models FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R



Tho-R:For control of defrosting.
Tho-A:For heating and cooling to low outdoor temp., for control of defrosting.
Tho-D:For control of discharge pipe temperature.
Tho-S:For control of suction pipe temperature.
Tho-C:For control of temperature under the dome.

Notes (1) Preset point of protective devices.
PSH:4.055 (ON)/3.658 (OFF) MPa
PSL:0.079 (ON)/0.227 (OFF) MPa
(2) Function of thermistor
Thi-R1,2:Heating operation:Indoor fan control
Cooling operation:Frost prevention control
Super heat control
Thi-R3:Super heat control



Notes (1) Preset point of protective devices
63H1: Open 3.8MPa, Clase 2.9MPa
(For protection)

(2) Function of thermistor

PSH: For compressor control
Cooling: 3.70 ON (MPa)
Heating: 3.00 ON (MPa)

PSL: ON 0.18MPa, OFF 0.236MPa
(For compressor control)
ON 0.134MPa, OFF 0.18MPa
(For Protection)

Thı-R1, R2: Heating operation : Indoor fan control.
Cooling operation : Frost prevention control.
Super heat control.

Thı-R3: For super heat control of cooling operation.

Tho-D: For control of discharge pipe temperature.

Tho-C: For control of temperature under the dome.

Tho-S: For control of suction pipe temperature.

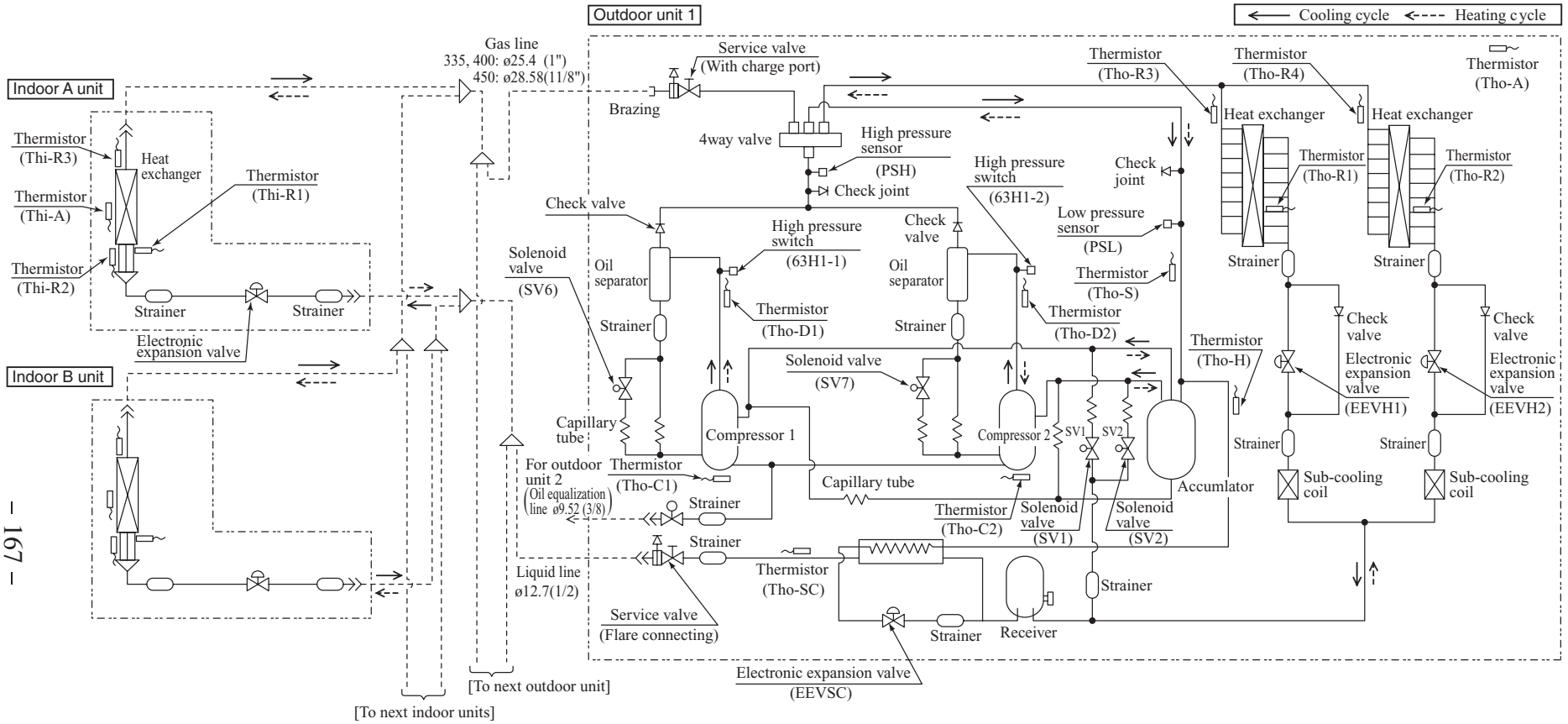
Tho-R1, R2: For control of defrosting.

Tho-A: For control of defrosting.

Tho-R3, R4: Electronic expansion valve (EEVH1, 2) control of heating operation

Tho-SC: Electronic expansion valve (EEVSC) control of cooling operation.

Tho-H: For super heat control of sub-cooling coil.



Notes (1) Preset point of protective devices
63H1-1, 2: Open 4.15MPa, Close 3.15MPa
(For protection)

(2) Function of thermistor

PSH: For compressor control
Cooling: 3.70 ON (MPa)
Heating: 3.00 ON (MPa)

PSL: ON 0.18MPa, OFF 0.20MPa
(For compressor control)
ON 0.134MPa, OFF 0.18MPa
(For protection)

Thı-R1, R2: Heating operation : Indoor fan control.
Cooling operation : Frost prevention control.
Super heat control.

Thı-R3: For super heat control of cooling operation.

Tho-D: For control of discharge pipe temperature.

Tho-C: For control of temperature under the dome.

Tho-S: For control of suction pipe temperature.

Tho-R1, R2: For control of defrosting.

Tho-A: For control of defrosting.

Tho-R3, R4: Electronic expansion valve (EEVH1, 2) control of heating operation

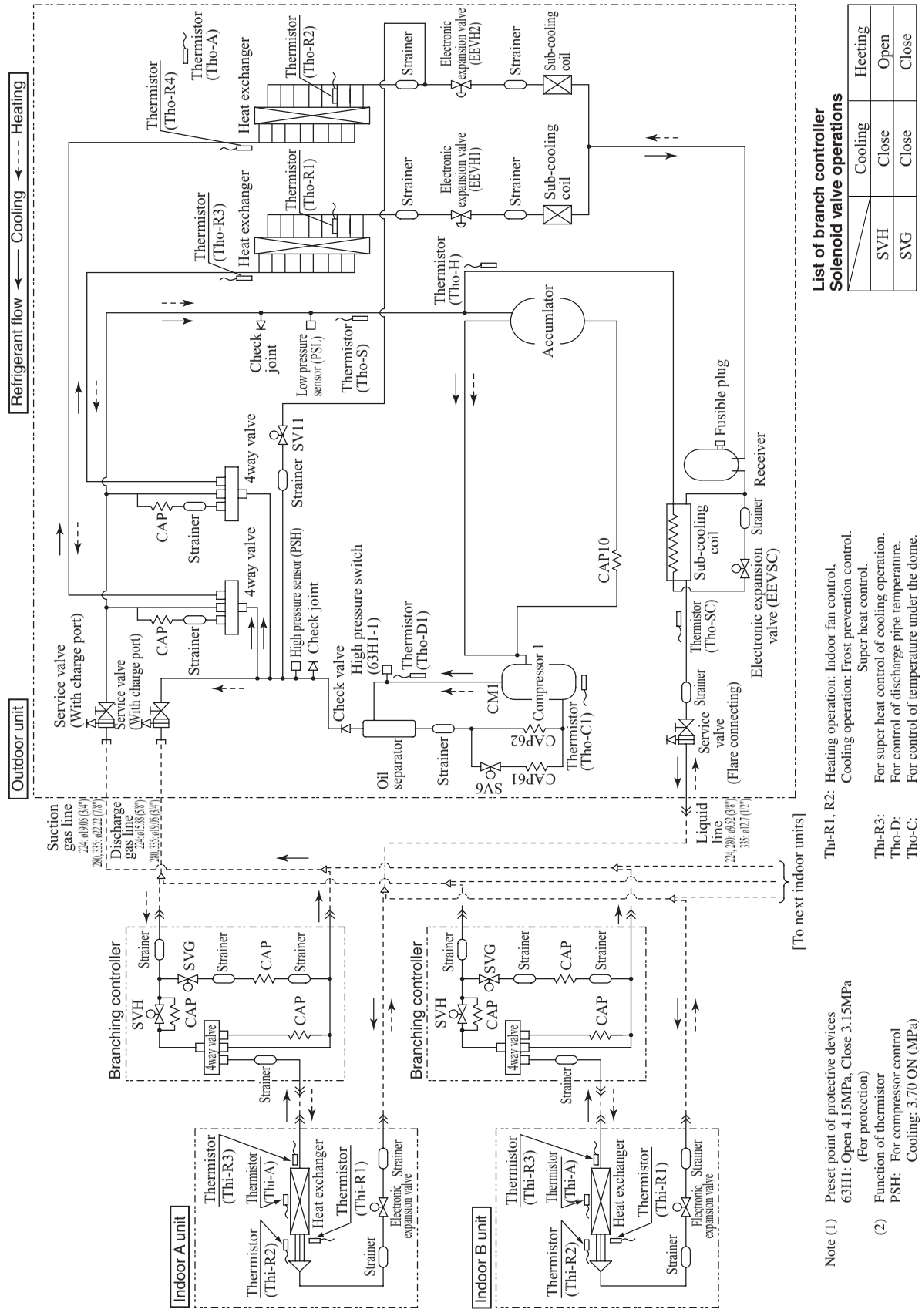
Tho-SC: Electronic expansion valve (EEVSC) control of cooling operation.

Tho-H: For super heat control of sub-cooling coil.

(2) KXR series

(a) Cooling and heating operation

Models FDCA224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR



List of branch controller Solenoid valve operations

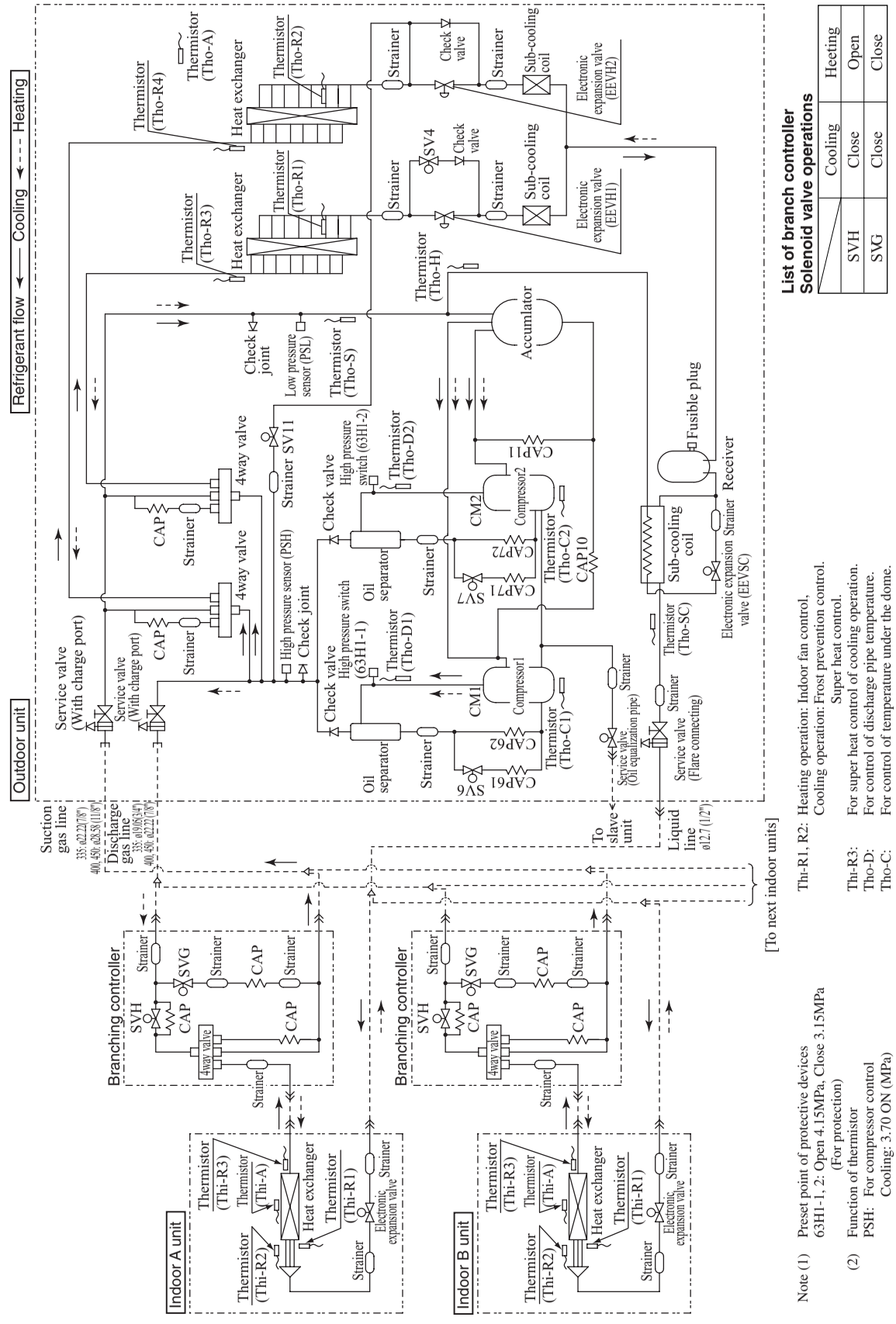
	Cooling	Heeting
SVH	Close	Open
SVG	Close	Close

Note (1) Preset point of protective devices
63H1: Open 4.15MPa, Close 3.15MPa
(For protection)

(2) Function of thermistor
PSH: For compressor control
Cooling: 3.70 ON (MPa)
Heating: 3.00 ON (MPa)
PSL: ON 0.18MPa, OFF 0.236MPa
(For compressor control)
ON 0.134MPa, OFF 0.18MPa
(For Protection)

Thi-R1, R2: Heating operation: Indoor fan control,
Cooling operation: Frost prevention control.
Super heat control.
Thi-R3: For super heat control of cooling operation.
Tho-D: For control of discharge pipe temperature.
Tho-C: For control of temperature under the dome.
Tho-S: For control of suction pipe temperature.
Tho-R1, R2: For control of defrosting.
Tho-A: For control of defrosting.
Tho-R3, R4: Electric expansion valve (EEVH1, 2) control of heating operation.
Tho-SC: Electric expansion valve (EEVSC) control of cooling operation.
Tho-H: For super heat control of sub-cooling coil.

Models FDCA335HKXRE4BRE, 400HKXRE4BR, 450HKXRE4BR, 504HKXRE4BR, 560HKXRE4BR, 615HKXRE4BR, 680HKXRE4BR



List of branch controller Solenoid valve operations

	Cooling	Heeting
SVH	Close	Open
SVG	Close	Close

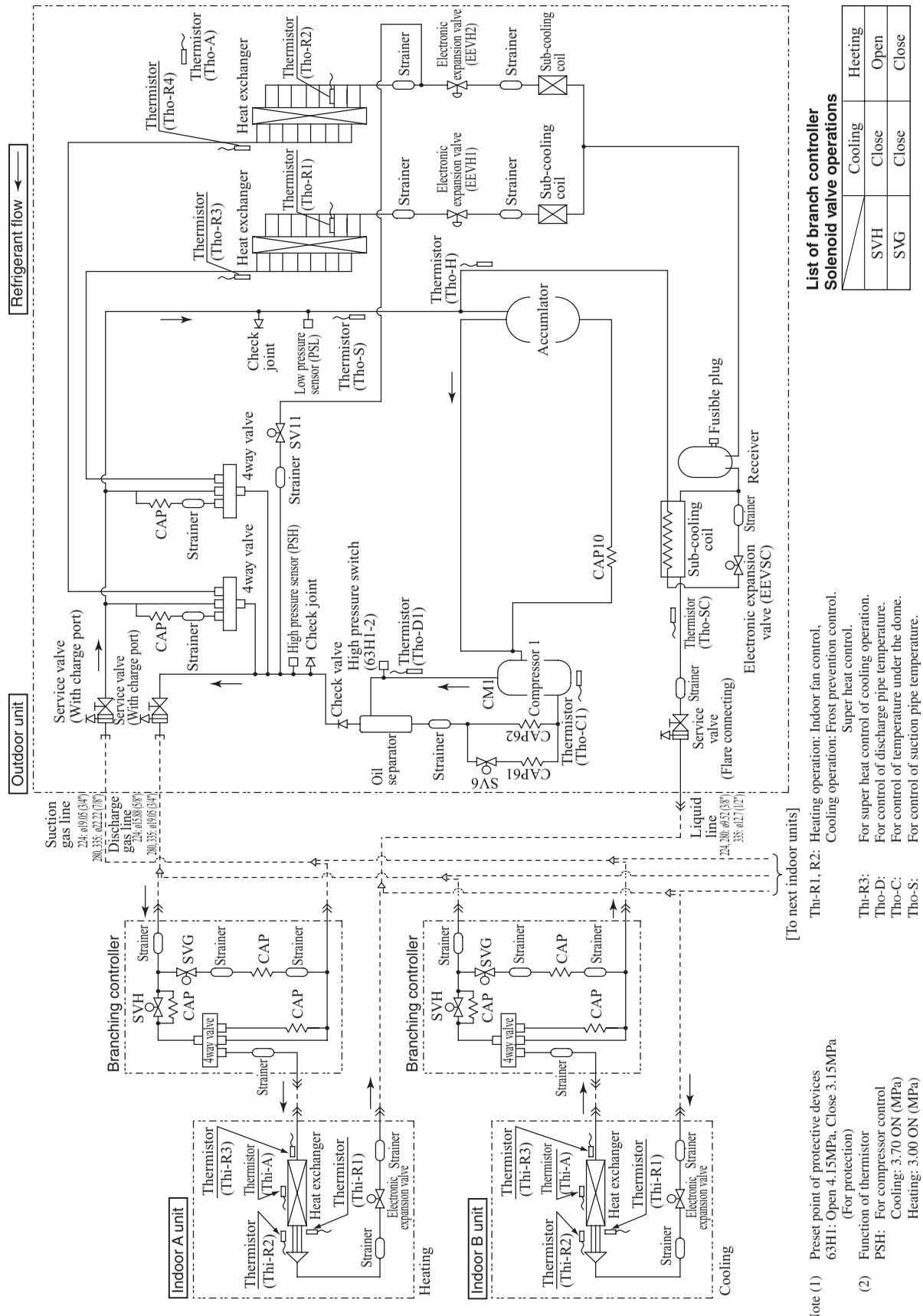
Note (1) Preset point of protective devices
63H1-1, 2: Open 4.15MPa, Close 3.15MPa
(For protection)

(2) Function of thermistor
PSH: For compressor control
Cooling: 3.70 ON (MPa)
Heating: 3.00 ON (MPa)
PSL: ON 0.18MPa, OFF 0.236MPa
(For compressor control)
ON 0.134MPa, OFF 0.18MPa
(For Protection)

Thi-R1, R2: Heating operation: Indoor fan control,
Cooling operation: Frost prevention control.
Super heat control.
Thi-R3: For super heat control of cooling operation.
Tho-D: For control of discharge pipe temperature.
Tho-C: For control of temperature under the dome.
Tho-S: For control of suction pipe temperature.
Tho-R1, R2: For control of defrosting.
Tho-A: For control of defrosting.
Tho-R3, R4: Electric expansion valve (EEVH1, 2) control of heating operation.
Tho-SC: Electric expansion valve (EEVSC) control of cooling operation.
Tho-H: For super heat control of sub-cooling coil.

(b) Mixed heating/cooling operation

Models FDCA224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR



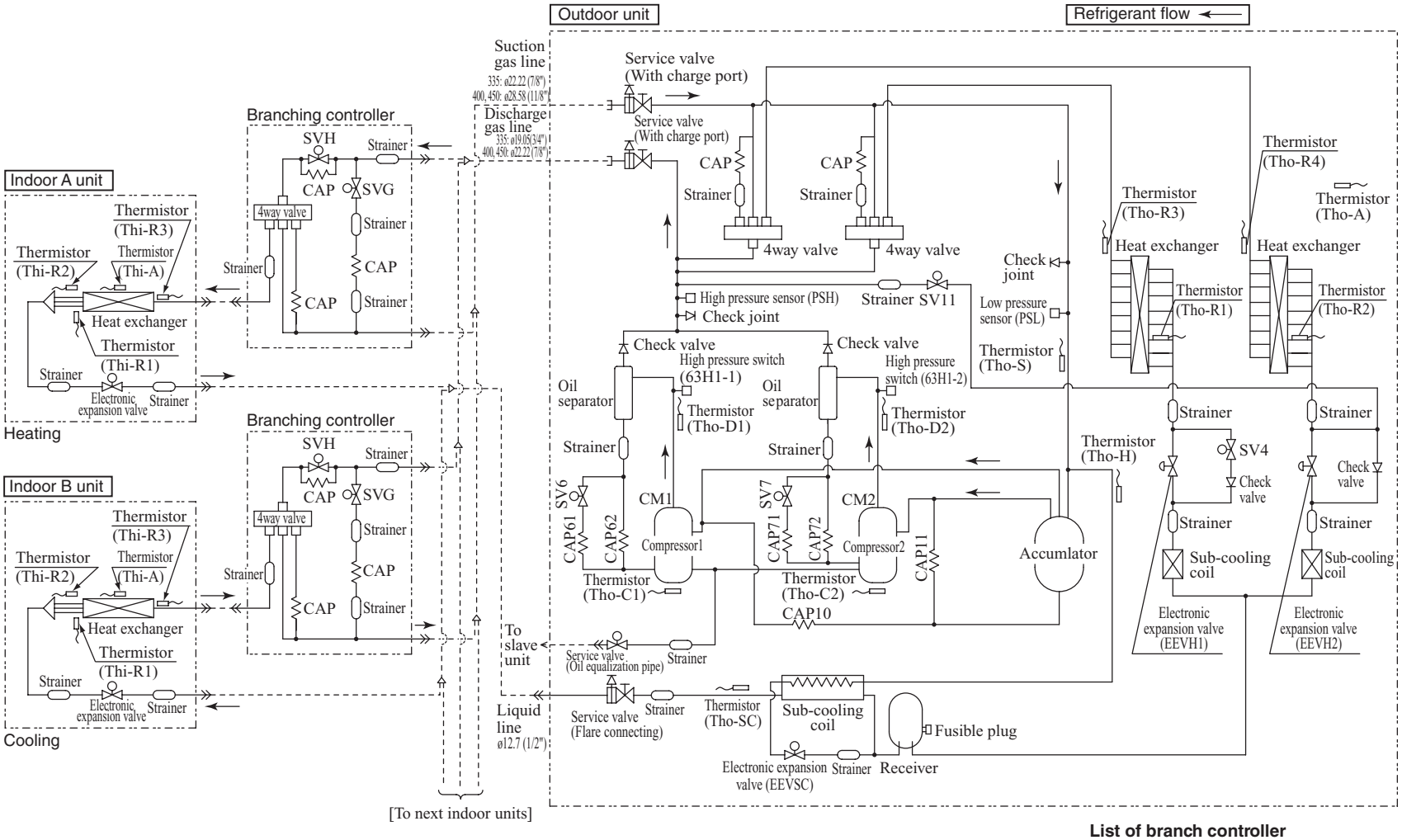
List of branch controller Solenoid valve operations

	Cooling	Heeting
SVH	Close	Open
SVG	Close	Close

Note (1) Preset point of protective devices
63H1: Open 4.15MPa, Close 3.15MPa (For protection)

(2) Function of thermistor
PSH: For compressor control
Cooling: 3.70 ON (MPa)
Heating: 3.00 ON (MPa)
PSL: ON 0.18MPa, OFF 0.236MPa (For compressor control)
ON 0.134MPa, OFF 0.18MPa (For Protection)

Thi-R1, R2: Heating operation: Indoor fan control,
Cooling operation: Frost prevention control.
Super heat control.
Thi-R3: For super heat control of cooling operation.
Tho-D: For control of discharge pipe temperature.
Tho-C: For control of temperature under the dome.
Tho-S: For control of suction pipe temperature.
Tho-R1, R2: For control of defrosting.
Tho-A: For control of defrosting.
Tho-R3, R4: Electric expansion valve (EEVH1, 2) control of heating operation.
Tho-SC: Electric expansion valve (EEVSC) control of cooling operation.
Tho-H: For super heat control of sub-cooling coil.



Note (1) Preset point of protective devices
63H1-1, 2: Open 4.15MPa, Close 3.15MPa
(For protection)

(2) Function of thermistor
PSH: For compressor control
Cooling: 3.70 ON (MPa)
Heating: 3.00 ON (MPa)
PSL: ON 0.18MPa, OFF 0.236MPa
(For compressor control)
ON 0.134MPa, OFF 0.18MPa
(For Protection)

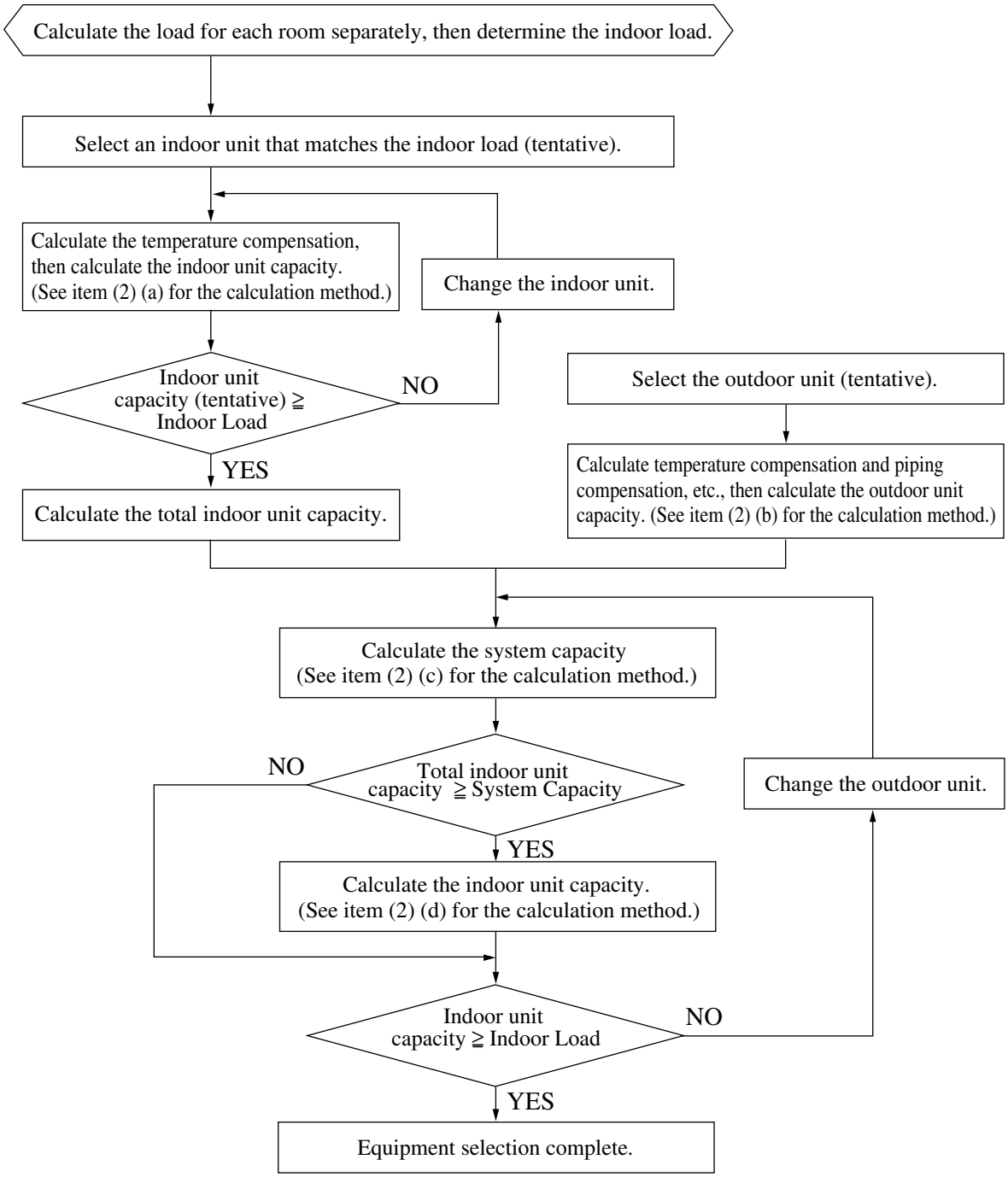
Thı-R1, R2: Heating operation: Indoor fan control,
Cooling operation: Frost prevention control.
Super heat control.
Thı-R3: For super heat control of cooling operation.
Tho-D: For control of discharge pipe temperature.
Tho-C: For control of temperature under the dome.
Tho-S: For control of suction pipe temperature.
Tho-R1, R2: For control of defrosting.
Tho-A: For control of defrosting.
Tho-R3, R4: Electric expansion valve (EEVH1, 2) control of heating operation.
Tho-SC: Electric expansion valve (EEVSC) control of cooling operation.
Tho-H: For super heat control of sub-cooling coil.

List of branch controller Solenoid valve operations

	Cooling	Heeting
SVH	Close	Open
SVG	Close	Close

4.4 Selection chart

(1) Equipment selection flow



(2) Capacity calculation method

(a) Calculating the indoor unit capacity compensation

Indoor unit capacity (cooling, heating) = Indoor unit total rated capacity
× Capacity compensation coefficient according to temperature conditions

See item (3) (a) concerning the capacity compensation coefficient according to temperature conditions.

(b) Calculating the outdoor unit capacity compensation

Outdoor Unit Capacity (Cooling, Heating) = Outdoor unit rated capacity (rated capacity when 100% connected)
× Capacity compensation coefficient according to temperature conditions
× Capacity compensation coefficient according to piping length
× Capacity compensation coefficient according to height difference
× Correction of heating capacity in relation to the frost on the outdoor unit heat exchanger
× Capacity compensation coefficient according to indoor unit connection capacity

① See item (3) (a) concerning the capacity compensation coefficient according to temperature conditions.

② See item (3) (c) concerning the capacity compensation coefficient according to piping length.
In the case of cooling capacity compensation, the compensation coefficient differs depending on the piping size if the length exceeds 90 m, so exercise caution. The compensation coefficient is the same in the case of heating capacity compensation regardless of the model (horsepower).

③ See item (3) (d) concerning the capacity compensation coefficient according to height difference. This compensation should be carried out only in cases where the outdoor unit is lower during cooling and higher during heating.

④ See item (3) (e) correction of heating capacity in relation to the frost on the outdoor unit heat exchanger. This compensation should be carried out only when calculating the heating capacity.

⑤ See item (3) (f) concerning the capacity compensation coefficient according to indoor unit connected capacity. This compensation should be carried out only in cases where the indoor unit total capacity is 100% or higher.

(c) Calculating system capacity

Compare the capacities determined in items (a) and (b) above and let the smaller value be the system capacity (cooling, heating).

① In cases where indoor unit total capacity (cooling, heating) > outdoor unit capacity (cooling, heating)
System capacity (cooling, heating) = Outdoor unit capacity (cooling, heating)

② In cases where indoor unit total capacity (cooling, heating) < outdoor unit capacity (cooling, heating)
System capacity (cooling, heating) = Indoor unit capacity (cooling, heating)

(d) Calculating indoor unit capacity [item (c) ①only]

Indoor unit capacity (cooling, heating) = System capacity (cooling, heating)
× [(Indoor unit capacity) / (Indoor unit total capacity)]

Capacity calculation examples

Example 1

Cooling (when the indoor unit connected total capacity is less than 100%)

- Outdoor unit FDCA735HKXE4BR ..... 1 Unit
- Indoor unit FDTA71KXE4R ..... 8 Units
- Piping length ..... 60 m (Equivalent length)
- Indoor, outdoor unit height difference ..... 15 m (Outdoor unit is lower)
- Temperature conditions ..... Outdoor temperature: 33°C DB
- Temperature conditions ..... Indoor temperature: 19°C WB

<Indoor unit total cooling capacity>: Item (2) (a) calculation.

- Indoor unit rated cooling capacity: 7.1 kW
- Capacity compensation coefficient according to temperature conditions:
  1.02 (Calculated according to Indoor 19°C WB / Outdoor 33°C DB); (See page 176)
  Indoor unit cooling capacity: 7.1 kW × 1.02 ≒ 7.2 kW
- Indoor unit total cooling capacity calculation;
  indoor unit total cooling capacity: 7.2 kW × 8 units = 57.6 kW

<Outdoor unit maximum cooling capacity> : Item (2) (b) calculation

- Outdoor unit rated cooling capacity: 73.5 kW
- Capacity compensation coefficient according to temperature conditions:
  1.02 (Calculated according to Indoor 19°C WB / Outdoor 33°C DB); (See page 176)
  Outdoor unit cooling capacity: 73.5 kW × 1.02 ≒ 75.0 kW
- Capacity compensation coefficient according to piping length: 0.96 (calculated according to 60 m length); (See page 179)
  75.0 kW × 0.96 = 72.0 kW

• Capacity compensation coefficient according to height difference: 0.97 (calculated according to 15 m difference); (See page 184)
72.0 kW × 0.97 ≒ 69.8 kW

• Capacity compensation coefficient according to indoor unit connected total capacity: 1.0 ← (71 × 8) / 735 < 100%)
No compensation

<System cooling capacity>: Item (2) (c) calculation

Compare the indoor unit total cooling capacity and the outdoor unit maximum cooling capacity. The smaller value is the actual system cooling capacity.

• Indoor unit total cooling capacity: 57.6 kW ⇨ System cooling capacity: 57.6 kW
• Outdoor unit maximum cooling capacity: 69.8 kW

<Indoor unit capacity compensation> No compensation (7.2 kW)

Example 2

(Notes) Calculations were made using the European specification ø34.92 gas pipe.

Cooling (when the indoor unit connected total capacity is 100% or higher)

• Outdoor unit FDCA735HKXE4BR ..... 1 Unit
• Indoor unit FDTA71KXE4R ..... 11 Units
• Piping length ..... 120 m (Equivalent length)
• Indoor, outdoor unit height difference ..... 15 m (Outdoor unit is higher)
• Temperature conditions ..... Outdoor temperature: 35°C DB
• Temperature conditions ..... Indoor temperature: 18°C WB

<Indoor unit total cooling capacity>: Item (2) (a) calculation.

• Indoor unit rated cooling capacity: 7.1 kW
• Capacity compensation coefficient according to temperature conditions:
0.94 (Calculated according to Indoor 18°C WB / Outdoor 35°C DB); (See page 176)
Indoor unit cooling capacity: 7.1 kW × 0.94 ≒ 6.7 kW
• Indoor unit total cooling capacity calculation;
indoor unit total cooling capacity: 6.7 kW × 11 units ≒ 73.7 kW

<Outdoor unit maximum cooling capacity> : Item (2) (b) calculation

• Outdoor unit rated cooling capacity: 73.5 kW
• Capacity compensation coefficient according to temperature conditions:
0.94 (Calculated according to Indoor 18°C WB / Outdoor 35°C DB); (See page 176)
Outdoor unit cooling capacity: 73.5 kW × 0.94 ≒ 69.1 kW
• Capacity compensation coefficient according to piping length: 0.93 (calculated according to 120 m length); (See page 179)
69.1 kW × 0.93 ≒ 64.3 kW
• Capacity compensation coefficient according to height difference: 1.0 (the outdoor unit is higher during cooling)
No compensation
• Capacity compensation coefficient according to indoor unit connected total capacity: 1.01 ← (71 × 11) / 735 = 106%) (See page 190)
64.3 kW × 1.01 ≒ 64.9 kW

<System cooling capacity>: Item (2) (c) calculation

Compare the indoor unit total cooling capacity and the outdoor unit maximum cooling capacity. The smaller value is the actual system cooling capacity.

• Indoor unit total cooling capacity : 73.7 kW ⇨ System cooling capacity: 64.9 kW
• Outdoor unit maximum cooling capacity : 64.9 kW

<Indoor unit cooling capacity Compensation>: Item (2) (d) calculation.

$$\frac{64.9\ \text{kW} \times 6.7\ \text{kW}}{73.7\ \text{kW}} \fallingdotseq 5.9\ \text{kW}$$

Example 3

Heating (when the indoor unit connected total capacity is 100% or higher)

• Outdoor unit FDCA735HKXE4BR ..... 1 Unit
• Indoor unit FDTA71KXE4R ..... 11 Units
• Piping length ..... 60 m (Equivalent length)
• Indoor, outdoor unit height difference ..... 20 m (Outdoor unit is higher)
• Temperature conditions ..... Outdoor temperature: 6°C WB
• Temperature conditions ..... Indoor temperature: 19°C DB

<Indoor unit total heating capacity>: Item (2) (a) calculation.

• Indoor unit rated heating capacity:8.0 kW
• Capacity compensation coefficient according to temprature conditions:
1.04 (Calculated according to Outdoor 6°C WB / Indoor 19°C DB); (See page 177)
Indoor unit heating capacity: 8.0 kW × 1.04 ≒ 8.3 kW
• Indoor unit total heating capacity calculation;
indoor unit total heating capacity: 8.3 kW × 11 units ≒ 91.3 kW

<Outdoor unit maximum heating capacity> : Item (2) (b) calculation

- Outdoor unit rated heating capacity: 82.5 kW
- Capacity compensation coefficient according to temperature conditions:
  1.04 (Calculated according to Outdoor 6°C WB / Indoor 19°C DB); (See page 177)
  Outdoor unit heating capacity: 82.5 kW × 1.04 = 85.8 kW
- Capacity compensation coefficient according to piping length: 0.96 (calculated according to 60 m length); (See page 179)
  85.8 kW × 0.96 ≒ 82.4 kW
- Capacity compensation coefficient according to height difference: 0.96 (calculated according to 20 m difference); (See page 184)
  82.4 kW × 0.96 ≒ 79.1 kW
- Correction of heating capacity in relation to the frost on the outdoor unit heat exchanger: 1.0;
  79.1 kW × 1.0 ≒ 79.1 kW.
- Capacity compensation coefficient according to indoor unit connected total capacity: 1.01←(71 × 11) / 735 = 106%) (See page 190)
  79.1 kW × 1.01 ≒ 79.9 kW.

<System heating capacity>: Item (2) (c) calculation

Compare the indoor unit total heating capacity and the outdoor unit maximum heating capacity. The smaller value is the actual system heating capacity.

- Indoor unit total heating capacity : 91.3 kW ⇨ System heating capacity: 79.9 kW
- Outdoor unit maximum heating capacity : 79.9 kW

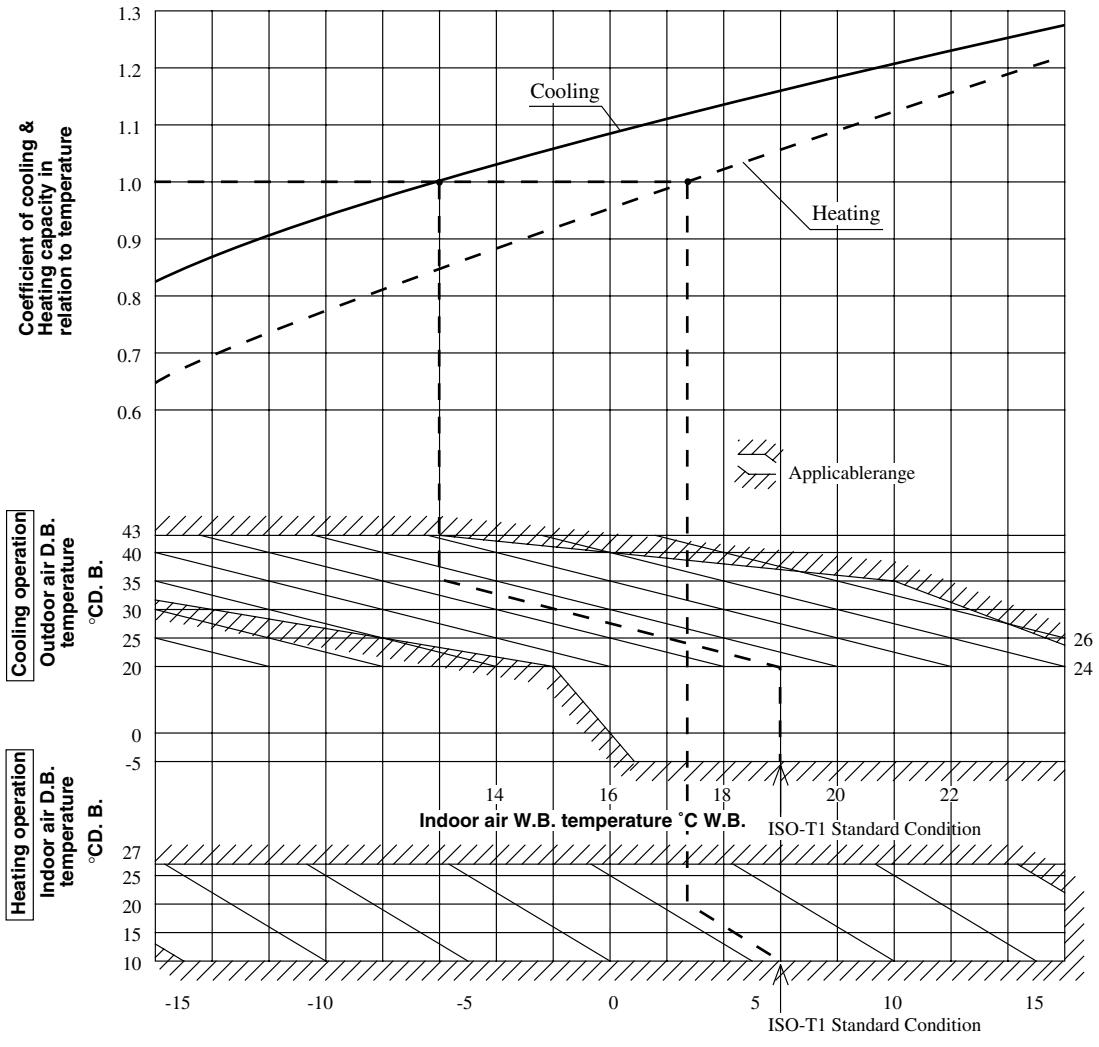
<Indoor unit heating capacity compensation> (Item (2) (d) calculation

$$\frac{79.9\ \text{kW} \times 8.3\ \text{kW}}{91.3\ \text{kW}} \fallingdotseq 7.3\ \text{kW}$$

(3) Capacity compensation coefficient

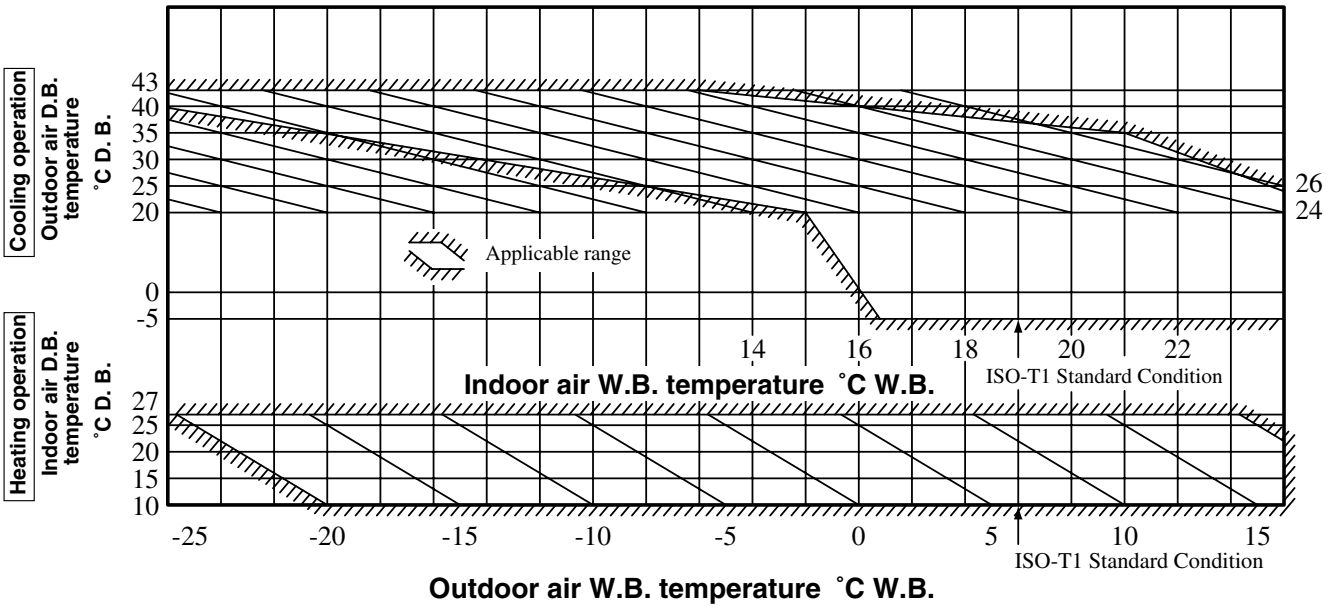
(a) Range of usage & limitations or Coefficient of cooling and heating capacity in relation to temperatures

(i) Models FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R



(ii) Models FDCA224~1360HKXE4BR, 224~1360HKXRE4BR

1) Rage of usage & limitations



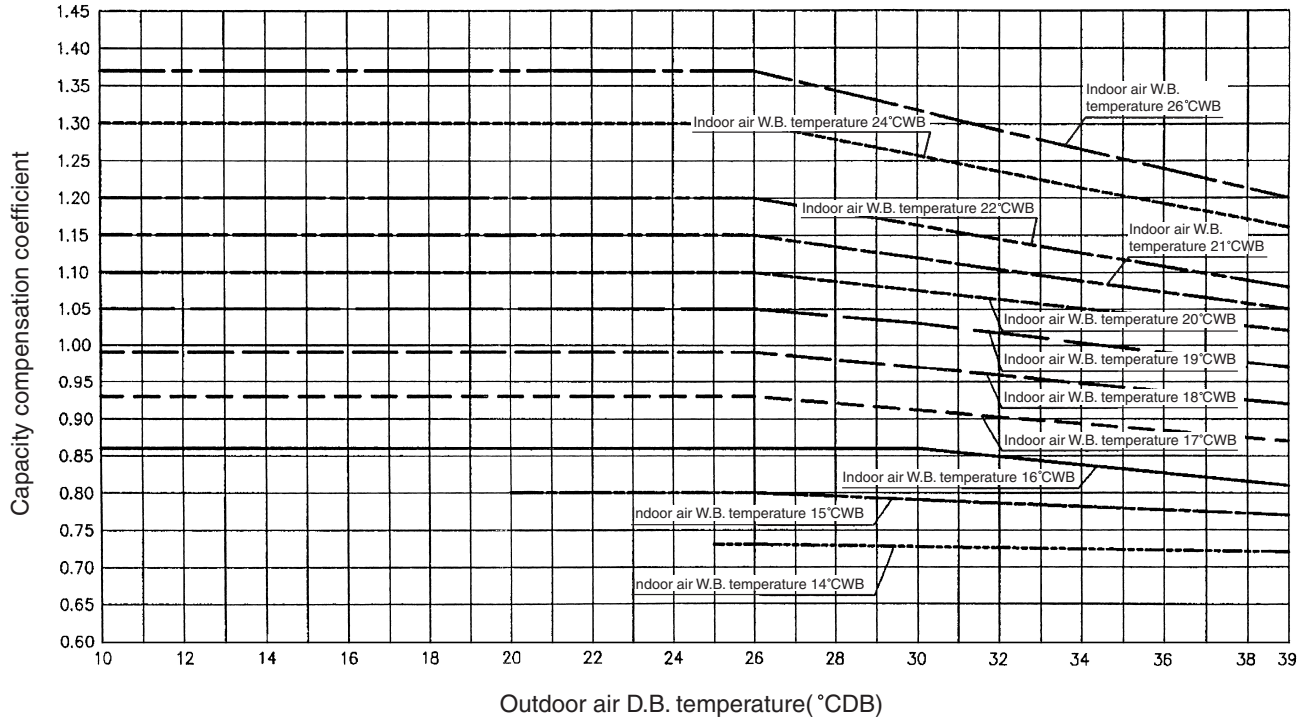
2) Coefficient of cooling and heating capacity in relation to temperatures

Notes (1) When there is simultaneous cooling operation with an outside temperature of 5°C or less, there is a reduction in cooling capacity compared with cooling operation only. (KXR series only)
(Not suitable for year-round cooling applications in server rooms and the like.)

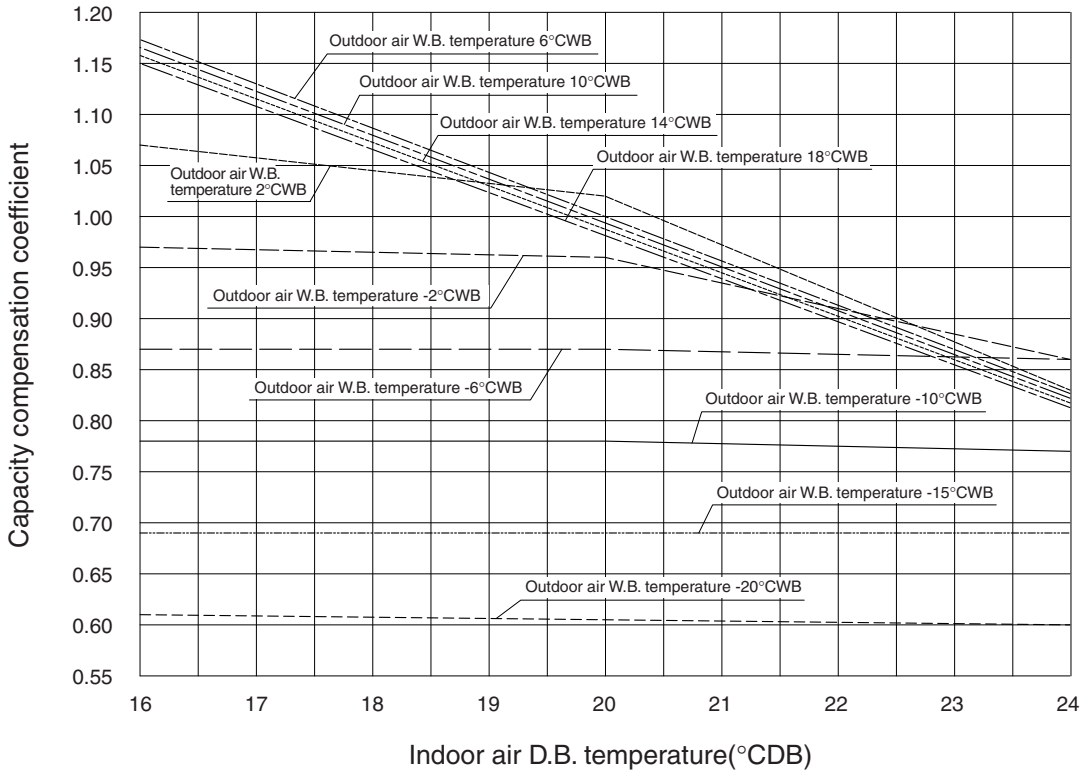
(b) Capacity compensation coefficient and power consumption compensation coefficient according to indoor and outdoor temperature conditions.

1) Capacity compensation coefficient

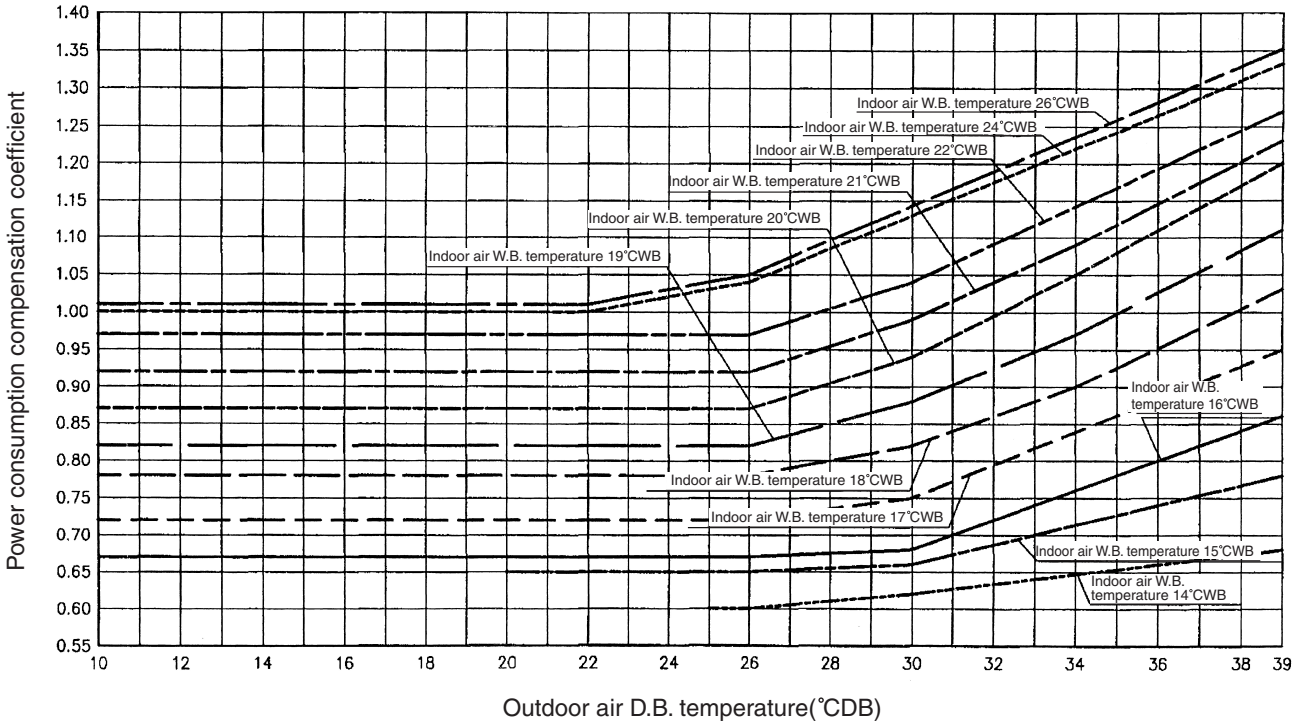
◆Cooling



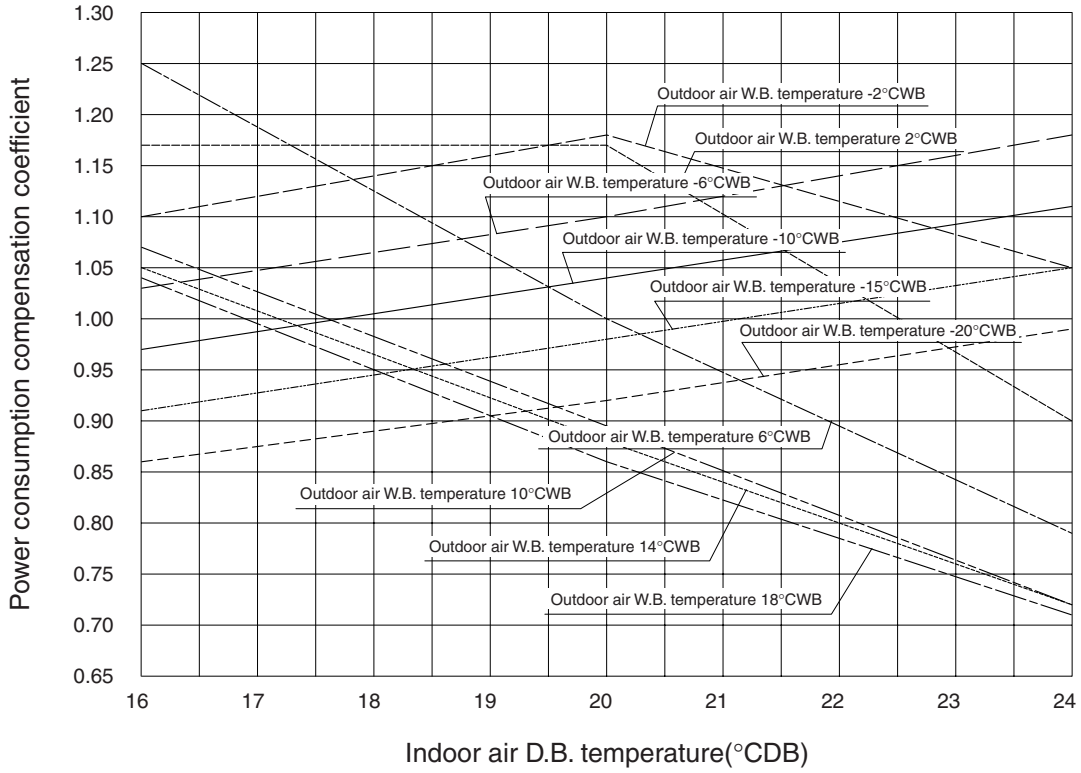
◆**Heating**



2) Power consumption correction factor



◆Heating

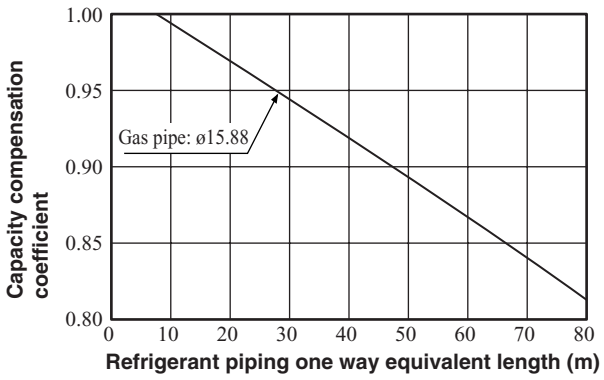


(c) Correction of cooling and heating capacity in relation to one way length of refrigerant piping.

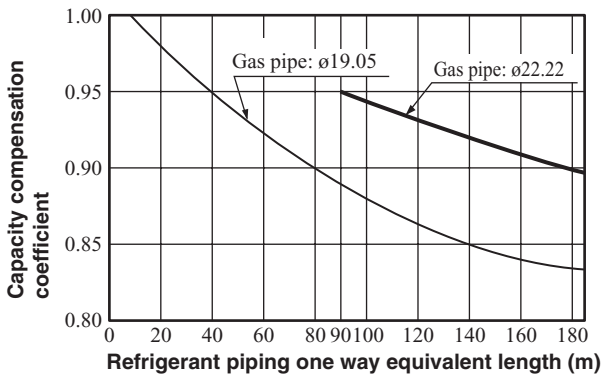
1) Cooling

a) KX series

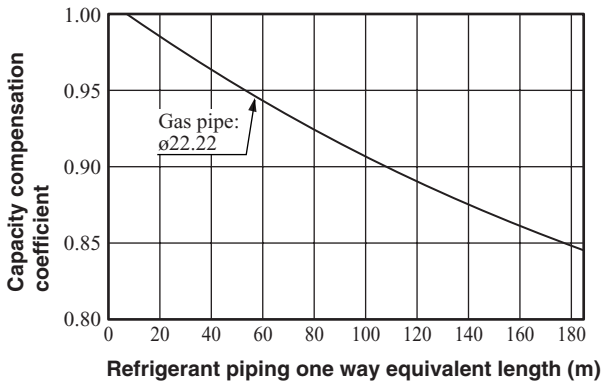
Models FDCA140HKXEN4R, 140, 160HKXES4R



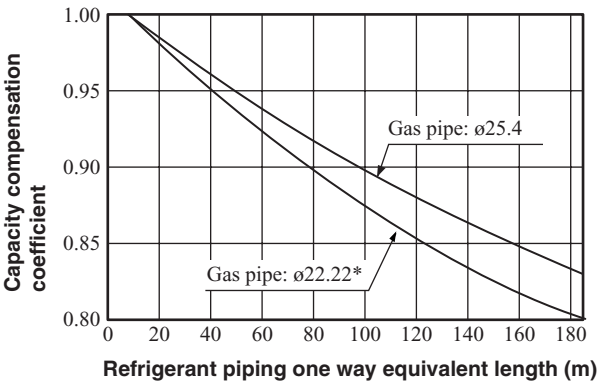
Model FDCA224HKXE4BR



Model FDCA280HKXE4BR

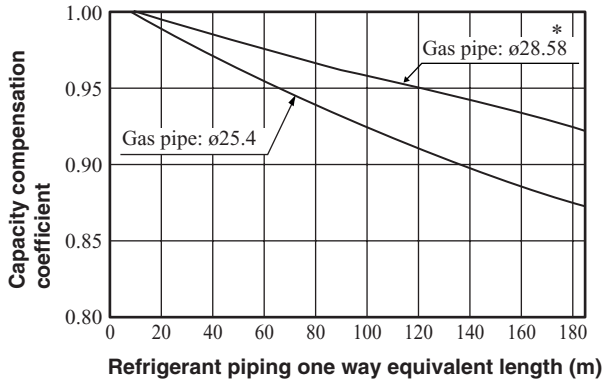


Model FDCA335HKXE4BR

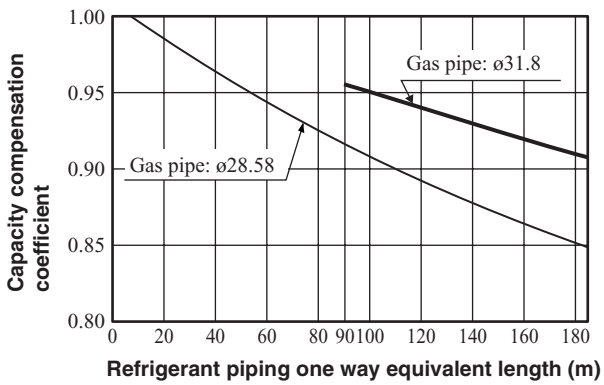


Note (1) Parts with the * mark show the piping size in case used in Europe.

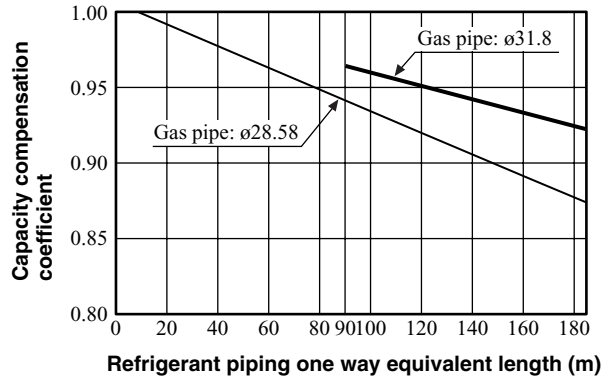
Model FDCA400HKXE4BR



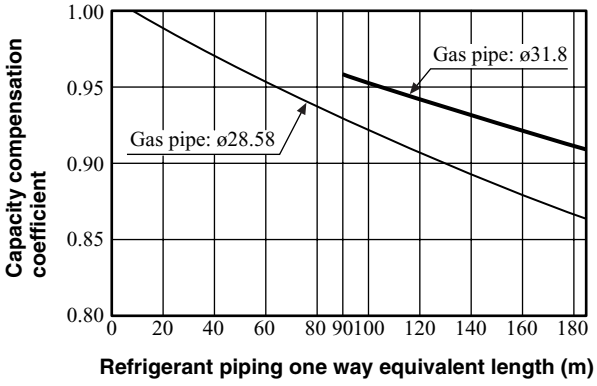
Model FDCA450HKXE4BR



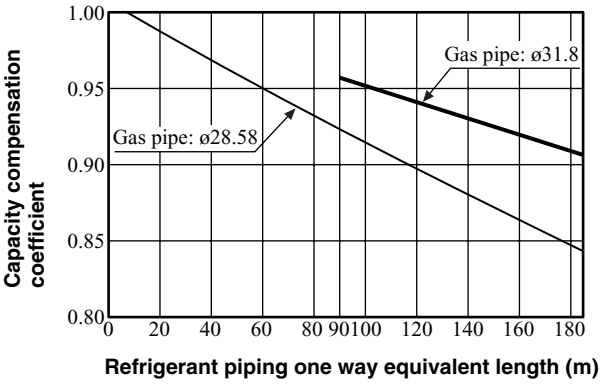
Model FDCA504HKXE4BR



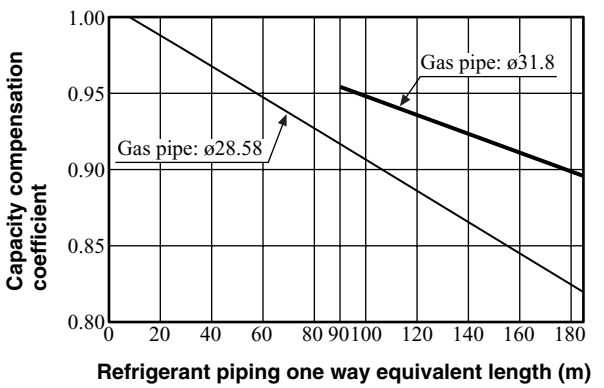
Model FDCA560HKXE4BR



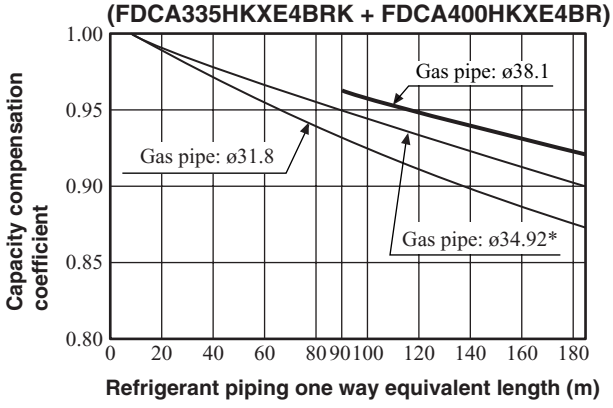
Model FDCA615HKXE4BR



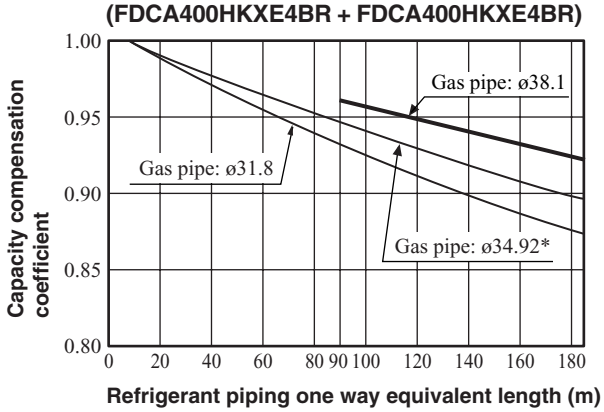
Model FDCA680HKXE4BR



Model FDCA735HKXE4BR
(FDCA335HKXE4BRK + FDCA400HKXE4BR)

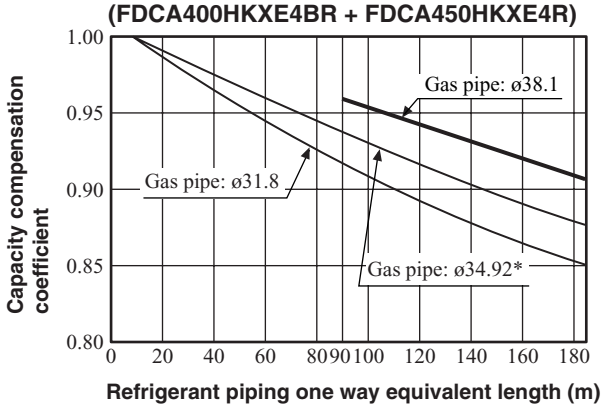


Model FDCA800HKXE4BR
(FDCA400HKXE4BR + FDCA400HKXE4BR)

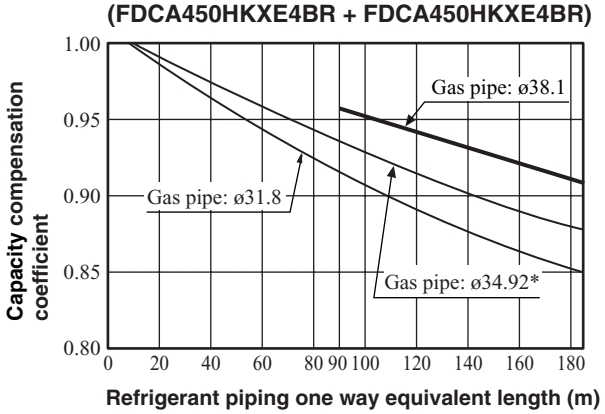


Note (1) Parts with the * mark show the piping size in case used in Europe.

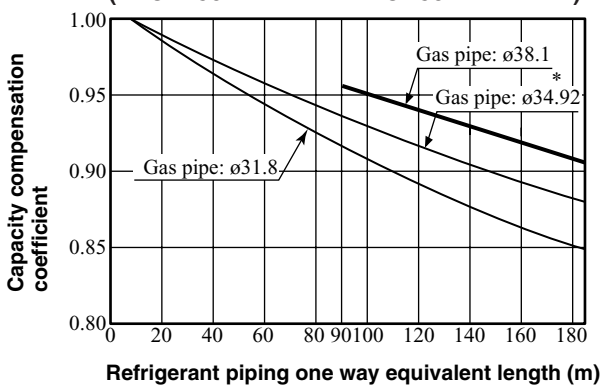
Model FDCA850HKXE4BR
(FDCA400HKXE4BR + FDCA450HKXE4R)



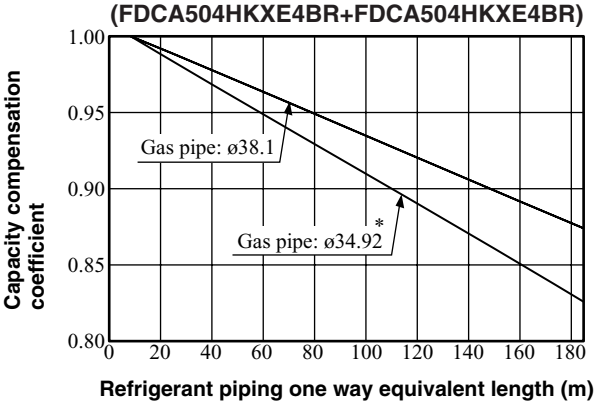
Model FDCA900HKXE4BR
(FDCA450HKXE4BR + FDCA450HKXE4BR)



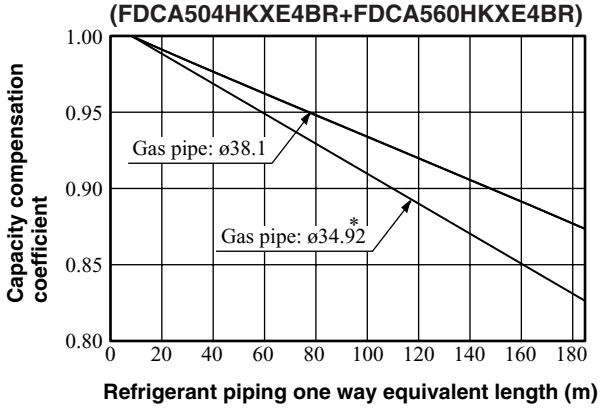
Model FDCA960HKXE4BR
(FDCA450HKXE4BR+FDCA504HKXE4BR)



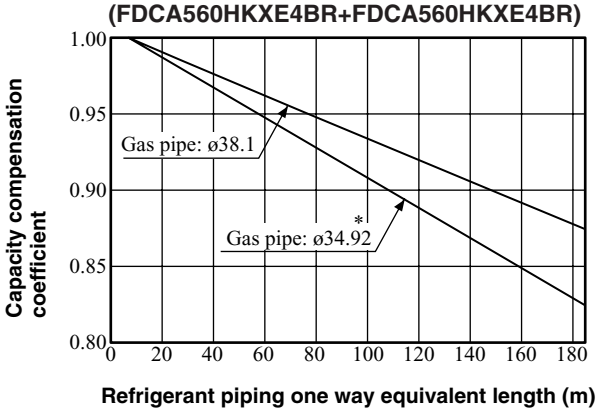
Model FDCA1010HKXE4BR
(FDCA504HKXE4BR+FDCA504HKXE4BR)



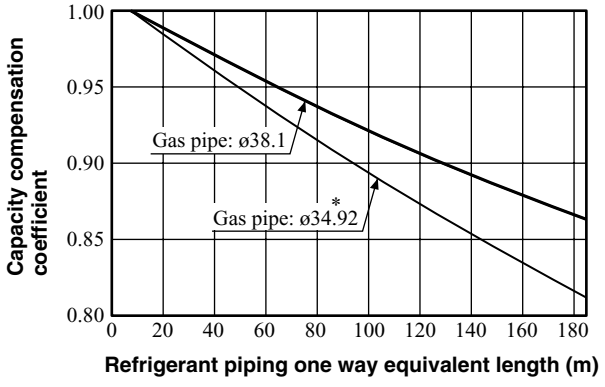
Model FDCA1065HKXE4BR
(FDCA504HKXE4BR+FDCA560HKXE4BR)



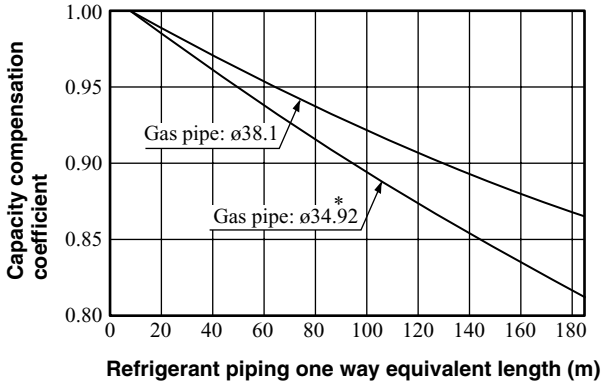
Model FDCA1130HKXE4BR
(FDCA560HKXE4BR+FDCA560HKXE4BR)



Model FDCA1180HKXE4BR
(FDCA560HKXE4BR+FDCA615HKXE4BR)

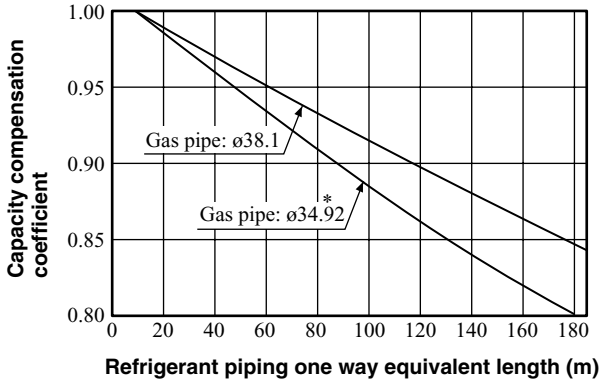


Model FDCA1235HKXE4BR
(FDCA615HKXE4BR+FDCA615HKXE4BR)

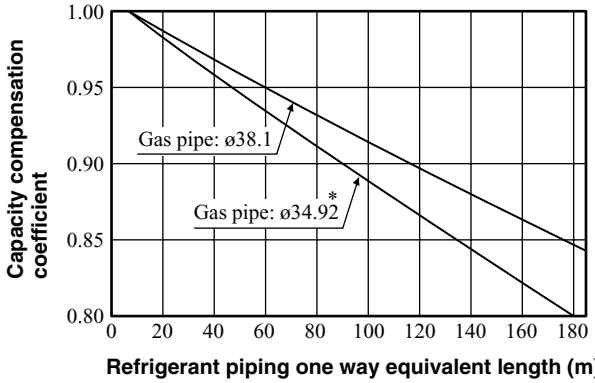


Note (1) Parts with the * mark show the piping size in case used in Europe.

Model FDCA1300HKXE4BR
(FDCA615HKXE4BR+FDCA680HKXE4BR)



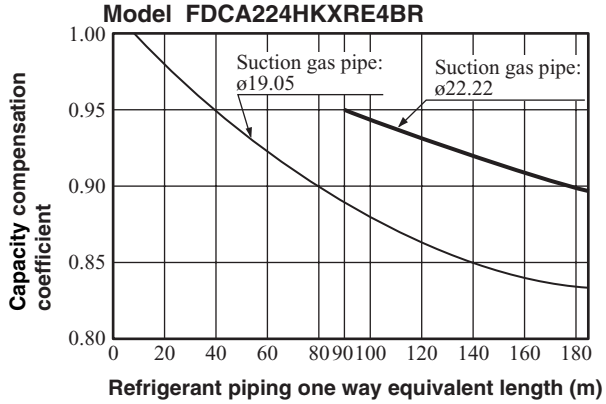
Model FDCA1360HKXE4BR
(FDCA680HKXE4BR+FDCA680HKXE4BR)



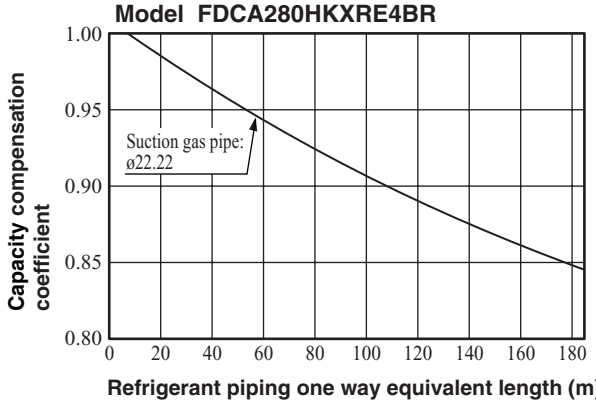
Note (1) Parts with the * mark show the piping size in case used in Europe.

b) KXR series

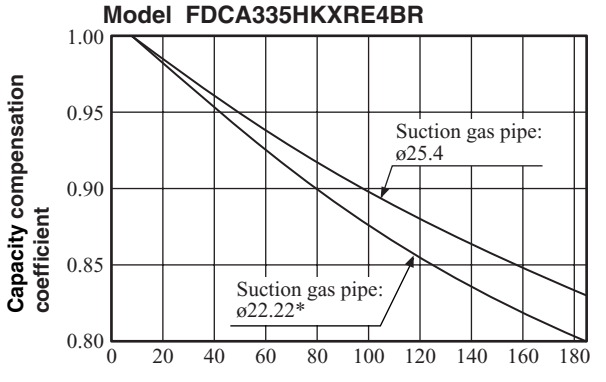
Model FDCA224HKXRE4BR



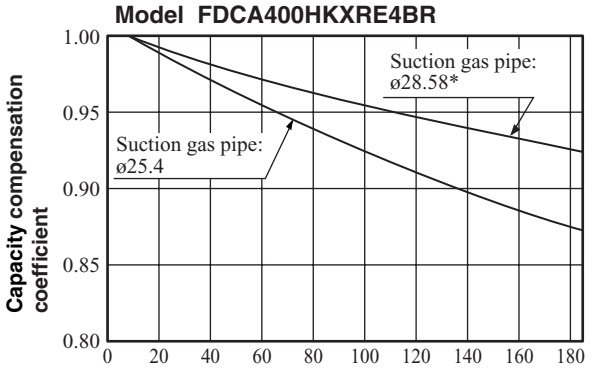
Model FDCA280HKXRE4BR



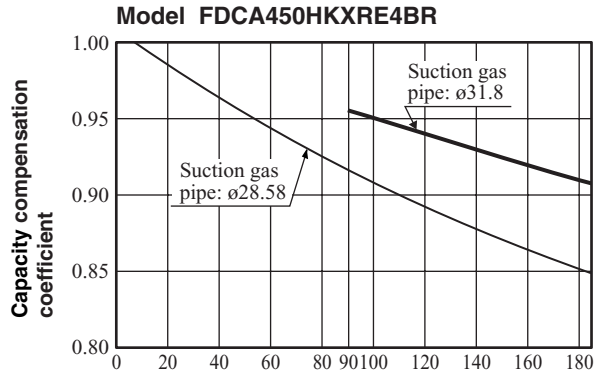
Model FDCA335HKXRE4BR



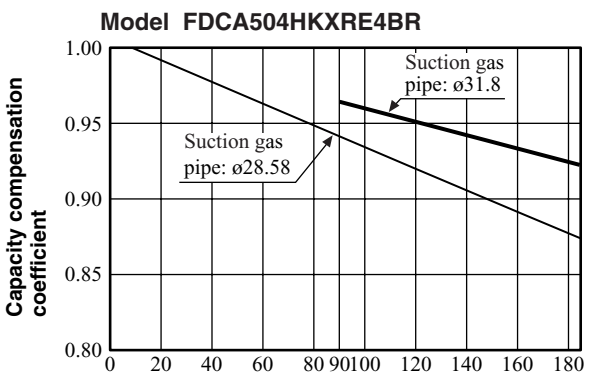
Model FDCA400HKXRE4BR



Model FDCA450HKXRE4BR

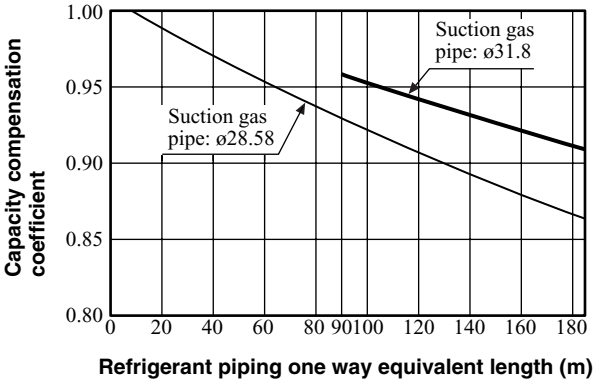


Model FDCA504HKXRE4BR

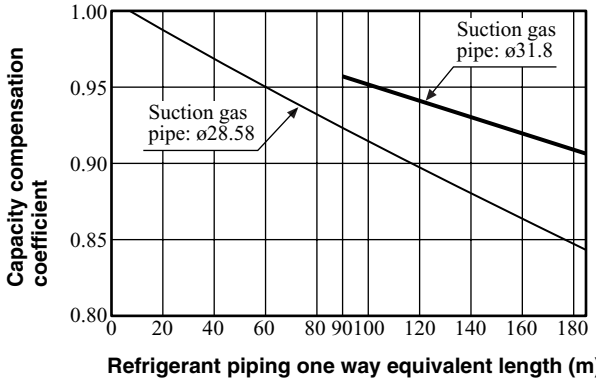


Note (1) Parts with the * mark show the piping size in case used in Europe.

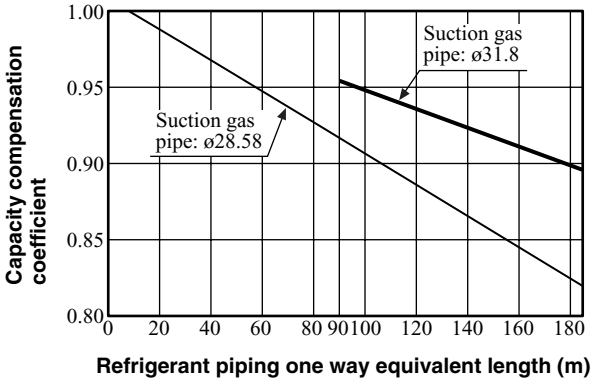
Model FDCA560HKXRE4BR



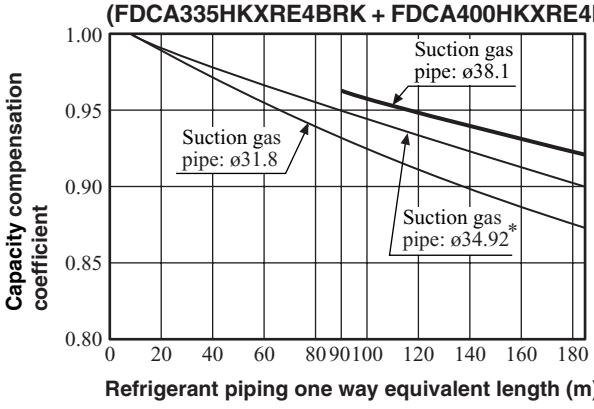
Model FDCA615HKXRE4BR



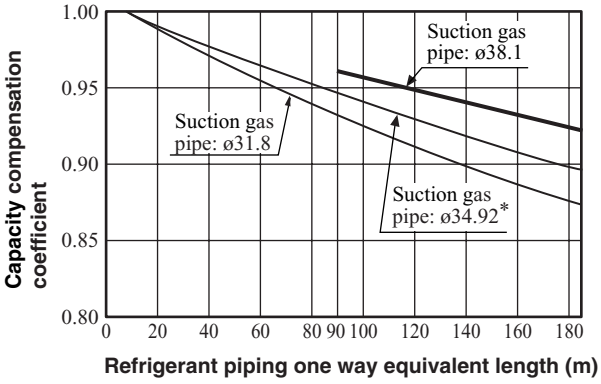
Model FDCA680HKXRE4BR



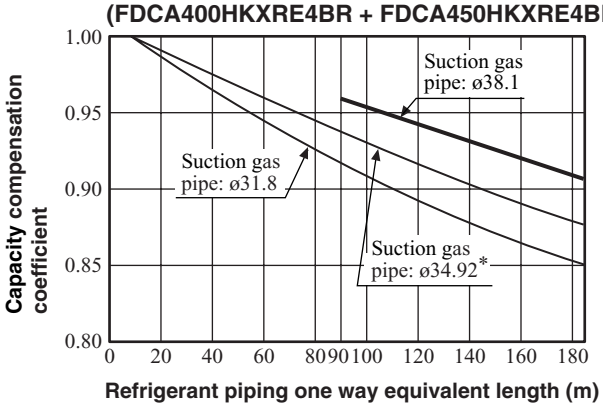
Model FDCA735HKXRE4BR
(FDCA335HKXRE4BRK + FDCA400HKXRE4BR)



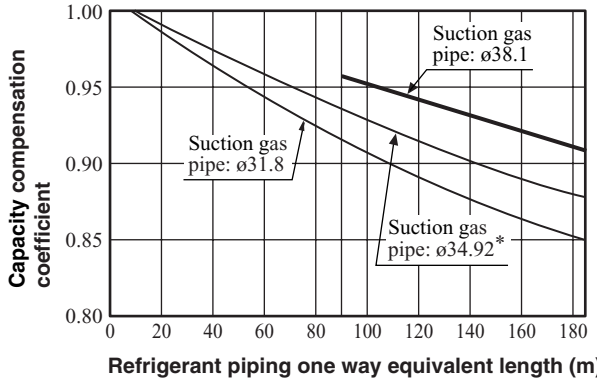
Model FDCA800HKXRE4BR
(FDCA400HKXRE4BR + FDCA400HKXRE4BR)



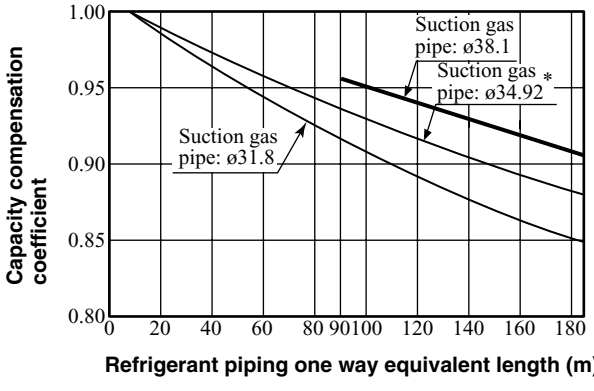
Model FDCA850HKXRE4BR
(FDCA400HKXRE4BR + FDCA450HKXRE4BR)



Model FDCA900HKXRE4BR
(FDCA450HKXRE4BR + FDCA450HKXRE4BR)

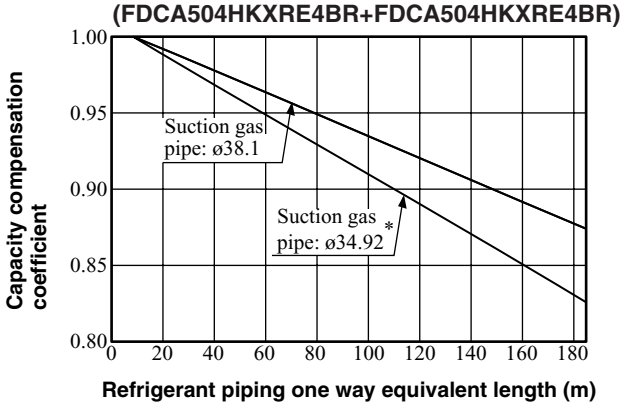


Model FDCA960HKXRE4BR
(FDCA450HKXRE4BR+FDCA504HKXRE4BR)

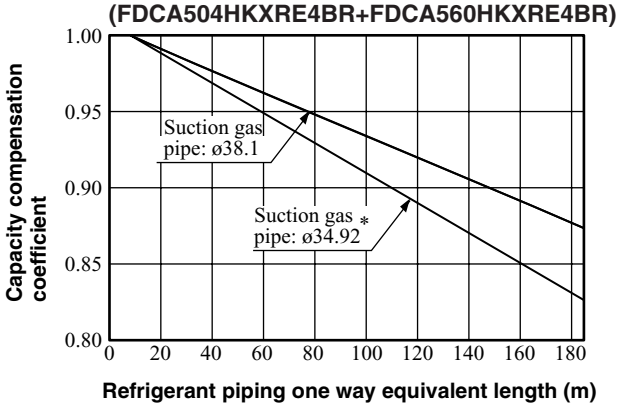


Note (1) Parts with the * mark show the piping size in case used in Europe.

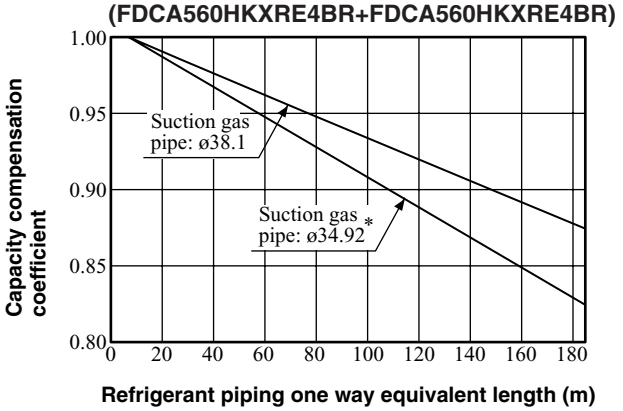
Model FDCA1010HKXRE4BR
(FDCA504HKXRE4BR+FDCA504HKXRE4BR)



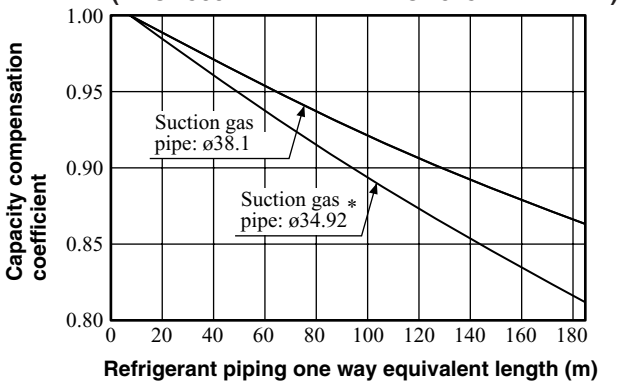
Model FDCA1065HKXRE4BR
(FDCA504HKXRE4BR+FDCA560HKXRE4BR)



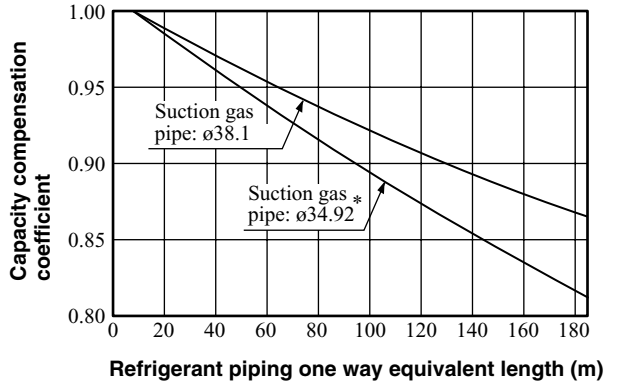
Model FDCA1130HKXRE4BR
(FDCA560HKXRE4BR+FDCA560HKXRE4BR)



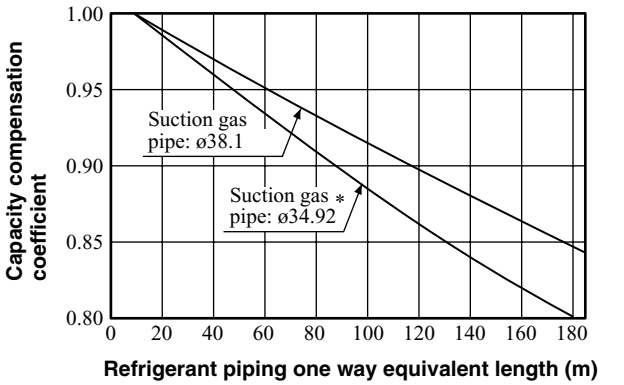
Model FDCA1180HKXRE4BR
(FDCA560HKXRE4BR+FDCA615HKXRE4BR)



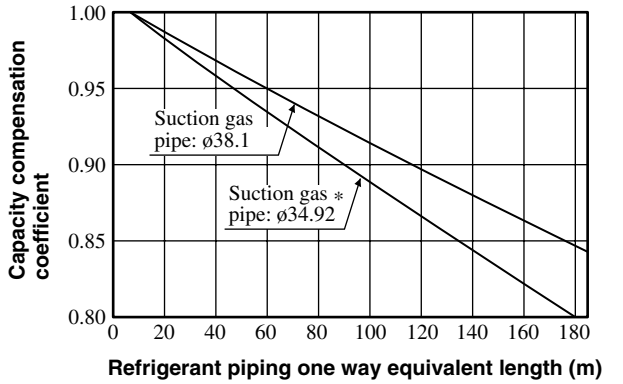
Model FDCA1235HKXRE4BR
(FDCA615HKXRE4BR+FDCA615HKXRE4BR)



Model FDCA1300HKXRE4BR
(FDCA615HKXRE4BR+FDCA680HKXRE4BR)

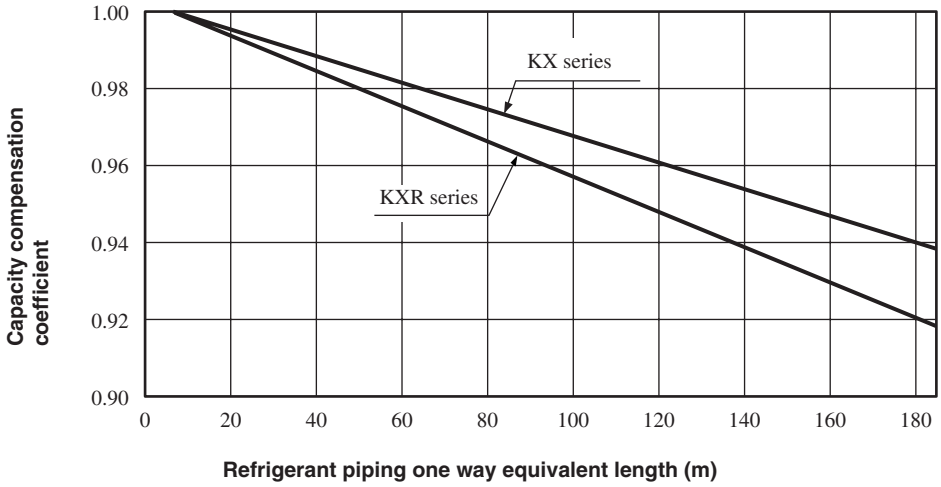


Model FDCA1360HKXRE4BR
(FDCA680HKXRE4BR+FDCA680HKXRE4BR)



Note (1) Parts with the * mark show the piping size in case used in Europe.

2) Heating (Common)



Note (1) Equivalent piping length can be obtained by calculating as follows.
Equivalent piping length = Real gas piping length + Number of bends in gas piping × Equivalent piping length of bends.

Equivalent length of each joint — Unit : m/one part

Gas piping size	ϕ9.52	ϕ12.7	ϕ15.88	ϕ19.05	ϕ25.4	ϕ28.58	ϕ31.8
Joint (90˚elbow)	0.15	0.20	0.25	0.30	0.40	0.45	0.55

(d) When the outdoor unit is located at a lower height than the indoor unit in cooling operation and when the outdoor unit is located at a higher height than the indoor unit in heating operation, the following values should be subtracted from the values in the above table.

Height difference between the indoor unit and outdoor unit in the vertical height difference	**5 m**	**10 m**	**15 m**	**20 m**	**25 m**	**30 m**
Adjustment coefficient	0.99	0.98	0.97	0.96	0.95	0.94

Height difference between the indoor unit and outdoor unit in the vertical height difference	**35 m**	**40 m**	**45 m**	**50 m**
Adjustment coefficient	0.93	0.92	0.91	0.90

(e) Correction of heating capacity in relation to the frost on the outdoor unit heat exchanger

Air inlet temperature of outdoor unit in ˚C WB	**-20**	**-15**	**-13**	**-11**	**-9**	**-7**	**-5**	**-3**	**-1**	**1**	**3**	**5 or more**
Adjustment coefficient	0.96	0.96	0.96	0.95	0.94	0.93	0.91	0.88	0.86	0.87	0.92	1

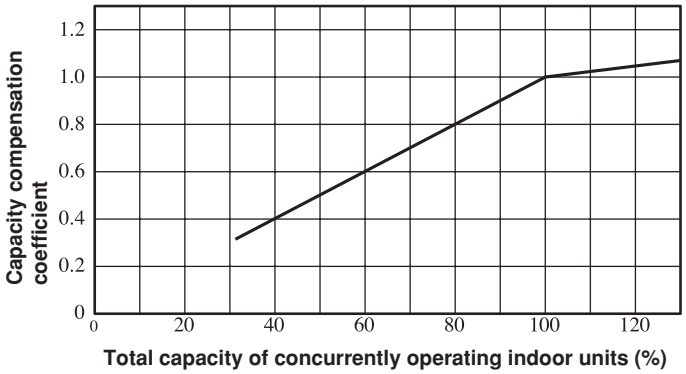
The correction factors will change drastically according to weather conditions. So necessary adjustment should be made empirically according to the weather data of the particular area.

(f) The capacity compensation coefficient and power consumption compensation coefficient vary according to the total capacity of concurrently operating indoor units, as shown next page.

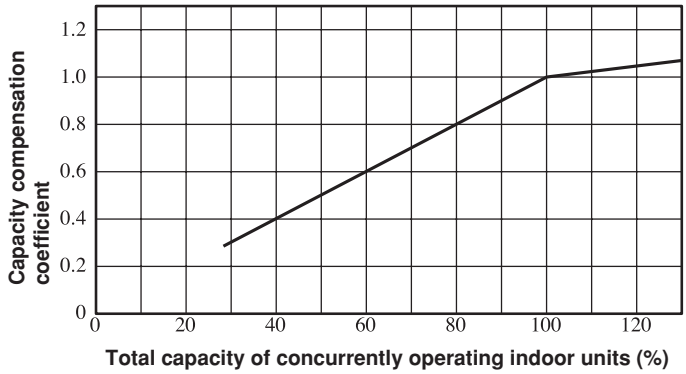
Model FDCA140HKXEN4R, 140, 160HKXES4R

◆ **Capacity compensation coefficient**

Cooling

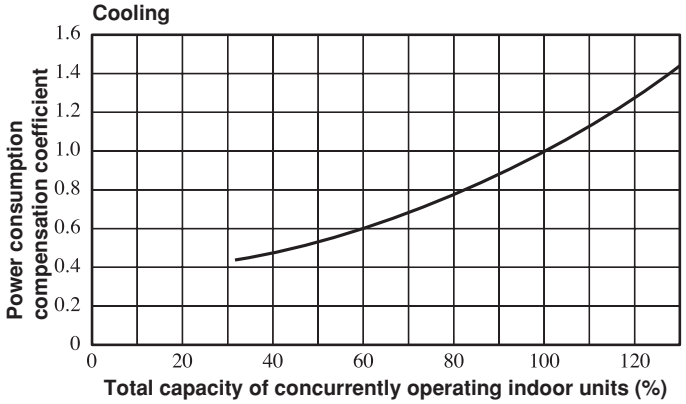


Heating

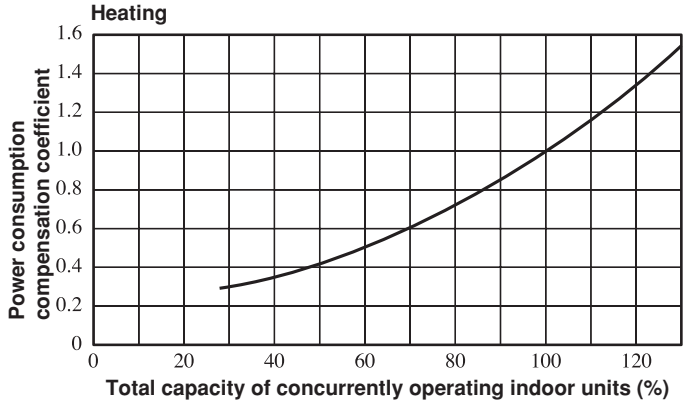


◆ **Power consumption compensation coefficient**

Cooling



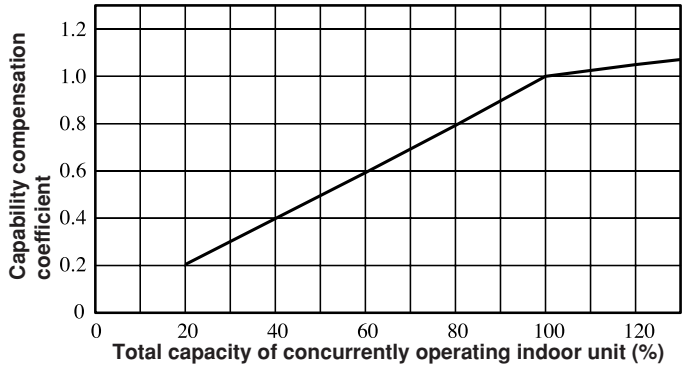
Heating



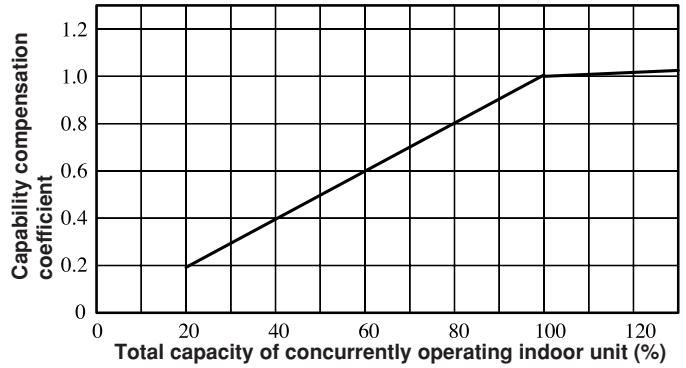
Model FDCA224HKXE4BR
224HKXRE4BR

◆ **Capability compensation coefficient**

Cooling

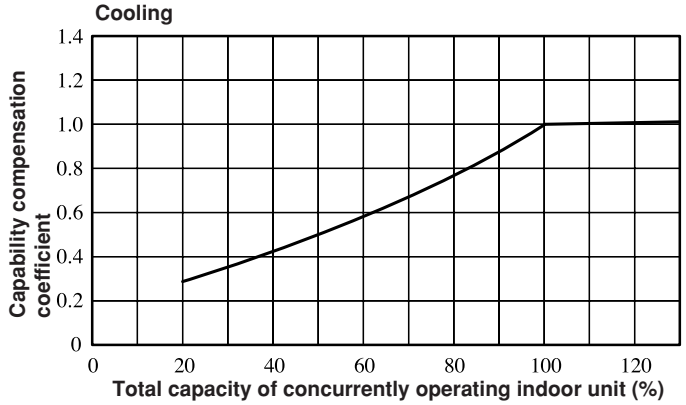


Heating

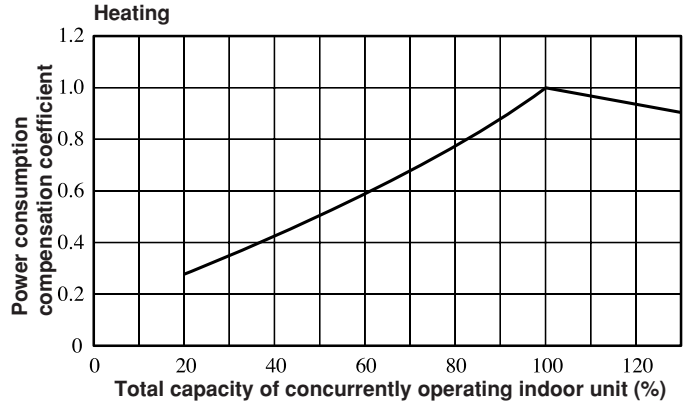


◆ **Power consumption compensation coefficient**

Cooling



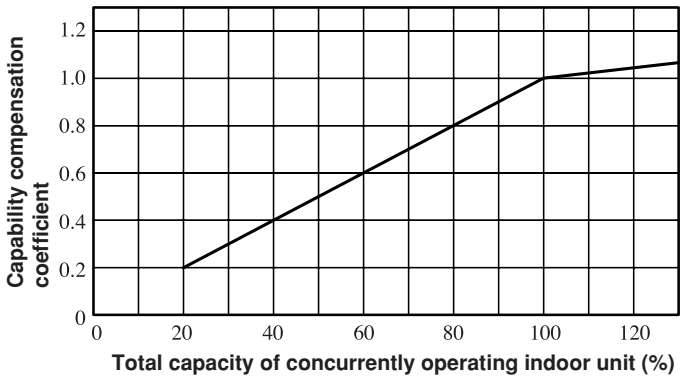
Heating



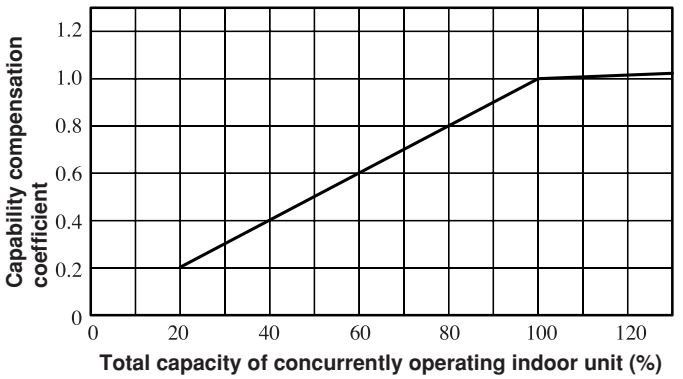
Model FDCA280HKXE4BR
280HKXRE4BR

◆ **Capability compensation coefficient**

Cooling

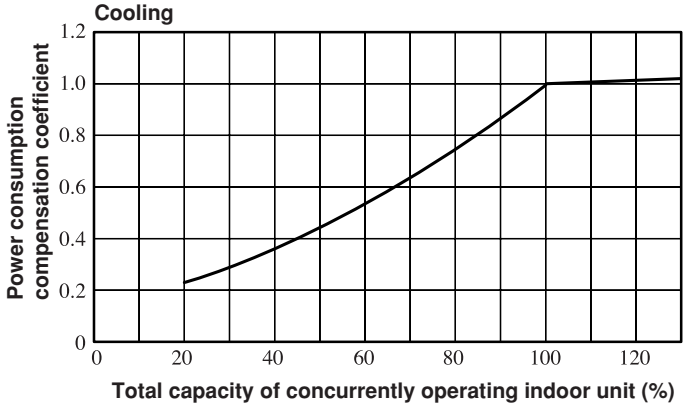


Heating

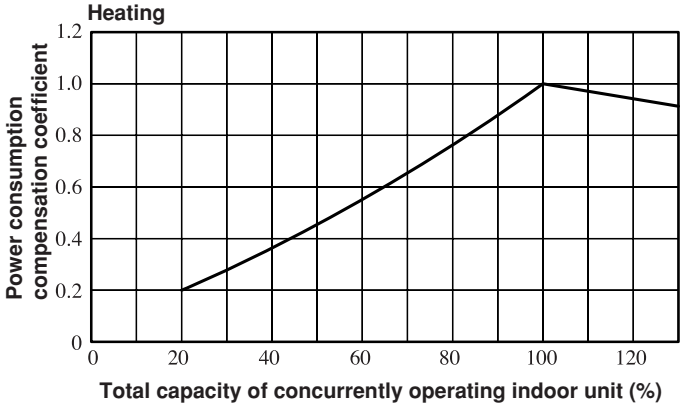


◆ **Power consumption compensation coefficient**

Cooling



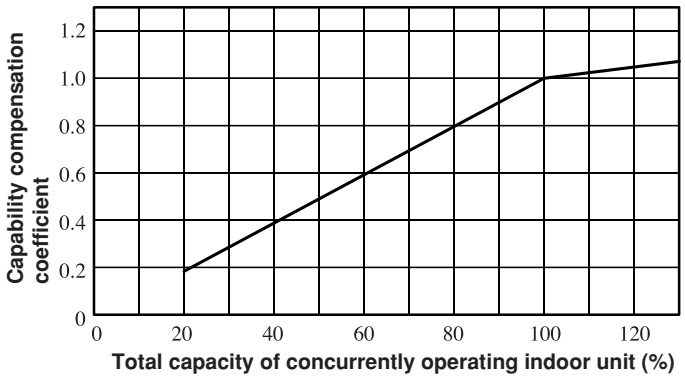
Heating



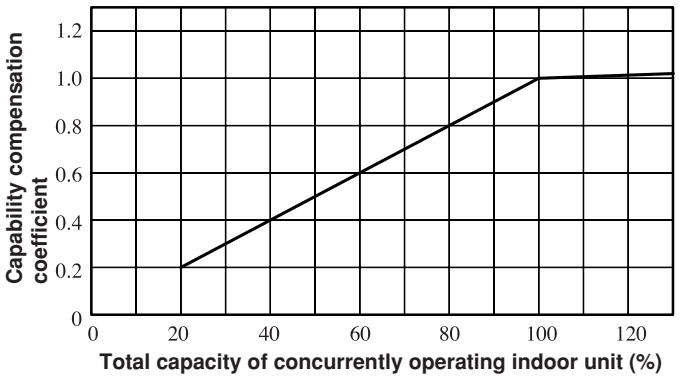
Model FDCA335HKXE4BR
335HKXER4BR

◆ **Capability compensation coefficient**

Cooling

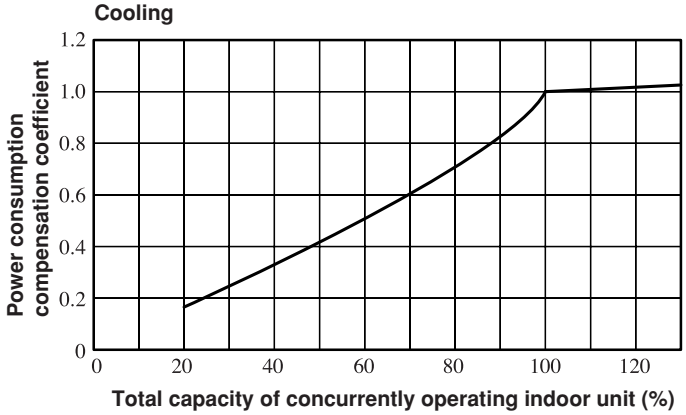


Heating

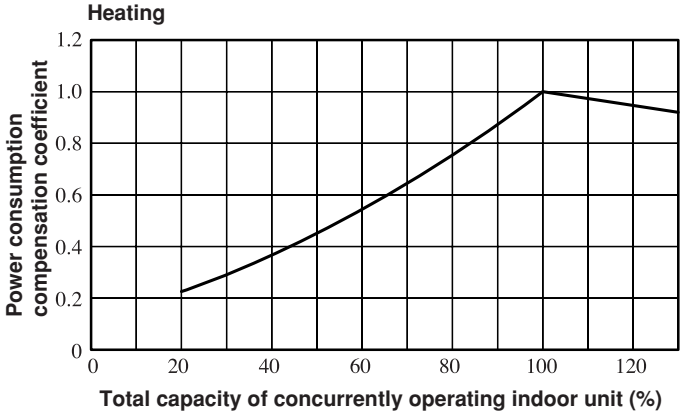


◆ **Power consumption compensation coefficient**

Cooling



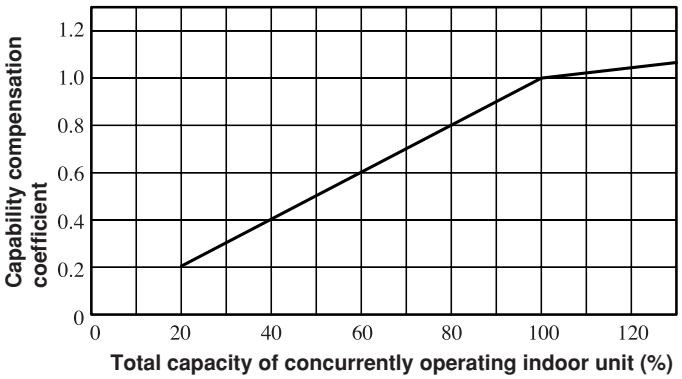
Heating



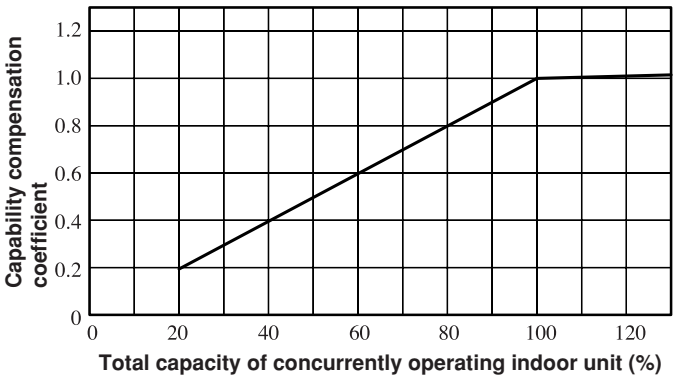
Model FDCA400HKXE4BR
400HKXRE4BR

◆ **Capability compensation coefficient**

Cooling

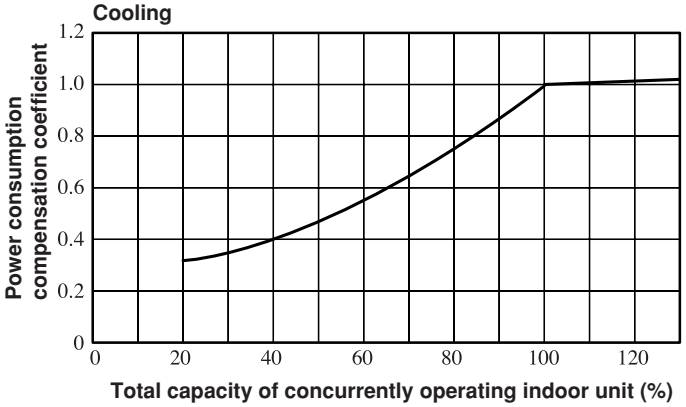


Heating

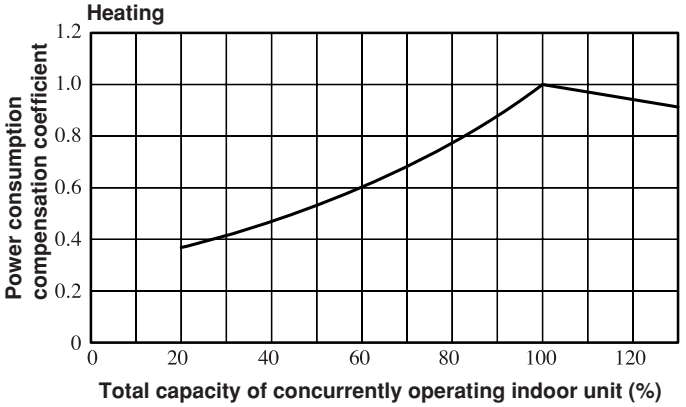


◆ **Power consumption compensation coefficient**

Cooling



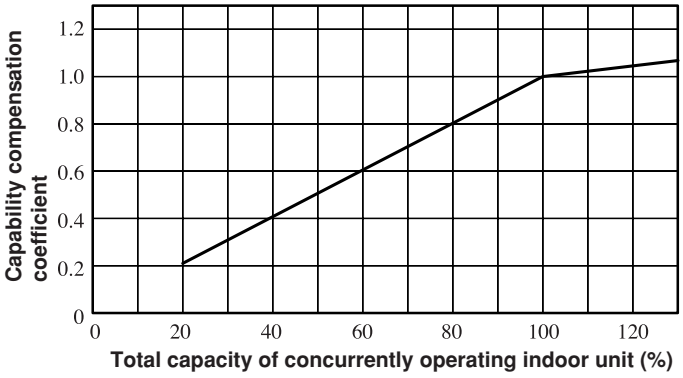
Heating



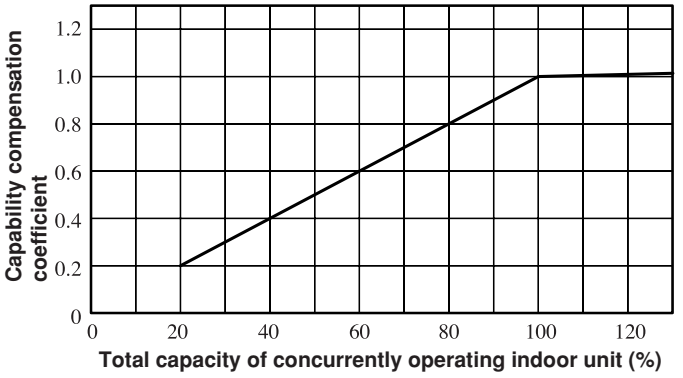
Model FDCA450HKXE4BR
450HKXER4BR

◆ **Capability compensation coefficient**

Cooling

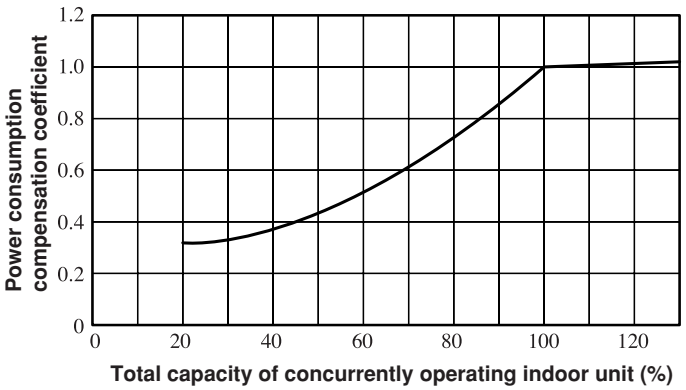


Heating

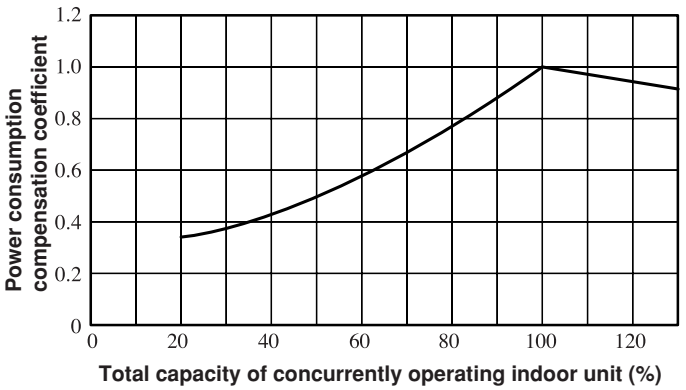


◆ **Power consumption compensation coefficient**

Cooling



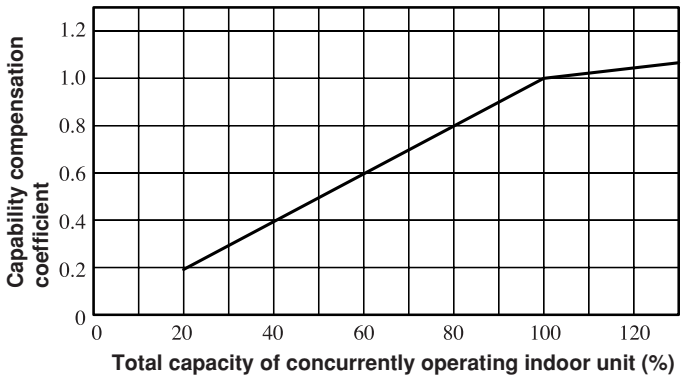
Heating



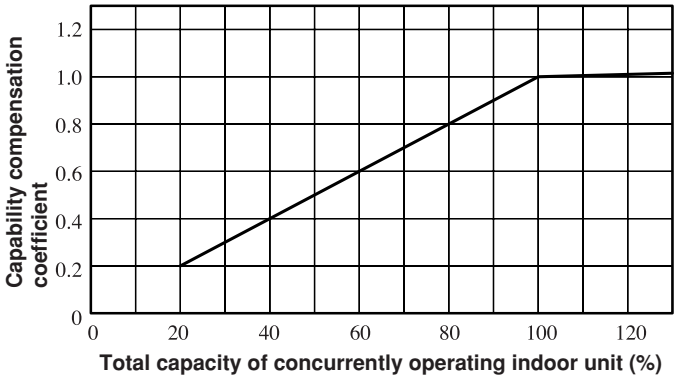
Model FDCA504HKXE4BR
504HKXRE4BR

◆ **Capability compensation coefficient**

Cooling

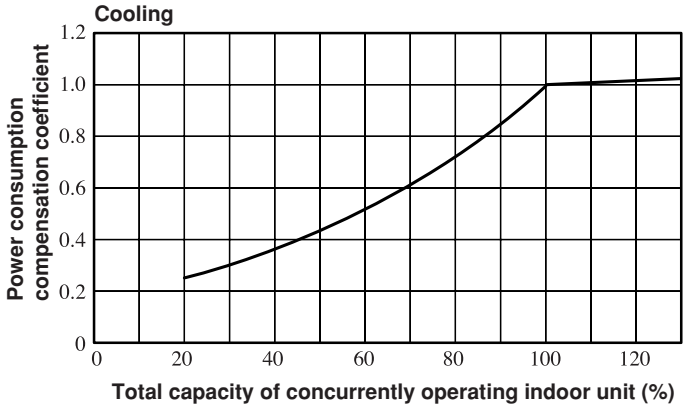


Heating

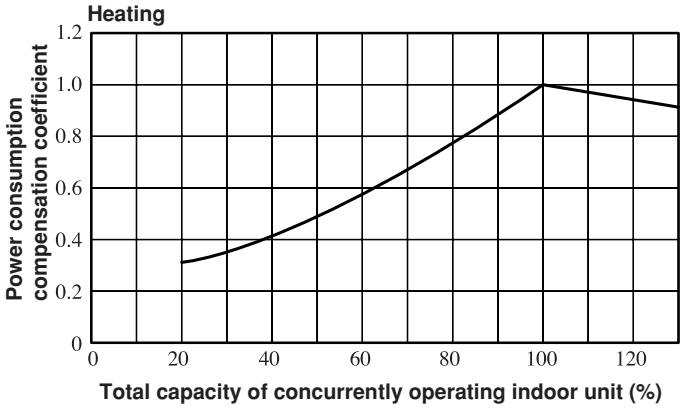


◆ **Power consumption compensation coefficient**

Cooling



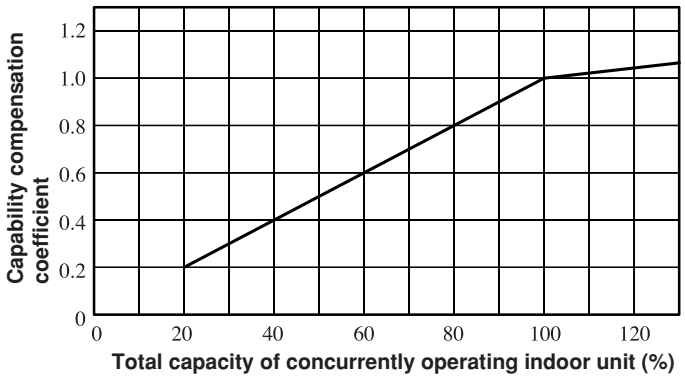
Heating



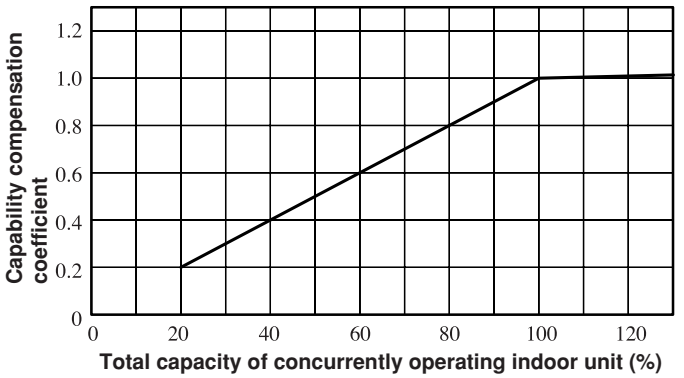
Model FDCA560HKXE4BR
560HKXER4BR

◆ **Capability compensation coefficient**

Cooling

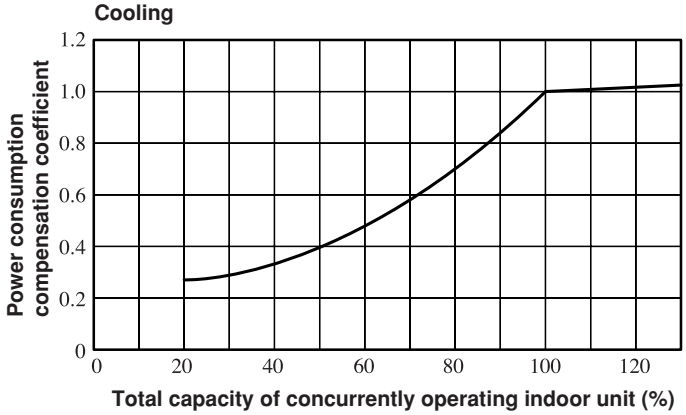


Heating

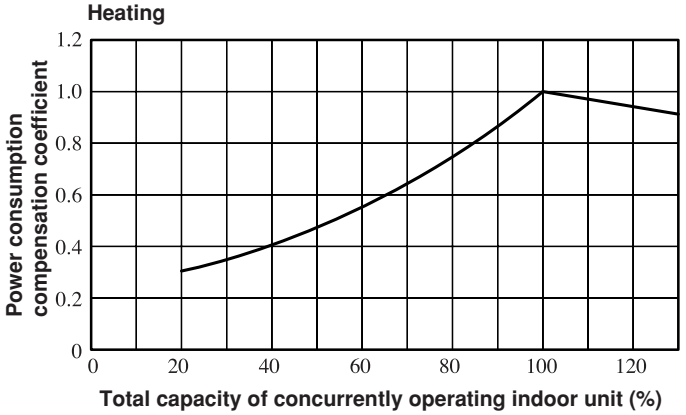


◆ **Power consumption compensation coefficient**

Cooling



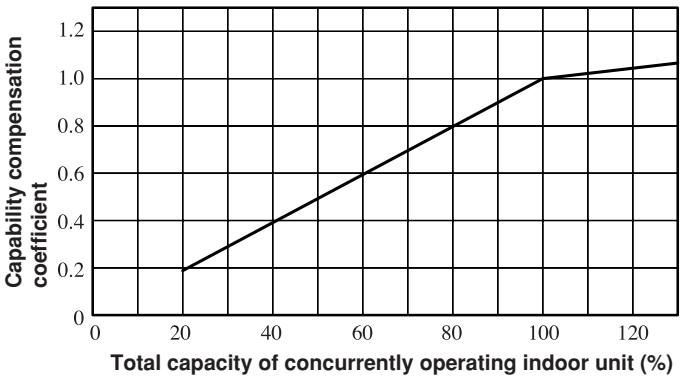
Heating



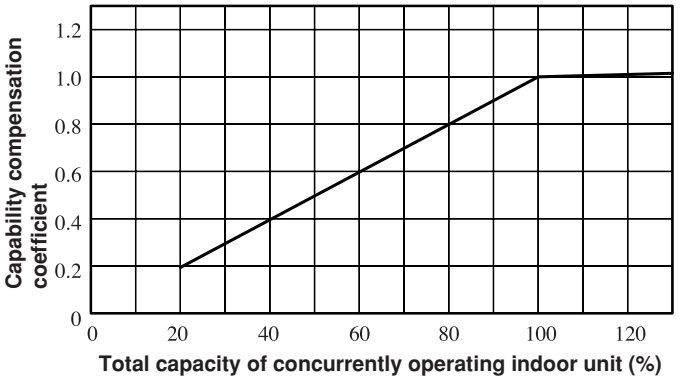
Model FDCA615HKXE4BR
615HKXRE4BR

◆ **Capability compensation coefficient**

Cooling

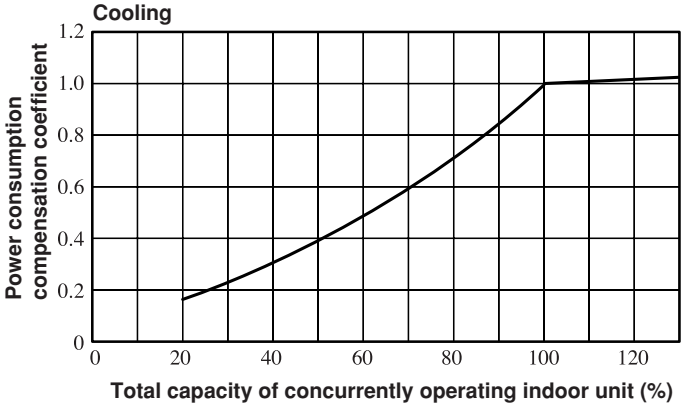


Heating

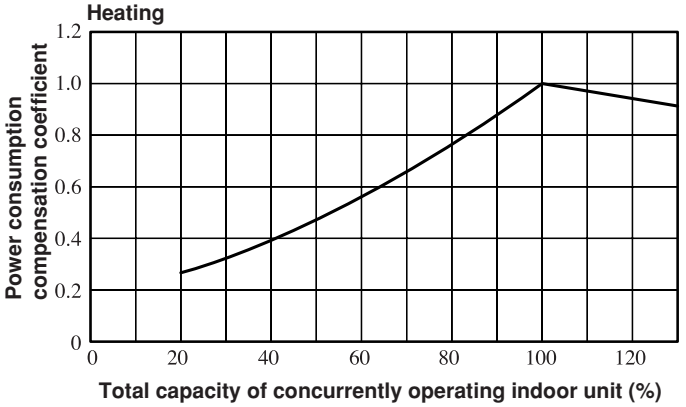


◆ **Power consumption compensation coefficient**

Cooling



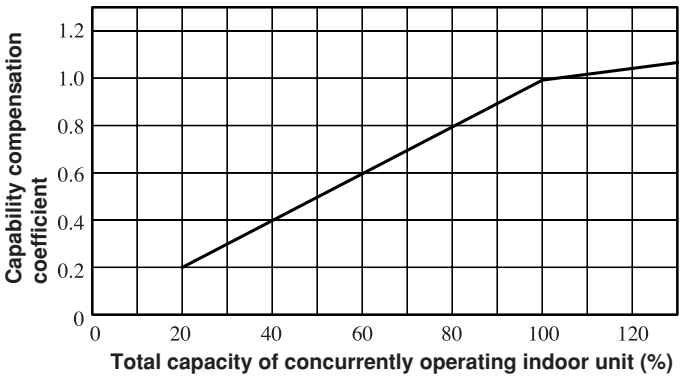
Heating



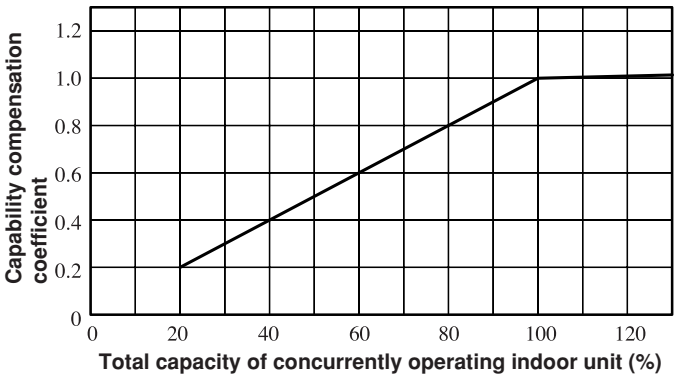
Model FDCA680HKXE4BR
680HKXER4BR

◆ **Capability compensation coefficient**

Cooling

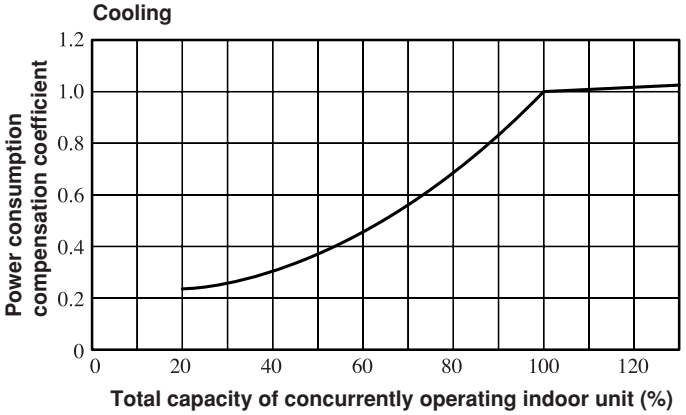


Heating

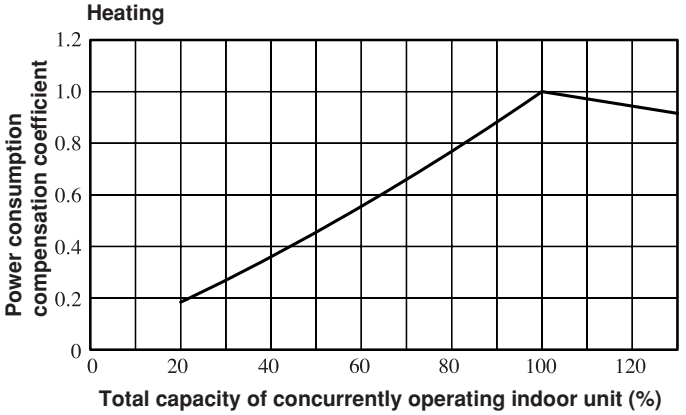


◆ **Power consumption compensation coefficient**

Cooling



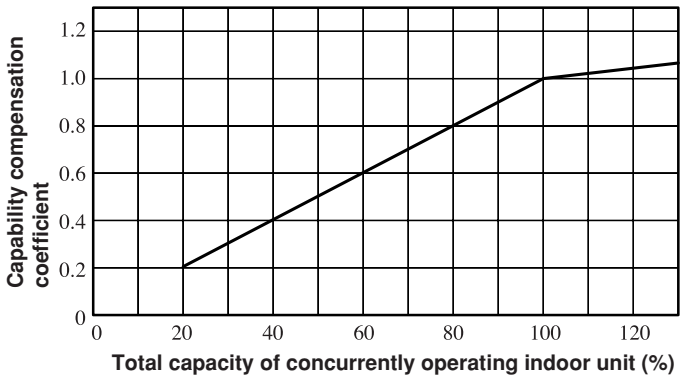
Heating



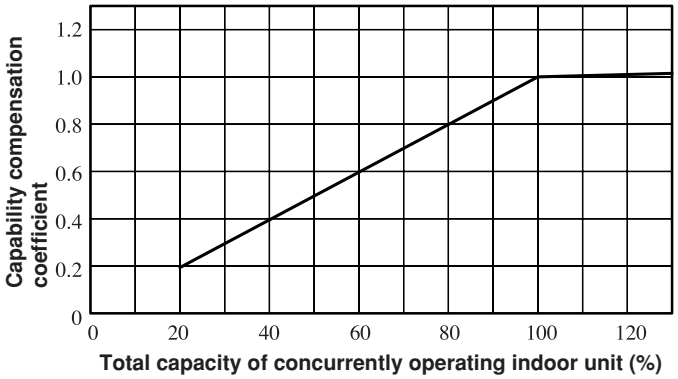
Model FDCA735HKXE4BR
735HKXRE4BR

◆ **Capability compensation coefficient**

Cooling

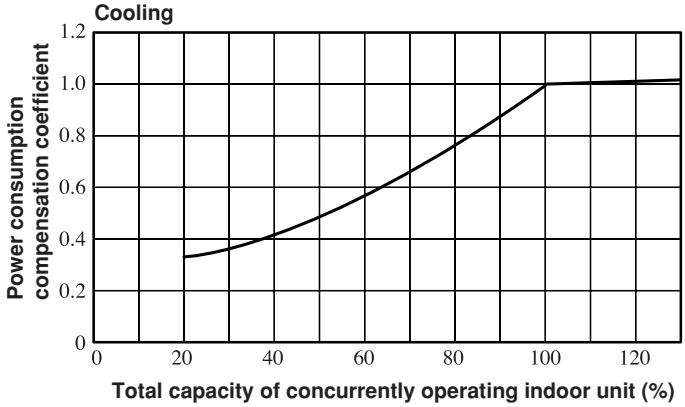


Heating

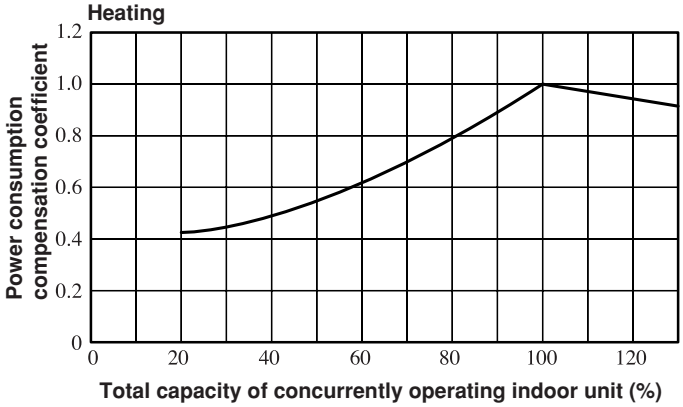


◆ **Power consumption compensation coefficient**

Cooling



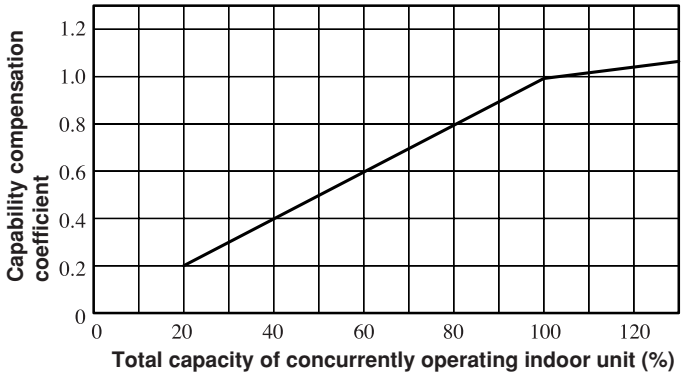
Heating



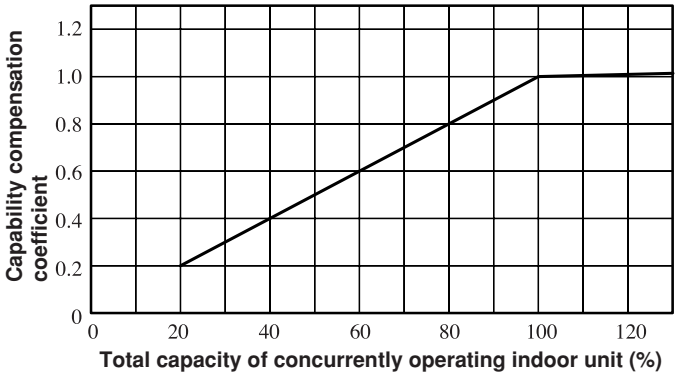
Model FDCA800HKXE4BR
800HKXER4BR

◆ **Capability compensation coefficient**

Cooling

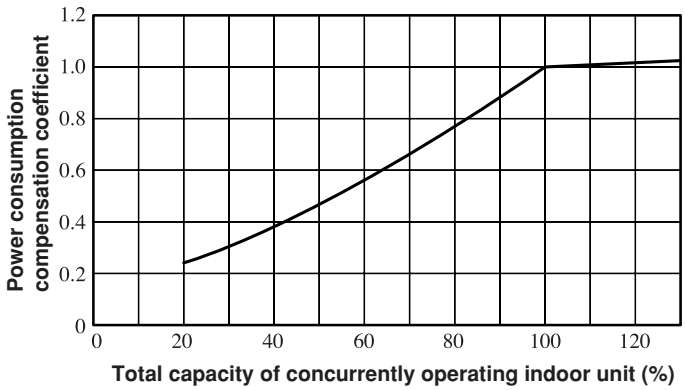


Heating

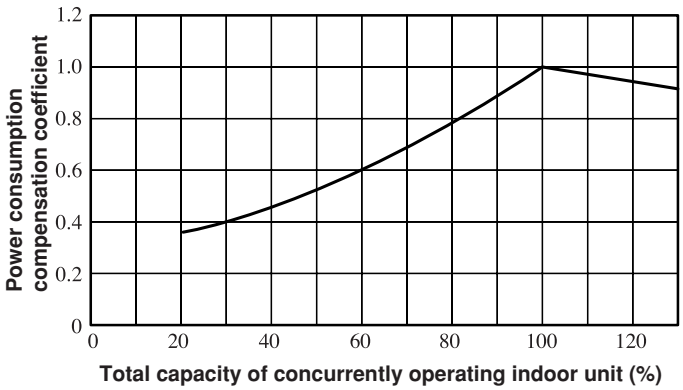


◆ **Power consumption compensation coefficient**

Cooling



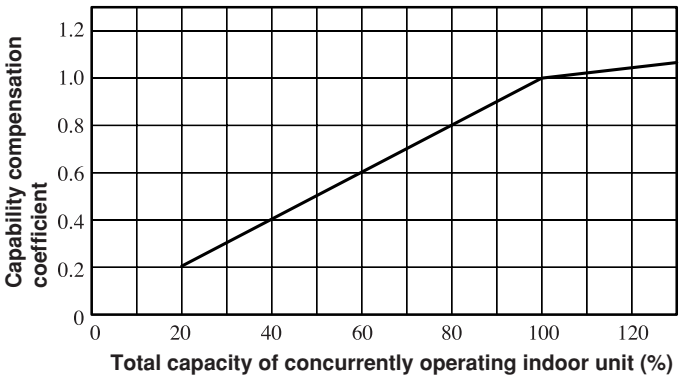
Heating



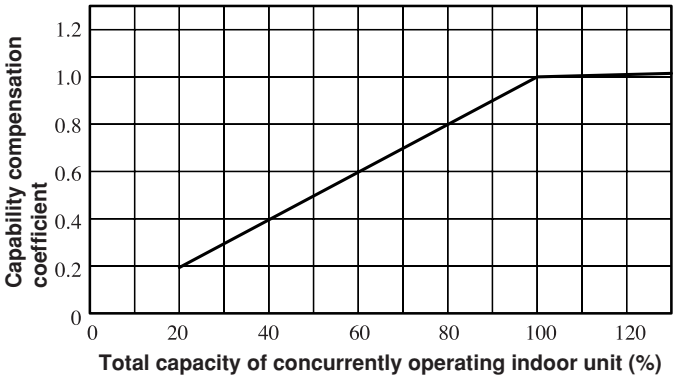
Model FDCA850HKXE4BR
850HKXRE4BR

◆ **Capability compensation coefficient**

Cooling

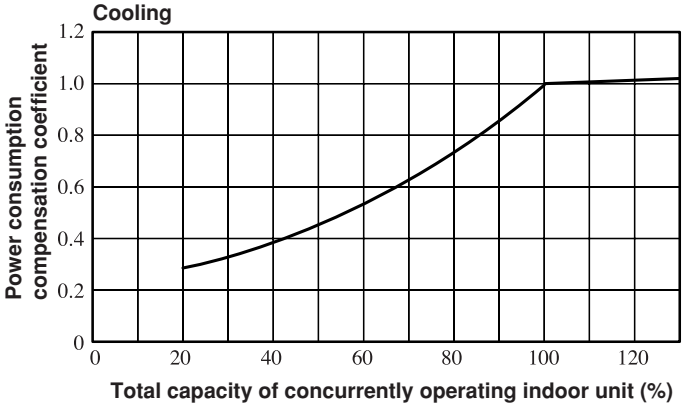


Heating

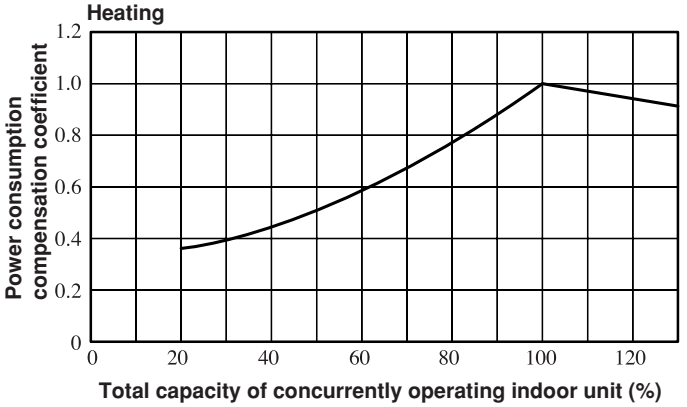


◆ **Power consumption compensation coefficient**

Cooling



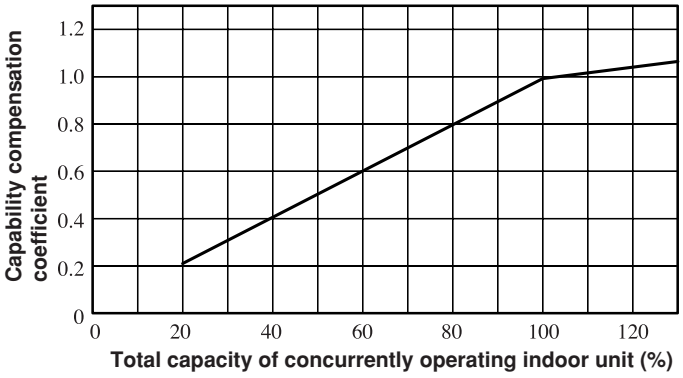
Heating



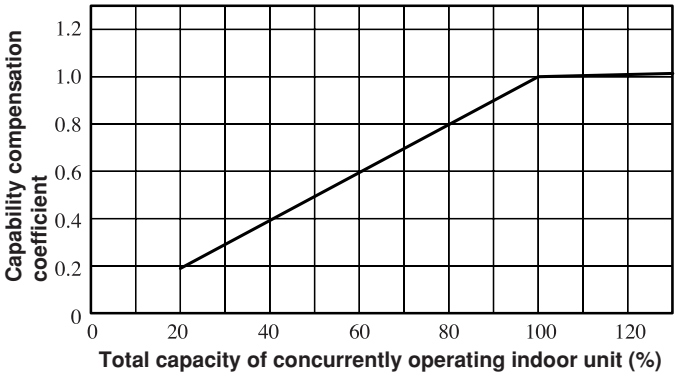
Model FDCA900HKXE4BR
900HKXER4BR

◆ **Capability compensation coefficient**

Cooling

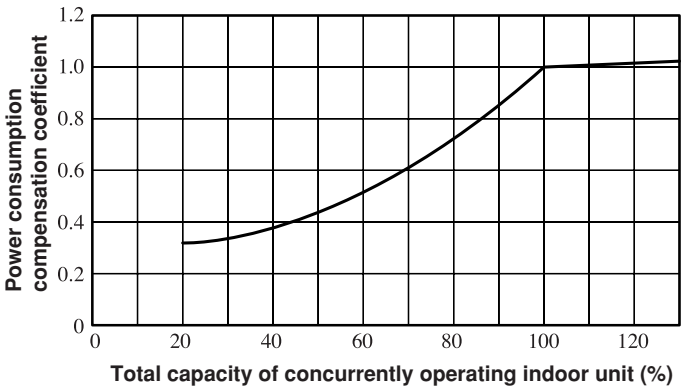


Heating

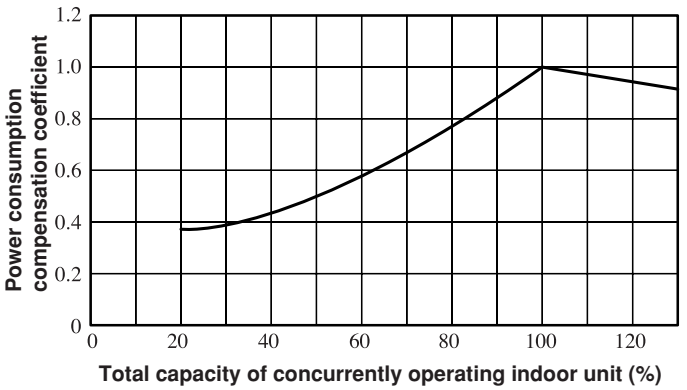


◆ **Power consumption compensation coefficient**

Cooling



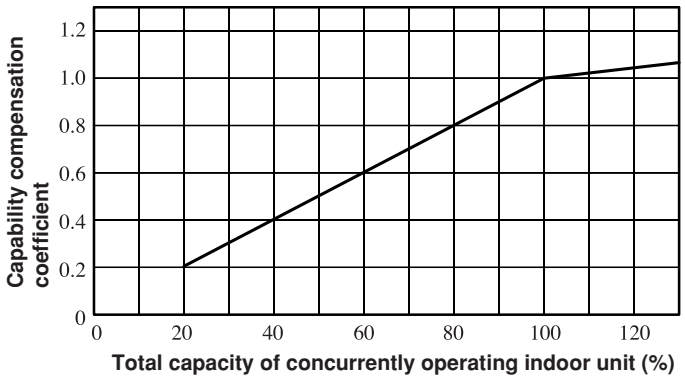
Heating



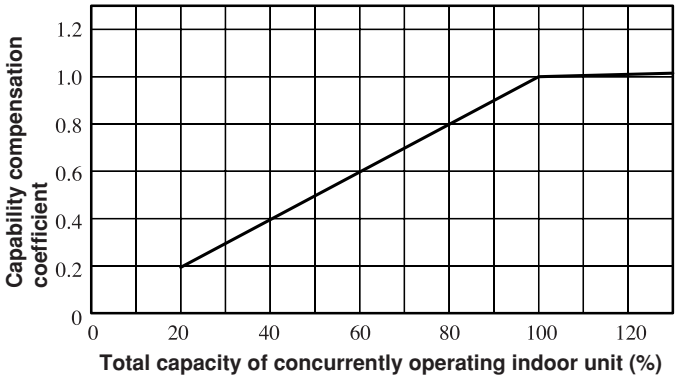
Model FDCA960HKXE4BR
960HKXRE4BR

◆ **Capability compensation coefficient**

Cooling

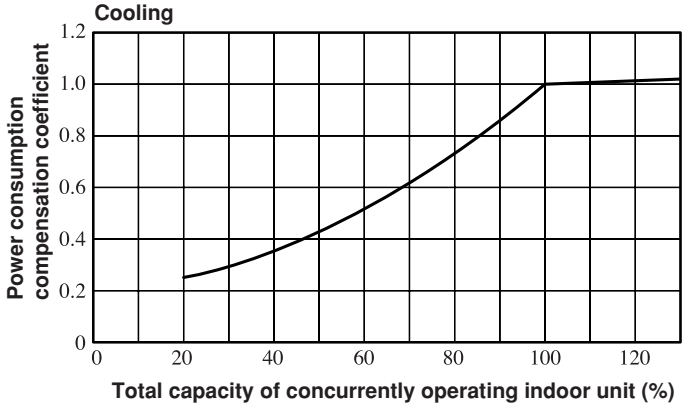


Heating

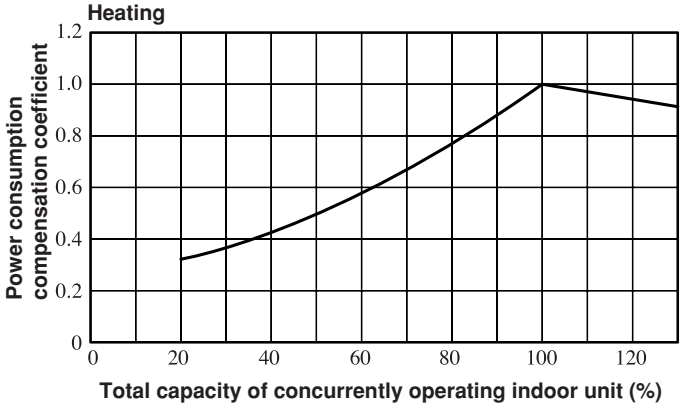


◆ **Power consumption compensation coefficient**

Cooling



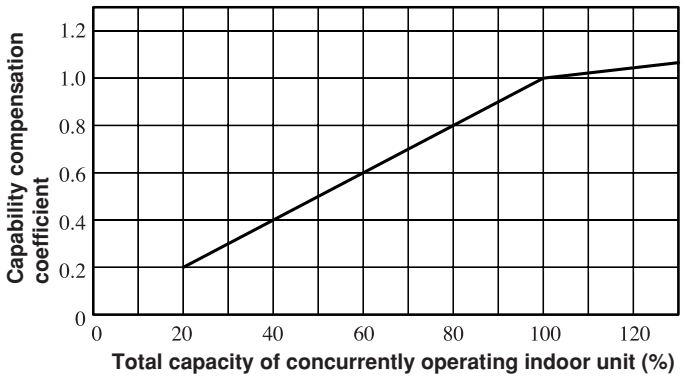
Heating



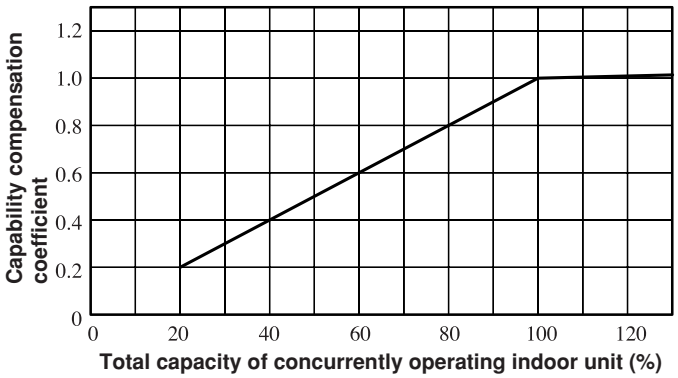
Model FDCA1010HKXE4BR
1010HKXER4BR

◆ **Capability compensation coefficient**

Cooling

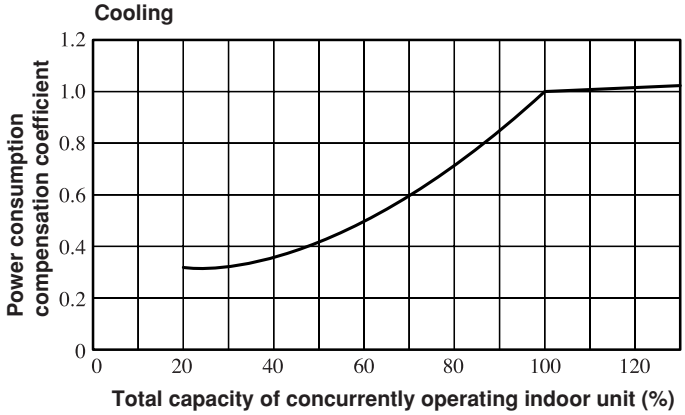


Heating

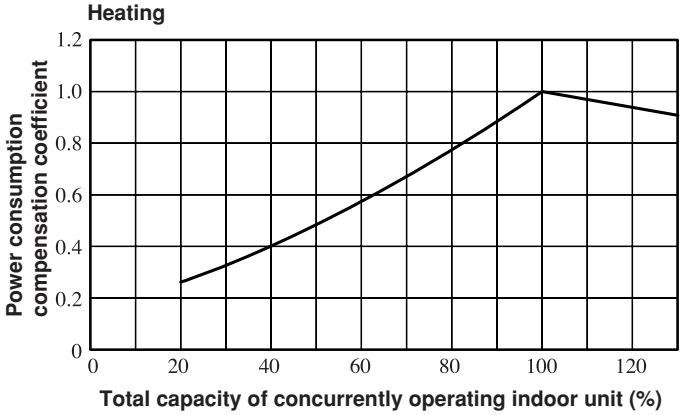


◆ **Power consumption compensation coefficient**

Cooling



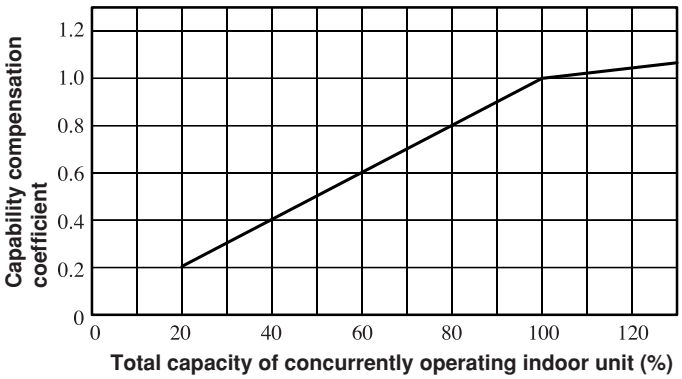
Heating



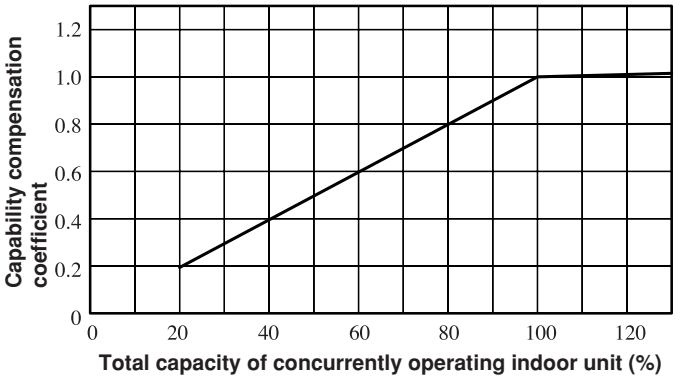
Model FDCA1065HKXE4BR
1065HKXRE4BR

◆ **Capability compensation coefficient**

Cooling

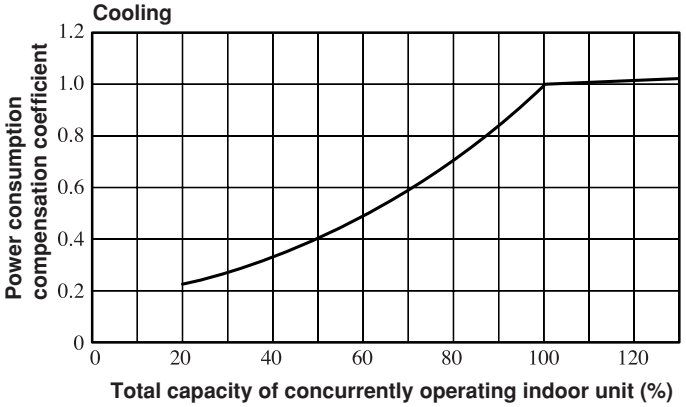


Heating

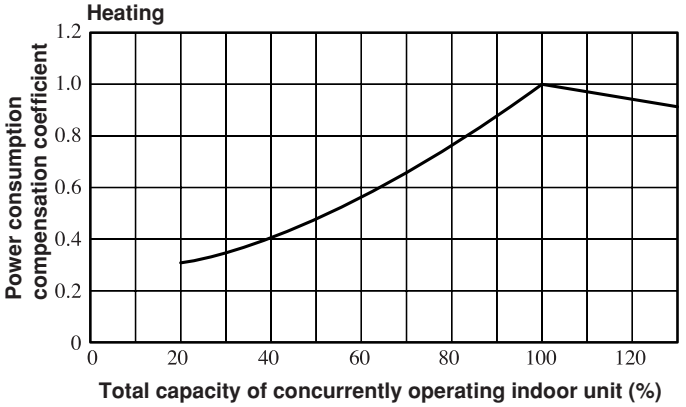


◆ **Power consumption compensation coefficient**

Cooling



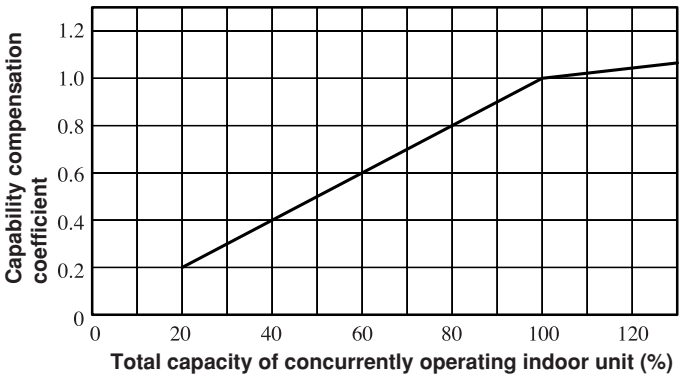
Heating



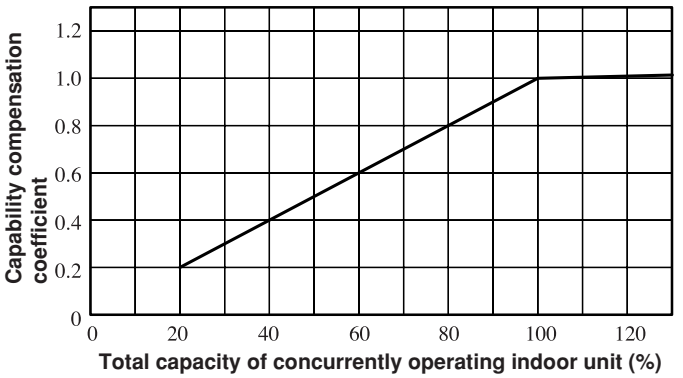
Model FDCA1130HKXE4BR
1130HKXER4BR

◆ **Capability compensation coefficient**

Cooling

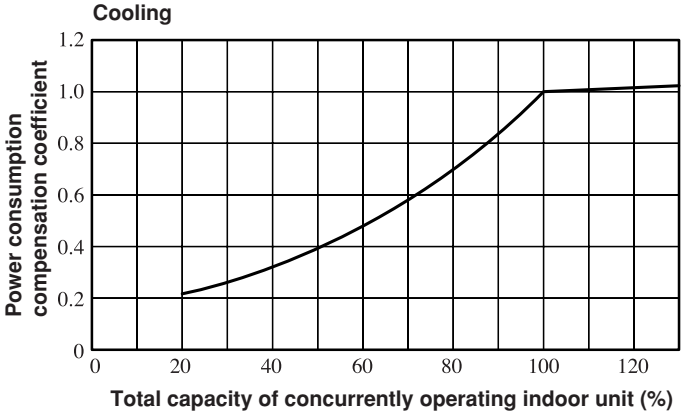


Heating

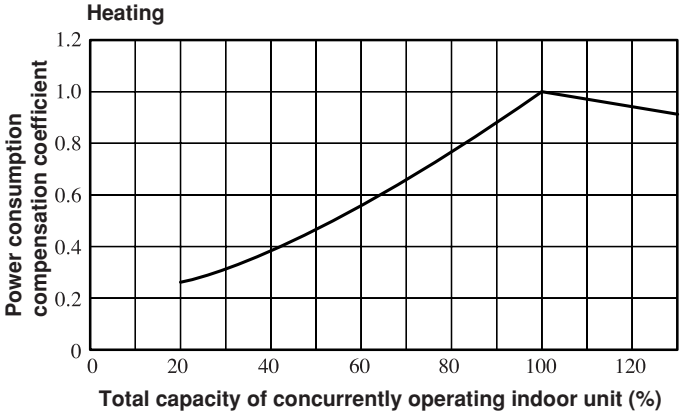


◆ **Power consumption compensation coefficient**

Cooling



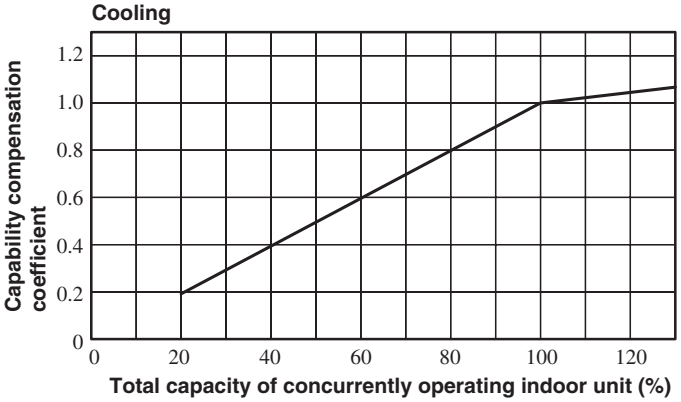
Heating



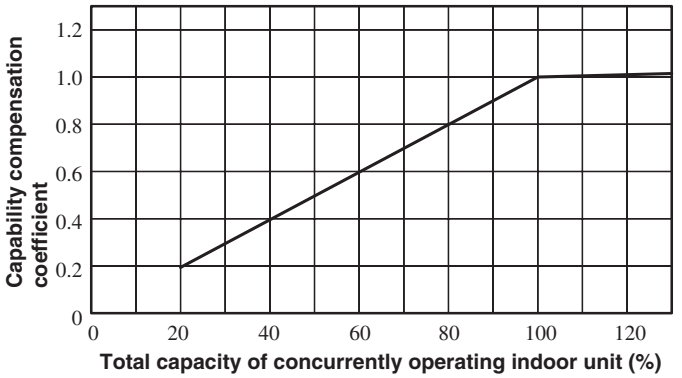
Model FDCA1180HKXE4BR
1180HKXRE4BR

◆ **Capability compensation coefficient**

Cooling

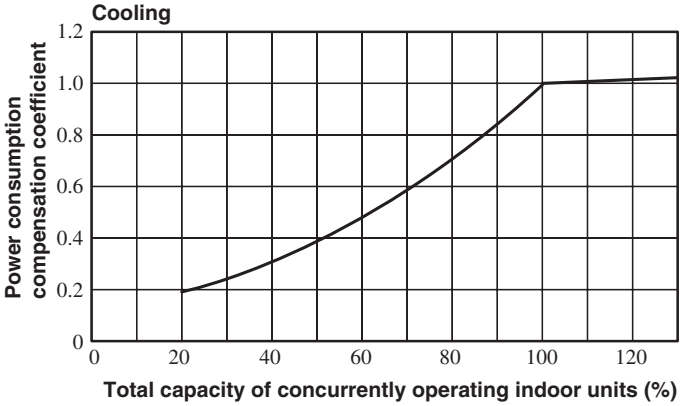


Heating

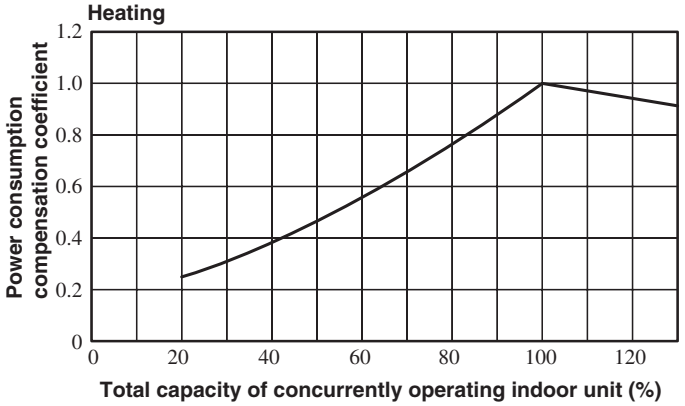


◆ **Power consumption compensation coefficient**

Cooling



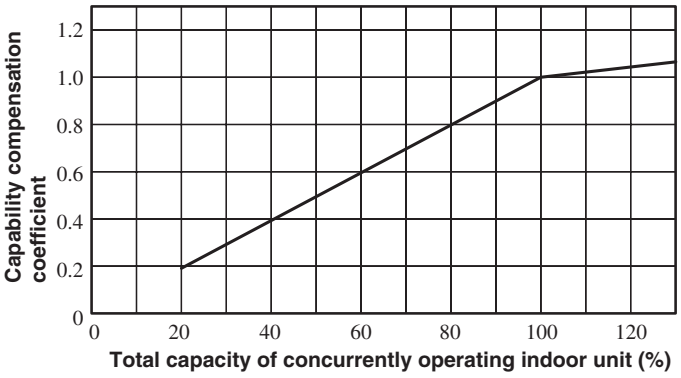
Heating



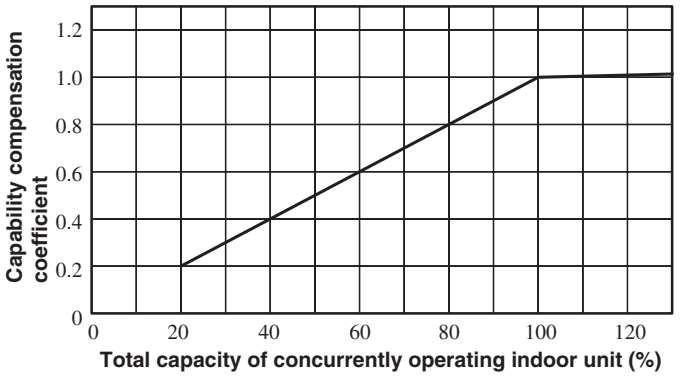
Model FDCA1235HKXE4BR
1235HKXER4BR

◆ **Capability compensation coefficient**

Cooling

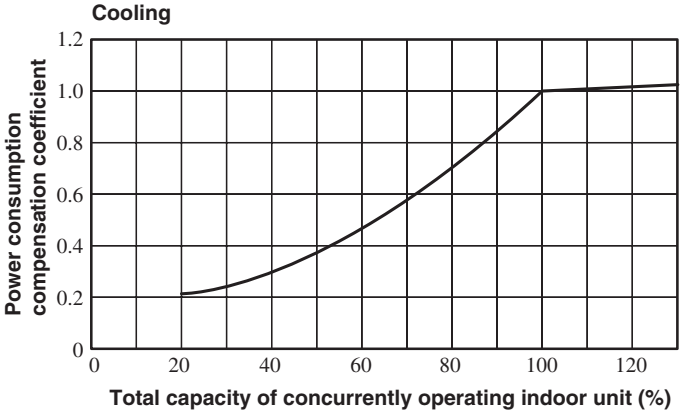


Heating

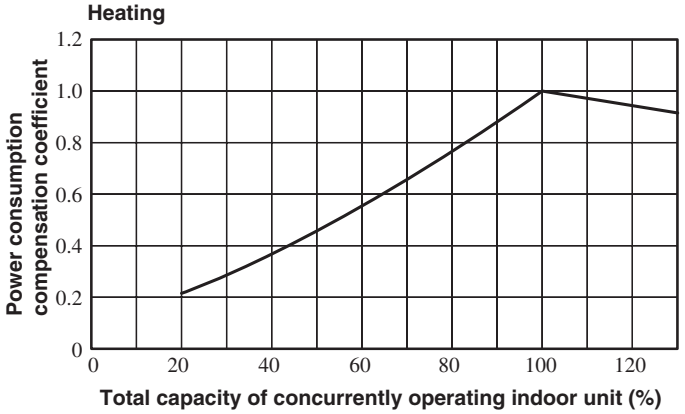


◆ **Power consumption compensation coefficient**

Cooling



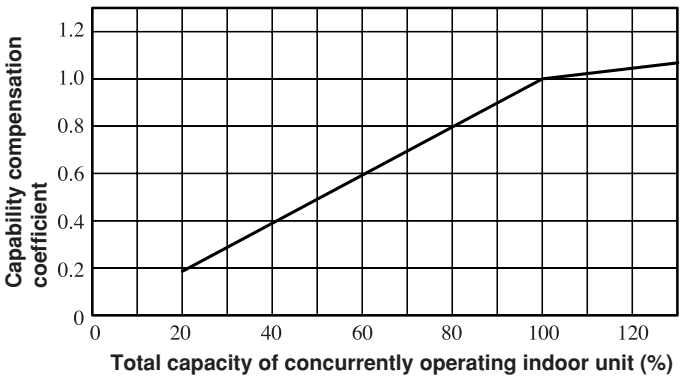
Heating



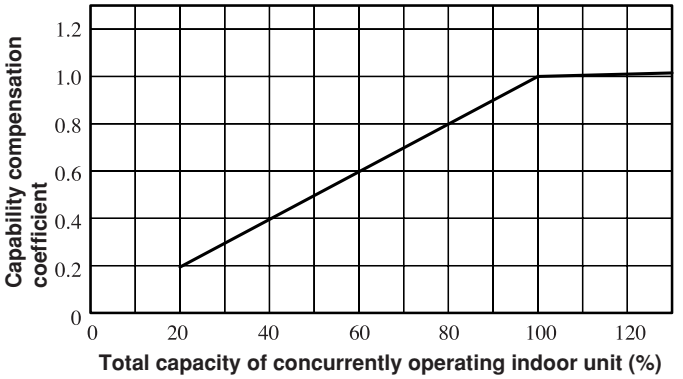
Model FDCA1300HKXE4BR
1300HKXRE4BR

◆ **Capability compensation coefficient**

Cooling

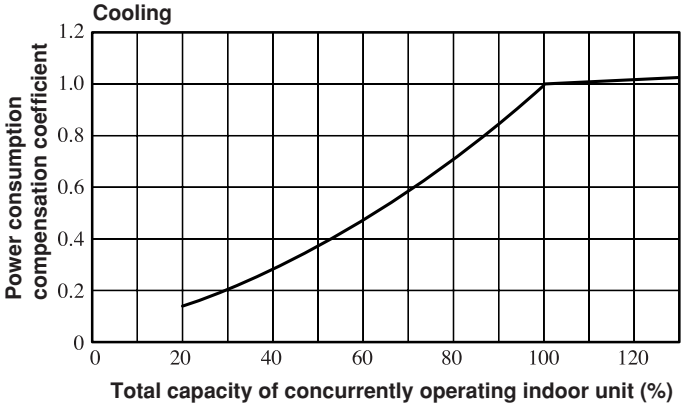


Heating

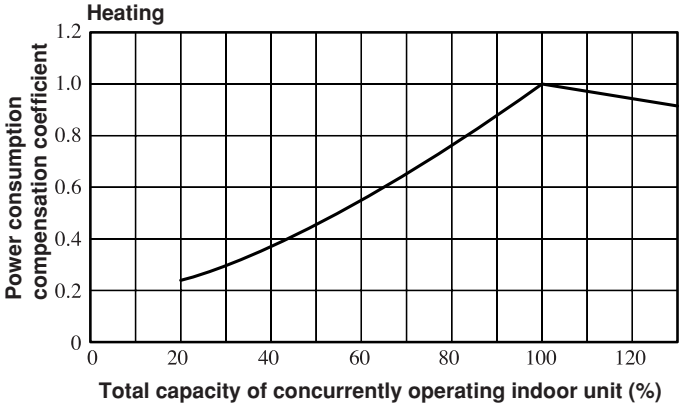


◆ **Power consumption compensation coefficient**

Cooling



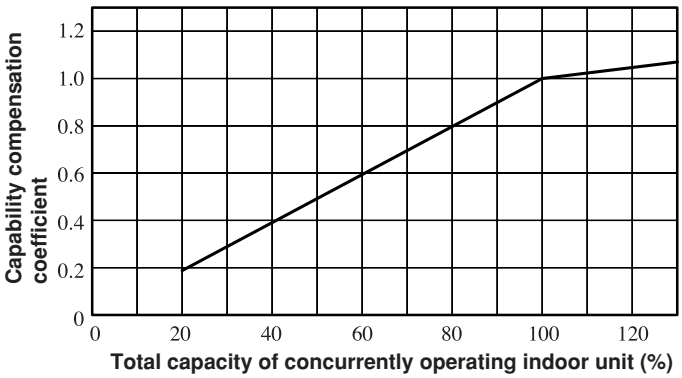
Heating



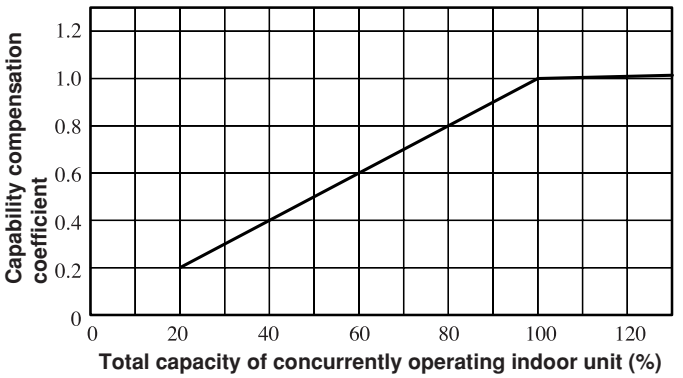
Model FDCA1360HKXE4BR
1360HKXER4BR

◆ **Capability compensation coefficient**

Cooling

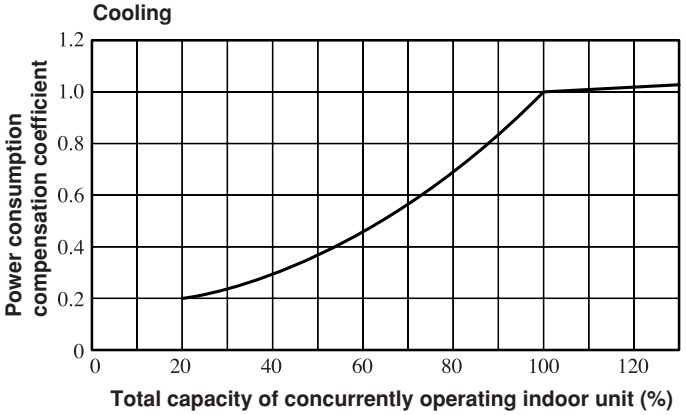


Heating

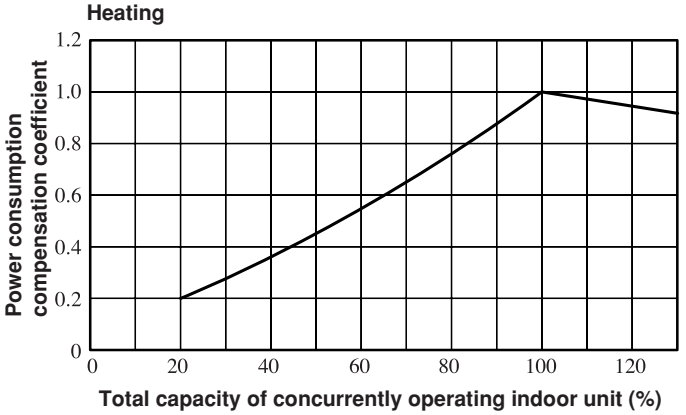


◆ **Power consumption compensation coefficient**

Cooling



Heating



(4) Sensible heat capacity

(a) FDTC Series

Model FDTCA22KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	1.91	1.79	2.16	1.98	2.29	1.99	2.42	2.01	2.65	2.15	2.88	2.15
	12	—	—	1.91	1.79	2.16	1.98	2.29	1.99	2.42	2.01	2.65	2.15	2.88	2.15
	14	—	—	1.91	1.79	2.16	1.98	2.29	1.99	2.42	2.01	2.65	2.15	2.88	2.15
	16	—	—	1.91	1.79	2.16	1.98	2.29	1.99	2.42	2.01	2.65	2.15	2.88	2.15
	18	—	—	1.91	1.79	2.16	1.98	2.29	1.99	2.42	2.01	2.65	2.15	2.88	2.15
	20	—	—	1.90	1.79	2.16	1.98	2.29	1.99	2.42	2.01	2.65	2.15	2.88	2.15
	22	—	—	1.90	1.79	2.16	1.98	2.29	1.99	2.42	2.01	2.65	2.15	2.88	2.15
	24	—	—	1.90	1.79	2.16	1.98	2.29	1.99	2.42	2.00	2.64	2.15	2.86	2.14
Hi	26	1.60	1.54	1.90	1.79	2.16	1.98	2.29	1.99	2.42	2.00	2.63	2.14	2.84	2.14
	28	1.60	1.53	1.90	1.79	2.15	1.97	2.27	1.98	2.40	2.00	2.60	2.14	2.79	2.12
	30	1.60	1.53	1.90	1.79	2.14	1.97	2.26	1.98	2.38	1.99	2.56	2.12	2.75	2.11
	32	1.59	1.53	1.88	1.78	2.11	1.96	2.23	1.97	2.35	1.98	2.52	2.11	2.70	2.09
	34	1.59	1.52	1.86	1.77	2.09	1.95	2.20	1.96	2.32	1.97	2.48	2.10	2.65	2.08
	35	1.58	1.52	1.85	1.77	2.07	1.94	2.20	1.95	2.30	1.96	2.47	2.09	2.63	2.07
	36	1.58	1.52	1.83	1.76	2.06	1.94	2.18	1.95	2.29	1.96	2.45	2.08	2.61	2.07
	38	1.58	1.52	1.81	1.74	2.04	1.93	2.15	1.94	2.26	1.94	2.41	2.07	2.57	2.05
	39	1.58	1.51	1.80	1.73	2.02	1.92	2.13	1.93	2.24	1.94	2.39	2.07	2.55	2.04

Model FDTCA28KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	2.42	2.01	2.76	2.22	2.92	2.24	3.09	2.26	3.38	2.41	3.67	2.41
	12	—	—	2.42	2.01	2.76	2.22	2.92	2.24	3.09	2.26	3.38	2.41	3.67	2.41
	14	—	—	2.42	2.01	2.76	2.22	2.92	2.24	3.09	2.26	3.38	2.41	3.67	2.41
	16	—	—	2.42	2.01	2.76	2.22	2.92	2.24	3.09	2.26	3.38	2.41	3.67	2.41
	18	—	—	2.42	2.01	2.76	2.22	2.92	2.24	3.09	2.26	3.38	2.41	3.67	2.41
	20	—	—	2.42	2.01	2.76	2.22	2.92	2.24	3.09	2.26	3.38	2.41	3.67	2.41
	22	—	—	2.42	2.00	2.75	2.22	2.92	2.24	3.09	2.26	3.38	2.41	3.67	2.41
	24	—	—	2.42	2.00	2.75	2.22	2.91	2.24	3.08	2.26	3.36	2.40	3.64	2.40
Hi	26	2.04	1.92	2.42	2.00	2.75	2.22	2.91	2.24	3.07	2.25	3.34	2.40	3.61	2.39
	28	2.03	1.92	2.42	2.00	2.74	2.21	2.89	2.23	3.05	2.24	3.30	2.39	3.55	2.37
	30	2.03	1.92	2.41	2.00	2.72	2.21	2.88	2.22	3.03	2.24	3.26	2.37	3.50	2.35
	32	2.02	1.91	2.39	1.99	2.69	2.18	2.84	2.21	2.99	2.22	3.21	2.36	3.43	2.33
	34	2.02	1.91	2.36	1.98	2.66	2.17	2.80	2.19	2.95	2.21	3.16	2.33	3.37	2.31
	35	2.02	1.91	2.35	1.98	2.64	2.16	2.80	2.19	2.93	2.20	3.14	2.31	3.35	2.30
	36	2.02	1.91	2.34	1.97	2.62	2.16	2.77	2.18	2.91	2.19	3.12	2.30	3.32	2.28
	38	2.01	1.90	2.31	1.96	2.59	2.14	2.73	2.15	2.87	2.18	3.07	2.29	3.26	2.26
	39	2.01	1.90	2.29	1.96	2.57	2.14	2.71	2.15	2.85	2.17	3.05	2.28	3.24	2.26

Model FDTCA36KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.12	2.58	3.54	2.84	3.75	2.87	3.97	2.90	4.34	3.09	4.72	3.09
	12	—	—	3.12	2.58	3.54	2.84	3.75	2.87	3.97	2.90	4.34	3.09	4.72	3.09
	14	—	—	3.12	2.58	3.54	2.84	3.75	2.87	3.97	2.90	4.34	3.09	4.72	3.09
	16	—	—	3.12	2.58	3.54	2.84	3.75	2.87	3.97	2.90	4.34	3.09	4.72	3.09
	18	—	—	3.12	2.58	3.54	2.84	3.75	2.87	3.97	2.90	4.34	3.09	4.72	3.09
	20	—	—	3.11	2.58	3.54	2.84	3.75	2.87	3.97	2.90	4.34	3.09	4.71	3.09
	22	—	—	3.11	2.58	3.54	2.84	3.75	2.87	3.97	2.90	4.34	3.09	4.71	3.09
	24	—	—	3.11	2.58	3.54	2.84	3.75	2.87	3.96	2.89	4.32	3.08	4.68	3.08
Hi	26	2.62	2.46	3.11	2.58	3.53	2.84	3.74	2.87	3.95	2.89	4.30	3.07	4.64	3.06
	28	2.61	2.46	3.11	2.58	3.52	2.83	3.72	2.86	3.92	2.87	4.25	3.06	4.57	3.04
	30	2.61	2.45	3.10	2.57	3.50	2.83	3.70	2.85	3.90	2.86	4.19	3.04	4.50	3.01
	32	2.60	2.45	3.07	2.56	3.46	2.81	3.65	2.83	3.84	2.84	4.13	3.01	4.41	2.99
	34	2.60	2.45	3.04	2.55	3.42	2.79	3.60	2.81	3.79	2.83	4.06	2.99	4.33	2.96
	35	2.59	2.45	3.02	2.54	3.39	2.78	3.60	2.81	3.77	2.82	4.04	2.98	4.30	2.93
	36	2.59	2.45	3.00	2.53	3.37	2.77	3.56	2.79	3.74	2.81	4.01	2.96	4.27	2.92
	38	2.58	2.44	2.97	2.52	3.33	2.75	3.51	2.78	3.69	2.79	3.95	2.93	4.20	2.90
	39	2.58	2.44	2.95	2.51	3.31	2.75	3.49	2.77	3.67	2.78	3.92	2.92	4.17	2.89

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDTCA45KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.90	3.04	4.43	3.35	4.69	3.38	4.96	3.41	5.43	3.63	5.90	3.63
	12	—	—	3.90	3.04	4.43	3.35	4.69	3.38	4.96	3.41	5.43	3.63	5.90	3.63
	14	—	—	3.90	3.04	4.43	3.35	4.69	3.38	4.96	3.41	5.43	3.63	5.90	3.63
	16	—	—	3.90	3.04	4.43	3.35	4.69	3.38	4.96	3.41	5.43	3.63	5.90	3.63
	18	—	—	3.90	3.04	4.43	3.35	4.69	3.38	4.96	3.41	5.43	3.63	5.90	3.63
	20	—	—	3.89	3.04	4.43	3.35	4.69	3.38	4.96	3.41	5.43	3.63	5.89	3.63
	22	—	—	3.89	3.04	4.42	3.34	4.69	3.38	4.96	3.41	5.43	3.63	5.89	3.63
	24	—	—	3.89	3.04	4.42	3.34	4.68	3.38	4.95	3.41	5.40	3.62	5.85	3.61
Hi	26	3.28	2.88	3.89	3.04	4.41	3.34	4.68	3.38	4.94	3.41	5.37	3.61	5.80	3.60
	28	3.27	2.87	3.88	3.04	4.40	3.33	4.65	3.36	4.91	3.39	5.31	3.59	5.71	3.57
	30	3.26	2.87	3.88	3.04	4.37	3.32	4.62	3.35	4.87	3.37	5.24	3.56	5.62	3.54
	32	3.25	2.87	3.84	3.02	4.32	3.30	4.56	3.33	4.81	3.35	5.16	3.53	5.52	3.50
	34	3.24	2.86	3.80	3.00	4.27	3.28	4.50	3.30	4.74	3.32	5.08	3.50	5.42	3.46
	35	3.24	2.86	3.78	2.99	4.24	3.26	4.50	3.30	4.71	3.31	5.04	3.49	5.38	3.45
	36	3.24	2.86	3.75	2.98	4.22	3.25	4.45	3.28	4.68	3.30	5.01	3.48	5.33	3.44
	38	3.23	2.86	3.71	2.96	4.16	3.23	4.39	3.25	4.62	3.28	4.93	3.44	5.25	3.41
	39	3.23	2.85	3.69	2.95	4.14	3.22	4.36	3.24	4.59	3.26	4.90	3.43	5.21	3.39

Model FDTCA56KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	4.85	3.69	5.51	4.05	5.84	4.10	6.17	4.14	6.75	4.39	7.34	4.39
	12	—	—	4.85	3.69	5.51	4.05	5.84	4.10	6.17	4.14	6.75	4.39	7.34	4.39
	14	—	—	4.85	3.69	5.51	4.05	5.84	4.10	6.17	4.14	6.75	4.39	7.34	4.39
	16	—	—	4.85	3.69	5.51	4.05	5.84	4.10	6.17	4.14	6.75	4.39	7.34	4.39
	18	—	—	4.85	3.69	5.51	4.05	5.84	4.10	6.17	4.14	6.75	4.39	7.34	4.39
	20	—	—	4.84	3.68	5.51	4.05	5.84	4.10	6.17	4.14	6.75	4.39	7.33	4.39
	22	—	—	4.84	3.68	5.50	4.05	5.84	4.10	6.17	4.14	6.75	4.39	7.33	4.39
	24	—	—	4.84	3.68	5.50	4.04	5.83	4.09	6.16	4.14	6.72	4.38	7.27	4.37
Hi	26	4.08	3.48	4.84	3.68	5.49	4.04	5.82	4.09	6.15	4.13	6.69	4.37	7.22	4.35
	28	4.07	3.47	4.83	3.68	5.47	4.03	5.78	4.07	6.10	4.11	6.61	4.34	7.11	4.31
	30	4.06	3.47	4.83	3.68	5.44	4.02	5.75	4.06	6.06	4.10	6.52	4.31	6.99	4.27
	32	4.05	3.46	4.78	3.65	5.38	3.99	5.68	4.03	5.98	4.06	6.42	4.27	6.87	4.23
	34	4.04	3.46	4.73	3.63	5.31	3.97	5.61	4.00	5.90	4.03	6.32	4.24	6.74	4.19
	35	4.03	3.46	4.70	3.62	5.28	3.95	5.60	3.99	5.86	4.01	6.28	4.21	6.69	4.17
	36	4.03	3.46	4.67	3.61	5.25	3.93	5.54	3.97	5.82	4.00	6.23	4.20	6.64	4.16
	38	4.02	3.45	4.61	3.58	5.18	3.90	5.47	3.94	5.75	3.96	6.14	4.16	6.53	4.11
	39	4.02	3.45	4.59	3.57	5.15	3.89	5.43	3.92	5.71	3.95	6.09	4.15	6.48	4.10

(b) FDT Series

Model FDTA28KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	2.42	2.33	2.76	2.64	2.92	2.72	3.09	2.73	3.38	2.95	3.67	2.94
	12	—	—	2.42	2.33	2.76	2.64	2.92	2.72	3.09	2.73	3.38	2.95	3.67	2.94
	14	—	—	2.42	2.33	2.76	2.64	2.92	2.72	3.09	2.73	3.38	2.95	3.67	2.94
	16	—	—	2.42	2.33	2.76	2.64	2.92	2.72	3.09	2.73	3.38	2.95	3.67	2.94
	18	—	—	2.42	2.33	2.76	2.64	2.92	2.72	3.09	2.73	3.38	2.95	3.67	2.94
	20	—	—	2.42	2.33	2.76	2.64	2.92	2.72	3.09	2.73	3.38	2.95	3.67	2.94
	22	—	—	2.42	2.32	2.75	2.64	2.92	2.72	3.09	2.73	3.38	2.95	3.67	2.94
	24	—	—	2.42	2.32	2.75	2.64	2.91	2.72	3.08	2.73	3.36	2.94	3.64	2.93
Hi	26	2.04	1.96	2.42	2.32	2.75	2.64	2.91	2.72	3.07	2.73	3.34	2.93	3.61	2.93
	28	2.03	1.95	2.42	2.32	2.74	2.63	2.89	2.71	3.05	2.72	3.30	2.92	3.55	2.90
	30	2.03	1.95	2.41	2.32	2.72	2.61	2.88	2.71	3.03	2.72	3.26	2.91	3.50	2.89
	32	2.02	1.94	2.39	2.29	2.69	2.58	2.84	2.70	2.99	2.70	3.21	2.90	3.43	2.87
	34	2.02	1.94	2.36	2.27	2.66	2.55	2.80	2.68	2.95	2.69	3.16	2.87	3.37	2.85
	35	2.02	1.94	2.35	2.26	2.64	2.53	2.80	2.67	2.93	2.68	3.14	2.87	3.35	2.84
	36	2.02	1.94	2.34	2.24	2.62	2.52	2.77	2.66	2.91	2.68	3.12	2.86	3.32	2.83
	38	2.01	1.93	2.31	2.21	2.59	2.49	2.73	2.62	2.87	2.66	3.07	2.85	3.26	2.82
	39	2.01	1.93	2.29	2.20	2.57	2.47	2.71	2.60	2.85	2.65	3.05	2.84	3.24	2.81

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDTA36KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.12	2.74	3.54	3.02	3.75	3.04	3.97	3.05	4.34	3.28	4.72	3.28
	12	—	—	3.12	2.74	3.54	3.02	3.75	3.04	3.97	3.05	4.34	3.28	4.72	3.28
	14	—	—	3.12	2.74	3.54	3.02	3.75	3.04	3.97	3.05	4.34	3.28	4.72	3.28
	16	—	—	3.12	2.74	3.54	3.02	3.75	3.04	3.97	3.05	4.34	3.28	4.72	3.28
	18	—	—	3.12	2.74	3.54	3.02	3.75	3.04	3.97	3.05	4.34	3.28	4.72	3.28
	20	—	—	3.11	2.74	3.54	3.02	3.75	3.04	3.97	3.05	4.34	3.28	4.71	3.28
	22	—	—	3.11	2.74	3.54	3.02	3.75	3.04	3.97	3.05	4.34	3.28	4.71	3.28
	24	—	—	3.11	2.74	3.54	3.01	3.75	3.03	3.96	3.05	4.32	3.27	4.68	3.27
Hi	26	2.62	2.52	3.11	2.74	3.53	3.01	3.74	3.03	3.95	3.05	4.30	3.27	4.64	3.25
	28	2.61	2.51	3.11	2.74	3.52	3.01	3.72	3.02	3.92	3.04	4.25	3.25	4.57	3.23
	30	2.61	2.51	3.10	2.73	3.50	3.00	3.70	3.02	3.90	3.03	4.19	3.23	4.50	3.20
	32	2.60	2.50	3.07	2.72	3.46	2.98	3.65	3.00	3.84	3.01	4.13	3.21	4.41	3.18
	34	2.60	2.49	3.04	2.70	3.42	2.96	3.60	2.99	3.79	3.00	4.06	3.18	4.33	3.15
	35	2.59	2.49	3.02	2.70	3.39	2.96	3.60	2.98	3.77	2.99	4.04	3.17	4.30	3.14
	36	2.59	2.49	3.00	2.69	3.37	2.95	3.56	2.96	3.74	2.98	4.01	3.16	4.27	3.13
	38	2.58	2.48	2.97	2.67	3.33	2.93	3.51	2.95	3.69	2.96	3.95	3.12	4.20	3.09
	39	2.58	2.48	2.95	2.67	3.31	2.92	3.49	2.94	3.67	2.95	3.92	3.11	4.17	3.08

Model FDTA45KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.90	3.16	4.43	3.48	4.69	3.52	4.96	3.55	5.43	3.77	5.90	3.78
	12	—	—	3.90	3.16	4.43	3.48	4.69	3.52	4.96	3.55	5.43	3.77	5.90	3.78
	14	—	—	3.90	3.16	4.43	3.48	4.69	3.52	4.96	3.55	5.43	3.77	5.90	3.78
	16	—	—	3.90	3.16	4.43	3.48	4.69	3.52	4.96	3.55	5.43	3.77	5.90	3.78
	18	—	—	3.90	3.16	4.43	3.48	4.69	3.52	4.96	3.55	5.43	3.77	5.90	3.78
	20	—	—	3.89	3.16	4.43	3.48	4.69	3.52	4.96	3.55	5.43	3.77	5.89	3.78
	22	—	—	3.89	3.16	4.42	3.48	4.69	3.52	4.96	3.55	5.43	3.77	5.89	3.78
	24	—	—	3.89	3.16	4.42	3.47	4.68	3.52	4.95	3.54	5.40	3.76	5.85	3.77
Hi	26	3.28	3.01	3.89	3.16	4.41	3.47	4.68	3.51	4.94	3.54	5.37	3.75	5.80	3.73
	28	3.27	3.00	3.88	3.16	4.40	3.47	4.65	3.50	4.91	3.53	5.31	3.73	5.71	3.71
	30	3.26	3.00	3.88	3.16	4.37	3.46	4.62	3.49	4.87	3.51	5.24	3.71	5.62	3.68
	32	3.25	3.00	3.84	3.13	4.32	3.44	4.56	3.47	4.81	3.49	5.16	3.69	5.52	3.65
	34	3.24	2.99	3.80	3.11	4.27	3.41	4.50	3.44	4.74	3.46	5.08	3.66	5.42	3.62
	35	3.24	2.99	3.78	3.10	4.24	3.40	4.50	3.44	4.71	3.45	5.04	3.64	5.38	3.60
	36	3.24	2.99	3.75	3.09	4.22	3.39	4.45	3.42	4.68	3.44	5.01	3.63	5.33	3.59
	38	3.23	2.99	3.71	3.07	4.16	3.37	4.39	3.39	4.62	3.41	4.93	3.60	5.25	3.56
	39	3.23	2.98	3.69	3.07	4.14	3.36	4.36	3.38	4.59	3.40	4.90	3.59	5.21	3.55

Model FDTA56KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	4.85	3.60	5.51	3.96	5.84	4.01	6.17	4.05	6.75	4.31	7.34	4.31
	12	—	—	4.85	3.60	5.51	3.96	5.84	4.01	6.17	4.05	6.75	4.31	7.34	4.31
	14	—	—	4.85	3.60	5.51	3.96	5.84	4.01	6.17	4.05	6.75	4.31	7.34	4.31
	16	—	—	4.85	3.60	5.51	3.96	5.84	4.01	6.17	4.05	6.75	4.31	7.34	4.31
	18	—	—	4.85	3.60	5.51	3.96	5.84	4.01	6.17	4.05	6.75	4.31	7.34	4.31
	20	—	—	4.84	3.60	5.51	3.96	5.84	4.01	6.17	4.05	6.75	4.31	7.33	4.31
	22	—	—	4.84	3.60	5.50	3.96	5.84	4.01	6.17	4.05	6.75	4.31	7.33	4.31
	24	—	—	4.84	3.60	5.50	3.95	5.83	4.01	6.16	4.04	6.72	4.29	7.27	4.29
Hi	26	4.08	3.39	4.84	3.60	5.49	3.95	5.82	4.00	6.15	4.04	6.69	4.28	7.22	4.27
	28	4.07	3.38	4.83	3.59	5.47	3.94	5.78	3.99	6.10	4.02	6.61	4.25	7.11	4.23
	30	4.06	3.38	4.83	3.59	5.44	3.93	5.75	3.97	6.06	4.01	6.52	4.21	6.99	4.18
	32	4.05	3.37	4.78	3.57	5.38	3.90	5.68	3.94	5.98	3.97	6.42	4.16	6.87	4.14
	34	4.04	3.37	4.73	3.55	5.31	3.87	5.61	3.91	5.90	3.94	6.32	4.13	6.74	4.08
	35	4.03	3.37	4.70	3.53	5.28	3.85	5.60	3.91	5.86	3.92	6.28	4.11	6.69	4.06
	36	4.03	3.37	4.67	3.52	5.25	3.84	5.54	3.88	5.82	3.90	6.23	4.10	6.64	4.05
	38	4.02	3.36	4.61	3.50	5.18	3.81	5.47	3.84	5.75	3.87	6.14	4.06	6.53	4.01
	39	4.02	3.36	4.59	3.48	5.15	3.79	5.43	3.83	5.71	3.85	6.09	4.04	6.48	4.00

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDTA71KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	6.15	4.57	6.99	5.01	7.41	5.08	7.82	5.13	8.56	5.45	9.30	5.46
	12	—	—	6.15	4.57	6.99	5.01	7.41	5.08	7.82	5.13	8.56	5.45	9.30	5.46
	14	—	—	6.15	4.57	6.99	5.01	7.41	5.08	7.82	5.13	8.56	5.45	9.30	5.46
	16	—	—	6.15	4.57	6.99	5.01	7.41	5.08	7.82	5.13	8.56	5.45	9.30	5.46
	18	—	—	6.15	4.57	6.99	5.01	7.41	5.08	7.82	5.13	8.56	5.45	9.30	5.46
	20	—	—	6.14	4.57	6.99	5.01	7.41	5.08	7.82	5.13	8.56	5.45	9.29	5.46
	22	—	—	6.13	4.56	6.98	5.01	7.41	5.08	7.82	5.13	8.56	5.45	9.29	5.46
	24	—	—	6.13	4.56	6.97	5.01	7.39	5.07	7.81	5.12	8.52	5.43	9.22	5.43
Hi	26	5.17	4.29	6.13	4.56	6.97	5.00	7.38	5.07	7.80	5.12	8.48	5.42	9.15	5.40
	28	5.15	4.29	6.13	4.56	6.94	4.99	7.33	5.05	7.74	5.09	8.38	5.38	9.01	5.34
	30	5.15	4.28	6.12	4.56	6.90	4.97	7.29	5.03	7.68	5.07	8.27	5.34	8.87	5.29
	32	5.13	4.27	6.06	4.53	6.82	4.94	7.20	4.98	7.58	5.03	8.14	5.28	8.70	5.24
	34	5.12	4.27	5.99	4.49	6.74	4.90	7.11	4.95	7.48	4.99	8.02	5.23	8.55	5.17
	35	5.11	4.26	5.96	4.47	6.70	4.88	7.10	4.94	7.43	4.97	7.96	5.21	8.48	5.15
	36	5.11	4.26	5.92	4.46	6.65	4.86	7.02	4.91	7.38	4.94	7.90	5.19	8.41	5.13
	38	5.10	4.26	5.85	4.43	6.57	4.82	6.93	4.87	7.28	4.90	7.78	5.14	8.28	5.08
	39	5.09	4.25	5.81	4.41	6.52	4.80	6.88	4.85	7.23	4.88	7.72	5.12	8.21	5.06

Model FDTA90KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	7.79	6.03	8.86	6.63	9.39	6.70	9.92	6.76	10.85	7.20	11.79	7.21
	12	—	—	7.79	6.03	8.86	6.63	9.39	6.70	9.92	6.76	10.85	7.20	11.79	7.21
	14	—	—	7.79	6.03	8.86	6.63	9.39	6.70	9.92	6.76	10.85	7.20	11.79	7.21
	16	—	—	7.79	6.03	8.86	6.63	9.39	6.70	9.92	6.76	10.85	7.20	11.79	7.21
	18	—	—	7.79	6.03	8.86	6.63	9.39	6.70	9.92	6.76	10.85	7.20	11.79	7.21
	20	—	—	7.79	6.03	8.86	6.63	9.39	6.70	9.92	6.76	10.85	7.20	11.78	7.20
	22	—	—	7.78	6.02	8.85	6.62	9.39	6.70	9.92	6.76	10.85	7.20	11.78	7.20
	24	—	—	7.78	6.02	8.84	6.62	9.37	6.69	9.90	6.75	10.80	7.18	11.69	7.17
Hi	26	6.55	5.69	7.78	6.02	8.83	6.61	9.36	6.69	9.88	6.74	10.75	7.16	11.60	7.14
	28	6.53	5.68	7.77	6.02	8.79	6.60	9.30	6.66	9.81	6.71	10.62	7.11	11.42	7.07
	30	6.53	5.68	7.76	6.01	8.75	6.58	9.24	6.64	9.74	6.69	10.49	7.06	11.24	7.00
	32	6.51	5.67	7.68	5.98	8.64	6.53	9.13	6.59	9.61	6.64	10.32	7.00	11.03	6.93
	34	6.49	5.66	7.60	5.94	8.54	6.49	9.01	6.54	9.49	6.58	10.16	6.94	10.84	6.87
	35	6.48	5.65	7.55	5.92	8.49	6.47	9.00	6.54	9.42	6.56	10.09	6.91	10.76	6.84
	36	6.48	5.65	7.51	5.90	8.43	6.45	8.90	6.50	9.36	6.54	10.02	6.88	10.67	6.81
	38	6.46	5.65	7.42	5.86	8.33	6.40	8.78	6.45	9.23	6.49	9.86	6.82	10.49	6.74
	39	6.45	5.64	7.37	5.84	8.27	6.38	8.72	6.42	9.17	6.46	9.79	6.79	10.41	6.71

Model FDTA112KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	9.70	7.61	11.02	8.35	11.68	8.44	12.34	8.52	13.51	9.09	14.67	9.10
	12	—	—	9.70	7.61	11.02	8.35	11.68	8.44	12.34	8.52	13.51	9.09	14.67	9.10
	14	—	—	9.70	7.61	11.02	8.35	11.68	8.44	12.34	8.52	13.51	9.09	14.67	9.10
	16	—	—	9.70	7.61	11.02	8.35	11.68	8.44	12.34	8.52	13.51	9.09	14.67	9.10
	18	—	—	9.70	7.61	11.02	8.35	11.68	8.44	12.34	8.52	13.51	9.09	14.67	9.10
	20	—	—	9.69	7.61	11.02	8.35	11.68	8.44	12.34	8.52	13.51	9.09	14.66	9.09
	22	—	—	9.68	7.60	11.01	8.35	11.68	8.44	12.34	8.52	13.51	9.09	14.66	9.09
	24	—	—	9.68	7.60	11.00	8.34	11.66	8.43	12.32	8.51	13.44	9.07	14.55	9.05
Hi	26	8.15	7.21	9.68	7.60	10.99	8.34	11.65	8.43	12.30	8.50	13.37	9.04	14.44	9.02
	28	8.13	7.20	9.67	7.60	10.94	8.32	11.57	8.40	12.21	8.46	13.22	8.98	14.21	8.92
	30	8.12	7.20	9.65	7.59	10.89	8.30	11.50	8.37	12.12	8.43	13.05	8.92	13.99	8.85
	32	8.10	7.18	9.55	7.55	10.75	8.24	11.36	8.31	11.96	8.36	12.85	8.84	13.73	8.76
	34	8.08	7.17	9.45	7.50	10.63	8.19	11.21	8.25	11.80	8.30	12.64	8.77	13.48	8.68
	35	8.06	7.16	9.40	7.48	10.56	8.16	11.20	8.24	11.73	8.27	12.56	8.74	13.38	8.64
	36	8.06	7.16	9.34	7.45	10.49	8.13	11.08	8.19	11.65	8.24	12.47	8.71	13.27	8.60
	38	8.04	7.15	9.23	7.40	10.36	8.08	10.93	8.14	11.49	8.18	12.28	8.64	13.06	8.53
	39	8.03	7.14	9.17	7.38	10.29	8.05	10.85	8.10	11.41	8.15	12.19	8.59	12.96	8.50

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDTA140KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	12.12	8.96	13.78	9.83	14.60	9.96	15.43	10.06	16.88	10.70	18.34	10.71
	12	—	—	12.12	8.96	13.78	9.83	14.60	9.96	15.43	10.06	16.88	10.70	18.34	10.71
	14	—	—	12.12	8.96	13.78	9.83	14.60	9.96	15.43	10.06	16.88	10.70	18.34	10.71
	16	—	—	12.12	8.96	13.78	9.83	14.60	9.96	15.43	10.06	16.88	10.70	18.34	10.71
	18	—	—	12.12	8.96	13.78	9.83	14.60	9.96	15.43	10.06	16.88	10.70	18.34	10.71
	20	—	—	12.11	8.95	13.78	9.83	14.60	9.96	15.43	10.06	16.88	10.70	18.33	10.70
	22	—	—	12.10	8.95	13.76	9.83	14.60	9.96	15.43	10.06	16.88	10.70	18.33	10.70
	24	—	—	12.10	8.95	13.75	9.82	14.57	9.95	15.40	10.05	16.80	10.67	18.19	10.65
Hi	26	10.19	8.41	12.10	8.95	13.73	9.82	14.56	9.94	15.37	10.04	16.72	10.64	18.05	10.60
	28	10.16	8.39	12.08	8.94	13.68	9.79	14.46	9.90	15.26	9.99	16.52	10.54	17.77	10.49
	30	10.15	8.39	12.07	8.93	13.61	9.76	14.38	9.86	15.15	9.94	16.31	10.46	17.49	10.39
	32	10.12	8.37	11.94	8.87	13.44	9.69	14.20	9.78	14.95	9.86	16.06	10.36	17.16	10.26
	34	10.09	8.36	11.82	8.82	13.29	9.62	14.01	9.70	14.76	9.78	15.81	10.27	16.86	10.15
	35	10.08	8.35	11.75	8.78	13.20	9.58	14.00	9.70	14.66	9.74	15.69	10.22	16.73	10.11
	36	10.08	8.35	11.68	8.75	13.12	9.54	13.85	9.63	14.56	9.70	15.58	10.17	16.59	10.06
	38	10.05	8.34	11.54	8.69	12.95	9.46	13.66	9.56	14.36	9.62	15.34	10.07	16.32	9.95
	39	10.04	8.33	11.47	8.65	12.87	9.42	13.57	9.51	14.27	9.58	15.23	10.03	16.20	9.91

Models FDTA160HKE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	13.86	9.81	15.74	10.76	16.69	10.93	17.63	11.07	19.30	11.70	20.96	11.76
	12	—	—	13.86	9.81	15.74	10.76	16.69	10.93	17.63	11.07	19.30	11.70	20.96	11.76
	14	—	—	13.86	9.81	15.74	10.76	16.69	10.93	17.63	11.07	19.30	11.70	20.96	11.76
	16	—	—	13.86	9.81	15.74	10.76	16.69	10.93	17.63	11.07	19.29	11.70	20.96	11.76
	18	—	—	13.85	9.81	15.74	10.76	16.69	10.92	17.63	11.07	19.29	11.70	20.95	11.76
	20	—	—	13.84	9.80	15.74	10.76	16.68	10.93	17.63	11.07	19.29	11.70	20.95	11.76
	22	—	—	13.83	9.80	15.73	10.75	16.68	10.92	17.64	11.07	19.29	11.70	20.95	11.75
	24	—	—	13.83	9.80	15.72	10.75	16.66	10.91	17.60	11.06	19.20	11.66	20.79	11.68
Hi	26	11.65	9.15	13.83	9.80	15.70	10.74	16.64	10.90	17.57	11.04	19.10	11.62	20.63	11.61
	28	11.62	9.13	13.81	9.79	15.63	10.71	16.54	10.86	17.44	10.98	18.87	11.52	20.30	11.46
	30	11.60	9.13	13.79	9.78	15.55	10.67	16.43	10.81	17.32	10.92	18.65	11.43	19.98	11.34
	32	11.57	9.11	13.65	9.71	15.37	10.58	16.23	10.72	17.09	10.82	18.36	11.31	19.62	11.20
	34	11.54	9.09	13.50	9.64	15.18	10.47	16.02	10.61	16.86	10.71	18.06	11.19	19.26	11.06
	35	11.52	9.09	13.42	9.60	15.09	10.43	16.00	10.60	16.75	10.67	17.93	11.14	19.11	11.01
	36	11.52	9.09	13.34	9.55	14.99	10.39	15.82	10.52	16.64	10.62	17.80	11.08	18.96	10.95
	38	11.49	9.07	13.18	9.47	14.80	10.30	15.61	10.40	16.42	10.51	17.54	10.98	18.66	10.84
	39	11.47	9.06	13.10	9.43	14.71	10.26	15.51	10.36	16.31	10.46	17.41	10.91	18.51	10.78

(c) FDTW Series

Models FDTWA28KXE4BR

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	2.42	2.26	2.76	2.49	2.92	2.51	3.09	2.53	3.38	2.72	3.67	2.72
	12	—	—	2.42	2.26	2.76	2.49	2.92	2.51	3.09	2.53	3.38	2.72	3.67	2.72
	14	—	—	2.42	2.26	2.76	2.49	2.92	2.51	3.09	2.53	3.38	2.72	3.67	2.72
	16	—	—	2.42	2.26	2.76	2.49	2.92	2.51	3.09	2.53	3.38	2.72	3.67	2.72
	18	—	—	2.42	2.26	2.76	2.49	2.92	2.51	3.09	2.53	3.38	2.72	3.67	2.72
	20	—	—	2.42	2.26	2.76	2.49	2.92	2.51	3.09	2.53	3.38	2.72	3.67	2.71
	22	—	—	2.42	2.26	2.75	2.49	2.92	2.51	3.09	2.53	3.38	2.72	3.67	2.71
	24	—	—	2.42	2.26	2.75	2.49	2.91	2.51	3.08	2.53	3.36	2.71	3.64	2.71
Hi	26	2.04	1.96	2.42	2.26	2.75	2.49	2.91	2.51	3.07	2.53	3.34	2.71	3.61	2.69
	28	2.03	1.95	2.42	2.26	2.74	2.49	2.89	2.50	3.05	2.52	3.30	2.69	3.55	2.68
	30	2.03	1.95	2.41	2.26	2.72	2.48	2.88	2.50	3.03	2.51	3.26	2.68	3.50	2.66
	32	2.02	1.94	2.39	2.24	2.69	2.47	2.84	2.49	2.99	2.49	3.21	2.66	3.43	2.64
	34	2.02	1.94	2.36	2.23	2.66	2.45	2.80	2.47	2.95	2.48	3.16	2.64	3.37	2.62
	35	2.02	1.94	2.35	2.23	2.64	2.45	2.80	2.47	2.93	2.48	3.14	2.61	3.35	2.61
	36	2.02	1.94	2.34	2.22	2.62	2.44	2.77	2.46	2.91	2.47	3.12	2.61	3.32	2.58
	38	2.01	1.93	2.31	2.21	2.59	2.43	2.73	2.45	2.87	2.45	3.07	2.59	3.26	2.56
	39	2.01	1.93	2.29	2.21	2.57	2.43	2.71	2.43	2.85	2.44	3.05	2.59	3.24	2.56

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Models FDTWA45KXE4BR

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.90	3.29	4.43	3.64	4.69	3.67	4.96	3.70	5.43	3.96	5.90	3.96
	12	—	—	3.90	3.29	4.43	3.64	4.69	3.67	4.96	3.70	5.43	3.96	5.90	3.96
	14	—	—	3.90	3.29	4.43	3.64	4.69	3.67	4.96	3.70	5.43	3.96	5.90	3.96
	16	—	—	3.90	3.29	4.43	3.64	4.69	3.67	4.96	3.70	5.43	3.96	5.90	3.96
	18	—	—	3.90	3.29	4.43	3.64	4.69	3.67	4.96	3.70	5.43	3.96	5.90	3.96
	20	—	—	3.89	3.29	4.43	3.64	4.69	3.67	4.96	3.70	5.43	3.96	5.89	3.95
	22	—	—	3.89	3.29	4.42	3.64	4.69	3.67	4.96	3.70	5.43	3.96	5.89	3.95
	24	—	—	3.89	3.29	4.42	3.64	4.68	3.67	4.95	3.70	5.40	3.95	5.85	3.94
Hi	26	3.28	3.14	3.89	3.29	4.41	3.64	4.68	3.67	4.94	3.69	5.37	3.94	5.80	3.93
	28	3.27	3.14	3.88	3.29	4.40	3.63	4.65	3.65	4.91	3.68	5.31	3.92	5.71	3.89
	30	3.26	3.13	3.88	3.29	4.37	3.61	4.62	3.64	4.87	3.67	5.24	3.89	5.62	3.86
	32	3.25	3.12	3.84	3.27	4.32	3.59	4.56	3.62	4.81	3.64	5.16	3.86	5.52	3.83
	34	3.24	3.11	3.80	3.25	4.27	3.56	4.50	3.60	4.74	3.62	5.08	3.84	5.42	3.80
	35	3.24	3.11	3.78	3.24	4.24	3.55	4.50	3.60	4.71	3.61	5.04	3.82	5.38	3.78
	36	3.24	3.11	3.75	3.23	4.22	3.54	4.45	3.57	4.68	3.59	5.01	3.79	5.33	3.74
	38	3.23	3.10	3.71	3.22	4.16	3.52	4.39	3.54	4.62	3.57	4.93	3.76	5.25	3.72
	39	3.23	3.10	3.69	3.21	4.14	3.51	4.36	3.53	4.59	3.56	4.90	3.75	5.21	3.71

Models FDTWA56KXE4BR

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	4.85	3.77	5.51	4.15	5.84	4.19	6.17	4.23	6.75	4.50	7.34	4.51
	12	—	—	4.85	3.77	5.51	4.15	5.84	4.19	6.17	4.23	6.75	4.50	7.34	4.51
	14	—	—	4.85	3.77	5.51	4.15	5.84	4.19	6.17	4.23	6.75	4.50	7.34	4.51
	16	—	—	4.85	3.77	5.51	4.15	5.84	4.19	6.17	4.23	6.75	4.50	7.34	4.51
	18	—	—	4.85	3.77	5.51	4.15	5.84	4.19	6.17	4.23	6.75	4.50	7.34	4.51
	20	—	—	4.84	3.77	5.51	4.15	5.84	4.19	6.17	4.23	6.75	4.50	7.33	4.50
	22	—	—	4.84	3.77	5.50	4.14	5.84	4.19	6.17	4.23	6.75	4.50	7.33	4.50
	24	—	—	4.84	3.77	5.50	4.14	5.83	4.18	6.16	4.22	6.72	4.49	7.27	4.48
Hi	26	4.08	3.57	4.84	3.77	5.49	4.13	5.82	4.18	6.15	4.22	6.69	4.48	7.22	4.46
	28	4.07	3.56	4.83	3.76	5.47	4.12	5.78	4.17	6.10	4.20	6.61	4.44	7.11	4.42
	30	4.06	3.56	4.83	3.76	5.44	4.11	5.75	4.15	6.06	4.19	6.52	4.42	6.99	4.38
	32	4.05	3.55	4.78	3.74	5.38	4.07	5.68	4.12	5.98	4.15	6.42	4.38	6.87	4.34
	34	4.04	3.55	4.73	3.72	5.31	4.05	5.61	4.09	5.90	4.12	6.32	4.34	6.74	4.29
	35	4.03	3.55	4.70	3.70	5.28	4.03	5.60	4.09	5.86	4.10	6.28	4.32	6.69	4.27
	36	4.03	3.55	4.67	3.69	5.25	4.02	5.54	4.05	5.82	4.09	6.23	4.31	6.64	4.26
	38	4.02	3.54	4.61	3.66	5.18	3.99	5.47	4.02	5.75	4.05	6.14	4.27	6.53	4.22
	39	4.02	3.54	4.59	3.65	5.15	3.98	5.43	4.00	5.71	4.04	6.09	4.25	6.48	4.20

Model FDTWA71KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	6.15	4.64	6.99	5.10	7.41	5.16	7.82	5.22	8.56	5.54	9.30	5.54
	12	—	—	6.15	4.64	6.99	5.10	7.41	5.16	7.82	5.22	8.56	5.54	9.30	5.54
	14	—	—	6.15	4.64	6.99	5.10	7.41	5.16	7.82	5.22	8.56	5.54	9.30	5.54
	16	—	—	6.15	4.64	6.99	5.10	7.41	5.16	7.82	5.22	8.56	5.54	9.30	5.54
	18	—	—	6.15	4.64	6.99	5.10	7.41	5.16	7.82	5.22	8.56	5.54	9.30	5.54
	20	—	—	6.14	4.64	6.99	5.10	7.41	5.16	7.82	5.22	8.56	5.54	9.29	5.54
	22	—	—	6.13	4.64	6.98	5.09	7.41	5.16	7.82	5.22	8.56	5.54	9.29	5.54
	24	—	—	6.13	4.64	6.97	5.09	7.39	5.16	7.81	5.21	8.52	5.53	9.22	5.51
Hi	26	5.17	4.37	6.13	4.64	6.97	5.09	7.38	5.15	7.80	5.21	8.48	5.51	9.15	5.49
	28	5.15	4.37	6.13	4.63	6.94	5.08	7.33	5.13	7.74	5.18	8.38	5.47	9.01	5.44
	30	5.15	4.36	6.12	4.63	6.90	5.06	7.29	5.12	7.68	5.15	8.27	5.43	8.87	5.39
	32	5.13	4.36	6.06	4.60	6.82	5.03	7.20	5.07	7.58	5.11	8.14	5.38	8.70	5.33
	34	5.12	4.35	5.99	4.57	6.74	4.99	7.11	5.03	7.48	5.07	8.02	5.33	8.55	5.27
	35	5.11	4.35	5.96	4.56	6.70	4.97	7.10	5.03	7.43	5.05	7.96	5.30	8.48	5.24
	36	5.11	4.35	5.92	4.54	6.65	4.95	7.02	5.00	7.38	5.03	7.90	5.28	8.41	5.22
	38	5.10	4.34	5.85	4.50	6.57	4.90	6.93	4.96	7.28	4.99	7.78	5.24	8.28	5.18
	39	5.09	4.34	5.81	4.49	6.52	4.88	6.88	4.93	7.23	4.97	7.72	5.22	8.21	5.15

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDTWA90KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	7.79	5.72	8.86	6.27	9.39	6.36	9.92	6.43	10.85	6.81	11.79	6.84
	12	—	—	7.79	5.72	8.86	6.27	9.39	6.36	9.92	6.43	10.85	6.81	11.79	6.84
	14	—	—	7.79	5.72	8.86	6.27	9.39	6.36	9.92	6.43	10.85	6.81	11.79	6.84
	16	—	—	7.79	5.72	8.86	6.27	9.39	6.36	9.92	6.43	10.85	6.81	11.79	6.84
	18	—	—	7.79	5.72	8.86	6.27	9.39	6.36	9.92	6.43	10.85	6.81	11.79	6.84
	20	—	—	7.79	5.71	8.86	6.27	9.39	6.36	9.92	6.43	10.85	6.81	11.78	6.83
	22	—	—	7.78	5.71	8.85	6.27	9.39	6.36	9.92	6.43	10.85	6.81	11.78	6.83
	24	—	—	7.78	5.71	8.84	6.27	9.37	6.35	9.90	6.42	10.80	6.79	11.69	6.79
Hi	26	6.55	5.36	7.78	5.71	8.83	6.26	9.36	6.35	9.88	6.41	10.75	6.77	11.60	6.74
	28	6.53	5.35	7.77	5.71	8.79	6.25	9.30	6.32	9.81	6.38	10.62	6.72	11.42	6.68
	30	6.53	5.35	7.76	5.70	8.75	6.22	9.24	6.30	9.74	6.35	10.49	6.67	11.24	6.61
	32	6.51	5.34	7.68	5.66	8.64	6.17	9.13	6.24	9.61	6.29	10.32	6.61	11.03	6.54
	34	6.49	5.33	7.60	5.62	8.54	6.13	9.01	6.19	9.49	6.24	10.16	6.54	10.84	6.47
	35	6.48	5.33	7.55	5.60	8.49	6.11	9.00	6.19	9.42	6.21	10.09	6.51	10.76	6.44
	36	6.48	5.33	7.51	5.58	8.43	6.07	8.90	6.14	9.36	6.18	10.02	6.48	10.67	6.41
	38	6.46	5.32	7.42	5.54	8.33	6.03	8.78	6.09	9.23	6.13	9.86	6.42	10.49	6.34
	39	6.45	5.32	7.37	5.51	8.27	6.01	8.72	6.06	9.17	6.11	9.79	6.39	10.41	6.31

Model FDTWA112KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	9.70	7.63	11.02	8.38	11.68	8.46	12.34	8.53	13.51	9.12	14.67	9.11
	12	—	—	9.70	7.63	11.02	8.38	11.68	8.46	12.34	8.53	13.51	9.12	14.67	9.11
	14	—	—	9.70	7.63	11.02	8.38	11.68	8.46	12.34	8.53	13.51	9.12	14.67	9.11
	16	—	—	9.70	7.63	11.02	8.38	11.68	8.46	12.34	8.53	13.51	9.12	14.67	9.11
	18	—	—	9.70	7.63	11.02	8.38	11.68	8.46	12.34	8.53	13.51	9.12	14.67	9.11
	20	—	—	9.69	7.63	11.02	8.38	11.68	8.46	13.34	8.53	13.51	9.12	14.66	9.11
	22	—	—	9.68	7.62	11.01	8.38	11.68	8.46	12.34	8.53	13.51	9.12	14.66	9.11
	24	—	—	9.68	7.62	11.00	8.37	11.66	8.46	12.32	8.53	13.44	9.10	14.55	9.07
Hi	26	8.15	7.23	9.68	7.62	10.99	8.37	11.65	8.45	12.30	8.52	13.37	9.07	14.44	9.03
	28	8.13	7.22	9.67	7.62	10.94	8.35	11.57	8.42	12.21	8.48	13.22	9.00	14.21	8.96
	30	8.12	7.21	9.65	7.61	10.89	8.32	11.50	8.39	12.12	8.45	13.05	8.94	13.99	8.87
	32	8.10	7.20	9.55	7.57	10.75	8.27	11.36	8.33	11.96	8.39	12.85	8.87	13.73	8.78
	34	8.08	7.19	9.45	7.52	10.63	8.22	11.21	8.28	11.80	8.33	12.64	8.80	13.48	8.70
	35	8.06	7.19	9.40	7.50	10.56	8.19	11.20	8.27	11.73	8.30	12.56	8.75	13.38	8.67
	36	8.06	7.19	9.34	7.47	10.49	8.16	11.08	8.22	11.65	8.27	12.47	8.72	13.27	8.62
	38	8.04	7.17	9.23	7.43	10.36	8.11	10.93	8.17	11.49	8.21	12.28	8.65	13.06	8.55
	39	8.03	7.16	9.17	7.40	10.29	8.08	10.85	8.13	11.41	8.18	12.19	8.62	12.96	8.52

Model FDTWA140KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	12.12	9.16	13.78	10.05	14.60	10.17	15.43	10.28	16.88	10.92	18.34	10.92
	12	—	—	12.12	9.16	13.78	10.05	14.60	10.17	15.43	10.28	16.88	10.92	18.34	10.92
	14	—	—	12.12	9.16	13.78	10.05	14.60	10.17	15.43	10.28	16.88	10.92	18.34	10.92
	16	—	—	12.12	9.16	13.78	10.05	14.60	10.17	15.43	10.28	16.88	10.92	18.34	10.92
	18	—	—	12.12	9.16	13.78	10.05	14.60	10.17	15.43	10.28	16.88	10.92	18.34	10.92
	20	—	—	12.11	9.16	13.78	10.05	14.60	10.17	15.43	10.28	16.88	10.92	18.33	10.91
	22	—	—	12.10	9.15	13.76	10.04	14.60	10.17	15.43	10.28	16.88	10.92	18.33	10.91
	24	—	—	12.10	9.15	13.75	10.04	14.57	10.16	15.40	10.27	16.80	10.89	18.19	10.86
Hi	26	10.19	8.62	12.10	9.15	13.73	10.03	14.56	10.16	15.37	10.26	16.72	10.86	18.05	10.82
	28	10.16	8.61	12.08	9.15	13.68	10.01	14.46	10.12	15.26	10.21	16.52	10.79	17.77	10.72
	30	10.15	8.60	12.07	9.14	13.61	9.98	14.38	10.08	15.15	10.17	16.31	10.70	17.49	10.63
	32	10.12	8.59	11.94	9.07	13.44	9.91	14.20	10.01	14.95	10.08	16.06	10.61	17.16	10.50
	34	10.09	8.58	11.82	9.01	13.29	9.84	14.01	9.92	14.76	10.00	15.81	10.51	16.86	10.40
	35	10.08	8.57	11.75	8.98	13.20	9.81	14.00	9.91	14.66	9.96	15.69	10.46	16.73	10.36
	36	10.08	8.57	11.68	8.95	13.12	9.76	13.85	9.85	14.56	9.92	15.58	10.42	16.59	10.29
	38	10.05	8.56	11.54	8.89	12.95	9.69	13.66	9.78	14.36	9.83	15.34	10.33	16.32	10.20
	39	10.04	8.55	11.47	8.86	12.87	9.65	13.57	9.74	14.27	9.79	15.23	10.29	16.20	10.16

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

(d) FDTQ , FDQM Series

Model FDTQA22KXE4R , FDQMA22KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	1.91	1.47	2.16	1.62	2.29	1.64	2.42	1.65	2.65	1.75	2.88	1.76
	12	—	—	1.91	1.47	2.16	1.62	2.29	1.64	2.42	1.65	2.65	1.75	2.88	1.76
	14	—	—	1.91	1.47	2.16	1.62	2.29	1.64	2.42	1.65	2.65	1.75	2.88	1.76
	16	—	—	1.91	1.47	2.16	1.62	2.29	1.64	2.42	1.65	2.65	1.75	2.88	1.76
	18	—	—	1.91	1.47	2.16	1.62	2.29	1.64	2.42	1.65	2.65	1.75	2.88	1.76
	20	—	—	1.90	1.47	2.16	1.62	2.29	1.64	2.42	1.65	2.65	1.75	2.88	1.76
	22	—	—	1.90	1.47	2.16	1.62	2.29	1.64	2.42	1.65	2.65	1.75	2.88	1.76
	24	—	—	1.90	1.47	2.16	1.62	2.29	1.64	2.42	1.65	2.64	1.75	2.86	1.76
Hi	26	1.60	1.39	1.90	1.47	2.16	1.62	2.29	1.64	2.42	1.65	2.63	1.75	2.84	1.75
	28	1.60	1.39	1.90	1.47	2.15	1.61	2.27	1.63	2.40	1.64	2.60	1.74	2.79	1.72
	30	1.60	1.39	1.90	1.47	2.14	1.61	2.26	1.62	2.38	1.64	2.56	1.72	2.75	1.71
	32	1.59	1.39	1.88	1.46	2.11	1.59	2.23	1.61	2.35	1.62	2.52	1.71	2.70	1.70
	34	1.59	1.38	1.86	1.45	2.09	1.58	2.20	1.60	2.32	1.61	2.48	1.70	2.65	1.68
	35	1.58	1.38	1.85	1.45	2.07	1.58	2.20	1.60	2.30	1.61	2.47	1.69	2.63	1.67
	36	1.58	1.38	1.83	1.44	2.06	1.57	2.18	1.59	2.29	1.60	2.45	1.68	2.61	1.66
	38	1.58	1.38	1.81	1.43	2.04	1.56	2.15	1.57	2.26	1.58	2.41	1.67	2.57	1.65
	39	1.58	1.37	1.80	1.42	2.02	1.56	2.13	1.56	2.24	1.58	2.39	1.66	2.55	1.64

Model FDTQA28KXE4R , FDQMA28KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	2.42	1.91	2.76	2.09	2.92	2.12	3.09	2.14	3.38	2.28	3.67	2.28
	12	—	—	2.42	1.91	2.76	2.09	2.92	2.12	3.09	2.14	3.38	2.28	3.67	2.28
	14	—	—	2.42	1.91	2.76	2.09	2.92	2.12	3.09	2.14	3.38	2.28	3.67	2.28
	16	—	—	2.42	1.91	2.76	2.09	2.92	2.12	3.09	2.14	3.38	2.28	3.67	2.28
	18	—	—	2.42	1.91	2.76	2.09	2.92	2.12	3.09	2.14	3.38	2.28	3.67	2.28
	20	—	—	2.42	1.90	2.76	2.09	2.92	2.12	3.09	2.14	3.38	2.28	3.67	2.28
	22	—	—	2.42	1.90	2.75	2.09	2.92	2.12	3.09	2.14	3.38	2.28	3.67	2.28
	24	—	—	2.42	1.90	2.75	2.09	2.91	2.12	3.08	2.13	3.36	2.27	3.64	2.26
Hi	26	2.04	1.80	2.42	1.90	2.75	2.09	2.91	2.11	3.07	2.13	3.34	2.26	3.61	2.25
	28	2.03	1.80	2.42	1.90	2.74	2.09	2.89	2.10	3.05	2.12	3.30	2.25	3.55	2.24
	30	2.03	1.80	2.41	1.90	2.72	2.08	2.88	2.10	3.03	2.11	3.26	2.23	3.50	2.21
	32	2.02	1.79	2.39	1.89	2.69	2.06	2.84	2.08	2.99	2.10	3.21	2.21	3.43	2.19
	34	2.02	1.79	2.36	1.88	2.66	2.05	2.80	2.07	2.95	2.08	3.16	2.19	3.37	2.17
	35	2.02	1.79	2.35	1.87	2.64	2.04	2.80	2.07	2.93	2.07	3.14	2.18	3.35	2.15
	36	2.02	1.79	2.34	1.86	2.62	2.04	2.77	2.05	2.91	2.07	3.12	2.17	3.32	2.14
	38	2.01	1.79	2.31	1.85	2.59	2.02	2.73	2.04	2.87	2.05	3.07	2.15	3.26	2.13
	39	2.01	1.79	2.29	1.85	2.57	2.02	2.71	2.03	2.85	2.04	3.05	2.14	3.24	2.12

Model FDTQA36KXE4R , FDQMA36KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.12	2.27	3.54	2.49	3.75	2.52	3.97	2.55	4.34	2.71	4.72	2.71
	12	—	—	3.12	2.27	3.54	2.49	3.75	2.52	3.97	2.55	4.34	2.71	4.72	2.71
	14	—	—	3.12	2.27	3.54	2.49	3.75	2.52	3.97	2.55	4.34	2.71	4.72	2.71
	16	—	—	3.12	2.27	3.54	2.49	3.75	2.52	3.97	2.55	4.34	2.71	4.72	2.71
	18	—	—	3.12	2.27	3.54	2.49	3.75	2.52	3.97	2.55	4.34	2.71	4.72	2.71
	20	—	—	3.11	2.27	3.54	2.49	3.75	2.52	3.97	2.55	4.34	2.71	4.71	2.71
	22	—	—	3.11	2.27	3.54	2.48	3.75	2.52	3.97	2.55	4.34	2.71	4.71	2.71
	24	—	—	3.11	2.27	3.54	2.48	3.75	2.52	3.96	2.54	4.32	2.70	4.68	2.69
Hi	26	2.62	2.12	3.11	2.27	3.53	2.48	3.74	2.51	3.95	2.54	4.30	2.69	4.64	2.68
	28	2.61	2.12	3.11	2.26	3.52	2.47	3.72	2.50	3.92	2.53	4.25	2.67	4.57	2.65
	30	2.61	2.12	3.10	2.26	3.50	2.47	3.70	2.49	3.90	2.52	4.19	2.65	4.50	2.63
	32	2.60	2.11	3.07	2.25	3.46	2.45	3.65	2.47	3.84	2.49	4.13	2.62	4.41	2.59
	34	2.60	2.11	3.04	2.23	3.42	2.43	3.60	2.45	3.79	2.47	4.06	2.59	4.33	2.56
	35	2.59	2.11	3.02	2.22	3.39	2.42	3.60	2.45	3.77	2.46	4.04	2.58	4.30	2.55
	36	2.59	2.11	3.00	2.21	3.37	2.41	3.56	2.43	3.74	2.45	4.01	2.57	4.27	2.54
	38	2.58	2.10	2.97	2.20	3.33	2.39	3.51	2.41	3.69	2.43	3.95	2.55	4.20	2.51
	39	2.58	2.10	2.95	2.19	3.31	2.38	3.49	2.40	3.67	2.42	3.92	2.53	4.17	2.50

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

(e) FDTS Series

Model FDTSA22KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	1.91	1.83	2.16	2.08	2.29	2.20	2.42	2.33	2.65	2.55	2.88	2.62
	12	—	—	1.91	1.83	2.16	2.08	2.29	2.20	2.42	2.33	2.65	2.55	2.88	2.62
	14	—	—	1.91	1.83	2.16	2.08	2.29	2.20	2.42	2.33	2.65	2.55	2.88	2.62
	16	—	—	1.91	1.83	2.16	2.08	2.29	2.20	2.42	2.33	2.65	2.55	2.88	2.62
	18	—	—	1.91	1.83	2.16	2.08	2.29	2.20	2.42	2.33	2.65	2.55	2.88	2.62
	20	—	—	1.90	1.83	2.16	2.08	2.29	2.20	2.42	2.33	2.65	2.55	2.88	2.62
	22	—	—	1.90	1.82	2.16	2.08	2.29	2.20	2.42	2.33	2.65	2.55	2.88	2.62
	24	—	—	1.90	1.82	2.16	2.07	2.29	2.20	2.42	2.32	2.64	2.53	2.86	2.61
Hi	26	1.60	1.54	1.90	1.82	2.16	2.07	2.29	2.20	2.42	2.32	2.63	2.52	2.84	2.60
	28	1.60	1.53	1.90	1.82	2.15	2.06	2.27	2.18	2.40	2.30	2.60	2.49	2.79	2.59
	30	1.60	1.53	1.90	1.82	2.14	2.05	2.26	2.17	2.38	2.29	2.56	2.46	2.75	2.58
	32	1.59	1.53	1.88	1.80	2.11	2.03	2.23	2.14	2.35	2.26	2.52	2.42	2.70	2.56
	34	1.59	1.52	1.86	1.78	2.09	2.00	2.20	2.11	2.32	2.23	2.48	2.38	2.65	2.54
	35	1.58	1.52	1.85	1.77	2.07	1.99	2.20	2.11	2.30	2.21	2.47	2.37	2.63	2.52
	36	1.58	1.52	1.83	1.76	2.06	1.98	2.18	2.09	2.29	2.20	2.45	2.35	2.61	2.50
	38	1.58	1.52	1.81	1.74	2.04	1.95	2.15	2.06	2.26	2.17	2.41	2.31	2.57	2.46
	39	1.58	1.51	1.80	1.73	2.02	1.94	2.13	2.05	2.24	2.15	2.39	2.30	2.55	2.44

Model FDTSA28KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	2.42	2.33	2.76	2.64	2.92	2.77	3.09	2.78	3.38	2.99	3.67	2.98
	12	—	—	2.42	2.33	2.76	2.64	2.92	2.77	3.09	2.78	3.38	2.99	3.67	2.98
	14	—	—	2.42	2.33	2.76	2.64	2.92	2.77	3.09	2.78	3.38	2.99	3.67	2.98
	16	—	—	2.42	2.33	2.76	2.64	2.92	2.77	3.09	2.78	3.38	2.99	3.67	2.98
	18	—	—	2.42	2.33	2.76	2.64	2.92	2.77	3.09	2.78	3.38	2.99	3.67	2.98
	20	—	—	2.42	2.33	2.76	2.64	2.92	2.77	3.09	2.78	3.38	2.99	3.67	2.98
	22	—	—	2.42	2.32	2.75	2.64	2.92	2.77	3.09	2.78	3.38	2.99	3.67	2.98
	24	—	—	2.42	2.32	2.75	2.64	2.91	2.77	3.08	2.78	3.36	2.99	3.64	2.97
Hi	26	2.04	1.96	2.42	2.32	2.75	2.64	2.91	2.77	3.07	2.78	3.34	2.98	3.61	2.97
	28	2.03	1.95	2.42	2.32	2.74	2.63	2.89	2.76	3.05	2.77	3.30	2.97	3.55	2.95
	30	2.03	1.95	2.41	2.32	2.72	2.61	2.88	2.75	3.03	2.76	3.26	2.96	3.50	2.93
	32	2.02	1.94	2.39	2.29	2.69	2.58	2.84	2.73	2.99	2.75	3.21	2.94	3.43	2.91
	34	2.02	1.94	2.36	2.27	2.66	2.55	2.80	2.69	2.95	2.74	3.16	2.92	3.37	2.90
	35	2.02	1.94	2.35	2.26	2.64	2.53	2.80	2.69	2.93	2.73	3.14	2.92	3.35	2.89
	36	2.02	1.94	2.34	2.24	2.62	2.52	2.77	2.66	2.91	2.72	3.12	2.91	3.32	2.88
	38	2.01	1.93	2.31	2.21	2.59	2.49	2.73	2.62	2.87	2.71	3.07	2.90	3.26	2.87
	39	2.01	1.93	2.29	2.20	2.57	2.47	2.71	2.60	2.85	2.70	3.05	2.89	3.24	2.86

Model FDTSA36KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.12	2.87	3.54	3.17	3.75	3.19	3.97	3.21	4.34	3.43	4.72	3.42
	12	—	—	3.12	2.87	3.54	3.17	3.75	3.19	3.97	3.21	4.34	3.43	4.72	3.42
	14	—	—	3.12	2.87	3.54	3.17	3.75	3.19	3.97	3.21	4.34	3.43	4.72	3.42
	16	—	—	3.12	2.87	3.54	3.17	3.75	3.19	3.97	3.21	4.34	3.43	4.72	3.42
	18	—	—	3.12	2.87	3.54	3.17	3.75	3.19	3.97	3.21	4.34	3.43	4.72	3.42
	20	—	—	3.11	2.87	3.54	3.17	3.75	3.19	3.97	3.21	4.34	3.43	4.71	3.42
	22	—	—	3.11	2.87	3.54	3.17	3.75	3.19	3.97	3.21	4.34	3.43	4.71	3.42
	24	—	—	3.11	2.87	3.54	3.16	3.75	3.19	3.96	3.21	4.32	3.43	4.68	3.41
Hi	26	2.62	2.52	3.11	2.87	3.53	3.16	3.74	3.19	3.95	3.20	4.30	3.42	4.64	3.40
	28	2.61	2.51	3.11	2.87	3.52	3.16	3.72	3.18	3.92	3.19	4.25	3.40	4.57	3.38
	30	2.61	2.51	3.10	2.87	3.50	3.15	3.70	3.17	3.90	3.18	4.19	3.38	4.50	3.35
	32	2.60	2.50	3.07	2.85	3.46	3.13	3.65	3.15	3.84	3.17	4.13	3.36	4.41	3.33
	34	2.60	2.49	3.04	2.84	3.42	3.12	3.60	3.13	3.79	3.15	4.06	3.34	4.33	3.30
	35	2.59	2.49	3.02	2.83	3.39	3.11	3.60	3.13	3.77	3.14	4.04	3.33	4.30	3.29
	36	2.59	2.49	3.00	2.82	3.37	3.10	3.56	3.12	3.74	3.13	4.01	3.32	4.27	3.28
	38	2.58	2.48	2.97	2.81	3.33	3.08	3.51	3.10	3.69	3.11	3.95	3.30	4.20	3.26
	39	2.58	2.48	2.95	2.80	3.31	3.08	3.49	3.09	3.67	3.10	3.92	3.29	4.17	3.25

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDTSA45KXE4BR

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.90	3.44	4.43	3.79	4.69	3.83	4.96	3.86	5.43	4.13	5.90	4.12
	12	—	—	3.90	3.44	4.43	3.79	4.69	3.83	4.96	3.86	5.43	4.13	5.90	4.12
	14	—	—	3.90	3.44	4.43	3.79	4.69	3.83	4.96	3.86	5.43	4.13	5.90	4.12
	16	—	—	3.90	3.44	4.43	3.79	4.69	3.83	4.96	3.86	5.43	4.13	5.90	4.12
	18	—	—	3.90	3.44	4.43	3.79	4.69	3.83	4.96	3.86	5.43	4.13	5.90	4.12
	20	—	—	3.89	3.44	4.43	3.79	4.69	3.83	4.96	3.86	5.43	4.13	5.89	4.12
	22	—	—	3.89	3.44	4.42	3.79	4.69	3.83	4.96	3.86	5.43	4.13	5.89	4.12
	24	—	—	3.89	3.44	4.42	3.79	4.68	3.82	4.95	3.85	5.40	4.12	5.85	4.11
Hi	26	3.28	3.14	3.89	3.44	4.41	3.79	4.68	3.82	4.94	3.85	5.37	4.11	5.80	4.09
	28	3.27	3.14	3.88	3.43	4.40	3.78	4.65	3.81	4.91	3.84	5.31	4.09	5.71	4.06
	30	3.26	3.13	3.88	3.43	4.37	3.77	4.62	3.80	4.87	3.82	5.24	4.07	5.62	4.03
	32	3.25	3.12	3.84	3.41	4.32	3.75	4.56	3.77	4.81	3.79	5.16	4.04	5.52	4.00
	34	3.24	3.11	3.80	3.40	4.27	3.73	4.50	3.75	4.74	3.77	5.08	4.00	5.42	3.97
	35	3.24	3.11	3.78	3.39	4.24	3.72	4.50	3.75	4.71	3.76	5.04	3.99	5.38	3.96
	36	3.24	3.11	3.75	3.38	4.22	3.71	4.45	3.73	4.68	3.75	5.01	3.98	5.33	3.94
	38	3.23	3.10	3.71	3.36	4.16	3.69	4.39	3.71	4.62	3.72	4.93	3.95	5.25	3.91
	39	3.23	3.10	3.69	3.35	4.14	3.68	4.36	3.70	4.59	3.71	4.90	3.94	5.21	3.90

Model FDTSA71KXE4BR

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	6.15	4.93	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.30	5.89
	12	—	—	6.15	4.93	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.30	5.89
	14	—	—	6.15	4.93	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.30	5.89
	16	—	—	6.15	4.93	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.30	5.89
	18	—	—	6.15	4.93	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.30	5.89
	20	—	—	6.14	4.92	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.29	5.89
	22	—	—	6.13	4.92	6.98	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.29	5.89
	24	—	—	6.13	4.92	6.97	5.41	7.39	5.47	7.81	5.51	8.52	5.87	9.22	5.86
Hi	26	5.17	4.66	6.13	4.92	6.97	5.41	7.38	5.47	7.80	5.51	8.48	5.86	9.15	5.83
	28	5.15	4.66	6.13	4.92	6.94	5.40	7.33	5.45	7.74	5.48	8.38	5.82	9.01	5.79
	30	5.15	4.65	6.12	4.92	6.90	5.38	7.29	5.43	7.68	5.46	8.27	5.78	8.87	5.74
	32	5.13	4.65	6.06	4.89	6.82	5.35	7.20	5.39	7.58	5.42	8.14	5.74	8.70	5.68
	34	5.12	4.64	5.99	4.86	6.74	5.32	7.11	5.35	7.48	5.39	8.02	5.69	8.55	5.63
	35	5.11	4.64	5.96	4.84	6.70	5.30	7.10	5.35	7.43	5.37	7.96	5.67	8.48	5.61
	36	5.11	4.64	5.92	4.83	6.65	5.28	7.02	5.32	7.38	5.35	7.90	5.64	8.41	5.59
	38	5.10	4.63	5.85	4.80	6.57	5.25	6.93	5.28	7.28	5.31	7.78	5.60	8.28	5.53
	39	5.09	4.63	5.81	4.78	6.52	5.23	6.88	5.26	7.23	5.29	7.72	5.58	8.21	5.51

(f) FDU Series

Model FDUA224KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	19.40	14.89	22.04	16.37	23.36	16.56	24.68	16.71	27.01	17.73	29.34	17.80
	12	—	—	19.40	14.89	22.04	16.37	23.36	16.56	24.68	16.71	27.01	17.73	29.34	17.80
	14	—	—	19.40	14.89	22.04	16.37	23.36	16.56	24.68	16.71	27.01	17.73	29.34	17.80
	16	—	—	19.40	14.89	22.04	16.37	23.36	16.56	24.68	16.71	27.01	17.73	29.34	17.80
	18	—	—	19.40	14.89	22.04	16.37	23.36	16.56	24.68	16.71	27.01	17.73	29.34	17.80
	20	—	—	19.38	14.88	22.04	16.37	23.36	16.56	24.68	16.71	27.01	17.73	29.32	17.80
	22	—	—	19.35	14.87	22.02	16.36	23.36	16.56	24.68	16.71	27.01	17.73	29.32	17.80
	24	—	—	19.35	14.87	22.00	16.35	23.32	16.54	24.64	16.69	26.88	17.68	29.10	17.71
Hi	26	16.31	14.07	19.35	14.87	21.97	16.34	23.30	16.53	24.60	16.67	26.75	17.63	28.87	17.55
	28	16.26	14.05	19.33	14.86	21.88	16.30	23.14	16.46	24.42	16.60	26.43	17.51	28.43	17.40
	30	16.24	14.04	19.31	14.85	21.77	16.26	23.00	16.41	24.24	16.53	26.10	17.38	27.98	17.24
	32	16.20	14.02	19.11	14.76	21.50	16.12	22.71	16.28	23.92	16.40	25.69	17.23	27.46	17.06
	34	16.15	14.00	18.91	14.67	21.26	16.01	22.42	16.16	23.61	16.27	25.29	17.07	26.97	16.89
	35	16.13	13.99	18.79	14.61	21.12	15.95	22.40	16.15	23.45	16.21	25.11	17.01	26.77	16.82
	36	16.13	13.99	18.68	14.56	20.99	15.90	22.15	16.05	23.30	16.15	24.93	16.94	26.54	16.74
	38	16.08	13.97	18.46	14.46	20.72	15.78	21.86	15.91	22.98	16.02	24.55	16.80	26.12	16.60
	39	16.06	13.96	18.35	14.41	20.59	15.72	21.71	15.84	22.83	15.96	24.37	16.74	25.92	16.53

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDUA280KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	24.25	18.96	27.55	20.82	29.20	21.03	30.86	21.21	33.77	22.65	36.68	22.67
	12	—	—	24.25	18.96	27.55	20.82	29.20	21.03	30.86	21.21	33.77	22.65	36.68	22.67
	14	—	—	24.25	18.96	27.55	20.82	29.20	21.03	30.86	21.21	33.77	22.65	36.68	22.67
	16	—	—	24.25	18.96	27.55	20.82	29.20	21.03	30.86	21.21	33.77	22.65	36.68	22.67
	18	—	—	24.25	18.96	27.55	20.82	29.20	21.03	30.86	21.21	33.77	22.65	36.68	22.67
	20	—	—	24.22	18.95	27.55	20.82	29.20	21.03	30.86	21.21	33.77	22.65	36.65	22.66
	22	—	—	24.19	18.94	27.52	20.80	29.20	21.03	30.86	21.21	33.77	22.65	36.65	22.66
	24	—	—	24.19	18.94	27.50	20.79	29.15	21.01	30.80	21.19	33.60	22.59	36.37	22.56
Hi	26	20.38	17.95	24.19	18.94	27.47	20.78	29.12	21.00	30.74	21.17	33.43	22.53	36.09	22.47
	28	20.33	17.92	24.16	18.93	27.36	20.73	28.92	20.92	30.52	21.08	33.04	22.39	35.53	22.24
	30	20.30	17.91	24.14	18.92	27.22	20.68	28.76	20.85	30.30	20.99	32.62	22.23	34.97	22.05
	32	20.24	17.88	23.88	18.80	26.88	20.53	28.39	20.70	29.90	20.84	32.12	22.04	34.33	21.84
	34	20.19	17.86	23.63	18.69	26.57	20.41	28.03	20.55	29.51	20.68	31.61	21.83	33.71	21.63
	35	20.16	17.84	23.49	18.63	26.40	20.33	28.00	20.55	29.32	20.61	31.39	21.75	33.46	21.51
	36	20.16	17.84	23.35	18.57	26.24	20.27	27.69	20.42	29.12	20.53	31.16	21.66	33.18	21.42
	38	20.10	17.82	23.07	18.45	25.90	20.13	27.33	20.28	28.73	20.38	30.69	21.50	32.65	21.24
	39	20.08	17.81	22.93	18.38	25.73	20.06	27.13	20.20	28.53	20.30	30.46	21.42	32.40	21.16

(g) FDUM Series

Model FDUMA22KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	1.91	1.79	2.16	1.97	2.29	1.99	2.42	2.00	2.65	2.14	2.88	2.14
	12	—	—	1.91	1.79	2.16	1.97	2.29	1.99	2.42	2.00	2.65	2.14	2.88	2.14
	14	—	—	1.91	1.79	2.16	1.97	2.29	1.99	2.42	2.00	2.65	2.14	2.88	2.14
	16	—	—	1.91	1.79	2.16	1.97	2.29	1.99	2.42	2.00	2.65	2.14	2.88	2.14
	18	—	—	1.91	1.79	2.16	1.97	2.29	1.99	2.42	2.00	2.65	2.14	2.88	2.14
	20	—	—	1.90	1.79	2.16	1.97	2.29	1.99	2.42	2.00	2.65	2.14	2.88	2.13
	22	—	—	1.90	1.79	2.16	1.97	2.29	1.99	2.42	2.00	2.65	2.14	2.88	2.13
	24	—	—	1.90	1.79	2.16	1.97	2.29	1.99	2.42	2.00	2.64	2.14	2.86	2.13
Hi	26	1.60	1.54	1.90	1.79	2.16	1.97	2.29	1.99	2.42	2.00	2.63	2.14	2.84	2.12
	28	1.60	1.53	1.90	1.78	2.15	1.97	2.27	1.98	2.40	1.99	2.60	2.13	2.79	2.11
	30	1.60	1.53	1.90	1.78	2.14	1.96	2.26	1.98	2.38	1.98	2.56	2.12	2.75	2.10
	32	1.59	1.53	1.88	1.78	2.11	1.96	2.23	1.96	2.35	1.97	2.52	2.11	2.70	2.09
	34	1.59	1.52	1.86	1.77	2.09	1.94	2.20	1.95	2.32	1.96	2.48	2.09	2.65	2.07
	35	1.58	1.52	1.85	1.77	2.07	1.94	2.20	1.95	2.30	1.96	2.47	2.09	2.63	2.06
	36	1.58	1.52	1.83	1.76	2.06	1.93	2.18	1.94	2.29	1.95	2.45	2.08	2.61	2.06
	38	1.58	1.52	1.81	1.74	2.04	1.92	2.15	1.94	2.26	1.94	2.41	2.07	2.57	2.05
	39	1.58	1.51	1.80	1.73	2.02	1.92	2.13	1.93	2.24	1.93	2.39	2.06	2.55	2.04

Model FDUMA28KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	2.42	2.16	2.76	2.38	2.92	2.40	3.09	2.41	3.38	2.59	3.67	2.59
	12	—	—	2.42	2.16	2.76	2.38	2.92	2.40	3.09	2.41	3.38	2.59	3.67	2.59
	14	—	—	2.42	2.16	2.76	2.38	2.92	2.40	3.09	2.41	3.38	2.59	3.67	2.59
	16	—	—	2.42	2.16	2.76	2.38	2.92	2.40	3.09	2.41	3.38	2.59	3.67	2.59
	18	—	—	2.42	2.16	2.76	2.38	2.92	2.40	3.09	2.41	3.38	2.59	3.67	2.59
	20	—	—	2.42	2.16	2.76	2.38	2.92	2.40	3.09	2.41	3.38	2.59	3.67	2.59
	22	—	—	2.42	2.16	2.75	2.38	2.92	2.40	3.09	2.41	3.38	2.59	3.67	2.59
	24	—	—	2.42	2.16	2.75	2.38	2.91	2.39	3.08	2.41	3.36	2.58	3.64	2.57
Hi	26	2.04	1.96	2.42	2.16	2.75	2.37	2.91	2.39	3.07	2.41	3.34	2.57	3.61	2.57
	28	2.03	1.95	2.42	2.15	2.74	2.37	2.89	2.39	3.05	2.40	3.30	2.56	3.55	2.54
	30	2.03	1.95	2.41	2.15	2.72	2.37	2.88	2.38	3.03	2.39	3.26	2.54	3.50	2.53
	32	2.02	1.94	2.39	2.14	2.69	2.34	2.84	2.36	2.99	2.38	3.21	2.53	3.43	2.51
	34	2.02	1.94	2.36	2.13	2.66	2.33	2.80	2.35	2.95	2.37	3.16	2.51	3.37	2.48
	35	2.02	1.94	2.35	2.13	2.64	2.32	2.80	2.35	3.93	2.35	3.14	2.50	3.35	2.48
	36	2.02	1.94	2.34	2.12	2.62	2.31	2.77	2.32	2.91	2.35	3.12	2.50	3.32	2.47
	38	2.01	1.93	2.31	2.10	2.59	2.30	2.73	2.31	2.87	2.34	3.07	2.48	3.26	2.45
	39	2.01	1.93	2.29	2.10	2.57	2.30	2.71	2.31	2.85	2.31	3.05	2.47	3.24	2.44

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDUMA36KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.12	2.77	3.54	3.06	3.75	3.08	3.97	3.11	4.34	3.31	4.72	3.30
	12	—	—	3.12	2.77	3.54	3.06	3.75	3.08	3.97	3.11	4.34	3.31	4.72	3.30
	14	—	—	3.12	2.77	3.54	3.06	3.75	3.08	3.97	3.11	4.34	3.31	4.72	3.30
	16	—	—	3.12	2.77	3.54	3.06	3.75	3.08	3.97	3.11	4.34	3.31	4.72	3.30
	18	—	—	3.12	2.77	3.54	3.06	3.75	3.08	3.97	3.11	4.34	3.31	4.72	3.30
	20	—	—	3.11	2.77	3.54	3.06	3.75	3.08	3.97	3.11	4.34	3.31	4.71	3.30
	22	—	—	3.11	2.77	3.54	3.06	3.75	3.08	3.97	3.11	4.34	3.31	4.71	3.30
	24	—	—	3.11	2.77	3.54	3.06	3.75	3.08	3.96	3.10	4.32	3.31	4.68	3.29
Hi	26	2.62	2.52	3.11	2.77	3.53	3.05	3.74	3.08	3.95	3.10	4.30	3.30	4.64	3.28
	28	2.61	2.51	3.11	2.77	3.52	3.05	3.72	3.07	3.92	3.09	4.25	3.28	4.57	3.26
	30	2.61	2.51	3.10	2.77	3.50	3.04	3.70	3.06	3.90	3.08	4.19	3.26	4.50	3.24
	32	2.60	2.50	3.07	2.75	3.46	3.03	3.65	3.04	3.84	3.06	4.13	3.24	4.41	3.21
	34	2.60	2.49	3.04	2.74	3.42	3.01	3.60	3.03	3.79	3.04	4.06	3.22	4.33	3.19
	35	2.59	2.49	3.02	2.73	3.39	3.00	3.60	3.02	3.77	3.03	4.04	3.21	4.30	3.18
	36	2.59	2.49	3.00	2.73	3.37	2.99	3.56	3.01	3.74	3.02	4.01	3.20	4.27	3.17
	38	2.58	2.48	2.97	2.71	3.33	2.97	3.51	2.99	3.69	3.00	3.95	3.18	4.20	3.15
	39	2.58	2.48	2.95	2.70	3.31	2.96	3.49	2.98	3.67	2.99	3.92	3.17	4.17	3.14

Model FDUMA45KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.90	3.32	4.43	3.65	4.69	3.69	4.96	3.72	5.43	3.97	5.90	3.96
	12	—	—	3.90	3.32	4.43	3.65	4.69	3.69	4.96	3.72	5.43	3.97	5.90	3.96
	14	—	—	3.90	3.32	4.43	3.65	4.69	3.69	4.96	3.72	5.43	3.97	5.90	3.96
	16	—	—	3.90	3.32	4.43	3.65	4.69	3.69	4.96	3.72	5.43	3.97	5.90	3.96
	18	—	—	3.90	3.32	4.43	3.65	4.69	3.69	4.96	3.72	5.43	3.97	5.90	3.96
	20	—	—	3.89	3.32	4.43	3.65	4.69	3.69	4.96	3.72	5.43	3.97	5.89	3.96
	22	—	—	3.89	3.32	4.42	3.65	4.69	3.69	4.96	3.72	5.43	3.97	5.89	3.96
	24	—	—	3.89	3.32	4.42	3.65	4.68	3.69	4.95	3.72	5.40	3.96	5.85	3.95
Hi	26	3.28	3.14	3.89	3.32	4.41	3.65	4.68	3.68	4.94	3.71	5.37	3.95	5.80	3.93
	28	3.27	3.14	3.88	3.31	4.40	3.64	4.65	3.67	4.91	3.69	5.31	3.93	5.71	3.91
	30	3.26	3.13	3.88	3.31	4.37	3.63	4.62	3.66	4.87	3.68	5.24	3.91	5.62	3.88
	32	3.25	3.12	3.84	3.30	4.32	3.61	4.56	3.64	4.81	3.66	5.16	3.88	5.52	3.85
	34	3.24	3.11	3.80	3.28	4.27	3.59	4.50	3.61	4.74	3.64	5.08	3.85	5.42	3.81
	35	3.24	3.11	3.78	3.27	4.24	3.58	4.50	3.61	4.71	3.62	5.04	3.84	5.38	3.80
	36	3.24	3.11	3.75	3.26	4.22	3.57	4.45	3.59	4.68	3.61	5.01	3.83	5.33	3.78
	38	3.23	3.10	3.71	3.24	4.16	3.54	4.39	3.57	4.62	3.58	4.93	3.80	5.25	3.76
	39	3.23	3.10	3.69	3.23	4.14	3.53	4.36	3.56	4.59	3.57	4.90	3.79	5.21	3.75

Model FDUMA56KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	4.85	3.85	5.51	4.25	5.84	4.29	6.17	4.33	6.75	4.62	7.34	4.61
	12	—	—	4.85	3.85	5.51	4.25	5.84	4.29	6.17	4.33	6.75	4.62	7.34	4.61
	14	—	—	4.85	3.85	5.51	4.25	5.84	4.29	6.17	4.33	6.75	4.62	7.34	4.61
	16	—	—	4.85	3.85	5.51	4.25	5.84	4.29	6.17	4.33	6.75	4.62	7.34	4.61
	18	—	—	4.85	3.85	5.51	4.25	5.84	4.29	6.17	4.33	6.75	4.62	7.34	4.61
	20	—	—	4.84	3.85	5.51	4.25	5.84	4.29	6.17	4.33	6.75	4.62	7.33	4.61
	22	—	—	4.84	3.85	5.50	4.24	5.84	4.29	6.17	4.33	6.75	4.62	7.33	4.61
	24	—	—	4.84	3.85	5.50	4.24	5.83	4.29	6.16	4.33	6.72	4.60	7.27	4.59
Hi	26	4.08	3.66	4.84	3.85	5.49	4.24	5.82	4.28	6.15	4.32	6.69	4.59	7.22	4.57
	28	4.07	3.65	4.83	3.85	5.47	4.23	5.78	4.27	6.10	4.30	6.61	4.56	7.11	4.53
	30	4.06	3.65	4.83	3.84	5.44	4.22	5.75	4.25	6.06	4.28	6.52	4.52	6.99	4.50
	32	4.05	3.64	4.78	3.82	5.38	4.19	5.68	4.22	5.98	4.25	6.42	4.49	6.87	4.44
	34	4.04	3.64	4.73	3.80	5.31	4.16	5.61	4.19	5.90	4.22	6.32	4.45	6.74	4.40
	35	4.03	3.64	4.70	3.79	5.28	4.15	5.60	4.19	5.86	4.20	6.28	4.43	6.69	4.39
	36	4.03	3.64	4.67	3.78	5.25	4.13	5.54	4.17	5.82	4.19	6.23	4.42	6.64	4.37
	38	4.02	3.63	4.61	3.75	5.18	4.10	5.47	4.14	5.75	4.16	6.14	4.38	6.53	4.33
	39	4.02	3.63	4.59	3.74	5.15	4.09	5.43	4.12	5.71	4.14	6.09	4.37	6.48	4.32

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDUMA71KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	6.15	4.93	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.30	5.89
	12	—	—	6.15	4.93	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.30	5.89
	14	—	—	6.15	4.93	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.30	5.89
	16	—	—	6.15	4.93	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.30	5.89
	18	—	—	6.15	4.93	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.30	5.89
	20	—	—	6.14	4.92	6.99	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.29	5.89
	22	—	—	6.13	4.92	6.98	5.42	7.41	5.47	7.82	5.52	8.56	5.89	9.29	5.89
	24	—	—	6.13	4.92	6.97	5.41	7.39	5.47	7.81	5.51	8.52	5.87	9.22	5.86
Hi	26	5.17	4.66	6.13	4.92	6.97	5.41	7.38	5.47	7.80	5.51	8.48	5.86	9.15	5.83
	28	5.15	4.66	6.13	4.92	6.94	5.40	7.33	5.45	7.74	5.48	8.38	5.82	9.01	5.79
	30	5.15	4.65	6.12	4.92	6.90	5.38	7.29	5.43	7.68	5.46	8.27	5.78	8.87	5.74
	32	5.13	4.65	6.06	4.89	6.82	5.35	7.20	5.39	7.58	5.42	8.14	5.74	8.70	5.68
	34	5.12	4.64	5.99	4.86	6.74	5.32	7.11	5.35	7.48	5.39	8.02	5.69	8.55	5.63
	35	5.11	4.64	5.96	4.84	6.70	5.30	7.10	5.35	7.43	5.37	7.96	5.67	8.48	5.61
	36	5.11	4.64	5.92	4.83	6.65	5.28	7.02	5.32	7.38	5.35	7.90	5.64	8.41	5.59
	38	5.10	4.63	5.85	4.80	6.57	5.25	6.93	5.28	7.28	5.31	7.78	5.60	8.28	5.53
	39	5.09	4.63	5.81	4.78	6.52	5.23	6.88	5.26	7.23	5.29	7.72	5.58	8.21	5.51

Model FDUMA90KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	7.79	5.91	8.86	6.48	9.39	6.56	9.92	6.63	10.85	7.05	11.79	7.05
	12	—	—	7.79	5.91	8.86	6.48	9.39	6.56	9.92	6.63	10.85	7.05	11.79	7.05
	14	—	—	7.79	5.91	8.86	6.48	9.39	6.56	9.92	6.63	10.85	7.05	11.79	7.05
	16	—	—	7.79	5.91	8.86	6.48	9.39	6.56	9.92	6.63	10.85	7.05	11.79	7.05
	18	—	—	7.79	5.91	8.86	6.48	9.39	6.56	9.92	6.63	10.85	7.05	11.79	7.05
	20	—	—	7.79	5.90	8.86	6.48	9.39	6.56	9.92	6.63	10.85	7.05	11.78	7.05
	22	—	—	7.78	5.90	8.85	6.48	9.39	6.56	9.92	6.63	10.85	7.05	11.78	7.05
	24	—	—	7.78	5.90	8.84	6.47	9.37	6.56	9.90	6.62	10.80	7.02	11.69	7.02
Hi	26	6.55	5.57	7.78	5.90	8.83	6.47	9.36	6.55	9.88	6.61	10.75	7.00	11.60	6.99
	28	6.53	6.56	7.77	5.89	8.79	6.45	9.30	6.53	9.81	6.58	10.62	6.96	11.42	6.92
	30	6.53	6.56	7.76	5.89	8.75	6.44	9.24	6.50	9.74	6.55	10.49	6.90	11.24	6.85
	32	6.51	5.55	7.68	5.85	8.64	6.39	9.13	6.46	9.61	6.50	10.32	6.84	11.03	6.78
	34	6.49	5.54	7.60	5.82	8.54	6.35	9.01	6.40	9.49	6.45	10.16	6.78	10.84	6.71
	35	6.48	5.54	7.55	5.80	8.49	6.32	9.00	6.39	9.42	6.43	10.09	6.75	10.76	6.68
	36	6.48	5.54	7.51	5.78	8.43	6.30	8.90	6.35	9.36	6.40	10.02	6.72	10.67	6.65
	38	6.46	5.53	7.42	5.73	8.33	6.25	8.78	6.30	9.23	6.34	9.86	6.66	10.49	6.58
	39	6.45	5.52	7.37	5.71	8.27	6.23	8.72	6.28	9.17	6.32	9.79	6.64	10.41	6.55

Model FDUMA112KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	9.70	7.75	11.02	8.53	11.68	8.62	12.34	8.69	13.51	9.26	14.67	9.27
	12	—	—	9.70	7.75	11.02	8.53	11.68	8.62	12.34	8.69	13.51	9.26	14.67	9.27
	14	—	—	9.70	7.75	11.02	8.53	11.68	8.62	12.34	8.69	13.51	9.26	14.67	9.27
	16	—	—	9.70	7.75	11.02	8.53	11.68	8.62	12.34	8.69	13.51	9.26	14.67	9.27
	18	—	—	9.70	7.75	11.02	8.53	11.68	8.62	12.34	8.69	13.51	9.26	14.67	9.27
	20	—	—	9.69	7.75	11.02	8.53	11.68	8.62	12.34	8.69	13.51	9.26	14.66	9.27
	22	—	—	9.68	7.74	11.01	8.53	11.68	8.62	12.34	8.69	13.51	9.26	14.66	9.27
	24	—	—	9.68	7.74	11.00	8.52	11.66	8.61	12.32	8.68	13.44	9.24	14.55	9.23
Hi	26	8.15	7.36	9.68	7.74	10.99	8.52	11.65	8.61	12.30	8.67	13.37	9.22	14.44	9.18
	28	8.13	7.35	9.67	7.74	10.94	8.50	11.57	8.57	12.21	8.64	13.22	9.16	14.21	9.10
	30	8.12	7.35	9.65	7.74	10.89	8.48	11.50	8.55	12.12	8.60	13.05	9.10	13.99	9.02
	32	8.10	7.33	9.55	7.69	10.75	8.42	11.36	8.49	11.96	8.54	12.85	9.02	13.73	8.94
	34	8.08	7.32	9.45	7.65	10.63	8.36	11.21	8.43	11.80	8.48	12.64	8.95	13.48	8.85
	35	8.06	7.32	9.40	7.62	10.56	8.33	11.20	8.42	11.73	8.45	12.56	8.92	13.38	8.82
	36	8.06	7.32	9.34	7.60	10.49	8.30	11.08	8.37	11.65	8.42	12.47	8.88	13.27	8.78
	38	8.04	7.31	9.23	7.55	10.36	8.24	10.93	8.32	11.49	8.36	12.28	8.82	13.06	8.71
	39	8.03	7.30	9.17	7.52	10.29	8.22	10.85	8.29	11.41	8.33	12.19	8.78	12.96	8.68

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDUMA140KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	12.12	9.54	13.78	10.49	14.60	10.60	15.43	10.69	16.88	11.40	18.34	11.39
	12	—	—	12.12	9.54	13.78	10.49	14.60	10.60	15.43	10.69	16.88	11.40	18.34	11.39
	14	—	—	12.12	9.54	13.78	10.49	14.60	10.60	15.43	10.69	16.88	11.40	18.34	11.39
	16	—	—	12.12	9.54	13.78	10.49	14.60	10.60	15.43	10.69	16.88	11.40	18.34	11.39
	18	—	—	12.12	9.54	13.78	10.49	14.60	10.60	15.43	10.69	16.88	11.40	18.34	11.39
	20	—	—	12.11	9.53	13.78	10.49	14.60	10.60	15.43	10.69	16.88	11.40	18.33	11.38
	22	—	—	12.10	9.53	13.76	10.48	14.60	10.60	15.43	10.69	16.88	11.40	18.33	11.38
	24	—	—	12.10	9.53	13.75	10.48	14.57	10.59	15.40	10.68	16.80	11.36	18.19	11.34
	26	10.19	9.01	12.10	9.53	13.73	10.47	14.56	10.58	15.37	10.67	16.72	11.33	18.05	11.29
	28	10.16	9.00	12.08	9.52	13.68	10.45	14.46	10.54	15.26	10.62	16.52	11.26	17.77	11.19
	30	10.15	9.00	12.07	9.51	13.61	10.42	14.38	10.51	15.15	10.58	16.31	11.18	17.49	11.10
	32	10.12	8.98	11.94	9.46	13.44	10.35	14.20	10.43	14.95	10.50	16.06	11.07	17.16	10.99
	34	10.09	8.97	11.82	9.40	13.29	10.27	14.01	10.36	14.76	10.42	15.81	10.98	16.86	10.86
	35	10.08	8.96	11.75	9.37	13.20	10.23	14.00	10.35	14.66	10.38	15.69	10.94	16.73	10.82
	36	10.08	8.96	11.68	9.31	13.12	10.20	13.85	10.29	14.56	10.35	15.58	10.90	16.59	10.78
	38	10.05	8.95	11.54	9.25	12.95	10.13	13.66	10.22	14.36	10.27	15.34	10.82	16.32	10.69
	39	10.04	8.94	11.47	9.22	12.87	10.09	13.57	10.18	14.27	10.23	15.23	10.77	16.20	10.64

(h) FDUR Series

Model FDURA45KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	3.90	3.74	4.43	4.22	4.69	4.25	4.96	4.28	5.43	4.58	5.90	4.57
	12	—	—	3.90	3.74	4.43	4.22	4.69	4.25	4.96	4.28	5.43	4.58	5.90	4.57
	14	—	—	3.90	3.74	4.43	4.22	4.69	4.25	4.96	4.28	5.43	4.58	5.90	4.57
	16	—	—	3.90	3.74	4.43	4.22	4.69	4.25	4.96	4.28	5.43	4.58	5.90	4.57
	18	—	—	3.90	3.74	4.43	4.22	4.69	4.25	4.96	4.28	5.43	4.58	5.90	4.57
	20	—	—	3.89	3.74	4.43	4.22	4.69	4.25	4.96	4.28	5.43	4.58	5.89	4.56
	22	—	—	3.89	3.73	4.42	4.22	4.69	4.25	4.96	4.28	5.43	4.58	5.89	4.56
	24	—	—	3.89	3.73	4.42	4.22	4.68	4.25	4.95	4.28	5.40	4.57	5.85	4.55
	26	3.28	3.14	3.89	3.73	4.41	4.22	4.68	4.25	4.94	4.28	5.37	4.56	5.80	4.54
	28	3.27	3.14	3.88	3.73	4.40	4.21	4.65	4.23	4.91	4.26	5.31	4.54	5.71	4.51
	30	3.26	3.13	3.88	3.72	4.37	4.20	4.62	4.22	4.87	4.24	5.24	4.52	5.62	4.48
	32	3.25	3.12	3.84	3.68	4.32	4.15	4.56	4.20	4.81	4.22	5.16	4.49	5.52	4.45
	34	3.24	3.11	3.80	3.65	4.27	4.10	4.50	4.18	4.74	4.20	5.08	4.47	5.42	4.42
	35	3.24	3.11	3.78	3.62	4.24	4.07	4.50	4.18	4.71	4.18	5.04	4.45	5.38	4.41
	36	3.24	3.11	3.75	3.60	4.22	4.05	4.45	4.16	4.68	4.17	5.01	4.44	5.33	4.39
	38	3.23	3.10	3.71	3.56	4.16	4.00	4.39	4.14	4.62	4.15	4.93	4.42	5.25	4.37
	39	3.23	3.10	3.69	3.54	4.14	3.97	4.36	4.13	4.59	4.14	4.90	4.41	5.21	4.36

Model FDURA56KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	4.85	4.66	5.51	5.20	5.84	5.23	6.17	5.26	6.75	5.64	7.34	5.62
	12	—	—	4.85	4.66	5.51	5.20	5.84	5.23	6.17	5.26	6.75	5.64	7.34	5.62
	14	—	—	4.85	4.66	5.51	5.20	5.84	5.23	6.17	5.26	6.75	5.64	7.34	5.62
	16	—	—	4.85	4.66	5.51	5.20	5.84	5.23	6.17	5.26	6.75	5.64	7.34	5.62
	18	—	—	4.85	4.66	5.51	5.20	5.84	5.23	6.17	5.26	6.75	5.64	7.34	5.62
	20	—	—	4.84	4.65	5.51	5.20	5.84	5.23	6.17	5.26	6.75	5.64	7.33	5.62
	22	—	—	4.84	4.64	5.50	5.19	5.84	5.23	6.17	5.26	6.75	5.64	7.33	5.62
	24	—	—	4.84	4.64	5.50	5.19	5.83	5.23	6.16	5.26	6.72	5.63	7.27	5.60
	26	4.08	3.91	4.84	4.64	5.49	5.18	5.82	5.23	6.15	5.25	6.69	5.62	7.22	5.59
	28	4.07	3.90	4.83	4.64	5.47	5.17	5.78	5.21	6.10	5.24	6.61	5.59	7.11	5.55
	30	4.06	3.90	4.83	4.63	5.44	5.16	5.75	5.20	6.06	5.22	6.52	5.56	6.99	5.52
	32	4.05	3.89	4.78	4.59	5.38	5.14	5.68	5.18	5.98	5.19	6.42	5.53	6.87	5.48
	34	4.04	3.88	4.73	4.54	5.31	5.10	5.61	5.15	5.90	5.17	6.32	5.50	6.74	5.44
	35	4.03	3.87	4.70	4.51	5.28	5.07	5.60	5.15	5.86	5.15	6.28	5.48	6.69	5.43
	36	4.03	3.87	4.67	4.48	5.25	5.04	5.54	5.11	5.82	5.14	6.23	5.47	6.64	5.41
	38	4.02	3.86	4.61	4.43	5.18	4.97	5.47	5.09	5.75	5.11	6.14	5.44	6.53	5.38
	39	4.02	3.85	4.59	4.40	5.15	4.94	5.43	5.07	5.71	5.10	6.09	5.42	6.48	5.36

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDURA71KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	6.15	5.69	6.99	6.30	7.41	6.35	7.82	6.39	8.56	6.84	9.30	6.83
	12	—	—	6.15	5.69	6.99	6.30	7.41	6.35	7.82	6.39	8.56	6.84	9.30	6.83
	14	—	—	6.15	5.69	6.99	6.30	7.41	6.35	7.82	6.39	8.56	6.84	9.30	6.83
	16	—	—	6.15	5.69	6.99	6.30	7.41	6.35	7.82	6.39	8.56	6.84	9.30	6.83
	18	—	—	6.15	5.69	6.99	6.30	7.41	6.35	7.82	6.39	8.56	6.84	9.30	6.83
	20	—	—	6.14	5.69	6.99	6.30	7.41	6.35	7.82	6.39	8.56	6.84	9.29	6.82
	22	—	—	6.13	5.69	6.98	6.30	7.41	6.35	7.82	6.39	8.56	6.84	9.29	6.82
	24	—	—	6.13	5.69	6.97	6.30	7.39	6.34	7.81	6.39	8.52	6.83	9.22	6.80
Hi	26	5.17	4.96	6.13	5.69	6.97	6.29	7.38	6.34	7.80	6.38	8.48	6.82	9.15	6.78
	28	5.15	4.95	6.13	5.69	6.94	6.28	7.33	6.32	7.74	6.36	8.38	6.78	9.01	6.74
	30	5.15	4.94	6.12	5.68	6.90	6.27	7.29	6.30	7.68	6.34	8.27	6.75	8.87	6.69
	32	5.13	4.93	6.06	5.66	6.82	6.24	7.20	6.27	7.58	6.29	8.14	6.71	8.70	6.64
	34	5.12	4.91	5.99	5.63	6.74	6.21	7.11	6.24	7.48	6.26	8.02	6.66	8.55	6.60
	35	5.11	4.91	5.96	5.62	6.70	6.19	7.10	6.23	7.43	6.24	7.96	6.64	8.48	6.58
	36	5.11	4.91	5.92	5.60	6.65	6.17	7.02	6.20	7.38	6.22	7.90	6.63	8.41	6.56
	38	5.10	4.89	5.85	5.57	6.57	6.14	6.93	6.17	7.28	6.19	7.78	6.59	8.28	6.52
	39	5.09	4.89	5.81	5.56	6.52	6.13	6.88	6.15	7.23	6.17	7.72	6.57	8.21	6.50

Model FDURA90KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	7.79	7.48	8.86	8.48	9.39	8.53	9.92	8.57	10.85	9.23	11.79	9.20
	12	—	—	7.79	7.48	8.86	8.48	9.39	8.53	9.92	8.57	10.85	9.23	11.79	9.20
	14	—	—	7.79	7.48	8.86	8.48	9.39	8.53	9.92	8.57	10.85	9.23	11.79	9.20
	16	—	—	7.79	7.48	8.86	8.48	9.39	8.53	9.92	8.57	10.85	9.23	11.79	9.20
	18	—	—	7.79	7.48	8.86	8.48	9.39	8.53	9.92	8.57	10.85	9.23	11.79	9.20
	20	—	—	7.79	7.47	8.86	8.48	9.39	8.53	9.92	8.57	10.85	9.23	11.78	9.20
	22	—	—	7.78	7.46	8.85	8.47	9.39	8.53	9.92	8.57	10.85	9.23	11.78	9.20
	24	—	—	7.78	7.46	8.84	8.47	9.37	8.52	9.90	8.57	10.80	9.21	11.69	9.17
Hi	26	6.55	6.29	7.78	7.46	8.83	8.47	9.36	8.52	9.88	8.56	10.75	9.19	11.60	9.14
	28	6.53	6.27	7.77	7.46	8.79	8.44	9.30	8.50	9.81	8.53	10.62	9.15	11.42	9.09
	30	6.53	6.26	7.76	7.45	8.75	8.40	9.24	8.48	9.74	8.51	10.49	9.10	11.24	9.03
	32	6.51	6.25	7.68	7.37	8.64	8.29	9.13	8.43	9.61	8.47	10.32	9.05	11.03	8.97
	34	6.49	6.23	7.60	7.29	8.54	8.20	9.01	8.39	9.49	8.42	10.16	9.00	10.84	8.91
	35	6.48	6.22	7.55	7.25	8.49	8.15	9.00	8.39	9.42	8.40	10.09	8.97	10.76	8.89
	36	6.48	6.22	7.51	7.21	8.43	8.10	8.90	8.35	9.36	8.38	10.02	8.95	10.67	8.86
	38	6.46	6.20	7.42	7.12	8.33	7.99	8.78	8.29	9.23	8.33	9.86	8.90	10.49	8.81
	39	6.45	6.19	7.37	7.08	8.27	7.94	8.72	8.27	9.17	8.31	9.79	8.88	10.41	8.78

Model FDURA112KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	9.70	8.45	11.02	9.32	11.68	9.42	12.34	9.48	13.51	10.14	14.67	10.13
	12	—	—	9.70	8.45	11.02	9.32	11.68	9.42	12.34	9.48	13.51	10.14	14.67	10.13
	14	—	—	9.70	8.45	11.02	9.32	11.68	9.42	12.34	9.48	13.51	10.14	14.67	10.13
	16	—	—	9.70	8.45	11.02	9.32	11.68	9.42	12.34	9.48	13.51	10.14	14.67	10.13
	18	—	—	9.70	8.45	11.02	9.32	11.68	9.42	12.34	9.48	13.51	10.14	14.67	10.13
	20	—	—	9.69	8.45	11.02	9.32	11.68	9.42	12.34	9.48	13.51	10.14	14.66	10.12
	22	—	—	9.68	8.44	11.01	9.32	11.68	9.42	12.34	9.48	13.51	10.14	14.66	10.12
	24	—	—	9.68	8.44	11.00	9.31	11.66	9.41	12.32	9.47	13.44	10.12	14.55	10.09
Hi	26	8.15	7.83	9.68	8.44	10.99	9.31	11.65	9.40	12.30	9.46	13.37	10.10	14.44	10.05
	28	8.13	7.81	9.67	8.44	10.94	9.29	11.57	9.37	12.21	9.43	13.22	10.05	14.21	9.98
	30	8.12	7.80	9.65	8.43	10.89	9.27	11.50	9.33	12.12	9.39	13.05	9.99	13.99	9.91
	32	8.10	7.77	9.55	8.39	10.75	9.22	11.36	9.27	11.96	9.34	12.85	9.92	13.73	9.82
	34	8.08	7.75	9.45	8.35	10.63	9.17	11.21	9.22	11.80	9.28	12.64	9.85	13.48	9.75
	35	8.06	7.74	9.40	8.33	10.56	9.14	11.20	9.21	11.73	9.23	12.56	9.82	13.38	9.71
	36	8.06	7.74	9.34	8.30	10.49	9.11	11.08	9.17	11.65	9.20	12.47	9.79	13.27	9.68
	38	8.04	7.72	9.23	8.25	10.36	9.06	10.93	9.11	11.49	9.15	12.28	9.70	13.06	9.61
	39	8.03	7.71	9.17	8.23	10.29	9.03	10.85	9.08	11.41	9.12	12.19	9.67	12.96	9.56

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDURA140KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	12.12	10.46	13.78	11.51	14.60	11.61	15.43	11.70	16.88	12.53	18.34	12.50
	12	—	—	12.12	10.46	13.78	11.51	14.60	11.61	15.43	11.70	16.88	12.53	18.34	12.50
	14	—	—	12.12	10.46	13.78	11.51	14.60	11.61	15.43	11.70	16.88	12.53	18.34	12.50
	16	—	—	12.12	10.46	13.78	11.51	14.60	11.61	15.43	11.70	16.88	12.53	18.34	12.50
	18	—	—	12.12	10.46	13.78	11.51	14.60	11.61	15.43	11.70	16.88	12.53	18.34	12.50
	20	—	—	12.11	10.45	13.78	11.51	14.60	11.61	15.43	11.70	16.88	12.53	18.33	12.50
	22	—	—	12.10	10.45	13.76	11.50	14.60	11.61	15.43	11.70	16.88	12.53	18.33	12.50
	24	—	—	12.10	10.45	13.75	11.50	14.57	11.59	15.40	11.69	16.80	12.50	18.19	12.45
Hi	26	10.19	9.78	12.10	10.45	13.73	11.49	14.56	11.59	15.37	11.68	16.72	12.47	18.05	12.41
	28	10.16	9.76	12.08	10.44	13.68	11.47	14.46	11.55	15.26	11.64	16.52	12.37	17.77	12.32
	30	10.15	9.74	12.07	10.43	13.61	11.44	14.38	11.52	15.15	11.58	16.31	12.30	17.49	12.23
	32	10.12	9.72	11.94	10.38	13.44	11.38	14.20	11.45	14.95	11.51	16.06	12.22	17.16	12.10
	34	10.09	9.69	11.82	10.33	13.29	11.32	14.01	11.38	14.76	11.43	15.81	12.13	16.86	12.01
	35	10.08	9.68	11.75	10.30	13.20	11.28	14.00	11.37	14.66	11.40	15.69	12.09	16.73	11.97
	36	10.08	9.68	11.68	10.27	13.12	11.25	13.85	11.32	14.56	11.36	15.58	12.05	16.59	11.92
	38	10.05	9.65	11.54	10.19	12.95	11.18	13.66	11.25	14.36	11.29	15.34	11.97	16.32	11.84
	39	10.04	9.64	11.47	10.16	12.87	11.15	13.57	11.21	14.27	11.25	15.23	11.94	16.20	11.80

(i) FDQS Series

Model FDQSA22KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	1.91	1.83	2.16	2.06	2.29	2.08	2.42	2.09	2.65	2.25	2.88	2.24
	12	—	—	1.91	1.83	2.16	2.06	2.29	2.08	2.42	2.09	2.65	2.25	2.88	2.24
	14	—	—	1.91	1.83	2.16	2.06	2.29	2.08	2.42	2.09	2.65	2.25	2.88	2.24
	16	—	—	1.91	1.83	2.16	2.06	2.29	2.08	2.42	2.09	2.65	2.25	2.88	2.24
	18	—	—	1.90	1.83	2.16	2.06	2.29	2.08	2.42	2.09	2.65	2.25	2.88	2.24
	20	—	—	1.90	1.83	2.16	2.06	2.29	2.08	2.42	2.09	2.65	2.25	2.88	2.24
	22	—	—	1.90	1.83	2.16	2.06	2.29	2.08	2.42	2.09	2.65	2.25	2.88	2.24
	24	—	—	1.90	1.83	2.16	2.06	2.29	2.08	2.42	2.09	2.64	2.25	2.86	2.24
Hi	26	1.60	1.54	1.90	1.83	2.16	2.06	2.29	2.08	2.42	2.09	2.63	2.24	2.84	2.23
	28	1.60	1.53	1.90	1.82	2.15	2.06	2.27	2.07	2.40	2.08	2.60	2.23	2.79	2.22
	30	1.60	1.53	1.90	1.82	2.14	2.05	2.26	2.07	2.38	2.07	2.56	2.22	2.75	2.20
	32	1.59	1.53	1.88	1.80	2.11	2.03	2.23	2.06	2.35	2.06	2.52	2.20	2.70	2.18
	34	1.59	1.52	1.86	1.78	2.09	2.00	2.20	2.04	2.32	2.05	2.48	2.19	2.65	2.17
	35	1.58	1.52	1.85	1.77	2.07	1.99	2.20	2.04	2.30	2.05	2.47	2.19	2.63	2.16
	36	1.58	1.52	1.83	1.76	2.06	1.98	2.17	2.03	2.29	2.04	2.45	2.18	2.61	2.16
	38	1.58	1.52	1.81	1.74	2.04	1.95	2.15	2.02	2.26	2.03	2.41	2.17	2.57	2.15
	39	1.58	1.51	1.80	1.73	2.02	1.94	2.13	2.02	2.24	2.02	2.39	2.16	2.55	2.14

Model FDQSA28KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	2.42	2.09	2.76	2.30	2.92	2.31	3.09	2.33	3.38	2.49	3.67	2.48
	12	—	—	2.42	2.09	2.76	2.30	2.92	2.31	3.09	2.33	3.38	2.49	3.67	2.48
	14	—	—	2.42	2.09	2.76	2.30	2.92	2.31	3.09	2.33	3.38	2.49	3.67	2.48
	16	—	—	2.42	2.09	2.76	2.30	2.92	2.31	3.09	2.33	3.38	2.49	3.67	2.48
	18	—	—	2.42	2.09	2.75	2.30	2.92	2.31	3.09	2.33	3.38	2.49	3.67	2.48
	20	—	—	2.42	2.09	2.75	2.30	2.92	2.31	3.09	2.33	3.38	2.49	3.67	2.48
	22	—	—	2.42	2.09	2.75	2.30	2.92	2.31	3.09	2.33	3.38	2.49	3.67	2.48
	24	—	—	2.42	2.09	2.75	2.29	2.92	2.31	3.08	2.33	3.36	2.49	3.64	2.48
Hi	26	2.04	1.96	2.42	2.09	2.75	2.29	2.91	2.31	3.08	2.32	3.34	2.48	3.61	2.47
	28	2.03	1.95	2.42	2.08	2.73	2.29	2.89	2.30	3.05	2.32	3.30	2.47	3.55	2.45
	30	2.03	1.95	2.41	2.08	2.72	2.28	2.88	2.30	3.03	2.31	3.26	2.46	3.50	2.43
	32	2.02	1.94	2.39	2.07	2.69	2.27	2.84	2.28	2.99	2.29	3.21	2.44	3.43	2.42
	34	2.02	1.94	2.36	2.06	2.66	2.26	2.80	2.27	2.95	2.28	3.16	2.42	3.37	2.40
	35	2.02	1.94	2.35	2.06	2.64	2.25	2.80	2.27	2.93	2.27	3.14	2.41	3.34	2.39
	36	2.02	1.94	2.34	2.05	2.62	2.25	2.77	2.26	2.91	2.27	3.12	2.41	3.32	2.38
	38	2.01	1.93	2.31	2.04	2.59	2.23	2.73	2.25	2.87	2.25	3.07	2.39	3.27	2.36
	39	2.01	1.93	2.29	2.03	2.57	2.23	2.71	2.24	2.85	2.25	3.05	2.38	3.24	2.36

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDQSA36KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.12	2.48	3.54	2.72	3.75	2.76	3.97	2.78	4.34	2.96	4.72	2.96
	12	—	—	3.12	2.48	3.54	2.72	3.75	2.76	3.97	2.78	4.34	2.96	4.72	2.96
	14	—	—	3.12	2.48	3.54	2.72	3.75	2.76	3.97	2.78	4.34	2.96	4.72	2.96
	16	—	—	3.12	2.48	3.54	2.72	3.75	2.76	3.97	2.78	4.34	2.96	4.72	2.96
	18	—	—	3.12	2.48	3.54	2.72	3.75	2.76	3.97	2.78	4.34	2.96	4.71	2.96
	20	—	—	3.11	2.48	3.54	2.72	3.75	2.76	3.97	2.78	4.34	2.96	4.71	2.96
	22	—	—	3.11	2.48	3.54	2.72	3.75	2.76	3.97	2.78	4.34	2.96	4.71	2.96
	24	—	—	3.11	2.48	3.54	2.72	3.75	2.75	3.96	2.78	4.32	2.95	4.68	2.95
Hi	26	2.62	2.35	3.11	2.48	3.53	2.72	3.74	2.75	3.95	2.77	4.30	2.95	4.64	2.93
	28	2.61	2.35	3.11	2.47	3.52	2.71	3.72	2.74	3.92	2.76	4.25	2.93	4.57	2.91
	30	2.61	2.34	3.10	2.47	3.50	2.71	3.70	2.73	3.90	2.75	4.20	2.90	4.50	2.88
	32	2.60	2.34	3.07	2.46	3.46	2.69	3.65	2.71	3.84	2.73	4.13	2.88	4.42	2.85
	34	2.60	2.34	3.04	2.44	3.42	2.67	3.61	2.69	3.79	2.71	4.06	2.86	4.33	2.83
	35	2.59	2.34	3.02	2.44	3.39	2.66	3.60	2.69	3.77	2.70	4.03	2.85	4.30	2.81
	36	2.59	2.34	3.00	2.43	3.37	2.65	3.56	2.67	3.74	2.69	4.01	2.83	4.27	2.80
	38	2.58	2.33	2.97	2.41	3.33	2.64	3.51	2.65	3.69	2.67	3.95	2.81	4.20	2.78
	39	2.58	2.33	2.95	2.40	3.31	2.63	3.49	2.64	3.67	2.66	3.92	2.80	4.16	2.77

Model FDQSA45KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.90	3.04	4.43	3.35	4.69	3.39	4.96	3.42	5.43	3.65	5.90	3.64
	12	—	—	3.90	3.04	4.43	3.35	4.69	3.39	4.96	3.42	5.43	3.65	5.90	3.64
	14	—	—	3.90	3.04	4.43	3.35	4.69	3.39	4.96	3.42	5.43	3.65	5.89	3.64
	16	—	—	3.90	3.04	4.43	3.35	4.69	3.39	4.96	3.42	5.43	3.65	5.89	3.64
	18	—	—	3.90	3.04	4.43	3.35	4.69	3.39	4.96	3.42	5.43	3.65	5.89	3.64
	20	—	—	3.89	3.04	4.43	3.35	4.69	3.39	4.96	3.42	5.43	3.65	5.89	3.64
	22	—	—	3.89	3.04	4.42	3.35	4.69	3.39	4.96	3.42	5.43	3.65	5.89	3.64
	24	—	—	3.89	3.04	4.42	3.35	4.69	3.39	4.95	3.42	5.40	3.63	5.85	3.63
Hi	26	3.28	2.89	3.89	3.04	4.42	3.35	4.68	3.38	4.94	3.42	5.37	3.62	5.80	3.61
	28	3.27	2.88	3.88	3.04	4.40	3.34	4.65	3.37	4.91	3.40	5.31	3.60	5.71	3.58
	30	3.26	2.88	3.88	3.04	4.37	3.33	4.62	3.36	4.87	3.38	5.24	3.57	5.62	3.54
	32	3.25	2.88	3.84	3.02	4.32	3.31	4.56	3.34	4.81	3.36	5.16	3.54	5.52	3.51
	34	3.24	2.87	3.80	3.00	4.27	3.28	4.51	3.31	4.74	3.33	5.08	3.51	5.42	3.48
	35	3.24	2.87	3.78	2.99	4.24	3.27	4.50	3.31	4.71	3.32	5.04	3.50	5.38	3.46
	36	3.24	2.87	3.75	2.98	4.22	3.26	4.45	3.29	4.68	3.31	5.01	3.48	5.33	3.44
	38	3.23	2.87	3.71	2.96	4.16	3.24	4.39	3.26	4.62	3.29	4.93	3.46	5.25	3.42
	39	3.23	2.86	3.69	2.95	4.14	3.23	4.36	3.25	4.59	3.27	4.90	3.44	5.21	3.40

Model FDQSA56KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	4.85	3.50	5.51	3.83	5.84	3.90	6.17	3.94	6.75	4.18	7.34	4.18
	12	—	—	4.85	3.50	5.51	3.83	5.84	3.90	6.17	3.94	6.75	4.18	7.34	4.18
	14	—	—	4.85	3.50	5.51	3.83	5.84	3.90	6.17	3.94	6.75	4.18	7.34	4.18
	16	—	—	4.85	3.50	5.51	3.83	5.84	3.90	6.17	3.94	6.75	4.18	7.33	4.18
	18	—	—	4.85	3.50	5.51	3.83	5.84	3.90	6.17	3.94	6.75	4.18	7.33	4.18
	20	—	—	4.84	3.50	5.51	3.83	5.84	3.90	6.17	3.94	6.75	4.18	7.33	4.18
	22	—	—	4.84	3.50	5.51	3.83	5.84	3.90	6.17	3.94	6.75	4.18	7.33	4.18
	24	—	—	4.84	3.50	5.50	3.83	5.83	3.90	6.16	3.94	6.72	4.17	7.28	4.16
Hi	26	4.08	3.28	4.84	3.50	5.50	3.83	5.82	3.89	6.15	3.93	6.68	4.15	7.22	4.14
	28	4.07	3.27	4.83	3.49	5.47	3.82	5.79	3.87	6.11	3.91	6.61	4.12	7.11	4.10
	30	4.06	3.27	4.83	3.49	5.44	3.81	5.75	3.86	6.06	3.89	6.53	4.09	6.99	4.05
	32	4.05	3.26	4.78	3.47	5.38	3.78	5.68	3.81	5.98	3.86	6.42	4.04	6.87	4.01
	34	4.04	3.26	4.73	3.44	5.31	3.75	5.61	3.78	5.90	3.82	6.32	4.00	6.74	3.96
	35	4.03	3.25	4.70	3.43	5.28	3.73	5.60	3.78	5.86	3.81	6.28	3.98	6.69	3.94
	36	4.03	3.25	4.67	3.42	5.25	3.72	5.54	3.75	5.82	3.78	6.23	3.97	6.64	3.92
	38	4.02	3.25	4.61	3.39	5.18	3.69	5.46	3.72	5.75	3.75	6.14	3.93	6.53	3.88
	39	4.01	3.25	4.59	3.38	5.15	3.67	5.43	3.71	5.71	3.73	6.09	3.91	6.48	3.86

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

(j) FDE Series

Model FDEA36KXER

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	3.12	2.69	3.54	2.96	3.75	2.99	3.97	3.01	4.34	3.22	4.72	3.22
	12	—	—	3.12	2.69	3.54	2.96	3.75	2.99	3.97	3.01	4.34	3.22	4.72	3.22
	14	—	—	3.12	2.69	3.54	2.96	3.75	2.99	3.97	3.01	4.34	3.22	4.72	3.22
	16	—	—	3.12	2.69	3.54	2.96	3.75	2.99	3.97	3.01	4.34	3.22	4.72	3.22
	18	—	—	3.12	2.69	3.54	2.96	3.75	2.99	3.97	3.01	4.34	3.22	4.72	3.22
	20	—	—	3.11	2.69	3.54	2.96	3.75	2.99	3.97	3.01	4.34	3.22	4.71	3.22
	22	—	—	3.11	2.69	3.54	2.96	3.75	2.99	3.97	3.01	4.34	3.22	4.71	3.22
	24	—	—	3.11	2.69	3.54	2.96	3.75	2.98	3.96	3.01	4.32	3.21	4.68	3.21
	26	2.62	2.52	3.11	2.69	3.53	2.96	3.74	2.98	3.95	3.01	4.30	3.21	4.64	3.20
	28	2.61	2.51	3.11	2.69	3.52	2.95	3.72	2.97	3.92	3.00	4.25	3.19	4.57	3.17
	30	2.61	2.51	3.10	2.68	3.50	2.95	3.70	2.97	3.90	2.99	4.19	3.17	4.50	3.14
	32	2.60	2.50	3.07	2.67	3.46	2.93	3.65	2.95	3.84	2.96	4.13	3.15	4.41	3.12
	34	2.60	2.49	3.04	2.66	3.42	2.91	3.60	2.93	3.79	2.94	4.06	3.13	4.33	3.09
	35	2.59	2.49	3.02	2.65	3.39	2.91	3.60	2.93	3.77	2.93	4.04	3.12	4.30	3.08
	36	2.59	2.49	3.00	2.64	3.37	2.90	3.56	2.91	3.74	2.93	4.01	3.09	4.27	3.05
	38	2.58	2.48	2.97	2.63	3.33	2.88	3.51	2.90	3.69	2.91	3.95	3.07	4.20	3.03
	39	2.58	2.48	2.95	2.62	3.31	2.87	3.49	2.89	3.67	2.90	3.92	3.06	4.17	3.02

Model FDEA45KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	3.90	3.04	4.43	3.33	4.69	3.37	4.96	3.41	5.43	3.63	5.90	3.63
	12	—	—	3.90	3.04	4.43	3.33	4.69	3.37	4.96	3.41	5.43	3.63	5.90	3.63
	14	—	—	3.90	3.04	4.43	3.33	4.69	3.37	4.96	3.41	5.43	3.63	5.90	3.63
	16	—	—	3.90	3.04	4.43	3.33	4.69	3.37	4.96	3.41	5.43	3.63	5.90	3.63
	18	—	—	3.90	3.04	4.43	3.33	4.69	3.37	4.96	3.41	5.43	3.63	5.90	3.63
	20	—	—	3.89	3.03	4.43	3.33	4.69	3.37	4.96	3.41	5.43	3.63	5.89	3.63
	22	—	—	3.89	3.03	4.42	3.33	4.69	3.37	4.96	3.41	5.43	3.63	5.89	3.63
	24	—	—	3.89	3.03	4.42	3.33	4.68	3.36	4.95	3.39	5.40	3.62	5.85	3.61
	26	3.28	2.87	3.89	3.03	4.41	3.33	4.68	3.36	4.94	3.39	5.37	3.61	5.80	3.60
	28	3.27	2.87	3.88	3.03	4.40	3.32	4.65	3.35	4.91	3.37	5.31	3.58	5.71	3.56
	30	3.26	2.87	3.88	3.03	4.37	3.31	4.62	3.34	4.87	3.36	5.24	3.56	5.62	3.53
	32	3.25	2.86	3.84	3.01	4.32	3.29	4.56	3.31	4.81	3.34	5.16	3.53	5.52	3.50
	34	3.24	2.86	3.80	2.99	4.27	3.27	4.50	3.29	4.74	3.31	5.08	3.50	5.42	3.46
	35	3.24	2.86	3.78	2.98	4.24	3.26	4.50	3.29	4.71	3.30	5.04	3.48	5.38	3.45
	36	3.24	2.86	3.75	2.97	4.22	3.25	4.45	3.27	4.68	3.29	5.01	3.47	5.33	3.43
	38	3.23	2.85	3.71	2.95	4.16	3.22	4.39	3.25	4.62	3.26	4.93	3.44	5.25	3.40
	39	3.23	2.85	3.69	2.94	4.14	3.21	4.36	3.23	4.59	3.25	4.90	3.42	5.21	3.38

Model FDEA56KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	4.85	3.54	5.51	3.89	5.84	3.94	6.17	3.99	6.75	4.22	7.34	4.22
	12	—	—	4.85	3.54	5.51	3.89	5.84	3.94	6.17	3.99	6.75	4.22	7.34	4.22
	14	—	—	4.85	3.54	5.51	3.89	5.84	3.94	6.17	3.99	6.75	4.22	7.34	4.22
	16	—	—	4.85	3.54	5.51	3.89	5.84	3.94	6.17	3.99	6.75	4.22	7.34	4.22
	18	—	—	4.85	3.54	5.51	3.89	5.84	3.94	6.17	3.99	6.75	4.22	7.34	4.22
	20	—	—	4.84	3.54	5.51	3.89	5.84	3.94	6.17	3.99	6.75	4.22	7.33	4.22
	22	—	—	4.84	3.54	5.50	3.88	5.84	3.94	6.17	3.99	6.75	4.22	7.33	4.22
	24	—	—	4.84	3.54	5.50	3.88	5.83	3.93	6.16	3.98	6.72	4.21	7.27	4.20
	26	4.08	3.32	4.84	3.54	5.49	3.88	5.82	3.93	6.15	3.98	6.69	4.19	7.22	4.18
	28	4.07	3.32	4.83	3.53	5.47	3.87	5.78	3.91	6.10	3.96	6.61	4.16	7.11	4.14
	30	4.06	3.31	4.83	3.53	5.44	3.86	5.75	3.90	6.06	3.94	6.52	4.13	6.99	4.09
	32	4.05	3.31	4.78	3.51	5.38	3.83	5.68	3.87	5.98	3.90	6.42	4.09	6.87	4.05
	34	4.04	3.30	4.73	3.48	5.31	3.80	5.61	3.83	5.90	3.87	6.32	4.05	6.74	4.00
	35	4.03	3.30	4.70	3.47	5.28	3.78	5.60	3.83	5.86	3.85	6.28	4.03	6.69	3.98
	36	4.03	3.30	4.67	3.46	5.25	3.77	5.54	3.80	5.82	3.83	6.23	4.01	6.64	3.96
	38	4.02	3.29	4.61	3.43	5.18	3.74	5.47	3.77	5.75	3.80	6.14	3.97	6.53	3.92
	39	4.02	3.29	4.59	3.42	5.15	3.71	5.43	3.76	5.71	3.78	6.09	3.95	6.48	3.90

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDEA71KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	6.15	4.95	6.99	5.44	7.41	5.50	7.82	5.54	8.56	5.91	9.30	5.92
	12	—	—	6.15	4.95	6.99	5.44	7.41	5.50	7.82	5.54	8.56	5.91	9.30	5.92
	14	—	—	6.15	4.95	6.99	5.44	7.41	5.50	7.82	5.54	8.56	5.91	9.30	5.92
	16	—	—	6.15	4.95	6.99	5.44	7.41	5.50	7.82	5.54	8.56	5.91	9.30	5.92
	18	—	—	6.15	4.95	6.99	5.44	7.41	5.50	7.82	5.54	8.56	5.91	9.30	5.92
	20	—	—	6.14	4.94	6.99	5.44	7.41	5.50	7.82	5.54	8.56	5.91	9.29	5.90
	22	—	—	6.13	4.94	6.98	5.44	7.41	5.50	7.82	5.54	8.56	5.91	9.29	5.90
	24	—	—	6.13	4.94	6.97	5.44	7.39	5.49	7.81	5.54	8.52	5.90	9.22	5.88
Hi	26	5.17	4.70	6.13	4.94	6.97	5.44	7.38	5.49	7.80	5.53	8.48	5.88	9.15	5.86
	28	5.15	4.69	6.13	4.94	6.94	5.42	7.33	5.47	7.74	5.51	8.38	5.84	9.01	5.81
	30	5.15	4.69	6.12	4.93	6.90	5.41	7.29	5.45	7.68	5.49	8.27	5.80	8.87	5.76
	32	5.13	4.68	6.06	4.91	6.82	5.36	7.20	5.42	7.58	5.45	8.14	5.76	8.70	5.70
	34	5.12	4.67	5.99	4.88	6.74	5.33	7.11	5.38	7.48	5.41	8.02	5.71	8.55	5.65
	35	5.11	4.67	5.96	4.86	6.70	5.31	7.10	5.38	7.43	5.39	7.96	5.69	8.48	5.63
	36	5.11	4.67	5.92	4.85	6.65	5.30	7.02	5.34	7.38	5.37	7.90	5.67	8.41	5.61
	38	5.10	4.67	5.85	4.82	6.57	5.26	6.93	5.30	7.28	5.33	7.78	5.63	8.28	5.56
	39	5.09	4.66	5.81	4.80	6.52	5.24	6.88	5.28	7.23	5.31	7.72	5.61	8.21	5.54

Model FDEA112KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	9.70	7.52	11.02	8.28	11.68	8.37	12.34	8.45	13.51	9.00	14.67	9.01
	12	—	—	9.70	7.52	11.02	8.28	11.68	8.37	12.34	8.45	13.51	9.00	14.67	9.01
	14	—	—	9.70	7.52	11.02	8.28	11.68	8.37	12.34	8.45	13.51	9.00	14.67	9.01
	16	—	—	9.70	7.52	11.02	8.28	11.68	8.37	12.34	8.45	13.51	9.00	14.67	9.01
	18	—	—	9.70	7.52	11.02	8.28	11.68	8.37	12.34	8.45	13.51	9.00	14.67	9.01
	20	—	—	9.69	7.52	11.02	8.28	11.68	8.37	12.34	8.45	13.51	9.00	14.66	9.00
	22	—	—	9.68	7.51	11.01	8.28	11.68	8.37	12.34	8.45	13.51	9.00	14.66	9.00
	24	—	—	9.68	7.51	11.00	8.27	11.66	8.36	12.32	8.44	13.44	8.97	14.55	8.95
Hi	26	8.15	7.12	9.68	7.51	10.99	8.27	11.65	8.36	12.30	8.43	13.37	8.95	14.44	8.91
	28	8.13	7.11	9.67	7.51	10.94	8.25	11.57	8.32	12.21	8.39	13.22	8.89	14.21	8.83
	30	8.12	7.10	9.65	7.50	10.89	8.22	11.50	8.30	12.12	8.36	13.05	8.82	13.99	8.75
	32	8.10	7.09	9.55	7.46	10.75	8.17	11.36	8.24	11.96	8.29	12.85	8.75	13.73	8.66
	34	8.08	7.08	9.45	7.41	10.63	8.11	11.21	8.18	11.80	8.23	12.64	8.67	13.48	8.58
	35	8.06	7.08	9.40	7.39	10.56	8.08	11.20	8.17	11.73	8.20	12.56	8.64	13.38	8.54
	36	8.06	7.08	9.34	7.36	10.49	8.05	11.08	8.12	11.65	8.17	12.47	8.60	13.27	8.51
	38	8.04	7.07	9.23	7.31	10.36	8.00	10.93	8.06	11.49	8.11	12.28	8.53	13.06	8.43
	39	8.03	7.06	9.17	7.29	10.29	7.97	10.85	8.03	11.41	8.07	12.19	8.50	12.96	8.40

Model FDEA140KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	12.12	9.00	13.78	9.88	14.60	10.02	15.43	10.12	16.88	10.74	18.34	10.76
	12	—	—	12.12	9.00	13.78	9.88	14.60	10.02	15.43	10.12	16.88	10.74	18.34	10.76
	14	—	—	12.12	9.00	13.78	9.88	14.60	10.02	15.43	10.12	16.88	10.74	18.34	10.76
	16	—	—	12.12	9.00	13.78	9.88	14.60	10.02	15.43	10.12	16.88	10.74	18.34	10.76
	18	—	—	12.12	9.00	13.78	9.88	14.60	10.02	15.43	10.12	16.88	10.74	18.34	10.76
	20	—	—	12.11	8.99	13.78	9.88	14.60	10.02	15.43	10.12	16.88	10.74	18.33	10.76
	22	—	—	12.10	8.99	13.76	9.88	14.60	10.02	15.43	10.12	16.88	10.74	18.33	10.76
	24	—	—	12.10	8.99	13.75	9.87	14.57	10.01	15.40	10.11	16.80	10.71	18.19	10.70
Hi	26	10.19	8.47	12.10	8.99	13.73	9.86	14.56	10.00	15.37	10.10	16.72	10.67	18.05	10.65
	28	10.16	8.46	12.08	8.98	13.68	9.84	14.46	9.94	15.26	10.05	16.52	10.60	17.77	10.53
	30	10.15	8.45	12.07	8.97	13.61	9.81	14.38	9.91	15.15	10.00	16.31	10.51	17.49	10.43
	32	10.12	8.44	11.94	8.91	13.44	9.73	14.20	9.83	14.95	9.92	16.06	10.42	17.16	10.32
	34	10.09	8.42	11.82	8.86	13.29	9.66	14.01	9.75	14.76	9.83	15.81	10.32	16.86	10.20
	35	10.08	8.41	11.75	8.82	13.20	9.63	14.00	9.74	14.66	9.78	15.69	10.27	16.73	10.16
	36	10.08	8.41	11.68	8.79	13.12	9.59	13.85	9.68	14.56	9.74	15.58	10.23	16.59	10.11
	38	10.05	8.40	11.54	8.72	12.95	9.52	13.66	9.60	14.36	9.66	15.34	10.14	16.32	10.01
	39	10.04	8.39	11.47	8.69	12.87	9.48	13.57	9.56	14.27	9.62	15.23	10.08	16.20	9.97

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

(k) FDK Series

Model FDKA22KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	1.91	1.83	2.16	2.03	2.29	2.04	2.42	2.05	2.65	2.20	2.88	2.20
	12	—	—	1.91	1.83	2.16	2.03	2.29	2.04	2.42	2.05	2.65	2.20	2.88	2.20
	14	—	—	1.91	1.83	2.16	2.03	2.29	2.04	2.42	2.05	2.65	2.20	2.88	2.20
	16	—	—	1.91	1.83	2.16	2.03	2.29	2.04	2.42	2.05	2.65	2.20	2.88	2.20
	18	—	—	1.91	1.83	2.16	2.03	2.29	2.04	2.42	2.05	2.65	2.20	2.88	2.20
	20	—	—	1.90	1.83	2.16	2.03	2.29	2.04	2.42	2.05	2.65	2.20	2.88	2.20
	22	—	—	1.90	1.82	2.16	2.02	2.29	2.04	2.42	2.05	2.65	2.20	2.88	2.20
	24	—	—	1.90	1.82	2.16	2.02	2.29	2.04	2.42	2.05	2.64	2.20	2.86	2.19
	26	1.60	1.54	1.90	1.82	2.16	2.02	2.29	2.04	2.42	2.05	2.63	2.19	2.84	2.18
	28	1.60	1.53	1.90	1.82	2.15	2.02	2.27	2.03	2.40	2.04	2.60	2.18	2.79	2.17
	30	1.60	1.53	1.90	1.82	2.14	2.02	2.26	2.03	2.38	2.03	2.56	2.17	2.75	2.16
	32	1.59	1.53	1.88	1.80	2.11	2.01	2.23	2.02	2.35	2.02	2.52	2.16	2.70	2.14
	34	1.59	1.52	1.86	1.78	2.09	2.00	2.20	2.01	2.32	2.01	2.48	2.15	2.65	2.13
	35	1.58	1.52	1.85	1.77	2.07	1.99	2.20	2.00	2.30	2.01	2.47	2.14	2.63	2.12
	36	1.58	1.52	1.83	1.76	2.06	1.98	2.18	2.00	2.29	2.00	2.45	2.14	2.61	2.11
	38	1.58	1.52	1.81	1.74	2.04	1.95	2.15	1.98	2.26	1.99	2.41	2.12	2.57	2.10
	39	1.58	1.51	1.80	1.73	2.02	1.94	2.13	1.98	2.24	1.98	2.39	2.12	2.55	2.10

Model FDKA28KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	2.42	2.05	2.76	2.26	2.92	2.28	3.09	2.30	3.38	2.46	3.67	2.46
	12	—	—	2.42	2.05	2.76	2.26	2.92	2.28	3.09	2.30	3.38	2.46	3.67	2.46
	14	—	—	2.42	2.05	2.76	2.26	2.92	2.28	3.09	2.30	3.38	2.46	3.67	2.46
	16	—	—	2.42	2.05	2.76	2.26	2.92	2.28	3.09	2.30	3.38	2.46	3.67	2.46
	18	—	—	2.42	2.05	2.76	2.26	2.92	2.28	3.09	2.30	3.38	2.46	3.67	2.46
	20	—	—	2.42	2.05	2.76	2.26	2.92	2.28	3.09	2.30	3.38	2.46	3.67	2.46
	22	—	—	2.42	2.05	2.75	2.26	2.92	2.28	3.09	2.30	3.38	2.46	3.67	2.46
	24	—	—	2.42	2.05	2.75	2.26	2.91	2.28	3.08	2.30	3.36	2.45	3.64	2.45
	26	2.04	1.96	2.42	2.05	2.75	2.26	2.91	2.28	3.07	2.29	3.34	2.45	3.61	2.44
	28	2.03	1.95	2.42	2.05	2.74	2.25	2.89	2.27	3.05	2.29	3.30	2.43	3.55	2.42
	30	2.03	1.95	2.41	2.05	2.72	2.25	2.88	2.27	3.03	2.28	3.26	2.42	3.50	2.40
	32	2.02	1.94	2.39	2.03	2.69	2.24	2.84	2.25	2.99	2.26	3.21	2.40	3.43	2.38
	34	2.02	1.94	2.36	2.02	2.66	2.22	2.80	2.24	2.95	2.25	3.16	2.38	3.37	2.36
	35	2.02	1.94	2.35	2.02	2.64	2.21	2.80	2.24	2.93	2.24	3.14	2.37	3.35	2.35
	36	2.02	1.94	2.34	2.01	2.62	2.21	2.77	2.22	2.91	2.23	3.12	2.37	3.32	2.34
	38	2.01	1.93	2.31	2.00	2.59	2.19	2.73	2.21	2.87	2.22	3.07	2.35	3.26	2.32
	39	2.01	1.93	2.29	1.99	2.57	2.19	2.71	2.20	2.85	2.21	3.05	2.34	3.24	2.31

Model FDKA36KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	3.12	2.59	3.54	2.85	3.75	2.88	3.97	2.90	4.34	3.09	4.72	3.10
	12	—	—	3.12	2.59	3.54	2.85	3.75	2.88	3.97	2.90	4.34	3.09	4.72	3.10
	14	—	—	3.12	2.59	3.54	2.85	3.75	2.88	3.97	2.90	4.34	3.09	4.72	3.10
	16	—	—	3.12	2.59	3.54	2.85	3.75	2.88	3.97	2.90	4.34	3.09	4.72	3.10
	18	—	—	3.12	2.59	3.54	2.85	3.75	2.88	3.97	2.90	4.34	3.09	4.72	3.10
	20	—	—	3.11	2.59	3.54	2.85	3.75	2.88	3.97	2.90	4.34	3.09	4.71	3.09
	22	—	—	3.11	2.59	3.54	2.85	3.75	2.88	3.97	2.90	4.34	3.09	4.71	3.09
	24	—	—	3.11	2.59	3.54	2.85	3.75	2.87	3.96	2.89	4.32	3.09	4.68	3.08
	26	2.62	2.46	3.11	2.59	3.53	2.85	3.74	2.87	3.95	2.89	4.30	3.08	4.64	3.07
	28	2.61	2.46	3.11	2.58	3.52	2.84	3.72	2.86	3.92	2.88	4.25	3.06	4.57	3.04
	30	2.61	2.46	3.10	2.58	3.50	2.83	3.70	2.85	3.90	2.87	4.19	3.04	4.50	3.02
	32	2.60	2.45	3.07	2.57	3.46	2.81	3.65	2.84	3.84	2.85	4.13	3.02	4.41	2.99
	34	2.60	2.45	3.04	2.55	3.42	2.80	3.60	2.82	3.79	2.83	4.06	3.00	4.33	2.97
	35	2.59	2.45	3.02	2.55	3.39	2.79	3.60	2.82	3.77	2.82	4.04	2.99	4.30	2.96
	36	2.59	2.45	3.00	2.54	3.37	2.78	3.56	2.80	3.74	2.81	4.01	2.98	4.27	2.94
	38	2.58	2.45	2.97	2.52	3.33	2.76	3.51	2.78	3.69	2.79	3.95	2.95	4.20	2.92
	39	2.58	2.44	2.95	2.52	3.31	2.75	3.49	2.77	3.67	2.78	3.92	2.94	4.17	2.91

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDKA45KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	3.90	3.11	4.43	3.41	4.69	3.45	4.96	3.48	5.43	3.71	5.90	3.71
	12	—	—	3.90	3.11	4.43	3.41	4.69	3.45	4.96	3.48	5.43	3.71	5.90	3.71
	14	—	—	3.90	3.11	4.43	3.41	4.69	3.45	4.96	3.48	5.43	3.71	5.90	3.71
	16	—	—	3.90	3.11	4.43	3.41	4.69	3.45	4.96	3.48	5.43	3.71	5.90	3.71
	18	—	—	3.90	3.11	4.43	3.41	4.69	3.45	4.96	3.48	5.43	3.71	5.90	3.71
	20	—	—	3.89	3.10	4.43	3.41	4.69	3.45	4.96	3.48	5.43	3.71	5.89	3.71
	22	—	—	3.89	3.10	4.42	3.41	4.69	3.45	4.96	3.48	5.43	3.71	5.89	3.71
	24	—	—	3.89	3.10	4.42	3.41	4.68	3.44	4.95	3.48	5.40	3.70	5.85	3.69
	26	3.28	2.95	3.89	3.10	4.41	3.41	4.68	3.44	4.94	3.48	5.37	3.69	5.80	3.68
	28	3.27	2.94	3.88	3.10	4.40	3.40	4.65	3.43	4.91	3.46	5.31	3.67	5.71	3.64
	30	3.26	2.94	3.88	3.10	4.37	3.39	4.62	3.42	4.87	3.45	5.24	3.64	5.62	3.61
	32	3.25	2.94	3.84	3.08	4.32	3.37	4.56	3.39	4.81	3.42	5.16	3.61	5.52	3.58
	34	3.24	2.93	3.80	3.06	4.27	3.35	4.50	3.37	4.74	3.39	5.08	3.58	5.42	3.54
	35	3.24	2.93	3.78	3.05	4.24	3.33	4.50	3.37	4.71	3.38	5.04	3.57	5.38	3.53
	36	3.24	2.93	3.75	3.04	4.22	3.32	4.45	3.35	4.68	3.37	5.01	3.55	5.33	3.51
	38	3.23	2.93	3.71	3.02	4.16	3.30	4.39	3.32	4.62	3.34	4.93	3.53	5.25	3.49
	39	3.23	2.92	3.69	3.01	4.14	3.29	4.36	3.31	4.59	3.33	4.90	3.51	5.21	3.47

Model FDKA56KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	4.85	3.90	5.51	4.27	5.84	4.31	6.17	4.35	6.75	4.65	7.34	4.64
	12	—	—	4.85	3.90	5.51	4.27	5.84	4.31	6.17	4.35	6.75	4.65	7.34	4.64
	14	—	—	4.85	3.90	5.51	4.27	5.84	4.31	6.17	4.35	6.75	4.65	7.34	4.64
	16	—	—	4.85	3.90	5.51	4.27	5.84	4.31	6.17	4.35	6.75	4.65	7.34	4.64
	18	—	—	4.85	3.90	5.51	4.27	5.84	4.31	6.17	4.35	6.75	4.65	7.34	4.64
	20	—	—	4.84	3.89	5.51	4.27	5.84	4.31	6.17	4.35	6.75	4.65	7.33	4.64
	22	—	—	4.84	3.89	5.50	4.27	5.84	4.31	6.17	4.35	6.75	4.65	7.33	4.64
	24	—	—	4.84	3.89	5.50	4.26	5.83	4.31	6.16	4.35	6.72	4.63	7.27	4.62
	26	4.08	3.69	4.84	3.89	5.49	4.26	5.82	4.31	6.15	4.34	6.69	4.62	7.22	4.60
	28	4.07	3.69	4.83	3.89	5.47	4.25	5.78	4.29	6.10	4.32	6.61	4.59	7.11	4.56
	30	4.06	3.68	4.83	3.89	5.44	4.24	5.75	4.28	6.06	4.31	6.52	4.56	6.99	4.52
	32	4.05	3.68	4.78	3.86	5.38	4.21	5.68	4.25	5.98	4.27	6.42	4.52	6.87	4.48
	34	4.04	3.67	4.73	3.84	5.31	4.19	5.61	4.22	5.90	4.24	6.32	4.49	6.74	4.44
	35	4.03	3.67	4.70	3.83	5.28	4.17	5.60	4.21	5.86	4.23	6.28	4.47	6.69	4.42
	36	4.03	3.67	4.67	3.82	5.25	4.16	5.54	4.19	5.82	4.21	6.23	4.45	6.64	4.40
	38	4.02	3.67	4.61	3.79	5.18	4.13	5.47	4.16	5.75	4.18	6.14	4.42	6.53	4.37
	39	4.02	3.66	4.59	3.78	5.15	4.12	5.43	4.14	5.71	4.17	6.09	4.40	6.48	4.35

Model FDKA71KXE5R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	6.15	4.94	6.99	5.45	7.41	5.51	7.82	5.55	8.56	5.93	9.30	5.93
	12	—	—	6.15	4.94	6.99	5.45	7.41	5.51	7.82	5.55	8.56	5.93	9.30	5.93
	14	—	—	6.15	4.94	6.99	5.45	7.41	5.51	7.82	5.55	8.56	5.93	9.30	5.93
	16	—	—	6.15	4.94	6.99	5.45	7.41	5.51	7.82	5.55	8.56	5.93	9.30	5.93
	18	—	—	6.15	4.94	6.99	5.45	7.41	5.51	7.82	5.55	8.56	5.93	9.30	5.93
	20	—	—	6.14	4.94	6.99	5.45	7.41	5.51	7.82	5.55	8.56	5.93	9.29	5.93
	22	—	—	6.13	4.94	6.98	5.45	7.41	5.51	7.82	5.55	8.56	5.93	9.29	5.93
	24	—	—	6.13	4.94	6.97	5.45	7.39	5.50	7.81	5.55	8.52	5.91	9.22	5.90
	26	5.17	4.70	6.13	4.94	6.97	5.44	7.38	5.50	7.80	5.54	8.48	5.90	9.15	5.88
	28	5.15	4.70	6.13	4.94	6.94	5.43	7.33	5.48	7.74	5.52	8.38	5.86	9.01	5.82
	30	5.15	4.69	6.12	4.93	6.90	5.42	7.29	5.47	7.68	5.50	8.27	5.82	8.87	5.78
	32	5.13	4.69	6.06	4.91	6.82	5.38	7.20	5.42	7.58	5.46	8.14	5.77	8.70	5.72
	34	5.12	4.68	5.99	4.88	6.74	5.35	7.11	5.39	7.48	5.42	8.02	5.73	8.55	5.67
	35	5.11	4.68	5.96	4.87	6.70	5.33	7.10	5.39	7.43	5.41	7.96	5.71	8.48	5.65
	36	5.11	4.68	5.92	4.85	6.65	5.31	7.02	5.36	7.38	5.39	7.90	5.68	8.41	5.63
	38	5.10	4.67	5.85	4.82	6.57	5.27	6.93	5.31	7.28	5.34	7.78	5.64	8.28	5.58
	39	5.09	4.67	5.81	4.81	6.52	5.26	6.88	5.29	7.23	5.33	7.72	5.59	8.21	5.52

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

(I) FDFL , FDFU Series

Model FDFLA28KXE4R , FDFUA28KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	2.42	2.33	2.76	2.64	2.92	2.74	3.09	2.75	3.38	2.97	3.67	2.96
	12	—	—	2.42	2.33	2.76	2.64	2.92	2.74	3.09	2.75	3.38	2.97	3.67	2.96
	14	—	—	2.42	2.33	2.76	2.64	2.92	2.74	3.09	2.75	3.38	2.97	3.67	2.96
	16	—	—	2.42	2.33	2.76	2.64	2.92	2.74	3.09	2.75	3.38	2.97	3.67	2.96
	18	—	—	2.42	2.33	2.76	2.64	2.92	2.74	3.09	2.75	3.38	2.97	3.67	2.96
	20	—	—	2.42	2.33	2.76	2.64	2.92	2.74	3.09	2.75	3.38	2.97	3.67	2.96
	22	—	—	2.42	2.32	2.75	2.64	2.92	2.74	3.09	2.75	3.38	2.97	3.67	2.96
	24	—	—	2.42	2.32	2.75	2.64	2.91	2.74	3.08	2.75	3.36	2.96	3.64	2.95
Hi	26	2.04	1.96	2.42	2.32	2.75	2.64	2.91	2.73	3.07	2.75	3.34	2.96	3.61	2.94
	28	2.03	1.95	2.42	2.32	2.74	2.63	2.89	2.73	3.05	2.74	3.30	2.94	3.55	2.92
	30	2.03	1.95	2.41	2.32	2.72	2.61	2.88	2.72	3.03	2.73	3.26	2.92	3.50	2.91
	32	2.02	1.94	2.39	2.29	2.69	2.58	2.84	2.71	2.99	2.72	3.21	2.91	3.43	2.88
	34	2.02	1.94	2.36	2.27	2.66	2.55	2.80	2.69	2.95	2.70	3.16	2.89	3.37	2.86
	35	2.02	1.94	2.35	2.26	2.64	2.53	2.80	2.69	2.93	2.70	3.14	2.88	3.35	2.86
	36	2.02	1.94	2.34	2.24	2.62	2.52	2.77	2.66	2.91	2.69	3.12	2.88	3.32	2.85
	38	2.01	1.93	2.31	2.21	2.59	2.49	2.73	2.62	2.87	2.68	3.07	2.86	3.26	2.83
	39	2.01	1.93	2.29	2.20	2.57	2.47	2.71	2.60	2.85	2.67	3.05	2.86	3.24	2.83

Model FDFLA45KXE4R , FDFUA45KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	3.90	3.42	4.43	3.77	4.69	3.80	4.96	3.82	5.43	4.11	5.90	4.10
	12	—	—	3.90	3.42	4.43	3.77	4.69	3.80	4.96	3.82	5.43	4.11	5.90	4.10
	14	—	—	3.90	3.42	4.43	3.77	4.69	3.80	4.96	3.82	5.43	4.11	5.90	4.10
	16	—	—	3.90	3.42	4.43	3.77	4.69	3.80	4.96	3.82	5.43	4.11	5.90	4.10
	18	—	—	3.90	3.42	4.43	3.77	4.69	3.80	4.96	3.82	5.43	4.11	5.90	4.10
	20	—	—	3.89	3.42	4.43	3.77	4.69	3.80	4.96	3.82	5.43	4.11	5.89	4.10
	22	—	—	3.89	3.42	4.42	3.77	4.69	3.80	4.96	3.82	5.43	4.11	5.89	4.10
	24	—	—	3.89	3.42	4.42	3.77	4.68	3.80	4.95	3.82	5.40	4.10	5.85	4.08
Hi	26	3.28	3.14	3.89	3.42	4.41	3.76	4.68	3.79	4.94	3.82	5.37	4.09	5.80	4.07
	28	3.27	3.14	3.88	3.42	4.40	3.76	4.65	3.78	4.91	3.80	5.31	4.07	5.71	4.04
	30	3.26	3.13	3.88	3.42	4.37	3.75	4.62	3.77	4.87	3.79	5.24	4.04	5.62	4.01
	32	3.25	3.12	3.84	3.40	4.32	3.73	4.56	3.75	4.81	3.77	5.16	4.01	5.52	3.98
	34	3.24	3.11	3.80	3.38	4.27	3.71	4.50	3.73	4.74	3.74	5.08	3.98	5.42	3.94
	35	3.24	3.11	3.78	3.37	4.24	3.70	4.50	3.73	4.71	3.73	5.04	3.97	5.38	3.93
	36	3.24	3.11	3.75	3.36	4.22	3.69	4.45	3.71	4.68	3.72	5.01	3.96	5.33	3.92
	38	3.23	3.10	3.71	3.35	4.16	3.66	4.39	3.68	4.62	3.70	4.93	3.93	5.25	3.89
	39	3.23	3.10	3.69	3.34	4.14	3.65	4.36	3.67	4.59	3.69	4.90	3.92	5.21	3.88

Model FDFUA56KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
	10	—	—	4.85	3.85	5.51	4.23	5.84	4.27	6.17	4.32	6.75	4.59	7.34	4.59
	12	—	—	4.85	3.85	5.51	4.23	5.84	4.27	6.17	4.32	6.75	4.59	7.34	4.59
	14	—	—	4.85	3.85	5.51	4.23	5.84	4.27	6.17	4.32	6.75	4.59	7.34	4.59
	16	—	—	4.85	3.85	5.51	4.23	5.84	4.27	6.17	4.32	6.75	4.59	7.34	4.59
	18	—	—	4.85	3.85	5.51	4.23	5.84	4.27	6.17	4.32	6.75	4.59	7.34	4.59
	20	—	—	4.84	3.85	5.51	4.23	5.84	4.27	6.17	4.32	6.75	4.59	7.33	4.59
	22	—	—	4.84	3.84	5.50	4.23	5.84	4.27	6.17	4.32	6.75	4.59	7.33	4.59
	24	—	—	4.84	3.84	5.50	4.23	5.83	4.27	6.16	4.31	6.72	4.58	7.27	4.57
Hi	26	4.08	3.65	4.84	3.84	5.49	4.22	5.82	4.27	6.15	4.31	6.69	4.57	7.22	4.55
	28	4.07	3.64	4.83	3.84	5.47	4.21	5.78	4.25	6.10	4.28	6.61	4.54	7.11	4.51
	30	4.06	3.64	4.83	3.84	5.44	4.20	5.75	4.24	6.06	4.26	6.52	4.51	6.99	4.47
	32	4.05	3.63	4.78	3.82	5.38	4.17	5.68	4.21	5.98	4.23	6.42	4.47	6.87	4.43
	34	4.04	3.63	4.73	3.79	5.31	4.14	5.61	4.18	5.90	4.20	6.32	4.43	6.74	4.38
	35	4.03	3.63	4.70	3.78	5.28	4.13	5.60	4.18	5.86	4.19	6.28	4.41	6.69	4.37
	36	4.03	3.63	4.67	3.77	5.25	4.11	5.54	4.15	5.82	4.17	6.23	4.40	6.64	4.35
	38	4.02	3.62	4.61	3.74	5.18	4.09	5.47	4.12	5.75	4.14	6.14	4.36	6.53	4.31
	39	4.02	3.62	4.59	3.73	5.15	4.06	5.43	4.10	5.71	4.13	6.09	4.35	6.48	4.30

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

Model FDFLA71KXE4R , FDFUA71KXE4R

Air Flow	Outdoor Temp	Indoor Temp													
		14°CWB		16°CWB		18°CWB		19°CWB		20°CWB		22°CWB		24°CWB	
	°CDB	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC	TC	SHC
Hi	10	—	—	6.15	4.92	6.99	5.41	7.41	5.47	7.82	5.52	8.56	5.88	9.30	5.88
	12	—	—	6.15	4.92	6.99	5.41	7.41	5.47	7.82	5.52	8.56	5.88	9.30	5.88
	14	—	—	6.15	4.92	6.99	5.41	7.41	5.47	7.82	5.52	8.56	5.88	9.30	5.88
	16	—	—	6.15	4.92	6.99	5.41	7.41	5.47	7.82	5.52	8.56	5.88	9.30	5.88
	18	—	—	6.15	4.92	6.99	5.41	7.41	5.47	7.82	5.52	8.56	5.88	9.30	5.88
	20	—	—	6.14	4.92	6.99	5.41	7.41	5.47	7.82	5.52	8.56	5.88	9.29	5.88
	22	—	—	6.13	4.91	6.98	5.41	7.41	5.47	7.82	5.52	8.56	5.88	9.29	5.88
	24	—	—	6.13	4.91	6.97	5.41	7.39	5.46	7.81	5.52	8.52	5.87	9.22	5.85
	26	5.17	4.67	6.13	4.91	6.97	5.40	7.38	5.46	7.80	5.51	8.48	5.85	9.15	5.83
	28	5.15	4.67	6.13	4.91	6.94	5.39	7.33	5.44	7.74	5.49	8.38	5.82	9.01	5.78
	30	5.15	4.66	6.12	4.91	6.90	5.38	7.29	5.42	7.68	5.47	8.27	5.78	8.87	5.73
	32	5.13	4.66	6.06	4.88	6.82	5.34	7.20	5.38	7.58	5.42	8.14	5.72	8.70	5.68
	34	5.12	4.65	5.99	4.85	6.74	5.31	7.11	5.35	7.48	5.38	8.02	5.68	8.55	5.62
	35	5.11	4.65	5.96	4.84	6.70	5.29	7.10	5.34	7.43	5.36	7.96	5.66	8.48	5.60
	36	5.11	4.65	5.92	4.82	6.65	5.27	7.02	5.31	7.38	5.34	7.90	5.64	8.41	5.57
	38	5.10	4.64	5.85	4.79	6.57	5.24	6.93	5.28	7.28	5.30	7.78	5.59	8.28	5.53
	39	5.09	4.64	5.81	4.77	6.52	5.22	6.88	5.26	7.23	5.28	7.72	5.57	8.21	5.51

Note (1) Symbols are as follows :

TC :Total cooling capacity (kw)
SHC :Sensible heat capacity (kw)

4.5 APPLICATION DATA

SAFETY PRECAUTIONS

- Please read these "Safety Precautions" first then accurately execute the installation work.
- Though the precautionary points indicated herein are divided under two headings, ⚠WARNING and ⚠CAUTION, those points which are related to the strong possibility of an installation done in error resulting in death or serious injury are listed in the ⚠WARNING section. However, there is also a possibility of serious consequences in relationship to the points listed in the ⚠CAUTION section as well.

  In either case, important safety related information is indicated, so by all means, properly observe all that is mentioned.
- After completing the installation, along with confirming that no abnormalities were seen from the operation tests, please explain operating methods as well as maintenance methods to the user (customer) of this equipment, based on the owner's manual. Moreover, ask the customer to keep this sheet together with the owner's manual.

⚠ WARNING

- Installation should be performed by the dealer or a company speciallizing in this type of installarion. If you install the equipment yourself, installation errors could result in water leaks, electric shock, and/or a fire, as well as other hazards.
- Conduct installation work in accordance with the instructions in this installation manual. Installation errors could result in water leaks, electric shock, or fire.
- Sling the unit at the specified points with ropes properly rated for the weight in liftting it for portage. An improper manner of portage can result in a fail of the unit resulting in an accident invoiving personal death or injury.
- When installing a unit in a small rooms, take measure so that if the refrigerant leaks, it does not exceed the concentration limit. For information regarding measures to prevent the concentration limit from being exceed, please contact the dealer.
- It refrigerant leaks and the concentration limit is exceeded, suffocation could occur.
- Install the equipment in a location that can sufficiently support the weight of the equipment. If the area is not strong enough, an accident could result from the unit falling.
- Install the equipment in a location that can withstand strong winds, such as typhoons, and earthquakes. If the installation is not secure, an accident could result from the unit falling.
- Always turn off power before work is performed inside the unit such as for installation or servicing. A failure to observe this instruction can cause a danger or electric shock.
- Electrical work should be done by a licensed electrician who shall do the work in accordance with the Technical Standards Regarding Electrical Equipment. Indoor Wiring Provisions, and this installation manual. The electrician shall use specified circuits for the equipment. If the power supply circuit capacity is insuficient or the work is not done correcty, it could result in electric shock or a fire.
- For wiring, the specified cable should be used, the connections should be secure, and the fixtures shall be strong enough to prevent cables from being pulled out from the terminal connections. Incorrect connections or work fixtures could result in heat generation or a fire.
- In cabling, arrange cables suitably so that they may not get off their support and then fix the service panel securely. Improper installation can cause heat generation and a resultant fire. Please prevent any substance other than the specified refrigerant (R410A) such as air from entering the refrigerant cycle in installing or moving the air conditioning system. Contamination by air or a foreign substance can cause an abnormal pressure build-up inside the refrigerant cycle and a resultant explosion and personaly injury.
- Use only parts supplied with the unit and specified supply parts for installation. The use of unauthorized parts may cause the leaking of water or electricitly causing a danger of electric shock or a fire, a refrigerant leak, performance degradation, and control failures.
- Do not open operation valves (either liquid or gas or both) until refrigerant piping, an air-tightness test and an air purge are completed. When a leak of refrigerant gas occurs during piping work, stop brazing pipes and ventilate the room. Refrigerant gas, when it comes into contact with bare fire, can generate a toxic gas.
- When installation is completed, check for refrigerant gas leaks. If the refrigerant gas leaks indoors, it could come in contact with a fan heater, burner, or hot plate, which could generate a poisonous gas.

⚠ CAUTION

- Ground the equipment. Do not connect the ground wire to gas piping, water piping, a lightning rod, or telephone ground wires. It grounding is not performed correctly electric shock could occur.
- Depending on the installation location, a circuit breaker may need to be installed. It a circuit breaker is not installed, electric shock may occur.
- Please follow this manual faithfully in performing installation work. Improper installation work can cause abnormal vibrations and noise generation.
- Do not install the equipment in areas where there is danger of flammable gas leaks. It such gas does leak it could collect around the units and cause a fire.
- Install the drain piping in accordance with the installation manual so that it properly discharges waste water and is maintained at a temperature that prevents condensation.
- Do not install the outdoor unit where winds from its fan blow directly onto a plant, etc. Winds can affect adversely to the plant, etc.
- Secure a space for inspection and maintenance as specified in the manual. An insufficient space can result in an accident such as a fall from the installation point and a resultant personal injury.
- When the outdoor unit is installed on a roof or at an elevated point, provide permanent ladders and handrails along the access route and fences and handrails around the outdoor unit.
- In tightening a flare nut, use a double spanner and observe the specified tightening torque. Care must be taken so as not to overtighten a nut and damage the flare part. (Please refer to the tightening torque) The loosening or damage of the flare part can cause a refrigerant gas leak and a resultant lack-of-oxygen accident.
- Please dress the refrigerant piping with a heat insulation material for prevention of dew condensation. Improper heat insulation for prevention of dew condensation can cause the leaking or dripping of water and a resultant soaking of household effects.
- When refrigerant piping is completed, check its air-tighteness with nitrogen gas to make sure it does not have a leak. A leak of refrigerant gas in a narrow room beyond the safety limit concentration can cause a lack-of oxygen accident.
- If the humidity exceeds 80% or the drain or piping become clogged, condensation from the indoor unit could drip and cause damage. Please do not install the indoor units above items of furniture, etc. that you do not want to get wert. Also, do not place items that you do not want to get wet underneath the indoor units.

(1) Installation of indoor unit

(a) Ceiling recessed compact type (FDTC)

(i) Selection of installation location

1) Select location where the space above ceiling is larger than those mentioned below and perfect draining can be assured.
2) With the customer's consent, select a location with following suitable conditions.
   a) Where cool air or hot air can easily pass through.
      If the height of the location exceeds 3 m, hot air will gather in the ceiling. Suggest to the customer to also install a circulator.
   b) Where water can be completely drained. A sloping location for drainage.
   c) Where there are no wind disturbances to the air return air supply, where the fire alarm will not be set off erroneosly, where no air circulation short circuits occur.
   d) Where there is no direct sunlight.
   e) If the humidity above the ceiling exceeds 80% or the condensation temperature above the ceiling exceeds 28ºC, affix polyurethane foam (with a thickness to 10 or greater) above the insulation in the ceiling panels.

   ⟨ Carry out tests of the main unit under the above conditions and confirm that there is no failure. However, if the environment where the unit is installed exceeds the above conditions and the unit is operated in high humidity conditions, there is danger of condensate dripping down. If there is a possibility that the unit will be used under such conditions, dress 10 to 20 mm of insulation material on the main unit, piping and drain pipes. ⟩

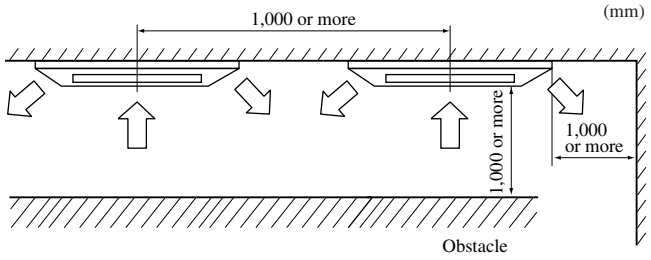
3) Consider the supporting strength of the location. If the strength is not sufficient to sustain the unit weight, use reinforcing materials.

(ii) Installation space for unit

a) When a sufficient interval cannot be secured between the unit and a wall or another unit, shut up diffusers on that port to block air supply and make sure that no air short-circuiting is occurring. (A air supply port blocking material is available as an optional part)
   • Do not use the unit in the "Lo" wind mode, when air is blown into two or three directions.

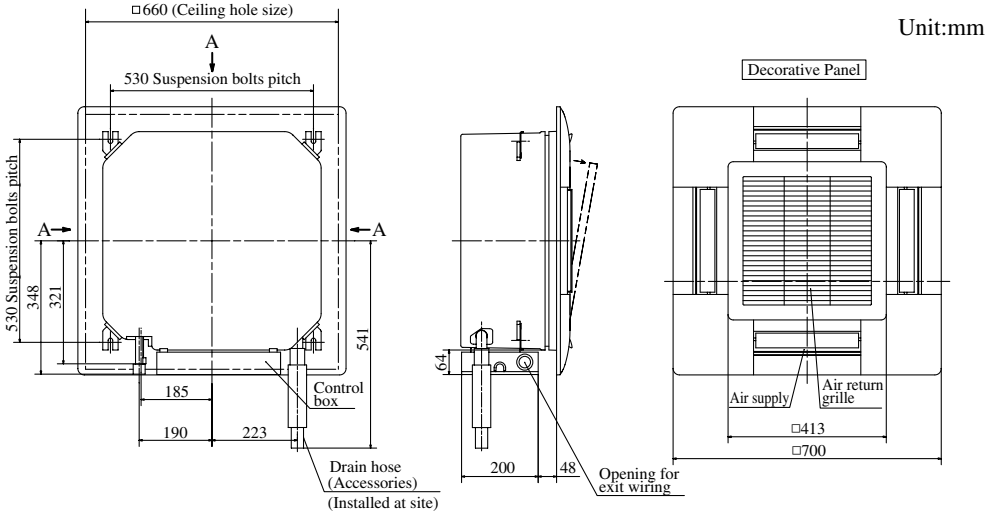
• Installation space

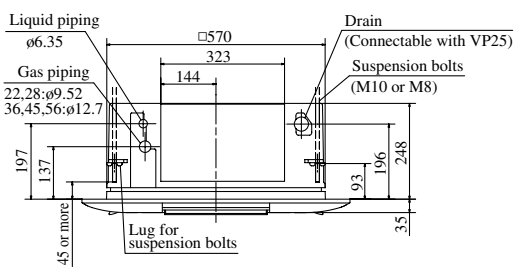
(mm)

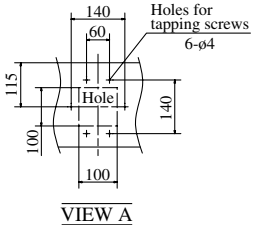


Note (1) This shows the installation interval dimensions between units centered on the units.

Unit:mm





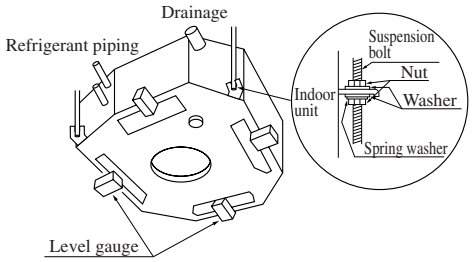


(iii) Suspension

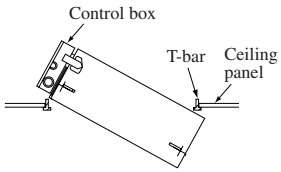
- Please arrange four sets of a suspension bolt (M10 or M8), a nut matching the bolt, a flat washers and a spring washer at the installation site.

When suspended from the ceiling

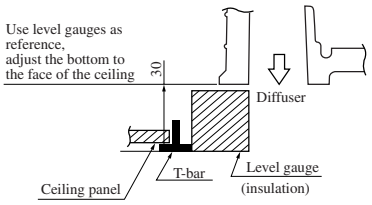
1) This unit is designed for installation on a 2 × 2 grid ceiling.
   If necessary, please detach the T bar temporarily before you install it.
   (When it is installed on a ceiling other than 2 × 2 grid ceiling, please do not fail to provide an inspection port on the control box side.)
2) Determine the positions of suspension bolts (530 × 530).
3) Use four suspension bolts, each fastened in such a manner that it can withstand pull force of 490N.
4) Make suspension bolts to the length that leaves approximately 45mm of them above the ceiling. In hoisting the unit main body in, temporarily fasten the four lower nuts of the suspension bolts approx. 93 mm from the ceiling and the four upper nuts at positions sufficiently far from the lower nuts so that they may not hamper installation work when the unit is hoisted in or the height is adjusted.

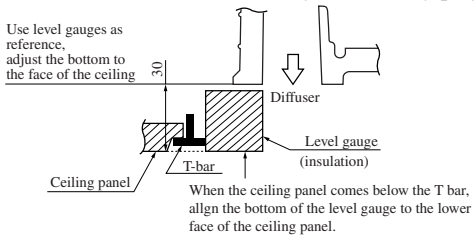


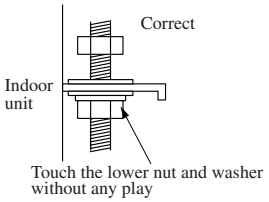
5) Put in the unit on an angle.

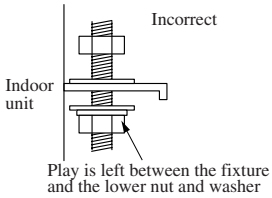


6) After hoisting in the unit, attach level gauges supplied as accessories and determine the unit position (height). To adjust height, use the four lower nuts with the four upper nuts left loose. Please make sure that the unit's four hanging fixtures touch the four lower nuts and washers evenly without any play.

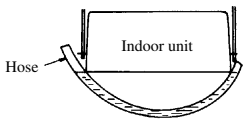








7) Please make sure that the unit main body is installed levelly. Level must be checked with a level or a clear hose filled with water. (A tolerable height difference at an end of the unit is eithin 3 mm)



8) After you have adjusted the height and level of the unit, fasten the four upper nuts to fix the unit.

Note (1) Do not adjust the height with the upper nuts. It may cause deformation due to excessive force working on the unit main body, which can result in such problems that you cannot attach the panel or noises are generated from the interfering fan.

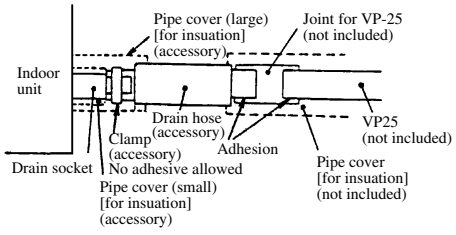
When embedded into ceiling

1) Determine the positions of hanging bolts (530 × 530).
   The pitch center of a suspension bolt must accord with the center of the unit.
2) Use four suspension bolts, each fastened in such a manner that it can withstand pull force of 490N.
3) Fix the unit as per (iii) 5) and 7) above.

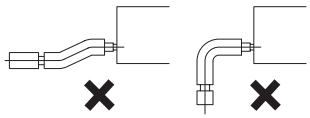
Note (1): When a suspension bolt exceeds 1.3 m in length, use an M10 bolt and give it reinforcements such as braces.

(iv) Drain Piping

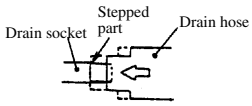
1) Glue the drain hose supplied as an accessory and a VP-25 joint before lifting the unit.
2) The drain hose is to provide a buffer to absorb a slight dislocation of the unit or the drain piping during installation work. If it is subject to abuse such as being bent or pulled deliberately, it may break, which will result in a water leak.



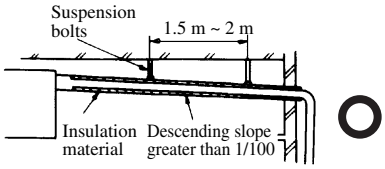
3) Care must be taken so as not to allow an adhesive to run into the drain hose. When it is hardened, it can cause a breakage of a flexible part, if the flexible part receives stress.



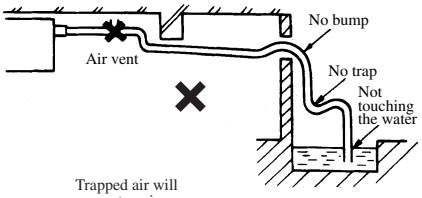
4) Use VP-25 general-purpose hard PVC pipes for drain piping.
5) Insert the drain hose supplied as an accessory (soft PVC end) to the stepped part of the unit's drain socket and then fasten it with the clamp also supplied as an accessory.



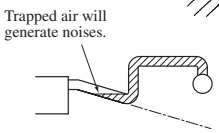
6) Adhesive must not be used.
   a) Attach a VP-25 joint (to be procured locally) to joint it with the drain hose (hard PVC end) and then attach a VP-25 (to be procured locally) to the joint.
   b) Give the drain piping a descending grade (1/50-1/100) and never create a bump to go over or a trap.



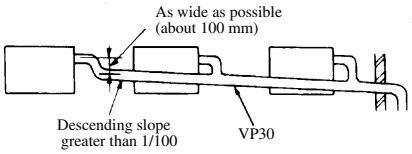
   c) In connecting drain pipes, care must be taken so as not to apply force to the unit side piping and fix the pipe at a point as close to the unit as possible.
   d) Do not create an air vent under any circumstances.
   e) When drain piping is implemented for more than one unit, provide a collecting main about 100 mm below the units' drain outlets from which it collects drain. Use a VP-30 or larger pipe for a collecting main.
   f) Do not fail to provide heat insulation at the following two points because they can cause dew condensation and a resultant water leak.

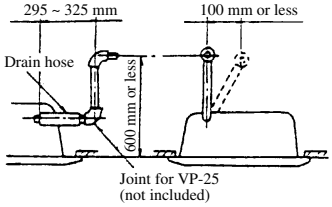


7) Drain socket
   After a drain test is completed, apply a pipe cover (small: accessory) onto the drain socket, cover the pipe cover (small), the clamp and part of the drain hose with a pipe cover (large: accessory) and wrap it with a tape completely without leaving any gaps.
   (Cut pipe covers into appropriate shapes)



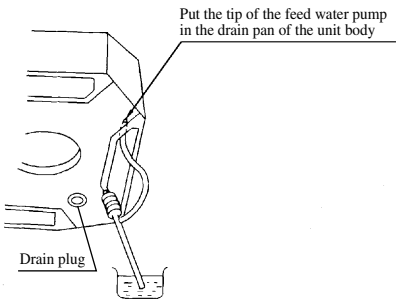
8) Hard PVC pipes laid indoor
   a) Since a drain pipe outlet can be raised up to 600 mm from the ceiling, use elbows, etc. to install drain pipes, if there are obstacles preventing normal drain pipe arrangement. When the drain pipe is raised at a point far from a unit, it can cause an overflow due to a back flow of drain upon stoppage, so arrange piping to keep the dimensions specified in the illustration shown on the left.
   b) Install the drain pipe outlet where no odor is likely to be generated.
   c) Do not lead the drain pipe into a ditch where the generation of harmful gas such as sulfuric gas or flammable gas is expected. A failure to observe this instruction may cause such harmful or flammable gas to flow into the room.





Drainage test

① Check that water is draining thoroughly during test run, and that there are no water leaks from the joints and the drain pan.
② The test has to be performed even if the unit is installed in the season when the unit is used for heating.
③ In a new house, perform the test before the ceiling is fitted.
- Using a water pump, pour about 1000 cc of water to the drain pan through the supply outlet.
- Check the transparent drain-out section of the drain hose for normal flow of drainage.
  * While observing the noise from the drain motor, test drain operation.
- Take off the drain plug to release the water. After the water is drained, place the drain pulg back where it was..
  * Be careful not to get splashed when pulling the drain plug.



Forced drain pump operation

◆ Set up from a unit side.
① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.
② After the test, be sure to turn off the DIP switch.
(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain connections of the pipe)

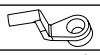
◆ Setup from a remote controller side.

Drain pump operation from a recomte controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation.
   ① Press the TEST button for three seconds or longer.
   The display will change from "SELECT ITEM"⟶ " SET"⟶ " TEST RUN ▼ "
   ② Press the ▼ button once while " TEST RUN ▼ " is displayed, and cause "DRAIN PUMP " to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display: " DRAIN PUMP RUN"⟶ " ⟶ STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
   The air conditioning system will become OFF.

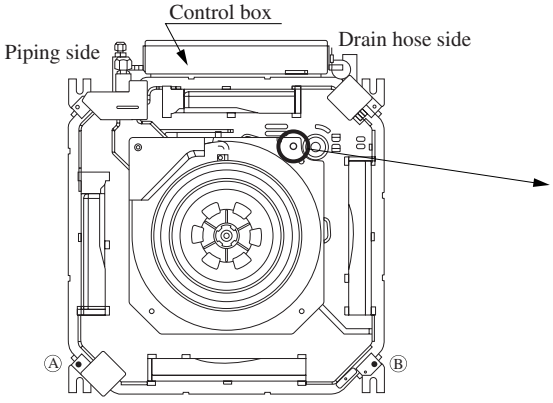
(v) Panel installation

1) Accessories (It is attached to the panel)

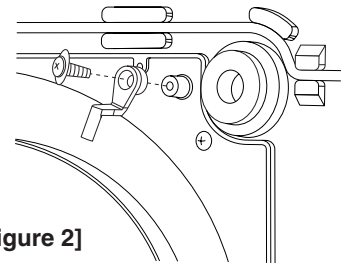
1	Hook		1 piece	For fixing temporarily
2	Chain		2 piece	
3	Screw		4 piece	For hoisting the panel
4	Screw		1 piece	For attaching a hook
5	Screw		2 piece	For attaching a chain

2) Make sure that the unit main body is positioned at the correct height and the opening on the ceiling is made to the correct dimensions with the level gauge supplied with the main body.
Remove the level gauge before you attach the panel.

3) Screw in two bolts out of the four supplied with the panel by about slightly less than 5mm. (● mark Ⓐ, Ⓑ) [Figure 1]



[Figure 1]

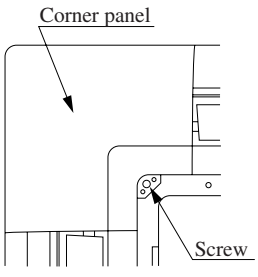


[Figure 2]

4) Attach the hook supplied with the panel to the main body with the hook fixing screw (1 screw). [Figure 2]

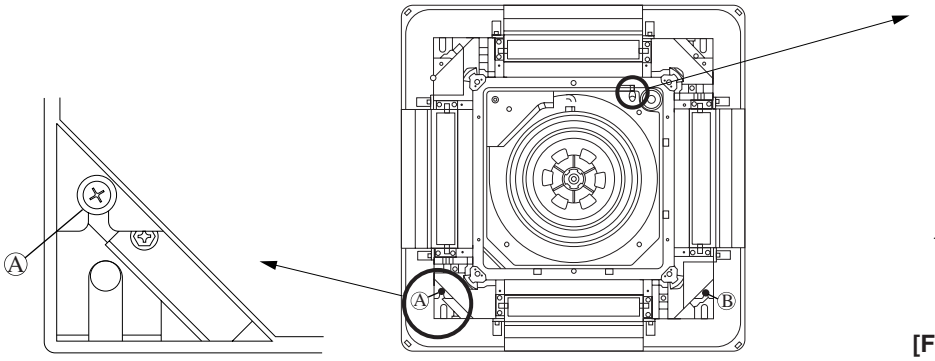
5) Open the air return grille.

6) Please remove the screw of a corner panel and remove a corner panel. (four places) [Figure 3]

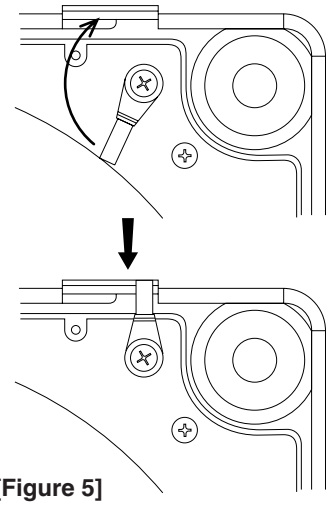


[Figure 3]

7) A panel is hooked on two bolts (● mark Ⓐ, Ⓑ) [Figure 4]



[Figure 4]



[Figure 5]

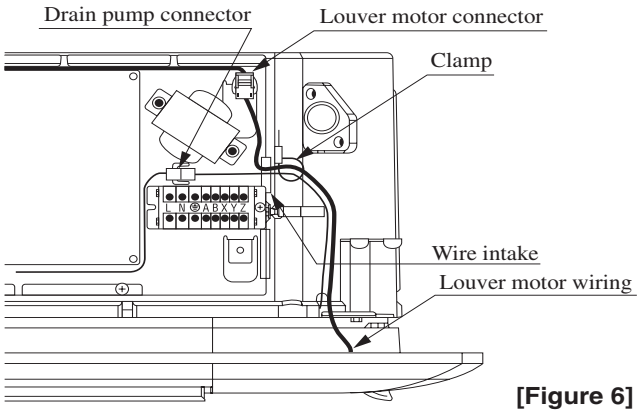
8) Please rotate a hook, put in the slot on the panel, and carry out fixing the panel temporarily. [Figure 5]

9) Tighten the two bolts used for fixing the panel temporarily and the other two.

10) Please open the lid of a control box.

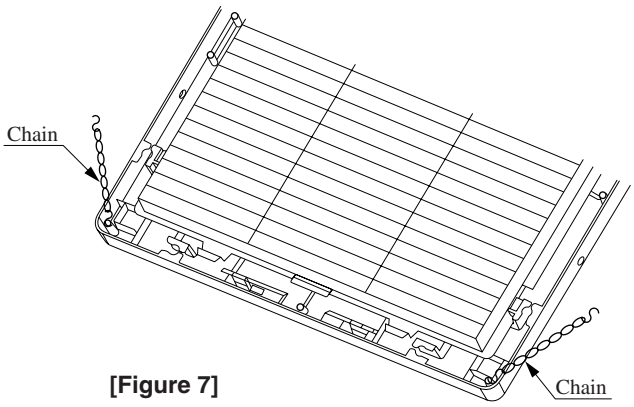
11) Like drain pump wiring, please band together by the clamp and put in louver motor wiring into a control box. [Figure 6]

12) Please connect a louver motor connector. [Figure 6]



[Figure 6]

13) Attach two chains to the air return grille with two screws. [Figure 7]



[Figure 7]

14) Replace the corner panels. Please also close a chain with a screw together then.

15) Close the air return grille.

(b) Ceiling recessed type (FDT)

(i) Selection of installation location

1) Select location where the space above ceiling is larger than those mentioned below and perfect draining can be assured.

Model	Space above ceiling (h)
FDT28, 36, 45, 56, 71	Over 290mm
FDT90	Over 315mm
FDT112, 140, 160	Over 385mm

2) With the customer's consent, select a location with following suitable conditions.
   a) Where cool air or hot air can easily pass through.
      If the height of the location exceeds 3 m, hot air will gather in the ceiling. Suggest to the customer to also install a circulator.
   b) Where water can be completely drained. A sloping location for drainage.
   c) Where there are no wind disturbances to the air return and air supply, where the fire alarm will not be set off erroneosly, where no air circulation short circuits occur.
   d) Where there is no direct sunlight.
   e) If the humidity above the ceiling exceeds 80% or the condensation temperature above the ceiling exceeds 28ºC, affix polyurethane foam (with a thickness to 10 or greater) above the insulation in the ceiling panels.

   (Carry out tests of the main unit under the above conditions and confirm that there is no failure. However, if the environment where the unit is installed exceeds the above conditions and the unit is operated in high humidity conditions, there is danger of condensate dripping down. If there is a possibility that the unit will be used under such conditions, dress 10 to 20 mm of insulation material to the main unit, piping and drain pipes.)

3) Consider the supporting strength of the location. If the strength is not sufficient to sustain the unit weight, use reinforcing materials.

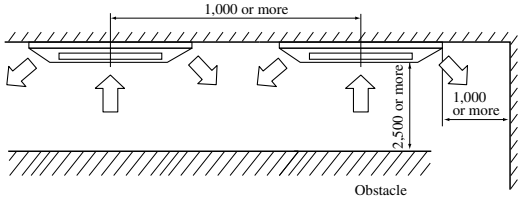
(ii) Installation space for unit

a) When a sufficient interval cannot be secured between the unit and a wall or another unit, shut up diffusers on that port to block air supply and make sure that no short-circuiting is occurring. (A air supply port blocking material is available as an optional part)

- Do not use the unit in the "LO" wind mode, when air is blown into two or three directions.

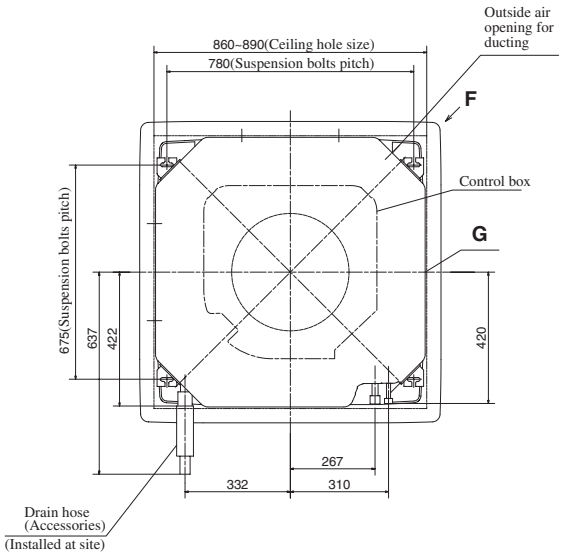
b) When the unit has 2500 mm or less clearance, attach a fan guard (option part) on the intake side of the fan.

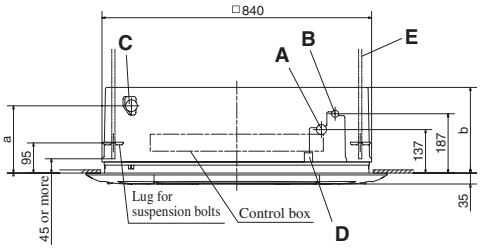
• Installation space



Note (1) This shows the installation interval dimensions between units centered on the units.

Unit:mm





A	Gas pipe connecting port
B	Liquid pipe connecting port
C	Drain line connecting port
D	Hole for wiring
E	Suspension bolt
F	Outside air opening for ducting
G	Outlet air opening for ducting

Model	a	b
FDT 28~71	212	270
FDT 90	212	295
FDT 112~160	269	365

(iii) Suspension

- Please arrange four sets of a suspension bolt (M10 or M8), a nut matching the bolt, a flat washers and a spring washer at the installation site.

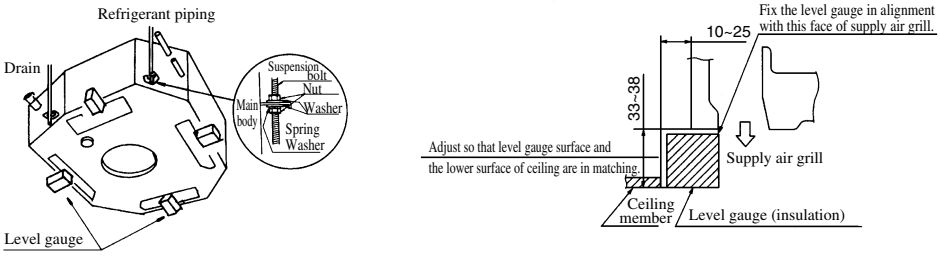
When suspended from the ceiling

1) Cut and opening of □860~□890.

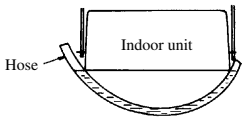
   In cutting an operating on the ceiling, use the unit's cardboard container for shipment as a reference of the size of opening.

   The center of the opening on the ceiling must accord with the center of the unit.

2) Determine the positions of suspension bolts (675×780).
3) Use four suspension bolts, each fastened in such a manner that it can withstand pull force of 490N.
4) Make suspension bolts to the length that leaves approximately 70 mm of them above the ceiling.
5) After hoisting in the unit, attach level gauges supplied as accessories and determine the unit position (height).



6) Use a transparent tube with water filled inside to check the level of the unit. (A tolerable height difference at an end of the unit is within 3 mm)



When embedded into ceiling

1) Determine the positions of suspension bolts (675×780).

   The pitch center of a suspension bolt must accord with the center of the unit.

2) Use four suspension bolts, each fastened in such a manner that it can withstand pull force of 490N.
3) In cutting an opening on the ceiling, use the unit's cardboad container for shipment as a reference of the size of opening.
4) Fix the unit as per 5) and 6) above.

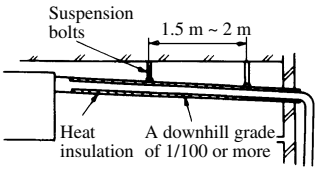
   The unit's cardboard container for shipment can be used to cover the indoor unit.

Note (1): When a hanging bolt exceeds 1.3 m in length, use an M10 bolt and give it reinforcements such as braces.

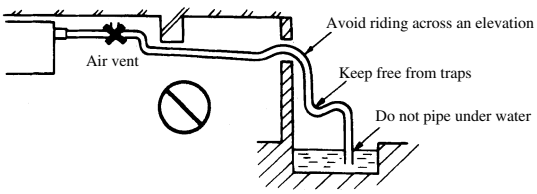
(iv) Drain Piping

1) Drain piping should always be in downhill decline (1/50 ~ 1/100) and avoid riding across and elevation or making traps.

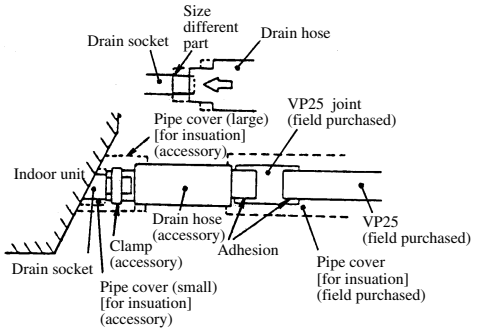
• Good piping

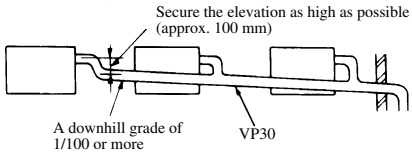


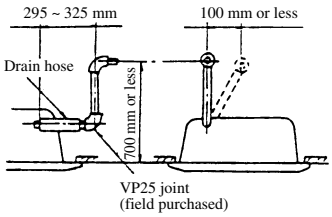
• Improper piping



2) When connecting the drain pipe to unit, pay sufficient attention not to apply excess force to the piping on the unit side. Also, fix the piping at a point as close as possible to the unit.
3) For drain pipe, use hard PVC general purpose pipe VP-25(I.D.1") which can be purchased locally. When connecting, insert a PVC pipe end securely into the drain socket before tightening securely using the attached drain hose and clamp. Adhesive must not be used connection of the drain socket and drain hose (accessory).
4) When constructing drain piping for several units, position the common pipe about 100 mm below the drain outlet of each unit as shown in the sketch. Use VP-30(11/4") or thicker pipe for this purpes.
5) Be sure to provide heat insulation to hard PVC pipes of indoor placement.
6) Do not ever provide an air vent.
7) The height of the drain head can be elevated up to a point 700 mm above the ceiling and, when an obstacle exisits in the ceiling space, elevate the piping to avoid the obstacle using an elbow or corresponding gadget. When doing this, if the stretch for the needed height is too high, the back-flow quantity of drain at the event of interruption of the operation gets too much and it may cause overflow at the drain pan. Therefore, make the height of the drain pipe within the distance given in the sketeh below.
8) Avoid positioning the drain piping outlet at a place where generation of odor may be stimulated. Do not lead the drain piping direct into a sewer from where sulfur gas may generate.
9) The purpose of drain hose is to absorb minute discrepancy of the unit or the drain piping occurred when they are installed. Therefore, when it is bent intentionally or used under expanded condition, it may be damaged and result in water leakage.



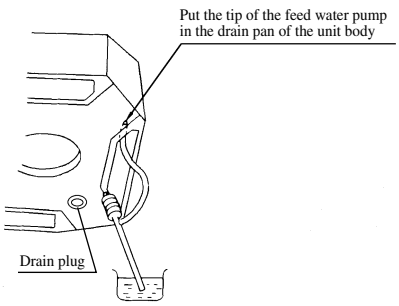




Drainage test

① Check that water is draining thoroghly during test run, and that there are no water leaks from the joints and the drain pan.
② The test has to be performed even if the unit is installed in the season when the unit is used for heating.
③ In a new house, perform the test before the ceiling is fitted.

- Using a water pump, pour about 1000 cc of water to the drain pan through the supply outlet.
- Check the transparent drain-out section of the drain hose for normal flow of drainage.
  * While observing the noise from the drain motor, test drain operation.
- Take off the drain plug to release the water. After the water is drained, place the drain plug back where it was..
  * While observing the noise from the drain motor, test drain operation.



Forced drain pump operation

◆ Set up from a unit side.
① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.
② After the test, be sure to turn off the DIP switch.
(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain connections of the pipe)

◆ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation.
   ① Press the TEST button for three seconds or longer.
   The display will change from "◆ SELECT ITEM"→ " ○ SET"→ " TEST RUN ▼ "
   ② Press the ▼ button once while " TEST RUN ▼ " is displayed, and cause "DRAIN PUMP ◆" to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display: " DRAIN PUMP RUN"→ " ○ → STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
   The air conditioning system will become OFF.

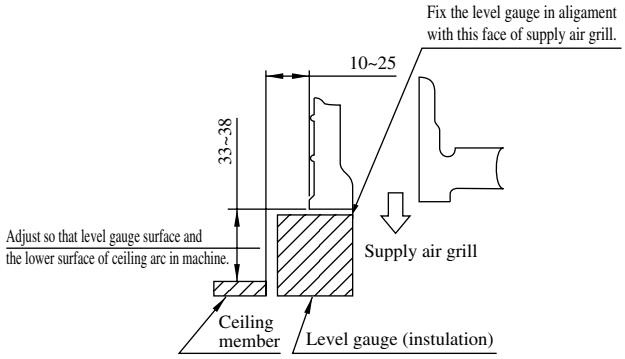
(v) Panel installation

1) Accessories

Name	Quantity
Air inlet grille	1
Air filter	1
Suspension bolts	4

2) Confirm the unit's installation level.

- Make sure from the level gauge (insulation) packed with the air conditioner unit that the installation height of the unit and the dimensions of the opening in the ceiling are correct.
- Confirm the installation level of the air conditioner unit and ceiling material.
- Affix the level gauge included with the air conditioner unit and fix the unit's installation height.
- Remove the level gauge before installing the unit.
- The unit's installation height can be minutely adjusted by means of the corner openings after the panel is installed. (For details, see 6) "Installing the Panel.")



Note (1) : If the installation level of the air conditioner unit and ceiling material exceed the proper range, it will cause an undue load to be borne during installation of the panel and could cause damage.

3) Unit installation direction and panel and air return grille direction

(a) The unit and panel installation orientation is directional.
- Match up the outlet (small) parts with the refrigerant piping direction.
- Make sure of the motor and switch connector connection directions. (For details, see 6) "Installing the Panel.")

(b) The panel and air return grille installation orientation is not directional.
If you are changing the direction of the air return grille, change the panel's striker installation position to the "Pull" character position direction on the surface of the grille.

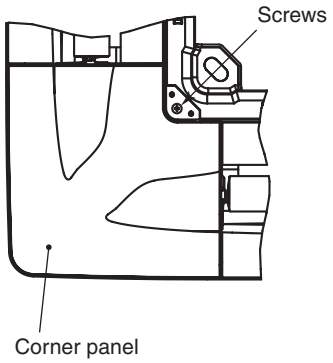
4) Removing the air return grille

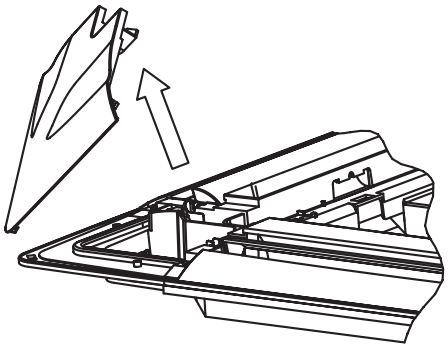
① Raise up the notched portion of the air return grille and open it.

② With the air return grille open, remove the air return grille hinge from the decorator panel.

5) Removing the corner panel

• Take out the screw in the corner, then lift up the corner panel in the arrow direction and remove it.





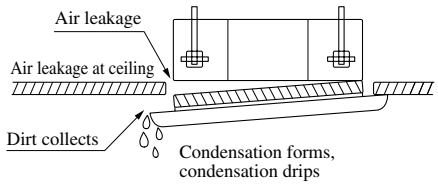
6) Panel installation

① Screw in lightly 2 of the 4 air conditioner unit suspension bolts in opposite corners from each other by about 5 mm. (Fasten the drain piping side and the opposite corner temporarily.)

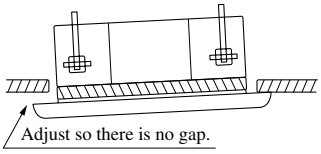
② Hang the panel on the two suspension bolts to install it temporarily.

③ Install the two remaining suspension bolts and tighten all four of the bolts.

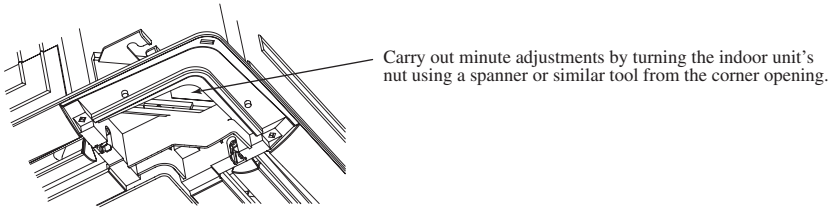
Notes (1) : If the suspension bolts are not tightened sufficiently, it could cause the following trouble, so tighten the bolts securely.



(2) : If there is still a gap between the ceiling and the decorator panel even after the suspension bolts are tightened, readjust the height of the indoor unit.



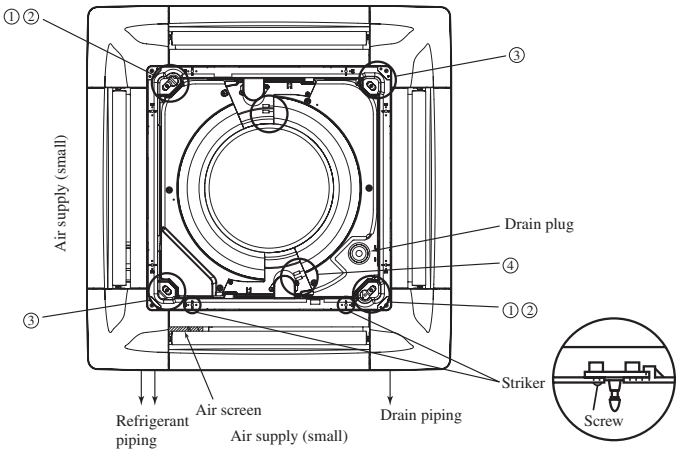
(3) : The unit's installation height can be minutely adjusted with the decorator panel as is as long as the indoor unit is level and drain piping are not affected.



④ Connect the (white, 5p) louver motor connector.

⑤ Place each of the connectors inside the control box.

Note (1) : If the air supply louver does not operate using the remote controller, check the connector's connection, then turn the main power supply OFF for 10 seconds or longer and turn the power ON again.



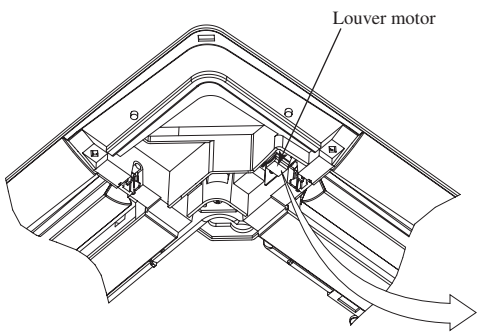
7) If the vertical air-flow direction is fixed

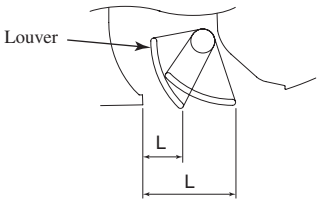
- This decorator panel is designed so that you can fix the vertical air-flow direction at each air outlet to match the environment at your installation location. Set it as required by the customer. Furthermore, when the vertical air-flow direction is fixed, remote control operation and all automatic controls are disabled. The actual setting may also differ from the LCD display in the remote controller.

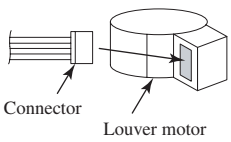
① Turn off the main power supply (turn it off at the ground fault circuit breaker).

② Disconnect the connector to the louver motor at the air outlet you want to fix the position of.
Wrap vinyl electrical tape around the disconnected connector to insulate it.

③ Slowly move the vertical air-flow louver you want to fix the position of by hand and set the vertical air-flow direction so that it is within the range shown in the table below.







<Setting Range>

Vertical air-flow direction criterion	Horizontal 30º	Downward 70º
L Dimension (mm)	36.5	22.5

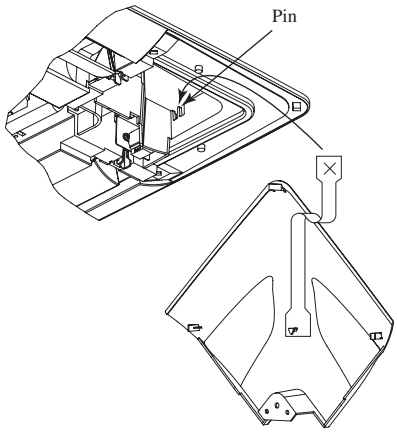
* It can be set anywhere desires as long as it is within a range of 22.5 and 36.5 mm.

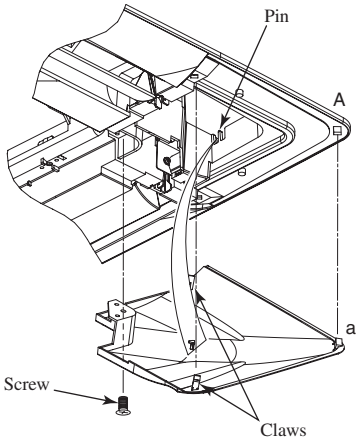
Note (1) : Do not set the position outside this range.
Doing so causes condensate to drip and to form as well as dirtying of the ceiling surface, and could cause abnormal operation.

8) Corner panel installation

① Hook the corner panel strap to the pin on the decorator panel as shown in the figure.

② Insert part a on the corner panel in part A on the decorator panel, then fit the 2 claws and fasten the corner panel screw.





9) Installing the air return grille

- Install the air return grille by following the removal procedure (item 4) in reverse order.

Note (1) : Match up the installation position of the panel's striker and the "Pull" character position direction on the surface of the grille. If these do not match, the striker could be damaged.

(c) 2-way outlet ceiling recessed type (FDTW)

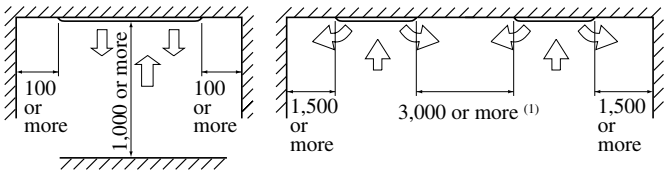
(i) Selection of installation location

1) This unit is a ceiling surface direct return air and direct supply air type.

Install the unit a place the allows air to reach every part of the room, in accordance with the shape and heigh of the room.

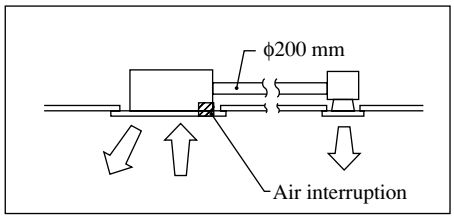
- **Installation space**

Unit : mm



Note (1) This shows the installation interval dimensions between units.

2) This unit permits connecting a branch duct (ϕ200 mm) according to the method shown in the figure below so that air disribution may be improved to the shape of the room. (For the connecting port of the duct, refer to the exterior dimension on page 78 ~ 80.)



3) Cold air throw

Unit : m

Item \ Models	FDTW28, 45, 56	FDTW71, 90	FDTW112	FDTW140
Standerd	4.0	4.5	4.7	5.0
UHi	4.5	5.0	5.2	5.5

Note (1) The cold air throw is the same in 2 directions.
Conditions:
1.Unit height: 3.0 m above the floor
2.Fan speed: Hi
3.Location: Freee space without obstacle
4.The throw is as the per the table above.
5.Air velocity at the throw: 0.3(m/s)

4) Places where cool or heated air circulates freely. When the installation height exceeds 3.0m, warmed air stays close to the ceiling. In such cases, suggest your client users to install air circulators.
5) Places where perfect drainage can be prepared and sufficient drainage gradient is available.
6) Places free from air disturbances to the return air port and supply hole of the indoor unit, places where the fire alarm may not malfunction to short circuit.
7) If the humidity above the ceiling exceeds 80% or the condensation temperature above the ceiling exceeds 28ºC, affix polyurethane foam (with a thickness to 10 or greater) above the insulation in the ceiling panels.

(Carry out tests of the main unit under the above conditions and confirm that there is no failure. However, if the environment where the unit is installed exceeds the above conditions and the unit is operated in high humidity conditions, there is danger of condensate dripping down. If there is a possibility that the unit will be used under such conditions, dress 10 to 20 mm of insulation material to the main unit, piping and drain pipes.)

8) Places exposed to oil splashes or steam (e.g. kitchens and machine plants.)

Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.

9) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is generated or remains.

Installation and use at such places will cause corrosion in the heat exchanger and damage in molded synthetic resin parts.

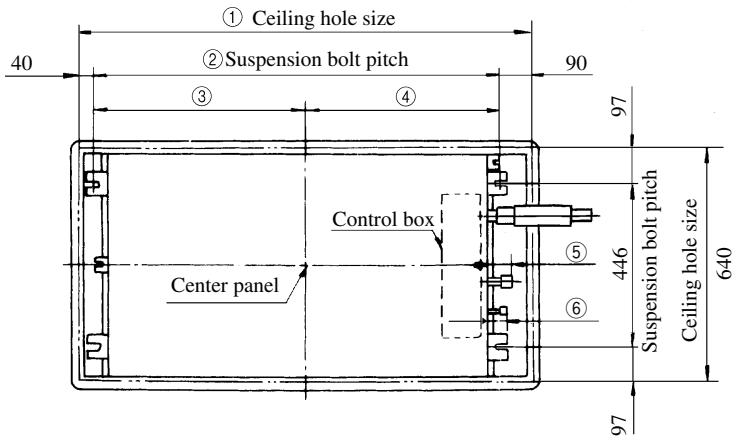
10) Place adjacent to equipment generating electromagnetic waves or high-frquency waves such as in hospitals. Generated noise may cause malfunctioning of the controller.

(ii) Preparations for installation

1) Ceiling hole and suspension bolt positions

a) The pattern sheet shrinks or expands as humidity changes, so check the actual size before use.

b) The ceiling hole sizes and suspension bolt sizes are shown in the following figure.



Dimension table

Unit : mm

Mark / Models	①	②	③	④	⑤	⑥
FDTW28, 45, 56	1015	885	468	417	70	60
FDTW71, 90	1260	1130	590	540	82.5	65
FDTW112, 140	1730	1600	825	775	80.5	70

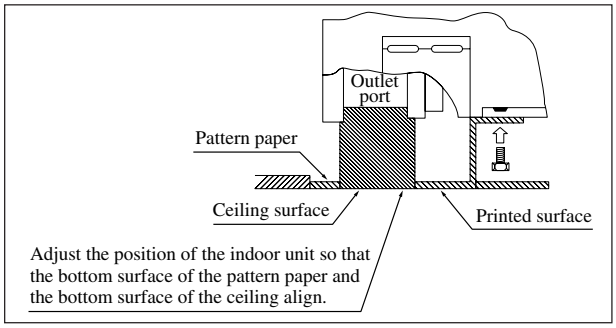
(iii) Installation

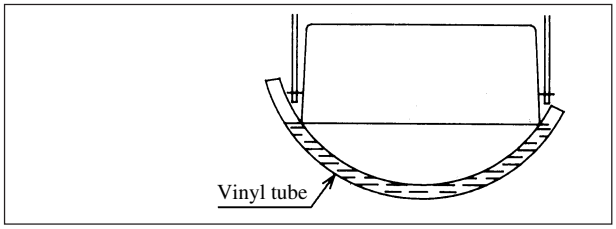
For the suspension bolt, use four M10 or W 3/8 bolts and secure so that each bolt can withstand a 490N pullout load.

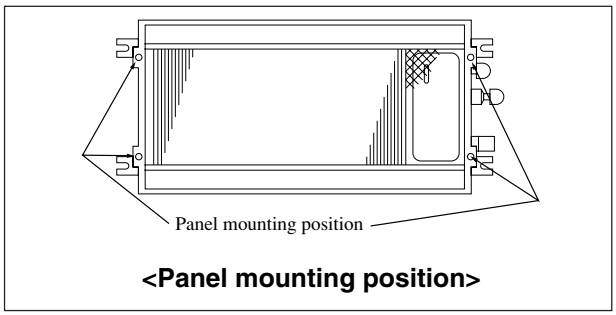
Use a suspension bolt length that extends approximately 95 mm from the ceiling surface.

A. If there is a ceiling

1) Open the hole in the installation location to the ceiling opening dimensions.
2) Install the suspension bolts (procured locally) at the designated locations.
   (Use care as the center of the spacing for the suspension bolts is not at the center of the panel.)
3) Hang the unit, use the four bolts to mount the pattern paper provided to the panel mounting section and adjust the height.
4) Use a level or transparent hose with water in it to confirm that the unit is level. If the unit is not level, problems such as water leakage or improper operation of the float switch could occur.
5) After confirming the above, secure the unit in position.



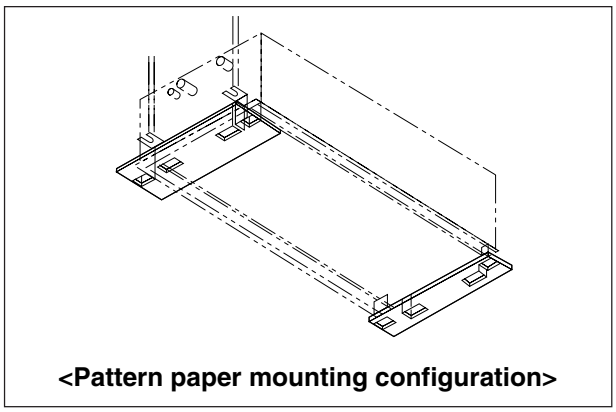




<Panel mounting position>

B. If ceiling is to be installed later

1) Follow steps A2) to A4) in the previous section "A. If there is a ceiling" to install the unit and mount the pattern paper.
2) When the ceiling is installed, the outer perimeter of the pattern paper can be referred to for making the opening in the ceiling.
3) After checking the height and that the unit is level, secure the unit in position.

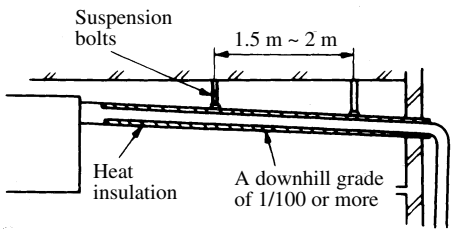


<Pattern paper mounting configuration>

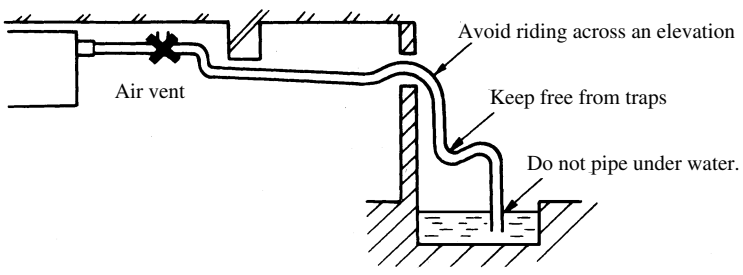
(iv) Drain piping

1) Drain piping should always be in a downhill grade (1/50-1/100) and avoid riding across an elevation or making traps.

- **Good piping**

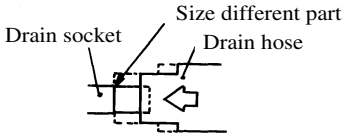


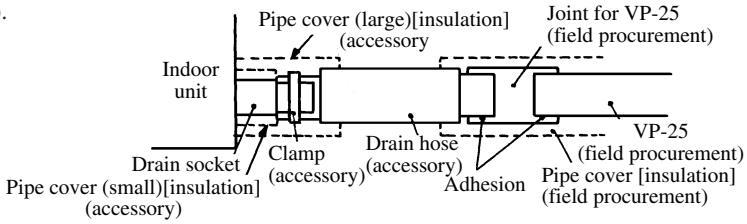
- **Improper piping**



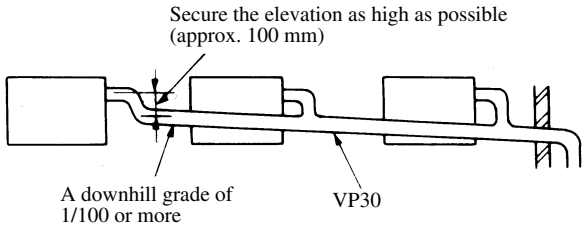
2) When connecting the drain pipe to the unit, pay suffcient attention not to apply excess force to the piping on the unit side. Also, fix the piping at a point as close as possible to the unit.

3) For drain pipe, use hard PVC ganeral purpose pipe VP-25 (I.D.1") which can be purchased locally. When connecting, insert a PVC pipe end securely into the drain socket before tightening securly using the attached drain hose and clamp. Adhesive must not be used connection of the drain socket and drain hose (accessory).





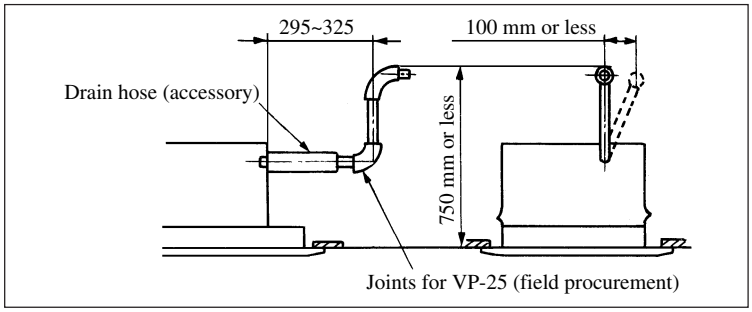
4) When constructing drain piping for several units, position the common pipe about 100mm below the drain outlet of each unit as shown in the sketch below. Use VP-30 or thicker pipe for this pupose.



5) Be sure to provide heat insulation to hard PVC pipes of indoor placement.

6) Do not ever provide an air vent.

7) The height of the drain head may be elevated up to a point 750mm above the ceiling and, when an obstacle exists in the ceiling space, elevate the piping to avoid the obstacle using an elbow or corresponding gadget. When doing this, if the stretch for the needed height is too high, the back-fiow quantity of drain at the time of interruption of the operation gets too much and it may cause overflow at the drain pan. Therefore, make the height of the drain pipe within the distance given in the drawing below.



8) Avoid positioning the drain piping outlet at a place where generation of odor may be stimulated. Do not lead the drain piping direct into a sewer from where sulfur gas may generate.

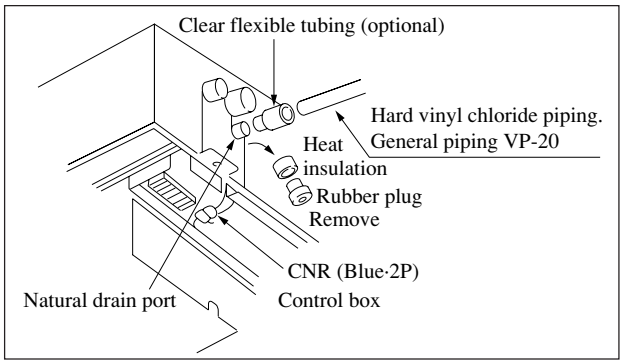
When using a natural drain port

1) Remove the heat insulating material and rubber plug of the natural drain port.

2) By using the natural drain connecting tube (option), connect the drain pipe (VP-20) and completely clamp it with a clamp.
Note (1) If the drain pipe is directly connected to the natural drain port, the drain pan becomes unremovable.

3) Disconnect the connector CNR (blue, 2P) for the drain motor.

Note (1) If the connector remains connected, drain water is discharged from the standard pipe connecting port, leading to water leakage.



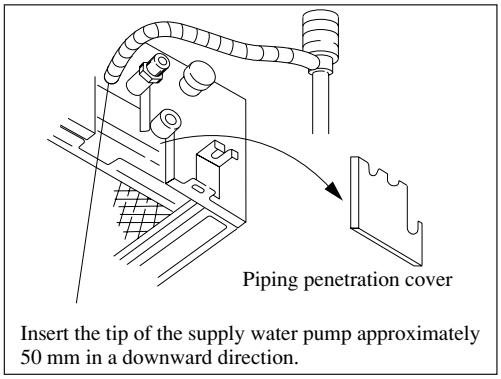
Drainage test

When using the standard drain port, execute a drainage test after completion of electric work.

① During the test run, make sure that drain flows properly through the piping and that no water leaks from connections.

② Be sure to conduct this test even when the unit is installed in the heating season.

③ In case of a new building, conduct the test before it is furnished with the ceiling.



Insert the tip of the supply water pump approximately 50 mm in a downward direction.

1) Inject about 1,000cc by using a feed water pump from the grommet on the drain pump side.

2) At the drain port (transparent portion), check if drainage is performed.

3) After completion of the drain test, completely perform heat insulation fot the drain pipe up to the indoor unit.

Forced drain pump operation

♦Setup from a unit side.

① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.

② After the test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check for leaks and drain conditions of the pipe.)

♦ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

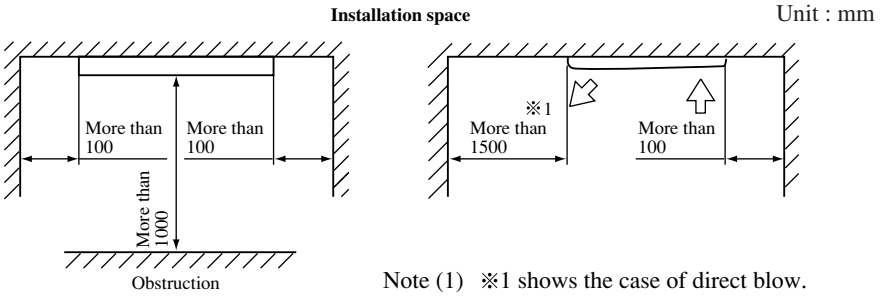
1. To start a forced drain pump operation
   ① Press the TEST button for three seconds or longer.
   The display will change from "SELECT ITEM"→ "SET"→ " TEST RUN ▼ "
   ② Press the ▼ button once while " TEST RUN ▼ " is displayed, and cause "DRAIN PUMP ⬍" to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display:"DRAIN PUMP RUN"→ " → STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
   The air conditioning system will become OFF.

(d) Ceiling recessed single air supply port type (FDTQ)

(i) Avoid the following locations for installation and uses

1) Locations where oil splashes and moisture are abundant (e.g., kitchens, mechanical workshops).
   These locations may result in corrosion and lower performance of the heat exchanger and cause damage to plastic parts.
2) Locations with corrosive gases (such as sulfurous acid gas), flammable gases (such as thinners, gasoline) and areas where there are possibilities of gas accumulation. These locations can result in corrosion of the heat exchanger and damage plastic parts. Also, the flammable gas could cause a fire.
3) Locations near medical equipment radiating electromagnetic waves in hospitals or other facilities, and around appliances emitting high frequencies. The electromagnetic noise may cause the controller to malfunction.
4) Locations exposed to sea breezes (seaside areas). Sea breezes may cause corrosion of the outer frame and the heat exchanger.

(ii) Installation space for the indoor unit



Note (1) ※1 shows the case of direct blow.

1) With the customer's consent, select a suitable location according to the following conditions.
   - Where cool air or hot air can easily pass through.
     If the height of the location exceeds 3 m, hot air will gather below the ceiling. Suggest to the customer to also install a circulation fan.
   - Where wiring and plumbing to outdoor areas may easily be conducted.
   - Where water can be completely drained. A sloping location for drainage.
   - Where there is no wind disturbance to the air return and air suplly, the fire alarm will not be set off erroneously, and no air short circuits occur.
   - Where there is no direct sunlight.
   - If the humidity above the ceiling exceeds 80% or the condensation temperature above the ceiling exceeds 28ºC, affix polyurethane foam (with a thickness to 10 or greater) above the insulation in the ceiling panels.

     (Carry out tests of the main unit under the above conditions and confirm that there is no failure. However, if the environment where the unit is installed exceeds the above conditions and the unit is operated in high humidity conditions, there is danger of condensate dripping down. If there is a possibility that the unit will be used under such conditions, dress 10 to 20 mm of insulation material on the main unit, piping and drain pipes.)

2) Consider the supporting strength of the location. If the strength is not sufficient to sustain the unit weight, use reinforcing materials.

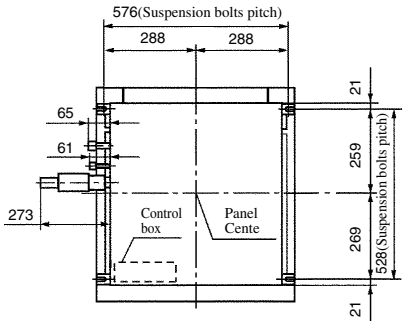
(iii) Suspending the unit

Use four (4) M10 or W3/8 suspension bolts. Secure them firmly so that each can withstand a pull-out load of 490N.

Adjust their length to approximately 40 mm from the ceiling.

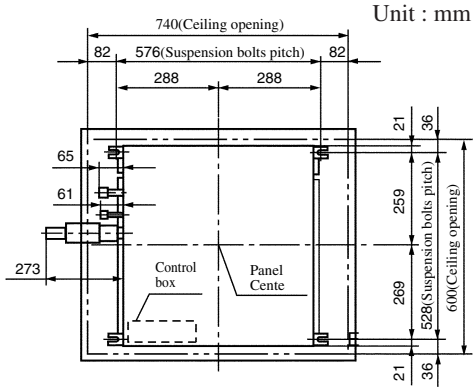
● For TQ-PSA-14W-ER panel

Unit : mm



● For TQ-PSB-14W-ER panel

Unit : mm



1) When hanging from the ceiling

a) The panel has two types: for 2 × 2 grid ceiling and for conventional ceiling.

① When installing on a 2 × 2 grid ceiling, put in the unit on an angle, or hang the unit with the T bar temporarily removed.

When installing on a conventional ceiling, cut an installation opening (740 mm × 600 mm) in the ceiling, and hang the unit.

b) Set the suspension bolts (to be prepared at job site) in place.

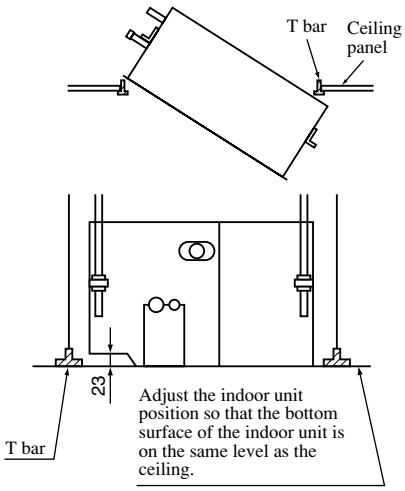
c) Adjust the unit's height so that the bottom surface of the unit is on the same level as the ceiling (bottom surface of the T bar). (The blow outlet is contained in the ceiling.)

The allowable difference in height between the bottom surface of the ceiling and that of the indoor unit is when the indoor unit face is no higher than 5 mm.

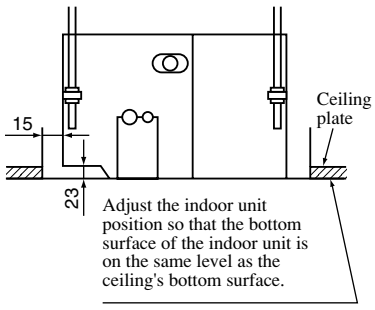
Caution

Do not install the indoor unit lower than the bottom surface of the ceiling.

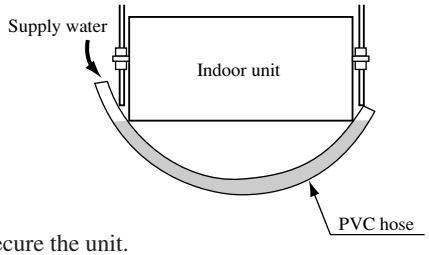
● For TQ-PSA-14W-ER panel



● For TQ-PSB-14W-ER panel



d) Level the unit using a hose filled with water. If the unit is out of level, water leaks or malfunctioning of the floating switch may occur.



e) After ensuring the above, secure the unit.

2) When embedded into ceiling

a) Install the unit following steps b) and c) of the above part 1).

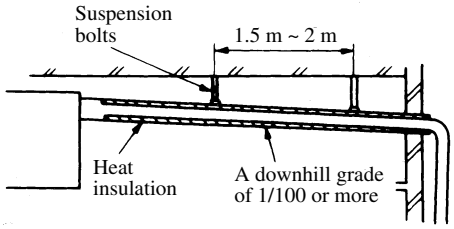
b) When installing on a conventional ceiling, cut an installation opening (740 mm × 600 mm) in the ceiling.

c) Check the installation height and level, and after that, secure the unit.

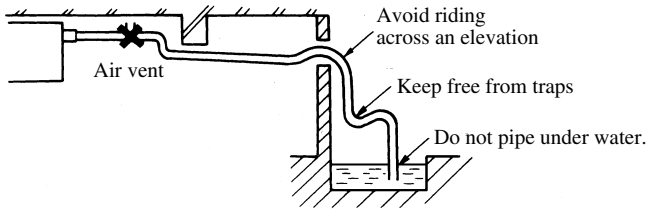
(iv) Drain piping

1) Drain piping should always be in a downhill grade (1/50-1/100) and avoid riding across an elevation or making traps.

- **Good piping**

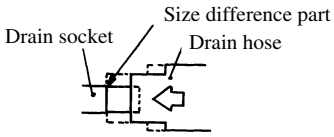


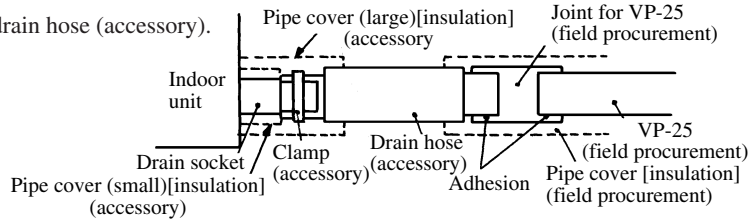
- **Improper piping**



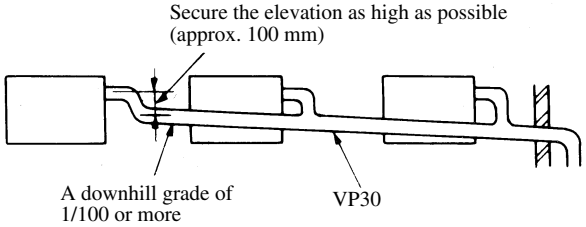
2) When connecting the drain pipe to the unit, pay suffcient attention not to apply excess force to the piping on the unit side. Also, fix the piping at a point as close as possible to the unit.

3) For drain pipe, use hard PVC ganeral purpose pipe VP-25 (I.D.1") which can be purchased locally. When connecting, insert a PVC pipe end securely into the drain socket before tightening securly using the attached drain hose and clamp. Adhesive must not be used connection of the drain socket and drain hose (accessory).





4) When constructing drain piping for several units, position the common pipe about 100mm below the drain outlet of each unit as shown in the sketch below. Use VP-30 or thicker pipe for this pupose.

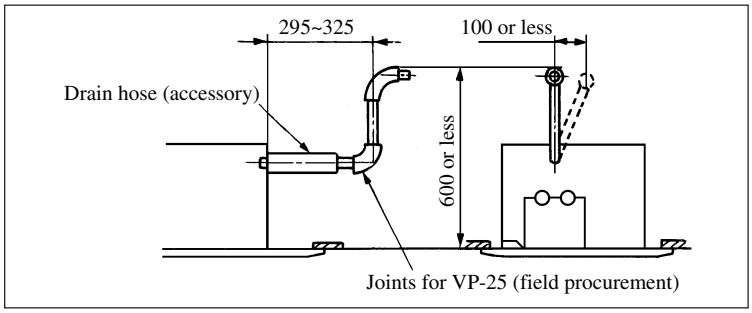


5) Be sure to provide heat insulation to hard PVC pipes of indoor placement.

6) Do not ever provide an air vent.

7) The height of the drain head may be elevated up to a point 600mm above the ceiling and, when an obstacle exists in the ceiling space, elevate the piping to avoid the obstacle using an elbow or corresponding gadget. When doing this, if the stretch for the needed height is too high, the back-fiow quantity of drain at the time of interruption of the operation gets too much and it may cause overflow at the drain pan. Therefore, make the height of the drain pipe within the distance given in the drawing below.

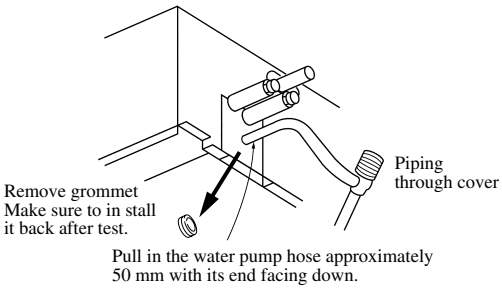
Unit : mm

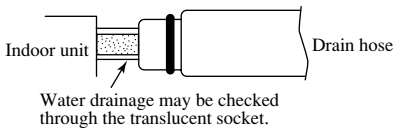


8) Avoid positioning the drain piping outlet at a place where generation of odor may be stimulated. Do not lead the drain piping direct into a sewer from where sulfur gas may generate.

(v) Drain test (Perform the drain test after the electrical wiring work has been finished.)

- Check that water is draining thoroughly during the test run, and that there are no water leaks from the joints.
- The test has to be performed even if the unit is installed in a season when the unit is used for heating.
- In a new house, perform the test before the ceiling is fitted.





1) Remove the grommet, and using a water pump, pour about 1000cc of water, from the position shown in the left figure.
   Caution
   When pouring water, be sure to perform the drain pump forced operation.
2) Check the drain-out section (transparent section) for normal flow of drainage.
3) Take off the drain plug to release the water. After water release has been confirmed, replace the drain plug as it was.
   * Be careful not to get splashed when pulling the drain plug.
4) After the drain test, thoroughly insulate the drain pipe, up to the main unit.

Forced drain pump operation

◆Setup from a unit side.

- Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump will operates continuously.
- After the drain test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check for leaks and drain conditions of the pipe.)

♦ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation
   ① Press the TEST button for three seconds or longer.
   The display will change from "◆ SELECT ITEM"→ "○ SET"→ "✳ TEST RUN ▼ "
   ② Press the ▼ button once while "✳ TEST RUN ▼ " is displayed, and cause "DRAIN PUMP ◆ " to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display:"DRAIN PUMP RUN"→ "○ → STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
   The air conditioning system will become OFF.

(vi) Panel installation (Panel installing bolts are attached to the panel.)

① Check that the indoor unit's height and opening dimensions in the ceiling are correct.

② Check that level is ensured.

③ Open the air return grill.

④ Screw in two of the four suspension bolts attached to the panel, on the piping side and at its opposite angle, by a little less than 5 mm (● marks).

⑤ Hook the panel into two of the suspension bolts to pre-install it.
With pre-installation is performed, first hook the panel to bolt A, then to bolt B while rotating the panel.
(Take care so that the unit does not rotate during pre-installation.)

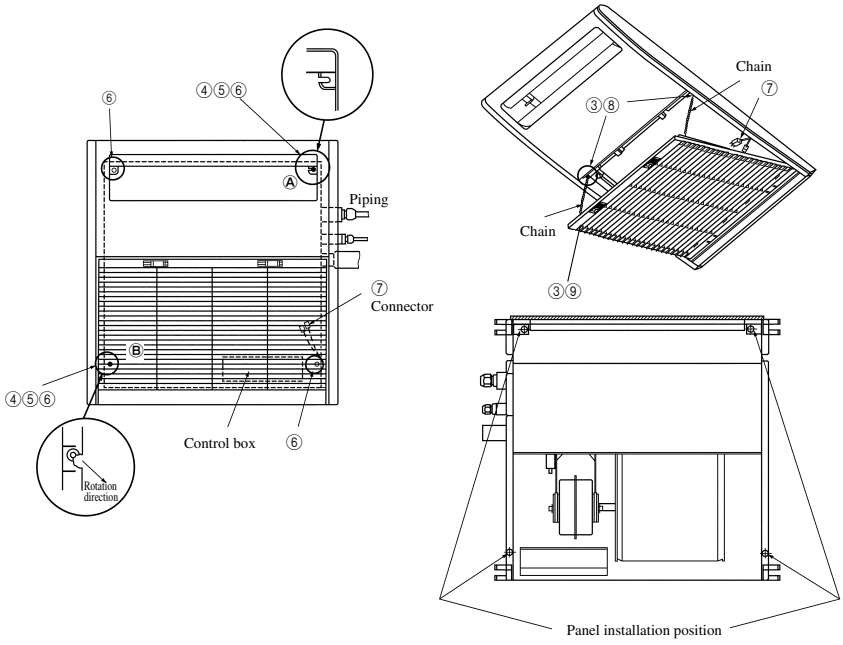
⑥ Tighten the pre-installed suspension bolts and two remaining suspension bolts.

⑦ Attach the louver motor connector (white, 4P) and the limit switch connector (white, 2P).

⑧ Use the provided screws to tighten chains to the panel. Chain installing screws is contained in the same bag as suspension bolts.

⑨ Close the air return grill. Now installation is complete.

⑩ When the louver motor does not operate with the remote control, check connections of the connectors, turn off the power for more than 10 seconds and reset.



(vii) Indoor unit repair procedure for duct connection

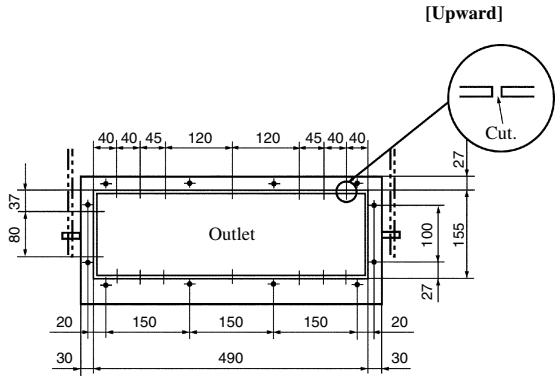
1) Drill hole for duct

a) While referring to the following dimensions, notch the insulation. (The insulation is equipped with the marks in advance.)

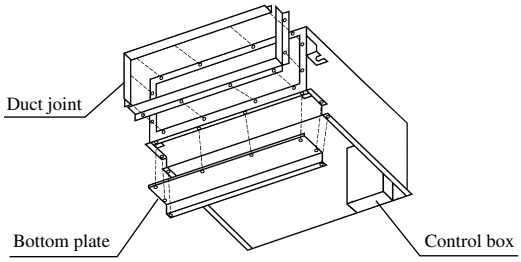
b) Cut joints for the hole, and drill hole.

c) Connect the duct joint using screws attached to the panel.

Unit : mm



d) Connect the bottom plate using screws attached to the panel.



e) Blower fan tap switch

The following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

① Set SW9-4 provided on the indoor unit PCB to ON.

② By means of function setting from the remote control unit, set the setting ⓒ of "I/U FUNCTION ▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap) as shown right.

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

For the details of operating procedures, please refer to the installation manual of your remote control unit.

f) LOUVER switch disabled setting

By means of function setting from the remote control unit, set the setting ⓒ of "▤ FUNCTION ▲" (remote control unit function) to "LOUVER INVALID" (LOUVER switch disabled) as shown right.

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
07	LOUVER S/W	LOUVER INVALID

For the details of operating procedures, please refer to the installation manual of your remote control unit.

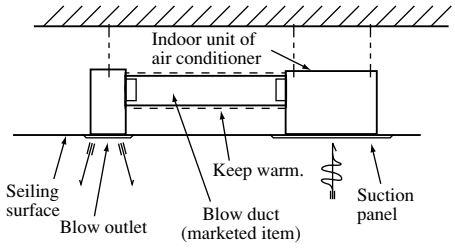
2) Duct work

a) Calculate air flow volume and the outside static pressure to select the duct's length and shape, and air supply outlet.

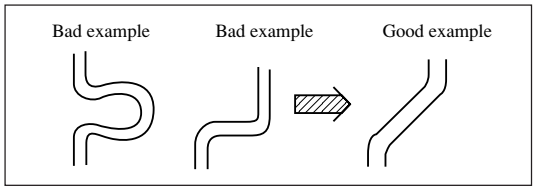
Caution

Take care that the outside static pressure does not exceed 30 Pa.

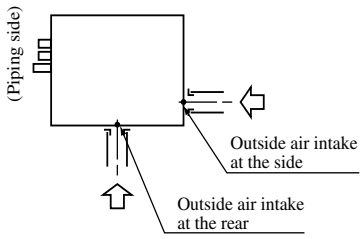
The unit has condensation owing to the decrease in air capacity, possibly causing the ceiling and household goods to become wet.



b) Reduce the number of bends as much as possible. (Corner R should be as large as possible.)



c) Connecting the air return duct



d) Outside air intake

- Use the intake, which is easier for work, either at the rear or the side.

e) Duct connection

- Connect the 125 mm diameter round duct, using the air return/supply duct flange separately sold (for connecting the 125 mm diameter round duct). (Band clamp)
- Keep the duct warm to protect from condensation.

f) Checking of indoor unit installation level

① There are two kinds of panel, which are TQ-PSA-14W-ER panel and TQ-PSB-14W-ER panel. When installing to the existing ceiling, check that opening dimensions in the ceiling are correct.

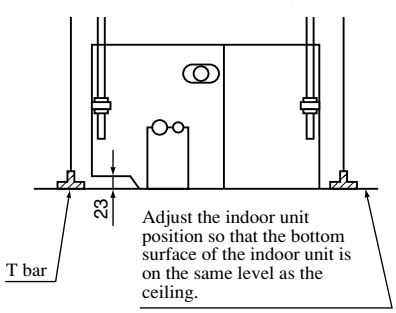
Check the installation level of the air-conditioner indoor unit and the ceiling members.

② Adjust the air-conditioner indoor unit height so that the under surface of the indoor unit and the under surface of the ceiling agree with each other. (The air supply port shall be housed in the ceiling.)

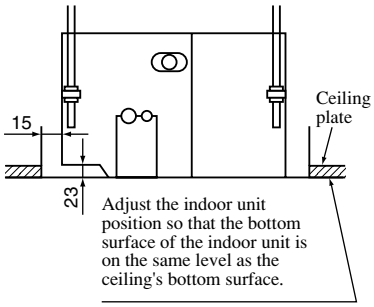
③ The allowable height difference between the under surface of the ceiling and the under surface of the indoor unit is less than 5 mm upward shift of the indoor unit.

Do not install the indoor unit lower than the bottom surface of the ceiling.

● For QR-PNA-14W-ER panel



● For QR-PNB-14W-ER panel



g) Panel installation

① Insert a flat head screw driver, etc. into the slot on the air supply port cover of the panel to remove the cover from the panel.

② Open air return grill.

③ Screw in two of the four suspension bolts attached to the panel, on the piping side and at its opposite angle, by a little less than 5 mm (● marks).

④ Hook the panel into two of the suspension bolts to pre-install it.

With pre-installation is performed, first hook the panel on the bolt A Then to the bolt B .While rotating the panel. (Take care so that the unit does not rotate during pre-installation.)

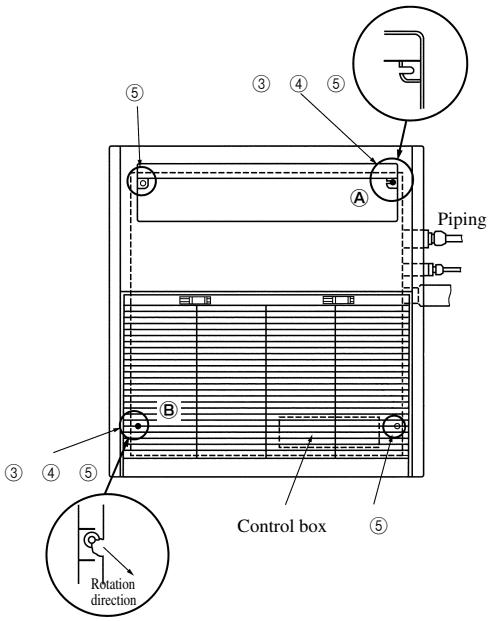
⑤ Tighten the pre-installed suspension bolts and tow remaining suspension bolts.

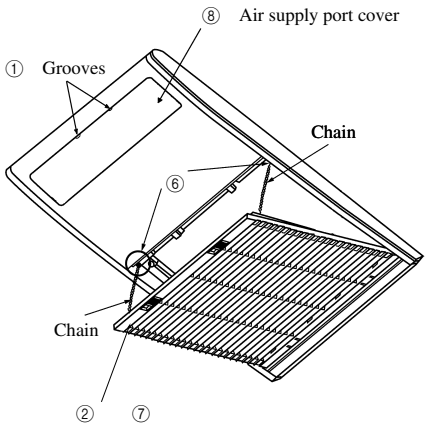
⑥ Use the provided screws to tighten chains to the panel. Chain installing screws is contained in the same bag as suspension bolts.

⑦ Close the air return grill. (Check whether the chain is installed securely.)

⑧ Push the air supply cover into place from the bottom of the panel, and fit it as it was.

Check that the air supply cover is securely fitted and does not fall.

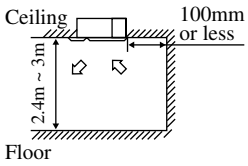
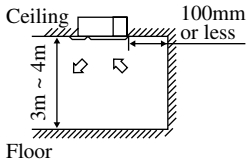




(e) 1-way outlet ceiling recessed type (FDTS)

Preparation of indoor unit

It can be installed by either one of the following methods. Select the most adequate method for your particular case.

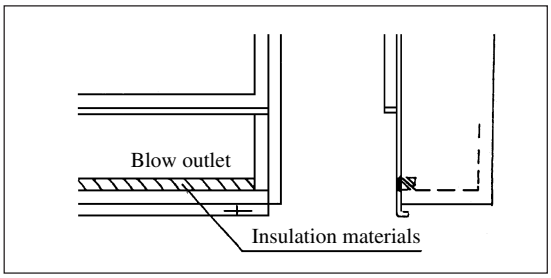
	Ⓐ Standard installation	Ⓑ Higher ceiling
Installation example and limitation		

Note (1) In the case of installing on the high ceiling, part of indoor unit requires some modification.

Procedures of rework

Installation on higher ceiling

Adhere the insulation materials attached to the direct blow panel on the blow outlet of indoor unit.



(i) Selection of installation location

1) Where cool and hot air will be distributed sufficiently.

   Where the installation heigh exceeds 3m, warmed air is likely to concentrate close to the ceiling. In such case, you should install also a circulator.

Reference • **Cold air throw**

Unit : m

Item / Models	Reaching distance	
	Standard	Higher ceiling
All models	7	

[Conditions] 1. Unit heigh

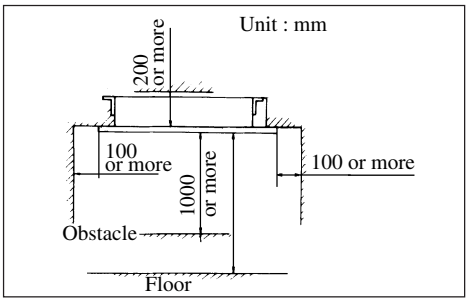
Standard ceiling: 2.4~3.0(m) above floor Higher ceiling: 3.0~4.0(m) above floor

2. Fan speed: Hi
3. Place: Free space without obstruction;
4. Reaching distance means the horizontal distance for the wind to reach the floor.
5. Wind velocity at the reaching distance: 0.5m/s

Note (1) Wind capacity is UHi in case of a higher ceiling. It is value of Hi for other cases.

2) Where the ceiling has sufficient rigidity.
3) Where there is no obstacles in front of the suction intel and blow outlet.
4) It should be avoided such places as kitchen, machine factory, etc. where there profuse liquid splashes or thick steam.
5) Where the height of ceiling exceeds 200mm.

6) Where a space as shown below can be secured.



7) It should be avoided where a machine generating high frequency waves is installed.
8) Select a place to branch the piping so that same distance will be a obtained for each of one way piping.
9) If the humidity above the ceiling exceeds 80% or the condensation temperature above the ceiling exceeds 28ºC, affix polyurethane foam (with a thickness to 10 or greater) above the insulation in the ceiling panels.

Carry out tests of the main unit under the above conditions and confirm that there is no failure. However, if the environment where the unit is installed exceeds the above conditions and the unit is operated in high humidity conditions, there is danger of condensate dripping down. If there is a possibility that the unit will be used under such conditions, dress 10 to 20 mm of insulation material to the main unit, piping and drain pipes.

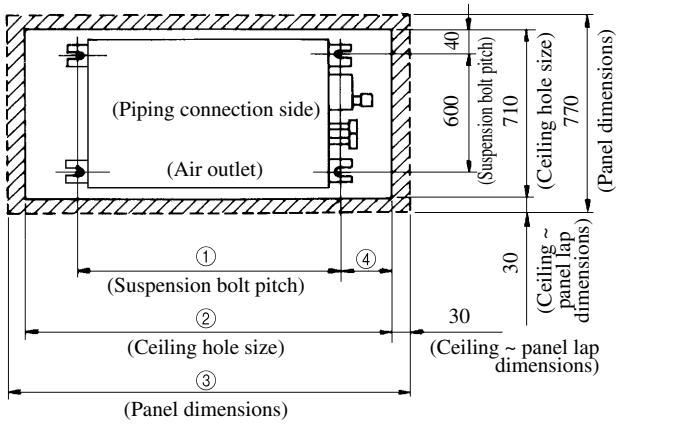
10) Where it is convenient for the piping and wiring to the outdoor.
11) Where protected from direct exposure to sun beams.
12) Where it is free from volatile gas generation.

(ii) Standard location

1) Installation

a) Ceiling hole size and position of suspension bolt

Unit : mm

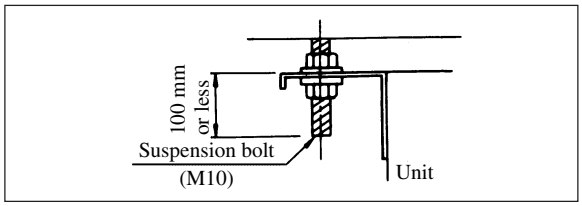


Unit : mm

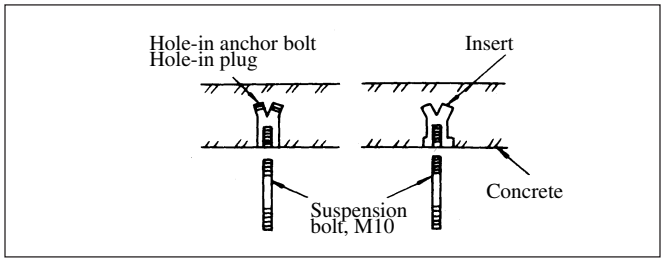
Models \ Mark	①	②	③	④
FDTS22, 28, 36, 45	990	1230	1290	180
FDTS71	1250	1440	1500	145

b) Length of fixed suspension bolt (customer orderd parts M10)

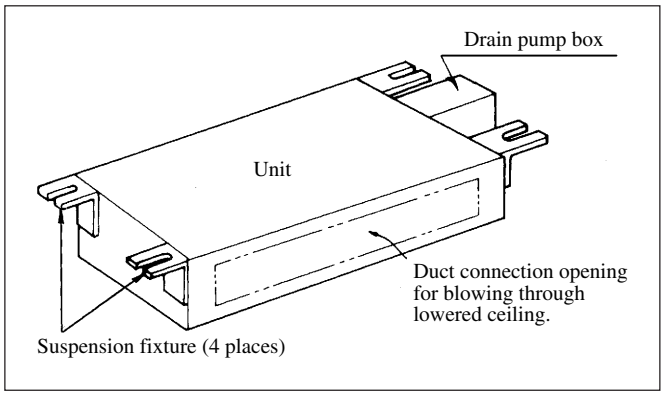
[Reference] Suspension bolt pitch is adjustable within ± 10mm in sidewise direction. Since there is no adjustment allowance in back and forth direction, determine the position exactly with a measure. (Lap margin between ceiling and panel is 30mm.)



c) Fixing of Suspension bolt. Fix the bolts securely as shown below or by any other adequate means.



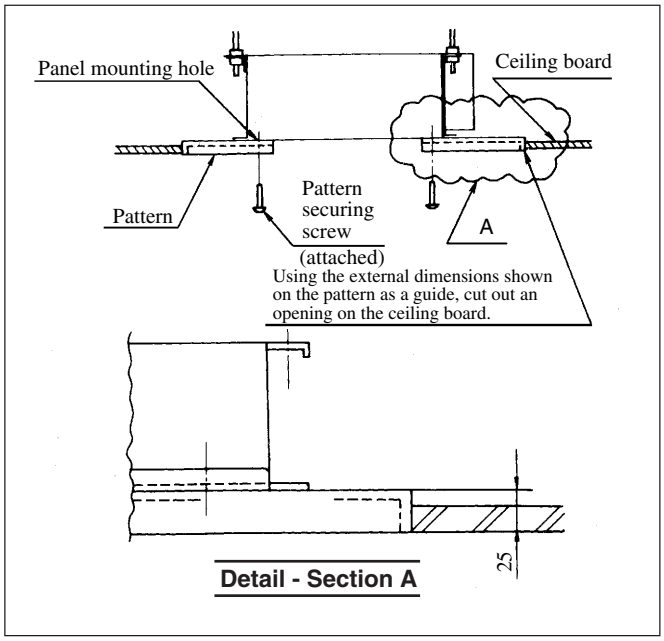
d) Installation



Procedures

① Install nuts on the Suspension bolts at onside. Suspension the suspension fixtures on the Suspension bolts first and then insert the remaining fixtures on the remaining Suspension bolts at and lock them with nuts.

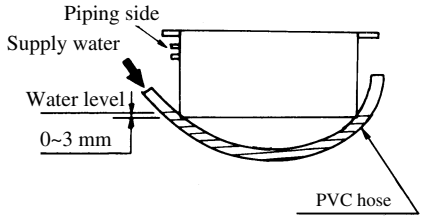
② Since the indoor unit and the panel height cannot be adjusted, adjust the height using an attached pattern before fixing the indoor unit.



Check of levelness

Check the levelness as follows. Use a level gauge or adjust the levelness with the following method.

- Adjust the bottom of indoor unit and the water level as shown below.

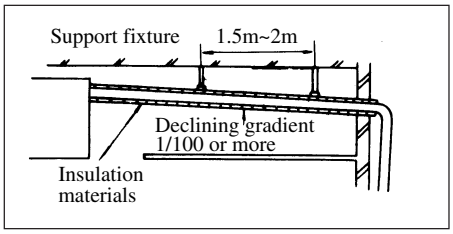


Slightly lower the piping side

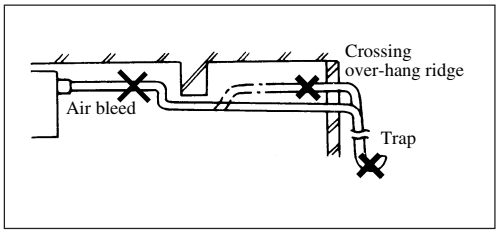
2) Drain pipe

a) Set the drain pipe as a declining gradient (1/50 ~ 1/100) and avoid to cross an over-hand ridge or to allow a trap on the way.

- **Good piping**

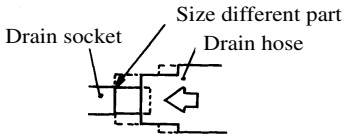


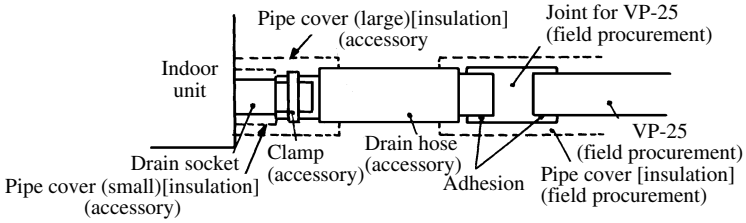
- **Improper piping**



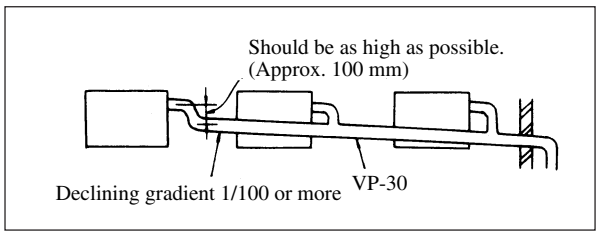
b) When connecting the drain pipe to the unit, pay suffcient attention not to apply excess force to the piping on the unit side. Also, fix the piping at a point as close as possible to the unit.

c) For drain pipe, use hard PVC ganeral purpose pipe VP-25 (I.D.1") which can be purchased locally. When connecting, insert a PVC pipe end securely into the drain socket before tightening securly using the attached drain hose and clamp. Adhesive must not be used connection of the drain socket and drain hose (accessory).





d) When there are plural number of drain pipes, arrange to position the converging pipe at about 100mm below the drain outlet as shown below. Use a pipe of VP-30 or higher for the converging pipe.

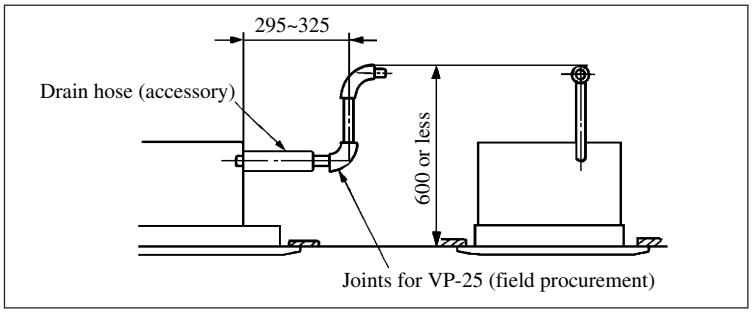


e) Make sure to provide the thermal insulation for the hard vinyl chloride pipe and drain socket provided indoor.

f) Air bleed should not be provided in any event.

- When it is necessary to raise the drain head, the limitation is up to 600mm below the bottom face of ceiling where the unit is installed. The distance is the dimension of the pipe which is installed perpendicularly from a point close to the output for drain pipe connection.

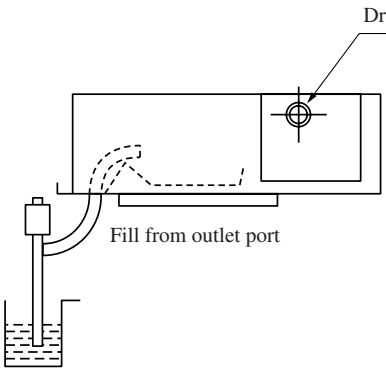
Unit : mm

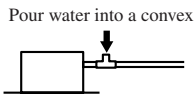


Drain test

[Perform this before installing the ornament panel]

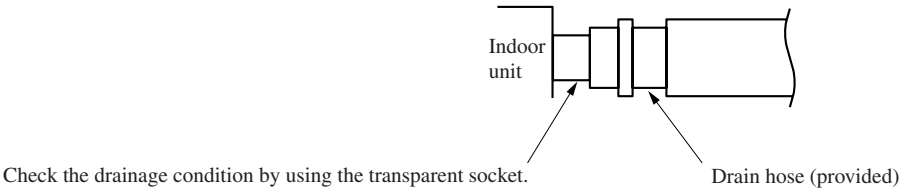
- Perform this upon completion of electrical work.
- Gradually introduce 2,000~3,000cc of water as shown below.





(If the electrical work has not been completed, connect a convex joint in the drain pipe connection to provide a water inlet.
Then, check if water leaks from the piping system and that drain flows through the drain pipe normally.)

- Connect the remote control switch and set to cooling operation. The drain pump will operate with the compressor on.
- Test whether or not the water is draining while listening to the operating sounds of the electric motor for the drain water.



- Check that water is draining smoothly and that there is no water dripping from the connections or other areas.

Forced drain pump operation

◆Setup from a unit side.

① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.

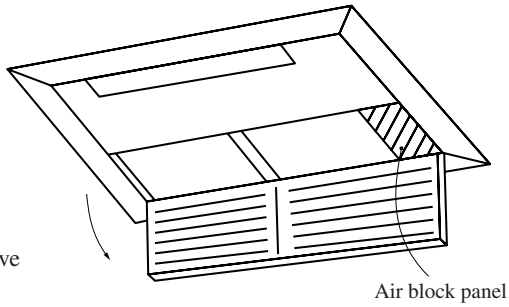
② After the test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain conditions of the pipe.)

♦ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

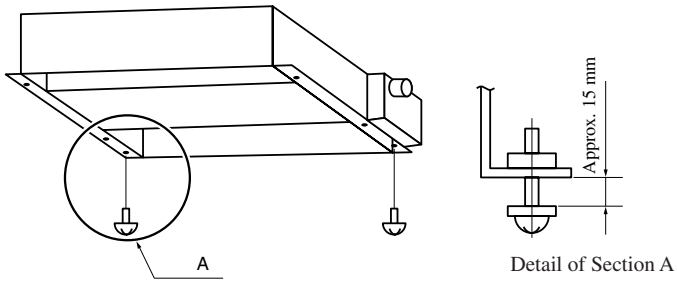
1. To start a forced drain pump operation
   ① Press the TEST button for three seconds or longer.
   The display will change from "AIR CON No SELECT ITEM"→ "SET"→ "TEST RUN ▼ "
   ② Press the ▼ button once while "TEST RUN ▼" is displayed, and cause "DRAIN PUMP ▲▼" to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display: "DRAIN PUMP RUN"→ "→ STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop. The air conditioning system will become OFF.



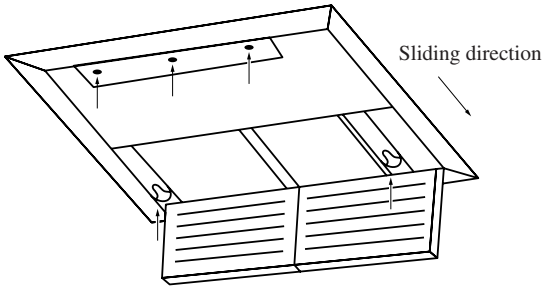
Mounting the Panel

① Open the air return grille and remove the air block panel from the inside. (Remove the 2 screws.)

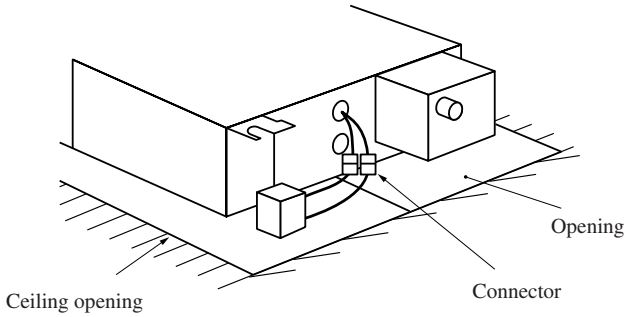
② Mount the two (M5 x 35) panel mounting screws to the indoor unit



③ Hang the panel on the two mounting screws on the indoor unit by using the two ⌂ shaped holes. Slide the panel approximately 10 mm. Use the 5 panel mounting screws to secure the panel.



④ Use the opening to connect the connectors for the louver motor and limit switches.



⑤ Reinstall the wind shield plate.

(iii) Installation on higher ceiling

Adhere the insulation materials on the blow outlet of the indoor unit. All others are same as the standard installation.

(f) Medium static pressure ducted type (FDQM)

(i) Selection of installation location

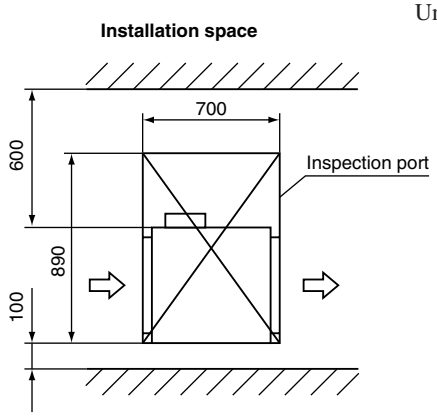
1) Avoid installation and use at those places listed below.
   a) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).
      Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.
   b) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is generated or remains. Installation and use at such places will cause corrosion in the heat exchanger and damage in molded synthetic resin parts.
   c) Places adjacent to equipment generating electromagnetic waves or high-frequency waves such as in hospitals. Generated noise may cause malfunctioning of the controller.

2) Select places for installation satisfying the following conditions and, at the same time, obtain the consent on the part of your client user,.
   a) Places where chilled or heated air circulates freely. When the installation height exceeds 3m, warmed air stays close to the ceiling. In such cases, suggest your client users to install air circulators.
   b) Places where perfect drainage can be prepared and sufficient drainage gradient is available.
   c) Places free from air disturbances to the return air port and supply hole of the indoor unit, places where the fire alarm may not malfunction to short circuit.
   d) If the humidity above the ceiling exceeds 80% or the condensation temperature above the ceiling exceeds 28ºC, affix polyurethane foam (with a thickness to 10 or greater) above the insulation in the ceiling panels.

   (Carry out tests of the main unit under the above conditions and confirm that there is no failure. However, if the environment where the unit is installed exceeds the above conditions and the unit is operated in high humidity conditions, there is danger of condensate dripping down. If there is a possibility that the unit will be used under such conditions, dress 10 to 20 mm of insulation material to the main unit, piping and drain pipes.)

3) Check if the selected place for installation is rigid enough to stand the weight of the unit.
   Otherwise, apply reinforcement using boards and beams before starting the installation work.

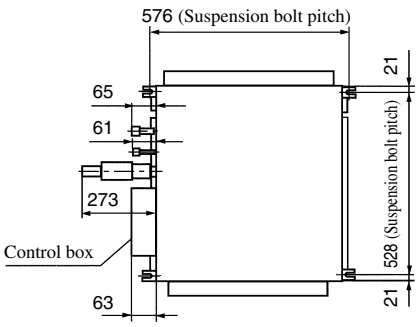
Unit : mm



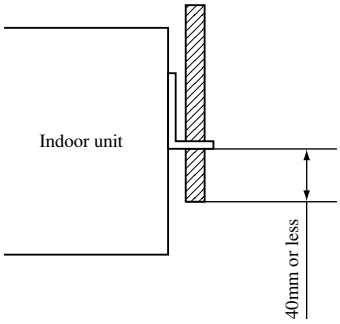
(ii) Suspension the Unit

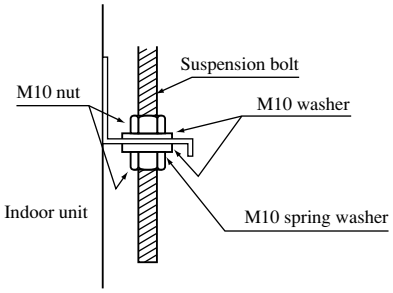
Use four (4) M10 or W3/8 suspension bolts. Secure them firmly so that each can withstand a pull-out load of 490N.

Unit : mm



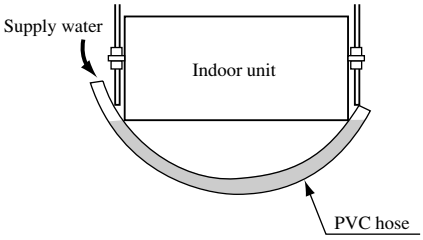
1) Adjust suspension bolts length to the following dimension.





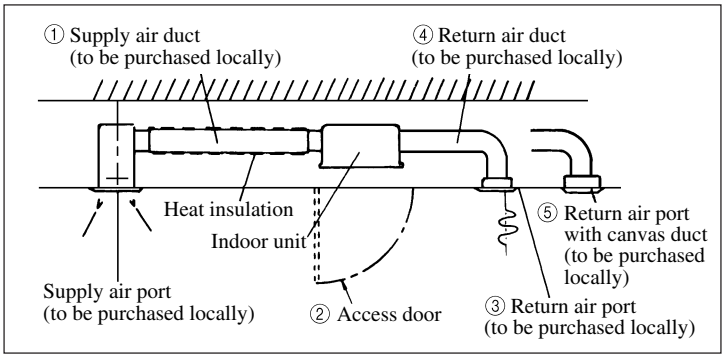
2) Set the suspension bolts (to be prepared at job site) in place.

3) Level the unit using a level or a hose filled with water. If the unit is out of level, water leaks or malfunctioning of the floating switch may occur.

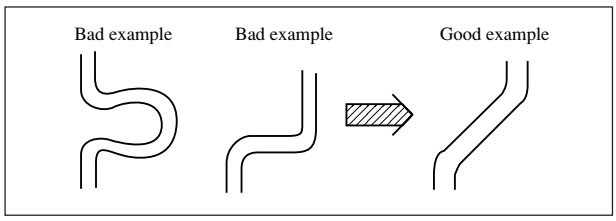


4) After ensuring the above, secure the unit.

(iii) Duct installation



1) Calculate air flow volume and the outside static pressure to select the duct's length and shape, and air supply port.
   Caution
   Take care that the outside atatic pressure does not exceed 30 Pa. The unit has condensation owing to the decrease in air capacity, possibly causing the ceiling and household goods to become wet.
2) The indoor unit is not provided with an air filter. Assemble it into the air return grill for which cleaning is easy.
3) Make the duct the shortest in length.

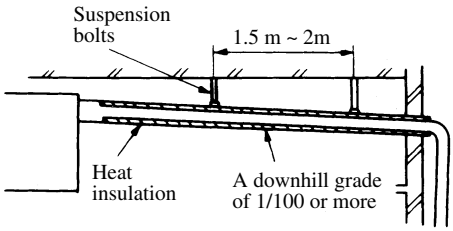


4) Make the bend radius large
5) When connecting the indoor unit to the duct flange of the blow outlet, attach the insulation material to the fixed portion to protect it from condensation.
6) Conduct the duct work before ceiling attachment.
7) Make sure to keep the air return duct warm to protect it from condensation.
8) Install the air supply hole where air can flow all over the room.
9) Make sure to install the inspection opening in the ceiling. It is needed for the maintenance of electrical parts, the motor and other parts.

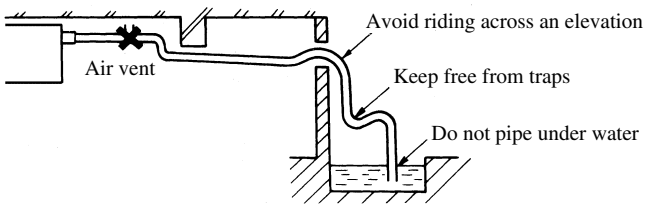
(iv) Drain piping

1) Drain piping should always be in a downhill grade (1/50-1/100) and avoid riding across an elevation or making traps.

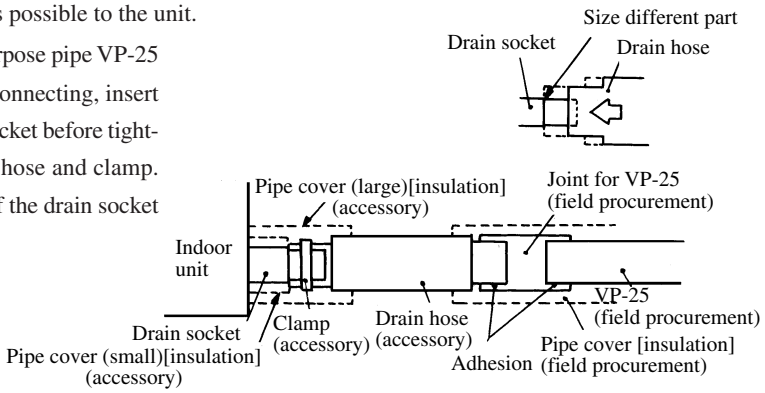
● Good piping



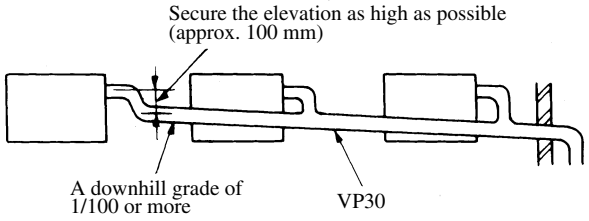
● Improper piping



2) When connecting the drain pipe to the unit, pay suffcient attention not to apply excess force to the piping on the unit side. Also, fix the piping at a point as close as possible to the unit.
3) For drain pipe, use hard PVC general purpose pipe VP-25 which can be purchased locally. When connecting, insert a PVC pipe end securely into the drain socket before tightening securely using the attached drain hose and clamp. Adhesive must not be used connection of the drain socket and drain hose (accessory).



4) When constructing drain piping for several units, position the common pipe about 100 mm below the drain outlet of each unit as shown in the sketch below. Use VP-30 or thicker pipe for this purpose.

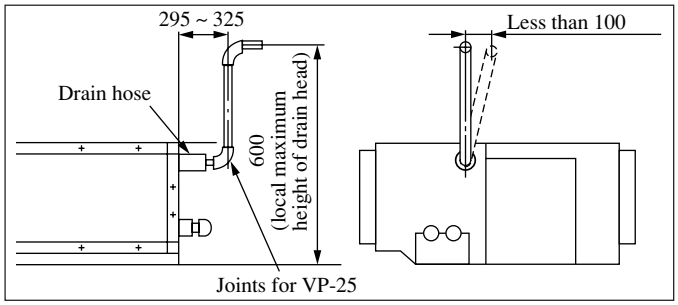


5) Be sure to provide heat insulation to hard PVC pipes of indoor placement.

6) Do not ever provide an air vent.

7) The height of the drain head may be elevated up to a point 600 mm from the bottom of unit and, when an obstacle exists in the ceiling space, elevate the piping to avoid the obstacle using an elbow or corresponding gadget. When doing this, if the stretch for the needed height is too high, the back-flow quantity of drain at the time of interruption of the operation gets too much and it may cause overflow at the drain pan. Therfore, make the height of the drain pipe withing the distance given in the drawing below.

Unit : mm



8) Avoid positioning the drain piping outlet at a place where generation of odor may stimulated. Do not lead the drain piping direct into a sewer from where sulfur gas may generate.

(v) Drain test (Perform the drain test after the electrical wiring work has been finished.)

- Check that water is draining thoroughly during the test run, and that there are no water leaks from the joints.
- The test has to be performed even if the unit is installed in a season when the unit is used for heating.
- In a new house, perform the test before the ceiling is fitted.

Forced drain pump operation

♦ Setup from a unit side.

① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.

② After the test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain conditions of the pipe.)

♦ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation

① Press the TEST button for three seconds or longer.

The display will change from "◆ SELECT ITEM"→ " ○ SET"→ " TEST RUN ▼ "

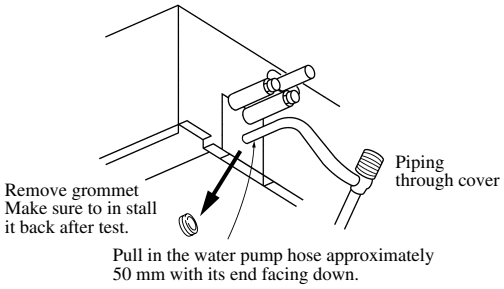
② Press the ▼ button once while " TEST RUN ▼ " is displayed, and cause [DRAIN PUMP ◆" to be displayed.

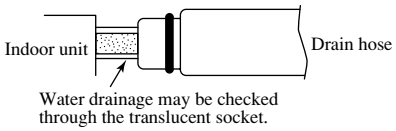
③ When the SET button is pressed, a drain pump operation will start.

Display: "DRAIN PUMP RUN"→ " ○ → STOP"

2. To cancel a drain pump operation.

① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
The air conditioning system will become OFF.



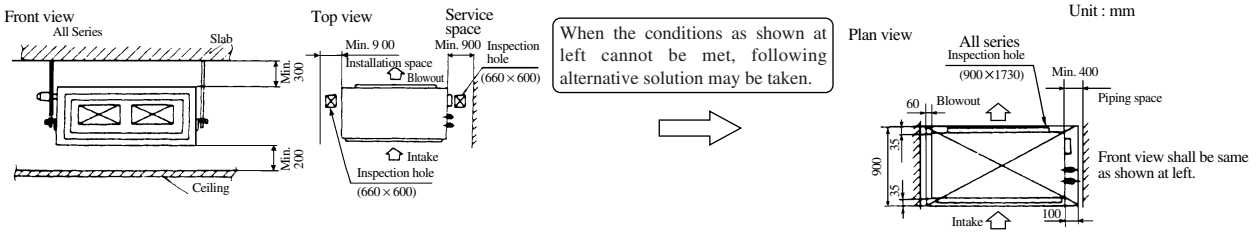


1) Remove the piping through cover, and using a water pump, pour about 1000cc of water, from the position shown in the left figure.
   Caution
   When pouring water, be sure to perform the drain pump forced operation.
2) Check the drain-out section (transparent section) for normal flow of drainage.
3) Take off the drain plug to release the water. After water release has been confirmed, replace the drain plug as it was.
   * Be careful not to get splashed when pulling the drain plug.
4) After the drain test, thoroughly insulate the drain pipe, up to the indoor unit.

(g) High static pressure duct type (FDU)

(i) Selection of installation location

1) Install the unit at a place as shown below and which meets the conditions as shown by the following table.



Air conditions, limitation of air volume

Item / Models	Air volume (m^3/min)			Indoor unit return air temperature		Ambient temperature around indoor unit
	Rating	Lower limit	Upper limit	Cooling	Heating	
224model	51	38	65	Upper limit 26¡CWB When outdoor temperature is 35¡C Lower limit 16.5¡CWB When outdoor temperature is 15¡C	Upper limit 27¡CDB Outdoor temperature is below 20¡CWB Lower limit 10¡CDB Outdoor temperature is above 10¡CWB	Dew point temperature below 23¡C
280model	68	51	87			
				For further details refer to the engineering data which		

2) Places where perfect drainage can be prepared and sufficient drainage gradient is available.

3) Places free from air disturbances to the air return and air supply of the indoor unit.

4) If the humidity above the ceiling exceeds 80% or the condensation temperature above the ceiling exceeds 28ºC, affix polyurethane foam (with a thickness to 10 or greater) above the insulation in the ceiling panels.

⟨ Carry out tests of the main unit under the above conditions and confirm that there is no failure. However, if the environment where the unit is installed exceeds the above conditions and the unit is operated in high humidity conditions, there is danger of condensate dripping down. If there is a possibility that the unit will be used under such conditions, dress 10 to 20 mm of insulation material to the main unit, piping and drain pipes. ⟩

5) Do not place where the unit is exposed to oil splashes or steam (e.g. kitchens and machine plants).
(Installation and use at such places will cause the performance drop, corrosion in the heat exchanger and damage in molded synthetic resin parts.)

6) Do not place where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is generated or remains.
Installation and use at such places will cause corrosion in the heat exchanger and damage in molded synthetic resin parts.

7) Do not place adjacent to equipment generating electromagnetic waves or high-frequency waves such as in hospitals, Generated noise may cause malfunctioning of the controller.

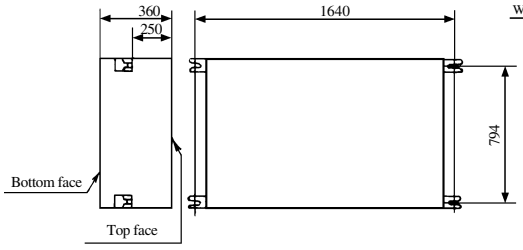
(ii) Installation

<Delivery>

○ When delivering the package, move the package to the installation as close as possible.

○ When it is unpacked and then moved to the installation place, sufficient care must be taken not to damage the unit during transfer.

<Hanging bolt location>



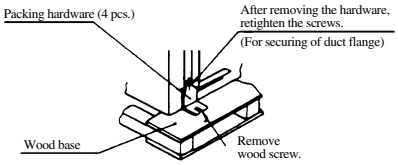
○ To adjust the level, use a level gauge or adjust as shown by the left figure.

Note: Unless the level is adjusted properly, the float switch may malfunction or operate improperly.

<Packing hardware>

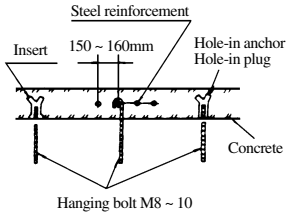
Four pieces of packing hardware are used.

Discard them after unpacking.

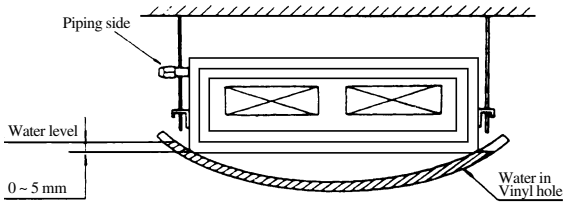


<Securing of Hanging Bolt>

Secure the hanging bolts by either one of following methods.

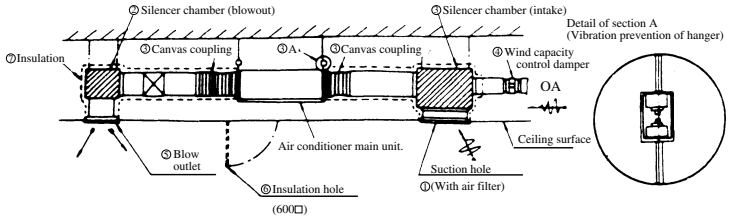


<Adjustment level>



Adjust the piping side a little lower than the opposite side.

(iii) Duct work



① Air filter is not installed in the main unit of air conditioner. Air filter should be installed in the suction grill which allows an ample access for cleaning.

② Silencer chamber(s) may be necessary depending on the noise level allowed in the room where the air conditioner is installed.
Additional silencer may be necessary where a particularly low noise is required.
(Provision of silencer is a must at offices and a meeting room.)

③ In order not to transmit vibration from the main unit of air conditioner to the ceiling or slab, it is necessary to provide means to prevent vibration, for example, a canvas coupling on the duct or rubber cushion on the main unit of air conditioner.

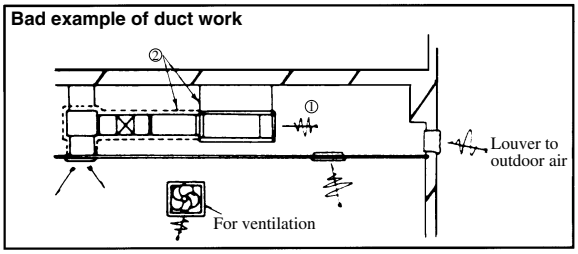
④ A damper to control air volume should be installed on the joint of OA duct to facilitate control of air capacity after the installation.

⑤ Location and from of blow outlet should be selected so that air from the outlet will be distributed all over the room, and equipped with a device to control air volume.

⑥ Make sure to provide an inspection hole on the ceiling. It is indispensable to service electric equipment, motor, functional components and cleaning of heat exchanger.

⑦ Make sure to insulate the duct to prevent dewing on it.
Thickness of insulating material is 65 mm minimum.

Bad example of duct work



① If a duct is not provided at the suction side but it is substituted with the space over the ceiling, humidity in the space will increase by the influence of capacity of ventilation fan, strength of wind blowing against the outdoor air louver, weather (rainy day) and others.

a) Moisture in air is likely to condense over the external plates of the unit and to drip on the ceiling.
Unit should be operated under the conditions as listed in the above table and within the limitation of air flow volume.
When the building is a concrete structure, especially immediately after the construction, humidity tends to rise even if the space over the ceiling is not substituted in place of a duct.
In such occasion, it is necessary to insulate the entire unit with glass wool (25 mm).
(Use a wire net or equivalent to hold the glass wool in place.)

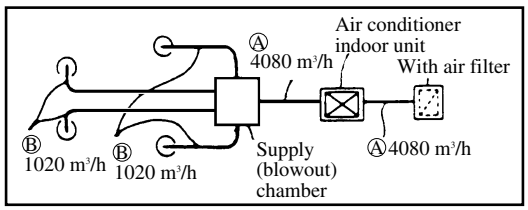
b) It may run out the allowable limit of unit operation (Example: When outdoor air temperature is 35°CDB, return air temperature is 27°CWB) and it could result in such troubles as compressor overload, etc.

c) There is a possibility that the supply air volume may exceed the allowable range of operation due to the capacity of ventilation fan or strength of wind blowing against external air louver so that drainage from the heat exchanger may fail to reach the drain pan but leak outside (e.g. drip onto the ceiling) with consequential water leakage in the room.

② Unless vibration isolation is provided between the unit and duct and between the unit and the slab, vibration will be transmitted to the duct so that vibration noise may generate from between the ceiling and supply outlet or vibration may be transmitted to the slab. Make sure to provide an effective vibration prevention means.

<Simplified method for determination of duct dimensions>

In the following method, it is assumed that the friction resistance per unit length of duct is 1 Pa/m (0.1 mm Aq/m) and a side of duct is 250 mm.
Air volume rating is assumed to be FDUA280KXE4R.



○ Calculation of duct resistance
(Use following simplified calculations.)

	Air volume	Duct (mm × mm)
Section Ⓐ	4080m³/h (68m³min)	250 × 830
Section Ⓑ	1020m³/h (17m³min)	250 × 270

Linear pipe section	Calculate based on 1 Pa per 1 m in length 1 Pa/m.
Curved pipe section	Take a curved section as equivalent to 3 ~4 m in straight line.
Blowout section	Calculate based on 25 Pa.
Chamber	Calculate by taking 1 pc. as 50Pa.
Suction grill (with filter)	Calculate by taking 1 pc. as 40Pa.

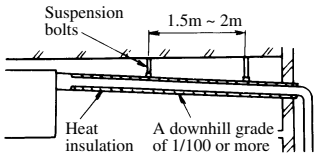
<Table of simplified selection of duct dimensions>

Duct form / Air volume / Item	Square duct Dimensions
m³/h(m³/min)	(mm × mm)
100	250 × 60
200	250 × 90
300	250 × 120
400	250 × 140
500	250 × 170
Section Ⓑ 600(10)	250 × 190
800	250 × 230
1,000	250 × 270
1,200(20)	250 × 310
1,400	250 × 350
1,600	250 × 390
1,800(30)	250 × 430
2,000	250 × 470
Section Ⓐ 2,400	250 × 560
3,000(50)	250 × 650
3,500	250 × 740
4,000	250 × 830
4,500	250 × 920
5,000	250 × 1000
5,500	250 × 1090
6,000(100)	250 × 1180

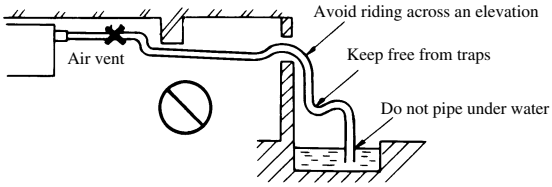
(iv) Drain Piping

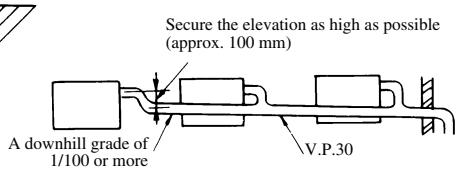
1) Drain piping should always be in a downhill grade (1/50~1/100) and avoid riding across an elevation or making traps.

• Good piping



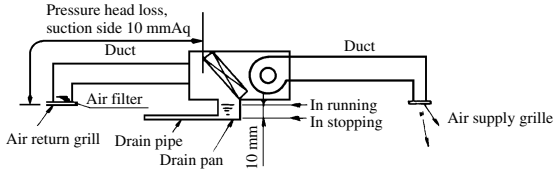
• Improper piping





2) When connecting the drain pipe to unit, pay sufficient attention not to apply excess force to the piping on the unit side. Also, fix the piping at a point as close as possible to the unit.
3) For drain pipe, use hard PVC general purpose pipe VP-25(I.D.1˝) which can be purchased locally.
4) When constructing drain piping for several units, position the common pipe about 100 mm below the drain outlet of each unit as shown in the sketch. Use VP-30 (11/4˝) or thicker pipe this purpose.
5) Be sure to provide heat insulation to hard PVC pipes of indoor placement.
6) Do not ever provide an air vent.
7) Avoid postitioning the drain piping outlet at a place where generation of odor may be stimulated. Do not lead the drain piping direct into a sewer from where sulfur gas may generate.

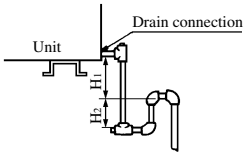
If the duct is connected and then the blower is operated, inside air pressure will become negative compared with the atmospheric pressure.



Example: If the pressure loss at the suction side, such as the air return grill, air filter and duct, is 100 Pa, the level of drain water will rise approx. 10 mm higher than the state of operation stop.

<Provision of trap>

Since the drain outlet is disposed at a position that makes the pressure negative, it is necessary to provide a trap (during the piping work) in order to prevent water leakage due to rising of water level in the drain pan.
Trap must be so constructed to facilitate cleaning. It should be better to employ a "T" joint as shown below. In addition, the height of trap should be as specified below. The trap should be provided close to the unit.

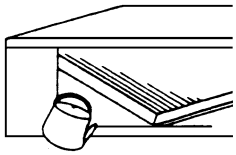


• Provide a trap on way of the drain pipe as shown at left.

H_1=100 mm or static pressure of blower
H_2=1/2 H_1 or 50 ~ 100 mm

(v) Drain Test

When the drain piping work is over, inject water to inspect if the piping is arranged properly or not.



○ Remove the side panel and supply gradually 1,000 cc of water to see if water is drained smoothly or not. Check also for water leakage.

(vi) Operating method of fan controller

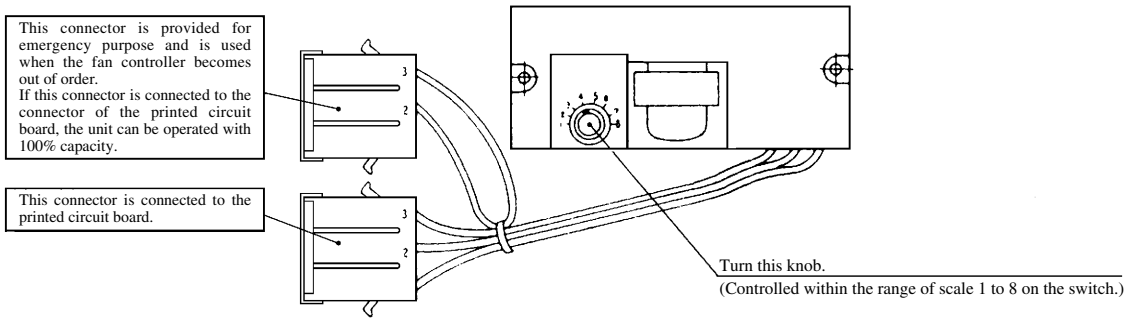
○ This unit allows to continuously adjust the air volume with the fan controller switch which is built in the electric equipment box.

It is not necessary to control the air volume (outside unit static pressure adjustment) with the damper, etc. at the duct side. Select the point of operation so that it will be within the range of air volume withch can be operated. (Refer to the limitation of air capacity as shown below.)

Location of the fan controller in the electric equipment box and the operating method are shown below.

○ Refer in advance to the blower characteristics quoted in the separate engineering data, and select the number on the scale of fan controller switch.

Referring to the figure below, adjust the number on the scale of fan controller switch at the number selected during the test run after completion of electrical work and check if the intended air volume is obtained or not.



Operation of fan controller

Note(1) Make sure to turn power off before operating the fan controller because there is risk of contacting charged sections.

(h) Satellite ducted type (FDUM)

(i) Selection of installation location

1) Avoid installation and use at those places listed below.

a) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).
Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.

b) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is gnerated or remains. Installation and use at such places will cause corrosion in the heat exchanger and damage in molded synthetic resin parts.

c) Places adjacent to equipment generating electromagnetic waves or high-frequency waves such as in hospitals. Generated noise may cause malfunctioning of the controller.

2) Select places for installation satisfying the following conditions and, at the same time, obtain the consent on the part of your client user,.

a) Places where chilled or heated air circulates freely. When the installation height exceeds 3m, warmed air stays close to the ceiling. In such cases, suggest your client users to install air circulators.

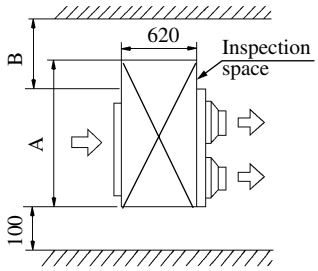
b) Places where perfect drainage can be prepared and sufficient drainage gradient is available.

c) Places free from air disturbances to the return air port and supply hole of the indoor unit, places where the fire alarm may not malfunction to short circuit.

d) Places with the environmental dew-point temperature is lower than 28˚C and the relative humidity is less than 80%.

(This unit is tested under ISO installation conditions to make sure that there are no defects. However, if it is operated under conditions of high humidity that exceed the conditions above, there is danger of condensate falling from the unit. If there is a possibility that the unit will be used under such conditions, dress 10~20 mm of insulation on the entire unit body, the piping and drain pipe.)

3) Check if the selected place for installation is rigid enough to stand the weight of thew unit.
Otherwise, apply reinforcement using boards and beams before starting the installation work.



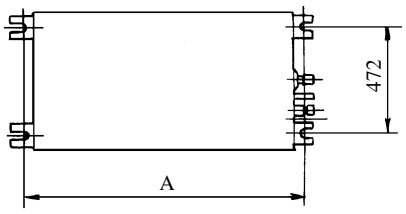
Unit : mm

Mark / Models	A	B
FDUMA22, 28, 36, 45, 56	1100	600
FDUMA71, 90	1300	600
FDUMA112, 140	1720	600

(ii) Suspension

Be sure to observe the finished length of the suspension bolts given below.

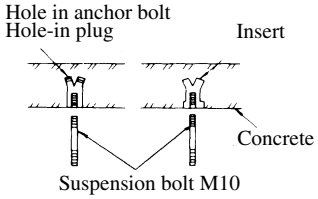
Unit : mm

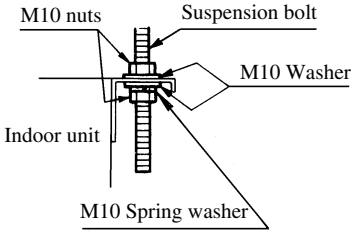


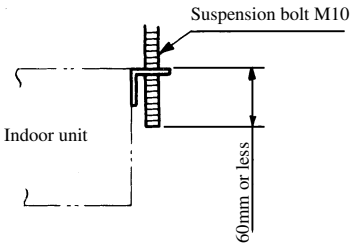
Models \ Mark	A
FDUMA22, 28, 36, 45, 56	786
FDUMA71, 90	986
FDUMA112, 140	1406

1) Fixing the suspension bolt (customer ordered parts M10)

Securely fix the suspension bolt as illustrated below or in another way.



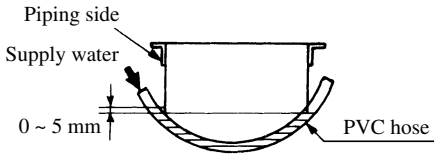




2) Adjusting the unit's levelness

a) Adjust the out-levelness using a level vial or by the following method.

- Make adjustment so that the relation between the lower surface of the indoor unit proper and water level in the hose becomes given below.



Bring the piping side slightly lower

b) Unless the levelness is adjusted properly, the malfunction of the float switch will occur.

3) Blower fan tap switch

The following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

② By means of function setting from the remote control unit, set the setting ⓒ of "I/U FUNCTION ▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap) as shown right.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ
01	Hi CEILING SET	Hi CEILING 1

For the details of operating procedures, please refer to the installation manual of your remote control unit.

(iii) Duct work

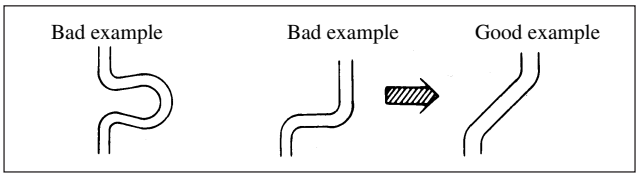
① Supply air duct

- 1-spot, 2-spot, 3-spot and 4-spot with ∅200 type duct are the standard specifications. Determine the number of spots based on following table.

FDUMA22	FDUMA28, 36, 45, 56	FDUMA71, 90	FDUMA112, 140
1-spot	2-spot	2 ~ 3-spot (1)	3 ~ 4-spot (2)

Notes (1) Shield the central supply air port for 2-spot.
(2) Shield the supply air port around the center for 3-spot.

- Limit the difference in length between spots at less than 2:1.
- Reduce the length of duct as much as possible.
- Reduce the number of bends as much as possible. (Corner R should be as larger as possible.)



- Use a band, etc. to connect the indoor unit and the supply air duct flange.
- Conduct the duct installation work before finshing the ceiling.

② Access door

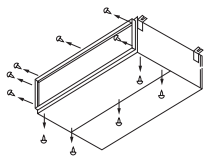
Access door must be provided without fail.

- **Dimensions of access door and service space**

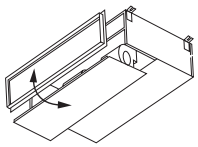
(See exterior dimensions in page 92 to 95.)

③ Return air port

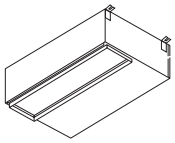
- When shipped, the return air port lies on the back.
- When connecting the duct to the return air port, remove the air filte if it is fitted to return air port.
- When placing the return air port to carry out suction from the bottom side, use the following procedure to replace the return air duct joint and the bottom plate.



• Remove the screws which fasten the bottom plate and the duct joint on the return air port of the unit.



• Replace the removed bottom plate and duct joint.

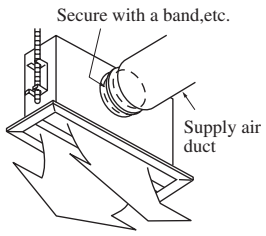


• Fit the duct joint with a screw, fit the bottom plate.

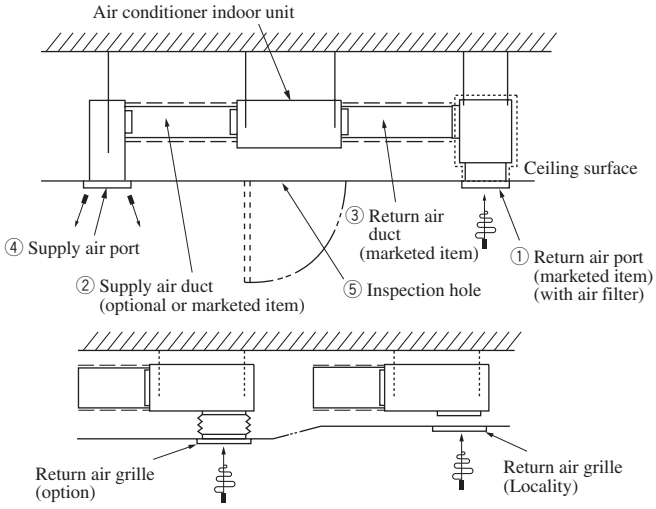
- Make sure to insulate the duct to prevent dewing on it.

④ Install the specitic supply air duct in a location where the air will circulate to the entire room.

- The duct connection is specific to the 200 circular duct.
- Conduct the installation of the specific supply air hole and the connection of the duct before attaching them to the ceiling.
- Insulate the area where the duct is secured by a band for dew condensation prevention.

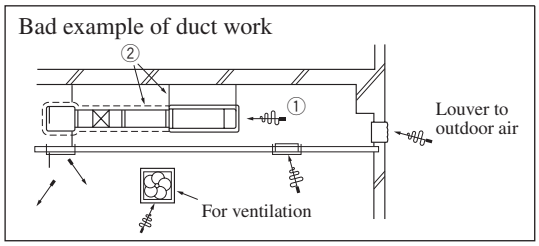


⑤ Make sure provide an inspection hole on the ceiling. It is indispensable to service electric equipment, motor, functional components and cleaning of heat exchanger.



⑥ If a duct is not provided at the return air side but it is substituted with the space over the ceiling, humidity in the space will increase by the influence of capacity of ventilation fan, strength of wind blowing againat the outdoor air louver, weather (rainy day) and others.

- Moisture in air is likely to condense over the external plates of the unit and to drip on the ceiling. Unit should be operated under the conditions as listed in the above table and within the limitation of wind volume. When the building is a concrete strucially immediately after the construction, humidity tends to rise if the space over the ceiling is not substitued in place of a duct. In such occasion, it is necessary to insulate the entire unit with glass wool (25mm). (Use a wire net or equivalent to hold glass wool in place.)
- It may run out the allowable limit of unit operation (Example: When outdoor air temperature is 35ºCD.B, return air temperature is 27ºCW.B) and it could result in such troules as compressor overload, etc..
- There is a possibility that the supply air volume may exceed the allowable range of operation due to the capacity of ventilation fan or strength of wind blowing against external air louver so that drainage from be heat exchanger may fail to reach the drain pan leak outside (e.g. drip on to the ceiling) with consequential water leakage in the room.



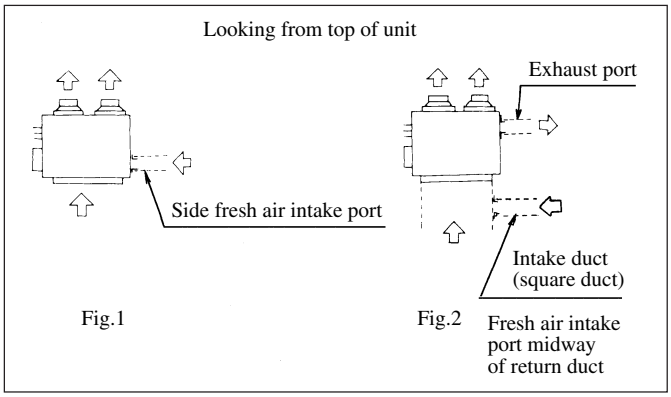
Notice: Aspecific cover plate is available when changing the 4 spot to the 3 spot, or when changing the 3 spot to the 2 spot.

Note (1) Do not change from 2 spot to 1 spot.

⑦ **Return air duct: Use square duct.**

⑧ **Return air port with canvas duct**

1) Connection of intake and exhaust ducts.



2) Duct connecting position.

< Fresh air intake >

a) Use side air intake port.

b) In case of simultaneous intake and exhaust, the side air intake port cannot be used, therefore, take air from the midway air intake port along the intake duct.

< Exhaust > Make sure to use suction as well.

c) Use a side exhaust port.

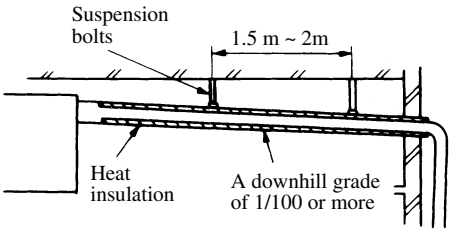
3) Duct connection

Use intake and exhaust duct flange of separately sold (for connection of ∅125mm round duct) to connect ∅125mm round duct. The duct clamped by bands must be thermally insulated to prevent dew condensation.

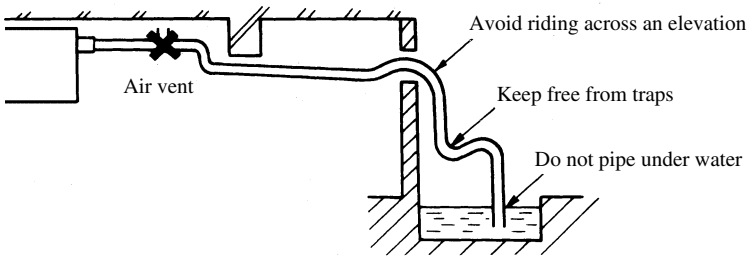
(iv) Drain piping

1) Drain piping should always be in a downhill grade (1/50-1/100) and avoid riding across an elevation or makeing traps.

● **Good piping**

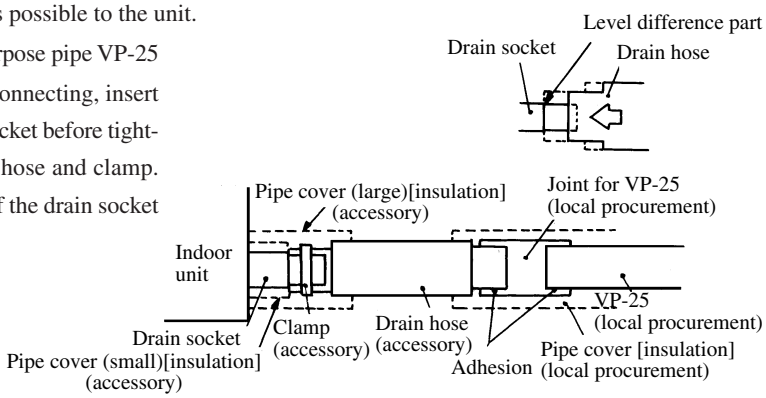


● **Improper piping**

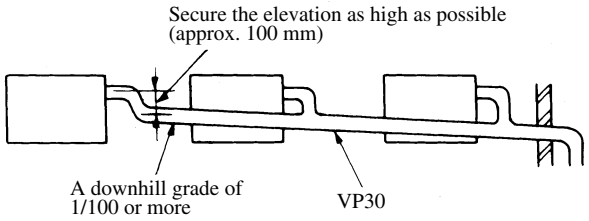


2) When connecting the drain pipe to the unit, pay suffcient attention not to apply excess force to the piping on the unit side. Also, fix the piping at a point as close as possible to the unit.

3) For drain pipe, use hard PVC general purpose pipe VP-25 which can be purchased locally. When connecting, insert a PVC pipe end securely into the drain socket before tightening securely using the attached drain hose and clamp. Adhesive must not be used connection of the drain socket and drain hose (accessory).



4) When constructing drain piping for several units, position the common pipe about 100 mm below the drain outlet of each unit as shown in the sketch below. Use VP-30 or thicher pipe for this purpose.

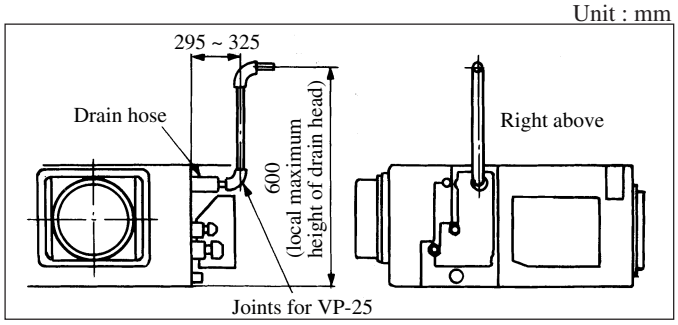


5) Be sure to provide heat insulation to hard PVC pipes of indoor placement.

6) Do not ever provide an air vent.

7) The height of the drain head may be elevated up to a point 600 mm from the bottom of unit and, when an obstacle exists in the ceiling space, elevate the piping to avoid the obstacle using an elbow or corresponding gadget. When doing this, if the stretch for the needed height is too high, the back-flow quantity of drain at the time of interruption of the operation gets too much and it may cause overflow at the drain pan. Therfore, make the height of the drain pipe withing the distance given in the drawing below.

Unit : mm



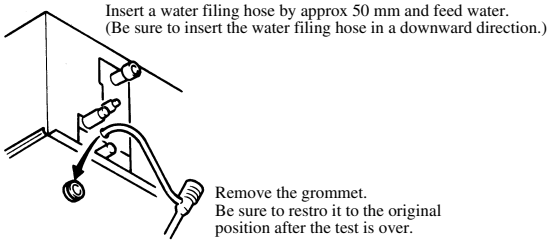
8) Avoid positioning the drain piping outlet at a place where generation of odor may stimulated. Do not lead the drain piping direct into a sewer from where sulfur gas may generate.

9) Drainage test

a) During trial operation, make sure that drainage is properly execued and check that leakage is not found at connections.

b) Be sure to carry out a drainage test when installing the system during a heating season.

c) When installing the system in a building under construction, carry out the drainage test before ceiling tiles are installed.



① Supply approx 1000cc of water through the outlet of the unit using a feed water pump.

② Make sure that drainage is proceeding properly at the see-through outlet of the unit.

* Also confirm the revolving sound of the condensate motor when checking the drainage.

③ Then remove the drain plug at lower section of the unit to drain water off. After making sure water is not left, restore the drain plug to the original position.

Forced drain pump operation

♦ Setup from a unit side.

① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.

② After the test, be sure to turn off the DIP switch.

(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain conditions of the pipe.)

♦ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

1. To start a forced drain pump operation
   ① Press the TEST button for three seconds or longer.
   The display will change from "AIR CON No SELECT ITEM"→ " ○ SET"→ "TEST RUN ▼"
   ② Press the ▼ button once while " TEST RUN ▼" is displayed, and cause "DRAIN PUMP ▲▼" to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display: "DRAIN PUMP RUN"→ " ○ → STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
   The air conditioning system will become OFF.

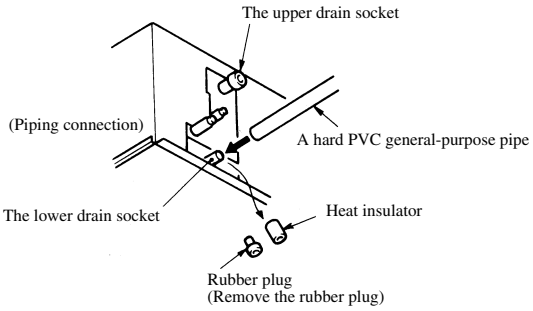
10)Drainage from the lower drain socket

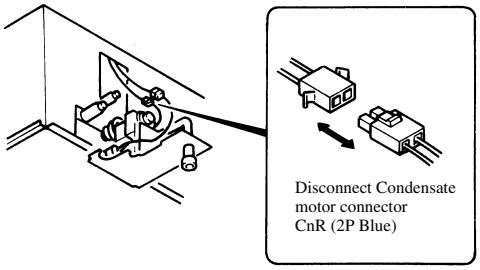
Only if the drain pipe can be installed in a downhill grade (1/50-1/100), the lower drain socket can be used for connecting to the drain pipe as illustrated.

(Disconnect the connector for the drain motor)

As shown in the sketch to the right, disconnect the drain motor connector CnR (blue color coding).

If the system is started with this connector connected as is, drain water is discharged out of the upper drain socket causing a heavy water lekage.





(i) Ceiling mounted duct type (FDUR)

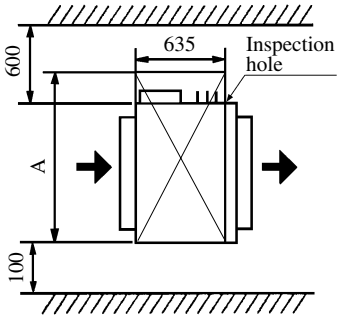
(i) Selection of installation location

1) Avoid installation and use at those places listed below.
   a) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).
      Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.
   b) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is generated or remains. Installation and use at such places will cause corrosion in the heat exchanger and damage in molded synthetic resin parts.
   c) Places adjacent to equipment generating electromagnetic waves or high-frequency waves such as in hospitals. Generated noise may cause malfunctioning of the controller.

2) Select places for installation satisfying the following conditions and, at the same time, obtain the consent on the part of your client user,
   a) Places where chilled or heated air circulates freely. When the installation height exceeds 3m, warmed air stays close to the ceiling. In such cases, suggest your client users to install air circulators.
   b) Places where perfect drainage can be prepared and sufficient drainage gradient is available.
   c) Places free from air disturbances to the return air port and supply hole of the indoor unit, places where the fire alarm may not malfunction to short circuit.
   d) If the humidity above the ceiling exceeds 80% or the condensation temperature above the ceiling exceeds 28ºC, affix polyurethane foam (with a thickness to 10 or greater) above the insulation in the ceiling panels.

   (Carry out tests of the main unit under the above conditions and confirm that there is no failure. However, if the environment where the unit is installed exceeds the above conditions and the unit is operated in high humidity conditions, there is danger of condensate dripping down. If there is a possibility that the unit will be used under such conditions, dress 10 to 20 mm of insulation material to the main unit, piping and drain pipes.)

3) Check if the selected place for installation is rigid enough to stand the weight of thew unit.
   Otherwise, apply reinforcement using boards and beams before starting the installation work.

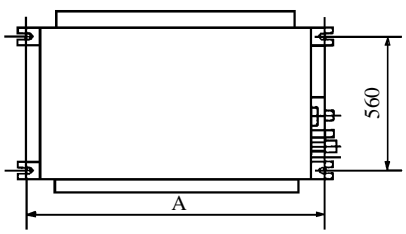


Unit : mm

Models \ Mark	A
FDUR45, 56, 71	1200
FDUR90, 112, 140	1720

(ii) Suspension

Be sure to observe the finished length of the suspension bolts given below.

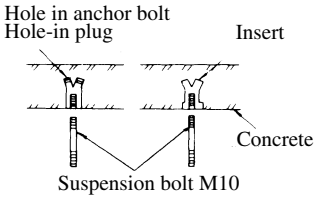


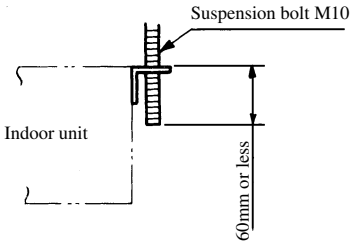
Unit : mm

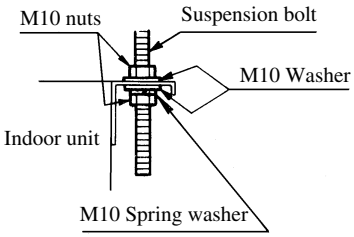
Models \ Mark	A
FDUR45, 56, 71	886
FDUR90, 112, 140	1406

1) Fixing the suspension bolt (customer ordered parts M10)

Securely fix the suspension bolt as illustrated below or in another way.





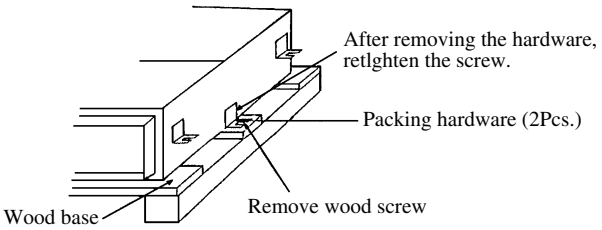


(iii) Installation of indoor unit

Packing hardware

Two pieces of packing handware are uesd.

Discard them after unpacking.



- Fix the indoor unit to the hanger bolts.

  If required, it is possible to suspend the unit to the beam,etc.

  Directly by use of the bolts without using the hanger bolts.

- When installing the unit, heed must be taken that the side touching the wood frame is the top surface of the unit.

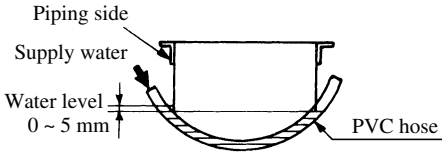
Note

When the dimensions of indoor unit and ceiling holes does not match, it can be adjusted with the slot holes of hanging bracket.

1) Adjusting the unit's levelness

a) Adjust the out-levelness using a level vial or by the following method.

- Make adjustment so that the relation between the lower surface of the unit proper and water level in the hose becomes given below.



Bring the piping side slightly lower

b) Unless the levelness is adjusted properly, the malfunction of the float switch will occur.

2) Blower fan tap switch

The following two methods are available in switching the blower fan tap. Switch to the high-speed tap with one of these methods.

① Set SW9-4 provided on the indoor unit PCB to ON.

② By means of function setting from the remote control unit, set the setting ⓒ of "I/U FUNCTION ▲" (indoor unit function) to "Hi CEILING 1" (high-speed tap) as shown right.

SW9-4	ON	Fan control,high speed (High ceiling)
	OFF	Fan control,standard

Function number Ⓐ	Function description Ⓑ	Setting ⓒ
01	Hi CEILING SET	Hi CEILING 1

For the details of operating procedures, please refer to the installation manual of your remote control unit.

Unit : Pa

Static Pressure / Models	Standard tap	High tap
FDUR45, 56	50	85
FDUR71, 90, 112, 140	50	130

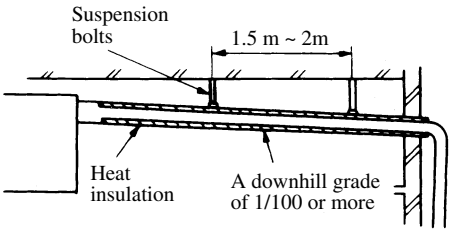
⚠ CAUTION

- Traps should not be used under static pressure outside the unit mentioned above. Dew condensation may occur with the unit and wet the ceiling or furniture.
- Do not use under static pressure outside the unit of 50Pa or less. Water drops may be blown from the diffuser outlet of the unit and wet the ceiling or furniture.

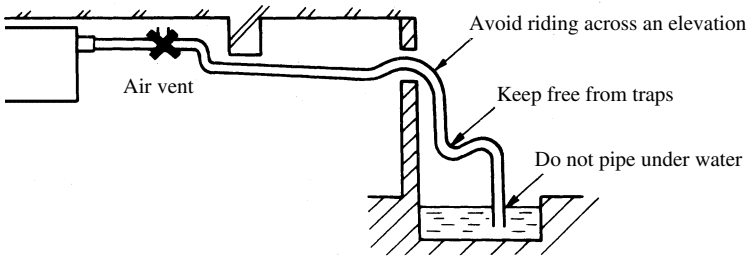
(iv) Drain piping

1) Drain piping should always be in a downhill grade (1/50-1/100) and avoid riding across an elevation or making traps.

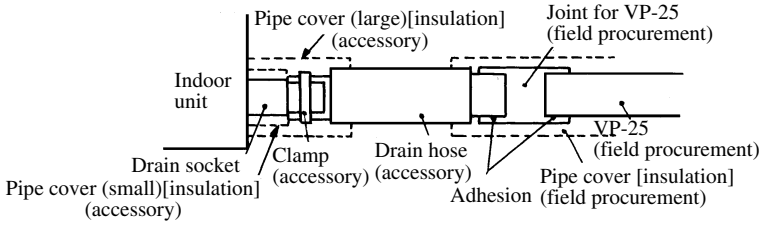
● Good piping

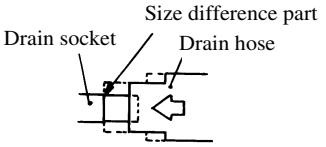


● Improper piping

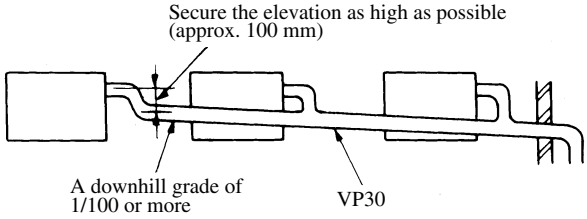


2) When connecting the drain pipe to the unit, pay suffcient attention not to apply excess force to the piping on the unit side. Also, fix the piping at a point as close as possible to the unit.
3) For drain pipe, use hard PVC general purpose pipe VP-25 which can be purchased locally. When connecting, insert a PVC pipe end securely into the drain socket before tightening securely using the attached drain hose and clamp. Adhesive must not be used connection of the drain socket and drain hose (accessory).

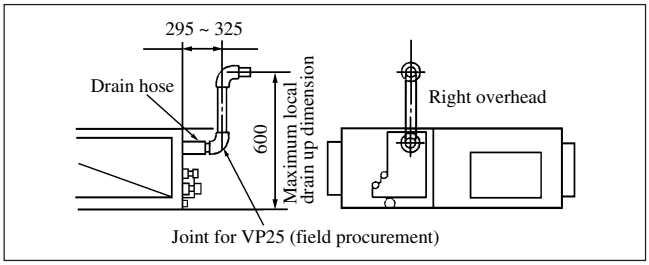




4) When constructing drain piping for several units, position the common pipe about 100 mm below the drain outlet of each unit as shown in the sketch below. Use VP-30 or thicker pipe for this purpose.



5) Be sure to provide heat insulation to hard PVC pipes of indoor placement.
6) Do not ever provide an air vent.
7) The height of the drain head may be elevated up to a point 600 mm from the bottom of unit and, when an obstacle exists in the ceiling space, elevate the piping to avoid the obstacle using an elbow or corresponding gadget. When doing this, if the stretch for the needed height is too high, the back-flow quantity of drain at the time of interruption of the operation gets too much and it may cause overflow at the drain pan. Therfore, make the height of the drain pipe withing the length given in the drawing below.



8) Avoid positioning the drain piping outlet at a place where generation of odor may stimulated. Do not lead the drain piping direct into a sewer from where sulfur gas may generate.

9) Drainage test

1) Conduct a drainage test after completion of the electrical work.

2) During the trial, make sure that drain flows properly through the piping and that no water leaks from connections.

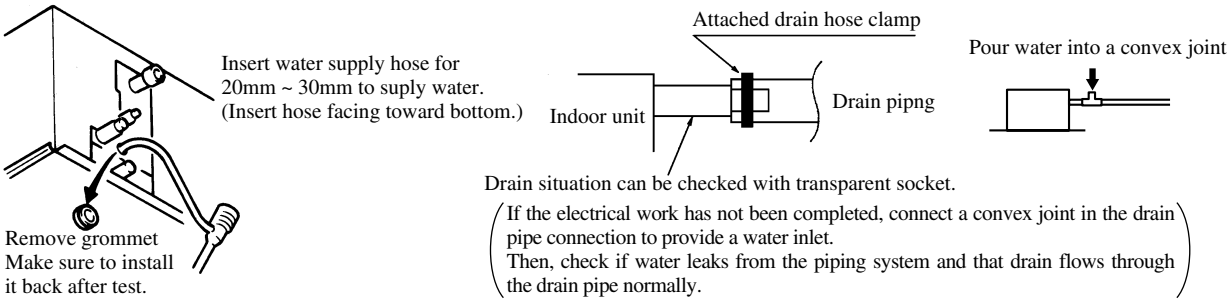
3) In case of a new building, conduct the test before it is furnished with the ceiling.

4) Be sure to conduct this test even when the unit is installed in the heating season.

Procedures

① Supply about 1000 cc of water to the unit through the air outlet by using a feed water pump.

② Check the drain while cooling operation.



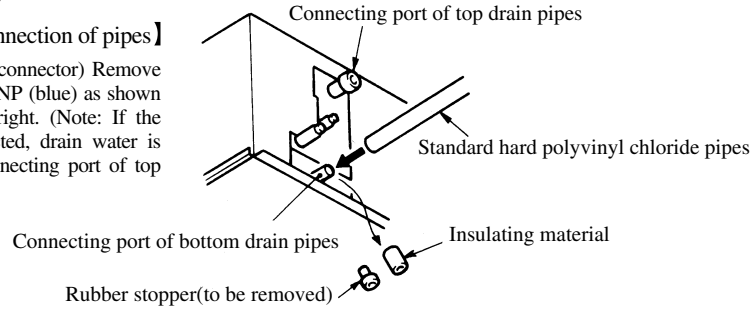
(If the electrical work has not been completed, connect a convex joint in the drain pipe connection to provide a water inlet.
Then, check if water leaks from the piping system and that drain flows through the drain pipe normally.)

10) Outline of bottom drain piping work

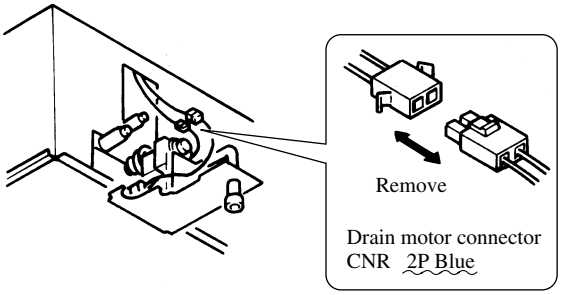
a) If the bottom drain piping can be done with a descending gradient (1/50-1/100), it is possible to connect the pipes as shown in the drawing below.

【Connection of pipes】

(Removing drain motor connector) Remove drain motor connector CNP (blue) as shown in the drawing on the right. (Note: If the connector is left connected, drain water is discharged from the connecting port of top pipes, causing leakage.)



b) Do not use acetone-based adhesives to connect to the drain socket.



Forced drain pump operation

♦ Setup from a unit side.

① Turn on DIP switch SW5-1 on the PCB of the indoor unit. The drain pump operates continuously.

② After the test, be sure to turn off the DIP switch.

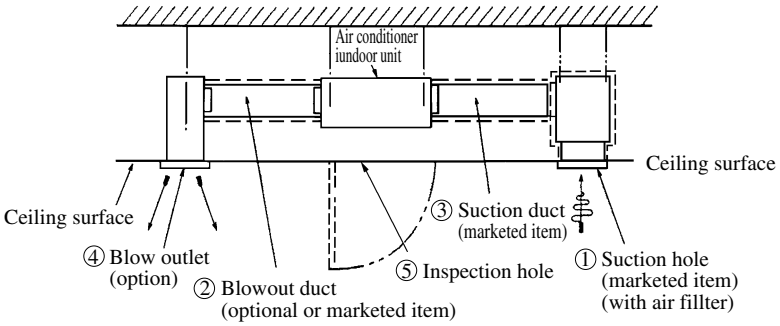
(When electrical work is not completed, connect a convex joint to the drain pipe joint area, arrange an inlet and check leaks and drain conditions of the pipe.)

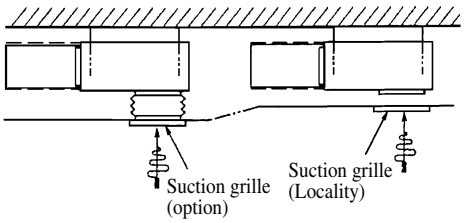
♦ Setup from a remote controller side.

Drain pump operation from a remote controller unit is possible. Operate a remote controller unit by following the steps described below.

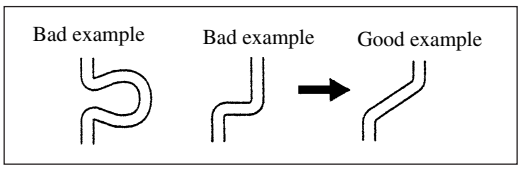
1. To start a forced drain pump operation
   ① Press the TEST button for three seconds or longer.
   The display will change from "◆ SELECT ITEM"→ " ○ SET]→ " ✳ TEST RUN ▼ "
   ② Press the ▼ button once while " ✳ TEST RUN ▼" is displayed, and cause "DRAIN PUMP ◆" to be displayed.
   ③ When the SET button is pressed, a drain pump operation will start.
   Display: "DRAIN PUMP RUN"→ " ○ → STOP"
2. To cancel a drain pump operation.
   ① If either SET or ON/OFF button is pressed, a forced drain pump operation will stop.
   The air conditioning system will become OFF.

(v) Duct work



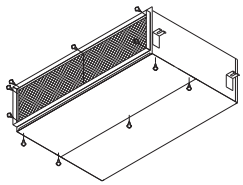


1) A corrugated board (for preventing sputtering) is attached to the main body of the air conditioner (on the outlet port). Do not remove it until connecting the duct.
   a) An air filter is provided on the main body of the air conditioner (on the inlet port). Remove it when connecting the duct on the inlet port.
2) Blowout duct
   a) Reduce the length of duct as much as possible.
   b) Reduce the number of bends as much as possible.
   c) (Corner R should be as large as possible.)

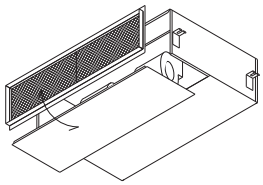


   d) Conduct the duct installation work before finishing the ceiling.

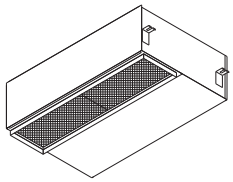
3) Inlet port
   a) When shipped, the inlet port lies on the back.
   b) When connecting the duct to the inlet port, remove the air filter fitted to the inlet port.
   c) When placing the inlet port to carry out suction from the bottom side, use the following procedure to replace the air return duct joint and the bottom plate.
4) Make sure to insulate the duct to prevent dewing on it.
5) Location and form of air supply outlet should be selected so that air from the outlet will be distributed all over the room, and equipped with a device to control air volume.
6) Make sure provide an inspection hole on the ceiling. It is indispensable to service electric equipment, motor, functional components and cleaning of heat exchanger.



● Remove the screws which fasten the bottom plate and the duct joint on the inlet port side of the unit.

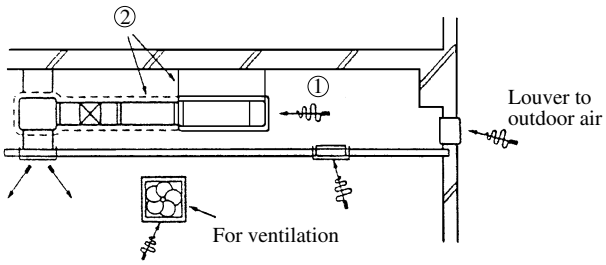


● Replace the removed bottom plate and duct joint



● Fit the duct joint with a screw, fit the bottom plate.

Bad example of duct work

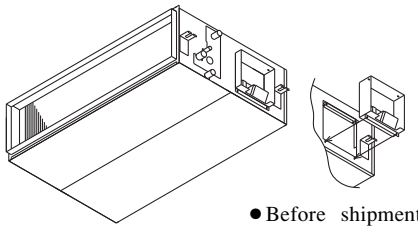


7) If a duct is not provided at the air return side but it is substituted with the space over the ceiling, humidity in the space will increase by the influence of capacity of ventilation fan, strength of wind blowing against the out door air louver, weather (rainy day) and others.
   a) Moisture in air is likely to condense over the external plates of the unit and to drip on the ceiling.
      Unit should be operated under the conditions as listed in the above table and within the limitation of wind volume.
      When the building is a concrete structure, especially immediately after the construction, humidity tends to rise even if the space over the ceiling is not substituted in place of a duct.
      In such occasion, it is necessary to insulate the entire unit with glass wool (25mm). (Use a wire net or equivalent to hold the glass wool in place.)
   b) It may run out the allowable limit of unit operation (Example: When outdoor air temperature is 35˚C DB, return air temperature is 27˚C WB) and it could result in such troubles as compressor overload, etc..
   c) There is a possibillty that the supply air volume may exceed the allowable range of operation due to the capacity of ventilation fan or strength of wind blowing against external air louver so that drainage from be heat exchanger may fail to reach the drain pan but leak outside (e. g. drip on to the ceiling) with consequential water leakage in the room.

(vi) Control box (Only case of FDUR90, 112, 140)

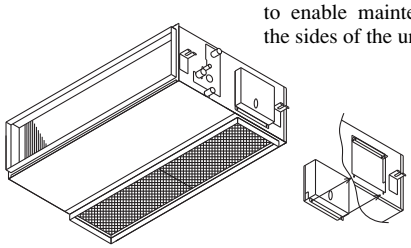
- During bottom side air return, the orientation of the control box can be changed to allow the control box to be maintained from the inlet port.

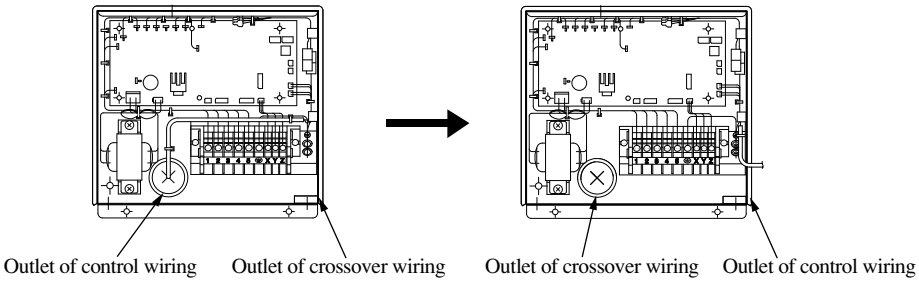
1) Remove the bottom plate (on the inlet port side), and all wiring connectors from the control box.



- Before shipment from the plant, arrangements are made to enable maintenance from the sides of the unit.

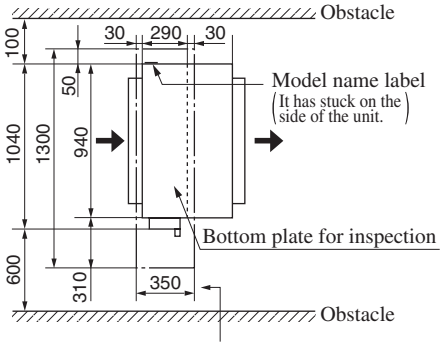
2) Remove the three screws that fasten the cabinet inside the control box.
3) Pull the control box toward the outside of the unit.
4) Change the wiring route of the wiring inside the control box.
5) Fit the control box from the inside of the unit.
6) Fit the three screws that fasten the cabinet.
7) Correctly connect all wiring connectors.



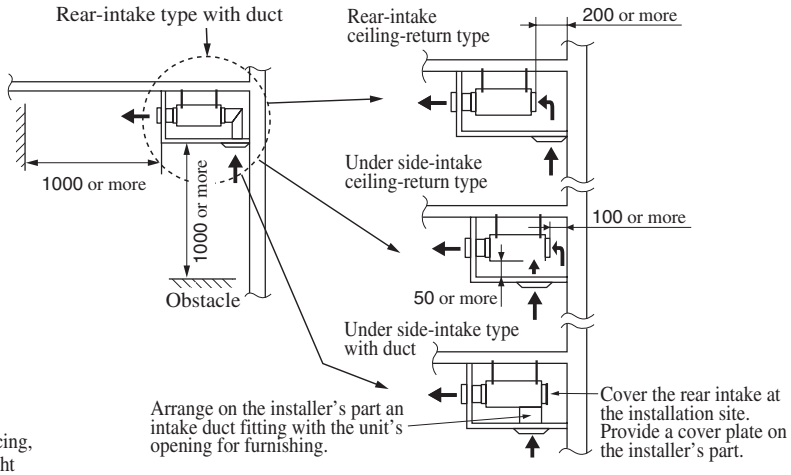


(j) Ultra thin ducted type (FDQS)

(i) Selection of installation location



An access measuring 350mm × 1300mm is required for servicing, so please provide a 350mm × 1300mm inspection opening right beneath it.
(For servicing the control, fan, fan motor and drain pump)



Notice Underside-intake type installation is not recommended for hotel and residential installations due to a high noise level.

1) With the customer's consent, select a location with the following suitable conditions:
   ① Where cool air or hot air can easily pass through. If the height of the location exceeds 3 meters, hot air will gather around the ceiling. In such case, suggest to the customer to also install a circulator.
   ② Where wiring and piping to outdoor areas may easily be conducted.
   ③ Where water can be completely drained.
   ④ Where the ceiling for the installation section is firm.
   ⑤ Where there are no wind disturbances to the suction inlet and blowing outlet, where the fire alarm will not be set off erroneously, and where no short circuits occur.
   ⑥ When installing in locations of high humidity, consider measures against condensation, such as insulation materials.
   ⑦ Avoid location where there are abundant oil splashes and moisture (i.e., kitchens, mechanical workshops). These locations may cause poor performance of the heat exchanger, corrosion, and damage to the plastic parts.
   ⑧ Where there is no direct sunlight.

⑨ Avoid locations close to devices emitting high frequencies. Electromagnetic noises may cause malfunction of the control.

⑩ Avoid locations with corrosive gases (such as sulfuric acid gas), inflammable gases (such as thinner, gasoline) and where gases may accumulate. These locations may cause corrosion to the heat exchanger and damage to the plastic parts.

⑪ There is a possibility of surrounding atmosphere to exceed the threshold concentration of refrigerant gas when the refrigerant gas leaks. Therefore, to prevent suffocation it is necessary to havea ventilation hole to another room or to install a ventilator for the unit which is linked with a gas detector.

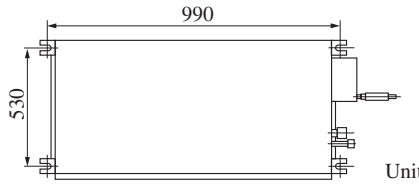
⑫ The air conditioner and the remote control should be placed at least 1 meter away from the televistion and the radio.

⑬ **The unit has been tested in accordance with JIS dew point conditions to ensure trouble free operations. However, if the unit operates at a high temperature (above the dew point temperature of 23 °C), water droplets may fall. In this case, cover the pipes and the drain pipes further with insulating materials of 10-20 mm thickness. Also add insulating materials of 10-20 mm thickness onto the unit exterior panels.**

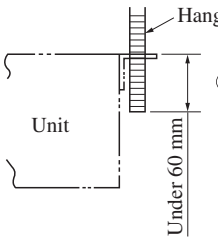
2) Consider the supporting strength of the location. If the strength is not sufficient to sustain the unit weight, use reinforcing materials such as boards or crossbeams before installation.

(ii) Preparations for hanging in the attic

Hanging Bolt Location



Unit : mm



○ Please adhere to the measurements given below for the length of the hanging bolts.

(iii) Moving and installing the unit

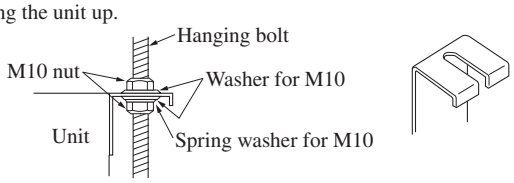
Moving

○ Move the packed box as close to the installation area as possible.
○ If it must be unpacked, wrap the unit with a nylon sling or apply a support panel and lift it with a rope to avoid damage to the unit.

Installation

[Hanging]

Hang the unit up.

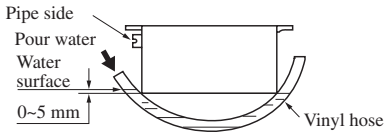


If the measurements between the unit and the ceiling holedo not match upon installation, it may be adjusted with the long holed installation tool.

Adjustment for horizontality

○ Either use a level vial, or adjust the level according to the method below.

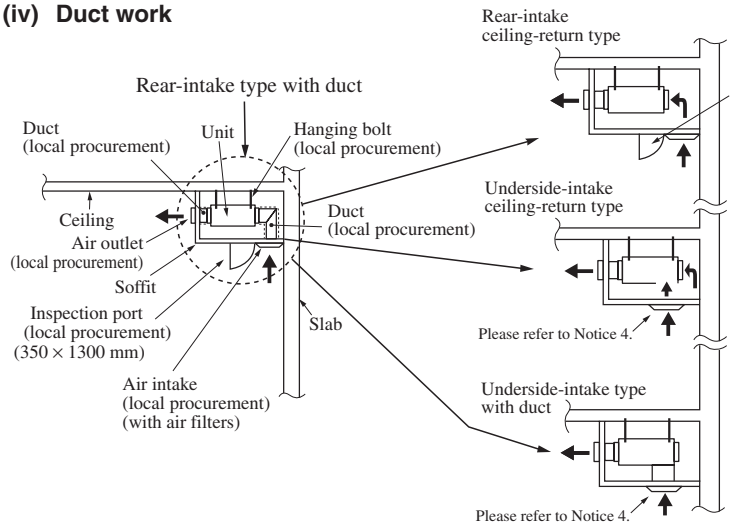
● Adjust so the bottom side of the unit will be leveled with the water surface as illustrated below.

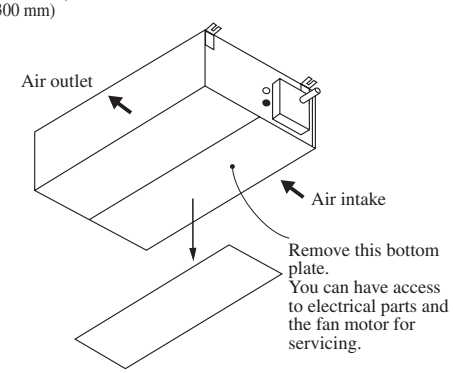


Let the pipe side be slightly sloped.

○ If the unit is not leveled, it may cause malfunctions or inoperation of the float switch

(iv) Duct work



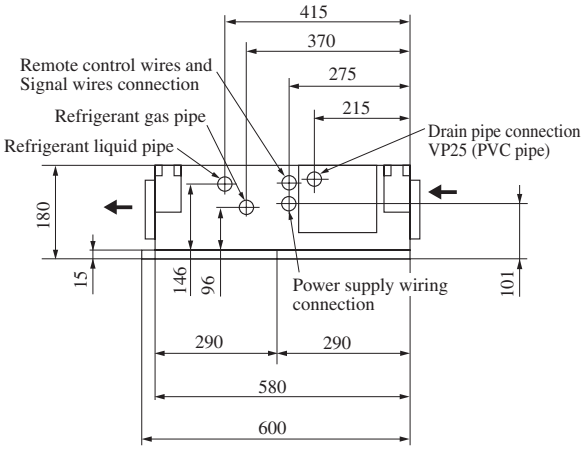


1) This unit is designed for installation in a soffit. It is not designed to inhale fresh air directly.
2) In the case of an underside-intake ceiling-return type installation, remove the bottom plate of the unit on the fan side to make it an underside intake type.
   The rear intake should be used together.
3) The air conditioning unit main body is not equipped with air filters. Incorporate air filters in an air intake grille, which will facilitate the cleaning of air filters.
4) In the case of a rear-intake type with duct and a rear-intake ceiling-return type installation, be sure to provide a 350 mm × 1300 mm inspection opening right beneath the unit's fan side bottom plate to permit servicing of the unit as illustrated in installation geometries.
   In the case of an underside-intake type with duct and underside-intake ceiling-return thpe, provide an intake opening right beneath the unit's fan side bottom plate so that it will serve as an inspection opening as well.
   Please also see to its dimensions so that the intake opening will be made to 350 mm × 1300 mm.
5) Take care to install a duct horizontally in connecting the unit with a diffuser.
6) When a canvas duct is used for either intake or outlet duct, install it with care so that it may not get flattened.
7) Select a desirable diffuser position and diffuser form to ensure the distribution of winds throughout the room and use a diffuser employing a strusture that provides the capability to regulate winds.
8) Install the air conditioning unit main body via vibration-isolating rubbers to prevent vibrations from propagating directly from the air conditloning unit main body to the ceiling and slab.
9) Secure at least 0.15m^2 for the opening of an air intake.
10) Never fail to heat-insulate the ducts to prevent condensation on their surfaces.

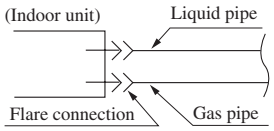
(v) Refrigerant pipng

① Use the pipes of the following material: seamless phosphorous deoxidized copper Type 1 (C1220T, JISH3300).
② Thoroughly insulate the pipes on the gas and liquid sides.
● On the gas side, the maximum temperature may reach 120 °C, so use insulating materials which can withstand this temperature.
③ The refrigerant is filled in the outdoor unit. Only fill the necessary on-site pipes with the refrigerant.
④ The pipes should be bent into a curve with a radius as large as possible. It is not to be bent repeatedly.
⑤ Use two spanners to remove the flare nuts at the end of the pipe. A fter connecting the pipe, use two spanners to tighten it.
⑥ When attaching the flare nuts, apply freezing machine oil over the flare screw area and screw them manually for 3 to 4 turns.
⑧ After checking for any gas leaks, cover the pipe joints with the joint insulating material provided as an accessory, and secure the two ends with clamps.
⑨ The unit has been tested in accordance with JIS dew point conditions to ensure trouble free operations. However, if the unit operates at a high temperature (above the dew point temperature of 23 °C), water droplets may fall. In this case, cover the pipes and the drain pipes further with insulating materials of 10-20 mm thickness.
⑩ Do not bend or squash the pipes.
⑪ Do not allow rubbish, swarf or moisture to enter the pipes when conducting plumbing work.

Pipe locations Unit : mm



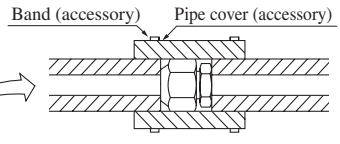
Piping Connect the refrigerant pipes as in the illustration below.



Insulating the pipe

See the Instructions attached to the outdoor unit for refrigerant piping.
Completely insulate both the gas pipe side and the liquid pipe side

● After checking gas leaks, cover the flared joints of the indoor unit with the provided insulator and firmly secure both ends with the provided bands.

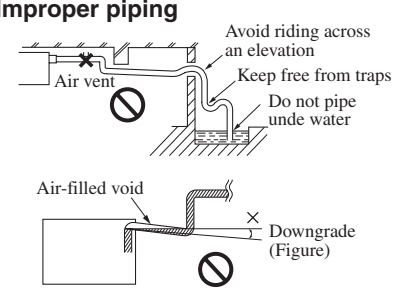


(vi) Drain piping

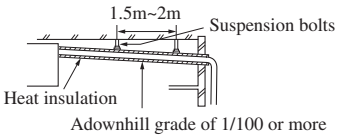
Operation instructions

(a) Drain piping should always be in a downhill grade (1/50~1/100) and avoid riding across and elevation or making traps.

● **Improper piping**



● **Good piping**

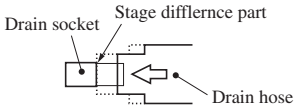


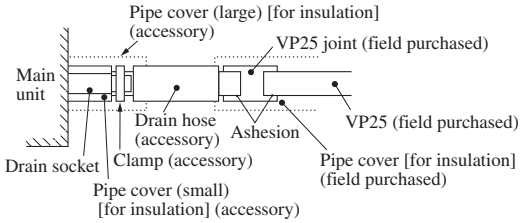
・Please do not give a downgrade to the drainpipe as illustrated in the drawing on the left. This will create an air-filled void and cause noise generation upon stopping.

(b) When connecting the drain pipe to unit, pay sufficient attention not to apply excess force to the piping on the unit side. Also, fix the piping at a point as close as possible to the unit.

(c) For drain pipe, use hard PVC general purpose pipe VP-25 (I.D.1"). which can be purchased locally. When connecting, insert a PVC pipe end securely into the drain socket before tightening securely using the attached drain hose and clamp. Adhesive must not be usedconnection of the drain socket and drain hose (accessory).

● **Do not use acetone-based adhesives to connect to the drain socket.**





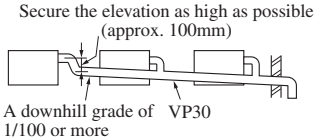
(d) When constructing drain piping for several units, position the common pope about 100mm below the drain outlet of each unit as shown in the sketch. Use VP-30 (11/4") or thicker pipe for this purpose.

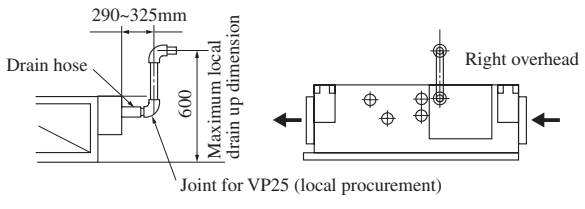
(e) Be sure to provide heat insulation to hard PVC pipes of indoor placement.

(f) Do not ever provide an air vent.

(g) You can elevate the drain outlet up to 600mm from the indoor unit's lower face. When an obstacle exists in the ceiling space, elevate the piping to avoid the obstacle using an elbow or corresponding gadget. When doing this, if the stretch for the needed height is higher than 600mm, the back-flow quantity of drain at the event of interruption of the operation gets too much and it may cause overflow at the drain pan. Therefore, make the height of the drain pipe within the distance given in the sketch below.

(h) Avoid positioning the drain piping outlet at a place where generation of odor may be stimulated. Do not lead the drain piping direct into a sewer from where sulfur gas may generate.





Drainage test

① Conduct a drainage test after completion of the electrical work.

② During the trial, make sure that drain flows properly through the piping and that no water leaks from connections.

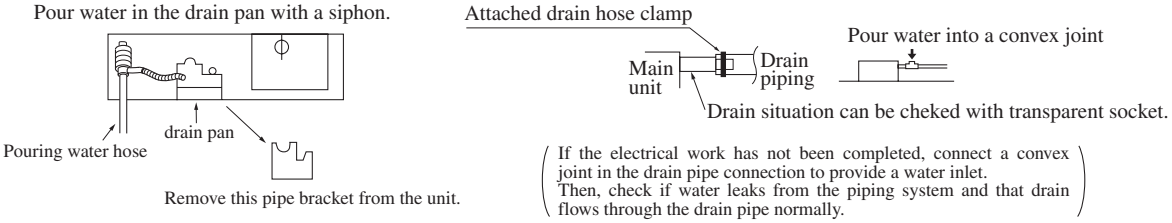
③ In case of a new building, conduct the test before it is furnished with the ceiling.

④ Be sure to conduct this test even when the unit is installed in the heating season.

Procedures

① Supply about 1000 cc of water to the unit through the air outlet by using a feed water pump.

② Check the drain while cooling operation.



(k) Ceiling suspended type (FDE)

(i) Selection of installation location

1) A place where good air circulation and delivery can be obtained.

Cold air throw

Unit : m

Models	FDE36, 45	FDE56, 71	FDE112, 140
Air throw	7.5	8	9

Conditions

(1) Installation height: 2.4 ~ 3.0 m above the floor

(2) Fan speed: Hi

(3) Location: Free space without obstacles

(4) Distance of reach indicates the horizontal distance after the wind touched down on the floor.

(5) Air velocity at the throw: 0.5 (m/sec.)

2) A place where ceiling has enough strength to support the unit.

3) A place where there is no obstruction to the return air inlet and supply air outlet ports.

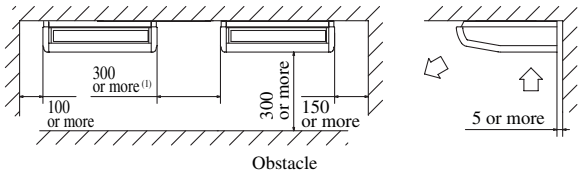
4) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).

Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.

5) A place where the space shown below may be secured.

Ceiling mouting installation

Unit : mm



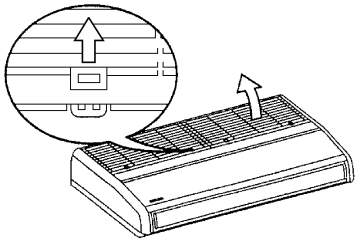
Note (1) This shows the installation interval dimensions between units.

6) This unit uses a microcomputer as a control device. Therefore avoid installing the unit near the equipment that generates strong electromagnetic waves and noise.

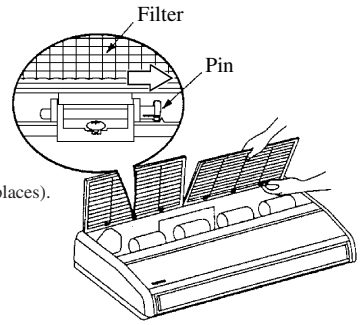
(ii) Installation preparation

1) Remove the air return grille.

Slide the stoppers (4 places).

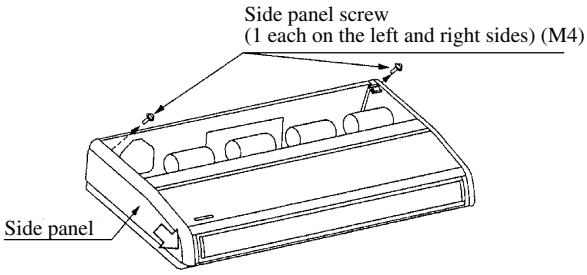


Take out the pins (4 or 6 places).



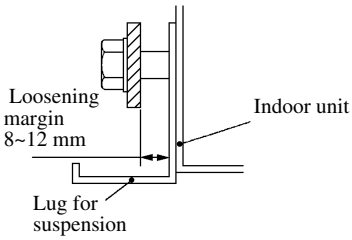
2) Remove the side panels.

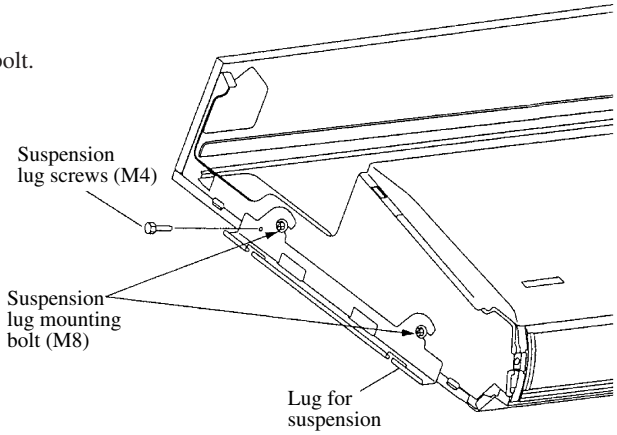
Take out the screws, then slide the side panels in the arrow direction to remove them.



3) Remove the suspension lug.

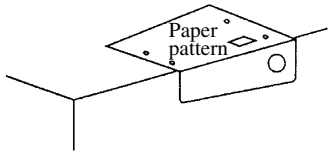
Take out the screws, then loosen the installation bolt.



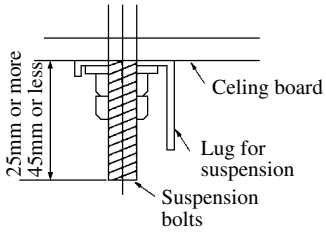


4) Suspension Bolt Position

a) Using the paper pattern supplied as an accessory as a criterion, select suspension bolt positions and piping hole positions, then install the suspension bolts and make holes for piping. After positioning, remove the paper pattern.

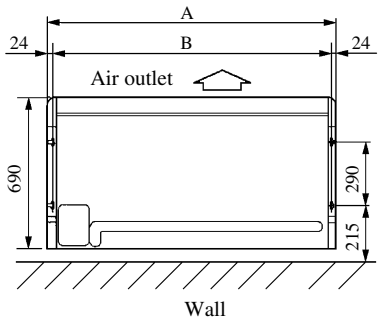


b) Keep strictly to the suspension bolt lengths specified below.



Unit : mm

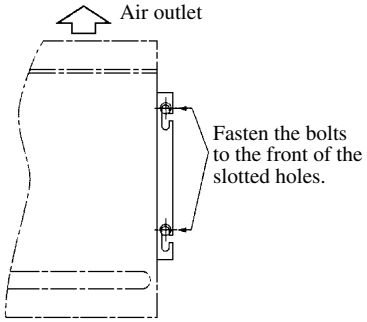
Model	A	B
FDE 36, 45	1070	1022
FDE 56, 71	1320	1272
FDE 112,140	1620	1572

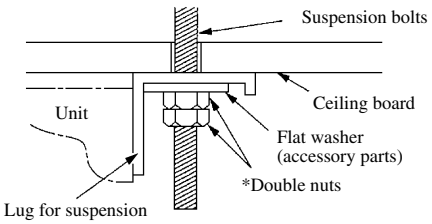


(iii) Installation

1) Fasten the suspension lugs to the suspension bolts.

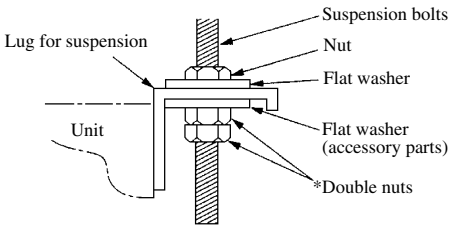
<If there is ceiling material>





*Fasten it securely with double nuts.

<If there is no ceiling material>

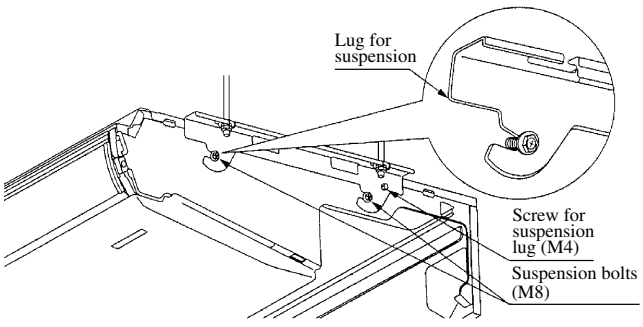


2) Attach the unit to the suspension lugs.

① Slide the unit onto the suspension lugs from the front, hanging it on the bolts.

② Fasten the unit securely on the left and right sides with 4 suspension bolts (M8).

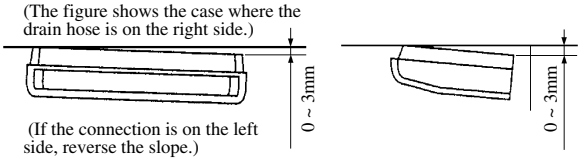
③ Tighten the 2 screws (M4) on the left and right sides.



⚠ After sliding the side panels on from the front to rear, fasten them securely with the screws.

3) IN order to make it easier for water to drain out. install the unit so that the water drain side slopes downward.

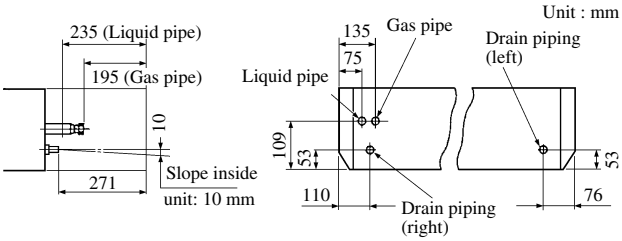
● Left-right direction **● Front-rear direction**



⚠ If the slope is reversed, there is danger of water leaking out.

(iv) Refrigerant Piping

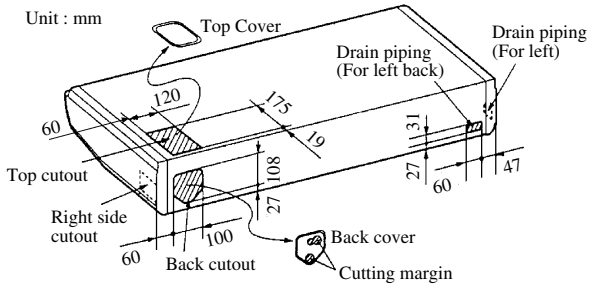
1) Piping Position



2) Piping Connection Position

Piping can be connection from 3 different directions. Remove the cutout from hole where the piping will be connected using side cutters or similar tool. Cut a hole for the piping connection in the back cover according to the cutting margin shown. Cut a hole in the ceiling side in accordance with the position of the piping. Also, after the piping is installed, seal the space around the piping with putty, etc. to keep dust from getting inside the unit.

(In order to prevent damage to wires from the edges, be sure to use the back and top covers.)



(v) Drain Piping

1) Drain piping can be connected from the back, right and left sides.

2) When installing drain piping, be sure to use the insulating material supplied for the drain hose and drain hose clamp.

a) Connect the drain hose fully all the way to the base of the fitting.

b) Fasten the hose securely with the drain hose clamp.

c) Keep strictly within the lengths specified below for the suspension bolts.

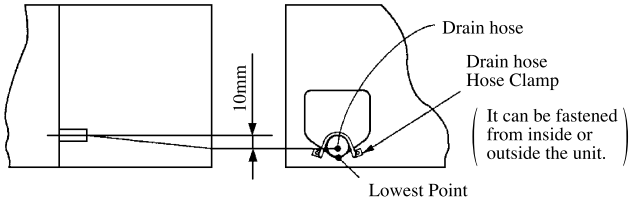
3) If drain piping is installed on the left side, change the rubber plug and insulating material (tubular) from the left side piping connection port to the right side.

⚠ Be careful that water doesn't pour out when the drain plug is removed.

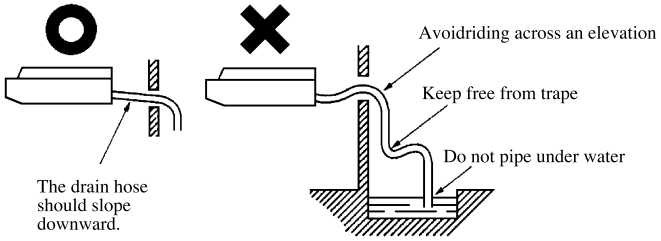
⚠WARNING

Use the fitting supplied with the unit to connect the drain hose, fastening it at the lowest point so that there is no slack, and establishing a 10 mm drain slope.

* Keep electrical wiring from running beneath the drain hose.



⚠ Be sure to fasten the drain hose down with a clamp.
There is danger of water overflowing the drain hose.

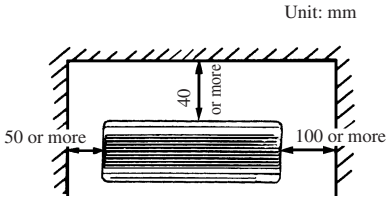


After piping has been installed, check to make sure water drains well and that there is no overflow.

(I) Wall mounted type (FDK)

Models FDKA22~56KXE4R

(i) Selection of installation location



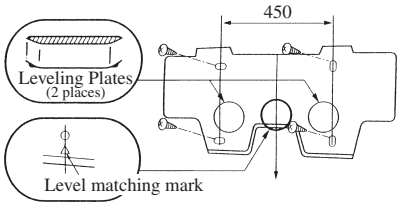
1) Select the installation location that meets the following conditions and obtain the customer's consent.
   a) Location where cold and warm air spread all over the room
   b) Location where piping and wiring to the outdoors can easily be laid down.
   c) Location where the drain can be discharged completely.
   d) Location where the wall to mount the unit is rigid.
   e) Location where there is no wind obstruction to the return air and supply air grills.
   f) Location not exposed to direct sunshine.
   g) Avoid the location exposed to oil splash or vapor.
   h) Avoid the location near to the machine emitting high-frequency radio wave.
   i) Avoid the location where the receiver of remote control is subject to strong illumination.
   j) Select the location where the unit can securely be operated by the wireless remote controller referring to the Article “Effective distance of wireless remote controller” indicated at the backside.
   k) Secure the space for inspection and maintenance work.

(ii) Attaching of mounting plate

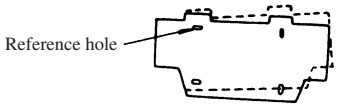
1) The indoor unit weighs approx, FDK22~56 model : 12kg. Therefore, check whether the portion to install the unit can bear the weight of unit. If it seems to be danger, reinforce the portion by a plate or a beam before installing the unit. It is not allowed to install the unit directly on the wall. Whenever you install the unit, use the attached mounting plate.

2) Find structural members (Intermediate pillar, etc.) suitable for mounting the unit, then install the unit firmly while checking levelness.

Unit: mm



3) Adjust the level of mounting plate under the condition that four screws are tightened temporarily.



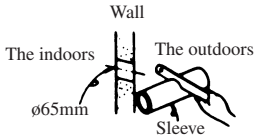
4) Turn the mounting plate around the reference hole to adjust the levelness.

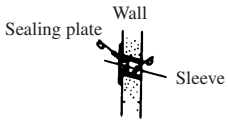
⚠WARNING

Install the unit where it can bear the weight with sufficient strength margin. In the case of insufficient strength or insufficient installation work, the unit may fall and cause injury.

(iii) Procedure for making hole on the wall

- Make a downgrade (5°) from the indoors toward the outdoors.

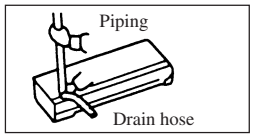




(iv) Forming of piping and drain hose

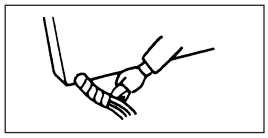
1) Rear take out case

a) Forming of piping



- Hold the root portion of piping, change the direction then expand and make forming.

b) Tape winding

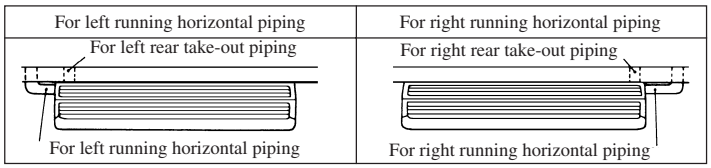


- Wind the tape on the portion which passes through the hole on the wall.
- Always make taping on the wiring which crosses with the piping, if any.

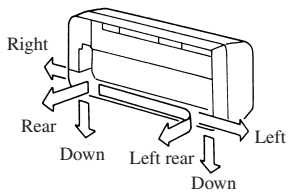
Note(1) After forming of piping and before tape winding, confirm that the connecting wire is securely fixed to the terminal block.

2) Cautions for left take-out and rear take-out case

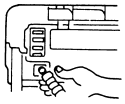
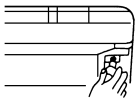
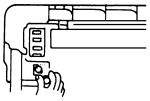
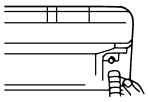
a) Looking down



b) The piping can be taken out from the rear, left, left rear, right and down.

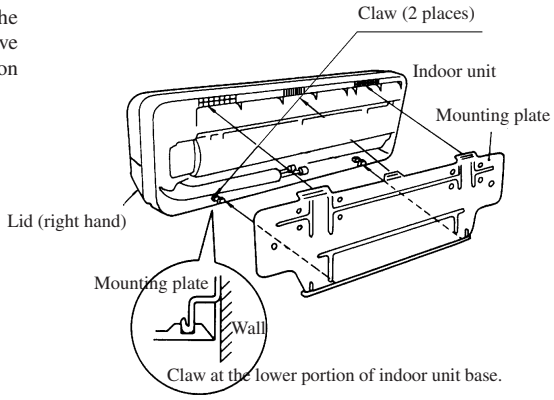


b) Procedure for changing drain hose

1. Remove the drain hose.	2. Remove the drain cap.	3. Insert the drain cap.	4. Connect the drain hose.
			
• Pull the drain hose off while turning the end around.	• Remove by hand or pliers.	• Insert the drain cap which was removed in procedure 2 securely using a hexagonal wrench, etc. Note(1) When it is not inserted securely, water leakage may occur.	• Push the end of the drain hose onto the fitting while turning it around. Note(1) When it is not inserted securely, water leakage may occur.

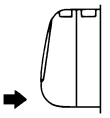
(v) Installation of unit

- To remove the unit from the mounting plate, remove the right and left lids then remove the claw at the lower portion of base.



Installation work procedure

(1) Hang the upper portion of indoor unit on the mounting plate.



(2) The indoor unit can be fixed with one action by pushing its lower portion slightly.

(vi) Drain piping

1) Lay the drain piping with downgrade to facilitate flow of drain,and do not make a trap or chevron-shaped bend. (The drain piping can be taken out from the unit to the left, right, rear and down direction.)
2) Wrap the thermal insulator on the hard vinyl chloride pipe (VP-16) laid in the room.
3) Run the drain piping in a place where there is no fear of abnormal odors being generated at the end of the drain hose.
4) Do not run the drain piping directly into a sewer where sulfur-based poisonous or flammable gases are generated. There is danger of poisonous or flammable gases penetrating into the building through the drain piping.
5) Pour water into the drain pan below the heat exchanger to check that water is drained outdoors.

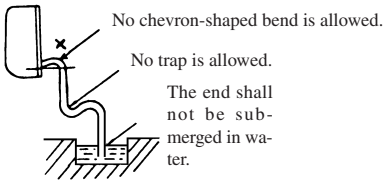
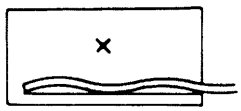
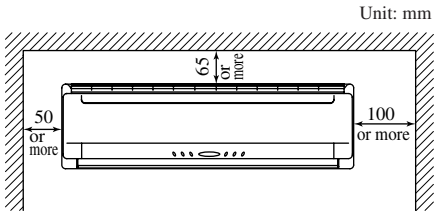


Illustration showing the end of drain hose



Model FDKA71KXE5R

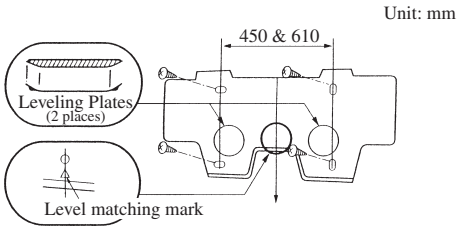
(i) Selection of installation location



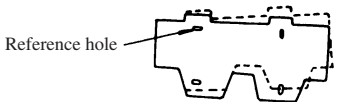
1) Select the installation location that meets the following conditions and obtain the customer's consent.
   a) Location where cold and warm air spread all over the room
   b) Location where piping and wiring to the outdoors can easily be laid down.
   c) Location where the drain can be discharged completely.
   d) Location where the wall to mount the unit is rigid.
   e) Location where there is no wind obstruction to the return air and supply air grills.
   f) Location not exposed to direct sunshine.
   g) Avoid the location exposed to oil splash or vapor.
   h) Avoid the location near to the machine emitting high-frequency radio wave.
   i) Avoid the location where the receiver of remote control is subject to strong illumination.
   j) Select the location where the unit can securely be operated by the wireless remote controller referring to the Article "Effective distance of wireless remote controller" indicated at the backside.
   k) Secure the space for inspection and maintenance work.

(ii) Attaching of mounting plate

1) The indoor unit weighs approx, FDK71 model : 18kg. Therefore, check whether the portion to install the unit can bear the weight of unit. If it seems to be dangerous, reinforce the portion by a plate or a beam before installing the unit. It is not allowed to install the unit directly on the wall. Whenever you install the unit, use the attached mounting plate.
2) Find structural members (Intermediate pillar, etc.) suitable for mounting the unit, then install the unit firmly while checking levelness.



3) Adjust the level of mounting plate under the condition that four screws are tightened temporarily.



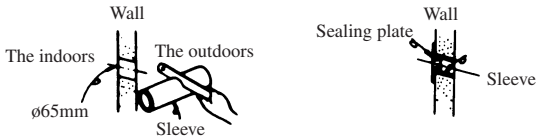
4) Turn the mounting plate around the reference hole to adjust the levelness.

⚠WARNING

Install the unit where it can bear the weight with sufficient strength margin. In the case of insufficient strength or insufficient installation work, the unit may fall and cause injury.

(iii) Procedure for making hole on the wall

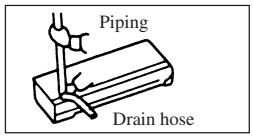
- Make a downgrade (5°) from the indoors toward the outdoors.



(iv) Forming of piping and drain hose

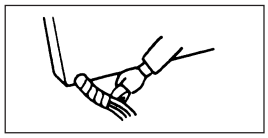
1) Rear take out case

a) Forming of piping



- Hold the root portion of piping, change the direction then expand and make forming.

b) Tape winding

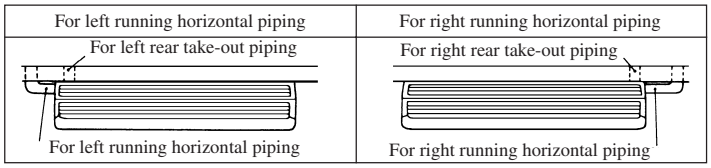


- Wind the tape on the portion which passes through the hole on the wall.
- Always make taping on the wiring which crosses with the piping, if any.

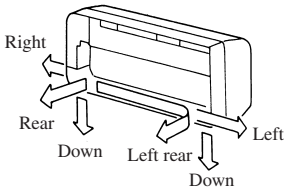
Note (1) After forming of piping and before tape winding, confirm that the connecting wire is securely fixed to the terminal block.

2) Cautions for left take-out and rear take-out case

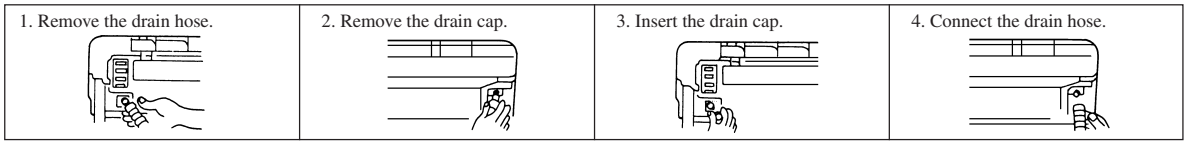
a) Looking down



b) The piping can be taken out from the rear, left, left rear, right and down.



c) Procedure for changing drain hose



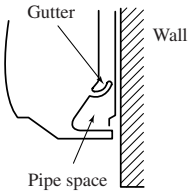
- Pull the drain hose off while turning the end around.
- Remove by hand or pliers.
- Insert the drain cap which was removed in procedure 2 securely using a hexagonal wrench, etc.

Note (1) When it is not inserted securely, water leakage may occur.

- Push the end of the drain hose onto the fitting while turning it around.

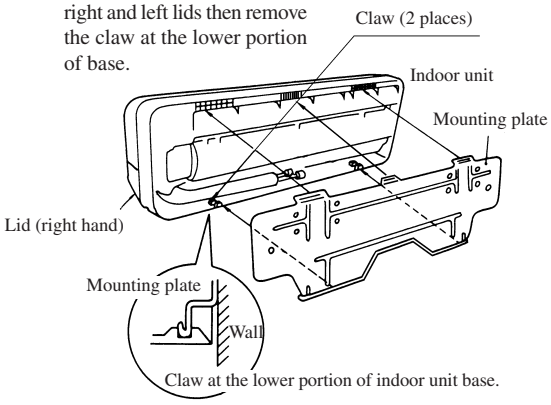
Note (1) When it is not inserted securely, water leakage may occur.

d) This air conditioner is designed to collect dew formed on itsback in the drain pan for discharging, so please do not lay power cables, etc. in any part above the gutter.



(v) Installation of unit

- To remove the unit from the mounting plate, remove the right and left lids then remove the claw at the lower portion of base.



Installation work procedure

(1) Hang the upper portion of indoor unit on the mounting plate.

(2) The indoor unit can be fixed with one action by pushing its lower portion slightly.

(vi) Drain piping

1) Lay the drain piping with downgrade to facilitate flow of drain,and do not make a trap or chevron-shaped bend. (The drain piping can be taken out from the unit to the left, right, rear and down direction.)
2) Wrap the thermal insulator on the hard vinyl chloride pipe (VP-16) laid in the room.
3) Run the drain piping in a place where there is no fear of abnormal odors being generated at the end of the drain hose.
4) Do not run the drain piping directly into a sewer where sulfur-based poisonous or flammable gases are generated. There is danger of poisonous or flammable gases penetrating into the building through the drain piping.
5) Pour water into the drain pan below the heat exchanger to check that water is drained outdoors.

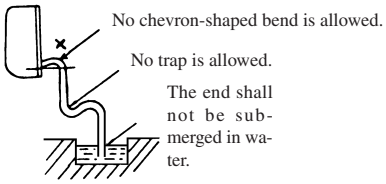
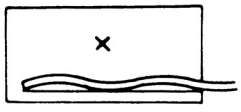


Illustration showing the end of drain hose



(m) Floor standing exposed type (FDFL)

Model: All models

(i) Selection of installation location

1) A place where good air circulation and delivery can be obtained.

● Cold air throw

Unit : m

Models	All models
Air throw	**4**

[Conditions]

(1) Fan speed: Hi

(2) Location: Free space without obstacles

(3) Distance of reach indicates the horizontal distance after the wind touched down the floor.

(4) Air velocity at the throw: 0.5 (m/sec.)

2) Where there is no obstacle around the Air inlet port or Air outlet port.

3) Where a sufficient space can be reserved for the service of air filter and the attachment/removal of panels.

4) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).
Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.

5) Where pipes and wires can be arranged conveniently.

6) On the solid floor

7) Where the unit is not exposed directly to sun light.

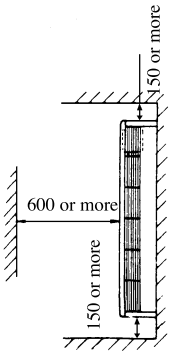
8) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is generated or remains.
Installation and use at such place will cause corrosion in the heat exchanger and damage in molded synthtic resin parts.

9) Where a complete draining can be assured.

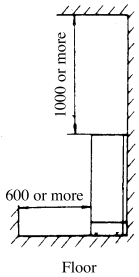
10) Where a sufficient space can be reserved for service.

Floor standing installation

• Floor fixation



• Wall fixation



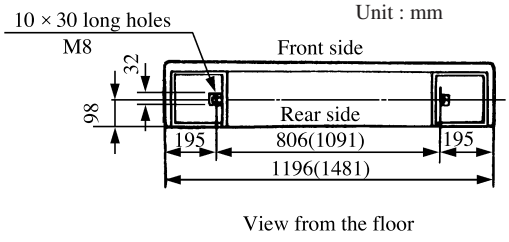
Unit : mm

(ii) Bolt positions

1) Bolt positions for metal settings used for floor fixation.

• Metal fitting used for floor fixation (accessories).

Unit : mm

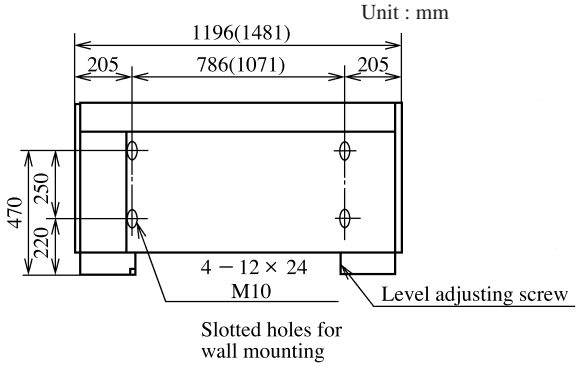


View from the floor

Note (1) Value in ( ) indicates 71 type.

2) Bolt positions for wall fixation

Unit : mm

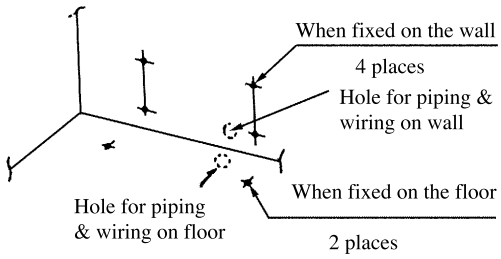


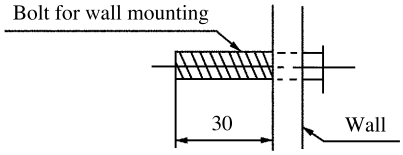
Slotted holes for wall mounting

(iii) Installation of unit

1) Floor standing installation

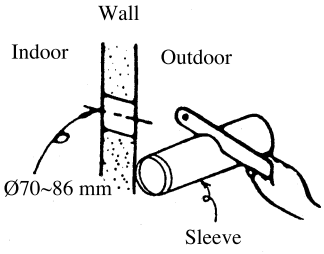
a) Position of mounting bracket fixing bolts Drill holes by referring to figures below.

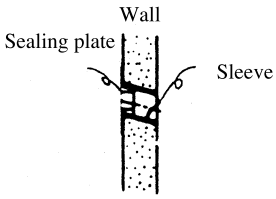




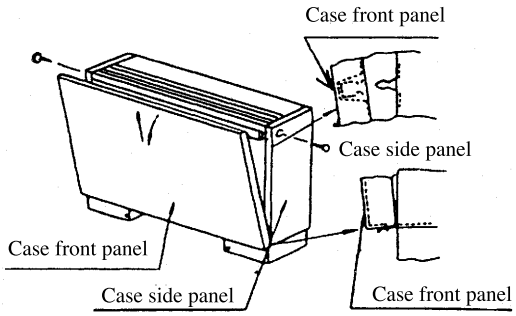
Note (1) Be sure to use a bolt of the length for wall mouning.

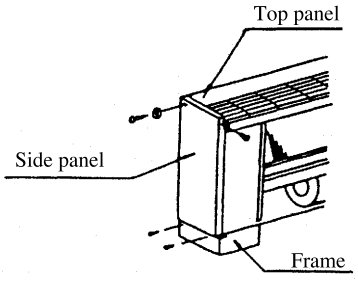
b) The methed of drilling the wall is as follows.





c) Remove the front and side panels.

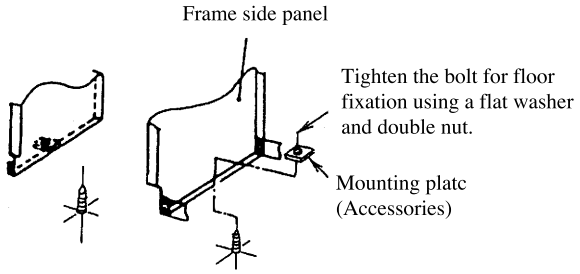




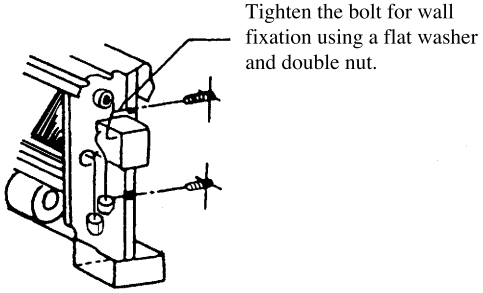
d) Level the unit using the level adjusting screw. Installation will be complrted after attaching side and front panel.

e) Exceute fixation following the directions described below.

● When fixed on the floor



● When fixed on the wall



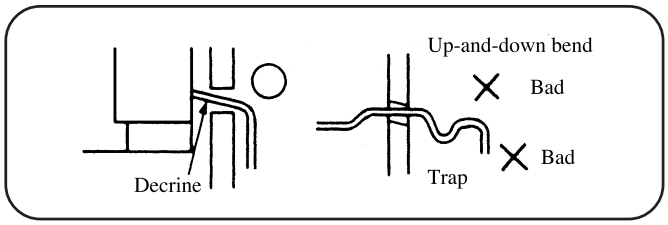
(iv) Drain piping

The drain piping can be directed to the floor or rear sides as follows.

(a) Connect a drain piping to the drain outlet and fix it by use of tigghening band.

(b) Indoor side drain piping must be thermally insulated.

(c) After finishing the drain piping, check the drainage by pouring some water in the drain pan.



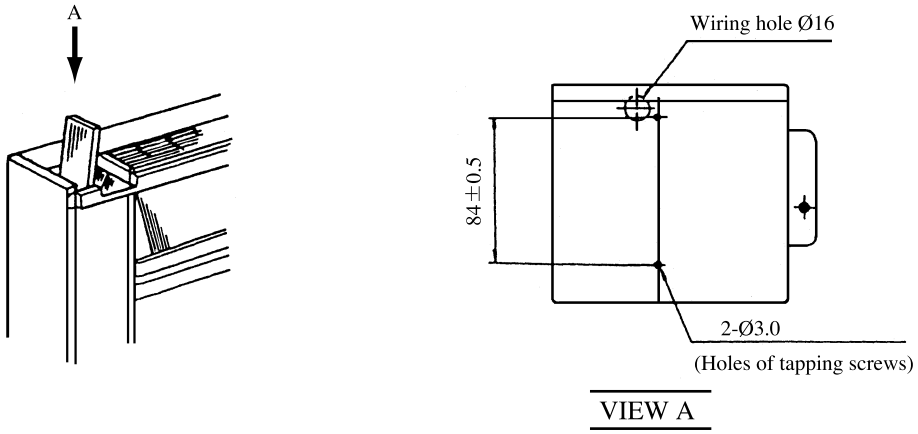
(v) Installation of remote controller (on the indoor unit)

Attached remote controller may be installed on the indoor unit as shown below. The work can be done on the spot when the customer asks so or by other reasons.

Refer to the page 274 when it is installed on the wall.

1) Detach the front panel.

Unit: mm



2) Remote controller installation.

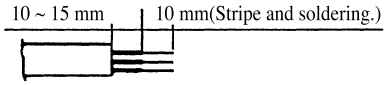
- Attach the lower case with the screws (M4 × 12) accessory.

3) Remote controller wiring.

a) Connect the terminals between the remote controller and the control box as per these wire color codes:[(X) (red). (Y) (white), (Z) (biack)], using the wires included in the kit.

b) The wires should have a surplus length of approximately 30 cm. (Necessary when servicing with the front panel detached.)

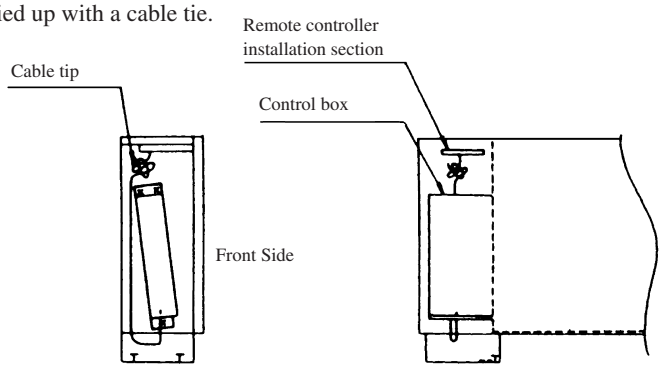
c) In case of stranded wire strip and solder as shown below when cutting the wire. (Omitting the soldering process may cause looseness of the wiring.)



4) Wiring route.

a) Wire from the wiring hole through the rear side of the control box to the terminal block.

b) Any suplus wires should be tied up with a cable tie.



(n) Floor standing hidden type (FDFU)

Model: All models

(i) Selection of installation hidden location

1) A place where good air circulation and delivery can be obtained.

● Cold air throw Unit : m

Models	All models
Air throw	**4**

[Conditions]

(1) Fan speed: Hi

(2) Location: Free space without obstacles

(3) Distance of reach indicates the horizontal distance after the wind touched down the floor.

(4) Air velocity at the throw: 0.5 (m/sec.)

2) Where there is no obstacle around the Air inlet port or Air outlet port.

3) Where a sufficient space can be reserved for the service of air filter and the attachment/removal of panels.

4) Places exposed to oil splashes or steam (e.g. kitchens and machine plants).
Installation and use at such places will incur deteriorations in the performance or corrosion with the heat exchanger or damage in molded synthetic resin parts.

5) Where pipes and wires can be arranged conveniently.

6) On the solid floor

7) Where the unit is not exposed directly to sun light.

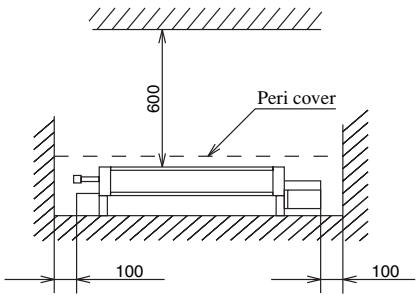
8) Places where corrosive gas (such as sulfurous acid gas) or inflammable gas (thinner, gasoline, etc.) is generated or remains.
Installation and use at such place will cause corrosion in the heat exchanger and damage in molded synthtic resin parts.

9) Where a complete draining can be assured.

10) Where a sufficient space can be reserved for service.

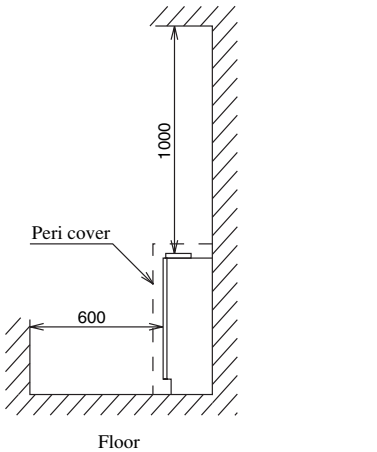
Floor standing installation

• Floor fixation



• Wall fixation

Unit : mm



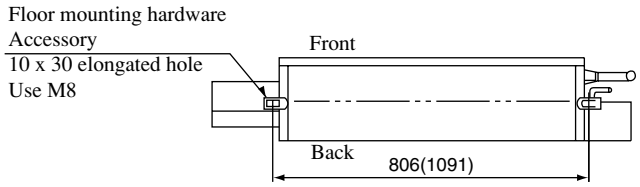
(ii) Bolt positions

1) Bolt positions for metal settings used for floor fixation.

- Metal fitting used for floor fixation (accessories).

Unit : mm

Bolt positions for floor mounting hardware

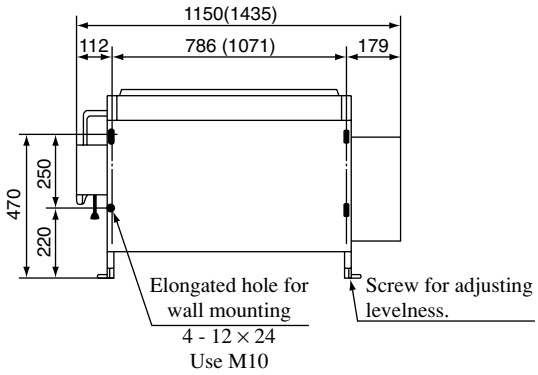


As viewed from floor side.

Note (1) Value in ( ) indicates 71 type.

2) Bolt positions for wall fixation

Unit : mm

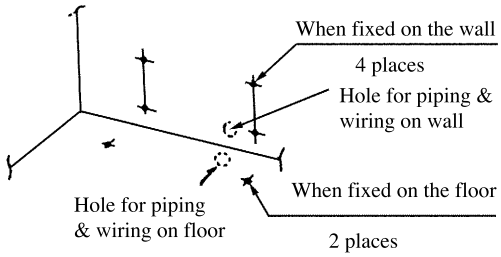


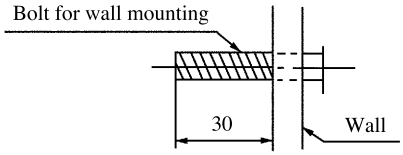
(iii) Installation of unit

1) Floor standing installation

a) Position of mounting bracket fixing bolts

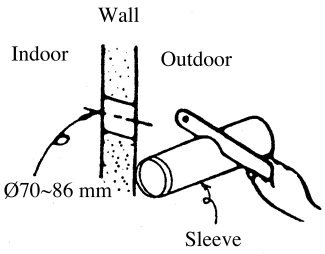
Drill holes by referring to figures below.

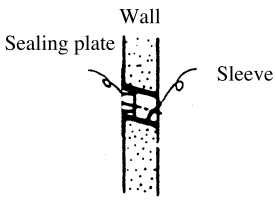




Note (1) Be sure to use a bolt of the length for wall mouning.

b) The methed of drilling the wall is as follows.

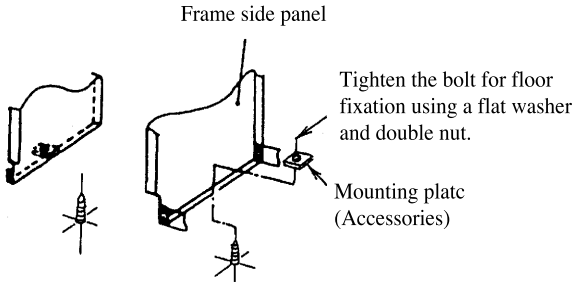




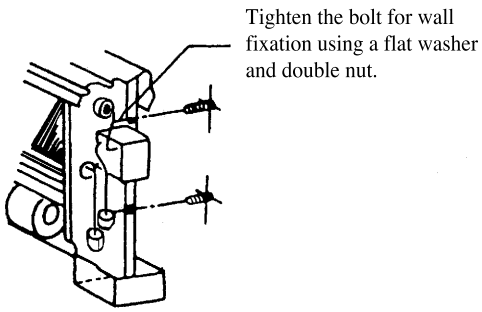
c) Level the unit using the level adjusting screw. Installation will be complrted after attaching side and front panel.

d) Exceute fixation following the directions described below.

● When fixed on the floor



● When fixed on the wall



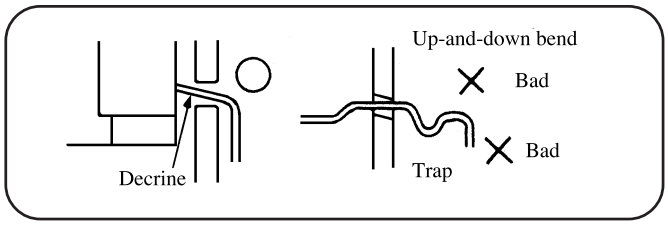
(iv) Drain piping

The drain piping can be directed to the floor or rear sides as follows.

(a) Connect a drain piping to the drain outlet and fix it by use of tigghening band.

(b) Indoor side drain piping must be thermally insulated.

(c) After finishing the drain piping, check the drainage by pouring some water in the drain pan.



(2) Installation of remote controller (Option parts)

(a) Selection of installation location

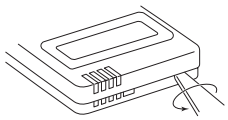
Avoid the following locations

1) Direct sunlight.
2) Close to heating device.
3) Highly humid or water splashing area.
4) Uneven surface.

(b) Installation procedure

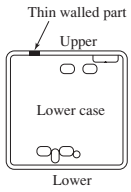
a) Exposed fiting

1) Open the remote controller case.



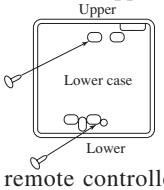
- Put a screw driver (flat-head) into the concavity made on the upper part of a remote controller and twist it lightly to open the casing.

2) The cord of a remote controller can only be pulled out in the upward direction.



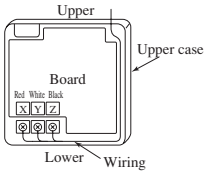
- Cut off with nippers or a knife a thin walled part made on the upper end of the rmote controller bottom casing, and then remove burrs with a file or the like.

3) Fix the remote controller bottom casing onto a wall with two wood screws supplied as accessories.

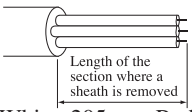


4) Connect the remote controller to the terminal block. Connect the terminals of the remote controller to the indoor unit with the same numbers. Because the terminal block has polarity, the device becomes inoperative if there are wrong connections.

Terminals: ⓍRed wire, ⓎWhite wire, ⓏBlack wire



- Use a cord of 0.3mm^2 (recommended) - 0.5mm^2 (maximum) for a remote controller cord. Remove a sheathe of the remote controller cord for the section laid within the remote controller casing.
  The length of each wire that should be left after a sheath is removed is as follows:

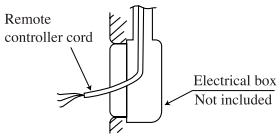


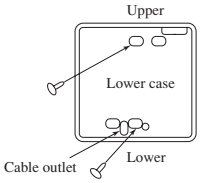
Black: 195mm, White: 205mm, Red: 215mm

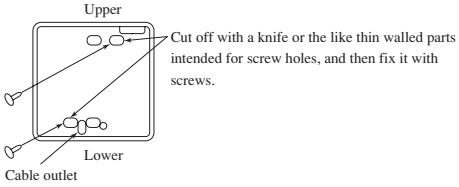
5) Replace the top casing as before.
6) Use a cord clamp to attach the remote controller cord to the wall.
7) Set the functions according to the types of indoor unit. See section "Setting function". Refer to page 287.

(c) Recessed fitting

1) The Electrical box and remote controller (shield wire must be use in case of extension) are first embedded.



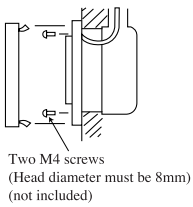




2) Remove the upper case to the remote controller.
3) Attach the lower case to the Electricl box with two M4 screws. (Head diameter must be 8 mm). Choose either of the following two positions in fixing it with screws.
4) Connect the remote controller cord to the remote controller.

   Refer to [Exposed Fitting].

5) Installation work is completed by replacing the top casing onto the bottom casing as before.
6) Set the functions according to the types of indoor unit. See section "Setting function". Refer to page 310.



Precation in extending the remote controller cord

▶ Maximum total extension 600m.

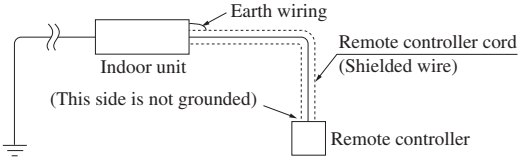
The cord should be a shielded wire.

● For all types : 0.3mm^2 × 3 cores

Note (1) Use cables up to 0.5mm^2 (maximum) for those laid inside the remote controller casing and connect to a different size cable at a vicinity point outside the remote controller, if necessary.

Within 100-200m····· 0.5 mm^2 × 3 cores
Within 300m····· 0.75 mm^2 × 3 cores
Within 400m····· 1.25 mm^2 × 3 cores
Within 600m····· 2.0 mm^2 × 3 cores

● The shielded wire should be grounded at one side only.



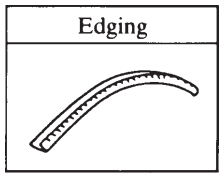
(3) Installation of outdoor unit

◆ **Models FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R**

(a) Accessories

Confirm accessories shown below are attached in the bag with this installation manual.

1) "Edging" for protection of electric wires from opening edge.



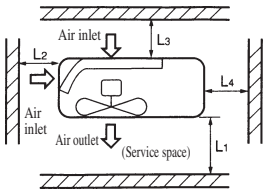
(b) Selecting installation location

(Obtain approval from the customer when selecting the installation area.)

1) Please install with the customer's consent in a location that follows the conditions listed below.
   a) A location which can sustain the weight of the unit.
   b) Where there is no possibility of flammable gas leaks.
   c) Where air is not trapped.
   d) Out of the heat range of other heat sources.
   e) Where noise and hot air will not bother neighboring residents.
   f) Where wind does not hinder the intake and outlet pipes.
   g) If a unit is installed into a special environment as shown below, there will be a danger that the corrosion of the outdoor unit or its malfunctioning is caused. If this is the case, please consult with the distributor from whom you have purchased the unit.
      - Where corrosive gas is generated (such as a hot-spring resort area).
      - Where the unit is subject to sea breezes (coastal area).
      - Where the unit is subject to oil mists.
      - Where equipment generating electromagnetic waves exists in the vicinity.
2) Minimum installation space (Please select an installation point with due attention to the direction of installation of the refrigerant pipe)
   a) The height of a wall facing the diffuser must not exceed the height of the unit.
   b) Walls surrounding the unit in the four sides are not acceptable. There must be a 1-meter or larger space in the above.
   c) When units are installed side by side, leave a 10- mm or wider service space between the units.
   d) When more than one unit are installed, provide sufficient intake space consciously so that short circuiting may not occur.
   e) Where piling snow can bury the outdoor unit, provide proper snow guards.

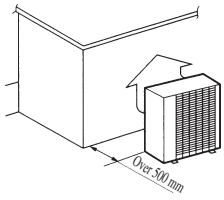
Unit : mm

Sample / Size	Ⅰ	Ⅱ	Ⅲ
L_1	Open	Open	500
L_2	300	5	Open
L_3	100	300	150
L_4	5	5	5

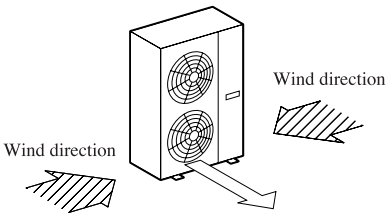


3) When strong winds occur
   - Where it is likely that the unit is subjected to strong winds, provide wind guards according to the following guidelines. Strong winds can cause performance degradation, an accidental stop due to a rise of high pressure and a broken fan.

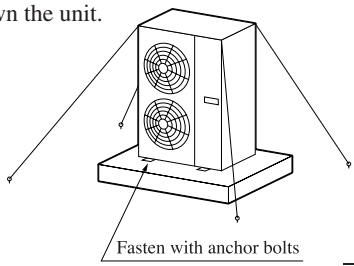
① Place the unit outlet pipe perpendicular to the wind direction.



② Please install so the direction of the air from the blowing outlet will be perpendicular to the direction of the wind.



③ Where the foundation is not level, use wires to tie down the unit.



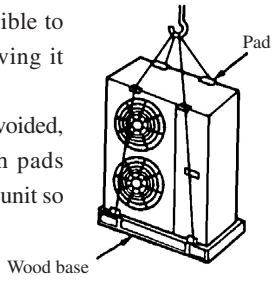
(c) Unit delivery and installation.

(Take particular care in carrying in or moving the unit, and always perform such an operation with two or more persons.)

⚠ CAUTION **When you sling the unit for portage, do not fail to take into consideration the deviation of the gravity center from its center.**
Improper slinging may cause the unit to lose balance and fall.

1) Delivery

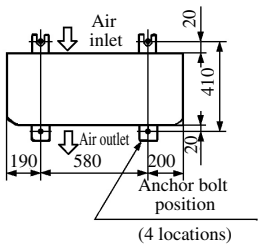
- Delivery the unit as close as possible to the installation site before removing it from the packaging.
- If unpacked and deliver cannot be avoided, use a nylon sling or a rope with pads placed where the rope contacts the unit so it is not scratched.

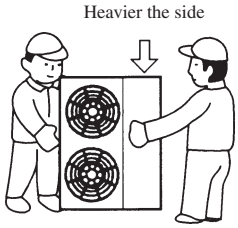


2) Portage

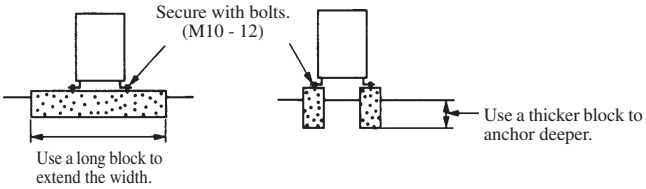
- The right hand side of the unit as viewed from the front (diffuser side) is heavier. A person carrying the right hand side must take heed of this fact. A person carrying the left hand side must hold with his right hand the handle provided on the front panel of the unit and with his left hand the corner column section.

3) Bolt fastening positions





a) In installing the unit, fix the unit's legs with bolts specified below.



b) The protrusion of an anchor bolt on the front side must be kept within 15 mm.
c) Securely install the unit so that it does not fall over during earthquakes or strong winds, etc.
d) Refer to the above illustrations for information regarding concrete foundations.
e) Install the unit in a level area. (With a gradient of 5 mm or less). Improper installation can result in a compressor failure, broken piping within the unit and abnormal noise generation.

◆ **Models FDCA224~1360HKXE4BR**
FDCA224~1360HKXRE4BR

(a) Selecting the installation location

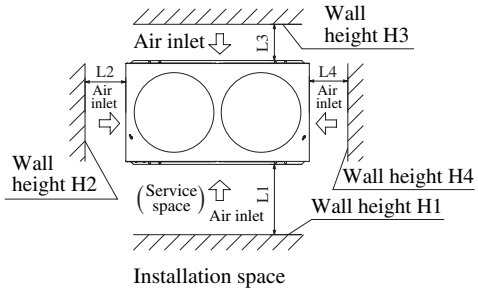
1) Where air is not trapped.
2) Where the installation fittings can be firmly installed.
3) Where wind does not hinder the intake and outlet pipes.
4) Out the heat range of other heat sources.
5) Where it is safe for the drain water to be discharged.
6) Where noise and hot air will not bother neighboring residents.
7) Where snow will not accumulate.
8) Where strong winds will not blow against the outlet pipe.
9) A place where stringent regulation of electric noises is applicable.
10) A place where TV set or radio receiver is placed within 5m. (If electrical interference is caused, seek a place less likely to cause the problem)

Notes (1) A four-sided enclosure cannot be used. Leave a space of at least 1m above the unit.
(2) If there is a danger of a short-circuit, then install a wind direction variable adapter.
(3) When installing multiple units, provide sufficient intake space so that a short-circuit does not occur.
(4) In areas where there is snowfall, install the unit in a frame or under a snow hood to prevent snow from accumulating on it.
(Inhibition of collective drain discharge in a snowy country)
(5) Do not install the equipment in areas where there is a danger of flammable gas leaks.
∗ Please ask your distributor about optional parts such as wind vane adapters, snow guard hoods, etc.

(b) Installation space (service space) example

Please secure sufficient clearance (room for maintenance work, passage, draft and piping). (If your installation site does not fulfill the installation condition requirements set out on this drawing, please consult with your distributor or the manufacturer)

1) When one unit is installed



※ 2m clearance above the unit

Unit: mm

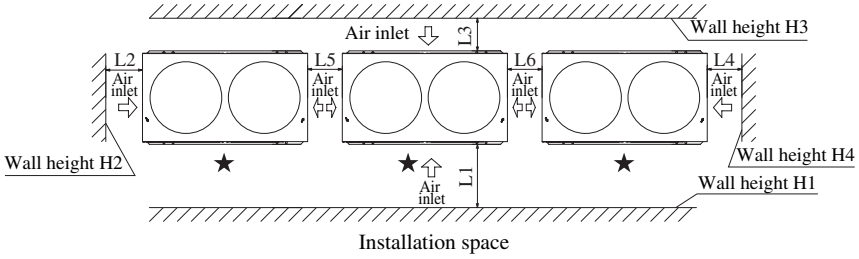
Dimensions \ Example installation	Ⅰ	Ⅱ
L1	500	Open
L2	10	10
L3	100	100
L4	10	Open
H1	1500	–
H2	No limit	No limit
H3	1000	No limit
H4	No limit	–

2) When more than one unit are installed.

Items with a ★ mark show the service panel side.

[In ordinary construction, assure a space of 10 mm or greater in front of the unit in consideration of the needed work space.]

① Example of installation of 3 units in a row



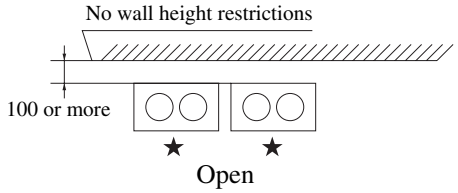
※ 2m clearance above the unit

Unit: mm

Dimensions \ Example installation	Ⅰ	Ⅱ
L1	500	Open
L2	10	200
L3	100	300
L4	10	Open
L5	10 (0)	400
L6	10 (0)	400
H1	1500	No limit
H2	No limit	No limit
H3	1000	No limit
H4	No limit	No limit

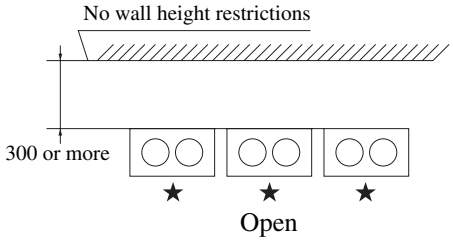
② Example of installation of 2 units in a row:

In the case of a wall in back of the units.



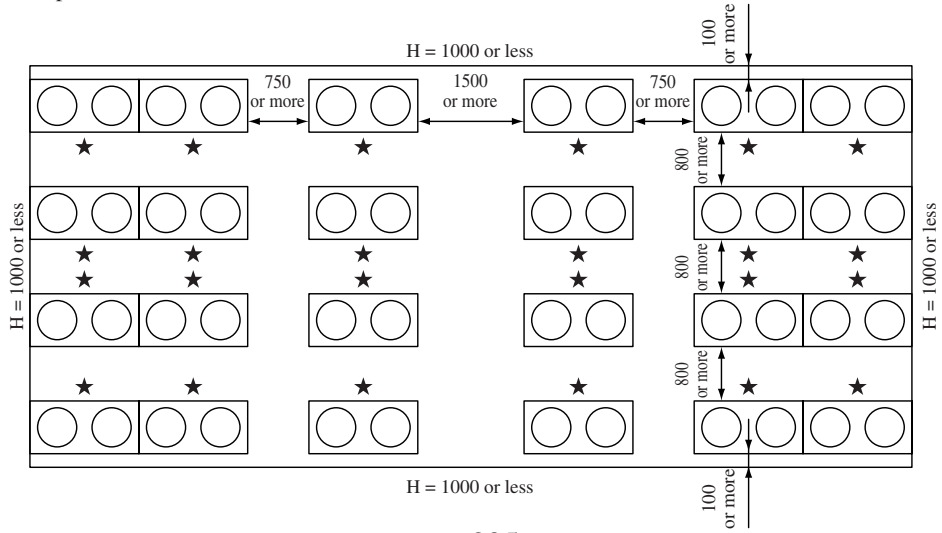
③ Example of installation of 3 units in a row:

In the case of a wall in back of the units.



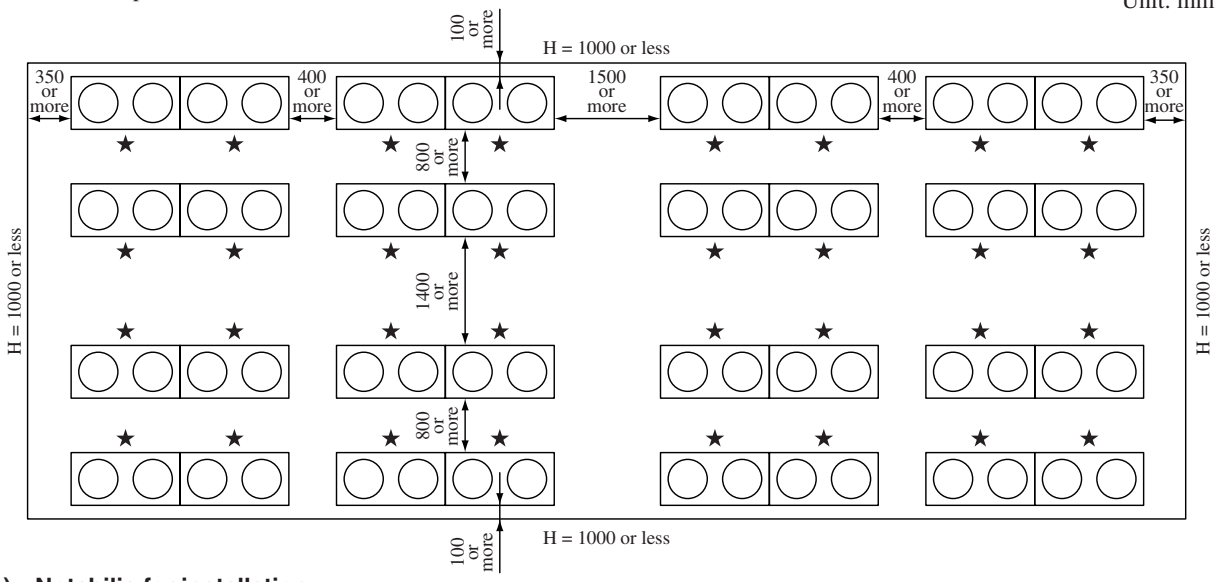
④ Example of installation of 4 rows with 6 units each.

Unit: mm



⑤ Example of installation of 4 rows with 8 units each.

Unit: mm

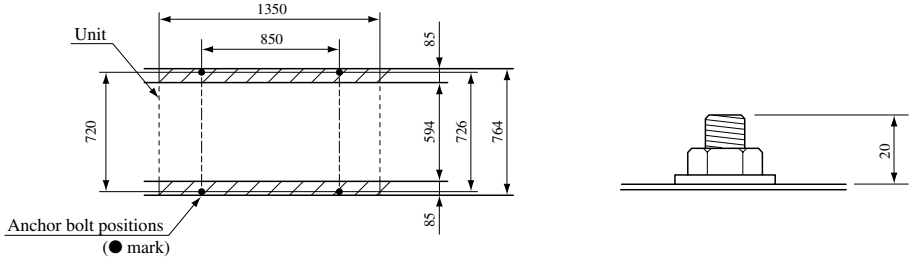


(c) Notabilia for installation

1) Anchor bolt positions

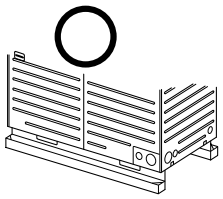
- Use four anchor bolts (M10) to fix an outdoor unit's anchoring legs at all times. Ideally, an anchor bolt should protrude 20mm.

Unit : mm

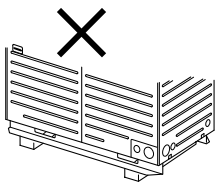


2) Base

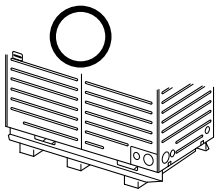
1) Please install a unit after ascertaining that the bases have been made to sufficient strength and level to ensure the unit against vibration or noise generation.
2) Please construct a base to the size of a shadowed area (the entire bottom area of an outdoor unit's anchoring leg) shown on the above drawing or larger.



Normally, it is desirable that a base as specified in the drawing above is provided.



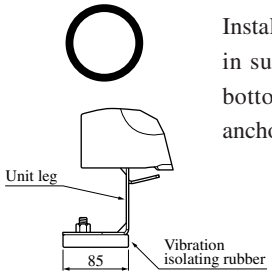
A base used for a former model is wrongly oriented and not acceptable.



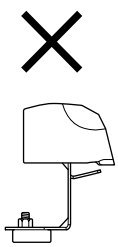
Please use it for renewal installation. (Please add a base on the center)

3) Vibration isolating rubber

1) A vibration isolating rubber must support an outdoor unit's anchoring leg by its entire bottom area.



Install a vibration isolating rubber in such a manner that the entire bottom area of an outdoor unit's anchoring leg will rest on it.



Do not install an outdoor unit in such a manner that a part of the bottom area of its anchoring leg is off a vibration isolating rubber.

(4) Refrigerant piping

(a) Refrigerant piping restrictions

◆ **Models FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R**

Please do not fail to observe the following pipe sizes and limitations of use.
A failure to observe this instruction can result in a compressor failure or performance degradation.

1) Total pipe length (Combined total length of pipes) ..... Within 100mm
2) Maximum length (To the farthest indoor unit) ..... Within 70m
3) ø 9.52 total liquid pipe length ..... Within 50m
4) Head
   a) When the outdoor unit above the indoor unit ..... Within 30m
   b) When the outdoor unit is below the indoor unit ..... Within 15m
   c) Height difference between indoor units in the same system ..... Within 4m

◆ **Models FDCA224~1360HKXE4BR**

1) Maximum length (from an outdoor unit to the farthest indoor unit)
   ..... 160 m or less as actual pipe length (185 m or less as equivalent pipe length)
   (When an actual pipe length exceeds 90 m, however, it is necessary to change the pipe size. Please determine the main pipe size by consulting with the Main Selection Reference Table set out in Section (c). 2))
2) Total pipe length ..... 510 m or less
3) Main pipe length ..... 130 m or less
4) Allowable pipe length from the first branching ..... 40 m or less
5) Allowable elevation difference (head difference)
   a) When an outdoor unit is installed above ..... 50 m or less
   b) When an outdoor unit is installed below ..... 40 m or less
   c) Difference in the elevation of indoor units in a system ..... 15 m or less
6) Restrictions on piping applicable to the section between an outdoor unit and an outdoor unit side branching pipe (combination unit)
   a) Difference in the elevation ..... 0.4 m or less
   b) Distance between an outdoor unit and an outdoor unit side branching pipe ..... 5 m or less
   c) Length of oil equalization piping ..... 10 m or less

◆ **Models FDCA224~1360HKXRE4BR**

1) Maximum length (from an outdoor unit to the farthest indoor unit)
   ..... 160 m or less as actual pipe length (185 m or less as equivalent pipe length)
   (When an actual pipe length exceeds 90 m, however, it is necessary to change the pipe size. Please determine the main pipe size by consulting with the Main Selection Reference Table set out in Section (3). (b))
2) Total pipe length ..... 510 m or less
3) Main pipe length ..... 130 m or less
4) Allowable pipe length from the first branching ..... 40 m or less
5) Allowable elevation difference (head difference)
   a) When an outdoor unit is installed above ..... 50 m or less
   b) When an outdoor unit is installed below ..... 40 m or less
   c) Elevation difference between indoor units or between branching controllers within a system .... 15 m or less
   d) Elevation difference between the first branch and the branching controller ..... 15 m or less
   e) Elevation difference between the branching controller and the indoor unit.
      i) When above indoor unit ..... 1 m or less
      ii) When below indoor unit ..... 4 m or less
6) Restrictions on piping applicable to the section between an outdoor unit and an outdoor unit side branching pipe (combination unit)
   a) Difference in the elevation ..... 0.4 m or less
   b) Distance between an outdoor unit and an outdoor unit side branching pipe ..... 5 m or less
   c) Length of oil equalization piping ..... 10 m or less

(b) Piping material selection

1) Please use pipes clean on both the inside and outside and free from contaminants harmful to operation such as sulfur, oxides, dust, chips, oil, fat and water.
2) Use the following material for refrigerant piping.
   Material: phosphorus deoxidized seamless copper pipe (C1120T-0, 1/2H, JIS H3300)
   Use C1220T-1/2H for ø19.05 or larger, or C1220T-0 for ø15.88 or smaller
3) Do not use ø28.58 × t1.0 and ø34.92 × t1.2 as a bent pipe.
4) Thickness and size: Please select proper pipes according to the pipe size selection guideline.
   (Since this used R410A, always use 1/2H pipes of a specified minimum thickness or thicker for all pipes of ø19.05 or langer, because the pressure resistance requirement is not satisfied with O-type pipes).
5) For branching pipes, use a genuine branching pipe set or header set at all times. (optional parts)
6) For the handling of service valves, please refer to Section (d). (iv): Handling of service valves.
7) In installing pipes, observe the restrictions on the use of pipes set out in Section (a) (Maximum length, total pipe length, allowable pipe length from the first branching, allowable elevation difference (head difference)) without fail.
8) Install a branching pipe set and a branching controller, playing attention to the direction of attachment, after your have perused through the installation manual supplied with it..

(c) Pipe size selection

1) Outdoor unit-Outdoor unit side branching pipe
   Please use a pipe conforming to the pipe size specified for outdoor unit connection.

a) KX series

Outdoor unit	Outdoor unit outlet pipe specifications					
	Gas pipe	Connection method	Liquid pipe	Connection method	Oil equalizing(1) pipe	Connection method
FDCA140	ø15.88 × t1.0	Flare	ø9.52 × t0.8	Flare	—	—
FDCA224	ø19.05 × t1.0	Brazed				
FDCA280	ø22.22 × t1.0					
FDCA335	ø25.4(ø22.22) × t1.0		ø12.7 × t0.8			
FDCA335-K						
FDCA400	ø25.4(ø28.58) × t1.0				ø9.52 × t0.8	Flare
FDCA450~680	ø28.58 × t1.0					

Note (1) Please connect the master and slave unit with an oil equalizing pipe, when they are used in a combined installation. (It is not required, when a unit is used as a standalone installation)
(2) Values is ( ) show piping sizes in the case that models for Europe are used.

b) KXR series

Outdoor unit	Outdoor unit outlet pipe specifications							
	Suction gas pipe	Connection method	Discharge gas pipe	Connection method	Liquid pipe	Connection method	Oil equalizing(1) pipe	Connection method
FDCA224	ø19.05 × t1.0	Brazed	ø15.88 × t1.0	Brazed	ø9.52 × t0.8	Flare	—	—
FDCA280	ø22.22 × t1.0		ø19.05 × t1.0		ø12.7 × t0.8			
FDCA335								
FDCA335-K							ø9.52 × t0.8	Flare
FDCA400	ø28.58 × t1.0		ø22.22 × t1.0					
FDCA450~680								

Note (1) Please connect the master and slave unit with an oil equalizing pipe, when they are used in a combined installation. (It is not required, when a unit is used as a standalone installation)

2) Main (Outdoor unit side branching pipe – Indoor unit side first branching pipe)
If the longest distance (measured between the outdoor unit and the farthest indoor unit) is 90m or longer (actual length), please change the main pipe size according to the table below.

a) KX series

Outdoor unit	Main pipe size (normal)		Pipe size for an actual length of 90m or longer	
	Gas pipe	Liquid pipe	Gas pipe	Liquid pipe
FDCA224	ø19.05 × t1.0	ø9.52 × t0.8	ø22.22 × t1.0	ø12.7 × t0.8
FDCA280	ø22.22 × t1.0		ø25.4×t1.0 (ø22.22)	
FDCA335	ø25.4(ø22.22) × t1.0	ø12.7 × t0.8		
FDCA400	ø25.4(ø28.58) × t1.0		ø28.58 × t1.0	
FDCA450	ø28.58 × t1.0		ø31.8 × t1.1 (ø28.58 × t1.0)	ø15.88 × t1.0
FDCA504				
FDCA560				
FDCA615				
FDCA680				
FDCA735	ø31.8 × t1.1 (ø34.92 × t1.2)	ø15.88 × t1.0	ø38.1 × t1.35 (ø34.92 × t1.2)	ø19.05 × t1.0
FDCA800				
FDCA850				
FDCA900				
FDCA960				
FDCA1010	ø38.1 × t1.35 (ø34.92 × t1.2)	ø19.05 × t1.0		ø22.22 × t1.0
FDCA1065				
FDCA1130				
FDCA1180				
FDCA1235				
FDCA1300				
FDCA1360				

Note (1) Values is ( ) show piping sizes in the case that models for Europe are used.

b) KXR series

Outdoor unit	Main pipe size (normal)			Pipe size for an actual length of 90m or longer		
	Suction gas pipe	Discharge gas pipe	Liquid pipe	Suction gas pipe	Discharge gas pipe	Liquid pipe
FDCA224	ø19.05 × t1.0	ø15.88 × t1.0	ø9.52 × t0.8	ø22.22 × t1.0	ø15.88 × t1.0	ø12.7 × t0.8
FDCA280	ø22.22 × t1.0	ø19.05 × t1.0			ø19.05 × t1.0	
FDCA335			ø12.7× t0.8			
FDCA400	ø28.58 × t1.0	ø22.22 × t1.0		ø28.58 × t1.0	ø22.22 × t1.0	ø15.88 × t1.0
FDCA450						
FDCA504						
FDCA560						
FDCA615						
FDCA680						
FDCA735	ø34.92 × t1.0	ø28.58 × t1.0	ø15.88 × t1.0	ø34.92 × t1.0	ø28.58 × t1.0	ø19.05 × t1.0
FDCA800						
FDCA850						
FDCA900						
FDCA960						
FDCA1010						
FDCA1065			ø19.05 × t1.0			ø22.22 × t1.0
FDCA1130						
FDCA1180						
FDCA1235						
FDCA1300						
FDCA1360						

3) Indoor unit side first branching pipe – Indoor unit side branching pipe
Please choose from the table below an appropriate pipe size as determined by the total capacity of indoor units connected downstream, provided, however, that the pipe size for this section should not exceed the main size .

a) KX series

Total capacity of indoor units	Gas pipe	Liquid pipe
Less than 70	ø 12.7 × t1.0	ø 9.52 × t0.8
70 or more but less than 180	ø 15.88 × t1.0	
180 or more but less than 371	ø 19.05 × t1.0	ø 12.7 × t0.8
371 or more but less than 540	ø 25.4 × t1.0(ø28.58 × t1.0)	ø15.88 × t1.0
540 or more but less than 700	ø 28.58 × t1.0	
700 or more but less than 1100	ø 31.8 × t1.1(ø34.92 × t1.2)	ø 19.05 × t1.0
1100 or more	ø 31.8 × t1.1(ø34.92 × t1.2)	

Note (1) Values in ( ) show piping sizes in the case that models for Europe are used.

b) KXR series

Total capacity of indoor units	Section gas pipe	Discharge gas pipe	Liquid pipe
Less than 70	ø 12.7 × t0.8	ø 9.52 × t0.8	ø 9.52 × t0.8
70 or more but less than 180	ø 15.88 × t1.0	ø 12.7 × t0.8	
180 or more but less than 371	ø 19.05 × t1.0	ø 15.88 × t1.0	ø 12.7 × t0.8
371 or more but less than 540	ø 28.58 × t1.0	ø 22.22 × t1.0	ø15.88 × t1.0
540 or more but less than 700			
700 or more but less than 1100	ø 34.92 × t1.2	ø 28.58 × t1.0	ø 19.05 × t1.0
1100 or more			

4) Indoor unit side branching pipe – Indoor unit

Indoor unit connection pipe size table

- In the downstream of a branching controller, no discharge gas pipe needs to be connected.

a) KX series

Indoor unit	Gas pipe	Liquid pipe
22, 28	ø 9.52 × t 0.8	ø 6.35 × t0.8
36, 45, 56	ø 12.7 × t 0.8	
71, 80, 90, 112, 140, 160	ø 15.88 × t 1.0	ø 9.52 × t0.8
224	ø 19.05 × t 1.0	
280	ø 22.22 × t 1.0	

b) KXR series

- In the downstream of a branching controller, no discharge gas pipe needs to be connected.

Indoor unit	Suction gas pipe	Discharge gas pipe	Liquid pipe
22, 28	ø 9.52 × t0.8	ø 6.35 × t0.8	ø 6.35 × t0.8
36, 45, 56	ø 12.7 × t0.8	ø 9.52 × t0.8	
71, 80, 90, 112, 140	ø 15.88 × t1.0	ø 12.7 × t0.8	ø 9.52 × t0.8
224	ø 19.05 × t1.0	ø 15.88 × t1.0	
280	ø 22.22 × t1.0	ø 19.05 × t1.0	

5) Selection of an outdoor unit side branch pipe set

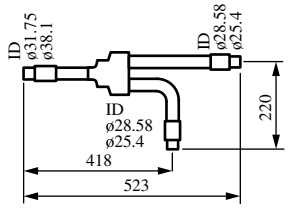
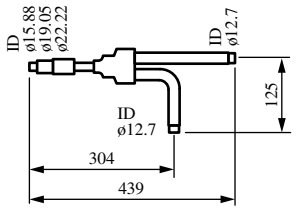
This branch pipe set will always become neccessary when units are used in combination. (When a unit is used as a standalone installation, it is not required.

Outdoor unit	Branch pipe set
FDCA735~1360HKXE4BR	DOS-2A-1
FDCA735~1360HKXRE4BR	DOS-2A-1-R

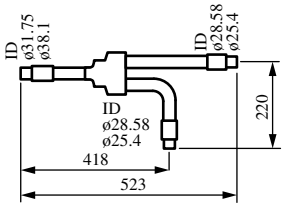
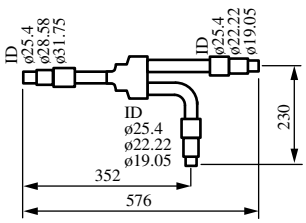
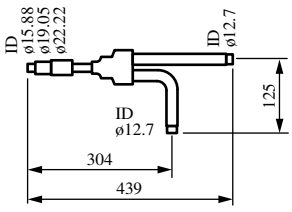
Notes (1) In connecting an outdoor unit, please use a pipe conforming to the pipe size specified for outdoor unit connection.
(2) Choose a different-diameter pipe joint matching a main pipe size specified in the following section in installing pipes (main pipes) on the outdoor unit side.
(3) Always install branching joints (for both gas and liquid) in such a manner that they form either correct horizontal or vertcal branch.

• Branch pipe set shapes

KX series

Model	Item	Branch pipe	Item	Branch pipe
DOS-2A-1	Gas line		Liquid line	

KXR series

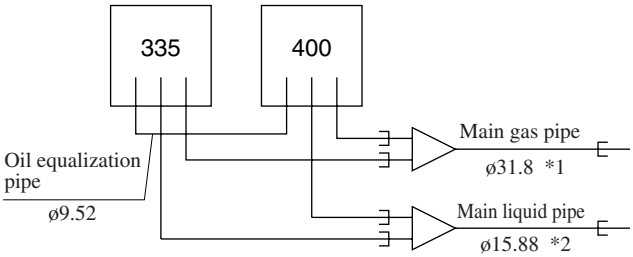
Model	Item	Branch pipe	Item	Branch pipe	Item	Branch pipe
DOS-2A-1-R	Suction gas line		Discharge gas line		Liquid line	

6) Selecting the piping size of combined outdoor units.

a) KX series

Model FDCA735HKXE4BR

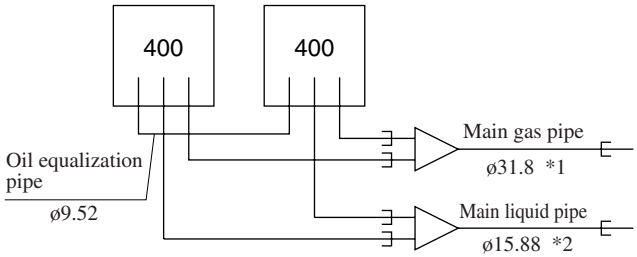
Combination: FDCA335HKXE4BRK + FDCA400HKXE4BR
[Branch piping Set: DOS-2A-1]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø38.1 and *2 becomes ø19.05.

Model FDCA800HKXE4BR

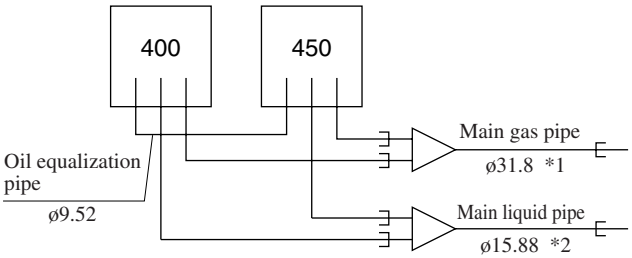
Combination: FDCA400HKXE4BR + FDCA400HKXE4BR
[Branch piping Set: DOS-2A-1]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø38.1 and *2 becomes ø19.05.

Model FDCA850HKXE4BR

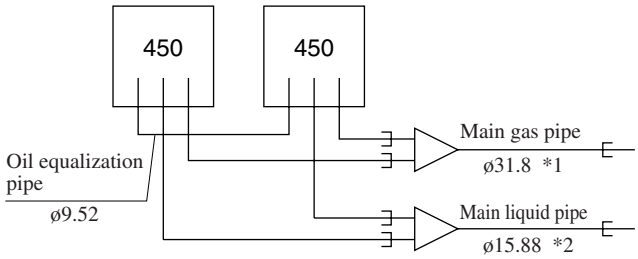
Combination: FDCA400HKXE4BR + FDCA450HKXE4BR
[Branch piping Set: DOS-2A-1]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø38.1 and *2 becomes ø19.05.

Model FDCA900HKXE4BR

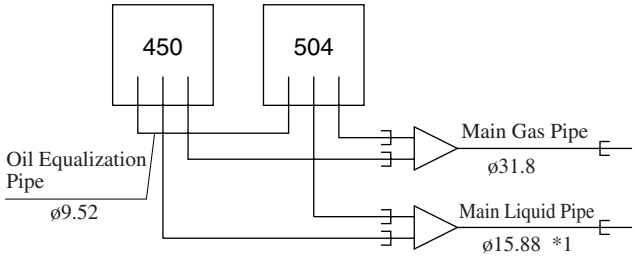
Combination: FDCA450HKXE4BR + FDCA400HKXE4BR
[Branch piping Set: DOS-2A-1]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø38.1 and *2 becomes ø19.05.

Model FDCA960HKXE4BR

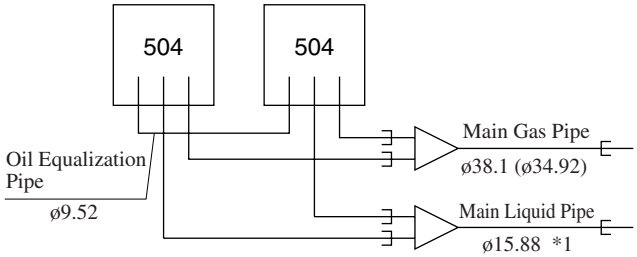
Combination: FDCA450HKXE4BR + FDCA504HKXE4BR
[Branch Piping Set: DOS-2A-1]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø19.05.

Model FDCA1010HKXE4BR

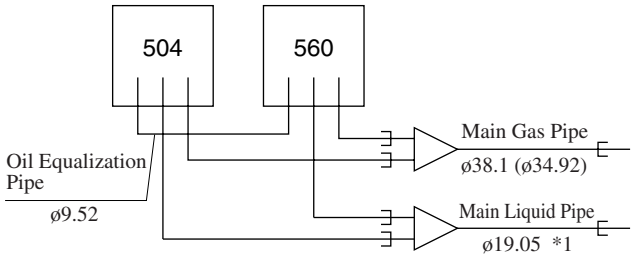
Combination: FDCA504HKXE4BR + FDCA504HKXE4BR
[Branch Piping Set: DOS-2A-1]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Model FDCA1065HKXE4BR

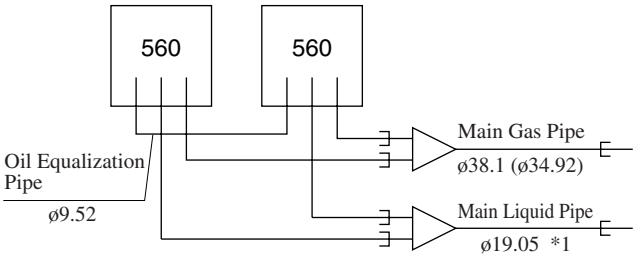
Combination: FDCA504HKXE4BR + FDCA560HKXE4BR
[Branch Piping Set: DOS-2A-1]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Model FDCA1130HKXE4BR

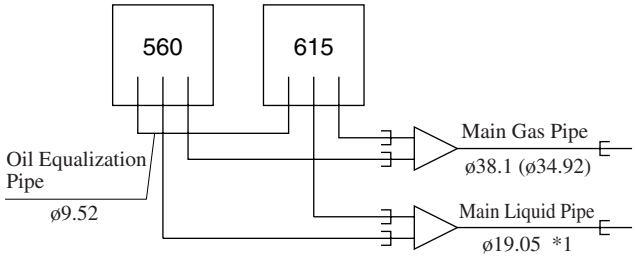
Combination: FDCA560HKXE4BR + FDCA560HKXE4BR
[Branch Piping Set: DOS-2A-1]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Model FDCA1180HKXE4BR

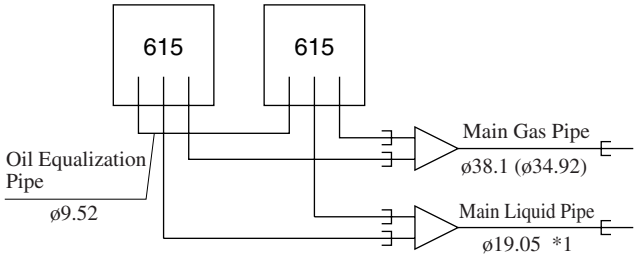
Combination: FDCA560HKXE4BR + FDCA615HKXE4BR
[Branch Piping Set: DOS-2A-1]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Model FDCA1235HKXE4BR

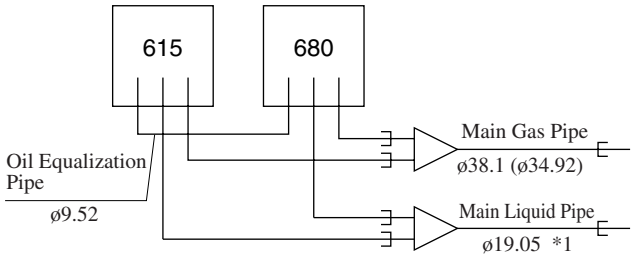
Combination: FDCA615HKXE4BR + FDCA615HKXE4BR
[Branch Piping Set: DOS-2A-1]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Model FDCA1300HKXE4BR

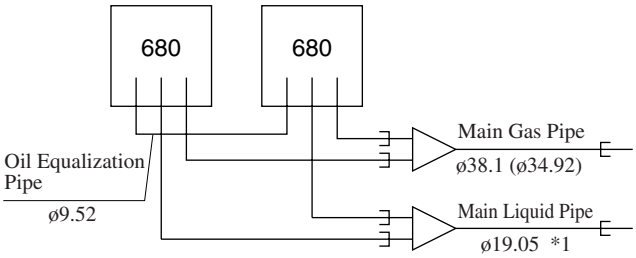
Combination: FDCA615HKXE4BR + FDCA680HKXE4BR
[Branch Piping Set: DOS-2A-1]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Model FDCA1360HKXE4BR

Combination: FDCA680HKXE4BR + FDCA680HKXE4BR
[Branch Piping Set: DOS-2A-1]



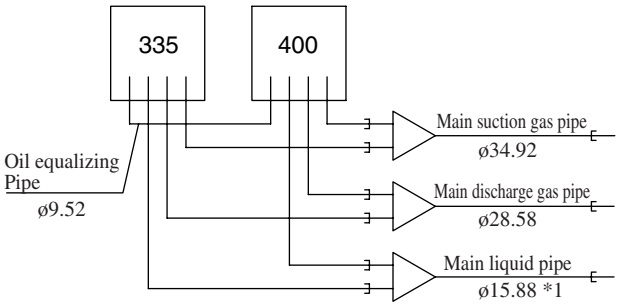
If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Note (1) Values in ( ) show piping sizes in the case that models for Europe are used.
(2) If a ø34.92 piping size is used in Europe, branch piping is necessary. Please procure the necessary piping locally.

7) KXR series

Model FDCA735HKXRE4BR

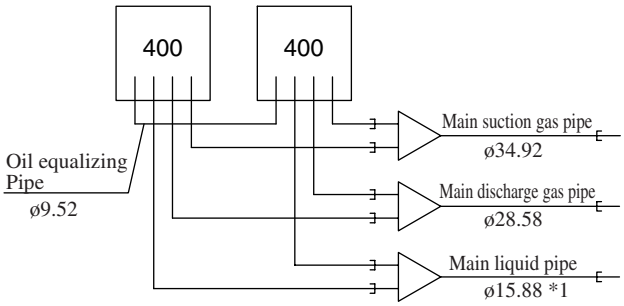
Combination: FDCA335HKXRE4BRK + FDCA400HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø19.05.

Model FDCA800HKXRE4BR

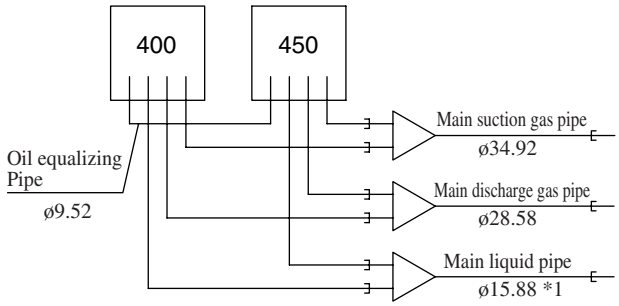
Combination: FDCA400HKXRE4BR + FDCA400HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø19.05.

Model FDCA850HKXRE4BR

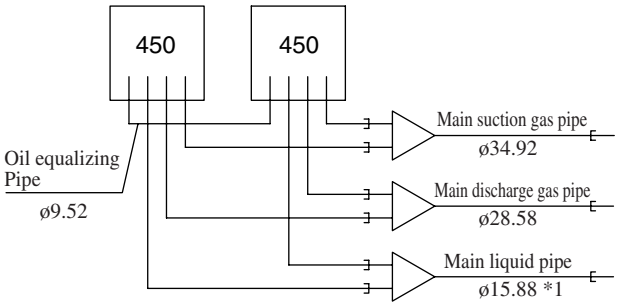
Combination: FDCA400HKXRE4BR + FDCA450HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø19.05.

Model FDCA900HKXRE4BR

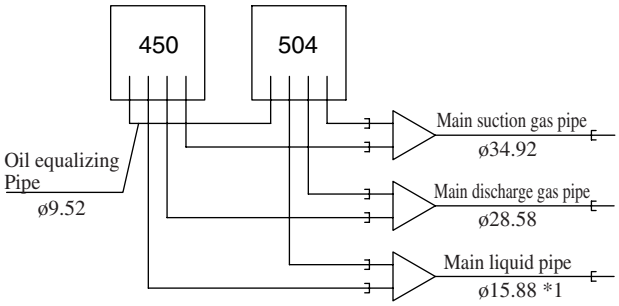
Combination: FDCA450HKXRE4BR + FDCA450HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø19.05.

Model FDCA960HKXRE4BR

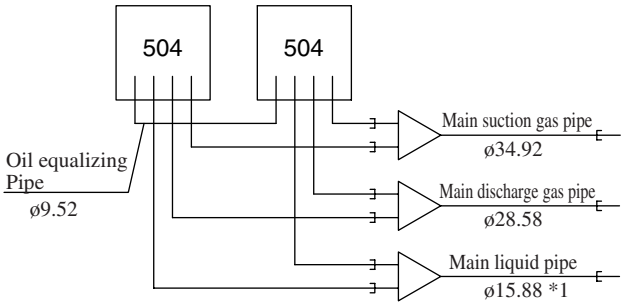
Combination: FDCA450HKXRE4BR + FDCA504HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø19.05.

Model FDCA1010HKXRE4BR

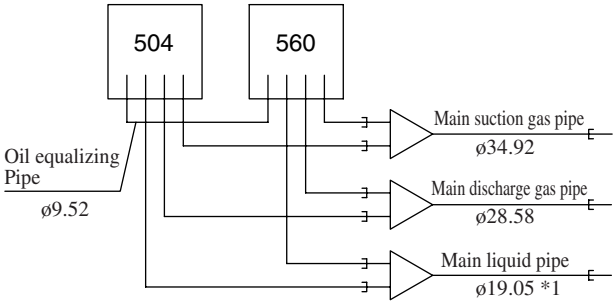
Combination: FDCA504HKXRE4BR + FDCA504HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø19.05.

Model FDCA1065HKXRE4BR

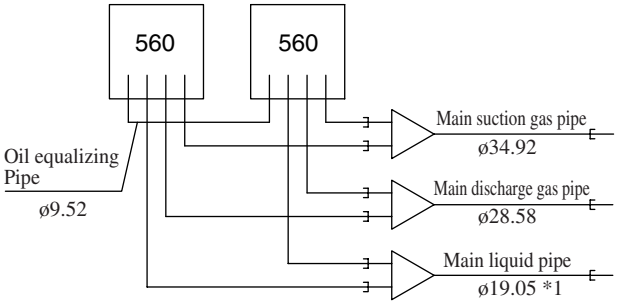
Combination: FDCA504HKXRE4BR + FDCA560HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Model FDCA1130HKXRE4BR

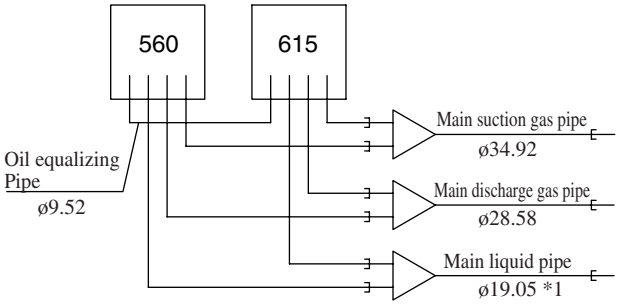
Combination: FDCA560HKXRE4BR+ FDCA560HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Model FDCA1180HKXRE4BR

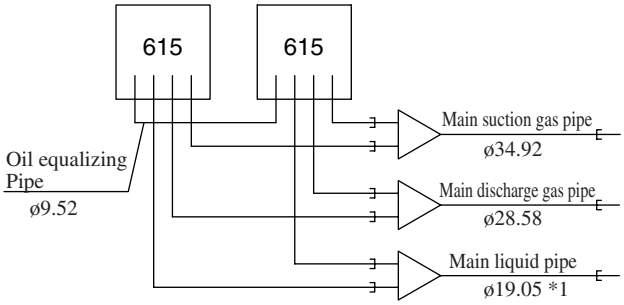
Combination: FDCA560HKXRE4BR + FDCA615HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Model FDCA1235HKXRE4BR

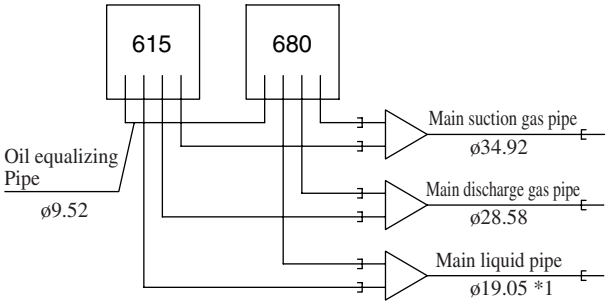
Combination: FDCA615HKXRE4BR + FDCA615HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Model FDCA1300HKXRE4BR

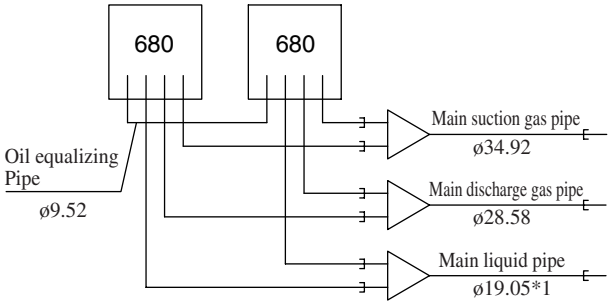
Combination: FDCA615HKXRE4BR + FDCA680HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

Model FDCA1360HKXRE4BR

Combination: FDCA680HKXRE4BR + FDCA680HKXRE4BR
[Branch Piping Set: DOS-2A-1-R]



If the main pipe exceeds 90m in length (actual length),
*1 becomes ø22.22.

8) Selection of on indoor unit side branching pipe set

Method of selecting a branching pipe set

- As an appropriate branching pipe size varies with the connected capacity (total capacity connected downstream), determine a size from the following table.

a) KX series

Total capacity downstream	Branching pipe set
Less than 180	DIS-22-1
180 or more but less than 371	DIS-180-1
371 or more but less than 540	DIS-371-1
540 or more	DIS-540-1

b) KXR series

- In the upstream of a branching controller

Total capacity downstream	Branching pipe set model type
Less than 180	DIS-22-1-R
180 or more but less than 371	DIS-180-1-R
371 or more but less than 540	DIS-371-1-R
540 or more	DIS-540-1-R

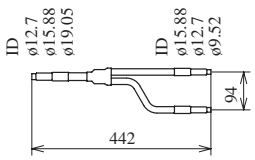
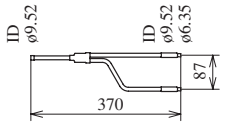
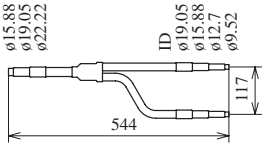
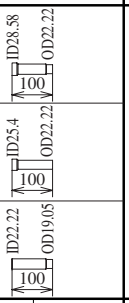
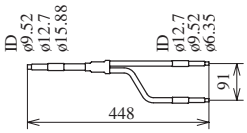
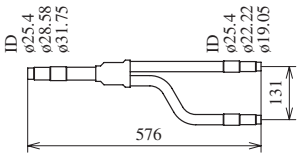
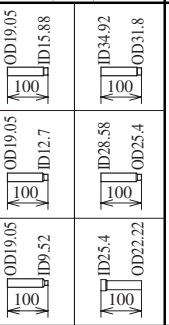
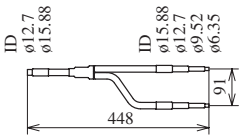
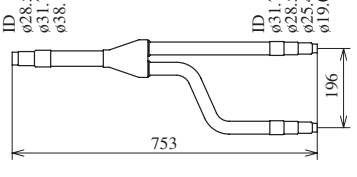
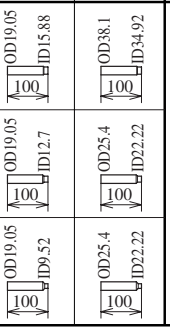
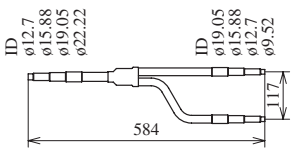
- In the downstream of a branching controller

Total capacity downstream	Branching pipe set model type
Less than 180	DIS-22-1
180 or more but less than 280	DIS-180-1

Notes (1) In connecting an indoor unit with the indoor unit side branching pipe set, plase use a pipe conforming to the pipe size specified for indoor unit connection.
(2) Always install branching joints (for suction gas, discharge gas and liquid) in such a manner that that they form either correct horizontal or vertical branch.

- Branch pipe set shapes

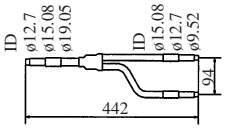
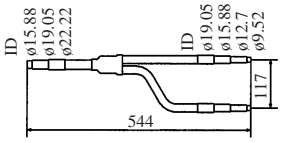
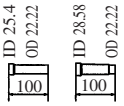
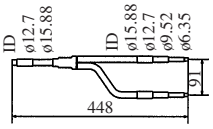
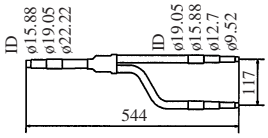
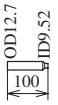
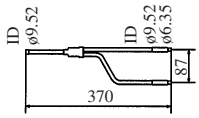
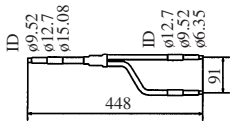
Unit: mm

Model	Item	Branch pipe	Reducer	Item	Branch pipe	Reducer
DIS-22-1	Gas line		———	Liquid line		———
DIS-180-1	Gas line			Liquid line		———
DIS-371-1	Gas line			Liquid line		———
DIS-540-1	Gas line			Liquid line		

Notes: (1) Insulation is provided with the branch pipes.
(2) Pipes should be cut to the installation site requirements, with the pipe being severed at the center part of the desired diameter.
(3) Branch joints (gas & liquid) must be installed as either a "horizontal branch" or a "vertical branch".

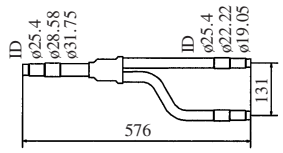
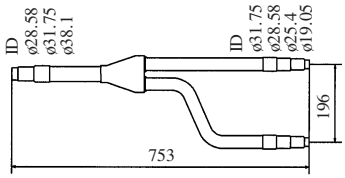
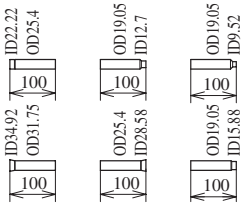
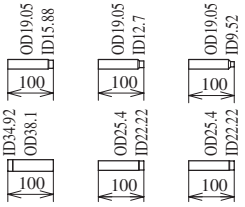
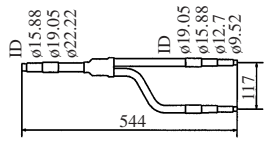
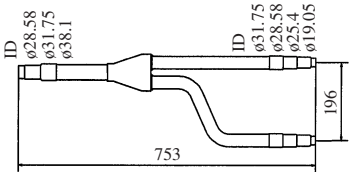
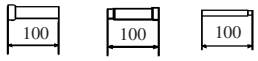
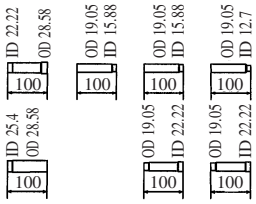
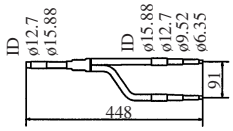
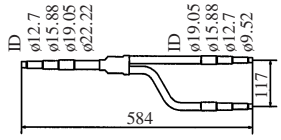
• Branch pipe set shapes

Unit: mm

Item \ Model	DIS-22-1-R	DIS-180-1-R
Suction gas line		
		Reducer: 
Discharge gas line		
	Reducer: 	Reducer: 
Liquid line		

Notes: (1) Insulation is provided with the branch pipes.
(2) Pipes should be cut to the installation site requirements, with the pipe being severed at the center part of the desired diameter.
(3) Branch joints (gas & liquid) must be installed as either a "horizontal branch" or a "vertical branch".

Unit: mm

Item \ Model	DIS-371-1-R	DIS-540-1-R
Suction gas line		
Reducer		
Discharge gas line		
Reducer		
Liquid line		
Reducer		

Notes: (1) Insulation is provided with the branch pipes.
(2) Pipes should be cut to the installation site requirements, with the pipe being severed at the center part of the desired diameter.
(3) Branch joints (gas & liquid) must be installed as either a "horizontal branch" or a "vertical branch".

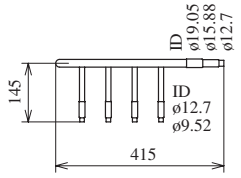
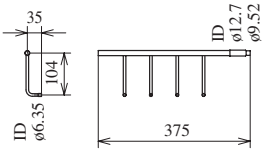
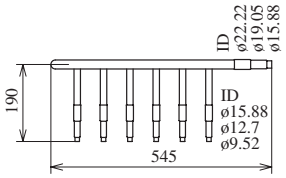
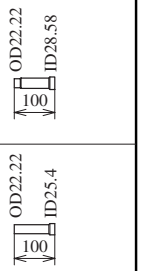
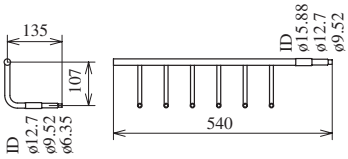
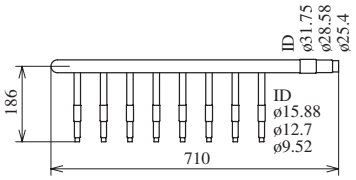
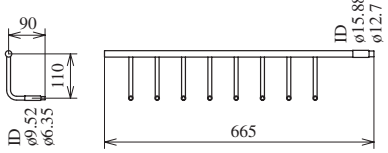
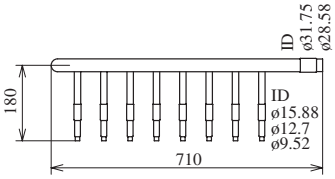
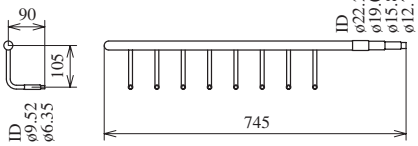
9) Header Method (KX series only)

- Depending on the number of units connected, connect plugged pipes (to be procured on the installer's part) at a branching point (on the indoor unit connection side).
- For determination of appropriate header, different diameter pipe joint and blind pipe sizes, please refer to "Header Set," (which can be purchased separately).

Total capacity downstream	Header set model type	Number of branches
Less than 180	HEAD4-22-1	4 branches at the most
180 or more but less than 371	HEAD6-180-1	6 branches at the most
371 or more but less than 540	HEAD8-371-1	8 branches at the most
540 or more	HEAD8-540-1	8 branches at the most

• Header pipe set shapes

Unit: mm

Model	Item	Header pipe	Reducer	Item	Header pipe
HEAD4-22-1	Gas line		——	Liquid line	
HEAD6-180-1	Gas line			Liquid line	
HEAD8-371-1	Gas line		——	Liquid line	
HEAD8-540-1	Gas line			Liquid line	

Notes: (1) Insulation is provided with the branch pipes.
(2) Pipes should be cut to the installation site requirements, with the pipe being severed at the center part of the desired diameter.
(3) Branch joints (gas & liquid) must be installed as either a "horizontal branch" or a "vertical branch".
(4) Indoor units 224 and 280 can not connected to the header.

10) Selection of a branching controller (KXR series only)

1) Selection an appropriate one according to the combined total capacity of the indoor units connected downstreem.
2) The number of indoor units that can be connected to branching controllers are depicted in the belou.
3) No liquid pipe needs to be connected to a branching controller.
4) In the downstream of a branching controller, no gas discharge pipe needs to be connected.
5) Do not run the unit, while a branching unit is yet to be connected with indoor units.

Total capacity downstream	Branching controller model type	Number of connectable units
Less than 112	PFD112-ER	1~5
112 or more but less than 180	PFD180-ER	1~8
180 or more but 280 or more	PFD280-ER	1~10

11) Integrated branching controller(KXR series only)

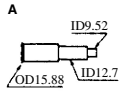
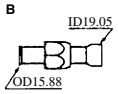
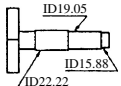
a) Before beginning installation

① Indoor units “should not be connected” to a branching controller, when they exceed a range specified for either combined total capacity or number in the table below.

Branching controller model	Total of four branches		Per branch	
	Capacity restrictions	Maximum number of units connectable	Capacity restrictions	Maximum number of units connectable
PFD112X4-ER	Less than 371	16 units	Less than 112	5 units

Notes (1) **When multiple indoor units are connected to one branch, use one remote controller for control, or enable remote control sensor.**
(2) When there is any branch that is not connected with an indoor unit, securely tighten the flare at the refrigerant piping connection port, or make use from the right side (from No. 4 circuit) towards the connection port.
(3) An indoor unit with a capacity up to 112 can be connected.

② Make sure that no accessory is missing.

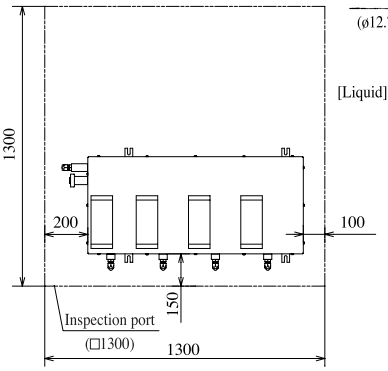
Different diameter pipe joint		Flange joint
For outdoor unit - gas discharge pipe For indoor unit gas pipe	For outdoor unit - gas discharge pipe	For outdoor unit - gas discharge pipe
A  5 pieces	B  1 piece	 1 piece

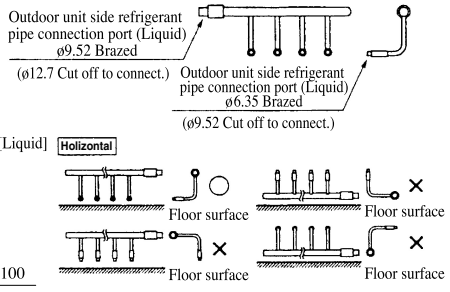
b) Installation of a branching controller

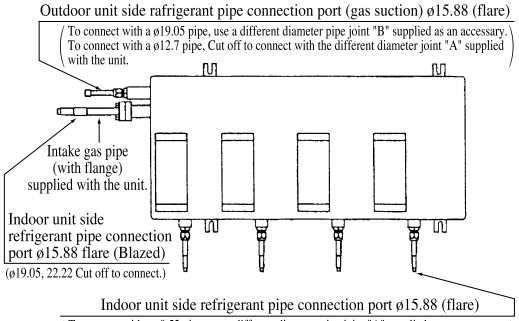
① Selecting the installation location.

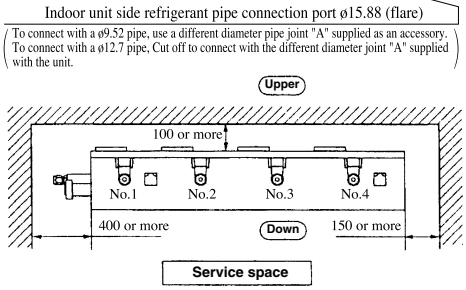
- A branching controller sometimes generates noises during control operations whether the system is in operation or stands still. When it is installed in a place with a low background noise level, please take sppropriate precautions such as installing it away from the indoor unit.
- The position where you can install refrigerant pipes within the specified restrictions on length.
- The position where you can install hanger bolts and secure a required level of strength. (The position where pulling force of 20 kg per bolt is endured)
- The position where a service space conforming to the requirements shown in the drawing on the right can be secured.

Notes (1) Do not fail to provide an inspection port at the specified position.
(2) A branching controller cannot be installed upside down. Please install it in such a manner that the main body is held level.



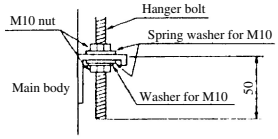






Notes (1) Heat insulating materials are supplied with the unit. Please use them.
(2) Please cut off a pipe suitably on the installation site at the middle of a section of a diameter to be used.
(3) Please install a header in such a manner that it will branch horizontally.

② The positions of hanger bolts.
Use four M10 bolts for the hanging bolts. (to be procured from a local supplier)
Please fasten securely as illustrated in the drawing below.



When you install the main body, but you cannot position it properly to the opening of the ceiling, please adjust the position by moving it along a fixing metal’s oblong hole.

③ Cautions when carrying a unit.

- In carrying the unit, please hold it by the hooks. Holding pipes can result in pipe deformation and unit failure.
- Do not put your hand in the notch area for fear that you should get hurt.
- Since the unit is heavy (30kg), take care in handling it.

c) Refrigerant piping

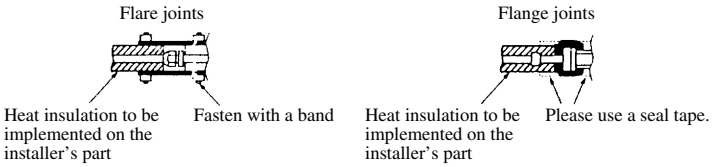
- A branching controller has on its main body beneath the connection ports such indications as "S.G (OUT)," "D.G (OUT)" and "I.G (IN)" provided for the outdoor unit gas suction pipe, the outdoor unit gas discharge pipe and indoor unit gas pipes respectively, so please make sure that you connect correct pipes to correct ports.
- No liquid pipe needs to be connected to a branching controller.
- In connecting pipes to a branching controller or an indoor unit, always tighten a flare joint with two spanners applied at a time.
- Please use a flange joint supplied with the unit to connect an intake gas pipe. Tighten two bolts evenly with a gasket for flange connection inserted securely in the middle.
  (Fastening torque: 35 +/- 4N-m)

* observe the following tightening torque in tightening a flare nut.

Ø6.35	14~18(N·m)
Ø9.52	34~42(N·m)
Ø12.7	49~61(N·m)
Ø15.88	68~82(N·m)

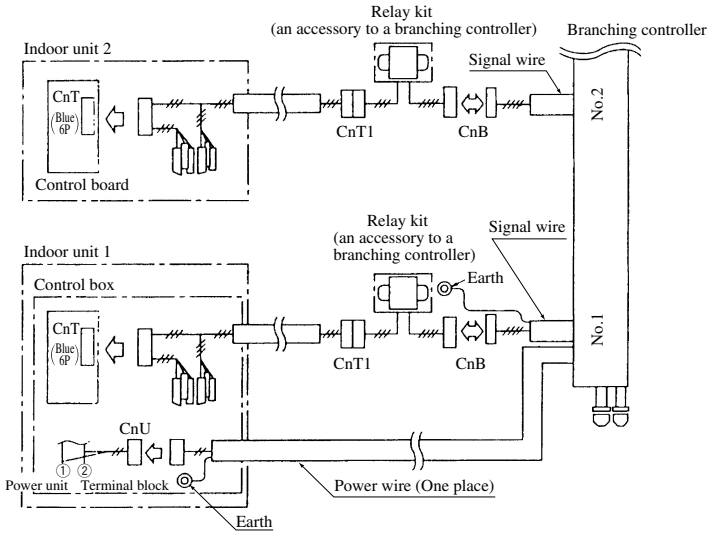
① Refrigerant pipe connection.

- Please heat-insulate a pipe connection with a pipe cover or a flange cover supplied with the unit without fail.



d) Electrical wiring work

- Please implement cabling according to the instructions contained in the drawing below.



Notes (1) Please connect a signal wire from a relay kit to the connector of the same connection port number with the coolant pipe.

(2) Please connect the power cable of a branching controller to the indoor unit's unit CnU. (at one place)

(3) Do not extend the signal wire between an indoor unit and a relay kit beyond a 2 m cable supplied as an accessory.

(4) To extend signal cables connecting between a relay kit and a branching controller and a power cable connecting between an indoor unit and a branching controller, please use the cables specified below. In extending these cables, make sure that the consistency of cable colors is maintained. (When you extend signal and power cables, do not forget to extend a grounding wire accordingly as well.)

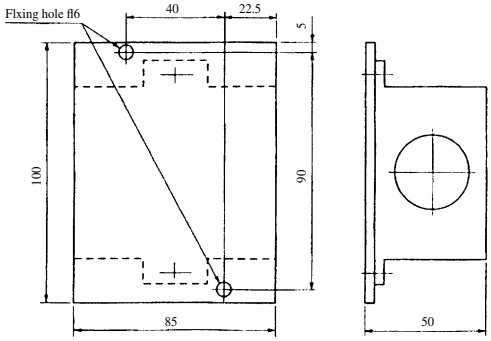
Signal wire	2.0/2.0(mm²) × 4(pieces)
Power wire	2.0/2.0(mm²) × 2(pieces)

(5) Please connect the earth wire from a branching controller to an indoor unit and relay kits.

(6) Please fix a relay kit with 2 screws (to be procured on the installer's part) on the back of the ceiling or a wall in the proximity of an indoor unit.

(7) When installation work is completed, please check the above-mentioned points for any connection errors.

○ Appearance drawing of a relay kit



Example of piping

◆ KX series

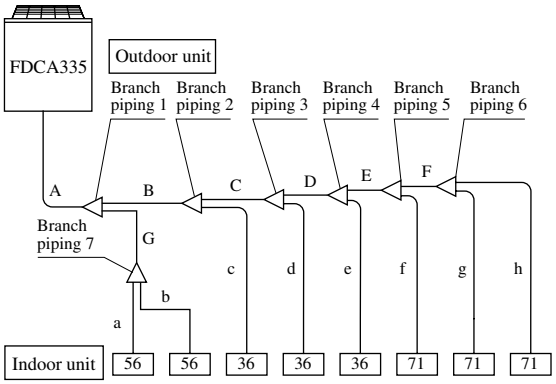
■ Branch system

Outdoor unit: FDCA335HKXE4BR

Indoor unit: Combination of 8 units

[Branch pipe set : DIS-371-1 × 1 set, DIS-180-1 × 4 set, DIS-22-1 × 2 set]

[Total capacity: 433]



• Selecting piping size

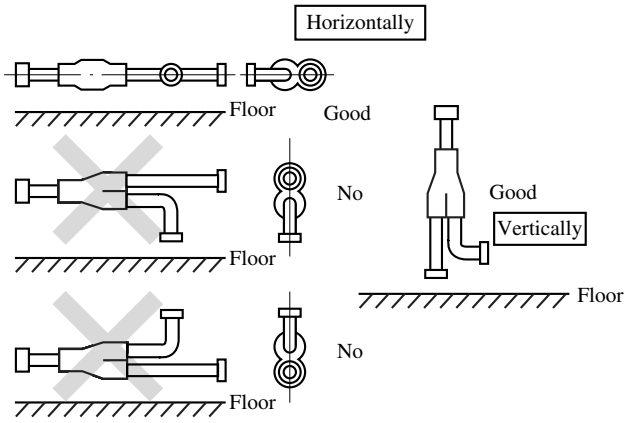
Item	Selection procedure	Piping size (mm)	
		Gas line	Liquid line
A	Same as the outdoor unit piping size	ø25.4	ø12.7
B	Total capacity of the connected indoor units 321	ø19.05	ø12.7
C	Total capacity of the connected indoor units 285	ø19.05	ø12.7
D	Total capacity of the connected indoor units 249	ø19.05	ø12.7
E	Total capacity of the connected indoor units 213	ø19.05	ø12.7
F	Total capacity of the connected indoor units 142	ø15.88	ø9.52
G	Total capacity of the connected indoor units 112	ø15.88	ø9.52
a	Indoor unit piping size (56).	ø12.7	ø6.35
b	Indoor unit piping size (56).	ø12.7	ø6.35
c	Indoor unit piping size (36).	ø12.7	ø6.35
d	Indoor unit piping size (36).	ø12.7	ø6.35
e	Indoor unit piping size (36).	ø12.7	ø6.35
f	Indoor unit piping size (71).	ø15.88	ø9.52
g	Indoor unit piping size (71).	ø15.88	ø9.52
h	Indoor unit piping size (71).	ø15.88	ø9.52

• Selection of branch piping size.

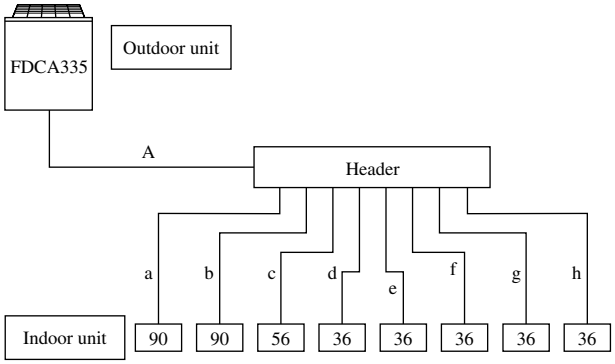
Item	Selection procedure	Branch piping set
Branch piping 1	Total capacity of the connected indoor units 433	DIS-371-1
Branch piping 2	Total capacity of the connected indoor units 321	DIS-180-1
Branch piping 3	Total capacity of the connected indoor units 285	DIS-180-1
Branch piping 4	Total capacity of the connected indoor units 249	DIS-180-1
Branch piping 5	Total capacity of the connected indoor units 213	DIS-180-1
Branch piping 6	Total capacity of the connected indoor units 142	DIS-22-1
Branch piping 7	Total capacity of the connected indoor units 112	DIS-22-1

Notes (1) Make the selection based on the size of each piping for branch piping sets with different size connections.
(2) If diameter adjustment is need for branch connection and on the indoor unit side, always makes the adjustment at the branch connection.

Notes (1) Use the designated piping size for the piping between the outdoor unit and the first branch.
(2) Choose the appropriate sized reducer for piping between the branch pipe and the indoor unit.
The size of reducer should match the piping size of the indoor unit.
(3) Locate the branch pipe horizontally or vertically as illustrated on the right.



■ Header system
Outdoor unit: FDCA335HKXE4BR
Indoor unit: Combination of 8 units
[Header pipe set : HEAD8-371-1 × 1 set]
[Total capacity: 416]



• Selecting piping size

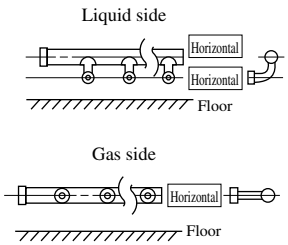
Item	Selection procedure	Piping size (mm)	
		Gas line	Liquid line
A	Same as the outdoor unit piping size	ø25.4	ø12.7
a	Indoor unit piping size (90)	ø15.88	ø9.52
b	Indoor unit piping size (90)	ø15.88	ø9.52
c	Indoor unit piping size (56)	ø12.7	ø6.35
d	Indoor unit piping size (36)	ø12.7	ø6.35
e			
f			
g			
h			

• Selection header pipe size

Item	Selection point	Model
Header	Total indoor unit capacity	HEAD8-371-1

Notes(1) Select the appropriate size of each pipe for the offset pipe joints included with the header set.
(2) If it is necessary to adjust the diameter of the header and indoor unit side piping, be sure to do so on the header side.

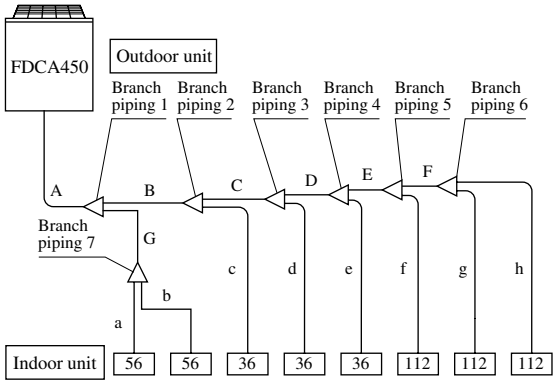
Remarks (1) Install the header so that both the gas pipe and liquid pipe are horizontal and so that branches are horizontal.



(2) It is not necessary to install a trap in the stand pipe.

Example of piping

■ Branch system (When piping length exceeds 90m)
Outdoor unit: FDCA450HKXE4BR
Indoor unit: Combination of 8 units
[Branch pipe set : DIS-540-1 × 1 set, DIS-371 × 3 set, DIS-180 × 2 set, DIS-22-1 × 1 set]
[Total capacity: 556]



• Selecting piping size

Item	Selection procedure	Piping size (mm)		
		Gas line	Liquid line	
A	Same as the outdoor unit piping size	ø31.8	ø12.7	
B	Total capacity of the connected indoor units 444	ø25.4	ø12.7	※1
C	Total capacity of the connected indoor units 408	ø25.4	ø12.7	※2
D	Total capacity of the connected indoor units 372	ø25.4	ø12.7	※3
E	Total capacity of the connected indoor units 336	ø19.05	ø12.7	
F	Total capacity of the connected indoor units 224	ø19.05	ø12.7	
G	Total capacity of the connected indoor units 112	ø15.88	ø9.52	
a	Indoor unit piping size (56).	ø12.7	ø6.35	
b	Indoor unit piping size (56).	ø12.7	ø6.35	
c	Indoor unit piping size (36).	ø12.7	ø6.35	
d	Indoor unit piping size (36).	ø12.7	ø6.35	
e	Indoor unit piping size (36).	ø12.7	ø6.35	
f	Indoor unit piping size (112).	ø15.88	ø9.52	
g	Indoor unit piping size (112).	ø15.88	ø9.52	
h	Indoor unit piping size (112).	ø15.88	ø9.52	

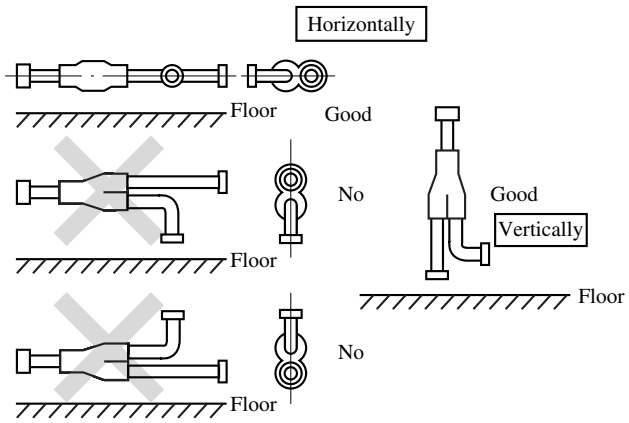
Note (1) Piping sizes for ※1, ※2, ※3 are as follows: When the total indoor unit capacity is 444 for ※1, 408 for ※2, and 372 for ※3, the gas side will be ø 25.4 and the liquid side will be ø15.88. Because the upstream liquid side is ø12.7, however, an adjustment must be made upstream.

• Selection of branch piping size.

Item	Selection procedure	Branch piping set
Branch piping 1	Total capacity of the connected indoor units 556	DIS-540-1
Branch piping 2	Total capacity of the connected indoor units 444	DIS-371-1
Branch piping 3	Total capacity of the connected indoor units 408	DIS-371-1
Branch piping 4	Total capacity of the connected indoor units 372	DIS-371-1
Branch piping 5	Total capacity of the connected indoor units 336	DIS-180-1
Branch piping 6	Total capacity of the connected indoor units 224	DIS-180-1
Branch piping 7	Total capacity of the connected indoor units 112	DIS-22-1

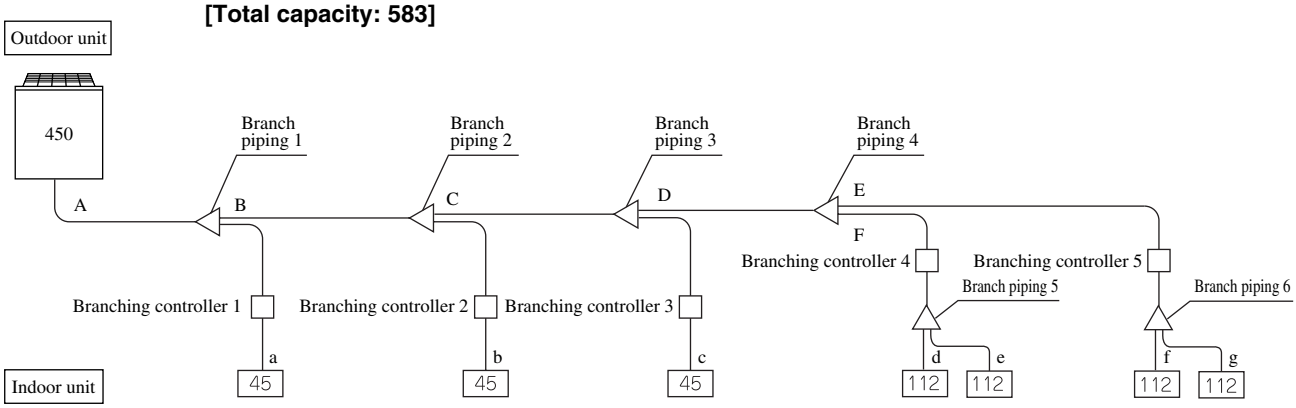
Notes (1) Make the selection based on the size of each piping for branch piping sets with different size connections.
(2) If diameter adjustment is need for branch connection and on the indoor unit side, always makes the adjustment at the branch connection.

Notes (1) Use the designated piping size for the piping between the outdoor unit and the first branch.
(2) Choose the appropriate sized reducer for piping between the branch pipe and the indoor unit.
The size of reducer should match the piping size of the indoor unit.
(3) Locate the branch pipe horizontally or vertically as illustrated to the right.



◆ **KXR series**

■ Branch system (Total piping length: 120 m)
Outdoor unit: FDCA450HKXRE4BR
Indoor unit: Combination of 8 units
[Branch pipe set : DIS-540-1-R × 1 set, DIS-371-1-R × 3 set, DIS-180-1 × 2 set]
[Total capacity: 583]

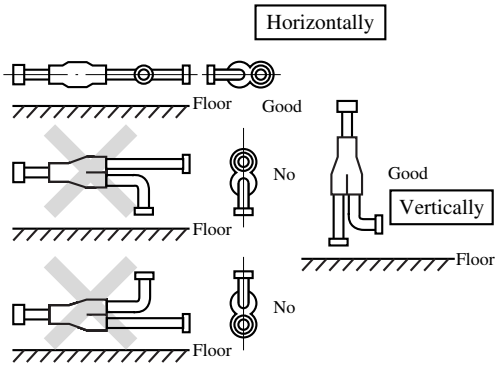


• Selecting piping size

Item	Selection procedure	Piping size (mm)			
		Suction gas line	Discharge gas line	Liquid line	
A	Same as the outdoor unit piping size	ø28.58	ø22.22	ø12.7	
B	Total capacity of the connected indoor units 538	ø28.58	ø22.22	ø12.7	*1
C	Total capacity of the connected indoor units 493	ø28.58	ø22.22	ø12.7	*2
D	Total capacity of the connected indoor units 448	ø28.58	ø22.22	ø12.7	*3
E	Total capacity of the connected indoor units 224	ø19.05	ø15.88	ø12.7	
F	Total capacity of the connected indoor units 224	ø19.05	ø15.88	ø12.7	
a	Indoor unit piping size (45).	ø12.7		ø6.35	
b	Indoor unit piping size (45).				
c	Indoor unit piping size (45).				
d	Indoor unit piping size (112).	ø15.88		ø9.52	
e	Indoor unit piping size (112).				
f	Indoor unit piping size (112).				
g	Indoor unit piping size (112).				

Notes (1) The sizes of piping marked * are indoor unit total capacity: 538 for *1, 493 for *2 and 448 for *3, and ø15.88 on the liquid line side in the case of downstream. However, since the liquid line side upstream pipe is ø12.7, it matches with that.

Notes (1) Use the designated piping size for the piping between the outdoor unit and the first branch.
(2) Choose the appropriate sized reducer for piping between the branch pipe and the indoor unit.
The size of reducer should match the piping size of the indoor unit.
(3) Locate the branch pipe horizontally or vertically as illustrated to the below.



• Selection of branch piping size.

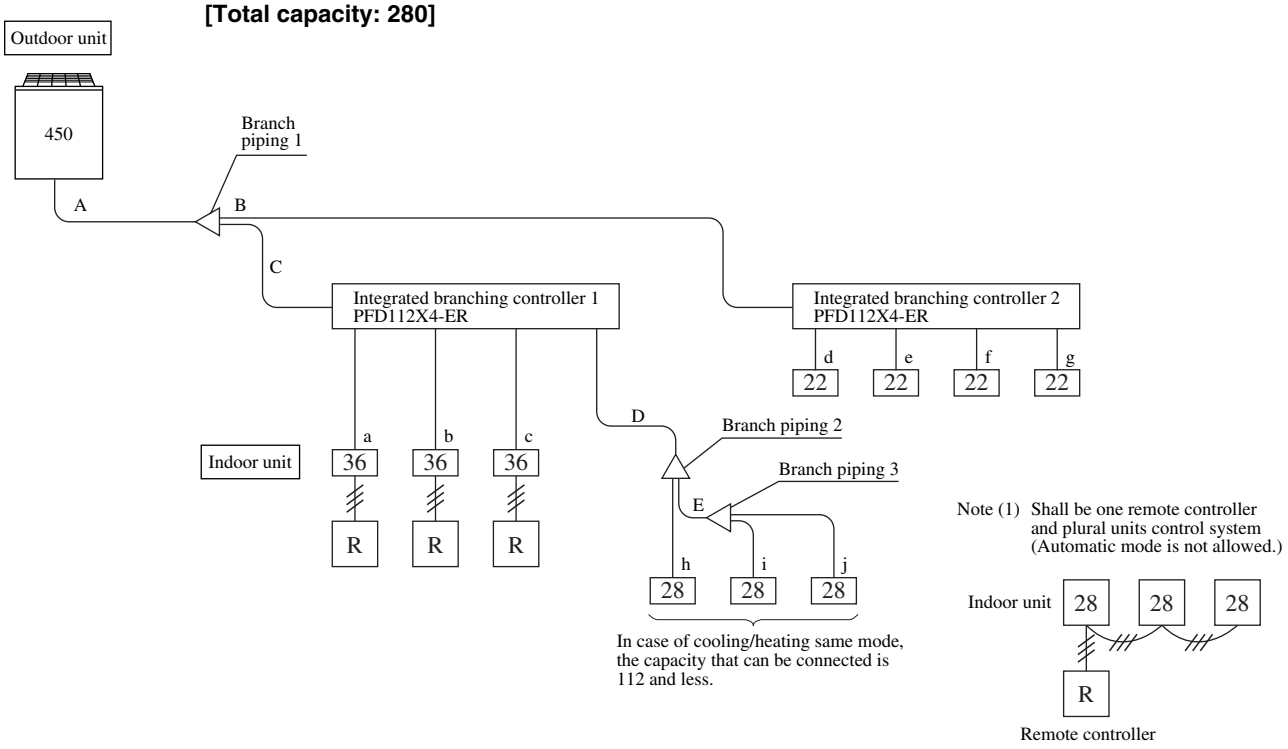
Item	Selection procedure	Branch piping set
Branch piping 1	Total capacity of the connected indoor units 583	DIS-540-1-R
Branch piping 2	Total capacity of the connected indoor units 538	DIS-371-1-R
Branch piping 3	Total capacity of the connected indoor units 493	DIS-371-1-R
Branch piping 4	Total capacity of the connected indoor units 448	DIS-371-1-R
Branch piping 5	Total capacity of the connected indoor units 224	DIS-180-1
Branch piping 6	Total capacity of the connected indoor units 224	DIS-180-1

Notes (1) Make the selection based on the size of each piping for branch piping sets with different size connections.
(2) If diameter adjustment is need for branch connection and on the indoor unit side, always makes the adjustment at the branch connection.

Item	Selection procedure	Branching controller model
Branch controller 1	Total capacity of the connected indoor units 45	PFD112-ER
Branch controller 2	Total capacity of the connected indoor units 45	PED112-ER
Branch controller 3	Total capacity of the connected indoor units 45	PED112-ER
Branch controller 4	Total capacity of the connected indoor units 224	PED280-ER
Branch controller 5	Total capacity of the connected indoor units 224	PED280-ER

Notes (1) Please select appropriate irregular joints for the branch controller (PFD112-ER, 280-ER) according to the pipe sizes to each indoor unit.

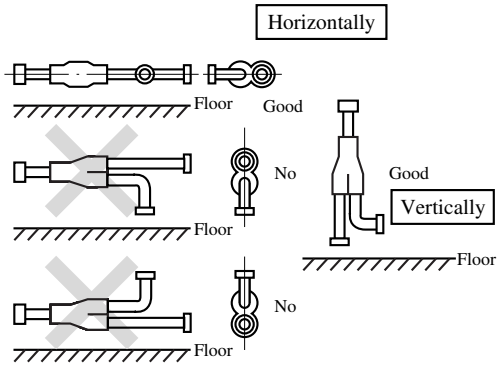
■ Integrated branching controller (Total piping length: 80 m)
Outdoor unit: FDCA450HKXRE4BR
Indoor unit: Combination of 8 units
[Branch pipe set : DIS-180-1-R × 1 set, DIS-22-1 × 2 set]
[Total capacity: 280]



• Selecting piping size

Item	Selection procedure	Piping size (mm)		
		Suction gas line	Discharge gas line	Liquid line
A	Same as the outdoor unit piping size	ø28.58	ø22.22	ø12.7
B	Total capacity of the connected indoor units 280	ø19.05	ø15.88	ø12.7
C	Total capacity of the connected indoor units 192	ø19.05	ø15.88	ø12.7
D	Total capacity of the connected indoor units 84	ø12.7	ø9.52	ø9.52
E	Total capacity of the connected indoor units 56	ø12.7	ø9.52	ø9.52
a	Indoor unit piping size (36).	ø12.7		ø6.35
b	Indoor unit piping size (36).			
c	Indoor unit piping size (36).			
d	Indoor unit piping size (22).	ø9.52		
e	Indoor unit piping size (22).			
f	Indoor unit piping size (22).			
g	Indoor unit piping size (22).			
h	Indoor unit piping size (28).			
i	Indoor unit piping size (28).			
j	Indoor unit piping size (28).			

Notes (1) Use the designated piping size for the piping between the outdoor unit and the first branch.
(2) Choose the appropriate sized reducer for piping between the branch pipe and the indoor unit.
The size of reducer should match the piping size of the indoor unit.
(3) Locate the branch pipe horizontally or vertically as illustrated to the below.



• Selection of branch piping size.

Item	Selection procedure	Branch piping set
Branch piping 1	Total capacity of the connected indoor units 280	DIS-180-1-R
Branch piping 2	Total capacity of the connected indoor units 84	DIS-22-1
Branch piping 3	Total capacity of the connected indoor units 56	DIS-22-1

Notes (1) Make the selection based on the size of each piping for branch piping sets with different size connections.
(2) If diameter adjustment is need for branch connection and on the indoor unit side, always makes the adjustment at the branch connection.

(d) Piping work

(i) On-site piping work

1) Important

a) Please take care so that installed pipes may not touch components within a unit.

b) Keep service valves closed while pipe installation work is underway.

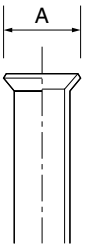
c) Give sufficient protections (compressed and brazed or by an adhesive tape) to pipe ends so that any water or foreign matters enter the pipes.

d) In bending a pipe, bend it to the largest possible radius (at least four times the pipe diameter). Do not bend a pipe repeatedly to corrent its from.

e) Pipes are to be flare connected at the following points : between an outdoor unit's liquid pipe and liquid refrig erant piping and between a branching controller and refrigerant piping. Flare a pipe after engaging a flare nut onto it. A flare size for R410A is different from that for conventional R407C. Although we recommend the use of flaring tools developed specifically for R410A, conventional flaring tools can also be used by adjusting the measurement of protrusion B with a protrusion control gauge.

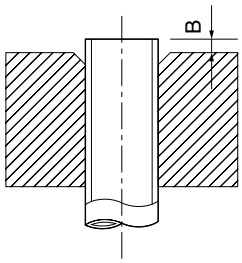
f) As it is a unit designed for R410A, the use of ester oil as flare joint oil is recommended.

g) Tighten a flare joint securely with double spanners. Observe flare nut tightening torque specified in the table below.



Flared pipe end: A (mm)

Copper pipe outer diameter	A $^{0}_{-0.4}$
ø6.35	9.1
ø9.52	13.2
ø12.7	16.6
ø15.88	19.7



Copper pipe protrusion for flaring: B (mm)

Copper pipe outer diameter	In the case of a rigid (clutch) type	
	With an R410A tool	With a conventional tool
ø6.35	0~0.5	0.7~1.3
ø9.52		
ø12.7		
ø15.88		

	Tightening torque
ø6.35	14 ~ 18N·m (1.4 ~ 1.8 kg·m)
ø9.52	34 ~ 42N·m (3.4 ~ 4.2 kg·m)
ø12.7	49 ~ 61N·m (4.9 ~ 6.1 kg·m)
ø15.88	68 ~ 82N·m (6.8 ~ 8.2 kg·m)

h) Pipes are to be brazed to connect an outdoor unit's gas pipe with refrigerant piping or refrigerant piping with a branching pipe set.

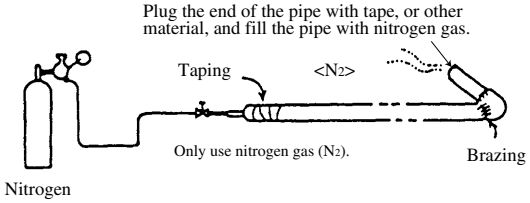
i) Brazing must be performed under a nitrogen gas flow. Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.

j) Brazing of the service valve and the pipes should be performed while cooling the valve body with a wet towel.

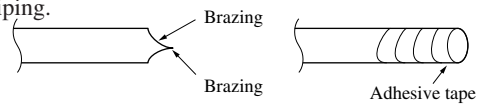
k) Perform flushing. To flush the piping, charge nitrogen gas at about 0.02 MPa with a pipe end closed with a hand. When pressure inside builds up to a sufficient level, remove the hand to flush. (in flushing a pipe, close the other end of the pipe with a plug).

2) Operation procedure

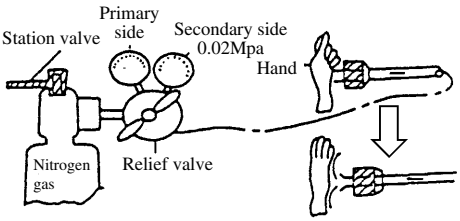
a) Brazing must be performed under a nitrogen gas flow. Without nitrogen gas, a large quantity of foreign matters (oxidized film) are created, causing a critical failure from capillary tube or expansion valve clogging.



b) Give sufficient protections (compressed and brazing or with an adhesive tape) so that water or foreign matters may not enter the piping.



c) Perform flushing. To flush the piping. charge nitrogen gas at about 0.02 MPa with a pipe end closed with a hand. When pressure inside builds up to a sufficient level, remove the hand to flush. (in flushing a pipe, close the other end of the pipe with a plug).



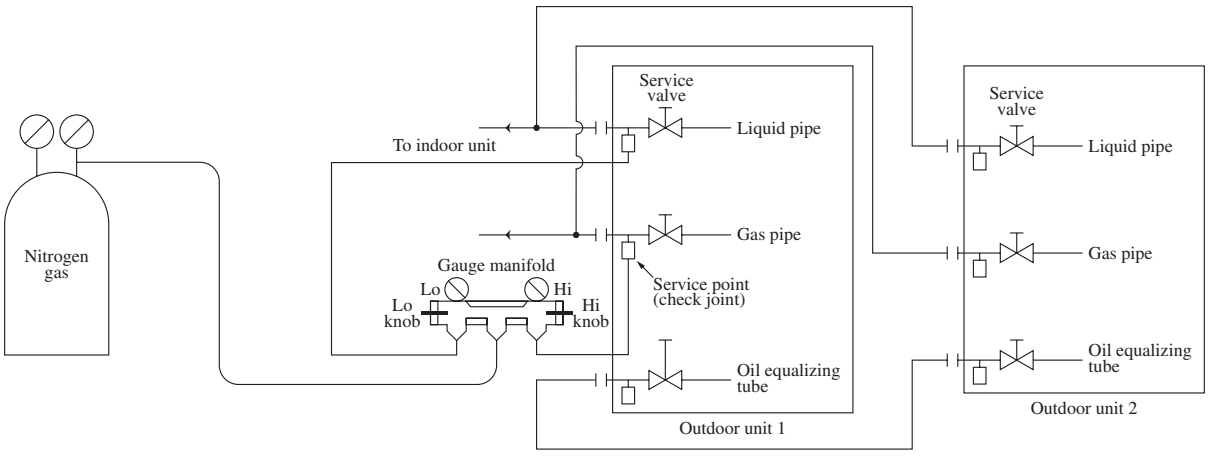
d) In laying pipes on the installation site, keep the service valves shut all the time.

e) In brazing an service valve and a pipe, braze them by cooling the valve main body with a wet towel or the like.

(ii) Air tightness test

◆ **KX series**

1) Although an outdoor unit itself has been tested for air tightness at the factory, please check the connected pipes and indoor units for air tightness from the check joint of the service valve on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
2) Since refrigerant piping is pressurized to the design pressure of a unit with nitrogen gas for testing air tightness, please connect instruments according the drawing below.
   Under no circumstances should chorine-based refrigerant, oxygen or any other combustible gas be used to pressurize a system keep the service valve shut all the time. Do not open it under any circumstances.
   Pressurize all of the liquid, gas and oil equalizing pipes.
3) In pressurizing the piping, do not apply the specified level of pressure all at once, but gradually raise pressure.
   a) Raise the pressure to 0.5 MPa, and stop. Leave it for five minutes to see if the pressure drops.
   b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
   c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
   d) If no pressure drop is observed with an installation pressurized to the specifed level and left for about one day, It is acceptable. When the ambient temperature changes 1˚C, the pressure also changes approximately 0.01 MPa. The pressure, if changed, should be compensated for.
   e) If a pressure drop is observed in checking e) and a) - d), a leak exists somewhere. Find a leak by applying bubble test liquid to welded parts and flare joints and repair it. After repair, conduct an air-tightness test again.
4) Always evacuate the pipes after the airtightness test.



◆ **KXR series**

1) Although an outdoor unit itself has been tested for air tightness at the factory, please check the connected pipes and indoor units for air tightness from the check joint of the service valve on the outdoor unit side. While conducting a test, keep the service valve shut all the time.
2) Since refrigerant piping is pressurized to the design pressure of a unit with nitrogen gas for testing air tightness, please connect instruments according the drawing below.

   Under no circumstances should chorine-based refrigerant, oxygen or any other combustible gas be used to pressurize a system keep the service valve shut all the time. Do not open it under any circumstances.

   Pressurize all of the liquid and suction gas, discharge gas and oil equalizing pipes.
3) In pressurizing the piping, do not apply the specified level of pressure all at once, but gradually raise pressure.
   a) Raise the pressure to 0.5 MPa, and stop. Leave it for five minutes to see if the pressure drops.
   b) Then raise the pressure to 1.5 MPa, and stop. Leave it for five more minutes to see if the pressure drops.
   c) Then raise the pressure to the specified level (4.15 MPa), and record the ambient temperature and the pressure.
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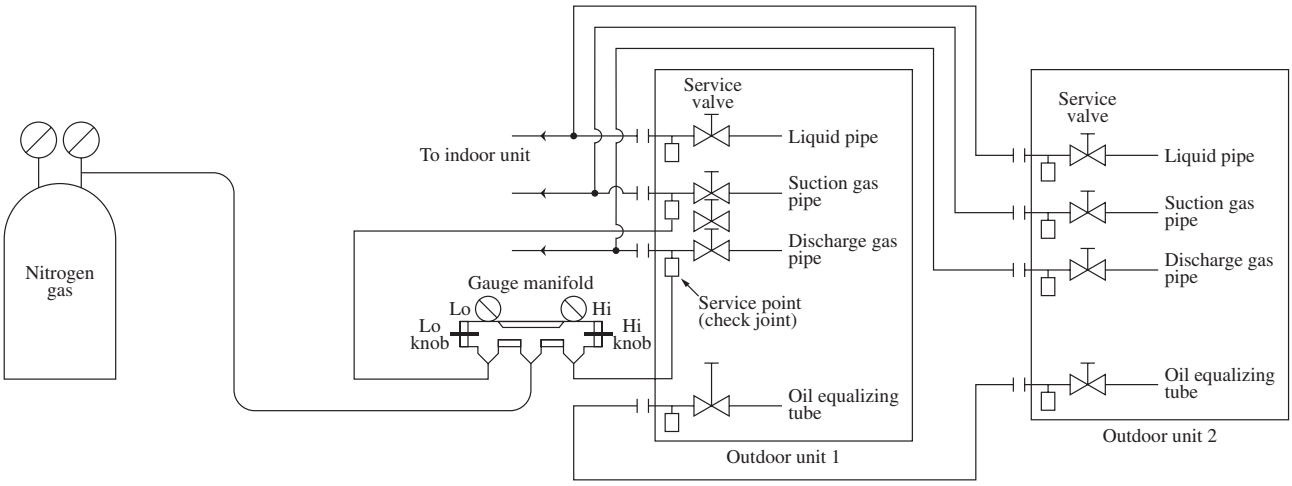
4) Always evacuate the pipes after the airtightness test.

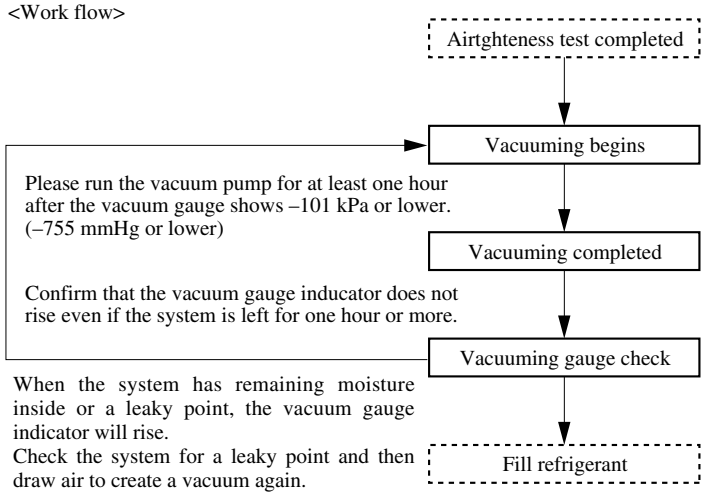


(iii) EVACUATION

Please pull air from the check joints of the service valves on both gas and liquid pipe(KX series) or suction and discharge gas(KXR series) sides.

Please also pull air from the oil equalizing pipe. (Please pull air separately from the rest of the piping by using the oil equalizing valve check jpint)

<Work flow>



Pay attention to the following points in addition to the above for the R410A and compatible machines.

○ To prevent a different oil from entering, please assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R470C, etc.).

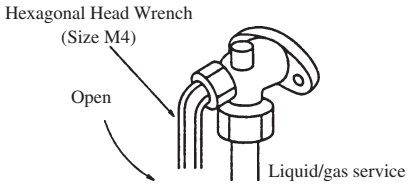
○ Use a counterflow prevention adapter to prevent vacuum pump oil from entering the refrigerant system.

(iv) Method of operating service valves

◆ Models FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R

1) When a vacuum air purge is completed, remove the valve rod cap nuts and open the service valves (both liquid and gas sides) as illustrated below. After you have made sure that the valves are in the full-open position, tighten the cap nuts (for the valve rods and charge ports).

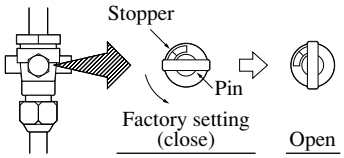
▶ Hexagonal wrench type



- Open the valve rod until it touches the stopper.
- You need not apply force to push it further.
- When an operation is completed, replace the cap nut and tighten it as before.

▶ Pin type

Remove the hexagon cap nut, set it as illustrated in the drawing below.

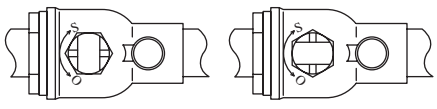


- When a pin setting operation is completed, replace the cap nut and tighten it as before.

◆ Models FDCA224~1360HKXE4BR, 224~1360HKXRE4BR

Method of opening/closing a valve

1) Remove the cap, turn the gas pipe side until comes to the "Closed" position as indicated in the drawing on the right.
2) For the liquid side pipe and oil equalizing pipe side, turn with a hexagonal wrench until the shaft stops. If excessive force is applied, the valve main body can be damaged. Always use a dedicated special tool.
3) Tighten the cap securely.
   For tightening torque, refer to the table next page.



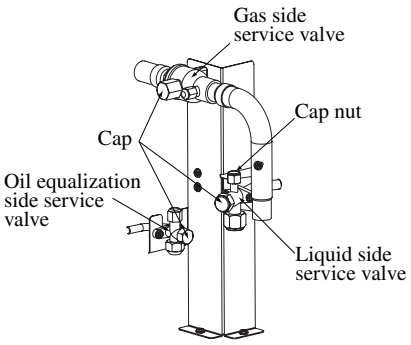
3) Tighten the cap securely.

For tightening torque, refer to the table below.

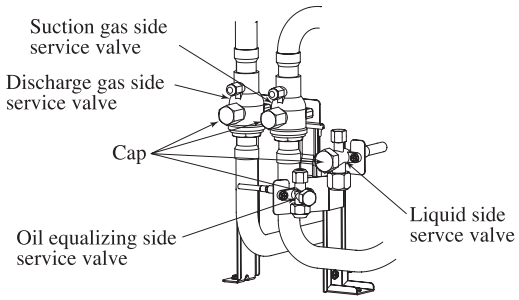
	Tightening torque N · m		
	Shaft (valve main body)	Cap (lid)	Cap nut (check joint section)
For gas pipes	7 or less	30 or less	13
For liquid pipes	7.85 (MAX 15.7)	29.4 (MAX 39.2)	8.8 (MAX 14.7)
For oil equalizing pipes	4.9 (MAX 11.8)	16.2 (MAX 24.5)	8.8 (MAX 14.7)

For flare nut tightening torque, please refer to Section (d)–(i) Piping work on the installation site.

◆ **KX series**



◆ **KXR series**



(v) Additional refrigerant charge

Charge additional refrigerant in the liquid state.

Be sure to use a scale to measure the filling amount when adding refrigerant. If you cannot charge all refrigerant with the outdoor unit lying idle, charge it with the unit running in the test run mode. If operated for a long time with insufficient refrigerant the compressor will be damaged. (In particular, when adding refrigerant during operation, complete the job within 30 min.)

Fill this unit only with the standard amount of refrigerant (piping length 0 m fill quantity).

Determine the amount of refrigerant to be charged additionally using the following formula and put down the amount of refrigerant added on the refrigerant charge volume recording plate provided on the back of the side panel.

1) Additional charge amount

Item / Model	Additional charge amount per 1 m of liquid pipe						Factory charge amount at time of shipment	
	ø22.2	ø19.05	ø15.88	ø12.7	ø9.52	ø6.35	Outdoor unit	Remarks
FDCA140	–	–	–	–	–	–	7.5kg	Supplemental charges unnecessary
FDCA160								
FDCA224	0.35 kg/m	0.25 kg/m	0.17 kg/m	0.11 kg/m	0.054 kg/m	0.022 kg/m	14.2 kg	Additional refrigeramt Charge is not required
FDCA280								
FDCA335								
FDCA335-K							17.0 kg	
FDCA400								
FDCA450								
FDCA504							19.4 kg	
FDCA560								
FDCA615							26.2 kg	
FDCA680								

Correction coefficient in accordance with the outdoor unit capacity.(KXR series only)

Outdoor unit capacity	FDCA224~680	FDCA735~1360
A	1.3	1.2

Calculation of amount of refrigerant to be charged in local piping

The amount refrigerant additionally charged in local piping depends on connection pipe size but not on indoor unit type.

[Amount of refrigerant to be charged in the local piping = Actual length of liquid pipe Amount of refrigerant additionally charged per meter of liquid pipe]

[Example] Amount of refrigerant additionally charged = {(ℓ 1 × 0.35) + (ℓ 2 × 0.25) + (ℓ 3 × 0.17) + (ℓ 4 × 0.11) + (ℓ 5× 0.054) + (ℓ 6 × 0.022)} × A

ℓ 1: Overall length (m) of ø22.22 liquid pipe

ℓ 2: Overall length (m) of ø19.05 liquid pipe

ℓ 3: Overall length (m) of ø15.88 liquid pipe

ℓ 4: Overall length (m) of ø12.7 liquid pipe

ℓ 5: Overall length (m) of ø9.52 liquid pipe

ℓ 6: Overall length (m) of ø6.35 liquid pipe

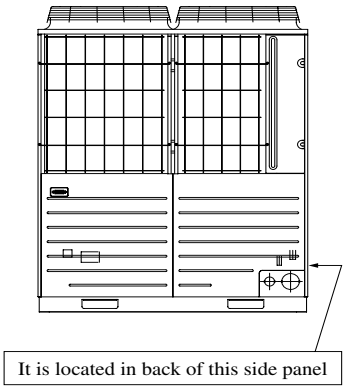
A: Factor determinede by the outdoor unit capacity

Pay attention to the following points in addition to the above for the R410A and compatible machines.

- To prevent a different oil from entering, please assign dedicated tools, etc. to each refrigerant type. Under no circumstances must a gauge manifold and a charge hose in particular be shared with other refrigerant types (R22, R470C, etc.).
- Do not use a charge cylinder under any circumstances. There is a danger that the composition of the refrigerant will change when R410A is transferred to a cylindser.
- When charging refrigerant, use liquid refrigerant from a cylinder from liquid side service valve. If refrigerant is charged in a gas form, the composition may change considerably.

Please note

Put down on the refrigerant charge volume recording plate provided on the back of the side panel the amount of refrigerant calculated from the pipe length and the amount charged.



(vi) Heating and condensation prevention

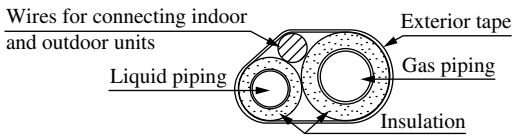
1) Dress refrigerant pipes (both gas and liquid pipes) for heat insulation and prevention of dew condensation. Improper heat insulation/anti-dew dressing can result in a water leak or dripping causing damage to household effects, etc.
2) Use a heat insulating material that can withstand 120˚C or a higher temperature. Poor heat insulating capacity can cause heat insulation problems or cable deterioration.

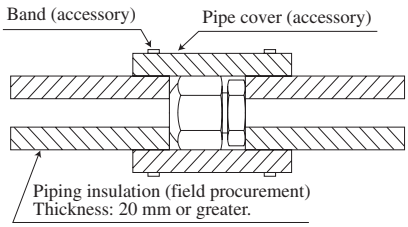
a) The suction gas pipe can cause during a cooling operation dew condensation, which will become drain water causing a possible water-leak accident, while the dischrge gas pipe can reach during a heating operation as high a temperature as 60˚C to 110˚C, posing a risk of bums, when touched accidentally. So, do not fail to dress them with heat insulation material.

b) Warp all flare joints for indoor units and branching controller with heat insulating parts (pipe cover) for heat insulation (both gas and liquid pipes).

c) Give heat insulation to suction gas and discharge gas pipes and liquid side pipes. Bundle a heat insulating material and a pipe tightly together so that no gaps may be left between them and warp them together with a connecting cable by a dressing tape.

d) Although this air conditioning unit has been tested under the ISO condensation test conditions, the dripping of water may occur when it is operated in a high-humidity atmosphere (28˚C or a higher dew point temperature). In such a case, apply an additional heat insulation material of 10 to 20 mm thick to dress an indoor unit body, piping and drain pipes.





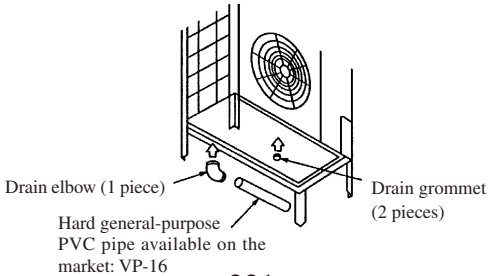
(e) Drainage (Model FDCA140 and FDCA160 only)

1) Where drain water from the outdoor unit causes problems, implement drain piping with drain elbows and drain gromments, which are supplied separately as option parts.

2) There are 3 holes in the bottom panel of the outdoor unit to drain condensation.

3) Where condensate is guided to a drain, install the unit on a flat base (an option part supplied separately) or concrete blocks.

4) Connect a drain elbow as illustrated and plug the other holes with grommets.



(5) Electric wiring

Electrical installation work must be performed by an electrical installation service provider qualified by a power provider of the country.

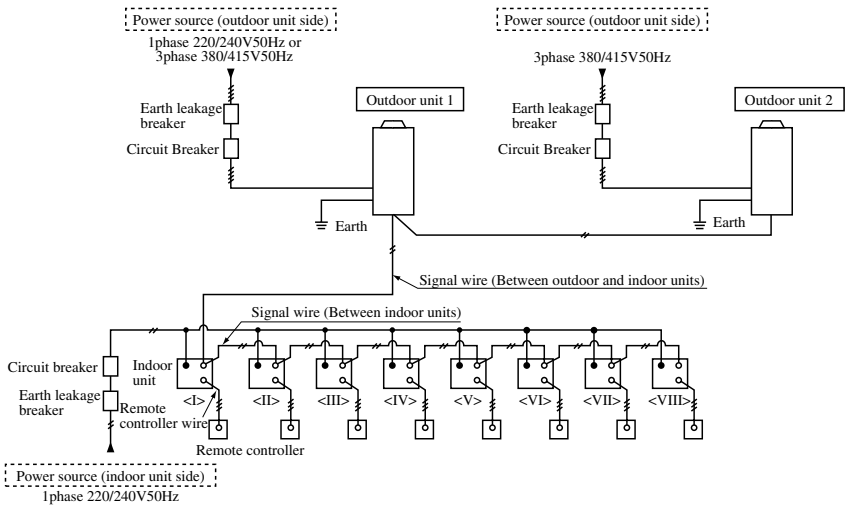
Electrical installation work must be executed according to the technical standards and other regulations applicable to electrical installations in the country.

⚠ **Please install an earth leakage breaker without fail. The installation of an earth leakage breaker is compulsory in order to prevent electric shocks or fire accidents.**

Please note

① Use only copper wires.
Do not use any supply cord lighter than one specified in parentheses for each type below.
• braided cord (cde designation 60245 IEC 51), if allowed in the relevant part 2;
• ordinary tough rubber sheathed cord (code designation 60245 IEC 53);
• flat twin tinsel cord (code designation 60227 IEC 41)
• ordinary polyvinyl chloride sheathed cord (code designation 60227 IEC 53).
Please do not use anything lighter than polychloroprene sheathed flexible cord (cord designation 60245 IEC 57) for supply cords of parts of appliances for outdoor use.
② Use separate power supplies for the indoor and outdoor units.
③ Ground the unit. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or telephone grounding wire. If improperly grounded, an electric shock or malfunction may result.
④ A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.
⑤ The installation of an impulse withstanding type earth leakage breaker is neccessary. A failure to install an earth leakage breaker can result in an accident such as an electric shock or a fire. Do not turn on the power until the electrical work is completed. Be sure to turn off the power when servicing.
⑥ Please do not use a condensive capacitor for power factor improvement under any circumstances. (It does not improve power factor, while it can cause an abnormal overheat accident)
⑦ For power supply cables, use conduits.
⑧ Please do not lay electronic control cables (remote control and signaling wires) and other cables together outside the unit. Laying them together can result in malfunctioning or a failure of the unit due to electric noises.
⑨ Power cables and signaling wires must always be connected to the power cable terminal block and secured by cable fastening clamps provided in the unit.
⑩ Fasten cable so that they may not touch the piping etc.
⑪ When cables are connected, please make sure that all electrical components within the electrical component box are free of loose connector coupling or terminal connection and then attach the cover securely. (Improper cover attachment can result in malfunctioning or a failure of the unit, if water penetrates into the box.)
⑫ A grounding wire must be connected before connecting the power cable. Provide a grounding wire longer than the power cable.

(a) Wiring system diagrams



(b) Method of connecting power cables

(i) Method of leading out cables

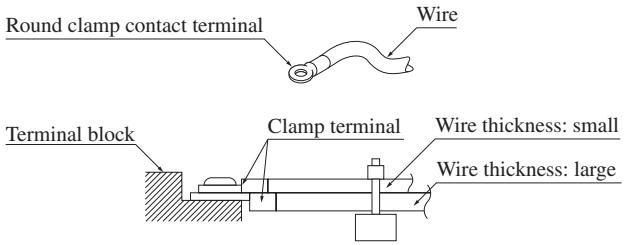
1) Cables can be laid through the front, right, left (FDCA224~1360 only), bottom . or rear (FDCA140, 160 only) casing.
2) In wiring on the installation site, cut off a knock-out [ø50 or oblong hole measuring 40 × 80 (FDCA224~1360 only)] covering a penetration of the casing with nippers.

(ii) Notabilia in connecting power cables

Power cables must always be connected to the power cable terminal block and clamped outside the electrical component box.

In connecting to the power cable terminal block, use round solderless terminals.

1) Use specified wires in wiring, and fasten them securely in such a manner that the terminal blocks are not subject to external force.
2) In fastening a screw of a terminal block, use a correct-size drive.
   Fastening a screw of a terminal block with excessive force can break the screw.
3) When electrical installation work is completed, make sure that all electrical components within the electrical compo nent box are free of loose connector coupling or terminal connection.



Tightening torque (N·m)		
M4	Terminal block for signal wires	0.68 ~ 0.82
M8	Grounding wire	5.97 ~ 7.25
M12	Power supply terminal block	22.05 ~ 26.46

(iii) Outdoor unit power supply specifications

Model	Power source	Cable size for power source (mm^2)	Wire length (m)	Moulded-case circuit breaker (A)		Earth leakage breaker	Earth wire	
				Rated current	Switch capacity		Size (mm^2)	Screw type
FDCA140	1phase 2 wire 220/240V 50Hz	3.5	13	30	30	30A30mA less than 0.1 sec	2.0	M5
FDCA140	3-phase 4 wire 380/415V 50Hz	3.5	35	30	30	30A30mA less than 0.1 sec	2.0	M5
FDCA160								
FDCA224		5.5	54	40	50	60A100mA less than 0.1 sec	3.5	M5
FDCA280		5.5	54	40	50	60A100mA less than 0.1 sec	3.5	M5
FDCA335		5.5	54	40	50	60A100mA less than 0.1 sec	3.5	M5
FDCA335-K		14	76	60	60	60A100mA less than 0.1 sec	5.5	M5
FDCA400 ~680		14	76	60	60	60A100mA less than 0.1 sec	5.5	M5

Please note

① The method of laying cables has been determined pursuant to the Japanese indoor wiring regulations (JEAC8001). (Please adapt it to the regulations in effect in each country)
② In the case of distributed, separate power supply system, the listed data represent those of an outdoor unit.
③ For details, please refer to the installation manual supplied with the indoor.

(iv) Indoor unit power supply specifications

Combined total capacity of indoor units	Cable size for power source (mm^2)	Wire length (m)	Moulded-case circuit breaker (For ground fault, overload and short circuit protection)	Signal wire size (mm^2)	
				Outdoor-Indoor	Indoor-Indoor
Less than 7A	2	21	20A100mA less than 0.1 sec	2cores × 0.75-2.0	2cores × 0.75-2.0
Less than 11A	3.5	21	20A100mA less than 0.1 sec		
Less than 12A	5.5	33	20A100mA less than 0.1 sec		
Less than 16A	5.5	24	30A100mA less than 0.1 sec		
Less than 19A	5.5	20	40A100mA less than 0.1 sec		
Less than 22A	8	27	40A100mA less than 0.1 sec		
Less than 28A	8	21	50A100mA less than 0.1 sec		

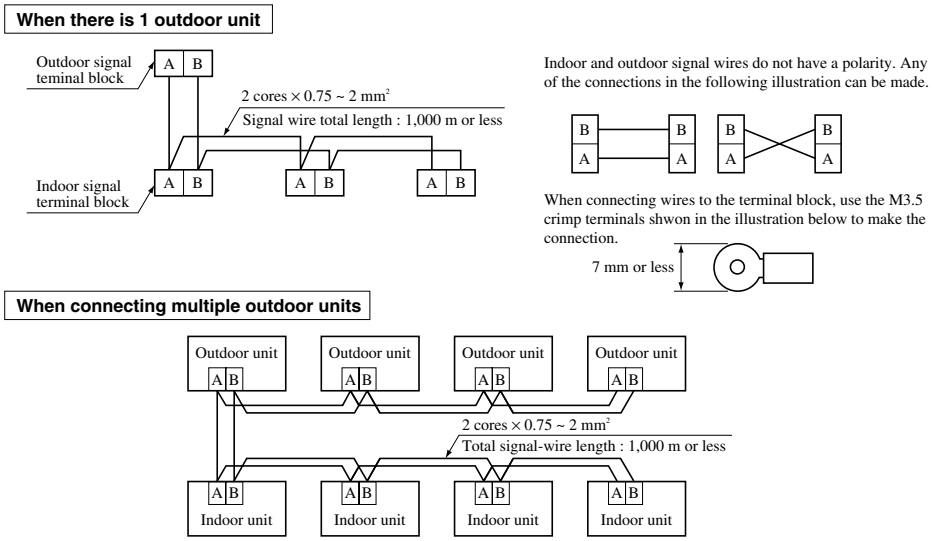
Please note

① The method of laying cables has been determined pursuant to the Japanese indoor wiring regulations (JEAC8001). (Please adapt it to the regulations in effect in each country)
② Wire length in the table above is the value for when the indoor unit is connect to the power cable in series also the wire size and minimum length when the power drop is less than 2% are shown. If the current exceeds the value in the table above, change the wire size according to the indoor wiring regulations. (Please adapt it to the regulations in effect in each country)
③ For details, please refer to the installation manual supplied with the indoor unit.

(c) Method of connecting signaling wires

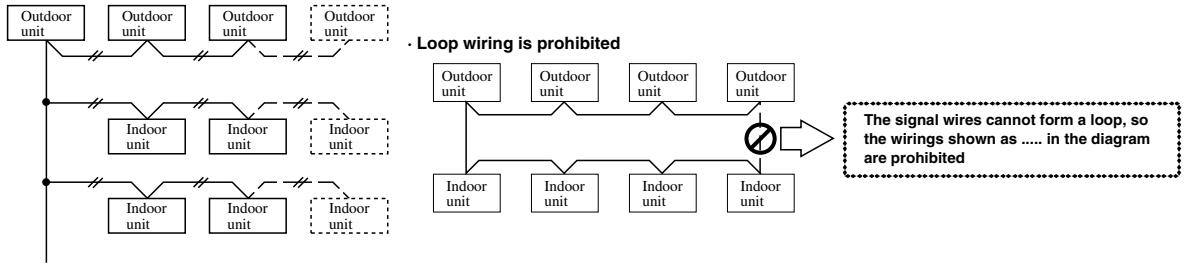
- The signal wires are 5VDC, so absolutely do not connect them to a 220/240V wire. If such a connection is mistakenly made, all the printed circuit boards will be burned out. Signal wires do not have a polarity. Connect them between the indoor and outdoor units, between indoor units, between indoor units, and between the same terminal Nos. (Connection between (A) and (A), (B) and (B).)
- Please use shielded cords for signaling wires. (For grounding of a shielded cord, find a point of connection to the metal casing in the proximity of the terminal block for the AB lines)

Indoor and outdoor signal wires



(i) The maximum number of indoor units that can be connected in a system is 48 and it is possible to configure outdoor units and/or indoor units as an outdoor or indoor unit group connected with each other with two connecting wires.

(ii) The signal wires can also be connected using the method shown below.



(d) Remote controller wiring specifications

(i) For the remote controller the standard wire is 0.3mm² × 3 cores. The max. length is up to 600m. When the wire is more than 100m long, use the wire shown in the following table.

Length (m)	Wire size
100 to 200	0.5mm² × 3 cores
To 300	0.75mm² × 3 cores
To 400	1.25mm² × 3 cores
To 600	2.0mm² × 3 cores

(ii) When the remote controller wire runs parallel to another power supply wire or when it is subject to outside noise, such as from a high-frequency device, use shielded wire. (Be sure to ground only one end of the shielded wire.)

(e) Unit address setting

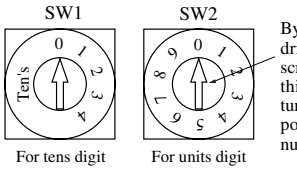
This control system controls the controllers of more than one air conditioner's outdoor unit, indoor unit and remote control unit through communication control, using the microcomputers built in the respective controllers. Address setting needs to be done for both outdoor and indoor units. Turn on power in the order of the units and then the indoor units. Use 1 minute as the rule of thumb for an interval between them.

(i) Outdoor unit address setting

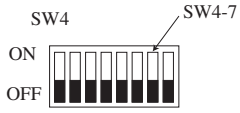
In setting an address to an outdoor unit, use the rotary switches for setting an outdoor unit number to be used in communications with indoor units and the dipswitch for master/slave setting. (When an outdoor unit is used as a standalone installation, it is not necessary to set the dipswitch for master/slave setting)

There are rotary switches for outdoor unit number setting and a dipswitch for master/slave setting provided on the controller board.

SW1: Outdoor No. switch (tens digit) [0-4]
SW2: Outdoor No. switch (units digit) [0-9]
SW4-7: Master/slave setting switches
[OFF is for setting as a master unit and ON, a slave unit
The factory setting for shipment is OFF.]



Outdoor unit rotary switches (SW)



Outdoor unit dip switches (SW)

When outdoor units are used in combination, it is essential to specify the master and slave. Set one of the two outdoor units to the master and other to the slave.
(You can whichever one for the master)

1) Automatic address setting

Set as follows before power is turned on: Turning on power will cause the address to be registered with the outdoor unit.

a) Set the rotary switches for outdoor unit number setting to "49" or "48", the default setting for shipment.
b) Similarly, set the rotary switches for outdoor unit number setting to "49" or "48", the default setting for shipment, for the master unit used in a combined installation. Dip switch SW4-7 should be set to OFF.
c) Similarly, set the rotary switches for outdoor unit number setting to "49" or "48", the default setting for shipment, for the slave unit used in a combined installation.
Then, set the dipswitch SW4-7 for master/slave setting to ON.

Outdoor unit	SW1	SW2	SW4-7	Address on a network
Master unit	4	8 or 9	OFF	49
Slave unit	4	8 or 9	ON	00

The master unit will be registered as "49" regardless of the SW1 and SW2 setting (48 or 49)
The slave unit will be registered as "00" as indicated in the table above because of the SW4-7 setting.

2) Manual or remote control address setting

Set as follows before power is turned on: Turning on power will cause the address to be registered with the outdoor unit.

a) Set the rotary switches for outdoor unit number setting to a number within the range of 00 to 47.
In setting a number, care must be taken so that no duplicating outdoor unit number is assigned in the same network.
b) Similarly, set the rotary switches for master outdoor unit number setting to a number within the range of 00 to 47 for the master unit used in a combined installation.
c) For the slave unit used in a combined installation, set the rotary switches for outdoor unit number setting to the same number with the master unit and then set the dipswitch SW4-7 for master/slave setting to ON.

Refrigerant system	Outdoor unit	SW1	SW2	SW4-7	Address on a network
A	Master unit	3	2	OFF	32
	Slave unit	3	2	ON	33
B	Master unit	3	4	OFF	34
	Slave unit	3	4	ON	35

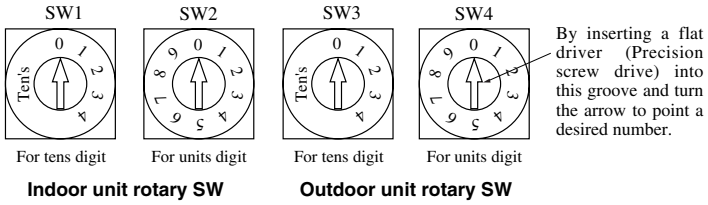
This table shows the examples of address settings. The network address of a slave unit is set to the master unit address+1. When the network address of a slave unit exceeds 47, then it will be set from 00 in the ascending order. When successive addresses are set, care must be taken so that an address duplicating with one used for a slave unit in the refrigerant system A is not used for the master unit of refrigerant system B.

(ii) Indoor unit address setting

In setting an address to an indoor unit, use the switches for setting an indoor unit number to be used in communications with outdoor units and the switches for outdoor unit number setting.

An indoor unit has two sets of switches (four in total) to set indoor unit and outdoor unit numbers.

SW1: Indoor No. switch (tens digit) [0-4]
SW2: Indoor No. switch (units digit) [0-9]
SW3: Outdoor No. switch (tens digit) [0-4]
SW4: Outdoor No. switch (units digit) [0-9]



1) Automatic address setting

Set as follows before power is turned on: Turning on power will cause the address to be registered with the indoor unit.

a) Set the rotary switches for indoor unit number setting to “49” or “48”, “49” is the default setting for shipment.
b) Set the rotary switches for outdoor unit number setting to “49” or “48”, “49” is the default setting for shipment.
Turn on power in the order of the outdoor units and the indoor units. Use over 1 minute as the rule of thumb for interval between them.

Please note

Turn on power to centralized controls when addresses are set.
When power is turned on in the wrong order, a failure to recognize addresses may occur.

2) Manual address setting

Set as follows before power is turned on: Turning on power will cause the address to be registered with the indoor unit.

a) Set the rotary switches for indoor unit number setting to a number within tne range of 00 to 47.
In setting a number, care must be taken so that no duplicating indoor unit number is assigned in the same network.
b) Set the rotary switches for outdoor unit number setting to the corresponding outdoor unit’s address number within the range of 00 to 47.
Turn on power in the order of the outdoor units and then the indoor units. Use over 1 minute as the rule of thumb for an interval between them.

Please note

You can set addresses when one or more refrigerant systems are connected in a network.
When more than one unit are controlled from a remote control unit, care must be taken so that duplicating indoor unit number is assigned within the group of units placed under the remote control unit.
When the outdoor units are used in combination, set the rotary switches for outdoor unit number setting to the corresponding master outdoor unit's address number within the range of 00 to 47.

3) Remote control address setting

Set as follows before power is turned on. (Same as automatic address setting)

a) Set the rotary switches for indoor unit number setting to “49” to “48”, “49” is the default setting for shipment.
b) Set the rotary switches for outdoor unit number setting to “49” to “48”, “49” is the default setting for shipment.
After completing of the above-mentioned switch setting, turn on power in the order of the outdoor units and then the indoor units. Use over 1 minute as the rule of thumb for an interval between them.
Press down the “Air conditioner No.” switch of the remote control unit for 3 seconds or longer. “Outdoor No. setting” will appear on the dot display of the remote control unit.
Set an outdoor number by pressing either ▲ or ▼ switch on the remote control unit. When the outdoor number is set, press the “Set” switch of the remote control unit.
This completes outdoor unit number setting, so move to indoor unit number setting. As with outdoor unit number setting, press either ▲ or ▼ switch on the remote control unit to set an indoor unit number
When the indoor number is set, press the “Set” switch of the remote control unit. The number accepted by the remote control unit as an entry blinks on the dot display for about 2 seconds and then the display returns to its normal screen.

Please note

You can set address when one or more refrigerant systems are connected in a network.
It is possible when an indoor unit and a remote control unit are connected in a one-to-one configuration. (It is not allowed to control more than one unit from one remote control unit)
When two remote control units are connected to an indoor unit, it is allowed to set from the master remote control unit only.
Address setting is accepted only when the unit is not in operation. Addresses cannot be set from a slave control unit.

Please note

Turn on power to centralized controls when addresses are set.
When power is turned on in the wrong order, a failure to recognize addresses may occur.

(iii) Error indication associated with address setting

1) When more than one module using automatic address setting exist on a network, E31 will be displayed on a remote control unit as an error code indicating a duplicating outdoor unit address.
2) When 49 or more indoor units are connected, E2 will be displayed on a remote control unit as an error code indicating a duplicating indoor unit address, because the network bounds to involve a duplicating indoor unit address.
3) When addresses set automatically and addresses set with a remote control unit exist on a network, E46 will be displayed on a remote control unit as an error code indicating incorrect address setting.
4) When an outdoor unit number that does not exist on the network is specified in remote control address setting, E3 will be displayed on a remote control unit as an error code indicating incorrect pairing of indoor-outdoor units.
5) When more than one indoor unit are connected to a remote control unit in remote control address setting, E11 will be displayed on a remote control unit.
6) When an indoor unit number that has been registered with the network is specified in remote control address setting, E2 will be displayed on a remote control unit as an error code indicating a duplicating indoor unit address.
7) When no unit designated as the master exist in an outdoor unit group, E3 will be displayed on a remote control unit as an error code indicating a network communication error.
8) When more than one unit designated as a master exist in an outdoor unit group, E31 will be displayed on a remote control unit an error code indicating incorrect outdoor unit address setting.
9) When more than one unit designated as a slave exist in an outdoor unit group, E31 will be displayed on a remote control unit as an error code indicating incorrect outdoor unit address setting.
10) When the outdoor units are used in combination and you have forgotten master/slave setting (SW4-7), E31 will be displayed as an error code indicating a duplicating address.

Method for clearing addresses stored in the memory by automatic or remote control address setting.

○ Press the “Fan Speed” switch while the “Check” and “Timer” switches are depressed. (Depress three switches at a time) This will clear the addresses stored in the memory.
When the indoor units and outdoor units are turned off and then on again, they will return to the state before address setting, allowing you to set addresses again.

(6) Setting function with the remote controller

(a) The factory settings of this unit's functions are as follows: If you want to charge a setting, follow the procedure found in the installation manual and set to your desired setting.

For the method of setting, please refer to the installation manual of a remote control unit.

Remote control unit functions (FUNCTION ▼)

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ	Factory setting
01	GRILLE SET (Grille lift panel setting)	INVALID	○
		50Hz AREA ONLY	
		60Hz AREA ONLY	
02	AUTO RUN SET	AUTO RUN ON	※
		AUTO RUN OFF	
03	TEMP S/W	VALID	○
		INVALID	
04	MODE S/W	VALID	○
		INVALID	
05	ON/OFF S/W	VALID	○
		INVALID	
06	FANSPEED S/W	VALID	○
		INVALID	
07	LOUVER S/W	VALID	※
		INVALID	
08	TIMER S/W	VALID	○
		INVALID	
09	SENSOR S/W (Remote control sensor setting)	INSENSOR OFF (Invalid)	○
		SENSOR ON (Valid)	
10	POWER FAILURE COMPENSATION SET	INVALID	○
		VALID	
11	VENTI SET	NO VENTI	○
		VENTI LINK SET	
		NO VENTI LINK	
12	TEMP RANGE SET	DISP CHARGE	
		NO DISP CHARGE	○
13	I/U FAN SPEED (Indoor unit fan speed setting)	3 FAN SPEED	※
		2 FAN SPEED	
		1 FAN SPEED	
14	MODEL TYPE	HEAT PUMP	※
		COOLING ONLY	
15	EXTERNAL CONTROL SET	INDIVIDUAL OPERATION	○
		SAME OPERATION FOR ALL UNITS	
16	ERROR DISP SET	ERROR DISP	○
		NO ERROR DISP	
17	POSITION (Louver control setting)	FIX (1 OF 4) (4 position stop)	○
		IN MOTION (Free stop)	
18	°C/°F SET	°C	○
		°F	

Notes (1) Setting marked with [○] are the default settings.

(2) Setting marked with [※] are those that are set automatically according to an indoor unit or an outdoor unit connected.
Please check default settings with the indoor unit's installation manual.

(3) When Item 17 " POSITION " is changed, please also change Item 04 " POSITION " setting found in " Indoor unit functions."

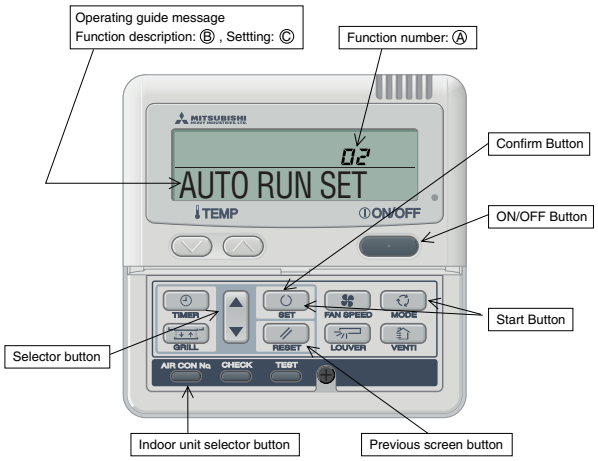
Indoor unit functions (I/U FUNCTION ▲)

Function number Ⓐ	Function description Ⓑ	Setting Ⓒ	Factory setting
01	Hi CEILING SET	STANDARD	○
		Hi CEILING 1	
03	FILTER SIGN SET	NO DISPLAY	
		AFTER 180H	
		AFTER 600H	○
		AFTER 1000H	
		1000H→STOP	
04	POSITION (Louver control setting)	FIX (1 OF 4) (4 positiion stop)	○
		IN MOTION (Free stop)	
05	EXTERNAL INPUT SET	LE VEL INPUT	○
		PULSE INPUT	
06	OPERATION PERMISSION PROHIBITED	NORMAL OPERATION	○
		VALID	
07	ROOM TEMP OFF SET (Heating room temperature off set)	NORMAL OPERATION	○
		TEMP SHIFT +3˚C	
08	FAN CONTROL (Heating fan control)	LOW FAN	※
		STOP→LOW FAN (Intermittent operation)	
09	FREEZE PREVENT TEMP	TEMP Hi	
		TEMP Lo	○
10	FREEZE PREVENT CONTROL	FAN CONTROL ON	○
		FAN CONTROL OFF	

Notes (1) Setting marked with [○] are the default settings.

(2) Setting marked with [※] are those that are set automatically according to an indoor unit or an outdoor unit connected.
Please check default settings with the indoor unit's installation manual.

(b) Function setting method



1) Stop the air conditioner
2) Press the SET and MODE buttons simultaneously for 3 seconds or longer.
   The screen display will be switched as follows:
   "SELECT ITEM" → "SET" → "FUNCTION SET ▼ "

3) Press the SET button.
   The unit will enter the function setting mode. The screen display will charge to " FUNCTION ▼".
4) Check which category your desired setting belongs to, " FUNCTION ▼ (Remote controller unit function)" or " I/U FUNCTION ▲" (Indoor unit function).
5) Press either ▲ or ▼ button.
   Select either " FUNCTION ▼ " or "I/U FUNCTION ▲".

6) Press the SET button.

When " FUNCTION▼ " is selected.

① "DATA LOADING" (blinking)→ "FUNCTION"→ "GRILLE ↑↓ SET" (Function number: Ⓐ, Function description: Ⓑ)
   The screen display will be switched like this.

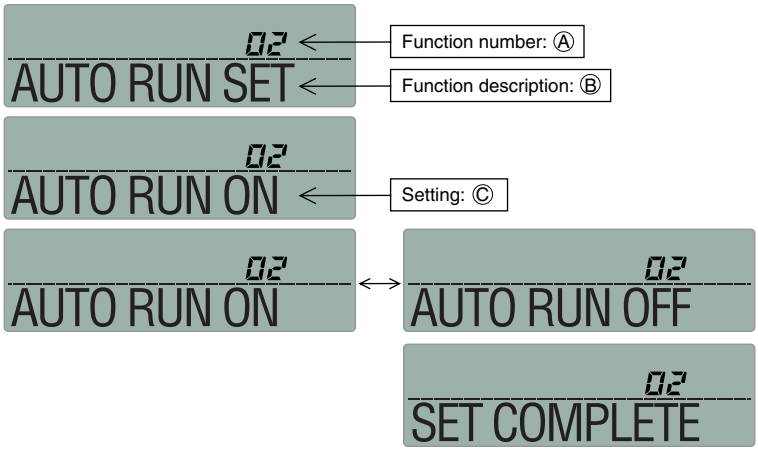
② Press either ▲ or ▼ button.
   "Function number: Ⓐ, Function description: Ⓑ "from the list of remote controller unit functions will be displayed one by one. Select a desired function.

③ Press the SET button.
   The screen display will be switched as follows:
   "SETTING" → "Setting: Ⓒ" (ex. "AUTO RUN ON")

④ Press either ▲ or ▼ button.
   A list of "Settings: Ⓒ" will be displayed one by one. Select your desired setting.

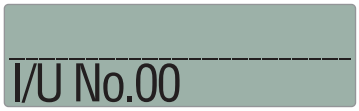
⑤ Press the SET button.
   The selected setting is displayed for 2 seconds, then followed by "SET COMPLETE" and the function setting process is completed.
   Then the screen display will be switched to "Function number: Ⓐ, Function description: Ⓑ," so if you want to continue to set another function, repeat the steps as explained above.
   To finish the function setting process, please proceed to Step (c).

* When "02 AUTO RUN SET " is selected.



When "I/U FUNCTION ▲" is selected.

① The screen display will be switched as follows:
"◆☝ I/U SELECT"→ "○☝ SET"→ "I/U No.00" (blinking)

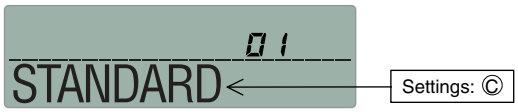


② Press either ▲ or ▼ button.
Select the indoor unit number that you want to change settings. If only one indoor unit is connected, the indoor unit number will not charge, so please proceed to Step ③.
If "ALL I/U ▼ " is selected while indoor group control is in effect, you can set all units to the same settings.

③ Press the SET button.
Indoor unit number indication will change from blinking to lit continuously, The screen display will be switched as follows:
"DATA LOADING" (blinking for about 2 to 23 seconds)→ "◆☝ FUNCTION"→ "Hi CEILING SET" (Function number: Ⓐ, Function description: Ⓑ)
* When "01 Hi CEILING SET" is selected.

④ Press either ▲ or ▼ button.
"Function number: Ⓐ, Function description: Ⓑ" from the list of indoor unit functions will be displayed one by one. Select a desired function.

⑤ Press the SET button.
The screen display will be switched as follows: "◆☝ SETTING"→ "Setting: Ⓒ" (ex. "STANDARD")



⑥ Press either ▲ or ▼ button.
A list "Setting: Ⓒ" will be displayed one by one. Select your desired setting.

⑦ Press the SET button.
The selected setting is displayed for 2 seconds, then followed by "SET COMPLETE" and the function setting process is completed.
Then the screen display will be switched to "Function number: Ⓐ, Function description: Ⓑ" so if you want to continue to set another function, repeat the stepa as explained above. To finish the function setting process, please proceed to Step 8.

⑧ Press AIR CON No. button.
The screen display will go back to the indoor unit selection screen (ex. " I/U No.00").
If you want to continue to set another indoor unit, please follow the steps explained above.

(c) Press the ON/OFF button.

This ends a function setting process. Even if a function setting process is not completed, this ends the process. Please note that any setting that is not completed will become void.

- **Pressing the RESET button during a function setting process will allow you to go back the previous step. Please note that any setting that is not completed will become void.**
- **Method of checking the current setting**
  While following the above mentioned step, the setting that appears when the SET button is pressed for each "Function number: Ⓐ, Function description: Ⓑ" is the current setting "Stting: Ⓒ". (When "ALL I/U ▼" is selected, the setting of the indoor unit with the lowest number is displayed)
- **Settings are stored in the controller and not lost even a power outage occurs.**

(d) Changing the remote controller's temperature setting range

1) The temperature setting range of the remote controller can be changed.
Through remote controller button operations, the upper limit and lower limit set temperature values can be changed individually.
During heating operation, the changed upper limit value becomes valid and at times other than during heating operation, (during cooling, dehumidification, auto and fan operation), the changed lower limit value becomes valid.
Range of Possible Changes
Upper Limit Value: 22~30℃ (valid during heating) Lower Limit Value: 18 ~ 26℃ (valid at times other than during heating)

2) Operation

a) With the remote controller in the stopped state, press the SET and MODE buttons simultaneously for 3 seconds or longer. The display will changed from " SELECT ITEM"→ " SET " → "FUNCTION SET ▼ "

b) Press the ▼ button once. The display will change to " TEMP RANGE ▲ ."

c) Press the SET button to enter the temperature range setting mode.

d) Using the ▲ or ▼ button, select "Hi LIMIT SET ▲ " or "Lo LIMIT SET ▼ ," the press the SET button.

e) If "Hi LIMIT SET" is selected,

① The display changes from " SET UP " → "Hi LIMIT 22ºC " (flashing).

② Using the " TEMP S/W" button, select the upper limit value. Display example: "Hi LIMIT 22ºC " (flashing)

③ Press the SET button to fix the setting. Display example: "Hi LIMIT 22ºC" (lighted up)

f) If "Lo LIMIT SET" is selected,

① The display changes from " SET UP"→ "Lo LIMIT 26ºC " (flashing).

② Using the TEMP S/W button, select the upper limit value. Display example: "Lo LIMIT 26ºC " (flashing)

③ Press the SET button to fix the setting. Display example: "Lo LIMIT 26ºC" (lighted up)

g) Press the ON/OFF button to end the setting procedure.

(The procedure also ends if the ON/OFF button is pressed during the setting operation. However, settings which have not been fixed become invalid, so exercise caution.)

• If the RESET button is pressed during a setting operation, the display returns to the previously displayed setting screen. However, settings which have not been fixed become invalid, so exercise caution.

* If "NO DISP CHANGE" is selected in No. 12, "TEMP RANGE SET" of the remote controller's functions, No. ① of the function setting modes, the remote controller's display does not change even if the temperature range has been changed.

(Example) If the upper limit is set at 28˚C

Function No. A	Function Contents B	Setting Contents C	Control Contents
12	TEMP RANGE SET	DISP CHANGE	The remote controller's display and sent data upper limit changes to 28ºC.
		NO DISP CHANGE	The remote controller's display upper limit remains at 30ºC and only the upper limit of the sent data is changed to 28ºC.

(7) Pump down operation

A pump down operation occurs when specified by Dip Switch settings (SW5-1, 2, 3). (Pump down operation is not possible when indoor units are running.) Connected units should be controlled from the master unit.

(a) Pump down procedure

(i) Close the outdoor unit's liquid side control valve.
(ii) Turn SW5-2 (trial run mode) ON (cooling).
(iii) Turn SW5-3 (pump down switch) ON.
(iv) Turn SW5-1 (trial run switch) ON.
(v) The red and green LEDs on the outdoor control PCB begin to blink continuously, and "PoS" displays at the 7-segment display.

Cautions regarding refrigerant recovery by pump down operation

- All refrigerant is not recovered even if a pump down operation is performed. Depending on the piping length or the temperature, some refrigerant will not be recovered, although the residual level will be such that less time is required for a final refrigerant recovery by the recovery unit.
- As a general guideline, a refrigerant recovery is possible by performing a 20kg pump down at 12~16 horse-power.

(8) Test run

(a) Before beginning operation

(i) Measure the electric component terminal and ground with a 500 V megger to check that it is more than 1 MΩ.
(ii) Be sure to turn on the power to the crank case heater 6 hours before operation.
(iii) Confirm that the bottom of the compressor has become warm.
(iv) Be sure to fully open the service valves (liquid, gas and oil equalizing pipe) for the outdoor unit.
Operating the outdoor unit with the valves closed may damage the compressor.
(v) Check that the power to all indoor units has been turned on. If not, water leakage may occur.

(b) Test operation

(i) Test run from an outdoor unit.
Whether CnS1 is sat to ON or OFF, you can start a test run by using the SW5-1 and SW5-2 switches provided on the outdoor unit PCB.
Select the test run mode first.
Please set SW5-2 to ON for a cooling test run of OFF for a heating test run. (It is set to OFF at the factory for shipment)
Turning SW5-1 from OFF to ON next will cause all connected indoor units to start.
When a test run is completed, please set SW5-1 to OFF.
Note During a test run, an indoor unit cannnot be operated from the remote control unit (to change settings). ("Under centralized control" is indicated)

(ii) Carry out the following test operation procedure using the remote controller.

1) Starting the Cooling Test Operation
① Press the ON/OFF button to start operation.
② Press the MODE button and select "❄ (COOL)".
③ Press the TEST button continuously for 3 seconds or longer.
The display changes from "SELECT ITEM" → "SET" → "❄ TEST RUN ▼" .
④ When "❄ TEST RUN ▼ " is displayed, press the SET button to begin the cooling test operation. The display shows "❄ TEST RUN."

2) Canceling the Cooling Test Operation
Pressing the ON/OFF button or the TEMP button ends the cooling test operation.
The "❄ TEST RUN" display is cleared.

Checking Operation Data

Operation data can be checked with remote controller operation.
① Press the CHECK button.
The display change from "SELECT ITEM" → "SET"→ "OPERATION DATA ▼".
② Press the SET button while "OPERATION DATA ▼" is displayed.
③ The display will change to "I/U No. 00 ▲" (blinking indication).
Select the indoor unit number you want to have data displayed with the ▲ ▼ button.
(When only one indoor unit is connected, the indoor unit number displayed on the screen will not change)

④ Determine the indoor unit number with the SET button.
(The indoor unit number changes from blinking indication to continuous indication)
"DATA LOADING" (A blinking indication appears while data is loaded)

"OPERATION DATA ⬍" appears and data number 01 is displayed.

⑤ Upon operation of the ▲ ▼ button, the current operation data is displayed in order from Data number 01.
The items displayed are as follows.
↓
* Depending on models, the items that do not have corresponding data are not displayed.

⑥ To display the data of a different indoor unit, press the AIR CON No. button, which allows you to go back to the indoor unit selection screen.

⑦ Pressing the ON/OFF button will stop displaying data.

Pressing the RESET button during remote controller operation will undo your last operation and allow you to go back to the previous screen.

Number	Data item	
01	✳	(Operation mode)
02	SET TEMP	
03	RETURN AIR	
04	I/U HEAT EXCH 1	(Indoor unit heat exchanger temperature 1)
05	I/U HEAT EXCH 2	(Indoor unit heat exchanger temperature 2)
07	I/U FAN	(Indoor unit fan speed)
08	REQUEST FREQUENCY	
09	RESPONSE FREQUENCY	
10	EXPANSION VALVE OPENING ANGLE	
11	INDOOR OPERATION TIME	
11	TOTAL I/U RAN	(Indoor unit operation hours)
21	OUTDOOR	(Outside air temperature)
22	O/U HEAT EXCH 1	(Outdoor unit heat exchanger temperature 1)
23	O/U HEAT EXCH 2	(Outdoor unit heat exchanger temperature 2)
24	COMP HERTZ	
25	HIGH PRESSURE	
26	LOW PRESSURE	
27	DISCHARGE	(Discharge pipe temperature)
28	DOME BOTTOM	
29	CT	
31	O/U FAN	(Outdoor unit fan speed)
32	SILENT MODE ON/OFF	
34	63H1 ON/OFF	
35	DEFROST ON/OFF	
36	TOTAL COMP RUN	(Compressor operation hours)
37	EEV 1	(Expansion valve opening 1)
38	EEV 2	(Expansion valve opening 2)

(9) Notabilia as a unit designed for R410A

(a) Do not use any refrigerant other than R410A.
R410A will rise to pressure about 1.6 times higher than that of a conventional refrigerant.

(b) A unit designed for R410A has adopted a different size indoor unit operation valve charge port and a different size check joint provided in the unit to prevent the charging of a wrong refrigerant by mistake. The processed dimension of the flared part of a refrigerant pipe and a flare nut's parallel side measurement have also been altered to raise strength against pressure. Accordingly, you are required to arrange dedicated R410A tools listed in the table below before installing or servicing this unit.

(c) Do not use a charge cylinder. The use of a charge cylinder will cause the refrigerant composition to charge, which results in performance degradation.

(d) In charging refrigerant, always take it out from a cylinder in the liquid phase.

(e) All indoor units must be models designed exclusively for R410A. Please check connectable indoor unit models in a catalog, etc. (A wrong indoor unit, if connected into the system, will impair proper system operation)

	Dedicated R410A tools
a)	Gauge manifold
b)	Charge hose
c)	Electronic scale for refrigerant charging
d)	Torque wrench
e)	Flare tool
f)	Protrucsion control copper pipe gauge
g)	Vaccum pump adapter
h)	Gas leak detector

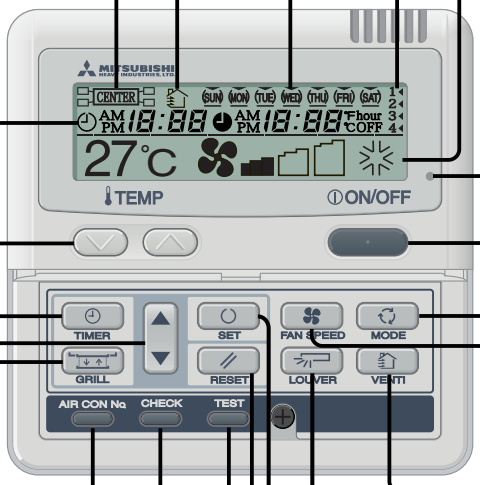
4.6 OUTLINE OF OPERATION CONTROL BY MICROCOMPUTER

4.6.1 Wired remote controller (Optional parts)

The figure below shows the remote controller with the cover opened. Note that all the items that may be displayed in the liquid crystal display area are shown in the figure for the sake of explanation.

Characters displayed with dots in the liquid crystal display area are abbreviated.

Pull the cover downward to open it.



Central control display
Displayed when the air conditioning system is controlled by the option controller.

Timer operation display
Displays the settings related to timer operation.

Temperature setting switches
These switches are used to set the temperature of the room.

TIMER switch
This switch is used to select a timer mode.

Timer setting switches
These switches are used to set the timer mode and time.

GRILL switch
This switch has no function.
When this switch is pressed,
INVALID OPER (Invalid Operation)
is displayed, but it does not mean a failure.

AIR CON No. (Air conditioning system No.) switch
Displays the number of the connected air conditioning system.

CHECK switch
This switch is used at servicing.

TEST switch
This switch is used during test operation.

Vent Indicator
Indicates operation in the Ventilation mode.

Weekly timer display
Displays the settings of the weekly timer.

Operation setting display area
Displays setting temperature, airflow volume, operation mode and operation message.

Operation/Check indicator light
During operation: Lit in green
In case of error: Flashing in red

Operation/Stop switch
This switch is used to operate and stop the air conditioning system. Press the switch once to operate the system and press it once again to stop the system.

MODE switch
This switch is used to switch between operation modes.

FAN SPEED switch
This switch is used to set the airflow volume.

VENT switch
Switch that operates the connected ventilator.

LOUVER switch
This switch is used to operate/stop the swing louver.

SET switch
This switch is used to apply the timer operation setting.
This switch is also used to make silent mode operation settings.

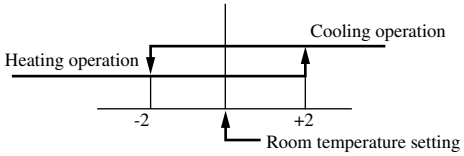
RESET switch
Press this switch while making settings to go back to the previous operation.
This switch is also used to reset the "FILTER CLEANING" message display.
(Press this switch after cleaning the air filter.)

* If you oress any of the switches above and " INVALID OPER" is display, the switch has no function. But it does not mean a failure.

4.6.2 Operation control function by the indoor controller

(1) Automatic operation (Heat recovery type only)

Once the [Auto] mode is selected by remote control, the operating mode is automatically selected according to the setting temperature and the intake air temperature of the indoor unit and cooling or heating operation is performed. The determination is performed when the thermostat has been in the OFF mode for 10 minutes or more continuously.



Room temperature (detected with Thi-A)(deg.)

Notes (1) No determination is made if the mode setting is cooling, dehumidify or heating and the cooling and heating thermostats have been in the off mode for 10 minutes in the automatic operation mode.
(2) If set to automatic operation mode when the intake temperature is within ±2 in relation to the setting temperature, the same operation as the previous automatic operation will be performed. (Note that it will be the heating mode when first turned on after the power has been turned off.)

(2) Cooling operation

(a) Cooling

1) "Cooling" is started by a "Cool" mode signal being received from the remote control or optional remote control unit (hereafter, remote control).
2) During cooling, operation of the cooling thermostat sends the required frequency to the outdoor unit.
   When operation is stopped, the required frequency is sent to the outdoor units after 5 seconds have passed since operation started.
   However, in the case of FDE, louver reference position control is performed when operation starts, then 5 seconds after reference position control ends, the required frequency is sent to the outdoor unit.
3) Operation of each device during cooling.

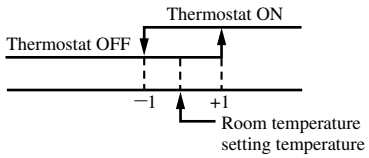
		When the compressor is ON	When the compressor is OFF
Indoor unit required Hz	**Thermostat ON Indoor unit**	Fuzzy calculation	0 Hz
	Thermostat OFF Indoor unit	0 Hz	
Indoor fan	**Thermostat ON Indoor unit**	Predetermined(1)	Predetermined(1)
	Thermostat OFF Indoor unit	Predetermined(1)	
Indoor expansion valve	**Thermostat ON(3) Indoor unit**	Overheating control	Fully closed
	Thermostat OFF(3) Indoor unit	0 pulse(2)	

Notes (1) Depends on the fan speed mode item.
(2) Oil return control has priority.
(3) Includes stop and blower (including unmatch).

4) After cooling stops, the fan continues to run (Lo) for 15 seconds.

(b) Cooling thermostat off

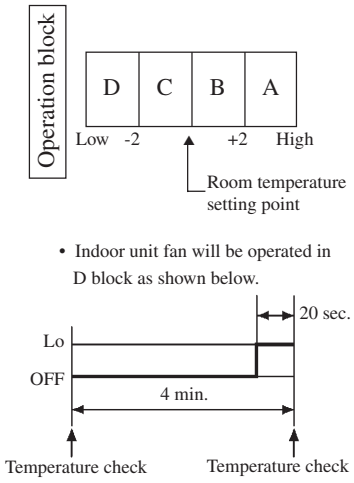
1) Fan control operates the thermostat as shown in the following diagram.
   If the thermostat goes ON, even if the thermostat is OFF as shown in the following diagram, the thermostat does not go OFF for 2 minutes after the compressor goes ON. If the thermostat goes OFF within 2 minutes, a minimum required frequency other than 0 Hz is output.
2) If all the thermostats for indoor units in a module go OFF, outdoor units carry out cooling thermostat OFF operation in modular units.



Room temperature (detected with Thi-A)(deg.)

(3) Dehumidifying (Thermal dry)

1) This cooling operation is mainly for dehumidifying, with which the compressor, indoor and outdoor fans are operated in the patterns as listed in the following table and in accordance with operation blocks switched with the room temperature sensor. The operation blocks are selected by checking the return air temperature at 4-minute intervals. Respective functional items are operated in each operation block as shown by the following table.



Item \ Operation block		A	B	C	D
Indoor unit frequency (Hz)	22 model	10	10	10	0
	28 model	15	10	10	0
	36 model	20	15	10	0
	45 model	20	15	10	0
	56 model	25	15	15	0
	71 model	30	20	15	0
	90 model	45	30	25	0
	112 model	50	40	35	0
	140 model	60	45	35	0
	160 model	70	50	35	0
	224 model	95	70	50	0
	280 model	120	85	55	0
Compressor		Sum of frequencies on combined indoor units			
Indoor unit electronic expansion valve		Superheat control			
Indoor unit fan	3 speed model	Me	Lo	Lo	Lo↔OFF
	2 speed model	Hi	Lo	Lo	Lo↔OFF
	1 speed model	Hi	Hi	Hi	Hi↔OFF
Outdoor unit fan		Operation	Operation	Operation	Stop

2) After dehumidification ends, the fan continues to run (Lo) for 15 seconds.

Note: For the FDK Series and indoor unit capacity types 22~56 data show for when the fan is stopped.

(4) Heating operation

(a) Heating

1) If the "Heat" mode is received from the remote control, etc., heating operation begins.
2) During heating, the required frequency is sent to the outdoor unit in accordance with the heating thermostat operation.
3) Operation of each device during heating.

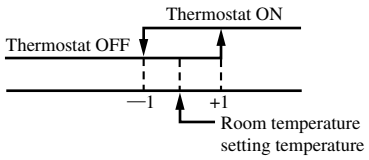
		When the compressor is ON	When the compressor is OFF
Indoor unit required Hz	**Thermostat ON Indoor unit**	Fuzzy calculation	0 Hz
	Thermostat OFF Indoor unit	0 Hz	
Indoor fan	**Thermostat ON Indoor unit**	Predetermined(1)	Runs on Lo(1)
	Thermostat OFF Indoor unit	Predetermined(1)	
Indoor expansion valve	**Thermostat ON(3) Indoor unit**	Heating outlet temperature control	60 pulse
	Thermostat OFF(3) Indoor unit	Heating stop unit expansion valve control 2(2)	

Notes (1) It depends on the fan speed switch setting. However, hot start has priority.
(2) Oil return control has priority.
(3) Includes stop and blower (including unmatch).
(4) The settings of J3 and J4 make intermittent operation and stop possible.

4) The required indoor unit frequency is the same as for cooling.
5) Heating preparation means during heating thermostat OFF control, hot start control and during defrost control.
6) The remote control's LCD displays "Heating preparation" during hot start control or defrost control.

(b) Heating operation with thermostat OFF

1) The thermostat operates as shown in the following diagram through fuzzy control.
   If the thermostat goes ON, even if the thermostat is off in the following diagram, it doesn't go OFF for 2 minutes after the compressor goes ON. If the thermostat goes OFF within 2 minutes, a minimum required frequency other than 0 Hz is output.



Room temperature (detected with Thı-A)(deg)

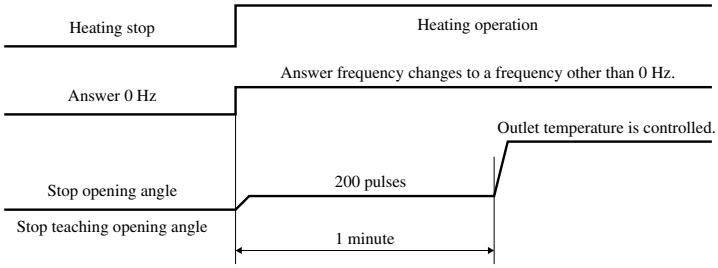
2) If all the thermostats for indoor units in a module go OFF, outdoor units carry out heating thermostat OFF operation in modular units.
3) Intermittent fan operation control
   a) When the jumper wire J3 (SW7-3), J4 (SW7-4) on the indoor PCB is shorted (installed at shipping),the fan of the unit of which the thermostat is turned OFF during heating is operated in the Lo mode, and the indoor fan is turned OFF if the temperature rises 1˚C or more than the return air temperature at the thermostat OFF.
   b) Indoor fan OFF condition is maintained for 5 minutes and then the operation is reset at the Lo mode again. After operating for 2 minutes in the Lo mode, return air temperature is checked and, if it is 1˚C or higher, the indoor fan is turned OFF or, if it is not higher than 1˚C, the Lo mode operation continues.

Notes (1) If the heating thermostat has been turned OFF, the temperature is indicated on the remote controller only when the indoor fan is operated in the Lo mode. When it is OFF, the room temperature at the end of Lo operation is indicated.
(2) If the operation is changed to the defrosting mode while the heating thermostat is at OFF or the thermostat is turned OFF during defrosting, the indoor fan is turned OFF.

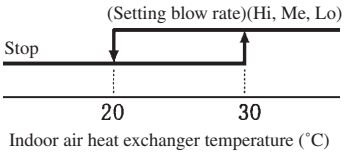
4) Fan Lo Operation Control
   If jumper wire J3 (SW7-3) and J4 (SW7-4) on the indoor PCB (set at shipping) is disconnected, indoor units with the thermostat turned OFF during heating operation will operate with the fan on Lo.
5) Fan stop control
   a) If the jumper wire J3 (SW7-3) on the indoor PCB (installed at shipment) is opened or the thermostat is turned OFF during heating operation with the remote control sensor operating, the fan on the indoor unit is turned OFF.

(c) Hot start (Prevention of cold draft during heating)

When a heating operation is starting, and when the answer frequency has changed from 0 Hz, the expansion valve is fixed at 200 pulses for 1 minute.



1) If the required frequency in the room is other than 0 Hz at the start of heating operation, the indoor fan is controlled in accordance with the temperature of indoor air heat exchanger (detected with Thı-R1, R2).



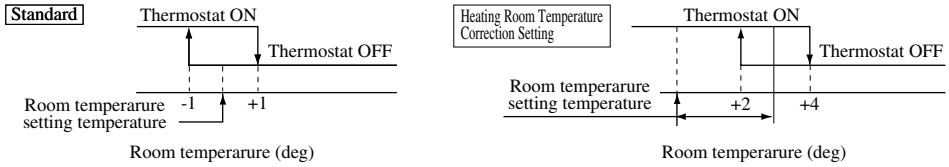
Note (1) When the hot start (the compressor is operating and the indoor unit fan is not operating at the setting blow rate) is going on, the heating preparation is displayed (LCD on the remote controller).

2) During heating, the required frequency becomes 0 Hz (heating thermostat OFF), then afterward, if the required frequency is other than 0 Hz, and the answer back frequency from the outdoor unit is other than 0 Hz (during thermostat reset), hot start control is carried out.
3) If the indoor fan motor is OFF continuously for 7 minutes due to hot start control, the indoor fan motor goes ON regardless of the temperature detected by the heat exchanger temperature thermistor (Thi-R1, R2) and "Heating Preparation" LCD goes off.
4) Even if the fan motor is stopped continuously for 7 minutes during defrosting, it is not turned ON forcibly, but after defrosting is completed, if the fan motor is OFF continuously for 7 minutes, it is turned ON regardless of the temperature detected by the heat exchanger temperature thermistor (Thi-R1, R2).

(5) Value shift adjustment of room air temperature detection in heating

Under the standard specifications, the room temperature is adjusted at the setting temperature by controlling the indoor unit capacity based on the setting temperature of thermostat and the suction air temperature.

However, where the unit is installed in the ceiling and warm air tends to stay around the ceiling, temperature in the living space may not be adjusted at the setting temperature. If "ROOM TEMP OFFSET" (heating space temperature compensation) is set in the remote controller's functions, the thermostat is set to go OFF at a temperature which is 3 degrees higher than the space temperature setting, enabling an improved feeling of warmth in the room.



(6) FILTER sign

(a) If cumulative operating time (the time the Run/Stop switch is ON) reaches 600 hours, "FILTER CLEANING" is displayed in the remote controller.

Note (1) If jumper wire J1 (SW7-1) on the indoor PCB is disconnected, this function is deactivated.

(b) The functions of the remote controller can be set to display 180 hours, 600 hours, 1,000 hours, 1,000 hours & Forced Stop, and no display.

(c) If it is set on 1,000 hours & Forced Stop, after 1,000 hours of operation, there is a forced stop after an additional 24 hours have passed. (If the filter sign is not reset, operation cannot be resumed.)

Resetting from the remote controller is possible at all times (while running, while stopped and before time up) when a filter reset signal is received. It is also reset when the power is turned OFF.

(7) Auto swing control (FDTC, FDT, FDTW, FDTQ, FDTS, FDE and FDK only)

(a) Louver Control

(i) When the air conditioner is operating, press the "LOUVER" switch to move the swing louvers. "AUTO ⇆ " is displayed for 3 seconds, then the swing louvers begin moving up and down continuously.

(ii) When you desire to fix the position of the swing louvers, press the "LOUVER" switch while the swing louvers are moving, and 4 stop positions will be displayed one at a time in 1 second intervals. When the position you desire to louvers to stop at is displayed, press the "LOUVER" switch again. The display will stop message (ex. "STOP 1-⌐") will be displayed for 3 seconds and the swing louvers will stop.

(iii) Louver operation when the power to the 4-position louver controller is turned on.

When the power is turned on, the louvers automatically swing 1 (2) time (without remote controller operation). This operation inputs the position of the louver motor (LM) in the microcomputer so it can confirm the louver position.

Notes (1) The louver position LCD displays the swing operation for 10 seconds when the "LOUVER" switch is turned ON. After that, "AUTO ⇆ " is displayed for 3 seconds in the LCD.

Notes (2) Values in ( ) show in cases other than the FDT, FDE and FDK 22~56 models.

(b) Louver auto horizontal set during heating

The louvers are in the horizontal position regardless of whether the auto swing switch is operated (auto swing or louver stop) while " ☼✋ (Heating Preparation)" is displayed (during hot start and when the heating thermostat is OFF). (This is to prevent cold drafts), and the display that was in the louver position display LCD before this control was activated continues. If the "Heating Preparation" display goes off, both the louvers and the LCD display return to their original setting.

(c) Louver free stop control

If "IN MOTION (louver free stop)" is set in the remote controller's function settings, the louver motor stops if there is a stop signal from the remote control unit and the stop position is stored in memory. Also, if there is an auto swing signal from the remote control unit, auto swing control starts from the position the louvers were in before being stopped.

(8) Condensate pump motor (DM) control (Only FDTC, FDT, FDTW, FDTQ, FDTS, FDR, FDQM, FDUM FDQS models)

1) This operates if the inverter frequency is other than 0 Hz during cooling, auto cooling and dehumidification.
2) If the drain motor goes on, then goes OFF in accordance with the conditions in item 1), the motor continues to run for 5 minutes, then stops. Also, in the case of an abnormal stop, the motor also continues to run for 5 minutes.
3) If the compressor is ON and goes OFF, the drain motor continues to run for 5 minutes.
4) Even in states other than the above states (heating, blower, stop, heating thermostat OFF), drain motor control is enacted by the drain sensor.
5) When expansion valve control opens the expansion valve during cooling as in item 1) of oil return control, the drain motor for that unit continues to run with a 5-minute delay in addition to the oil return control time.

(9) High ceiling control

In the case of indoor units installed in high ceilings, air flow mode control can be changed using DIP switch SW9-4 on the indoor PCB, or by using the remote controller indoor function setting (see page 448).

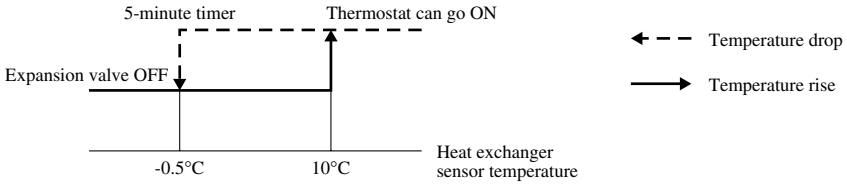
DIP SW / Item	SW9-4 OFF (Normal Control)	SW9-4 ON (High Ceiling Control)
Air Flow Mode	Hi, Me, Lo	UHi, Hi, Me

Notes (1) When the unit is shipped, SW9-4 is turned OFF.
(2) If SW9-4 is ON, the fan operates in Me even during hot start and when the heating thermostat is OFF.

(10) Frost prevention during cooling, dehumidifying

Thermostat OFF control

1) During "Cooling" and "Dehumidification," the thermostat is turned OFF in accordance with the temperature sensed by the heat exchanger sensors (Thi-R1, 2).



2) For 4 minutes after the thermostat goes ON, forced thermostat OFF control of anti-frost doesn't operate.
   a) At the point when 4 minutes have passed since the thermostat went ON, if either heat exchanger sensor Thi-R1 or R2 senses that the temperature is higher than the anti-frost temperature, sensing begins when the sensor is in the ON ready state.
3) After 4 minutes have passed since the thermostat went ON, if either heat exchanger sensor Thi-R1 or R2 senses that the temperature is lower than the anti-frost temperature (- 0.5ºC) continuously for 5 minutes, the thermostat is turned OFF forcibly.
   Also, the thermostat is turned ON if the temperature sensed by Thi-R1 and R2 enters the thermostat ON ready range.
4) An "Anti-frost" signal is sent to the outdoor unit.

(11) Indoor expansion valve control

(a) Cooling superheat control

1 minute after the thermostat switches ON during a cooling or dehumidifying operation, superheating is maintained at a suitable level by expansion valve aperture control based on the difference between the indoor heat exchanger's inlet and outlet temperatures (detected by Thı-R3 and Thı-R1 or R2), and the amount of deviation from the superheat setting value. Cooling superheat control ends when operation stops, or when the thermostat switches OFF.

(b) Heating paused unit refrigerant control

In order to control the amount of refrigerant collected in a heating paused unit during outdoor unit heating operation, paused unit refrigerant control occurs individually at the paused units that satisfy the following conditions.

(i) Start conditions

① After thermostat switches OFF
② After heating → stop, or stop → blow switching
③ After outdoor unit heating begins during a stop (including error stops)
④ After electronic expansion valve full-closed control
⑤ After receiving a "refrigerant recovery" signal from the outdoor unit

} After 12 hours elapses

(ii) Control description

The electronic expansion valve opens to the setting aperture for 1 minutes.

(iii) Control termination conditions.

① When the outdoor unit stops
② When a defrost operation begins
③ When the thermostat switches ON
④ When the indoor heat exchanger sensor (Thı-R1 or Thı-R2) detects a temperature exceeding 55°C.

(12) Thermistor (Return air, heat exchanger) disconnected

(a) Return air temperature thermistor (Thi-A)

Disconnection sensed: If the temperature is -20ºC or lower continuously for 5 seconds.
Short circuit sensed: If the temperature is 48ºC or higher continuously for 5 seconds.
Anomaly display: E7

(b) Indoor heat exchanger temperature thermistor (Thi-R_1, R_2, R_3)

Disconnection sensed: If the temperature is -40ºC or lower continuously for 5 seconds.
Short circuit sensed: If the temperature is 70ºC or higher continuously for 5 seconds.
Anomaly display: E6

(13) Indoor fan anomaly [FDTC, FDTA112, 140, 160 or FDKA22 ~ 56 types only]

If the indoor unit fan speed is less than 200 rpm continuously for 30 seconds after a n indoor unit fan run command is output, it stops for 2 seconds. After 2 seconds, it restarts, but if this operation is repeated 4 times within 60 seconds, an anomalous stop is performed.

(14) External control (remote display)/control of input signal

Make sure to connect the standard remote control unit. Control of input signal is not available without the standard remote control unit.

(a) External control (remote display) output

Following output connectors (CNT) are provided on the printed circuit board of indoor unit.

(i) Operation output: Power to engage DC 12V relay (provided by the customer) is outputted during operation.

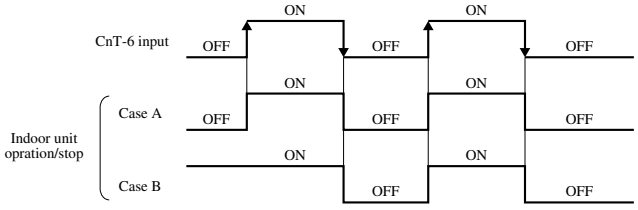
(ii) Heating output: Power to engage DC 12V relay (provided by the customer) is outputted during the heating operation.

(iii) Compressor ON output: Power to engage DC 12V relay (provided by the customer) is outputted while the compressor is operating.

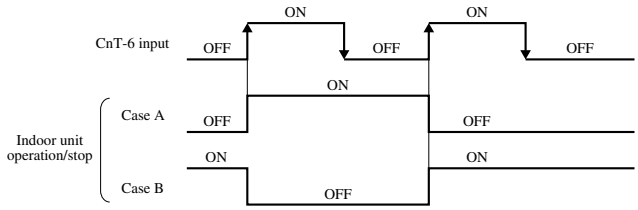
(iv) Error output: When any error occurs, the power to engage DC 12V relay (provided by the customer) is outputted.

(b) Control of input signal

1) The mode is switched to the remote operation input processing mode by nonvolatile memory (EEPROM) on the indoor unit's circuit board.
2) SW5-3 on the indoor unit's circuit board is turned OFF (factory setting).
   The air conditioner goes ON when the signal input to CNT-6 changes from OFF to ON. The air conditioner goes OFF when it changes from ON to OFF. There is no reverse operation.



   It is possible to turn the air conditioner ON or OFF using the remote control or center console, etc.
3) SW 5-3 on the indoor unit's circuit board is turned ON (when set locally)
   This is enabled only when the input signal to CnT-6 is turned from OFF to ON. Air conditioner operation is reversed.



4) CNT-6 input is enabled only when in the center mode.
5) When the "Cooling" (heating) mode is stored in memory, if the remote control signal line or the remote start/stop input terminal (Cn-T) receives an operation start signal from the HA terminal, a cooling operation (heating operation) begins.
6) During operation, the compressor operation signal is output from the outdoor unit to the remote control line and the remote monitor terminal (Cn-T).
7) If "Level Input" is received in accordance with the wired remote control's indoor function setting "external input switching," the control in item 2) is activated. If "Edge Input" is received, the control in item 3) is activated.

(15) Multiple units control-simultaneous control of 16 unit with one remote controller

(a) Function

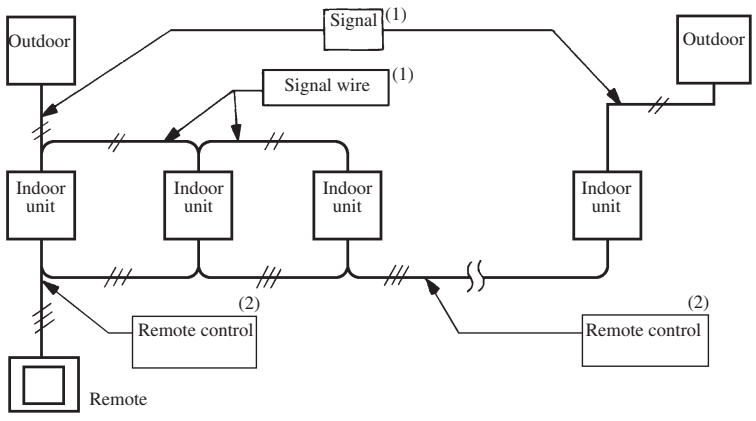
Multiple units (even of outdoor different systems, 16 units maximum) can be simultaneously controlled by using a remote controller. The remote controller is used to set the "operation mode", and all the unit can be operated and stopped. Thermostat and protective functions of each unit functions independently.

Note(1) When part of the group gets out of order (the protective device operates), the relevant unit comes to an abnormal stop, but other normal units keep operating.

(b) Wiring Procedures

(i) Lay power cable of each unit and signal wire as usual. (Remove the remote control switches from all units excluding only one unit.)
Lay wiring for the remote controller separately from power cable and wires for all other electrical equipment.

(ii) Arrange the terminal block (X, Y, Z) of the remote controller as shown below for the simultaneous control, and lay cross over in each indoor unit.



Notes (1) The overall length of the signal wire shall be less than 1000m.
(2) The length of remote control signal wire and crossover for remote controller between room shall be less than 600m.

4.6.3 Operation control function by the outdoor controller

■ KX series

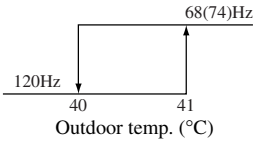
All-in-one type

◆ Models FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R

(1) Compressor operating frequency

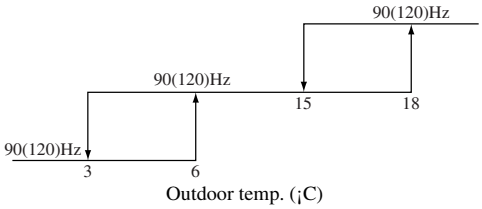
The compressor's maximum operating frequency during cooling and heating is as shown below. The minimum operating frequency is 20 Hz during both cooling and heating.

Maximum operating frequency during cooling



Note (1) The values in parentheses are for FDCA140, 160HKXES4R.

Maximum operating frequency during heating



(2) Compressor starting control

(a) 4-way valve switching assurance start

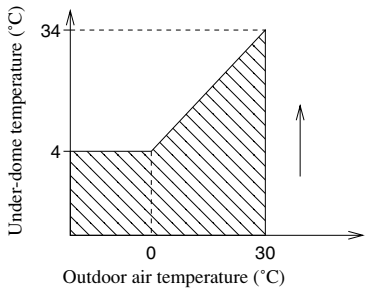
1) If the compressor starts under any conditions other than the following conditions, a 4-way valve switching protection start is performed.
   In the second and consecutive starts of the compressor after its power is turned ON, if the thermostat ON conditions are established and it goes ON before 6 hours have passed since it went OFF. However, if there is a change in the operation mode after the thermostat goes OFF (heating, fan or remote control stop after cooling or dehumidification, or cooling, dehumidification, fan or remote control stop after heating), a 4-way valve switching protection start is performed the next time the compressor is started.
2) When the compressor starts, it starts at the command speed of 60 Hz, and not at the target speed.
3) 4-way valve switching protection start ends 30 seconds after the compressor starts and control changes to compressor protective start control.

(b) Compressor protective start

The following compressor protective start is performed after 4-way valve switching protection.

	Initial start (remote controller ON, abnormal release)	Thermostat ON start	
		Change to thermostat OFF operation mode	No change to thermostat OFF operation mode
First time of cumulative compressor ON operations.	Compressor protective start B depending on crankcase heater power on time	Compressor protective start B depending on crankcase heater power on time	Compressor protective start B depending on crankcase heater power on time
Second or subsequent time of cumulative compressor ON operations.	Protective start	Protective start	Inching protective start

1) Protective start
   a) The actual compressor operating frequency after 4-way valve switching protection is completed is a command frequency of 38Hz until 2 minutes after the compressor starts, and when the frequency increases, its maximum rate of increase is 6 Hz/30 sec.
   b) Control is based on the target speed when 2 minutes have passed after starting.
2) Starting Inching Protection
   a) When the thermostat goes ON after the unit stops while the thermostat is OFF, the specified compressor operating frequency is set at 38 Hz until 2 minutes have passed since compressor operation started, and the upper limit during increases in frequency is set at 6 Hz / 30 seconds.
      Note (1) If an attempt is made to change the operating mode while the thermostat is stopped, inching protective start when the compressor starts again is not carried out, but 4-way valve switching protective start is carried out.
   b) It follows the target frequency when 2 minutes have passed after starting.
3) Compressor Protection Start B by Crankcase Heater On Time
   a) Compressor protective start is carried out when any of the following conditions is satisfied.
      ◆When SW3-4 is OFF
      ① When the cumulative number of compressor starts since the power was turned ON is one start, and 30 minutes or more have passed since the power was turned ON.
      ② When the cumulative number of compressor protective starts since the power was turned ON is one start and the outdoor temperature and under-dome temperature are outside the range indicated by the shaded portion of the graph below.



◆When SW3-4 is ON
When the cumulative number of compressor starts since the power was turned ON is one start.

[Control Content]

ⓐ The compressor's speed increases are kept within an upper limit of 6 Hz / 5 min. for 30 minutes after starting.

ⓑ Between 30 minutes and 40 minutes after starting, the compressor's speed increases are kept within an upper limit of 6 Hz / 2 min.

ⓒ When the compressor stops within 40 minutes after starting, the next time it starts, the frequency increase upper limit method used in this control continues until a cumulative time of 40 minutes has passed.

b) If the outdoor temperature and under-dome temperature are within the range indicated by the shaded portion of the above graph during compressor protective start B control, the following control is carried out and the compressor is not started.

① The following data are displayed in the 7-segment display.
Display Data: "30" is displayed after the power ON value then this value decreases by "1" every minute thereafter.

② It is possible to start the compressor after 30 minutes have passed since the power was turned ON.

③ If the temperatures change so that they are outside the range indicated by the shaded portion of the above graph before 30 minutes have passed since the power was turned ON, it is possible to start the compressor.

(3) Outdoor fan control

(a) Fan tap and fan motor control contents during control

Fan tap	FM01	FM02
6 speed	UHi	UHi
5 speed	UHi	Hi
4 speed	Hi	Hi
3 speed	Hi	Lo
2 speed	Lo	Lo
1 speed	Lo	OFF
0 speed	OFF	OFF

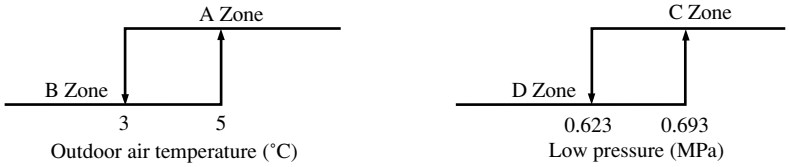
(b) When the fan motor starts, it runs at speed 4, and after it has been running for 20 seconds, it moves to the various controls. (Heating only)

(c) Fan tap control

1) Heating

a) Fan tap control is performed in accordance with the low pressure (sensed by PSL) and the outdoor air temperature (sensed by Tho-A). However, when it is within the detected temperature range when the power is ON, the fan tap starts at a low speed when high pressure control is on with heating operation, it operates according to the following.

	A Zone	B Zone
C Zone	4 speed	4 speed
D Zone	6 speed	6 speed



b) If the outdoor fan starts when the outdoor temperature (detected by Tho-A) is 12ºC or higher), it starts under the following conditions.

① After starting at the 4-speed fan tap, the speed changes to 2 speed after 3 seconds.

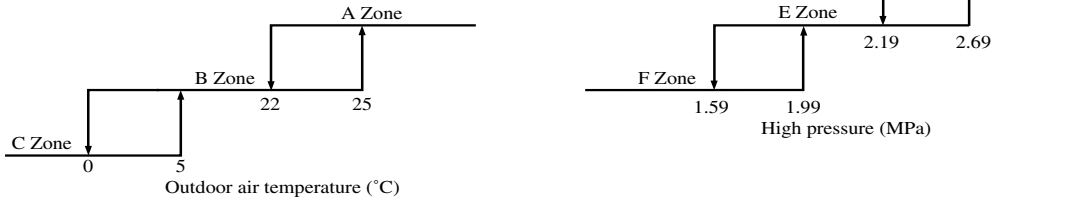
② After forced operation at the 2 speed fan tap for 4 minutes, control changes to the control in item a).

③ If outdoor fan control is started by the high pressure sensor during this control sequence, this control sequence has priority, and if the outdoor temperature is 12ºC or higher, the forced 4-minute 2 speed fan tap operation continues.

2) Cooling

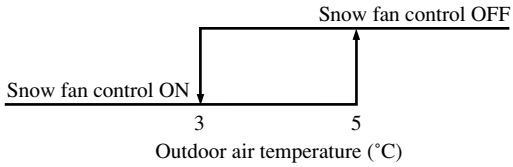
Fan tap control is performed in accordance with the high pressure (sensed by PSH) and the outdoor air temperature (sensed by Tho-A). However, when it is within the detected temperature range when the power is ON, the fan tap starts at a low speed.

	A Zone	B Zone	C Zone
D Zone	6 speed	4 speed	2 speed
E Zone	4 speed	2 speed	1 speed
F Zone	4 speed	1 speed	0



(d) Snow fan control

If jumper wire J8 (SW4-8) on the outdoor unit PCB is open, a full stop is performed, and in the anomalous stop mode, if the temperature of the outdoor air at the outdoor unit fan becomes 3ºC or lower, it runs at 6th speed for 30 seconds once every 10 minutes.



(4) Defrosting

(a) Temperature conditions defrosting

(i) When all the following conditions are satisfied, temperature conditions defrosting begins.

1) There have been 45 minutes of cumulative compressor operation since defrosting was completed, or there have been 30 minutes of cumulative compressor operation since the start of heating operation (remote control unit ON).
2) 5 minutes have passed since the compressor went ON.
3) 5 minutes have passed since the outdoor fan started operating.
4) When one of the following conditions is met after all of the conditions above are met.
   ① When the outside air temperature sensed by the outdoor heat exchanger temperature thermistor (Tho-R) is below the defrosting start temperature shown in Table. 1 below continuously for 60 seconds.
   ② When the intake gas saturation temperature determined from the value detected by the low pressure sensor (PSL) and the temperature detected by the outside air temperature thermistor (Tho-A) is below the defrosting start temperature shown in Table. 2 continuously for 3 minutes. (However, detection by the low pressure sensor (PSL) is not performed for 10 minutes after the compressor starts.)
   ③ When the temperature detected by the outside air temperature thermistor (Tho-A) is–10ºC or higher but less than 5ºC, and the low pressure is lower than 0.243 MPa, or when the temperature sensed by the outside air temperature thermistor (Tho-A) is lower than –10ºC and the low pressure is less than 0.2048 MPa. (However, the amount of actual compressor operating time since the end of defrosting in item 1) above is 30 minutes.)

Table 1

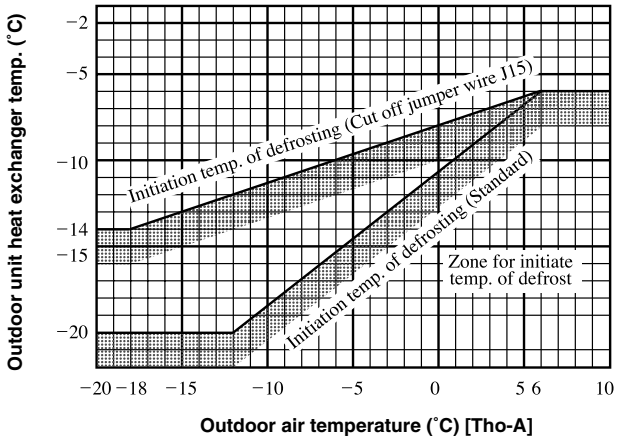
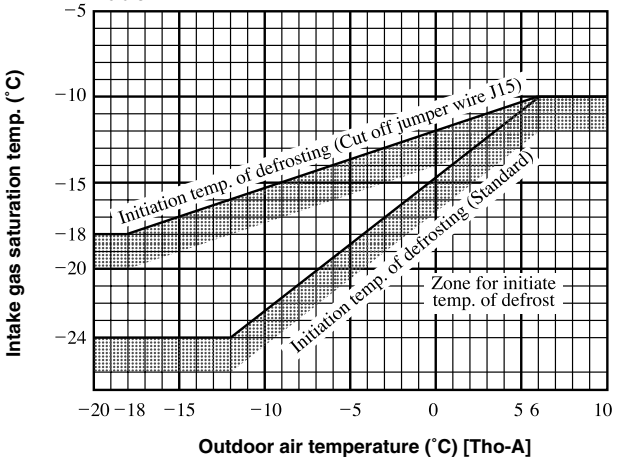


Table 2



(ii) Changing the defrosting start temperature range

Disconnect jumper J15 on the outdoor PCB.

1) When there is a total of 30 minutes of operation in the heating mode after defrosting is terminated.
2) When the temperatures detected by the outdoor heat exchanger temperature thermistor (Tho-R) and the outside air temperature thermistor (Tho-A) are below the defrosting start temperature in Fig. 1 continuously for 30 seconds, or when the intake gas saturation temperature determined from the value detected by the low pressure sensor (PSL) and the temperature detected by the outside air temperature thermistor (Tho-A) is below the defrosting start temperature shown in Fig. 2 continuously for 30 seconds.
3) When conditions are normal except for items 1) and 2) above.

(iii) Defrosting end conditions

If either of the following conditions is satisfied, the defrosting end operation starts.

1) When 10 minutes have passed since the start of defrosting.
2) When an outdoor heat exchanger thermistor (Tho-R) temperature of 18 (12) ºC or higher is detected continuously for 10 seconds or longer.

Note (1) Values in ( ) show in the case where jumper J15 is open.

(b) Time conditions defrosting (Oil return control during heating)

(i) When 4 hours of cumulative running time have passed since the compressor's power was turned ON and cumulative compressor running time in the first operation in the heating mode exceeds 1 hour. However, if the mode was changed from cooling to heating, 30 minutes after the compressor was turned ON.

(ii) If temperature conditions defrost operating time prior to time conditions defrosting was 2 minutes 30 seconds or longer, the time conditions defrost timer (4 hours) is reset. (It is regarded that oil return during temperature conditions defrosting was complete.)

(iii) Time conditions defrost is performed after the 4-hour timer's time is up, or 45 minutes or more after the previous temperature conditions defrost is completed, whichever is the slowest.

(iv) Defrosting end conditions

1) When 2 minutes 30 seconds have passed since the start of defrost operation and an outdoor heat exchanger thermistor (Tho-R) temperature of 18 (12) ºC or higher is detected continuously for 10 seconds or longer.

Note (1) Values in ( ) show in the case where jumper J15 is open.

2) When 10 minutes have passed since the start of defrosting.

(v) If the temperature detected by the outdoor heat exchanger thermistor M is 12ºC or higher within 2 minutes 30 seconds after defrosting starts, the outdoor fan runs at speed 6, then stops when the temperature drops to 9ºC or lower.

Outdoor Heat Exchanger Temperature (˚C)

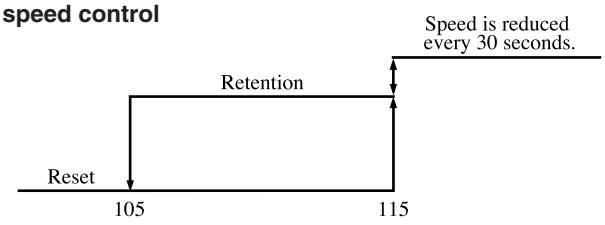
Note (1) The fan stops without relation to the temperature when 2 minutes 30 seconds have passed.

(5) Compressor protective control

(a) Discharge pipe temperature control

If the discharge pipe temperature exceeds the set value, the compressor's speed is controlled to suppress the rise in the discharge pipe temperature. If it rises still higher, the compressor is stopped.

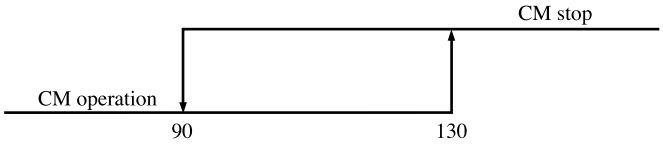
(i) Compressor speed control



Discharge pipe temperature (˚C)

(ii) Discharge pipe temperature anomaly

1) If the discharge pipe temperature rises to 130ºC or higher, the compressor is stopped. It recovers automatically if the temperature drops to 90ºC or lower.



Discharge pipe temperature (˚C)

2) If the discharge pipe temperature is anomalous 5 times within 60 minutes, or if the temperature remains at 130ºC or higher continuously for 60 minutes, including when the compressor is stopped, the unit performs an anomalous stop (E36).

Note (1) If the discharge pipe temperature does not drop to 90ºC or lower continuously for 45 minutes after a discharge temperature anomaly occurs, the compressor cannot be restarted. (It is possible to reset it using the remote control unit.)

(b) Current safe control

1) If the input current value (converter inlet N-phase)at the inverter inlet exceeds the set value, the compressor's speed drops. If the detected value increases even if the speed goes down, the speed will drop even further.
2) This control ends if the value drops below the cancellation value continuously for 3 minutes or below the set value continuously for 6 minutes.

(c) High pressure control

(i) Heating

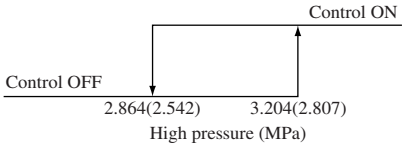
1) Compressor speed protect control

a) During compressor operation, when all the following conditions are satisfied, compressor speed is reduced.
① SW4-7 ON: when the pressure for the high pressure exceeds 3.0MPa.
② SW4-7 OFF: when the pressure for the high pressure exceeds 3.2MPa.

b) This control ends when the pressure for the high pressure is the above pressure or lower than for six minutes continuously.

c) When the compressor frequency is 20 Hz and the pressure for the high pressure exceeds 3.8 MPa, the compressor stops.

d) Control of outside fan by pressure for high pressure (PSH)
If the pressure for the high pressure reaches 3.204 (2.807) MPa or greater during heating operation, the outdoor fan is set to speed 2.



Note (1) The values within ( ) will be displayed when sw4-7 is switched off.

(ii) Cooling

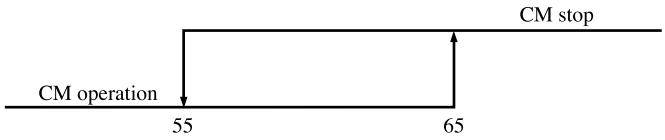
a) When the high pressure is 3.507 MPa or greater during compressor operation, the compressor speed is reduced.

b) The high pressure is detected 1 minute later, and if it is 3.507 MPa or higher, the speed drops further.

c) If the high pressure drops below 3.507 MPa, this control ends and speed protect release operation begins.

(iii) Control by outdoor heat exchanger temperature

1) If the temperature at the outdoor heat exchanger rises to 65ºC (continuation 2 seconds) or higher during cooling, the compressor is stopped. If the temperature drops to 55ºC or lower, the compressor recovers automatically.



Outdoor unit heat exchanger temp. (˚C)

2) If the outdoor heat exchanger temperature rises to 65ºC 5 times within 60 minutes, or is 65ºC or higher continuously for 60 minutes, including when the compressor is stopped, the unit is subjected to an anomalous stop (E35).

Note (1) If the outdoor heat exchanger temperature drops to 55ºC continuously for 3 minutes after an anomalous stop occurs, it is possible to reset it using the remote control unit.

(iv) Anomalous pressure sensing by the high pressure sensor (PSH)

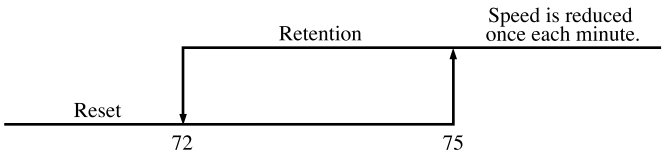
1) If the high pressure (PSH) is 4.055 MPa or greater, the compressor is stopped.

2) If the high pressure (PSH) is 3.658 MPa or less, it returns automatically.

3) If high pressure (PSH) of 3.658 MPa or greater continues for 60 minutes or more after 4.055 MPa or greater is detected five times within 60 minutes for item a) above, the unit is stopped abnormally (E40).

(d) Power transistor temperature control

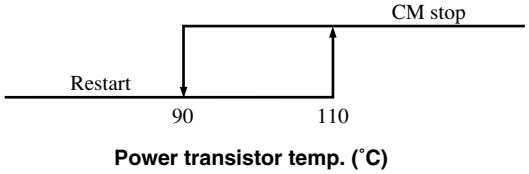
If the power transistor's cooling fin temperature (Tho-P) exceeds the set temperature, the compressor's capacity is controlled, preventing the power transistor's temperature from rising.



Power transistor temp. (˚C)

(ii) Power transistor overheating protection

The compressor is stopped if the power transistor's temperature rises to 110ºC. If the temperature drops to 90ºC within 3 minutes, the compressor recovers automatically, but if this process is repeated 5 times in 60 minutes, or if the temperature stays at 110ºC continuously for 60 minutes, an anomalous stop is performed (E41).



(e) Low pressure control

(i) Compressor speed control

1) If 10 minutes have passed since the compressor started and all the following conditions are satisfied, the compressor's speed is reduced.
   ① Pressure measured by the low pressure sensor (PSL) is ≦ 0.150 MPa continuously for 10 seconds.
2) The low pressure is measured 10 seconds later, and if it is 0.150 MPa or lower, the compressor speed is reduced even further.
3) If the low pressure rises to 0.189 MPa or higher, this control ends and speed protect release operation begins.

(ii) Low pressure abnormal detection

1) If the low pressure sensor senses a pressure of 0.079 MPa or lower continuously for 15 seconds and if 10 minutes have passed since the compressor started, the pressure detected by the low pressure sensor is 0.15 MPa or lower and super heat operation with a temperature of 30ºC or higher is detected continuously for 60 seconds, the compressor stops.
2) If the low pressure sensor detects a pressure of 0.227 MPa or higher continuously for 10 seconds, operation is resumed 3 minutes later.

(iii) Low pressure abnormal stop control

1) If the conditions in item (ii) occur 3 times in 60 minutes, including when the compressor is stopped, a low pressure (PSL) of 0.079 MPa or lower is detected continuously for 60 minutes or longer and a low pressure (PSL) of 0.079 MPa or lower is detected continuously after the compressor starts, an emergency stop is performed (E49).

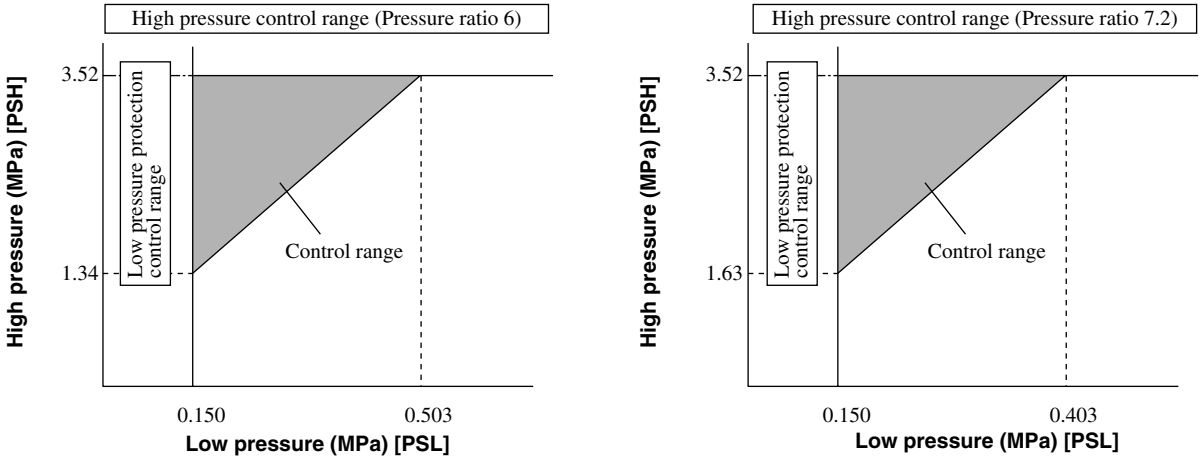
(f) High pressure ratio protection control

During heating, the compressor's speed is controlled in accordance by the low pressure sensor and high pressure sensor.

(i) Starting conditions

When all the following conditions are satisfied:

① When 5 minutes have passed since the compressor started in the heating mode.
② If the outdoor fan is ON and 5 minutes have passed since operation started.
③ If 5 minutes have passed since defrosting ended.
④ If the pressure levels detected by the low pressure sensor (PSL) and high pressure sensor (PSH) are within the control range shown in the figures below for 30 seconds.



(ii) Control contents

The compressor's speed is reduced. 1 minute later, the sensors operate again and if the ratio is within the range in item ④, the speed is reduced still further.

(iii) End conditions

When operation has continued 6 minutes outside the control range in item ④.

(g) Inverter protection control

(i) Current cut control

This prevents overcurrent in the inverter. If the current exceeds the set value, the compressor is stopped. 3 minutes later, it recovers automatically, but if current cut operates 4 times within 15 minutes, the compressor is subjected to an anomalous stop (E42).

(h) Compressor Protection at Low Frequencies

1) If a low frequency of 30 Hz or lower continues for 20 minutes or longer, the compressor is run at 30 Hz for 1 minute.
2) If the high pressure becomes 3.5 MPa or higher during this control, refrigerant return is performed for 60 seconds.
3) If the compressor cannot be run at 30 Hz. for 1 minute 30 seconds by protective control, etc., the compressor is forcibly stopped for 3 minutes.

(6) Thermistor disconnection (discharge • suction • heat exchanger • outdoor under-dome, temperature, low pressure sensor and high pressure sensor)

(a) Outdoor heat exchanger, outdoor thermistor, low pressure sensor, high pressure sensor

If a temperature of –50ºC or lower is sensed by the outdoor heat exchanger thermistor, or –30 ºC or lower is sensed by the outdoor thermistor for 5 seconds, or the low pressure sensor or high pressure sensor voltage is 0 V or lower or 3.94 V or higher in the interval between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor is stopped. After a 3-minute delay, the compressor is restarted, but if this occurs 3 times within 40 minutes, an abnormal stop is performed.

Note (1) No sensing is performed during defrosting or for 3 minutes after defrosting.

(b) Discharge pipe, suction pipe, under-dome temperature thermistor

If the discharge pipe thermistor temperature detects a temperature of 3ºC or lower and the suction pipe and under-dome temperature thermistor detects a temperature of –50ºC or lower continuously for 5 seconds in the interval between 10 minutes and 10 minutes 20 seconds after the compressor goes ON, the compressor is stopped. After a 3-minute delay, the compressor is restarted, but if the same conditions are detected again 3 times within 40 minutes, an anomalous stop is performed.

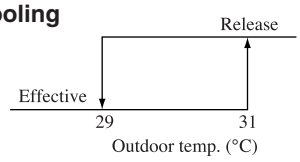
Note (1) No sensing is performed during defrosting or for 3 minutes after defrosting.

(7) Silent mode control

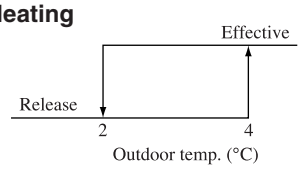
Silent mode operation is started by the CnG2 connector on the outdoor unit PCB being in the open state, or by a command from the remote controller.

(a) Silent mode operation is effective within the following temperature ranges.

During Cooling



During Heating

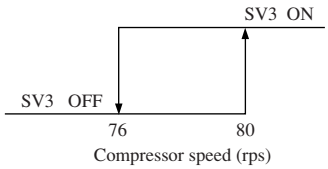


(b) When the outdoor fan is started, it starts in 4th speed, then after 20 seconds of operation, the fan tap upper limit becomes 2nd speed.

(c) The upper limit of the compressor operating frequency is set at 80 Hz.

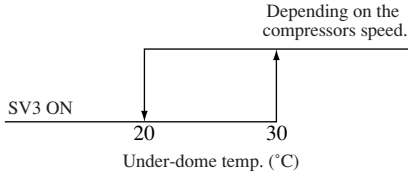
(8) Oil separator bypass valve (SV2, 3) control (SV2 is normally ON while the compressor is operating.)

(a) The oil separator bypass valves (SV3) are controlled in accordance with the compressor speed.

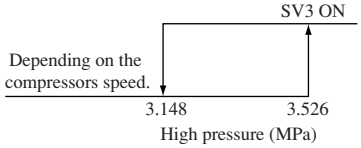


(b) When the following conditions are established, SV3 goes ON regardless of the compressor's speed.

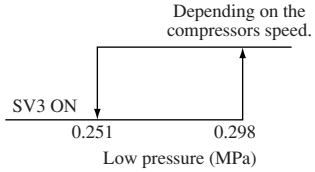
1) If the temperature detected by the under-dome temperature thermistor (Tho-C) during compressor operation is as shown below.



2) If the pressure detected by the high pressure sensor (PSH) during heating and during compressor operation is as shown below.



3) If the pressure detected by the low pressure sensor (PSL) during compressor operation is as shown below.



(9) Anomalous stop due to anomalous compressor start

(a) If the compressor cannot change to the DC motor rotor position detection operation within 5 seconds after compressor start conditions are established, the compressor stops temporarily, then after 3 minutes, performs the position detection operation.

(b) If it cannot change to the position detection operation a 20 time, it is judged that a compressor anomalous start condition exists and it is subjected to an anomalous stop (E59).

(10) Compressor anomalous rotor lock

If, after changing to the compressor rotor position detection operation, the rotor position cannot be detected a second time, the compressor is stopped. After 3 minutes, it recovers automatically, but if this occurs 4 times within 15 minutes, the compressor is subjected to an anomalous stop (E60).

(11) Test operation

(a) Test operation can be performed from the outdoor unit using DIP switches SW5-1, 2 on the outdoor unit PCB.

SW5-1	ON	**SW5-2**	OFF	Test run for heating
			ON	Test run for cooling
	OFF	Normally and after test operation		

Be sure to turn SW5-1 OFF when the test operation is terminated.

(12) Pump down control

Pump down operation can be performed by operating DIP switches (SW5-1, 2, 3). (Pump down operation cannot be started while an indoor unit is operating or when there is an anomalous stop.)

(a) Pump down procedure

1) Close the liquid side service valve to the outdoor unit.
2) Set SW5-2 (test operation mode) in the ON (cooling) position.
3) Set SW5-3 (pump down switch) in the ON position.
4) Set SW5-1 (test operation switch) in the ON position. Pump down operation will start.

(b) Control contents

1) In the cooling mode, the compressor is started with the target speed set at 60 Hz.
2) The red and green LED's on the outdoor unit PCB flashs continuously and "POS" is displayed in the 7-segment LED.
3) Except for low pressure control, each type of protection and anomalous sensing control is activated.
4) Compressor protective start B is cancelled.
5) The electronic expansion valves (cooling, heating) are opened.

(c) Control end conditions

End control is carried out through any of the following conditions.

1) Low Pressure ≦ 0.087 MPa is detected continuously for 5 seconds.
   ⓐ Red LED: Lighted; Green LED: flashing; 7-segment LED: "POE" is displayed.
   ⓑ At Low Pressure > 0.087 MPa, restarting is possible. (Turn SW5-1 OFF temporarily, then reset.)
2) Stop by abnormal sensing control
   ⓐ Red LED: Lighted; Green LED: flashing; 7-segment LED: Anomalous stop error code is displayed. displayed.
   ⓑ Restarting is impossible. Turn the power off, then on again to recover normal operation.
3) When cumulative compressor operating time through pump down control has reached 5 minutes.
   ⓐ Red LED: Off; Green LED: flashing, 7-segment LED: No display.
   ⓑ Repeat of the pump down operation is possible. (Turn SW5-1 OFF temporarily, then reset.)
4) If either SW5-1, 2 or 3 is turned OFF during pump down.

Caution: If the pump down switch is pressed, communications with the indoor units are canceled, so "Communications Anomaly, E5" is displayed on the indoor units and on the remotecontroller. However, there is nothing anomalous.

(13) Refrigerant Return Control

(a) If any of the following conditions is satisfied while the electronic expansion valve for heating (EEVh) during compressor operation in the heating mode, refrigerant is returned from each indoor unit with the thermostat off, the fan running, the unit in the OFF state or that is currently experiencing an emergency stop, in sequence at 30 second intervals.
   ① Low pressure ≦ 0.2 MPa
   ② Overheating ≧ 30 degrees
   ③ Discharge pipe temperature ≧ 120ºC

(b) When refrigerant return is completed for all the affected indoor units, or if the compressor goes OFF during this control, refrigerant return control is terminated.

(14) Cooling and heating forced operation

Turning SW3-7 on the outdoor unit PCB ON and shorting and opening CnG1 (with short pin), forces the indoor units to operate in the cooling or heating mode. If an operation mode other than a forced mode is commanded from the indoor units, mode unmatch is displayed in the remotecontroller, etc.

SW3-7	CnG1	Operation
OFF	Open circuit, Short circuit	Normal operation
ON	Open Circuit	Cooling
	Short Circuit	Heating

Note (1) When the unit is shipped from the factory, SW3-7 is OFF and CnG1 is open.

(15) Condensation protection control

(a) When there is one or more indoor units with an electronic expansion valve (EEVC) completely open with cooling operation or drying operation and thermo ON, the compressor speed and outdoor unit fan are controlled.

① The lower limit value for the speed of the compressor shall be 50 Hz.

② If the cooling electronic expansion valve is completely open at a compressor speed of 50 Hz or less, the outdoor fan tab is dropped with speed 1 / 5 minutes.

③ When the outdoor fan tap is speed 2 or less with a compressor speed of 50 Hz or less, the compressor speed is lowered with 6 Hz / 5 minutes with the cooling electronic expansion valve completely open. (The lower limit value is 30 Hz)

(b) This control ends when there is other than the cooling electronic expansion valves being completely open when thermo is ON for all indoor units.

(16) Connected indoor units count protection

If the number of connected indoor units exceeds 8 units, an anomalous stop (E43) is performed.

(17) External input operation

External input: From CnS_1, operation permission/prohibition control; From CnS_2: Demand control/normal operation switching.

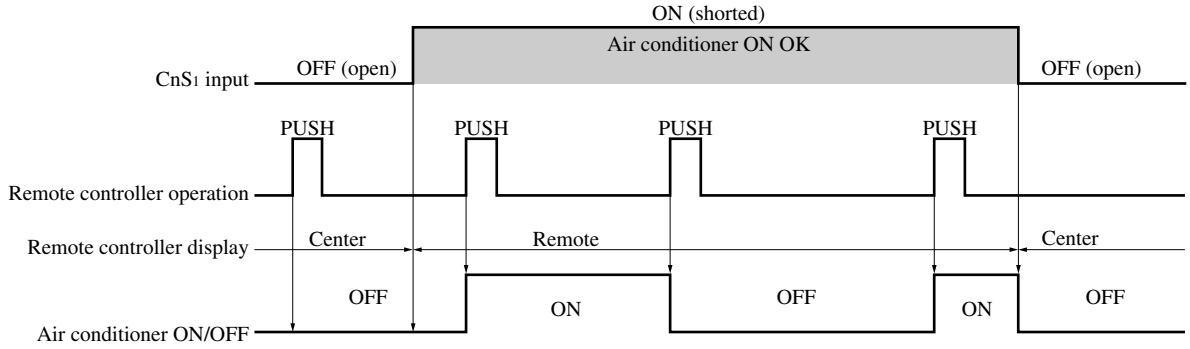
- J13: Switches between CnS_1 and CnS_2 input method.
  J13 short circuit: Level input by CnS_1 and CnS_2.
  J13 open: Pulse input by CnS_1 and CnS_2.

(a) From CnS_1, operation permission/prohibition control

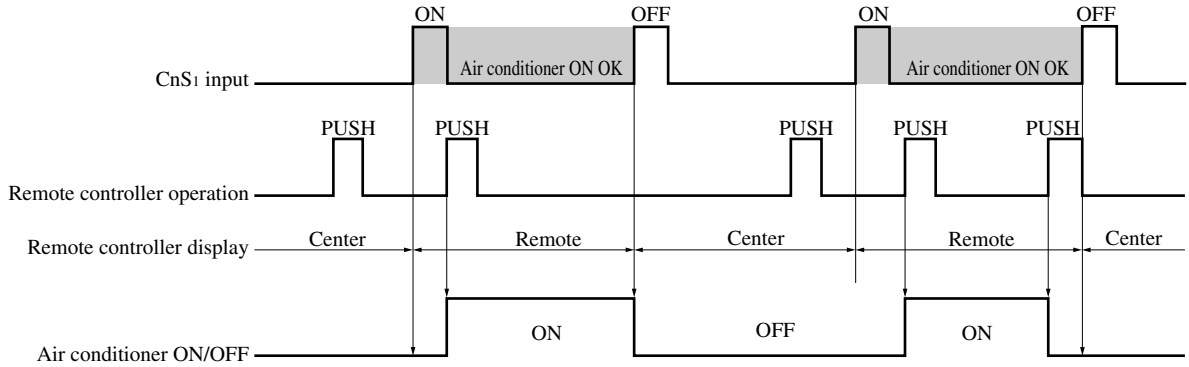
Input : CnS_1	CnS_1 input method change: J13	CnS_1 : Operation permission/ Prohibition mode change
Short circuit → Disconnection	J13; Short circuit Lever input	Operation prohibition mode ⟶ Operation permission mode
	J13; Disconnection Pulse input	Operation permission/Prohibition model change (Reversal)
Short circuit → Disconnection	J13; Short circuit	Operation permission mode ⟶ Operation prohibition mode
	J13; Disconnection	— (NOP)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.
2) CnS_1, performs the following operations by the changing of jumper wire J1 from short circuit to open circuit. If pulse input, the pulse duration is 500 ms or more.

① Operation with J13 short circuit



② Operation with J13 disconnection



(b) From CnS2, operation permission/prohibition control

Input : CnS2	CnS2 input method Formula switching: J13	Demand control/normal operating switching CnS2 :
Short circuit / Open circuit	J13; Short circuit Level input	Demand control ⟶ Normal operation
	J13; Open circuit Pulse input	Normal operation/Demand control switching (Reversal)
Short circuit / Open circuit	J13; Short circuit	Normal operation ⟶ Demand control
	J13; Open circuit	— (NOP)

Note (1) The factory settings are: J13 - short circuit; CnS2 - short circuit (short pin connection)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

2) Demand control

It is possible to switch the demand using jumper wires J5 and J6.

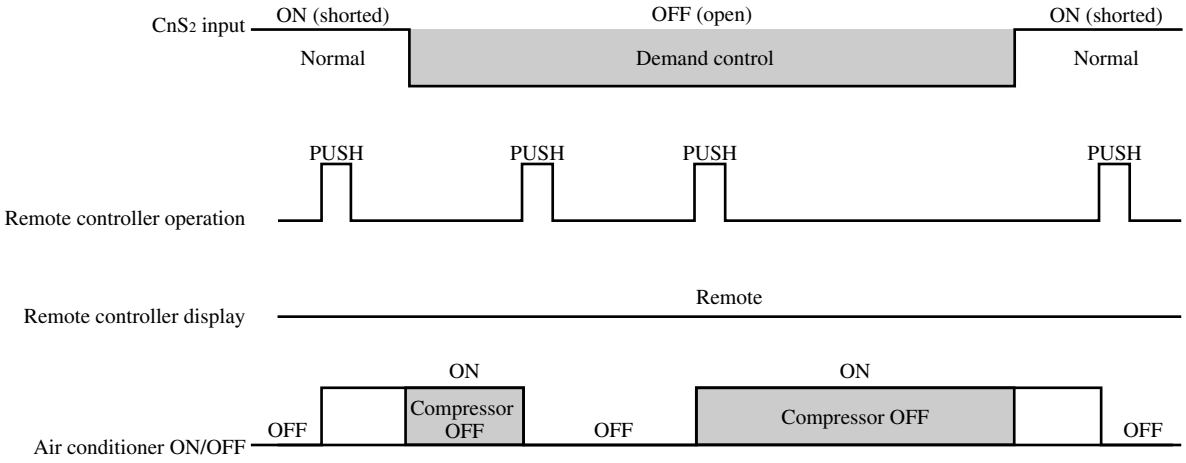
J6	J5	Compressor output (%)	Upper limit of compressor operation (Hz)
1	1	80	80
1	0	60	60
0	1	40	40
0	0	0	0

Note (1) 0: Open, 1: Shorted

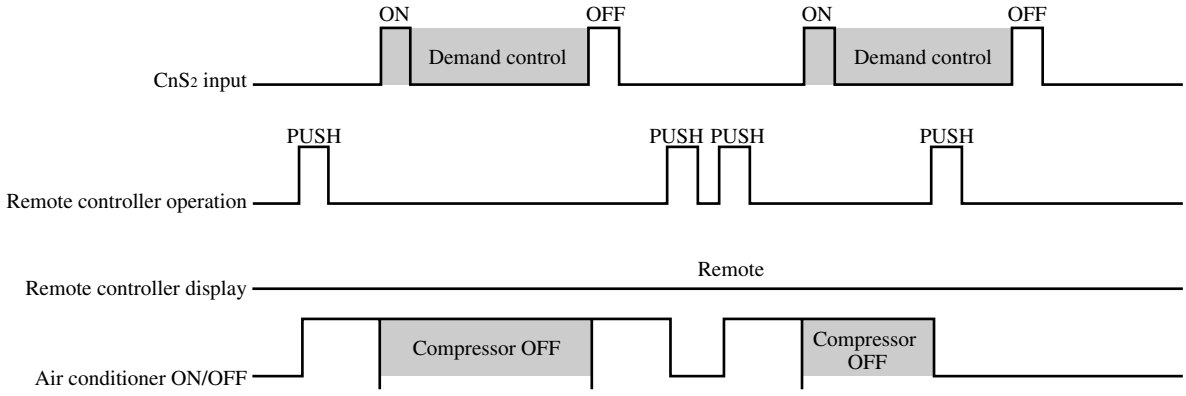
3) CnS2, performs the following operations by the changing of jumper wire J13 from short circuit to open circuit.

If pulse input, the pulse duration is 500 ms or more.

① J13 - Short circuit



② J13 - Open circuit



(18) Switching between operation and stoppage

(a) Set the channel of 7-segment LED to "70".

(b) Currently logged data is displayed in the data display part.
"0": first push priority (factory default).
"1": last push priority.

(c) Push down SW7 continuously for 3 seconds.

(d) Characters on the data display part flicker once every 0.5 second. Notice that the "Write Mode" will be ended if there is no switch input for 10 seconds in this state.

(e) Push down SW8 to switch to "1".
In the flickering state, if SW7 is pushed down continuously for 3 seconds, the "1" of data display part will light up and the setting will be saved.
The content saved after any revision won't be lost even if power supply is switched on again. If another revision is desired, repeat operation and set again.

(19) 7-Segment display

The data in the following table can be displayed using the display select switch (SW8: 1's digit; SW9: 10's digit).

Code No.	Contents of display	Data display range	Minimum units	Remarks
00	CM1 operating frequency, error code or pump down display	0~120	1Hz	Normally, the frequency is displayed. When there is an error, E?? is displayed. During pump down, PoS, PoE is displayed.
02	Tho-A (Outdoor air temp.)	L,-20~43	1˚C	[L] is indicated when the temperature is -20˚C or below and the actual temperature is indicated when it is higher than -20˚C and up to 43˚C.
03	Tho-R (Heat exchanger temp. 1) (Exit. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
07	Tho-D (Discharge pipe temp.)	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
10	Tho-C (Under-dome temp.) (CM1)	L,5~80	1˚C	[L] is indicated when the temperature is 5˚C or below and the actual temperature is indicated when it is higher than 5˚C and up to 80˚C.
12	Tho-P (Power transistor temp.) (CM1)	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
16	Tho-S (Suction pipe temp.)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
18	Super heat	0~50	0.1˚C	
20	CT1 (CM1) Current	0~50	1A	
22	EEVH Heating expansion valve opening angle	0~500	1 Pulse	
25	EEVC Expansion Valve opening angle for ending cooling.	0~500	1 Pulse	
26	FM01 Number of rotations			Order of 100: UH, Order of 10: H Order of 1: L
27	FM02 Number of rotations			Order of 100: UH, Order of 10: H Order of 1: L
28	PSH (Hi pressure sensor)	0~5.00	0.01MPa	
29	PSL (Low pressure sensor)	0~2.00	0.01MPa	
30	Crankcase heater	0,1	–	Order of 100: –, Order of 10: CH1, Order of 1: – (0: OFF, 1: ON)
32	SV2, SV3	0,1	–	Order of 100: –, Order of 10: SV2 Order of 1: SV3 (0: close, 1: open)
34	20S	0,1	–	Order of 100: 20S, Order of 10: – Order of 1: – (0: close, 1: open)
35	Compressor stop causes ①	0,1	–	Order of 100 : Defective under-dome thermistor Order of 10 : Defective outdoor unit heat exchanger thermistor Order of 1 : – (0:Normal, 1: Anomaly)
36	Compressor stop causes ②	0,1	–	Order of 100 : – Order of 10 : – Order of 1 : –Defective discharge pipe thermistor (0:Normal, 1: Anomaly)
37	Compressor stop causes ③	0,1	–	Order of 100 : Defective under-dome thermistor Order of 10 : Anomalous high pressure Order of 1 : – (0:Normal, 1: Anomaly)
38	Compressor stop causes ④	0,1	–	Order of 100 : Defective suction pipe thermistor Order of 10 : Defective low pressure sensor Order of 1 : Defective high pressure sensor (0:Normal, 1: Anomaly)
39	Compressor stop causes ⑤	0,1	–	Order of 100 : Anomalous in inverter 1 communication Order of 10 : – Order of 1 : Anomalous high pressure (0:Normal, 1: Anomaly)
40	Compressor stop causes ⑥	0,1	–	Order of 100 : Anomalous low pressure Order of 10 : Anomalous discharge pipe temp. Order of 1 : – (0:Normal, 1: Anomaly)
41	Compressor stop causes ⑦	0,1	–	Order of 100 : Defect CM1 starting Order of 10 : – Order of 1 : CM1 Rotor lock (0:Normal, 1: Anomaly)
42	Compressor stop causes ⑧	0,1	–	Order of 100 : – Order of 10 : CM1 Current cut Order of 1 : – (0:Normal, 1: Anomaly)
43	Compressor stop causes ⑨	0,1	–	Order of 100 : Power transistor overheating Order of 10 : – Order of 1 : 0 (0:Normal, 1: Anomaly)
44	Compressor stop causes ⑩	0,1	–	Order of 100 : Heating high pressure protection Order of 10 : Stop command from indoor Order of 1 : 0 (0:Normal, 1: Anomaly)
45	Compressor stop causes ⑪	0,1	–	Order of 100 : Dilution protection Order of 10 : Demand control 0% Order of 1 : Low frequency protection (0:Normal, 1: Anomaly)
46	Control status	0,1	–	Order of 100 : During equal oil control Order of 10 : During oil return control Order of 1 : During defrost (0:Non-operative, 1: Operation)

Code No.	Contents of display	Data display range	Minimum units	Remarks
47	Control status	0,1	–	Order of 100 : During discharge temp. control Order of 10 : During high pressure control Order of 1 : During current safe control (0:Non-operative, 1: Operation)
48	Control status	0,1	–	Order of 100 : During low pressure control Order of 10 : During power thansistor control Order of 1 : – (0:Non-operative, 1: Operation)
49	Control status	0,1	–	Order of 100 : Cooling high pressure protection control Order of 10 : High pressure power ratio Order of 1 : – (0:Non-operative, 1: Operation)
50	Number of connected indoor unit	0~50	1	
51	Number of operation indoor unit	0~50	1	
52	Required Hz total	0~999	1Hz	
53	Target Fk	0~999	1Hz	
54	Compressor cumulative operating time (CM1)	0~655	100h	
56	Discharge pressure saturation temperature	-50~70	0.1˚C	1˚C at –10 or lower
57	Air inlet pressure saturation temperature	-50~30	0.1˚C	1˚C at –10 or lower
58	Target cooling low pressure	0.60~0.90	0.01MPa	
63	Inverter 1 operating frequency command	0~120	1Hz	
66	Control status	0,1	_	Order of 100 : During silent mode Order of 10 : During capacity measurement mode Order of 1 : During test operation (0:Non-operative, 1: Operation)
67	Control status	0. 1	–	Order of 100 : Unmatch Order of 10 : Indoor EEV check Order of 1 : Refrigerant volume measurement (0:Non-operative, 1: Operation)
68	Control status	0. 1	–	Order of 100 : Piping cleaning Order of 10 : – Order of 1 : – (0:Non-operative, 1: Operation)
75	Snow protection fan control	0,1	–	0: Snow protection fan control deactivated 1: Snow protection fan control activated
76	Check operation	0,1	–	0: Not implemented 1: Completed
77	Data reset	---, dEL	–	
80	Counter · Thermistor disconnection	0~2	–	
81	Counter · Inverter communications error	0~3	–	
82	Counter · High pressure protection	0,1	–	
83	Counter · Compressor 1 starting failure	0,1	–	
84	Counter · Anomalous low pressure ①	0~4	–	
87	Counter · Motor lock of compressor	0~3	–	
88	Counter · Overheating of power transistor	0~4	–	
89	Counter · Anomalous temp. of discharge pipe	0,1	–	
91	Counter · Current cut (CM1)	0~3	–	
93	Counter · Indoor-outdoor communications error	0~255	–	
95	Counter · CPU reset	0~255	–	
96	Counter · Anomalous FM01	0~255	–	
97	Counter · Anomalous FM02	0~255	–	
98	Program version	–	–	Example (2.11)
99	Auto send display	–		

(20) Saving of Operation Data

Operating data for a period of 30 minutes prior to the time when trouble occurs are recorded, and these data can be fetched to a personal computer through the RS232C connector on the control board. Data are updated continuously, and when there is an anomalous stop, data updates stop at that point. Pressing DIP switch SW7 for 3 seconds causes the data to be erased. Data can also be sampled at 1 minutes intervals during operation and fetched to a personal computer.

Code No.	Write-in contents	Record data					
		Data write-in range	Write-in unit	Number of bytes	Contents		
1	Anomaly code	00~99	–	1	00: No anomalous, outdoor unit all anomalous ???		
2	Address of unit where trouble occurred	00~FF	–	1	0~3F: Outdoor side, 40~6F: Indoor side		
3	Operation mode	0~4	–	1	0	Stop	
					2	Cooling	
					4	Heating	
4	High pressure sensor	0.00~6.00	A/D value	1			
5	Low pressure sensor	0.00~1.00	A/D value	1			
6	Tho-R1 (Heat exchanger temp. 1)	-35~75	A/D value	2			
10	Tho-D (Discharge pipe temp.) (CM1)	20~140	A/D value	1			
14	Tho-A (Outdoor air temp.)	-30~40	A/D value	1			
15	Tho-P (Power transistor temp.) (Heat dissipation fin)	20~140	A/D value	1			
16	Tho-C (Under-dome temp.)	-15~75	A/D value	2			
17	Tho-S (Suction pipe temp.)	-35~75	A/D value	2			
20	CT1 Current	0~50	A/D value	1			
24	Power source voltage	180~220	A/D value	1			
26	Solenoid valve	–	–	1	Bit0	20S	0:OFF, 1:ON
					Bit2	SV2	0:OFF, 1:ON
					Bit3	SV3	0:OFF, 1:ON
27	Crankcase heater etc.	–	–	1	Bit0	CH	0:OFF, 1:ON
28	Fan speed	0~15	1 speed	1			
31	FM1(AC) speed	0~3	1 speed	1	0:OFF, 1:Lo, 2:Me, 3:Hi		
32	FM2(AC) speed	0~3	1 speed	1	0:OFF, 1:Lo, 2:Me, 3:Hi		
34	EEV-c opening angle	0~65535	1 pulse	2			
35	EEV-h opening angle	0~65535	1pulse	2			
36	Indoor unit connection number	0~255	1 unit	1			
37	Indoor unit connection capacity	0~65535	–	2			
38	Indoor unit thermostat ON number	0~255	1 unit	1			
39	Indoor unit thermostat ON capacity	0~65535	–	2			
40	Required Hz total	0~65535	1Hz	2			
41	Target Fk	0~65535	1Hz	2			
42	Inverter CM1 operation frequency	0~255	1Hz	1			
44	Answer Hz total	0~65535	1Hz	2			
45	Expansion valve compensation frequency (Heating thermostat OFF)	0~255	1Hz	1			
48	CM1 Cumulative operating time (estimated)	0~65535	1h	2			
49	CM1 Compressor start times	0~65535	20 times	2			
50	Compressor stop causes	–	–	1	Bit0	Defective outdoor temperature thermistor	
					Bit1	Defective outdoor unit heat exchanger thermistor	
					Bit2	Defective low pressure sensor	
					Bit3	Inverter anomalous communication	
					Bit4	Anomalous high pressure	
					Bit5	Defect inverter starting	
					Bit6	Anomalous low pressure	
					Bit7	Rata lock	
51	Compressor stop causes	–	–	1	Bit0	Power transistor overheating	
					Bit1	Defective discharge pipe thermistor	
					Bit2	Anomalous discharge pipe temp.	
					Bit3	Current cut	
					Bit4	Anomalous heat exchanger and high pressure	
					Bit5	Defective high pressure sensor	
					Bit6	Defective suction pipe thermistor	
					Bit7	Defective under-dome thermistor	
52	Compressor stop causes	–	–	1	Bit0	–	
					Bit1	Low frequency protective stop	
					Bit2	Indoor stop command	
					Bit3	Dilution protective stop	
					Bit4	Stop by Demand	
					Bit5	High pressure protective stop	
					Bit6	Operating mode switching stop	
					Bit7	–	
53	Control status	0~180	1 second	1	CM1 3-minute delay timer		

Code No.	Write-in contents	Record data				
		Data write-in range	Write-in unit	Number of bytes	Contents	
59	Control status oil return	0~2	–	1	0	None
					1	Waiting for oil return
					2	Under for oil return
60	Control status defrost conditions	0~3	–	1	0	None
					1	Temperature conditions
					2	Strengthening temperature conditions
					3	Time conditions
61	Control status defrost status	0~6	–	1	0	None
					1	Frequency down & maintain
					2	–
					3	To maximum frequency
					4	Until end conditions are established
					5	Frequency down and maintain
					6	Defrost end operation
62	Control status Td	0~4	–	1	0	None
					1	Frequency down
					2	Holding frequency
					3	Waiting for cancel
					4	Establishing cancel conditions
63	Control status	0, 1	–	1	Discharge pipe temperature thermistor error counter	
64	Control status HP	0~4	–	1	0	None
					1	Frequency down
					2	Holding frequency
					3	Waiting for cancel
					4	Establishing cancel conditions
65	Control status	0, 1	–	1	HP Error counter	
66	Control status CS	0~4	–	1	0	None
					1	Frequency down
					2	Holding frequency
					3	Waiting for cancel
					4	Establishing cancel conditions
67	Control status LP	0~4	–	1	0	None
					1	Frequency down
					2	Holding frequency
					3	Waiting for cancel
					4	Establishing cancel conditions
68	Control status	0, 1	–	1	LP Error counter	
72	Control status PT	0~4	–	1	0	None
					1	Frequency down
					2	Holding frequency
					3	Waiting for cancel
					4	Establishing cancel conditions
74	Control status CH compressor protective start	0~17	–	1	0~16	During protective start
					17	Protective start end
75	Control status	0, 1	–	1	External operation (CnS1) 0: Operation prohibition 1: Operation permission	
76	Control status	0, 1	–	1	Demand (CnS2) 0: None 1: Under control	
77	Control status	0, 1	–	1	Demand (CnG1) 0: None 1: Under control	
78	Control status	0, 1	–	1	Demand (CnG2) 0: None 1: Under control	
80	Control status	0~3	–	1	Inverter · Current cut anomaly counter	
81	Control status	0~4	–	1	Inverter · Power transistor overheating anomaly counter	
82	Control status	0~3	–	1	Inverter · Rotor lock anomaly counter	
83	Control status	0~1	–	1	Inverter · Starting failure counter	
84	Control status	0~3	–	1	Inverter · Communications anomaly counter	
88	Control status	0~2	–	1	Thermistor disconnection counter	
89	Control status	0,1	–	1	Frequency release operation 0: None 1: Under control	
90	Registered indoor units 1~8 operation mode	0~4	–	8	0:	AUTO
					1:	DRY
					2:	COOL
					3:	FAN
					4:	HEAT
91	Registered indoor units 1~8 required Hz	0~255	1Hz	8		
92	Registered indoor units 1~8 answer Hz	0~255	1Hz	8		
93	Registered indoor units 1~8 local control	–	–	1	Operating mode unmatch	
94	Registered indoor units 1~8 local control	–	–	1	Oil return	

◆ Models FDCA224HKXE4BR, 280HKXE4BR, 335HKXE4BR

(1) Operations of major functional items under each operation mode

Functional item \ Operation mode	Cooling		Fan	Heating			Dehumidify
	Thermostat ON	Thermostat OFF		Thermostat ON	Thermostat OFF	Defrost	
Indoor unit fan	Remote controller command	Remote controller command	Remote controller command	Remote controller command	Intermittent operation	○→×	○/×
Indoor unit electronic expansion valve	Overheating control response	Fully closed	Fully closed	Overheating control response	60 pulse	Model-specific aperture opening angle	Overheating Control Response
Compressor [CM1]	○	×	×	○	×	○	○/×
Magnetic contactor CM1 [52C1]	○	○	×/○	○	○	○	○
Outdoor unit fan [FMo-1]	○/×	×	×/○	○/×	×	○→×	○/×
Outdoor unit fan [FMo-2]	○	×	×/○	○	×	○→×	○/×
Inverter cooling fan [FMC1]	○/×	○/×	×	○/×	○/×	○/×	○/×
4 way valve [20S]	×	×	×	○	○	○→×	×
Electronic expansion valve for heating [EEVH1, 2]	Fully open	Fully open	Fully closed	Opening Angle Control	Fully closed	Opening Angle Control	Fully open
Electronic expansion valve for sub-cooling [EEVSC]	Opening Angle Control	Fully closed	Fully closed	Opening Angle Control	Fully closed	Fully closed	Opening Angle Control
Solenoid valve [SV1]	○/×	×	×	○/×	×	○/×	○/×
Solenoid valve [SV6]	○/×	×	×	○/×	×	○/×	○/×
Solenoid valve [SV11]	×	×	×	○/×	×	×	×
Solenoid valve [SV12]	×	×	×	×	×	×	×
Crankcase heater [CH1]	○/×	○/×	○/×	○/×	○/×	○/×	○/×

Notes(1) ○ : ON, × : OFF, ○/× : ON or OFF

(2) 4-way valve switching assurance

When the compressor is switching from the stopped state to the start state, after the compressor start control functions, there is an increase in frequency from 10Hz (synchronous operation).

(a) 0-20Hz Operation

It operates in the range of 0 – 20Hz. However, in this operation, the compressor cannot be operated with the current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. control, under-dome temp. control or compression ratio protection controls.

(b) 20 – 40Hz (49) Operation

Maximum frequency is determined based on the temperature detected with the outdoor air temperature thermistor (Tho-A).

1) If the temperature is 0 °C or lower, after starting with 49Hz as the maximum frequency, it stops at 49Hz.
2) If the temperature is higher than 0°C, after starting with 40Hz as the maximum frequency, it stops at 40Hz. However, if the starting conditions for current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. controls or compession ratio protection controls are satisfied during this time, this control ends and control according to current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. controls , under-dome temp. control or compession ratio protection controls commences, and if the compressor's frequency is determined and cancelled, operation returns to normal operation.

(3) Compressor protective start

After 4-way valve switching assurance is completed, the following compressor protection begins.

		Initial Start (Remote controller ON error cancel)	Thermostat ON start	
			Operation Mode Changed While Thermostat Was OFF	Operation Mode Unchanged While Thermostat Was OFF
Compressor ON count: 1st time	Less than 45 minutes after power ON	Compressor protective start B according to crankcase heater's power ON time	Compressor protective start B according to crankcase heater's power ON time	Compressor protective start B according to crankcase heater's power ON time
	45 minutes or more after power ON	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time
Compressor ON count: From 2nd time	Less than 45 minutes after stop	Protective start	Protective start	Protective start
	45 minutes or more after stop	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time

Note: If the under-dome temperature exceeds 30ºC, compressor protective start A and B end and operation starts.

(a) Compressor protective start

The compressor's speed is controlled as follows, regardless of the target frequency.

1) Operation occurs at 20Hz for a 1 minute 45 second period following a compressor start.
2) Operation occurs in accordance with pressure control after the post-start 1 minute 45 second period.

(b) Compressor protective start sequence "A" according to crankcase heater power ON time

The cumulative power ON time from power ON is calculated, and compressor protective start sequence "A" control occurs at the 1st compressor start after a 45-minute period, and at all subsequent compressor starts that follow a power ON after a compressor stop of 45 minutes or longer.

1) The inverter is set to 20Hz following 4-way valve switching assurance. The target frequency is then established 1 minute after a 1-minute period has elapsed since the frequency reduction to 20Hz was reached.
2) During a 15-minute period following the start, the 20Hz frequency is increased at a rate of 5Hz per minute, and the start of the 15-minute period becomes the inverter's start completion point (10Hz).
3) If the inverter is stopped within a 15-minute period after a compressor start, this control increases the frequency 5Hz per minute for 15 minutes when the compressor starts again.

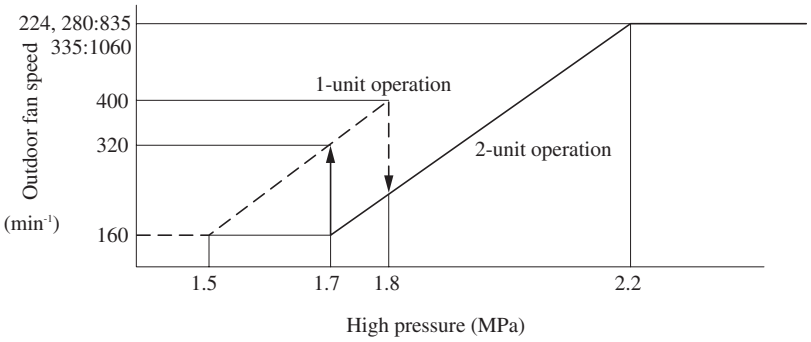
(c) Compressor protective start sequence "B" according to crankcase heater power ON time

The cumulative power ON time from power ON is calculated, and compressor protective start sequence "B" control occurs at the 1st compressor start within a 45-minute period.

1) The inverter is set to 20Hz following 4-way valve switching assurance. The target frequency is then established 1 minute after a 1-minute period has elapsed since the frequency reduction to 20Hz was reached.
2) During a 18-minute period following the start, the 20Hz frequency is increased at a rate of 5Hz per minute, and the start of the 18-minute period becomes the inverter's start completion point (10Hz).
3) The frequency is increased 5Hz per minute through the 18-minute to 24-minute period, and this control ends when 24 minutes is reached.
4) After this control ends 1 time, the system reverts to protective start "A" control from the 2nd time, or after 45 minutes have elapsed.
5) If the inverter is stopped for 24 minutes following a compressor start, a protective start is performed when started again, and protective start sequence "B" control increases the frequency for a period of 24 minutes. However, the system reverts to protective start sequence "A" control when started again if 45 minutes or more have elapsed since the inverter stop.

(4) Cooling high pressure control

• 2-unit operation is switched to 1-unit operation by the outdoor fan speed running at high pressure.



Control termination conditions

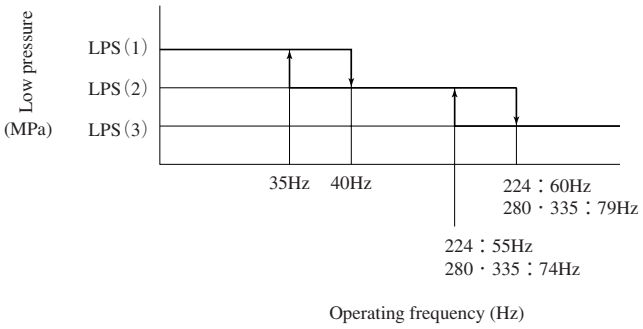
1) When a mode other than cooling or dehumidifying is selected.

2) When compressor stops

(5) Cooling low pressure control

During cooling and dehumidifying operations, a constant low pressure is maintained by compressor frequency control.

(a) After compressor protective start ends (1 minute 45 seconds), the compressor's frequency is controlled as shown below.



Unit: MPa

Model	LPS (1)	LPS (2)	LPS (3)
224	0.80	0.75	0.70
280	0.82	0.77	0.73
335	0.82	0.79	0.76

(b) Control termination conditions

(i) When a mode other than cooling or dehumidifying is selected.

(ii) When the compressor stops.

(6) Heating high pressure control

During heating operation, a constant high pressure is maintained by compressor frequency control.

(a) Control activation condition

1 minute 45 seconds have elapsed since the completion of a compressor protective start.

(b) Control description

The compressor frequency is controlled to maintain a high pressure of 2.75Mpa.

(c) Control termination conditions

(i) When a mode other than heating is selected.

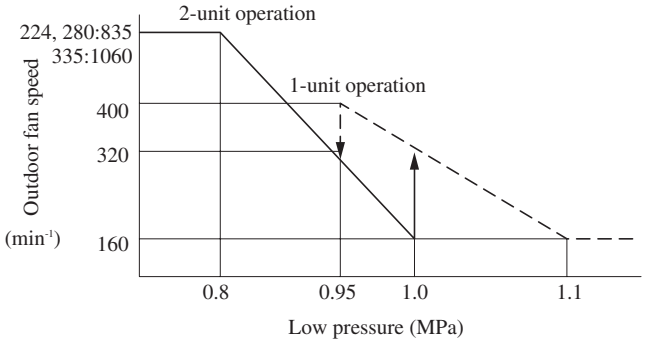
(ii) When the compressor stops.

(7) Heating low pressure control

Low pressure is controlled in accordance with the outdoor unit's fan speed during a heating operation.

(a) After compressor protective start ends (1 minute 45 seconds), when the low pressure is 0.80 MPa or higher, this control is activated.

(b) The outdoor unit's fan speed is controlled in accordance with the low pressure by switching between 2-unit and 1-unit operation.



Control termination conditions

1) When a mode other than heating is selected.

2) When the compressor stops.

(8) Emergency stop control

When an indoor unit's external input (optional: refrigerant leakage, etc.) indicates a refrigerant leak, that information is transmitted to the outdoor unit, stopping operation. An emergency stop error is then transmitted to all indoor units that are running.

(a) Error stop occurs when the "emergency stop" command is received from the indoor unit.

(b) Error code E63 occurs, and the "emergency stop" command is transmitted to all indoor units.

(c) When a "emergency stop clear" command is received from the indoor unit, the outdoor unit's error status is cleared, and an "emergency stop clear" command is transmitted to all the indoor units.

(9) Compression ratio protection control

The frequency is reduced in accordance with the compressor's compression ratio.

(a) Control activation conditions

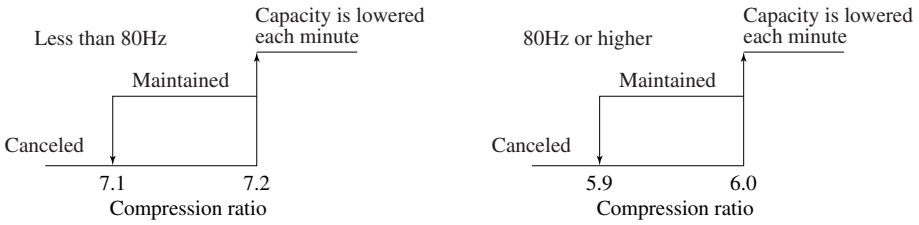
This control is activated when all the following conditions are satisfied.

(i) When 10 minutes or more have elapsed since the compressor start.

(ii) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

Note (1) The above does not apply for a 10-minute period following a defrost, or when pump-down control is in progress.

(b) Control description



(c) Control termination conditions

Control ends when any one of the following conditions is satisfied.

(i) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

(ii) When the compression ratio falls below the cancel value.

(10) Outdoor fan control

(a) DC fan motor control

The outdoor fan tap has 0 speed to 4nd speed assigned as the regular speed depending on the model and operation mode. Under normal operation, 1st speed and 4nd speed is used, and in each outdoor fan control, control is stepless between 1st speed and 4nd speed.

(b) Outdoor fan tap

Unit: min^{-1}

Fan tap	FDCA224, 280				FDCA335			
	Cooling		Heating		Cooling		Heating	
	FM_{O1}	FM_{O2}	FM_{O1}	FM_{O2}	FM_{O1}	FM_{O2}	FM_{O1}	FM_{O2}
1th speed	0	160	0	160	0	160	0	160
2th speed	0	400	0	400	0	400	0	400
3th speed	160	160	160	160	160	160	160	160
4th speed	835	835	835	835	1060	1060	1060	1060

(c) When operation is starting, operation is at 4nd speed.

(d) Judgment of whether or not to start the DC fan motor

(i) If the outdoor fan starts after stopping, the fan speed is checked and start control is performed.

(ii) If the unit is stopped (free-running state) and the fan speed is in reverse, either FM_{O1} or FM_{O2} is 700 min^{-1} or higher, it is not started, and if both FM_{O1} and FM_{O2} is under 700 min^{-1} for 3 seconds, it is started.

(iii) The compressor is started regardless of the state of the outdoor fan, and the above contents are sensed 5 seconds or more after the time that 52C1 goes ON.

(11) Snow protection fan control

(a) This control is enabled/disabled by the selector switch at the 7-segment display.

① Set the Code No. to "75".

② "0" or "1" displays at the data display area.

0: Outdoor fan control disabled (factory setting)

1: Outdoor fan control enabled

③ Press SW7 continuously for 3 seconds.

④ "0" or "1" blinks every 0.5 seconds at the data display area.

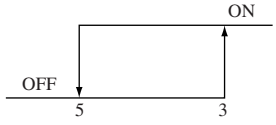
⑤ Press SW8 to toggle between the blinking "0" and "1" displays.

⑥ If SW7 is pressed for 3 seconds or longer while "0" and "1" is blinking, the blinking stops, and that enabled/disabled setting is registered. If enabled, fan control occurs as described below.

⑦ Outdoor fan control occurs in accordance with the information stored in memory, even if the power is turned OFF and back ON again.

(b) Control description

(i) If the outside temperature drops to 3°C or lower when all units are stopped, or during an error stop, the outdoor fan runs at level 4 speed once every 10 minutes.



Outdoor air temperature (°C)

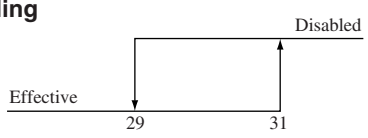
(ii) The outdoor fan runs for 30 seconds.

(iii) During this snow protection control, the compressor's magnetic contactor (52C1) is ON.

(12) Silent mode control

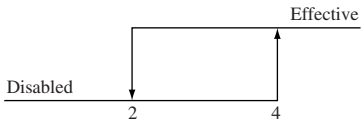
(a) If the silent mode start signal is received from an indoor unit or CnG2 (with short pin) is shorted, if the outdoor temperature is within the following range, operation is performed in the silent mode.

• Cooling



Outdoor air temperature (°C)

• Heating



Outdoor air temperature (°C)

(b) Outdoor fan upper limit speed, compressor upper limit operating speed (other than for 30 seconds after startup and during defrost operation).

Item / model	Upper limit fan speed	Upper limit compressor operating speed
FDCA224	400 min^{-1}	58 Hz
FDCA280	400 min^{-1}	76 Hz
FDCA335	500 min^{-1}	79 Hz

(13) Forced heating/cooling operation

With this control, SW3-7 on the outdoor unit PCB is turned on and CnG1 (equipped with short circuit pin) is shorted or opened so as to forcibly determine whether the indoor unit is operated for cooling or heating. If any operation mode other than the forcible mode is commanded from the indoor unit, the mode unmatch message is displayed on the remote controller or others and the operation enters in the blowing mode.

SW3-7	CnG1	Operation
OFF	Open/short	Normal operation
ON	Open	Cooling
	Short	Heating

Note (1) SW-7 is at OFF and CnG1 is open at the shipping from factory.

(14) Indoor unit connection number protection

If the number of indoor units on the connection exceeds the number as listed below, the compressor stops with the error stop.

Item / model	All model
Number of units on connection	20 units

Note (1) They are the numbers of units used for judgement of error for the purpose of control and not equal to the numbers of units which can be connected.

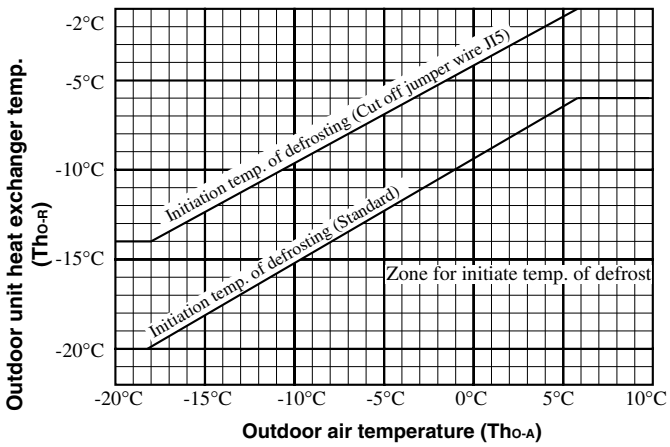
(15) Defrosting

(a) Temperature condition defrosting

(i) Conditions for starting defrosting

When all the following conditions are met, the defrosting operation will start.

1) The cumulative operating time of the compressor comes up to 33 minutes after completion of a defrosting operation, or it comes up to 33 minutes after a heating operation starts (the remote controller is turned on).
2) If 8 minutes have passed after the compressor goes ON after it has gone OFF.
3) If 8 minutes have passed after one outdoor unit fan goes ON after all outdoor fans have gone OFF.
4) After all the above conditions are satisfied, when the temperature at the outdoor heat exchanger thermistor (Tho-R) and outdoor temperature thermistor is below the defrost initiation temperature in the above graph continuously for 3 minutes.



(ii) Conditions for finishing defrosting

- Standard (J14: shorted)
  1) When the increase of the temperature of the heat exchanger thermistor (Tho-R1 or Tho-R2) is greater than 9ºC.
  2) When 12 minutes have passed since defrosting started.
- With operation Judgment Function (J14: Open)
  1) If Tho-R1 and R2 are ≧ 9ºC, after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 2 minutes and 30 seconds have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 14ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.
  2) If Tho-R1 or R2 are < 9ºC after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 5 minutes have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 14ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.

(b) Time condition defrosting (oil return)

(i) Defrosting start conditions

1) Defrosting starts when the heating mode is in effect at the 1st compressor start following a power ON, and when the heating mode is in effect after 2 hours of cumulative operation time. However, if mode switching from cooling to heating occurred, defrosting starts 33 minutes after CM1 operation begins.
2) If there was 5 minutes or more of temperature condition defrosting before time condition defrosting, the 10-hour timer for time condition defrosting is reset.
3) The "time condition defrosting" time is the point when the detected oil rise amount reaches the setting value (following 2 hours of cumulative compressor operation time counting from the 1st compressor start after power ON), or the point when 10 hours elapse, whichever comes first.
4) When the 10-hour timer period elapses, time condition defrosting occurs at the completion of the previous temperature condition defrosting operation, or after 33 minutes, whichever comes first.

(ii) Defrosting end conditions

If either of the following conditions is satisfied, the defrosting end operation starts.

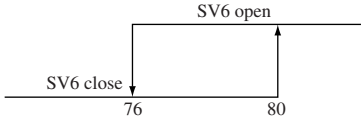
1) If defrosting continues for 5 minutes and the temperature sensed by Tho-R1 and Tho-R2 becomes 9ºC or higher.
2) If 12 minutes has passed since defrosting started.

(16) Oil separator solenoid valve (SV6) control

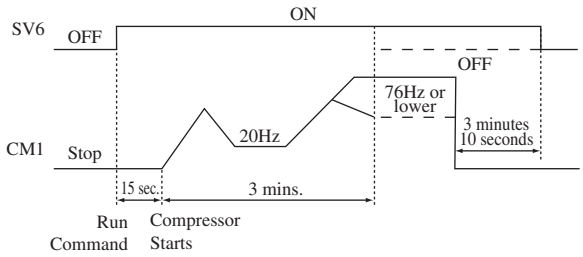
(a) If the inverter compressor starts, solenoid valve SV6 opens (goes ON), then 15 seconds later, it starts.

(b) SV6 stays open (ON) for 3 minutes, until compressor protective start are completed.

(c) If the compressor operating frequency becomes 80Hz or higher, SV6 opens (goes ON) and it goes off if the frequency is 76Hz or lower.



(d) If the inverter compressor goes off after SV6 opens (goes ON), SV6 remains open (ON) for 3 minutes and 10 seconds, then closes (goes OFF).



(17) Unit protective maintenance related devices

(a) Test operation mode

1) Outdoor unit test operation mode operation is started by the DIP switches SW5-1 and 5-2 on the outdoor unit control board.

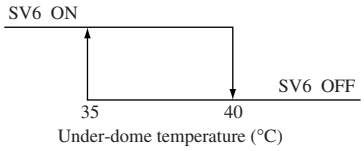
Switch functions

SW5-1	ON	**SW5-2**	OFF	Heating Test Operation
			ON	Cooling Test Operation
	OFF	Normal or Test Operation End		

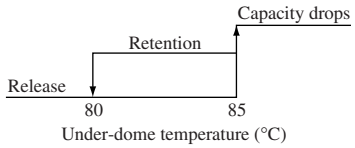
Notes (1) Leave all DIP Switches except 5-1 and 5-2 OFF.
(2) This operation takes priority over other options such as the center console. It sets the options in the operating state.

(b) Under-dome temperature control

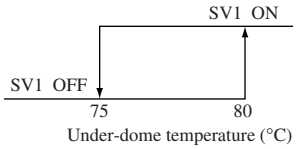
1) The oil separator solenoid valve (SV6) are controlled in accordance with the temperature at the under-dome thermistor (Tho-C) installed on the compressor.



2) The compressor's capacity is controlled in accordance with the under-dome temperature (Tho-C).

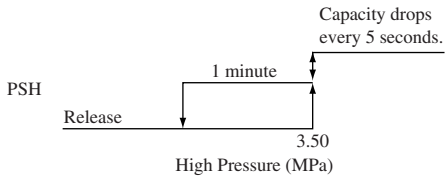


3) The cooling solenoid (SV1) is controlled in accordance with the under-dome temperature (Tho-C).



(c) Cooling high pressure protective control

1) During cooling and dehumidifying operation, if the high pressure sensor (PSH) exceeds the cooling high pressure upper limit value while the compressor is ON. However, this is not valid until the frequency reaches 20 Hz after the inverter starts.

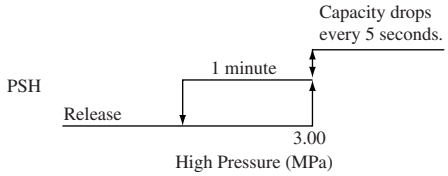


2) When the high pressure exceeds the cooling high pressure upper limit value, the compressor's capacity drops, then after 5 seconds pass, if the cooling high pressure upper limit is still exceeded, the capacity is lowered still further.
3) If the high pressure drops below the cooling high pressure upper limit value, and that condition continues for 1 minute. After that, control returns to cooling normal control.

(d) Heating high pressure protective control

(i) Compressor capability control by high pressure

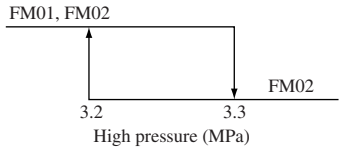
1) During heating, if the high pressure sensor (PSH) exceeds the heating high pressure upper limit value while the compressor is ON. However, this is not valid until the frequency reaches 20 Hz after the inverter starts.



2) When the high pressure exceeds the heating high pressure upper limit value, the compressor's capacity drops, then after 5 seconds pass, if the heating high pressure upper limit is still exceeded, the capacity is lowered still further.
3) If the high pressure drops below the heating high pressure upper limit value, and that condition continues for 1 minute. After that, control returns to heating normal control.

(ii) Outdoor unit fan speed control in accordance with high pressure

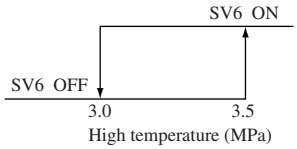
1) Starting conditions
   When the high pressure is 3.0 MPa or greater after compressor protection start and end (1 min. 45 sec.).
2) Control contents
   a) Fan speed is controlled between 160 to 835 (1060) min^{-1}. Fan motors 01 and 2 have the same speed.
   Note (1) The values in parentheses are for FDCA335.
   b) When the high pressure reaches or exceeds the following values, the fan motor FM01 (right side) is stopped.



3) Under the following conditions, outdoor unit fan speed control is ended.
   a) When the mode has been switched from heating operation to another mode.
   b) If the compressor stops.
   c) When the high pressure is below 3.0 MPa.

(iii) Solenoid Valve (SV6) Control

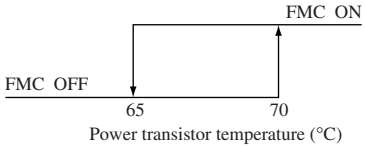
1) The solenoid valve (SV6) goes ON when the high pressure (sensed by PSH) rises to 3.5 MPa or higher during heating operation.



2) Under the following conditions, solenoid valve (SV6) control is ended.
   - When the mode has been switched from heating operation to another mode.
   - If the compressor stops.
   - If the high pressure (sensed by PSH) becomes lower than 3.0 MPa.

(e) Inverter cooling fan control

(i) Inverter power transistor temperature rises are controlled by the cooling fan (FMC) in accordance with the temperature sensed by the power transistor temperature thermistor (Tho-P) after the inverter starts.

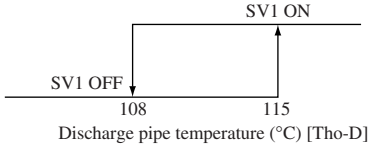


(ii) A cooling fan ON status is maintained for 3 minutes 10 seconds if the cooling fan (FMC) is ON when the compressor is switched from ON to OFF.

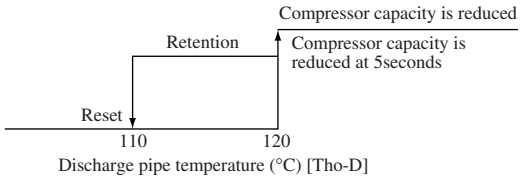
(f) Discharge pipe temperature control

If the discharge pipe temperature (sensed by Tho-D) exceeds the set value, the compressor cooling solenoid valve (SV1) goes ON, the indoor expansion valve opens and the compressor's capacity is controlled, thus suppressing rises in the discharge pipe temperature. If the temperature rises even further, the compressor stops.

(i) Compressor Cooling Solenoid Valve (SV1) Control

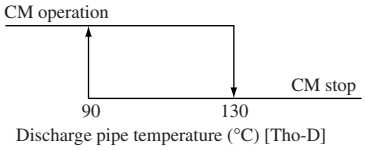


(ii) Compressor control



(iii) Discharge pipe temperature error

- When the discharge pipe temperatures (Tho-D detection) rise beyond 130°C and is maintained for 2 seconds, the compressors are stopped but it will be reset if the temperatures drop below 90°C.



- If the discharge pipe temperature (Tho-D detection) occurs twice within 60 minutes or the condition higher than 130 °C has continued for 60 minutes including the duration of time of compressor stop, the unit operation is stopped with the error stop.

Note (1) Unless the temperature of 90 °C or under is maintained for 45 minutes after the discharge pipe error, the unit cannot be started again. (Reset the power supply to clear.)

(g) Current safe control

(i) The compressor speed is reduced if the inverter inlet's input voltage (converter inlet L3-phase) exceeds the setting value. If the input voltage still remains above the setting value, the speed is reduced again.

(ii) This control ends when the input voltage drops below the setting value for 3 continuous minutes.

(h) Current cut control

Cuts an inverter overcurrent. When the current exceeds the setting value, the inverter is immediately stopped, and is then automatically restarted 3 minutes later. If 4 overcurrent cuts occur within a 15-minute period, 52C1 is switched OFF, and an error stop status is established.

(i) Anomalous high pressure increase protection

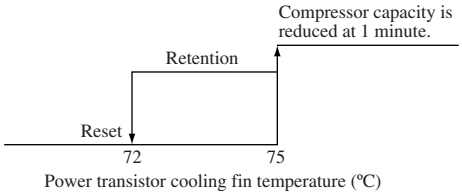
If the high pressure side pressure switch [63H1: 3.8 Open / 2.9 Closed MPa] operates 5 times within 60 minutes or operates for 60 minutes, an anomalous stop is performed.

However, when first operated, the compressor is stopped, then after a 3-minute delay, normal operation is resumed.

(j) Power transistor temperature control

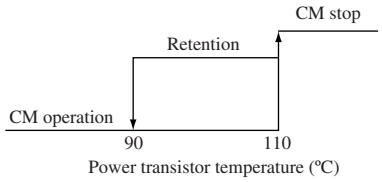
If the temperature of the power transistor cooling fins (sensed by Tho-P) exceeds the set value, the compressor's capacity is controlled to keep the power transistor's temperature from rising. If it rises still higher, the compressor is stopped.

1) Compressor control



2) Power transistor temperature anomaly

- If the temperature sensed by the power transistor temperature thermistor rises to 110ºC or higher, the compressor is stopped.

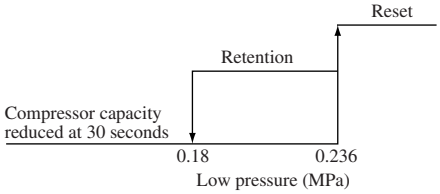


- If the power transistor's temperature is anomalous 5 times within 60 minutes, or if the temperature is 110ºC or higher for 60 minutes continuously, including when the compressor is stopped, an anomalous stop is performed.

(k) Low pressure protective control

If the low pressure (sensed by PSL) drops below the set value, the compressor's capacity is controlled to prevent the low level pressure from dropping. If it drops still further, the compressor is stopped.

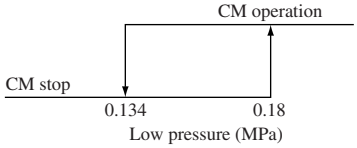
1) Compressor control



Note (1) Starting Conditions
- 1 minutes and 45 seconds have passed since starting.
- Sensed continuously for 10 seconds

2) Low pressure anomaly

- If the low pressure (sensed by PSL) drops to 0.134 MPa or lower continuously for 30 seconds, the compressor is stopped and if a pressure of 0.18 MPa or higher is detected continuously for 10 seconds, the compressor is automatically reset. If this occurs 2 times within 60 minutes, an anomalous stop is performed.



- A low pressure (sensed by PSL) of 0.18 MPa or lower while the compressor is stopped, or sensed continuously for 30 seconds while the compressor is operating, is prohibited.
- First cooling operation after the power is turned on
  If a low pressure of 0.003 MPa or lower is detected continuously for 60 seconds after 4-way valve switching assurance, the compressor is stopped, and if a low pressure of 0.18 MPa or higher is detected continuously for 10 seconds, the compressor is restarted automatically, but if an anomalous pressure is detected again, an anomalous stop is performed. It is possible to reset the system only by turning the power off, then turning it on again.

(18) Pump down control

Pump down operation can be performed through operation of DIP switches (SW5-1, 2, 3). (Pump down operation cannot be done during indoor unit operation, backup operation or during an anomalous stop.)

(a) Pump down procedure

1) Close the liquid side service valve on the outdoor unit.
2) Turn SW5-2 (test operation operating mode) ON (cooling).
3) Turn SW5-3 (pump down switch) ON.
4) Turn SW5-1 (test operation switch) ON. This will start the pump down operation.

(b) Control

1) The compressor operates in cooling mode with 52Hz (280, 335:62Hz) as the upper frequency limit.
2) The red and green (LED's) on the outdoor control PCB flashs together continuously and "PoS" is displayed in the 7-segment display.
3) Except for low pressure control, all the protective and anomaly sensing controls are activated.
4) Test operation commands are sent to the indoor units.
5) The sub cooling coil electronic expansion valve (EEVSC) closes fully during pump down control.

(c) Ending

If any of the following conditions exists, pump down operation ends.

1) If a low pressure (sensed by PSL) of ≦ 0.01 MPa is detected continuously for 5 seconds.
   a) The displays are as follows.
      · Red LED: Lights up continuously · Green LED: flashing
      · 7-segment LED display: PoE · Remote controller: Stop
   b) It is possible for operation to restart if the low pressure (sensed by PSL) becomes > 0.01 MPa.
2) If operation is stopped by anomaly sensing control.
3) If the cumulative compressor operation time totals 15 minutes.
   a) The displays are as follows.
      · Red LED: Off · Green LED: flashing
      · 7-segment LED display: No display · Remote controller: Stop
4) If any one of DIP switches SW5-1, 2 or 3 is turned OFF during the pump down operation.

(19) External input operation

External input: From CnS1, operation permission/prohibition control; From CnS2: Demand control/normal operation switching.

- J13: Switches between CnS1 and CnS2 input method.

  J13 short circuit: Level input by CnS1 and CnS2.

  J13 open: Pulse input by CnS1 and CnS2.

(a) From CnS1, operation permission/prohibition control

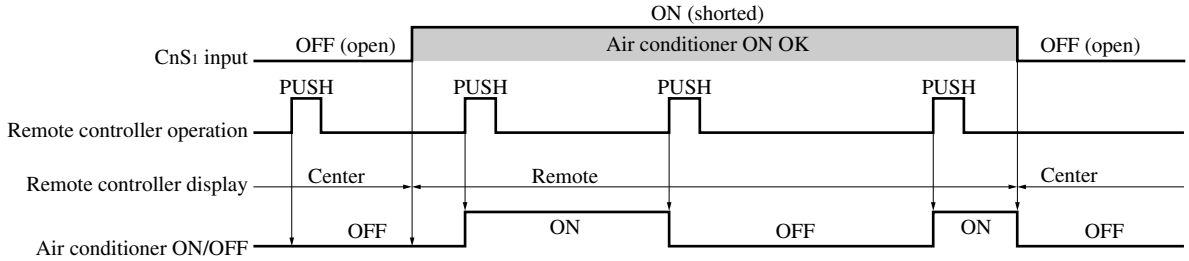
Input : CnS1	CnS1 input method change: J13	CnS1 : Operation permission/ Prohibition mode change
Short circuit / Disconnection	J13; Short circuit Lever input	Operation prohibition mode ⟶ Operation permission mode
	J13; Disconnection Pulse input	Operation permission/Prohibition model change (Reversal)
Short circuit / Disconnection	J13; Short circuit	Operation permission mode ⟶ Operation prohibition mode
	J13; Disconnection	— (NOP)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

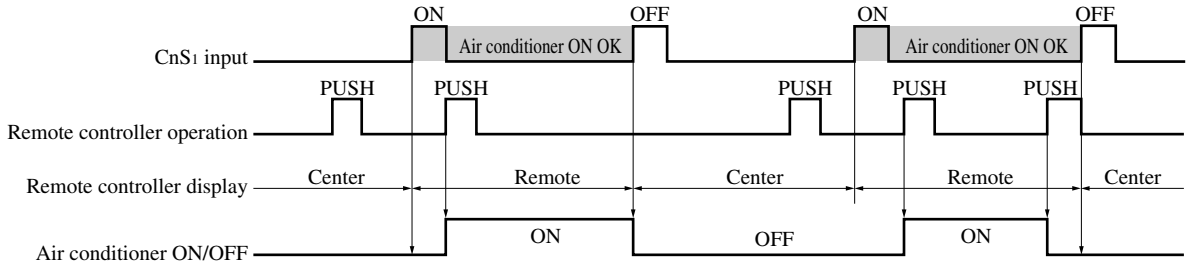
2) CnS1, performs the following operations by the changing of jumper wire J1 from short circuit to open circuit.

   If pulse input, the pulse duration is 500 ms or more.

① Operation with J13 short circuit



② Operation with J13 disconnection



(b) From CnS2, operation permission/prohibition control

Input : CnS2	CnS2 input method Formula switching: J13	CnS2 : Demand control/normal operating switching
Short circuit / Open circuit	J13; Short circuit Level input	Demand control → Normal operation
	J13; Open circuit Pulse input	Normal operation/Demand control switching (Reversal)
Short circuit / Open circuit	J13; Short circuit	Normal operation → Demand control
	J13; Open circuit	— (NOP)

Note (1) The factory settings are: J13 - short circuit; CnS2 - short circuit (short pin connection)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

2) Demand control

It is possible to switch the demand using DIP switch SW4-5, 6.

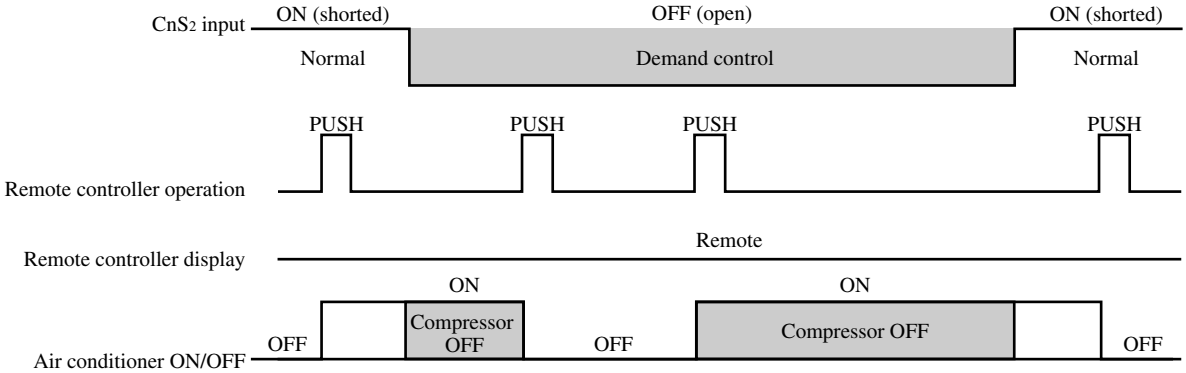
SW45	SW4-6	Compressor output (%)
0	0	80
1	0	60
0	1	40
1	1	0

Note (1) 0: Open, 1: Shorted

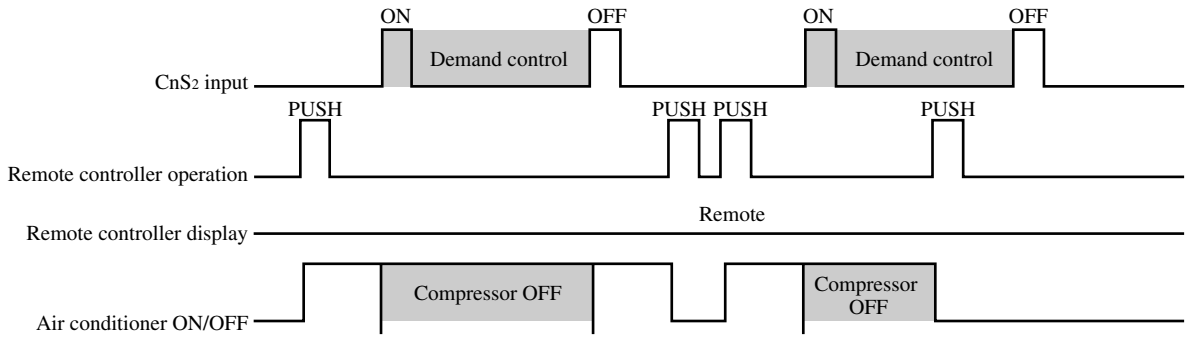
3) CnS2, performs the following operations by the changing of jumper wire J13 from short circuit to open circuit.

If pulse input, the pulse duration is 500 ms or more.

① J13 - Short circuit



② J13 - Open circuit



(20) 7-Segment display

The data in the following table can be displayed using the display select switch (SW8: 1's digit; SW9: 10's digit).

Code No.	Contents of display	Data display range	Minimum units	Remarks
–	Unusual cade Pump down Check mode Outdoor unit setup	–	–	E?? PoE, PoS CH? OPE??
00	CM1 operating frequency	0~130	1Hz	
02	Tho-A Outdoor air temp.	L,-20~43	1˚C	[L] is indicated when the temperature is -20˚C or below and the actual temperature is indicated when it is higher than -20˚C and up to 43˚C.
03	Tho-R1 Heat exchanger temp. 1 (Exit. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
04	Tho-R2 Heat exchanger temp. 2 (Exit. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
05	Tho-R3 Heat exchanger temp. 3 (Entrance. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
06	Tho-R4 Heat exchanger temp. 4 (Entrance. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
07	Tho-D1 Discharge pipe temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
10	Tho-C1 Under-dome temp.	L,5~90	1˚C	[L] is indicated when the temperature is 5˚C or below and the actual temperature is indicated when it is higher than 5˚C and up to 80˚C.
12	Tho-P1 Power transistor temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
14	Tho-SC Sub-cooling coil temp.1	L,18~73	1˚C	[L] is indicated when the temperature is 18˚C or below and the actual temperature is indicated when it is higher than 18˚C and up to 73˚C.
15	Tho-SC Sub-cooling coil temp.2	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
16	Tho-S Suction pipe temp.	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
17	Cooling operation super cooling	0~50	0.1˚C	
18	Super heat	0~50	0.1˚C	
19	Superheat of sub-cooling coil	0~50	0.1˚C	
20	CT1 Current	0~50	1A	
22	EEVH1 Heating expansion valve opening angle	0~500	1 Pulse	
23	EEVH2 Heating expansion valve opening angle	0~500	1 Pulse	
24	Opening angle of EEVSC overcooling coil expansion valve	0~500	1 Pulse	
26	FM01 Number of rotations	0~999	10 min^{-1}	
27	FM02 Number of rotations	0~999	10 min^{-1}	
28	PSH High pressure sensor	0~5.00	0.01MPa	
29	PSL Low pressure sensor	0~2.00	0.01MPa	
30	FMC1 Cooling fan Crankcase heater	0,1	–	Order of 100 : FMC1 Order of 10 : CH1 Order of 1 : – (0: OFF, 1: ON)
31	63H1	0,1	–	Order of 100 : 63H1 Order of 10 : – (0: Close, 1: Open)
32	SV1	0.1	–	Order of 100 : SV1 Order of 10 : – Order of 1 : – (0: Close, 1: Open)

Code No.	Contents of display	Data display range	Minimum units	Remarks
33	SV6	0,1	–	Order of 100 : SV6 Order of 10 : – Order of 1 : – (0: Close, 1: Open)
34	20S	0,1	–	Order of 100 : 20S, Order of 10 : – Order of 1 : – (0: close, 1: open)
35	Compressor stop causes ①	0,1	–	Order of 100 : Defective outdoor temperature thermistor Order of 10 : Defective outdoor unit heat exchanger thermistor 1 Order of 1 : Defective outdoor unit heat exchanger thermistor 2 (0:Normal, 1: Anomaly)
36	Compressor stop causes ②	0,1	–	Order of 100 : Defective outdoor unit heat exchanger thermistor 3 Order of 10 : Defective outdoor unit heat exchanger thermistor 4 Order of 1 : Defective discharge pipe thermistor (0:Normal, 1: Anomaly)
37	Compressor stop causes ③	0,1		Order of 100 : – Order of 10 : Defective Sub cooling coil thermistor 1 Order of 1 : Defective Sub cooling coil thermistor 2 (0:Normal, 1: Anomaly)
38	Compressor stop causes ④	0,1	–	Order of 100 : Defective suction pipe thermistor Order of 10 : Defective low pressure sensor Order of 1 : Defective high pressure sensor (0:Normal, 1: Anomaly)
39	Compressor stop causes ⑤	0,1	–	Order of 100 : Anomaly in inverter 1 Order of 10 : – Order of 1 : Anomalous high pressure (0:Normal, 1: Anomaly)
40	Compressor stop causes ⑥	0,1	–	Order of 100 : Anomalous low pressure Order of 10 : Anomalous discharge pipe thermistor Order of 1 : – (0:Normal, 1: Anomaly)
41	Compressor stop causes ⑦	0,1	–	Order of 100 : Defect CM starting Order of 10 : – Order of 1 : Rotor lock (0:Normal, 1: Anomaly)
42	Compressor stop causes ⑧	0,1	–	Order of 100 : – Order of 10 : CM Current cut Order of 1 : – (0:Normal, 1: Anomaly)
43	Compressor stop causes ⑨	0,1	–	Order of 100 : Power transistor overheating Order of 10 : – Order of 1 : Anomalous in DC fan1 (0:Normal, 1: Anomaly)
44	Compressor stop causes ⑩	0,1	–	Order of 100 : Anomalous in DC fan2 Order of 10 : Stop command from indoor Order of 1 : Operation mode charge (0:Normal, 1: Anomaly)
45	Compressor stop causes ⑪	0,1	–	Order of 100 : Dilute protection Order of 10 : Demand control 0% Order of 1 : 0 (0:Normal, 1: Anomaly)
46	Control status	0,1	–	Order of 100 : During equal oil equalization control Order of 10 : During oil return control Order of 1 : During defrost (0:Non-operation, 1: Operation)
47	Control status	0,1	–	Order of 100 : During Td control Order of 10 : During HP control Order of 1 : During CS control (0:Non-operation, 1: Operation)
48	Control status	0,1	–	Order of 100 : During LP control Order of 10 : During PT control Order of 1 : Under cooling low pressure control (0:Non-operation, 1: Operation)
49	Control status	0,1	–	Order of 100 : Cooling high pressure protection control Order of 10 : High pressure power ratio Order of 1 : Under heating low pressure control (0:Non-operation, 1: Operation)
50	Number of connected indoor unit	0~50	1	
51	Number of operation indoor unit	0~50	1	
52	Required Hz total	0~999	1Hz	
53	Target Fk	0~999	1Hz	
54	Compressor cumulative operating time (CM1)	0~655	100h	
56	Discharge pressure saturation temperature	-50~70	0.1˚C	1˚C at –10 or lower
57	Air inlet pressure saturation temperature	-50~30	0.1˚C	1˚C at –10 or lower
58	Target cooling low pressure	0.00~2.00	0.01MPa	
59	Target heating high pressure	1.60~4.15	0.01MPa	
63	Inverter 1 operating frequency command	0~130	1Hz	
66	Control status	0,1	–	Order of 100 : During silent mode Order of 10 : During capacity measurement mode Order of 1 : During test operation (0:Non-operation, 1: Operation)
67	Control status	0,1	–	Order of 100 : Unmatch Order of 10 : Indoor EEV check Order of 1 : – (0:Non-operation, 1: Operation)

Code No.	Contents of display	Data display range	Minimum units	Remarks
68	Control status	0,1	–	Order of 100 : Piping cleaning Order of 10 : Under-dome temperature control Order of 1 : Compession ratio protection control (0:Non-operation, 1: Operation)
70	Operation priority switching	0,1	–	0: Prior press priority (when shipped) 1: After press priority
71	High pressure control of cooling	2.2, 2.5	0.01MPa	2.2: Factory setting 2.5: Alternate setting
72	Low pressure control of cooling	-0.05~+0.05	0.01MPa	0.00: Factory setting
73	Heating high pressure compensation	0.00~0.30	0.01MPa	0.00: Factory setting
74	Low pressure of heating	0.80, 0.90	–	0.80: Factory setting 0.90: Alternate setting
75	Snow protection fan control	0,1	–	0: Snow protection fan control deactivated 1: Snow protection fan control activated
77	Data reset	---, dEL	–	
78	Figure language sub version	–	–	(Example: 730)
79	Figure language logic version	–	–	(Example: 126)
80	Counter · Thermistor disconnection	0~2	–	
81	Counter · Inverter 1 communications error	0~3	–	
82	Counter · High pressure protection	0~4	–	
83	Counter · Compressor 1 starting failure	0,1	–	
84	Counter · Anomalous low pressure ① (Under stop)	0~4	–	
85	Counter · Anomalous low pressure ② (Immediately after starting)	0,1	–	
86	Counter · Anomalous low pressure ③ (Under operation)	0~4	–	
87	Counter · Motor lock of compressor 1	0~3	–	
88	Counter · Overheating of power transistor 1	0~4	–	
89	Counter · Anomalous temp. of discharge pipe 1	0,1	–	
91	Counter · Current cut (CM1)	0~3	–	
93	Counter · Indoor-outdoor communications error	0~255	–	
94	Counter · Outdoor inverter communications error 2	0~255	–	
95	Counter · CPU reset	0~255	–	
96	Counter · Anomalous FM01	0~255	–	
97	Counter · Anomalous FM02	0~255	–	
98	Program version	–	–	Example (2.70)
99	Auto send display	–	–	

(21) Saving of Operation Data

Operating data for a period of 30 minutes prior to the time when trouble occurs are recorded, and these data can be fetched to a personal computer through the RS232C connector on the control board. Data are updated continuously, and when there is an anomalous stop, data updates stop at that point. Pressing DIP switch SW7 for 3 seconds causes the data to be erased. Data can also be sampled at 1 ~ 60 second intervals during operation and fetched to a personal computer.

• Data is transmitted from a personal computer upon demand.

Data	Data Range	Example
Software version	ASCII 15-byte	KD4C270######## (#: NULL)
PID (program ID)	ASCII 2-byte	D8
Outdoor unit capacity	ASCII 3-byte	280
Power supply frequency	ASCII 2-byte	60
Outdoor address	ASCII 2-byte	00 ~ 3F
Indoor address × 16 units	ASCII 2-byte × 16 units	40 ~ 7F
Indoor capacity × 16 units	ASCII 3-byte × 16 units	022 ~ 280

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
00	Anomaly code	00~99		1	00: No anomaly, outdoor unit all anomalous ???
01	Address of unit where trouble occurred	00~FF	–	1	0~3F: Outdoor unit side, 40~6F: Indoor unit side
02	Operation mode	0~2	–	1	0 Stop 2 Cooling 4 Heating
03	High pressure sensor	0.00~5.00	A/D value	1	
04	Low pressure sensor	0.00~2.00	A/D value	1	
05	Heat exchanger temp. 1 (Exit, Front)	-35~75	A/D value	2	Cooling liquid side
06	Heat exchanger temp. 2 (Exit, Rear)	-35~75	A/D value	2	Cooling liquid side
07	Heat exchanger temp. 3 (Entrance, Front)	-35~75	A/D value	2	Cooling gas side
08	Heat exchanger temp. 4 (Entrance, Rear)	-35~75	A/D value	2	Cooling gas side
09	Tho-D Discharge pipe temp.	20~140	A/D value	1	
11	Tho-C Under-dome temp.	-15~90	A/D value	1	
13	Tho-A Outdoor air temp.	-20~43	A/D value	1	
14	Tho-P Power transistor temp. (Heat dissipation fin)	20~140	A/D value	1	
16	Tho-SC Sub cooling coil temp. 1	18~73	A/D value	1	Liquid pipe side
17	Tho-H Sub cooling coil temp. 2	-35~75	A/D value	2	Suction pipe side
18	Tho-S Suction pipe temp.	-35~75	A/D value	2	
19	Cooling operation super cooling	0~50	A/D value	1	
20	Super heat	0~50	A/D value	1	
21	Super heat of sub-cooling coil	0~50	A/D value	1	
22	CT1 Current	0~50	A/D value	1	

Code No.	Write-in contents	Record data					
		Data write-in range	Write-in unit	Number of bytes	Contents		
24	Power source voltage	180~500	A/D value	1			
25	Pressure switch	–	–	1	Bit0	63H1	0: open, 1: close
26	Solenoid valve	–	–	1	Bit0	20S	0:OFF, 1:ON
					Bit2	SV1	0:OFF, 1:ON
					Bit4	SV6	0:OFF, 1:ON
27	Crankcase heater etc.	–	–	1	Bit0	CH1	0:OFF, 1:ON
					Bit2	FM1,2	0:OFF, 1:ON
28	FM01 Number of rotations	0~65535	10 min^{-1}	2			
29	FM02 Number of rotations	0~65535	10 min^{-1}	2			
30	EEVH1 opening angle	0~65535	1pulse	2			
31	EEVH2 opening angle	0~65535	1pulse	2			
32	EEVSC opening angle	0~65535	1pulse	2			
34	Indoor unit connection number	0~255	1 unit	1			
35	Indoor unit connection capacity	0~65535	–	2			
36	Indoor unit thermostat ON number	0~255	1 unit	1			
37	Indoor unit thermostat ON capacity	0~65535	–	2			
38	Required Hz total	0~65535	1Hz	2			
39	Target FK	0~65535	1Hz	2			
40	Inverter CM1 operation frequency	0~255	1Hz	1			
42	Answer Hz total	0~65535	1Hz	2			
43	Compressor cumulative operating time (estimate)	0~65535	1 h	2			
45	Compressor start times	0~65535	×20 times	2			
47	Compressor stop causes			1	Bit0	Defective outdoor temperature thermistor	
					Bit1	Defective outdoor unit heat exchanger 1 thermistor	
					Bit2	Defective outdoor unit heat exchanger 2 thermistor	
					Bit3	Defective outdoor unit heat exchanger 3 thermistor	
					Bit4	Defective outdoor unit heat exchanger 4 thermistor	
					Bit5	Defective discharge pipe thermistor	
					Bit7	Defective sub-cooling coil thermistor 1	
48	Compressor stop causes	–	–	1	Bit0	Defective sub-cooling coil thermistor 2	
					Bit1	Defective suction pipe thermistor	
					Bit2	Defective low pressure sensor	
					Bit3	Defective high pressure sensor	
					Bit4	Inverter 1 anomalous communication	
					Bit6	Anomalous high pressure	
					Bit7	Anomalous Low pressure	
49	Compressor stop causes	–	–	1	Bit0	Td1 Anomalous discharge pipe temp.	
					Bit2	CM starting defect	
					Bit4	Rotor lock of CM	
					Bit6	Current cut of CM	

Code No.	Write-in contents	Record data				
		Data write-in range	Write-in unit	Number of bytes	Contents	
50	Compressor stop causes	–	–	1	Bit0	Power transistor 1 overheating
					Bit1	Power transistor 2 overheating
					Bit2	FM01 anomaly
					Bit3	FM02 anomaly
					Bit4	Compressor stop command from indoor unit
					Bit6	Dilution rate protection
					Bit7	Demand control 0%
51	Control status	0~180	1 second	1	CM 3-minute delay timer	
53	Discharge pressure saturation temperature	-50~70	0.1˚C	2		
54	Intake pressure saturation temperature	-50~70	0.1˚C	2		
55	Control status oil return	0,1	–	1	0	None
					1	Under control
56	Control status oil return	0~2	–	1	0	None
					1	Waiting for oil return
					2	Under oil return
57	Control status defrost conditions	0~3	–	1	0	None
					1	Temperature conditions
					2	Strengthening temperature conditions
					3	Time conditions
			–			
58	Control status defrost status	0~4	–	1	0	None
					1	Defrosting status 1
					2	Defrosting status 2
					3	Defrosting status 3
			–		4	Defrosting status 4
59	Control status Td	0~2	–	1	0	None
					1	Frequency down
					2	Under. control
60	Control status	0, 1	–	1	Td1 error counter	
62	Control status HP	0~2	–	1	0	None
					1	Frequency down
					2	Under high pressure control
63	Control status	0~1	–	1	HP error (63H1) counter	
64	Control status CS	0~2	–	1	0	None
					1	Frequency down
					2	Under CS control
65	Control staus LP	0~2	–	1	0	None
					1	Frequency down
					2	Under low pressure control
66	Control status	0~3	–	1	LP error (when stopped) counter	
67	Control status	0~4	–	1	LP error (when started) counter	
68	Control status	0,1	–	1	LP error (when driving) counter	
69	Control status PT	0~2	–	1	0	None
					1	Frequency down
					2	Under PT control
70	Check operation status	–	–	1	Bit0	Unmatch check
					Bit1	Indoor side EEV check
					Bit3	Piping cleaning
71	Control status	0~360	1 minutes	2	CH compressor protection timer	
72	Control status CH compressor protective start	0~15	–	1	15	Protective start end
					0~14	During protective start
73	Switch etc.	–	–	1	Bit0	External operation (CnS1)
						0: Operation prohibition
						1: Operation permission
					Bit1	Demand (CnS2)
						0: None
						1: Under control
					Bit2	Forced cooling, heating (CnG1)
						0: None
						1: Under control
					Bit3	Silent mode (CnG2)
						0: None
						1: Under control

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
					Bit4: Back up operation 0: None 1: Back up operation Bit5: Hz cancel operation 0: None 1: Under control
74	Control status	0~3	–	1	Current cut anomaly counter
75	Control status	0~4	–	1	Power transistor overheating anomaly counter
76	Control status	0~3	–	1	Rotor lock anomaly counter
77	Control status	0~1	–	1	Starting failure counter
78	Control status	0~3	–	1	Communications anomaly counter
79	Control status	0~3	–	1	Current cut anomaly counter
84	Control status	0~1	–	1	DC fan motor 1 error counter
85	Control status	0~1	–	1	DC fan motor 2 error counter
86	Control status	0~2	–	1	Sensor disconnection counter
87	Control status	0~255	–	1	Communications error counter
88	Registered indoor units 1~8 operation mode	0~4	–	8	0 AUTO 1 DRY 2 COOL 3 FAN 4 HEAT
89	Registered indoor units 1~8 required Hz	0~255	1Hz	8	
90	Registered indoor units 1~8 answer Hz	0~255	1Hz	8	
91	Operation priority switching	0~1	–	1	0 Prior press priority 1 After press priority
92	High pressure control of cooling	2.2,2.5	0.01MPa	1	
93	Cooling low pressure compensation	-0.05~+0.05	0.01MPa	1	
94	Low pressure control of heating	0.8,0.9	0,01MPa	1	
95	Snow protection fan control	0~1	–	1	0 With 1 None
96	CM1 frequency command	0~130	1Hz	1	
98	Target cooling low pressure	0.00~2.00	0.01MPa	1	
99	Control status TC	0~2	–	1	0 None 1 Frequency down 2 Under-dome temperature control
100	Target heating high pressure	1.60~4.15	0.01MPa	1	1.60MPa It shifts and outputs.
101	Heating high pressure compensation	0.00~0.30	0.01MPa	1	
102	Control / status SCR	0~2	–	1	0 None 1 Frequency down 2 Under compression ratio protection control

All-in-one type (also for combined use) and Combined type.

◆ **Models** FDCA335HKXE4BR(K), 400HKXE4BR, 450HKXE4BR, 504HKXE4BR, 560HKXE4BR, 615HKXE4BR, 680HKXE4BR, 735HKXE4B, 800HKXE4B, 850HKXE4B, 900HKXE4B, 960HKXE4BR, 1010HKXE4BR, 1065HKXE4BR, 1130HKXE4BR, 1180HKXE4BR, 1235HKXE4BR, 1300HKXE4BR, 1360HKXE4BR

(1) Operations of major functional items under each operation mode

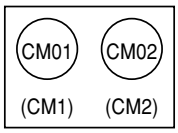
Functional item \ Operation mode	Cooling		Fan	Heating			Dehumidify
	Thermostat ON	Thermostat OFF		Thermostat ON	Thermostat OFF	Defrost	
Indoor unit fan	Remote controller command	Remote controller command	Remote controller command	Remote controller command	Intermittent operation	○→×	○/×
Indoor unit electronic expansion valve	Overheating control response	Fully closed	Fully closed	Overheating control response	60 pulse	Model-specific aperture opening angle	Overheating Control Response
Compressor [CM1]	○	×	×	○	×	○	○/×
Magnetic contactor CM1 [52C1]	○	○	×/○	○	○	○	○
Compressor [CM2]	○/×	×	×	○/×	×	○	○/×
Magnetic contactor CM2 [52C2]	○	○	×	○	○	○	○
Outdoor unit fan [FMo-1]	○/×	×	×/○	○/×	×	○→×	○/×
Outdoor unit fan [FMo-2]	○	×	×/○	○	×	○→×	○/×
Inverter cooling fan [FMC1, 2]	○/×	○/×	×	○/×	○/×	○/×	○/×
Ventilation fan [FMC3]	○/×	○/×	×	○/×	○/×	○/×	○/×
4 way valve [20S]	×	×	×	○	○	○→×	×
Electronic expansion valve for heating [EEVH1, 2]	Fully open	※1	※2	Opening angle control	※2	Fully closed / Fully open	Fully open
Electronic expansion valve for sub-cooling [EEVSC]	Opening angle control	Fully closed	Fully closed	Fully closed	Fully closed	Fully closed	Opening angle control
Solenoid valve [SV1]	○/×	×	×	○/×	×	○/×	○/×
Solenoid valve [SV2]	○/×	×	×	○/×	×	○/×	○/×
Solenoid valve [SV6] [SV7]	○/×	×	×	○/×	×	○/×	○/×
Solenoid valve [SV11]	×	×	×	○/×	×	×	×
Solenoid valve [SV12]	×	×	×	×	×	×	×
Crankcase heater [CH1,2]	○/×	○/×	○/×	○/×	○/×	○/×	○/×

Notes(1) ○ : ON, × : OFF, ○/× : ON or OFF, ×/○ : OFF or ON
(2) ※1: The master is fully open and the slave is fully closed.
(3) ※2: Switching from cooling to OFF is in accordance with ※1. Switching from heating to OFF is in accordance with low pressure protective control for both master and slave units, with the valve being fully closed except for opening angle.

(2) Compressor starting order and load classes

(a) All-in-one type (FDCA335 ~ FDCA680)

1) The starting order of compressors 1 and 2 is switched each time an outdoor unit stop occurs.

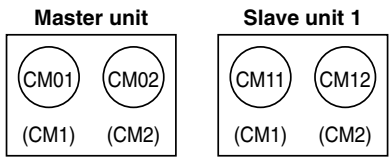


2) The loads and corresponding operation frequencies for each compressor are shown in the table below (the table shows CM1 being started first. When CM2 is started first, the CM1 frequency indicated for load class 1 applies to CM2 instead.)

Load Class	0	1	2
CM1	0Hz	20~112Hz	42~120Hz
CM2	0Hz	0Hz	42~120Hz

(b) Combined (FDCA735 ~ FDCA1360)

Combination specifications: Master unit + 1 slave unit



Operating frequency ranges for each compressor corresponding to different loads are as shown below. The following table applies to the case when CM01 starts at first. (When CM11 starts first, the frequency of CM01 for the Load Category 1 becomes the frequency of CM11.

Load Category		0	1	2	3
Master unit	CM01	0Hz	20~112Hz	42~112Hz	42~120Hz
	CM02	0Hz	0Hz	0Hz	42~120Hz
Slave unit	CM11	0Hz	0Hz	42~112Hz	42~120Hz
	CM12	0Hz	0Hz	0Hz	42~120Hz

(3) Compressor start control between outdoor units (Master unit/slave unit)

(a) Determining the starting order for the master unit and slave units

Determine the starting order for the outdoor units of master unit and slave units, which is decided by the order in which the power switches are turned on.

1) Starting order of master unit (N=0) … First
2) Starting order of slave unit 1 (N=1) …… Second

(b) Determining starting order for compressors within master unit and slave unit groups.

Determine the starting order for compressors 1 and 2 within the master unit and slave unit groups as follows.

1) Starting order of compressor 1 (M=0) … First
2) Starting order of compressor 2 (M=1) … Second

(c) Compressor starting order and start control for combination specifications I

When all outdoor units change from the full stop state to the cooling/dehumidifying operation (including when all indoor units start from the cooling thermostat OFF state)

1) Start control
   a) Starting is controlled by determining the start order and the stop order for compressors in the load categories.
   b) When only one outdoor unit is used, the starting order for compressor 1 and compressor 2 is switched on each occasion when the outdoor unit stops.
   c) Each time the master unit and each slave unit stop independently of each other, the starting order for compressor 1 and compressor 2 is switched.
   d) Each time an outdoor unit stops within the master unit and slave unit groups, the starting order for compressors within the master unit and slave unit groups is switched.
   Starting order of outdoor units Master unit→Slave unit

Model	Starting Order of Outdoor Units	Starting Order of Compressors
FDCA355~680	–	CM 1 → CM 2 → CM 1
FDCA735~1360	Master unit → Slave unit → Master unit	CM 1 → CM 2 → CM 1

(d) Compressor starting order and start control for combination specifications II

When all outdoor units change from the full stop state or a cooling/dehumidifying operation to the heating operation (Excluding starting from the heating thermostat OFF state)

1) Start control
   This is same as the cooling/dehumidifying operation.
2) After the compressor which is first in the starting order starts, all outdoor units are started temporarily in accordance with the operation order N.
3) 4-way valves (20S) are subject to the control prior to the start of the compressor.
4) 4-way valve switching protection
   a) Regarding the outdoor unit which is second in the starting order, the 4-way valve (20S) is turned ON in compliance with 4-way valve switching protection control in order to perform 4-way valve switching protection control. (During the 4-way valve switching protection operation, the outdoor fan motor is operated under normal control.)
   b) After 4-way valve switching protection operation, the compressors are stopped in accordance with the target operation frequency. (4-way valve is in the ON condition.)
   c) Unless all 4-way valves on the outdoor units which are in second place in the starting order can be turned ON, the Compressor ON command is transmitted continually until they are turned ON.

(4) Starting the compressor (Master unit/slave unit)

As shown in the following table, compressor starts occur in accordance with the amount of elapsed time from power ON, and in accordance with the number of starts that have occurred. However, during defrost control, oil return control, and equal oil control, starts occur in accordance with those controls.

Condition	Start Method
① Defrost control 1st start occurs 45 minutes or more after power ON, and subsequent starts occur after a power ON that follows a compressor stop of 45 minutes or longer.	After 4-way valve switching assurance, perform compressor protective start sequence "A" in accordance with the crankcase heater ON time. (See page 362)
② Oil return control 1st start occurs less than 45 minutes after power ON.	After 4-way valve switching assurance, perform compressor protective start sequence "A" in accordance with the crankcase heater ON time. (See page 362)
③ Equal oil control Starts other than ① and ② above.	After 4-way valve switching assurance, perform a compressor protective start sequence.

(a) 4-way valve switching assurance

When the compressor (CM1, CM2) is switching from the stopped state to the start state, after the compressor start control functions, there is an increase in frequency from 10Hz (synchronous operation).

(i) 0-20Hz Operation

It operates in the range of 0 – 20Hz. However, in this operation, the compressor cannot be operated with the current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. control, unde-dome temp. control or compression ratio protection controls.

(ii) 20 – 40Hz (48) Operation

Maximum frequency is determined based on the temperature detected with the outdoor air temperature thermistor (Tho-A).

1) If the temperature is 0 °C or lower, after starting with 48Hz as the maximum frequency, it stops at 48Hz.
2) If the temperature is higher than 0°C, after starting with 40Hz as the maximum frequency, it stops at 40Hz. However, if the starting conditions for current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. controls or compession ratio protection controls are satisfied during this time, this control ends and control according to current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. controls , under-dome temp. control or compession ratio protection controls commences, and if the compressor's frequency is determined and cancelled, operation returns to normal operation.

(b) Compressor protective start

(i) After 4-way valve switching assurance is completed, the following compressor protection begins.

		Initial Start (Remote controller ON error cancel)	Thermostat ON start	
			Operation Mode Changed While Thermostat Was OFF	Operation Mode Unchanged While Thermostat Was OFF
Compressor ON count: 1st time	Less than 45 minutes after power ON	Compressor protective start B according to crankcase heater's power ON time	Compressor protective start B according to crankcase heater's power ON time	Compressor protective start B according to crankcase heater's power ON time
	45 minutes or more after power ON	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time
Compressor ON count: From 2nd time	Less than 45 minutes after stop	Protective start	Protective start	Protective start
	45 minutes or more after stop	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time

Note: If the under-dome temperature exceeds 30ºC, compressor protective start A and B end and operation starts.

(ii) The compressor's speed is as follows regardless of the target frequency.

1) Up to 1 minute and 45 seconds after the compressor starts, operation is at 20Hz.
2) When 1 minute and 45 seconds has passed since starting, operation is in accordance with the target speed.

(c) Compressor protective starting sequence A, in accordance with the amount of time power to the crankcase heater has been on.

The amount of time the power to the heater has been on since the power was switched ON is calculated, and if 45 or more minutes have passed and it is the first start, or if 45 or more minutes have passed and the compressor has been stopped, then the power turned on again, and the cumulative number of starts is 2 times or more, starting is done according to this control sequence.

1) The inverter is set to 20Hz following 4-way valve switching assurance. The target frequency is then established 1 minute after a 1-minute period has elapsed since the frequency reduction to 20Hz was reached.
2) During a 15-minute period following the start, the 20Hz frequency is increased at a rate of 5Hz per minute, and the start of the 15-minute period becomes the inverter's start completion point (10Hz).
3) If the inverter is stopped within a 15-minute period after a compressor start, this control increases the frequency 5Hz per minute for 15 minutes when the compressor starts again.

(d) Compressor protective starting sequence B, in accordance with the amount of time power to the crank-case heater has been on.

Power on time is calculated after the power is turned ON, and the first compressor start if less than 45 minutes have passed is according to this control.

1) The inverter is set to 20Hz following 4-way valve switching assurance. The target frequency is then established 1 minute after a 1-minute period has elapsed since the frequency reduction to 20Hz was reached.
2) During a 18-minute period following the start, the 20Hz frequency is increased at a rate of 5Hz per minute, and the start of the 18-minute period becomes the inverter's start completion point (10Hz).
3) The frequency is increased 5Hz per minute through the 18-minute to 24-minute period, and this control ends when 24 minutes is reached.
4) After this control ends 1 time, the system reverts to protective start "A" control from the 2nd time, or after 45 minutes have elapsed.
5) If the inverter is stopped for 24 minutes following a compressor start, a protective start is performed when started again, and protective start sequence "B" control increases the frequency for a period of 24 minutes. However, the system reverts to protective start sequence "A" control when started again if 45 minutes or more have elapsed since the inverter stop.

(5) Compressor pre-start control (Master unit/slave unit)

(a) The following control occurs from the point when the compressor ON conditions are satisfied.

(i) Pre-start control when operation mode is the same as at the previous operation:

1) If in the "cooling / dehumidifying" mode, the 4-way valve switches OFF. If in the "heating" mode, it switches ON. However, When in the same mode as at the previous operation, with the prescribed power ON condition (see above item) established, the 4-way valve's power ON status continues as it is

2) Solenoid valves SV6 and SV7 switch ON.

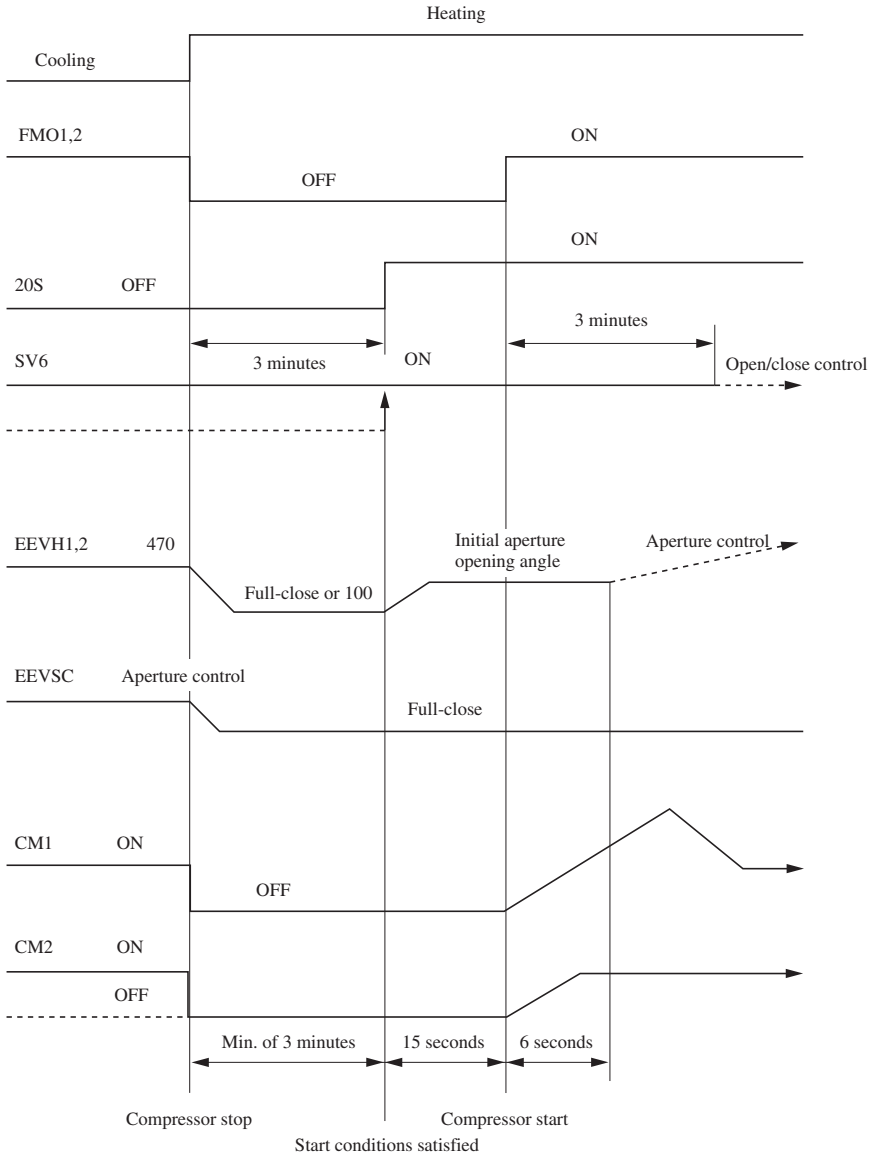
3) The apertures of the heating mode's EEVH1, 2, and the sub cooling coil's EEVSC are set to their initial opening angles. The EEVH1 and 2 expansion valves are started first, and after their operation is completed, the EEVSC expansion valve operation begins.

(Unit: Pulse)

Item / Name	Operation mode	
	Cooling	Heating
EEVH1, 2	470	10
EEVSC	32	0

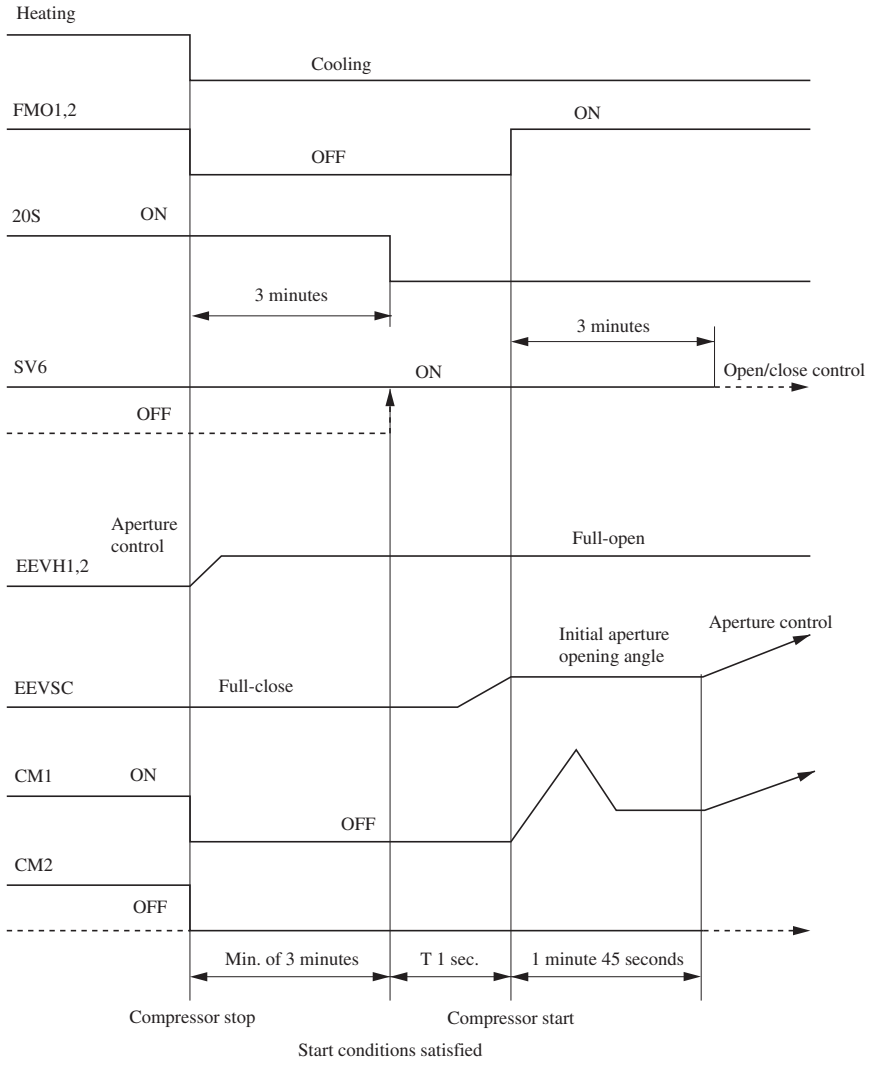
Note (1) Master units and slave units are operated by the unit.

◆Cooling → Heating



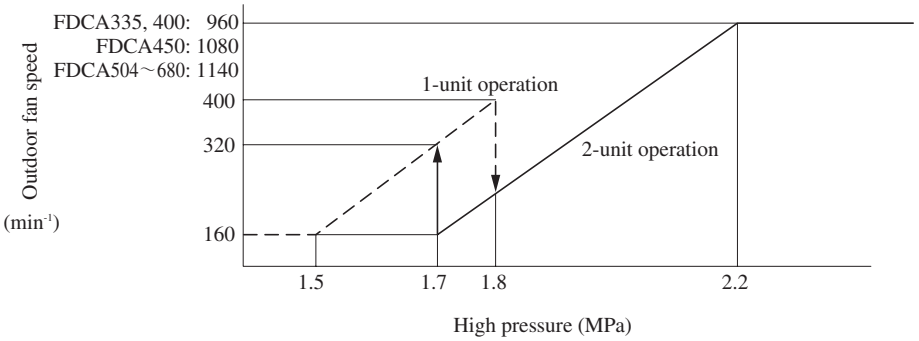
4) Fan motors FMo1, FMo2, and the compressor start 15 seconds after the compressor ON conditions are satisfied.

◆**Heating → Cooling**



(6) Cooling high pressure control (Master unit/slave unit)

• 2-unit operation is switched to 1-unit operation by the outdoor fan speed running at high pressure.



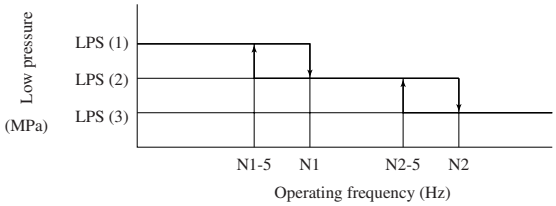
Control termination conditions

1) When a mode other than cooling or dehumidifying is selected.
2) When compressor stops

(7) Cooling low pressure control (Master unit only)

During cooling and dehumidifying operations, a constant low pressure is maintained by compressor frequency control.

(a) After compressor protective start ends (1 minute 45 seconds), the compressor's frequency is controlled as shown below.



Model	LPS (1)	LPS (2)	LPS (3)	N1	N2	N1-5	N2-5
335	0.81	0.79	0.77	60Hz × 1	46Hz × 2	55Hz × 1	41Hz × 2
400	0.80	0.77	0.73	70Hz × 1	50Hz × 2	65Hz × 1	45Hz × 2
450	0.81	0.79	0.75	70Hz × 1	54Hz × 2	65Hz × 1	49Hz × 2
504	0.82	0.79	0.71	70Hz × 1	54Hz × 2	65Hz × 1	49Hz × 2
560	0.82	0.78	0.69	70Hz × 1	64Hz × 2	65Hz × 2	59Hz × 2
615	0.81	0.77	0.67	80Hz × 1	70Hz × 2	75Hz × 1	65Hz × 2
680	0.81	0.77	0.65	80Hz × 1	70Hz × 2	75Hz × 1	65Hz × 2
735	0.82	0.79	0.76	70Hz × 2	50Hz × 4	65Hz × 2	45Hz × 4
800	0.80	0.77	0.73	70Hz × 2	50Hz × 4	65Hz × 2	45Hz × 4
850	0.82	0.79	0.71	70Hz × 2	54Hz × 4	65Hz × 2	49Hz × 4
900	0.82	0.78	0.69	70Hz × 2	64Hz × 4	65Hz × 2	59Hz × 4
960	0.82	0.78	0.69	70Hz × 2	64Hz × 4	65Hz × 2	59Hz × 4
1010	0.82	0.79	0.76	80Hz × 2	80Hz × 4	75Hz × 2	75Hz × 4
1065	0.82	0.79	0.76	80Hz × 2	80Hz × 4	75Hz × 2	75Hz × 4
1130	0.82	0.79	0.71	70Hz × 2	54Hz × 4	65Hz × 2	49Hz × 4
1180	0.82	0.79	0.71	70Hz × 2	54Hz × 4	65Hz × 2	49Hz × 4
1235	0.82	0.78	0.69	70Hz × 2	64Hz × 4	65Hz × 2	59Hz × 4
1300	0.82	0.78	0.69	70Hz × 2	64Hz × 4	65Hz × 2	59Hz × 4
1360	0.81	0.77	0.67	70Hz × 2	64Hz × 4	65Hz × 2	59Hz × 4

(b) Control termination conditions

(i) When a mode other than cooling or dehumidifying is selected.

(ii) When the compressor stops.

(8) Heating high pressure control (Master unit only)

During heating operation, a constant high pressure is maintained by compressor frequency control.

(a) Control activation condition

1 minute 45 seconds have elapsed since the completion of a compressor protective start.

(b) Control description

The compressor frequency is controlled to maintain a high pressure of 2.75Mpa.

(c) Control termination conditions

(i) When a mode other than heating is selected.

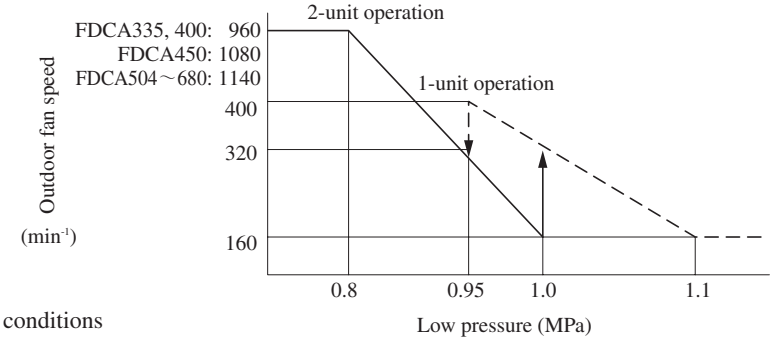
(ii) When the compressor stops.

(9) Heating low pressure control (Master unit/slave unit)

• Low pressure is controlled in accordance with the outdoor unit's fan speed during a heating operation.

(a) After compressor protective start ends (1 minute 45 seconds), when the low pressure is 0.80 MPa or higher, this control is activated.

(b) The outdoor unit's fan speed is controlled in accordance with the low pressure by switching between 2-unit and 1-unit operation.



Control termination conditions

1) When a mode other than heating is selected.

2) When the compressor stops.

(10) Outdoor fan control (Master unit/slave unit)

(a) DC fan motor control

The outdoor fan tap has 0 speed to 4nd speed assigned as the regular speed depending on the model and operation mode. Under normal operation, 1st speed and 4nd speed is used, and in each outdoor fan control, control is stepless between 1st speed and 4nd speed.

(b) Outdoor fan tap

Unit: min^{-1}

Fan tap	FDCA335, 400				FDCA450				Remarks
	Cooling		Heating		Cooling		Heating		
	FM_{o1}	FM_{o2}	FM_{o1}	FM_{o2}	FM_{o1}	FM_{o2}	FM_{o1}	FM_{o2}	
0th speed	0	0	0	0	0	0	0	0	Stop
1th speed	0	160	0	160	0	160	0	160	1-unit operation min. speed
2th speed	0	400	0	400	0	400	0	400	1-unit operation max. speed
3th speed	160	160	160	160	160	160	160	160	2-unit operation min. speed
4th speed	960	960	960	960	1080	1080	1080	1080	2-unit operation max. speed

Unit: min^{-1}

Fan tap	FDCA504～1360				Remarks
	Cooling		Heating		
	FM_{o1}	FM_{o2}	FM_{o1}	FM_{o2}	
0th speed	0	0	0	0	Stop
1th speed	0	160	0	160	1-unit operation min. speed
2th speed	0	400	0	400	1-unit operation max. speed
3th speed	160	160	160	160	2-unit operation min. speed
4th speed	1140	1140	1140	1140	2-unit operation max. speed

(c) When operation is starting, operation is at 4nd speed.

(d) Judgment of whether or not to start the DC fan motor

(i) If the outdoor fan starts after stopping, the fan speed is checked and start control is performed.

(ii) If the unit is stopped (free-running state) and the fan speed is in reverse, either FM_{O1} or FM_{O2} is 700 min^{-1} or higher, it is not started, and if both FM_{O1} and FM_{O2} is under 700 min^{-1} for 3 seconds, it is started.

(iii) The compressor is started regardless of the state of the outdoor fan, and the above contents are sensed 5 seconds or more after the time that 52C1 goes ON.

(11) Snow protection fan control (Master unit/slave unit)

Set this for the master unit as well as slave units.

(a) This control is enabled/disabled by the selector switch at the 7-segment display.

① Set the Code No. to "75".

② "0" or "1" displays at the data display area.

0: Outdoor fan control disabled (factory setting)

1: Outdoor fan control enabled

③ Press SW7 continuously for 3 seconds.

④ "0" or "1" blinks every 0.5 seconds at the data display area.

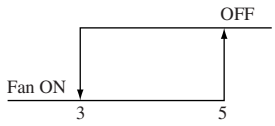
⑤ Press SW8 to toggle between the blinking "0" and "1" displays.

⑥ If SW7 is pressed for 3 seconds or longer while "0" and "1" is blinking, the blinking stops, and that enabled/disabled setting is registered. If enabled, fan control occurs as described below.

⑦ Outdoor fan control occurs in accordance with the information stored in memory, even if the power is turned OFF and back ON again.

(b) Control description

(i) If the outside temperature drops to 3°C or lower when all units are stopped, or during an error stop, the outdoor fan runs at level 4 speed once every 10 minutes.



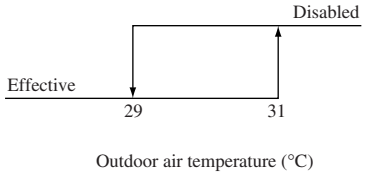
(ii) The outdoor fan runs for 30 seconds.

(iii) During this snow protection control, the compressor's magnetic contactor (52C1) is ON.

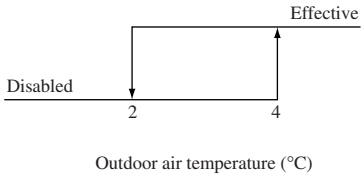
(12) Silent mode control (Master unit/slave unit)

(a) If the silent mode start signal is received from an indoor unit or CnG2 (with short pin) is shorted, if the outdoor temperature is within the following range, operation is performed in the silent mode.

• Cooling



• Heating



(b) Outdoor fan maximum speed & maximum compressor operation frequency (excluding the 30-second period after a start, and defrost operations)

1) The maixmum outdoor fan speed is 500min^{-1}.

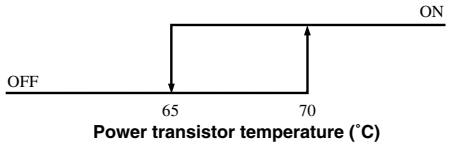
2) Maximum compressor operation frequency Max. Operation Frequency (Hz)

Model	Freguency(Hz)	Model	Freguency(Hz)	Model	Freguency(Hz)
FDCA335	46 × 2	**FDCA735**	42 × 4	**FDCA1130**	70 × 4
FDCA400		**FDCA800**	46 × 4	**FDCA1180**	74 × 4
FDCA450	52 × 2	**FDCA850**	50 × 4	**FDCA1235**	78 × 4
FDCA504	60 × 2	**FDCA900**	52 × 4	**FDCA1300**	
FDCA560	70 × 2	**FDCA960**	56 × 4	**FDCA1360**	
FDCA615	78 × 2	**FDCA1010**	60 × 4	—	—
FDCA680	84 × 2	**FDCA1065**	64 × 4	—	—

(13) Inverter cooling fan control (Master unit/slave unit)

This control applies to the master unit and slave units independently.

(a) After the inverter starts, the cooling fans (FMO1, 2) are turned ON or OFF depending on the temperatures detected by the power transistor thermistor (Tho-P1, 2).



(b) When the compressor changes from the ON to the OFF state, if the cooling fan is turned ON, the fan continues in the ON state for 3 minutes 10 seconds.

(14) Compression ratio protection control (Master unit/slave unit)

The frequency is reduced in accordance with the compressor's compression ratio.

(a) Control activation conditions

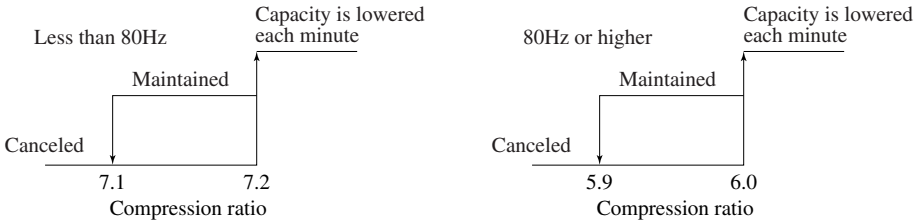
This control is activated when all the following conditions are satisfied.

(i) When 10 minutes or more have elapsed since the compressor start.

(ii) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

Note (1) The above does not apply for a 10-minute period following a defrost, or when pump-down control is in progress.

(b) Control description



(c) Control termination conditions

Control ends when any one of the following conditions is satisfied.

(i) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

(ii) When the compression ratio falls below the cancel value.

(15) Forced heating/cooling operation (Master unit only)

With this control, SW3-7 on the outdoor unit PCB is turned on and CnG1 (equipped with short circuit pin) is shorted or opened so as to forcibly determine whether the indoor unit is operated for cooling or heating. If any operation mode other than the forcible mode is commanded from the indoor unit, the mode unmatch message is displayed on the remote controller or others and the operation enters into the fan mode.

SW3-7	CnG1	Operation
OFF	Open/short	Normal operation
ON	Open	Cooling
	Short	Heating

Note (1) SW-7 is at OFF and CnG1 is open at the shipping from factory.

(16) Indoor unit connection number protection (Master unit only)

If the number of indoor units on the connection exceeds the number as listed below, the compressor stops with the error stop.

Item \ model	All model
Number of units on connection	48 units

Note (1) They are the numbers of units used for judgement of error for the purpose of control and not equal to the numbers of units which can be connected.

(17) Defrosting (Master unit/slave unit)

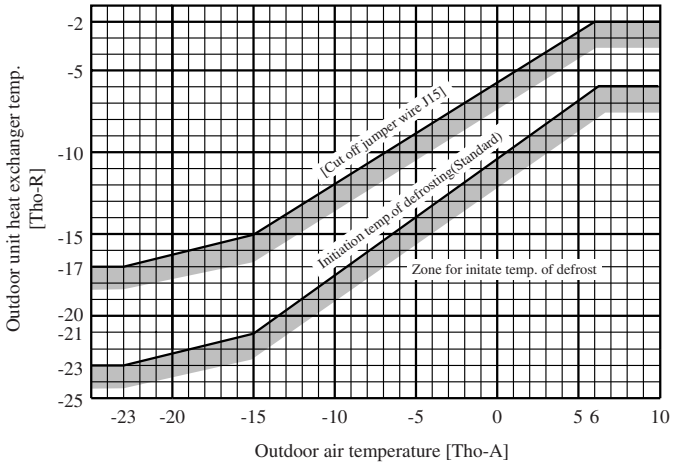
If defrosting start conditions are established at the outdoor unit heat exchanger for any of the indoor units, a defrosting operation starts.

(a) Temperature condition defrosting

(i) Conditions for starting defrosting

When all the following conditions are met, the defrosting operation will start.

1) The cumulative operating time of the compressor comes up to 33 minutes after completion of a defrosting operation, or it comes up to 33 minutes after a heating operation starts (the remote controller is turned on).
2) If 8 minutes have passed after the compressor goes ON after it has gone OFF.
3) If 8 minutes have passed after one outdoor unit fan goes ON after all outdoor fans have gone OFF.



4) After all the above conditions are satisfied, when the temperature at the outdoor heat exchanger thermistor (Tho-R) and outdoor temperature thermistor is below the defrost initiation temperature in the above graph continuously for 3 minutes.

(ii) Conditions for finishing defrosting

- Standard (J14: shorted)
  1) When the increase of the temperature of the heat exchanger thermistor (Tho-R1 or Tho-R2) is greater than 9ºC.
  2) When 12 minutes have passed since defrosting started.
- With operation Judgment Function (J14: Open)
  1) If Tho-R1 and R2 are ≧ 9ºC, after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 2 minutes and 30 seconds have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 14ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.
  2) If Tho-R1 or R2 are < 9ºC after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 5 minutes have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 14ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.

(b) Time condition defrosting (oil return)

(i) Defrosting start conditions

1) Defrosting starts when the heating mode is in effect at the 1st compressor start following a power ON, and when the heating mode is in effect after 2 hours of cumulative operation time. However, if mode switching from cooling to heating occurred, defrosting starts 33 minutes after CM1 operation begins.
2) If there was 5 minutes or more of temperature condition defrosting before time condition defrosting, the 10-hour timer for time condition defrosting is reset.
3) The "time condition defrosting" time is the point when the detected oil rise amount reaches the setting value (following 2 hours of cumulative compressor operation time counting from the 1st compressor start after power ON), or the point when 10 hours elapse, whichever comes first.
4) When the 10-hour timer period elapses, time condition defrosting occurs at the completion of the previous temperature condition defrosting operation, or after 33 minutes, whichever comes first.

(ii) Defrosting end conditions

If either of the following conditions is satisfied, the defrosting end operation starts.

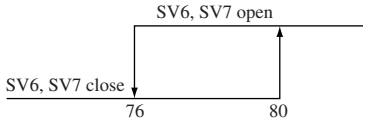
1) The temperature sensed by Tho-R1 and Tho-R2 becomes 9ºC or higher.
2) If 12 minutes has passed since defrosting started.

(18) Oil separator solenoid valve (SV6, 7) control (Master unit/slave unit)

(a) If the inverter compressor (CM1, 2) starts, solenoid valve SV6, 7 opens (goes ON), then 15 seconds later, it starts.

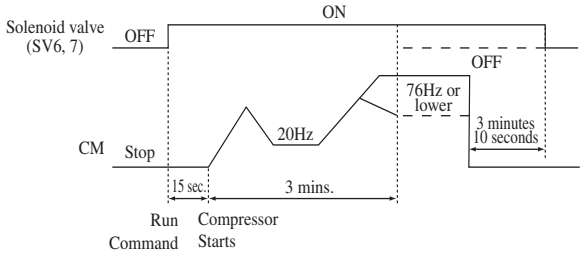
(b) SV6, 7 stays open (ON) for 3 minutes, until 4-way valve switching assurance and compressor protective start are completed.

(c) If the compressor operating frequency becomes 80Hz or higher, SV6, 7 opens (goes ON) and it goes off if the frequency is 76Hz or lower.

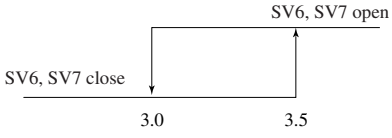


Actual compressor frequency (Hz)

(d) If the inverter compressor goes off after SV6, 7 opens (goes ON), SV6, 7 remains open (ON) for 3 minutes and 10 seconds, then closes (goes OFF).



(e) During heating operations, The SV6 and SV7 valves switch ON when the high pressure is 3.5MPa or higher, and switch OFF when the high pressure is 3.0MPa or lower.



High pressure (MPa)

(19) Emergency stop control

When an indoor unit's external input (optional: refrigerant leakage, etc.) indicates a refrigerant leak, that information is transmitted to the outdoor unit, stopping operation. An emergency stop error is then transmitted to all indoor units that are running.

(a) Error stop occurs when the "emergency stop" command is received from the indoor unit.

(b) Error code E63 occurs, and the "emergency stop" command is transmitted to all indoor units.

(c) When a "emergency stop clear" command is received from the indoor unit, the outdoor unit's error status is cleared, and an "emergency stop clear" command is transmitted to all the indoor units.

(20) Outdoor unit combined protection (Master unit/slave unit)

This protection judges the capacity of outdoor units that can be connected and displays any errors on the 7-segment display. However, it does not perform emergency stops or send any error messages to the indoor units.

(a) Combined units

The errors of units other than the following combined units are not responede to by this function.

Outdoor unit model	Combined outdoor unit model						
Model	FDCA335 HKXE4R-K	FDCA400 HKXE4R	FDCA450 HKXE4R	FDCA504 HKXE4R	FDCA560 HKXE4R	FDCA615 HKXE4R	FDCA680 HKXE4R
FDCA735	1	1	–	–	–	–	–
FDCA800	–	2	–	–	–	–	–
FDCA850	–	1	1	–	–	–	–
FDCA900	–	–	2	–	–	–	–
FDCA960	–	–	1	1	–	–	–
FDCA1010	–	–	–	2	–	–	–
FDCA1065	–	–	–	1	1	–	–
FDCA1130	–	–	–	–	2	–	–
FDCA1180	–	–	–	–	1	1	–
FDCA1235	–	–	–	–	–	2	–
FDCA1300	–	–	–	–	–	1	1
FDCA1360	–	–	–	–	–	–	2

(b) 7-segment display during an error

Outdoor unit model	Data display	Operation disabling content
OPE	3	Combined outdoor units are disabled.

(c) Control termination conditions

Control ends when compressors stop in all units.

(21) Automatic backup operation (Master unit/slave unit)

When one or more compressors fail, operation occurs using only the normal compressors.

(a) Automatic backup operation is only enabled when SW3-2 is ON (alternate setting) at the master unit.

(b) The following error status are disabled and not detected at failed compressors.

① L3-phase "open phase" error (E32)
② Discharge pipe temperature error (E36)
③ Heat exchanger thermistor disconnection (E37)
④ Outdoor temperature thermistor disconnection (E38)
⑤ Discharge pipe temperature thermistor (E39)
⑥ High pressure error (E40)
⑦ Power transistor overheating (E41)
⑧ Current cut (E42)
⑨ Inverter PCB communication error (E45)
⑩ DC fan error (E48)
⑪ Power transistor overheating (continuous) (E51)
⑫ Suction pipe thermistor disconnection (E53)
⑬ High pressure and low pressure sensor disconnected (E54)
⑭ Under-dome temperature sensor disconnected (E55)
⑮ Power transistor temperature sensor disconnected (E56)
⑯ Compressor start error (E59)
⑰ Compressor rotor lock error (E60)

(c) If any of the item (b) errors shown above occur while a compressor is running, that compressor is stopped, but other compressors continue running as usual.

(d) After recovering from the error, with start conditions satisfied, the compressors (CM1, 2) which are capable of running at the minimum frequency are started.

(e) An automatic recovery does not occur if a thermistor disconnection/severed wire occurs 3 times within 40 minutes. (Unit is stopped.)

(f) When a failure-recovered compressor is started, the other compressors revert back to their usual control.

(22) Unit protective maintenance related devices

(a) Test operation mode (Master unit only)

1) This control is performed from the master unit. It cannot be controlled from the slave unit side. If control from the slave unit side is attempted, the following codes are indicated on the 7-segment display.

Code indicator	Data indicator	Description of disabled control
OPE	10	Setting from a slave unit is invalid.

Note (1) Normal display can be restored if the test operation control switch is reset.

2) Outdoor unit test operation mode operation is started by the DIP switches SW5-1 and 5-2 on the outdoor unit PCB.

Switch functions

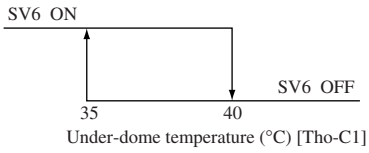
SW5-1	ON	**SW5-2**	OFF	Heating Test Operation
			ON	Cooling Test Operation
	OFF	Normal or Test Operation End		

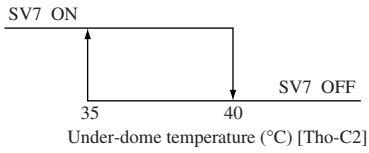
Notes (1) Leave all DIP Switches except 5-1 and 5-2 OFF.

(2) This operation takes priority over other options such as the center console. It sets the options in the operating state.

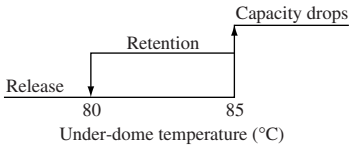
(b) Under-dome temperature control (Master unit/slave unit)

1) The oil separator solenoid valve (SV6, 7) are controlled in accordance with the temperature at the under-dome thermistor (Tho-C) installed on the compressor.

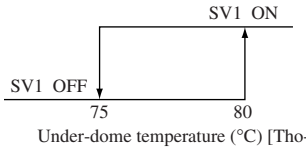


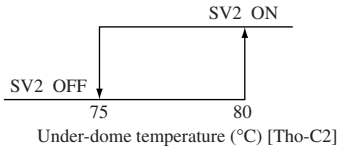


2) The compressor's capacity is controlled in accordance with the under-dome temperature (Tho-C1, 2).



3) The cooling solenoid (SV1, 2) is controlled in accordance with the under-dome temperature (Tho-C).



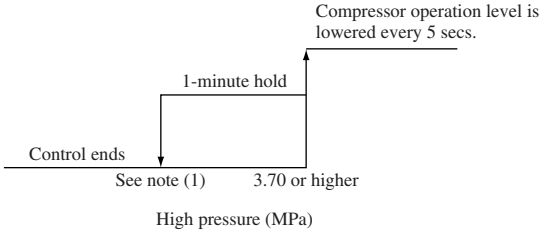


(c) High pressure protective control (Master unit/slave unit)

During cooling and heating operations, high pressure is detected by the high pressure sensor (PSH), and the compressor and outdoor fan are controlled to prevent the pressure from rising.

1) Cooling

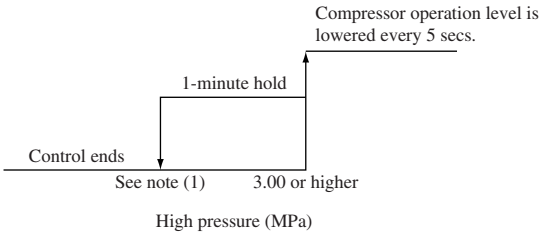
High pressure based compressor control



Note (1) High pressure of less than 3.70MPa continues for 1 minute

2) Heating

a) High pressure based fan speed control



Note (1) High pressure of less than 3.00MPa continues for 1 minute

b) High pressure based fan speed control

i) Control activation conditions

When a high pressure of 3.0MPa or higher occurs 1 minute 45 seconds after a compressor protective start completion.

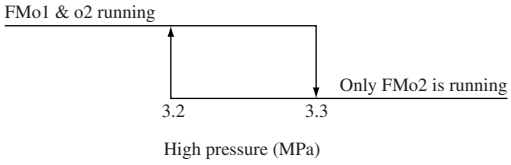
ii) Control description

① The fan speed is kept within a 160~960 (1080) min^{-1} range.

Both fan motors (FMo1 & 2) run at the same speed.

Note (1) Values shown in parentheses apply to the FDCA450 model.

② The FMo1 fan motor (right side) stops if the high pressure exceeds the value shown below.



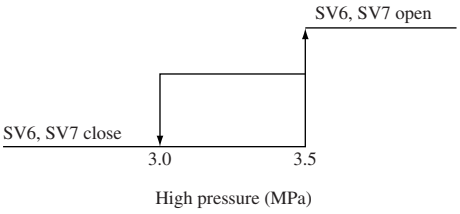
iii) Control termination conditions

① When a mode other than heating is selected.

② When the compressor stops.

③ When the high pressure becomes less than 3.0MPa.

3) Solenoid valves SV6 & SV7 open (ON) when the high pressure reaches 3.5MPa or higher.



(d) Compressor protective start control (Master unit/slave unit)

1) Compressor protection at low frequency

a) 30Hz operation is performed for 1 minute when a 29Hz or lower operation has continued for 20 minutes.

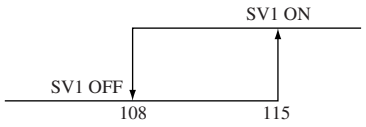
2) Compressor start delay (3-minute timer)

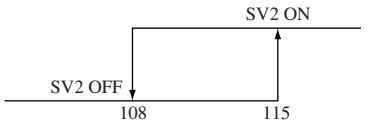
The inverter compressor (CM1) does not start again for 3 minutes after being stopped by cooling/heating thermostat control, by the remote controller, or by an error.

(e) Discharge pipe temperature control (Master unit/slave unit)

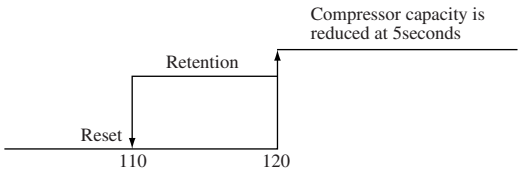
If the discharge pipe temperature (sensed by Tho-D1, D2) exceeds the set value, the compressor cooling solenoid valve (SV1, 2) goes ON, the indoor expansion valve opens and the compressor's capacity is controlled, thus suppressing rises in the discharge pipe temperature. If the temperature rises even further, the compressor stops.

(i) Compressor cooling solenoid Valve (SV1, 2) control



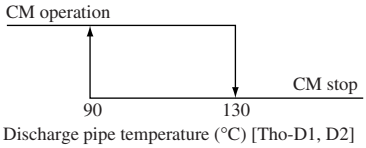


(ii) Compressor control



(iii) Discharge pipe temperature error

- When the discharge pipe temperatures (Tho-D1, D2 detection) rise beyond 130°C and is maintained for 2 seconds, the compressors are stopped but it will be reset if the temperatures drop below 90°C.



- Compressors are counted individually if a discharge pipe temperature (Tho-D1, D2 detection) error occurs 2 times within 60 minutes.
- Control description

  When the master unit auto-backup operation is invalid (SW3-2 ON), it stops with an anomalous stop. When the master unit auto-backup operation is valid (SW3-2 OFF, the factory setting), it does not stop with an anomalous stop and the compressor remains stopped.

Note (1) Unless the temperature of 90 °C or under is maintained for 45 minutes after the discharge pipe error, the unit cannot be started again. (Reset the power supply to clear.)

(f) Current safe control (Master unit/slave unit)

(i) The compressor speed is reduced if the inverter inlet's input voltage (converter inlet L3-phase) exceeds the setting value while the compressor is running at a speed of 20Hz or higher. If the setting value is still exceeded after the speed reduction, the speed is reduced again.

(ii) This control ends when the input voltage drops below the setting value for a continuous period of 3 minutes, and the speed protection cancel operation begins.

(iii) This is performed by the master unit and slave units independently.

(g) Current cut control (Master unit/slave unit)

This control prevents overcurrent conditions at the inverter. The inverter is immediately stopped when the current exceeds the setting value, and is then automatically restarted 3 minutes later. If the current control is activated 4 times within 15 minutes, 52C1 and 52C2 are switched OFF, and an error stop occurs.

(h) Anomalous high pressure increase protection (Master unit/slave unit)

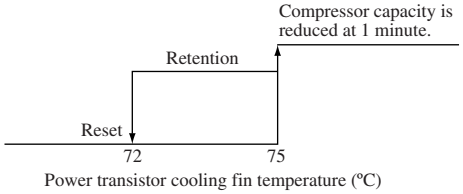
If the high pressure side pressure switch [63H1-1, 63H1-2: 4.15 Open / 3.15 Closed MPa] operates 5 times within 60 minutes or operates for 60 minutes, an abnormal stop is performed.

However, when first operated, the compressor is stopped, then after a 3-minute delay, normal operation is resumed.

(i) Power transistor temperature control (Master unit/slave unit)

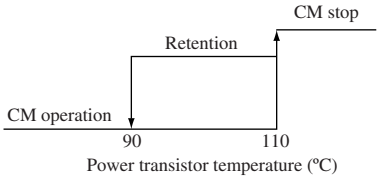
If the temperature of the power transistor cooling fins (sensed by Tho-P) exceeds the set value, the compressor's capacity is controlled to keep the power transistor's temperature from rising. If it rises still higher, the compressor is stopped.

1) Compressor control



2) Power transistor temperature anomaly

- If the temperature sensed by the power transistor temperature thermistor rises to 110ºC or higher, the compressor (CM1, 2) is stopped.

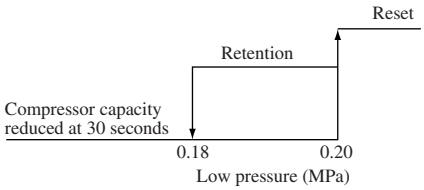


- If the power transistor's temperature is anomalous 5 times within 60 minutes, or if the temperature is 110ºC or higher for 15 minutes continuously, including when the compressor is stopped, an abnormal stop is performed.

(j) Low pressure protective control (Master unit only)

If the low pressure (sensed by PSL) drops below the set value, the compressor's capacity is controlled to prevent the low level pressure from dropping. If it drops still further, the compressor is stopped.

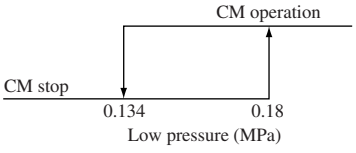
1) Compressor control



Note (1) Starting Conditions
- Later than 1 minute 45 seconds after compressor operation starts
- Sensed continuously for 10 seconds

2) Low pressure anomaly

- If the low pressure (sensed by PSL) drops to 0.134 MPa or lower continuously for 30 seconds, the compressor is stopped and if a pressure of 0.18 MPa or higher is detected continuously for 10 seconds, the compressor is automatically reset. If this occurs 2 times within 60 minutes, an anomalous stop is performed.



- A low pressure (sensed by PSL) of 0.18 MPa or lower while the compressor is stopped, or sensed continuously for 30 seconds while the compressor is operating, is prohibited.
- First cooling operation after the power is turned on
  If a low pressure of 0.003 MPa or lower is detected continuously for 60 seconds after 4-way valve switching assurance, the compressor is stopped, and if a low pressure of 0.18 MPa or higher is detected continuously for 10 seconds, the compressor is restarted automatically, but if an anomalous pressure is detected again, an anomalous stop is performed. It is possible to reset the system only by turning the power off, then turning it on again.

3) Heating electronic expansion valve (EEVH1, 2) opening angle control when heating operation is stopped

- If heating operation is stopped, the pulse to the heating electronic expansion valves (EEVH1, 2) is changed to 100 if the low pressure is less than 0.236 MPa.
- After that, if the low pressure rises to 0.246 MPa or higher while operation is stopped, the heating electronic expansion valves (EEVH1, 2) are opened fully.

(23) Pump down control (Master unit/slave unit)

(a) This control is performed from the master unit side. It cannot be controlled from the slave unit side. If control from the slave unit side is attempted, the following codes are displayed on the 7-segment display of the slave unit.

Code indicator	Data indicator	Description of disabled control
OPE	10	Setting from a slave unit is invalid.

Note (1) The display returns to normal if the pump-down control switch is reset.

(b) Pump down operation can be performed through operation of DIP switches (SW5-1, 2, 3). (Pump down operation cannot be done during indoor unit operation, backup operation or during an anomalous stop.)

(i) Pump down procedure

1) Close the liguid side service valve on the outdoor unit.
2) Turn SW5-2 (test operation operating mode) ON (cooling).
3) Turn SW5-3 (pump down switch) ON.
4) Turn SW5-1 (test operation switch) ON.

(ii) Control

1) In the cooling mode, it operates with the compressor's pump-down frequency (see the following table) as the upper limit.

Model	Frequency (Hz)	Model	Frequency (Hz)	Model	Frequency (Hz)
FDCA335	80×1	**FDCA735**	74×2	**FDCA1130**	60×4
FDCA400	80×1	**FDCA800**	80×2	**FDCA1180**	64×4
FDCA450	46×2	**FDCA850**	42×4	**FDCA1235**	68×4
FDCA504	52×2	**FDCA900**	46×4	**FDCA1300**	68×4
FDCA560	60×2	**FDCA960**	48×4	**FDCA1360**	72×4
FDCA615	68×2	**FDCA1010**	52×4	—	—
FDCA680	72×2	**FDCA1065**	56×4	—	—

2) The red and green (LED's) on the outdoor control PCB flashes together continuously and "PoS" is displayed in the 7-segment display.
3) Except for low pressure control, all the protective and anomalous sensing controls are activated.
4) Test operation commands are sent to the indoor units.
5) The sub cooling coil electronic expansion valve (EEVSC) closes fully during pump down control.
6) Oil equalization control and oil return control (cooling and heating) are prohibited.

(iii) Ending

If any of the following conditions exists, pump down operation ends.

1) If a low pressure (sensed by PSL) of ≦ 0.01 MPa is detected continuously for 5 seconds.
   a) The displays are as follows.
      · Red LED: Lights up continuously · Green LED: flashing · 7-segment LED display: PoE · Remote controller: Stop
2) If operation is stopped by anomalous sensing control.
3) If the cumulative compressor operation time totals 15 minutes.
   a) The displays are as follows.
      · Red LED: stays OFF · Green LED: flashing · 7-segment LED display: No display · Remote controller: Stop
4) If any one of DIP switches SW5-1, 2 or 3 is turned OFF during the pump down operation.

(24) External input operation (Master unit only)

External input: From CnS1, operation permission/prohibition control; From CnS2: Demand control/normal operation switching.

- J13: Switches between CnS1 and CnS2 input method.

  J13 short circuit: Level input by CnS1 and CnS2.

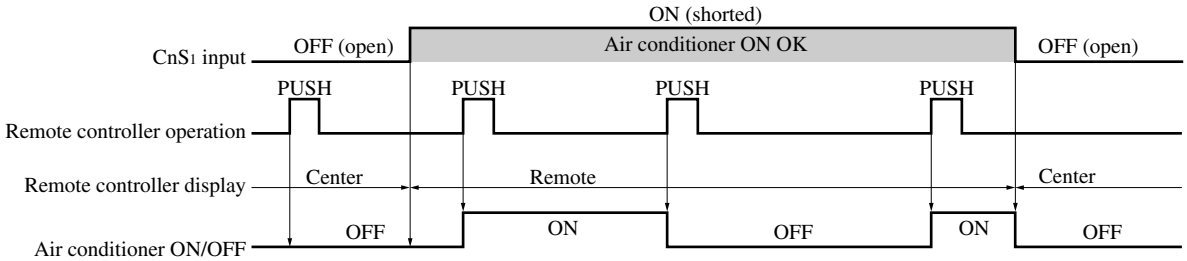
  J13 open: Pulse input by CnS1 and CnS2.

(a) From CnS1, operation permission/prohibition control

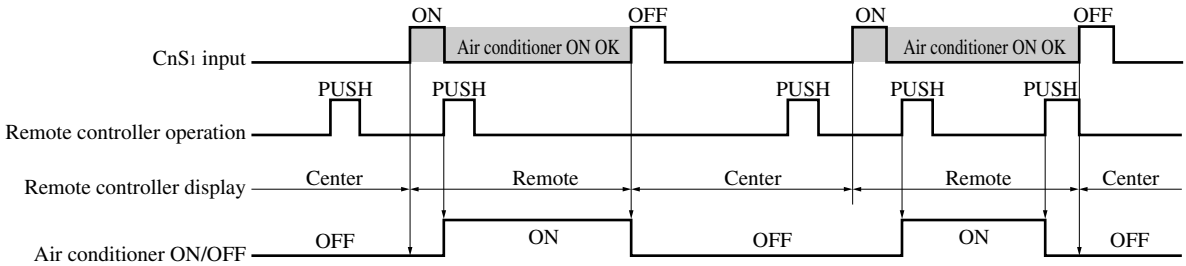
Input : CnS1	CnS1 input method change: J13	CnS1 : Operation permission/ Prohibition mode change
Short circuit → Disconnection	J13; Short circuit Lever input	Operation prohibition mode → Operation permission mode
	J13; Disconnection Pulse input	Operation permission/Prohibition model change (Reversal)
Short circuit → Disconnection	J13; Short circuit	Operation permission mode → Operation prohibition mode
	J13; Disconnection	— (NOP)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.
2) CnS1, performs the following operations by the changing of jumper wire J1 from short circuit to open circuit.
   If pulse input, the pulse duration is 500 ms or more.

① Opreation with J13 short circuit



② Opreation with J13 disconnection



(b) From CnS2, operation permission/prohibition control

Input : CnS2	CnS2 input method Formula switching: J13	CnS2 : Demand control/normal operating switching
Short circuit / Open circuit	J13; Short circuit Level input	Demand control → Normal operation
	J13; Open circuit Pulse input	Normal operation/Demand control switching (Reversal)
Short circuit / Open circuit	J13; Short circuit	Normal operation → Demand control
	J13; Open circuit	— (NOP)

Note (1) The factory settings are: J13 - short circuit; CnS2 - short circuit (short pin connection)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

2) Demand control

It is possible to switch the demand using DIP switch SW4-5, 6.

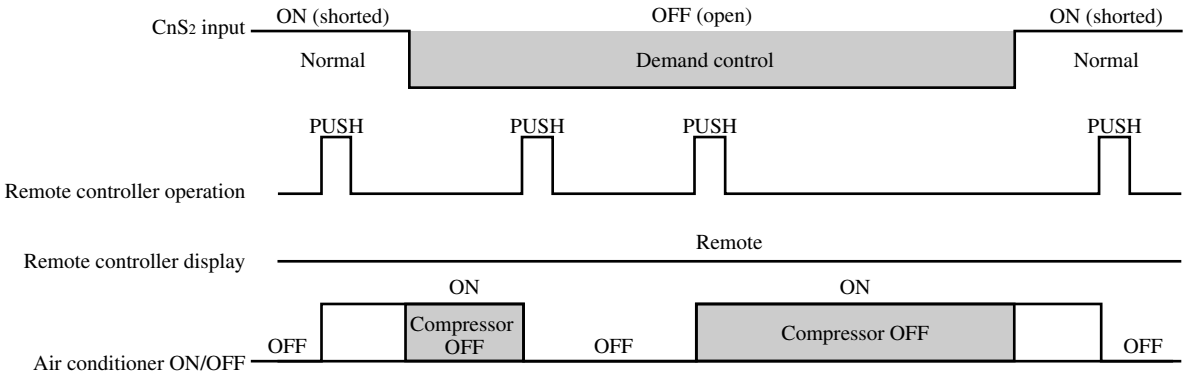
SW4-5	SW4-6	Compressor output (%)
0	0	80
1	0	60
0	1	40
1	1	0

Note (1) 0: Open, 1: Shorted

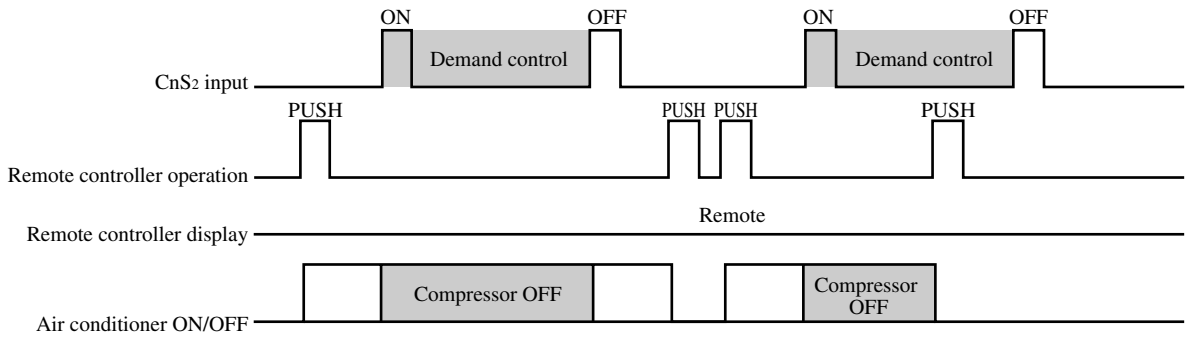
3) CnS2, performs the following operations by the changing of jumper wire J13 from short circuit to open circuit.

If pulse input, the pulse duration is 500 ms or more.

① J13 - Short circuit



② J13 - Open circuit



(25) 7-Segment display (Master unit/slave unit)

The data in the following table can be displayed using the display select switch (SW8: 1's digit; SW9: 10's digit).

Code No.	Contents of display	Data display range	Minimum units	Remarks
–	Unusual code Pump down Check mode Outdoor unit setup	–	–	E?? PoE, PoS CH? OPE??
00	CM1 operating frequency	0~130	1Hz	
01	CM2 operating frequency	0~130	1Hz	
02	Tho-A Outdoor air temp.	L,-20~43	1˚C	[L] is indicated when the temperature is -20˚C or below and the actual temperature is indicated when it is higher than -20˚C and up to 43˚C.
03	Tho-R1 Heat exchanger temp. 1 (Exit. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
04	Tho-R2 Heat exchanger temp. 2 (Exit. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
05	Tho-R3 Heat exchanger temp. 3 (Entrance. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
06	Tho-R4 Heat exchanger temp. 4 (Entrance. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
07	Tho-D1 Discharge pipe temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
08	Tho-D2 Discharge pipe temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
10	Tho-C1 Under-dome temp.	L,5~90	1˚C	[L] is indicated when the temperature is 5˚C or below and the actual temperature is indicated when it is higher than 5˚C and up to 80˚C.
11	Tho-C2 Under-dome temp.	L,5~90	1˚C	[L] is indicated when the temperature is 5˚C or below and the actual temperature is indicated when it is higher than 5˚C and up to 80˚C.
12	Tho-P1 Power transistor temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
13	Tho-P2 Power transistor temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
14	Tho-SC Sub-cooling coil temp.1	L,18~73	1˚C	[L] is indicated when the temperature is 18˚C or below and the actual temperature is indicated when it is higher than 18˚C and up to 73˚C.
15	Tho-SC Sub-cooling coil temp.2	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
16	Tho-S Suction pipe temp.	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
17	Cooling operation super cooling	0~50	0.1˚C	
18	Super heat	0~50	0.1˚C	
19	Super heat of sub-cooling coil	0~50	0.1˚C	
20	CT1 Current	0~70	1A	
21	CT2 Current	0~70	1A	
22	EEVH1 Heating expansion valve opening angle	0~500	1 Pulse	
23	EEVH2 Heating expansion valve opening angle	0~500	1 Pulse	
24	Opening angle of EEVSC overcooling coil expansion valve	0~500	1 Pulse	
26	FM01 Number of rotations	0~1500	10 min^{-1}	

Code No.	Contents of display	Data display range	Minimum units	Remarks
27	FM02 Number of rotations	0~1500	10 min^{-1}	
28	PSH High pressure sensor	0~5.00	0.01MPa	
29	PSL Low pressure sensor	0~2.00	0.01MPa	
30	FMC1, 2 Cooling fan Crankcase heater	0,1	–	Order of 100 : FMC1, 2 Order of 10 : CH1 Order of 1 : CH2 (0: OFF, 1: ON)
31	63H1-1 63H1-2	0,1	–	Order of 100 : 63H1-1, 2 Order of 10 : – (0: Close, 1: Open)
32	SV1 SV2	0,1	–	Order of 100 : SV1 Order of 10 : SV2 Order of 1 : – (0: Close, 1: Open)
33	SV6 SV7	0,1	–	Order of 100 : SV6 Order of 10 : SV7 Order of 1 : – (0: Close, 1: Open)
34	20S	0,1	–	Order of 100 : 20S, Order of 10 : – Order of 1 : – (0: close, 1: open)
35	Compressor stop causes ①	0,1	–	Order of 100 : Defective outdoor temperature thermistor Order of 10 : Defective outdoor unit heat exchanger thermistor 1 Order of 1 : Defective outdoor unit heat exchanger thermistor 2 (0:Normal, 1: Abnormal)
36	Compressor stop causes ②	0,1	–	Order of 100 : Defective outdoor unit heat exchanger thermistor 3 Order of 10 : Defective outdoor unit heat exchanger thermistor 4 Order of 1 : Defective discharge pipe thermistor 1 (0:Normal, 1: Abnormal)
37	Compressor stop causes ③	0,1		Order of 100 : Defectived discharge pipe thermistor 2 Order of 10 : Defective Sub cooling coil thermistor 1 Order of 1 : Defective Sub cooling coil thermistor 2 (0:Normal, 1: Abnormal)
38	Compressor stop causes ④	0,1	–	Order of 100 : Defective suction pipe thermistor Order of 10 : Defective low pressure sensor Order of 1 : Defective high pressure sensor (0:Normal, 1: Abnormal)
39	Compressor stop causes ⑤	0,1	–	Order of 100 : Anomaly in inverter 1 Order of 10 : Anomaly in inverter 2 Order of 1 : Anomalous high pressure (0:Normal, 1: Abnormal)
40	Compressor stop causes ⑥	0,1	–	Order of 100 : Anomalous low pressure Order of 10 : Anomalous discharge pipe thermistor 1 Order of 1 : Anomalous discharge pipe thermistor 2 (0:Normal, 1: Abnormal)
41	Compressor stop causes ⑦	0,1	–	Order of 100 : Defect CM1 starting Order of 10 : Defect CM2 starting Order of 1 : Rotor lock CM1 (0:Normal, 1: Abnormal)
42	Compressor stop causes ⑧	0,1	–	Order of 100 : Rotor lock CM2 Order of 10 : CM1 Current cut Order of 1 : CM2 Current cut (0:Normal, 1: Abnormal)
43	Compressor stop causes ⑨	0,1	–	Order of 100 : Power transistor 1 overheating Order of 10 : Power transistor 2 overheating Order of 1 : Anomaly in DC fan1 (0:Normal, 1: Abnormal)
44	Compressor stop causes ⑩	0,1	–	Order of 100 : Anomaly in DC fan2 Order of 10 : Stop command from indoor Order of 1 : Operation mode charge (0:Normal, 1: Abnormal)
45	Compressor stop causes ⑪	0,1	–	Order of 100 : Dilute protection Order of 10 : Demand control 0% Order of 1 : 0 (0:Normal, 1: Abnormal)
46	Control status	0,1	–	Order of 100 : During equal oil control Order of 10 : During oil return control Order of 1 : During defrost (0:Non-operation, 1: Operation)
47	Control status	0,1	–	Order of 100 : During Td control Order of 10 : During HP control Order of 1 : During CS control (0:Non-operation, 1: Operation)
48	Control status	0,1	–	Order of 100 : During LP control Order of 10 : During PT control Order of 1 : Under cooling low pressure control (0:Non-operation, 1: Operation)
49	Control status	0,1	–	Order of 100 : Cooling high pressure protection control Order of 10 : Heating high pressure protection control Order of 1 : Heating low pressure protection control (0:Non-operation, 1: Operation)
50	Number of connected indoor unit	0~50	1	
51	Number of operation indoor unit	0~50	1	
52	Required Hz total	0~999	1Hz	
53	Target Fk	0~999	1Hz	
54	Compressor cumulative operating time (CM1)	0~655	100h	

Code No.	Contents of display	Data display range	Minimum units	Remarks
55	Compressor cumulative operating time (CM2)	0~655	100h	
56	Discharge pressure saturation temperature	-50~70	0.1˚C	1˚C at –10 or lower
57	Air inlet pressure saturation temperature	-50~30	0.1˚C	1˚C at –10 or lower
58	Target cooling low pressure	0.00~2.00	0.01MPa	
59	Target heating high pressure	1.60~4.15	0.01MPa	
60	Counter · Compressor 2 starting failure	0, 1	–	
61	Counter · Motor lock compressor 2	0~3	–	
62	Power transistor 2 overheating	0~4	–	
63	Inverter 1 operating frequency command	0~130	1Hz	
64	Inverter 2 operating frequency command	0~130	1Hz	
65	Counter · Inverter 2 communications error	0~3	_	
66	Control status	0,1	_	Order of 100 : During silent mode Order of 1 : During test operation (0:Non-operation, 1: Operation)
67	Control status	0,1	–	Order of 100 : Unmatch Order of 10 : Indoor EEV check Order of 1 : – (0:Non-operation, 1: Operation)
68	Control status	0,1	–	Order of 100 : Piping cleaning Order of 10 : Under-dome temperature control Order of 1 : Compession ratio protection control (0:Non-operation, 1: Operation)
70	Operation priority switching	0,1	–	0: Prior press priority (when shipped) 1: After press priority
71	High pressure control of cooling	2.2, 2.5	0.01MPa	2.2: Factory setting 2.5: Alternate setting
72	low pressure control of cooling	-0.05~+0.05	0.01MPa	0.00: Factory setting
73	Heating high pressure compensation	0.00~0.30	0.01MPa	0.00: Factory setting
74	Low pressure of heating	0.80, 0.90	–	0.8: Factory setting 0.9: Alternate setting
75	Snow protection fan control	0,1	–	0: Snow protection fan control deactivated 1: Snow protection fan control activated
77	Data reset	---, dEL	–	
80	Counter · Thermistor disconnection	0~2	–	
81	Counter · Inverter 1 communications error	0~3	–	
82	Counter · High pressure protection	0~4	–	
83	Counter · Compressor 1 starting failure	0,1	–	
84	Counter · Anomalous low pressure ① (Under stop)	0~4	–	

Code No.	Contents of display	Data display range	Minimum units	Remarks
85	Counter · Anomalous low pressure ② (Immediately after starting)	0,1	–	
86	Counter · Anomalous low pressure ③ (Under operation)	0~4	–	
87	Counter · Motor lock of compressor 1	0~3	–	
88	Counter · Overheating of power transistor 1	0~4	–	
89	Counter · Anomalous temp. of discharge pipe 1	0,1	–	
90	Counter · Anomalous temp. of discharge pipe 2	0,1	–	
91	Counter · Current cut (CM1)	0~3	–	
92	Counter · Current cut (CM2)	0~3	–	
93	Counter · Indoor-outdoor communications error	0~255	–	
94	Counter · Outdoor inverter communications error 2	0~255	–	
95	Counter · CPU reset	0~255	–	
96	Counter · Anomalous FM01	0~255	–	
97	Counter · Anomalous FM02	0~255	–	
98	Program version	–	–	Example (2.11)
99	Auto send display	–	–	

(26) Saving of Operation Data (Master unit/slave unit)

Operating data for a period of 30 minutes prior to the time when trouble occurs are recorded, and these data can be fetched to a personal computer through the RS232C connector on the control board. Data are updated continuously, and when there is an abnormal stop, data updates stop at that point. Pressing DIP switch SW7 for 5 seconds causes the data to be erased. Data can also be sampled at 1 ~ 60 second intervals during operation and fetched to a personal computer.

• Data is transmitted from a personal computer upon demand.

Data	Data Range	Example
Software version	ASCII 15-byte	KD3C218######## (#: NULL)
PID (program ID)	ASCII 2-byte	5D
Outdoor unit capacity	ASCII 3-byte	As shown in table at right
Power supply frequency	ASCII 2-byte	60
Outdoor address	ASCII 2-byte	00 ~ 3F
Indoor address × 16 units	ASCII 2-byte × 16 units	40 ~ 7F
Indoor capacity × 16 units	ASCII 3-byte × 16 units	022 ~ 280

Outdoor capacity data	Remarks
All-in-one type Ex: 16PS or S16	S: Horsepower of all-in-one type and all-in-one type (also for combined use)
Master unit of combination Ex: 32PS or S32	S: Horsepower of all-in-one type and all-in-one type (also for combined use)
Combined slave units Ex: 12PS or C12	C: Horsepower of combined slave units

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
00	Anomalous code	00~99	–	1	00: No anomalous, outdoor unit all anomalous ???
01	Address of unit where trouble occurred	00~FF	–	1	0~3F: Outdoor unit side, 40~6F: Indoor unit side
02	Operation mode	0~2	–	1	0 Stop 1 Cooling 2 Heating
03	High pressure sensor	0.00~5.00	A/D value	1	
04	Low pressure sensor	0.00~2.00	A/D value	1	
05	Heat exchanger temp. 1 (Exit, Front)	-35~75	A/D value	2	Cooling liquid side
06	Heat exchanger temp. 2 (Exit, Rear)	-35~75	A/D value	2	Cooling liquid side
07	Heat exchanger temp. 3 (Entrance, Front)	-35~75	A/D value	2	Cooling gas side
08	Heat exchanger temp. 4 (Entrance, Rear)	-35~75	A/D value	2	Cooling gas side
09	Tho-D1 Discharge pipe temp.	20~140	A/D value	1	
10	Tho-D2 Discharge pipe temp.	20~140	A/D value	1	
11	Tho-C1 Under-dome temp.	-15~90	A/D value	1	
12	Tho-C2 Under-dome temp.	-15~90	A/D value	1	
13	Tho-A Outdoor air temp.	-20~43	A/D value	1	
14	Tho-P1 Power transistor temp. (Heat dissipation fin)	20~140	A/D value	1	
15	Tho-P2 Power transistor temp. (Heat dissipation fin)	20~140	A/D value	1	
16	Tho-SC Sub cooling coil temp. 1	18~73	A/D value	1	Liquid pipe side
17	Tho-H Sub cooling coil temp. 2	-35~75	A/D value	2	Suction pipe side
18	Tho-S Suction pipe temp.	-35~75	A/D value	2	
19	Cooling operation super cooling	0~50	A/D value	1	
20	Super heat	0~50	A/D value	1	

Code No.	Write-in contents	Record data					
		Data write-in range	Write-in unit	Number of bytes	Contents		
21	Super heat of sub-cooling coil	0~50	A/D value	1			
22	CT1 Current	0~50	A/D value	1			
23	CT2 Current	0~50	A/D value	1			
24	Power source voltage	180~500	A/D value	1			
25	Pressure switch	–	–	1	Bit0	63H1	0: open, 1: close
					Bit1	63H1-R	0: open, 1:ON
					Bit2	63L	0: open, 1:ON
26	Solenoid valve	–	–	1	Bit0	20S	0:OFF, 1:ON
					Bit2	SV1	0:OFF, 1:ON
					Bit3	SV2	0:OFF, 1:ON
					Bit4	SV6	0:OFF, 1:ON
					Bit5	SV7	0:OFF, 1:ON
					Bit6	SV11	0: open, 1:ON
					Bit7	SV12	0: open, 1:ON
27	Crankcase heater etc.	–	–	1	Bit0	CH1	0:OFF, 1:ON
					Bit1	CH2	0:OFF, 1:ON
					Bit2	FM1,2	0:OFF, 1:ON
					Bit3	FMC3	0:OFF, 1:ON
28	FM01 Number of rotations	0~65535	10 min^{-1}	2			
29	FM02 Number of rotations	0~65535	10 min^{-1}	2			
30	EEVH1 opening angle	0~65535	1pulse	2			
31	EEVH2 opening angle	0~65535	1pulse	2			
32	EEVSC opening angle	0~65535	1pulse	2			
34	Indoor unit connection number	0~255	1 unit	1			
35	Indoor unit connection capacity	0~65535	–	2			
36	Indoor unit thermostat ON number	0~255	1 unit	1			
37	Indoor unit thermostat ON capacity	0~65535	–	2			
38	Required Hz total	0~65535	1Hz	2			
39	Target FK	0~65535	1Hz	2			
40	Inverter CM1 operation frequency	0~255	1Hz	1			
41	Inverter CM2 operation frequency	0~255	1Hz	1			
42	Answer Hz total	0~65535	1Hz	2			
43	Compressor 1 cumulative operating time (estimate)	0~65535	1 h	2			
44	Compressor 2 cumulative operating time (estimate)	0~65535	1 h	2			
45	Compressor 1 start times	0~65535	20 times	2			
46	Compressor 2 start times	0~65535	20 times	2			
47	Compressor stop causes	–	–	1	Bit0	Defective outdoor temperature thermistor	
					Bit1	Defective outdoor unit heat exchanger 1 thermistor	
					Bit2	Defective outdoor unit heat exchanger 2 thermistor	
					Bit3	Defective outdoor unit heat exchanger 3 thermistor	
					Bit4	Defective outdoor unit heat exchanger 4 thermistor	
					Bit5	Defective discharge pipe thermistor 1	
					Bit6	Defective discharge pipe thermistor 2	
					Bit7	Defective sub-cooling coil thermistor 1	

Code No.	Write-in contents	Record data				
		Data write-in range	Write-in unit	Number of bytes	Contents	
48	Compressor stop causes	–	–	1	Bit0	Defective sub-cooling coil thermistor 2
					Bit1	Defective suction pipe thermistor
					Bit2	Defective low pressure sensor
					Bit3	Defective high pressure sensor
					Bit4	Inverter 1 anomalous communication
					Bit5	Inverter 2 anomalous communication
					Bit6	Anomalous high pressure
					Bit7	Anomalous Low pressure
49	Compressor stop causes	–	–	1	Bit0	Td1 Anomalous discharge pipe temp.
					Bit1	Td2 Anomalous discharge pipe temp.
					Bit2	CM1 starting defect
					Bit3	CM2 starting defect
					Bit4	Rotor lock of CM1
					Bit5	Rotor lock of CM2
					Bit6	Current cut of CM1
					Bit7	Current cut of CM2
50	Compressor stop causes	–	–	1	Bit0	Power transistor 1 overheating
					Bit1	Power transistor 2 overheating
					Bit2	FM01 anomaly
					Bit3	FM02 anomaly
					Bit4	Compressor stop command from indoor unit
					Bit6	Dilution rate protection
					Bit7	Demand control 0%
51	Control status	0~180	1 second	1	CM1 3-minute delay timer	
52	Control status	0~180	1 second	1	CM2 3-minute delay timer	
53	Discharge pressure saturation temperature	-50~70	0.1˚C	2		
54	Intake pressure saturation temperature	-50~70	0.1˚C	2		
55	Control status oil return	0,1	–	1	0	None
					1	Under control
56	Control status oil return	0~2	–	1	0	None
					1	Waiting for oil return
					2	Under oil return
57	Control status defrost conditions	0~3	–	1	0	None
					1	Temperature conditions
					2	Strengthening temperature conditions
					3	Time conditions
			–			
58	Control status defrost status	0~4	–	1	0	None
					1	Defrosting status 1
					2	Defrosting status 2
					3	Defrosting status 3
			–		4	Defrosting status 4
59	Control status Td	0~2	–	1	0	None
					1	Frequency down
					2, 3	Under Td control
60	Control status	0~1	–	1	Td1 error counter	
61	Control status	0, 1	–	1	Td2 error counter	
62	Control status HP	0~2	–	1	0	None
					1	Frequency down
					2, 3	Under high pressure control
63	Control status	0~1	–	1	HP error (63H1) counter	
64	Control status CS	0~2	–	1	0	None
					1	Frequency down
					2, 3	Under CS control
65	Control status LP	0~2	–	1	0	None
					1	Frequency down
					2, 3	Under low pressure control
66	Control status	0~3	–	1	LP error (when stopped) counter	
67	Control status	0~4	–	1	LP error (when started) counter	

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
68	Control status	0,1	–	1	LP error (when driving) counter
69	Control status PT	0~2	–	1	0 None 1 Frequency down 2, 3 Under PT control
70	Check operation status	–	–	1	Bit0 Unmatch check Bit1 Indoor side EEV check Bit3 Piping cleaning
71	Control status	0~360	3 minutes	1	CH compressor protection timer
72	Control status CH compressor protective start	0~15	–	1	15 Protective start end 0~14 During protective start
73	Switch etc.	–	–	1	Bit0: External operation (CnS1); 0: Operation prohibition; 1: Operation permission Bit1: Demand (CnS2); 0: None; 1: Under control Bit2: Forced cooling, heating (CnG1); 0: None; 1: Under control Bit3: Silent mode (CnG2); 0: None; 1: Under control Bit4: Back up operation; 0: None; 1: Back up operation Bit5: Hz cancel operation; 0: None; 1: Under control
74	Control status	0~3	–	1	Current cut anomaly counter (INV1)
75	Control status	0~4	–	1	Power transistor overheating anomaly counter (INV1)
76	Control status	0~3	–	1	Rotor lock anomaly counte (INV1)
77	Control status	0~1	–	1	Starting failure counter (INV1)
78	Control status	0~3	–	1	Communications anomaly counter (INV1)
79	Control status	0~3	–	1	Current cut anomaly counter (INV2)
80	Control status	0~4	–	1	Power transistor overheating anomaly counter (INV2)
81	Control status	0~3	–	1	Rotor lock anomaly counte (INV2)
82	Control status	0~1	–	1	Starting failure counter (INV2)
83	Control status	0~3	–	1	Communications anomaly counter (INV2)
84	Control status	0~1	–	1	DC fan motor 1 error counter
85	Control status	0~1	–	1	DC fan motor 2 error counter
86	Control status	0~2	–	1	Thermistor disconnection counter
87	Control status	0~255	–	1	Communications error counter (INV)
88	Registered indoor units 1~8 operation mode	0~4	–	8	0 AUTO 1 DRY 2 COOL 3 FAN 4 HEAT

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
89	Registered indoor units 1~8 required Hz	0~255	1Hz	8	
90	Registered indoor units 1~8 answer Hz	0~255	1Hz	8	
91	Operation priority switching	0~1	–	1	0 Prior press priority 1 After press priority
92	High pressure control of cooling	2.20,2.50	0.01MPa	1	
93	Cooling low pressure compensation	-0.05~0.05	0.01MPa	1	
94	Low pressure control of heating	0.80,0.90	0,01MPa	1	
95	Snow protection fan control	0~1	–	1	0 With 1 None
96	CM1 frequency command	0~130	1Hz	1	
97	CM2 frequency command	0~130	1Hz	1	
98	Target cooling low pressure	0.00~2.00	0.01MPa	1	
99	Control status TC	0~2	–	1	0 None 1 Frequency down 2, 3 Under-dome temperature control
100	Target heating high pressure	1.60~4.15	0.01MPa	2	
101	Heating high pressure compensation	0.00~0.30	0.01MPa	1	
102	Control / status SCR	0~2	–	1	0 None 1 Frequency down 2, 3 Under compression ratio protection control

■ KXR series

All-in-one type

◆ Models FDCA224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR

(1) Operations of major functional items under each operation mode

Functional item \ Operation mode	Cooling		Fan	Heating			Dehumidify
	Thermostat ON	Thermostat OFF		Thermostat ON	Thermostat OFF	Defrost	
Indoor unit fan	Remote controller command	Remote controller command	Remote controller command	Remote controller command	Intermittent operation	○ → ×	○ / ×
Indoor unit electronic expansion valve	Overheating control response	Fully closed	Fully closed	Overheating control response	60 pulse	Model-specific aperture opening angle	Overheating Control Response
Compressor [CM1]	○	×	×	○	×	○	○ / ×
Magnetic contactor CM1 [52C1]	○	○	× / ○	○	○	○	○
Outdoor unit fan [FMo-1]	○ / ×	×	× / ○	○ / ×	×	○ → ×	○ / ×
Outdoor unit fan [FMo-2]	○	×	× / ○	○	×	○ → ×	○ / ×
Inverter cooling fan [FMC1]	○ / ×	○ / ×	×	○ / ×	○ / ×	○ / ×	○ / ×
4 way valve [20S, SL]	Refer to following table.						
Electronic expansion valve for heating [EEVH1, 2]	Refer to following table.						
Electronic expansion valve for sub-cooling [EEVSC]	Refer to following table.						
Solenoid valve [SV6]	○ / ×	×	×	○ / ×	×	○ / ×	○ / ×
Solenoid valve [SV11]	×	×	×	○ / ×	×	×	×
Crankcase heater [CH1]	○ / ×	○ / ×	○ / ×	○ / ×	○ / ×	○ / ×	○ / ×

Notes(1) ○ : ON, × : OFF, ○/× : ON or OFF

- 4-way valve (20S, SL), heating expansion valve (EEVH1, 2) and sub-cooling expansion valve (EEVSC) operating pattern
  The operating pattern for outdoor unit is determined from the run/stop signals and cooling/heating signals from the indoor units and from the indoor unit model capacity.
  Note (1) Switching of the operating pattern is controlled by the capacity of indoor units which have their thermostat ON and the pressure sensors (PSH, PSL).

Operating pattern	Outdoor heat exchanger		4-way valve			Electronic expansion valve		
	Heat exchanger 1	Heat exchanger 2	Used for heat exchanger	20S	20SL	EEVH1	EEVH2	EEVSC
C8	COND	COND	COND 100%	×	×	Fully open	Fully open	PI control
C4	COND	—	COND 50%	×	○	Fully open	Fully closed	PI control
C1	COND	–	COND 0~50%	×	○	60-100	Fully closed	PI control
C2	COND	EVA	COND 0%	×	○	60-100	PI control	PI control
C0	–	–	COND 0%	○	○	Fully closed	Fully closed	Fully closed
E4	EVA	–	EVA 50%	○	○	PI control	Fully closed	Fully closed
E8	EVA	EVA	EVA 100%	○	○	PI control	PI control	Fully closed

Note (1) ○: ON, ×: OFF

(2) 4-way valve switching assurance

When the compressor is switching from the stopped state to the start state, after the compressor start control functions, there is an increase in frequency from 10Hz (synchronous operation).

(a) 0-20Hz Operation

It operates in the range of 0 – 20Hz. However, in this operation, the compressor cannot be operated with the current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. control, unde-dome temp. control or compression ratio protection controls.

(b) 20 – 40Hz (49) Operation

Maximum frequency is determined based on the temperature detected with the outdoor air temperature thermistor (Tho-A).

1) If the temperature is 0 °C or lower, after starting with 49Hz as the maximum frequency, it stops at 49Hz.
2) If the temperature is higher than 0°C, after starting with 40Hz as the maximum frequency, it stops at 40Hz. However, if the starting conditions for current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. controls or compression ratio protection controls are satisfied during this time, this control ends and control according to current safe, high pressure controls, low pressure controls, power transistor temp. controls, discharge temp. controls , under-dome temp. control or compession ratio protection controls commences, and if the compressor's frequency is determined and cancelled, operation returns to normal operation.

(3) Compressor protective start

After 4-way valve switching assurance is completed, the following compressor protection begins.

		Initial Start (Remote controller ON error cancel)	Thermostat ON start	
			Operation Mode Changed While Thermostat Was OFF	Operation Mode Unchanged While Thermostat Was OFF
Compressor ON count: 1st time	Less than 45 minutes after power ON	Compressor protective start B according to crankcase heater's power ON time	Compressor protective start B according to crankcase heater's power ON time	Compressor protective start B according to crankcase heater's power ON time
	45 minutes or more after power ON	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time
Compressor ON count: From 2nd time	Less than 45 minutes after stop	Protective start	Protective start	Protective start
	45 minutes or more after stop	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time	Compressor protective start A according to crankcase heater's power ON time

Note: If the under-dome temperature exceeds 30ºC, compressor protective start A and B end and operation starts.

(a) Compressor protective start

The compressor's speed is controlled as follows, regardless of the target frequency.

1) Operation occurs at 20Hz for a 1 minute 45 second period following a compressor start.
2) Operation occurs in accordance with pressure control after the post-start 1 minute 45 second period.

(b) Compressor protective start sequence "A" according to crankcase heater power ON time

The cumulative power ON time from power ON is calculated, and compressor protective start sequence "A" control occurs at the 1st compressor start after a 45-minute period, and at all subsequent compressor starts that follow a power ON after a compressor stop of 45 minutes or longer.

1) The inverter is set to 20Hz following 4-way valve switching assurance. The target frequency is then established 1 minute after a 1-minute period has elapsed since the frequency reduction to 20Hz was reached.
2) During a 15-minute period following the start, the 20Hz frequency is increased at a rate of 5Hz per minute, and the start of the 15-minute period becomes the inverter's start completion point (10Hz).
3) If the inverter is stopped within a 15-minute period after a compressor start, this control increases the frequency 5Hz per minute for 15 minutes when the compressor starts again.

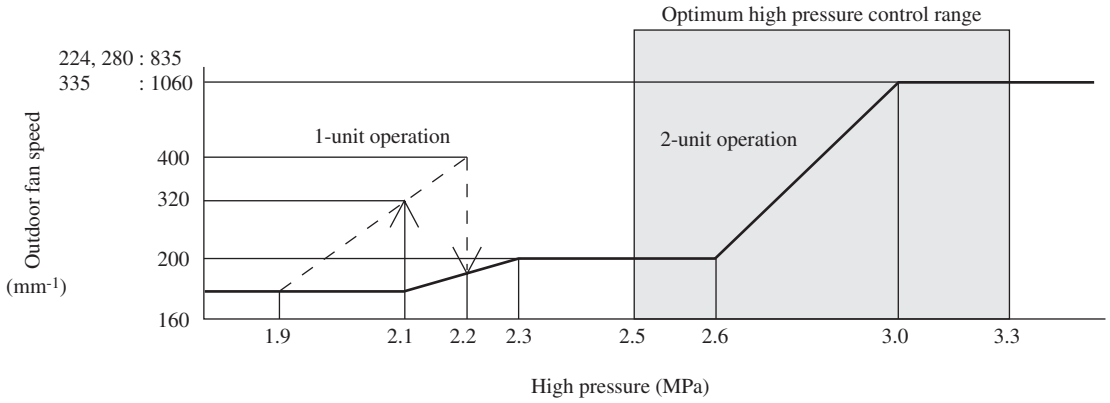
(c) Compressor protective start sequence "B" according to crankcase heater power ON time

The cumulative power ON time from power ON is calculated, and compressor protective start sequence "B" control occurs at the 1st compressor start within a 45-minute period.

1) The inverter is set to 20Hz following 4-way valve switching assurance. The target frequency is then established 1 minute after a 1-minute period has elapsed since the frequency reduction to 20Hz was reached.
2) During a 18-minute period following the start, the 20Hz frequency is increased at a rate of 5Hz per minute, and the start of the 18-minute period becomes the inverter's start completion point (10Hz).
3) The frequency is increased 5Hz per minute through the 18-minute to 24-minute period, and this control ends when 24 minutes is reached.
4) After this control ends 1 time, the system reverts to protective start "A" control from the 2nd time, or after 45 minutes have elapsed.
5) If the inverter is stopped for 24 minutes following a compressor start, a protective start is performed when started again, and protective start sequence "B" control increases the frequency for a period of 24 minutes. However, the system reverts to protective start sequence "A" control when started again if 45 minutes or more have elapsed since the inverter stop.

(4) Cooling high pressure control

• 2-unit operation is switched to 1-unit operation by the outdoor fan speed running at high pressure.



Control termination conditions

1) When a mode other than cooling or dehumidifying is selected.

2) When compressor stops

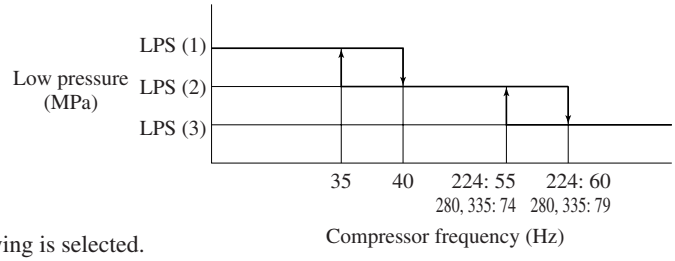
(5) Cooling low pressure control

During cooling and dehumidifying operations, a constant low pressure is maintained by compressor frequency control.

(a) Compressor frequency control occurs as shown below, 1 minute 45 seconds after the completion of a compressor protective start.

Unit: MPa

Model	LPS (1)	LPS (2)	LPS (3)
FDCA224	0.80	0.75	0.70
FDCA280	0.82	0.77	0.73
FDCA335	0.82	0.79	0.76



(b) Control termination conditions

(i) When a mode other than cooling or dehumidifying is selected.

(ii) When the compressor stops.

(iii) When oil return control is on.

(6) Heating high pressure control

During heating operation, a constant high pressure is maintained by compressor frequency control.

(a) Control activation condition

1 minute 45 seconds have elapsed since the completion of a compressor protective start.

(b) Control description

The compressor frequency is controlled to maintain a high pressure of 2.90Mpa.

(c) Control termination conditions

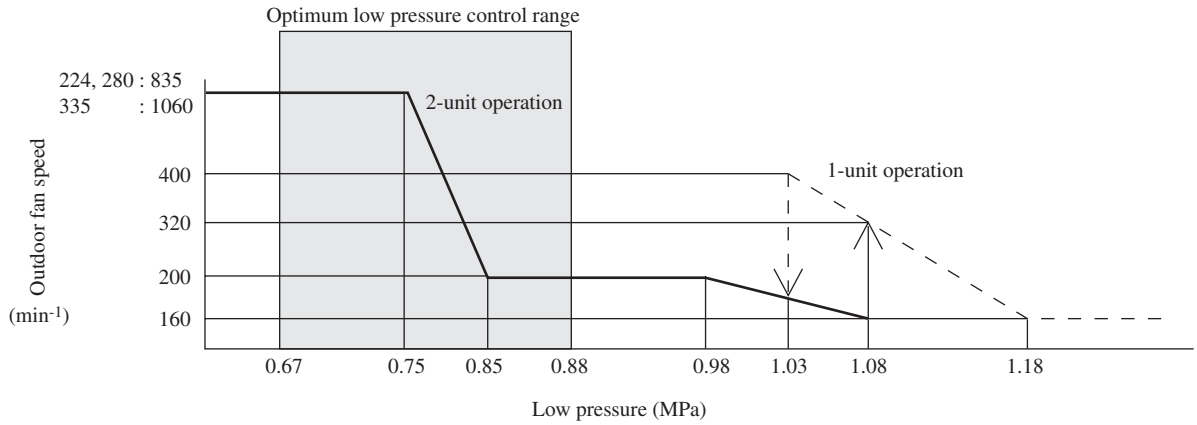
(i) When a mode other than heating is selected.

(ii) When the compressor stops.

(iii) When a dehumidifying operation has started.

(7) Heating low pressure control

• Switches the outdoor unit fan speed through pressure.



Control termination conditions

1) When a mode other than heating is selected.

2) When the compressor stops.

(8) Emergency stop control

When an indoor unit's external input (optional: refrigerant leakage, etc.) indicates a refrigerant leak, that information is transmitted to the outdoor unit, stopping operation. An emergency stop error is then transmitted to all indoor units that are running.

(a) Error stop occurs when the "emergency stop" command is received from the indoor unit.

(b) Error code E63 occurs, and the "emergency stop" command is transmitted to all indoor units.

(c) When a "emergency stop clear" command is received from the indoor unit, the outdoor unit's error status is cleared, and an "emergency stop clear" command is transmitted to all the indoor units.

(9) Compression ratio protection control

The frequency is reduced in accordance with the compressor's compression ratio.

(a) Control activation conditions

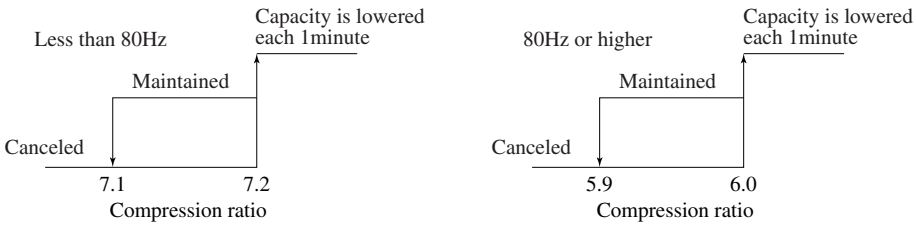
This control is activated when all the following conditions are satisfied.

(i) When 10 minutes or more have elapsed since the compressor start.

(ii) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

Note (1) The above does not apply for a 10-minute period following a defrost, or when pump-down control is in progress.

(b) Control description



(c) Control termination conditions

Control ends when any one of the following conditions is satisfied.

(i) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

(ii) When the compression ratio falls below the cancel value.

(10) Snow protection fan control

(a) This control is enabled/disabled by the selector switch at the 7-segment display.

① Set the Code No. to "75".

② "0" or "1" displays at the data display area.

0: Outdoor fan control disabled (factory setting)

1: Outdoor fan control enabled

③ Press SW7 continuously for 3 seconds.

④ "0" or "1" blinks every 0.5 seconds at the data display area.

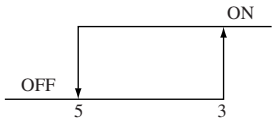
⑤ Press SW8 to toggle between the blinking "0" and "1" displays.

⑥ If SW7 is pressed for 3 seconds or longer while "0" and "1" is blinking, the blinking stops, and that enabled/disabled setting is registered. If enabled, fan control occurs as described below.

⑦ Outdoor fan control occurs in accordance with the information stored in memory, even if the power is turned OFF and back ON again.

(b) Control description

(i) If the outside temperature drops to 3°C or lower when all units are stopped, or during an error stop, the outdoor fan runs at level 4 speed once every 10 minutes.



Outdoor air temperature (°C)

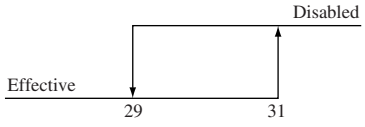
(ii) The outdoor fan runs for 30 seconds.

(iii) During this snow protection control, the compressor's magnetic contactor (52C1) is ON.

(11) Silent mode control

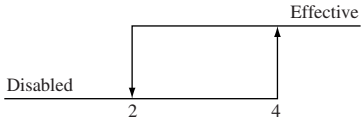
If the silent mode start signal is received from an indoor unit or CnG2 (with short pin) is shorted, if the outdoor temperature is within the following range, operation is performed in the silent mode.

• Cooling



Outdoor air temperature (°C)

• Heating



Outdoor air temperature (°C)

(12) Indoor unit connection number protection

If the number of indoor units on the connection exceeds the number as listed below, the compressor stops with the error stop.

Item \ model	All model
Number of units on connection	20 units

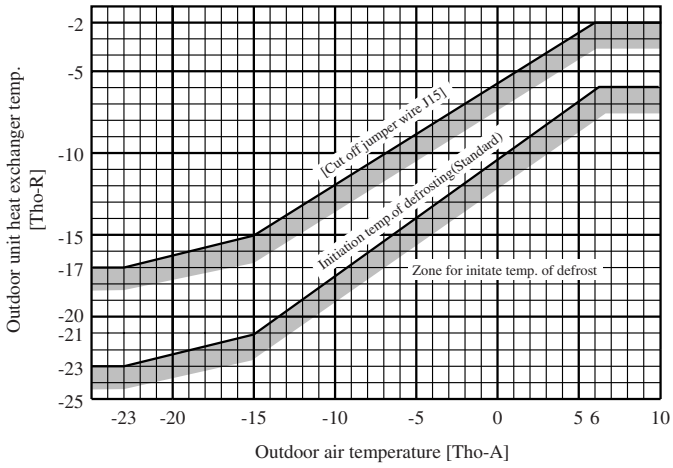
Note (1) They are the numbers of units used for judgement of error for the purpose of control and not equal to the numbers of units which can be connected.

(13) Defrosting

(a) Conditions for starting defrosting

When all the following conditions are met, the defrosting operation will start.

1) When the outdoor unit operating pattern is E8.
2) The cumulative operating time of the compressor comes up to 33 minutes after completion of a defrosting operation, or it comes up to 33 minutes after a heating operation starts (the remote controller is turned on).
3) If 8 minutes have passed after the compressor goes ON after it has gone OFF.
4) If 8 minutes have passed after one outdoor unit fan goes ON after all outdoor fans have gone OFF.
5) After all the above conditions are satisfied, when the temperature at the outdoor heat exchanger thermistor (Tho-R) and outdoor temperature thermistor is below the defrost initiation temperature in the above graph continuously for 3 minutes.



(b) Conditions for finishing defrosting

- Standard (J14: shorted)
  1) When the increase of the temperature of the heat exchanger thermistor (Tho-R1 or Tho-R2) is greater than 9ºC.
  2) When 12 minutes have passed since defrosting started.
- With operation Judgment Function (J14: Open)
  1) If Tho-R1 and R2 are ≧ 9ºC, after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 2 minutes and 30 seconds have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 14ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.
  2) If Tho-R1 or R2 are < 9ºC after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 5 minutes have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 14ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.

(c) Dehumidifying operation interrupted

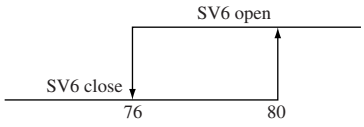
1) Compressor stopped
2) Oil return control conditions established

   In the relationship between oil return and dehumidifying operation, oil return has priority and if the system begins oil return during a dehumidifying operation, the dehumidifying operation is interrupted and the oil return operation is executed.

(14) Oil separator solenoid valve (SV6) control

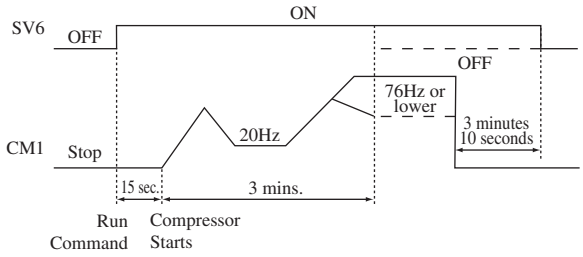
(a) SV6 stays open (ON) for 3 minutes, compressor protective start are completed.

(b) If the compressor operating frequency becomes 80Hz or higher, SV6 opens (goes ON) and it goes off if the frequency is 76Hz or lower.

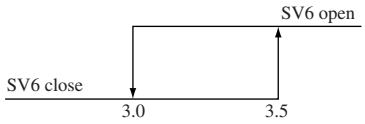


Actual compressor frequency (Hz)

(c) If the inverter compressor goes off after SV6 opens (goes ON), SV6 remains open (ON) for 3 minutes and 10 seconds, then closes (goes OFF).



(d) During a heating operation, when the high pressure becomes 3.5 MPa or higher, SV6 is opened (turned ON) and when the high pressure drops to 3.0 MPa or lower, SV6 is closed (turned OFF).



High pressure (MPa)

(15) Unit protective maintenance related devices

(a) Test operation mode

1) Outdoor unit test operation mode operation is started by the DIP switches SW5-1 and 5-2 on the outdoor unit control PCB.

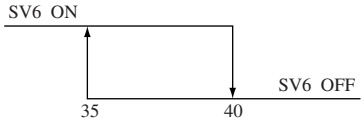
Switch functions

SW5-1	ON	**SW5-2**	OFF	Heating Test Operation
			ON	Cooling Test Operation
	OFF	Normal or Test Operation End		

Notes (1) This operation takes priority over other options such as the center console. It sets the options in the operating state.

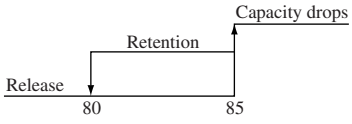
(b) Under-dome temperature control

1) The oil separator solenoid valve (SV6) are controlled in accordance with the temperature at the under-dome thermistor (Tho-C) installed on the compressor.



Under-dome temperature (°C)

2) The compressor's capacity is controlled in accordance with the under-dome temperature (Tho-C).



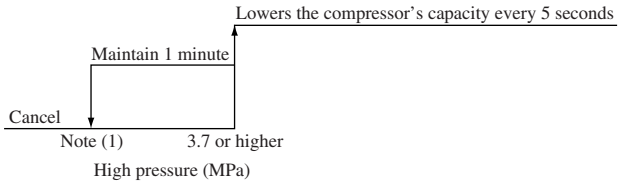
Under-dome temperature (°C)

(c) High pressure protective control

If the high pressure sensor (PSH) detects the high pressure during cooling or heating operation and controls the compressor capacity, outdoor unit fan and oil separator solenoid (SV6) to raise the pressure.

1) Cooling

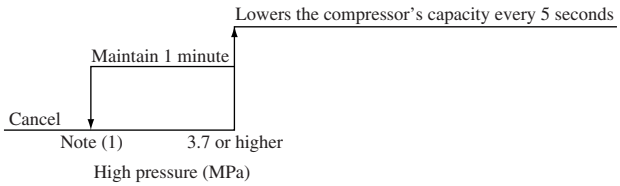
Compressor capacity control through high pressure



Note (1) Continues for 1 minute if the high pressure is less than 3.7 Mpa.

2) Heating

a) Compressor capacity control through high pressure



Note (1) Continues for 1 minute if the high pressure is less than 3.7 Mpa.

b) Compressor capacity control through fan speed control

i) Start conditions

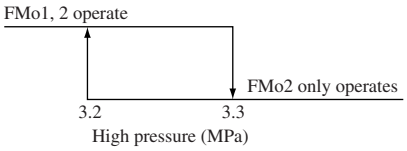
After compressor protection starts (1 minute 45 seconds), when the high pressure becomes 3.0 MPa or higher.

ii) Control content

① The fan speed is controlled within a range of 160 and 835 (1060) min^{-1}. Fan motors FMo1 and 2 are given a common speed.

Note (1) Values in ( ) show for model FDCA335.

② If the high pressure becomes higher than the following value, fan motor FMo1 (right side) stops.



iii) End conditions

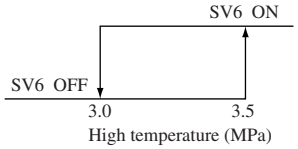
① When the system changes from heating operation to another mode.

② When the compressor stops.

③ When the high pressure drops below 3.0 MPa.

3) Solenoid Valve (SV6) Control

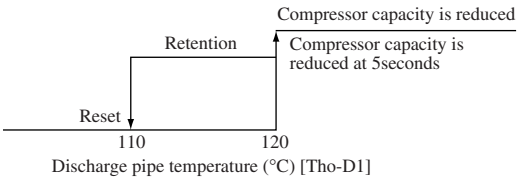
1) The solenoid valve (SV6) goes ON when the high pressure (sensed by PSH) rises to 3.5 MPa or higher during heating operation.



(d) Discharge pipe temperature control

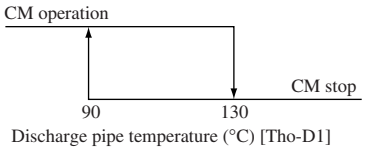
If the temperature of the discharge pipe (sensed by Tho-D1) exceeds the set value, the compressor's capacity is controlled and the rise in the discharge pipe temperature is controlled. If it continues to rise, the compressor stops.

(i) Compressor control



(ii) Discharge pipe temperature error

- When the discharge pipe temperatures (Tho-D1 detection) rise beyond 130°C and is maintained for 2 seconds, the compressors are stopped but it will be reset if the temperatures drop below 90°C.



- If the discharge pipe temperature (Tho-D1 detection) occurs twice within 60 minutes or the condition higher than 130 °C has continued for 60 minutes including the duration of time of compressor stop, the unit operation is stopped with the error stop.

Note (1) Unless the temperature of 90 °C or under is maintained for 45 minutes after the discharge pipe error, the unit cannot be started again. (Reset the power supply to clear.)

(e) Current safe control

(i) The compressor speed is reduced if the inverter inlet's input voltage (converter inlet L3-phase) exceeds the setting value. If the input voltage still remains above the setting value, the speed is reduced again.

(ii) This control ends when the input voltage drops below the setting value for 3 continuous minutes.

(f) Current cut control

Cuts an inverter overcurrent. When the current exceeds the setting value, the inverter is immediately stopped, and is then automatically restarted 3 minutes later. If 4 overcurrent cuts occur within a 15-minute period, 52C1 is switched OFF, and an error stop status is established.

(g) Anomalous high pressure increase protection

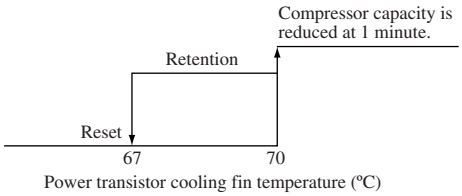
If the high pressure side pressure switch [63H1: 4.15 Open / 3.15 Closed MPa] operates 5 times within 60 minutes or operates for 60 minutes, an abnormal stop is performed.

However, when first operated, the compressor is stopped, then after a 3-minute delay, normal operation is resumed.

(h) Power transistor temperature control

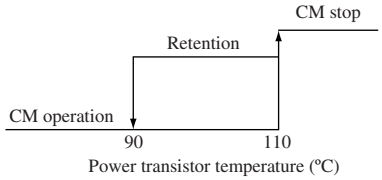
If the temperature of the power transistor cooling fins (sensed by Tho-P) exceeds the set value, the compressor's capacity is controlled to keep the power transistor's temperature from rising. If it rises still higher, the compressor is stopped.

1) Compressor control



2) Power transistor temperature anomaly

- If the temperature sensed by the power transistor temperature thermistor rises to 110ºC or higher, the compressor is stopped.

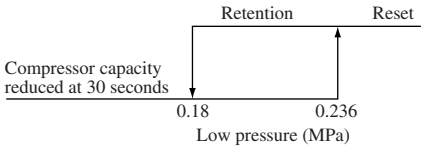


- If the power transistor's temperature is anomalous 5 times within 60 minutes, or if the temperature is 110ºC or higher for 60 minutes continuously, including when the compressor is stopped, an anomalous stop is performed.

(i) Low pressure protective control

If the low pressure (sensed by PSL) drops below the set value, the compressor's capacity is controlled to prevent the low level pressure from dropping. If it drops still further, the compressor is stopped.

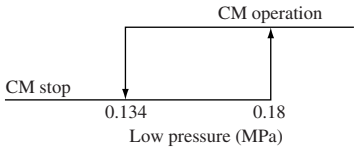
1) Compressor control



Note (1) Starting Conditions
- 1 minutes and 45 seconds have passed since starting.
- Sensed continuously for 10 seconds

2) Low pressure anomaly

- If the low pressure (sensed by PSL) drops to 0.134 MPa or lower continuously for 30 seconds, the compressor is stopped and if a pressure of 0.18 MPa or higher is detected continuously for 10 seconds, the compressor is automatically reset. If this occurs 2 times within 60 minutes, an anomalous stop is performed.



- Compressor operation at a low pressure (sensed by PSL) of 0.18 MPa or lower continuously for 30 seconds while stopped is prohibited. If this state is sensed 5 times in 60 minutes, it results in an anomalous stop. Recovery is possible only by resetting the power supply.
- When operating the unit in cooling mode the first time after turning on the power

  If a low pressure of 0.003 MPa or lower is detected continuously for 60 seconds after 4-way valve switching protection, the compressor is stopped, and if a pressure of 0.18 MPa or higher is detected continuously for 10 seconds the compressor restarts automatically. However, if this state is detected again 2 times within 60 minutes, it results in an emergency stop. Recovery is possible only by resetting the power supply.

(16) Pump down control

Pump down operation can be performed through operation of DIP switches (SW5-1, 2, 3). (Pump down operation cannot be done during indoor unit operation, backup operation or during an anomalous stop.)

(a) Pump down procedure

1) Close the liguid side service valve on the outdoor unit.
2) Turn SW5-2 (test operation operating mode) ON (cooling).
3) Turn SW5-3 (pump down switch) ON.
4) Turn SW5-1 (test operation switch) ON. This will start the pump down operation.

(b) Control

1) The compressor operates in cooling mode with 224: 50Hz (280, 335: 62Hz) as the upper frequency limit.
2) The red and green (LED's) on the outdoor control PCB flashs together continuously and "PoS" is displayed in the 7-segment display.
3) Except for low pressure control, all the protective and anomalous sensing controls are activated.

(c) Ending

If any of the following conditions exists, pump down operation ends.

1) If a low pressure (sensed by PSL) of ≦ 0.01 MPa is detected continuously for 5 seconds.
   a) The displays are as follows.
      · Red LED: Lights up continuously · Green LED: flashing
      · 7-segment LED display: PoE · Remote controller: Stop
2) If operation is stopped by anomalous sensing control.
3) If the cumulative compressor operation time totals 15 minutes.
   a) The displays are as follows.
      · Red LED: Off · Green LED: flashing
      · 7-segment LED display: No display · Remote controller: Stop
4) If any one of DIP switches SW5-1, 2 or 3 is turned OFF during the pump down operation.

(17) External input operation

External input: From CnS1, operation permission/prohibition control; From CnS2: Demand control/normal operation switching.

- J13: Switches between CnS1 and CnS2 input method.

  J13 short circuit: Level input by CnS1 and CnS2.

  J13 open: Pulse input by CnS1 and CnS2.

(a) From CnS1, operation permission/prohibition control

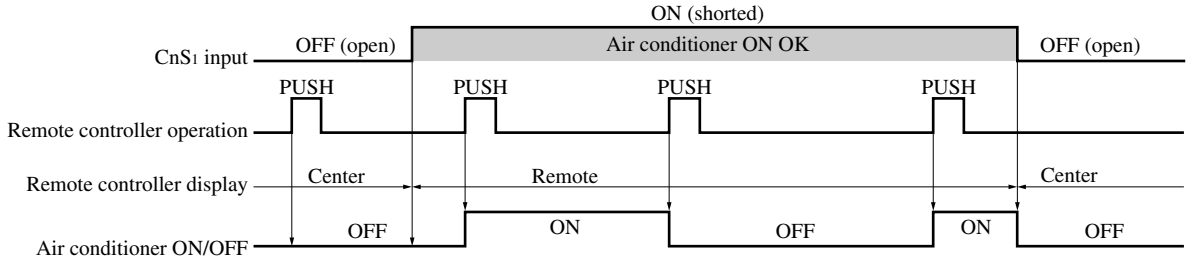
Input : CnS1	CnS1 input method change: J13	CnS1 : Operation permission/ Prohibition mode change
Short circuit / Disconnection	J13; Short circuit Lever input	Operation prohibition mode ⟶ Operation permission mode
	J13; Disconnection Pulse input	Operation permission/Prohibition model change (Reversal)
Short circuit / Disconnection	J13; Short circuit	Operation permission mode ⟶ Operation prohibition mode
	J13; Disconnection	— (NOP)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

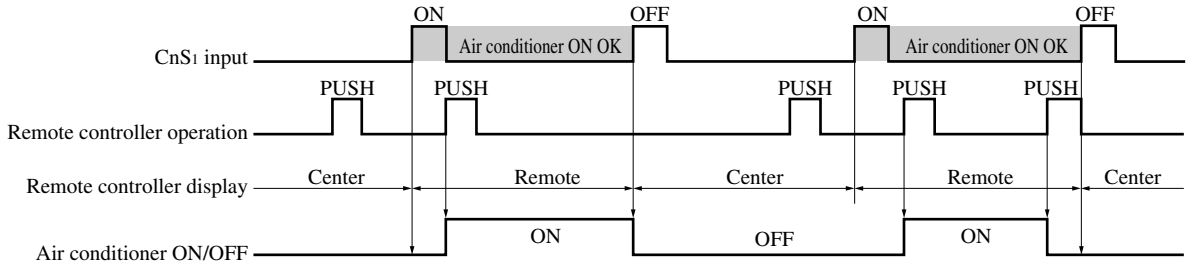
2) CnS1, performs the following operations by the changing of jumper wire J1 from short circuit to open circuit.

   If pulse input, the pulse duration is 500 ms or more.

① Operation with J13 short circuit



② Operation with J13 disconnection



(b) From CnS2, operation permission/prohibition control

Input : CnS2	CnS2 input method Formula switching: J13	CnS2 : Demand control/normal operating switching
Short circuit / Open circuit	J13; Short circuit Level input	Demand control → Normal operation
	J13; Open circuit Pulse input	Normal operation/Demand control switching (Reversal)
Short circuit / Open circuit	J13; Short circuit	Normal operation → Demand control
	J13; Open circuit	— (NOP)

Note (1) The factory settings are: J13 - short circuit; CnS2 - short circuit (short pin connection)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

2) Demand control

It is possible to switch the demand using DIP switch SW4-5, 6.

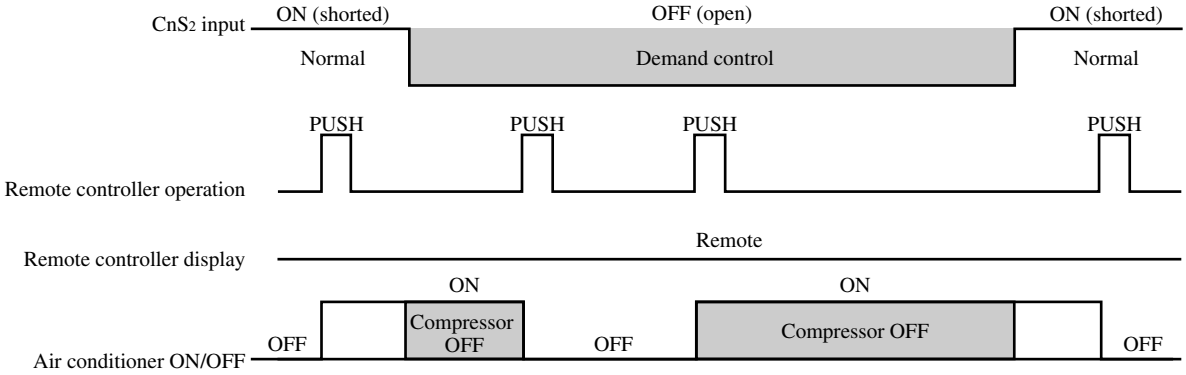
SW45	SW4-6	Compressor operation upper limits			Compressor output (%)
		224	280	335	
0	0	66Hz	79Hz	95Hz	80
1	0	50Hz	62Hz	70Hz	60
0	1	33Hz	40Hz	48Hz	40
1	1	OFF	OFF	OFF	0

Note (1) 0: Open, 1: Shorted

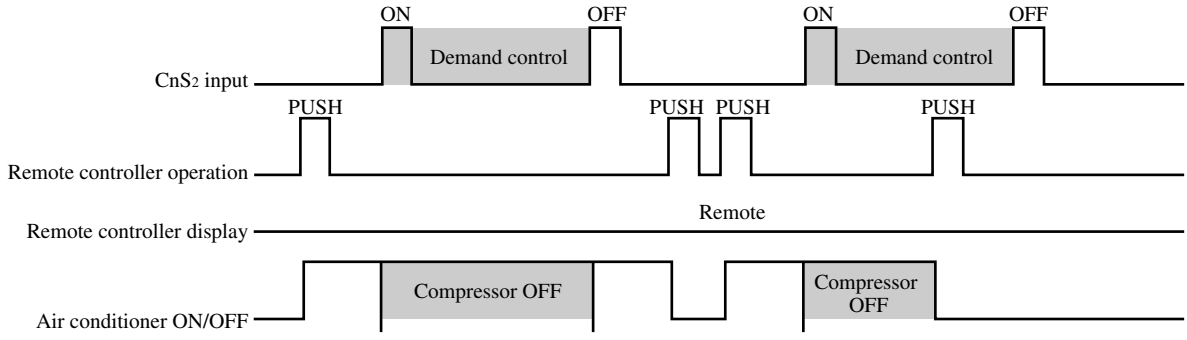
3) CnS2, performs the following operations by the changing of jumper wire J13 from short circuit to open circuit.

If pulse input, the pulse duration is 500 ms or more.

① J13 - Short circuit



② J13 - Open circuit



(18) 7-Segment display

The data in the following table can be displayed using the display select switch (SW8: 1's digit; SW9: 10's digit).

Code No.	Contents of display	Data display range	Minimum units	Remarks
–	Unusual code Pump down Check mode Outdoor unit setup	–	–	E?? PoE, PoS CH? OPE??
00	CM1 operating frequency	0~130	1Hz	
02	Tho-A Outdoor air temp.	L,-20~43	1˚C	[L] is indicated when the temperature is -20˚C or below and the actual temperature is indicated when it is higher than -20˚C and up to 43˚C.
03	Tho-R1 Heat exchanger temp. 1 (Exit. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
04	Tho-R2 Heat exchanger temp. 2 (Exit. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
05	Tho-R3 Heat exchanger temp. 3 (Entrance. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
06	Tho-R4 Heat exchanger temp. 4 (Entrance. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
07	Tho-D1 Discharge pipe temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
10	Tho-C1 Under-dome temp.	L,5~90	1˚C	[L] is indicated when the temperature is 5˚C or below and the actual temperature is indicated when it is higher than 5˚C and up to 80˚C.
12	Tho-P1 Power transistor temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
14	Tho-SC Sub-cooling coil temp.1	L,18~73	1˚C	[L] is indicated when the temperature is 18˚C or below and the actual temperature is indicated when it is higher than 18˚C and up to 73˚C.
15	Tho-H Sub-cooling coil temp.2	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
16	Tho-S Suction pipe temp.	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
17	Cooling operation super cooling	0~50	0.1˚C	
18	Super heat	0~50	0.1˚C	
19	Super heat of sub-cooling coil	0~50	0.1˚C	
20	CT1 Current	0~50	1A	
22	EEVH1 Heating expansion valve opening angle	0~500	1 Pulse	
23	EEVH2 Heating expansion valve opening angle	0~500	1 Pulse	
24	Opening angle of EEVSC overcooling coil expansion valve	0~500	1 Pulse	
26	FM01 Number of rotations	0~999	10 min^{-1}	
27	FM02 Number of rotations	0~999	10 min^{-1}	
28	PSH High pressure sensor	0~5.00	0.01MPa	
29	PSL Low pressure sensor	0~2.00	0.01MPa	
30	FMC1 Cooling fan Crankcase heater	0,1	–	Order of 100 : FMC1 Order of 10 : CH1 Order of 1 : – (0: OFF, 1: ON)
31	63H1-1, (63H1-2) (63H1-R)	0,1	–	Order of 100 : 63H1-1, 2 Order of 10 : 63H1-R (0: Close, 1: Open)
32	SV1 (SV2) (20SL)	0.1	–	Order of 100 : SV1 Order of 10 : SV2 Order of 1 : 20SL (0: Close, 1: Open)

Code No.	Contents of display	Data display range	Minimum units	Remarks
33	SV6 (SV7) SV10	0,1	–	Order of 100 : SV6 Order of 10 : SV7 Order of 1 : SV10 (0: Close, 1: Open)
34	20S SV11 SV12	0,1	–	Order of 100 : 20S Order of 10 : SV11 Order of 1 : SV12 (0: close, 1: open)
35	Compressor stop causes ①	0,1	–	Order of 100 : Defective outdoor temperature thermistor Order of 10 : Defective outdoor unit heat exchanger thermistor 1 Order of 1 : Defective outdoor unit heat exchanger thermistor 2 (0:Normal, 1: Anomaly)
36	Compressor stop causes ②	0,1	–	Order of 100 : Defective outdoor unit heat exchanger thermistor 3 Order of 10 : Defective outdoor unit heat exchanger thermistor 4 Order of 1 : Defective discharge pipe1 thermistor (0:Normal, 1: Anomaly)
37	Compressor stop causes ③	0,1		Order of 100 : – Order of 10 : Defective Sub cooling coil thermistor 1 Order of 1 : Defective Sub cooling coil thermistor 2 (0:Normal, 1: Anomaly)
38	Compressor stop causes ④	0,1	–	Order of 100 : Defective suction pipe thermistor Order of 10 : Defective low pressure sensor Order of 1 : Defective high pressure sensor (0:Normal, 1: Anomaly)
39	Compressor stop causes ⑤	0,1	–	Order of 100 : Anomalous in inverter 1 Order of 10 : – Order of 1 : Anomalous high pressure (0:Normal, 1: Anomaly)
40	Compressor stop causes ⑥	0,1	–	Order of 100 : Anomalous low pressure Order of 10 : Anomalous discharge pipe1 thermistor Order of 1 : – (0:Normal, 1: Anomaly)
41	Compressor stop causes ⑦	0,1	–	Order of 100 : Defect CM starting Order of 10 : – Order of 1 : Rotor lock (0:Normal, 1: Anomaly)
42	Compressor stop causes ⑧	0,1	–	Order of 100 : – Order of 10 : CM1 Current cut Order of 1 : – (0:Normal, 1: Anomaly)
43	Compressor stop causes ⑨	0,1	–	Order of 100 : Power transistor1 overheating Order of 10 : – Order of 1 : Anomalous in DC fun1 (0:Normal, 1: Anomaly)
44	Compressor stop causes ⑩	0,1	–	Order of 100 : Anomalous in DC fun2 Order of 10 : Stop command from indoor Order of 1 : Operation mode charge (0:Normal, 1: Anomaly)
45	Compressor stop causes ⑪	0,1	–	Order of 100 : Dilute protection Order of 10 : Demand control 0% Order of 1 : 0 (0:Normal, 1: Anomaly)
46	Control status	0,1	–	Order of 100 : During equal oil control Order of 10 : During oil return control Order of 1 : During defrost (0:Non-operation, 1: Operation)
47	Control status	0,1	–	Order of 100 : During Td control Order of 10 : During HP control Order of 1 : During CS control (0:Non-operation, 1: Operation)
48	Control status	0,1	–	Order of 100 : During LP control Order of 10 : During PT control Order of 1 : Under cooling low pressure control (0:Non-operation, 1: Operation)
49	Control status	0,1	–	Order of 100 : Cooling high pressure protection control Order of 10 : High pressure power ratio Order of 1 : Under heating low pressure control (0:Non-operation, 1: Operation)
50	Number of connected indoor unit	0~50	1	
51	Number of operation indoor unit	0~50	1	
52	Required Hz total	0~999	1Hz	
53	Target Fk	0~999	1Hz	
54	Compressor cumulative operating time (CM1)	0~655	100h	
56	Discharge pressure saturation temperature	-50~70	0.1˚C	1˚C at –10 or lower
57	Air inlet pressure saturation temperature	-50~70	0.1˚C	1˚C at –10 or lower
58	Target cooling low pressure	0.00~2.00	0.01MPa	
59	Target heating high pressure	1.60~4.15	0.01MPa	
63	Inverter 1 operating frequency command	0~130	1Hz	
66	Control status	0,1	–	Order of 100 : During silent mode Order of 10 : During capacity measurement mode Order of 1 : During test operation (0:Non-operation, 1: Operation)
67	Control status	0,1	–	Order of 100 : Unmatch Order of 10 : Indoor EEV check Order of 1 : – (0:Non-operation, 1: Operation)

Code No.	Contents of display	Data display range	Minimum units	Remarks
68	Control status	0,1	–	Order of 100 : Piping cleaning Order of 10 : Under-dome temperature control Order of 1 : Compession ratio protection control (0:Non-operation, 1: Operation)
69	Outdoor operation pattern	0~9	–	9: C4, 8:C3, 7:C2, 6:C1, 5:C0 4: E1, 3:E2, 2:E3, 1:E4
70	Operation priority switching	0,1	–	0: Prior press priority (when shipped) 1: After press priority
71	High pressure control of cooling	2.2, 2.5	0.01MPa	2.2: Factory setting 2.5: Alternate setting
72	low pressure control of cooling	-0.05~+0.05	0.01MPa	0.00: Factory setting
73	Heating high pressure compensation	0.00~0.30	0.01MPa	0.00: Factory setting
74	Low pressure of heating	0.80, 0.90	–	0.80: Factory setting 0.90: Alternate setting
75	Snow protection fan control	0,1	–	0: Snow protection fan control deactivated 1: Snow protection fan control activated
77	Data reset	---, dEL	–	
78	Figure language sub version	–	–	(Example: 730)
79	Figure language logic version	–	–	(Example: 126)
80	Counter · Thermistor disconnection	0~2	–	
81	Counter · Inverter 1 communications error	0~3	–	
82	Counter · High pressure protection	0,1	–	
83	Counter · Compressor 1 starting failure	0,1	–	
84	Counter · Anomalous low pressure ① (Under stop)	0~4	–	
85	Counter · Anomalous low pressure ② (Immediately after starting)	0,1	–	
86	Counter · Anomalous low pressure ③ (Under operation)	0~3	–	
87	Counter · Motor lock of compressor 1	0~3	–	
88	Counter · Overheating of power transistor 1	0~4	–	
89	Counter · Anomalous temp. of discharge pipe 1	0,1	–	
91	Counter · Current cut (CM1)	0~3	–	
93	Counter · Indoor-outdoor communications error	0~255	–	
94	Counter · Outdoor inverter communications error 2	0~255	–	
95	Counter · CPU reset	0~255	–	
96	Counter · Anomalous FM01	0~255	–	
97	Counter · Anomalous FM02	0~255	–	
98	Program version	–	–	
99	Auto send display	–	–	

(19) Saving of Operation Data

Operating data for a period of 30 minutes prior to the time when trouble occurs are recorded, and these data can be fetched to a personal computer through the RS232C connector on the control board. Data are updated continuously, and when there is an abnormal stop, data updates stop at that point. Pressing DIP switch SW7 for 3 seconds causes the data to be erased. Data can also be sampled at 1 minute intervals during operation and fetched to a personal computer.

• Data is transmitted from a personal computer upon demand.

Data	Data Range	Example
Software version	ASCII 15-byte	KD4C270######## (#: NULL)
PID (program ID)	ASCII 2-byte	D8
Outdoor unit capacity	ASCII 3-byte	280
Power supply frequency	ASCII 2-byte	60
Outdoor address	ASCII 2-byte	00 ~ 3F
Indoor address × 16 units	ASCII 2-byte × 16 units	40 ~ 7F
Indoor capacity × 16 units	ASCII 3-byte × 16 units	022 ~ 280

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
00	Anomaly code	00~99		1	00: No anomalous, outdoor unit all anomalous ???
01	Address of unit where trouble occurred	00~FF	–	1	0~3F: Outdoor unit side, 40~6F: Indoor unit side
02	Operation mode	0~2	–	1	0 Stop 2 Cooling 4 Heating
03	High pressure sensor	0.00~5.00	A/D value	1	
04	Low pressure sensor	0.00~2.00	A/D value	1	
05	Heat exchanger temp. 1 (Exit, Front) (Tho-R1)	-35~75	A/D value	2	Cooling liquid side
06	Heat exchanger temp. 2 (Exit, Rear) (Tho-R2)	-35~75	A/D value	2	Cooling liquid side
07	Heat exchanger temp. 3 (Entrance, Front) (Tho-R3)	-35~75	A/D value	2	Cooling gas side
08	Heat exchanger temp. 4 (Entrance, Rear) (Tho-R4)	-35~75	A/D value	2	Cooling gas side
09	Tho-D1 Discharge pipe temp.	20~140	A/D value	1	
11	Tho-C1 Under-dome temp.	-15~90	A/D value	1	
13	Tho-A Outdoor air temp.	-20~43	A/D value	1	
14	Tho-P1 Power transistor temp. (Heat dissipation fin)	20~140	A/D value	1	
16	Tho-SC Sub cooling coil temp. 1	18~73	A/D value	1	Liquid pipe side
17	Tho-H Sub cooling coil temp. 2	-35~75	A/D value	2	Suction pipe side
18	Tho-S Suction pipe temp.	-35~75	A/D value	2	
19	Cooling operation super cooling	0~50	0.01°C	2	
20	Super heat	0~50	0.01°C	2	
21	Super heat of sub-cooling coil	0~50	0.01°C	2	
22	CT1 Current	0~50	A/D value	1	

Code No.	Write-in contents	Record data					
		Data write-in range	Write-in unit	Number of bytes	Contents		
24	Power source voltage	180~500	A/D value	1			
25	Pressure switch	–	–	1	Bit0	63H1	0: open, 1: close
26	Solenoid valve	–	–	1	Bit0	20S	0:OFF, 1:ON
					Bit1	20SL	0:OFF, 1:ON
					Bit2	SV1,2	0:OFF, 1:ON
					Bit4	SV6	0:OFF, 1:ON
					Bit5	SV7	0:OFF, 1:ON
					Bit6	SV11,12	0:OFF, 1:ON
27	Crankcase heater etc.	–	–	1	Bit0	CH1	0:OFF, 1:ON
					Bit2	FM1,2	0:OFF, 1:ON
28	FM01 Number of rotations	0~65535	10 min^{-1}	2			
29	FM02 Number of rotations	0~65535	10 min^{-1}	2			
30	EEVH1 opening angle	0~65535	1pulse	2			
31	EEVH2 opening angle	0~65535	1pulse	2			
32	EEVSC opening angle	0~65535	1pulse	2			
34	Indoor unit connection number	0~255	1 unit	1			
35	Indoor unit connection capacity	0~65535	–	2			
36	Indoor unit thermostat ON number	0~255	1 unit	1			
37	Indoor unit thermostat ON capacity	0~65535	–	2			
38	Required Hz total	0~65535	1Hz	2			
39	Target FK	0~65535	1Hz	2			
40	Inverter CM1 operation frequency	0~255	1Hz	1			
42	Answer Hz total	0~65535	1Hz	2			
43	Compressor cumulative operating time (estimate)	0~65535	1 h	2			
45	Compressor start times	0~65535	20 times	2			
47	Compressor stop causes			1	Bit0	Defective outdoor temperature thermistor	
					Bit1	Defective outdoor unit heat exchanger 1 thermistor	
					Bit2	Defective outdoor unit heat exchanger 2 thermistor	
					Bit3	Defective outdoor unit heat exchanger 3 thermistor	
					Bit4	Defective outdoor unit heat exchanger 4 thermistor	
					Bit5	Defective discharge pipe thermistor	
					Bit7	Defective sub-cooling coil thermistor 1	
48	Compressor stop causes	–	–	1	Bit0	Defective sub-cooling coil thermistor 2	
					Bit1	Defective suction pipe thermistor	
					Bit2	Defective low pressure sensor	
					Bit3	Defective high pressure sensor	
					Bit4	Inverter 1 anomalous communication	
					Bit6	Anomalous high pressure	
					Bit7	Anomalous Low pressure	
49	Compressor stop causes	–	–	1	Bit0	Td1 Anomalous discharge pipe temp.	
					Bit2	CM starting defect	
					Bit4	Rota lock of CM	
					Bit6	Current cut of CM	

Code No.	Write-in contents	Record data				
		Data write-in range	Write-in unit	Number of bytes	Contents	
50	Compressor stop causes	–	–	1	Bit0	Power transistor 1 overheating
					Bit1	Power transistor 2 overheating
					Bit2	FM01 anomaly
					Bit3	FM02 anomaly
					Bit4	Compressor stop command from indoor unit
					Bit6	Dilution rate protection
					Bit7	Demand control 0%
51	Control status	0~180	1 second	1	CM 3-minute delay timer	
53	Discharge pressure saturation temperature	-50~70	0.01˚C	2		
54	Intake pressure saturation temperature	-50~70	0.01˚C	2		
55	Control status oil return	0,1	–	1	0	None
					1	Under control
56	Control status oil return	0~2	–	1	0	None
					1	Waiting for oil return
					2	Under oil return
57	Control status defrost conditions	0~3	–	1	0	None
					1	Temperature conditions
					2	Strengthening temperature conditions
					3	Time conditions
			–			
58	Control status defrost status	0~4	–	1	0	None
					1	Defrosting status 1
					2	Defrosting status 2
					3	Defrosting status 3
			–		4	Defrosting status 4
59	Control staus Td	0~2	–	1	0	None
					1	Frequency down
					2	Discharge pipe temp.
60	Control status	0, 1	–	1	Td1 error counter	
62	Control status HP	0~2	–	1	0	None
					1	Frequency down
					2	Under high pressure control
63	Control status	0~1	–	1	HP error (63H1) counter	
64	Control status CS	0~2	–	1	0	None
					1	Frequency down
					2	Under CS control
65	Control status LP	0~2	–	1	0	None
					1	Frequency down
					2	Under low pressure control
66	Control status	0~3	–	1	LP error (when stopped) counter	
67	Control status	0~4	–	1	LP error (when started) counter	
68	Control status	0,1	–	1	LP error (when driving) counter	
69	Control status PT	0~2	–	1	0	None
					1	Frequency down
					2	Under PT control
70	Check operation status	–	–	1	Bit0	Unmatch check
					Bit1	Indoor side EEV check
					Bit3	Piping cleaning
71	Control status	0~360	1 minutes	2	CH compressor protection timer	
72	Control status CH compressor protective start	0~15	–	1	15	Protective start end
					0~14	During protective start
73	Switch etc.	–	–	1	Bit0	External operation (CnS1)
						0: Operation prohibition
						1: Operation permission
					Bit1	Demand (CnS2)
						0: None
						1: Under control
					Bit2	Forced cooling, heating (CnG1)
						0: None
						1: Under control
					Bit3	Silent mode (CnG2)
						0: None
						1: Under control
					Bit4	Back up operation
						0: None
						1: Back up operation
					Bit5	Hz cancel operation
						0: None
						1: Under control

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
74	Control status	0~3	–	1	Current cut anomaly counter
75	Control status	0~4	–	1	Power transistor overheating anomaly counter
76	Control status	0~3	–	1	Rotor lock anomaly counte
77	Control status	0~1	–	1	Starting failure counter
78	Control status	0~3	–	1	Communications anomaly counter
79	Control status	0~3	–	1	Current cut anomaly counter
84	Control status	0~1	–	1	DC fan motor 1 error counter
85	Control status	0~1	–	1	DC fan motor 2 error counter
86	Control status	0~2	–	1	Sensor disconnection counter
87	Control status	0~255	–	1	Communications error counter
88	Registered indoor units 1~8 operation mode	0~4	–	8	0 AUTO 1 DRY 2 COOL 3 FAN 4 HEAT
89	Registered indoor units 1~8 required Hz	0~255	1Hz	8	
90	Registered indoor units 1~8 answer Hz	0~255	1Hz	8	
91	Operation priority switching	0~1	–	1	0 Prior press priority 1 After press priority
92	High pressure control of cooling	2.2,2.5	0.01MPa	1	
93	Cooling low pressure compensation	-0.05~+0.05	0.01MPa	1	
94	Low pressure control of heating	0.8,0.9	0,01MPa	1	
95	Snow protection fan control	0~1	1Hz	1	0 With 1 None
96	CM1 frequency command	0~130	1Hz	1	
98	Target cooling low pressure	0.00~2.00	0.01MPa	1	
99	Control status TC	0~2	–	1	0 None 1 Frequency down 2 Under-dome temperature control
100	Target heating high pressure	1.60~4.15	0.01MPa	1	
101	Heating high pressure compensation	0.00~0.30	0.01MPa	1	
102	Control / status SCR	0~2	–	1	0 None 1 Frequency down 2 Under compression ratio protection control
103	Target amount of overheating during heating	0~255	0.1°C	1	The actual range is 5ºC ~ 11ºC.
104	Cumulative amount of oil rise.	0~255	10cc	1	The actual range is 0 cc ~ 1100 cc.
105	Total capacity of thermostat ON indoor units during cooling.	0~65535		2	
106	Total capacity of thermostat ON indoor units during heating.	0~65535		2	
107	Outdoor unit operating pattern	0~255	1	1	The actual range is 0 ~ 17.

(20) Outdoor unit control

If an outdoor unit (a unit with all the heat exchangers integrated, and all the outdoor air and supply air processing units) is connected to multiple indoor units, as a rule, the cooling low pressure target and the heating high pressure target for cooling or heating are specified when the object is ventilation.

During cooling (evaporation temperature): 15ºC

During heating (condensation temperature): 30ºC

(a) Starting conditions

When only the thermostat of the outdoor unit for the operating indoor units is in the ON state.

(b) Control contents

(i) 0.22 MPa is added to the target cooling low pressure during compressor cooling low pressure control.

(ii) The target heating high pressure is set at 1.77 MPa during compressor heating high pressure control.

(c) End conditions

When the outdoor unit changes to operation other than outdoor unit only (thermostat ON) after the outdoor unit begins single operation.

(21) Pump down control during stop (liquid backflow prevention)

(a) Pump down control before starting

(i) Control contents

1) The EEV on indoor units which are in cooling mode is fully closed.
2) When the outdoor unit's operating mode is heating, EEVH1, 2 are fully closed.
3) The EEVSC is fully closed.
4) The outdoor unit's operating pattern is not changed.

(ii) Starting conditions

1) Operation start after a stop.
2) When there is an operation start after an indoor unit switches from cooling to heating.
3) When oil return control starts.
4) When normal control is recovered after oil return control ends.

(iii) End conditions

1) When the compressor stops.
2) When 5 minutes have passed since the compressor went ON.
3) Low pressure sensor ≦ 0.4 MPa (outdoor unit operating mode is cooling)
   Low pressure sensor ≦ 0.3 MPa (outdoor unit operating mode is heating)

(b) Pump down control after stop

(i) Control contents

1) The EEV on indoor units which are in cooling mode is fully closed.
2) When the outdoor unit's operating mode is heating, EEVH1, 2 are fully closed.
3) The EEVSC is fully closed.
4) The operating frequency command applied to the compressor is maintained. (protective control is activated)
5) The speed command applied to the outdoor unit's fan is maintained.
6) The outdoor unit's operating pattern does not change.

(ii) Starting Conditions

When operation stops after operation.

(iii) End conditions

1) When there is a full emergency stop.
2) Low pressure sensor ≦ 0.4 MPa (outdoor unit operating mode is cooling)
   Low pressure sensor ≦ 0.3 MPa (outdoor unit operating mode is heating)

(22) Outdoor unit equal pressure control

In a cooling/heating free multi-system, if an indoor unit is switched from cooling to heating, this control functions through a branch flow controller to switch the high pressure gas line and the low pressure gas line. When the branch flow controller's switching occurs, the pressure differential between the high pressure and low pressure sides is first changed to equal pressure, then switching is accomplished. Pressure equalization is done by switching the 4-way valve with the compressor stopped, so if any indoor unit is switched from cooling to heating, the compressor stops.

(a) Starting conditions

(i) When switching an indoor unit from cooling to heating during compressor operation (except during oil return or defrost control).

(ii) When all the indoor units are fully stopped and the compressor is stopped.

(iii) When the system is starting oil return control and the compressor is stopped.

(b) Control contents

(i) When an indoor unit is switched from cooling to heating, the compressor is stopped for 3 minutes. (auto recovery)

(ii) Outdoor unit cooling operation (outdoor unit heat exchanger high pressure → 4-way valve 20S, 20SL ON.
Outdoor unit heating operation (outdoor heat exchanger low pressure) → 4-way valve 20S, 20SL OFF.

(iii) This control is performed beginning 10 seconds after the compressor stops and continues for 2 minutes 40 seconds.

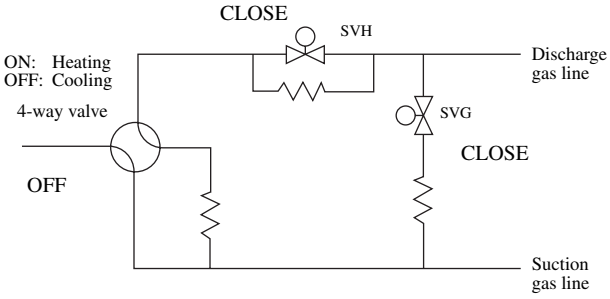
(c) End condition

After being stopped for 2 minutes 40 seconds.

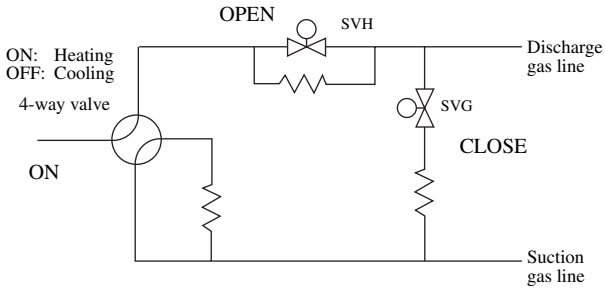
(23) Indoor unit branch flow controller control

If you switch between cooling and heating at an indoor unit in the free multi cooling/heating system, switching between the high pressure gas line and the low pressure gas line is accomplished by the branch flow controller. The branch flow controller performs control using the output from CNT on the indoor unit's control PCB. The CNT output operates with a x2 (heating output) bit and 2 x3 bits, so there are 4 branch flow controller states.

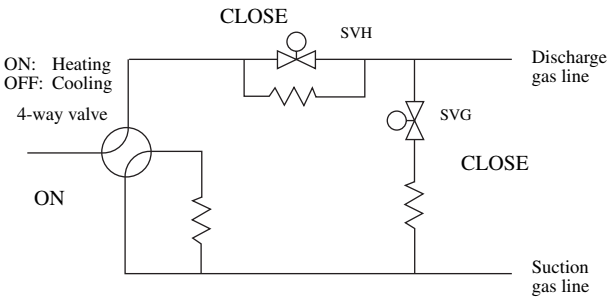
① Cooling state (No power state)



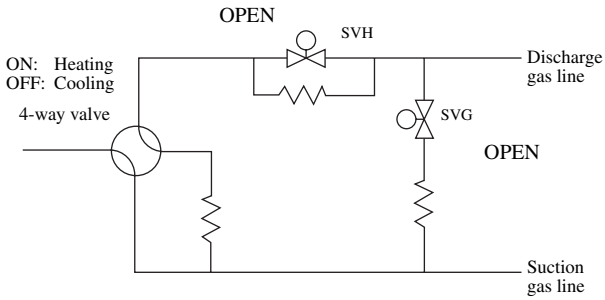
② Heating state



③ Intermediate state (Equal pressure state)



④ Oil return state



(a) Branch flow controller's control when the indoor unit's operating state changes

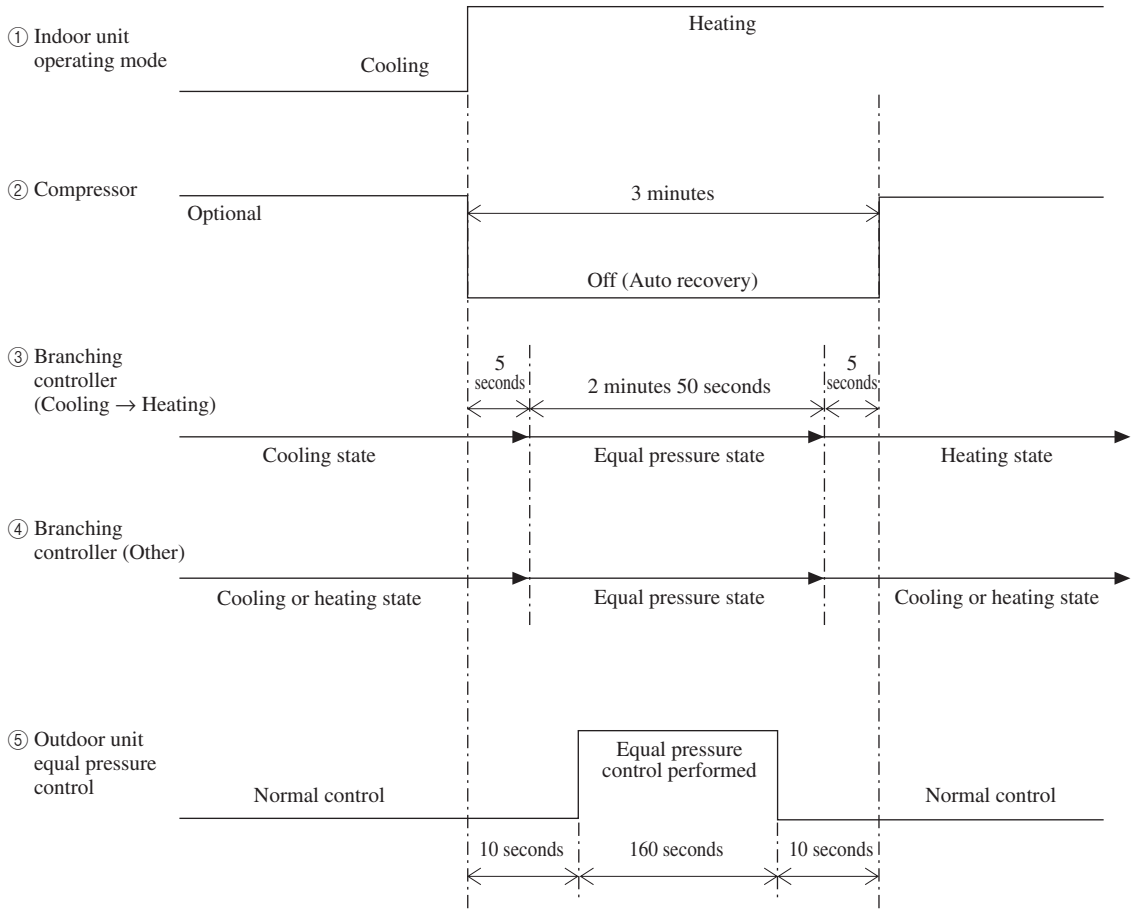
When the state of an indoor unit changes between cooling, heating and oil return, the branch flow controller is changed in the following sequence.

(i) In the case of Cooling → Heating, Cooling → Oil return, Heating → Oil return or Cooling/Heating → Full stop (Compressor stop)

(Recovery from oil return is excluded.)

<Control Content>

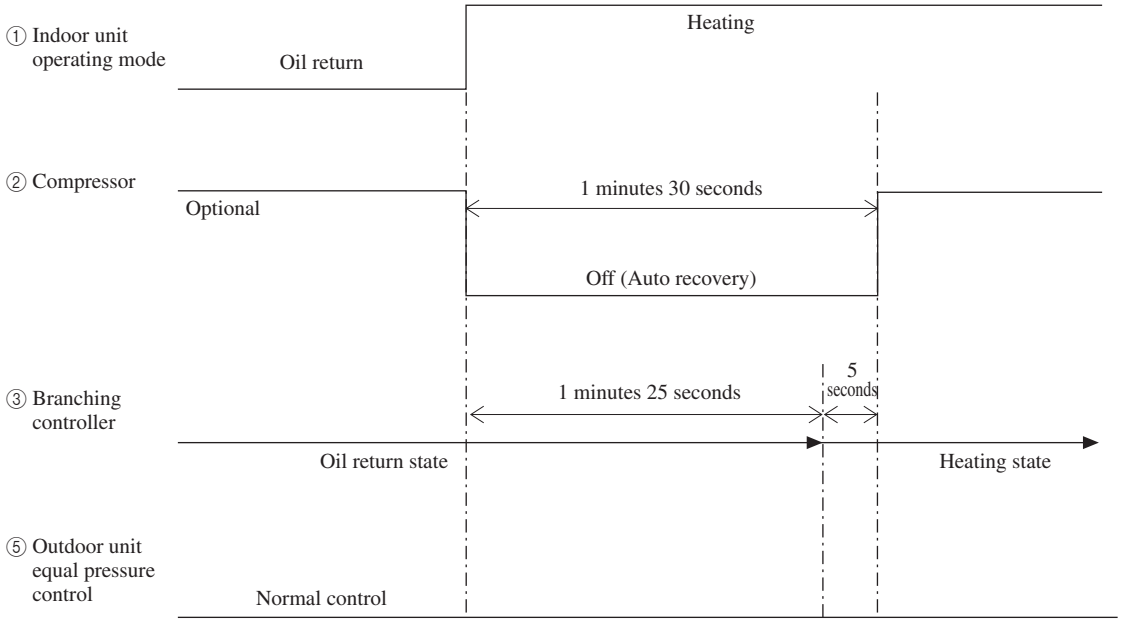
- If the outdoor unit is running and the compressor stops, after 5 seconds, the equal pressure state is maintained for 2 minutes 50 seconds, then the output is in accordance with the operating mode.
- If the compressor stops by the outdoor unit stopping, after 5 seconds, the equal pressure state is maintained for 2 minutes 50 seconds. Then the power off state (cooling state) is output.



(ii) Oil return → Cooling / Heating (Recovery from oil return)

<Control Content>

- Recovery from oil return while the outdoor unit is running causes the compressor to stop causes the output to be in accordance with the operating mode after 1 minute 25 seconds without entering the equal pressure state.



All-in-one type and Combined type

◆ **Models FDCA335HKXRE4BRK, 400HKXRE4BR, 450HKXRE4BR, 504HKXRE4BR, 560HKXRE4BR, 615HKXRE4BR, 680HKXRE4BR, 735HKXRE4BR, 800HKXRE4BR, 850HKXRE4BR, 900HKXRE4BR, 1010HKXRE4BR, 1065HKXRE4BR, 1130HKXRE4BR, 1180HKXRE4BR, 1235HKXRE4BR, 1300HKXRE4BR, 1360HKXRE4BR**

(1) Operations of major functional items under each operation mode

Functional item \ Operation mode	Cooling		Fan	Heating			Dehumidify
	Thermostat ON	Thermostat OFF		Thermostat ON	Thermostat OFF	Defrost	
Indoor unit fan	Remote controller command	Remote controller command	Remote controller command	Remote controller command	Intermittent operation	○→×	○/×
Indoor unit electronic expansion valve	Overheating control response	Fully closed	Fully closed	Overheating control response	60 pulse	Model-specific aperture opening angle	Overheating Control Response
Compressor [CM1]	○	×	×	○	×	○	○/×
Magnetic contactor CM1 [52C1]	○	○	×/○	○	○	○	○
Compressor [CM2]	○/×	×	×	○/×	×	○	○/×
Magnetic contactor CM2 [52C2]	○	○	×	○	○	○	○
Outdoor unit fan [FMo-1]	○/×	×	×/○	○/×	×	○→×	○/×
Outdoor unit fan [FMo-2]	○	×	×/○	○	×	○→×	○/×
Inverter cooling fan [FMC1, 2]	○/×	○/×	×	○/×	○/×	○/×	○/×
4 way valve [20S, SL]	Refer to following table.						
Electronic expansion valve for heating [EEVH1, 2]	Refer to following table.						
Electronic expansion valve for sub-cooling [EEVSC]	Refer to following table.						
Solenoid valve [SV4]	When the operating pattern is C2, ○ (See the table below concerning operating patterns.)						
Solenoid valve [SV6]	○/×	×	×	○/×	×	○/×	○/×
Solenoid valve [SV7]	○/×	×	×	○/×	×	○/×	○/×
Solenoid valve [SV11]	×	×	×	○/×	×	×	×
Crankcase heater [CH1,2]	○/×	○/×	○/×	○/×	○/×	○/×	○/×

Notes(1) ○ : ON, × : OFF, ○/× : ON or OFF, ×/○ : OFF or ON

- 4-way valve (20S, SL), heating expansion valve (EEVH1, 2) and sub-cooling expansion valve (EESC) operating pattern

  The operating pattern for outdoor unit is determined from the run/stop signals and cooling/heating signals from the indoor units and from the indoor unit model capacity.

  Note (1) Switching of the operating pattern is controlled by the capacity of indoor units which have their thermostat ON and the pressure sensors (PSH, PSL).

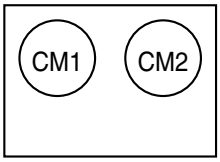
Operating pattern	Outdoor heat exchanger		For heat exchanger use	4-way Valve		Electronic expansion valve		
	Heat exchanger 1	Heat exchanger 2		20S	20SL	EEVH1	EEVH2	EEVSC
C8	COND	COND	COND 100%	×	×	Fully open	Fully open	PI control
C4	COND	–	COND 50%	×	○	Fully open	Fully closed	PI control
C1	COND	EVA	COND 0%	×	○	60-100	PI control	PI control
C2	COND	–	COND 0~50%	×	○	60-100	Fully closed	PI control
C0	–	–	COND 0%	○	○	Fully closed	Fully closed	Fully closed
E4	EVA	–	EVA 50%	○	○	PI control	Fully closed	Fully closed
E8	EVA	EVA	EVA 100%	○	○	PI control	PI control	Fully closed

Note (1) ○ : ON, ×: OFF

(2) Compressor starting order and load classes

The run/stop sequence of the compressors is according to compressor start control between the outdoor units in accordance with their respective standard and mixed specifications.

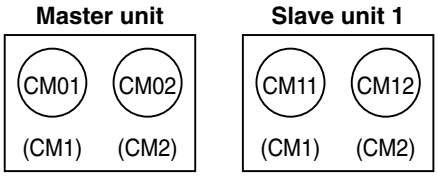
(a) Standard specifications ([FDCA400~680]: 2-compressor specifications)



The operating frequency range of each compressor with respect to the load is as shown below, with the table below showing the case where CM1 is started for the first time. (In the case of starting from CM2, the CM1 frequency for load category 1 is the CM2 frequency.

Load category	0	1	2
CM1	0Hz	20~112Hz	31~120Hz
CM2	0Hz	0Hz	31~120Hz

(b) Combination specifications (FDCA735~1360): Master unit + 1 slave unit



Operating frequency ranges for each compressor corresponding to different loads are as shown below. The following table applies to the case when CM01 starts at first. (When CM11 starts first, the frequency of CM01 for the load category 1 becomes the frequency of CM11.

If the system starts from CM1, the CH1 frequency in load category 1 becomes the CM1 frequency.

Load Category		0	1	2	3
Master unit	**CM01**	0Hz	20~112Hz	31~112Hz	31~120Hz
	CM02	0Hz	0Hz	0Hz	31~120Hz
Slave unit	**CM11**	0Hz	0Hz	31~112Hz	31~120Hz
	CM12	0Hz	0Hz	0Hz	31~120Hz

(3) Compressor start control between outdoor units (Master unit/slave unit)

(a) Determining the starting order for the master unit and slave units

Determine the starting order for the outdoor units of master unit and slave units, which is decided by the order in which the power switches are turned on.

1) Starting order of master unit (N=0) … First
2) Starting order of slave unit 1 (N=1) …… Second

(b) Determining starting order for compressors within master unit and slave unit groups.

Determine the starting order for compressors 1 and 2 within the master unit and slave unit groups as follows.

1) Starting order of compressor 1 (M=0) … First
2) Starting order of compressor 2 (M=1) … Second

(c) Compressor starting order and start control for combination specifications I

When all outdoor units change from the full stop state to the cooling/dehumidifying operation (including when all indoor units start from the cooling thermostat OFF state)

1) Start control
   a) Starting is controlled by determining the start order and the stop order for compressors in the load categories.
   b) When only one outdoor unit is used, the starting order for compressor 1 and compressor 2 is switched on each occasion when the outdoor unit stops.
   c) Each time the master unit and each slave unit stop independently of each other, the starting order for compressor 1 and compressor 2 is switched.
   d) Each time an outdoor unit stops within the master unit and slave unit groups, the starting order for compressors within the master unit and slave unit groups is switched.

   Starting order of outdoor units Master unit→Slave unit

Model	Starting order of outdoor units	Starting order of compressors
FDCA400~680	—	CM 1 → CM 2 → CM 1
FDCA735~1360	Master unit → Slave unit → Master unit	CM 1 → CM 2 → CM 1

(d) Compressor starting order and start control for combination specifications II

The following control is activated when all the outdoor units are operated.

1) After the compressor which is first in the starting order starts, all outdoor units are started temporarily in accordance with the operation order N.
2) 4-way valves (20S) are subject to the control prior to the start of the compressor.
3) 4-way valve switching protection
   a) Regarding the outdoor unit which is second in the starting order, the 4-way valve (20S) is turned ON in compliance with 4-way valve switching protection control in order to perform 4-way valve switching protection control. (During the 4-way valve switching protection operation, the outdoor blower is operated under normal control.)
   b) After 4-way valve switching protection operation, the compressors are stopped in accordance with the target operation frequency. (4-way valve is in the ON condition.)
4) Unless all 4-way valves on the outdoor units which are in second place in the starting order can be turned ON, the Compressor ON command is transmitted continually until they are turned ON.

(4) Snow protection fan control (Master unit/slave unit)

Set this for the master unit as well as slave units.

(a) This control is enabled/disabled by the selector switch at the 7-segment display.

① Set the Code No. to "75".

② "0" or "1" displays at the data display area.

0: Outdoor fan control disabled (factory setting)

1: Outdoor fan control enabled

③ Press SW7 continuously for 3 seconds.

④ "0" or "1" blinks every 0.5 seconds at the data display area.

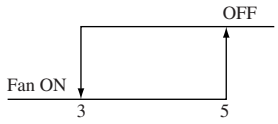
⑤ Press SW8 to toggle between the blinking "0" and "1" displays.

⑥ If SW7 is pressed for 3 seconds or longer while "0" and "1" is blinking, the blinking stops, and that enabled/disabled setting is registered. If enabled, fan control occurs as described below.

⑦ Outdoor fan control occurs in accordance with the information stored in memory, even if the power is turned OFF and back ON again.

(b) Control description

(i) If the outside temperature drops to 3°C or lower when all units are stopped, or during an error stop, the outdoor fan runs at level 4 speed once every 10 minutes.



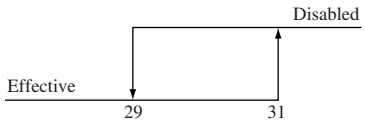
(ii) The outdoor fan runs for 30 seconds.

(iii) During this snow protection control, the compressor's magnetic contactor (52C1) is ON.

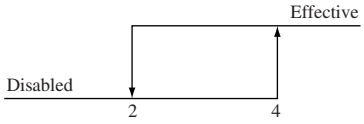
(5) Silent mode control (Master unit/slave unit)

(a) If the silent mode start signal is received from an indoor unit or CnG2 (with short pin) is shorted, if the outdoor temperature is within the following range, operation is performed in the silent mode.

• Cooling



• Heating



(b) Outdoor fan maximum speed & maximum compressor operation frequency (excluding the 30-second period after a start, and defrost operations)

1) The maixmum outdoor fan speed is 335 ~ 450: 500min^{-1}, 504 ~ 6801: 660min^{-1}.

Note (1) In the case of a combination unit, the slave unit is made independent and runs with the above speed.

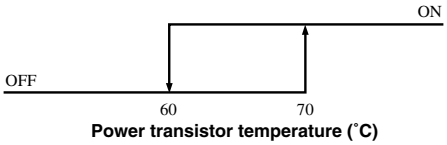
2) Maximum compressor operation frequency Max. Operation Frequency (Hz)

Model	(Hz)	Model	(Hz)	Model	(Hz)
FDCA400	46 × 4	**FDCA735**	42 × 4	**FDCA1065**	64 × 4
FDCA450	52 × 4	**FDCA800**	46 × 4	**FDCA1130**	70 × 4
FDCA504	60 × 2	**FDCA850**	50 × 4	**FDCA1180**	74 × 4
FDCA560	70 × 2	**FDCA900**	52 × 4	**FDCA1235**	78 × 4
FDCA615	78 × 2	**FDCA960**	56 × 4	**FDCA1300**	78 × 4
FDCA680	84 × 2	**FDCA1010**	60 × 4	**FDCA1360**	78 × 4

(6) Inverter cooling fan control (Master unit/slave unit)

This control applies to the master unit and slave units independently.

(a) After the inverter starts, the cooling fans (FCM1, 2) are turned ON or OFF depending on the temperatures detected by the power transistor thermistor (Tho-P1, 2).



(b) When the compressor changes from the ON to the OFF state, if the cooling fan is turned ON, the fan continues in the ON state for 3 minutes 10 seconds.

(7) Compression ratio protection control (Master unit/slave unit)

The frequency is reduced in accordance with the compressor's compression ratio.

(a) Control activation conditions

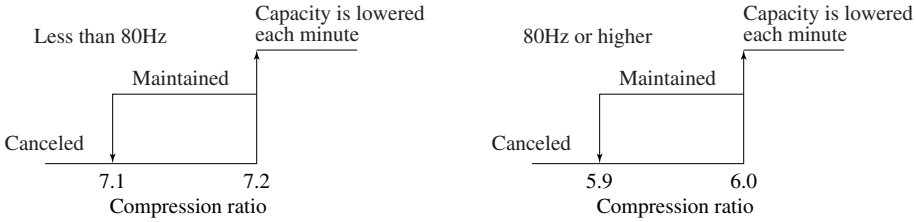
This control is activated when all the following conditions are satisfied.

(i) When 10 minutes or more have elapsed since the compressor start.

(ii) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

Note (1) The above does not apply for a 10-minute period following a defrost, or when pump-down control is in progress.

(b) Control description



(c) Control termination conditions

Control ends when any one of the following conditions is satisfied.

(i) When the low pressure is 0.18MPa or higher, and the high pressure is 3.52MPa or lower.

(ii) When the compression ratio falls below the cancel value.

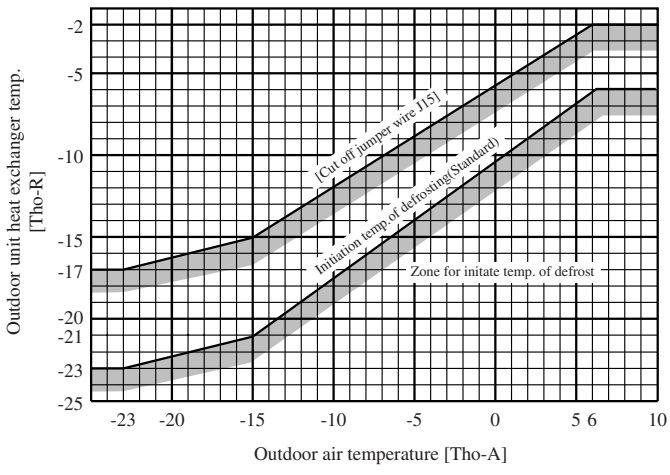
(8) Defrosting (Master unit/slave unit)

If the conditions for starting defrosting of the outdoor heat exchanger of any of the outdoor units are established during compressor operation, defrost operation starts.

(a) Conditions for starting defrosting

When all the following conditions are met, the defrosting operation will start.

1) When the outdoor unit operating pattern is E8.
2) The cumulative operating time of the compressor comes up to 33 minutes after completion of a defrosting operation, or it comes up to 33 minutes after a heating operation starts (the remote controller is turned on).
3) If 8 minutes have passed after the compressor goes ON after it has gone OFF.
4) If 8 minutes have passed after one outdoor unit fan goes ON after all outdoor fans have gone OFF.
5) After all the above conditions are satisfied, when the temperature at the outdoor heat exchanger thermistor (Tho-R) and outdoor temperature thermistor is below the defrost initiation temperature in the above graph continuously for 3 minutes.



(b) Conditions for finishing defrosting

- Standard (J14: shorted)
  1) When the increase of the temperature of the heat exchanger thermistor (Tho-R1 or Tho-R2) is greater than 9ºC.
  2) When 12 minutes have passed since defrosting started.
- With operation Judgment Function (J14: Open)
  1) If Tho-R1 and R2 are ≧ 9ºC, after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 2 minutes and 30 seconds have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 14ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.
  2) If Tho-R1 or R2 are < 9ºC after 2 minutes and 30 seconds have passed since defrosting started, if either of the following conditions is satisfied, the defrosting end operation starts.
     a) 5 minutes have passed since the temperature sensed by either Tho-R1 or Tho-R2 is 14ºC or higher.
     b) The temperature sensed by either Tho-R1 or Tho-R2 is 30ºC or higher.
     c) 14 minutes have passed since the start of defrosting.

(c) Dehumidifying Operation Interrupted

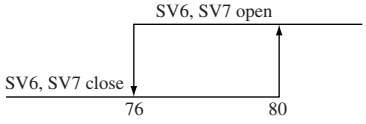
1) Compressor stopped
2) Oil return control conditions established

   In the relationship between oil return and dehumidifying operation, oil return has priority and if the system begins oil return during a dehumidifying operation, the dehumidifying operation is interrupted and the oil return operation is executed.

(9) Oil separator solenoid valve (SV6, 7) control (Master unit/slave unit)

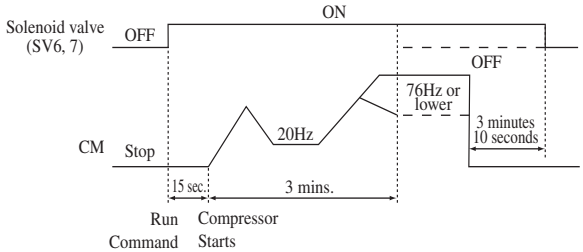
(a) 3 minutes after the compressor starts, the solenoids (SV6, 7) open (go ON).

(b) If the compressor operating frequency becomes 80Hz or higher, SV6, 7 opens (goes ON) and it goes off if the frequency is 76Hz or lower.

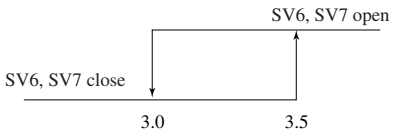


Actual compressor frequency (Hz)

(c) If the inverter compressor goes off after SV6, 7 opens (goes ON), SV6, 7 remains open (ON) for 3 minutes and 10 seconds, then closes (goes OFF).



(d) During heating operations, The SV6 and SV7 valves switch ON when the high pressure is 3.5MPa or higher, and switch OFF when the high pressure is 3.0MPa or lower.



High pressure (MPa)

(10) Emergency stop control

When an indoor unit's external input (optional: refrigerant leakage, etc.) indicates a refrigerant leak, that information is transmitted to the outdoor unit, stopping operation. An emergency stop error is then transmitted to all indoor units that are running.

(a) Error stop occurs when the "emergency stop" command is received from the indoor unit.

(b) Error code E63 occurs, and the "emergency stop" command is transmitted to all indoor units.

(c) When a "emergency stop clear" command is received from the indoor unit, the outdoor unit's error status is cleared, and an "emergency stop clear" command is transmitted to all the indoor units.

(11) Automatic backup operation

When one or more compressors fail, operation occurs using only the normal compressors.

(a) Automatic backup operation is only enabled when SW3-2 is ON (alternate setting) at the master unit.

(b) The following error status are disabled and not detected at failed compressors.

① L3-phase "open phase" error (E32)
② Discharge pipe temperature error (E36)
③ Heat exchanger thermistor disconnection (E37)
④ Outdoor temperature thermistor disconnection (E38)
⑤ Discharge pipe temperature thermistor (E39)
⑥ High pressure error (E40)
⑦ Power transistor overheating (E41)
⑧ Current cut (E42)
⑨ Inverter PCB communication error (E45)
⑩ DC fan error (E48)
⑪ Power transistor overheating (continuous) (E51)
⑫ Suction pipe thermistor disconnection (E53)
⑬ Under-dome temperature sensor disconnected (E55)
⑭ Power transistor temperature sensor disconnected (E56)
⑮ Compressor start error (E59)
⑯ Compressor rotor lock error (E60)

(c) If any of the item (b) errors shown above occur while a compressor is running, that compressor is stopped, but other compressors continue running as usual.

(d) After recovering from the error, with start conditions satisfied, the compressors (CM1, 2) which are capable of running at the minimum frequency are started.

(e) When a failure-recovered compressor is started, the other compressors revert back to their usual control.

(12) Unit protective maintenance related devices (Master unit only)

(a) Test operation mode

1) This control is performed from the master unit. It cannot be controlled from the slave unit side. If control from the slave unit side is attempted, the following codes are indicated on the 7-segment display.

Code indicator	Data indicator	Description of disabled control
OPE	10	Setting from a slave unit is invalid.

Note (1) Normal display can be restored if the test operation control switch is reset.

2) Outdoor unit test operation mode operation is started by the DIP switches SW5-1 and 5-2 on the outdoor unit PCB.

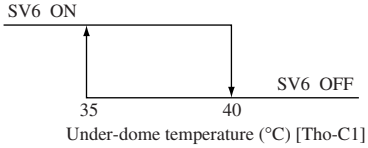
Switch functions

SW5-1	ON	**SW5-2**	OFF	Heating Test Operation
			ON	Cooling Test Operation
	OFF	Normal or Test Operation End		

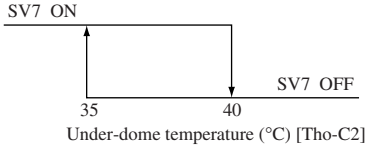
Notes (1) This operation takes priority over other options such as the center console. It sets the options in the operating state.

(b) Under-dome temperature control

1) The oil separator solenoid valve (SV6, 7) are controlled in accordance with the temperature at the under-dome thermistor (Tho-C) installed on the compressor.

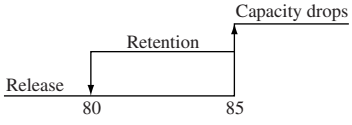


Under-dome temperature (°C) [Tho-C1]



Under-dome temperature (°C) [Tho-C2]

2) The compressor's capacity is controlled in accordance with the under-dome temperature (Tho-C1, 2).



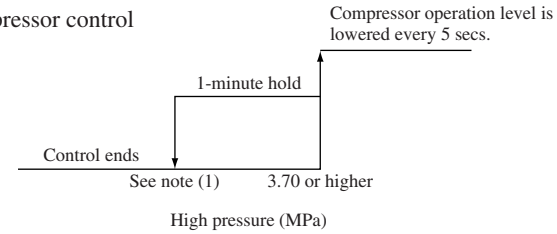
Under-dome temperature (°C)

(c) High pressure protective control (Master unit/slave unit)

During cooling and heating operations, high pressure is detected by the high pressure sensor (PSH), and the compressor and outdoor fan are controlled to prevent the pressure from rising.

1) Cooling

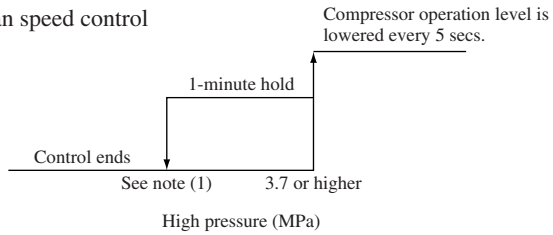
High pressure based compressor control



Note (1) High pressure of less than 3.70MPa continues for 1 minute

2) Heating

a) High pressure based fan speed control



Note (1) High pressure of less than 3.7MPa continues for 1 minute

b) High pressure based fan speed control

i) Control activation conditions

When a high pressure of 3.0MPa or higher occurs 1 minute 45 seconds after a compressor protective start completion.

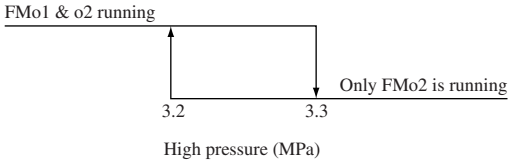
ii) Control description

① The fan speed is kept within a 160~960 (1080) min-1 range.

Both fan motors (FMo1 & 2) run at the same speed.

Note (1) Values shown in parentheses apply to the FDCA450 model.

② The FMo1 fan motor (right side) stops if the high pressure exceeds the value shown below.



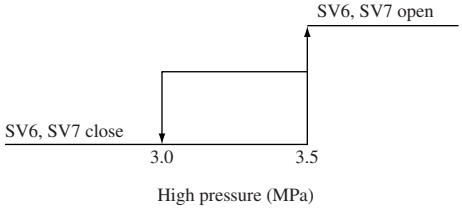
iii) Control termination conditions

① When a mode other than heating is selected.

② When the compressor stops.

③ When the high pressure becomes less than 3.0MPa.

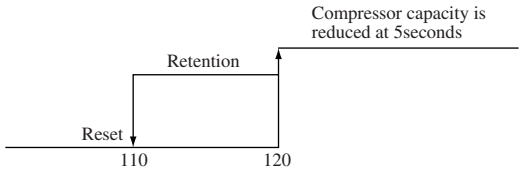
3) Solenoid valves SV6 & SV7 open (ON) when the high pressure reaches 3.5MPa or higher.



(d) Discharge pipe temperature control

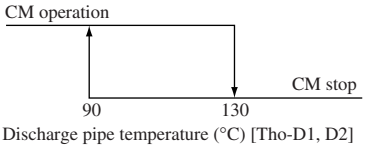
If the temperature of the discharge pipe (Tho-D1, D2) exceeds the set value, the compressor's capacity is controlled and the rise in the discharge pipe temperature is controlled. If it continues to rise, the compressor stops.(The master unit and slave units perform this operation independently.)

(i) Compressor control



(ii) Discharge pipe temperature error

- When the discharge pipe temperatures (Tho-D1, D2 detection) rise beyond 130°C and is maintained for 2 seconds, the compressors are stopped but it will be reset if the temperatures drop below 90°C.



- Compressors are counted individually if a discharge pipe temperature (Tho-D1, D2 detection) error occurs 2 times within 60 minutes.
- Control description

  When the master unit auto-backup operation is invalid (SW3-2 ON), it stops with an anomalous stop. When the master unit auto-backup operation is valid (SW3-2 OFF, the factory setting), it does not stop with an anomalous stop and the compressor remains stopped.

  Note (1) Unless the temperature of 90 °C or under is maintained for 60 minutes after the discharge pipe error, the unit cannot be started again. (Reset the power supply to clear.)

(e) Current safe control (Master unit/slave unit)

(i) The compressor speed is reduced if the inverter inlet's input voltage (converter inlet L3-phase) exceeds the setting value while the compressor is running at a speed of 20Hz or higher. If the setting value is still exceeded after the speed reduction, the speed is reduced again.

(ii) This control ends when the input voltage drops below the setting value for a continuous period of 3 minutes, and the speed protection cancel operation begins.

(iii) This is performed by the master unit and slave units independently.

(f) Anomalous high pressure increase protection (Master unit/slave unit)

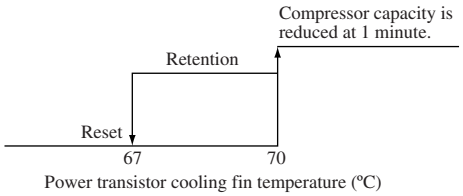
If the high pressure side pressure switch [63H1-1, 63H1-2: 4.15 Open / 3.15 Closed MPa] operates 5 times within 60 minutes or operates for 60 minutes, an anomalous stop is performed.

However, when first operated, the compressor is stopped, then after a 3-minute delay, normal operation is resumed.

(g) Power transistor temperature control (Master unit/slave unit)

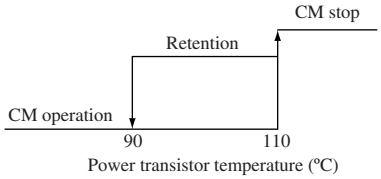
If the temperature of the power transistor cooling fins (sensed by Tho-P) exceeds the set value, the compressor's capacity is controlled to keep the power transistor's temperature from rising. If it rises still higher, the compressor is stopped.

1) Compressor control



2) Power transistor temperature anomaly

- If the temperature sensed by the power transistor temperature thermistor rises to 110ºC or higher, the compressor (CM1, 2) is stopped.

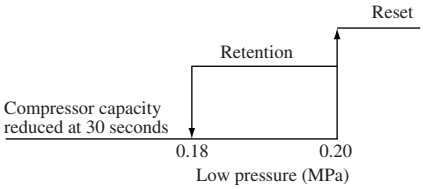


- If the power transistor's temperature is abnormal 5 times within 60 minutes (E41), or if the temperature is 110ºC or higher for 15 minutes continuously (E51), including when the compressor is stopped, an anomalous stop is performed.

(h) Low pressure protective control (Master unit/slave unit)

If the low pressure (sensed by PSL) drops below the set value, the compressor's capacity is controlled to prevent the low level pressure from dropping. If it drops still further, the compressor is stopped.

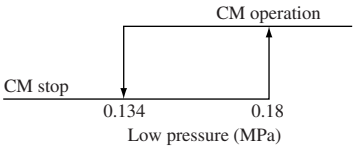
1) Compressor control



Note (1) Starting Conditions
- 10 minutes has passed since starting.
- Compressor operating frequency: Exceeds 20 Hz.
- Sensed continuously for 10 seconds

2) Low pressure anomaly

- If the low pressure (sensed by PSL) drops to 0.134 MPa or lower continuously for 30 seconds, the compressor is stopped and if a pressure of 0.18 MPa or higher is detected continuously for 10 seconds, the compressor is automatically reset. If this occurs 5 times within 60 minutes, an anomalous stop is performed.



- Compressor operation at a low pressure (sensed by PSL) of 0.18 MPa or lower continuously for 30 seconds while stopped is prohibited. If this state is sensed 5 times in 60 minutes, it results in an anomalous stop. Recovery is possible only by resetting the power supply.
- When operating the unit in cooling mode the first time after turning on the power

  If a low pressure of 0.003 MPa or lower is detected continuously for 60 seconds after 4-way valve switching protection, the compressor is stopped, and if a pressure of 0.18 MPa or higher is detected continuously for 10 seconds the compressor restarts automatically. However, if this state is detected again 2 times within 60 minutes, it results in an emergency stop. Recovery is possible only by resetting the power supply.

(13) Pump down control

(a) This control is performed from the master unit side. It cannot be controlled from the slave unit side. If control from the slave unit side is attempted, the following codes are displayed on the 7-segment display of the slave unit.

Code indicator	Data indicator	Description of disabled control
OPE	10	Setting from a slave unit is invalid.

Note (1) The display returns to normal if the pump-down control switch is reset.

(b) Pump down operation can be performed through operation of DIP switches (SW5-1, 2, 3). (Pump down operation cannot be done during indoor unit operation, backup operation or during an anomalous stop.)

(i) Pump down procedure

1) Close the liguid side service valve on the outdoor unit.
2) Turn SW5-2 (test operation operating mode) ON (cooling).
3) Turn SW5-3 (pump down switch) ON.
4) Turn SW5-1 (test operation switch) ON.

(ii) Control

1) The red and green (LED's) on the outdoor control PCB flashs together continuously and "PoS" is displayed in the 7-segment display.
2) Except for low pressure control, all the protective and anomalous sensing controls are activated.
3) Test operation commands are sent to the indoor units.

(iii) Ending

If any of the following conditions exists, pump down operation ends.

1) If a low pressure (sensed by PSL) of ≦ 0.01 MPa is detected continuously for 5 seconds.
   a) The displays are as follows.
      · Red LED: Lights up continuously · Green LED: flashing · 7-segment LED display: PoE · Remote controller: Stop
2) If operation is stopped by anomalous sensing control.
3) If the cumulative compressor operation time totals 15 minutes.
   a) The displays are as follows.
      · Red LED: stays OFF · Green LED: flashing · 7-segment LED display: No display · Remote controller: Stop
4) If any one of DIP switches SW5-1, 2 or 3 is turned OFF during the pump down operation.

(14) External input operation (Master unit/slave unit)

External input: From CnS_1, operation permission/prohibition control; From CnS_2: Demand control/normal operation switching.

- J13: Switches between CnS_1 and CnS_2 input method.

  J13 short circuit: Level input by CnS_1 and CnS_2.

  J13 open: Pulse input by CnS_1 and CnS_2.

(a) From CnS_1, operation permission/prohibition control

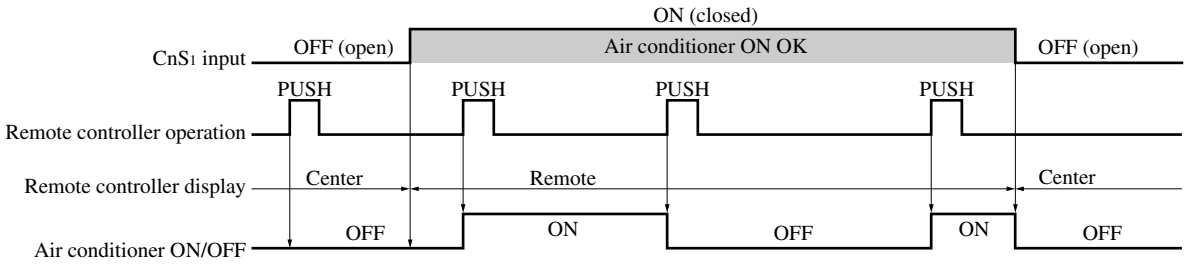
Input : CnS_1	CnS_1 input method change: J13	CnS_1 : Operation permission/ Prohibition mode change
Closed circuit → Disconnection	J13; Closed circuit Lever input	Operation prohibition mode → Operation permission mode
	J13; Disconnection Pulse input	Operation permission/Prohibition model change (Reversal)
Closed circuit → Disconnection	J13; Closed circuit	Operation permission mode → Operation prohibition mode
	J13; Disconnection (open)	— (NOP)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

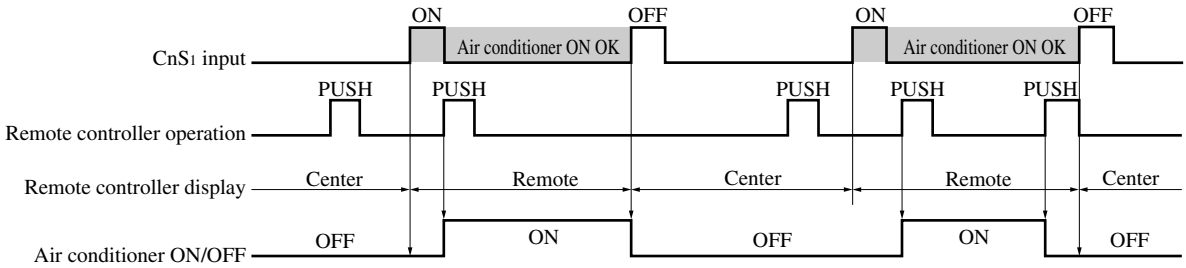
2) CnS1, performs the following operations by the changing of jumper wire J1 from closed circuit to open circuit.

If pulse input, the pulse duration is 500 ms or more.

① Opreation with J13 closed circuit



② Opreation with J13 disconnection (open)



(b) From CnS2, operation permission/prohibition control

Input : CnS2	CnS2 input method Formula switching: J13	CnS2 : Demand control/normal operating switching
Closed circuit / Open circuit	J13; Closed circuit Level input	Demand control → Normal operation
	J13; Open circuit Pulse input	Normal operation/Demand control switching (Reversal)
Closed circuit / Open circuit	J13; Closed circuit	Normal operation → Demand control
	J13; Open circuit	— (NOP)

Note (1) The factory settings are: J13 - closed circuit; CnS2 - closed circuit (closed pin connection)

1) The remote controller displays the operating mode. “To Option” sends the operating mode.

2) Demand control

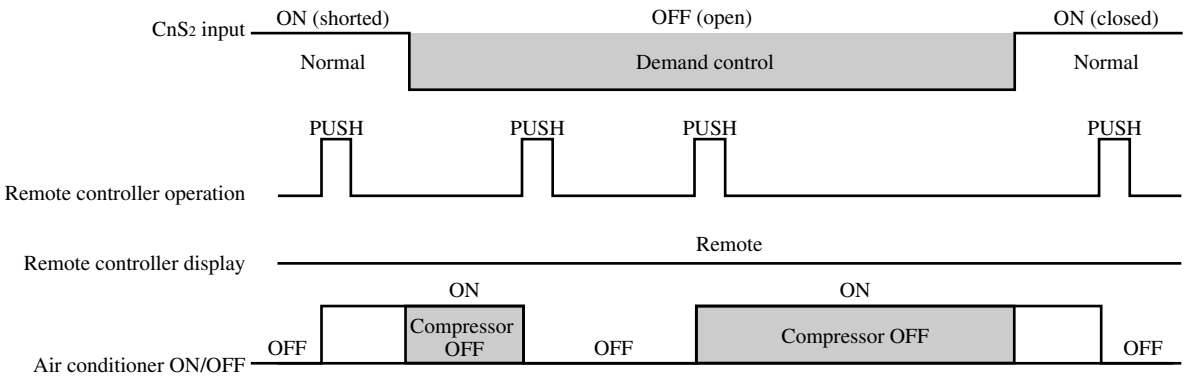
It is possible to switch the demand using DIP switch SW4-5, 6.

SW45	SW4-6	Compressor output (%)
0	0	80
1	0	60
0	1	40
1	1	0

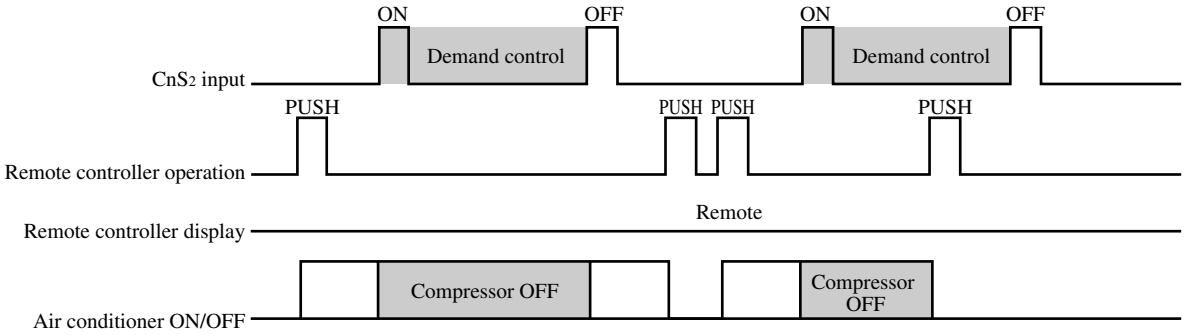
Note (1) 0: Open, 1: Closed

3) CnS2, performs the following operations by the changing of jumper wire J13 from short circuit to open circuit.
If pulse input, the pulse duration is 500 ms or more.

① J13 - Closed circuit



② J13 - Open circuit



(15) 7-Segment display (Master unit/slave unit)

The data in the following table can be displayed using the display select switch (SW8: 1's digit; SW9: 10's digit).

Code No.	Contents of display	Data display range	Minimum units	Remarks
–	Unusual cade Pump down Check mode Outdoor unit setup	–	–	E?? PoE, PoS CH? OPE??
00	CM1 operating frequency	0~130	1Hz	
01	CM2 operating frequency	0~130	1Hz	
02	Tho-A Outdoor air temp.	L,-20~43	1˚C	[L] is indicated when the temperature is -20˚C or below and the actual temperature is indicated when it is higher than -20˚C and up to 43˚C.
03	Tho-R1 Heat exchanger temp. 1 (Exit. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
04	Tho-R2 Heat exchanger temp. 2 (Exit. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
05	Tho-R3 Heat exchanger temp. 3 (Entrance. Front)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
06	Tho-R4 Heat exchanger temp. 4 (Entrance. Rear)	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
07	Tho-D1 Discharge pipe temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
08	Tho-D2 Discharge pipe temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
10	Tho-C1 Under-dome temp.	L,5~90	1˚C	[L] is indicated when the temperature is 5˚C or below and the actual temperature is indicated when it is higher than 5˚C and up to 80˚C.
11	Tho-C2 Under-dome temp.	L,5~90	1˚C	[L] is indicated when the temperature is 5˚C or below and the actual temperature is indicated when it is higher than 5˚C and up to 80˚C.
12	Tho-P1 Power transistor temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
13	Tho-P2 Power transistor temp.	L,31~136	1˚C	[L] is indicated when the temperature is 31˚C or below and the actual temperature is indicated when it is higher than 31˚C and up to 136˚C.
14	Tho-SC Sub-cooling coil temp.1	L,18~73	1˚C	[L] is indicated when the temperature is 18˚C or below and the actual temperature is indicated when it is higher than 18˚C and up to 73˚C.
15	Tho-SC Sub-cooling coil temp.2	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
16	Tho-S Suction pipe temp.	L,-25~73	1˚C	[L] is indicated when the temperature is -25˚C or below and the actual temperature is indicated when it is higher than -25˚C and up to 73˚C.
17	Cooling operation super cooling	0~50	0.1˚C	
18	Super heat	0~50	0.1˚C	
19	Super heat of sub-cooling coil	0~50	0.1˚C	
20	CT1 Current	0~70	1A	
21	CT2 Current	0~70	1A	
22	EEVH1 Heating expansion valve opening angle	0~500	1 Pulse	
23	EEVH2 Heating expansion valve opening angle	0~500	1 Pulse	
24	Opening angle of EEVSC overcooling coil expansion valve	0~500	1 Pulse	
26	FM01 Number of rotations	0~999	10 min^{-1}	

Code No.	Contents of display	Data display range	Minimum units	Remarks
27	FM02 Number of rotations	0~999	10 min^{-1}	
28	PSH High pressure sensor	0~5.00	0.01MPa	
29	PSL Low pressure sensor	0~2.00	0.01MPa	
30	FMC1, 2 Cooling fan Crankcase heater	0,1	–	Order of 100 : FMC1, 2 Order of 10 : CH1 Order of 1 : – (0: OFF, 1: ON)
31	63H1-1 63H1-2 (63H1-R)	0,1	–	Order of 100 : 63H1-1, 2 Order of 10 : 63H1-R (0: Close, 1: Open)
32	SV1 SV2 20SL	0,1	–	Order of 100 : SV1 Order of 10 : SV2 Order of 1 : 20SL (0: Close, 1: Open)
33	SV6 SV7	0,1	–	Order of 100 : SV6 Order of 10 : SV7 Order of 1 : – (0: Close, 1: Open)
34	20S SV11	0,1	–	Order of 100 : 20S, Order of 10 : SV11 Order of 1 : – (0: close, 1: open)
35	Compressor stop causes ①	0,1	–	Order of 100 : Defective outdoor temperature thermistor Order of 10 : Defective outdoor unit heat exchanger thermistor 1 Order of 1 : Defective outdoor unit heat exchanger thermistor 2 (0:Normal, 1: Anomaly)
36	Compressor stop causes ②	0,1	–	Order of 100 : Defective outdoor unit heat exchanger thermistor 3 Order of 10 : Defective outdoor unit heat exchanger thermistor 4 Order of 1 : Defective discharge pipe thermistor 1 (0:Normal, 1: Anomaly)
37	Compressor stop causes ③	0,1		Order of 100 : Defectived discharge pipe thermistor 2 Order of 10 : Defective Sub cooling coil thermistor 1 Order of 1 : Defective Sub cooling coil thermistor 2 (0:Normal, 1: Anomaly)
38	Compressor stop causes ④	0,1	–	Order of 100 : Defective suction pipe thermistor Order of 10 : Defective low pressure sensor Order of 1 : Defective high pressure sensor (0:Normal, 1: Anomaly)
39	Compressor stop causes ⑤	0,1	–	Order of 100 : Anomaly in inverter 1 Order of 10 : Anomaly in inverter 2 Order of 1 : Anomalous high pressure (0:Normal, 1: Anomaly)
40	Compressor stop causes ⑥	0,1	–	Order of 100 : Anomalous low pressure Order of 10 : Anomalous discharge pipe thermistor 1 Order of 1 : Anomalous discharge pipe thermistor 2 (0:Normal, 1: Anomaly)
41	Compressor stop causes ⑦	0,1	–	Order of 100 : Defect CM1 starting Order of 10 : Defect CM2 starting Order of 1 : Rotor lock CM1 (0:Normal, 1: Anomaly)
42	Compressor stop causes ⑧	0,1	–	Order of 100 : Rotor lock CM2 Order of 10 : CM1 Current cut Order of 1 : CM2 Current cut (0:Normal, 1: Anomaly)
43	Compressor stop causes ⑨	0,1	–	Order of 100 : Power transistor 1 overheating Order of 10 : Power transistor 2 overheating Order of 1 : Anomaly in DC fun1 (0:Normal, 1: Anomaly)
44	Compressor stop causes ⑩	0,1	–	Order of 100 : Anomaly in DC fun2 Order of 10 : Stop command from indoor Order of 1 : Operation mode charge (0:Normal, 1: Anomaly)
45	Compressor stop causes ⑪	0,1	–	Order of 100 : Dilute protection Order of 10 : Demand control 0% Order of 1 : 0 (0:Normal, 1: Anomaly)
46	Control status	0,1	–	Order of 100 : During equal oil control Order of 10 : During oil return control Order of 1 : During defrost (0:Non-operation, 1: Operation)
47	Control status	0,1	–	Order of 100 : During Td control Order of 10 : During HP control Order of 1 : During CS control (0:Non-operation, 1: Operation)
48	Control status	0,1	–	Order of 100 : During LP control Order of 10 : During PT control Order of 1 : Under cooling low pressure control (0:Non-operation, 1: Operation)
49	Control status	0,1	–	Order of 100 : Cooling high pressure protection control Order of 10 : Heating high pressure protection control Order of 1 : Heating low pressure protection control (0:Non-operation, 1: Operation)
50	Number of connected indoor unit	0~50	1	
51	Number of operation indoor unit	0~50	1	
52	Required Hz total	0~999	1Hz	
53	Target Fk	0~999	1Hz	
54	Compressor cumulative operating time (CM1)	0~655	100h	

Code No.	Contents of display	Data display range	Minimum units	Remarks
55	Compressor cumulative operating time (CM2)	0~655	100h	
56	Discharge pressure saturation temperature	-50~70	0.1˚C	1˚C at –10 or lower
57	Air inlet pressure saturation temperature	-50~30	0.1˚C	1˚C at –10 or lower
58	Target cooling low pressure	0.00~2.00	0.01MPa	
59	Target heating high pressure	1.60~4.15	0.01MPa	
60	Counter · Compressor 2 starting failure	0, 1	–	
61	Counter · Motor lock compressor 2	0~3	–	
62	Power transistor 2 overheating	0~4	–	
63	Inverter 1 operating frequency command	0~130	1Hz	
64	Inverter 2 operating frequency command	0~130	1Hz	
65	Counter · Inverter 2 communications error	0~3	–	
66	Control status	0,1	–	Order of 100 : During silent mode Order of 1 : During test operation (0:Non-operation, 1: Operation)
67	Control status	0,1	–	Order of 100 : Unmatch Order of 10 : Indoor EEV check Order of 1 : – (0:Non-operation, 1: Operation)
68	Control status	0,1	–	Order of 100 : Piping cleaning Order of 10 : Under-dome temperature control Order of 1 : Compession ratio protection control (0:Non-operation, 1: Operation)
69	Outdoor operation pattern	0~17	–	
70	Operation priority switching	0,1	–	0: Prior press priority (when shipped) 1: After press priority
71	High pressure control of cooling	2.2, 2.5	0.01MPa	2.2: Factory setting 2.5: Alternate setting
72	Low pressure control of cooling	-0.05~+0.05	0.01MPa	0.00: Factory setting
73	Heating high pressure compensation	0.00~0.30	0.01MPa	0.00: Factory setting
74	Low pressure of heating	0.80, 0.90	–	0.8: Factory setting 0.9: Alternate setting
75	Snow protection fan control	0,1	–	0: Snow protection fan control deactivated 1: Snow protection fan control activated
77	Data reset	---, dEL	–	
78	Graphic language sub-version	–	–	Example (730)
79	Graphic language logic version	–	–	Example (126)
80	Counter · Thermistor disconnection	0~2	–	
81	Counter · Inverter 1 communications error	0~3	–	
82	Counter · High pressure protection	0, 1	–	
83	Counter · Compressor 1 starting failure	0,1	–	

Code No.	Contents of display	Data display range	Minimum units	Remarks
84	Counter · Anomalous low pressure ① (Under stop)	0~4	–	
85	Counter · Anomalous low pressure ② (Immediately after starting)	0,1	–	
86	Counter · Anomalous low pressure ③ (Under operation)	0~3	–	
87	Counter · Motor lock of compressor 1	0~3	–	
88	Counter · Overheating of power transistor 1	0~4	–	
89	Counter · Anomalous temp. of discharge pipe 1	0,1	–	
90	Counter · Anomalous temp. of discharge pipe 2	0,1	–	
91	Counter · Current cut (CM1)	0~3	–	
92	Counter · Current cut (CM2)	0,1	–	
93	Counter · Indoor-outdoor communications error	0~255	–	
94	Counter · Outdoor inverter communications error 2	0~255	–	
95	Counter · CPU reset	0~255	–	
96	Counter · Anomalous FM01	0~255	–	
97	Counter · Anomalous FM02	0~255	–	
98	Program version	–	–	Example (2.11)
99	Auto send display	–	–	

Notes (1) Display of error numbers when an error occurs is done by turning DIP switch 3-1 ON and returning to operation.
(2) Code No. 77 can be reset. (Depending on the code No., data are displayed. Press SW7 for 3 seconds.)

(16) Saving of Operation Data (Master unit/slave unit)

Operating data for a period of 30 minutes prior to the time when trouble occurs are recorded, and these data can be fetched to a personal computer through the RS232C connector on the control board. Data are updated continuously, and when there is an anomalous stop, data updates stop at that point. Pressing DIP switch SW7 for 5 seconds causes the data to be erased. Data can also be sampled at 1 minute intervals during operation and fetched to a personal computer.

• Data is transmitted from a personal computer upon demand.

Data	Data Range	Example
Software version	ASCII 15-byte	KD3C218######## (#: NULL)
PID (program ID)	ASCII 2-byte	5D
Outdoor unit capacity	ASCII 3-byte	As shown in table at right
Power supply frequency	ASCII 2-byte	60
Outdoor address	ASCII 2-byte	00 ~ 3F
Indoor address × 16 units	ASCII 2-byte × 16 units	40 ~ 7F
Indoor capacity × 16 units	ASCII 3-byte × 16 units	022 ~ 280

Outdoor capacity data	Remarks
Master unit of combination Ex: 32PS or S32	S: Horsepower of combined master units
Combined slave units Ex: 12PS or C12	C: Horsepower of combined slave units
In the case of the fixed type Ex: 24PS or C24	S: Horsepower of combined master units

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
00	Anomaly code	00~99	–	1	00: No anomalous, outdoor unit all anomalous ???
01	Address of unit where trouble occurred	00~FF	–	1	0~3F: Outdoor unit side, 40~6F: Indoor unit side
02	Operation mode	0~2	–	1	0 Stop 1 Cooling 2 Heating
03	High pressure sensor	0.00~5.00	A/D value	1	
04	Low pressure sensor	0.00~2.00	A/D value	1	
05	Heat exchanger temp. 1 (Exit, Front)	-35~75	A/D value	2	Cooling liquid side
06	Heat exchanger temp. 2 (Exit, Rear)	-35~75	A/D value	2	Cooling liquid side
07	Heat exchanger temp. 3 (Entrance, Front)	-35~75	A/D value	2	Cooling gas side
08	Heat exchanger temp. 4 (Entrance, Rear)	-35~75	A/D value	2	Cooling gas side
09	Tho-D1 Discharge pipe temp.	20~140	A/D value	1	
10	Tho-D2 Discharge pipe temp.	20~140	A/D value	1	
11	Tho-C1 Under-dome temp.	-15~90	A/D value	1	
12	Tho-C2 Under-dome temp.	-15~90	A/D value	1	
13	Tho-A Outdoor air temp.	-20~43	A/D value	1	
14	Tho-P1 Power transistor temp. (Heat dissipation fin)	20~140	A/D value	1	
15	Tho-P2 Power transistor temp. (Heat dissipation fin)	20~140	A/D value	1	
16	Tho-SC Sub cooling coil temp. 1	18~73	A/D value	1	Liquid pipe side
17	Tho-H Sub cooling coil temp. 2	-35~75	A/D value	2	Suction pipe side
18	Tho-S Suction pipe temp.	-35~75	A/D value	2	
19	Cooling operation super cooling	0~50	0.01°C	2	
20	Super heat	0~50	0.01°C	2	
21	Super heat of sub-cooling coil	0~50	0.01°C	2	

Code No.	Write-in contents	Record data					
		Data write-in range	Write-in unit	Number of bytes	Contents		
22	CT1 Current	0~50	A/D value	1			
23	CT2 Current	0~50	A/D value	1			
24	Power source voltage	180~500	A/D value	1			
25	Pressure switch	–	–	1	Bit0	63H1	0: open, 1: close
					Bit1	63H1-R	0: open, 1: close
					Bit2	63L	0: open, 1: close
26	Solenoid valve	–	–	1	Bit0	20S	0:OFF, 1:ON
					Bit1	20SL	0:OFF, 1:ON
					Bit2	SV1	0:OFF, 1:ON
					Bit3	SV2	0:OFF, 1:ON
					Bit4	SV6	0:OFF, 1:ON
					Bit5	SV7	0:OFF, 1:ON
					Bit6	SV11	0:OFF, 1:ON
					Bit7	SV12	0:OFF, 1:close
27	Crankcase heater etc.	–	–	1	Bit0	CH1	0:OFF, 1:ON
					Bit1	CH2	0:OFF, 1:ON
					Bit2	FM1,2	0:OFF, 1:ON
					Bit3	FM3	0:OFF, 1:ON
					Bit4	SV3	0:OFF, 1:ON
					Bit5	SV4	0:OFF, 1:ON
28	FM01 Number of rotations	0~65535	10 min^{-1}	2			
29	FM02 Number of rotations	0~65535	10 min^{-1}	2			
30	EEVH1 opening angle	0~65535	1pulse	2			
31	EEVH2 opening angle	0~65535	1pulse	2			
32	EEVSC opening angle	0~65535	1pulse	2			
34	Indoor unit connection number	0~255	1 unit	1			
35	Indoor unit connection capacity	0~65535	–	2			
36	Indoor unit thermostat ON number	0~255	1 unit	1			
37	Indoor unit thermostat ON capacity	0~65535	–	2			
38	Required Hz total	0~65535	1Hz	2			
39	Target FK	0~65535	1Hz	2			
40	Inverter CM1 operation frequency	0~255	1Hz	1			
41	Inverter CM2 operation frequency	0~255	1Hz	1			
42	Answer Hz total	0~65535	1Hz	2			
43	Compressor 1 cumulative operating time (estimate)	0~65535	1 h	2			
44	Compressor 2 cumulative operating time (estimate)	0~65535	1 h	2			
45	Compressor 1 start times	0~65535	20 times	2			
46	Compressor 2 start times	0~65535	20 times	2			
47	Compressor stop causes	–	–	1	Bit0	Defective outdoor temperature thermistor	
					Bit1	Defective outdoor unit heat exchanger 1 thermistor	
					Bit2	Defective outdoor unit heat exchanger 2 thermistor	
					Bit3	Defective outdoor unit heat exchanger 3 thermistor	
					Bit4	Defective outdoor unit heat exchanger 4 thermistor	
					Bit5	Defective discharge pipe thermistor 1	
					Bit6	Defective discharge pipe thermistor 2	
					Bit7	Defective sub-cooling coil thermistor 1	

Code No.	Write-in contents	Record data				
		Data write-in range	Write-in unit	Number of bytes	Contents	
48	Compressor stop causes	–	–	1	Bit0	Defective sub-cooling coil thermistor 2
					Bit1	Defective suction pipe thermistor
					Bit2	Defective low pressure sensor
					Bit3	Defective high pressure sensor
					Bit4	Inverter 1 Anomalous communication
					Bit5	Inverter 2 Anomalous communication
					Bit6	Anomalous high pressure
					Bit7	Anomalous Low pressure
49	Compressor stop causes	–	–	1	Bit0	Td1 Anomalous discharge pipe temp.
					Bit1	Td2 Anomalous discharge pipe temp.
					Bit2	CM1 starting defect
					Bit3	CM2 starting defect
					Bit4	Rotor lock of CM1
					Bit5	Rotor lock of CM2
					Bit6	Current cut of CM1
					Bit7	Current cut of CM2
50	Compressor stop causes	–	–	1	Bit0	Power transistor 1 overheating
					Bit1	Power transistor 2 overheating
					Bit2	FM01 anomaly
					Bit3	FM02 anomaly
					Bit4	Compressor stop command from indoor unit
					Bit6	The compressor stops in accordance with the operation pattern.
					Bit7	Stops when switching between cooling and heating.
					Bit8	Demand control 0%
51	Control status	0~180	1 second	1	CM1 3-minute delay timer	
52	Control status	0~180	1 second	1	CM2 3-minute delay timer	
53	Discharge pressure saturation temperature	-50~70	0.01˚C	2		
54	Intake pressure saturation temperature	-50~70	0.01˚C	2		
55	Control status oil return	0,1	–	1	0	None
					1	Under control
56	Control status oil return	0~2	–	1	0	None
					1	Waiting for oil return
					2	Under oil return
57	Control status defrost conditions	0~3	–	1	0	None
					1	Temperature conditions
					2	Strengthening temperature conditions
					3	Time conditions
			–			
58	Control status defrost status	0~4	–	1	0	None
					1	Defrosting status 1
					2	Defrosting status 2
					3	Defrosting status 3
			–		4	Defrosting status 4
59	Control status Td	0~2	–	1	0	None
					1	Frequency down
					2	Under Td control
60	Control status	0~1	–	1	Td1 error counter	
61	Control status	0, 1	–	1	Td2 error counter	
62	Control status HP	0~2	–	1	0	None
					1	Frequency down
					2, 3	Under high pressure control
63	Control status	0~1	–	1	HP error (63H1) counter	
64	Control status CS	0~2	–	1	0	None
					1	Frequency down
					2, 3	Under CS control
65	Control status LP	0~2	–	1	0	None
					1	Frequency down
					2, 3	Under low pressure control
66	Control status	0~3	–	1	LP error (when stopped) counter	
67	Control status	0~4	–	1	LP error (when started) counter	

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
68	Control status	0,1	–	1	LP error (when driving) counter
69	Control status PT	0~2	–	1	0 None 1 Frequency down 2 Under PT control
70	Check operation status	–	–	1	Bit0 When pump-down control is activated during starting and stopping Bit1 When outdoor unit equal pressure control is activated Bit3 Increase master unit compressor 1 equal oil addition frequency (Hz) Bit4 Increase master unit compressor 2 equal oil addition frequency (Hz) Bit5 Increase slave unit compressor 1 equal oil addition frequency (Hz) Bit6 Increase slave unit compressor 2 equal oil addition frequency (Hz) Bit7 Increase equal oil rotation addition frequency (Hz)
71	Control status	0~360	3 minutes	2	CH compressor protection timer
72	Control status CH compressor protective start	0~15	–	1	15 Protective start end 0~14 During protective start
73	Switch etc.	–	–	1	Bit0 External operation (CnS1) 0: Operation prohibition 1: Operation permission Bit1 Demand (CnS2) 0: None 1: Under control Bit2 Forced cooling, heating (CnG1) 0: None 1: Under control Bit3 Silent mode (CnG2) 0: None 1: Under control Bit4 Back up operation 0: None 1: Back up operation Bit5 Hz cancel operation 0: None 1: Under control
74	Control status	0~3	–	1	Current cut anomaly counter (INV1)
75	Control status	0~4	–	1	Power transistor overheating anomaly counter (INV1)
76	Control status	0~3	–	1	Rotor lock anomaly counter (INV1)
77	Control status	0~1	–	1	Starting failure counter (INV1)
78	Control status	0~3	–	1	Communications anomaly counter (INV1)
79	Control status	0~3	–	1	Current cut anomaly counter (INV2)
80	Control status	0~4	–	1	Power transistor overheating anomaly counter (INV2)
81	Control status	0~3	–	1	Rotor lock anomaly counter (INV2)
82	Control status	0~1	–	1	Starting failure counter (INV2)
83	Control status	0~3	–	1	Communications anomaly counter (INV2)
84	Control status	0~1	–	1	DC fan motor 1 error counter
85	Control status	0~1	–	1	DC fan motor 2 error counter
86	Control status	0~2	–	1	Thermistor disconnection counter
87	Control status	0~255	–	1	Communications error counter (INV)
88	Registered indoor units 1~8 operation mode	0~4	–	8	0 AUTO 1 DRY 2 COOL 3 FAN 4 HEAT

Code No.	Write-in contents	Record data			
		Data write-in range	Write-in unit	Number of bytes	Contents
89	Registered indoor units 1~8 required Hz	0~255	1Hz	8	
90	Registered indoor units 1~8 answer Hz	0~255	1Hz	8	
91	Operation priority switching	0~1	–	1	0 Prior press priority 1 After press priority
92	High pressure control of cooling	2.2,2.5	0.01MPa	1	
93	Cooling low pressure compensation	-0.05~0.05	0.01MPa	1	
94	Low pressure control of heating	0.8,0.9	0,01MPa	1	
95	Snow protection fan control	0~1	–	1	0 With 1 None
96	CM1 frequency command	0~130	1Hz	1	
97	CM2 frequency command	0~130	1Hz	1	
98	Target cooling low pressure	0.00~2.00	0.01MPa	1	
99	Control status TC	0~2	–	1	0 None 1 Frequency down 2, 3 Under-dome temperature control
100	Target heating high pressure	1.60~4.15	0.01MPa	2	
101	Heating high pressure compensation	0.00~0.30	0.01MPa	1	
102	Control / status SCR	0~2	–	1	0 None 1 Frequency down 2, 3 Under compression ratio protection control
103	Heating target CSST temperature difference	0~255	0.1°C	1	The actual range is 5 ~ 30 deg.
104	Cumulative amount of oil rise.	0~255	10cc	1	The actual range is 0 cc ~ 1100 cc.
105	Total capacity of thermostat ON indoor units during cooling.	0~65535		2	
106	Total capacity of thermostat ON indoor units during heating.	0~65535		2	
107	Outdoor unit operating pattern	0~255	1	1	The actual range is 0 ~ 17.
108	Oil return countdown	0~255	3 minutes	1	The actual range is 0 ~ 600 minutes (10 hrs).
109	Indoor EEV control status	–	–	1	Bit0 Indoor unit EEV fully closed sensor control Bit1 Indoor unit non-heating avoidance control Bit2 Indoor unit heating stop indoor unit minute opening control Bit3 Indoor unit cooling start control Bit4 Indoor unit heating start control

(17) Pump down control during stop (liquid backflow prevention) (master unit)

(a) Pump down control before starting

(i) Control contents

1) The EEV on indoor units which are in cooling mode is fully closed.
2) When the outdoor unit's operating mode is heating, EEVH1, 2 are fully closed.
3) The EEVSC is fully closed.
4) The outdoor unit's operating pattern is not changed.

(ii) Starting conditions

1) Operation start after a stop.
2) When there is an operation start after an indoor unit switches from cooling to heating.
3) When oil return control starts.
4) When normal control is recovered after oil return control ends.

(iii) End conditions

1) When the compressor stops.
2) When 5 minutes have passed since the compressor went ON.
3) Low pressure sensor ≦ 0.4 MPa (outdoor unit operating mode is cooling)
   Low pressure sensor ≦ 0.3 MPa (outdoor unit operating mode is heating)

(b) Pump down control after stop

(i) Control contents

1) The EEV on indoor units which are in cooling mode is fully closed.
2) When the outdoor unit's operating mode is heating, EEVH1, 2 are fully closed.
3) The EEVSC is fully closed.
4) The operating frequency command applied to the compressor is maintained. (protective control is activated)
5) The speed command applied to the outdoor unit's fan is maintained.
6) The outdoor unit's operating pattern does not change.

(ii) Starting conditions

When operation stops after operation.

(iii) End conditions

1) When there is a full emergency stop.
2) Low pressure sensor ≦ 0.4 MPa (outdoor unit operating mode is cooling)
   Low pressure sensor ≦ 0.3 MPa (outdoor unit operating mode is heating)

(18) Outdoor unit control (master unit)

If an outdoor unit (a unit with all the heat exchangers integrated, and all the outdoor air and supply air processing units) is connected to multiple indoor units, as a rule, the cooling low pressure target and the heating high pressure target for cooling or heating are specified when the object is ventilation.

During cooling (evaporation temperature): 15ºC

During heating (condensation temperature): 30ºC

(a) Starting conditions

When only the thermostat of the outdoor unit for the operating indoor units is in the ON state.

(b) Control contents

(i) 0.22 MPa is added to the target cooling low pressure during compressor cooling low pressure control.

(ii) The target heating high pressure is set at 1.77 MPa during compressor heating high pressure control.

(c) End conditions

When the outdoor unit changes to operation other than outdoor unit only (thermostat ON) after the outdoor unit begins single operation.

(19) Outdoor unit equal pressure control (Master unit)

In a cooling/heating free multi-system, if an indoor unit is switched from cooling to heating, this control functions through a branch flow controller to switch the high pressure gas line and the low pressure gas line. When the branch flow controller's switching occurs, the pressure differential between the high pressure and low pressure sides is first changed to equal pressure, then switching is accomplished. Pressure equalization is done by switching the 4-way valve with the compressor stopped, so if any indoor unit is switched from cooling to heating, the compressor stops.

(a) Starting conditions

(i) When switching an indoor unit from cooling to heating during compressor operation (except during oil return or defrost control).

(ii) When all the indoor units are fully stopped and the compressor is stopped.

(iii) When the system is starting oil return control and the compressor is stopped.

(b) Control contents

(i) When an indoor unit is switched from cooling to heating, the compressor is stopped for 3 minutes. (auto recovery)

(ii) Outdoor unit cooling operation (outdoor unit heat exchanger high pressure

→ After the compressor stops for 10 seconds, the 4-way valve (20S) goes ON → OFF → ON, then for 35 seconds each time, then returns to the OFF position.

Outdoor unit heating operation (outdoor heat exchanger low pressure)

→ After the compressor stops for 10 seconds, the 4-way valve (20S) goes OFF → ON → OFF, then for 35 seconds each time, then returns to the ON position.

(iii) EEVH1, 2 are fully closed after the compressor stops.

(iv) For 180 seconds after the compressor stops, SV6 and 7 go ON.

(v) For 180 seconds after the compressor stops, when there is low pressure on side 2 of the outdoor heat exchanger (4-way valve 20SL: ON), SV11 goes ON.

(c) End condition

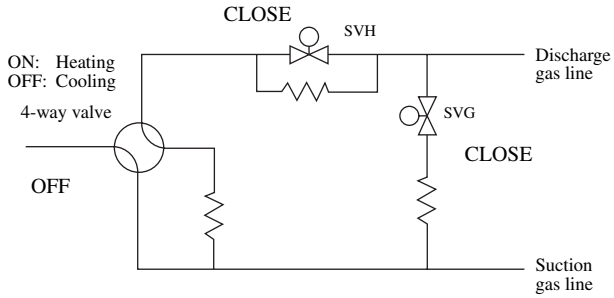
After being stopped for 180 seconds.

(d) Control is executed by the master unit, which performs all judgments, then the slave units follow the master unit.

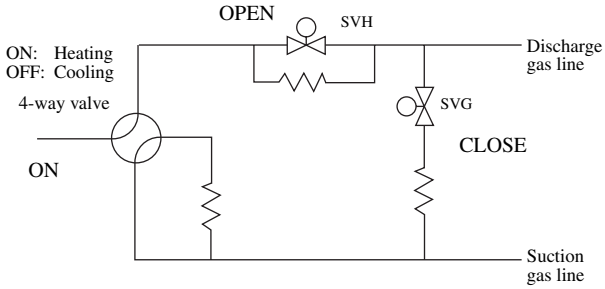
(20) Indoor unit branch flow controller control

If you switch between cooling and heating at an indoor unit in the free multi cooling/heating system, switching between the high pressure gas line and the low pressure gas line is accomplished by the branch flow controller. The branch flow controller performs control using the output from CNT on the indoor unit's control board. The CNT output operates with a x2 (heating output) bit and 2 x3 bits, so there are 4 branch flow controller states.

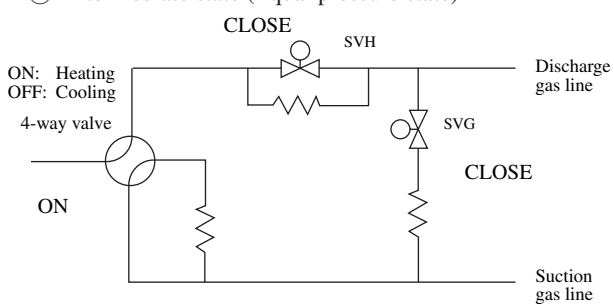
① Cooling state (No power state)



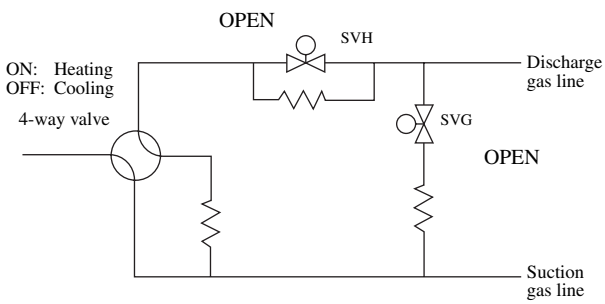
② Heating state



③ Intermediate state (Equal pressure state)



④ Oil return state



(a) Branch flow controller's control when the indoor unit's operating state changes

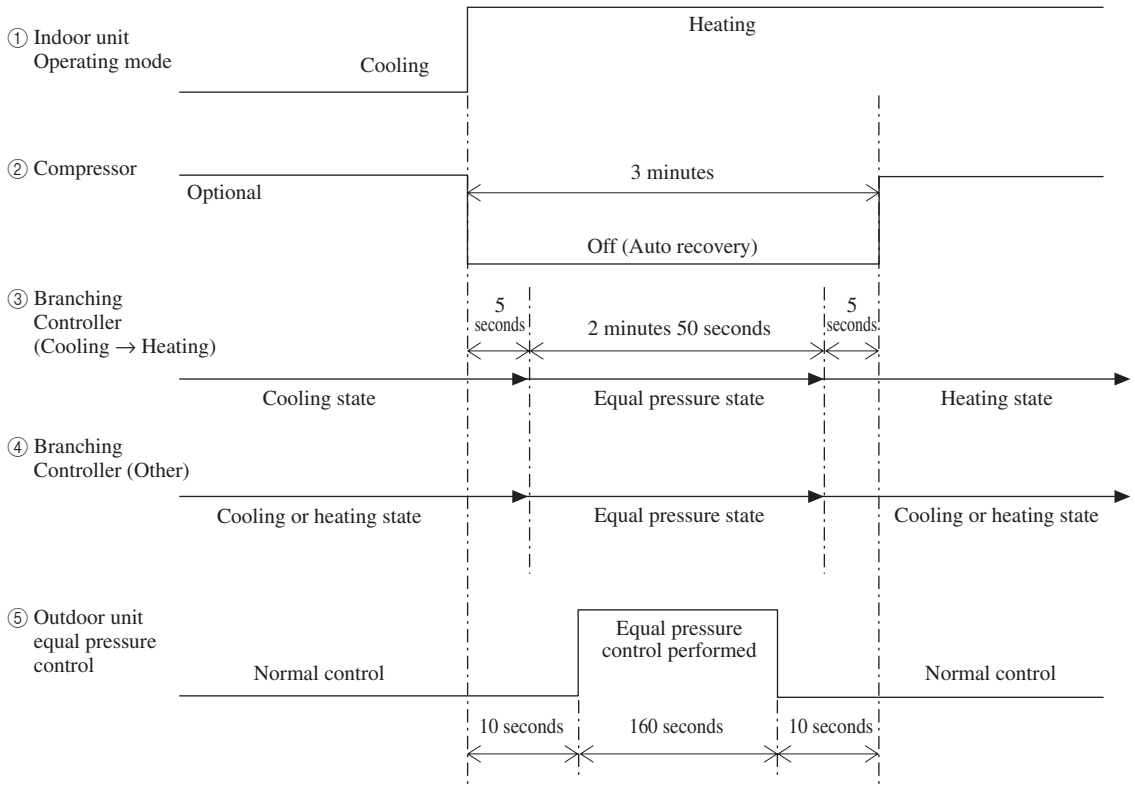
When the state of an indoor unit changes between cooling, heating and oil return, the branch flow controller is changed in the following sequence.

(i) In the case of Cooling → Heating, Cooling → Oil return, Heating → Oil return or Cooling/Heating → Full stop (Compressor stop)

(Recovery from oil return is excluded.)

<Control Content>

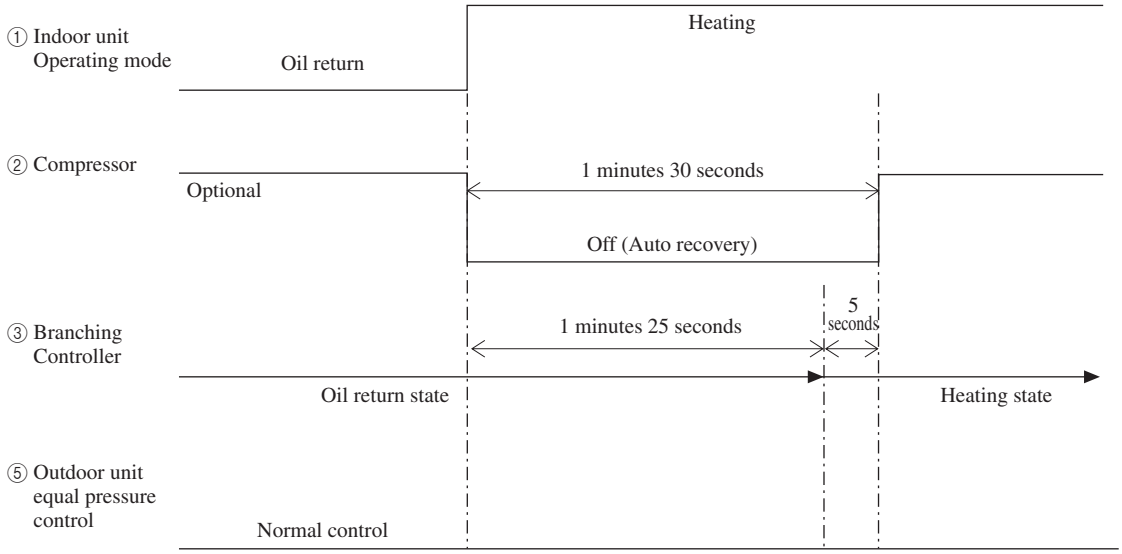
- If the outdoor unit is running and the compressor stops, after 5 seconds, the equal pressure state is maintained for 2 minutes 50 seconds, then the output is in accordance with the operating mode.
- If the compressor stops by the outdoor unit stopping, after 5 seconds, the equal pressure state is maintained for 2 minutes 50 seconds. Then the power off state (cooling state) is output.



(ii) Oil return → Cooling / Heating (Recovery from oil return)

<Control Content>

- Recovery from oil return while the outdoor unit is running causes the compressor to stop causes the output to be in accordance with the operating mode after 1 minute 25 seconds without entering the equal pressure state.



(21) Outdoor unit combined protection (Master unit/Slave unit)

This protection judges the capacity of outdoor units that can be connected and displays any errors on the 7-segment display. However, it does not perform emergency stops or send any error messages to the indoor units.

(a) Combined units

The errors of units other than the following combined units are not responded to by this function.

Outdoor unit model	Combined outdoor unit model						
	FDCA335 HKXRE4BRK	FDCA400 HKXRE4BR	FDCA450 HKXRE4BR	FDCA504 HKXRE4BR	FDCA560 HKXRE4BR	FDCA615 HKXRE4BR	FDCA680 HKXRE4BR
FDCA735	1	1	—	—	—	—	—
FDCA800	—	2	—	—	—	—	—
FDCA850	—	1	1	—	—	—	—
FDCA900	—	—	2	—	—	—	—
FDCA960	—	—	1	1	—	—	—
FDCA1010	—	—	—	2	—	—	—
FDCA1065	—	—	—	1	1	—	—
FDCA1130	—	—	—	—	2	—	—
FDCA1180	—	—	—	—	1	1	—
FDCA1235	—	—	—	—	—	2	—
FDCA1300	—	—	—	—	—	1	1
FDCA1360	—	—	—	—	—	—	2

(b) 7-segment display during an error

Code display	Data display	Operation disabling content
OPE	3	Combined outdoor units are disabled.

4.7 MAINTENANCE DATA

(1) Before starting troubleshooting

(a) Confirmation of the error code on the remote controller (by pressing the inspection switch) and the inspection display and normal display lamps on PCBs (Printed circuit board) of indoor/outldoor units

The microcomputer detects errors on electrical components, which include the microcomputer itself, errors on the power supply line and errors (overload, etc.) on the refrigerant circuit and the location of trouble is displayed (with the combination of error symbols of remote controller, normal (green) and inspection (red) display LED on PCBs of indoor/outdoor units). When any error occurs, check first the inspection display. It will guide you to trouble point and assist you to complete the repair work quickly.

Error code of the remote controller is recorded on microcomputer after the trouble has been reset automatically so that, if you press the inspection switch of remote controller, the error code and the number of unit in trouble are displayed for 10sec. The inspection display lamp on the indoor/outdoor unit PCB keeps flashing (glowing) even after the trouble was reset automatically. Inspection lamp on the indoor unit PCB is turned off if the remote controller is reset.

1) Inspection/normal: List of power display

Section	Display Section	Display	Contents of display
Remote controller	Power supply display	LCD	At power ON : Displays always the return air temperature and Center/Remote.
	Error code	LCD	At error : Displays E1 ~ E63 or blank depending on the kings of error.
	Inspection display	Red-LED	At error : Flash continuously (indicates the occurence of error).
Indoor/outdoor unit	Normal display	Green-LED2	At power ON (normal) : Flash continuously. At error : Off or continuous glowing or irregular illumination.
	Error display	Red-LED1	At error : Flash 1 ~ 3 times/5 sec for indoor unit depending on the kinds of error, continuous flash, irregular illumination or off. At error : Flash 1 ~ 6 times/10 sec for outdoor unit depending on the kinds of error, continuous flash, irregular illumination or off.
Invertes	Normaly display	Green-LED	At power ON (normal) : Flash continuously. At error : Off or continuous glowing or irregular illumination.
	Error display	Red-LED	1 time flashes: Current cut (power transistor over-current) • Short-circuited compressor wiring • Trouble on inverter PCB • Trouble on power transistor • Compressor motor neutral line disconnected. 2 time flashes: Power transistor overheat • Fastening of the power transistor to the heat dissipation fins (tighten the screws, apply silicone) is insufficient. • Power transistor is defective. 3 time flashes: Compressor rotor lock • Compressor breakdown • Inverter board breakdown 4 time flashes: Compressor starting is defective. • Compressor breakdown • Inverter board breakdown • Power transistor breakdown Lights up : Transmission error between inverter and outdoor unit • Connectors CN11 or CN12 is disconnected or beoken wire between connectors • Error on outdoor control PCB • Error on inverter PCB

2) Check Indicator Table

Whether a failure exists or not on the indoor unit and outdoor unit can be know by the contents of remote controller eroor code, indoor/outdoor unit green LED (power pilot lamp and microcomputer normality pilot lamp) or red LED (check pilot lamp).

Remote controller error code	Indoor unit LED		Outdoor unit LED		Cause
	Green	Red	Green	Red	
No-indication	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Normal
	Stays OFF	Stays OFF	Stays OFF	Stays OFF	Power OFF, T phase wiring is open, power source failure
	Keeps flashing	*3 time flash	Keeps flashing	Stays OFF	Remote controller wires X and Y are reversely connected. *For wire breaking at power ON, the LED is OFF. Remote controller wire is open. (X wire breaking : A beep is produced and no indication is made. Z wire breaking : No beep and no indication) The remote controller wires Y and Z are reversely connected.
E1	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	The remote controller wires are connected to A and B on the terminal block. The indoor/outdoor signal wire are connected in loop form. The indoor unit micro-computer runs away.
	Stay OFF or Lights continuously	Stay OFF or Lights continuously	Keeps flashing	Stays OFF	Indoor unit PCB fault
	Keeps flashing	*3 time flash	Keeps flashing	Stays OFF	Remote control wire breakage (signal) *For wire breaking at power ON, the LED is OFF.
E2	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	No. duplication at indoor unit addressing. More than 49 indoor unit are connected.
E3	Keeps flashing	2 time flash	Stays OFF	Stays OFF	Outdoor unit power supply OFF (detected only during operation)
	Keeps flashing	2 time flash	Keeps flashing	Stays OFF	The corresponding outdoor unit address No. is not found. (Detected only during operation)
	Keeps flashing	2 time flash	Irregular illumination	Stays OFF or Lights continuously	Outdoor unit power OFF (Detected only during operation)
E5	Keeps flashing	2 time flash	Keeps flashing	Stays OFF	Indoor / outdoor transmission error. Wire A and B swapping after power ON.
	Keeps flashing	2 time flash	Stays OFF	Stays OFF	Outdoor power unit failure (when the indoor power supply is different from the outdoor one).
	Keeps flashing	2 time flash	Irregular illumination	Stays OFF or Lights continuously	Outdoor unit microcomputer failure
E6	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Indoor unit heat exchanger thermistor failure
E7	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Indoor unit return air thermistor failure
E9	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	The float SW operates (with FS only). Drain up kit wiring fault.
E10	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	When multi-unit control by remote controller is performed, the number of units is over (more than 17 units). Two remote controller are provided for one controller is perfirmed.
E11	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Addresses setting for plural remote controllers
E12	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Addresses No. combination error or addressing is performed with the following combinations.
					Outdoor No, / Indoor No,
					0~47 / 48, 49
					48, 49 / 0~47
E16 (1)	Keeps flashing	1 time flash	Keeps flashing	Stays OFF	Defect of fan motor.
E28	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	Remote controller thermistor failure

Note (1) In the case of FDT112, 140, 160 or FDK22~56 type.

- **Models FDCA140HKXEN4R, 140KXXES4R, 160HKXEN4R**

Remote controller error code	Indoor unit LED		Outdoor unit LED		Outdoor LED 7-segment	Cause
	Green	Red	Green	Red		
E30	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E30	Unmatched indoor/outdoor connection
E31	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E31	Duplication outdoor unit address No. Outdoor unit address setting error.
E32	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E32	Absence of L2 phase (Voltage detection) (3-phase model)
E34	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E34	L3-phase wiring is open phase or reversal phase (3-phase model)
E35	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E35	Cooling high pressure error
E36	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E36-1	Discharge temperature (Tho-D) anomaly.
E37	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E37-1	Outdoor unit heat exchanger thermistor (Tho-R) failure
E38	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E38	Outdoor air temperature thermistor (Tho-A) failure
E39	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E39-1	Discharge pipe thermistor (Tho-D) failure
E40	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E40	High pressure (63H1) error
E41	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E41-1	Power transistor overheat
E42	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E42-1	Anomalous current cut of compressor
E43	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E43	The number of connectable units is exceeded.
E45	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E45-1	Transmission error between inverter and control PCB
E46	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	E46	Automatic address and remote controller address setting coexists in the same network.
E49	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E49	Low pressure (PSL) error
E51	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E51	Anomalous inverter
E53	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E53	Suction pipe thermistor (Tho-S) disconnection
E54	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E54-1	Low pressure sensor (PSL) disconnection/output error
	Keeps flashing	Stays OFF	Keeps flashing	2 time flash	E54-2	High pressure sensor (PSH) disconnection/output error
E55	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E55-1	Dome bottom thermistor 1 (Tho-C1) failure
				2 time flash	E55-2	Dome bottom thermistor 2 (Tho-C2) failure
E56	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E56-1	Power transistor thermistor 1 (Tho-P1) failure
				2 time flash	E56-2	Power transistor thermistor 2 (Tho-P2) failure
E59	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E59-1	Compressor startup error
E60	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E60-1	Compressor loader position detection error
E63	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E63	Emergency stop of indoor unit

- **Models FDCA224HKXE4BR, 280HKXE4BR, 335HKXE4BR**
  FDCA224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR

Remote controller error code	Indoor unit LED		Outdoor unit LED		Outdoor LED 7-Segment	Cause
	Green	Red	Green	Red		
E30	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E30	Unmatched indoor/outdoor connection
E31	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E31	Duplication outdoor unit address No. Outdoor unit address setting error.
E32	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E32	L3-phase wiring is open phase or reversal phose
E36	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E36-1	Discharge temperature (Tho-D1) anomaly.
E37	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E37-1	Outdoor unit heat exchanger thermistor (Tho-R1) failure
				2 time flash	E37-2	Outdoor unit heat exchanger thermistor (Tho-R2) failure
				3 time flash	E37-3	Outdoor unit heat exchanger thermistor (Tho-R3) failure
				4 time flash	E37-4	Outdoor unit heat exchanger thermistor (Tho-R4) failure
				5 time flash	E37-5	Outdoor unit heat exchanger thermistor (Tho-SC) failure
				6 time flash	E37-6	Outdoor unit heat exchanger thermistor (Tho-H) failure
E38	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E38	Outdoor air temperature thermistor (Tho-A) failure
E39	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E39-1	Discharge temperature thermistor (Tho-D1) failure
E40	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E40	High pressure (63H1-1) error
E41	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E41-1	Power transistor (CM1) overheat
E42	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E42-1	Anomalous current cut of compressor (CM1)
E43	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E43	The number of connectable units is exceeded.
E45	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E45-1	Transmission error between inverter and outdoor unit control PCB (CM1)
E46	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	—	Automatic address setting and remote controller address setting coexists in the same network.
E48	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E48-1	Anomaly in an outdoor fan motor FM01
				2 time flash	E48-2	Anomaly in an outdoor fan motor FM02
E49	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E49	Low pressure error (PSL)
E53	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E53	Suction pipe temperature thermistor (Tho-S) failure
E54	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E54-1	Low pressure sensor (PSL) disconnection/output error
				2 time flash	E54-2	High pressure sensor (PSH) disconnection/output error
E55	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E55-1	Dome bottom thermistor 1 (Tho-C1) failure
				2 time flash	E55-2	Dome bottom thermistor 2 (Tho-C2) failure
E56	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E56-1	Power transistor thermistor 1 (Tho-P1) failure
				2 time flash	E56-2	Power transistor thermistor 2 (Tho-P2) failure
E59	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E59-1	Compressor startup error (CM1)
E60	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E60-1	Compressor loader position detection error (CM1)
E63	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E63	Emergency stop of indoor unit

- **Models FDCA335HKXE4BRK, 400~1360HKXE4BR**
  FDCA335HKXRE4BRK, 400~1360HKXRE4BR

Remote controller error code	Indoor unit LED		Outdoor unit LED		Outdoor LED 7-Segment	Cause
	Green	Red	Green	Red		
E30	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E30	Unmatched indoor/outdoor connection
E31	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E31	Duplication outdoor unit address No. Outdoor unit address setting error.
E32	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E32	L3-phase wiring is open phase or reversal phose
E36	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E36-1	Discharge temperature (Tho-D1) anomaly.
				2 time flash	E36-2	Discharge temperature (Tho-D2) anomaly.
E37	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E37-1	Outdoor unit heat exchanger thermistor (Tho-R1) failure
				2 time flash	E37-2	Outdoor unit heat exchanger thermistor (Tho-R2) failure
				3 time flash	E37-3	Outdoor unit heat exchanger thermistor (Tho-R3) failure
				4 time flash	E37-4	Outdoor unit heat exchanger thermistor (Tho-R4) failure
				5 time flash	E37-5	Outdoor unit heat exchanger thermistor (Tho-SC) failure
				6 time flash	E37-6	Outdoor unit heat exchanger thermistor (Tho-H) failure
E38	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E38	Outdoor air temperature thermistor (Tho-A) failure
E39	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E39-1	Discharge temperature thermistor (Tho-D1) failure
				2 time flash	E39-2	Discharge temperature thermistor (Tho-D2) failure
E40	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E40	High pressure (63H1-1, 2) error
E41	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E41-1	Power transistor (CM1) overheat
				2 time flash	E41-2	Power transistor (CM2) overheat
E42	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E42-1	Anomalous current cut of compressor (CM1)
				2 time flash	E42-2	Anomalous current cut of compressor (CM2)
E43	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E43	The number of connectable units is exceeded.
E45	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E45-1	Transmission error between inverter and outdoor unit control PCB (CM1)
				2 time flash	E45-2	Transmission error between inverter and outdoor unit control PCB (CM2)
E46	Keeps flashing	Stays OFF	Keeps flashing	Stays OFF	—	Automatic address setting and remote controller address setting coexists in the same network.
E48	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E48-1	Anomaly in an outdoor fan motor FM01
				2 time flash	E48-2	Anomaly in an outdoor fan motor FM02
E49	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E49	Low pressure error (PSL)
E51	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E51-1	Power transistor overheating (CM1) (15 minute continuation)
				2 time flash	E51-2	Power transistor overheating (CM2) (15 minute continuation)
E53	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E53	Suction pipe temperature thermistor (Tho-S) failure
E54	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E54-1	Low pressure sensor (PSL) disconnection/output error
				2 time flash	E54-2	High pressure sensor (PSH) disconnection/output error
E55	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E55-1	Dome bottom thermistor 1 (Tho-C1) failure
				2 time flash	E55-2	Dome bottom thermistor 2 (Tho-C2) failure
E56	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E56-1	Power transistor thermistor 1 (Tho-P1) failure
				2 time flash	E56-2	Power transistor thermistor 2 (Tho-P2) failure
E59	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E59-1	Compressor startup error (CM1)
				2 time flash	E59-2	Compressor startup error (CM2)
E60	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E60-1	Compressor loader position detection error (CM1)
				2 time flash	E60-2	Compressor loader position detection error (CM2)
E61	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E61	Communication error between outdoor unit master unit and slave units.
E63	Keeps flashing	Stays OFF	Keeps flashing	1 time flash	E63	Emergency stop of indoor unit

3) Display sequence of error, inspection display lamp

a) One kind error

Display corresponding to the error is shown.

b) More than one errors.

Section	Display section
Error code of remote controller	• Displays the error of higher priority (When plural errors are persisting) E1>E10>E11>E2>E3>E5>E7>E9>E12 ..... E63 • Displays the present errors. (When a new error has occurred after the former error was reset.)
Inspection LED (red) of indoor unit PCB	
Inspection LED (red) of outdoor unit PCB	

c) Timing of error detection

- **Indoor unit side.**

Error detail	Error code	Timing of error detection
Transmission error of remote controller indoor unit	E1	When the transmission error continuously for 2 min.
CPU is out of control		Resetting was performed at the rate of 1 time per second. An anomalous stop occured 32-sec time flash.
Transmission error between indoor/outdoor units	E5	A check was made once every 20 second. An anomalous stop occured 7 time running.
Broken wire of heat exchanger thermistor	E6	After a compressor ON command, this failure was detected for 5 second in the period of 2 minutes to 2 minutes and 20 seconds.
Broken wire of indoor unit return air thermistor	E7	This failure was detected continuously for 5 seconds.
Drain error (float switch motion)	E9	At all times from 31 seconds after power ON.

- **Outdoor unit side.**

Error detail	Error code	Timing of error detection
Discharge temperature anomaly	E36	A stop occurs when this anomaly occurs for 2 seconds running at 130°C. After a stop for 3 minutes, an recovery is automatically made. An anomalous stop occurs when this anomaly occurs 2(5) times for 60 minutes. (The anomalous state is held for 45 minutes.)
Broken wire of heat exchanger thermister	E37	This failure is detected when it occurs for 5 seconds running in the period of 2 minutes to 2 minutes and 20 seconds with the compressor ON. An anomalous stop occurs when this failure occurs 3 times for 40 minutes.
Broken wire of outdoor temperature thermistor	E38	
Broken wire of discharge thermistor	E39	This failure is detected when it occurs for 5 seconds running in the period of 10 minutes to 10 minutes and 20 seconds with the compressor ON. An anomalous stop occurs when this failure occurs 3 times for 40 minutes.
High pressure cut	E40	An anomalous stop occurs when this anomaly occurs 5 times for 60 minutes.
Power transistor overheat	E41	Stops at 110ºC or higher, recovers automatically at 90°C or lower, anomalous stop if this occurs 5 times in 60 minutes.
Current cut	E42	An anomalous stop occurs when this anomaly occurs 4 times for 15 minutes.
Excessive number of indoor and outdoor units	E43	This error is detected when the number of connectable units is set over the specified value at remote control addressing.
Transmission error between inverter and outdoor unit PCB	E45	With a delay of 3 minutes, a recovery is automatically made. An anomalous stop occurs when this errors occurs 4 times for 15 minutes.
Broken wire of low pressures sensor	E54	If the voltage sensed by the sensor is 0V oe lower, or 3.49 V or higer continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3-minute delay, the compressor restarts. If this state is detected 3 times in 40 minutes.
Broken wire of high pressures sensor		
Broken wire of under -doom sensor	E55	If a disconnection is detected continuously for 5 seconds between 10 minutes and 10 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minutes delay, the compressor restarts. If this state is detected 3 times in 40 minutes.

Note (1) value in ( ) indicates FDCA140 type.

d) Recording and reset of error

Error display	Memory	Reset
Error code	• Saves in memory the mode (1) of higher priority	• Stop the unit operation by pressing the ON/OFF switch of remote controller. • Operation can be started again if the error has been reset. (2)
Indoor unit inspection lamp (red)	• Cannot save in memory	
Outdoor unit inspection lamp (red)	• Saves in memory the mode (1) of higher priority	

Notes (1) Priority is in the order of E1 > ... > E10 > ... > 63.

(2) Reset is disabled for 45min. at the error of outdoor unit or compressor overcurrent or the discharge gas temperature error.

e) Reset of error code in memory (when the error has been reset.)

Indoor unit: Press the Timer switch and the Stop switch while the Inspection switch of wired remote controller is held down or detach the power supply connector (CnW2) of indoor unit PCB and connect again or turn OFF the power.

Outdoor unit: Detach the power supply connector (CNA2) of outdoor unit PCB and connect again or turn OFF the power supply or turn on and off the SW3-1.

4) Indications with 7-segement indicator

Refer to page FDCA140, 160 series: 353,

FDCA224~355HKXE4BR: 371

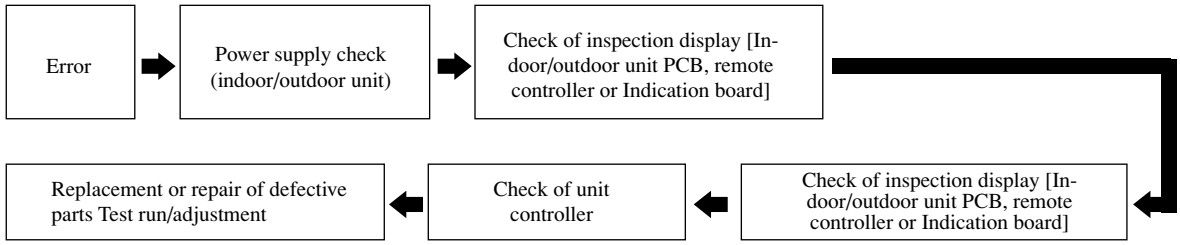
FDCA355HKXE4BRK • FDCA400~1360HKXE4BR: 398

FDCA224~355HKXRE4BR: 420,

FDCA355HKXRE4BRK • FDCA400~1360HKXRE4BR: 444

(2) Procedures of trouble diagnosis

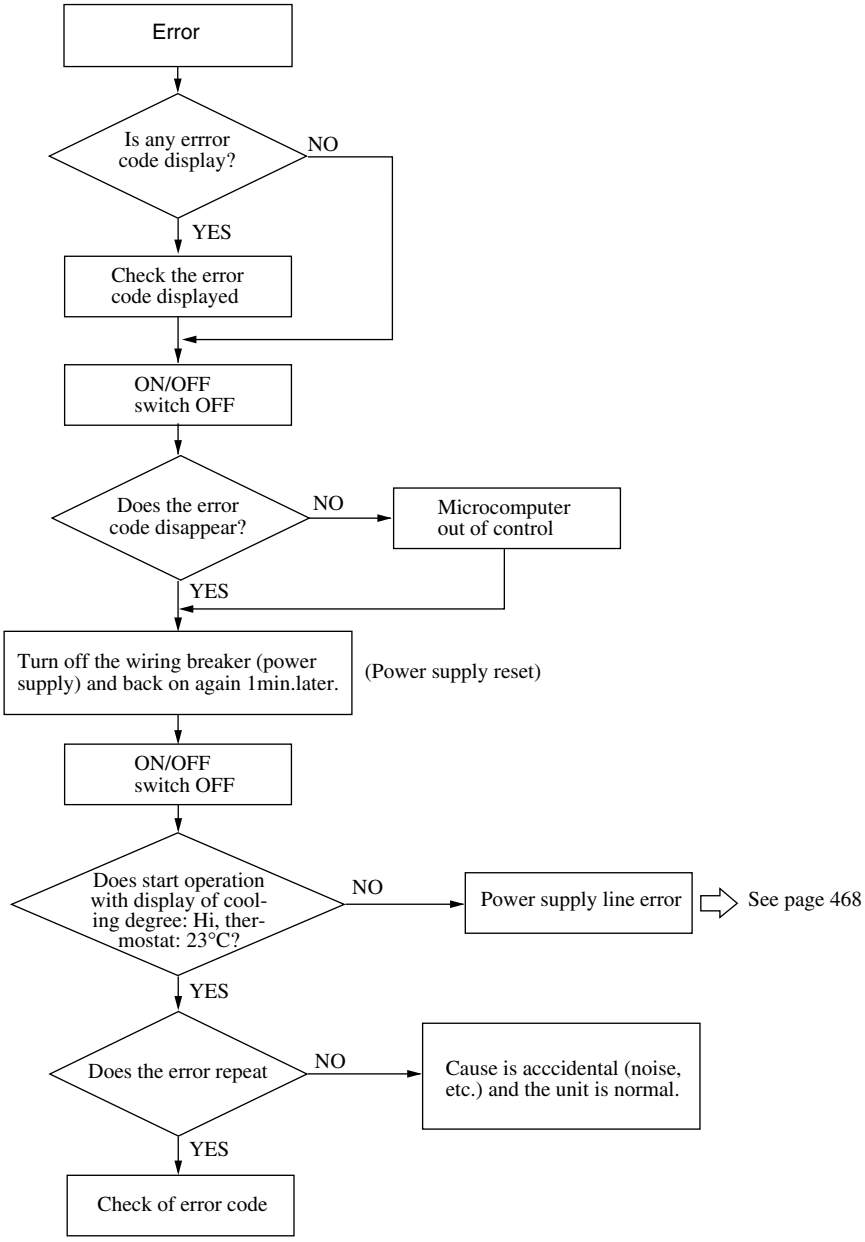
When any error occurs, inspect in following sequence. Detailed explanation on each step is given later in this text.



(a) Diagnosis by the power supply reset

When any error occurs, reset the power supply as described below to see if it is the result of accidental noise, etc.

Check at the indoor unit side.



Errors due to external noise, etc.

Error code may be displayed or the error may not be displayed normally even if the controller is normal because of external noise source(1) or joined or parallel arrangement of power cables and singal wires. It is because the wire of remote controller, wired remote controller signal wires for multiple units or the network signal wires may be influenced by external noises which are judged as signals by the microcomputer which reacts mistakenly.

When there is any noise source, it is necessary to the shield wire for the remote controller and signal wires.

Note (1) High frequency medical machine, rectifier motor application device, thyristor, broadcast transmission tower, power transmission line, power line of electric train, automatic door motor, elevator (voltage drop), wireless telephone, high voltage power distribution line, computer, personal computer and their cables. These do not necessarily always cause problems but they can be a source of electrical noise.

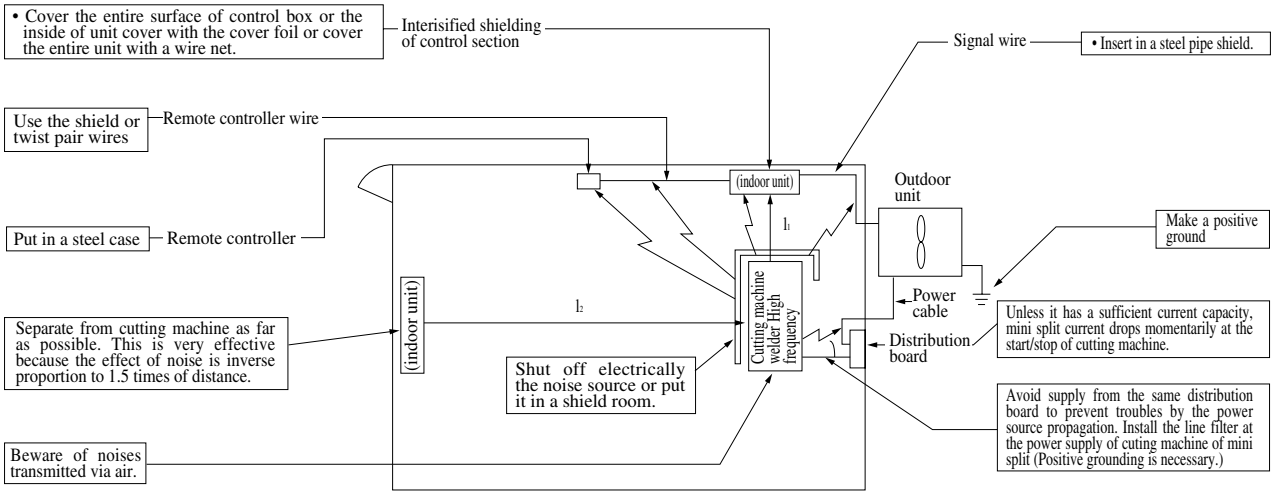
(2) Reference Effect of noise

- When noises inturude into remote controller.

  Anomalous or irregular display such as the flashing of irrelevant display (lamp) (for example, LEDs of cooling and heating illuminated simultaneously or the like) is observed even if the remote controller is not operated or the remote or the remote controller and, as the result, the operation of units may be disabled or similar anomalous phenomenons are observed.

- When noises intruded into the microcomputer of printed circuit board; State of operation becomes anomalous such as the units perform irregular operation while the remote controller is not operated, the operation cannot be stopped with the remote controller, etc.

Electro magnetic noise prevention (example)



(b) Error diagnosis procedures at the indoor unit side

To diagnose the error, measure the voltage (AC,DC), resistance, etc. at each connector around the printed circuit board of indoor unit PCB on the inspection display or the operation state of unit (no operation of compressor or blower, no switching of 4-way valve, etc.). If any defective parts are discovered, replace with the assembly of parts as shown next page.

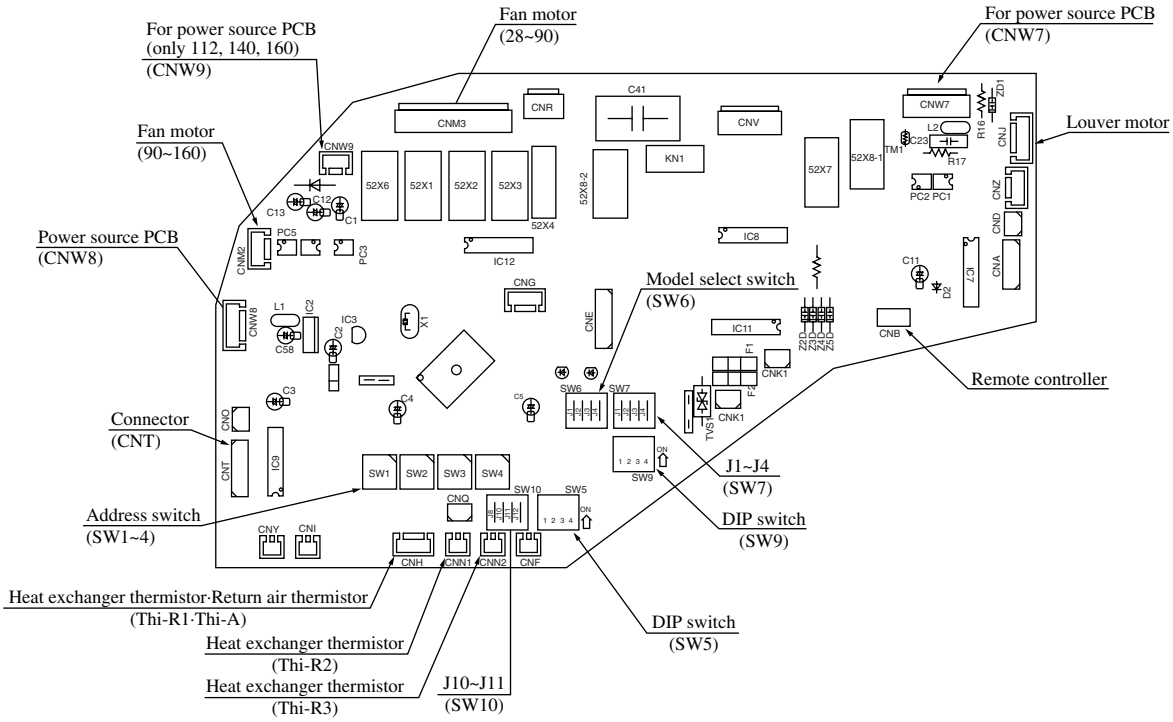
(i) Unit of replacement parts releated to indoor unit printed circuit board (Electric components on and around the microcomputer)

Indoor unit printed circuit board, thermistor (Return air, heat exchanger), remote controller switch, limit switch, transformer, fuse

Note (1) Judges the troubles on the parts of driving power circuit or cooling cycle with the ordinary check method.

(ii) Parts layout on the indoor unit printed circuit board

● The control board in the following figure shows for the FDT type.



● Function of jumper wires

Name			Function
J1 (SW7-1)		With	Filter sign: Valid
		None (1)	Filter sign: Invalid
J2 (SW7-2)		With	Normal operation operable
		None (1)	Operation permission prohibited
J3 (SW7-3)	With	J4 (SW7-4)	With — Heating thermostat OFF: Intermittenet operation
			None (1) — Heating thermostat OFF: Lo operation
	None (1)		With — Heating thermostat OFF: Stop
			None (1) — —
J10 (SW10-2)	With	J11 (SW10-3)	With — Remote controller air flow: 3 speed
			None (1) — Remote controller air flow: 1 speed
	None (1)		With — Remote controller air flow: 2 speed
			None (1) — Remote controller air flow: —

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut

● Function of DIP switches (SW5, 9)

Switch		Function
SW5-1	ON	Test run of condensate pump motor
	OFF	Normal
SW5-3	ON	Input signal — Reverse Invalid
	OFF	Run stop
SW5-4	ON	Emergency stop signal: Invalid
	OFF	Emergency stop signal: Valid
SW9-3	ON	Louver stop: Louver Range
	OFF	Louver stop: Normal
SW9-4	ON	Fan control: UH, H, M
	OFF	Fan control: H, M, L

Note (1) All OFF under load condition.

● **Replacement procedure of indoor unit micrcomputer printed circuit board**

Microcomputer printed circuit board can replaced with following procedure.

1) Confirm the parts numbers. (Refer to the following parts layout drawing for the location of parts number.)

Parts No.	Model	Parts No.	Model
PJA505A157ZB	FDTA28~71	**PJA505A158ZA**	FDQM, FDUM, FDTW, FDFL, FDFU, FDUR, FDU
PJA505A157ZA	FDTA90~160	**PJA505A158ZB**	FDTQ, FDTS, FDQS
PJA505A159ZA	FDE	**PHA505A025ZA**	FDKA22~71
PJA505A160ZA	FDTC		

● Model select switch (SW6)

Switch \ Model	22	28	36	45	56	71	90	112	140	160	224	280
SW6-1	OFF	ON	OFF	ON	OFF	ON	ON	OFF	ON	OFF	ON	OFF
SW6-2	OFF	OFF	ON	ON	OFF	OFF	ON	OFF	OFF	ON	ON	OFF
SW6-3	OFF	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	ON
SW6-4	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON	ON	ON	ON	ON

(iii) Check method when the error code is displayed

Remote controller or Indication board: Inspection LED, error code

Indoor unit PCB: Red LED (inspection display), Green LED (CPU. normal display)

Outdoor unit PCB: Red LED (inspection display), Green LED (CPU. normal display)

(iv) Check procedure depending on indication lamps (For the indoor unit)

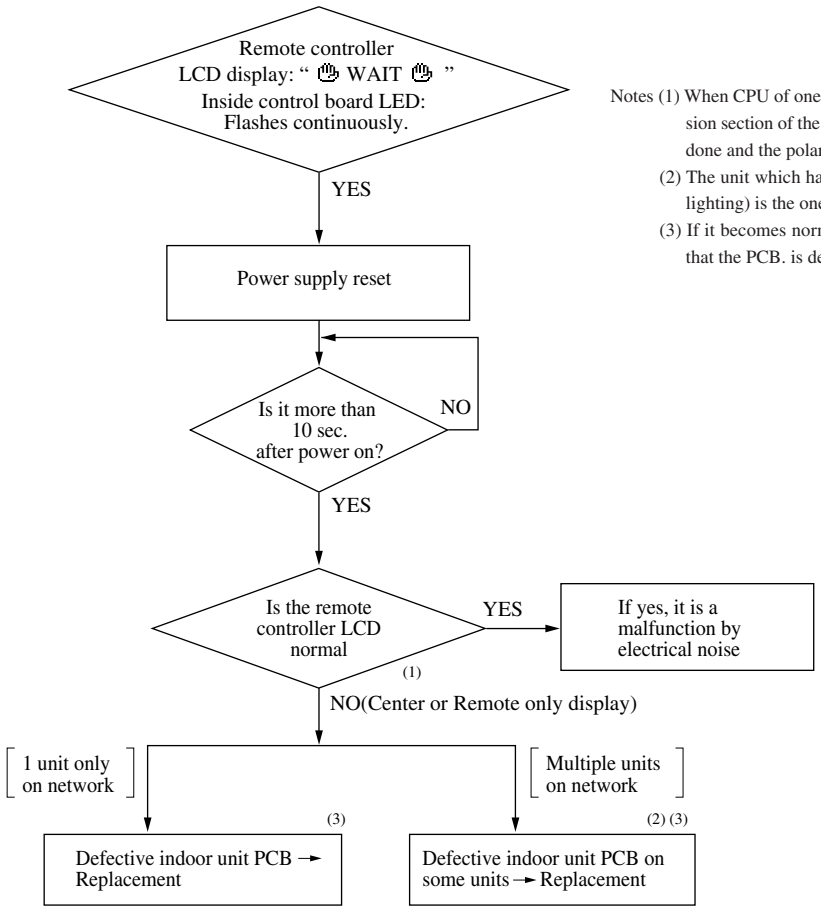
The next page error diagnosis is applicable to cases where only 1 unit is installed in a network unless stated otherwise but the check method is same even if there are multiple units on the network. Except the network occupation state due to out of control indoor unit CPU, the error display indicates the state of respective units. Check each unit specified by the error display as explained on next page.

1 **Error display : No display**
LCD display : No display

[Polarity determination trouble]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

- When the LCD display (Center/Remote, temperature display, etc.) of remote controller flashes, it means the polarity on the unit is not yet determined. Polarity determination is completed within a few seconds after the power on. If it is not completed in time, CPU out of control, etc. is suspected.

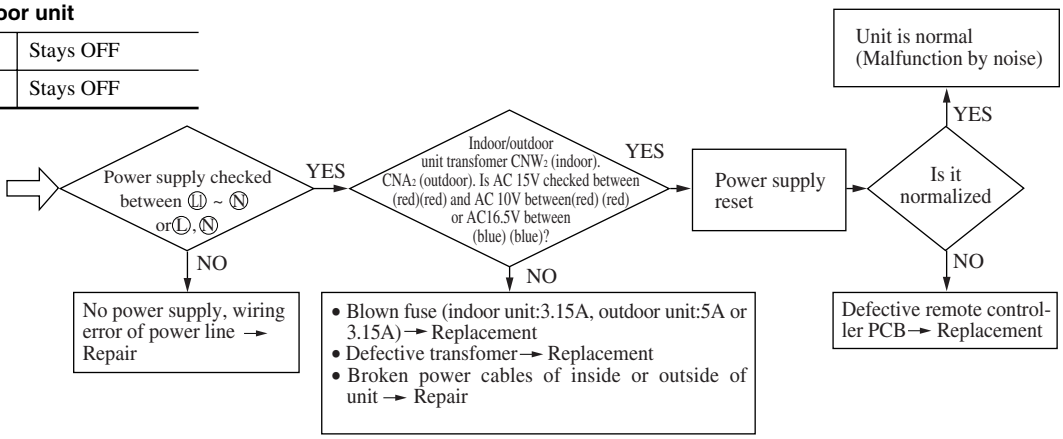


Notes (1) When CPU of one unit goes out of control, it occuping the transmission section of the network, so the transmission of other units are not done and the polarity of the whole network will not be determined.
(2) The unit which has its indoor and green LED keeps flashing (or no lighting) is the one with a defective indoor unit PCB.
(3) If it becomes normal after replacing the PCB. it can be considered that the PCB. is defective (defective network transmission circuit).

2 Error display : No display / LCD display : No display [Power supply line error]

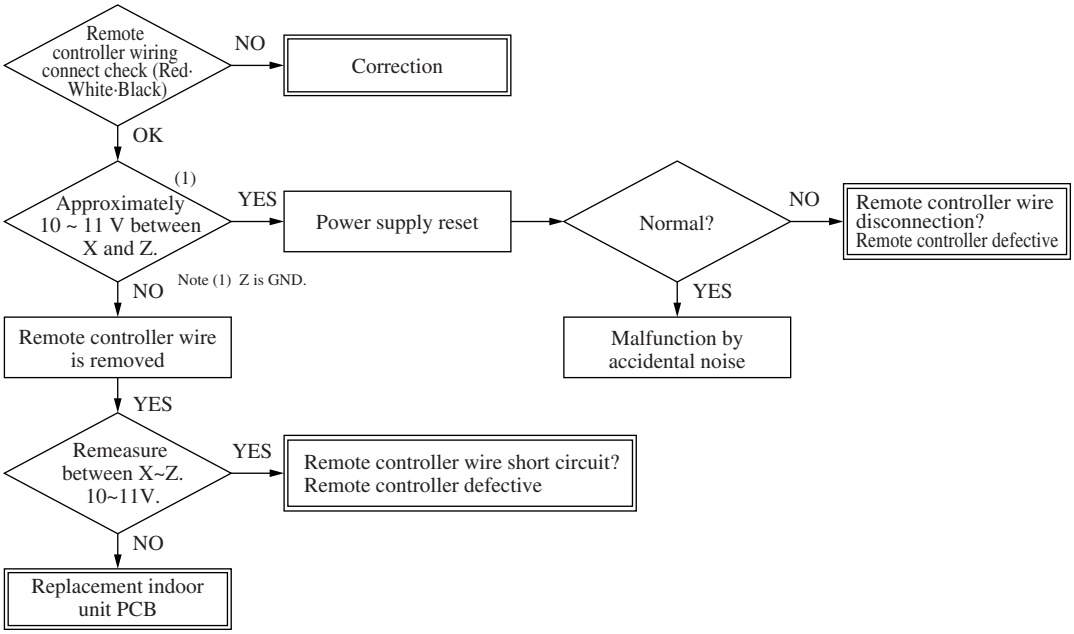
Outdoor unit	
Red LED	Stays OFF
Green LED	Stays OFF

Indoor unit	
Red LED	Stays OFF
Green LED	Stays OFF



Indoor unit		Outdoor unit	
Red LED	3 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

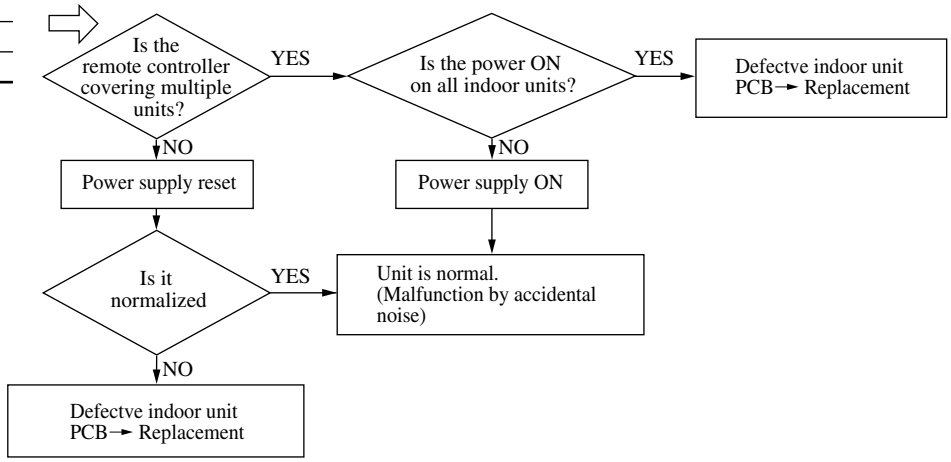
Flash of green LED means CPU is normal.



3 Error display : E1 [Communication error between remote controller~Indoor unit]

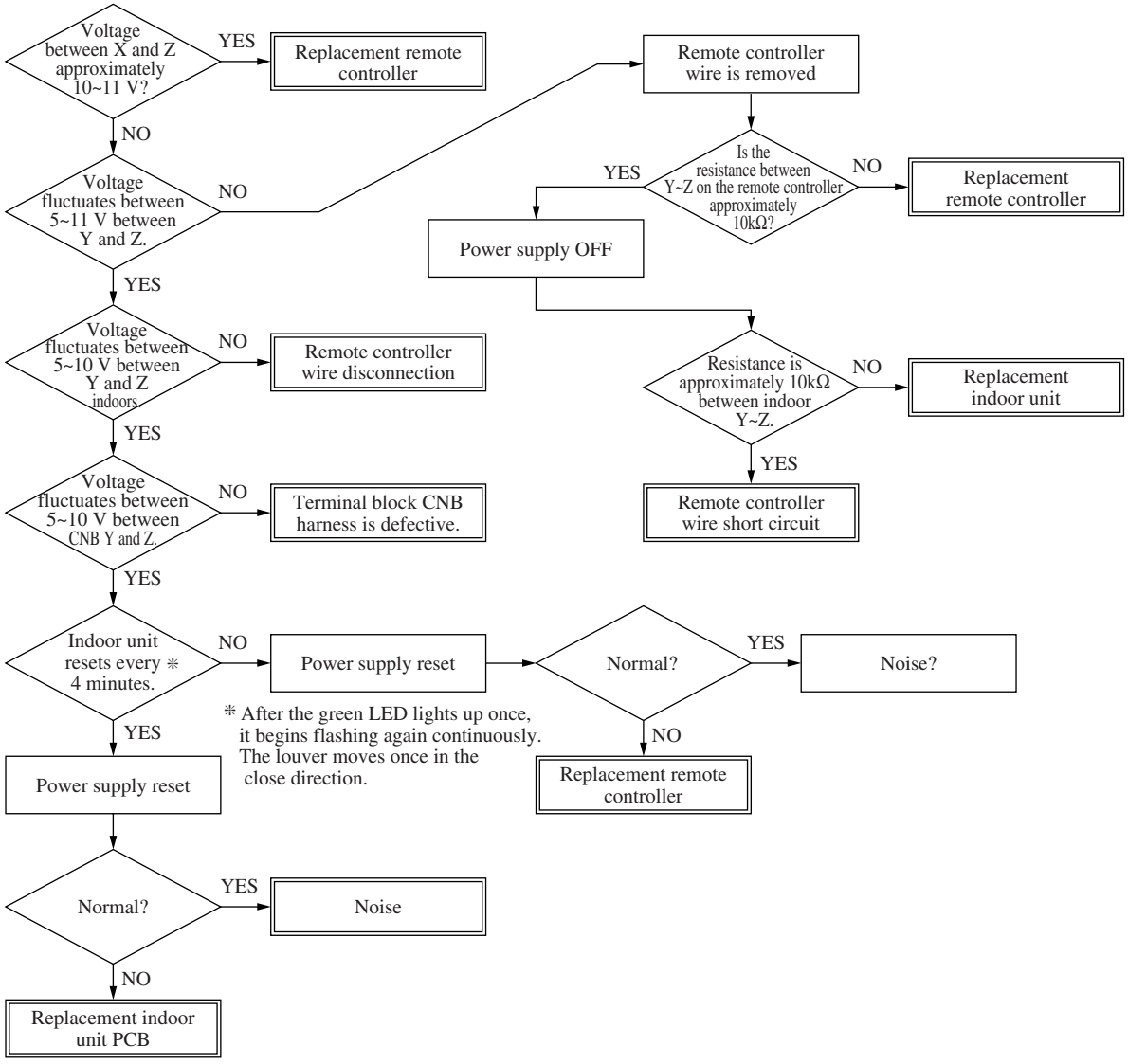
Indoor and outdoor unit	
Red LED	Stays OFF
Green LED	Keeps flashing (1)

Note (1) With the separate power supplies for indoor/outdoor units, the outdoor unit green LED may flash in some cases.

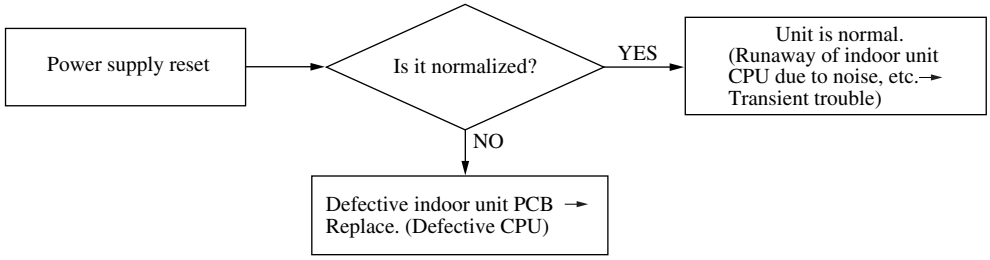


Indoor unit		Outdoor unit	
Red LED	*3 times flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

* Lamp OFF if remote controller wire is broken at power ON.

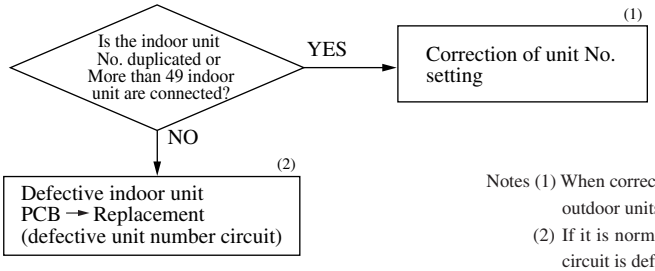


Indoor unit		Outdoor unit	
Red LED	Stays OFF or Lights continuously	Red LED	Stays OFF
Green LED	Stays OFF or Lights continuously	Green LED	Keeps flashing



4 Error display : E2 [Duplicated indoor unit No. or more than 49 indoor unit are connected.]

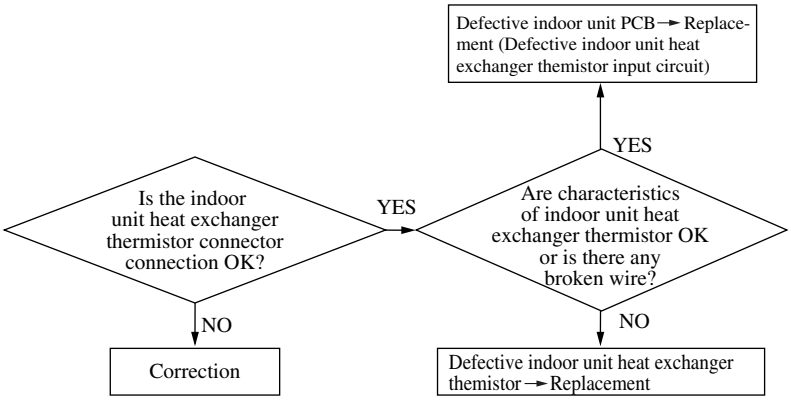
Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



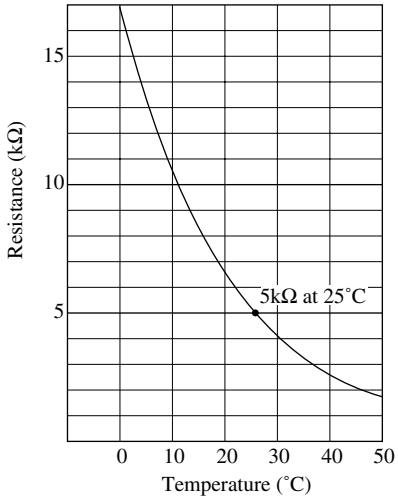
Notes (1) When correcting the unit number, check again the pairing of indoor/outdoor units (same Number assigned to coupled units) is correct.
(2) If it is normalized by changing PCB, judge the unit number input circuit is defective.

5 Error display : E6 [Defective indoor unit heat exchanger thermistor]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



Return air thermistor (Th_{I}-A)
Indoor unit heat exchanger thermistor (Th_{I}-R1, R2, R3)
Resistance temperature characteristics



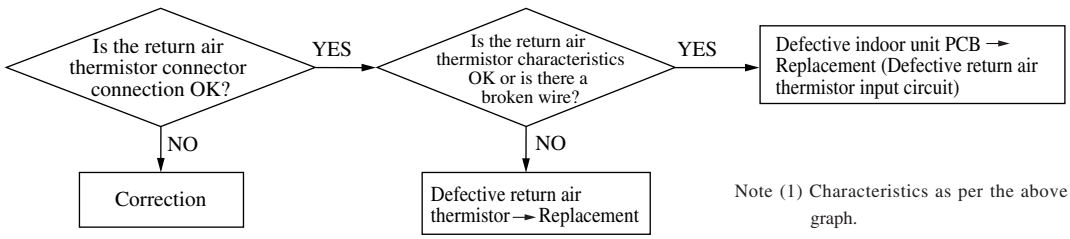
Note (1) 22.5 kΩ at -6˚C

● Display condition

If a temperature of –40ºC or lower is detected by the thermistor continuously for 5 seconds.

6 Error display : E7 [Detective return air thermistor]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



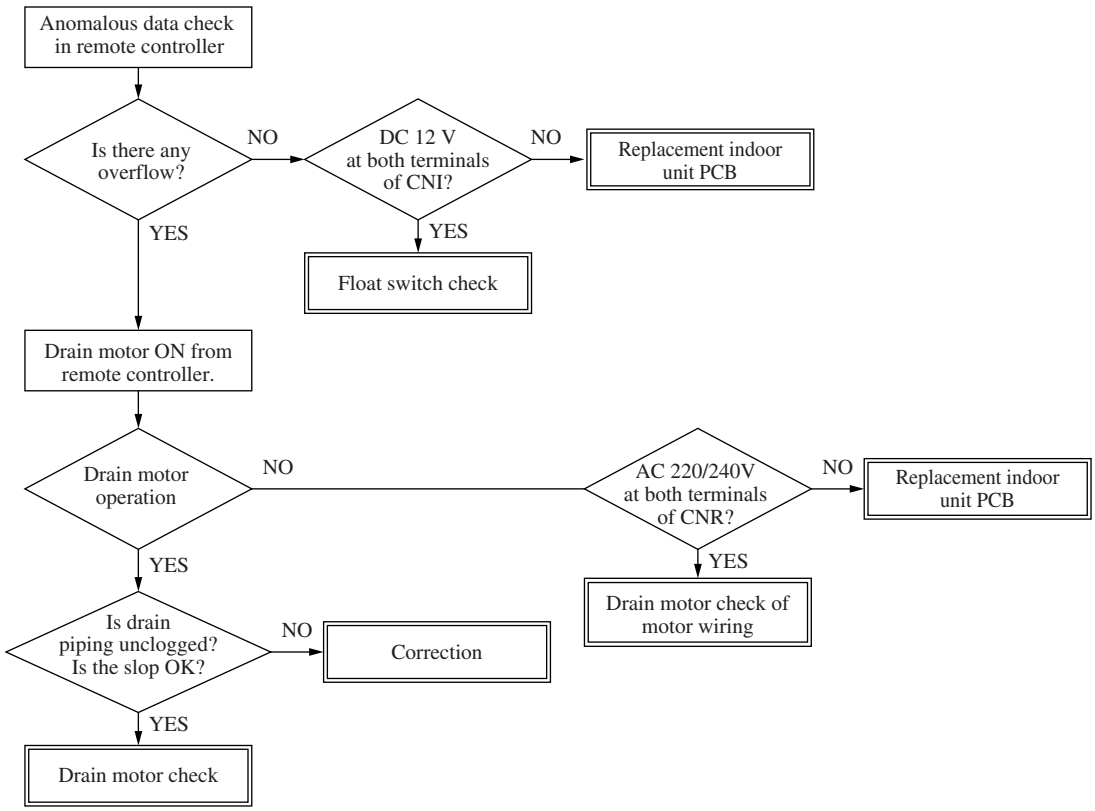
Note (1) Characteristics as per the above graph.

● Display Condition

If a temperature of –20ºC or lower is detected by the thermistor continuously for 5 seconds.

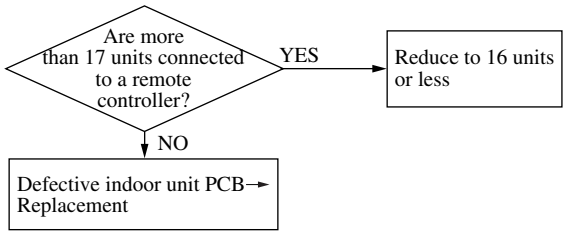
7 Error display : E9 [Drain trouble]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



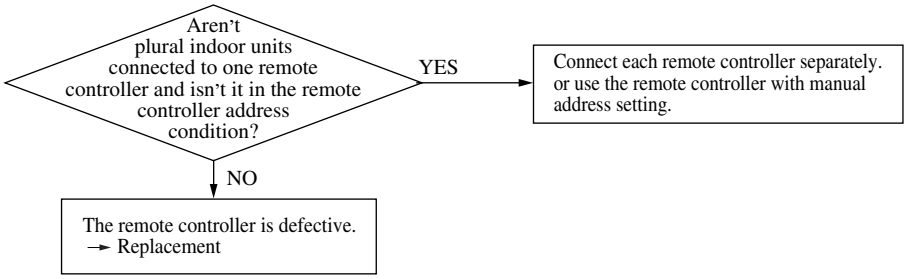
8 Error display : E10 [Control of 1 remote controller VS multiple units — Excessive number of units (more than 17 units)]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



9 Error display : E11 [Addresses setting for plural remote controllers]

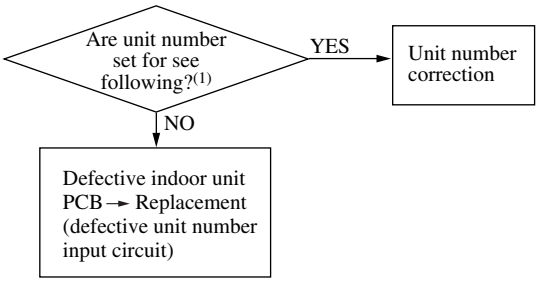
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



10 Error display : E12

[Address No. combination error or addressing is preformed with the following combinations.]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



Note (1)

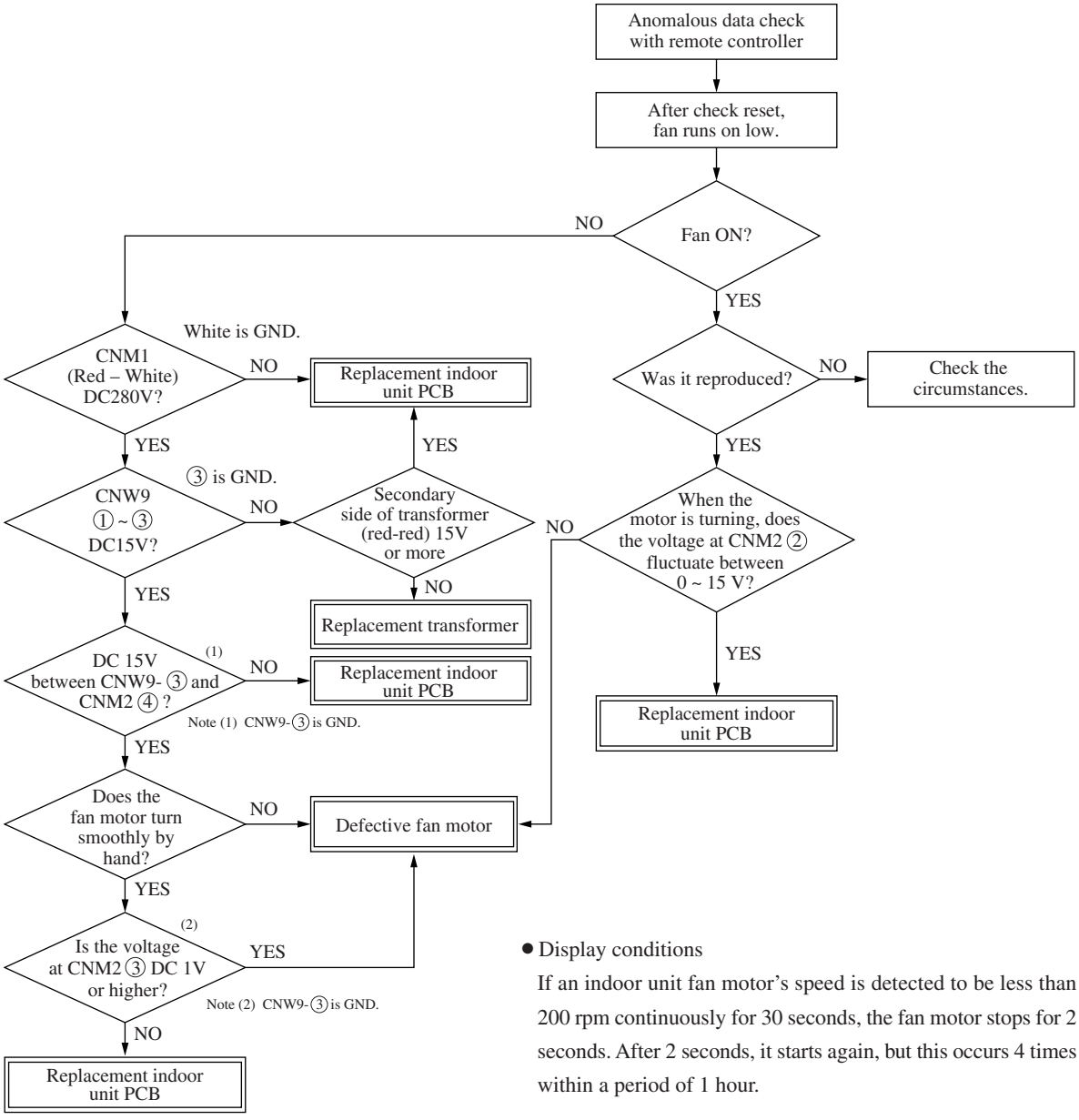
Outdoor unit address No.	Indoor unit address No.
00 ~ 47	48, 49
48, 49	00 ~ 47

11 Error display : E16

[Indoor unit fan motor anomaly]

Indoor unit		Outdoor unit	
Red LED	1 time flash	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing

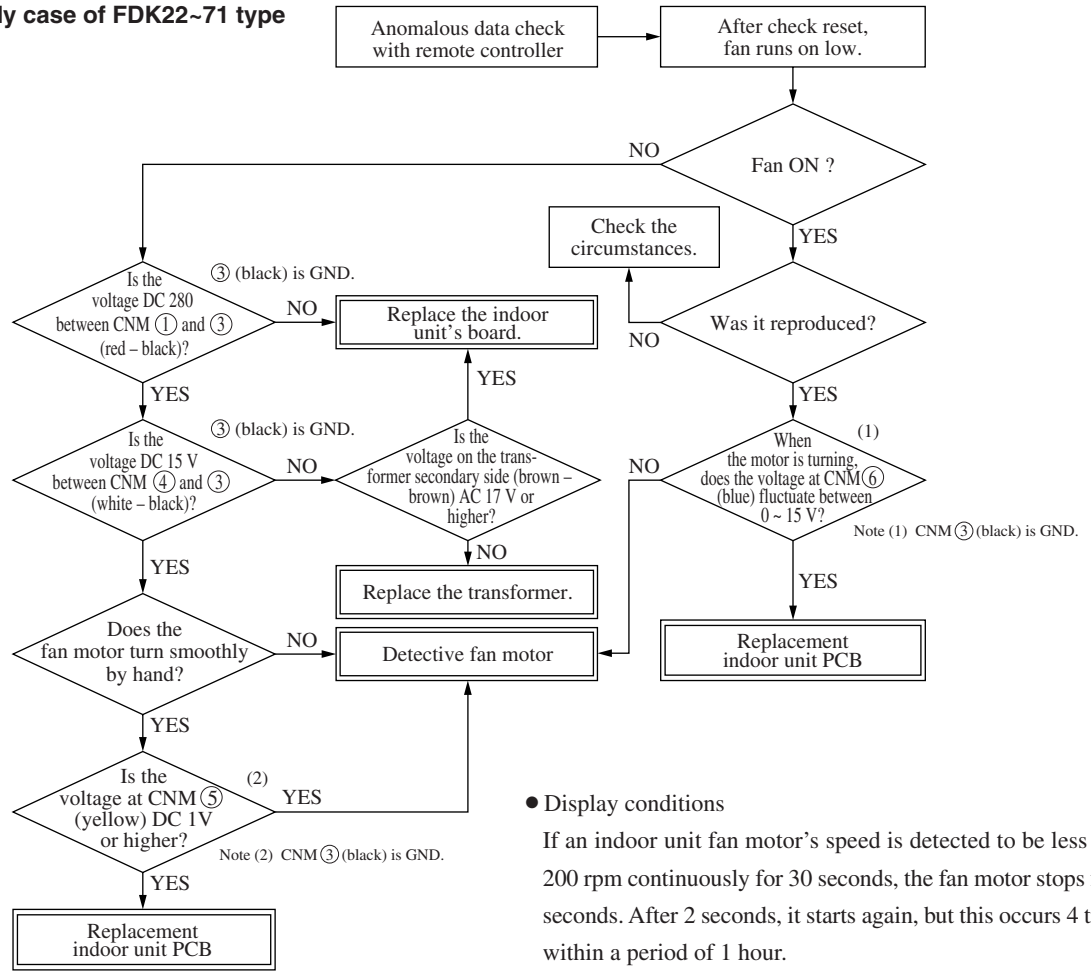
◆ **Only case of FDT112, 140, 160 type**



● Display conditions

If an indoor unit fan motor's speed is detected to be less than 200 rpm continuously for 30 seconds, the fan motor stops for 2 seconds. After 2 seconds, it starts again, but this occurs 4 times within a period of 1 hour.

◆ **Only case of FDK22~71 type**



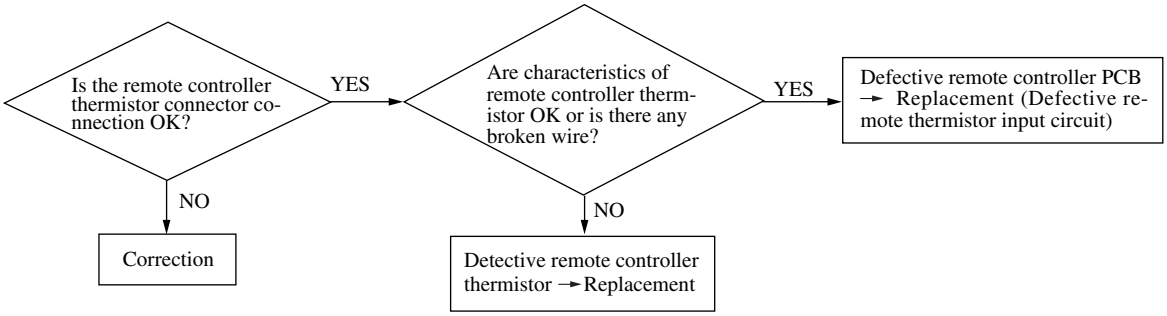
● Display conditions

If an indoor unit fan motor's speed is detected to be less than 200 rpm continuously for 30 seconds, the fan motor stops for 2 seconds. After 2 seconds, it starts again, but this occurs 4 times within a period of 1 hour.

---

12 Error display : E28 [Defective remote controller thermistor.]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



Resistance-temperature characteristic of remote controller thermister

Temperrature(°C)	Resistance value (kΩ)	Temperrature(°C)	Resistance value (kΩ)	Temperrature(°C)	Resistance value (kΩ)	Temperrature(°C)	Resistance value (kΩ)
0	65	14	33	30	16	46	8.5
1	62	16	30	32	15	48	7.8
2	59	18	27	34	14	50	7.3
4	53	20	25	36	13	52	6.7
6	48	22	23	38	12	54	6.3
8	44	24	21	40	11	56	5.8
10	40	26	19	42	9.9	58	5.4
12	36	28	18	44	9.2	60	5.0

(c) Error diagnosis procedures at the outdoor unit side

At the error diagnosis related to the outdoor unit, check at first the error code of remote controller and the illumination patterns of normal 1 and inspection display lamps in the same manner as the case of indoor unit.

Then estimate the outline, the cause and the location of error based on the pattern and proceed to the inspcetion and repair.

Since the self diagnosis function by means of the microcomputers of indoor/outdoor units provide the judgement of error of microcomputers them selves irregularity power supply line, overload, etc. caused by the installation space, inadequate volume of refrigerant etc., the location and cause of trouble will be discovered without difficulty.

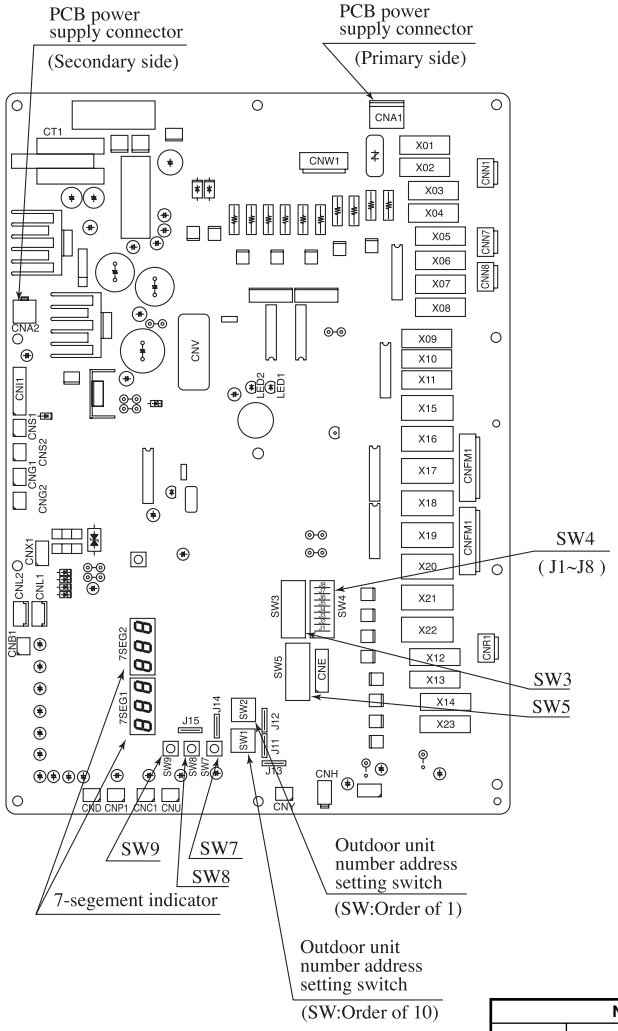
In addition, the display lamps error code of indoor/outdoor unit is kept flashing, (except when the power supply is iterrupted) after the irregularity is automatically recovered to give irregularity information to the service presonnel. If any mode of higher priority than the error retained in memory occurs after the reset of error, it is switched to that mode and saved in the memory.

(i) Replacement parts assembly related to the outdoor unit PCB

Outdoor unit PCB, outdoor unit inverter PCB, power transistor module, diode module, capacitor, reactor, noise filter, thermistor, (heat exchanger, discharge pipe, outdoor temperature etc.), fuse, transformer, etc.

(ii) Parts layout on the outdoor unit PCB

Models FDCA140HKXEN4R, 140HKXES4R, 160HKXES4R



• Function of DIP switch

Name		Function
SW3-1	ON	Inspection LED reset
	OFF	Normal
SW3-2	ON	Check operation - Effective
	OFF	Check operation - Invalid
SW3-4	ON	Service SW - Service
	OFF	Service SW - Normal
SW3-5	ON	Check operation - Check
	OFF	Check operation - Normal
SW3-6	ON	Piping washing operation
	OFF	Normal
SW3-7	ON	Forced cooling/heating
	OFF	Normal
SW3-8	ON	Test mode
	OFF	None
SW5-1	ON	Test run
	OFF	Normal
SW5-2	ON	Test run operation - Cooling
	OFF	Test run operation - Heating
SW5-3	ON	Pump down
	OFF	Normal

• Function of jumper wire

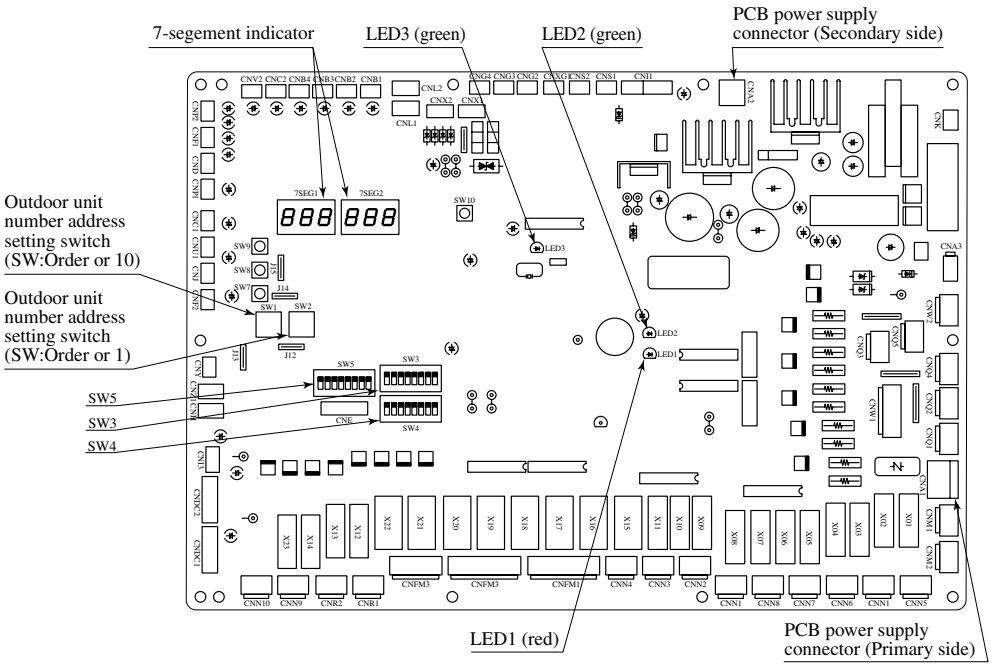
Name		Function
J8 (SW4-8)	With	Snow protection control - None
	None (1)	Snow protection control - With
J13	With	External input level
	None (1)	External input pulse
J15	With	Defrosting - Normal
	None (1)	Defrosting - Cold weather region

Model \ Jumper wire	J1 (SW4-1)	J2 (SW4-2)	J3 (SW4-3)
FDCA140HKXEN4R	None (1)	None (1)	None (1)
FDCA140HKXES4R	With	None (1)	None (1)
FDCA160HKXES4R	With	None (1)	None (1)

Name				Function	
J6 (SW4-6)	With	J5 (SW4-5)	With	Demand change (Compressor capability)	80%
			None (1)	Demand change (Compressor capability)	60%
	None (1)		With	Demand change (Compressor capability)	40%
			None (1)	Demand change (Compressor capability)	0%

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut.

Models FDCA224HKXE4BR~FDCA680HKXE4BR
FDCA224HKXRE4BR~FDCA680HKXRE4BR



• Function of DIP switch

Name		Function
SW3-1	ON	Inspection LED reset
	OFF	Normal
SW3-2	ON	Backup operation-With
	OFF	Backup operation-None
SW3-3	ON	Renewal
	OFF	Normal
SW3-7	ON	Forced cooling/heating
	OFF	Normal
SW3-8	ON	Test mode
	OFF	Normal
SW5-1	ON	Test run operatopm
	OFF	Normal
SW5-2	ON	Test run operation Cooling
	OFF	Test run operation - Heating
SW5-3	ON	Pump down
	OFF	Normal

SW4-1	SW4-2	SW4-3	SW4-4	Models
OFF	OFF	OFF	OFF	**FDCA224**
ON	OFF	OFF	OFF	**FDCA280**
OFF	ON	OFF	OFF	**FDCA335**
OFF	ON	OFF	OFF	**FDCA335-K**
OFF	OFF	ON	OFF	**FDCA400**
ON	OFF	ON	OFF	**FDCA450**
OFF	ON	ON	OFF	**FDCA504**
ON	ON	ON	OFF	**FDCA560**
OFF	OFF	OFF	ON	**FDCA615**
ON	OFF	OFF	ON	**FDCA680**

• Function of jumper wire

Name		Function
J13	With	External input level
	None (1)	External input pulse
J14	With	Defrosting temp. - Strengthening
	None (1)	Defrosting temp. - Normal
J15	With	Defrosting time - Cold weather region
	None (1)	Defrosting time - Normal

Note (1) "None" means that jumper wire is not provided on the PCB or the connection is cut.

Name				Function
SW4-6	ON	SW4-5	ON	Demand change (Compressor capability) 0%
			OFF	Demand change (Compressor capability) 40%
	OFF		ON	Demand change (Compressor capability) 60%
			OFF	Demand change (Compressor capability) 80%
–		SW4-7	ON	Address setup of master/slave unit-slave
			OFF	Address setup of master/slave unit-master

• Replacement procedure of outdoor unit control printed circuit board.

Micromputer printed circuit board can replaced with following procedure.

1) Confirm the parts numbers. (Refer to the following parts layout drawing for the location of parts number.)

Parts No.	Model
PCB505A042NF	FDCA140HKXEN4R
PCB505A042NA	FDCA140HKXES4R, 160HKXES4R
PCB505A042MC	FDCA224HKXE4BR, 280HKXE4BR, 335HKXE4BR
PCB505A041ZD	FDCA335HKXE4BRK, 400HKXE4BR~680HKXE4BR
PCB505A042RC	FDCA224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR
PCB505A042RF	FDCA335HKXRE4BRK, 400HKXRE4BR~680HKXRE4BR

(iii) Parts layout on the outdoor unit inverter PCB

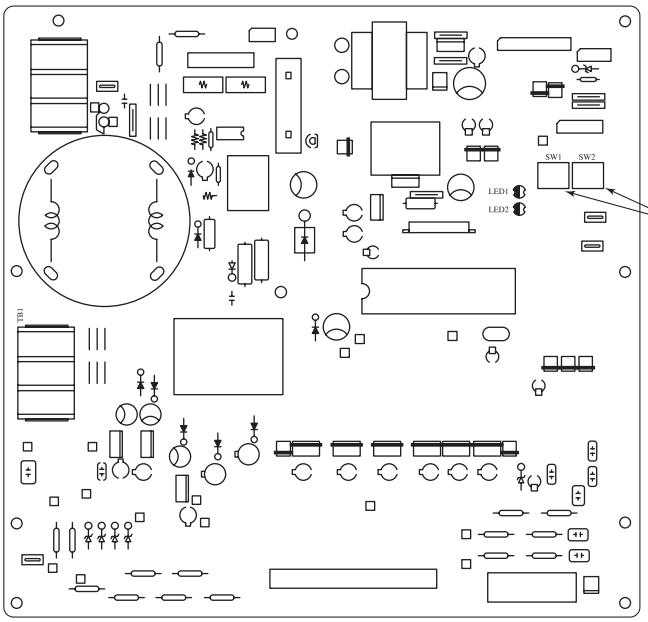
● **Replacement procedure of outdoor unit inverter printed circuit board**

Inverter printed circuit board can replaced with following procedure.

1) Confirm the parts numbers. (Refer to the following parts layout drawing for the location of parts number.)

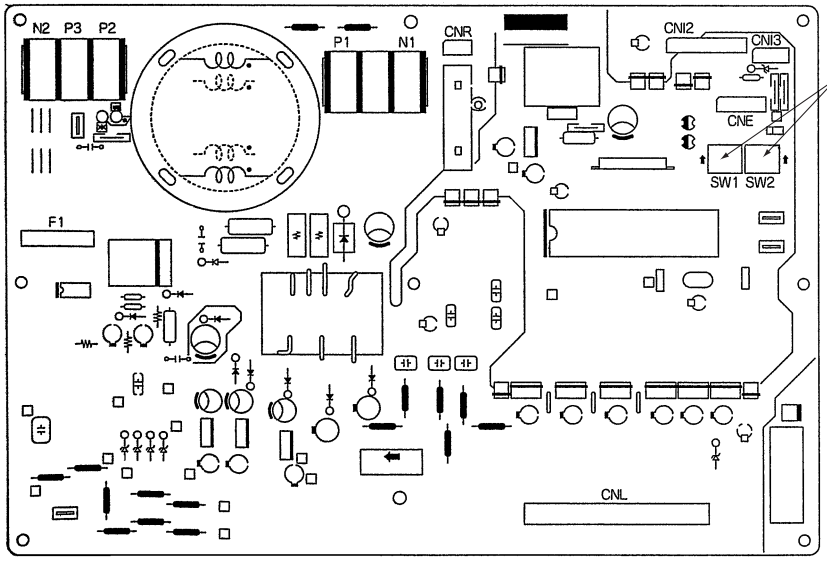
Parts No.	Model
PCB505A044ZD	FDCA140HKXEN4R
PCB505A044ZG	FDCA140HKXES4R, 160HKXES4R
PCB505A044ZA	FDCA224, 280, 335
PCB505A044ZB	FDCA335-K, 400~680

Models FDCA140HKXEN4BR, 140HKXES4BR, 160HKXES4BR, 224HKXE4BR, 280HKXE4BR, 335HKXE4BR
224HKXRE4BR, 280HKXRE4BR, 335HKXRE4BR



SW1,2
(It is OFF besides
SW2-1 (ON) entirely)

Models FDCA335HKXE4BRK, 400HKXE4BR~680HKXE4BR
FDCA335HKXRE4BRK, 400HKXRE4BR~680HKXRE4BR



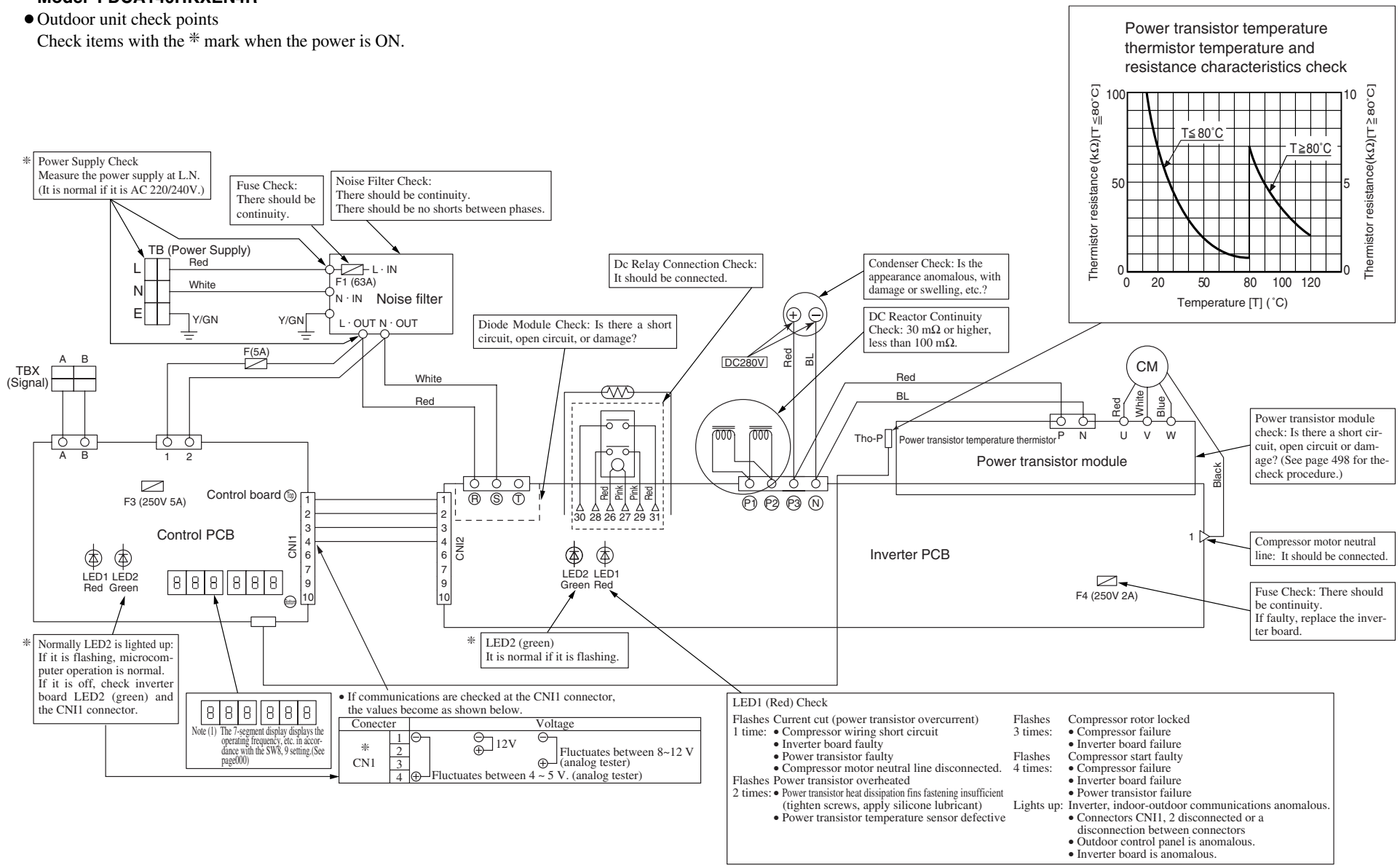
SW1,2
(It is OFF besides
SW2-1 (ON) entirely)

Outdoor Unit controller failure diagnosis circuit diagram

Model FDCA140HKXEN4R

● Outdoor unit check points

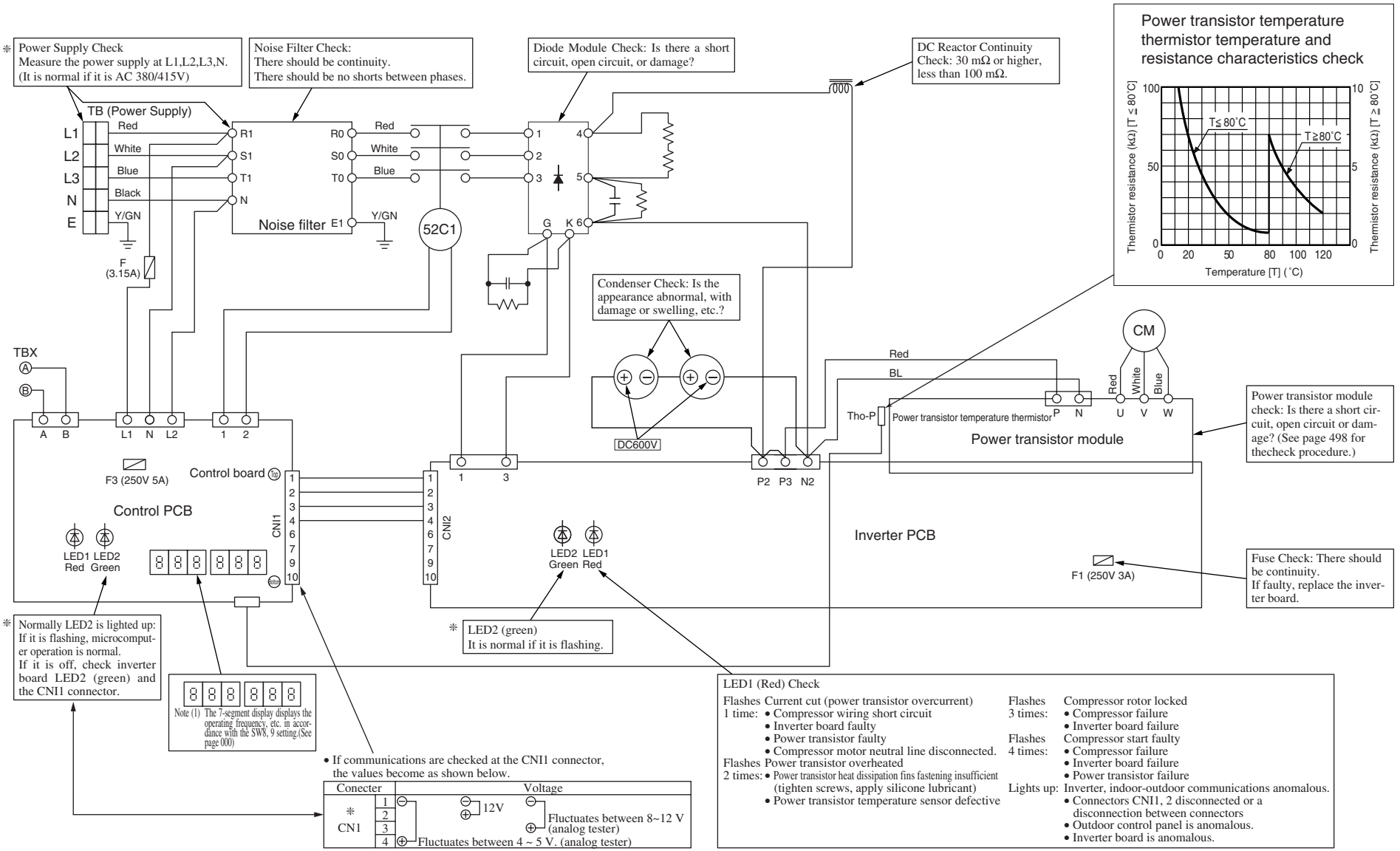
Check items with the ✻ mark when the power is ON.



Model FDCA140HKXES4R, 160HKXES4R

● Outdoor unit check points

Check items with the ✻ mark when the power is ON.

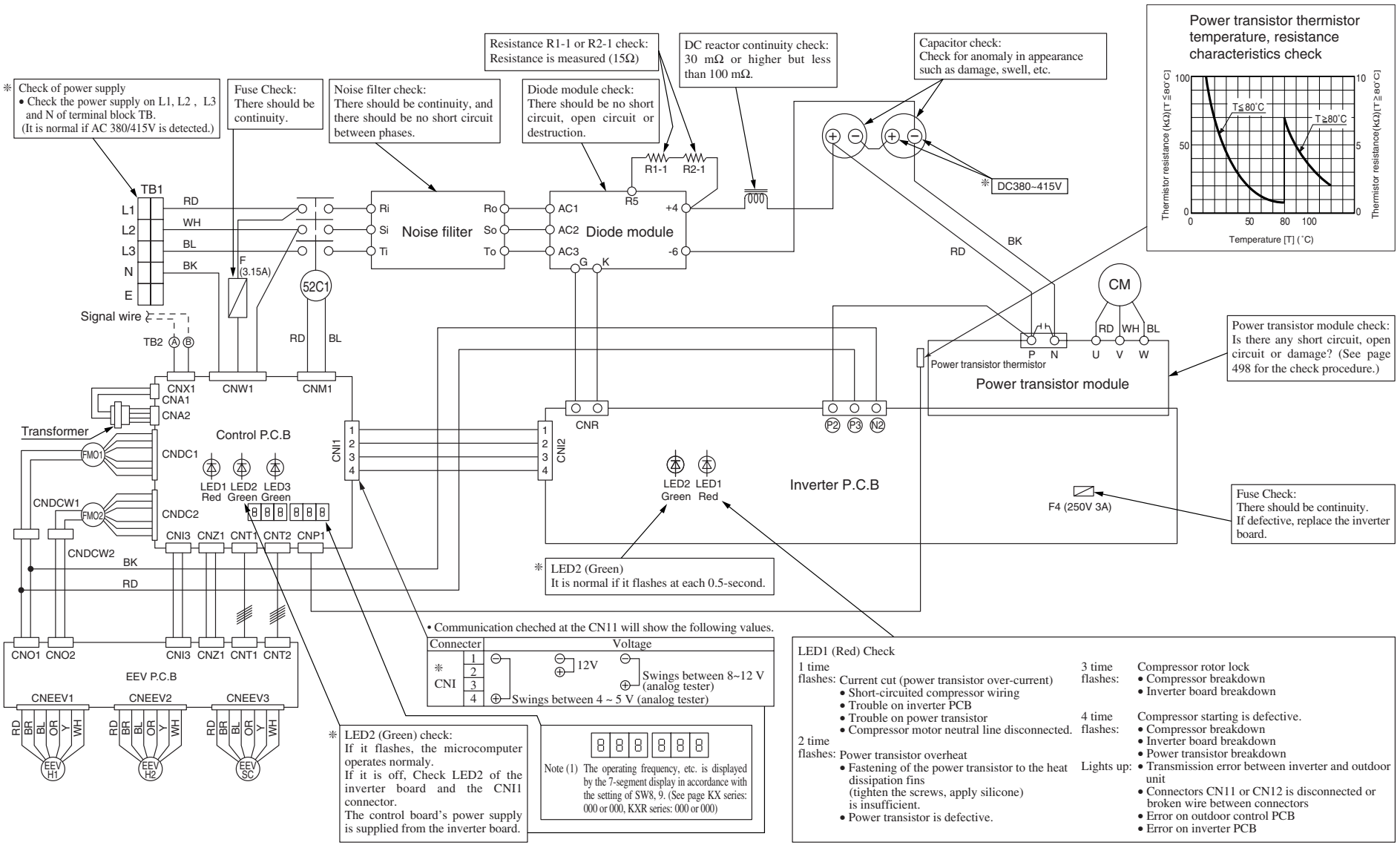


● Check points of inverter outdoor unit

▷ Check with power ON at the points marked with ✳.

This figure applies to the FDCA224, 280, 335.

The FDCA335-K, and 400~680 have 2 inverter related systems.



(iv) Check procedure depending on indication lamps (For the outdoor unit)

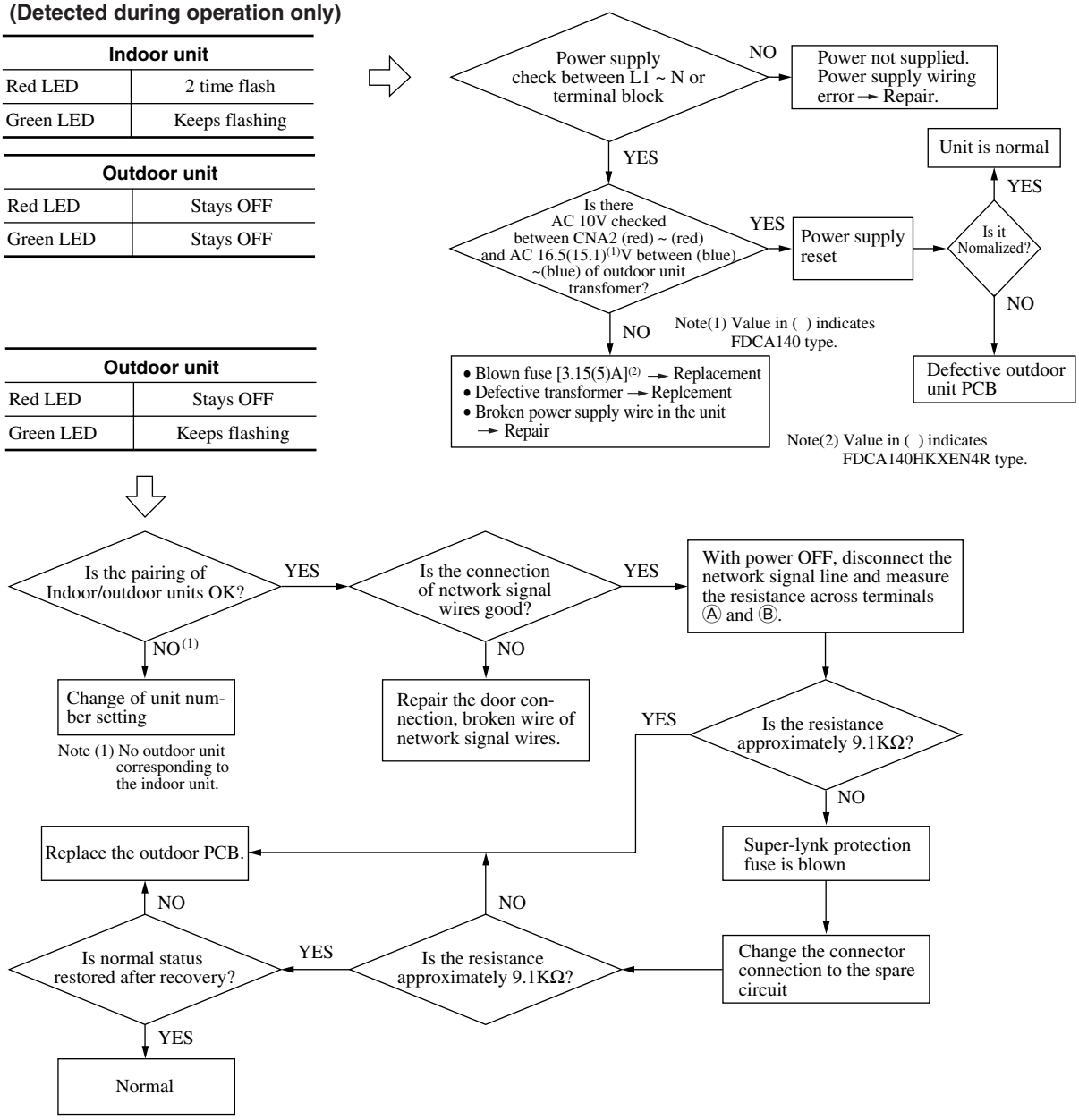
1 **Error display : E3** **[Error on the outdoor unit signal line]**

(Detected during operation only)

Indoor unit	
Red LED	2 time flash
Green LED	Keeps flashing

Outdoor unit	
Red LED	Stays OFF
Green LED	Stays OFF

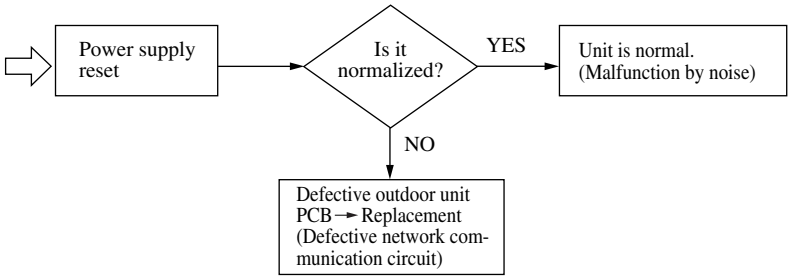
Outdoor unit	
Red LED	Stays OFF
Green LED	Keeps flashing



Error display : E3 **[Error on the outdoor unit signal line]**

(Detection at the power on)

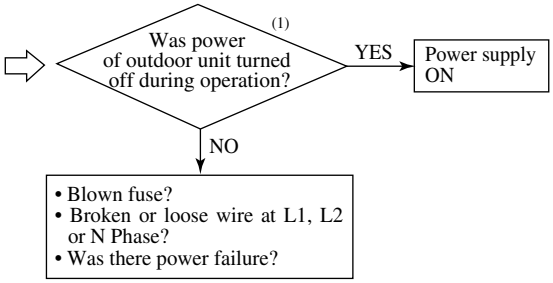
Outdoor unit	
Red LED	Stays OFF or Lights continuously
Green LED	Irregular illumination



2 Error display : E5 [Outdoor unit signal line error, power supply error]

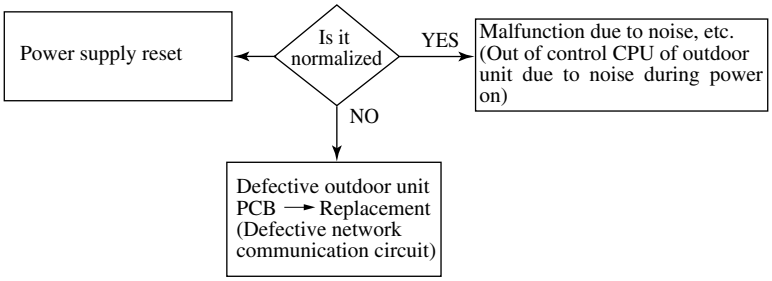
Indoor unit	
Red LED	2 time flash
Green LED	Keeps flashing

Outdoor unit	
Red LED	Stays OFF
Green LED	Stays OFF

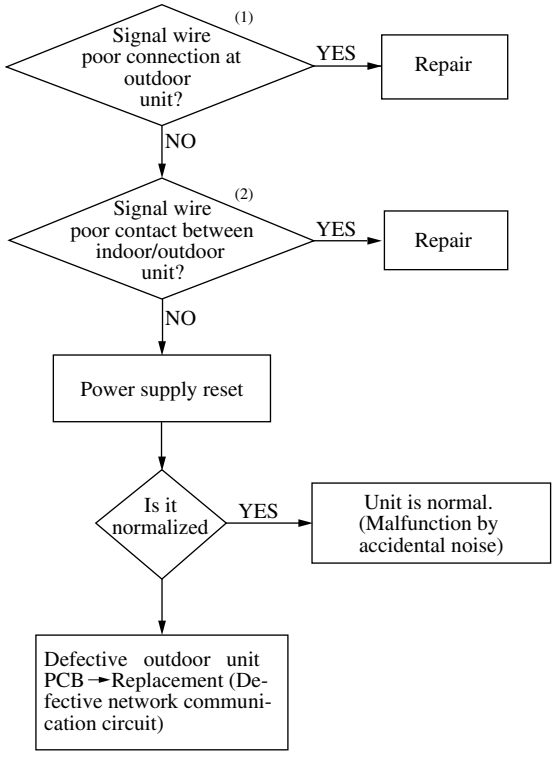


Note (1) This case is limited to the separate power supplies to indoor/outdoor units. (Combination of (indoor unit) red LED 2 time flash and (outdoor unit) green LED stays off means that the power supply to the outdoor unit has been interrupted during operation.)

Outdoor unit	
Red LED	Stays OFF or Keeps flashing
Green LED	Irregular illumination



Outdoor unit	
Red LED	Stays OFF
Green LED	Keeps flashing



Notes (1) Check for poor connection (looseness, misconnection) at outdoor unit terminal block and droken signal wires between outdoor units.

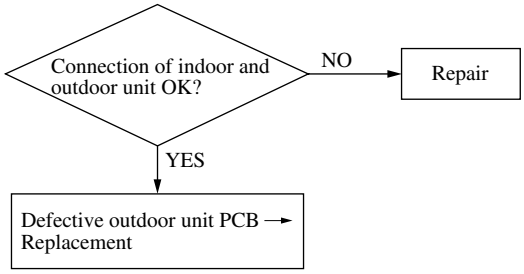
(2) Check the poor connection or broken signal wires between indoor/outdoor units.

3

Error display : E30
7-segment display : E30

[Connection error indoor and outdoor unit]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

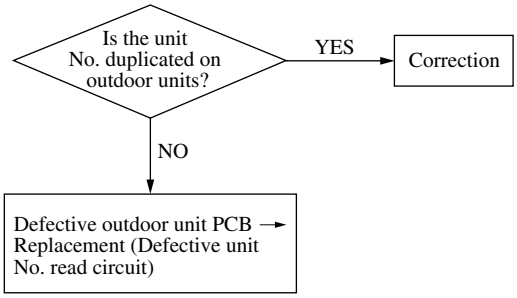


4

Error display : E31
7-segment display : E31

[Duplicated unit No. of outdoor units]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



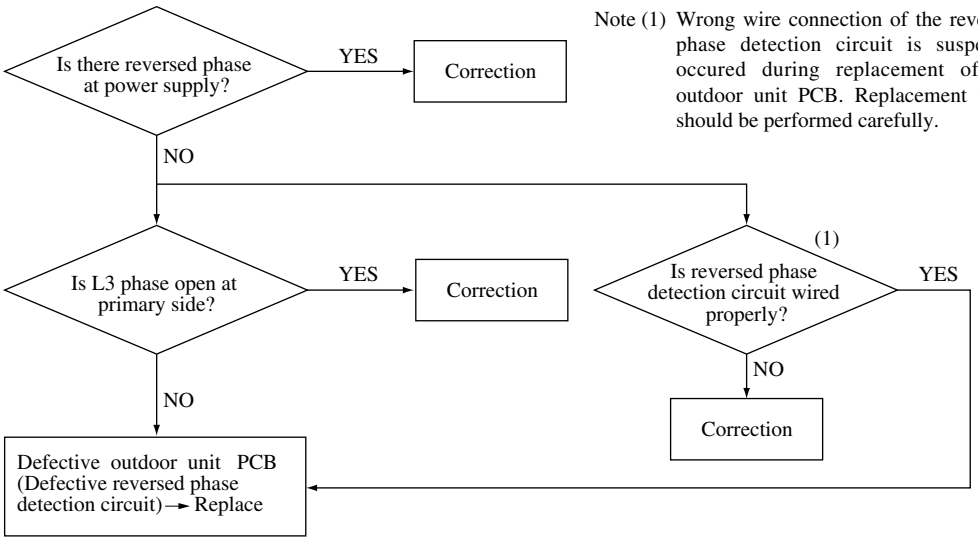
5

Error display : E32
7-segment display : E32

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

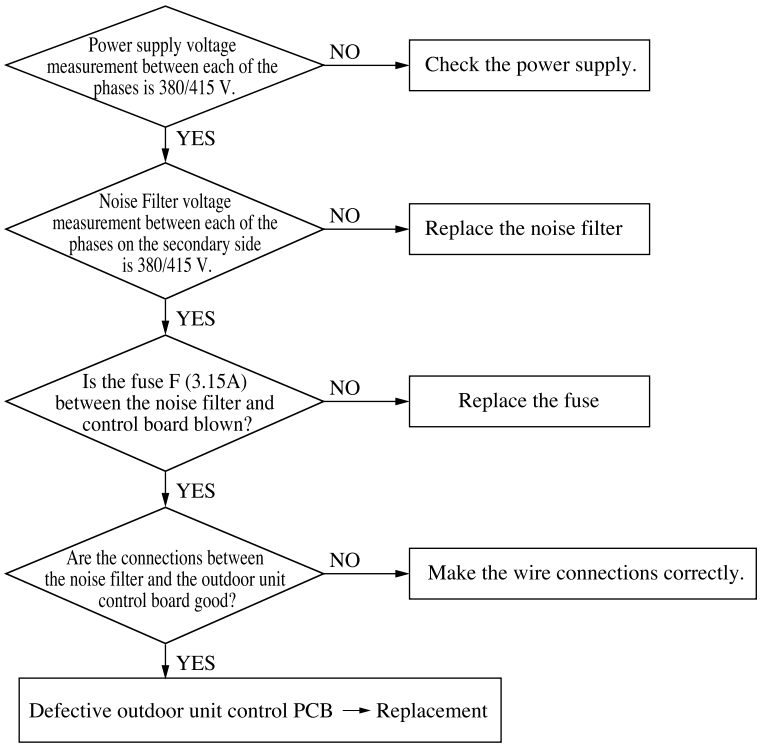
Models FDCA224~1360

[Reversed phase on power supply or open 52C L3 phase (primary side) on power supply]



Note (1) Wrong wire connection of the reversed phase detection circuit is suspected occured during replacement of the outdoor unit PCB. Replacement work should be performed carefully.

Model FDCA140HKXES4R, 160HKXES4R
[Absence of L2 phase (voltage detection)]

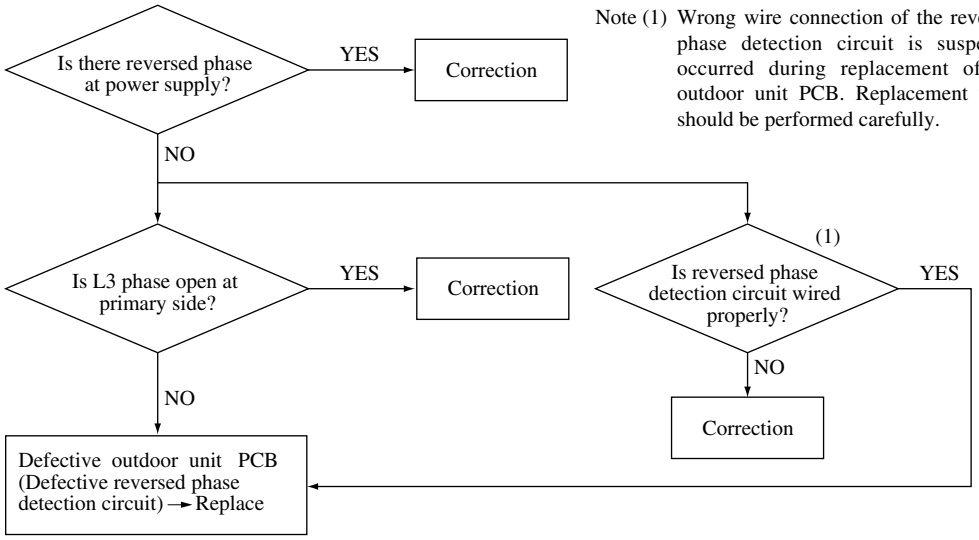


6

Error display : E34
7-segment display : E34

[Reversed phase on power supply or open 52C L3 phase (primary side) at power supply]
(Only case of FDCA140HKXES4R and 160HKXES4R model)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

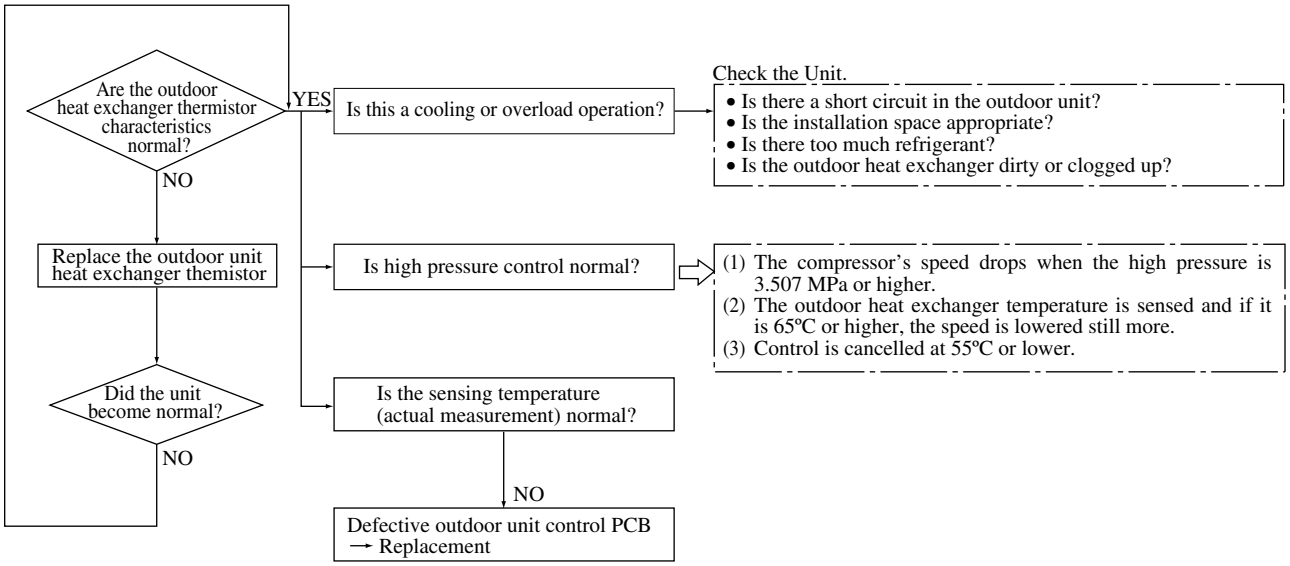


Note (1) Wrong wire connection of the reversed phase detection circuit is suspected occurred during replacement of the outdoor unit PCB. Replacement work should be performed carefully.

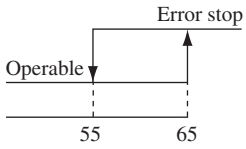
7 Error display : E35 [Cooling high pressure error]

7-segment display : E35

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



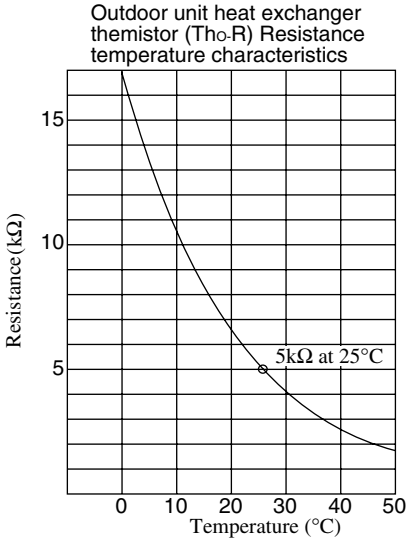
• Anomalous Temperature Detection



Outdoor unit heat exchanger temp. (ºC)

• Display Conditions

If a temperature of 65ºC or higher is detected 5 or more times within 60 minutes in the outdoor heat exchanger, including when the compressor is stopped, or this temperature is detected continuously for 60 minutes.

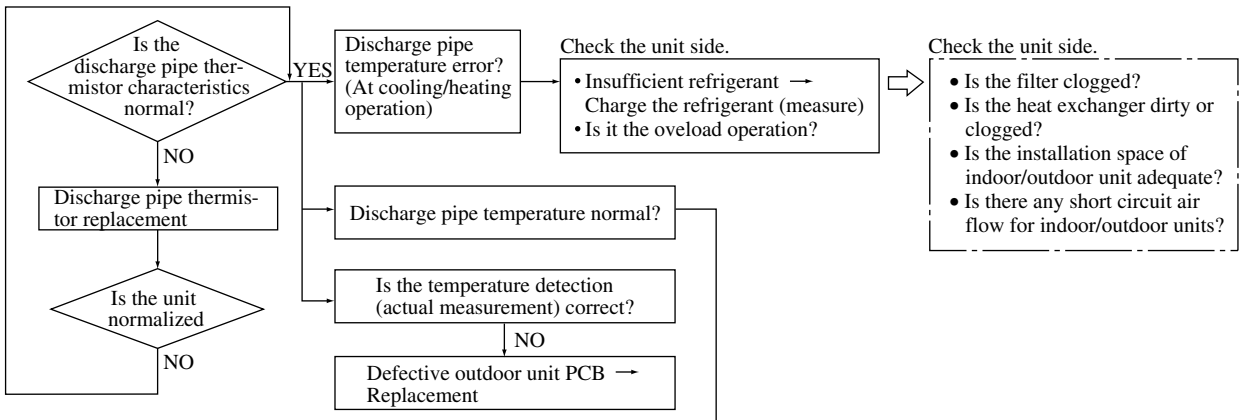


8 Error display : E36 [Discharge temperature error]

7-segment display : E36-1 / E36-2

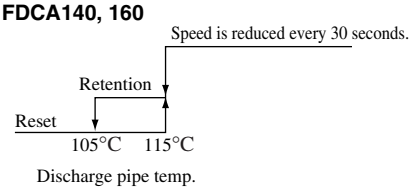
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1): Single flashing (E36-1) of outdoor unit LED indicates Tho-D1 and double flashing (E36-2) indicates Tho-D2.

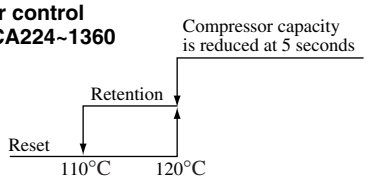


If the discharge pipe temperature (Tho-D1, 2) exceeds the set value the capacity of the compressor are controlled to restrict the rise in the discharge pipe temperature.

◆ Compressor control
• Models FDCA140, 160



◆ Compressor control
• Models FDCA224~1360



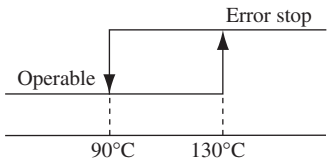
● Display conditions

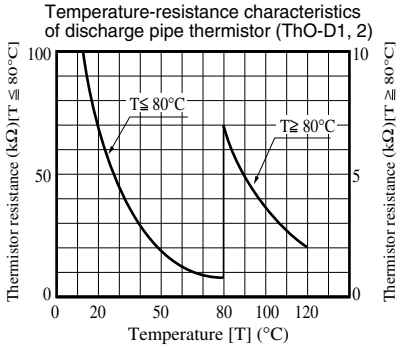
If the discharge pipe temperature becomes 130˚C or higher for 2 seconds, the compressor stops.

If it drops to 90˚C or lower, the compressor restarts, but, if this operation occurs 2 (5) times within 60 minutes.

Note (1) Value in ( ) indicater FDCA140, 160 type.

● Anomalous temperature detection





9

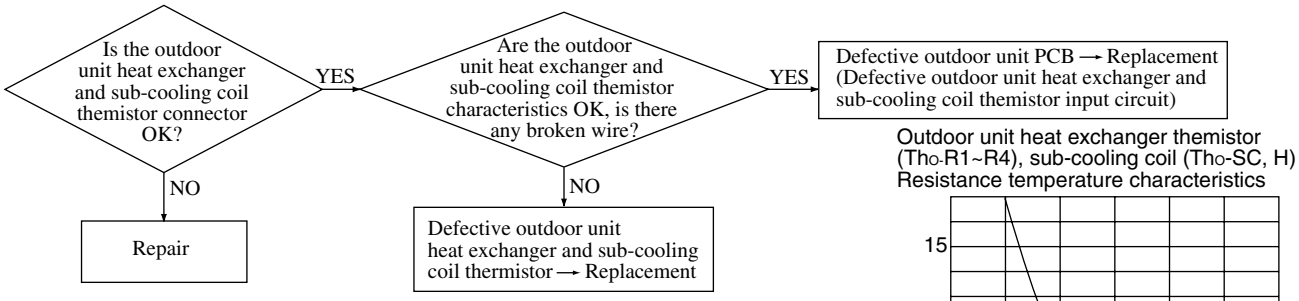
Error display : E37

7-segment display : E37-1 E37-2 E37-3 E37-4 E37-5 E37-6

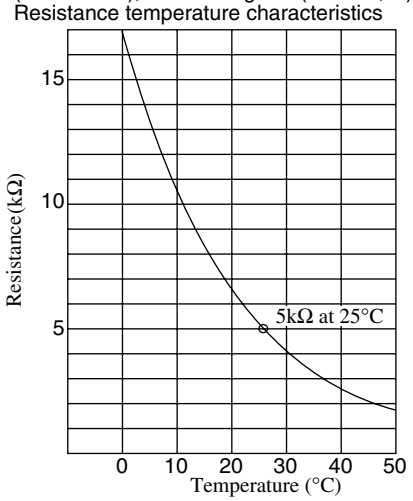
[Defective outdoor unit heat exchanger and sub-cooling coil thermistor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Tho-R1 flashes 1 time (E37-1), Tho-R2 flashes 2 times (E37-2), Tho-R3 flashes 3 times (E37-3), Tho-R4 flashes 4 times (E37-4), Tho-SC flashes 5 times (E37-5), Tho-H flashes 6 times (E37-6).



Outdoor unit heat exchanger themistor (Tho-R1~R4), sub-cooling coil (Tho-SC, H) Resistance temperature characteristics



● Display conditions

If the temperature sensed by the thermistor is –50˚C or lower continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 40 minutes.

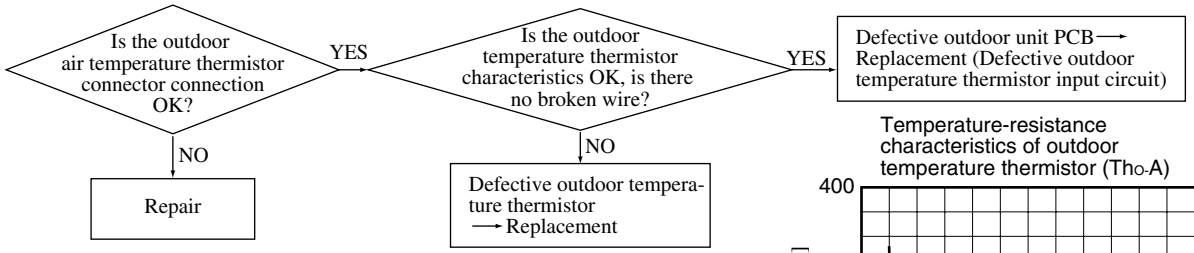
10

Error display : E38

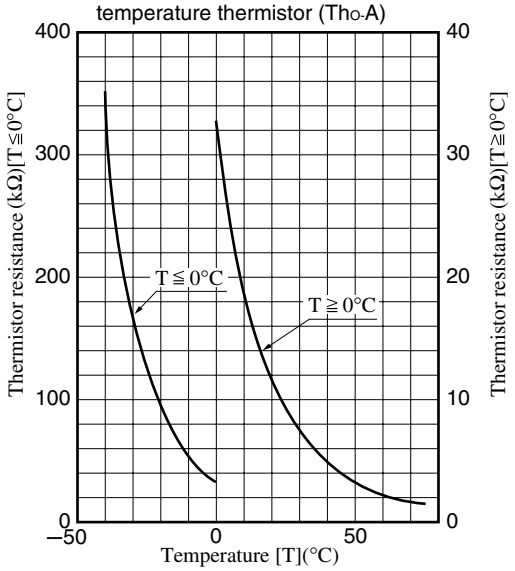
7-segment display : E38

[Defective outdoor temperature thermistor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



Temperature-resistance characteristics of outdoor temperature thermistor (Tho-A)



● Display Conditions

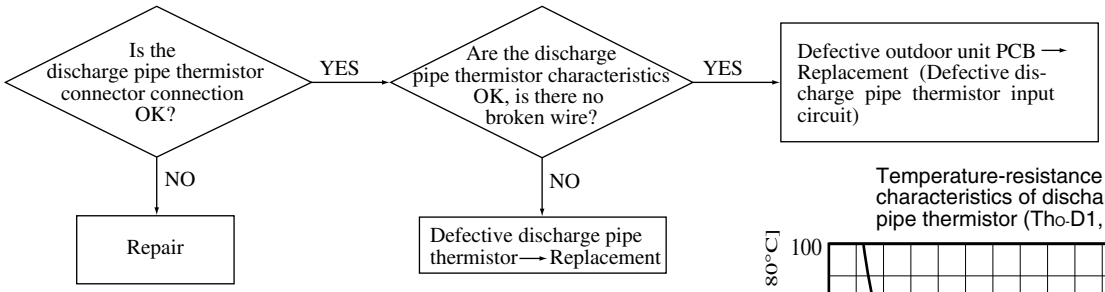
If the temperature detected by the thermistor is –30˚C or lower continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this condition is detected 3 times within 40 minutes.

11 Error display : E39 [Defective discharge pipe thermistor]

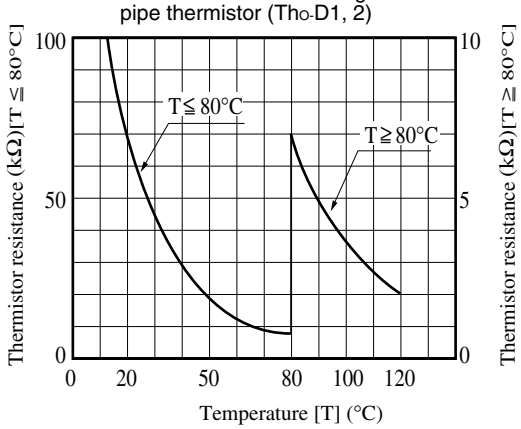
7-segment display : E39-1, E39-2

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing (E39-1) of outdoor unit LED indicates Tho-D1 and double flashing (E39-2) indicates Tho-D2.



Temperature-resistance characteristics of discharge pipe thermistor (Tho-D1, 2)



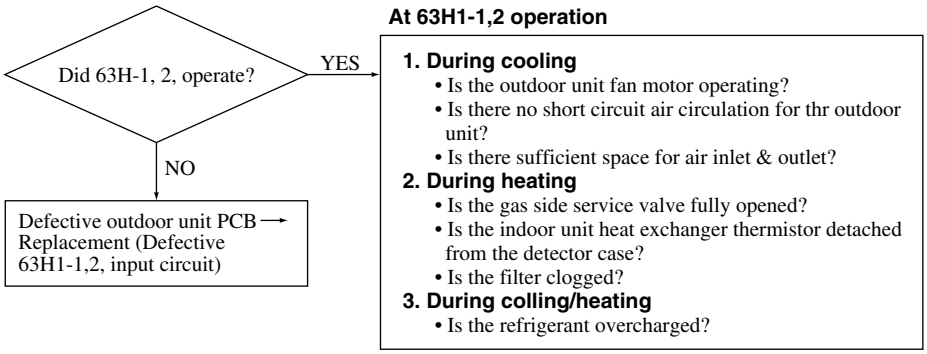
● Display conditions

If the temperature sensed by the thermistor is 3˚C or lower continuously for 5 seconds between 10 minutes and 10 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 40 minutes.

12 Error display : E40 [63H1-1,2, motion]

7-segment display : E40

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

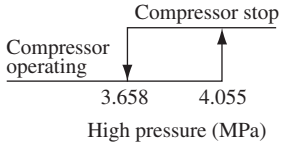


● Display conditions

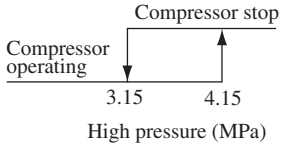
If the 63H1-1,2 goes OFF (open), the compressor stops. After a 3 minute delay, the compressor restarts. If this condition is detected 5 times within 60 minutes, or if the (open) state continues for 60 minutes without interruption.

● Anomalous pressure detection

Models FDC140, 160



Models FDCA224~1360

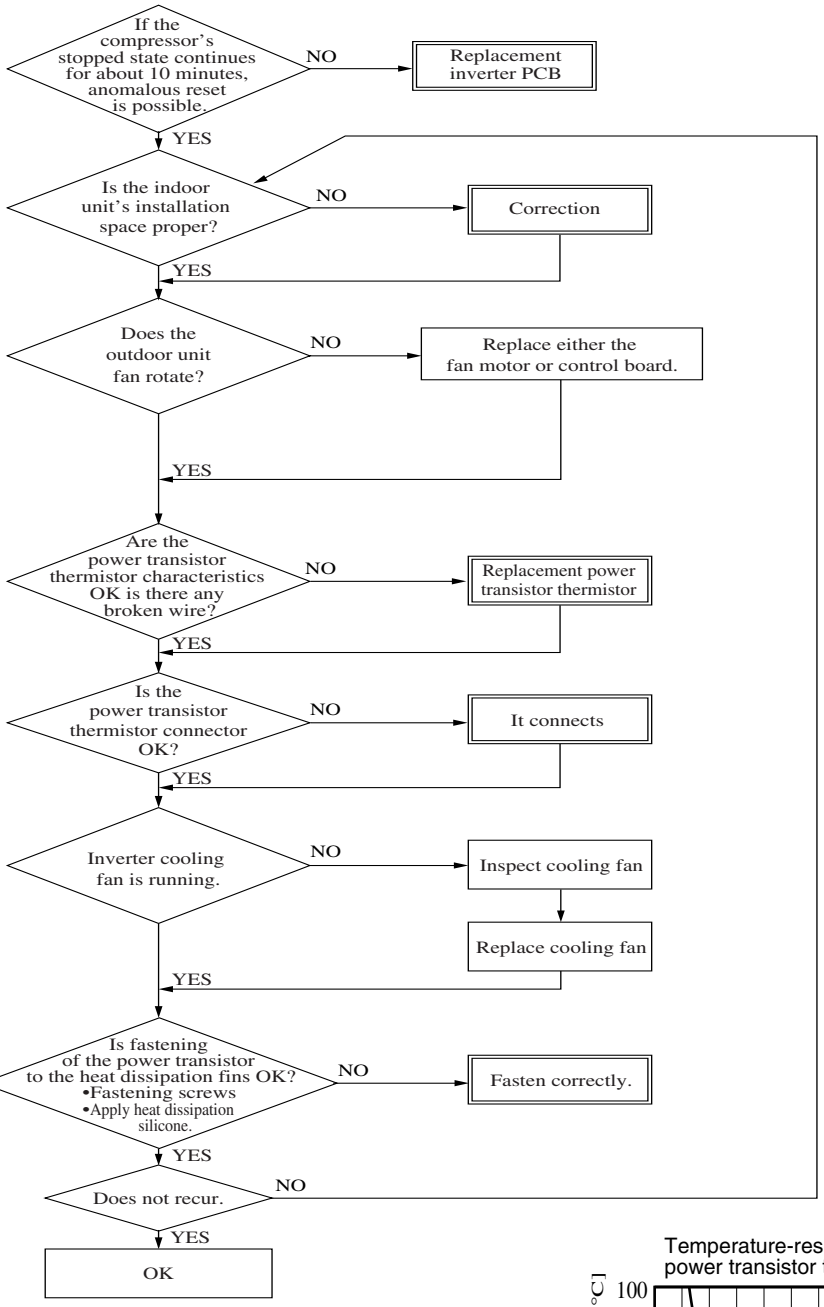


13 Error display : E41 [Power transistor overheating]

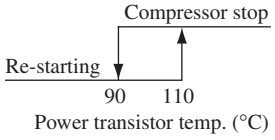
7-segment display : E41-1 / E41-2

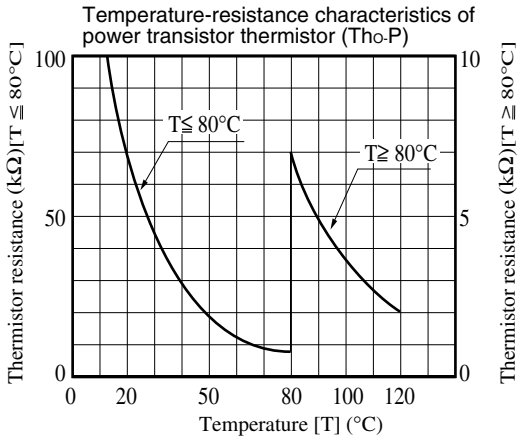
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing (E41-1) of outdoor unit LED indicates power transistor (CM1) overheat and double flashing (E41-2) indicates power transistor (CM2) overheat.



- Display conditions
  If the power transistor's temperature exceeds the set value, the compressor stops.
  When the temperature drops to 90˚C or lower, the compressor restarts, but if this occurs 5 times within 1 hour, or if this condition continues uninterrupted for 1 hour.
- Anomalous temperature detection.



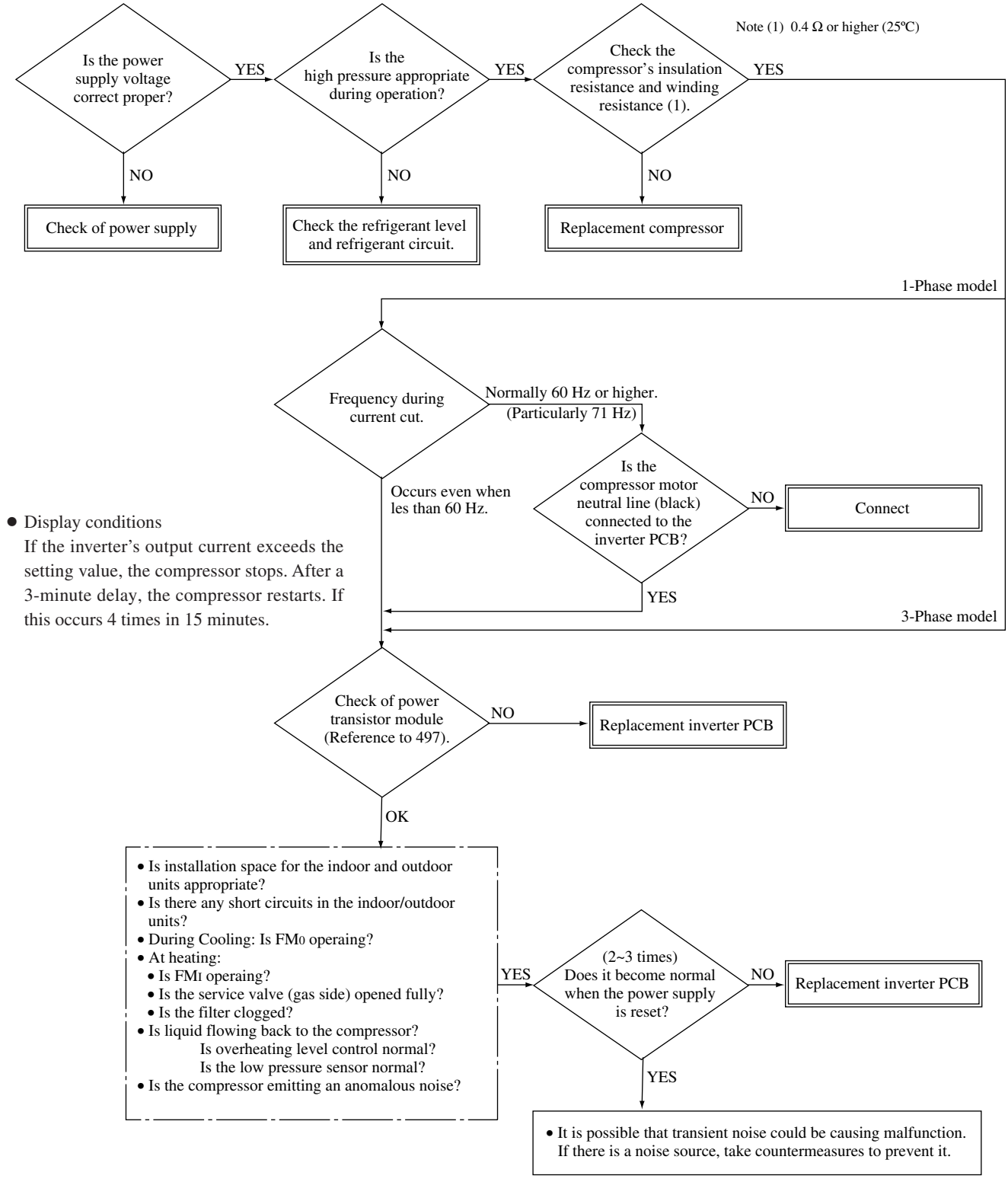


14 Error display : E42 [Current cut]

7-segment display : E42-1 / E42-2

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

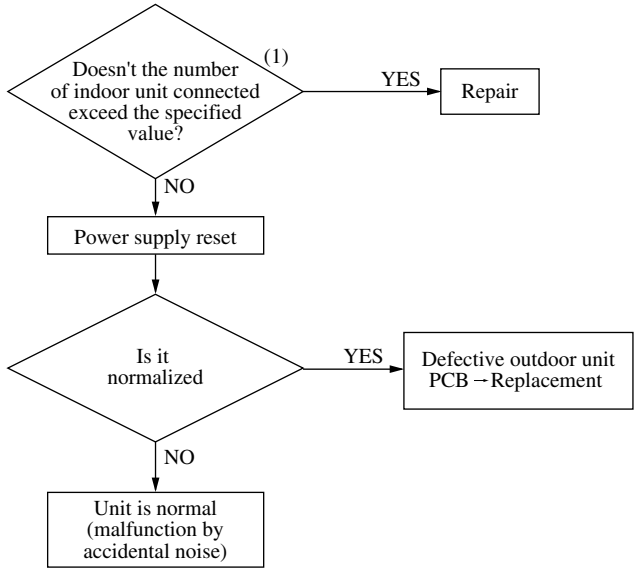
Note (1) Single flashing (E42-1) of outdoor unit LED indicates current cut (CM1) and double flashing (E42-2) indicates current cut (CM2).



- Display conditions
  If the inverter's output current exceeds the setting value, the compressor stops. After a 3-minute delay, the compressor restarts. If this occurs 4 times in 15 minutes.

15 Error display : E43 / 7-segment display : E43 [Excessive number of indoor units connected]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

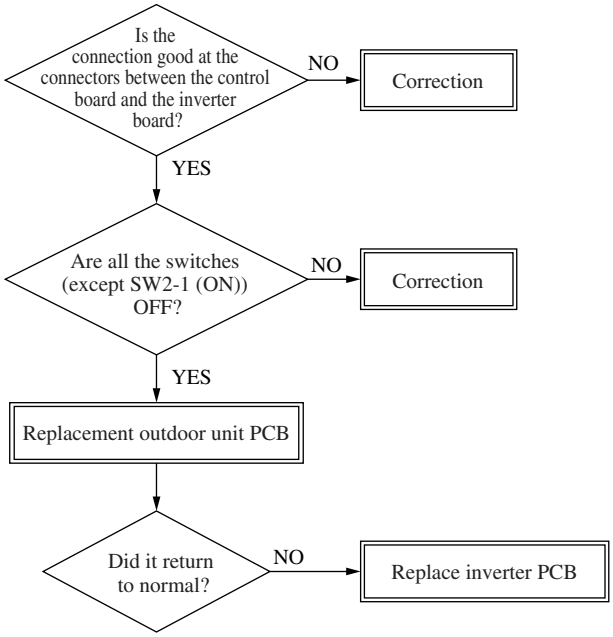


Notes (1) The maximum number of connectable units of each model is as follows :
FDCA140 type 6 (8), FDCA160 type 8
FDCA224 type 13, FDCA280 type 16
FDCA335 type 20, FDCA400 type 23
FDCA450 type 26, FDCA735 type 43
FDCA800 type 47, FDCA850~1360 type 48.
(2) Outdoor No. setting check for indoor units (to see if outdoor No. is of other system)
(3) In case of auto addressing erase the addresses stored in memory and perform re-setting

16 Error display : E45 / 7-segment display : E45-1 E45-2 [Transmission error between inverter and Outdoor unit PCB]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing (E45-1) of outdoor unit LED indicates transmission error between inverter and outdoor unit PCB (CM1).
Double flashing (E45-2) of outdoor unit LED indicates transmission error between inverter and outdoor unit PCB (CM2).

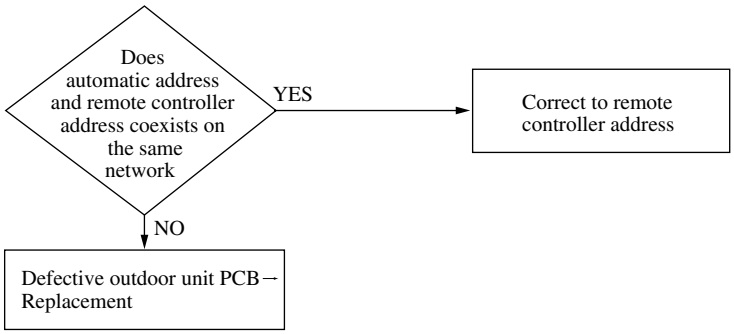


17

Error display : E46
7-segment display : ——

Automatic address setting and remote controller address setting coexists in the same network

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	Stays OFF
Green LED	Keeps flashing	Green LED	Keeps flashing



18

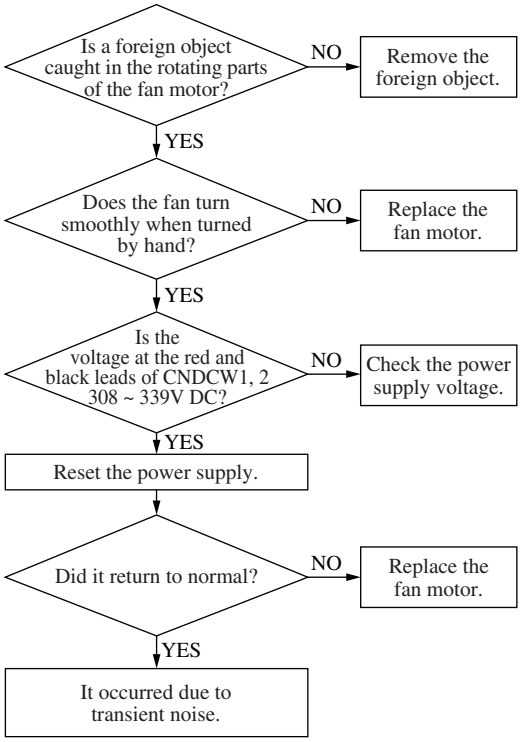
Error display : E48
7-segment display : E48-1 E48-2

[Anomaly in outdoor fan motor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing (E48-1) of outdoor unit LED indicates FM01 and double flashing (E48-2) indicates FM02.

• When outdoor unit is running

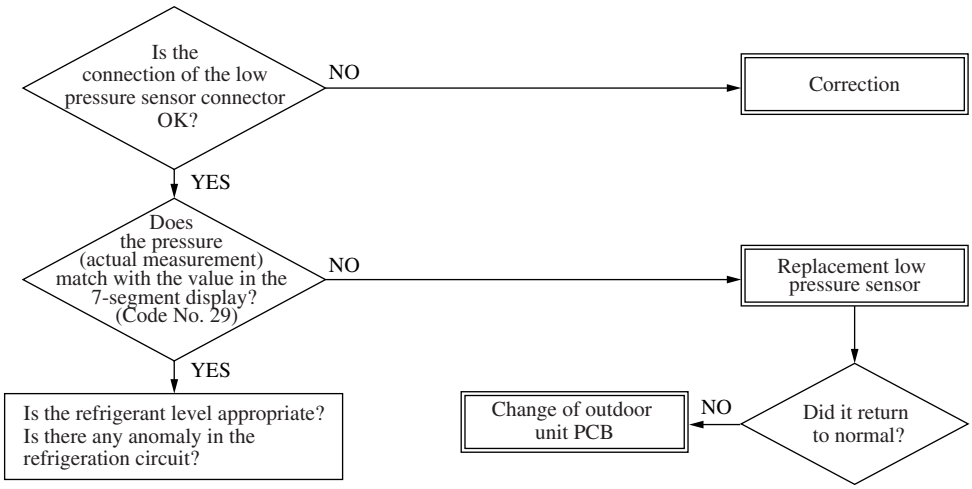


● Display Conditions

If an overcurrent or overheating signal is received from the outdoor fan motors (FMO1, 2), the compressor and outdoor fans stop. They start again after 3 minutes, but if this same trouble occurs 5 times (separately for FMO1, 2) again within 1 hour, or once within 45 minutes of the power being turned ON, an anomalous stop occurs.

19 Error display : E49 / 7-segment display : E49 [Low pressure anomaly]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



● Display conditions

Models FDCA140, 160

If a pressure of 0.079 MPa or lower is detected by the low pressure sensor, the compressor stops. After a delay of 3 minutes, the compressor restarts, but if this occurs 3 times within 60 minutes, or if this pressure continues for 60 minutes, including when the compressor is stopped.

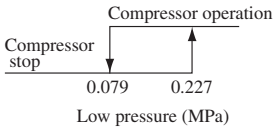
Models FDCA224~1360

- If the low pressure sensed by the low pressure sensor is 0.134 (0.079) MPa or lower, the compressor stops. After a 3 minute delay, the compressor restarts. If this occurs 2 times within 60 minutes.
- If the pressure sensed by the low pressure sensor while the compressor is stopped is 0.18 MPa or lower. If this occurs 5 times within 60 minutes.

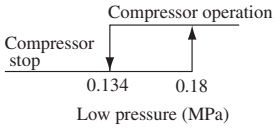
Note (1) It recovers only if there is a power supply reset.

● Anomalous pressure detection

Models FDCA140, 160

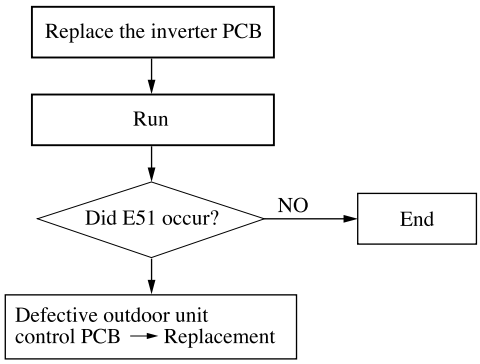


Models FDCA224~1360



20 Error display : E51 / 7-segment display : E51 [Anomalous inverter] (FDCA140 and 160 type only)

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

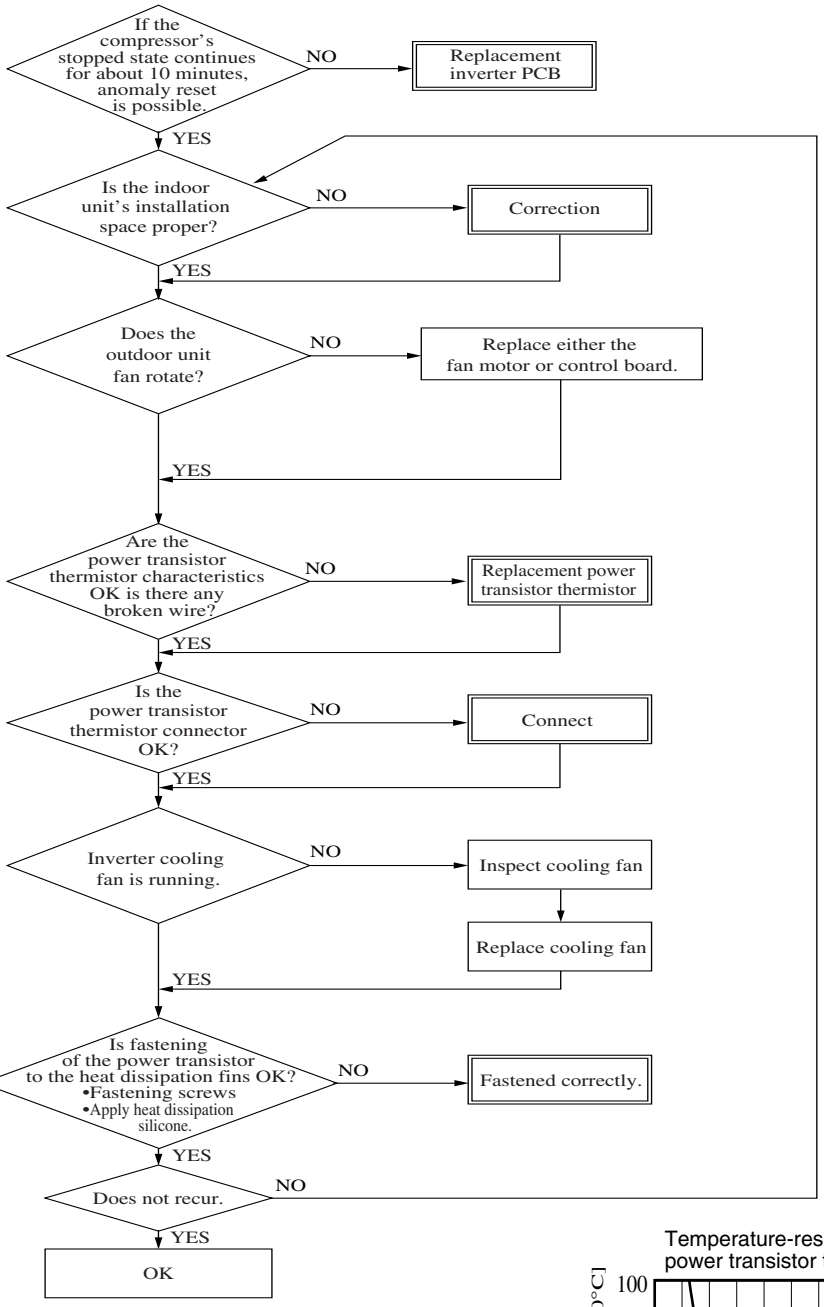


Error display : E51
7-segment display : E51-1 E51-2

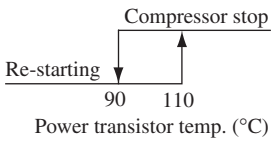
[Power transistor overheating (15 minute continuation)]
[Combination model only]

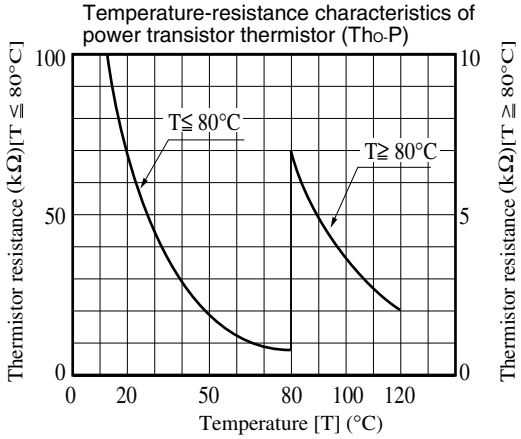
Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing (E51-1) of outdoor unit LED indicates power transistor (CM1) overheat and double flashing (E51-2) indicates power transistor (CM2) overheat.



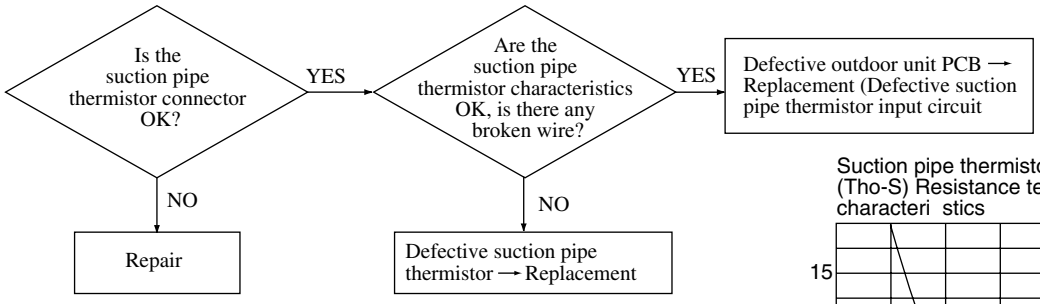
- Display conditions
  A power transistor temperature error occurs when a temperature of 110°C or higher continues for 15 minutes, including compressor stops.
- Anomalous temperature detection.

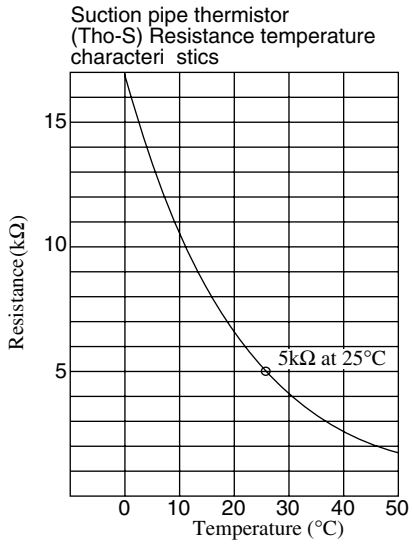




21 Error display : E53 / 7-segment display : E53 [Defective suction pipe temperature thermistor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing





● Display conditions

If the temperature detected by the thermistor is –50˚C or lower continuously for 5 seconds between 2(10) minutes and 2(10) minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this condition is detected 3 times within 40 minutes.

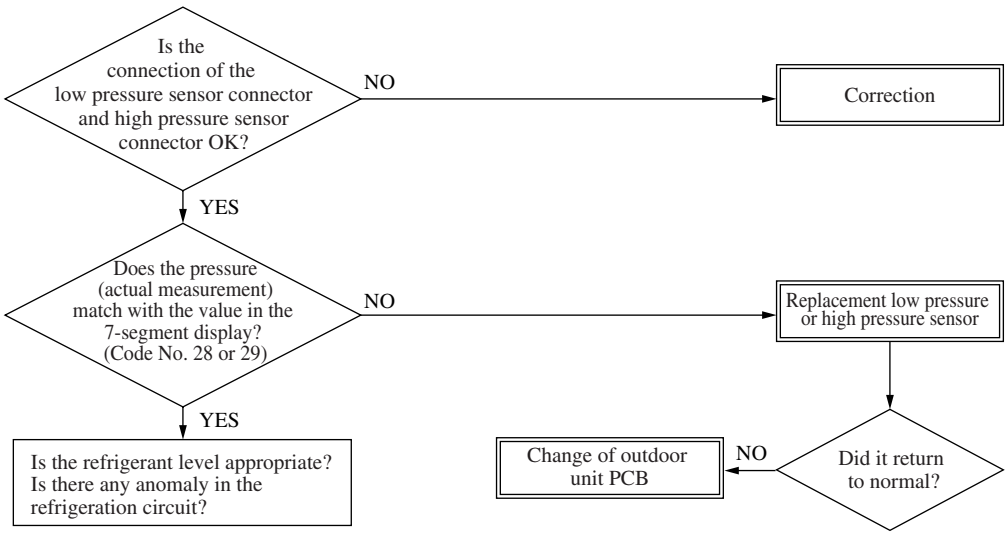
Note(1) Value in ( ) indicater FDCA140, 160 type.

---

22 Error display : E54 / 7-segment display : E54-1 E54-2 [Defective low pressure and high pressure sensor]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (1)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Single flashing (E54-1) indicates PSL and double flashing (E54-2) indicates PSH.



● Display conditions

If the voltage detected by the sensor is 0V or lower or 3.49 V or higher continuously for 5 seconds between 2 minutes and 2 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this condition is detected 3 times within 40 minutes.

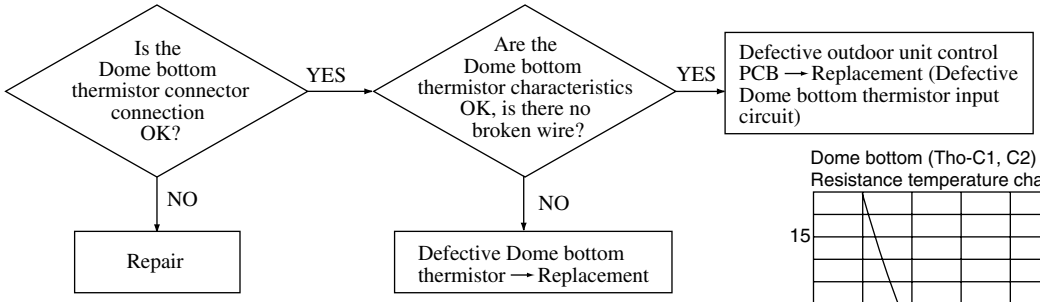
23

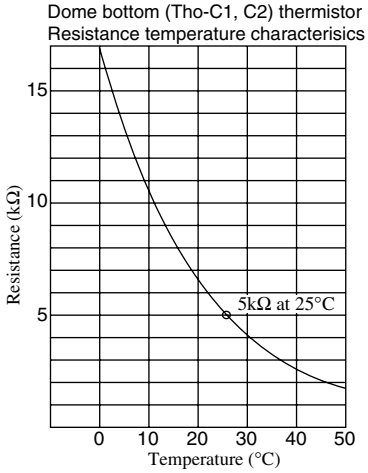
Error display : E55
7-segment display : E55-1 / E55-2

[Dome bottom thermistor faulty]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (2)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Check if the power supply system is normal.
(2) Single flashing (E55-1) of outdoor unit LED indicates anomaly in Dome bottom thermistor and double flashing (E55-2) indicates anomaly in Dome bottom thermistor (Tho-C2).





● Display conditions

If the temperature, sensed by the thermistor is –50˚C or lower continuously for 5 seconds between 10 minutes and 10 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 40 minutes.

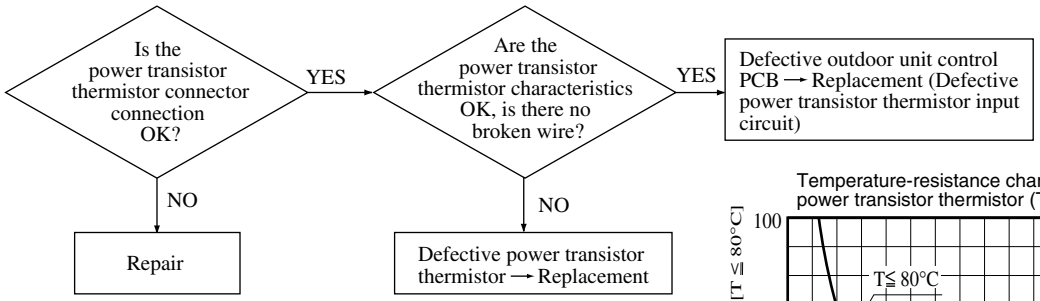
24

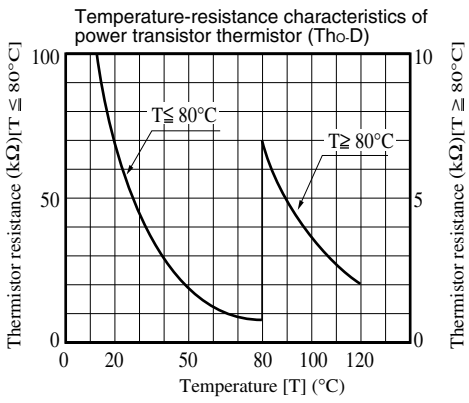
Error display : E56
7-segment display : E56-1 / E56-2

[Power transister thermistor faulty.]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (2)
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Check if the power supply system is normal.
(2) Single flashing of outdoor unit LED indicates power transistor thermistor (Tho-P1) and double flashing indicates power transistor thermistor (Tho-C2).





● Display conditions

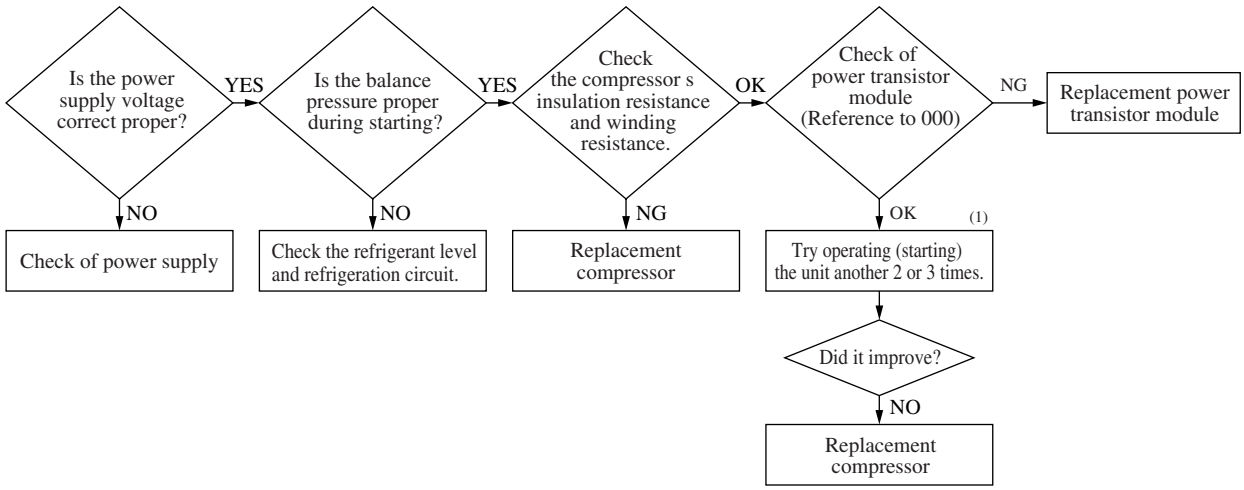
If the temperature, sensed by the thermistor is –10˚C or lower continuously for 5 seconds between 10 minutes and 10 minutes 20 seconds after the compressor goes ON, the compressor stops. After a 3 minute delay, the compressor restarts. If this state is detected 3 times in 40 minutes.

25 Error display : E59 [Anomaly in compressor starting]

7-segment display : E59-1 / E59-2

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (2)
Green LED	Keeps flashing	Green LED	Keeps flashing

Notes (1) Check if the power supply system is normal.
(2) Single flashing (E59-1) of outdoor unit LED indicates anomaly in compressor (CM1) starting and double flashing (E59-2) indicates anomaly in compressor (CM2) starting.



Note (1) While attempting to restart the compressor 2 or 3 times, the liquid refrigerant inside the compressor may be dispelled to outside the compressor and the starting anomaly may improve and recover.

● Display conditions

(1) If it can't be started in 20 attempts. (10 patterns × 2 times)

(2) A remote control reset is possible after 3 minutes passes.

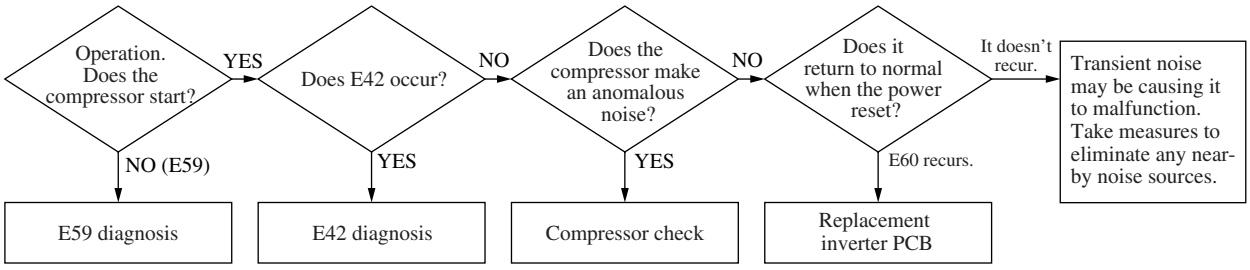
---

26 Error display : E60 [Compressor loader position detection error]

7-segment display : E60-1 / E60-2

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash (2)
Green LED	Keeps flashing	Green LED	Keeps flashing

Notes (1) Check if the power supply system is normal.
(2) Single flashing of outdoor unit LED indicates compressor (CM1) loader position detection error and double flashing indicates compressor (CM2) loader position detection error.



● Display conditions

(1) After rotor position detection operation, if the rotor's position cannot be detected again (4 times in 15 minutes), an error is displayed.

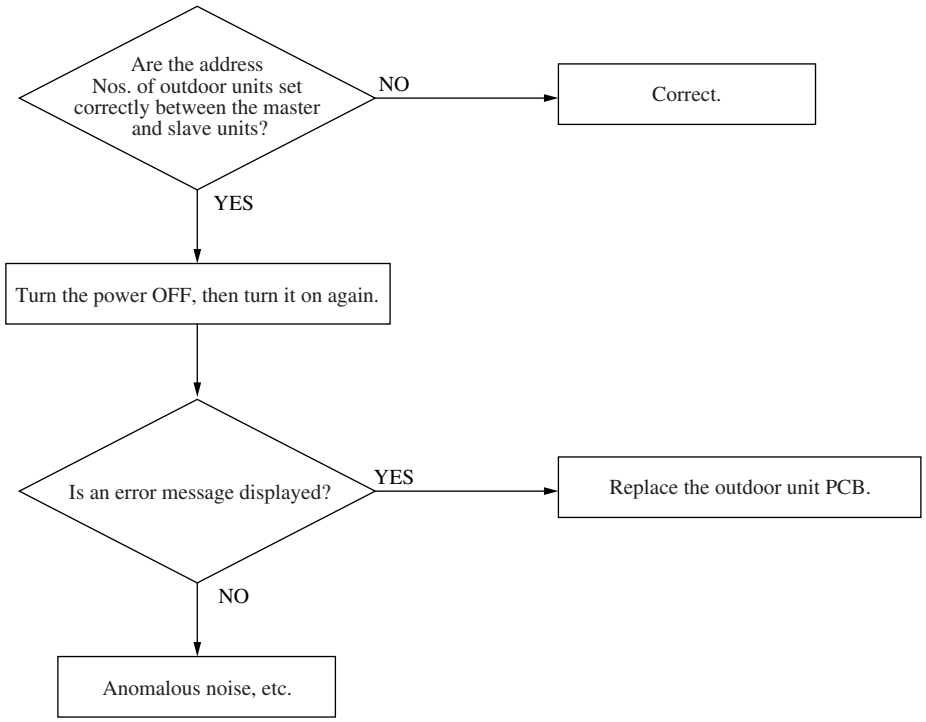
(2) A remote control reset is possible after 3 minutes passes.

27

Error display : E61
7-segment display : E61

[Communications error between the master unit and slave units]
[Combination model only]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing



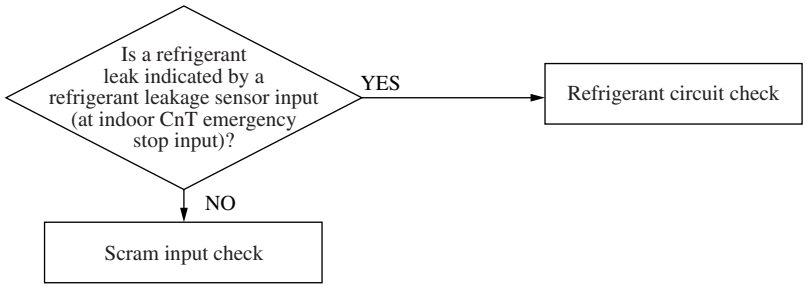
28

Error display : E63
7-segment display : E63

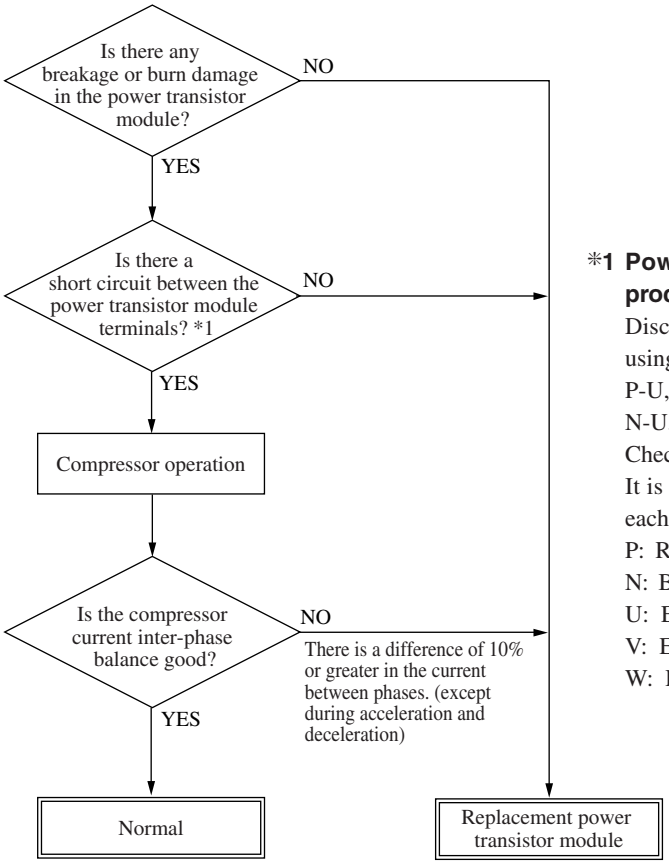
[Emergency stop of indoor unit]

Indoor unit		Outdoor unit	
Red LED	Stays OFF	Red LED	1 time flash
Green LED	Keeps flashing	Green LED	Keeps flashing

Note (1) Check if the power supply system is normal.



Checking the power transistor module (including the drive circuit)



***1 Power transistor module terminal short circuit check procedure**

Disconnect the compressor wiring, then check for short circuits using a tester.

P-U, P-V, P-W

N-U, N-V, N-W

Check between the P and N terminals.

It is easy to make tester contact with the following locations on each of the terminals.

P: Red harness side of the power transistor module terminal block.

N: Blue harness side of the power transistor module terminal block.

U: End of red harness to the compressor.

V: End of white harness to the compressor

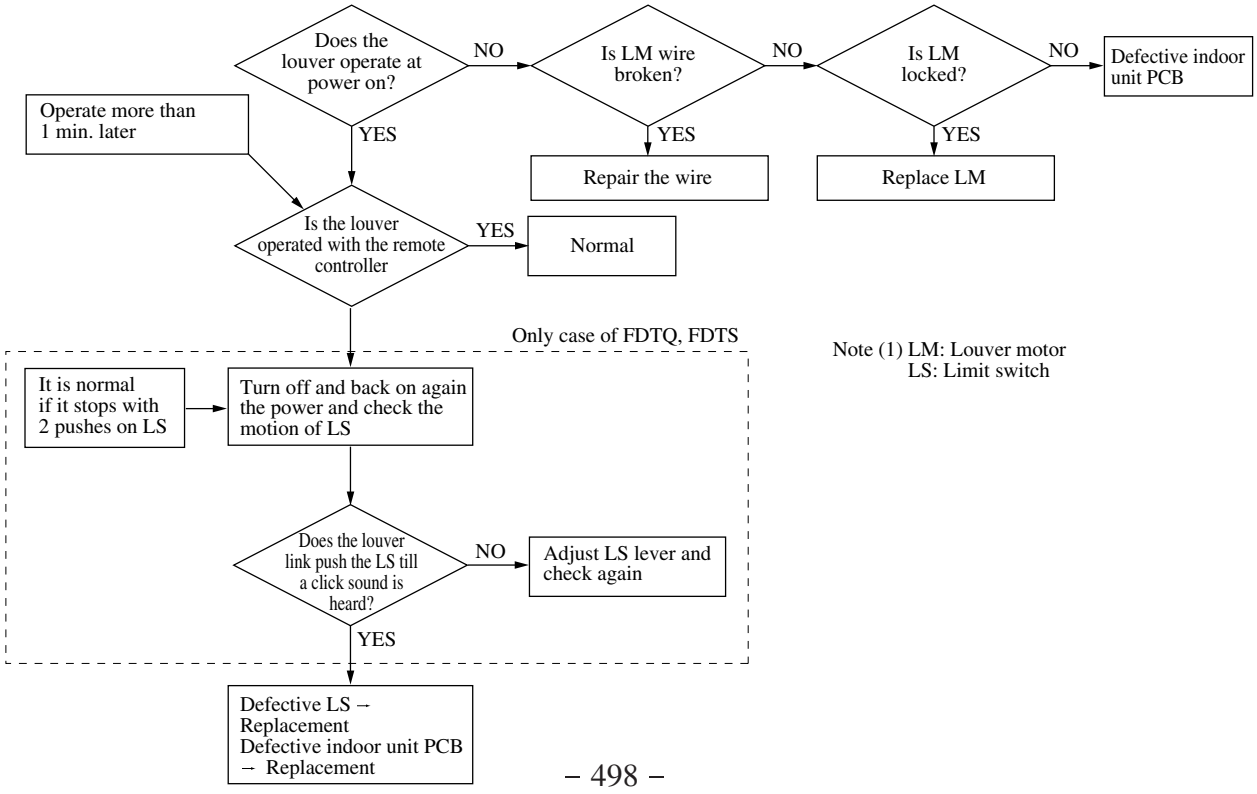
W: End of blue harness to the compressor

(d) How to advance checks for each faulty symptom

(i) Inspection method when there is no error display

1) Louver motor does not operate

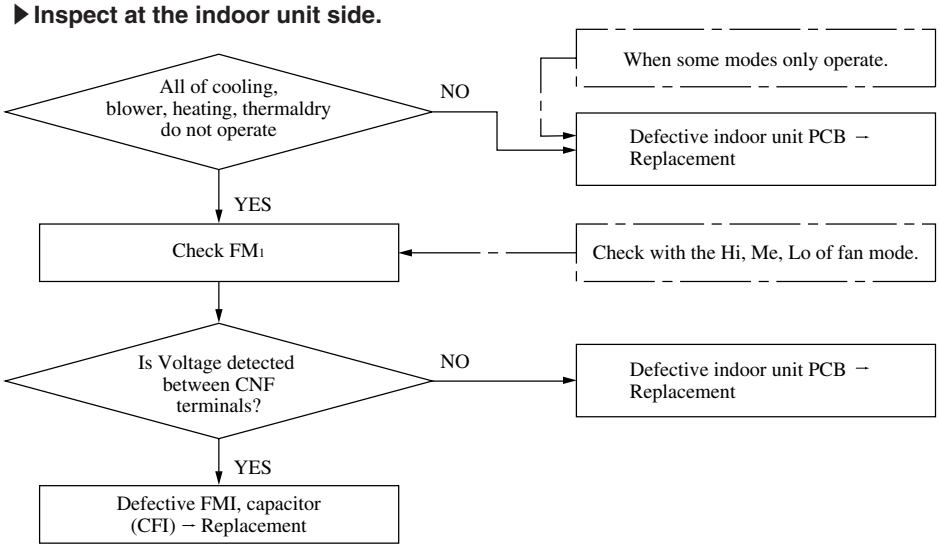
▶ Inspect at the indoor unit side.



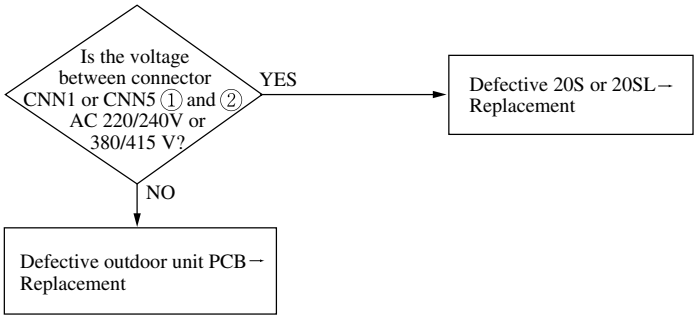
Note (1) LM: Louver motor
LS: Limit switch

2) When the indoor unit blower does not operate (Except for FDT112, 140, 160 FDK22~71 models)

▶ Inspect at the indoor unit side.



3) Four way valve does not switch during heating operation



(ii) When the cooling (heating) effect is felt insufficient. (Check also the refrigeration cycle for the refrigerant quantity, etc. in addition to the following.)

1) When the cooling effect is insufficient.

- Check if the protective function has tripped and, as a result, the compressor operation frequency has dropped below the specified frequency
- Does the indoor expansion valve operate properly? Is it clogged?
- Is the frosting prevention function operated?

Check method of the indoor unit electronic expansion valve

Check the indoor controller output to the expansion valve with the following procedures.

▶ Check how much volt is detected at the expansion valve (SM) connector and at the pin at control side of the connector CnA (white, 7P (5 cores)), and measure also how many seconds the voltages are applied.

White~Brown
Yellow~Brown
Orange~Brown
Blue~Brown

} Approx. DC 5V(2) is detected for approx. 15 seconds(1) at the power on.

▶ The indoor controller is normal if the seconds and voltages as indicated at left are confirmed.
When the expansion valve does not operate while the voltages are detected (operating sound is not heard), the expansion valve is defective.

▶ If the thermostat setting is changed, the expansion valve will operate approx. 20 seconds later. Then, approx. 5V will be confirmed at the CnA same as above.

Notes (1) 5V is maintained for 8 seconds after the power on, then it drops momentarily and recovers 5V for approx. 7 seconds.
(2) When measured with a digital multi-tester, voltages of approx. 6~3V are outputted one after another.

(e) Check anomalous operation data with the remote controller

Operation data are recorded when there is an anomalous state and these data can be displayed in the remote controller by operating the remote controller buttons.

(1) Press the CHECK button.
The display will change from " FUNCTION" → " SET" → "OPERATION DATA ▼"

(2) Press the ▼ button once. The display will change to "ERROR DATA ▲".

(3) Press the SET button to enter the anomalous operation data display mode.

(4) If there are anomaly from the past, they will be displayed by an error code and unit No.
(Example) "E8" (Lighted up)
"I/U No. 00 ▲" (Flashing)

(5) Using the ▲ or ▼ button, select the indoor unit No. you want to display the error data for.
If only one indoor unit is connected, the indoor unit No. does not change.

(6) Fix the selection using the SET button. (The displayed indoor unit No. will change from flashing to light up continuously.)
(Example) "E8"
"DATA LOADING" (This message flashes while data are being read.)
↓
"E8"
"ERROR DATA "
The data are then displayed beginning with item No. 01.
Displayed items are as shown below.

(7) Display the other data for when the error occurred in order from the currently displayed operation data No. 01 using the ▲ or ▼ button.
* Depending on the model, items for which corresponding data do not exist are not displayed.

(8) To change the indoor unit, press the AIR CON No. button and return to the indoor unit selection display.

(9) Press the ON/OFF button to end the anomalous operation data check.

If you press the RESET button during the settings, the display returns to the previous setting screen.

No.	Data item	
01	❊ (Operation mode)	
02	SET TEMP.	27°C
03	RETURN AIR	28°C
04	I/U HEAT EXCH1	6°C
05	I/U HEAT EXCH2	5°C
06	I/U HEAT EXCH3	4°C
07	I/U FAN	Hi
08	REQUIRED HERTZ	45Hz
09	SELECTED HERTZ	45Hz
10	EEV	480PULS
11	TOTAL I/U RUN	10500H
21	OUTDOOR	35°C
22	O/U HEAT EXCH1	55°C
23	O/U HEAT EXCH2	56°C
24	COMP HERTZ	85.0Hz
25	Hi PRESSURE	2.0MPa
26	Lo PRESSURE	0.40MPa
27	DISCHARGE	98°C
28	DOME BOTTOM	56°C
29	CT	26A
31	O/U FAN	Hi
32	SILENT MODE ON	
34	63H1 OFF	
35	DEFROST OFF	
36	TOTAL COMP RUN	8500H
37	EEV1	480PULS
38	EEV2	480PULS

5. WIRELESS KIT

5.1 FDT SERIES (OPTIONAL PARTS)

The FDT series is an exclusive series with all wired models. However, these models can also be used as wireless units by using the optional wireless kit.

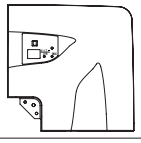
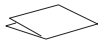
Model

Model
FDT series all model

(1) Wireless kit model

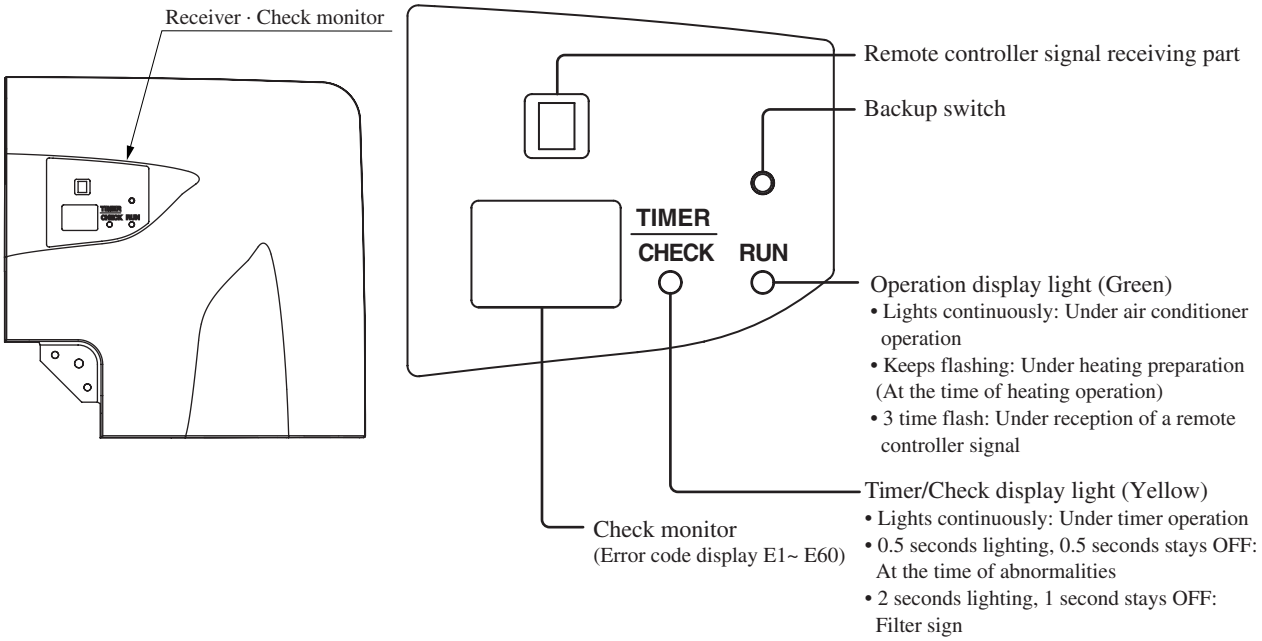
Model	Paint color
RCN-T-35W-ER	Plaster white

(2) Accessories

Name		Quantity	Name		Quantity
Receiver		1	AAA dry cell battery		2
Wireless remote controller		1	Wood screw for holder		2
Remote controller holder		1	Parts set		1

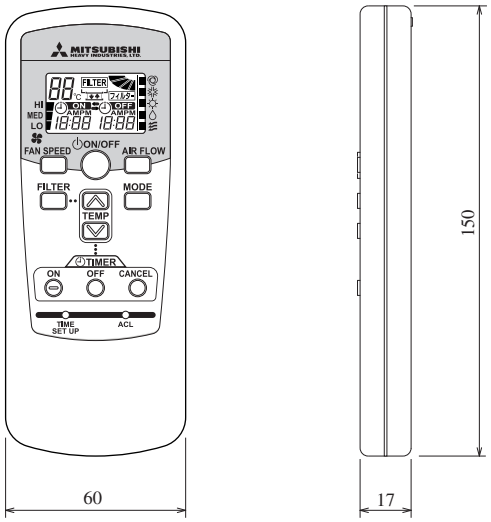
(3) Receiving outside view and function

● **Corner panel** ● **Receiver part details**



(4) Wireless remote controller

unit: mm



(5) Attachment of wireless kit

(a) Installation of the receiver

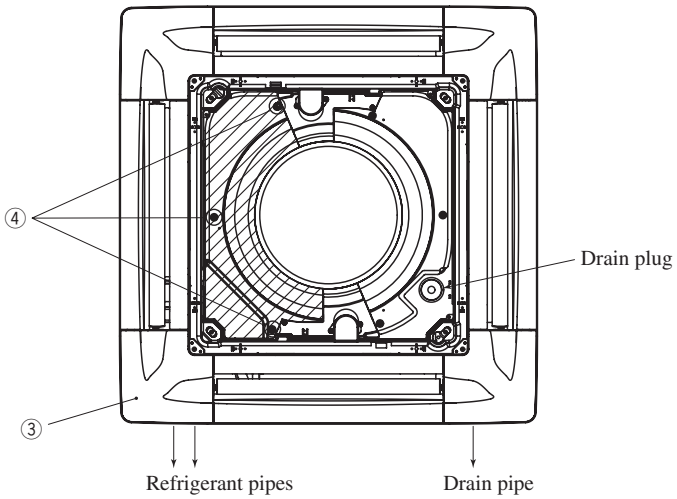
1) Preparation before installation

① Attach the cover panel supplied as an accessory onto the indoor unit according to the panel installation.

② Remove the air return grille.

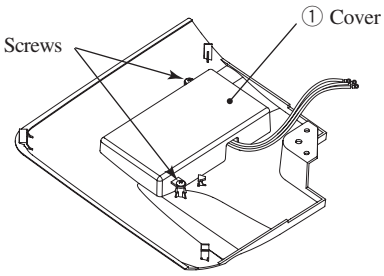
③ Remove a corner panel located on the refrigerant pipe side.

④ Remove three screws and detach the cover (indicated as a shadowed area) from the indoor unit control box.



2) Local setup

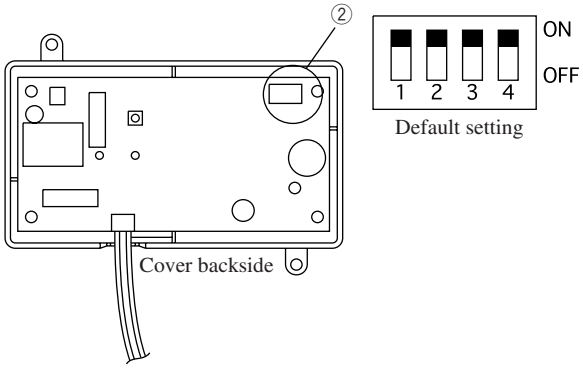
① Remove the cover by unscrewing two screws from the back of the receiver



Wireless kit backside

② Turn switches provided on the back of the PCB.
Switches (SW1-4) provided on the receiver PCB are for setting the following.
All switched are set to the ON position for shipment.

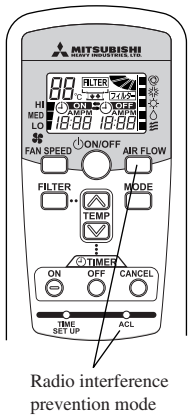
SW1	Prevention of unintended movement caused by interference.	ON:Normal OFF:Remote
SW2	Receiver master/slave setting	ON:Master OFF:Slave
SW3	Buzzer valid/invalid	ON:Valid OFF:Invalid
SW4	Cooling only/heat pump switching	ON:Heat pump OFF:Cooling only



③ When SW1 is turned to the OFF position, change the corresponding remote controller setting as follows.
Wireless remote controller setting change
Either pressing the "ACL" switch or inserting batteries with the "AIR FLOW" button depressed will change the mode setting to the radio interference prevention mode.

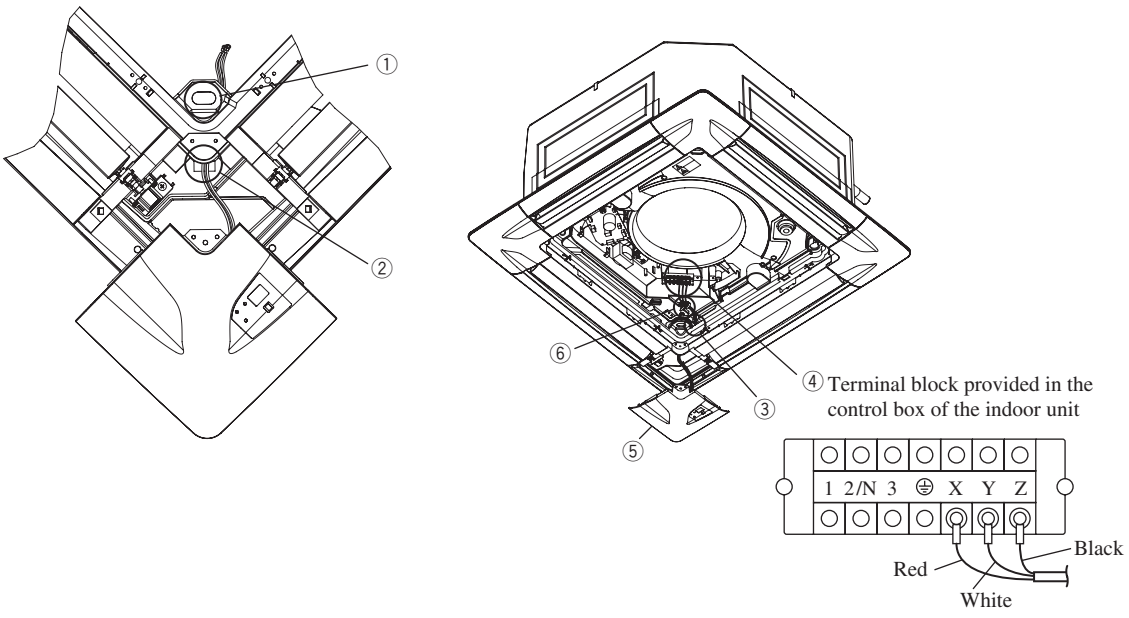
(*When batteries are removed, the setting will be reset to the default setting.
When batteries are removed, please follow the above procedure again.)

Please do not forget to explain the abovementioned operation method to the customer. The operation method is also set out in the instruction manual supplied with the indoor unit.



3) Attachment of wireless kit
① By loosening the panel hanger bolt, create a gap between the panel and the indoor unit.
② Lay the wireless kit wiring through the opening.
③ Place the wiring together with other wiring laid on site into the indoor unit.
④ Connect the wiring to the terminal block provided in the control box as follows.
X-Red,Y-White, Z-Black.
⑤ Attach the wireless kit to the panel according to the panel installation.
⑥ Bundle redundant wiring together with other wiring laid on site.

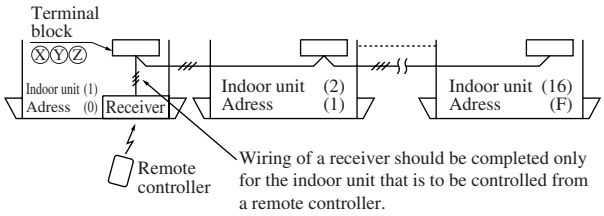
Note (1) Ensure that wirings are not caught between the receiver and the panel in attaching the receiver.



(6) Control of a plural number of indoor units with one remote controller

(a) Up to 16 indoor units can be connected.

① Connect indoor unit's Ⓧ, Ⓨ and Ⓩ terminal swith 3-core connecting wires (remote controller signal wires). For a connecting wire,please refer to the "Restrictions on the thickness and length of a connecting wire".



② The receiver wiring must be connected only for the indoor unit that will be operated by the remote controller directly.

③ Set the address of remote controller communication to [0] through [F] avoiding overlap with the rotaly switch SW2 provided on the indoor unit's PCB.

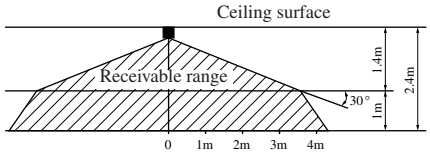
Note (1) Up to two receivers can be installed. When two receivers are used. it is necessary to turn SW2 provided on the PCB of one of the two receivers to the OFF position as a slave.

(b) Wireless remote controller operation distance

① Standard signal receiving range

[Condition] Illuminance at the receiver area: 300 lux.

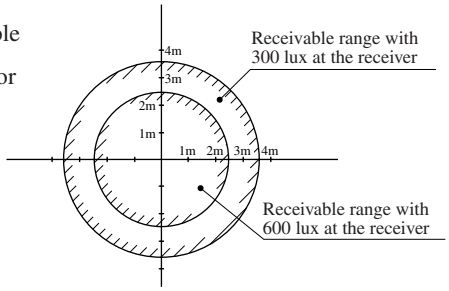
(When no lighting fixture is located within 1m of PAC in an ordinary office)



② Relation between illuminance at the receiver and the receivable range viewed from above

[Condition] Relation between illuminance at the receiver and the receivable range when a remote controller is operated 1m above the floor under the ceilling that is 2.4m above the floor.

When illuminance doubles, the receivable range drops to two thirds.



③ Points for attention in connecting a plural number of indoor units

[Condition] Illuminance at the receiver area: 300 lux.

(When no lighting fixture is located within 1m of PAC in an ordinary office)

[When more than one unit are installed close each other]

Distance between units that can prevent them from making the same movement is 5m.

(7) Check display list

Display	LED		Display method
	RUN	TIMER/CHECK	
Reception	Green	—	3 time flash (ON-0.25 seconds, OFF-0.25 seconds)
Hot keep	Green	—	Keeps flashing (ON-0.5 seconds, OFF-0.5 seconds)
Operation	Green	—	Lights continuously
Stop	Green	—	Stays OFF
Center mode	—	Yellow	3time flash (ON-0.25 seconds, OFF-0.25 seconds)
Check	—	Yellow	Keeps flashing (ON-0.5 seconds, OFF-0.5 seconds)
Filter sign	—	Yellow	Keeps flashing (ON-2 seconds, OFF-1 seconds)
Timer	—	Yellow	Lights continuously

5.2 EXCEPT FOR FDT SERIES

This product is dedicated for heat pump unit. Never install on the unit dedicated for cooling.

SAFETY PRECAUTIONS

- Always read these "Safety Precautions" thoroughly before starting installation work.
- These precautions describe important information related to safety. Always observe these precautions.
- Refer to the installation manual enclosed with the indoor unit for the indoor unit installation methods.
- After completing the installation, carry out a test operation, and confirm that there are anomaly.
  Also, explain the usage method to the user. Have the user store this manual for future reference.

⚠ WARNING

- Contact the installation to your dealer or a specialist. Incorrect installation by the user could cause electric shocks and fires.
- Always follow this instruction manual and accurately carry out the installation work. Incorrect installation could cause electric shocks and fires.
- The electric work must be carried out by a qualified electrician according to the Electrical Installation Technical Standards, Wiring Regulations and Instruction Manual. Incorrect work could cause electric shocks or fires.
- Use the designated cable for the wiring and make sure that it is securely connected. Fix the cable so that the external force of the cable is not applied on the terminal connection section. Incomplete connections or fixing could cause heating and fires.
- Always use the enclosed parts and designated parts for the installation work parts. Use of parts not designated by Mitsubishi could cause electric shocks or fires.

(1) Wireless kit model

RCND-KIT-HER

(2) Accessories (Confirm the following accessories).

① Light detection adaptor		1
② Wiring (3m)		1
③ Parts set (A)		1
④ Parts set (B)		1
⑤ Parts set (C)		1
⑥ Wireless remote controller		1
⑦ User's manual		1

① Screw for light detection adaptor		2
② Fixing band		1
③ Clamp		5
④ Screw for clamp		5

① Remote controller holder		1
② Screw for holder		2
③ Dry cell for remote controller		1

① Light detection section installation bracket		1
② Screw for the bracket		2
③ Installation fitting		2

(3) Setting of jumper wire

a) Method to prevent the malfunction due to the interference

Perform both procedures ① and ②.

This setting is made to prevent the interference with other household electric appliances or the interference occurred when two light detection adaptors are located closely.

① Setting change of the wireless remote controller

While pressing the AIR FLOW button, press ACL button or load the battery. The setting changes to the interference prevention setting.

② Modification of light detection adaptor substrate

Turn SW1-1 OFF (remote).

b) Changeover of Master/slave remote controller

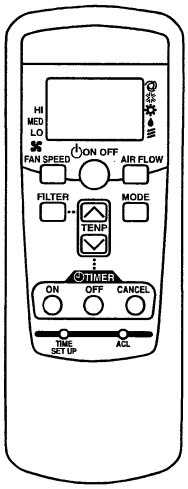
When you use the wireless remote controller as the slave remote controller, Turn light detection adaptor SW1-2 OFF (slave).

c) How to set the 3 air-blow speeds

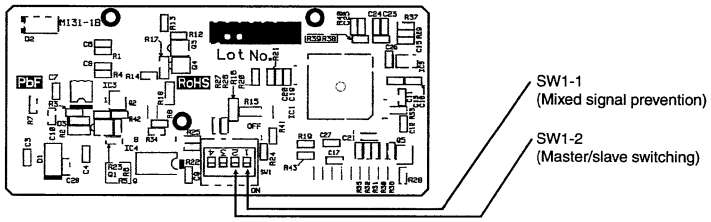
To change to 3-speed air blow, press the ACL switch while holding down the FAN SPEED button; or insert the batteries in the remote control while holding down the FAN SPEED button. (In that case, set the temperature range from 16 to 30°C if using the heating mode; or set from 18 to 30°C if not using the heating mode.)

Note (1) To cancel all the remote control settings, press the ACL switch. All remote control settings are then reset to initial (factory) settings.

● **Wireless remote controller**



● **Light detection adaptor substrate**



SW1-1	Prevention of malfunction from mixed signals	O N : Normal OFF : Remote
SW1-2	Receiver master/slave switching	O N : Master OFF : Slave

All switches are turned ON when the product is shipped from the factory.

⚠CAUTION

* When the battery is once removed, the setting returns to the initial setting condition (setting at factory shipping). Therefore, when the battery has been removed, perform the above mentioned wireless remote controller setting change work again.

Ensure to explain the handling method to the customer.
(The handling method is also mentioned in the operation manual.)

(4) Installation work

⚠ Avoid installing the receiver amp in the following positions, as faults may occur or light detection adaptor may be obstructed.

① Places subject to direct sunlight.
② Places near heat generating appliances.
③ Places with high humidity levels or where water may come in contact.
④ Places with bumpy surfaces.
⑤ Places near fluorescent lights (especially the inverter type) or where light may directly contact the light detection surface.
⑥ Places hidden by the indoor unit, etc., when looking from the wireless remote controller operation positions.
⑦ Places subject to the air blow off by the indoor unit.

The following two installation methods can be used to install the light detection adaptor onto the ceiling. Select a method according to the installation position.

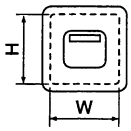
<Installation method>

• Installation with enclosed bracket.
• Direct installation onto the ceiling with wood screws.

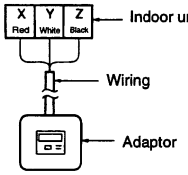
a) Drilling of the ceiling (ceiling opening)

Drill the light detection adaptor installation holes with the following dimensions at a the ceiling position where wires can be connected.

(A) Installation with enclosed bracket.	108 mm (H) × 108 mm (W)
(B) Direct installation onto with wood screws.	88 mm (H) × 101 mm (W)



b) Wiring connected to the light detection adaptor



▷Be careful of the wiring polarity. Ensure to connect the wire by matching the color of the wire with the color shown on the terminal block.

⚠CAUTION

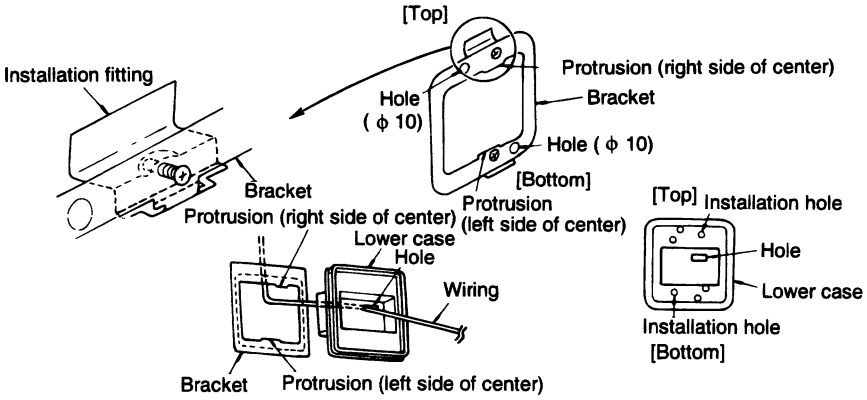
Do not connect the wiring to the power supply part of the terminal block.
If it is connected, printed board will be damaged.

c) Installation for light detection adaptor

Remove the screw on the side of the light detection adaptor, and sprit it into the upper case and lower case.
Install the receiver with one of the four installation methods d) or e) shown next page.

d) Installation with enclosed bracket

Use this method when installing onto a gypsum board (7 or 18 mm), etc.



① Catch the two protrusion of the enclosed bracket onto the fitting as shown above, and temporarily fix with the screws. (The bracket has an up/down and front/back orientation. Confirm the top/bottom protrusion positions and the positional relation of the ø 10 holes on the bracket and the installation hole on the lower case with the above drawing.)

② Insert the end of the installation fitting into the back of the ceiling from the opening, and tighten the screws to fix the bracket onto the ceiling.

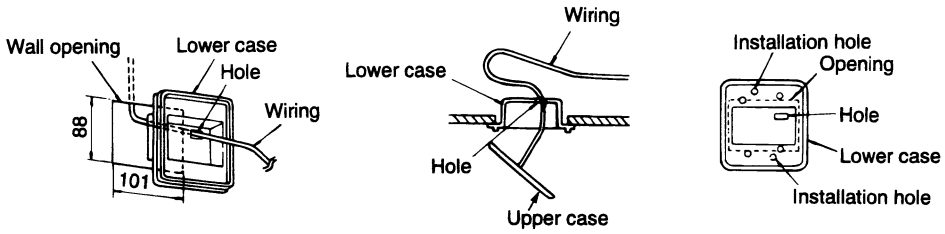
③ Pass the wiring from the rear side through the hole on the lower case.

④ Fit the lower case onto the bracket, and fix the lower case to the bracket using the two installation holes shown above. (The other four holes are not used.)

⑤ Follow steps ① to ③ for e) to complete the installation.

e) Direct installation onto the ceiling with wood screws

▷ Use this installation method when the ceiling is wooden, and there is no strength-wise problem in installing directly with wood screws.



① Fit the lower case into the ceiling opening. Make sure that the convex section on the back of the lower case and the clearance with the ceiling opening are as equal as possible on both sides.

② Using the two installation holes shown above, fix the lower case onto the ceiling with the enclosed wood screws. (The other four holes are not used.)

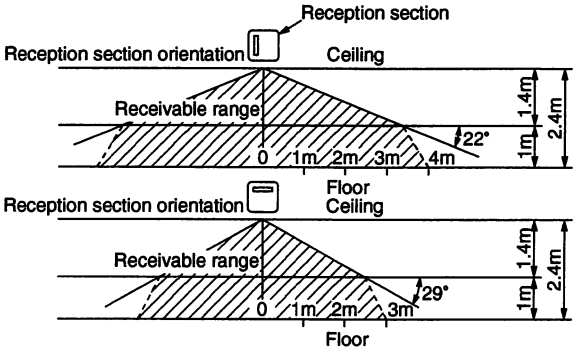
③ Fit the upper case onto the lower case, and tighten the screw.

(5) Wireless remote controller operation distance

a) When installed on ceiling

① standard reception distance

Conditions | Reception section illuminance 300 lux (When there are no lights on the ceiling within 1 m or the reception adaptor in a general office.)

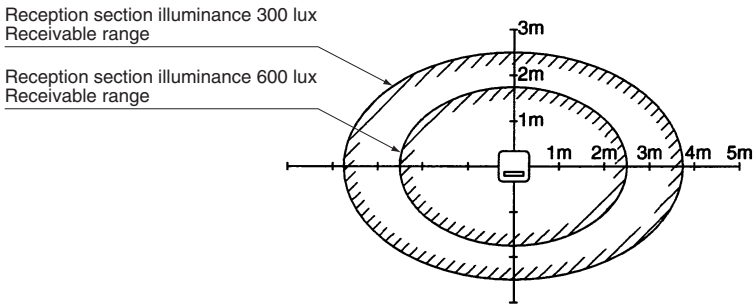


② Relation of reception section illuminance and reception distance looking from flat plane

Conditions | Relation of the reception section illuminance and reception distance when the remote controller is operated at a height of 1 m from the floor with a ceiling height of 2.4 m.
The reception distance becomes 2/3 when the illuminance is double.

b) When installed on wall

Conditions | Reception section illuminance **800 lux**

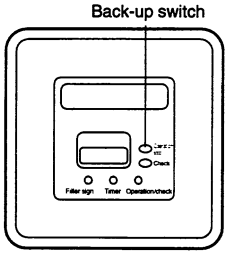


(6) Installation of remote controller

- Refer to the installation manual of remote controller

(7) Trial run of cooling operation

- While pressing the back-up switch on the receiver unit, transmit the signal of cooling operation from the wireless remote controller.



- If the unit does not operate normally at the trial run, check the unit referring to the inspection items shown on the wiring diagram plate stuck on the indoor and outdoor unit.

INVERTER DRIVEN MULTI-INDOOR-UNIT CLIMATE CONTROL SYSTEM

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