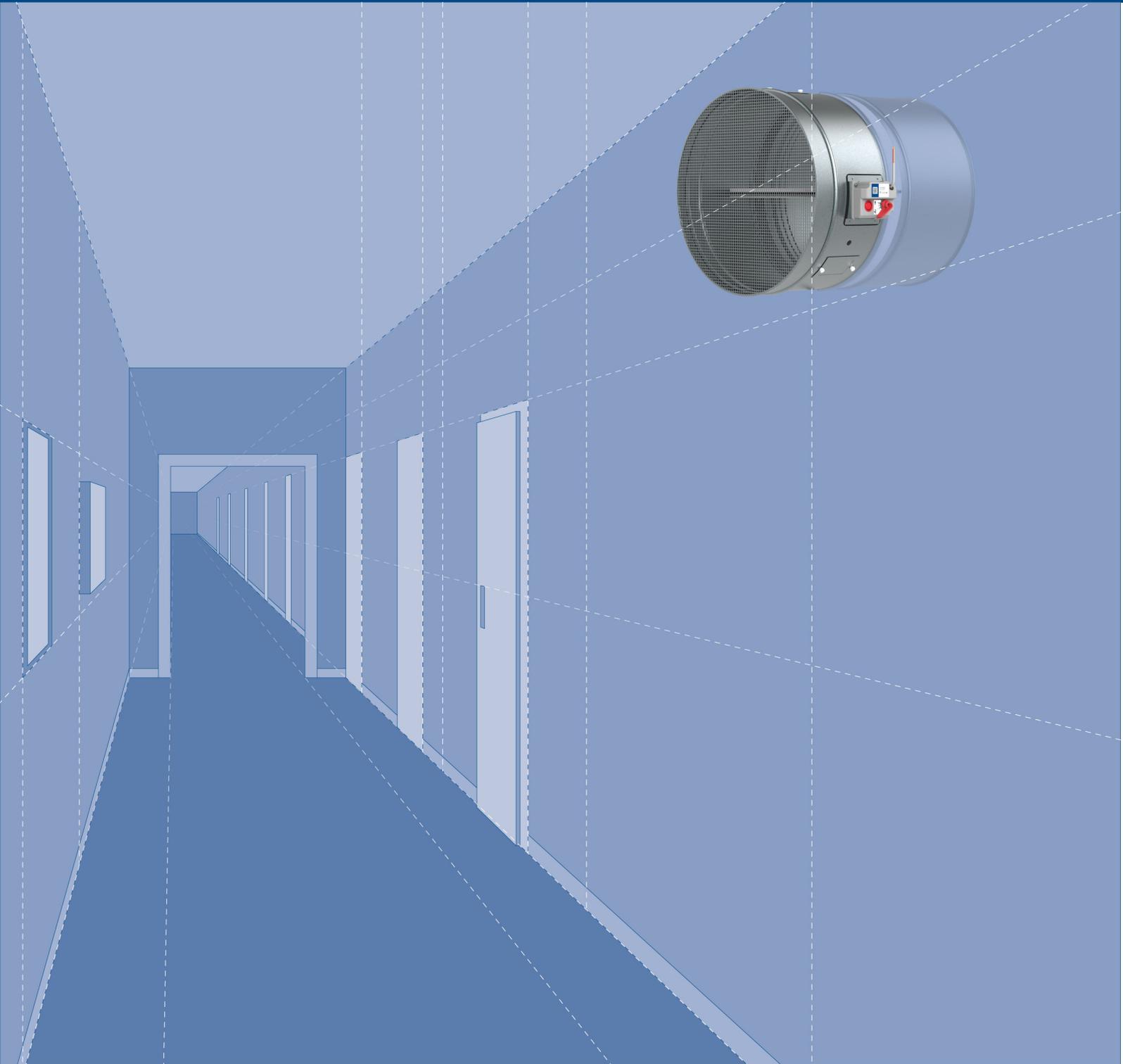


# FDR-3G...OF

Overflow Fire Damper FDR-3G



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# Overflow Fire Damper FDR-3G



## Description

Overflow fire dampers up to size 630 mm represent passive fire protection, designed with the help of compartmentalization to prevent the spread of toxic gases, smoke and fire. Standard fire dampers are designed and certified in accordance with EN 15650 and tested for EIS criteria according to EN 1366-2. Fire damper together with its installation form an inseparable part of fire resistivity rating. FDR-3G...OF fire dampers are designed for the installations listed and described in their User Manual. By default, all fire dampers are supplied with an manual mechanism or actuator mechanism, optionally with smoke detector. FDR-3G...OF is equipped on both ends with Grilles that together with the duct extensions cover blade overhangs.

## Manually Operated Fire Dampers

By default, all manually operated fire dampers are supplied with hand crank, optionally with micro switches. In case of fire, the fire damper is closes automatically after the melting of the thermal fuse. After the closing of the damper blade, it is mechanically locked in the closed position and can only be opened manually. The actuating mechanism is activated when the temperature of the air in the duct reaches 74°C and the damper closes within 10 seconds after the melting of the fuse.

## Actuator- Operated Fire Dampers

By default, all actuator operated fire dampers are supplied with an actuator with micro switches. A fire damper equipped with a spring return actuator can be closed with command from the building management system, or after the breaching of the thermoelectric fuse. Actuator operated fire dampers are standardly equipped with a thermoelectric fuse, that activates the closing of the damper after the reaching or exceeding of the ambient temperature of 72°C. The actuator power circuit is interrupted and its spring closes the damper blade within 20 seconds.

The activation mechanisms are removable and are interchangeable, for example an actuator operated mechanism instead of a manually operated mechanism.

## Highlights

- Activation types with fitted smoke detector
- Construction with included Grilles
- Tightness class 3C as standard

- Low pressure drop
- Changeable mechanism
- Inspection opening built-in
- Great variety of installations rated up to EI120S

### Activation Types

- H0-OF

Overflow fire damper with an activation mechanism with a cover, manual crank and with a spring return release mechanism activated by a fusible thermal link set to 74°C (on demand 100°C).

- H2-OF

Overflow fire damper with an activation mechanism H0-OF + open and closed indication with AC 230 V or AC/DC 24 V contact switches.

- H5-2-OF

Overflow fire damper with an activation mechanism H0-OF + a AC/DC 24 V electromagnetic release mechanism in the impulse connection (release takes place when the electromagnet is activated) + open and closed indication with AC 230 V or AC/DC 24 V contact switches.

- H6-2-OF

Overflow fire damper with an activation mechanism H0-OF + an AC 230 V electromagnetic release mechanism in the impulse connection (release takes place when the electromagnet is activated) + open and closed indication with AC 230 V or AC/DC 24 V contact switches.

- B230T-OF or G230T-OF

Overflow fire damper with an activation mechanism with a Belimo or Gruner spring return actuator (AC 230 V) with electro-thermal fuse 72°C and auxiliary switches.

- B24T-OF or G24T-OF

Overflow fire damper with an activation mechanism with a Belimo or Gruner spring return actuator (AC/DC 24 V) with electro-thermal fuse 72°C and auxiliary switches.

- BSD230T-OF or GSD230T-OF

Overflow fire damper with Smoke Detector fitted activation mechanism (AC 230 V) with a Belimo or Gruner spring return actuator with an electro-thermal fuse 72°C and auxiliary switches, with a Belimo supply and communication unit or Gruner power supply unit (Actuator powered through transformer and Smoke Detector AC/DC 24 V).

- BSD24T-OF or GSD24T-OF

Overflow fire damper with Smoke Detector fitted activation mechanism (AC/DC 24 V) with a Belimo or Gruner spring return actuator with an electro-thermal fuse 72°C and auxiliary switches, with a Belimo supply and communication unit or Gruner power supply unit (Actuator powered through Smoke Detector AC/DC 24 V).

### Design

Fire dampers have casings made from galvanized sheet metal. Blades from non-asbestos insulants have a rubber seal for cold smoke and an intumescent seal, that expands in a fire situation. Overflow fire damper is equipped on both ends with galvanized sheet metal Grilles mounted on sheetmetal duct extensions.

### Material Composition

The product contains galvanized sheet metal, calcium silicate board, fireproof carbon fiberglass, polyurethane foam and ethylene-propylene rubber. These are processed in accordance with local regulations. The product contains no hazardous substances, except for the solder in the thermofuse, which contains a milligram of lead.

### List of Accessories

Detailed information about accessories for FDR-3G...OF is available in SystemairDESIGN under Fire Damper Accessories.

- AM-FD: Activation Mechanisms
- CBR-FD: Cover Boards

## Technical Parameters

### Durability test

- 50 cycles/manually operated activation mechanism – with no change of the required properties
- 10000 + 100 + 100 cycles/actuator operated activation mechanism – with no change of the required properties

### Fire testing pressure

Underpressure up to 300 Pa

### Safety position

Closed. (In fire scenario the damper closes via spring in actuator or spring in manual mechanism)

### Airflow direction

Both directions

### Allowed air velocity

Damper can still operate at max. 12 m/s. Air without any mechanical or chemical contamination

### Side with fire protection

Depending on installation classification: From both sides (i <-> o)

### Repeated opening

Suitable for daily check procedure. It is not possible to operate the device after reaching Activation temperature.

### Activation Temperature

- Manually operated: 74 °C as standard by means of a spring after the melting of the thermofuse and/or after smoke sensor detection.
- Actuator operated: 72 °C as standard by means of the spring after current interruption in the electro-thermal fuse and/or after smoke sensor detection.

### Operational temperature

- Minimum: 0 °C
- Maximum: 60 °C for 74 °C and 72 °C thermofuse

### Environment suitability

Protected against weather disruptions, with temperature above 0 °C, up to 95% Rha, (3K5 according to EN 60721-3-3)

### Open/Closed indication

- Manually operated microswitches - Activation types H2-OF up to H6-2-OF
- Actuator operated built-in microswitches - Activation types B230T-OF/G230T-OF up to BSD24T-OF/GSD24T-OF

### Closing/Opening time

Manually operated < 10 s, actuator operated < 20 s

### Inspection possibility

By opening of the inspection lid. For smaller than DN160 after removing of the activation mechanism, or a inspection opening must be added to the connecting duct. Smoke sensor can be tested with test button or through damper grille with smoke spray tester.

### Maintenance

Not required. Dry cleaning if demanded by law in the country in which the dampers are installed.

### Revisions

Determined by law in the country in which the fire dampers are installed but at least every 12 months.

### Allowed pressure

1200 Pa

**Blade tightness (STN EN 1751)**

Class 3 as standard

**Tightness of the housing (STN EN 1751)**

Class C as standard

**Conformity with EC directives**

2006/42/EC Machinery Directive

2014/35/EU Low Voltage Directive

2014/30/EU Electromagnetic Compatibility Directive

**Driving actuator types**

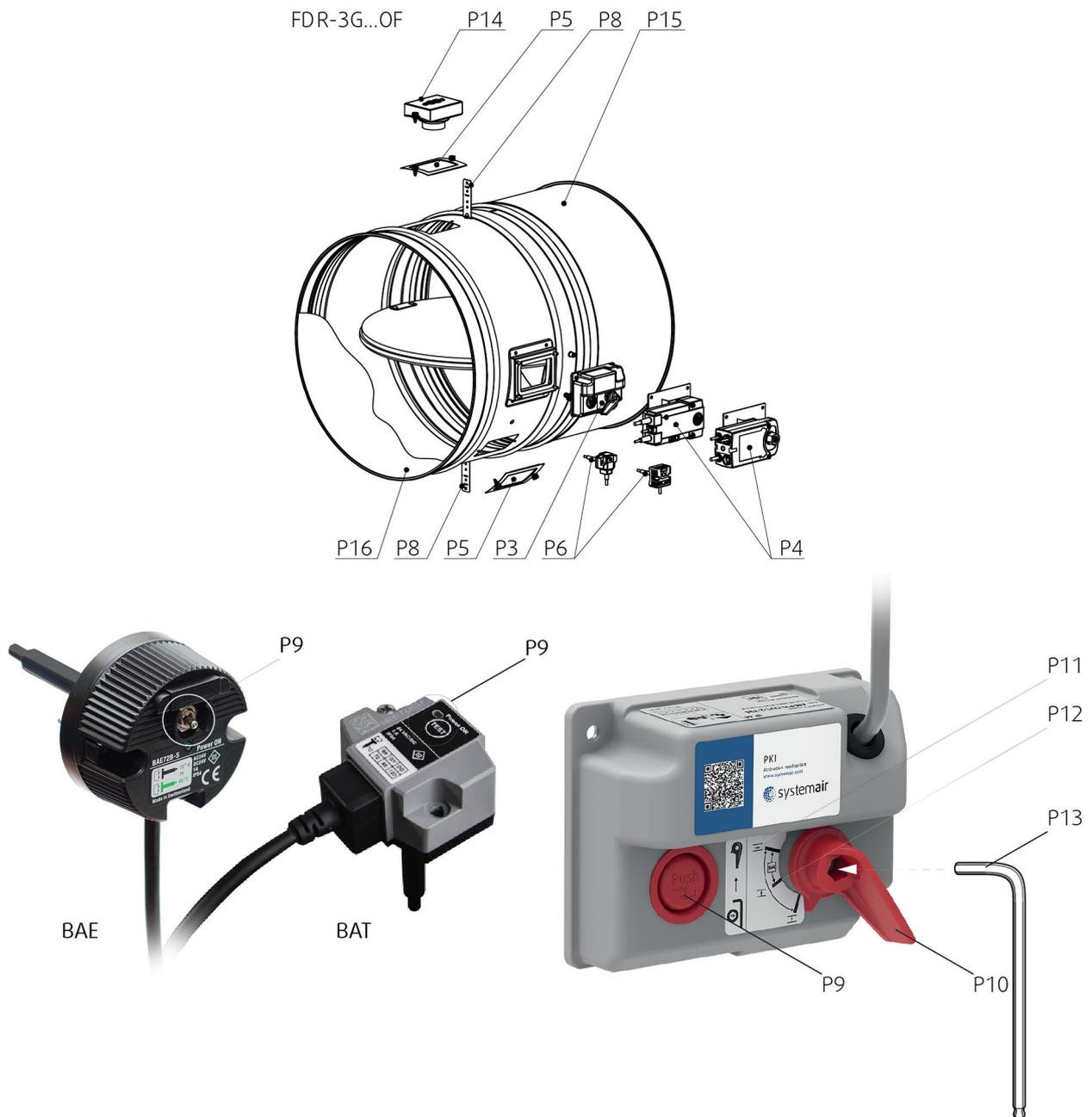
Belimo: BLF230-T, BLF24-T, BF230-T, BF24-T, BFN230-T, BFN24-T, BFN24-T, BFL230-T, BFL24-T (also with connection possibilities with acronyms ST, W)

Gruner: 360TA-230-12-S2, 360TA-024-12-S2, 340TA-230D-03-S2, 340TA-024D-03-S2, 340TA-230-05-S2, 340TA-024-05-S2 (also with connection possibilities with acronyms ST, W)

**Transport and Storage**

Dry indoor conditions with a temperature range of -20 °C to +50 °C

## Product parts



## Legend

- P1** Blade
- P2** Casing
- P3** Manually operated activation mechanism (H0;H...)
- P4** Actuator operated activation mechanism (B...;G...)
- P5** Inspection lid
- P6** Thermoelectric fuse (BAT72;TA-72)
- P7** Supply and communication unit (BKN230-24;FS-UFC24-2)
- P8** Bendable hanger
- P9** Release and test button
- P10** Crank
- P11** Open position
- P12** Closed position

**P13** Hexagon bent wrench No.10 (not part of delivery)

**P14** Smoke detector (Hekatron ORS 142)

**P15** Grid

**P16** Extended ductwork

## Assessed Performance - FDR-3G

19 CE 1396

Systemair Production a.s.

Hlavná 371, 900 43 Kalinkovo, Slovakia

1396-CPR-0162, FDR-3G

(valid for subgroups: ...EX, ...KS, ...OF)

EN 15650 : 2010

Circular fire dampers

Nominal activation conditions/sensitivity - **Pass**

- sensing element load bearing capacity
- sensing element response temperature

Response delay (response time) - **Pass**

- closure time

Operational reliability - **Pass**

- motorized cycle = 10.200 cycles
- manual cycle = 50 cycles
- modulated = 20.200 cycles

Fire resistance:

Resistivity depending on installation method and situation. Subtype FDR-3G...OF tested not connected to duct.

- integrity **E**
- maintenance of the cross section (under E)
- mechanical stability (under E)
- cross section (under E)
- insulation **I**
- smoke leakage **S**

Durability of response delay - **Pass**

- sensing element response temperature and load bearing capacity

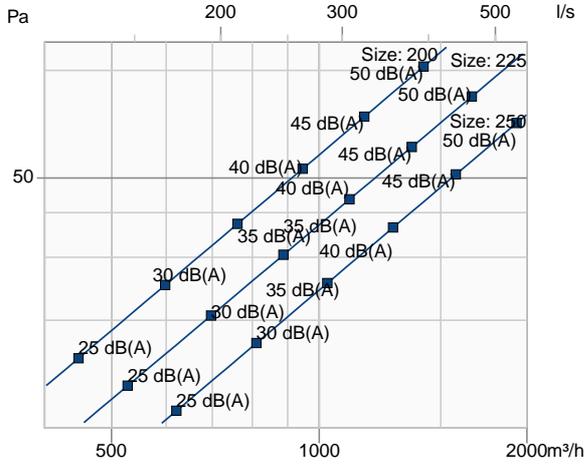
Durability of operational reliability - **Pass**

- open and closing cycle

# Diagrams

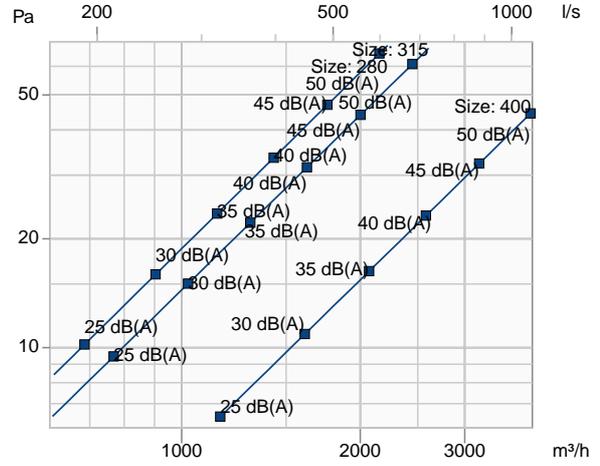
FDR-3G-...-H0-OF

Pressure drop & sound power level (A-weighted)



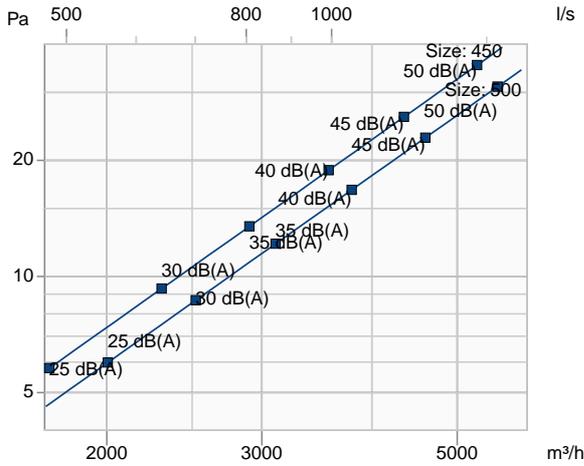
FDR-3G-...-H0-OF

Pressure drop & sound power level (A-weighted)



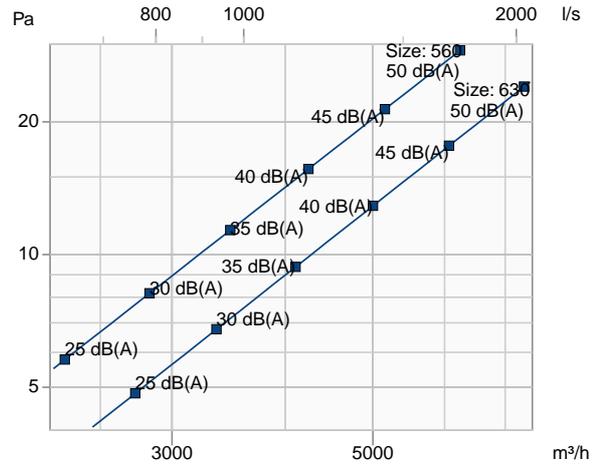
FDR-3G-...-H0-OF

Pressure drop & sound power level (A-weighted)



FDR-3G-...-H0-OF

Pressure drop & sound power level (A-weighted)

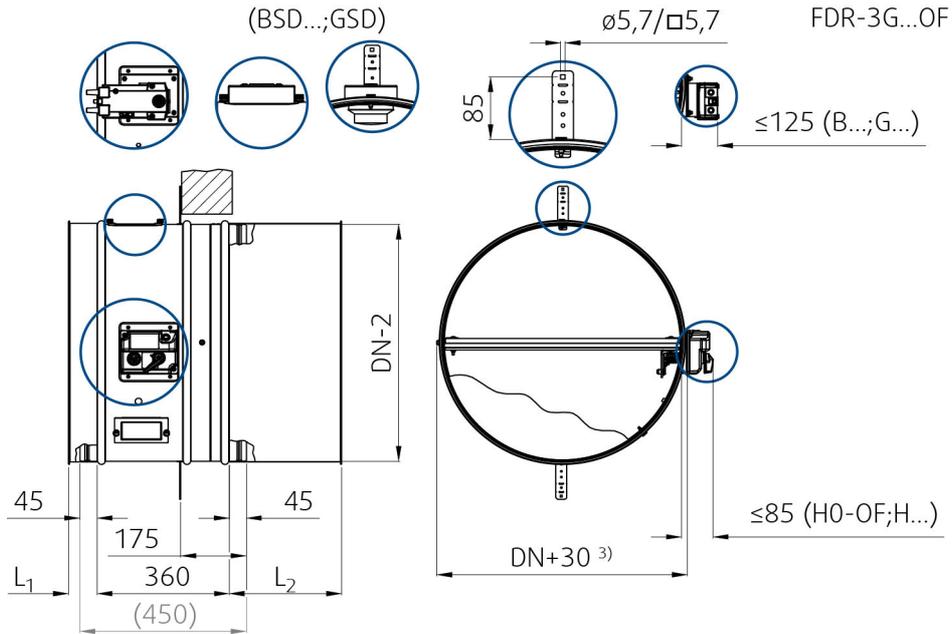


# Dimensions

## Free area

	DN (mm)										
	200	225	250	280	315	355	400	450	500	560	630
$A_v$ (m <sup>2</sup> )	0,0161	0,0217	0,0273	0,0350	0,0455	0,0595	0,0770	0,0966	0,1211	0,1540	0,1981

## Dimensions



Note: 3) Inclusive bearing

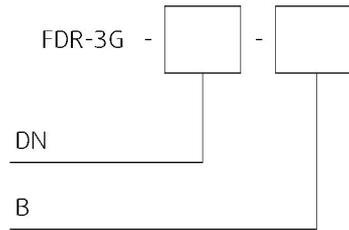
## Overhangs

	DN (mm)										
	200	225	250	280	315	355	400	450	500	560	630
$L_1$ (mm)	50										75
$L_2$ (mm)	50	195					295				

## Weights

m (kg ±5%)	DN (mm)										
	200	225	250	280	315	355	400	450	500	560	630
H0-OF, H2-OF, H5-2-OF, H6-2-OF	5,1	6,3	7,0	7,7	8,6	9,9	12,2	15,5	17,3	20,4	24,0
B230T-OF; G230T-OF, B24T-OF, G24T-OF	6,6	7,8	8,5	9,2	10,1	11,4	13,7	16,3	18,1	21,2	24,8
BSD230T-OF, GSD230T-OF, BSD24T-OF, GSD24T-OF	7,0	8,2	8,9	9,6	10,5	11,8	14,1	16,7	18,5	21,6	25,2

# Ordering Code



## DN - Nominal Dimension, $\varnothing$ DN

from 200 mm up to 630 mm

## B - Type of Activation (H0-OF up to GSD24T-OF)

**H0-OF** (Manual crank, no switches)

**H2-OF** (Manual crank, 2 switches 230V AC or 24V AC/DC)

**H5-2-OF** (Manual crank, 24V AC/DC electromagnet, 2 switches 230V AC or 24V AC/DC)

**H6-2-OF** (Manual crank, 230V AC electromagnet, 2 switches 230V AC or 24V AC/DC)

**B230T-OF** (230V AC Belimo Actuator)

**G230T-OF** (230V AC Gruner Actuator)

**B24T-OF** (24V AC/DC Belimo Actuator)

**G24T-OF** (24V AC/DC Gruner Actuator)

**BSD230T-OF** (230 V AC Supply unit & Smoke detector 24 V AC/DC & 24 V AC/DC Belimo Actuator)

**GSD230T-OF** (230 V AC Supply unit & Smoke detector 24 V AC/DC & 24 V AC/DC Gruner Actuator)

**BSD24T-OF** (Smoke detector 24 V AC/DC & 24 V AC/DC Belimo Actuator)

**GSD24T-OF** (Smoke detector 24 V AC/DC & 24 V AC/DC Gruner Actuator)

## Example of the Circular Overflow Fire Dampers Ordering Code

**FDR-3G-630-H2-OF**

Circular overflow fire damper, nominal diameter 630 mm, manually operated activation mechanism with open and closed position indication with switches AC 230 V or AC/DC 24 V.

Note: The fire resistivity depends on the installation method.



Inspection opening positions (Removable mechanism is available for all sizes):

$\varnothing 200 \leq \text{DN} \leq \varnothing 225$

Standardly in position: L; Additional inspection opening cannot be added.

$\varnothing 250 \leq DN \leq \varnothing 630$

Standardly in position: B; On demand in position: L, T.

# Installation Methods

 1 Wet	FDR-3G...OF DN200 ... DN630	EI 60 ( $v_e$ i ↔ o) S	a) 	b) 	 360°
		EI 90 ( $v_e$ i ↔ o) S			
		EI 120 ( $v_e$ i ↔ o) S			
 2 Dry	FDR-3G...OF DN200 ... DN630	EI 60 ( $v_e$ i ↔ o) S	a) 	b) 	 360°
		EI 90 ( $v_e$ i ↔ o) S			
 3 Soft	FDR-3G...OF DN200 ... DN630	EI 60 ( $v_e$ i ↔ o) S	a) 	b) 	 360°
		EI 90 ( $v_e$ i ↔ o) S			
 3H Hilti	FDR-3G...OF DN200 ... DN630	EI 60 ( $v_e$ - i ↔ o) S	a) 	b) 	 360°
		EI 90 ( $v_e$ - i ↔ o) S			

## Note:

Installations of subtype **FDR-3G...OF** were tested without connected duct, with natural convection.

## Legend:

- 1. Wet** - Wet Installation, Using Plaster/Mortar/Concrete Filling
- 2. Dry** - Dry Installation, using cover boards and mineral wool filing
- 3. Soft** - Soft Installation, using mineral wool filing
- 3H. Hilti** - Filling made only from Hilti foam
- a)** - Flexible (plasterboard) wall
- b)** - Concrete/masonry/cellular concrete (rigid) wall
- $v_e$**  - Vertical wall

## Installation, Maintenance & Operation

Some damper parts may have sharp edges – therefore to protect yourself from harm, please use gloves during damper installation and manipulation. In order to prevent electric shock, fire or any other damage which could result from incorrect damper usage and operation, it is important to:

1. ensure that installation is performed by a trained person.
2. follow the written and depicted instructions provided within Handbook closely.
3. perform damper inspection in accordance with Handbook.

4. check the damper's functionality as per the chapter "Fire Damper Functionality Check" before you install the fire damper. This procedure prevents the installation of a damper that has been damaged during transportation or handling.

#### Installation rules

- The damper must not support any part of the surrounding construction or wall which could cause damage and consequent damper failure.
- The damper driving mechanism can be placed on either side of the wall, however it needs to be placed so as to ensure easy access during inspection. When the damper is fitted with smoke sensor, the damper must be rotated so that the sensor is on highest position.
- According to the standard EN 1366-2, the distance between the fire damper bodies must be at least 200 mm. This condition does not apply for tested distances. Therefore Wet and Soft installations are approved for smaller distances under condition that the resulted resistivity is reduced to EI90S.
- The distance between the wall/ceiling and the fire damper must be at least 75 mm. This condition does not apply for tested distances. Therefore Wet and Soft installations are approved for smaller distances under condition that the resulted resistivity is reduced to EI90S.
- The fire damper must be installed into a fire partition structure in such a way that the damper blade in its closed position is located inside this structure. A bendable hinge is provided on the damper body which represents a plane where supporting construction begins.
- For each resistivity the minimum thickness of a its supporting construction cannot be decreased as per EN 1366-2 at least 200 mm from the installation opening.
- The gap in the installation opening between the fire damper and the wall/ceiling can be increased by up to 50% of the gap area, or decreased to the smallest amount possible that still provides sufficient space for the installation of the filling.

IN ACCORDANCE WITH EN 15650, EACH FIRE DAMPER MUST BE INSTALLED ACCORDING TO THE INSTALLATION INSTRUCTIONS PROVIDED BY THE MANUFACTURER!

## Installation 1 - Wet

### Using Plaster/Mortar/Concrete Filling

1. The supporting construction opening must be prepared as depicted. Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls. The opening dimensions are driven by the nominal dimensions of the damper with added clearance. For circular dampers prepare the opening of diameter D1 or width by height of D2.
2. Insert the closed damper into the middle of the opening so that the damper blade is in the wall. Use the bendable hanger (2; or hangers) to secure the damper against the wall using a suitable screw (F1; recommended screw diameter 5,5; e.g. DIN7981).
3. Fill in the area between the wall and the damper with plaster or mortar or concrete filling (2), while paying attention to prevent the fouling of the damper's functional parts, which could limit its correct functionality. The best way is to cover the functional parts during installation. The seepage of the filling material can be prevented by using boards. However, these are not required for wet installation.

First let the plaster or mortar or concrete filling harden and then perform the next steps!

4. If needed, uncover and clean the damper after installation.
5. Check the damper's functionality

### Installation - Standard Distances

According to the standard EN 1366-2, the minimum distance from the wall or ceiling to the damper body is 75 mm. For multiple crossings through a fire resistive wall the minimum distance between two damper bodies is 200 mm. This applies for distances between the damper and a nearby foreign object crossing the fire resistive wall.

### Installation - Smaller Distances - Maximum resistivity reduced to EI90S

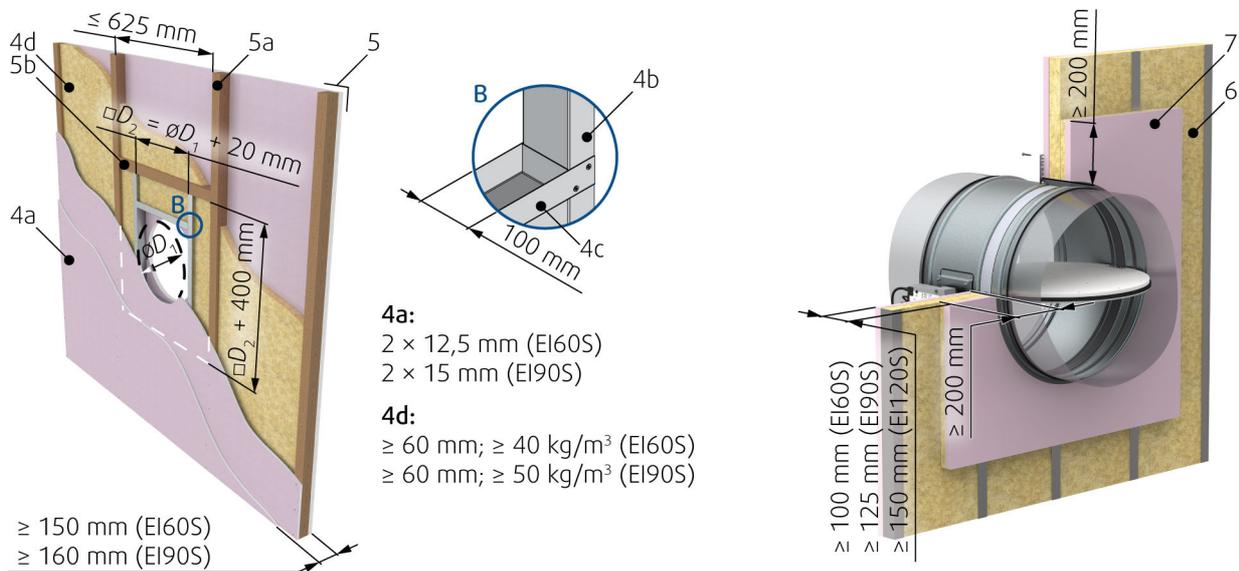
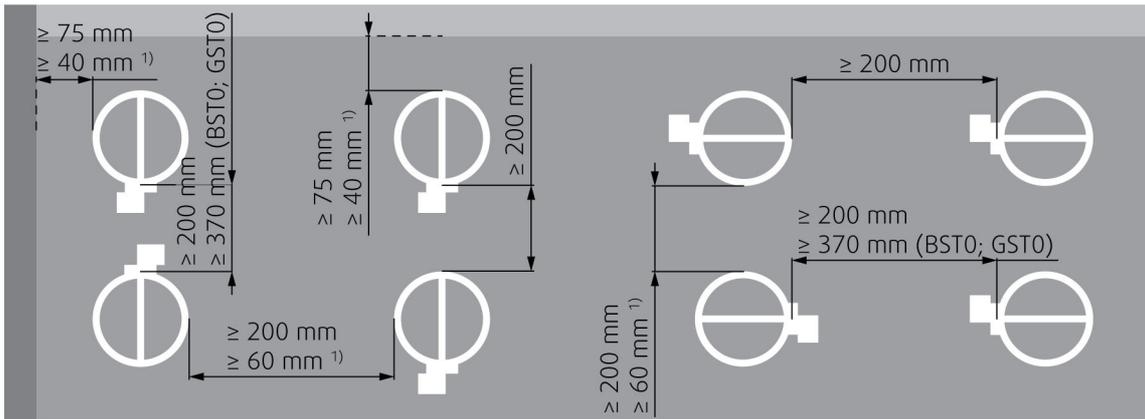
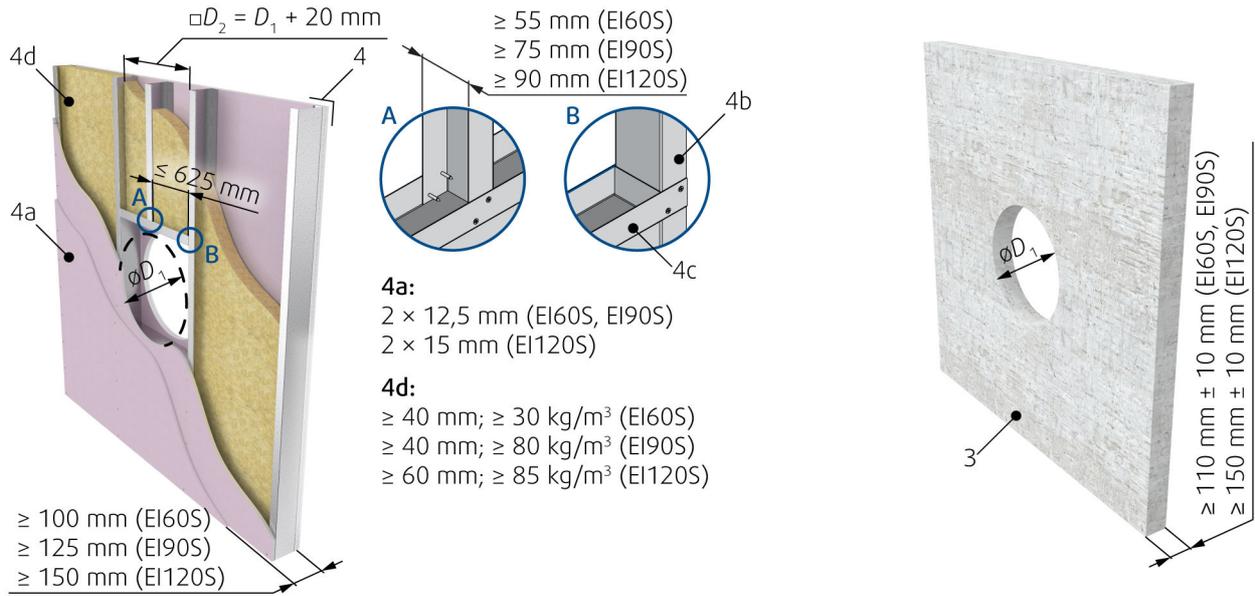
The distance between 2 individual fire dampers can be reduced to 60 mm, measured from surface to surface of the housing and the distance between the surface of the damper installed in the duct and the adjacent supporting construction (wall/floor) can be reduced to 40 mm, provided that the fire resistance classification will be reduced as follows: EI90 (v<sub>e</sub> i ↔ o) S.

### Installation in a Wall thinner than tested

Installation in a thinner wall is allowed under the condition that an additional layer/layers of fire protective board are fixed to the surface of the wall in order to achieve the same length of damper penetration seal as was tested. The minimum width of added boards around the damper is 200 mm. In addition, the alternative thinner wall should be classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application. For a protruding wall, the additional layers must be fixed on the steel supporting construction of the wall.

 1 Wet	FDR-3G...OF DN200 ... DN630	EI 60 (v <sub>e</sub> i ↔ o) S			 360°
		EI 90 (v <sub>e</sub> i ↔ o) S			
		EI 120 (v <sub>e</sub> i ↔ o) S			





### Legend

**F1** Screw  $\geq 5,5$  DIN7981 or suitable wall plug and screw size 6.

**F2** Plaster/mortar/concrete filling

**1** Fire damper (actuator side)

**2** Bendable hanger

**3** Concrete/masonry/cellular concrete wall or ceiling

**4** Flexible (plasterboard) wall

**4a** 2 layers of plasterboard fireproof plate type F, EN 520

**4b** Vertical CW – profiles

**4c** Horizontal CW – profiles

**4d** Mineral wool; thickness/cubic density see picture.

**5** Flexible (wood beam) wall

**5a** Vertical spruce wooden beam  $\geq 60 \times 100$  mm

**5b** Horizontal spruce wooden beam  $\geq 80 \times 100$  mm

**6**

Alternative thinner wall (classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application)

**7**

Area of 200 mm from opening around the damper must have the same composition and be created the same way as Flexible (plasterboard) wall.

### Notes:

**ve** Vertical (wall)

**ho** Horizontal (floor/ceiling)

**1)** Smaller distances – resistivity must be reduced to EI90 ( ve i<->o ) S

## Installation 2 - Dry

### Using Mineral Wool and Cover Boards

1. The supporting construction opening must be prepared as depicted. Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls. The opening dimensions are driven by the nominal dimensions of the damper with added clearance. For circular dampers prepare the opening of diameter D1.
2. With these dampers it is necessary to install the bendable hangers (2) onto the cover boards using suitable screws or screws with wall plug (F1). Therefore, it is necessary to begin by installing the bottom part/parts of the CBR-FD or CBS-FD cover boards. Insert the damper from the mechanism side and secure the bendable hangers of the damper into the cover plate using suitable screws (F1). Subsequently mount the remaining cover boards from the mechanism side.
3. Fill in the area between the wall and the damper with mineral wool (F3) with a density of at least 50 kg/m<sup>3</sup> thoroughly but in such a way that will not deform the damper housing, while paying attention to prevent the fouling of the damper's functional parts, which could limit its correct functionality.
4. Close the gap between the damper and the mounting opening, for a circular damper use CBR-FD cover boards, for a rectangular damper use CBS-FD cover boards with screws (F1) through pre-drilled holes.
5. All the gaps between the cover boards, between cover boards and the wall and between cover boards and the fire damper need to be filled with fire resistive coating (F4).
6. If needed, uncover and clean the damper after installation.
7. Check the damper's functionality

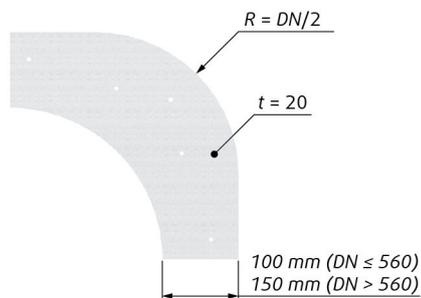
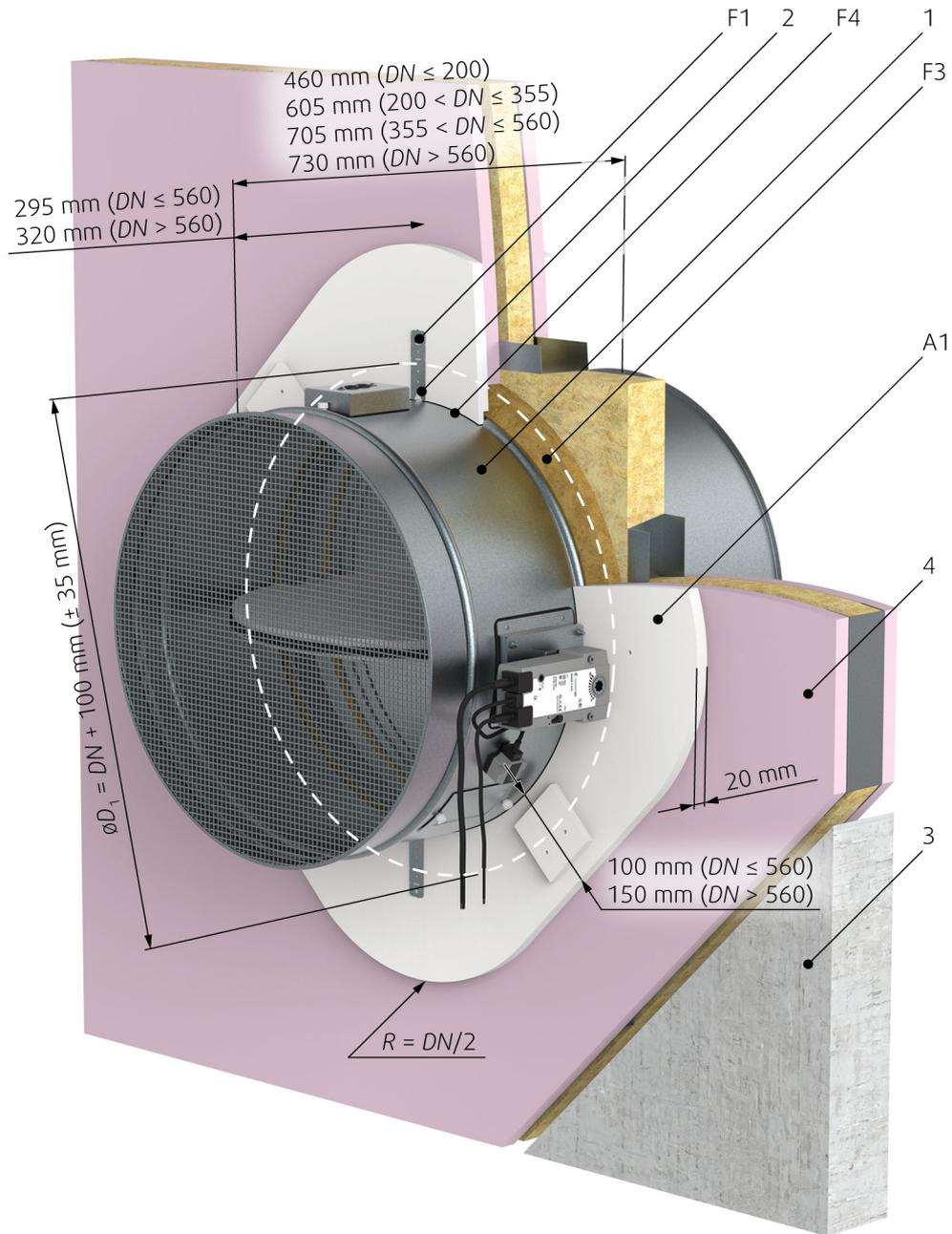
### Installation - Standard Distances

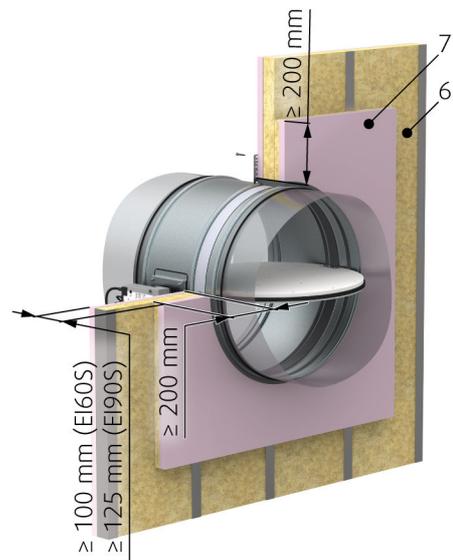
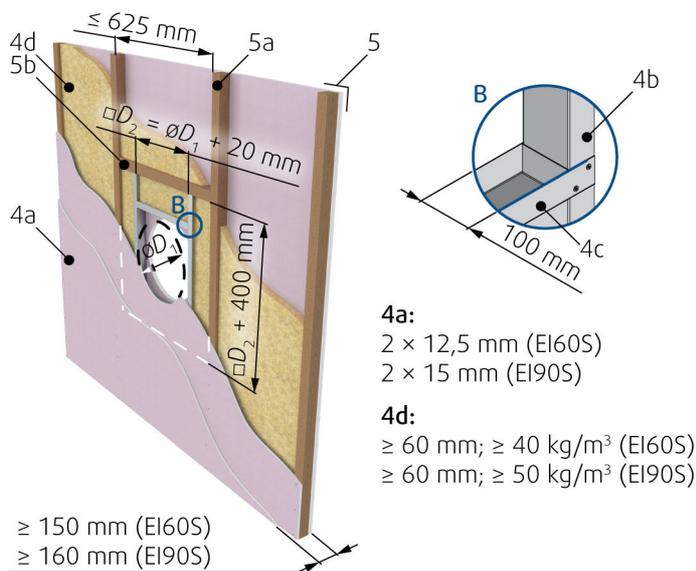
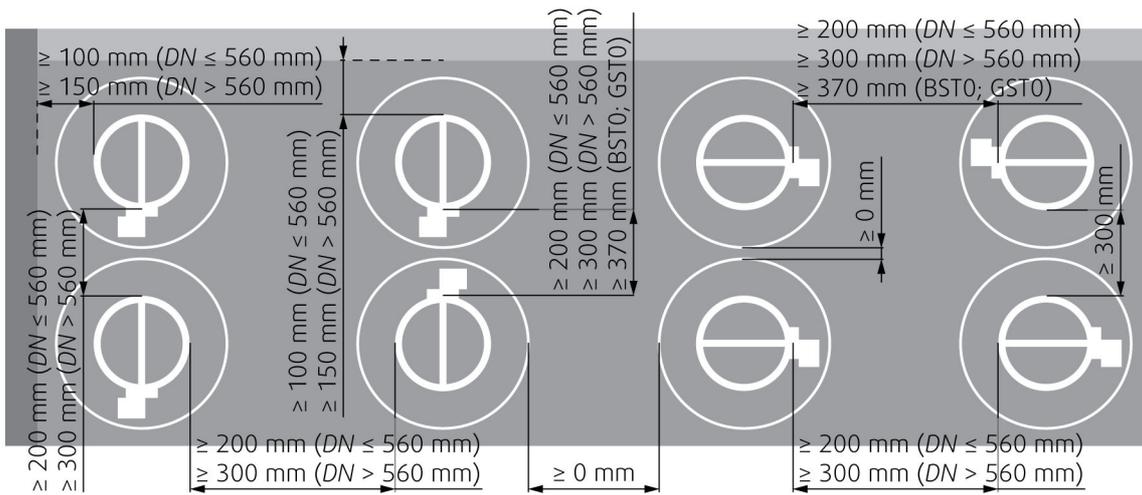
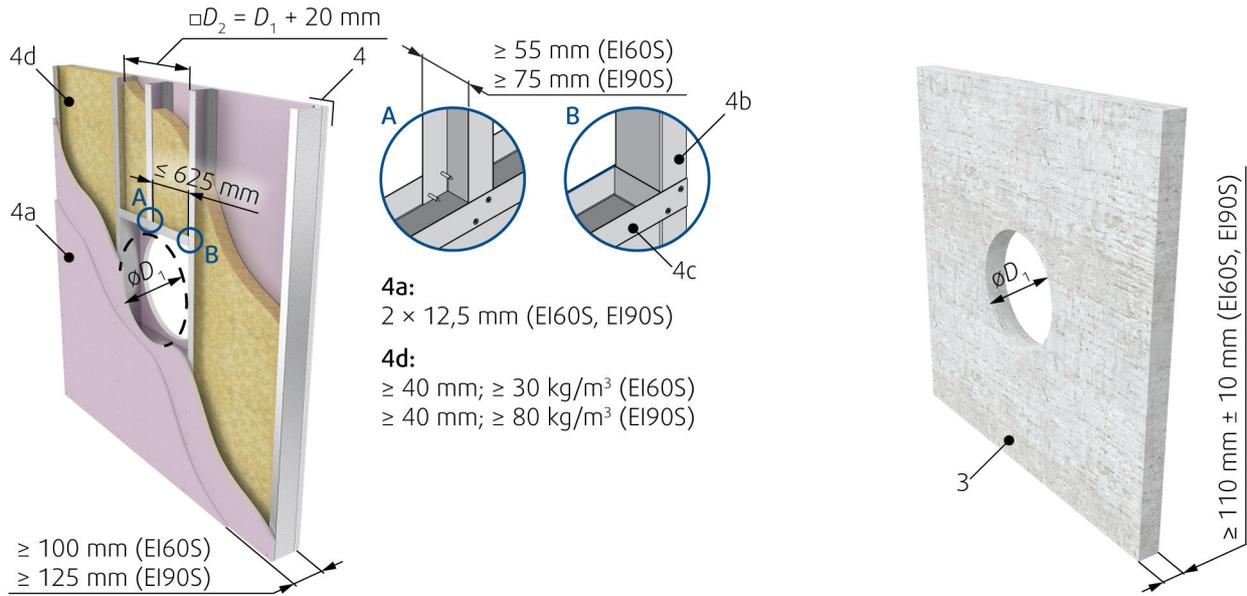
For Dry installation, the minimum distance from the wall or ceiling to the damper body is 100 mm and for DN>560 the distance is 150 mm. For multiple crossings through a fire resistive wall the minimum distance between two damper bodies is 200 mm and for DN>560 the minimum distance is 300 mm. This applies for distances between the damper and a nearby foreign object crossing the fire resistive wall.

### Installation in a Wall thinner than tested

Installation in a thinner wall is allowed under the condition that an additional layer/layers of fire protective board are fixed to the surface of the wall in order to achieve the same length of damper penetration seal as was tested. The minimum width of added boards around the damper is 200 mm. In addition, the alternative thinner wall should be classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application. For a protruding wall, the additional layers must be fixed on the steel supporting construction of the wall.

 2 Dry	FDR-3G...OF	EI 60 (v <sub>e</sub> i ↔ o) S	a) 	b) 	 360°
	DN200 ... DN630	EI 90 (v <sub>e</sub> i ↔ o) S			





### Legend

**F1** Screw  $\geq 5,5$  DIN7981 or suitable wall plug and screw size 6.

**F3** Mineral wool filling (min. 50 kg/m<sup>3</sup>)

**F4** Fire resistive coating, e.g. Promastop-CC/Promat

**A1** Cover board CBR-FD (accessory) obligatory

**1** Fire damper (actuator side)

**2** Bendable hanger

**3** Concrete/masonry/cellular concrete wall or ceiling

**4** Flexible (plasterboard) wall

**4a** 2 layers of plasterboard fireproof plate type F, EN 520

**4b** Vertical CW – profiles

**4c** Horizontal CW – profiles

**4d** Mineral wool; thickness/cubic density see picture.

**5** Flexible (wood beam) wall

**5a** Vertical spruce wooden beam  $\geq 60 \times 100$  mm

**5b** Horizontal spruce wooden beam  $\geq 80 \times 100$  mm

**6**

Alternative thinner wall (classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application)

**7**

Area of 200 mm from opening around the damper must have the same composition and be created the same way as Flexible (plasterboard) wall.

### Notes:

**ve** Vertical (wall)

**ho** Horizontal (floor/ceiling)

### Installation 3 - Soft

#### Installation into a Soft Crossing with fire-resistive coating

1. The supporting construction opening must be prepared as depicted. Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls. The opening dimensions are driven by the nominal dimensions of the damper with added clearance. For circular dampers prepare the opening of diameter D1 or width by height of D2.
2. Prepare mineral wool installation segments (F5) with thickness of the opening height. First apply a suitable fire resistive coating (F6) onto the damper at the place of its future placement, assemble and glue the filling of the future installation with the same fire resistive coating. After the fire resistive coating has dried the damper along with the filling are ready for installation.
3. Apply the same fire resistive coating (F6) onto the internal surface of the wall opening. Also apply the fire resistive coating on the external surface of the filling glued on the damper surface. Immediately after the fire resistive coating is applied, place the damper into the wall opening. The damper blade must be located in the supporting structure.
4. After inserting the damper into the opening and fixing it using the bendable hangers and suitable screws (F1), apply the same fire resistive coating (F6), at least 2 mm thick and 100 mm wide, on the exposed filling and wall edges evenly from both sides. Do not apply this layer in the place where the mechanism is located, inspection openings and manufacturer labels.
5. If needed, uncover and clean the damper after installation.
6. Check the damper's functionality

#### Installation - Standard Distances

According to the standard EN 1366-2, the minimum distance from the wall or ceiling to the damper body is 75 mm. For multiple crossings through a fire resistive wall the minimum distance between two damper bodies is 200 mm. This applies for distances between the damper and a nearby foreign object crossing the fire resistive wall.

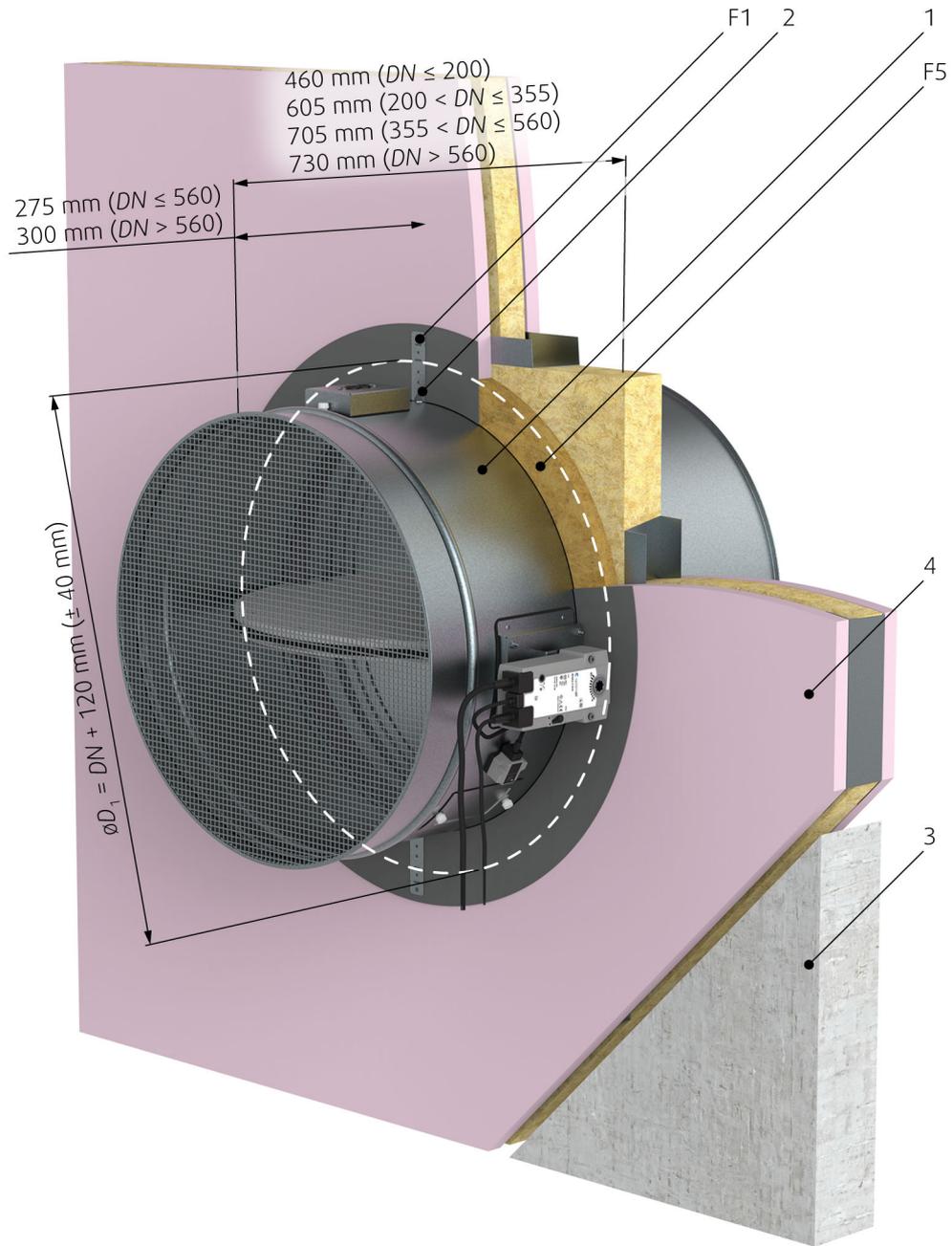
#### Installation - Smaller Distances

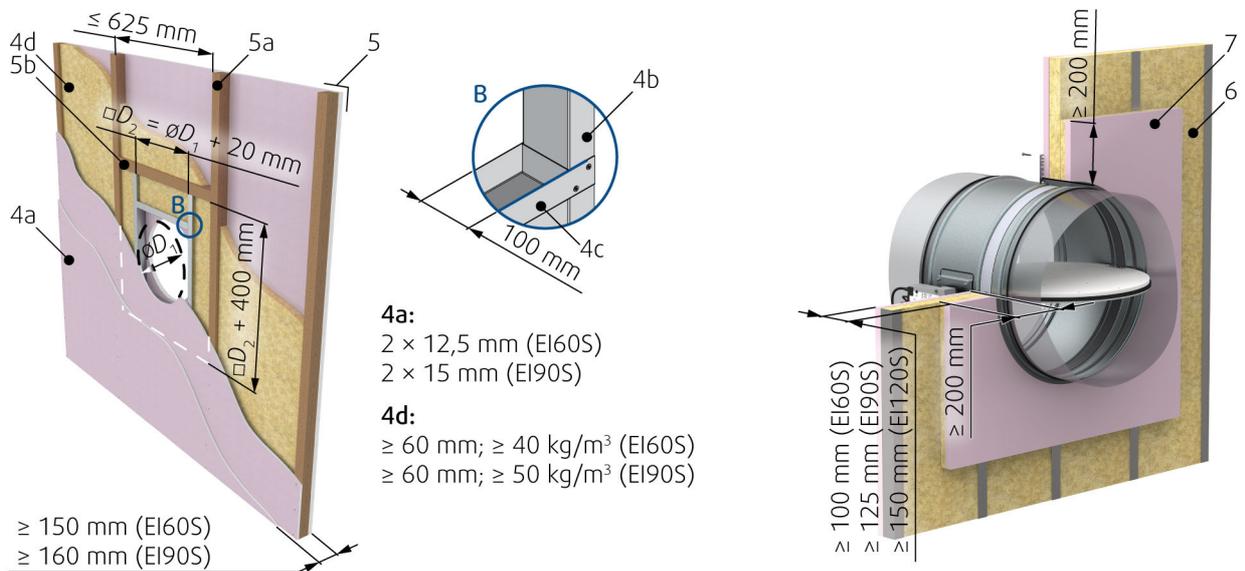
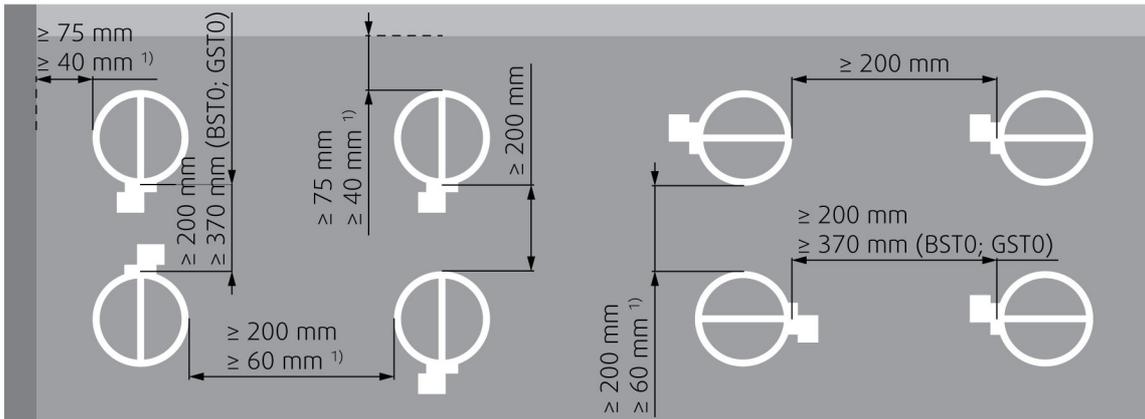
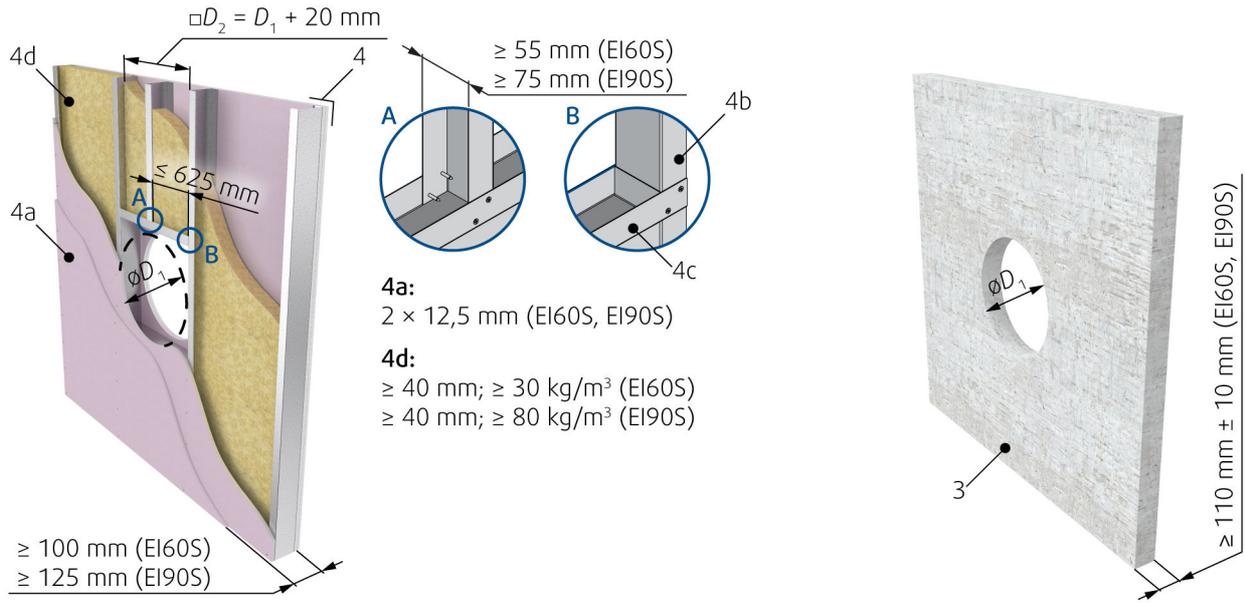
The distance between 2 individual fire dampers can be reduced to 60 mm, measured from surface to surface of the housing and the distance between the surface of the damper installed in the duct and the adjacent supporting construction (wall/floor) can be reduced to 40 mm.

#### Installation in a Wall thinner than tested

Installation in a thinner wall is allowed under the condition that an additional layer/layers of fire protective board are fixed to the surface of the wall in order to achieve the same length of damper penetration seal as was tested. The minimum width of added boards around the damper is 200 mm. In addition, the alternative thinner wall should be classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application. For a protruding wall, the additional layers must be fixed on the steel supporting construction of the wall.

 3 Soft	FDR-3G...OF DN200 ... DN630	EI 60 ( $v_e$ i ↔ o) S	a) 	b) 	 360°
		EI 90 ( $v_e$ i ↔ o) S			





## Legend

**F1** Screw  $\geq 5,5$  DIN7981 or suitable wall plug and screw size 6.

**F5** Mineral wool segment (minimum 150 kg/m<sup>3</sup>).

**F6** Layer of fire resistive coating (Promastop-CC/Promat) at least 2 mm thick for exposed surfaces.

**1** Fire damper (actuator side)

**2** Bendable hanger

**3** Concrete/masonry/cellular concrete wall or ceiling

**4** Flexible (plasterboard) wall

**4a** 2 layers of plasterboard fireproof plate type F, EN 520

**4b** Vertical CW – profiles

**4c** Horizontal CW – profiles

**4d** Mineral wool; thickness/cubic density see picture.

**5** Flexible (wood beam) wall

**5a** Vertical spruce wooden beam  $\geq 60 \times 100$  mm

**5b** Horizontal spruce wooden beam  $\geq 80 \times 100$  mm

**6**

Alternative thinner wall (classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application)

**7**

Area of 200 mm from opening around the damper must have the same composition and be created the same way as Flexible (plasterboard) wall.

## Notes:

**ve** Vertical (wall)

**ho** Horizontal (floor/ceiling)

## Installation 3H - Hilti

### Filling made only from Hilti foam

Tip: Excess material can be reused as the filling for this installation. It can be inserted into the cavity before you add new foam from the gun.

1. The supporting construction opening must be prepared as depicted. Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls. The opening dimensions are driven by the nominal dimensions of the damper with added clearance. For circular dampers prepare the opening of diameter D1.
2. Insert the damper into the opening concentric and fixing it with the opening using the bendable hangers and suitable screws (F1).
3. Wear protective gloves when handling foam. Insert the barrel of the foam gun into the middle of the cavity between damper and opening and fill it completely with foam (F17) pushed out foam can be quickly hand pushed back into the cavity.
4. After the filling (F17) is solidified, though it will always remain partly flexible, you can cut the excess foam that stands out from the wall.
5. If needed, uncover and clean the damper after installation.
6. Check the damper's functionality

### Installation - Standard Distances

According to the standard EN 1366-2, the minimum distance from the wall or ceiling to the damper body is 75 mm. For multiple crossings through a fire resistive wall the minimum distance between two damper bodies is 200 mm. This applies for distances between the damper and a nearby foreign object crossing the fire resistive wall.

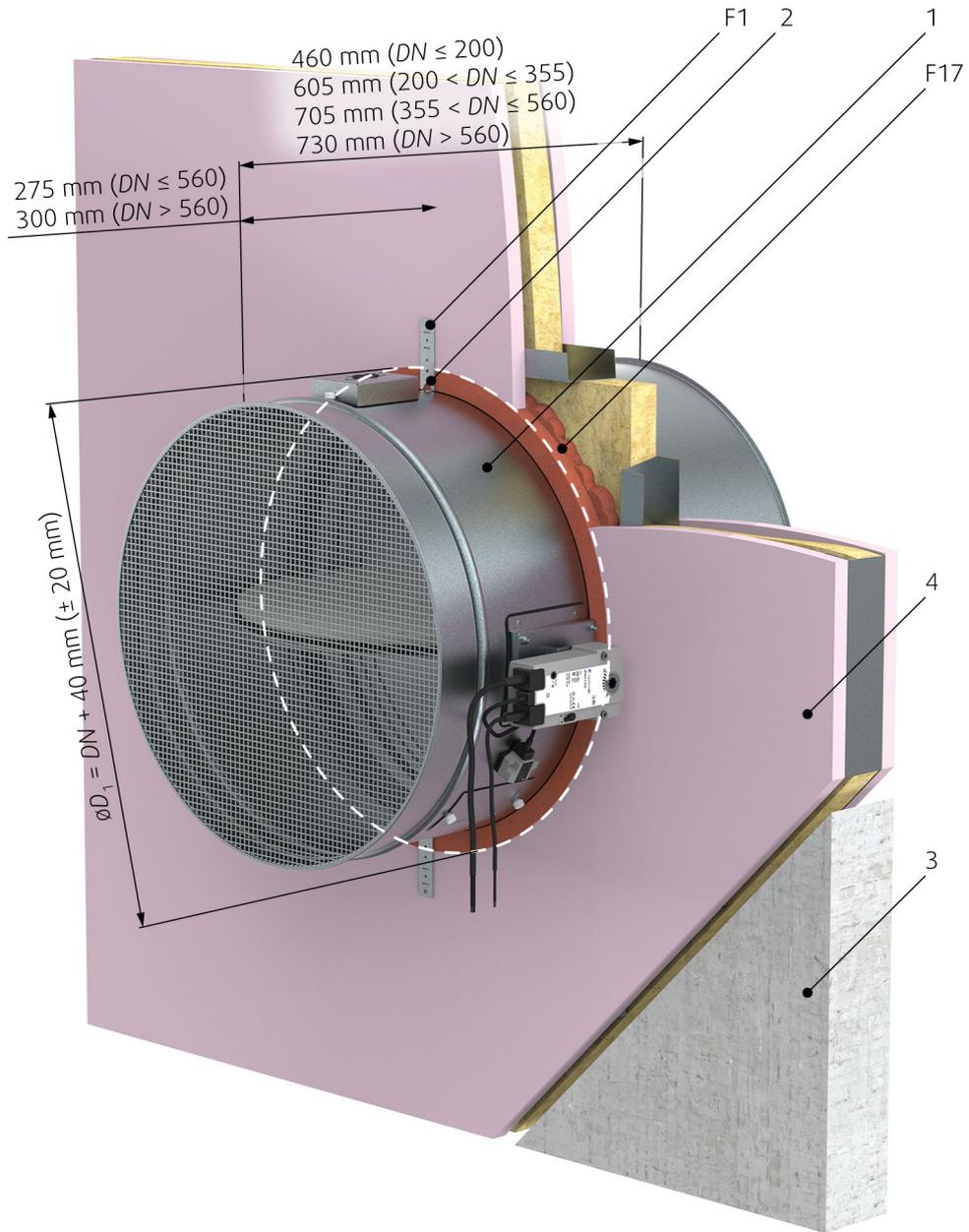
### Installation - Smaller Distances

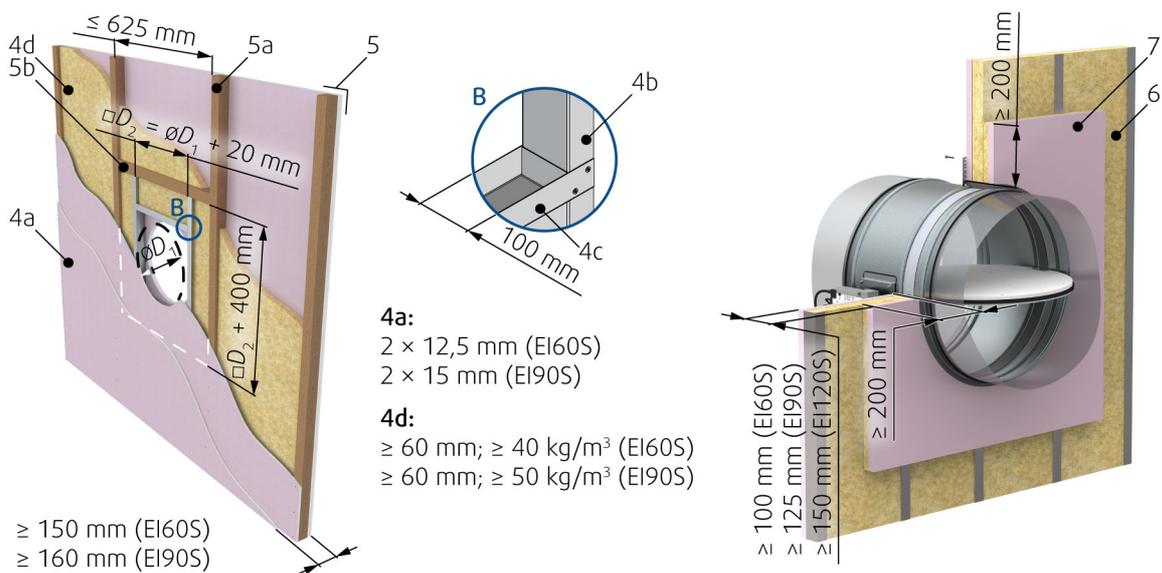
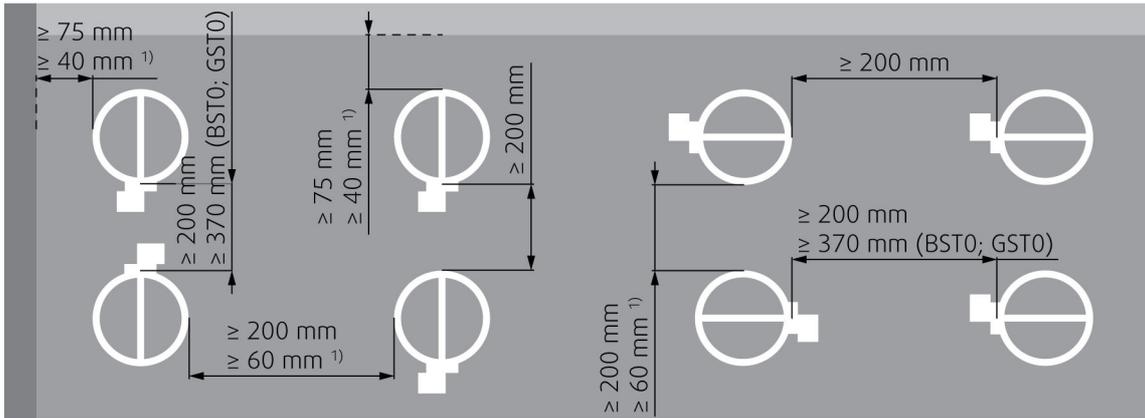
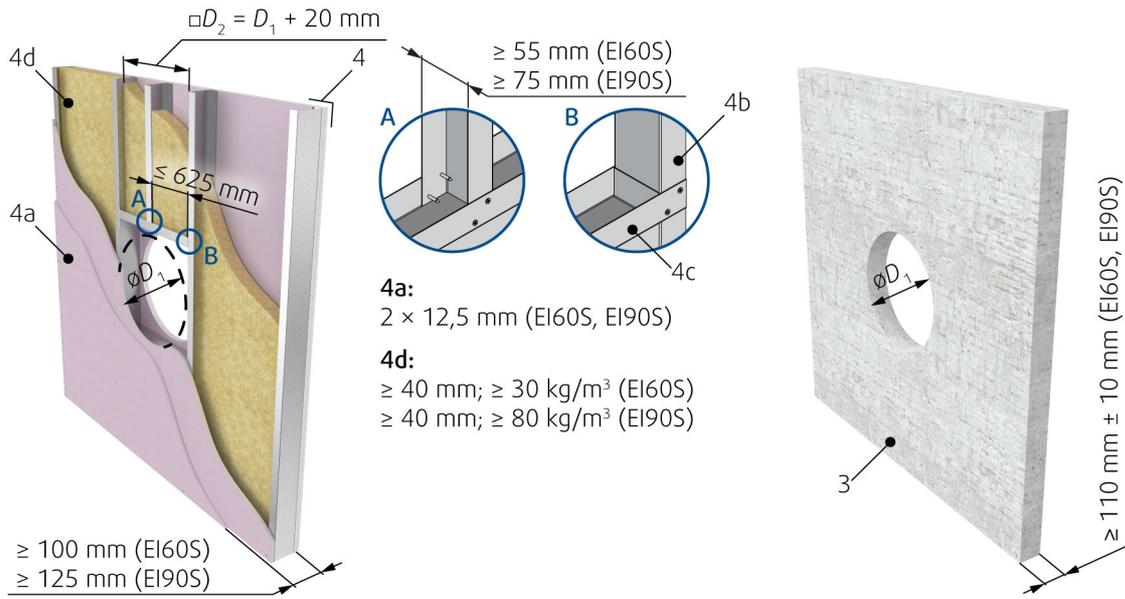
The distance between 2 individual fire dampers can be reduced to 60 mm, measured from surface to surface of the housing and the distance between the surface of the damper installed in the duct and the adjacent supporting construction (wall/floor) can be reduced to 40 mm.

### Installation in a Wall thinner than tested

Installation in a thinner wall is allowed under the condition that an additional layer/layers of fire protective board are fixed to the surface of the wall in order to achieve the same length of damper penetration seal as was tested. The minimum width of added boards around the damper is 200 mm. In addition, the alternative thinner wall should be classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application. For a protruding wall, the additional layers must be fixed on the steel supporting construction of the wall.

 3H Hilti	FDR-3G...OF	EI 60 ( $v_e - i \leftrightarrow o$ ) S	a) 	b) 	 360°
	DN200 ... DN630	EI 90 ( $v_e - i \leftrightarrow o$ ) S			





### Legend

**F1** Screw  $\geq 5,5$  e.g. DIN7981 or suitable wall plug and screw size 6.

**F17** Foam CFS-F FX/HILTI.

**1** Fire damper (actuator side)

**2** Bendable hanger

**3** Concrete/masonry/cellular concrete wall or ceiling

**4** Flexible (plasterboard) wall

**4a** 2 layers of plasterboard fireproof plate type F, EN 520

**4b** Vertical CW – profiles

**4c** Horizontal CW – profiles

**4d** Mineral wool; thickness/cubic density see picture.

**5** Flexible (wood beam) wall

**5a** Vertical spruce wooden beam  $\geq 60 \times 100$  mm

**5b** Horizontal spruce wooden beam  $\geq 80 \times 100$  mm

**6**

Alternative thinner wall (classified in accordance with EN 13501-2:2007 + A1: 2009 for fire resistance required for product application)

**7**

Area of 200 mm from opening around the damper must have the same composition and be created the same way as Flexible (plasterboard) wall.

### Notes:

**ve** Vertical (wall)

**1)** Smaller distances – maximum resistivity EI90 ( ve i<->o ) S

# Electrical connections

	DN (mm)										
	200	225	250	280	315	355	400	450	500	560	630
T/PC/A	B230T-OF/6,5 VA/BFL230-T B24T-OF/4 VA/BFL24-T B24T-W-OF/4 VA/BFL24-T-ST BSD230T-OF/11 VA/BFL24-T-ST + BKN230-24-C-MP + ORS144K BSD24T-OF/11 VA/BFL24-T + ORS144K					B230T-OF/10 VA/BN230-T B24T-OF/6 VA/BN24-T B24T-W-OF/6 VA/BN24-T-ST BSD230T-OF/11 VA/BN24-T-ST + BKN230-24-C-MP + ORS144K BSD24T-OF/11 VA/BN24-T + ORS144K					

	DN (mm)										
	200	225	250	280	315	355	400	450	500	560	630
T/PC/A	G230T-OF/9,5 VA/340TA-230-05... G24T-OF/9 VA/340TA-024-05... G24T-W-OF/9 VA/340TA-024-05...ST01 GSD230T-OF/11 VA/340TA-024-05...ST01 + BKN230-24-C-MP + ORS144K GSD24T-OF/11 VA/340TA-024-05... + ORS144K					G230T-OF/11,5 VA/360TA-230-12... G24T-OF/7 VA/360TA-024-12... G24T-W-OF/7 VA/360TA-024-12...ST01 GSD230T-OF/11 VA/360TA-024-12...ST01 + BKN230-24-C-MP + ORS144K GSD24T-OF/11 VA/360TA-024-12... + ORS144K					

**T/PC/A** - Activation Type / Power Consumption / Actuator

## Type of activation H0-OF

This type of activation mechanism does not have any electrical equipment.

## Type of activation H2-OF

IMPORTANT: Risk of electric shock!

Switch off the power supply before working on any electrical equipment.

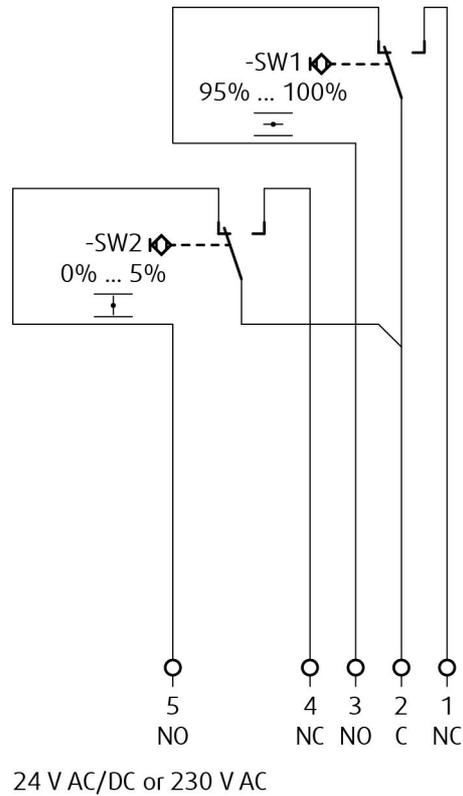
Allow only qualified electricians to work on the electrical system.

Microswitch: Power Supply: AC 125/250 V or DC 12/24 V

Electric Parameters: 3A

NOTES:

- Supply via safety isolation transformer!



### Legend

- 1 Grey cable colour
- 2 Orange cable colour
- 3 Pink cable colour
- 4 White cable colour
- 5 Red cable colour
- 6 Brown cable colour (Do not use for type of activation H2)
- X:7 Blue cable colour (Do not use for type of activation H2)

## Type of activation H5-2-0F

IMPORTANT: Risk of electric shock!

Switch off the power supply before working on any electrical equipment.

Allow only qualified electricians to work on the electrical system.

Microswitch:

Power Supply: AC 125/250 V or DC 12/24 V

Electric Parameters: 3A

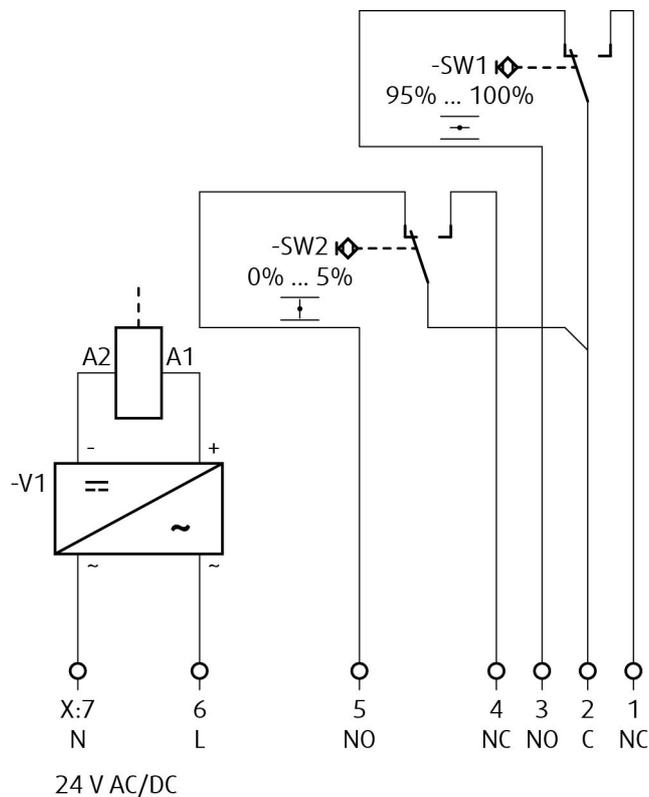
Impulse Electromagnet:

Power Supply: AC (50/60 Hz)/DC 24 V

Electric Parameters: 50 VA, load factor 10% (maximum 30 seconds in operation)

NOTES:

- 50 VA = Nominal activation power, maximum permissible magnet load = 300 VA
- Supply via safety isolation transformer.
- Power consumption must be monitored!



### Legend

- 1 Grey cable colour
- 2 Orange cable colour
- 3 Pink cable colour
- 4 White cable colour
- 5 Red cable colour
- 6 Brown cable colour
- X:7 Blue cable colour

## Type of activation H6-2-0F

IMPORTANT: Risk of electric shock!

Switch off the power supply before working on any electrical equipment.

Allow only qualified electricians to work on the electrical system.

Microswitch:

Power Supply: AC 125/250 V or DC 12/24 V

Electric Parameters: 3A

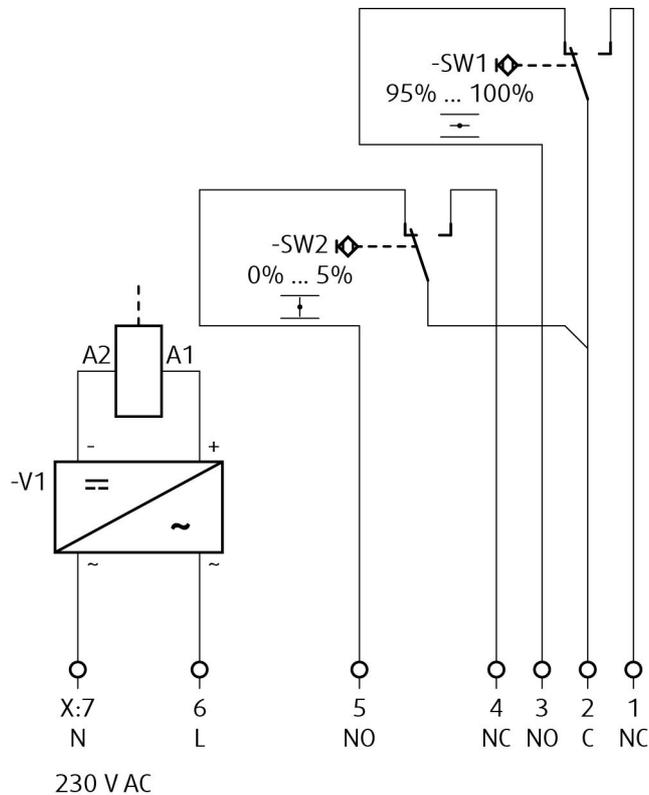
Impulse Electromagnet:

Power Supply: AC 230 V, 50/60 Hz

Electric Parameters: 50 VA, load factor 10% (maximum 30 seconds in operation)

NOTES:

- 50 VA = Nominal activation power, maximum permissible magnet load = 300 VA
- Caution! Main power supply voltage!
- A device that disconnects the pole conductors (minimum contact gap 3 mm) is required for isolation from the power supply.
- Power consumption must be monitored!



### Legend

- 1 Grey cable colour
- 2 Orange cable colour
- 3 Pink cable colour
- 4 White cable colour
- 5 Red cable colour
- 6 Brown cable colour
- X:7 Blue cable colour

### Type of activation B230T-OF

IMPORTANT: Risk of electric shock!

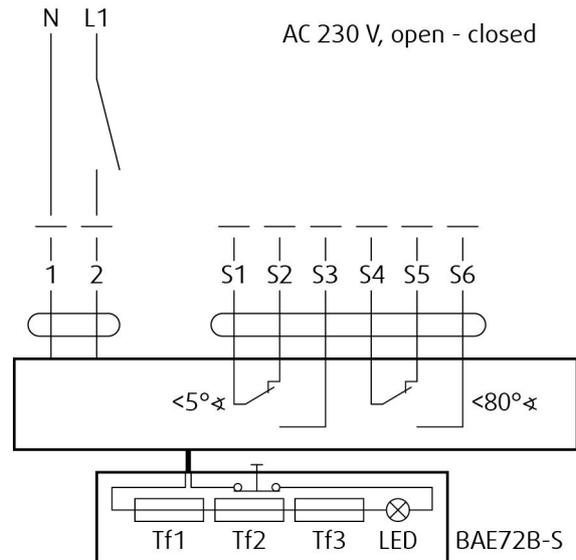
Switch off the power supply before working on any electrical equipment.

Allow only qualified electricians to work on the electrical system.

Actuator power supply: AC 230 V, 50/60 Hz

NOTES:

- Caution! Main power supply voltage!
- A device that disconnects the pole conductors (minimum contact gap 3 mm) is required for isolation from the power supply.
- Parallel connection of several actuators possible.
- Power consumption must be monitored!



### Legend

- 1** Blue cable colour
- 2** Brown cable colour
- S1** Violet cable colour
- S2** Red cable colour
- S3** White cable colour
- S4** Orange cable colour
- S5** Pink cable colour
- S6** Grey cable colour
- Tf** Thermal fuse

## Type of activation G230T-OF

IMPORTANT: Risk of electric shock!

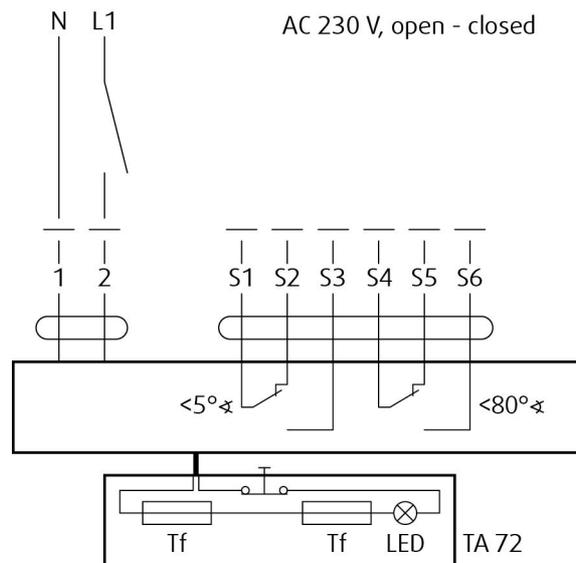
Switch off the power supply before working on any electrical equipment.

Allow only qualified electricians to work on the electrical system.

Actuator power supply: AC 230 V, 50/60 Hz

NOTES:

- Caution! Main power supply voltage!
- A device that disconnects the pole conductors (minimum contact gap 3 mm) is required for isolation from the power supply.
- Parallel connection of several actuators possible.
- Power consumption must be monitored!



### Legend

- 1** Blue cable colour
- 2** Brown cable colour
- S1** Violet cable colour
- S2** Red cable colour
- S3** White cable colour
- S4** Orange cable colour
- S5** Pink cable colour
- S6** Grey cable colour
- Tf** Thermal fuse

## Type of activation B24T-OF

IMPORTANT: Risk of electric shock!

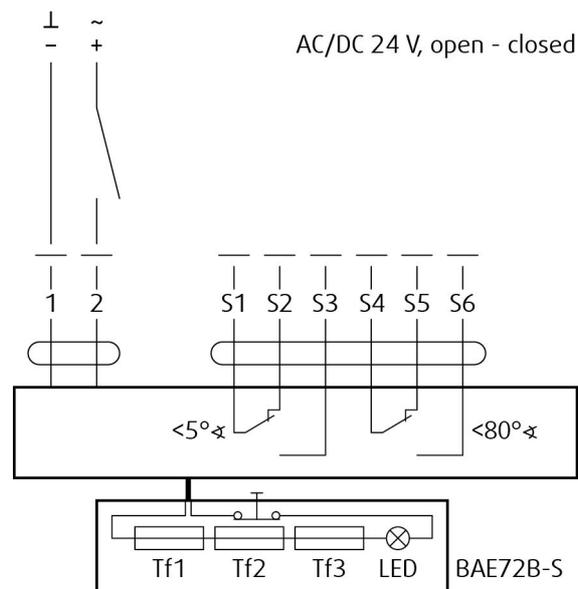
Switch off the power supply before working on any electrical equipment.

Allow only qualified electricians to work on the electrical system.

Actuator power supply: AC (50/60 Hz)/DC 24 V

NOTES:

- Supply via safety isolation transformer.
- Parallel connection of several actuators possible.
- Power consumption must be monitored!



### Legend

- 1** Blue cable colour (black for BF24-T)
- 2** Red cable colour (white for BF24-T)
- S1** Violet cable colour (white for BF24-T)
- S2** Red cable colour (white for BF24-T)
- S3** White cable colour (white for BF24-T)
- S4** Orange cable colour (white for BF24-T)
- S5** Pink cable colour (white for BF24-T)
- S6** Grey cable colour (white for BF24-T)
- Tf** Thermal fuse

## Type of activation G24T-OF

IMPORTANT: Risk of electric shock!

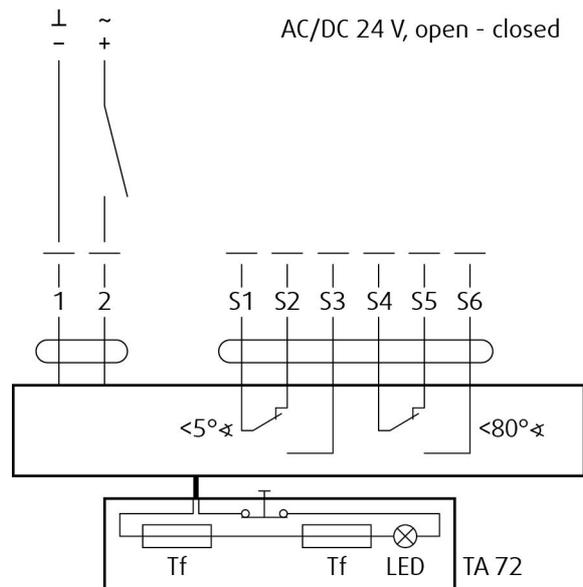
Switch off the power supply before working on any electrical equipment.

Allow only qualified electricians to work on the electrical system.

Actuator power supply: AC (50/60 Hz)/DC 24 V

NOTES:

- Supply via safety isolation transformer.
- Parallel connection of several actuators possible.
- Power consumption must be monitored!



### Legend

- 1** Black cable colour
- 2** Red cable colour
- S1** Violet cable colour
- S2** Red cable colour
- S3** White cable colour
- S4** Orange cable colour
- S5** Pink cable colour
- S6** Grey cable colour
- Tf** Thermal fuse

### Type of activation BSD230T-OF

IMPORTANT: Risk of electric shock!

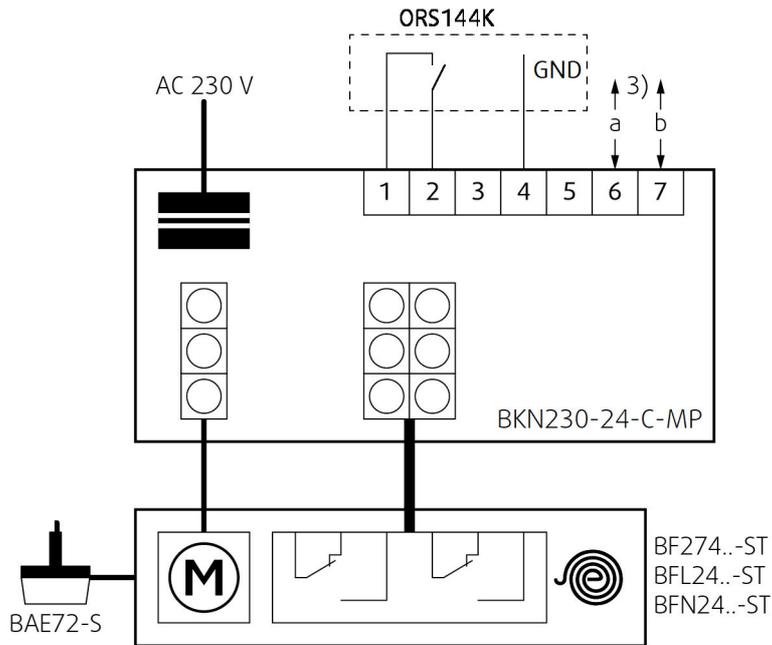
Switch off the power supply before working on any electrical equipment.

Only qualified electricians are allowed to work on the electrical system.

Power consumption must be observed.

NOTES:

- Caution! Main power supply voltage!
- A device that disconnects the pole conductors (minimum contact gap 3 mm) is required for isolation from the power supply.



### Legend

**1**

Jumper factory-fitted. Can be removed if necessary to be replaced by a thermoelectric trip (the safety function will be triggered if terminals 1 and 2 are not linked).

**2** Jumper only used for commissioning purposes and without BKS24-.. !

**3** 2-wire conductor to BKS24-..

### Type of activation GSD230T-OF

IMPORTANT: Risk of electric shock!

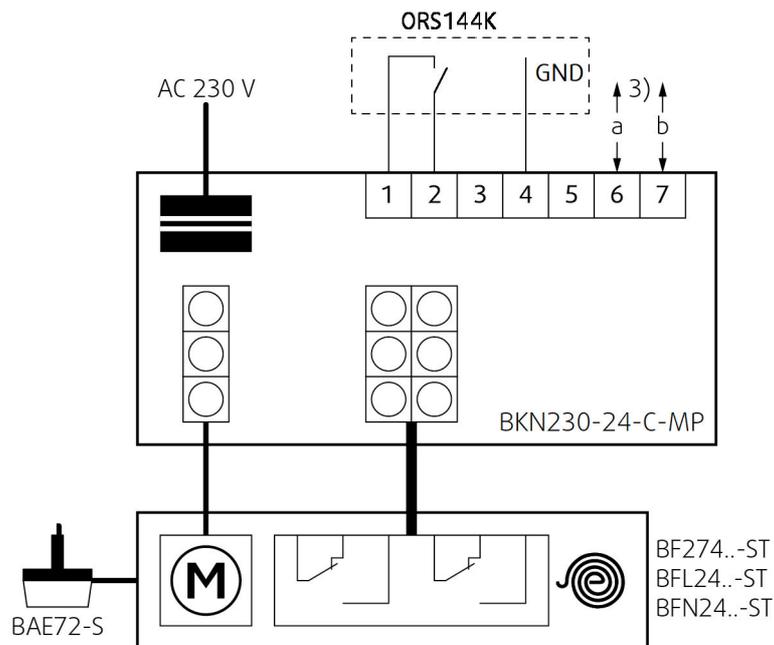
Switch off the power supply before working on any electrical equipment.

Only qualified electricians are allowed to work on the electrical system.

Power consumption must be observed.

NOTES:

- Caution! Main power supply voltage!
- A device that disconnects the pole conductors (minimum contact gap 3 mm) is required for isolation from the power supply.



### Legend

**1**

Jumper factory-fitted. Can be removed if necessary to be replaced by a thermoelectric trip (the safety function will be triggered if terminals 1 and 2 are not linked).

**2** Jumper only used for commissioning purposes and without BKS24-.. !

**3** 2-wire conductor to BKS24-..

### Type of activation BSD24T-OF

IMPORTANT: Risk of electric shock!

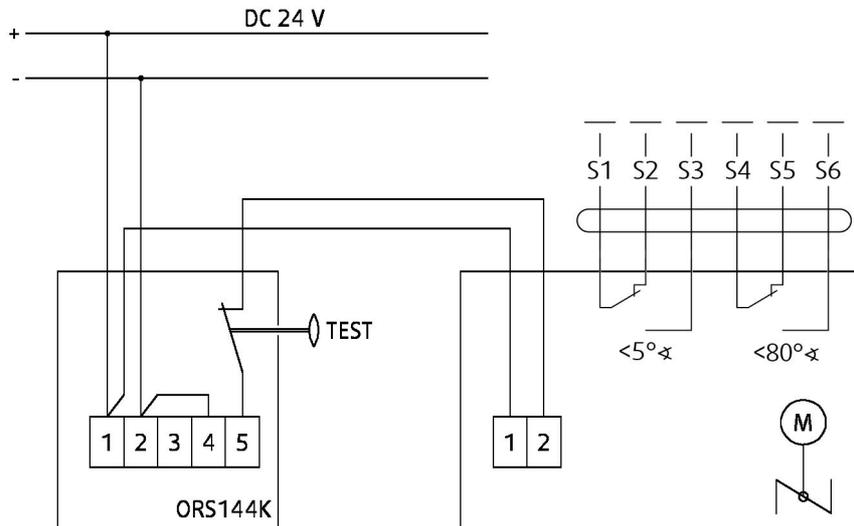
Switch off the power supply before working on any electrical equipment.

Allow only qualified electricians to work on the electrical system.

Power consumption must be observed.

NOTES:

- Supply via safety isolation transformer.



#### Legend

**1** Blue cable colour

**2** Brown cable colour

**S1** Violet cable colour (white for BF24-T)

**S2** Red cable colour (white for BF24-T)

**S3** White cable colour (white for BF24-T)

**S4** Orange cable colour (white for BF24-T)

**S5** Pink cable colour (white for BF24-T)

**S6** Grey cable colour (white for BF24-T)

**Tf** Thermal fuse

### Type of activation GSD24T-OF

IMPORTANT: Risk of electric shock!

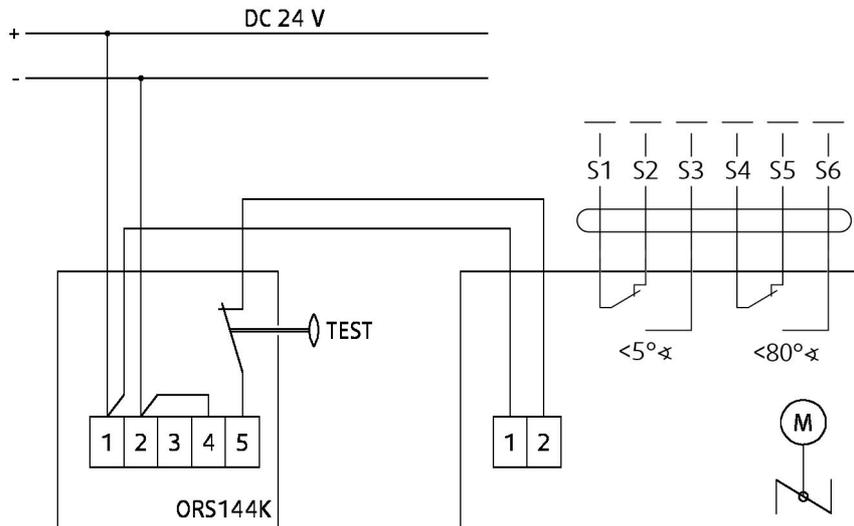
Switch off the power supply before working on any electrical equipment.

Allow only qualified electricians to work on the electrical system.

Power consumption must be observed.

NOTES:

- Supply via safety isolation transformer.



### Legend

- 1 Blue cable colour
- 2 Brown cable colour
- S1 Violet cable colour
- S2 Red cable colour
- S3 White cable colour
- S4 Orange cable colour
- S5 Pink cable colour
- S6 Grey cable colour
- Tf Thermal fuse

# Operation manual

## Warning

To avoid injury, make sure to wear gloves and keep the blades movement area clear while manipulating with the damper.

## Fire Damper Functionality Check

### Manually Operated Activation Mechanism

1. Open the damper - turn the red crank (P10) using a hexagon bent wrench No. 10 (P13). Turn the red crank so that the indicator arrow is pointing to the "OPEN" position (P11), the red crank needs to remain in the "OPEN" position, and the microswitch for the open position indication must be pushed (if installed).
2. Close the damper - release the mechanism by pressing the red release button (P9), the red crank will adjust its indicator arrow pointing to the "CLOSED" position (P12) and remain locked in this position, the microswitch for the closed position indication must be pushed (if installed).
3. Open the damper - turn the red crank (P10) using a hexagon bent wrench No. 10. (P13) Turn the red crank so that the indicator arrow is pointing to the "OPEN" position, the red crank needs to remain in the "OPEN" position, and the microswitch for the open position indication must be pushed (if installed).

### Spring Return Actuator Operated Activation Mechanism

1. The fire damper must open automatically after the actuator circuit closes - the arrow on the actuator axis must show the position 90°.
2. Press the control switch (P9) on the Thermoelectric fuse and hold it until the fire damper is fully closed - the arrow on the actuator axis must show the position 0°.
3. Release the control switch on the Thermoelectric fuse. The fire damper must become fully open - the arrow on the actuator axis must show the position 90° - which is the operating position.

### Smoke detector and spring return actuator operated activation mechanism

1. The fire damper must open automatically after the actuator circuit closes - the arrow on the actuator axis must show the position 0°.
2. Press the control switch (P9) on the Thermoelectric fuse and hold it until the fire damper is fully closed - the arrow on the actuator axis must show the position 90°.
3. Release the control switch (P9) on the Thermoelectric fuse. The fire damper must now open automatically.
4. Press the control switch on the smoke sensor and hold it until the fire damper is fully closed. Or use a smoke spray for sensor testing and spray into the grille directly onto the smoke detector. Check if the fire damper will fully close. After a while the smoke detector will clear itself from the testing spray and the damper will open again.
5. Release the control switch on the Thermoelectric fuse. The fire damper must become fully open - the arrow on the actuator axis must show the position 0° - which is the operating position.

## Operation Manual

After installation, it is necessary to adjust the damper into its operating position - open the fire damper.

### Spring Return Actuator Operated Activation Mechanism

Connect the electric driving mechanism to the relevant electric power supply (see Electrical connection section). The electromotor is activated and adjusts the damper into its open position.

### Manually Operated Activation Mechanism

Turn the red crank into the "OPEN" position. The damper blade must remain in open position.

## Damper Inspection

The activation mechanism keeps the dampers on stand-by during their entire life cycle in accordance with this manual issued by the manufacturer. It is not permitted to alter the dampers in any way nor perform any changes to their structure without the manufacturer's consent.

The operator performs regular checks of the dampers as per established regulations and standards at least once every 12 months. The check needs to be performed by an employee who has been specifically trained for this purpose. The current fire damper condition determined during the inspection needs to be entered into the operating logbook along with the date of the inspection, the legible name, surname and signature of the employee who performed the inspection. The Operating Journal includes a copy of the employee's authorization.

If any discrepancies are discovered, these need to be entered in the Operating Journal along with a proposal for their removal. The Operating Journal can be found in product documents section. Immediately after the installation and activation of the damper, it needs to be checked under the identical conditions as apply to the above mentioned 12-month inspections. The visual check ensures that visible damages on the inspected damper parts are seen. On its external side, the damper housing and the activation mechanism are checked.

Due to the need to perform a visual check of the damper's internal parts, open the inspection lid. For small sizes there is the possibility of removing the mechanism to perform the inspection. The removable mechanism always needs to be returned back into the damper with the damper blade being closed. The damper's internal casing, thermal fuse, sealings, foaming substance, the damper blade condition and accuracy of its closure during its leaning against the backstop in the closed position must all be checked. There must not be any strange objects or a layer of impurities from the air distribution systems inside the damper.

### **Recommended Inspection Steps According to the EN 15 650:**

1. Damper identification
2. Date of inspection
3. Inspecting electric connection of the activation mechanism (where applicable)
4. Inspecting damper for cleanliness and possible need for cleaning (where needed)
5. Inspecting blade and sealing condition, possible correction and logging (where needed)
6. Inspecting proper fire damper closure
7. Inspecting damper functionality – opening and closing using the control system, physical examination of the damper's behavior, possible correction and logging (where needed)
8. Inspecting end switches' functionality in the open and closed position, possible correction and logging (where needed)
9. Inspect whether the damper is fulfilling its role as part of the regulation system (where needed)
10. Inspect whether the damper remains in its standard operating position.
11. The damper is usually part of a system. In that case the whole system needs to be checked as described in its operation and requirements published by the builder of the system.

