

**7/S6**  
v 2.9 (en)



# FIRE DAMPER

## FDC40

## FIRE DAMPERS

### TABLE OF CONTENTS

FIRE DAMPER FDC40	387
FIRE CLASSIFICATION	387
SELECTION DIAGRAM	388
ORDERING KEY	388
DAMPER MODELS	389
FDC40-M cylindrical fire damper with electrical actuator	389
FDC40-R cylindrical fire damper with manual mechanism	389
FDC40-E cylindrical fire damper with solenoid actuator	390
INSTALLATION OPTIONS	391
Installation in a rigid wall (mortar based)	391
Installation in a flexible wall (mortar based)	391
Installation in ceiling (mortar based)	392
Installation in a rigid wall (mortarless)	392
Installation in a flexible wall (mortarless)	393
Installation in ceiling (mortarless)	393
Suspension for mortarless installation	394
ACCESSORIES	394
Flexible connectors	394
Cover grille	394
OPERATING INSTRUCTIONS	395
FDC40-R cylindrical fire damper with manual mechanism	395
FDC40-E cylindrical fire damper with solenoid actuator	395
Electrical characteristics and wiring scheme for a Belimo actuator	396
FIRE DAMPER CONTROL	397

**FIRE DAMPER FDC40**


- Used for the isolation of duct penetrations between fire compartments.
- Fire dampers consist of housing, fire-resistant damper blade and release mechanism.
- Casing made of galvanised sheet steel, damper blade made of special insulating material, damper blade shaft and push rod made of stainless steel, bearings made of brass, seals made of polyurethane and elastomer.

**Dimensions**

Standard diameters - FDC40												
Ø <sub>n</sub> [mm]	100	125	160	200	250	300	315	355	400	450	500	630

**FIRE CLASSIFICATION (according to EN 13501-3)**

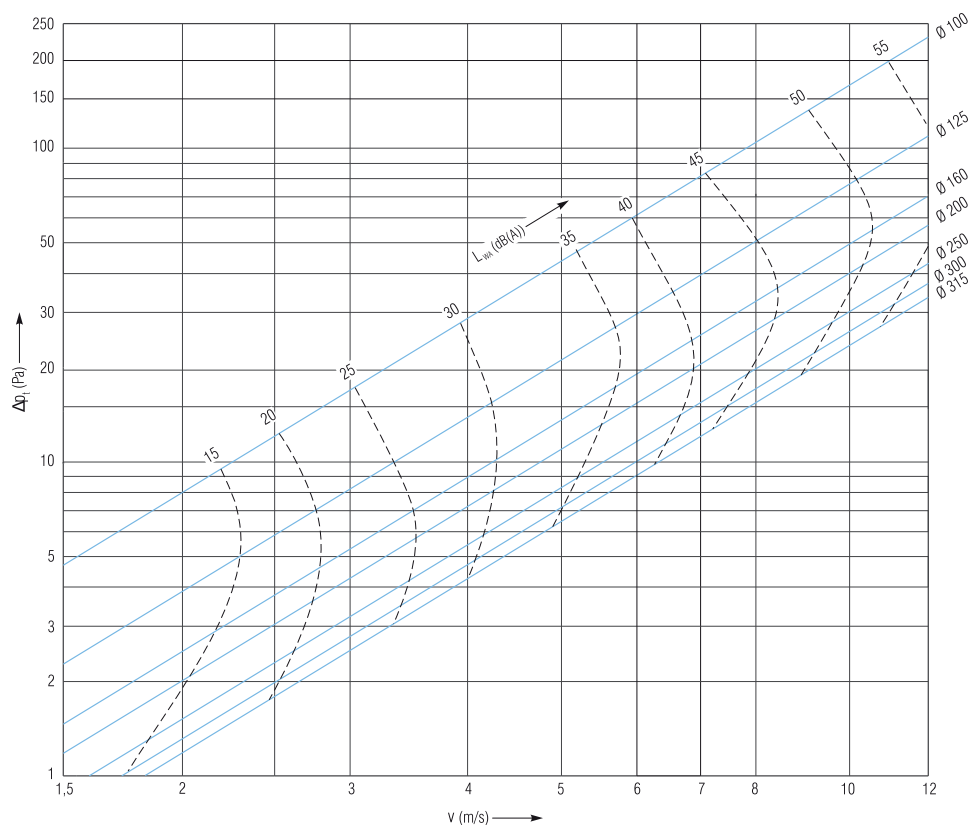
Fire resistance of fire damper depends on classification of walls or ceilings. It is allowed to install product to walls or ceilings as specified in table 1. Walls or ceilings with greater fire resistance can also be used. Fire damper should be installed according installation manual which can be found within this document.

Table 1

Wall details	Sealing	Thickness [mm]	Density [kg/m <sup>3</sup> ]	Dimensions BxH [mm]	Classification
Rigid wall	Mortar or gypsum	≥ 100	≥ 650	Ø100 up to Ø630	EI 120 S
Rigid wall	(Weichschott) mineral wool >140 kg/m <sup>3</sup> + coating	≥ 100	≥ 650		EI 120 S
Standard plasterboard wall (GKB, GKF)	mortar or gypsum + cover boards (Masterboard)	≥ 100			EI 60 S
Standard plasterboard wall (GKF)	mortar or gypsum + cover boards (Masterboard)	≥ 125			EI 90 S
Standard plasterboard wall (GKF)	mortar or gypsum + cover boards (Masterboard)	≥ 150			EI 120 S
Standard plasterboard wall (GKB, GKF)	(Weichschott) mineral wool >140 kg/m <sup>3</sup> + coating	≥ 100			EI 60 S
Standard plasterboard wall (GKF)	(Weichschott) mineral wool >140 kg/m <sup>3</sup> + coating	≥ 125			EI 90 S
Standard plasterboard wall (GKF)	(Weichschott) mineral wool >140 kg/m <sup>3</sup> + coating	≥ 150			EI 120 S
Ceiling	Mortar or gypsum	≥ 125	≥ 650		EI 90 S
Ceiling	(Weichschott) mineral wool >140 kg/m <sup>3</sup> + coating	≥ 125	≥ 650		EI 120 S
Ceiling	Mortar or gypsum	≥ 150	≥ 650		EI 90 S
Ceiling	(Weichschott) mineral wool >140 kg/m <sup>3</sup> + coating	≥ 150	≥ 650		EI 120 S

**SELECTION DIAGRAM**
**Symbol:**

$v$  - air velocity in the duct [m/s]  
 $\Delta p_t$  - total pressure loss [Pa]  
 $L_{WA}$  - sound power level [dB(A)]


**ORDERING KEY**
**Damper type**
**FDC40**
**- Ø250**
**- M230**
**- S**
**- G1**
**Damper dimensions**
 $\varnothing$  [mm]

**Mechanism type:**

R - manual mechanism

E230 - solenoid actuator AC230V

E24 - solenoid actuator AC 24V

M230 - electric actuator AC230V

M24 - electric actuator AC/DC 24V

**Options:**

s - electric limit switches (indicating damper "OPEN" and "CLOSED")

z - electric limit switch (indicating damper "CLOSED")

o - electric limit switch (indicating damper "OPEN")

**Grille:**

G1 - grid on one side

G2 - grid on both sides

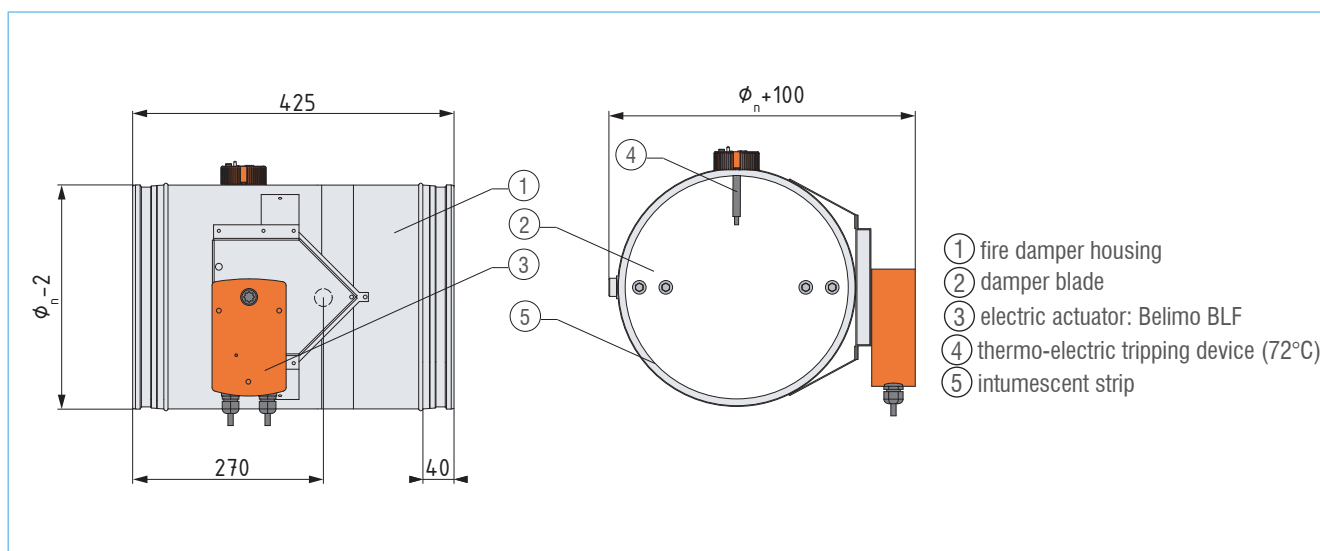
## DAMPER MODELS

### FDC40-M cylindrical fire damper with electric actuator

- Thermoelectric activation (72°C) with electric actuator and return spring
- Integrated end switches
- Fully automatic operation
- Networking capability (MP-BUS, LonWorks, AS-i BUS)

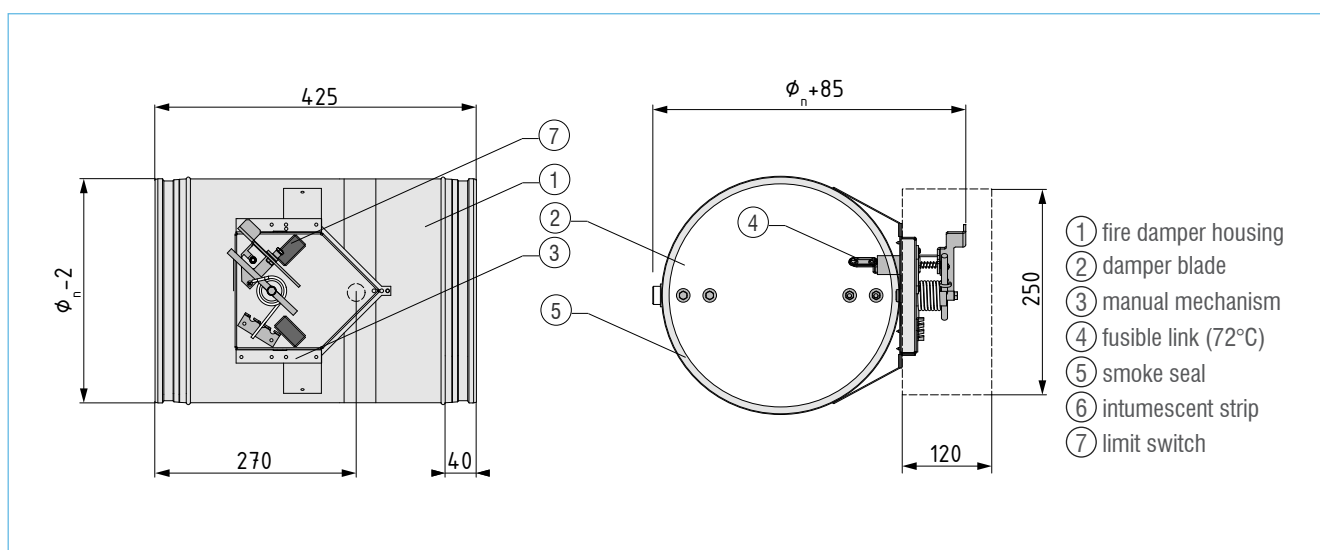
Options:

M230 – electric actuator AC 230V  
M24 – electric actuator AC/DC 24V



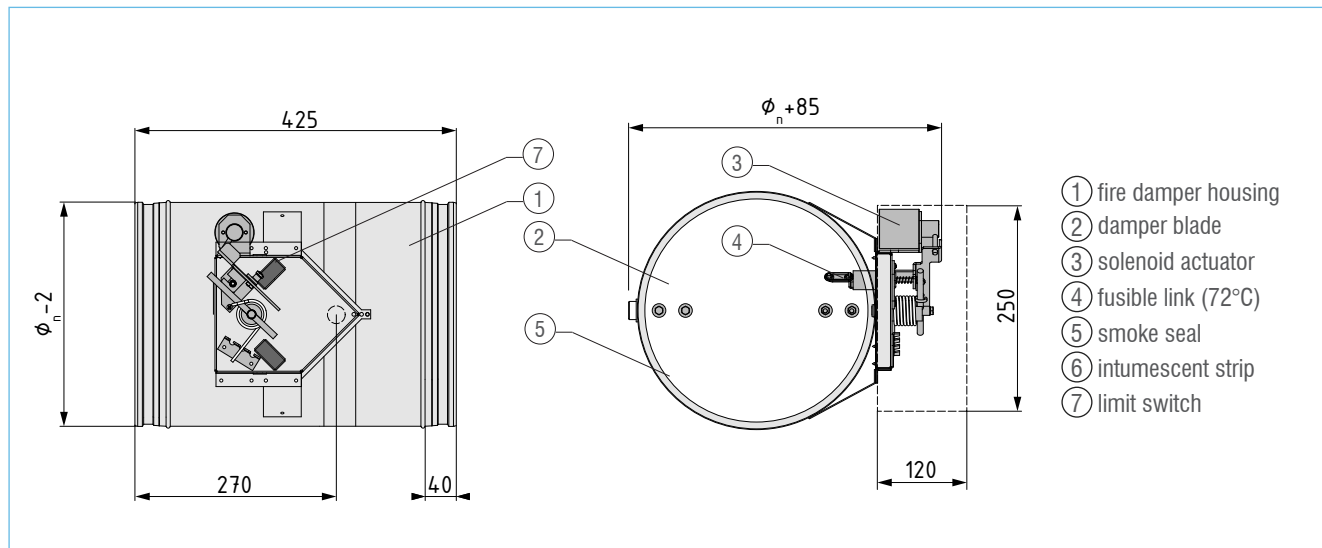
### FDC40-R cylindrical fire damper with manual mechanism

- automatic closure when the temperature in the duct exceed 72°C
- manual rearmation with handle
- manual unlocking possible for periodical test of fire damper



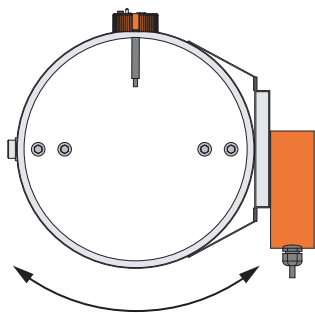
### FDC40-E cylindrical fire damper with solenoid actuator

- spring return actuator with integrated limit switches and thermoelectric release mechanism (72°C)
- manual rearmation with handle
- possible closing with solenoid
- manual closing possible



### All installation opportunities are valid for:

- Installation onto duct in any shaft axis angle position



- Airflow and fire protection in both sides
- Closed blade air leakage according to EN 1751, class 2
- Casing air leakage to EN 1751, class C (on demand)
- Fire damper can be equipped with thermic fuse with 72°C or for warm air ventilation systems 95°C release temperature
- Fire damper casing is manufactured from galvanized steel, but on demand can be made from:
  - Galvanized steel and powder coated
  - Stainless steel
  - Stainless steel and powder coated
- Fire damper for areas with potentially explosive atmospheres are also available (for additional information see FD-Ex catalog)

## INSTALLATION OPTIONS

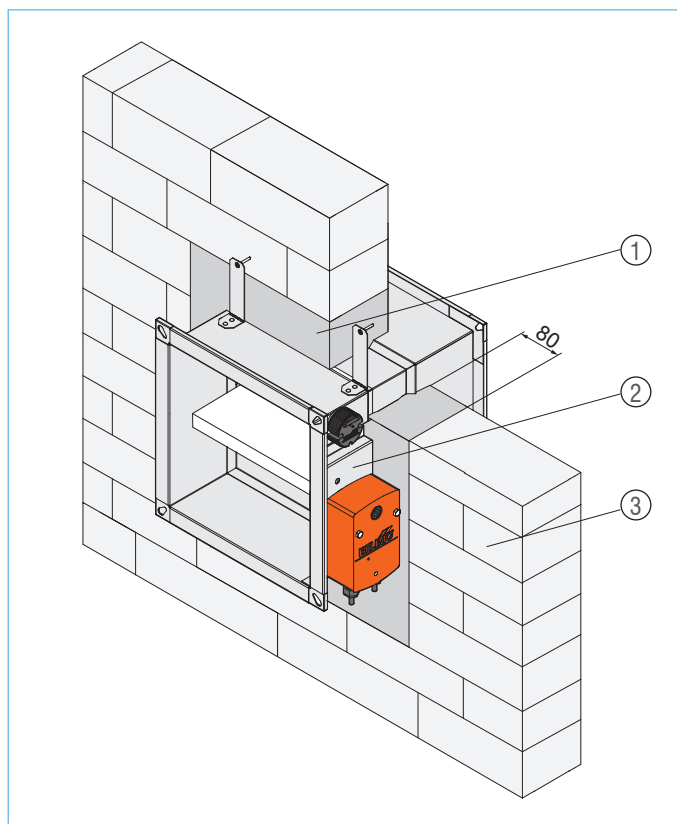
### Installation in a rigid wall (mortar based)

- Recommended wall opening for fire damper installation is  $\varnothing + 160\text{mm}$ , but openings from  $\varnothing + 80 \dots 200\text{ mm}$  can also be used (**\*decrease under specified value in opening size is allowed if there is sufficient room for seal installation**)
- Insert fire damper into wall and secure on wall face with two hinges that are placed on the top of fire damper casing. Hinges are used to hold only damper during installation! (for max. distance from wall 80 mm)
- Damper blade must be closed during installation
- Space between casing and wall must be filled with mortar, gypsum or concrete
- Test the fire damper after the installation
- During installation, manual or motorized mechanism must be protected from mortar, gypsum or concrete.

- ① Standard mortar or gypsum  
② Fire damper FDC40  
③ Wall, according to table 1



After installation check for damper blade mobility, preform an opening and closing test.



### Installation in a flexible wall (mortar based)

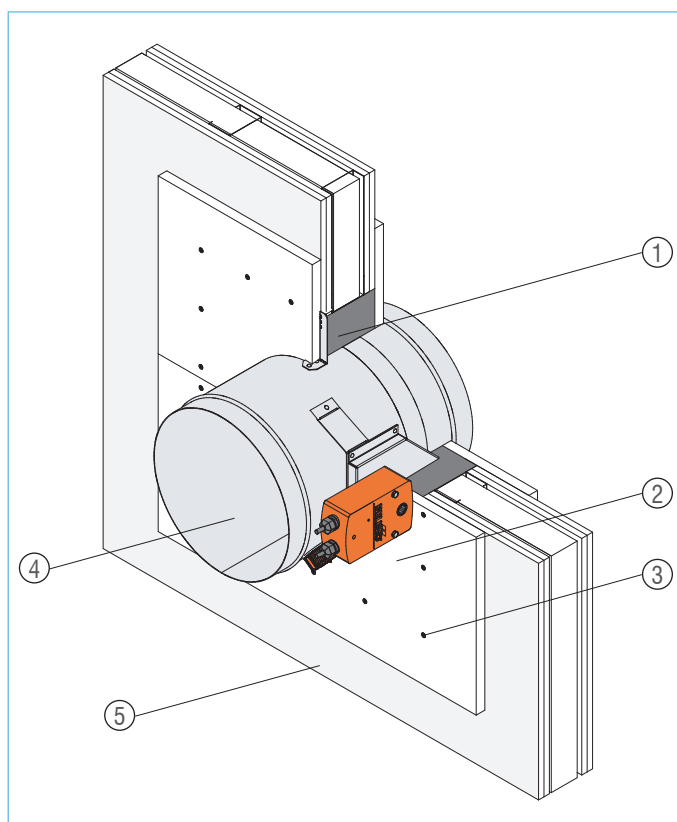
Installation steps:

- Recommended wall opening for fire damper installation is  $\varnothing + 160\text{mm}$ , but openings from  $\varnothing + 80 \dots 200\text{ mm}$  can also be used
- Insert fire damper into wall and secure on wall face with two hinges that are placed on the top of fire damper casing. Hinges are used to hold only damper during installation! (for max. distance from wall 80 mm)
- Damper blade must be closed during installation
- Space between casing and wall must be filled with mortar or gypsum
- Mortar or gypsum must be covered with fire resistant boards that are secured onto wall face with screws
- Test the fire damper after the installation
- During installation, manual or motorized mechanism must be protected from mortar and dust.

- ① Standard mortar or gypsum  
② Masterboard thickness 20mm  
③ Screw for gypsum plasterboard  
④ Fire damper FDC40  
⑤ Wall, according to table 1



After installation check for damper blade mobility, preform an opening and closing test.



## FIRE DAMPERS

### Installation in ceiling (mortar based)

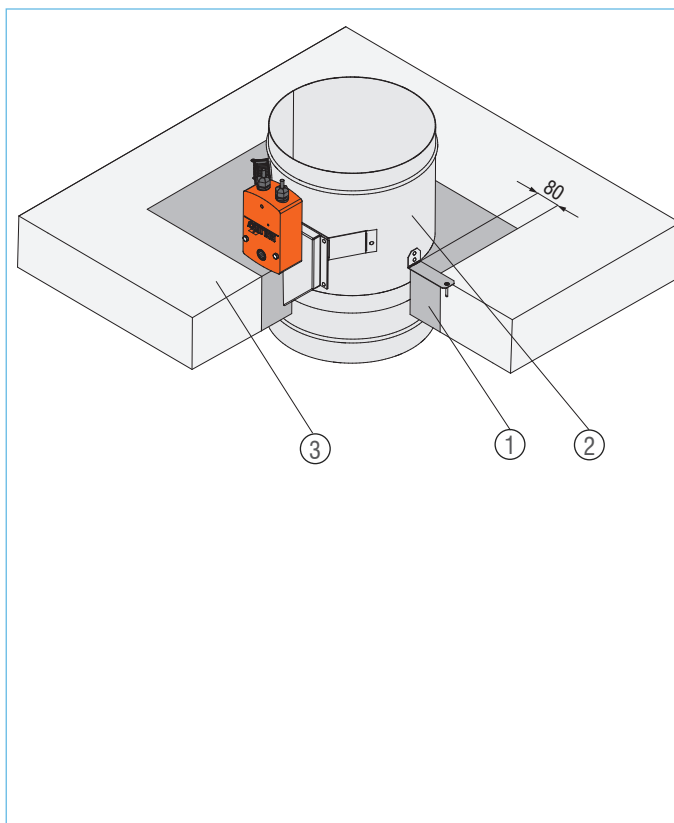
Installation steps:

- Recommended ceiling opening for fire damper installation is  $\varnothing + 160\text{mm}$ , but openings from  $\varnothing + 80 \dots 200\text{ mm}$  can also be used (**\*decrease under specified value in opening size is allowed if there is sufficient room for seal installation**)
- Insert fire damper into ceiling and secure on ceiling face with two hinges that are placed on the top of fire damper casing. Hinges are used to hold only damper during installation! (for max. distance from wall 80 mm)
- Damper blade must be closed during installation
- Space between casing and ceiling must be filled with mortar, gypsum or concrete
- Test the fire damper after the installation
- During installation, manual or motorized mechanism must be protected from mortar, gypsum or concrete.

- ① Standard mortar or gypsum
- ② Fire damper FDC40
- ③ Ceiling, according to table 1



After installation check for damper blade mobility, preform an opening and closing test.



### Installation in a rigid wall (mortarless)

Installation material: Fire damper FDC40, Mineral wool  $> 140\text{kg/m}^3$ , Fire protection coating, (HILTI weichschott system)

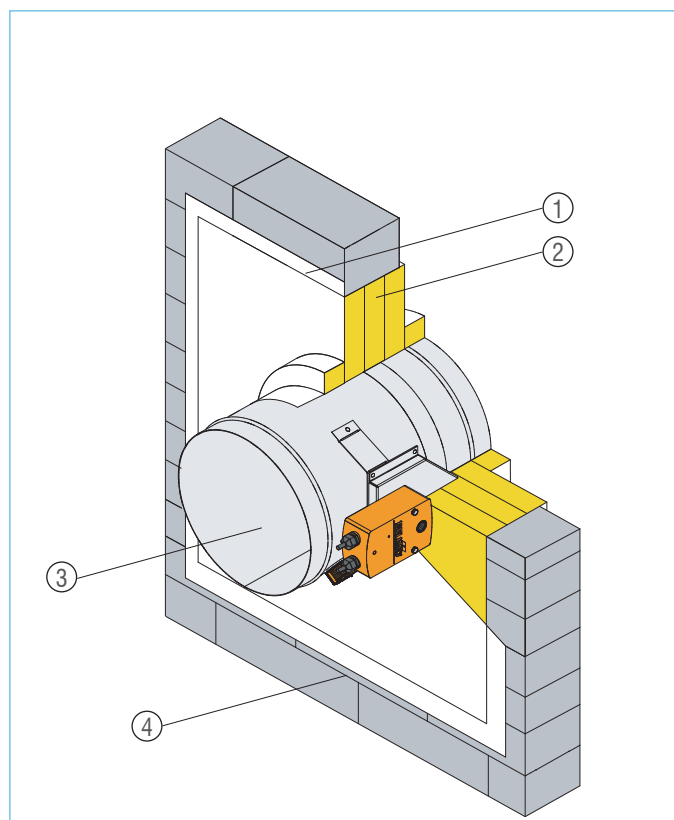
Installation steps:

- Recommended wall opening for fire damper installation is  $\varnothing + 400\text{mm}$ , but openings from  $\varnothing + 80 \dots 600\text{ mm}$  can also be used
- Insert fire damper into wall
- Damper blade must be closed during installation!!!
- Space between casing and wall close with three layers of mineral wool (density  $140\text{ kg/m}^3$  or more, coated on one side)
- Cut additional 50 mm thick rings to cover fire damper perimeter from both sides
- Connections of mineral wool seal with intumescent fire resistant sealant
- Mineral wool and damper casing must be coated with 2 mm thick fire protection coating
- Actuator and release unit must not be coated!!!
- Test the fire damper after the installation

- ① Fire protection coating
- ② Mineral wool insulation
- ③ Fire damper FDC40
- ④ Wall, according to table 1



After installation check for damper blade mobility, preform an opening and closing test.





### Installation in a flexible wall (mortarless)

Installation material: Fire damper FDC40, Mineral wool >140kg/m<sup>3</sup>, Fire protection coating, (HILTI weichschott system)

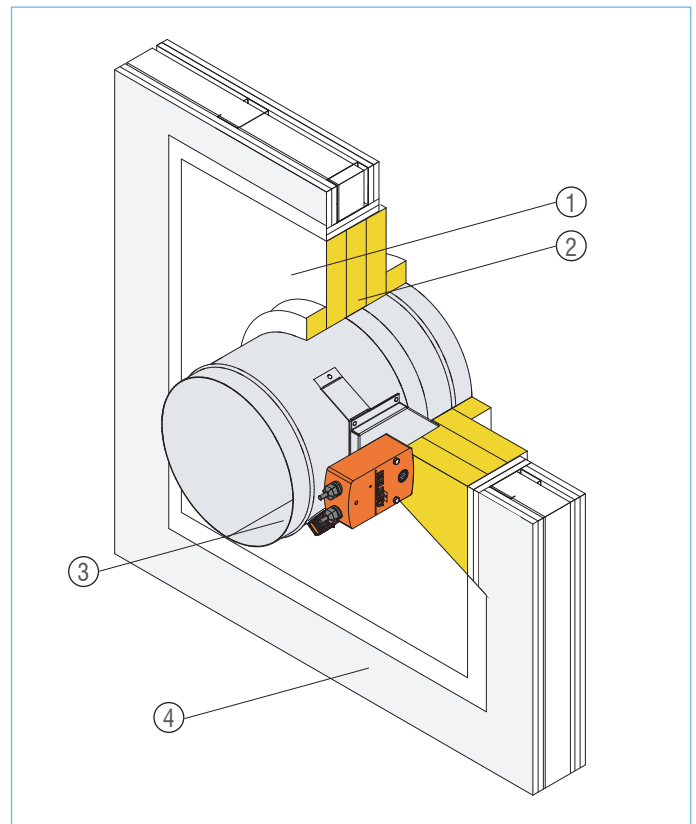
Installation steps:

- Recommended wall opening for fire damper installation is Ø + 400mm, but openings from Ø + 80...600 mm can also be used
- Insert fire damper into wall
- Damper blade must be closed during installation!!!
- Space between casing and wall close with three layers of mineral wool (density 140 kg/m<sup>3</sup> or more, coated on one side)
- Cut additional 50 mm thick rings to cover fire damper perimeter from both sides
- Connections of mineral wool seal with intumescent fire resistant sealant
- Mineral wool and damper casing must be coated with 2 mm thick fire protection coating
- Actuator and release unit must not be coated!!!
- Test the fire damper after the installation

- ① Fire protection coating
- ② Mineral wool insulation
- ③ Fire damper FDC40
- ④ Wall, according to table 1



After installation check for damper blade mobility, preform an opening and closing test.



### Installation in ceiling (mortarless)

Installation material: Fire damper FDC40, Mineral wool >140kg/m<sup>3</sup>, Fire protection coating, (HILTI weichschott system)

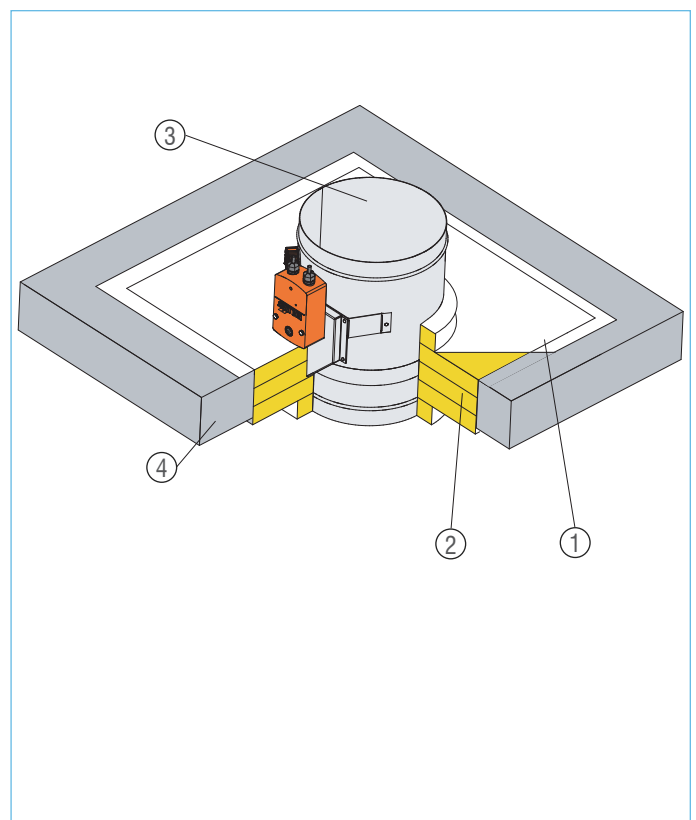
Installation steps:

- Recommended ceiling opening for fire damper installation is Ø + 400mm, but openings from Ø +80...600 mm can also be used
- Insert fire damper into ceiling
- Damper blade must be closed during installation!!!
- Space between casing and ceiling should be closed with three layers of mineral wool (density 140 kg/m<sup>3</sup> or more, coated on one side)
- Cut additional 50 mm thick rings to cover fire damper perimeter from both sides
- Connections of mineral wool should be sealed with intumescent fire resistant sealant
- Mineral wool and damper casing must be coated with 2 mm thick fire protection coating
- Actuator and release unit must not be coated!!!
- Test the fire damper after the installation

- ① Fire protection coating
- ② Mineral wool insulation
- ③ Fire damper FDC40
- ④ Wall, according to table 1



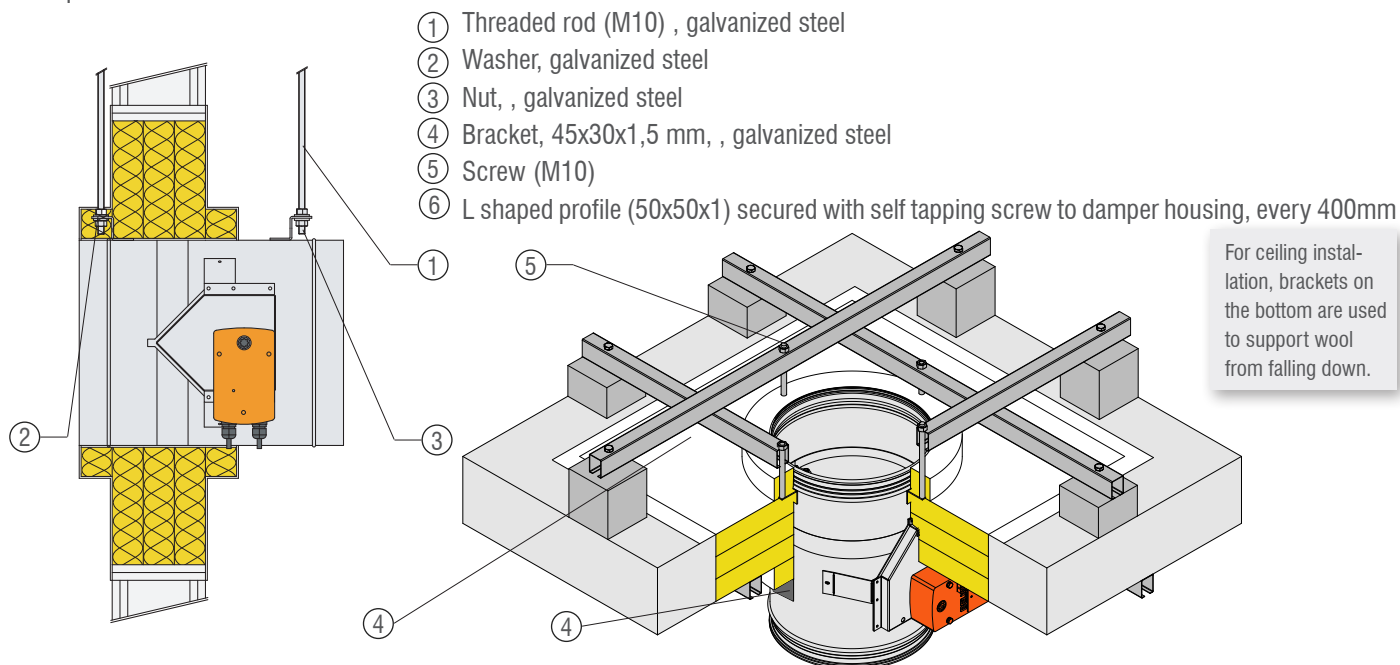
After installation check for damper blade mobility, preform an opening and closing test.



## FIRE DAMPERS

### Suspension for mortarless installation

Suspension systems are required for the dry mortarless installation of the fire damper with mineral wool in solid walls, flexible walls and ceiling slabs. Fire dampers can be suspended from solid ceiling slabs using adequately sized threaded rods. Load the suspension system only with the weight of the fire damper. Ducts must be suspended separately. Suspension systems longer than 1.5 m require fire-resistant insulation.



## ACCESSORIES

### Flexible connectors

Ventilation ducts must be installed in such manner that don't oppose loads on fire damper or wall in case of fire. This is important when damper is installed and sealed with mineral wool. Using flexible connectors when connecting fire dampers to ducts can eliminate that problem. Flexible connectors are available on demand in dimensions same as fire dampers.

When flexible connectors are being installed very important is to install extension piece if necessary (see table 2).

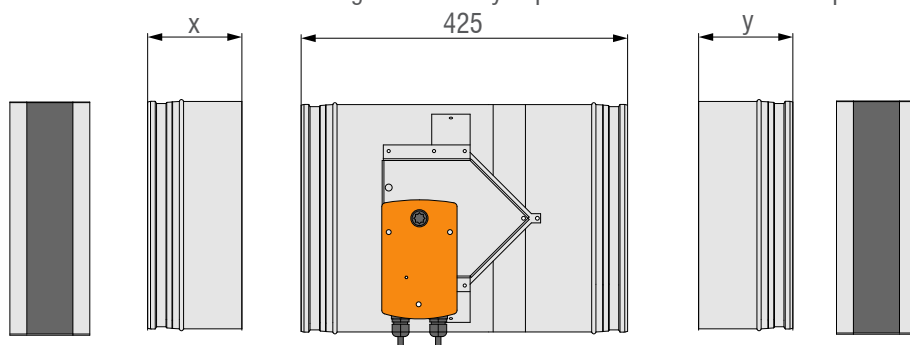


Table 2

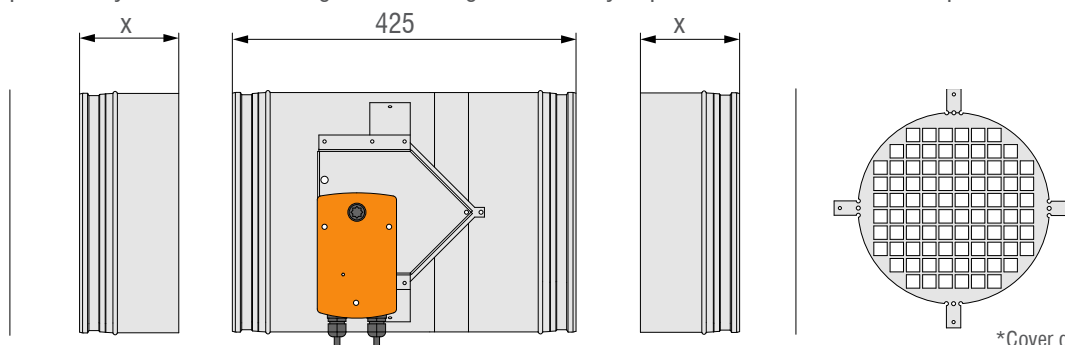
Øn, mm (fire damper diameter)	X/Y, mm (extension piece length)
400	-/65
450	-/90
500	-/115
560	30/145
630	65/180
800	250

\*Flexible connectors are shipped unassembled.

\*\*Extension piece is not supplied

### Cover grille

If fire damper is to be ducted only from one side, other end must have a cover grille. Cover grilles have cross sectional free area approximately 70%. When cover grilles are being installed very important is to install extension piece if necessary (see table 2).



\*Cover grilles are shipped unassembled.

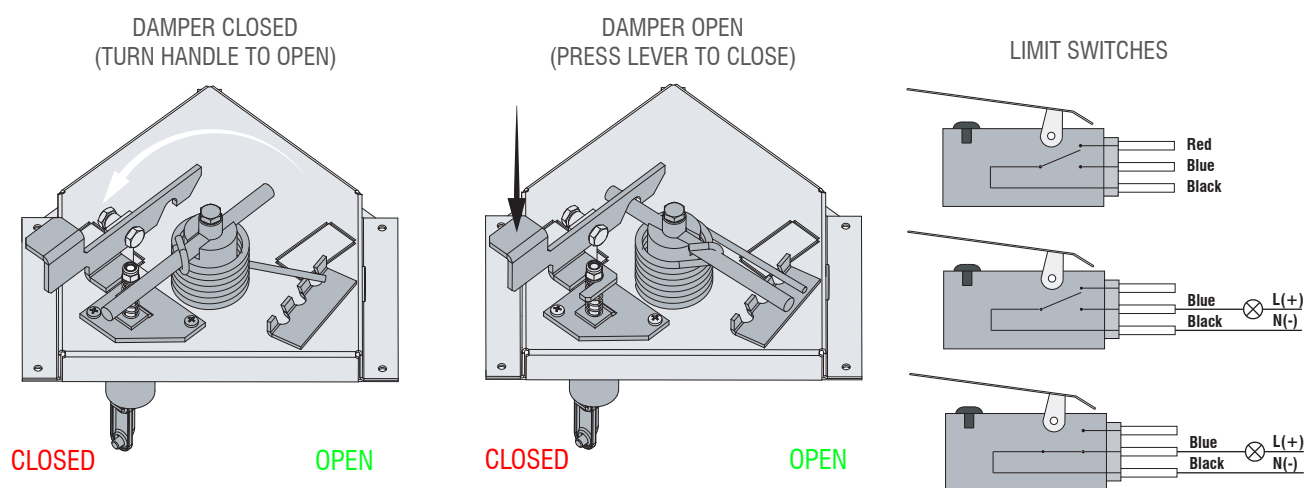
\*\*Extension piece is not supplied

## OPERATING INSTRUCTIONS

### FDC40-R cylindrical fire damper with manual mechanism

Fire damper is shipped with closed damper blade. Fire damper with manual actuating mechanism is open by turning handle counter-clockwise. Test of damper function is performed by pressing on a specified place on a lever. Fire damper can be optionally equipped with limit switches.

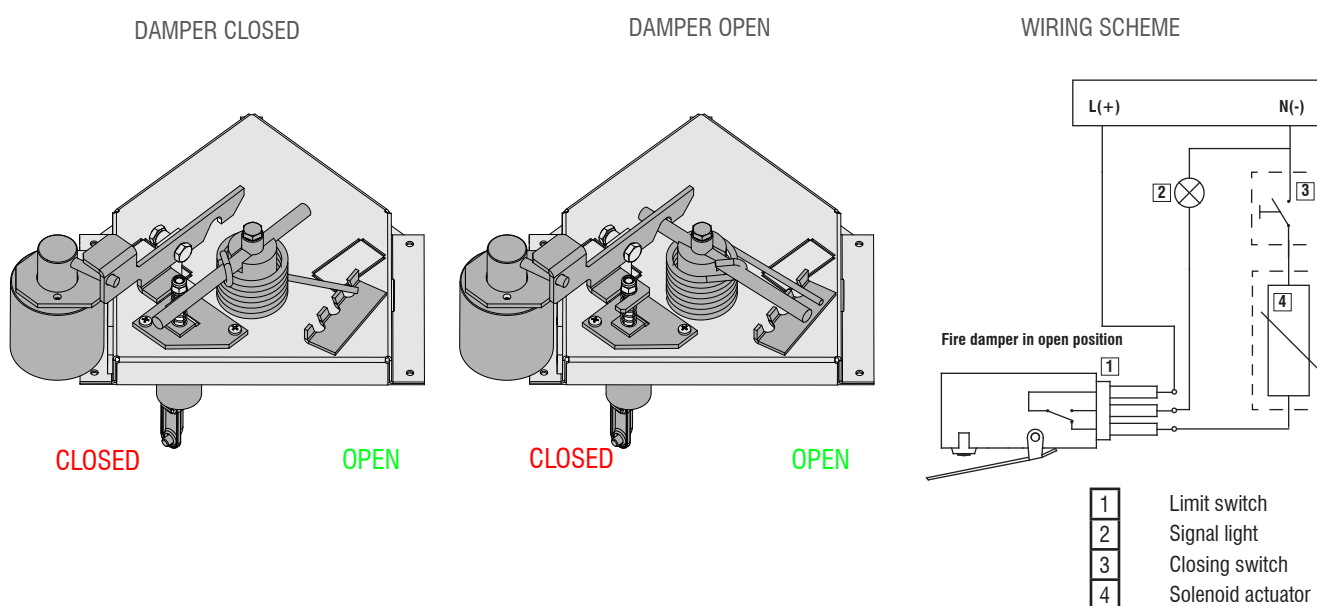
Limit switches used on fire dampers give indication of damper blade position. Relays or indicator lights for fire alarm systems can be used up to the maximum switch rating (Table 1.). One limit switch is required for damper blade position OPEN and one for CLOSED. Fire dampers with a fusible link can be supplied with one or two limit switches, the switches can also be fitted later.



### FDC40-R cylindrical fire damper with solenoid actuator

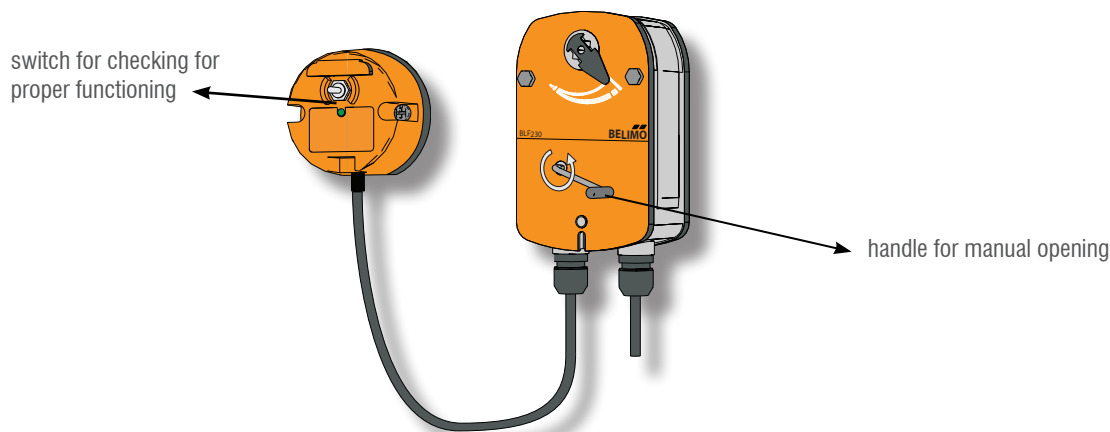
Fire damper is shipped with closed damper blade. Fire damper with manual actuating mechanism is open by turning handle counter-clockwise. Test of damper function is performed by pressing on a specified place on a lever, or by supplying solenoid with an current impulse. Fire damper can be optionally equipped with limit switches.

Limit switches used on fire dampers give indication of damper blade position. Relays or indicator lights for fire alarm systems can be used up to the maximum switch rating (Table 1.). One limit switch is required for damper blade position OPEN and one for CLOSED. Fire dampers with a fusible link can be supplied with one or two limit switches, the switches can also be fitted later.



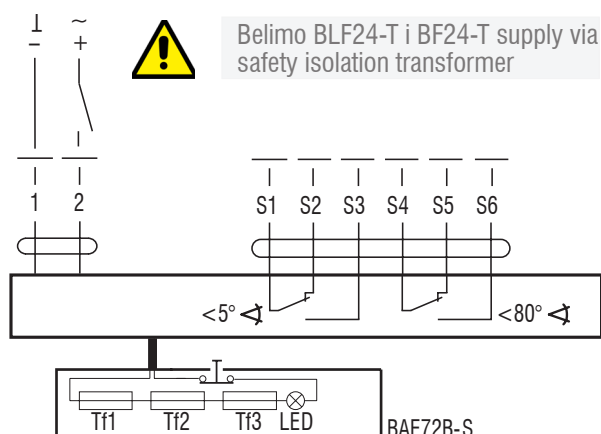
## Electrical characteristics and wiring scheme of electrical Belimo actuator

Damper is delivered in closed position. When electric actuator is connected to the power supply damper will open. When the damper reaches the end position (damper open), in which is it blocked, the electromotor will stop. Closing fire damper takes place automatically when a power failure occurs. Thermal tripping device that comes with fire damper causes power circuit break at a temperature of 72 °C (inside or outside duct). If checking is needed for proper functioning of fire damper, pushing the switch on the thermal tripping device will close damper. When switch on tripping device is released, the damper will open.



Damper can be opened without connecting to a voltage with enclosed handle turning in the direction of the arrow on electric actuator (clockwise). Damper can be locked in the desired position by fast turning back handle a quarter of a turn (counterclockwise). To unlock the electromotor, turn handle clockwise for a quarter of a turn. If the handle is released, damper will be closed by return spring. When damper is opened manually, electric actuator will not move the damper into closed position after power failure (thermoelectric fuse).

Type of Belimo actuator		BLF24-T	BF24-T	BLF230-T	BF230-T
Nominal voltage / power consumption	voltage	AC/DC 24V, 50/60Hz	AC/DC 24V, 50/60Hz	AC 230V, 50/60Hz	AC 230V, 50/60Hz
	opening	5 W	7 W	6 W	8 W
	holding	2,5 W	2 W	3 W	3 W
	for wire sizing	7 VA	10 VA	7 VA	12,5 VA
End switch		1 mA...3 A (0,5 A), DC 5 V...AC 250V	1mA...6A (3A), DC 5V... AC 250V	1 mA...3 A (0.5 A), DC 5 V...AC 250 V	1 mA...6 A (3 A), DC 5 V...AC 250 V
Running time	motor	40...75 s	<120 s	40...75 s	<140 s
	spring-return	~20 s	~16 s	~20 s	~16 s
Ambient temperature range		max. 50°C			



1	negative (direct-current) or neutral (alternating current)
2	positive (direct-current) or faze (alternating current)
S1	common micro switch closed damper
S2	normally closed micro switch closed damper
S3	normally open micro switch closed damper
S4	common micro switch open damper
S5	normally closed micro switch open damper
S6	normally open micro switch open damper
Tf1	temperature sensor on the outer side of the duct (ambient temperature) max. 72°C
Tf2	temperature sensor on the inner side of the duct (temperature in the duct) max. 72°C
Tf3	temperature sensor on the inner side of the duct (temperature in the duct) max. 72°C

## FIRE DAMPER CONTROL

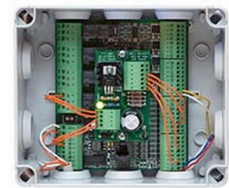
### Digital controller K-M200

- Digital controller K-M200 to control and monitor up to 200 motorized fire dampers and 200 smoke detectors
- Pre-programmed for fire safety application
- No programming knowledge necessary! Simple parameterisation through touch screen or remote access via web browser
- Communication: Modbus RTU (RS-485) to the K-FC24's / K-UFC24's and the internal I/O's, TCP / IP (Ethernet RJ45) for remote access or combining multiple units. Integrated IP-address
- Automatic test of the whole system including test report



### Digital field controller K-FC24

- Digital field controller to control and monitor up to 4 motorized fire dampers and 4 smoke detectors
- Communication: Modbus RTU (RS-485)
- The safety function of the connected devices is not affected when communication with Modbus is interrupted



### Universal digital field controller K-UFC24

- Universal System Link between motorized fire or smoke extraction dampers and any Modbus or BACnet system or analog control
- Controls and monitors max 2 fire or smoke extraction dampers as well as 1 smoke detector and 1 thermoelectrical tripping device
- The Universal Field Controller offers 3 different control modes (to be chosen through dip switch terminals) :
- Fire or smoke extraction application
- Bus protocols: Modbus (RS-485) or BACnet (Ms/Tp)
- Analog: Input and output signals
- Easy to install thanks to the mounting bracket which can be pre-installed. The UFC24 can be snapped on any time during the project
- Easy and clear indication of function, position and status with LEDs
- Independent functional control through test key at any time



## System overview

Controller /  
Building Management Level

