komfovent®

Fire and Smoke DAMPERS

komfovent®

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komfovent®

CONTENT

General description of fire and smoke dampers

Fire dampers manufactured by UAB AMALVA are certified by the Fire Research Centre

The dampers conform to the harmonized EN 15650:2010 standard and meet all the requirements of its Annex ZA. All dampers are denoted with the CE mark.
The fire dampers have been tested for fire resistance by the Fire Research Centre in accordance with the LST EN 1366-2 standard "Fire resistance tests for service installations Part 2 – Fire dampers" and are classified according to the EN 13501-3 standard "Fire classification of construction products and building elements Part 3 – Classification using data from fire resistance tests on products and elements used in building service installations: fire resisting ducts and fire dampers". EI30 rated fire dampers correspond to the 30 minutes fire resistance class, while EI60 rated fire dampers correspond to the 60 minutes fire resistance class and EI90 rated fire dampers correspond to the 90 minutes fire resistance class. Only certified materials with declarations of conformity are used for the manufacturing of the dampers.

Meanings of markings:

CE mark

Labels to indicate the position of damper blades.

Tightening of fuses with pliers or other devices is strictly prohibited.

General description of fire and smoke dampers

Fire dampers with a fusible link element (mechanical)

During the combustion process and at raised temperatures, the material of the fuse connection will melt, causing the stressed spring to close the fire damper.

UVA30	UVA60	UVS30	UVS60	UVS90
				

Fire dampers with an electric actuator (motorised)

During the combustion process, the actuator receives a signal from a centralised control system or from a temperature sensor, and will close the fire damper.

UVA30M	UVA60M	UVA90M	UVS30M	UVS60M	UVS90M
					

Smoke dampers with an electric actuator (motorised)

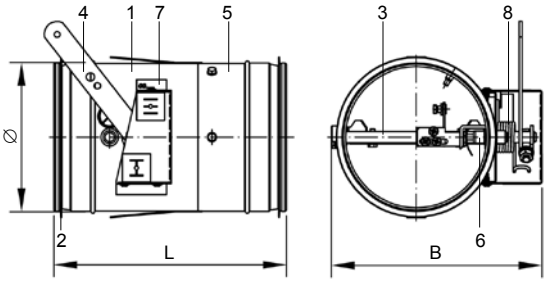
In the event of a fire in a room, the actuator receives a signal from a smoke detector or a centralised control system, and will open or close the smoke damper depending on whether the aim is to remove the smoke and heat from the room, or to prevent the smoke from getting into a clean room from a smoke ventilation system (smoke shaft).

DVSM	DVSM2
	
	Smoke shaft dampers

Round fire dampers with a fusible link element (mechanical)

UVA30-D-t

- fuse activation temperature (70)°C
- fire damper diameter, mm
- fire resistance EI 30 acc. to LST EN13501-3
- round
- fire damper



1. Housing
2. Seal
3. Damper blade
4. Lever
5. Expanding seal
6. Fuse
7. Axle cover
8. Spring

- The UVA housing is made of galvanised steel sheet DIN EN10142.
- The fuse is made of a brass rod and an end-piece which are interconnected with meltable material.
- Fuse actuation temperature is +70°C.
- The fuse bears the company stamp KOMFOVENT and the temperature mark at which the connector will melt.
- Fuses are for a one-time use, and are replaced after each actuation.
- The fire damper is made of fireproof materials.
- The inside of the fire damper has an adhesive seal, which expands and seals the damper during a fire.

D, mm	L, mm
100	250
125	250
160	300
200	300
250	300
315	500
355	500
400	500
450	500
500	500
560	500
630*	655**
710*	705**
800*	805**
900*	805**
1000*	805**

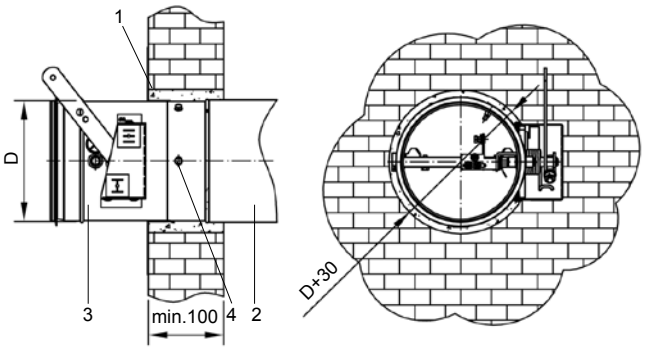
L_i = 40 mm (∅100÷315)
L_i = 65 mm (∅355÷800)
L_i = 100 mm (∅900÷1000)
L_i – part inserted into the duct

* rectangular fire dampers with round flanges are also manufactured.
** dimensions without the round flange.

Installation instructions:

- The UVA can be mounted in a wall or partition.
- The UVA must be installed in a partition, or on any side of the partition, so that the fire resistance of the duct (from the partition to the damper) is not less than that of the partition.
- When installing the UVA, the damper's blades must not fall outside of the overall dimensions of the wall or partition.
- The UVA is inserted into a cut-out opening, the recommended dimensions of which are calculated as follows: D+30 mm.
- Any vacant space should be filled with plaster, concrete or another fire resistant construction material or aggregate.

Installation scheme



1. Filling material
2. Duct
3. Fire damper
4. Axle

Need to know

These dampers offer simple fuse replacement, and are suitable for use where there is no possibility of installing a centralised control system.

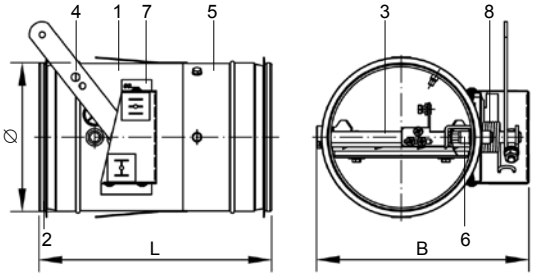
Important!

After the fire damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the fuse for its preventive inspection or replacement.

Round fire dampers with a fusible link element (mechanical)

UVA60-D-t

- fuse activation temperature (70)°C
- fire damper diameter, mm
- fire resistance EI 60 acc. to LST EN13501-3
- round
- fire damper



1. Housing
2. Seal
3. Damper blade
4. Lever
5. Expanding seal
6. Fuse
7. Axle cover
8. Spring

- The UVA housing is made of galvanised steel sheet DIN EN10142.
- The fuse is made of a brass rod and an end-piece which are interconnected with melting meltable material.
- Fuse actuation temperature is +70°C.
- The fuse bears the company stamp KOMFOVENT and the temperature mark at which the connector will melt.
- Fuses are for a one-time use, and are replaced after each actuation.
- The fire damper is made of fireproof materials.
- The inside of the fire damper is equipped with adhesive seal, which expands and seals the damper during a fire.

D, mm	L, mm
100	250
125	250
160	300
200	300
250	300
315	500
355	500
400	500
450	500
500	500
560	500
630*	655**
710*	705**
800*	805**
900*	805**
1000*	805**

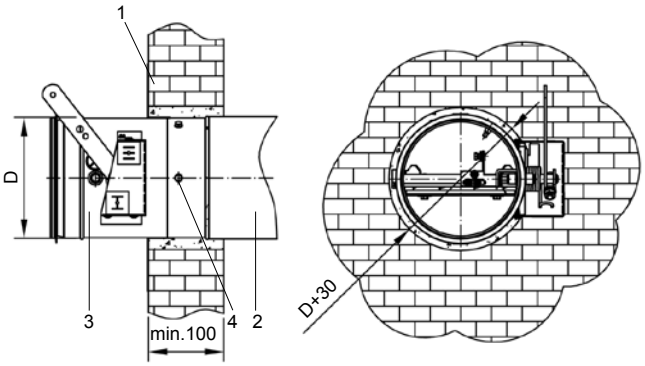
L_i = 40 mm (∅100÷315)
L_i = 65 mm (∅355÷800)
L_i = 100 mm (∅900÷1000)
L_i – part inserted into the duct

* rectangular fire dampers with round flanges are also manufactured.
** dimensions without the round flange.

Installation instructions:

- The UVA can be mounted in a wall or partition.
- The UVA must be installed in a partition, or on any side of the partition, so that the fire resistance of the duct (from the partition to the damper) is not less than that of the partition.
- When installing the UVA, the damper's blades must not fall outside of the overall dimensions of the wall or partition.
- The UVA is inserted into a cut-out opening, the recommended dimensions of which are calculated as follows: D+30 mm.
- Any vacant space should be filled with plaster, concrete or another fire resistant construction material or aggregate.

Installation scheme



1. Filling material
2. Duct
3. Fire damper
4. Axle

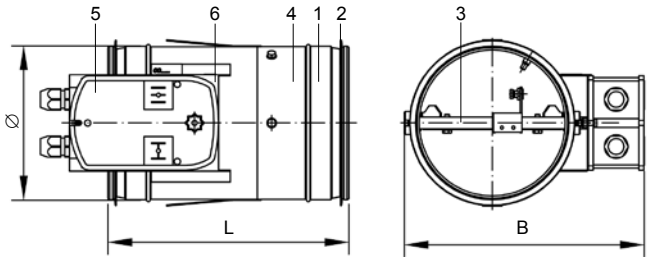
Need to know

These dampers offer simple fuse replacement, and are suitable for use where there is no possibility of installing a centralised control system.

Important!

After the fire damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the fuse for its preventive inspection or replacement.

Round fire dampers with an electric actuator (motorised)



1. Housing
2. Seal
3. Damper blade
4. Expanding seal
5. Actuator
6. Actuator holder

- The UVA housing is made of galvanised steel sheet DIN EN10142.
- When the actuator is not receiving an electric current, the damper closes.
- When the actuator is receiving an electric current, the damper opens.
- When the actuator is fitted with a temperature sensor, this must be installed in the duct for a one-time use, and replaced after each actuation.
- The inside of the fire damper is equipped with an adhesive seal, which expands and seals the damper during a fire.
- The fire damper is made of fireproof materials.

D, mm	L, mm
100	250
125	250
160	300
200	300
250	300
315	500
355	500
400	500
450	500
500	500
560	500
630*	655**
710*	705**
800*	805**
900*	805**
1000*	805**

L_i = 40 mm (∅100÷315)
L_i = 65 mm (∅355÷800)
L_i = 100 mm (∅900÷1000)
L_i – part inserted into the duct

* rectangular fire dampers with round flanges are also manufactured.
** dimensions without the round flange.

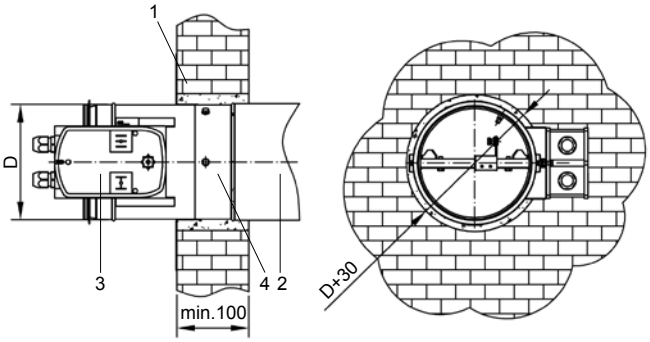
UVA30M-D

- fire damper diameter, mm
- fire damper with electric actuator
- fire resistance EI 30 acc. to LST EN13501-3
- round
- fire damper

Installation instructions:

- The UVA with the electric actuator can be mounted in a wall or partition.
- The UVA must be installed in a partition, or on any side of the partition, so that the fire resistance of the duct (from the partition to the damper) is not less than that of the partition.
- The UVA is inserted into a cut-out opening, the recommended dimensions of which are calculated as follows: D+30 mm.
- During the installation, the electric actuator may be located on any side of the wall.
- Any vacant space is filled with plaster, concrete or another fire resistant construction material or aggregate.
- When installing the UVA, be careful that the electric actuator is protected from any contact with the Filling material.
- During the installation, the UVA damper blades must be closed (the actuator is without a power supply).
- After turning on the power supply, the damper blades will open.

Installation scheme



1. Filling material
2. Duct
3. Fire damper
4. Axle

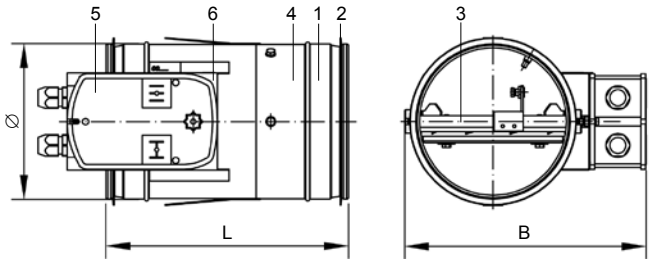
Need to know

All fire dampers within the system may be closed at the same time. Operation of the actuator can regularly be controlled from a centralised control point. Constant control of the fire damper blade position (open or closed) ensures extremely reliable fire protection. In addition, by using actuators with temperature sensors, it is possible to close the dampers when the temperature in the duct reaches 72^{0}C.

Important!

After the fire damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the actuator and temperature sensor for their preventive inspection or replacement.

Round fire dampers with an electric actuator (motorised)



1. Housing
2. Seal
3. Damper blade
4. Expanding seal
5. Actuator
6. Actuator holder

- The UVA housing is made of galvanised steel sheet DIN EN10142.
- When the actuator is not receiving an electric current, the damper closes.
- When the actuator is receiving an electric current, the damper opens.
- When the actuator is fitted with a temperature sensor, this must be installed in the duct for a one-time use, and replaced after each actuation.
- The inside of the fire damper is equipped with an adhesive seal, which expands and seals the damper during a fire.
- The fire damper is made of fireproof materials.

D, mm	L, mm
100	250
125	250
160	300
200	300
250	300
315	500
355	500
400	500
450	500
500	500
560	500
630*	655**
710*	705**
800*	805**
900*	805**
1000*	805**

L_i = 40 mm (∅100÷315)
L_i = 65 mm (∅355÷800)
L_i = 100 mm (∅900÷1000)
L_i – part inserted into the duct

* rectangular fire dampers with round flanges are also manufactured.
** dimensions without the round flange.

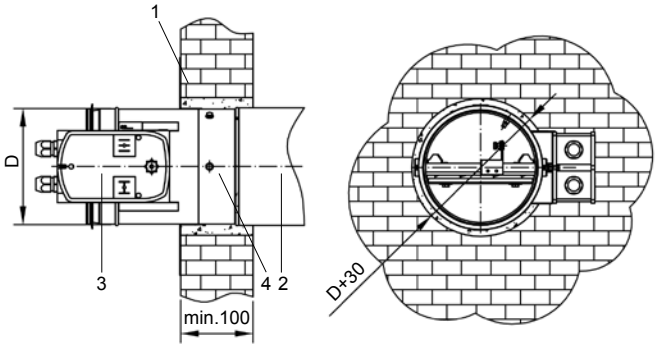
UVA60M-D

- fire damper diameter, mm
- fire damper with electric actuator
- fire resistance EI 60 acc. to LST EN13501-3
- round
- fire damper

Installation instructions:

- The UVA with the electric actuator can be mounted in a wall or partition.
- The UVA must be installed in a partition, or on any side of the partition, so that the fire resistance of the duct (from the partition to the damper) is not less than that of the partition.
- The UVA is inserted into a cut-out opening, the recommended dimensions of which are calculated as follows: D+30 mm.
- During the installation, the electric actuator may be located on any side of the wall.
- Any vacant space is filled with plaster, concrete or another fire resistant construction material or aggregate.
- When installing the UVA, be careful that the electric actuator is protected from any contact with the filling material.
- During the installation, the UVA damper blades must be closed (the actuator is without a power supply).
- After turning on the power supply, the damper blades will open.

Installation scheme



1. Filling material
2. Duct
3. Fire damper
4. Axle

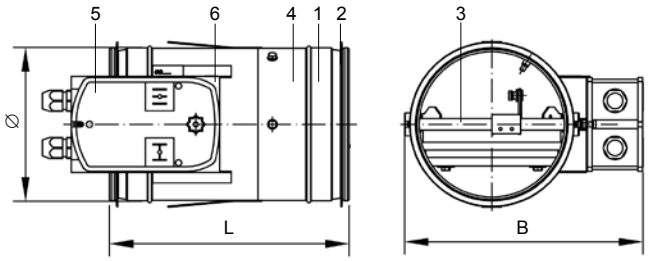
Need to know

All fire dampers within the system may be closed at the same time. Operation of the actuator can regularly be controlled from a centralised control point. Constant control of the fire damper blade position (open or closed) ensures extremely reliable fire protection. In addition, by using actuators with temperature sensors, it is possible to close the dampers when the temperature in the duct reaches 72^{0}C.

Important!

After the fire damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the actuator and temperature sensor for their preventive inspection or replacement.

Round fire dampers with an electric actuator (motorised)



1. Housing
2. Seal
3. Damper blade
4. Expanding seal
5. Actuator
6. Actuator holder

- The UVA housing is made of galvanised steel sheet DIN EN10142.
- When the actuator is not receiving an electric current, the damper closes.
- When the actuator is receiving an electric current, the damper opens.
- When the actuator is fitted with a temperature sensor, this must be installed in the duct for a one-time use, and replaced after each actuation.
- The inside of the fire damper UVA is equipped with an adhesive seal, which expands and seals the damper during a fire.
- The fire damper is made of fireproof materials.

D, mm	L, mm
160	300
200	300
250	300
315	500
355	500
400	500
450	500
500	500
560	500
630*	672**
710*	722**
800*	822**
900*	822**
1000*	822**

L_i = 40 mm (∅100÷315)
L_i = 65 mm (∅355÷800)
L_i = 100 mm (∅900÷1000)
L_i – part inserted into the duct

* rectangular fire dampers with round flanges are also manufactured.
** dimensions without the round flange.

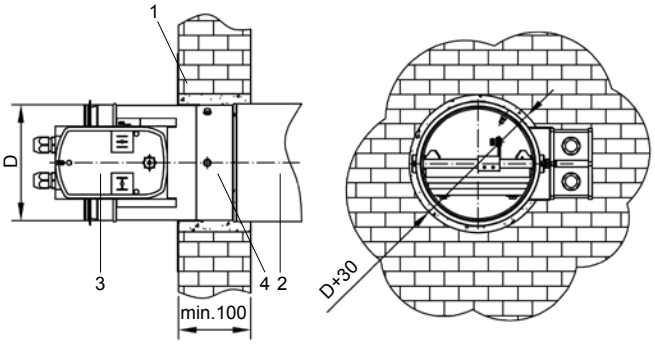
UVA90M-D

- fire damper diameter, mm
- fire damper with electric actuator
- fire resistance EI 90 acc. to LST EN13501-3
- round
- fire damper

Installation instructions:

- The UVA with the electric actuator can be mounted in a wall or partition.
- The UVA must be installed in a partition, or on any side of the partition, so that the fire resistance of the duct (from the partition to the damper) is not less than that of the partition.
- The UVA is inserted into a cut-out opening, the recommended dimensions of which are calculated as follows: D+30 mm.
- During the installation, the electric actuator may be located on any side of the wall.
- Any vacant space should be filled with plaster, concrete or another fire resistant construction material or aggregate.
- When installing the UVA, be careful that the electric actuator is protected from any contact with the filling material.
- During the installation, the UVA damper blades must be closed (the actuator is without a power supply).
- After turning on the power supply, the damper blades will open.

Installation scheme



1. Filling material
2. Duct
3. Fire damper
4. Axle

Need to know

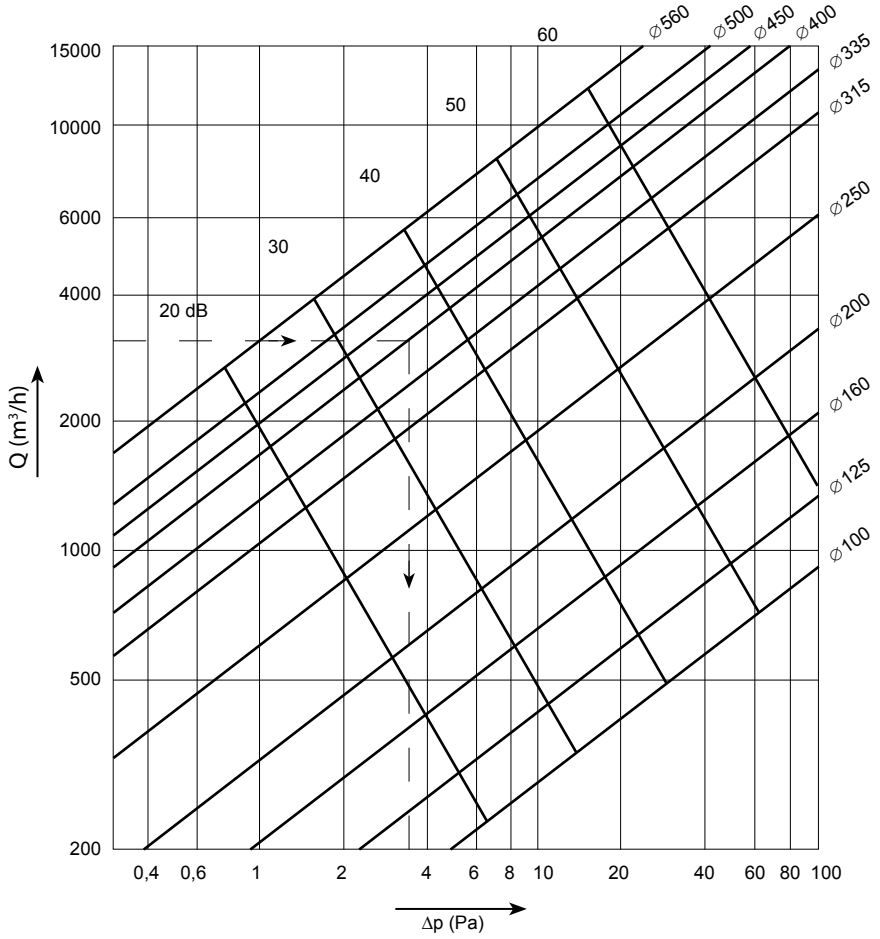
All fire dampers within the system may be closed at the same time. Operation of the actuator can regularly be controlled from a centralised control point. Constant control of the fire damper blade position (open or closed) ensures extremely reliable fire protection. In addition, by using actuators with temperature sensors, it is possible to close the dampers when the temperature in the duct reaches 72^{0}C.

Important!

After the fire damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the actuator and temperature sensor for their preventive inspection or replacement.

Technical characteristic of round fire dampers

Pressure loss and noise level



UVA30, UVA30M effective cross-area

Diameter D, mm	Effective cross-area A, m^2
100	0,0054
125	0,0091
160	0,0161
200	0,0263
250	0,0427
315	0,0649
355	0,0842
400	0,1090
450	0,1403
500	0,1755
560	0,2229

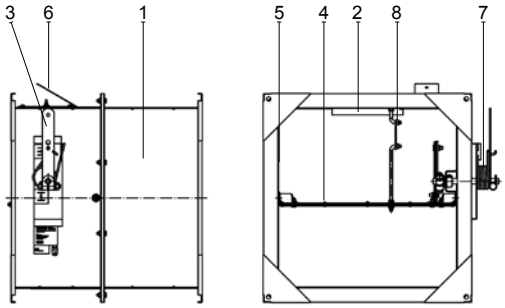
UVA60, UVA60M effective cross-area

Diameter D, mm	Effective cross-area A, m^2
100	0,0040
125	0,0074
160	0,0138
200	0,0234
250	0,0390
315	0,0640
355	0,0832
400	0,1079
450	0,1390
500	0,1740
560	0,2212

UVA90M effective cross-area

Diameter D, mm	Effective cross-area A, m^2
160	0,0105
200	0,0192
250	0,0337
315	0,0572
355	0,0756
400	0,0992
450	0,1293
500	0,1632
560	0,2091

Rectangular fire dampers with a fusible link element (mechanical)



1. Housing
2. Support
3. Lever
4. Damper blade
5. Expanding seal
6. Mounting plate
7. Spring
8. Fuse

UVS30-B/H-t

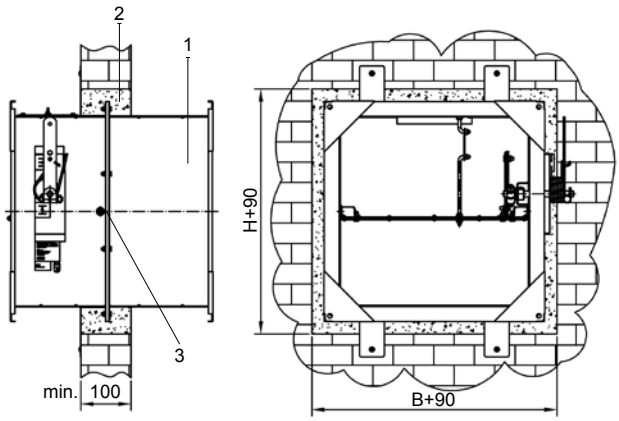
- fuse activation temperature 70^{0}C
- fire damper height, mm
- fire damper width, mm
- fire resistance EI 30 acc. to LST EN13501-3
- rectangular
- fire damper

Installation instructions:

- The UVS can be mounted in a wall or partition.
- The UVS must be installed in a partition, or on any side of partition, so that the fire resistance of the duct (from the partition to the damper) is not less than that of the partition.
- When installing the UVS, the damper's blades must not fall outside of the overall dimensions of the wall or partition.
- After turning out the mounting plate, the UVS is inserted into the cut-out opening in the partition wall. The recommended dimensions of this opening are calculated as follows: B+90 mm, H+90 mm.
- Any vacant space should be filled with plaster, concrete or another fire resistant construction material or aggregate.

- The UVS housing is made of galvanised steel sheet DIN EN10142.
- The inside the fire damper is equipped with an adhesive seal, which expands and seals the damper during a fire.
- Fuses are made of two brass plates joined with meltable material. The fuse bears the company stamp KOMFOVENT and the temperature mark at which the connector will melt.
- Fuse actuation temperature is +70°C.
- Fuses are for a one-time use, and are replaced after each actuation.
- The UVS damper is made of fireproof materials.

Installation scheme



1. Fire damper
2. Filling material
3. Axle

Details of manufactured dampers

H \ B	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200																
250																
300																
400																
500																
600																
700																
800																

damper length – 400 mm
flange – 20 mm

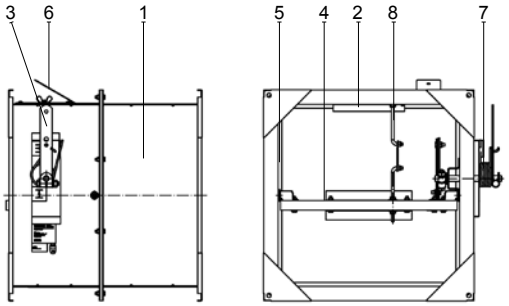
Need to know

Suitable for use where there is no possibility of installing a centralised control system. Non-standard dimensions of sides B and H are possible. Possible for applications in round duct systems (round flanges are also manufactured).

Important!

After the fire damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the fuse for its preventive inspection or replacement.

Rectangular fire dampers with a fusible link element (mechanical)



1. Housing
2. Support
3. Lever
4. Damper blade
5. Expanding seal
6. Mounting plate
7. Spring
8. Fuse

UVS60-B/H-t

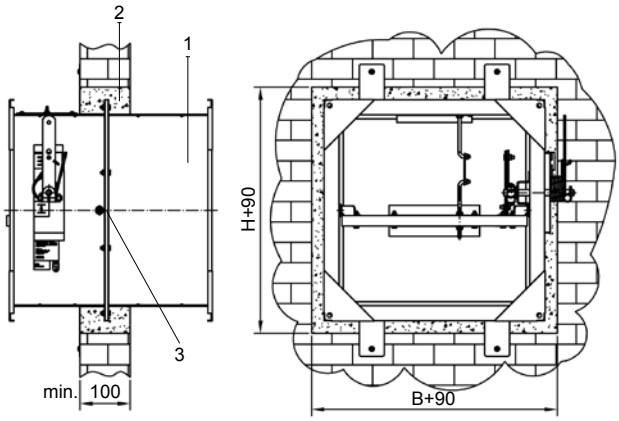
- fuse activation temperature 70°C
- fire damper height, mm
- fire damper width, mm
- fire resistance EI 60 acc. to LST EN13501-3
- rectangular
- fire damper

Installation instructions:

- The UVS can be mounted in walls or partitions.
- The UVS must be installed in a partition, or on any side of the partition, so that the fire resistance of the duct (from the partition to the damper) is not less than that of the partition.
- When installing the UVS, the damper's blades must not fall outside of the overall dimensions of the wall or partition.
- After turning out the mounting plate, the UVS is inserted into the cut-out opening in the partition wall. The recommended dimensions of this opening are calculated as follows: B+90 mm, H+90 mm.
- Any vacant space should be filled with plaster, concrete or another fire resistant construction material or aggregate.

- The UVS housing is made of galvanised steel sheet DIN EN10142.
- The inside the fire damper is equipped with an adhesive seal, which expands and seals the damper during a fire.
- Fuses are made of two brass plates joined with meltable material. The fuse bears the company stamp KOMFOVENT and the temperature mark at which the connector will melt.
- Fuse actuation temperature is +70°C.
- Fuses are for a one-time use, and are replaced after each actuation.
- The UVS damper is made of fireproof materials.

Installation scheme



1. Fire damper
2. Filling material
3. Axle

Details of manufactured dampers

H \ B	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200																
250																
300																
400																
500																
600																
700																
800																

damper length – 400 mm
flange – 20 mm

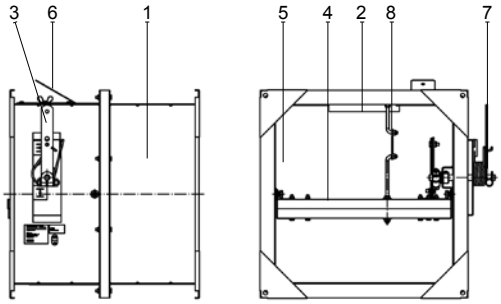
Need to know

Suitable for use where there is no possibility of installing a centralised control system. Non-standard dimensions of sides B and H are possible. Possible for applications in round duct systems (round flanges are also manufactured).

Important!

After the fire damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the fuse for its preventive inspection or replacement.

Rectangular fire dampers with a fusible link element (mechanical)



1. Housing
2. Support
3. Lever
4. Damper blade
5. Expanding seal
6. Mounting plate
7. Spring
8. Fuse

- The UVS housing is made of galvanised steel sheet DIN EN10142.
- The mounting plate and damper blades are made of fireproof materials.
- Fuses are made of two brass plates joined with meltable material. The fuse bears the company stamp KOMFOVENT and the temperature mark at which the connector will melt.
- Fuse actuation temperature is +70°C.
- Fuses are for a one-time use, and are replaced after each actuation.
- The inside of the fire damper is equipped with an adhesive seal, which expands and seals the damper during a fire.

Details of manufactured dampers

H \ B	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200																
250																
300																
400																
500																
600																
700																
800																

damper length – 400 mm
flange – 20 mm

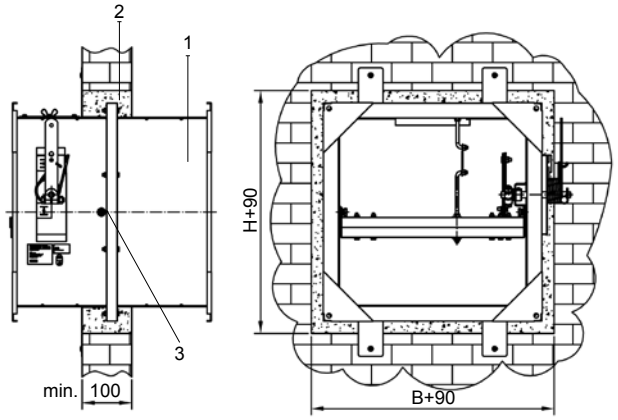
UVS90-B/H-t

- fuse activation temperature 70^{0}C
- fire damper height, mm
- fire damper width, mm
- fire resistance EI 90 acc. to LST EN13501-3
- rectangular
- fire damper

Installation instructions:

- The UVS can be mounted in walls or partitions.
- The UVS must be installed in a partition, or on any side of the partition, so that the fire resistance of the duct (from the partition to the damper) is not less than that of the partition.
- When installing the UVS, the damper's blades must not fall outside of the overall dimensions of the wall or partition.
- After turning out the mounting plate, the UVS is inserted into the cut-out opening in the partition wall. The recommended dimensions of this opening are calculated as follows: B+90 mm, H+90 mm.
- Any vacant space should be filled with plaster, concrete or another fire resistant construction material or aggregate.

Installation scheme



1. Fire damper
2. Filling material
3. Axle

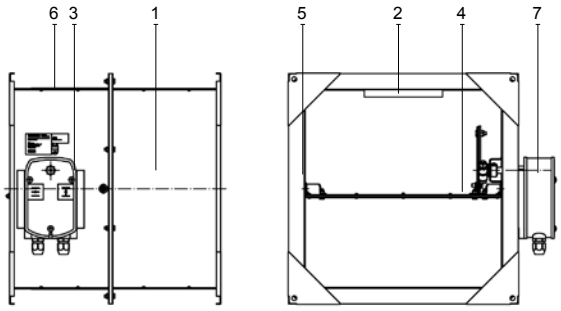
Need to know

Dampers can be mounted in any direction (horizontally or vertically). Suitable for use where there is no possibility of installing a centralised control system. Possible Non-standard dimensions of sides B and H are possible. Possible for applications in round duct systems (round flanges are also manufactured).

Important!

After the fire damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the fuse for its preventive inspection or replacement.

Rectangular fire dampers with an electric actuator (motorised)



1. Housing
2. Support
3. Actuator holder
4. Damper blade
5. Expanding seal
6. Mounting plate
7. Electric actuator

- The UVS housing is made of galvanised steel sheet DIN EN10142.
- When the actuator is not receiving an electric current, the damper closes.
- When the actuator is receiving an electric current, the damper opens.
- When the actuator is fitted with a temperature sensor, this must be installed in the duct for a one-time use, and replaced after each actuation.
- The inside the fire damper is equipped with an adhesive seal, which expands and seals the damper during a fire.
- The UVS damper is made of fireproof materials.

Details of manufactured dampers

H \ B	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200																
250																
300																
400																
500																
600																
700																
800																

damper length – 400 mm
flange – 20 mm

Important!
After the fire damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the fuse for its preventive inspection or replacement.

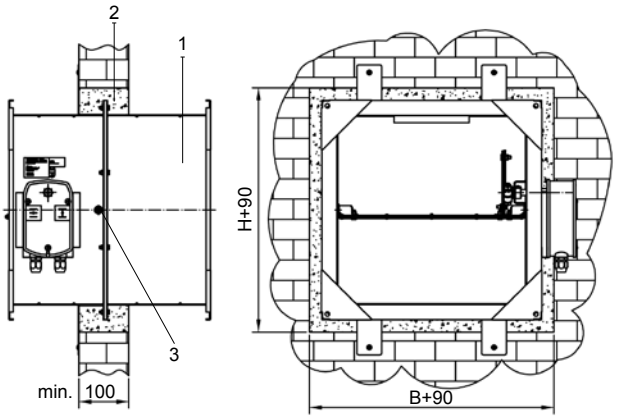
UVS30M-B/H

- fire damper height, mm
- fire damper width, mm
- with electric actuator
- fire resistance EI 30 acc. to LST EN13501-3
- rectangular
- fire damper

Installation instructions:

- The UVS can be mounted in walls or partitions.
- The UVS must be installed in a partition, or any side of the partition, so that the fire resistance of the duct (from the partition to the damper) is not less than that of the partition.
- When installing the UVS, the damper's blades must not fall outside of the overall dimensions of the wall or partition.
- When mounting, the electric actuator may be located on any side of the partition.
- After turning out the mounting plate, the UVS is inserted into the cut-out opening in the partition wall. The recommended dimensions of this opening are calculated as follows: H+90 mm, B+90 mm.
- During the installation, the UVA damper blades must be closed (the actuator is without a power supply). After turning on the power, the damper blades will open.
- Any vacant space should be filled with plaster, concrete or another fire resistant construction material or aggregate. When installing the UVA, be careful that the electric actuator is protected from any contact with the filling material.

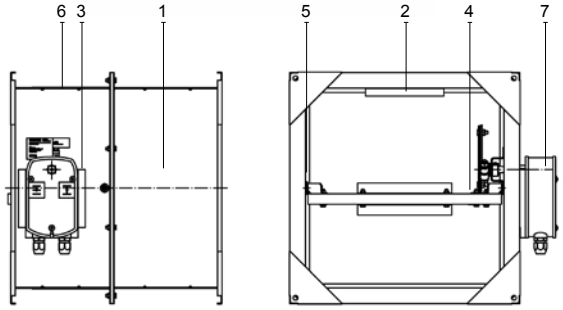
Installation scheme



1. Fire damper
2. Filling material
3. Axle

Need to know
All fire dampers in the system may be closed at the same time. Operation of the actuator can regularly be controlled from a centralised control point. Constant control of the UVS position (open or closed) ensures extremely reliable fire protection. In addition, by using actuators with temperature sensors, it is possible to close the dampers when the temperature in the duct reaches 72°C. Non-standard B and H side dimensions are possible.

Rectangular fire dampers with an electric actuator (motorised)



1. Housing
2. Support
3. Actuator holder
4. Damper blade
5. Expanding seal
6. Mounting plate
7. Electric actuator

- The UVS housing is made of galvanised steel sheet DIN EN10142.
- When the actuator is not receiving an electric current, the damper is closed.
- When the actuator is receiving an electric current, the damper opens.
- When the actuator is fitted with a temperature sensor, this must be installed in the duct for a one-time use, and replaced after each actuation.
- The inside the fire damper is equipped with an adhesive seal, which expands and seals the damper during a fire.
- The UVS damper is made of fireproof materials.

Details of manufactured dampers

H \ B	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200																
250																
300																
400																
500																
600																
700																
800																

damper length – 400 mm
flange – 20 mm

Important!
After the fire damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the actuator and temperature sensor for their preventive inspection or replacement.

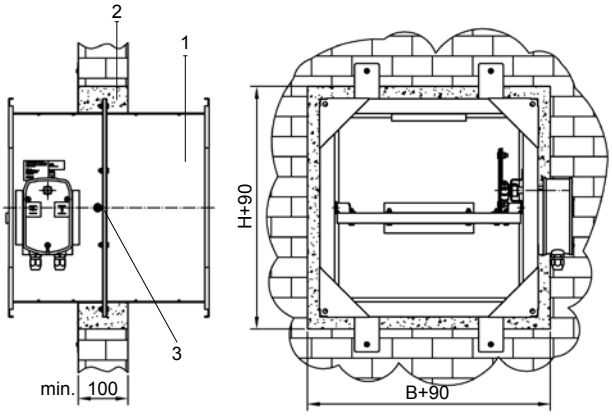
UVS60M-B/H

- fire damper height, mm
- fire damper width, mm
- with electric actuator
- fire resistance EI 60 acc. to LST EN13501-3
- rectangular
- fire damper

Installation instructions:

- The UVS can be mounted in walls or partitions.
- The UVS must be installed in a partition, or on any side of the partition, so that the fire resistance of the duct (from the partition to the damper) is not less than that of the partition.
- When installing the UVS, the damper's blades must not fall outside of the overall dimensions of the wall or partition.
- When mounting, the electric actuator may be located on any side of the partition.
- After turning out the mounting plate, the UVS is inserted into the cut-out opening in the partition wall. The recommended dimensions of this opening are calculated as follows: H+90 mm, B+90 mm.
- During installation, the UVA damper blades must be closed (the actuator is without a power supply). After turning on the power, the damper blades will open.
- Any vacant space should be filled with plaster, concrete or another fire resistant construction material or aggregate. When installing the UVA, be careful that the electric actuator is protected from any contact with the filling material.

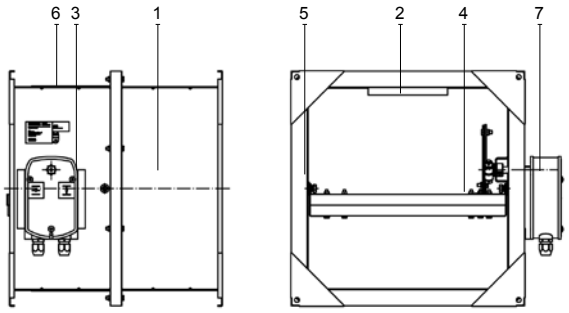
Installation scheme



1. Fire damper
2. Filling material
3. Axle

Need to know
All fire dampers within the system may be closed at the same time. Operation of the actuator can regularly be controlled from a centralised control point. Constant control of the UVS position (open or closed) ensures extremely reliable fire protection. In addition, by using actuators with temperature sensors, it is possible to close the dampers when the temperature in the duct reaches 72°C. Non-standard B and H side dimensions are possible.

Rectangular fire dampers with an electric actuator (motorised)



1. Housing
2. Support
3. Actuator holder
4. Damper blade
5. Expanding seal
6. Mounting plate
7. Electric actuator

- The UVS housing is made of galvanised steel sheet DIN EN10142.
- When the actuator is not receiving an electric current, the damper closes.
- When the actuator is receiving an electric current, the damper opens.
- When the actuator is fitted with a temperature sensor, this must be installed in the duct for a one-time use, and replaced after each actuation.
- The inside of the fire damper is equipped with an adhesive seal, which expands and seals the damper during a fire.
- The UVS damper is made of fireproof materials.

Details of manufactured dampers

H \ B	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200																
250																
300																
400																
500																
600																
700																
800																

damper length – 400 mm
flange – 20 mm

Important!
After the fire damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the actuator and temperature sensor for their preventive inspection or replacement.

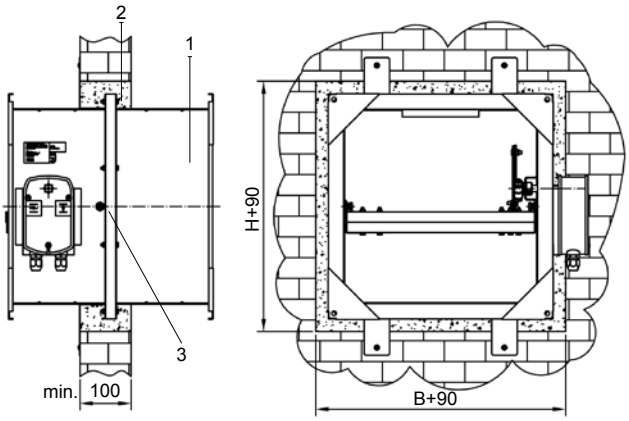
UVS90M-B/H

- fire damper height, mm
- fire damper width, mm
- with electric actuator
- fire resistance EI 90 acc. to LST EN13501-3
- rectangular
- fire damper

Installation instructions:

- The UVS can be mounted in walls or partitions.
- The UVS must be installed in a partition, or on any side of the partition, so that the fire resistance of the duct (from the partition to the damper) is not less than that of the partition.
- When installing the UVS, the damper's blades must not fall outside of the overall dimensions of the wall or partition.
- When mounting, the electric actuator may be located on any side of the partition.
- After turning out the mounting plate, the UVS is inserted into the cut-out opening in the partition wall. The recommended dimensions of this opening are calculated as follows: H+90 mm, B+90 mm.
- During the installation, the UVA damper blades must be closed (the actuator is without a power supply).
- After turning on the power, damper blades will open.
- Any vacant space should be filled with plaster, concrete or another fire resistant construction material or aggregate. When installing the UVA, be careful that the electric actuator is protected from any contact with the filling material.

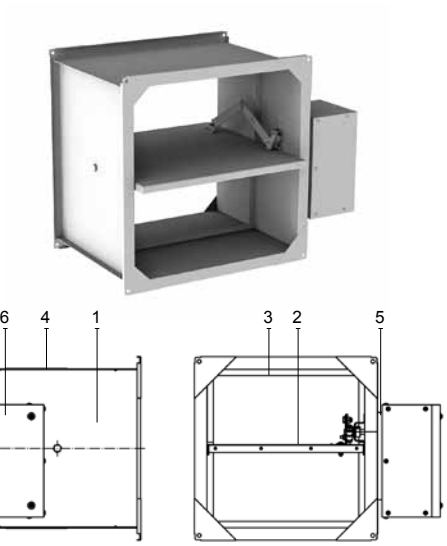
Installation scheme



1. Fire damper
2. Filling material
3. Axle

Need to know
All fire dampers within the system may be closed at the same time. Operation of the actuator can regularly be controlled from a centralised control point. Constant control of the UVS position (open or closed) ensures extremely reliable fire protection. In addition, by using actuators with temperature sensors, it is possible to close the dampers when the temperature in the duct reaches 72°C. Non-standard B and H side dimensions are possible.

Rectangular smoke dampers with an electric actuator (motorised)



DVSM-B/H

- smoke damper height, mm
- smoke damper width, mm
- with electric actuator
- rectangular
- smoke damper

1. Housing
2. Damper blade
3. Support with seal
4. Foldable mounting plate
5. Actuator holder
6. Insulated box for actuator

- The housing, damper blade, support, mounting plate and actuator holder are made of galvanised steel sheet DIN EN 10142.
- The damper blade closing position is enhanced by a support. The support is equipped with an adhesive fireproof seal, which withstands temperatures up to 1100°C and provides a higher degree of tightness to the damper.
- The actuator in the damper is protected from the heat by an insulated box. This box is made of temperature resistant and fireproof materials. The actuator is installed inside of the box. Actuators can be of 24V and 230V.

Application areas and principles of operation:
Rectangular smoke dampers perform the following functions:

- remove the smoke and heat from the premises with a fire source;
- reduce the air intake to the antismoke system from other floors;
- prevent the smoke from getting to other floors through the antismoke system (smoke shaft) where there is no source of fire;
- provide the premises protected from smoke with fresh air (staircase landings, atriums, etc.).

In the event of a fire in a room, the actuator receives a signal from a smoke detector or central centralised control system, and will open or close the smoke damper depending on whether the aim is to remove the smoke and heat from the room, or to prevent the smoke from getting into a clean room from the smoke ventilation system (smoke shaft).

Details of manufactured dampers

H \ B	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500
200																											
250																											
300																											
350																											
400																											
450																											
500																											
550																											
600																											
650																											
700																											
750																											
800																											

Damper length – 450 mm
flange – 20 mm

Rectangular smoke dampers with an electric actuator (motorised)

Installation instructions:

Smoke dampers can be mounted:

- in a wall horizontally (Fig. 1);
- in a wall vertically (Fig. 2);
- in a wall horizontally, when the wall has a built-in smoke shaft (Fig. 3);
- in a wall vertically, when the wall has a built-in smoke shaft (Fig. 4);
- in the ceiling (Fig. 5);
- in the ceiling, when the ceiling has a built-in smoke shaft (Fig. 5);
- directly into a rectangular duct (Fig. 6);
- into the duct offset (Fig. 7).

The rectangular smoke damper is mounted on the wall (or the shaft in the wall), into a cut-out opening (see. Fig. 3).
When mounting, the rectangular smoke damper is inserted into the opening with the dimensions as follows: B1 = B + 50 ... 100 mm, and H1 = H + 50 ... 100 mm.
The mounting plates are turned down and the damper is screwed to the wall with bolts;
The space between the wall and the damper must then be sealed with plaster, concrete or another construction material or aggregate so that smoke will not pass between the wall and damper.
The effective cross-area (free) of the smoke shaft or duct with an open damper must not be less than the effective cross-area of the damper.

Installation schemes

Fig. 1

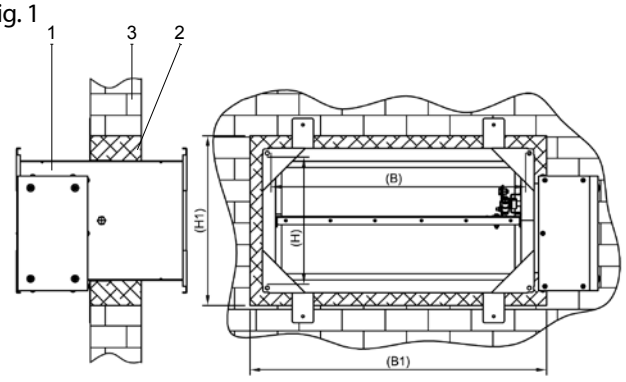
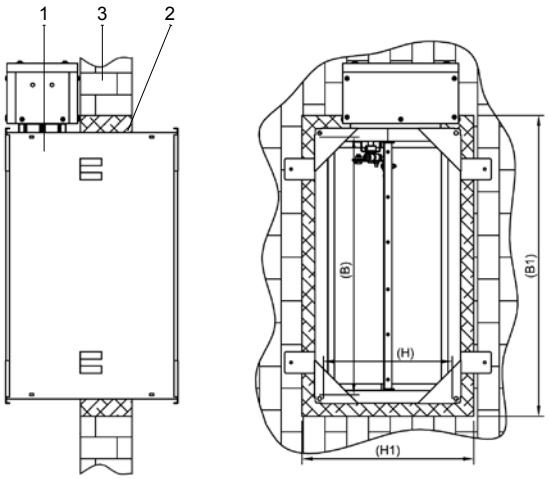


Fig. 2



1. Smoke damper
2. Filling material
3. Wall

Fig. 3

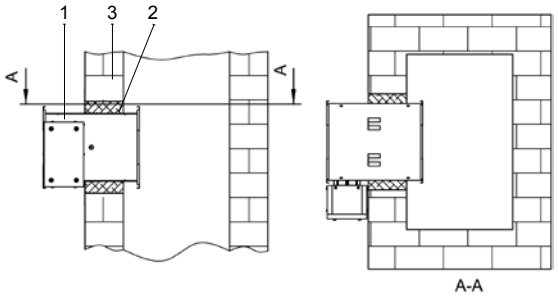


Fig. 4

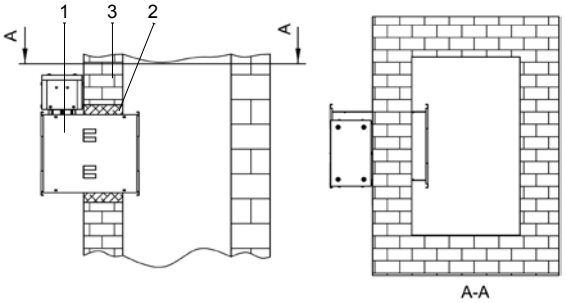
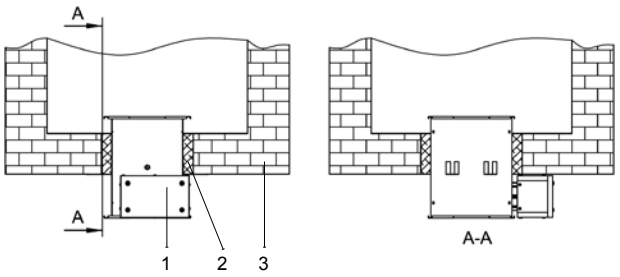


Fig. 5



1. Smoke damper
2. Filling material
3. Smoke shaft

Fig. 6

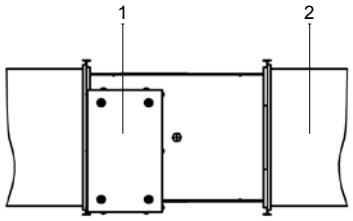
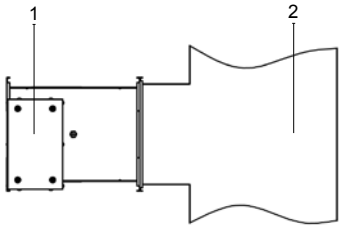


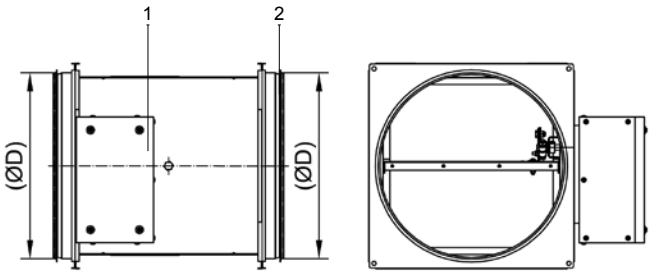
Fig. 7



1. Smoke damper
2. Duct

Rectangular smoke dampers with an electric actuator (motorised)

Attention!
Round smoke dampers are not manufactured by the company. However, rectangular dampers with rounded transitions are manufactured, and are suitable for connection with rounded ducts.



1. Smoke damper
2. Rounded transition

Round transitions are made in the following sizes (diameter D, mm)	
∅100	∅450
∅125	∅500
∅160	∅560
∅200	∅630
∅250	∅710
∅315	∅800
∅355	∅900
∅400	∅1000

Round transitions are connected to rectangular smoke dampers and have a connection flange of length L_i mm:

L_i = 40 mm (∅ 100÷315)
L_i = 65 mm (∅ 355÷800)
L_i = 100 mm (∅ 900÷1000)

L_i – part inserted into the duct.

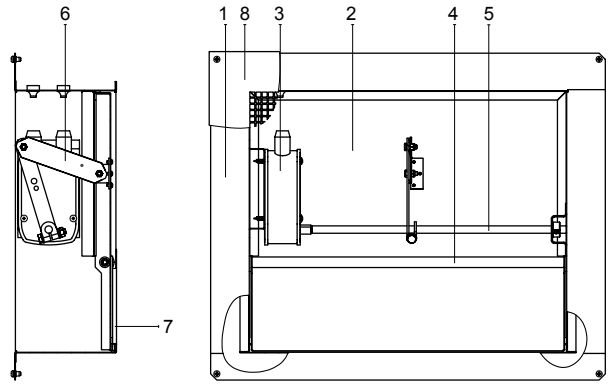
Need to know
All smoke dampers within the system may be controlled at the same time. Operation of the actuator can regularly be controlled from a centralised control point. Constant control of the DV damper blade position (open or closed) ensures extremely reliable fire protection. Non-standard B and H side dimensions are possible.

Important!
After the smoke damper has been mounted, it must be checked whether the damper blade rotates freely and there is good access to the actuator for its preventive inspection or replacement.

Rectangular shaft smoke dampers

DVSM2 B/H

- smoke damper height, mm
- smoke damper width, mm
- shaft
- with electric actuator
- rectangular
- smoke damper



1. Housing
2. Damper blade
3. Actuator
4. Damper axle
5. Actuator axle
6. Lever
7. Seal
8. Diffuser

Application areas and principles of operation:
Rectangular shaft smoke dampers perform the following functions:

- remove the smoke and heat from the premises with a fire source
- reduce the air intake to the antismoke system from other floors
- prevent the smoke from getting to other floors through the antismoke system (smoke shaft) where there is no source of fire
- provide the premises protected from smoke with fresh air (staircase landings, atriums, etc.).

In the event of a fire in a room, the actuator receives a signal from a smoke detector or a centralised control system, and will open or close the smoke damper depending on whether the aim is to remove the smoke and heat from the room, or to prevent the smoke from getting into a clean room from the smoke ventilation system (smoke shaft).

The smoke damper is manufactured with a decorative diffuser. The diffuser is painted a white colour (RAL 9010).

Details of manufactured dampers:
DVSM2 dampers are manufactured on request (and must be ordered individually)!
Length of all dampers:
L = 165 mm (closed, without a diffuser) L+5 mm (with a diffuser).

- Housing and damper blades are made of galvanised steel sheet EN 10142.
- The damper is designed for closing or opening the vent to the smoke ventilation system (smoke shaft). It is opened or closed depending on whether the aim is to remove the smoke and heat from the room, or to prevent the smoke from getting into a clean room from the smoke shaft.
- The actuator is mounted inside the damper, so it can be easily replaced (there is no need to disassemble the entire system). To change the actuator, it is necessary to unscrew the decorative diffuser, which will allow for easy access to the actuator.
- The housing is equipped with an adhesive fireproof seal, which will ensure the tightness of the smoke damper and will retain its properties up to 1100^{0}C.
- Smoke dampers are manufactured with a diffuser. The diffuser is made of galvanised steel sheet EN 10142 and is painted in RAL 9010 colour (white).
- The diffuser has a square 8x8 mm – 64% perforation.

Rectangular shaft smoke dampers

Installation instructions:

- Shaft smoke dampers can be mounted:
  - in a wall horizontally, when the wall has a built-in smoke shaft (Fig. 1),
  - in a wall vertically, when the wall has a built-in smoke shaft (Fig. 2),
  - in the ceiling, when the ceiling has a built-in smoke shaft (Fig. 3),
  - directly into a rectangular duct (Fig. 4),
  - into the duct offset (Fig. 5).
- The rectangular smoke damper is mounted on the wall (or the shaft in the wall), into a cut-out opening. The dimensions of the mounting hole are as follows: B1=B+10...20 mm, and H1=H+10...20 mm.
- The space between the wall and the damper must then be sealed with the gasket, or in another way, so that the smoke will not pass between the wall and damper.
- The protrusion of an opened damper is: L1=H-180 mm.
- The effective cross-area (free) of the smoke shaft or duct with an open damper must not be less than the effective cross-area of the damper.

Installation schemes

Fig. 1

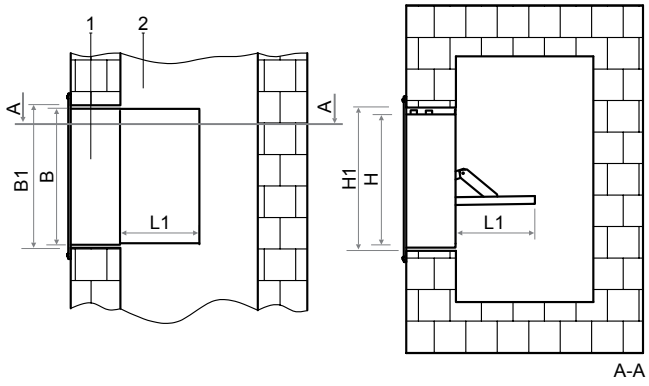
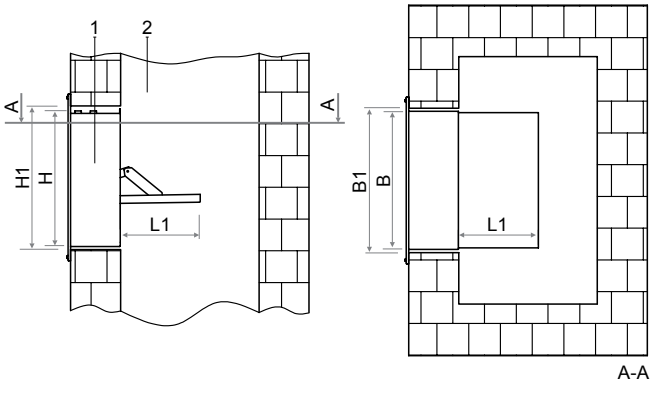
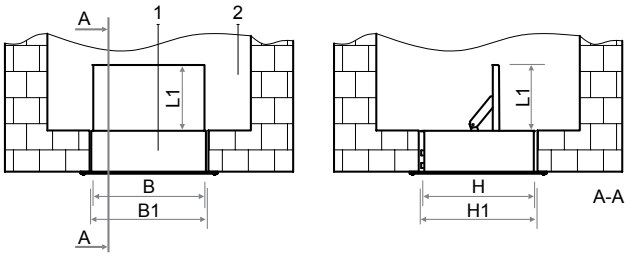


Fig. 2



1. Smoke damper DVSM 2 BxH
2. Smoke exhaust shaft

Fig. 3



1. Smoke damper DVSM 2 BxH
2. Smoke exhaust shaft

Fig. 4

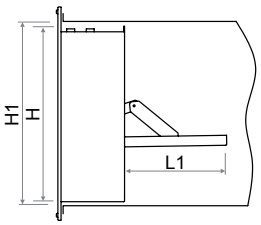
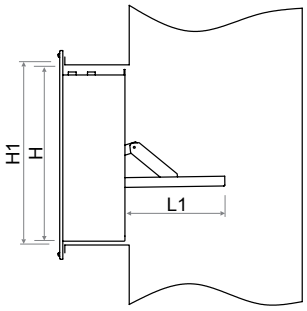


Fig. 5

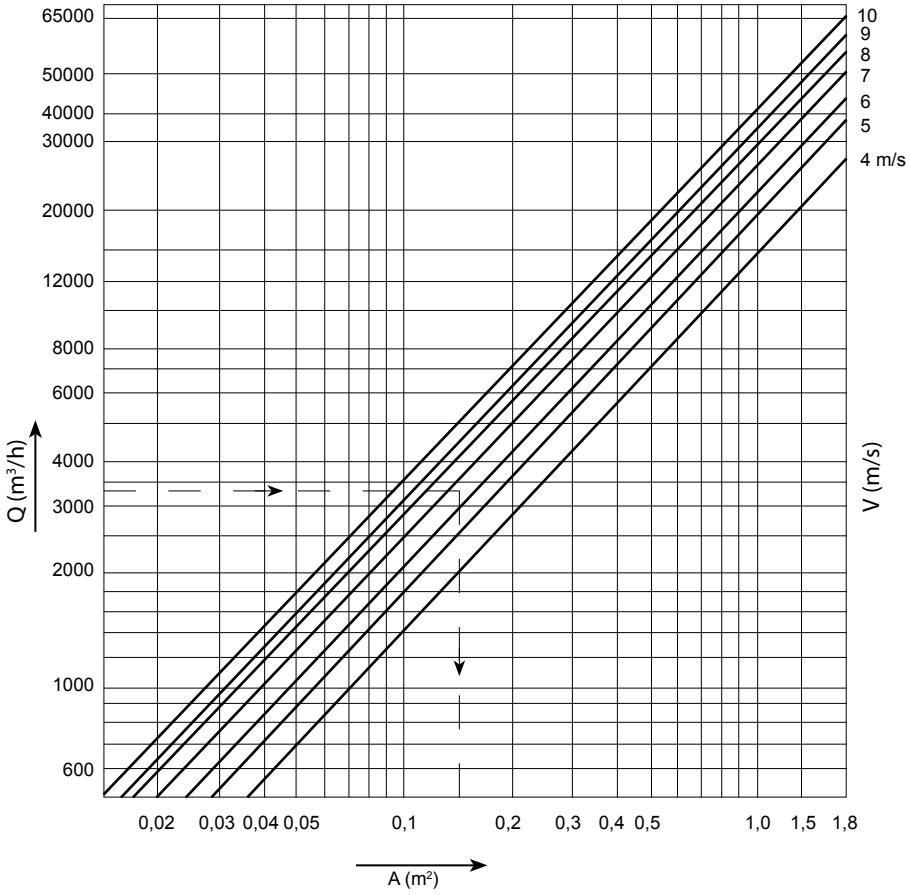


Important!

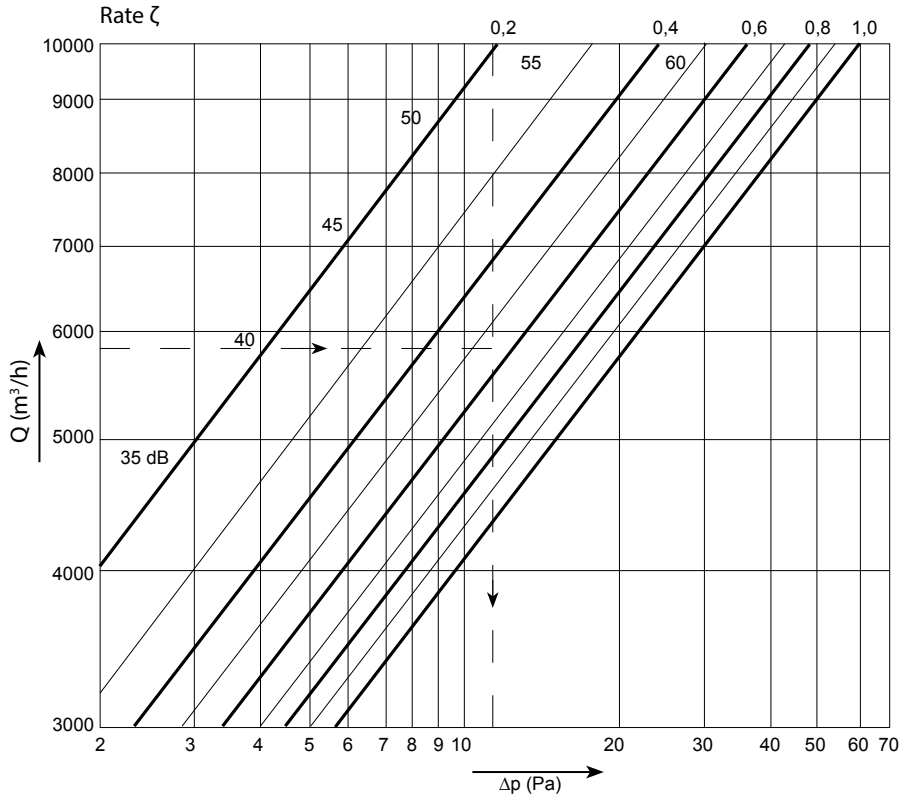
After the smoke damper has been mounted, it must be checked whether the damper blade rotates freely and does not stick at any point!

Technical characteristics of rectangular fire and smoke dampers

Determination of effective cross-area A, m²



Pressure loss and noise level



Technical characteristics of rectangular fire and smoke dampers

UVS30; UVS30M – effective cross-area A, m²

B \ H	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200	0,025	0,033	0,042	0,059	0,065	0,080	0,094	0,109	0,124	0,139	0,146	0,161	0,176	0,190	0,205	0,220
250	0,034	0,045	0,055	0,077	0,089	0,109	0,128	0,148	0,168	0,187	0,199	0,219	0,238	0,258	0,278	0,297
300	0,042	0,056	0,069	0,096	0,113	0,137	0,162	0,187	0,211	0,236	0,251	0,276	0,301	0,326	0,350	0,375
400	0,060	0,078	0,097	0,134	0,160	0,195	0,230	0,264	0,299	0,334	0,357	0,391	0,426	0,461	0,495	0,530
500	0,078	0,101	0,124	0,171	0,208	0,253	0,297	0,342	0,387	0,431	0,462	0,507	0,551	0,596	0,641	0,685
600	0,095	0,124	0,152	0,209	0,255	0,310	0,365	0,420	0,474	0,529	0,567	0,622	0,676	0,731	0,786	0,841
700	0,113	0,146	0,180	0,247	0,303	0,368	0,432	0,497	0,562	0,627	0,672	0,737	0,802	0,866	0,931	0,996
800	0,130	0,169	0,207	0,284	0,351	0,425	0,500	0,575	0,649	0,724	0,777	0,852	0,927	1,002	1,076	1,151

UVS30; UVS30M – resistance rate ζ

B \ H	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200	0,96	0,95	0,84	0,82	0,81	0,72	0,70	0,68	0,66	0,63	0,62	0,61	0,58	0,55	0,52	0,50
250	0,92	0,86	0,82	0,71	0,70	0,68	0,63	0,62	0,61	0,58	0,56	0,52	0,51	0,50	0,49	0,48
300	0,90	0,82	0,77	0,70	0,68	0,65	0,62	0,60	0,59	0,56	0,53	0,51	0,49	0,45	0,44	0,43
400	0,89	0,84	0,76	0,69	0,67	0,63	0,61	0,59	0,58	0,55	0,52	0,50	0,48	0,44	0,43	0,42
500	0,88	0,82	0,75	0,68	0,66	0,64	0,60	0,58	0,56	0,54	0,51	0,49	0,47	0,42	0,40	0,39
600	0,87	0,80	0,73	0,67	0,65	0,63	0,59	0,57	0,55	0,53	0,50	0,48	0,46	0,41	0,39	0,38
700	0,86	0,78	0,72	0,66	0,64	0,62	0,58	0,55	0,52	0,50	0,47	0,46	0,44	0,40	0,37	0,36
800	0,85	0,77	0,70	0,65	0,63	0,61	0,57	0,54	0,51	0,49	0,46	0,45	0,43	0,39	0,36	0,35

UVS60; UVS60M – effective cross-area A, m²

B \ H	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200	0,018	0,026	0,033	0,047	0,044	0,054	0,065	0,075	0,086	0,097	0,101	0,112	0,122	0,133	0,144	0,154
250	0,027	0,036	0,046	0,065	0,067	0,082	0,098	0,114	0,129	0,145	0,153	0,169	0,184	0,200	0,216	0,231
300	0,035	0,047	0,059	0,084	0,090	0,111	0,131	0,152	0,172	0,193	0,205	0,226	0,246	0,267	0,288	0,308
400	0,051	0,068	0,086	0,120	0,136	0,167	0,198	0,228	0,259	0,289	0,309	0,340	0,370	0,401	0,432	0,462
500	0,068	0,090	0,112	0,156	0,183	0,223	0,264	0,305	0,345	0,386	0,413	0,454	0,494	0,535	0,576	0,616
600	0,084	0,111	0,138	0,193	0,229	0,280	0,330	0,381	0,432	0,482	0,517	0,568	0,618	0,669	0,720	0,770
700	0,100	0,133	0,165	0,229	0,276	0,336	0,397	0,457	0,518	0,579	0,621	0,682	0,742	0,803	0,864	0,924
800	0,117	0,154	0,191	0,266	0,322	0,393	0,463	0,534	0,604	0,675	0,725	0,796	0,866	0,937	1,008	1,078

UVS60; UVS60M – resistance rate ζ

B \ H	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200	0,99	0,98	0,87	0,85	0,84	0,75	0,73	0,71	0,69	0,66	0,65	0,64	0,61	0,58	0,55	0,53
250	0,95	0,89	0,85	0,74	0,73	0,71	0,66	0,65	0,64	0,61	0,59	0,55	0,54	0,53	0,52	0,51
300	0,93	0,85	0,80	0,73	0,71	0,68	0,65	0,63	0,62	0,59	0,56	0,54	0,52	0,48	0,47	0,46
400	0,92	0,87	0,79	0,72	0,70	0,66	0,64	0,62	0,61	0,58	0,55	0,53	0,51	0,47	0,46	0,45
500	0,91	0,85	0,78	0,71	0,69	0,67	0,63	0,61	0,59	0,57	0,54	0,52	0,50	0,45	0,43	0,42
600	0,90	0,83	0,76	0,70	0,68	0,66	0,62	0,60	0,58	0,56	0,53	0,51	0,49	0,44	0,42	0,41
700	0,89	0,81	0,75	0,69	0,67	0,65	0,61	0,58	0,55	0,53	0,50	0,49	0,47	0,43	0,40	0,39
800	0,88	0,80	0,73	0,68	0,66	0,64	0,60	0,57	0,54	0,52	0,49	0,48	0,46	0,42	0,39	0,38

UVS90; UVS90M – effective cross-area A, m²

B \ H	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200	0,019	0,026	0,033	0,047	0,060	0,074	0,088	0,101	0,115	0,129	0,136	0,149	0,163	0,177	0,191	0,204
250	0,028	0,037	0,047	0,065	0,084	0,103	0,121	0,140	0,159	0,178	0,188	0,207	0,226	0,244	0,263	0,282
300	0,037	0,049	0,060	0,084	0,108	0,132	0,155	0,179	0,203	0,226	0,241	0,265	0,288	0,312	0,336	0,359
400	0,054	0,071	0,088	0,122	0,155	0,189	0,223	0,257	0,290	0,324	0,346	0,380	0,414	0,447	0,481	0,515
500	0,072	0,094	0,116	0,159	0,203	0,247	0,290	0,334	0,378	0,422	0,451	0,495	0,539	0,582	0,626	0,670
600	0,090	0,116	0,143	0,197	0,251	0,304	0,358	0,412	0,465	0,519	0,557	0,610	0,664	0,718	0,771	0,825
700	0,107	0,139	0,171	0,235	0,298	0,362	0,426	0,489	0,553	0,617	0,662	0,725	0,789	0,853	0,917	0,980
800	0,125	0,162	0,198	0,272	0,346	0,420	0,493	0,567	0,641	0,714	0,767	0,841	0,914	0,988	1,062	1,135

UVS90; UVS90M – resistance rate ζ

B \ H	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600
200	0,98	0,97	0,86	0,84	0,83	0,74	0,72	0,70	0,68	0,65	0,64	0,63	0,60	0,57	0,54	0,52
250	0,94	0,88	0,84	0,73	0,72	0,70	0,65	0,64	0,63	0,60	0,58	0,54	0,53	0,52	0,51	0,50
300	0,92	0,84	0,79	0,72	0,70	0,67	0,64	0,62	0,61	0,58	0,55	0,53	0,51	0,47	0,46	0,45
400	0,91	0,86	0,78	0,71	0,69	0,65	0,63	0,61	0,60	0,57	0,54	0,52	0,50	0,46	0,45	0,44
500	0,90	0,84	0,77	0,70	0,68	0,66	0,62	0,60	0,58	0,56	0,53	0,51	0,49	0,44	0,42	0,41
600	0,89	0,82	0,75	0,69	0,67	0,65	0,61	0,59	0,57	0,55	0,52	0,50	0,48	0,43	0,41	0,40
700	0,88	0,80	0,74	0,68	0,66	0,64	0,60	0,57	0,54	0,52	0,49	0,48	0,46	0,42	0,39	0,38
800	0,87	0,79	0,72	0,67	0,65	0,63	0,59	0,56	0,53	0,51	0,48	0,47	0,45	0,41	0,38	0,37

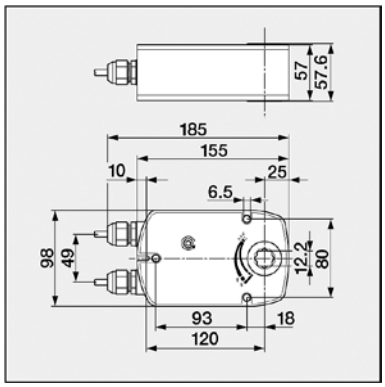
B mm – width, H mm – height

Electric actuators

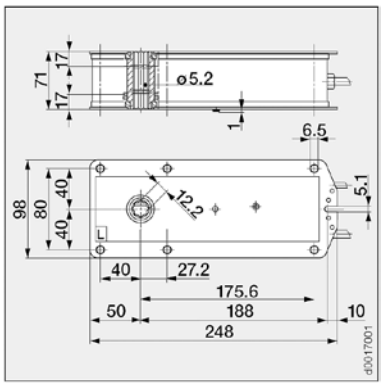
Operation principles of actuators
When an electric current is supplied to the actuator, the fire damper is in an open position. When the electricity supply to the actuator is interrupted, the return spring responds and closes the damper. The actuator can also be controlled manually and fixed in any position.

BLF / BF – actuators
BLF / BF actuators control fire dampers after receiving a signal from a centralised control system.

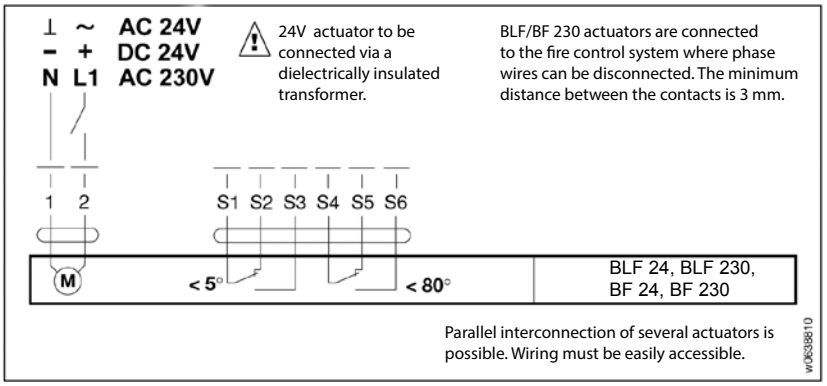
BLF



BF



Technical specifications	**BLF 24**	**BLF 230**	**BF 24**	**BF 230**
Electric current	AC 24V 50/60 Hz DC 24V	AC 230V 50/60 Hz	AC 24V 50/60 Hz DC 24V	AC 230V 50/60 Hz
Weight	1540 g	1680 g	2800 g	3100 g
Torque: Motor Return spring	 min. 4 Nm min. 4 Nm		 min. 4 Nm min. 4 Nm	
Response time: Motor Return spring	 40...75s (0...4 Nm) ≈ 20s (when t_{apl}=20°C)		 140s ≈ 16s (when t_{apl}=20°C)	
Rotation angle	95° (including a 5° rotation of the return spring)			
Working environment temperature	-30...+50°C			
Protection class	IP54			

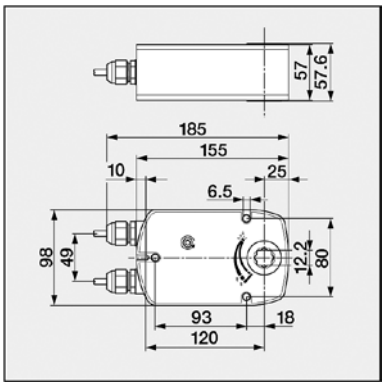


Electric actuators

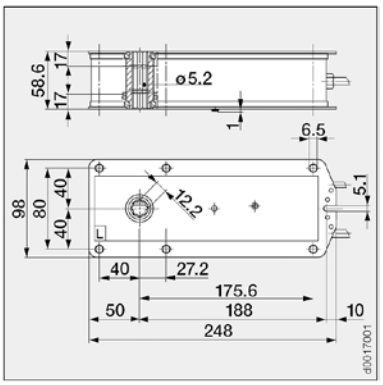
BLF...T / BF...T actuators
BLF...T / BF...T actuators control fire dampers after receiving signals from a centralised control system, or in response to a temperature sensor.
Once the air temperature reaches 72°C, temperature sensors will respond and permanently terminate the power supply to the actuator. After each actuation, temperature sensors must be replaced.

Temperature sensors:
- Type Tf1 – mounted outside the duct,
- Type Tf2 – mounted inside the duct.

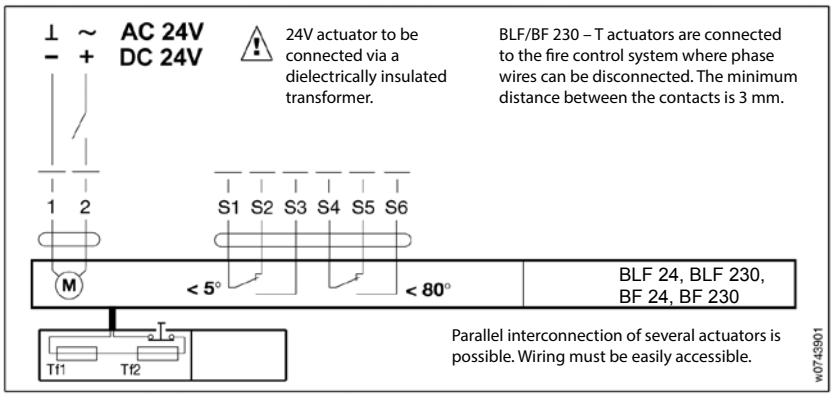
BLF...T



BF...T



Technical specifications	**BLF 24-T**	**BLF 230-T**	**BF 24-T**	**BF 230-T**
Electric current	AC 24V 50/60 Hz	AC 230V 50/60 Hz DC 24V	AC 24V 50/60 Hz	AC 230V 50/60 Hz DC 24V
Weight	1630 g	1730 g	2800 g	3100 g
Torque: Motor Return spring	 min. 4 Nm min. 4 Nm		 min. 18 Nm min. 12 Nm	
Response time: Motor Return spring	 40...75 s (0...4 Nm) ≈ 20 s (when t_{apl}=20°C)		 140 s ≈ 16 s (when t_{apl}=20°C)	
Rotation angle	95° (including a 5° rotation of the return spring)			
Temperature sensor activation temperature	Tf1: duct outside temperature 72°C Tf1: duct inside temperature 72°C			
Protection class	IP54			

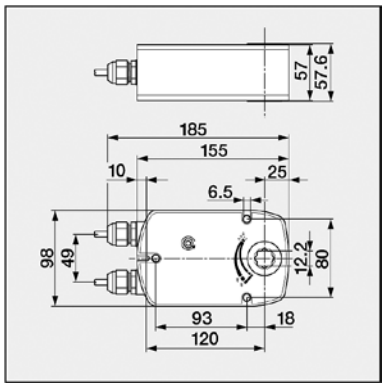


Electric actuators

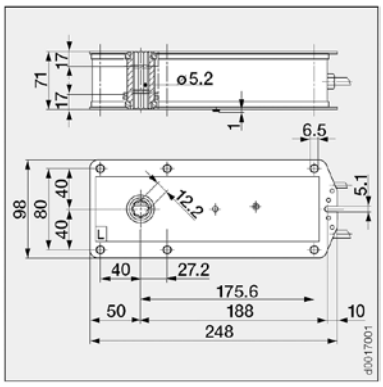
Operation principle of actuators
The actuator can be controlled electrically in both directions, and can be controlled manually to be fixed in any position.

BLE / BE – actuators
BLE / BE – actuators control fire dampers after receiving signals from a centralised control system.

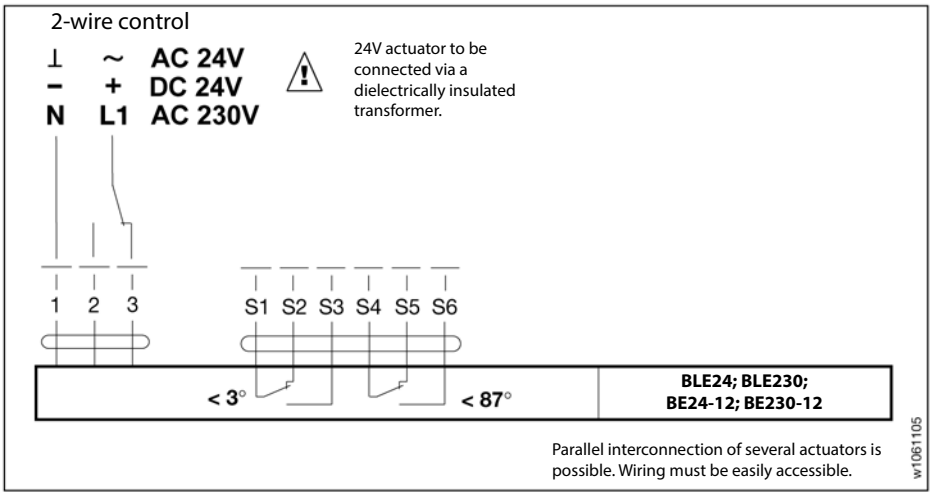
BLE



BE



Technical specifications	**BLE 24**	**BLE 230**	**BE 24-12**	**BE 230-12**
Electric current	AC 24V 50/60 Hz DC 24V	AC 230V 50/60 Hz	AC 24V 50/60 Hz DC 24V	AC 230V 50/60 Hz
Weight	1540 g	1680 g	2700 g	2700 g
Torque (nominal):	min 15 Nm @ at nominal voltage		40 Nm	
Response time:	<30 s, at -90° angle		<60 s, at - 90° angle	
Rotation angle	105° (including a mechanical surplus on each side)		100° (including a 5° mechanical surplus at the ends)	
Working environment temperature	-30...+50^{0}C			
Protection class	IP54			



Selection of electric actuators

BLF and BLF-T actuators are installed on all round fire dampers.

Selection of actuators for rectangular fire dampers

B \ H	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200	1250	1300	1350	1400	1450	1500	1550	1600
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800																													

	BLF-230; BLF-24; BLF-230T; BLF-24T
	BF-230; BF-24; BF-230T; BF-24T

Selection of actuators for rectangular smoke dampers

B \ H	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
200																					
250																					
300																					
350																					
400																					
450																					
500																					
550																					
600																					
650																					
700																					
750																					
800																					

	BLE24; BLE230
	BE24-12; BE230-12

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