

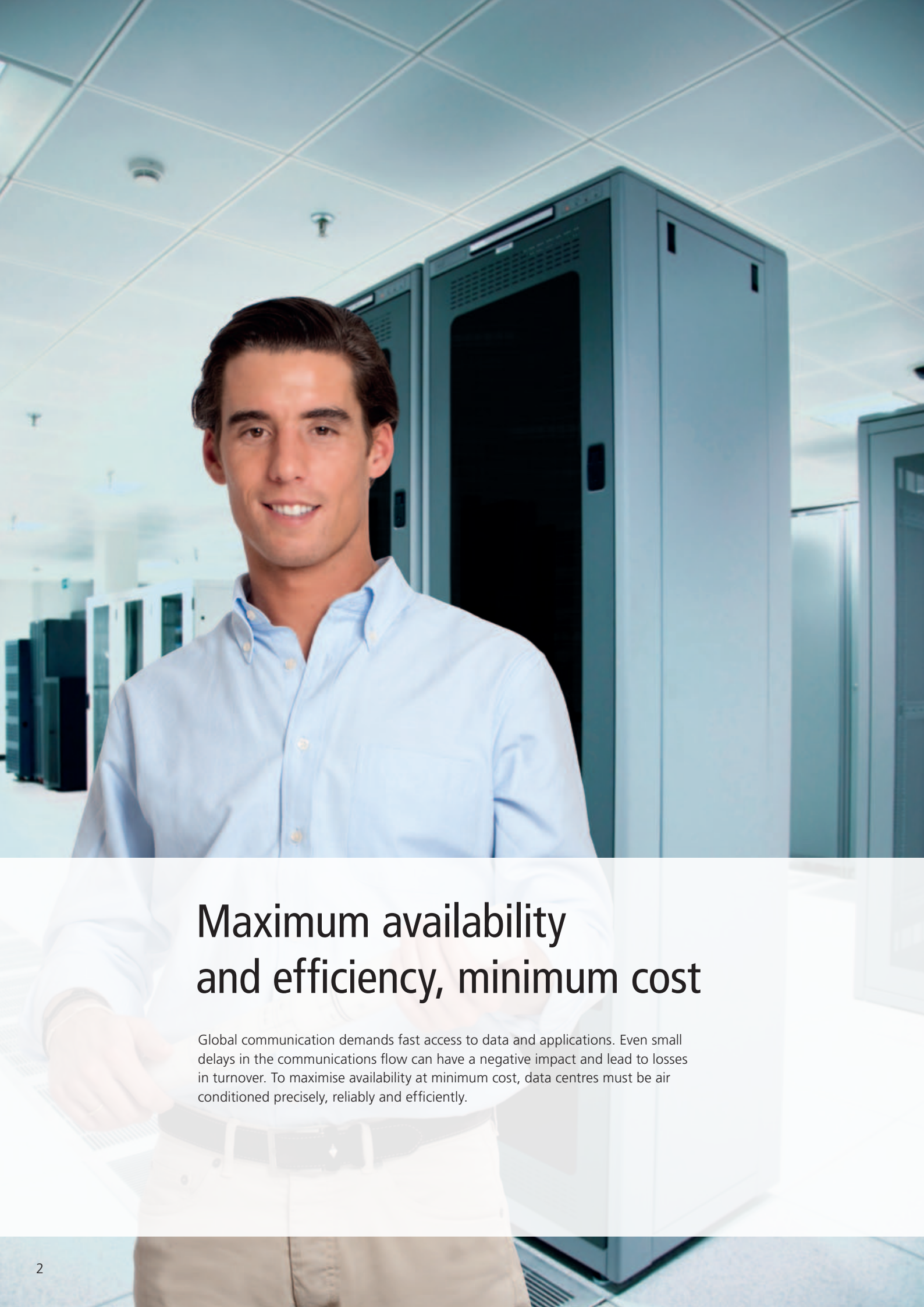


IT Cooling Solutions

CyberAir 3 – Precision Cooling Solutions

Maximum efficiency in data centre air conditioning





Maximum availability and efficiency, minimum cost

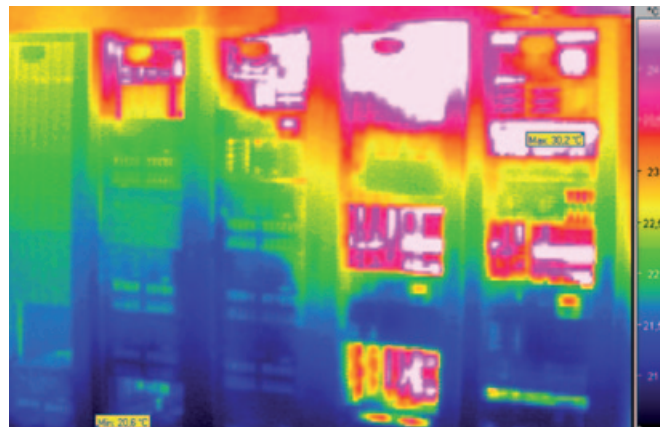
Global communication demands fast access to data and applications. Even small delays in the communications flow can have a negative impact and lead to losses in turnover. To maximise availability at minimum cost, data centres must be air conditioned precisely, reliably and efficiently.

CyberAir 3 from STULZ – on a Mission Energy in the data centre

When we introduced the CyberAir 2, we were the first manufacturer worldwide to present a precision air-conditioning system that cools data centres 60 % more economically. Now, in keeping with the goals of our Mission Energy, our engineers in Hamburg have taken on the task of extracting a few more percent in potential savings for you.

German Engineering powered by STULZ

For 40 years, we have been building and developing precision air-conditioning systems for data centres. These many years of experience, combined with state-of-the-art development tools, have come to fruition in the CyberAir 3. No other precision air-conditioning system offers more flexibility than the CyberAir 3, for each STULZ system can be tailored to your requirements.



A thermographic image visualises the hot and cold zones in the data centre, as on a weather map. In this way you can detect critical conditions in the air-conditioning system that may increase consumption.

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Air-conditioning solutions for data centres from a single source



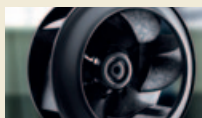
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German Engineering makes sure your technology is always available



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Unlimited versatility with a diverse range of options





Air-conditioning concepts for individual solutions

Planning the construction of a data centre is an engineering challenge that lies right at the start of our Mission Energy. The local climate, room configuration, environmental conditions, noise protection and safety – all these have a direct influence on the amount invested and on running costs.

The STULZ CyberAir 3 precision air-conditioning system answers to all these demands. From a wealth of options, our STULZ specialist advisers put together an individual system solution, which precisely matches your project requirements.

Whether you are refurbishing or running a legacy system or building a new one – choose energy-efficient air conditioning from STULZ



Expert, punctual implementation

Project and site management during the construction phase, selecting and monitoring subcontractors, not to mention actual start-up – STULZ is your specialist partner for expert, punctual implementation of your air-conditioning system. Every STULZ air-conditioning system is fully certified to ISO 9001:2000 and ISO 14001. Start-up includes a meticulous process of adjustment to the customer's situation, which is precisely logged and documented.



Tailored to individual requirements

To enable you to accurately estimate your budget, STULZ draws up a detailed quotation based on your requirements in terms of performance, availability, space planning and operational cost. Your STULZ specialist adviser configures an individual air-conditioning system, and helps you to draw up service specifications and invitations to tender.



Service without delay

STULZ CyberAir 3 precision air-conditioning systems are manufactured from high-quality components. In the STULZ Test Centre, they undergo an extensive stress test at temperatures ranging from -20° to +45° Celsius. In this way, we at STULZ ensure that our air-conditioning systems work reliably in any climate on Earth. Nevertheless, should problems arise, our STULZ Service Support is available worldwide.

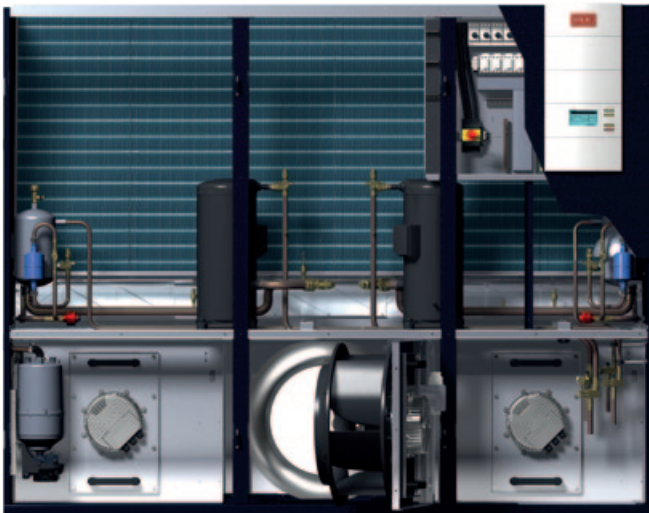
STULZ advice and support

- Individual planning assistance
- Specific performance data for individual projects
- Digital documentation
- Expert implementation and start-up
- Worldwide service

Mission Energy: Precision air conditioning wholly reinvented

Along with the high demands on data centre air conditioning, the need for exceptional ideas is also growing, such as how to regulate temperatures to within a degree at the lowest possible cost. To reach this goal, our engineers strive daily to enhance the energy efficiency of the precision climate control solutions.

The CyberAir 3 shows how serious we are: The result is a system with completely reworked air conduction, optimised in many details that work together in perfect harmony.



Eight cooling systems cool with three refrigerants

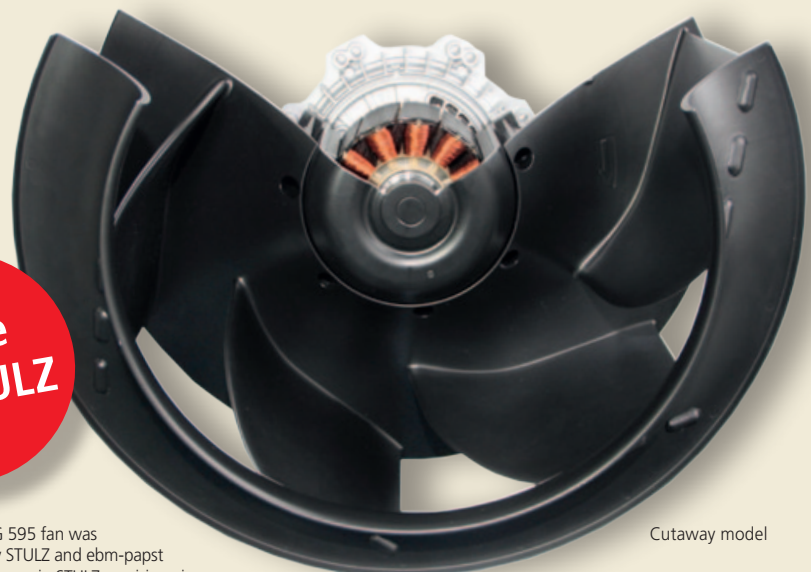
From a choice of eight cooling systems, data centre operators will find the optimum balance between investment, operating costs and energy efficiency. In addition to water as the cooling medium, the STULZ CyberAir 3 can run with three different refrigerants: standard R407C and R410A refrigerants, and high temperature R134a refrigerant.

The CyberAir 3 is available in cooling capacities between 18 ~ 245 kW.

EC fan with
fibreglass-reinforced
composite wheel

Made
for STULZ

The new R3G 595 fan was developed by STULZ and ebm-papst exclusively for use in STULZ precision air-conditioning systems.



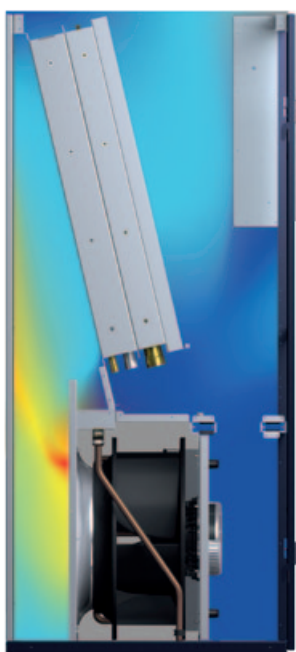
Cutaway model

Ideal air flow thanks to CFD simulation

Efficient, energy-saving technology

In the automotive industry, exterior surfaces are designed strictly according to aerodynamic considerations to reduce hindrances in air flow. For the CyberAir 3, we attacked the problem from the inside, using computational fluid dynamics (CFD) systems to analyse and build the new air conditioner according to air flow considerations. With the CFD analysis, we were able to find all areas in the air conditioner that have a negative effect on air flow and performance.

Thanks to the new fan and the CFD simulations, the CyberAir 3 has even better air conduction and takes full advantage of the positive effects that has on efficient operation.



Better air conduction results in more efficient operation of the air-conditioning system; the analysis was performed with CFD

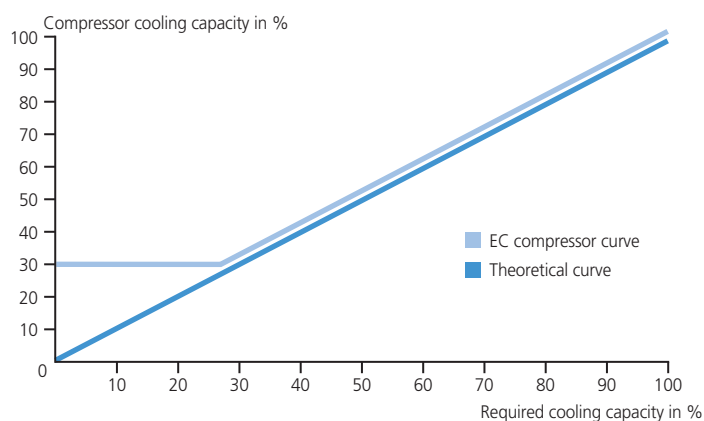


EC compressors for savings in partial load mode

New panel system

CyberAir 3 AS/GS and GES units are available with EC compressors, so that cooling capacity is changed by speed regulation, depending on actual heat load. That means maximum efficiency for partial loads combined with rapid changes in cooling capacity over a wide range from 30 % to 100 %.

- Best efficiency in cooling capacity due to stepless compressor control
- Best electronic efficiency due to brushless and maintenance-free motor
- Best mechanical efficiency due to scroll compressor



EC compressor

Only components of the highest quality are developed for precision air-conditioning systems from STULZ. To develop them, we seek the cooperation of select engineering partners such as ebm-papst, who designed a fan with a fibreglass-reinforced composite wheel and vane-type blades precisely in line with STULZ specifications.

With the latest materials and high-end injection moulding techniques, it is possible to produce a fully formed 3-D wheel that increases fan surface and reduces noise - and is a perfect fit for the CyberAir 3.

The new EC fan with fully formed 3-D composite wheel

- reduces the fan's power consumption
- is quieter
- moves the air more efficiently

Superior technology that pays for itself

The STULZ CyberAir 2 precision air-conditioning system satisfies the most exacting demands for availability and energy efficiency. From a selection of 8 cooling systems, 7 sizes and numerous equipment options, our STULZ specialist advisers select and configure a tailored solution for your specific operational infrastructure.





CyberAir 3 A/C units in standard door sizes are available as energy or space-saving versions. The seven available sizes range from 950 to 3,350 mm in width. The largest two sizes have a depth of 980 mm.

Control by microprocessor

Each STULZ CyberAir 3 A/C unit has its own electronic controller. The C7000 microprocessor controls all active components and communicates with other A/C units and BMS interfaces in the system.

Eight cooling systems

From a choice of eight cooling systems, data centre operators will find the optimum balance between investment, running costs and energy efficiency. All systems are available as both upflow and downflow versions.

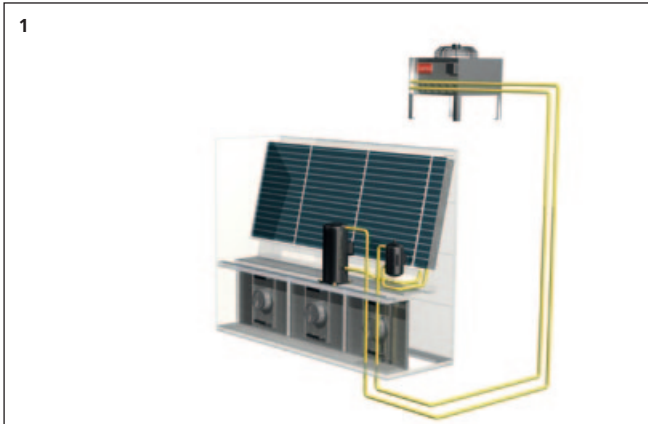
Save space and energy

STULZ CyberAir 3 A/C units are produced as a space-saving standard version, while the GE and GES types are also available in an energy-optimised, low-energy version.

STULZ CyberAir 3

- Stand-alone precision air-conditioning system for data centres and equipment rooms
- Flexible: 8 cooling systems in both upflow and downflow format, 7 sizes, standard and lowenergy versions
- The cooling systems are scalable in terms of both output and efficiency.
- Up to 90 % more energy efficiency with STULZ DFC and DFC² automatic air conditioning
- The C7000 microprocessor efficiently regulates all system states, CW standby management, the EC fan and the electronic expansion valve. Up to 20 air-conditioning modules can be operated per bus system.
- Three refrigerants
- Reliability through built-in redundancy and automatic alarm notification via SMS or e-mail
- Compact dimensions
- Filter control management
- All parts requiring maintenance can be accessed from the front

Eight systems ensure availability



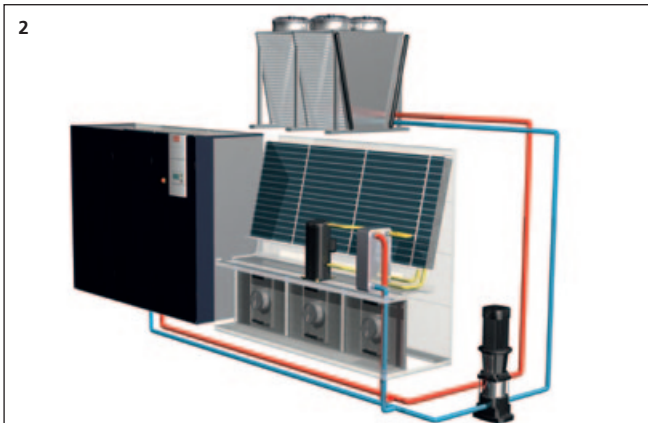
1. A-system: Compressor cooling system based on the direct evaporator principle (DX/direct expansion)

The refrigerant circuit of the A/C module consists of an evaporator, an expansion valve, a scroll compressor and an external air-cooled condenser.

The ambient air conveyed by the fan flows through the evaporator. As it does so, heat is removed from the air and is transferred to the refrigerant. The A/C unit and the external condenser are linked by means of a closed refrigerant circuit.

AS system:

Like the A-system, the AS system works according to the direct evaporator principle. And to make the system even more efficient, the AS system is exclusively available with an infinitely adjustable EC compressor.

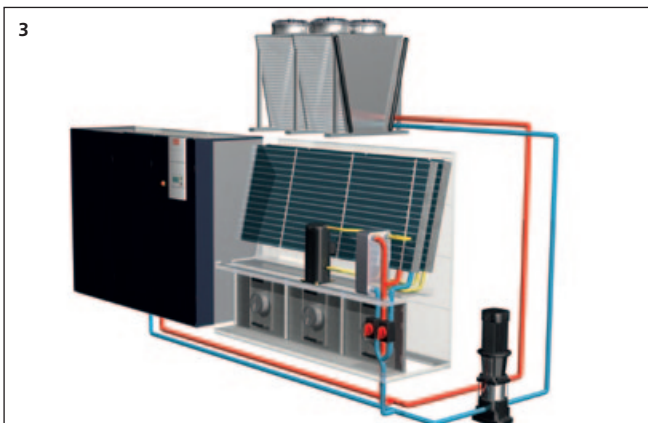


2. G-system: Simple heat dissipation via the waterglycol mixture

Like the A-system. Difference: In the G-system, the heat from the DX circuit is transferred to a water-glycol mixture by a plate-type condenser integrated in the A/C unit. The mixture circulates in a closed circuit, and emits the heat to the outside air via an external dry cooler.

GS system:

The GS system functions in the same way as the G-system. And to make the system even more efficient, the GS system is exclusively available with an infinitely adjustable EC compressor.



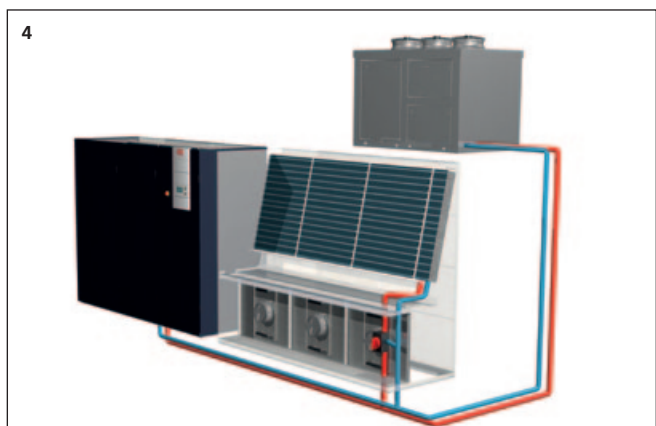
3. GE-system: Hybrid G-system with indirect free cooling

A hybrid cooling system, which combines a G-system with indirect free cooling. The GE system switches to energy-saving mode as soon as the outside temperature permits. The ambient air is then utilised for indirect free cooling. GE systems form the basis of DFC (Dynamic Free Cooling).

GES system: Hybrid G-system with Indirect Free Cooling and EC compressor

Like the GE system, the GES system functions on the principle of Indirect Free Cooling. And to make the system even more efficient, the GES system is exclusively available with an infinitely adjustable EC compressor.

Energy efficiency, capital investment, running costs, room size, noise protection, redundancy, local climate – every project has its own specific requirements when it comes to the precise air conditioning of sensitive data centres. The STULZ CyberAir 3 is therefore available with eight cooling systems: air or water-cooled, flexible mixed operation, backed up by Indirect and Direct Free Cooling, and energy-saving with STULZ DFC automatic air conditioning.

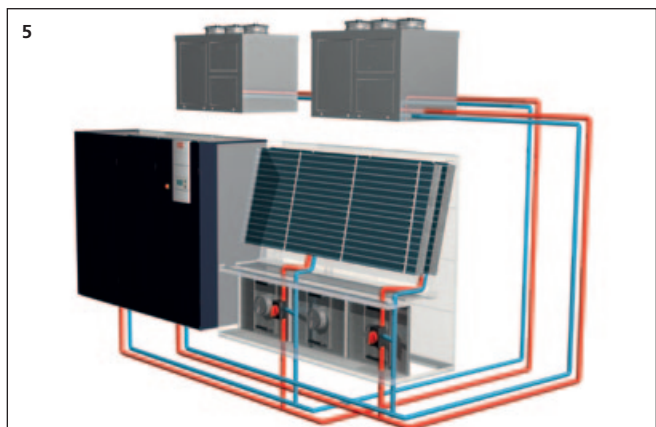


4. CW system: Liquid-cooled system

CW units manage without a refrigerant circuit of their own, but require separate chilled water production. The ambient air conveyed by the fan flows through the direct cooling unit, which transfers heat to the water-glycol mixture. A chiller removes the heat from this water-glycol mixture. The A/C unit and the chiller are connected to one another by means of a closed water-glycol circuit.

CWE/CWU systems:

These function like the CW system. To further increase efficiency, CWE/CWU systems feature a larger filter surface and offer the option of in-floor fan installation.

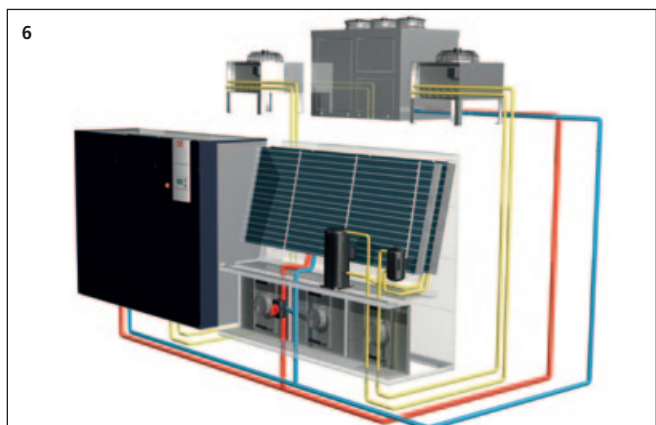


5. CW2 system: Liquid-cooled system with built-in redundancy

High-security systems often require a second, independent chilled water supply. Therefore, in the CW2 system, two redundant CW systems are integrated in one A/C unit, saving valuable space in the data centre.

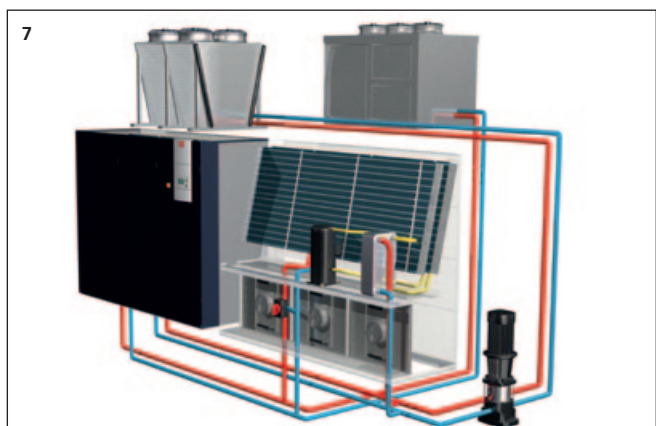
CWE2/CWU2 systems:

These function like the CW2 system. To further increase efficiency, CWE2/CWU2 systems feature a larger filter surface and offer the option of in-floor fan installation.



6. ACW system: CW system with redundant A-system (dual fluid)

Two independent cooling systems (CW and A) in one A/C module ensure maximum failure resistance. If the main, liquid-cooled system (CW) fails, the air-cooled A-system ensures that air conditioning continues without interruption.



7. GCW system: CW system with redundant G-system (dual fluid)

Similar design to the ACW cooling system, but with a liquid-cooled G-system working in combination with the CW system, instead of the A-system.

8. AU-System with Direct Free Cooling (DFC²)

For information and technical data on this system, please refer to the current STULZ DFC² brochure.



Efficiency is a matter of intelligence

Computers and smartphones are versatile all-rounders that shape our everyday private and business lives, while information is available around the clock. Our communication behaviour changes from day to day, making ever greater demands on data centres. But more power and faster servers necessarily lead to higher energy consumption for cooling the racks.

Most of the energy consumed in cooling data centres can be saved by the use of intelligent systems and innovative technology. And with the STULZ CyberAir 3, we are one step closer to achieving our Mission Energy goal in the data centre.

Adaptive ventilation with EC technology

With the introduction of the CyberAir 2, we were the first manufacturer to employ EC-driven fans for an entire product family. For the CyberAir 3 we went one step further, and entrusted ebm-papst with the task of developing a fibreglass-reinforced EC fan in a special size for the CyberAir 3, precisely in line with our specifications. The electronically controlled EC fans react steplessly to changing output requirements and are especially economical in partial load mode. EC fans consume up to 30 % less energy than conventional AC models!

More efficiency with EC compressor

The stepless drive of the EC compressors ensures fast changes in capacity in a range between 30 % and 100 %. Within this range, the system generates precisely the cooling capacity that is required to dissipate the actual heat load. EC compressors consume up to 24 % less energy than on/off controlled scroll compressors.

High-efficiency rear panel (optional for DX and GE systems downflow)

CyberAir 3 DX and GE systems can be equipped with an optional high-efficiency rear panel. This increases the depth of the units and ensures the surface area of the heat exchanger is used even more efficiently. To enable the units to still fit through normal standard doors, the rear panel can be removed and refitted with the greatest of ease.

Save with electronic load distribution at half the energy

All chilled water-cooled versions of the STULZ CyberAir 3 are available with the electronic CW standby manager as standard – keeping all A/C units in perfect balance in energy-saving partial load mode. In this way, the fans of the STULZ CyberAir 3 are able to use up to 70 % more economical.

Using reserves sensibly

The CW standby manager controls the speed of the EC fans and incorporates redundant standby units in a combined system operation. If an A/C unit drops out, the standby manager automatically increases the cooling output of the remaining devices. To do so, it accesses information from the C7000 microprocessor, which regulates the individual units of the system in a peer-to-peer network.



In conventional operating mode, the active A/C units run continuously at full load. The standby unit remains unused.



In partial load mode, the CW standby manager distributes the reserve capacity evenly between all A/C units. If individual units shut down or require maintenance, the remaining units automatically switch to controlled full load operation.

STULZ CyberAir: Always a good decision

Fan with the latest EC technology

- High efficiency of up to 92 %, reaping obvious savings in running costs
- Quiet-running, long life, maintenance-free
- Compressor with EC technology and state-of-the-art electronically controlled expansion valves
- Infinite compressor control for cooling capacity with maximum efficiency

High-efficiency rear panel (optional)

- The heat exchanger surface is used to the full
- Areas with hindrances to air flow are avoided

Up to 60 % more economical with STULZ DFC automatic air conditioning



STULZ CyberAir with DFC is the first precision airconditioning system in the world that automatically switches to the best operating mode on the basis of the heat load in the data centre and seasonal variations in outside temperature. For the CyberAir 3, the DFC system has been further developed and improved.

Full hybrid with Indirect Free Cooling

DFC combines compressor cooling and free cooling in four stages, and automatically searches for the most economical operating mode. In cool weather, DFC makes use of economical Indirect Free Cooling, which extracts all its cooling power from the ambient air. Energy-intensive compressor cooling (DX) is only switched on when absolutely necessary.

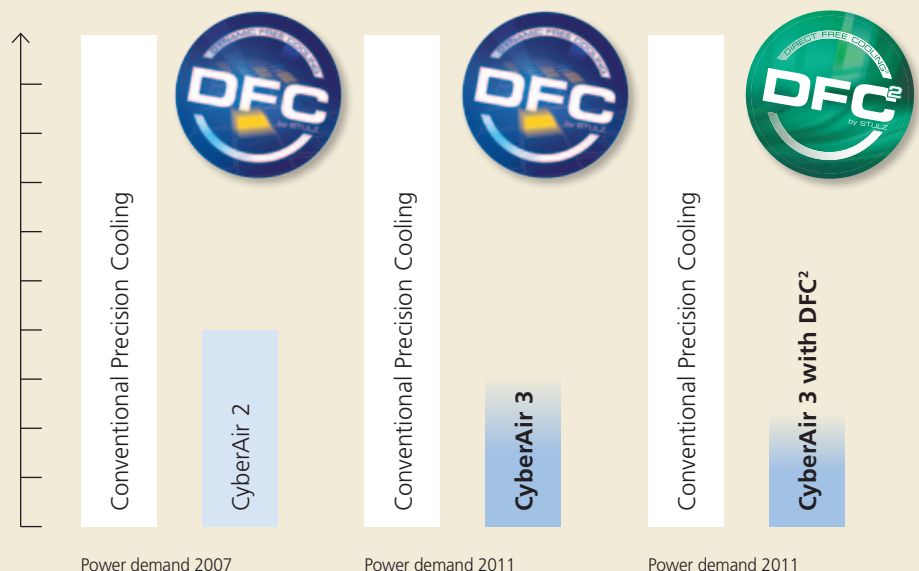
Complete electronic control for DFC savings

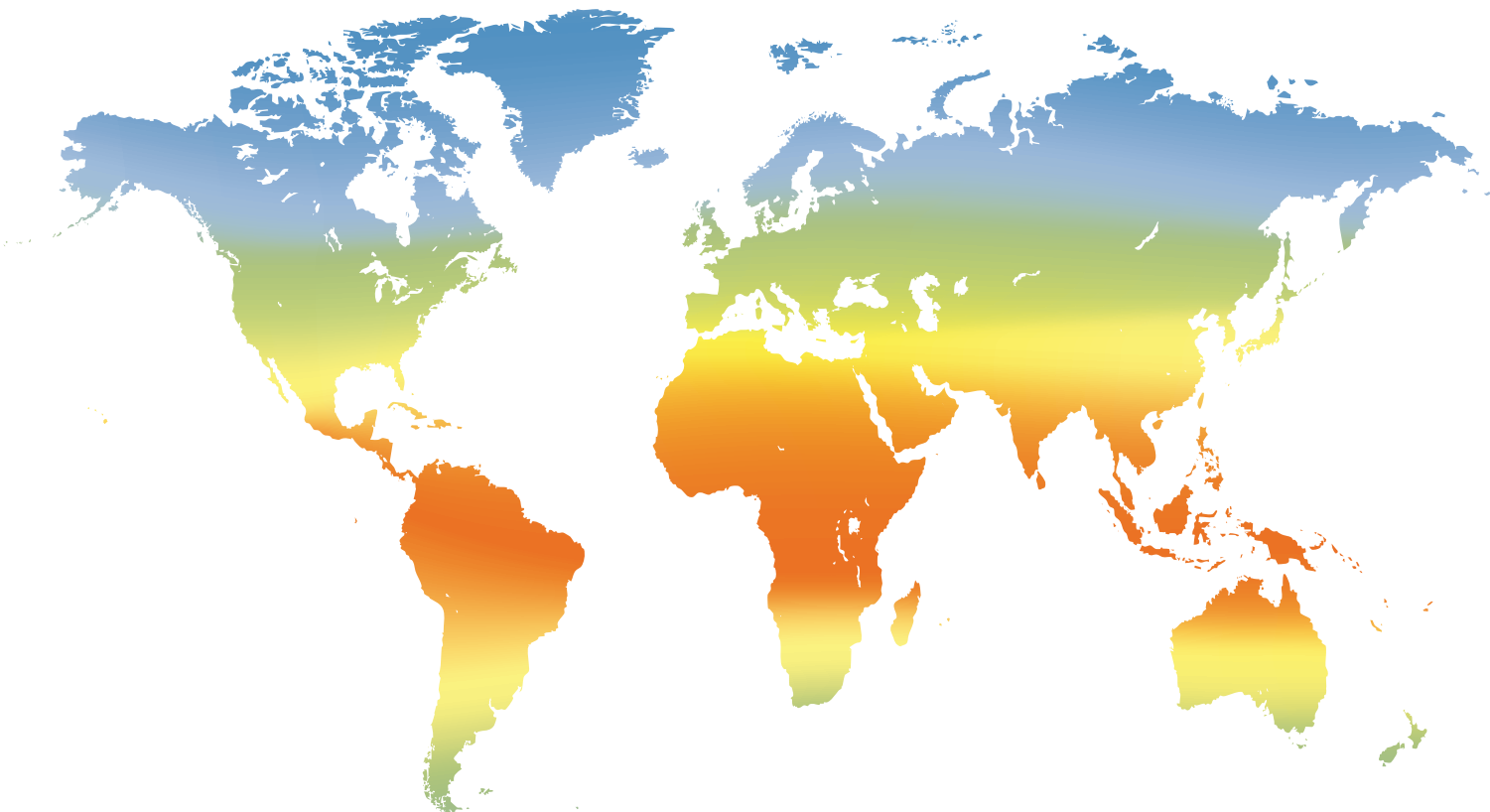
With utmost sensitivity and precision, DFC selects the most energy-saving mode, controls the speed of the EC fans in the A/C unit and those of the dry cooler, regulates the position of the control valves, reduces the electricity consumption of the pumps and ensures precise interior climate control. By incorporating standby units as well, DFC keeps all units, pumps and dry coolers in perfect balance in energy-saving partial load mode.

Whether you are interested in optimisation, construction or operation – STULZ can give you added scope for managing your operating costs – especially in comparison with conventional air-conditioning systems.

Even compared with the previous STULZ CyberAir 2 system, further reductions in energy consumption can still be realised with the new CyberAir 3.

*With Direct Free Cooling DFC² from STULZ, in many parts of the world the energy consumption of data centre air conditioning can be reduced by up to 90 %.



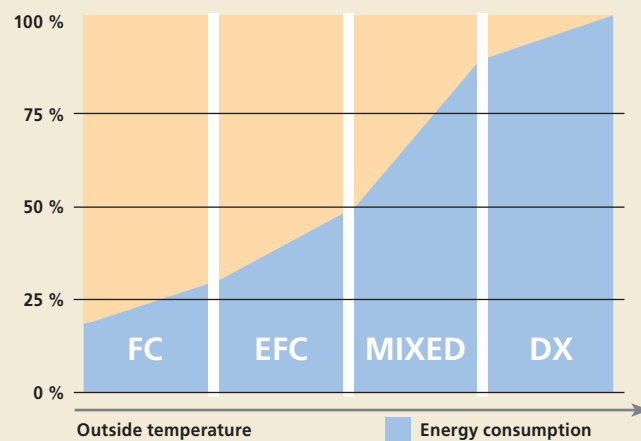


In moderate climates north and south of the equatorial zone, the energy-saving advantages of the STULZ CyberAir 3 with DFC and DFC2 can be exploited to the full. Electricity consumption for data centre air conditioning falls by up to 90 %.



STULZ DFC automatic air conditioning

- Electronically controlled GE cooling system, combining compressor cooling and free cooling in four stages:
 - FC – Free cooling energy-saving mode
 - EFC – Extended free cooling
 - MIXED – Compressor and free cooling
 - DX – Compressor cooling
- Electronic load distribution for partial load mode
- The efficiency of the compressor is increased in mixed mode thanks to the electronic expansion valve

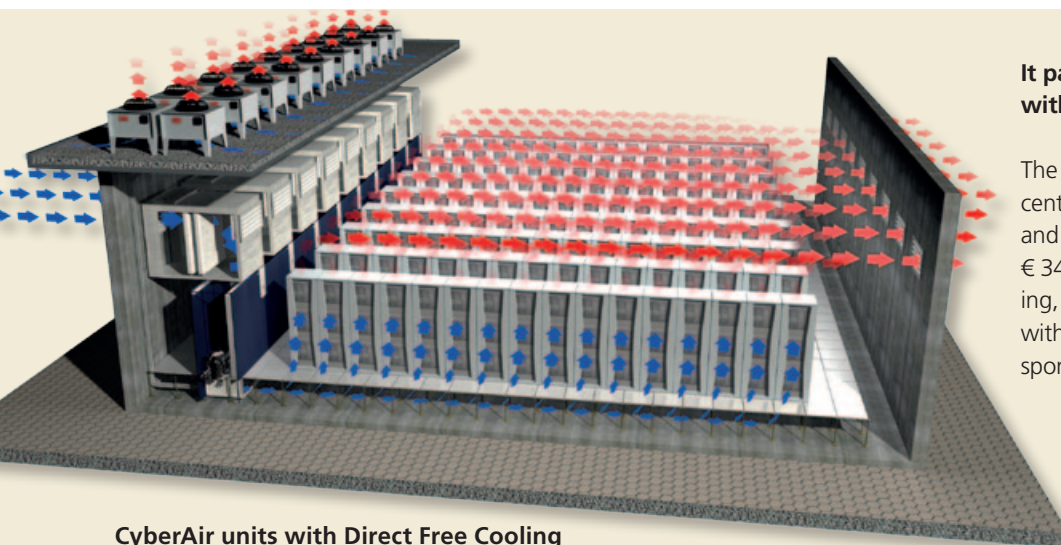


On a green mission – with Direct Free Cooling from STULZ

Future-proof and cost-efficient from years of experience

The trend is towards densely packed server rooms, which generate ever more computing power over an ever smaller surface area – and the resulting power is almost completely converted into heat. Without the use of energy-efficient air-conditioning solutions, the running costs of air-conditioning climb dramatically and can exceed the entire purchase cost of the technology in the data centre in just a few years.

With every new product development, therefore, our engineers are dedicated to the pursuit of further reducing the running costs of air-conditioning. We have repeatedly led the field of precision air-conditioning for almost 20 years now, and continue to develop new, even more efficient systems. Now and in the future, we are focused on one vision: Mission Energy from STULZ.



**CyberAir units with Direct Free Cooling
and fold-away heat exchanger**

It pays to have energy efficiency with STULZ air-conditioning systems:

The air-conditioning of a Hamburg data centre with a surface area of 800 m² and a heat load of 1 MW costs only € 34,000.- a year with Direct Free Cooling, as opposed to € 296,000.- a year with compressor cooling only. This corresponds to savings of € 262,000.- a year.

Source: STULZ comparison of system costs, basis for calculation 13 ct/kWh

Energy-saving potential thanks to ambient air

With Direct Free Cooling, conditioned ambient air below 18 °C is used to keep the data centre cool. This brings huge potential savings, but challenges as well. With this cooling method, a large volume of ambient air enters the rooms, so that extended temperature and humidity tolerances must be permitted. If the ambient temperature rises above 18 °C, either an integrated DX system with compressors or a separate chiller assumes the task of cooling the data centre, depending on the air-conditioning solution that is installed.

Thanks to our many years of experience with precision air-conditioning solutions, we have succeeded in optimising all components for Direct Free Cooling, ensuring compliance with the specifications for data centre temperature tolerances according to ASHRAE TC 9.9 – 2011.

In addition, the cooling unit and mixing and filtration box are available in various sizes, so they can be selected precisely to suit your requirements and to achieve optimum energy efficiency.

Percentage and number of hours per year of temperatures up to and including 18 °C (up to 27 °C possible according to ASHRAE TC 9.9 – 2011)

	Hamburg	London	Moscow	Canberra	Madrid	Istanbul	New York	Beijing	Johannesburg
Annual no. of hours below 18 °C ¹	8247	8014	7805	7786	6338	6224	5997	5563	4833
Percentage ²	95 %	91 %	89 %	89 %	72 %	71 %	68 %	63 %	55 %

¹Hours per year of temperatures up to and including 18 °C

²Percentage of hours with temperatures up to and including 18 °C over the year

Advantages

- Save up to 90 % on costs a year – with Direct Free Cooling
- High energy efficiency through the direct use of Free Cooling
- Fold-away heat exchanger in the CyberAir AMD for additional energy efficiency
- Additional savings opportunities in Mixed and DX mode, thanks to enlarged heat exchanger surfaces and low condensing temperature
- Excellent system scalability – “Build as you grow!”
No hydraulics (pipework, pumps, fittings)
- Maximum reliability thanks to self-contained, simply constructed air-conditioning systems
- Drastically lower energy consumption than all conventional systems
- High-quality materials and perfectly harmonised components
- Lower capital investment than with conventional Indirect Free Cooling systems

Energy efficiency in a whole new dimension

CyberAir CWE/CWU air-conditioning systems deliver maximum cooling capacity. Each unit is made up of two modules, and with their standard door format they are easy to transport and flexible in their data centre installation options.

Up to four maintenance-free, high-efficiency EC fans inside the separate module and variable control concepts greatly reduce energy consumption and cut operating costs.

New: CyberAir 3 ASD 2050 with new fibreglass-reinforced composite wheel fan

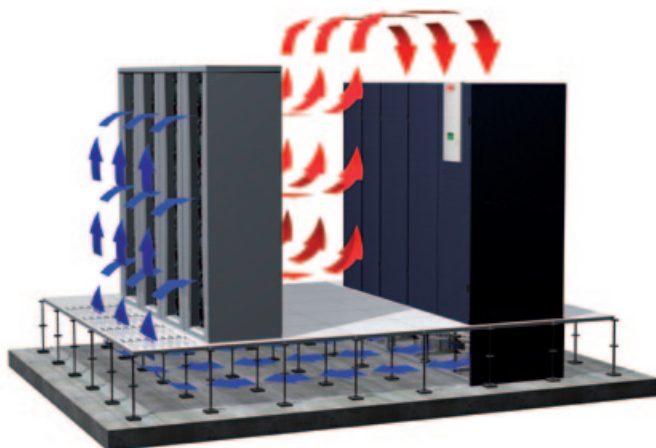


Working in combination with modern, free cooling chillers, STULZ CyberAir CWE/CWU air conditioners ensure energy-efficient operation and, depending on the system's location, can considerably reduce the running costs of the system as a whole.

When planning the system layout, an allowance should be made for high chilled water temperatures, to ensure that the proportion of Free Cooling can be maximised to suit the annual operating hours.

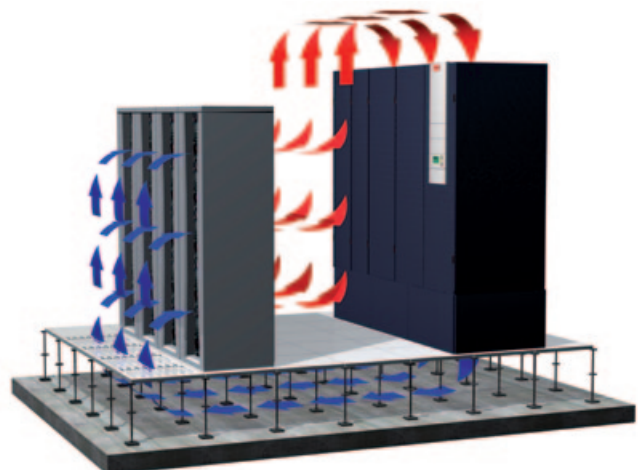
Other technical features of the CyberAir CWE/CWU series

- Maximum useful cooling capacity with greatly reduced power input
- Flexible installation according to available space and site conditions
- C7000 controller / CW standby management
- Very service-friendly, with front access
- Energy-optimised heat exchanger for high water and return air temperatures



CWU version:

Fan unit installed under raised floor (power input of fans is up to 35 % less than when installed on the raised floor)



CWE version:

Fan unit installed on raised floor when height of raised floor is insufficient

Save space and energy

The swivelling heat exchanger from STULZ automatically makes room for the most economical operating mode. At STULZ, efficiency is more than just a word. For we continuously invent, patent and test pioneering air-conditioning solutions, which are put to use all over the world.

Now, with our swivelling heat exchanger, you can exploit the possibilities of Direct Free Cooling to the full – and save up to 90 % of your energy costs! In this operating mode, our DFC² system cools your data centre exclusively with filtered ambient air. And this works best when the heat exchanger is not situated in the air duct!





STULZ CyberAir 3 allows for both central and distributed arrangement of A/C units. Every unit has its own intelligence. Up to 20 units work together in the system network.

High-quality, reliable and flexible

STULZ CyberAir 3 A/C units are manufactured with care from high-quality components. They are compact and can be combined as desired – and so adapt flexibly to the space and characteristics of your data centre. Redundant standby units ensure maximum levels of availability. Whether you have two units in a data centre or 20 – you will always benefit from STULZ quality. In all cases, the system ensures an optimum air supply.

Growing to suit the load

The resilient scalability of the STULZ CyberAir 3 range responds to rising heat loads caused by your expanding IT infrastructure. Further A/C units can even be added during ongoing operation. The C7000 microprocessor links up to 20 units in a network zone.

Targeted air conditioning

The A/C units can be located centrally in an air-conditioning room or distributed around the data centre. The cooling capacity of each A/C unit can be precisely adapted to the respective operating conditions. In all cases, the system enables optimum air distribution, which effectively prevents hot spots.

Small footprint, numerous possibilities

Designed to fit through a standard doorway, space can easily be found for every A/C unit without spending a great deal of time on transport and assembly. The system is preconfigured and ready for start-up once installed.



Made in Germany

Expertise in development and planning

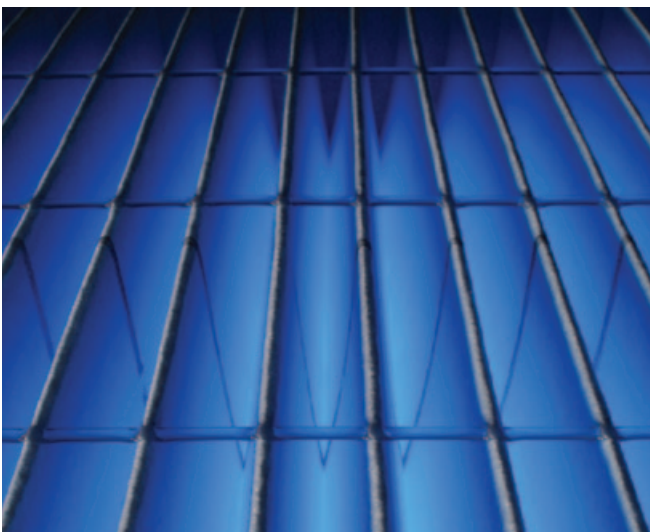
Experience from projects around the world, integrated development processes and regular audits and training of our partners ensures constant quality Made in Germany. We continually invest in new technology and processes, so that we can offer you the best solution. Our air-conditioning experts provide end-to-end support for your project, from initial contact through commissioning – and beyond if needed.

Quality workmanship

STULZ CyberAir 3 precision air-conditioning systems are manufactured from high-quality materials. Reliability and a long service life are guaranteed by production Made in Germany and continuous quality assurance. Each STULZ CyberAir 3 A/C unit is equipped with its own microprocessor, which automatically switches to a standby unit in the event of problems.

Simple maintenance

All fine tuning can be accomplished smoothly using the operator terminal of the STULZ C7000 microprocessor. Wearing parts inside the A/C units are positioned in such a way that all main components can be accessed from the front.



The filter system increases filter life while allowing minimal pressure losses.
Filter class G4 (EU4) is standard

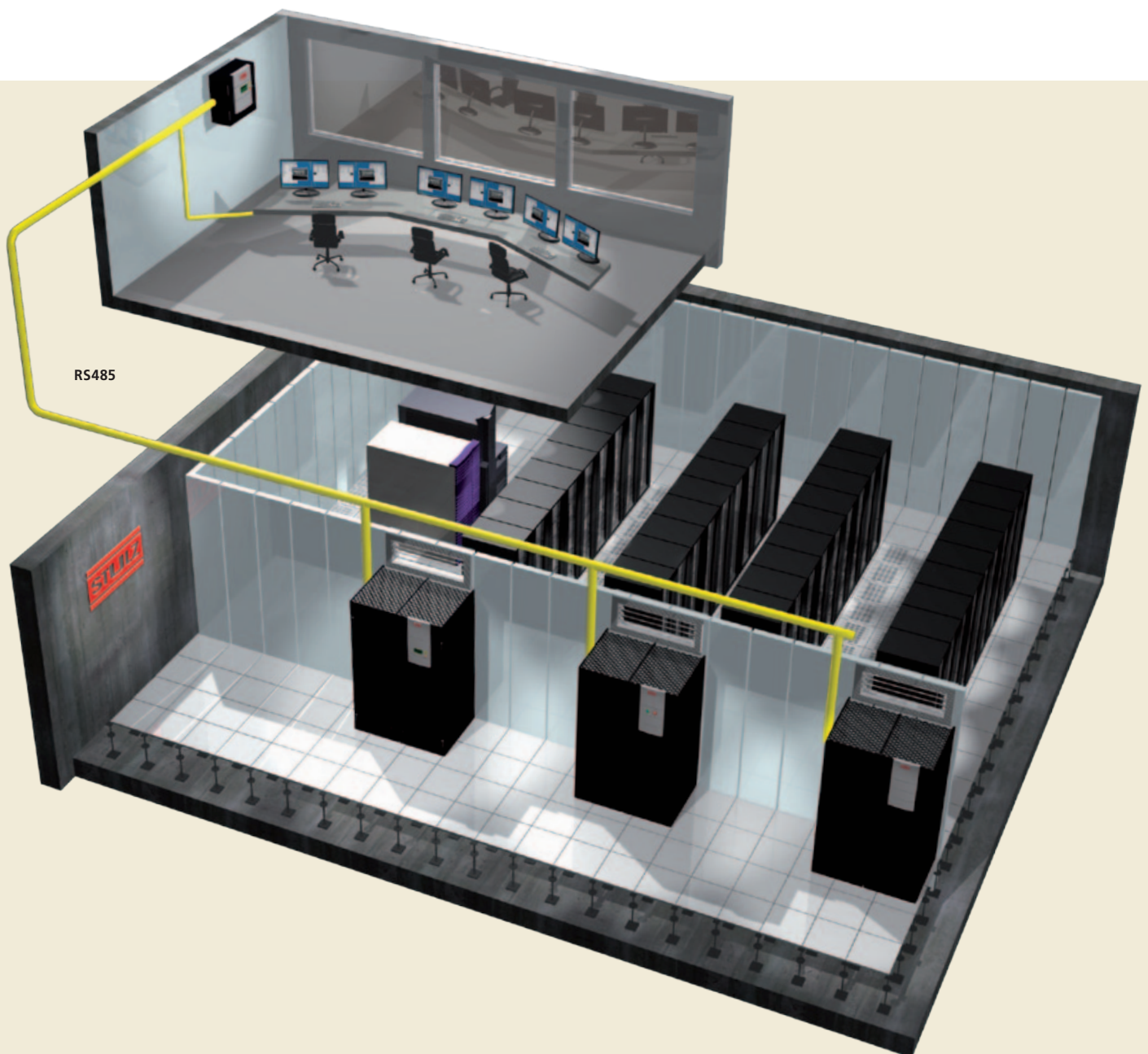


Quality down to the last detail

- A/C units in 7 sizes and with 8 cooling systems
- Precise air distribution, targeted removal of hotspots
- Scalable thanks to its modular construction, up to 20 units per room without additional hardware
- Automatic switchover to redundant standby units in the event of problems
- Perfect workmanship, superior materials
- Compact standard version or energy-optimised low-energy version
- Standard door size facilitates transport and assembly
- Convenient front only access for easy maintenance
- High-quality, hard-wearing powder coating of front panels

Control by microprocessor

To achieve the precise, reliable control of air conditioning, standby reserves and energy consumption, the STULZ CyberAir 3 is based on highly developed electronics. The STULZ C7000 microprocessor, which is integrated in every A/C unit, is the nerve centre of our innovative control concepts.

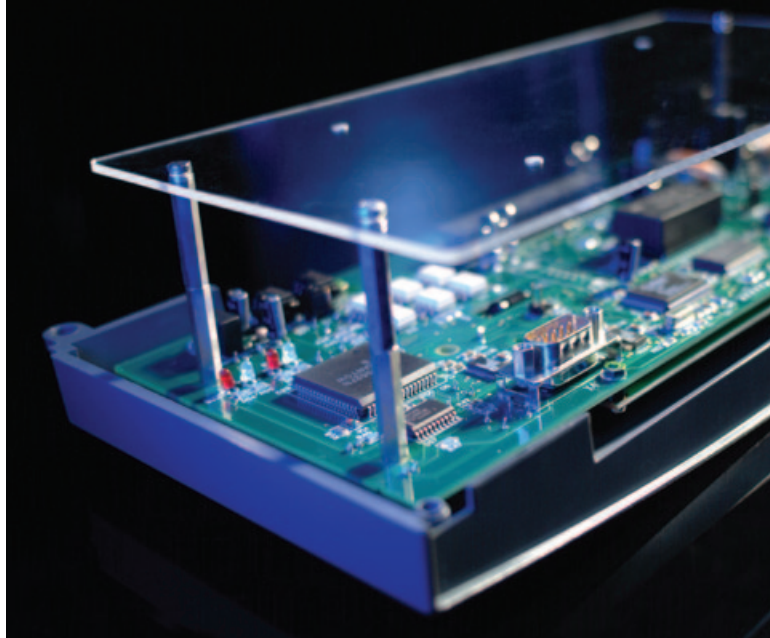


Networked system based on the RS485 standard

Bus systems based on the RS485 standard protocol offer high transmission rates and good reliability. Unlike an open Ethernet network, the closed RS485 bus system hermetically seals off the air-conditioning system out of harms' way of viruses and faulty software. As the global industry standard, RS485 ensures compatibility with all common BMS systems now and in the future.

All active components in perfect balance

The microprocessor keeps all active components of the system in balance. It adapts various parameters such as airflow, external pressure, noise level and cooling capacity of each A/C unit precisely in line with the room conditions. In addition, it supplies the data for the remote control units, initiates service messages and alarms via e-mail or SMS and can be linked via interfaces to all common BMS systems and to the internet.



C7000 basic version

This version comes equipped with all the necessary functions for controlling and monitoring the air-conditioning system. A service interface enables the C7000 to be precisely configured using a laptop. Optional signal lamps on the housing keep the user informed about the operating state of the A/C unit. The Modbus protocol frequently used for connection to BMS systems is already integrated in the microprocessor:

- High level of redundancy and availability thanks to autonomous controllers in every A/C module
- Sequencing with standby functions
- Control of up to 20 A/C modules per data bus system
- UPS operation with configurable components for low unit power consumption
- Recording of room conditions
- Event log
- Zone operation
- Service interface
- Modbus protocol preinstalled

C7000 Advanced user interface

This interface also features an external control panel with graphic display and an extended operator interface for connection to all common BMS systems. The Windows-type menu structure enables you to centrally control up to 20 A/C units. In addition to the functions of the basic version, the C7000 Advanced also offers the following:

- Large LCD graphic display for operation and control, either integrated in the A/C unit or as a separate remote control
- Simple adaptation to local conditions on start-up
- Can be operated in 12 languages
- Service interface for configuration and downloading software
- Manual mode for service purposes
- Suitable for connection to all common BMS systems. The RS485 and RS232 ports enable connection and interfacing to a BMS.
- Modbus and other data protocols preinstalled
- Optical and acoustic signalling of events
- The operator terminal is either incorporated in the air-conditioning unit, or available as a separate module

Network connection for convenient control

With intelligent network solutions from STULZ, you will always be in control of your STULZ CyberAir 3 precision air-conditioning system. You can enter and adjust setpoints, monitor the system and output operating data either using separate operator terminals, your PC or via a link to existing building management systems.

The serial RS485/RS232 interfaces enable connection with all common BMS systems from other manufacturers. Enjoy the convenience of controlling your air-conditioning system by web browser using the STULZ WIB8000 internet interface. And incorporate it in building management bus systems via the LonWorks®-based STULZ LIB7000 interface.

Basic interface STULZ MIB7000

- MIB = Multifunctional Interface Board
- BMS interfaces to bus systems in conformity with RS485 and RS232 standard
- Interfaces RS485 and RS232

Internet interface STULZ WIB8000

- WIB = Web Interface Board
- Communication via SNMP and HTTP IP protocols
- Browser-based configuration and operation (HTTP)

LonWorks® interface STULZ LIB7000

- LIB = Lon Interface Board, upgrade to MIB7000
- LonWorks® technology for STULZ air-conditioning systems

BMS suppliers	Data protocol							
Controller		C7000 IOC with E-bus	C7000 IOC	C7000 IOC with E-bus	C7000 IOC with E-bus	C7000 IOC with E-bus	C7000 IOC	C7000 IOC
Gateway			+ Advanced	+ MIB	+ WIB	+ MIB + LIB	+ CompTrol SMS	+ AT + LIB
Various manufacturers	Modbus RTU	●	●	●				
Various manufacturers	Modbus TCP/IP	●	●					
Kieback & Peter	P90		●	●				
Saia	S-Bus		●					
Various manufacturers	BACnet MSTP or IP	●	●					
LonWorks®	LonTalk®	●	●			●		●
Various manufacturers	SNMP				●			
Various manufacturers	HTTP				●			
Various manufacturers	GSM				*		●	

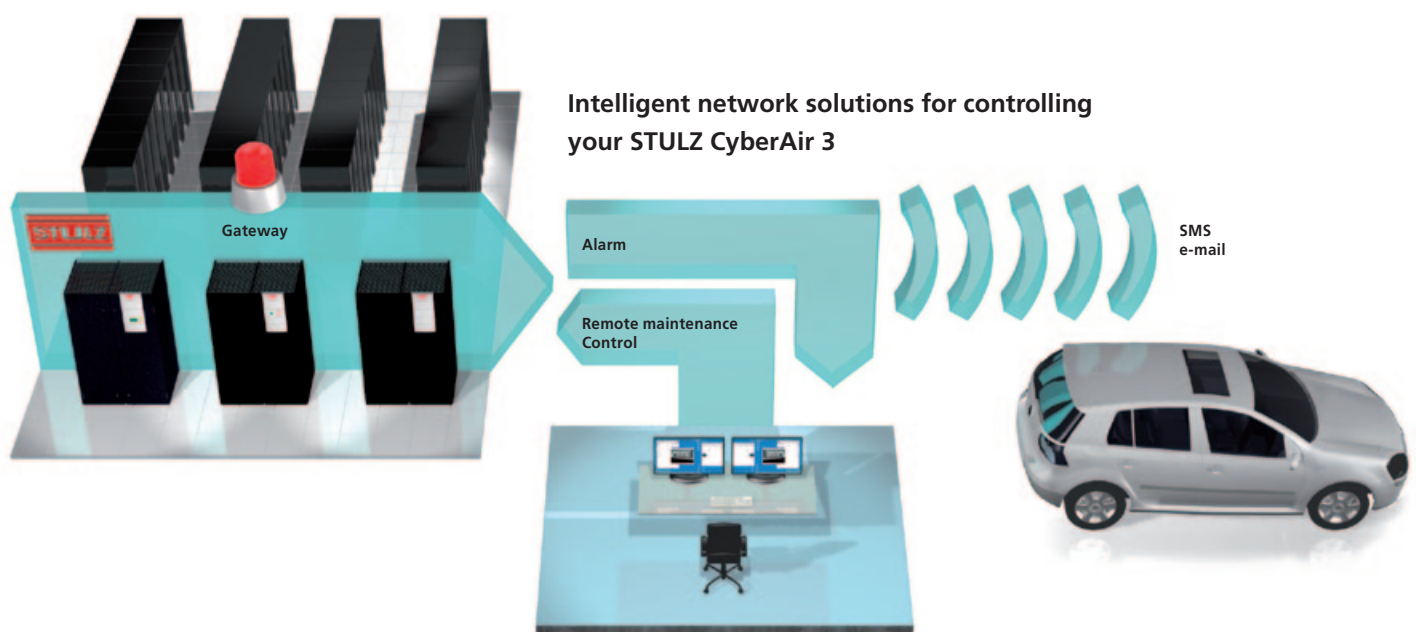
Cross-reference table: Gateway – data protocol

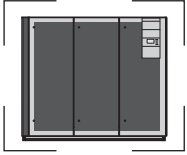
- Full functionality ● Customised gateway solution with protocol converter
 * SMS alarm notification via exchange server



Fully networked with building management systems

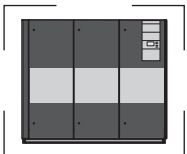
- Link to all building management systems from well-known manufacturers
- Remote control via web browser and SNMP and HTTP Internet protocols
- SMS or e-mail alarm notification via mobile phone with GSM modem





Mechanical and general options

- High-efficiency rear panel (optional for DX and GE systems downflow)
- Raised floorstand
- Louvered shutters
- Flexible canvas fittings
- Fresh air connection
- Filter class F5 (EU5)
- Discharge air plenums
- Suction base for upflow units
- Duct fitting with pocket filter attachment F6, F7, F9
- Mufflers
- Dual wall design
- Condensate pump
- Special paint

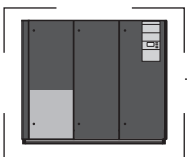


Heating options

- Electric heating, 1 to 3 stages, proportional
- Refrigerant heating
- Low-pressure hot water heating

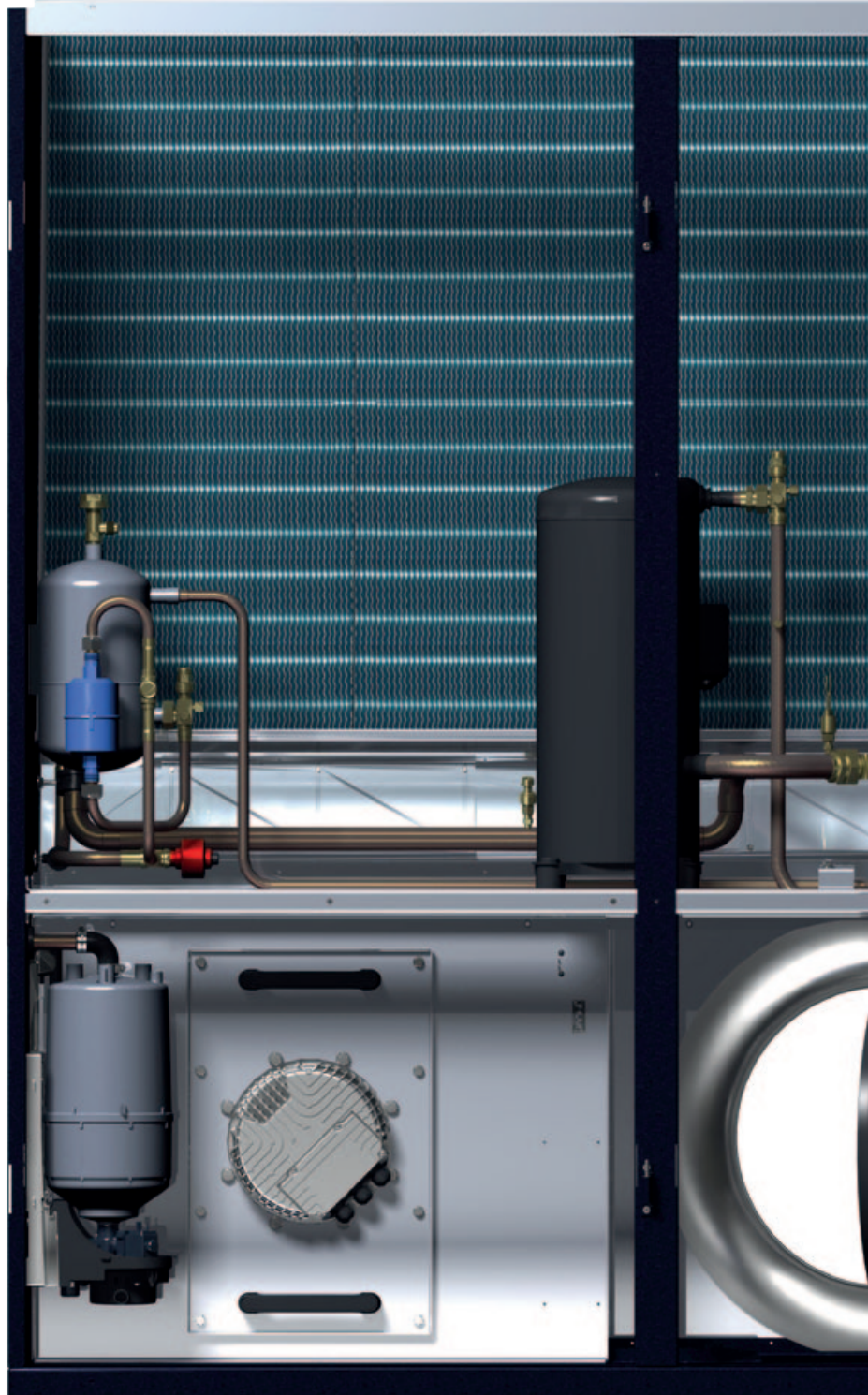
Options for air-cooled condensers

- Fan speed control
- Winter set-up for operation at temperatures down to -45 °C
- Anti-corrosive coating of heat exchanger pipes

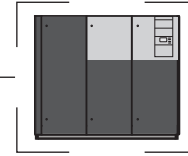
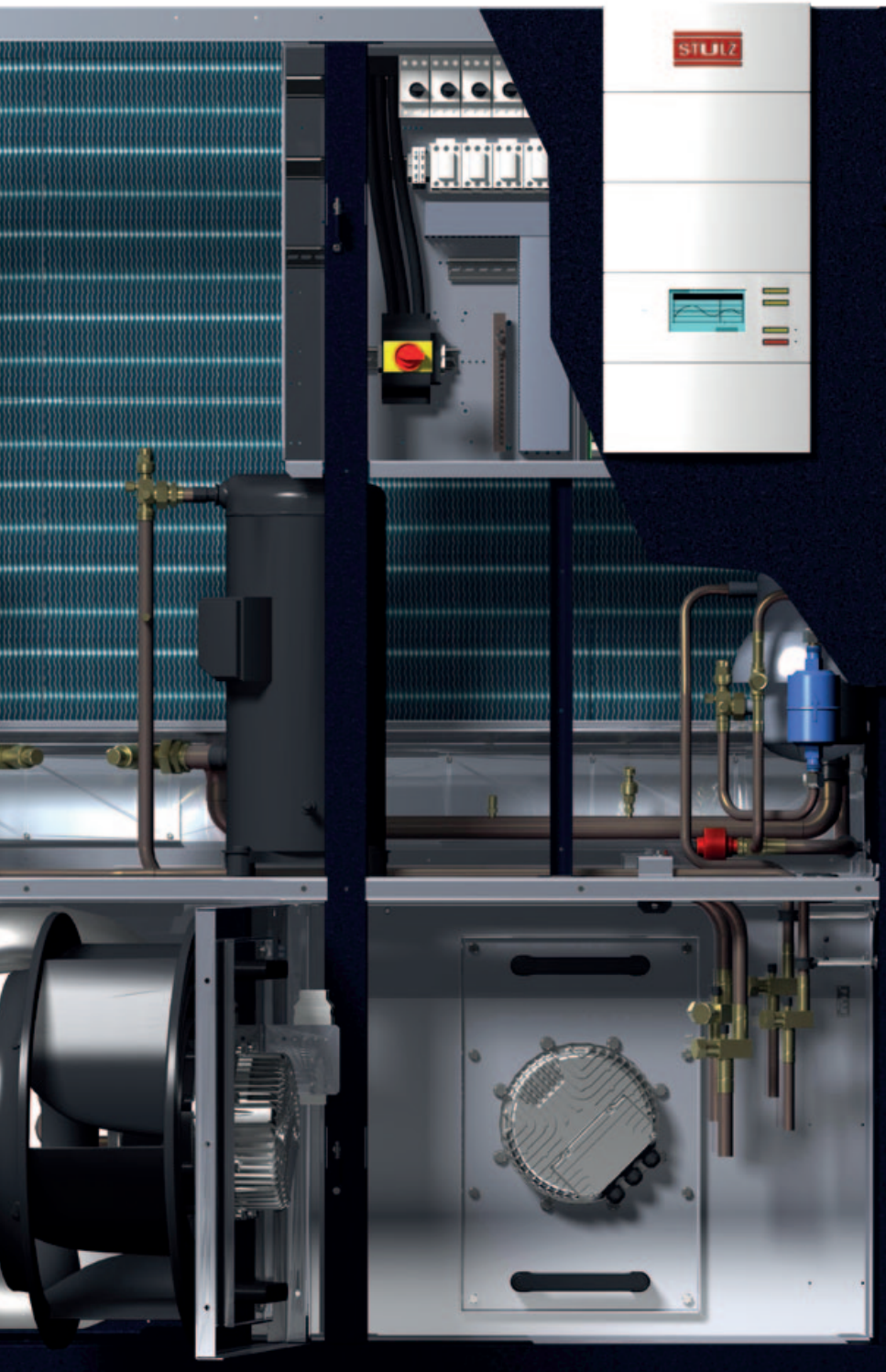


Humidifier options

- Proportional steam humidification

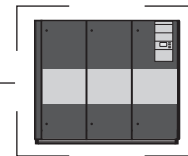


CyberAir 3 – Unlimited versatility with a diverse range of options



Electrotechnical options:

- Fire alarms
- Smoke alarms
- Emergency fire shutdown
- Water detection system
- Emergency manual override
- Triggering of fire doors
- Phase sequence monitoring
- Connection facility for remote On/Off
- Special voltages



Cooling system options

- Output regulation with suction throttle or discharge bypass
- 2-way CW valve
- Microprocessor-controlled regulation of condensation pressure via 2 or 3-way valves

Optional refrigerants

- R407C (standard)
- R410A
- R134a

Ease of maintenance

- Direct front access to all components requiring service, including the EC fans

CyberAir 3											
DX and Dual-Fluid units, single-circuit (1 compressor)											
ASD/ASU xxx A/G/ACW/GCW		191	221	251	281	321	371	391	421	461	541
Air flow	m³/h	5.900	6.500	7.000	7.000	9.500	10.500	10.800	11.500	14.000	15.000
DX cooling capacity (total) ¹⁾ R407C	kW	18.1	20.6	27.3	29.8	31.9	36.3	40.4	41.7	46.5	52.1
DX cooling capacity (sensible) ¹⁾ R407C	kW	18.1	20.6	24.0	25.0	30.3	33.6	35.6	37.9	43.7	47.3
Compressor power ¹⁾ R407C	kW	3.7	4.2	5.5	6.2	6.2	7.2	8.2	8.2	9.3	11.1
DX cooling capacity (total) ¹⁾ R410A	kW	18.8	21.2	26.5	30.0	32.0	36.8	40.7	41.3	46.6	53.3
DX cooling capacity (sensible) ¹⁾ R410A	kW	18.8	21.2	23.7	25.0	30.3	33.7	35.7	37.8	43.7	47.8
Compressor power ¹⁾ R410A	kW	3.7	4.5	5.7	6.3	6.3	7.3	8.3	8.3	9.4	11.3
DX cooling capacity (total) ¹⁾ R134a	kW	17.3	18.4	22.8	27.5	29.2	31.7	36.8	37.3	-	-
DX cooling capacity (sensible) ¹⁾ R134a	kW	17.3	18.4	22.8	24.1	29.2	31.7	34.2	37.3	-	-
Compressor power ¹⁾ R134a	kW	3.3	3.9	5.1	5.7	5.8	6.3	7.6	7.6	-	-
CW cooling capacity (total) ²⁾	kW	19.3	21.2	22.9	22.9	33.5	37.4	38.6	38.8	48.2	51.8
CW cooling capacity (sensible) ²⁾	kW	18.4	20.1	21.6	21.6	31.3	34.7	35.6	36.4	44.4	47.4
A, G units Downflow											
Max. available ESP	Pa	300	300	300	300	300	300	280	300	300	300
Noise level ³⁾	dBA	54.0	55.6	56.8	56.8	56.0	57.7	58.2	54.4	56.9	57.8
Fan absorbed power ⁴⁾	kW	0.9	1.1	1.4	1.4	1.4	1.8	2.0	1.2	2.2	2.6
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	0.8	1.0	1.3	1.3	1.3	1.7	1.8	1.1	2.0	2.5
Weight A/G	kg	329/334	330/335	348/355	352/360	463/475	463/475	465/476	548/560	550/562	550/563
A, G units Upflow											
Max. available ESP	Pa	450	400	320	320	440	300	250	450	420	350
Noise level ³⁾	dBA	56.1	57.5	58.7	58.7	57.8	59.1	59.8	56.4	58.7	59.6
Fan absorbed power ⁴⁾	kW	1.0	1.3	1.6	1.6	1.5	1.8	2.1	1.5	2.5	3.1
Weight A/G	kg	319/326	320/327	338/347	342/352	428/442	428/442	430/448	510/522	512/524	512/525
ACW, GCW units Downflow											
Max. available ESP	Pa	300	300	280	280	300	230	180	300	300	300
Noise level ³⁾	dBA	54.9	56.4	57.7	57.7	57.0	58.6	59.1	55.4	57.9	58.7
Fan absorbed power ⁴⁾	kW	1.0	1.3	1.6	1.6	1.6	2.1	2.3	1.5	2.7	3.2
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	0.9	1.2	1.5	1.5	1.4	1.9	2.1	1.4	2.4	3.0
Weight ACW/GCW	kg	348/351	348/351	367/372	370/375	488/501	489/501	490/502	591/606	592/607	593/608
ACW, GCW units Upflow											
Max. available ESP	Pa	420	330	250	250	370	220	170	450	340	260
Noise level ³⁾	dBA	57.0	58.5	59.7	59.7	58.6	60.2	60.6	57.3	59.6	60.5
Fan absorbed power ⁴⁾	kW	1.2	1.5	1.9	1.9	1.7	2.3	2.5	1.8	3.1	3.7
Weight ACW/GCW	kg	339/345	339/345	359/366	359/369	455/464	456/464	457/465	556/568	557/569	558/570
Size		1	1	1	1	2	2	2	3	3	3
DX and Dual-Fluid units, dual-circuit (2 compressors)											
ASD/ASU xxx A/G/ACW/GCW		412	462	522	562	622	712	812	872	1072	
Air flow	m³/h	11,500	13,500	14,500	16,500	19,000	20,000	21,500	23,000	24,500	
DX cooling capacity (total) ¹⁾ R407C	kW	40.4	45.9	53.7	56.8	63.3	71.8	83.2	91.4	102.4	
DX cooling capacity (sensible) ¹⁾ R407C	kW	37.9	43.3	47.8	53.6	60.1	64.8	75.3	81.1	88.0	
Compressor power ¹⁾ R407C	kW	8.4	9.6	11.0	11.0	12.4	14.4	16.4	18.6	22.2	
DX cooling capacity (total) ¹⁾ R410A	kW	42.3	48.7	52.4	54.0	63.2	72.4	82.7	91.5	104.8	
DX cooling capacity (sensible) ¹⁾ R410A	kW	38.6	44.4	47.3	54.0	60.0	65.1	75.2	81.2	89.0	
Compressor power ¹⁾ R410A	kW	9.0	10.4	11.4	11.4	12.6	14.6	16.6	18.8	22.6	
DX cooling capacity (total) ¹⁾ R134a	kW	35.6	40.8	45.5	48.1	57.9	62.4	74.7	-	-	
DX cooling capacity (sensible) ¹⁾ R134a	kW	35.6	40.8	45.5	48.1	57.9	62.4	74.7	-	-	
Compressor power ¹⁾ R134a	kW	7.8	8.6	10.2	10.0	11.6	12.6	15.2	-	-	
CW cooling capacity (total) ²⁾	kW	38.8	46.3	50.0	57.1	66.7	70.4	77.5	83.1	88.6	
CW cooling capacity (sensible) ²⁾	kW	36.4	42.8	45.9	52.8	60.8	64.0	70.2	75.0	79.5	
A, G units Downflow											
Max. available ESP	Pa	300	300	300	300	300	250	300	300	300	
Noise level ³⁾	dBA	54.4	56.4	57.3	56.9	58.7	59.3	59.6	60.9	62.2	
Fan absorbed power ⁴⁾	kW	1.2	2.0	2.4	2.4	3.6	4.1	3.1	3.8	4.6	
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	1.1	1.8	2.2	2.2	3.3	3.9	2.9	3.6	4.3	
Weight A/G	kg	574/588	574/589	608/623	710/745	719/747	721/748	826/853	828/855	829/857	
A, G units Upflow											
Max. available ESP	Pa	450	450	390	450	290	210	450	380	310	
Noise level ³⁾	dBA	56.4	58.3	59.1	58.7	60.4	61.0	62.0	63.3	64.6	
Fan absorbed power ⁴⁾	kW	1.5	2.3	2.8	2.6	3.9	4.6	3.6	4.3	5.2	
Weight A/G	kg	540/552	540/553	574/587	661/695	669/697	671/698	786/812	788/814	789/816	
ACW, GCW units Downflow											
Max. available ESP	Pa	300	300	300	300	250	170	300	300	250	
Noise level ³⁾	dBA	55.4	57.4	58.3	57.5	59.3	59.9	61.0	62.4	63.7	
Fan absorbed power ⁴⁾	kW	1.5	2.4	2.9	2.7	3.9	4.6	4.3	5.2	6.3	
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	1.4	2.2	2.7	2.5	3.7	4.3	3.9	4.8	5.7	
Weight ACW/GCW	kg	617/631	617/632	651/666	776/802	784/810	786/813	905/932	906/933	907/938	
ACW, GCW units Upflow											
Max. available ESP	Pa	450	380	300	390	210	130	380	300	220	
Noise level ³⁾	dBA	57.3	59.2	60.1	59.2	61.0	61.6	63.3	64.6	65.9	
Fan absorbed power ⁴⁾	kW	1.8	2.8	3.4	3.0	4.4	5.1	4.2	5.1	6.1	
Weight ACW/GCW	kg	577/597	577/598	610/632	728/757	735/764	737/767	866/891	867/892	868/897	
Size		3	3	3	4	4	4	5	5	5	

Remarks: All data apply at 400 V/3 ph/50 Hz with 20 Pa ESP (external static pressure) for downflow units and 50 Pa ESP for upflow units

¹⁾ DX cooling capacity for A, G units; return air conditions: 24 °C, 50 % r. h.; condensing temperature 45 °C

²⁾ CW cooling capacity for ACW and GCW units; return air conditions: 24°, 50 % r. h.; water temperature: 7 °C/12 °C

³⁾ Noise level at 2 m distance, free field

⁴⁾ The electric power input of the fans must be added to the room load

Technical data subject to change without notice.

CyberAir 3 with EC compressor								
DX and Dual-Fluid units, single-circuit (1 compressor)		ALD/ALU xxx AS/GS/ASCW/GSCW				ASD/ASU xxx AS/GS/ASCW/GSCW		
		191	221	251	281	321	371	391
Air flow	m³/h	5,000	5,500	7,000	7,000	8,000	10,000	11,000
DX cooling capacity (total) ¹⁾ R410A	kW	20.9	23.3	27.6	29.9	32.0	37.2	40.0
DX cooling capacity (sensible) ¹⁾ R410A	kW	20.9	23.3	27.6	29.9	32.0	37.2	40.0
Compressor power ¹⁾ R410A	kW	4.8	5.5	6.7	7.4	7.9	9.3	10.4
CW cooling capacity (total) ²⁾	kW	22.0	23.9	29.7	29.7	33.5	41.2	44.9
CW cooling capacity (sensible) ²⁾	kW	22.0	23.9	29.7	29.7	33.5	41.2	44.9
AS, GS units Downflow								
Max. available ESP	Pa	300	300	300	300	300	300	290
Noise level ³⁾	dBA	45.5	47.0	50.8	50.8	53.0	56.6	58.2
Fan absorbed power ⁴⁾	kW	0.2	0.3	0.6	0.6	0.8	1.6	2.1
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	0.2	0.3	0.5	0.5	0.8	1.5	1.9
Weight AS/GS	kg	462/475	462/475	462/475	470/481	470/481	470/481	470/481
AS, GS units Upflow								
Max. available ESP	Pa	450	450	450	450	450	430	270
Noise level ³⁾	dBA	48.0	49.3	52.8	52.8	54.8	58.3	59.9
Fan absorbed power ⁴⁾	kW	0.3	0.4	0.7	0.7	0.9	1.7	2.3
Weight AS/GS	kg	430/441	430/441	430/441	435/445	435/445	435/445	435/445
ASCW, GSCW units Downflow								
Max. available ESP	Pa	300	300	300	300	300	300	200
Noise level ³⁾	dBA	46.2	47.7	51.5	51.5	53.7	57.4	59.0
Fan absorbed power ⁴⁾	kW	0.3	0.3	0.7	0.7	1.0	1.8	2.4
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	0.2	0.3	0.6	0.6	0.9	1.7	2.2
Weight ASCW/GSCW	kg	488/498	488/498	488/498	495/506	495/506	495/506	495/506
ASCW, GSCW units Upflow								
Max. available ESP	Pa	450	450	450	450	450	360	180
Noise level ³⁾	dBA	48.6	50.0	53.5	53.5	55.6	59.1	60.6
Fan absorbed power ⁴⁾	kW	0.3	0.4	0.8	0.8	1.1	2.0	2.7
Weight ASCW/GSCW	kg	445/454	445/454	445/454	447/458	460/470	460/470	460/470
Size		2	2	2	2	2	2	2
DX and Dual-Fluid units, dual-circuit (2 compressors)		ASD/ASU xxx AS/GS/ASCW/GSCW						
		412	462	522	562	622	712	812
Air flow	m³/h	11,000	12,000	14,000	15,000	17,000	20,000	20,000
DX cooling capacity (total) ¹⁾ R410A	kW	43.2	48.2	53.4	56.9	64.3	72.7	82.0
DX cooling capacity (sensible) ¹⁾ R410A	kW	43.2	48.2	53.4	56.9	64.3	72.7	82.0
Compressor power ¹⁾ R410A	kW	9.6	11.1	12.4	12.6	14.2	16.1	18.7
CW cooling capacity (total) ²⁾	kW	44.0	47.6	54.6	60.1	67.2	77.8	80.0
CW cooling capacity (sensible) ²⁾	kW	44.0	47.6	54.6	60.1	67.2	77.8	80.0
AS, GS units Downflow								
Max. available ESP	Pa	300	300	300	300	300	300	300
Noise level ³⁾	dBA	53.5	54.6	56.5	55.4	57.0	59.1	57.5
Fan absorbed power ⁴⁾	kW	1.1	1.4	2.2	1.8	2.6	4.1	2.5
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	1.0	1.3	2.0	1.7	2.4	3.9	2.4
Weight AS/GS	kg	580/595	585/596	615/630	720/754	725/755	730/756	835/860
AS, GS units Upflow								
Max. available ESP	Pa	450	450	450	450	450	270	450
Noise level ³⁾	dBA	55.5	56.5	58.3	57.2	58.8	60.8	60.0
Fan absorbed power ⁴⁾	kW	1.3	1.7	2.5	2.1	2.9	4.7	3.0
Weight AS/GS	kg	547/555	548/560	581/592	670/703	675/704	680/706	795/820
ASCW, GSCW-System Downflow								
Max. available ESP	Pa	300	300	300	300	300	250	300
Noise level ³⁾	dBA	54.4	55.5	57.5	55.8	57.4	59.5	58.9
Fan absorbed power ⁴⁾	kW	1.3	1.7	2.7	2.1	2.9	4.6	3.5
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	1.2	1.6	2.4	1.9	2.7	4.3	3.2
Weight ASCW/GSCW	kg	625/635	626/637	655/672	781/808	789/815	793/818	910/940
ASCW, GSCW-System Upflow								
Max. available ESP	Pa	450	450	410	450	420	190	450
Noise level ³⁾	dBA	56.3	57.4	59.2	57.7	59.3	61.3	61.2
Fan absorbed power ⁴⁾	kW	1.6	2.0	3.1	2.3	3.3	5.2	3.5
Weight ASCW/GSCW	kg	582/602	583/604	614/636	735/763	741/770	742/772	870/894
Size		3	3	3	4	4	4	5

Remarks: All data apply at 400 V/3 ph/50 Hz with 20 Pa ESP (external static pressure) for downflow units and 50 Pa ESP for upflow units

¹⁾ DX cooling capacity for AS, GS units; return air conditions: 26°C, 40 % r. h.; condensing temperature 45°C

²⁾ CW cooling capacity for ASCW and GSCW units; return air conditions: 26°C, 40 % r. h.; water temperature: 7°C/12°C

³⁾ Noise level at 2 m distance, free field ⁴⁾ The electric power input of the fans must be added to the room load Technical data subject to change without notice.

Dimensions and number of fans				
Size		2	3	5
Width	mm	1,400	1,750	2,550
Height	mm	1,980	1,980	1,980
Depth	mm	890	890	890
Number of fans		1	2	3
Humidifier output and heating capacity				
Size		2	3	5
Max. humidifier capacity	kg/h	8	15	15
Max. no of heating steps (Downflow)		2	2	3
Max. heating capacity per step	kW	9	9	9
Max. overall heating capacity	kW	18	18	27
Max. no of heating steps (Upflow)		2	2	3
Max. heating capacity per step	kW	9	9	9
Max. overall heating capacity	kW	18	18	27

CyberAir 3															
GE units, single-circuit (1 compressor)		ASD/ASU xxx GE				ALD/ALU xxx GE									
		191	221	251	281	191	221	251	281	321	371	391	421	461	541
Air flow	m³/h	5,900	6,500	7,000	7,000	5,900	6,800	7,200	7,500	9,500	10,500	10,800	11,500	13,500	15,000
DX cooling capacity (total) ¹⁾ R407C	kW	18.1	20.6	27.3	29.8	18.7	21.4	27.8	30.8	32.0	37.0	41.5	43.0	48.0	54.1
DX cooling capacity (sensible) ¹⁾ R407C	kW	18.1	20.6	24.0	25.0	18.7	21.4	24.9	26.6	32.0	34.6	36.8	39.8	45.2	50.1
Compressor power ¹⁾ R407C	kW	3.7	4.2	5.5	6.2	3.7	4.2	5.5	6.2	6.2	7.2	8.2	8.2	9.3	11.2
DX cooling capacity (total) ¹⁾ R410A	kW	18.8	21.2	26.5	30.0	21.7	24.8	27.0	30.6	31.7	37.0	41.2	42.3	47.4	55.0
DX cooling capacity (sensible) ¹⁾ R410A	kW	18.8	21.2	23.7	25.0	20.3	23.1	24.6	26.5	31.7	34.5	36.7	39.5	45.0	50.4
Compressor power ¹⁾ R410A	kW	3.7	4.5	5.7	6.3	4.5	5.2	5.7	6.3	6.3	7.3	8.3	8.3	9.4	11.3
DX cooling capacity (total) ¹⁾ R134a	kW	17.3	18.4	22.8	27.5	17.8	19.0	23.5	28.4	29.6	32.3	37.2	38.5	-	-
DX cooling capacity (sensible) ¹⁾ R134a	kW	17.3	18.4	22.8	24.1	17.8	19.0	23.5	25.7	29.6	32.3	35.1	38.5	-	-
Compressor power ¹⁾ R134a	kW	3.3	3.9	5.1	5.7	3.3	3.8	5.0	5.7	5.8	6.3	7.6	7.7	-	-
CW cooling capacity (total) ²⁾	kW	18.3	19.8	22.6	24.1	19.9	22.3	25.3	27.2	30.4	33.8	36.8	38.6	43.6	50.3
CW cooling capacity (sensible) ²⁾	kW	18.3	19.8	21.4	22.3	19.9	22.3	24.0	25.5	29.8	32.6	34.5	37.0	42.1	47.3
GE units Downflow															
Max. available ESP	Pa	300	300	280	280	300	300	300	300	300	300	300	300	300	300
Noise level ³⁾	dBA	54.9	56.4	57.7	57.7	49.2	51.5	52.4	53.1	53.0	54.2	54.6	52.9	54.9	56.2
Fan absorbed power ⁴⁾	kW	1.0	1.3	1.6	1.6	0.4	0.6	0.7	0.8	0.9	1.2	1.3	0.9	1.5	2.0
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	0.9	1.2	1.5	1.5	0.4	0.6	0.7	0.7	0.8	1.1	1.2	0.9	1.4	1.9
Weight	kg	352	352	375	381	479	479	496	497	609	610	612	704	705	706
GE units Upflow															
Max. available ESP	Pa	420	330	250	250	450	450	450	450	450	450	450	450	450	450
Noise level ³⁾	dBA	57.0	58.5	59.7	59.7	51.3	53.4	54.3	54.4	55.1	56.2	56.6	55.0	56.8	58.1
Fan absorbed power ⁴⁾	kW	1.2	1.5	1.9	1.9	0.5	0.7	0.8	0.8	1.1	1.4	1.5	1.1	1.7	2.3
Weight	kg	337	337	366	372	448	448	464	465	575	576	578	654	655	656
Size		1	1	1	1	2	2	2	2	3	3	3	4	4	4
GE units, dual-circuit (2 compressors)															
ALD/ALU xxx GE		412	462	522	562	622	712	812	872	1072					
Air flow	m³/h	11,500	13,500	14,500	16,500	19,000	20,000	21,500	23,000	24,500					
DX cooling capacity (total) ¹⁾ R407C	kW	41.7	47.4	55.5	58.0	64.8	74.0	83.2	91.4	102.4					
DX cooling capacity (sensible) ¹⁾ R407C	kW	39.3	45.0	49.8	58.0	64.8	69.2	75.3	81.1	88.0					
Compressor power ¹⁾ R407C	kW	8.4	9.6	11.0	11.0	12.4	14.4	16.4	18.6	22.2					
DX cooling capacity (total) ¹⁾ R410A	kW	42.7	49.5	53.7	55.5	64.3	74.1	82.7	91.5	104.8					
DX cooling capacity (sensible) ¹⁾ R410A	kW	39.7	45.8	49.1	55.5	64.3	69.2	75.2	81.2	89.0					
Compressor power ¹⁾ R410A	kW	9.0	10.4	11.4	11.4	12.6	14.6	16.6	18.8	22.6					
DX cooling capacity (total) ¹⁾ R134a	kW	36.9	41.8	47.0	49.8	59.6	64.4	74.7	-	-					
DX cooling capacity (sensible) ¹⁾ R134a	kW	36.9	41.8	47.0	49.8	59.6	64.4	74.7	-	-					
Compressor power ¹⁾ R134a	kW	7.8	8.6	10.0	10.0	11.6	12.6	15.2	-	-					
CW cooling capacity (total) ²⁾	kW	37.9	44.0	50.1	54.0	61.2	68.9	76.3	84.2	92.9					
CW cooling capacity (sensible) ²⁾	kW	36.7	42.3	46.7	51.5	58.1	63.7	69.5	75.6	82.0					
GE units Downflow															
Max. available ESP	Pa	300	300	300	300	300	300	300	300	250					
Noise level ³⁾	dBA	52.9	54.9	55.8	55.6	58.5	59.5	61.0	62.4	63.7					
Fan absorbed power ⁴⁾	kW	0.9	1.5	1.8	2.0	3.0	3.5	4.3	5.2	6.3					
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	0.9	1.4	1.7	1.8	2.7	3.2	3.9	4.8	5.7					
Weight	kg	756	758	792	923	930	939	952	954	954					
GE units Upflow															
Max. available ESP	Pa	450	450	450	450	450	440	380	300	220					
Noise level ³⁾	dBA	55.0	56.8	57.7	58.3	60.9	61.9	63.3	64.6	65.5					
Fan absorbed power ⁴⁾	kW	1.1	1.7	2.1	2.1	3.0	3.5	4.2	5.1	5.8					
Weight	kg	708	710	743	889	896	905	918	920	920					
Size		4	4	4	5	5	5	5	5	5					

Remarks: All data apply at 400 V/3 ph/50 Hz with 20 Pa ESP (external static pressure) for downflow units and 50 Pa ESP for upflow units

¹⁾ DX cooling capacity for GE units; return air conditions: 24 °C, 50 % r. h.; condensing temperature 45 °C

²⁾ CW cooling capacity for GE units; return air conditions: 24°, 50 % r. h.; incoming water temperature: 7 °C ; glycol: 30 %

³⁾ Noise level at 2 m distance, free field

⁴⁾ The electric power input of the fans must be added to the room load

Technical data subject to change without notice.

Dimensions and number of fans					
Size		1	2	3	5
Width	mm	950	1,400	1,750	2,550
Height	mm	1,980	1,980	1,980	1,980
Depth	mm	890	890	890	890
Number of fans		1	1	2	3
Humidifier output and heating capacity					
Size		1	2	3	5
Max. humidifier capacity	kg/h	8	8	15	15
Max. no of heating steps (Downflow)		2	2	2	3
Max. heating capacity per step	kW	9	9	9	9
Max. overall heating capacity	kW	18	18	18	27
Max. no of heating steps (Upflow)		1	2	2	3
Max. heating capacity per step	kW	9	9	9	9
Max. overall heating capacity	kW	9	18	18	27

CyberAir 3 with EC compressor								
GES units, single-circuit (1 compressor)								
ALD/ALU xxx GES		191	221	251	281	321	371	391
Air flow	m³/h	5,000	5,500	7,000	7,500	8,000	9,500	10,500
DX cooling capacity (total) ¹⁾ R410A	kW	20.9	23.3	27.6	31.4	32.4	37.3	40.4
DX cooling capacity (sensible) ¹⁾ R410A	kW	20.9	23.3	27.6	31.4	32.4	37.3	40.4
Compressor power ¹⁾ R410A	kW	4.8	5.5	6.7	7.9	7.9	9.3	10.4
CW cooling capacity (total) ²⁾	kW	20.4	22.3	27.1	30.0	31.0	35.7	39.1
CW cooling capacity (sensible) ²⁾	kW	20.4	22.3	27.1	30.0	31.0	35.7	39.1
GES units Downflow								
Max. available ESP	Pa	300	300	300	300	300	300	300
Noise level ³⁾	dBA	46.2	47.7	51.6	52.7	50.5	52.6	53.8
Fan absorbed power ⁴⁾	kW	0.3	0.3	0.7	0.8	0.5	0.9	1.2
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	0.2	0.3	0.6	0.7	0.5	0.8	1.1
Weight	kg	480	480	495	505	615	615	615
GES units Upflow								
Max. available ESP	Pa	450	450	450	450	450	450	450
Noise level ³⁾	dBA	48.7	50.0	53.5	54.6	52.8	54.7	55.8
Fan absorbed power ⁴⁾	kW	0.3	0.4	0.8	0.9	0.7	1.1	1.4
Weight	kg	450	450	460	472	585	585	585
Size		2	2	2	2	3	3	3
GES units, dual-circuit (2 compressors)								
ALD/ALU xxx GES		412	462	522	562	622	712	812
Air flow	m³/h	10,000	11,500	13,500	13,000	15,000	17,000	20,000
DX cooling capacity (total) ¹⁾ R410A	kW	42.0	48.0	53.3	55.1	63.0	72.2	82.0
DX cooling capacity (sensible) ¹⁾ R410A	kW	42.0	48.0	53.3	55.1	63.0	72.2	82.0
Compressor power ¹⁾ R410A	kW	9.3	10.7	12.0	12.2	13.7	16.1	18.7
CW cooling capacity (total) ²⁾	kW	38.8	44.4	50.2	50.9	58.1	65.3	75.8
CW cooling capacity (sensible) ²⁾	kW	38.8	44.4	50.2	50.9	58.1	65.3	75.8
GES units Downflow								
Max. available ESP	Pa	300	300	300	300	300	300	300
Noise level ³⁾	dBA	50.7	52.5	54.5	50.2	53.1	55.5	58.9
Fan absorbed power ⁴⁾	kW	0.6	0.9	1.5	1.0	1.5	2.2	3.5
Fan absorbed power ⁴⁾ with option high efficiency rear panel	kW	0.6	0.9	1.4	0.9	1.4	2.0	3.2
Weight	kg	765	770	800	929	935	944	960
GES units Upflow								
Max. available ESP	Pa	450	450	450	450	450	450	450
Noise level ³⁾	dBA	53.1	54.6	56.5	53.3	55.8	58.1	61.2
Fan absorbed power ⁴⁾	kW	0.8	1.1	1.7	1.1	1.6	2.2	3.5
Weight	kg	720	725	750	897	904	911	926
Size		4	4	4	5	5	5	5

Remarks: All data apply at 400 V/3 ph/50 Hz with 20 Pa ESP (external static pressure) for downflow units and 50 Pa ESP for upflow units

¹⁾ DX cooling capacity for GES units; return air conditions: 26°C, 40 % r, h_i; condensing temperature 45°C

²⁾ CW cooling capacity for GES units; return air conditions: 26°C, 40 % r, h_i; incoming water temperature: 8°C ; glycol: 30 %

³⁾ Noise level at 2 m distance, free field ⁴⁾ The electric power input of the fans must be added to the room load Technical data subject to change without notice.

Dimensions and number of fans					
Size		2	3	4	5
Width	mm	1,400	1,750	2,200	2,550
Height	mm	1,980	1,980	1,980	1,980
Depth	mm	890	890	890	890
Number of fans		1	2	2	3
Humidifier output and heating capacity					
Size		2	3	4	5
Max. humidifier capacity	kg/h	8	15	15	15
Max. no of heating steps (Downflow)		2	2	3	3
Max. heating capacity per step		9	9	9	9
Max. overall heating capacity		18	18	27	27
Max. no of heating steps (Upflow)		2	2	3	3
Max. heating capacity per step		9	9	9	9
Max. overall heating capacity		18	18	27	27

CyberAir 3

CW units, Downflow (1 chilled water circuit)

ASD xxx CW		320	420	550	650	800	950	1000	1180	1250	1550	1800	2100
Air flow	m³/h	7,000	9,000	10,000	13,000	15,500	18,500	19,000	21,500	24,000	29,000	33,000	39,000
CW cooling capacity (total) ¹⁾	kW	30.1	38.2	54.0	67.5	83.7	100.4	112.6	125.9	135.2	159.4	184.0	214.0
Water temperature: 7 °C/12 °C													
CW cooling capacity (sensible) ¹⁾	kW	26.7	34.0	42.9	54.5	66.6	79.7	85.5	96.3	105.1	126.1	144.2	168.8
Water temperature: 7 °C/12 °C													
Hydraulic pressure drop ¹⁾	kPa	34	53	55	85	42	61	58	72	74	105	67	91
Water temperature: 7 °C/12 °C													
CW cooling capacity (total) ²⁾³⁾	kW	28.4	35.0	42.7	53.2	68.5	80.7	84.6	94.7	103.5	122.9	139.8	162.7
Water temperature: 10 °C/16 °C													
CW cooling capacity (sensible) ²⁾³⁾	kW	28.4	35.0	42.7	53.2	68.5	80.7	84.6	94.7	103.5	122.9	139.8	162.7
Water temperature: 10 °C/16 °C													
Hydraulic pressure drop ²⁾³⁾	kPa	78	116	70	104	55	75	79	97	68	93	64	86
Water temperature: 10 °C/16 °C													
Max. available ESP	Pa	300	290	300	80	300	110	300	190	300	230	300	150
Noise level ⁴⁾	dBA	50.4	57.1	53.4	60.4	60.6	65.0	60.8	63.9	59.4	64.3	61.4	65.5
Fan absorbed power ⁵⁾	kW	0.9	1.8	1.1	2.4	2.9	4.9	3.1	4.5	3.6	6.3	5.8	9.4
Weight	kg	281		350		503		586		688		870	
Size		1	1	2	2	3	3	4	4	5	5	7	7

CW units, Upflow (1 chilled water circuit)

ASU xxx CW		320	420	550	650	800	950	1000	1180	1250	1550		
Air flow	m³/h	7,000	9,000	10,000	13,000	16,000	19,000	19,000	22,000	24,000	29,000		
CW cooling capacity (total) ¹⁾	kW	30.1	38.2	54.0	67.5	77.7	92.9	100.3	115.9	127.7	153.9		
Water temperature: 7 °C/12 °C													
CW cooling capacity (sensible) ¹⁾	kW	26.7	34.0	42.9	54.5	64.9	77.2	80.2	92.7	102.3	123.2		
Water temperature: 7 °C/12 °C													
Hydraulic pressure drop ¹⁾	kPa	33	52	55	85	32	45	54	71	68	97		
Water temperature: 7 °C/12 °C													
CW cooling capacity (total) ²⁾³⁾	kW	28.4	35.0	42.7	53.2	62.1	72.7	81.1	92.7	101.5	120.5		
Water temperature: 10 °C/16 °C													
CW cooling capacity (sensible) ²⁾³⁾	kW	28.4	35.0	42.7	53.2	62.1	72.7	81.1	92.7	101.5	120.5		
Water temperature: 10 °C/16 °C													
Hydraulic pressure drop ²⁾³⁾	kPa	77	115	70	105	38	51	71	92	63	87		
Water temperature: 10 °C/16 °C													
Max. available ESP	Pa	450	280	450	60	410	190	410	190	450	230		
Noise level ⁴⁾	dBA	52.8	59.1	55.4	62.2	55.1	58.9	55.6	58.8	61.2	65.9		
Fan absorbed power ⁵⁾	kW	1.0	1.9	1.3	2.7	2.8	4.6	3.1	4.7	3.8	6.5		
Weight	kg	282		351		514		605		721			
Size		1	1	2	2	3	3	4	4	5	5		

Remarks: All data apply at 400 V/3 ph/50 Hz with 20 Pa ESP (external static pressure) for downflow units and 50 Pa ESP for upflow units

¹⁾ Return air conditions: 24 °C, 50 % r. h.; glycol: 0 %

²⁾ Return air conditions: 26 °C, 40 % r. h.; glycol: 0 %

³⁾ Data apply to units with optional high-powered cooler

⁴⁾ Noise level at 2 m distance, free field

⁵⁾ The electric power input of the fans must be added to the room load

Technical data subject to change without notice.

Dimensions and number of fans

Size		1	2	3	4	5	7
Width	mm	950	1,400	1,750	2,200	2,550	3,110
Height	mm	1,980	1,980	1,980	1,980	1,980	1,980
Depth	mm	890	890	890	890	890	980
Number of fans		1	1	2	2	3	4

Humidifier output and heating capacity

Size		1	2	3	4	5	7
Max. humidifier capacity	kg/h	8	8	15	15	15	15
Max. no of heating steps		1	1	2	2	3	3
Max. heating capacity per step	kW	9	9	9	9	9	9
Max. overall heating capacity	kW	9	9	18	18	27	27

CyberAir 3								
CWE/CWU units, Downflow (1 chilled water circuit)								
ASD xxx CWE/CWU		390	600	1050	1350	1700	2050	2400
Air flow	m³/h	10,000	12,500	23,000	24,000	33,000	47,000	48,000
CW cooling capacity (total) ¹⁾	kW	39.8	70.0	93.5	134.2	174.8	213.3	237.4
Water temperature: 7 °C/12 °C								
CW cooling capacity (sensible) ¹⁾	kW	36.3	54.8	84.5	105.0	140.1	183.7	196.1
Water temperature: 7 °C/12 °C								
Hydraulic pressure drop ¹⁾	kPa	42	69	70	91	189	82	102
Water temperature: 7 °C/12 °C								
CW cooling capacity (total) ²⁾³⁾	kW	36.9	54.0	82.7	97.7	120.7 ⁷⁾	186.0	195.6
Water temperature: 10 °C/16 °C								
CW cooling capacity (sensible) ²⁾³⁾	kW	36.9	54.0	82.7	97.7	120.7 ⁷⁾	186.0	195.6
Water temperature: 10 °C/16 °C								
Hydraulic pressure drop ²⁾³⁾	kPa	55	80	111	101	158 ⁷⁾	110	100
Water temperature: 10 °C/16 °C								
Noise level CWE (Fan on raised floor) ⁴⁾	dBA	54.3	59.8	60.5	61.9	61.6	62.6	63.6
Noise level CWU (Fan in raised floor void) ⁴⁾⁶⁾	dBA	54.1	58.9	60.0	59.3	58.7	61.4	61.9
Fan absorbed power CWE (Fan on raised floor) ⁵⁾	kW	1.9	2.1	5.0	4.7	7.0	11.3	11.2
Fan absorbed power CWU (Fan in raised floor void) ⁵⁾⁶⁾	kW	1.2	1.9	3.7	3.5	4.8	8.6	8.4
Weight	kg	365	482	559	692	863	1,055	1,133
Size		1	2	3	4	5	7	8
CW2 units, Downflow (2 chilled water circuit)								
ASD xxx CW2E/CW2U		350	570	750	1060	1450	1950	2150
Air flow	m³/h	10,000	12,500	19,000	23,000	32,000	44,000	46,500
CW cooling capacity (total) ¹⁾	kW	35.7	51.6	80.1	101.7	140.4	185.7	202.4
Water temperature: 7 °C/12 °C								
CW cooling capacity (sensible) ¹⁾	kW	33.5	46.4	71.2	87.2	120.5	160.6	173.6
Water temperature: 7 °C/12 °C								
Hydraulic pressure drop ¹⁾	kPa	33	37	78	74	106	74	101
Water temperature: 7 °C/12 °C								
CW cooling capacity (total) ²⁾³⁾	kW	36.4	48.4	72.4	85.0	116.1	150.9	165.9
Water temperature: 10 °C/16 °C								
CW cooling capacity (sensible) ²⁾³⁾	kW	36.4	48.4	72.4	85.0	116.1	150.9	165.9
Water temperature: 10 °C/16 °C								
Hydraulic pressure drop ²⁾³⁾	kPa	69	66	116	84	105	70	92
Water temperature: 10 °C/16 °C								
Noise level CWE (Fan on raised floor) ⁴⁾	dBA	58.0	59.6	55.8	58.7	60.8	62.9	64.2
Noise level CWU (Fan in raised floor void) ⁴⁾⁶⁾	dBA	55.4	57.8	55.2	58.5	59.3	62.0	62.4
Fan absorbed power CWE (Fan on raised floor) ⁵⁾	kW	2.4	3.0	3.8	5.7	7.9	11.5	11.9
Fan absorbed power CWU (Fan in raised floor void) ⁵⁾⁶⁾	kW	1.9	2.5	3.0	4.5	5.7	8.6	9.3
Weight	kg	474	556	662	760	928	1,205	1,273
Size		1	2	3	4	5	7	8

Remarks: All data apply at 400 V/3 ph/50 Hz with 20 Pa ESP (external static pressure) for downflow units; filter class F5

¹⁾ Return air conditions: 24 °C. 50 % r. h.; glycol: 0 %

²⁾ Return air conditions: 26 °C. 40 % r. h.; glycol: 0 %

³⁾ Data apply to units with optional high-powered cooler

⁴⁾ Noise level at 2 m distance. free field

⁵⁾ The electric power input of the fans must be added to the room load

⁶⁾ Measured at a height of raised floor = 900 mm

⁷⁾ Data with reduced air flow. details provided on request

Technical data subject to change without notice.

Dimensions and number of fans								
Size		1	2	3	4	5	7	8
Width	mm	950	1,400	1,750	2,200	2,550	3,110	3,350
Height	mm	2.495						
Depth	mm	890					980	
Number of fans		1	1	2	2	3	4	4
Humidifier output and heating capacity								
Size		1	2	3	4	5	7	8
Max. humidifier capacity	kg/h	8	8	15	15	15	15	15
Max. no of heating steps		1	1	2	2	3	3	3
Max. heating capacity per step	kW	9	9	9	9	9	9	9
Max. overall heating capacity	kW	9	9	18	18	27	27	27

CyberAir 3							
CW2 units, Downflow (2 chilled water circuit)							
ASD xxx CW2		270	510	670	810	1070	1170
Air flow	m³/h	8,500	11,500	17,500	21,000	26,000	36,000
CW cooling capacity (total) ¹⁾	kW	31.3	49.3	68.2	86.3	107.6	137.2
Water temperature: 7 °C/12 °C							
CW cooling capacity (sensible) ¹⁾	kW	28.3	42.6	60.7	74.7	93.4	120.7
Water temperature: 7 °C/12 °C							
Hydraulic pressure drop ¹⁾	kPa	109	79	69	91	111	85
Water temperature: 7 °C/12 °C							
CW cooling capacity (total) ²⁾³⁾	kW	27.8	41.6	59.3	72.4	90.2	118.4
Water temperature: 10 °C/16 °C							
CW cooling capacity (sensible) ²⁾³⁾	kW	27.8	41.6	59.3	72.4	90.2	118.4
Water temperature: 10 °C/16 °C							
Hydraulic pressure drop ²⁾³⁾	kPa	96	99	82	136	141	161
Water temperature: 10 °C/16 °C							
Max. available ESP	Pa	210	70	190	180	290	240
Noise level ⁴⁾	dBA	55.0	56.7	57.2	57.5	57.7	59.0
Fan absorbed power ⁵⁾	kW	2.0	2.7	4.2	4.6	5.3	7.8
Weight	kg	293	380	461	553	644	844
Size		1	2	3	4	5	7
CW2 units, Upflow (2 chilled water circuit)							
ASU xxx CW2		270	510	670	810	1070	
Air flow	m³/h	8,500	10,500	17,000	20,000	26,000	
CW cooling capacity (total) ¹⁾	kW	31.3	46.1	66.3	83.3	107.6	
Water temperature: 7 °C/12 °C							
CW cooling capacity (sensible) ¹⁾	kW	28.3	39.7	59.1	71.9	93.4	
Water temperature: 7 °C/12 °C							
Hydraulic pressure drop ¹⁾	kPa	106	73	65	83	120	
Water temperature: 7 °C/12 °C							
CW cooling capacity (total) ²⁾³⁾	kW	27.8	38.5	58.0	69.8	90.2	
Water temperature: 10 °C/16 °C							
CW cooling capacity (sensible) ²⁾³⁾	kW	27.8	38.5	58.0	69.8	90.2	
Water temperature: 10 °C/16 °C							
Hydraulic pressure drop ²⁾³⁾	kPa	94	86	78	124	145	
Water temperature: 10 °C/16 °C							
Max. available ESP	Pa	160	150	170	200	260	
Noise level ⁴⁾	dBA	57.2	57.4	58.9	58.8	58.9	
Fan absorbed power ⁵⁾	kW	2.3	2.5	4.5	4.6	5.8	
Weight	kg	296	384	476	573	718	
Size		1	2	3	4	5	

Remarks: All data apply at 400 V/3 ph/50 Hz with 20 Pa ESP (external static pressure) for downflow units and 50 Pa ESP for upflow units

¹⁾ Return air conditions: 24 °C, 50 % r. h.; glycol: 0 %

²⁾ Return air conditions: 26 °C, 40 % r. h.; glycol: 0 %

³⁾ Data apply to units with optional high-powered cooler

⁴⁾ Noise level at 2 m distance, free field

⁵⁾ The electric power input of the fans must be added to the room load

Technical data subject to change without notice.

Dimensions and number of fans							
Size		1	2	3	4	5	7
Width	mm	950	1,400	1,750	2,200	2,550	3,110
Height	mm	1,980	1,980	1,980	1,980	1,980	1,980
Depth	mm	890	890	890	890	890	980
Number of fans		1	1	2	2	3	4
Humidifier output and heating capacity							
Size		1	2	3	4	5	7
Max. humidifier capacity, Downflow	kg/h	4	8	15	15	15	15
Max. humidifier capacity, Upflow	kg/h	8	8	15	15	15	15
Max. no of heating steps		1	1	2	2	3	3
Max. heating capacity per step	kW	9	9	9	9	9	9
Max. overall heating capacity	kW	9	9	18	18	27	27



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