

# F-B90

## Multiblade Fire Damper

Handbook



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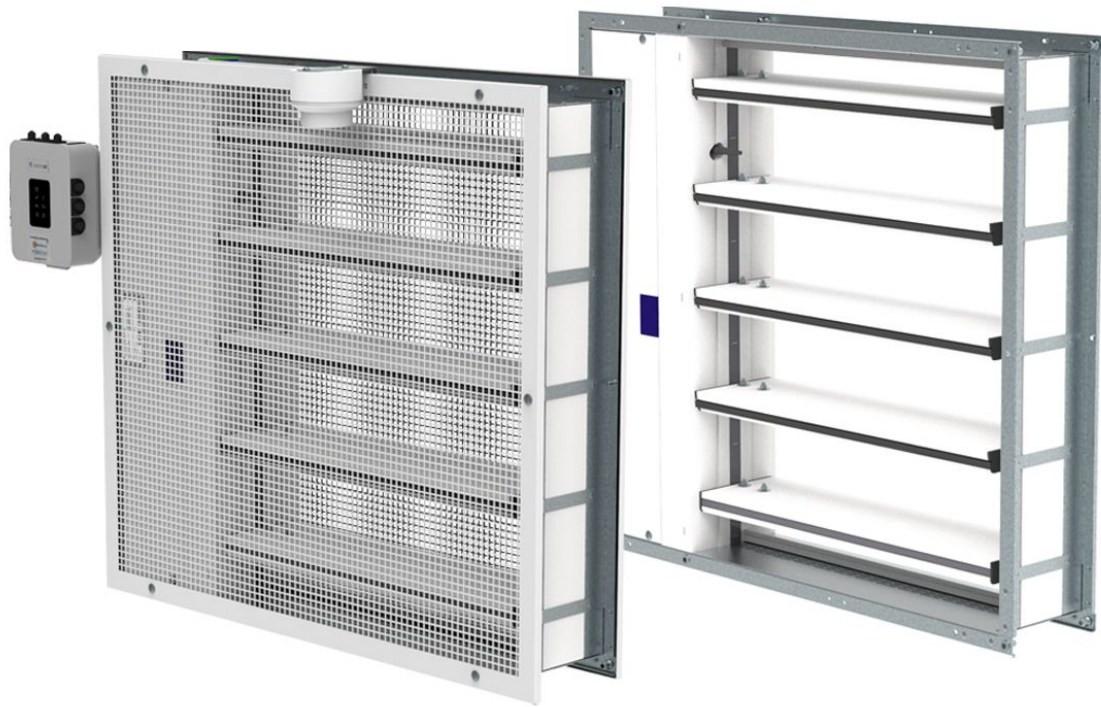
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## Description

Fire dampers represent passive fire protection and are designed to utilize compartmentalization to prevent the spread of toxic gases, smoke and fire. The opening and closure of the damper blade can be activated remotely for actuator versions. In case of fire when the air in the duct exceeds 72 °C or 74 °C, the thermal fuse melts in both actuator and manual versions. The melting of the thermal fuse activates the closure of the damper blade automatically. The damper blade is then mechanically locked in the closed position.

### Highlights

- Short body without blade overhangs
- Can be used as Air-transfer grille with cold smoke tightness
- Duct connection from both sides always available
- Symmetric structure and mechanism accessible from both sides
- Fit installation, filling not visible
- Available with smoke detection
- One sided duct connection ended with Grille

### Fire Resistivity

F-B90 fire dampers are CE certified following the Construction Products Regulation according to EN 15650:2010. Dampers are tested according to EN 1366-2:2015 and classified according to EN 13501-3 + A1:2009. The fire damper together with its installation form an inseparable part of the fire resistivity rating. F-B90 fire dampers are designed for the installations listed and described in their Handbook.

- Damper connected to duct on both sides or on one side only, installed within standard supporting construction in accordance with EN 1366-2:2015: **EI90 ( $v_e - h_o$  i↔o)S**
- Damper with grille on both sides and no duct connection (air transfer damper), installed within standard supporting construction in accordance with EN 1366-2:2015: **EI90 ( $v_e - i$ ↔o)S & EI120 ( $v_e - i$ ↔o)**

## Types of Product

There are different types of F-B90 connection. Thus, there are several types of grilles:

- **00** – without grille.
- **01, 02** – with grille on one side only.
- **11, 22** – with grille on both sides.

## Types of Activation

### • H0

Fire damper with a manual crank activation mechanism and with a spring return release mechanism activated by a fusible thermal link set to 74°C.

### • H2

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

### • B230T or G230T (G230T not available for sizes H=250)

Fire damper with an activation mechanism with a Belimo (B230T) or Gruner (G230T) spring return actuator (230V AC) with an electro-thermal fuse 72°C and auxiliary switches.

### • B24T or G24T (G24T not available for sizes H=250)

Fire damper with an activation mechanism with a Belimo (B24T) or Gruner (G24T) spring return actuator (24V AC/DC) with electro-thermal fuse 72°C and auxiliary switches.

### • BST0 or GST0 (GST0 not available for sizes H=250)

Fire damper with an activation mechanism with spring return actuator Belimo (BST0, AC/DC 24 V, supply through com. unit: AC 230 V) or Gruner (GST0, AC/DC 24 V, supply through com. unit: AC 24 V) with an electro-thermal fuse 72°C and auxiliary switches, with a Belimo supply and communication unit BKN230-24 or Gruner supply and communication unit fs-UFC24-2 (other communication units on demand).

### • B24T-SR or G24T-SR (G24T-SR not available for sizes H=250)

Fire damper with an activation mechanism with a Belimo (B24T-SR) or Gruner (G24T-SR) spring return actuator (24V AC/DC) with electro-thermal fuse 72°C and auxiliary switches for Modulated dampers (possibility to open the blade at the desired angle).

### • BSD230T or GSD230T (Only for Grille types 11 and 22 & GSD230T not available for sizes H=250)

Overflow fire damper with Smoke Detector fitted activation mechanism (230V AC) 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 than 24V AC/DC Smoke detector).

### • BSD24T or GSD24T (Only for Grille types 11 and 22 & GSD24T not available for sizes H=250)

Overflow fire damper with Smoke Detector fitted activation mechanism (24V AC/DC) 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 24V AC/DC Smoke detector).

# Design

The casing of the F-B90 is made of a galvanized sheet metal. Blades and mechanism access doors are made from calcium silicate boards. A foam seal with an intumescent seal that prevents leaks of heat or smoke. The casing has flanges on two sides with a thread to attach to sheet-metal duct flanges. Two sides of the damper have inserts with a thread to attach the grille. The damper casing and two covers on two sides give protection to the mechanism and the actuator of the F-B90. They also give access for easy connection.

## Composition of materials

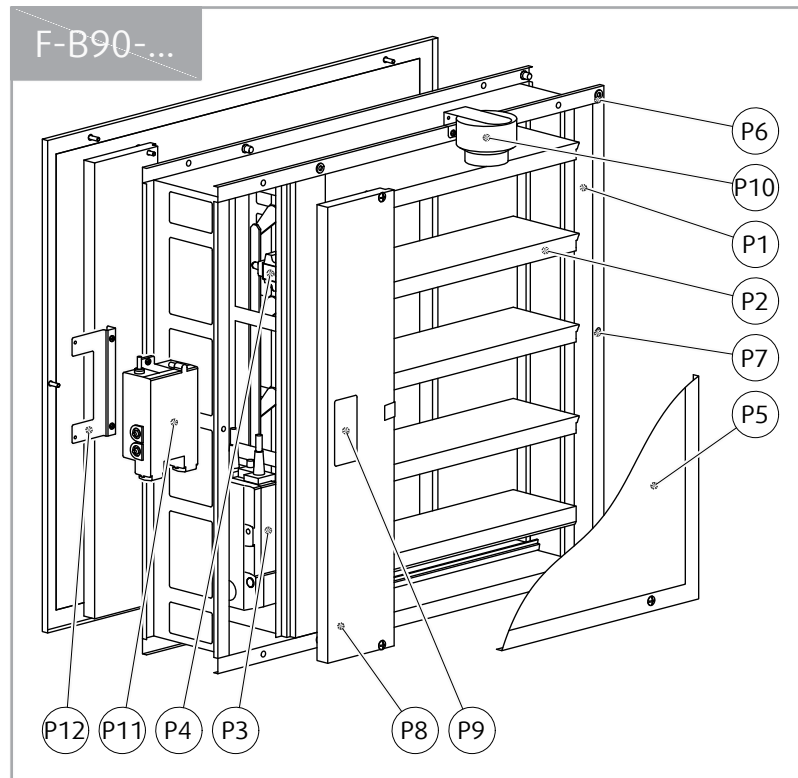
Body of the product contains these materials: Galvanized sheet metal; Galvanized steel fasteners; PE tapes and foil

Blades and mechanism access doors of the product contain these materials: Calcium silicate board; Polyurethane foam; Intumescent strips; Acrylic sealant



The manufacturing processes of these materials agree with local regulations. The product does not contain dangerous materials.

## Product Parts



## Legend

- P1** - Damper casing
- P2** - Damper blade
- P3** - Actuator
- P4** - Thermoelectric tripping device (with test button)
- P5** - Sheet metal grille
- P6** - Threaded inserts for duct connection
- P7** - Threaded inserts for the grille
- P8** - Mechanism cover
- P9** - Product label
- P10** - Smoke sensor ORS 144 K (Hekatron)
- P11** - Supply and communication unit (only for BST0 and GST0 activation types)
- P12** - Holder for communication unit (only for B24T-W and G24T-W activation types)

# Technical Parameters

## Durability Test

- Test procedure with 50 cycles and manual control (rotation from 0° to 90°)
- Test procedure with 10000 cycles and actuator control (rotation from 0° to 90°)
- Test procedure with 10000 cycles and actuator control for "mod" classification (rotation from 45° to 60°)
- No change of the necessary properties.
- No change of the necessary properties.
- No change of the necessary properties.

## Tested Pressures

Maximum underpressure during fire test 300 Pa

**Safe Position** Closed

**Possible Installations** Refer to the "Installation Methods" section

**Direction of the Airflow** Both direction for supply or extract

**Permitted air velocity during blade movement** 12 m/s

**Side with Fire Protection** Both sides: (i<->o) - symmetrical

**Closing and Opening Time** Motor running time: <20 s / 90°

**Closed or Open Status Indicator** Visually for type H0. Microswitches that are part of the mechanism or actuator signal the closed or open status.

## Environmental Conditions for Operation

The temperatures must be: -20 °C ... 50 °C

Relative humidity: Less than 95% (3K5, EN 60721-3-3)

Product protected from: Weather, rain and water from other sources

Condensation: Cannot form on the product

Icing: Cannot form on the product

## Access for Inspection

The inspection is possible through the grille. There is an inspection door that gives access to the connection and to the actuator. If necessary, a lid for the inspection on the connected duct must be created. Not included in the damper supply.

**Maintenance** Maintenance is not necessary. A dry-cleaning procedure can be mandatory, follow country legislation.

## Inspections

Obey local laws for the minimum time between inspection procedures. When not specified the maximum interval between inspections is 12 months

**Tightness of the Blade** Class 2 and class 3 (dimensions above nominal sizes W=400 mm & H=500 mm) of standard EN 1751 at 500 Pa

**Tightness of the Housing** Class C of standard EN 1751 at 500 Pa

## EC Directives

2006/42/EC Machinery Directive

2014/35/EU Low Voltage Directive

2014/30/EU Electromagnetic Compatibility Directive

## Driving Actuator Types

Belimo BF..., BFN..., BFL... ...230; ...24; ...24-ST; ...24-SR

Gruner 360-..., 340-..., TA-230-..., TA-024-..., CTA-024-..., TA-230D-..., TA-024D-..., CTA-024D-...

**Transportation and Storage** The temperature range must be: -30...50 °C

Make sure that the damper blade is in the closed position during transportation and protected from weather disruptions. The storage of the damper must be indoors.

## Assessed Performance

19 CE 1396

**Systemair Production a.s.**

Hlavná 371, 900 43 Kalinkovo, Slovakia

1396-CPR-0177

**F-B90**

**EN 15650 : 2010**

Fire damper

**Nominal activation conditions/sensitivity**

**Pass**

**Response delay (response time)**

Closure within period of 2 minutes

**Operational reliability**

**Manual:** 50 cycles

**Motorized:** 10200 cycles and 10000 cycles (modulated)

**Fire resistance:**

Duct on one or both sides: **EI90 ( $v_e - h_o i \leftrightarrow o$ )S**

Grille on both sides: **EI90 ( $v_e - i \leftrightarrow o$ )S & EI120 ( $v_e - i \leftrightarrow o$ )**

Resistivity depends on installation method and situation

• integrity

**E**

maintenance of the cross section

(under E)

mechanical stability

(under E)

• insulation

**I**

• smoke leakage

**S**

**Durability of response delay**

Preserved

**Durability of operational reliability**

Preserved (20.200 cycles)

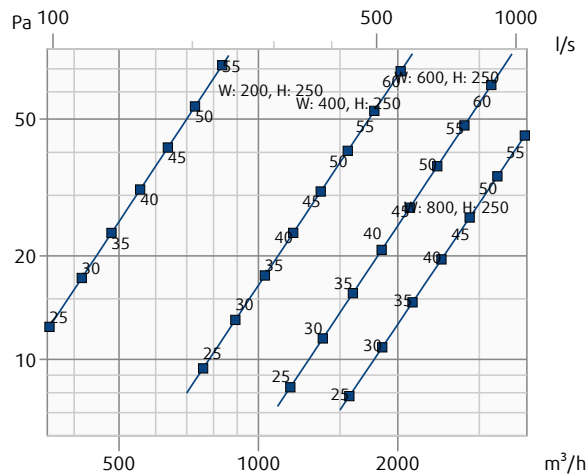
# Diagrams

The pressure drop, and A-weighted total discharged sound power level depend on the nominal width and height of the damper and air flow volume at different duct pressures. The type of activation does not influence the airflow parameter, therefore only one activation type is shown in the diagrams.

## Diagrams for Extract Air, Grille Type: 00

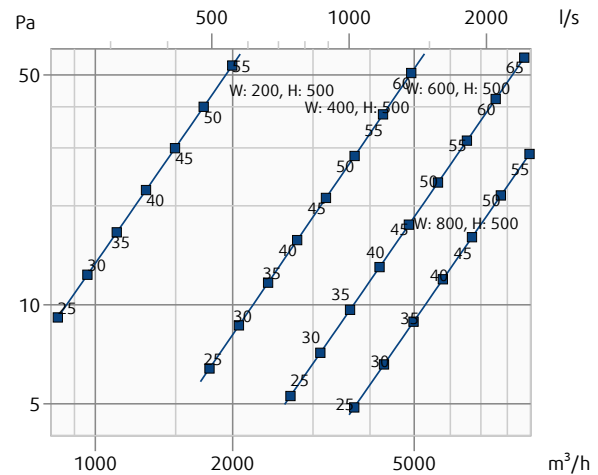
### F-B90-...-00

Pressure drop & A-weighted sound power level in dB(A)



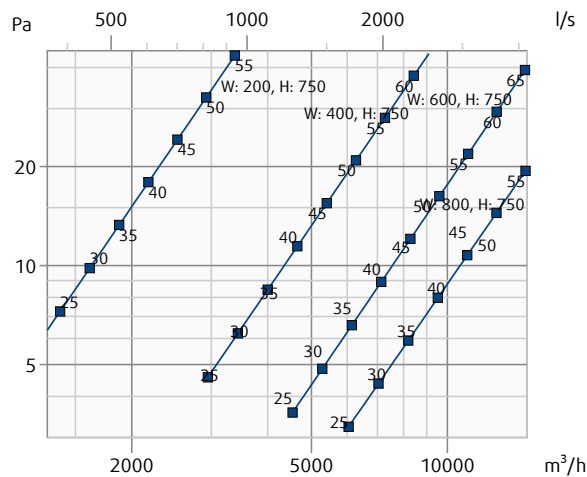
### F-B90-...-00

Pressure drop & A-weighted sound power level in dB(A)



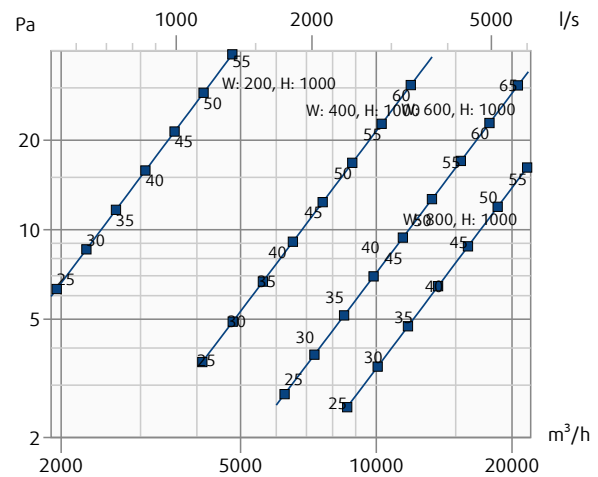
### F-B90-...-00

Pressure drop & A-weighted sound power level in dB(A)



### F-B90-...-00

Pressure drop & A-weighted sound power level in dB(A)



## Legend:

**Pa** - Pressure drop ( $p_s$ )

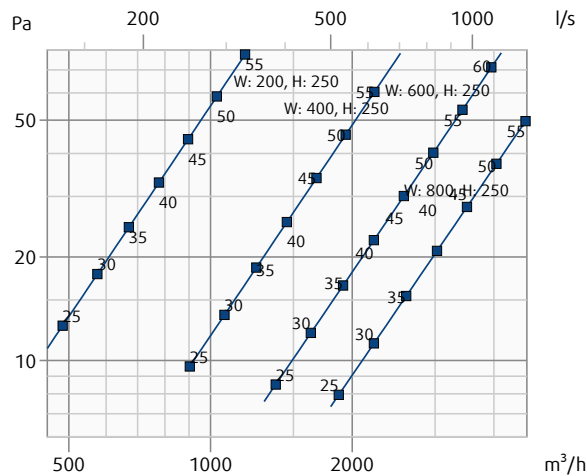
**m³/h; l/s** - Airflow volume ( $q_v$ )

**m/s** - Air face velocity ( $v$ )

## Diagrams for Supply Air, Grille Type: 00

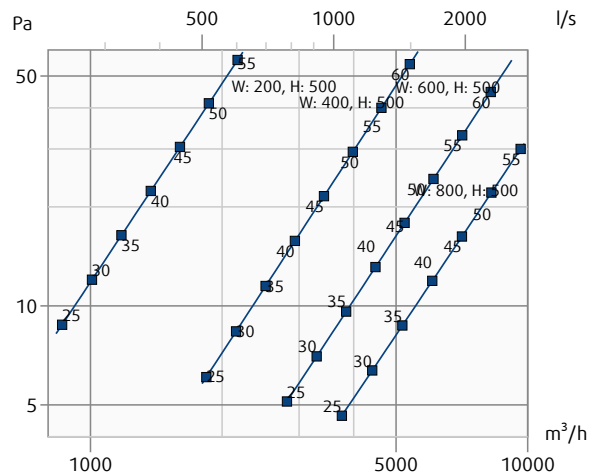
## F-B90-...-00

Pressure drop &amp; A-weighted sound power level in dB(A)



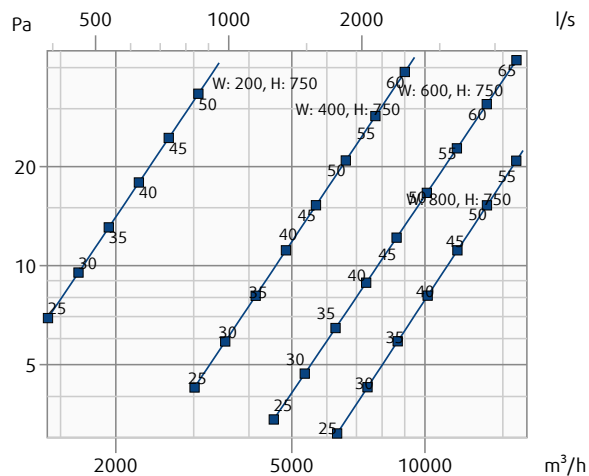
## F-B90-...-00

Pressure drop &amp; A-weighted sound power level in dB(A)



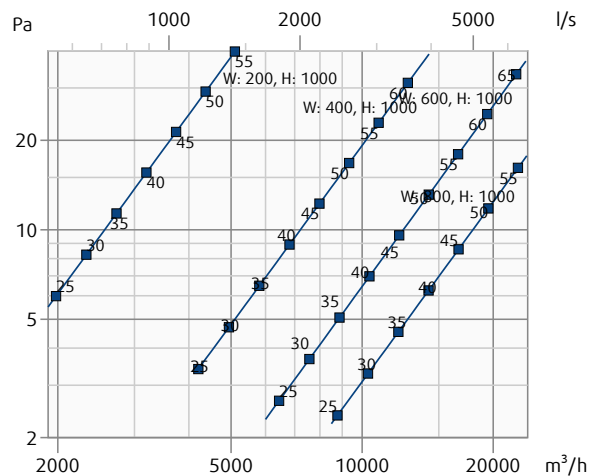
## F-B90-...-00

Pressure drop &amp; A-weighted sound power level in dB(A)



## F-B90-...-00

Pressure drop &amp; A-weighted sound power level in dB(A)



## Legend:

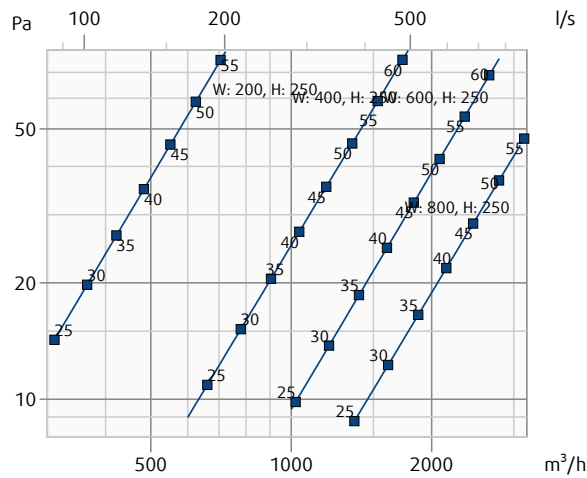
Pa - Pressure drop ( $p_s$ )m³/h; l/s - Airflow volume ( $q_v$ )m/s - Air face velocity ( $v$ )



## Diagrams for Extract Air, Grille Types: 01 &amp; 02

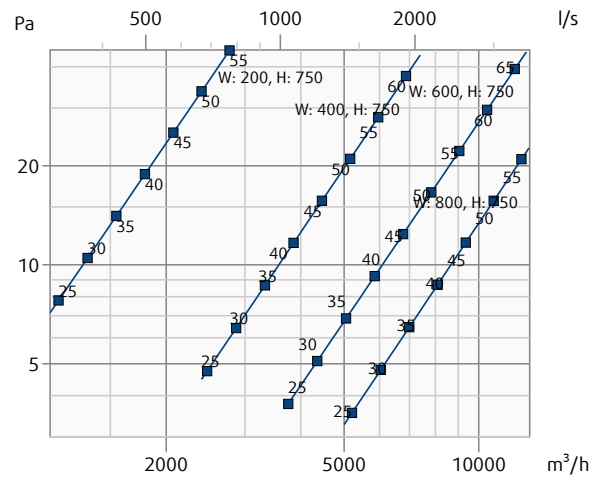
F-B90-...-01

Pressure drop &amp; A-weighted sound power level in dB(A)



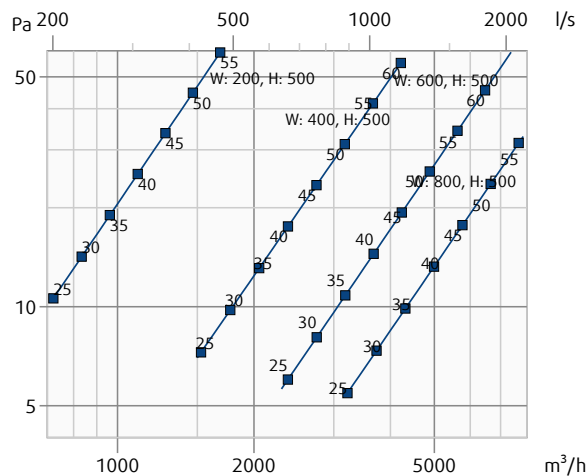
F-B90-...-01

Pressure drop &amp; A-weighted sound power level in dB(A)



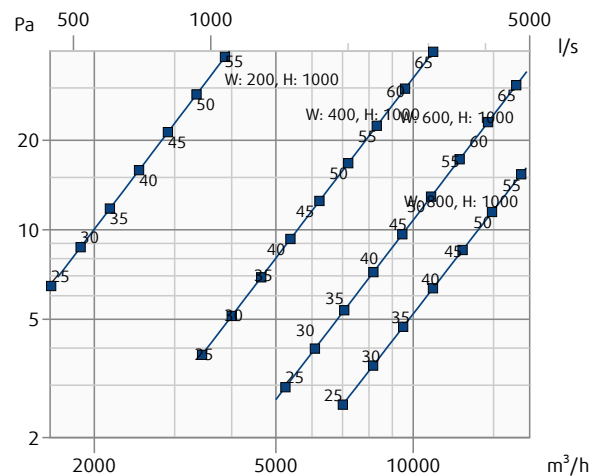
F-B90-...-01

Pressure drop &amp; A-weighted sound power level in dB(A)



F-B90-...-01

Pressure drop &amp; A-weighted sound power level in dB(A)



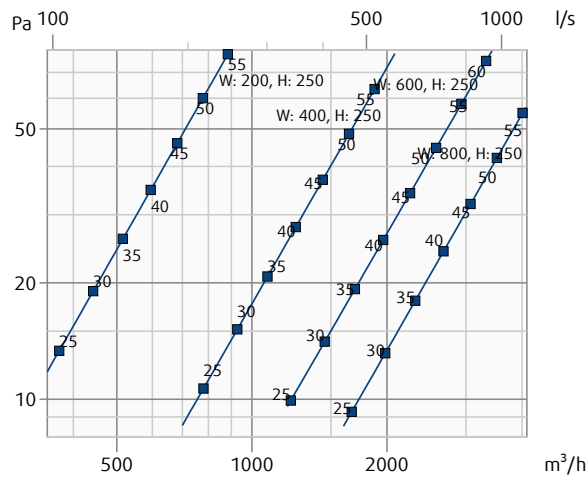
## Legend:

**Pa** - Pressure drop ( $p_s$ )**m³/h; l/s** - Airflow volume ( $q_v$ )**m/s** - Air face velocity ( $v$ )

## Diagrams for Supply Air, Grille Types: 01 &amp; 02

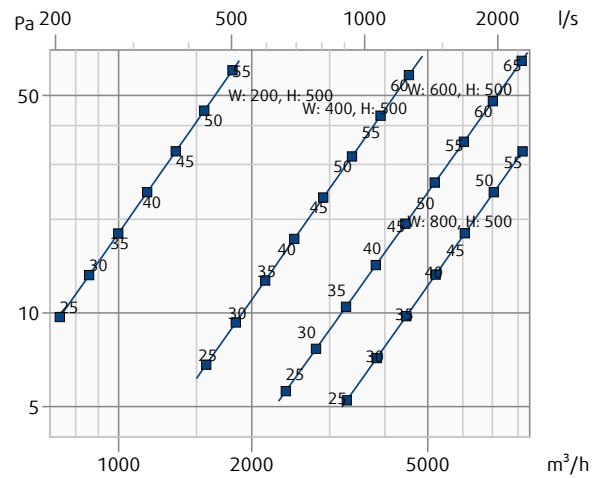
F-B90-...-01

Pressure drop &amp; A-weighted sound power level in dB(A)



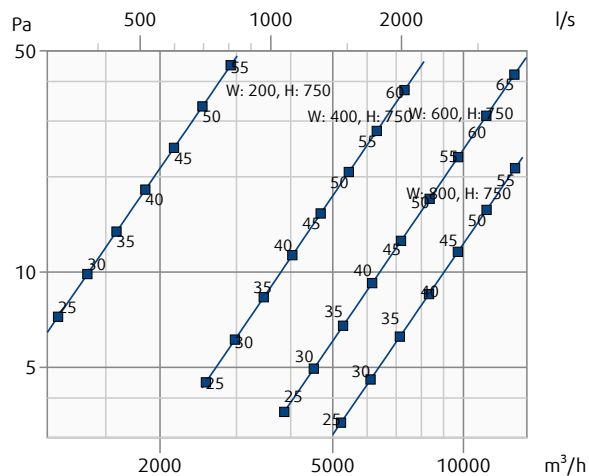
F-B90-...-01

Pressure drop &amp; A-weighted sound power level in dB(A)



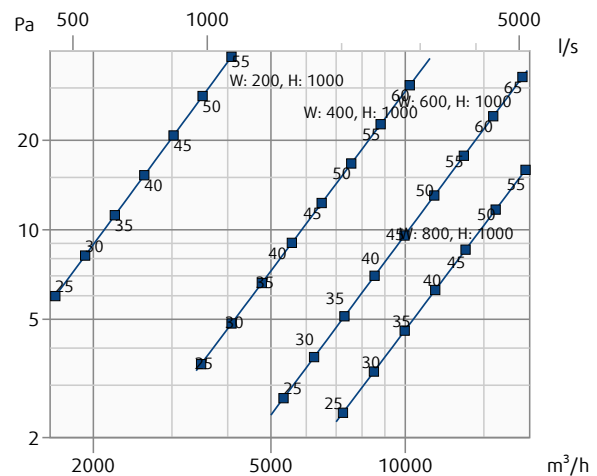
F-B90-...-01

Pressure drop &amp; A-weighted sound power level in dB(A)



F-B90-...-01

Pressure drop &amp; A-weighted sound power level in dB(A)



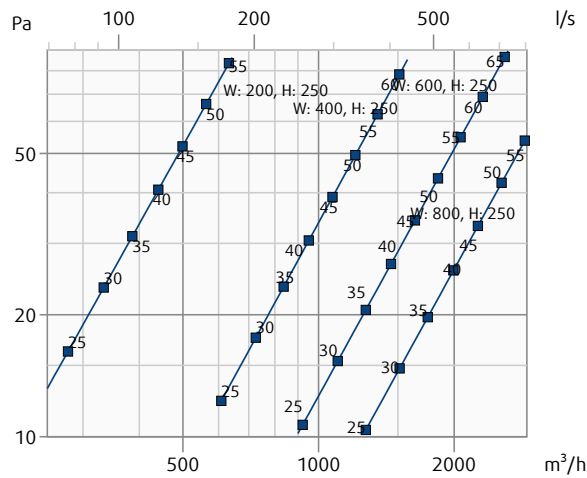
## Legend:

 $p_a$  - Pressure drop ( $p_s$ ) $m^3/h$ ;  $l/s$  - Airflow volume ( $q_v$ ) $m/s$  - Air face velocity ( $v$ )

## Diagrams for Extract and Supply Air, Grille Types: 11 &amp; 22

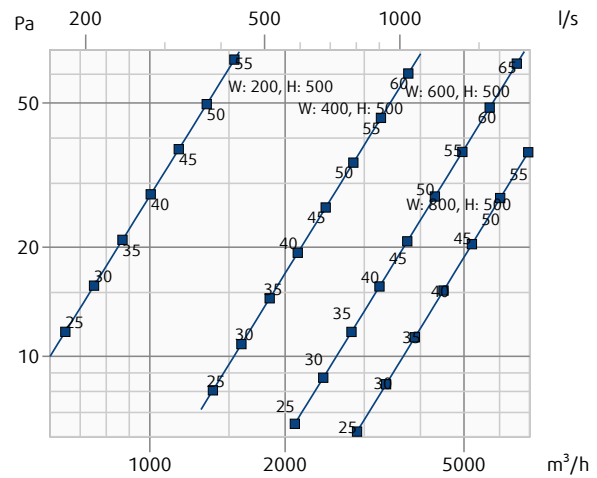
F-B90-...-11

Pressure drop &amp; A-weighted sound power level in dB(A)



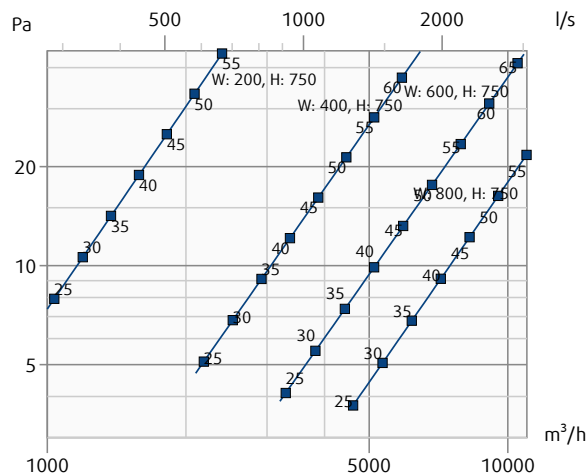
F-B90-...-11

Pressure drop &amp; A-weighted sound power level in dB(A)



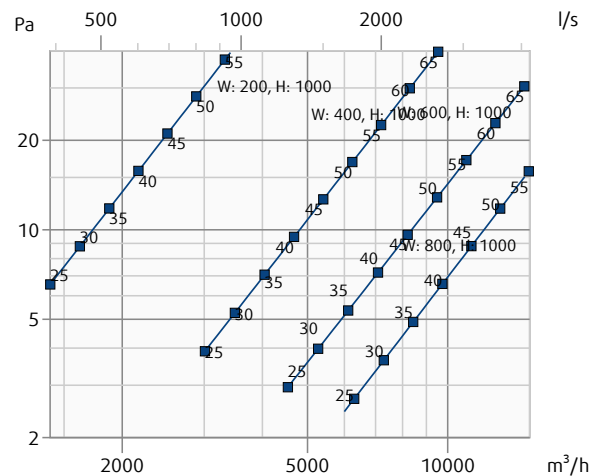
F-B90-...-11

Pressure drop &amp; A-weighted sound power level in dB(A)



F-B90-...-11

Pressure drop &amp; A-weighted sound power level in dB(A)



## Legend:


 $P_a$  - Pressure drop ( $p_s$ ) $m^3/h$ ;  $l/s$  - Airflow volume ( $q_v$ ) $m/s$  - Air face velocity ( $v$ )

# Dimensions & Weights

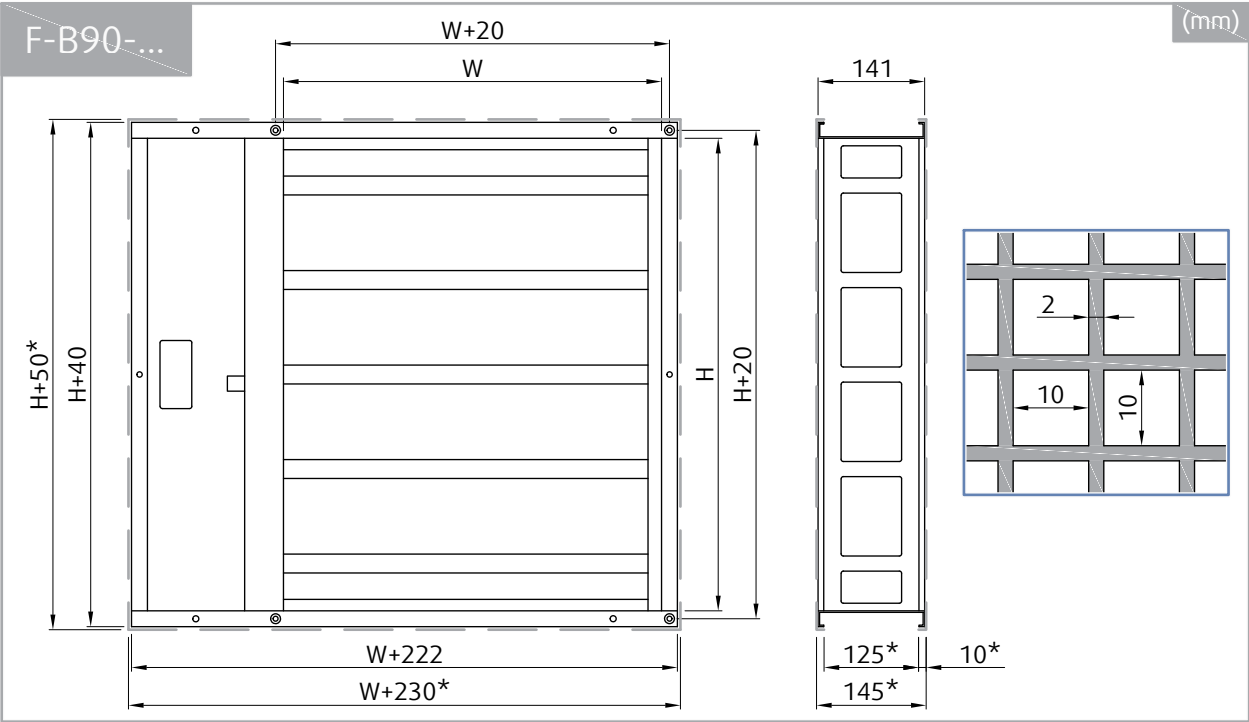
Free area of F-B90 Without Grille

| F-B90...00                       |      | W (mm) |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |       |
|----------------------------------|------|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| A <sub>v</sub> (m <sup>2</sup> ) |      | 150    | 175   | 200   | 225   | 250   | 280   | 300   | 315   | 350   | 355   | 400   | 450   | 500   | 550   | 560   | 600   | 630   | 650   | 700   | 710   | 750   | 800   |
| H (mm)                           | 250  | 0,022  | 0,026 | 0,030 | 0,035 | 0,039 | 0,044 | 0,047 | 0,050 | 0,056 | 0,057 | 0,064 | 0,073 | 0,081 | 0,090 | 0,091 | 0,098 | 0,103 | 0,107 | 0,115 | 0,117 | 0,124 | 0,132 |
|                                  | 375  | 0,035  | 0,041 | 0,048 | 0,055 | 0,062 | 0,070 | 0,075 | 0,079 | 0,089 | 0,090 | 0,102 | 0,116 | 0,129 | 0,143 | 0,145 | 0,156 | 0,164 | 0,170 | 0,183 | 0,186 | 0,197 | 0,210 |
|                                  | 500  | 0,047  | 0,057 | 0,066 | 0,075 | 0,084 | 0,095 | 0,103 | 0,108 | 0,121 | 0,123 | 0,140 | 0,158 | 0,177 | 0,195 | 0,199 | 0,214 | 0,225 | 0,232 | 0,251 | 0,255 | 0,269 | 0,288 |
|                                  | 625  | 0,060  | 0,072 | 0,084 | 0,095 | 0,107 | 0,121 | 0,131 | 0,138 | 0,154 | 0,157 | 0,178 | 0,201 | 0,225 | 0,248 | 0,253 | 0,272 | 0,286 | 0,295 | 0,319 | 0,323 | 0,342 | 0,366 |
|                                  | 750  | 0,073  | 0,087 | 0,101 | 0,116 | 0,130 | 0,147 | 0,158 | 0,167 | 0,187 | 0,190 | 0,215 | 0,244 | 0,272 | 0,301 | 0,307 | 0,329 | 0,347 | 0,358 | 0,386 | 0,392 | 0,415 | 0,443 |
|                                  | 875  | 0,086  | 0,103 | 0,119 | 0,136 | 0,153 | 0,173 | 0,186 | 0,196 | 0,220 | 0,223 | 0,253 | 0,287 | 0,320 | 0,354 | 0,360 | 0,387 | 0,407 | 0,421 | 0,454 | 0,461 | 0,488 | 0,521 |
|                                  | 1000 | 0,099  | 0,118 | 0,137 | 0,156 | 0,176 | 0,199 | 0,214 | 0,226 | 0,253 | 0,256 | 0,291 | 0,330 | 0,368 | 0,407 | 0,414 | 0,445 | 0,468 | 0,484 | 0,522 | 0,530 | 0,561 | 0,599 |

Free Area of Grille

|  |      | W (mm) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|--|------|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| A <sub>v</sub> (m <sup>2</sup> )   |      | 150    | 175  | 200  | 225  | 250  | 280  | 300  | 315  | 350  | 355  | 400  | 450  | 500  | 550  | 560  | 600  | 630  | 650  | 700  | 710  | 750  | 800  |
| H (mm)   | 250  | 0,01   | 0,02 | 0,02 | 0,03 | 0,03 | 0,04 | 0,04 | 0,05 | 0,05 | 0,05 | 0,06 | 0,07 | 0,07 | 0,08 | 0,08 | 0,09 | 0,10 | 0,10 | 0,11 | 0,11 | 0,12 | 0,13 |
|  | 375  | 0,02   | 0,03 | 0,03 | 0,04 | 0,04 | 0,05 | 0,05 | 0,06 | 0,06 | 0,06 | 0,07 | 0,08 | 0,09 | 0,10 | 0,10 | 0,11 | 0,12 | 0,12 | 0,13 | 0,13 | 0,14 | 0,15 |
|  | 500  | 0,04   | 0,05 | 0,05 | 0,05 | 0,06 | 0,07 | 0,07 | 0,08 | 0,09 | 0,09 | 0,10 | 0,11 | 0,13 | 0,14 | 0,14 | 0,15 | 0,16 | 0,17 | 0,18 | 0,18 | 0,19 | 0,21 |
|  | 625  | 0,05   | 0,06 | 0,06 | 0,07 | 0,08 | 0,09 | 0,09 | 0,10 | 0,11 | 0,11 | 0,13 | 0,14 | 0,16 | 0,18 | 0,18 | 0,20 | 0,21 | 0,21 | 0,23 | 0,23 | 0,25 | 0,26 |
|  | 750  | 0,06   | 0,07 | 0,07 | 0,08 | 0,09 | 0,11 | 0,11 | 0,12 | 0,13 | 0,14 | 0,16 | 0,18 | 0,20 | 0,22 | 0,22 | 0,24 | 0,25 | 0,26 | 0,28 | 0,28 | 0,30 | 0,32 |
|  | 875  | 0,08   | 0,09 | 0,09 | 0,10 | 0,11 | 0,12 | 0,13 | 0,14 | 0,16 | 0,16 | 0,18 | 0,21 | 0,23 | 0,25 | 0,26 | 0,28 | 0,29 | 0,30 | 0,33 | 0,33 | 0,35 | 0,38 |
|  | 1000 | 0,09   | 0,10 | 0,10 | 0,11 | 0,13 | 0,14 | 0,15 | 0,16 | 0,18 | 0,18 | 0,21 | 0,24 | 0,27 | 0,29 | 0,30 | 0,32 | 0,34 | 0,35 | 0,38 | 0,38 | 0,40 | 0,43 |

Dimensions



## Weights of F-B90 Without Grille

| F-B90...00<br>m (kg) |      | W (mm) |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |      |
|----------------------|------|--------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
|                      |      | 150    | 175  | 200  | 225  | 250  | 280  | 300  | 315  | 350  | 355  | 400  | 450  | 500  | 550  | 560  | 600  | 630  | 650  | 700  | 710  | 750  | 800  |
| H (mm)               | 250  | 6,0    | 6,2  | 6,5  | 6,7  | 6,9  | 7,1  | 7,3  | 7,4  | 7,7  | 7,8  | 8,2  | 8,6  | 9,0  | 9,4  | 9,5  | 9,9  | 10,2 | 10,3 | 10,7 | 10,8 | 11,2 | 11,6 |
|                      |      | 6,9    | 7,1  | 7,4  | 7,6  | 7,8  | 8,0  | 8,2  | 8,3  | 8,6  | 8,7  | 9,1  | 9,5  | 9,9  | 10,3 | 10,4 | 10,8 | 11,1 | 11,2 | 11,9 | 12,0 | 12,4 | 12,8 |
|                      |      | -      | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    | -    |
|                      | 375  | 8,2    | 8,5  | 8,8  | 9,0  | 9,3  | 9,6  | 9,9  | 9,9  | 10,4 | 10,5 | 10,9 | 11,5 | 12,0 | 12,6 | 12,7 | 13,1 | 13,5 | 13,6 | 14,2 | 14,3 | 14,7 | 15,3 |
|                      |      | 9,1    | 9,4  | 9,7  | 9,9  | 10,2 | 10,5 | 10,8 | 10,8 | 11,3 | 11,4 | 11,8 | 12,4 | 12,9 | 13,5 | 13,6 | 14,0 | 14,4 | 14,5 | 15,4 | 15,5 | 15,9 | 16,5 |
|                      |      | 9,2    | 9,5  | 9,8  | 10,0 | 10,3 | 10,6 | 10,9 | 10,9 | 11,4 | 11,5 | 11,9 | 12,5 | 13,0 | 13,6 | 13,7 | 14,1 | 14,5 | 14,6 | 15,2 | 15,3 | 15,7 | 16,3 |
|                      | 500  | 10,4   | 10,8 | 11,1 | 11,4 | 11,7 | 12,1 | 12,4 | 12,5 | 13,1 | 13,2 | 13,7 | 14,4 | 15,0 | 15,7 | 15,8 | 16,3 | 16,8 | 17,0 | 17,6 | 17,7 | 18,3 | 18,9 |
|                      |      | 11,3   | 11,7 | 12,0 | 12,3 | 12,6 | 13,0 | 13,3 | 13,4 | 14,0 | 14,1 | 14,6 | 15,3 | 15,9 | 16,6 | 16,7 | 17,5 | 18,0 | 18,2 | 18,8 | 18,9 | 19,5 | 20,1 |
|                      |      | 11,4   | 11,8 | 12,1 | 12,4 | 12,7 | 13,1 | 13,4 | 13,5 | 14,1 | 14,2 | 14,7 | 15,4 | 16,0 | 16,7 | 16,8 | 17,3 | 18,4 | 18,6 | 19,2 | 19,3 | 19,9 | 20,5 |
|                      | 625  | 12,7   | 13,0 | 13,4 | 13,8 | 14,2 | 14,6 | 15,0 | 15,1 | 15,7 | 15,8 | 16,5 | 17,3 | 18,0 | 18,8 | 18,9 | 19,6 | 20,1 | 20,3 | 21,1 | 21,2 | 21,9 | 22,6 |
|                      |      | 13,6   | 13,9 | 14,3 | 14,7 | 15,1 | 15,5 | 15,9 | 16,0 | 16,6 | 16,7 | 17,4 | 18,2 | 18,9 | 20,0 | 20,1 | 20,8 | 21,3 | 21,5 | 22,3 | 22,4 | 23,1 | 23,8 |
|                      |      | 13,7   | 14,0 | 14,4 | 14,8 | 15,2 | 15,6 | 16,0 | 16,1 | 16,7 | 16,8 | 17,5 | 18,3 | 19,0 | 19,8 | 20,5 | 21,2 | 21,7 | 21,9 | 22,7 | 22,8 | 23,5 | 24,2 |
|                      | 750  | 14,9   | 15,3 | 15,7 | 16,2 | 16,6 | 17,1 | 17,5 | 17,7 | 18,4 | 18,5 | 19,3 | 20,2 | 21,1 | 21,9 | 22,0 | 22,8 | 23,4 | 23,7 | 24,6 | 24,7 | 25,5 | 26,3 |
|                      |      | 15,8   | 16,2 | 16,6 | 17,1 | 17,5 | 18,0 | 18,4 | 18,6 | 19,3 | 19,4 | 20,5 | 21,4 | 22,3 | 23,1 | 23,2 | 24,0 | 24,6 | 24,9 | 25,8 | 25,9 | 26,7 | 27,5 |
|                      |      | 15,9   | 16,3 | 16,7 | 17,2 | 17,6 | 18,1 | 18,5 | 18,7 | 19,4 | 19,5 | 20,3 | 21,8 | 22,7 | 23,5 | 23,6 | 24,4 | 25,0 | 25,3 | 26,2 | 26,3 | 27,1 | 27,9 |
|                      | 875  | 17,1   | 17,6 | 18,1 | 18,6 | 19,1 | 19,6 | 20,1 | 20,2 | 21,1 | 21,2 | 22,1 | 23,1 | 24,1 | 25,1 | 26,2 | 26,5 | 26,7 | 27,0 | 28,1 | 28,2 | 29,1 | 30,1 |
|                      |      | 18,0   | 18,5 | 19,0 | 19,5 | 20,0 | 20,5 | 21,3 | 21,4 | 22,3 | 22,4 | 23,3 | 24,3 | 25,3 | 26,3 | 27,4 | 27,7 | 27,9 | 28,2 | 29,3 | 29,4 | 30,3 | 32,7 |
|                      |      | 18,1   | 18,6 | 19,1 | 19,6 | 20,1 | 20,6 | 21,1 | 21,8 | 22,7 | 22,8 | 23,7 | 24,7 | 25,7 | 26,7 | 27,8 | 28,1 | 28,3 | 28,6 | 29,7 | 29,8 | 30,7 | 31,7 |
|                      | 1000 | 19,3   | 19,8 | 20,4 | 20,9 | 21,5 | 22,1 | 22,6 | 22,8 | 23,8 | 23,9 | 24,9 | 26,0 | 27,1 | 28,2 | 28,3 | 29,3 | 30,1 | 30,4 | 31,5 | 31,6 | 32,7 | 33,8 |
|                      |      | 20,2   | 20,7 | 21,3 | 21,8 | 22,4 | 23,3 | 23,8 | 24,0 | 25,0 | 25,1 | 26,1 | 27,2 | 28,3 | 29,4 | 29,5 | 30,5 | 31,3 | 31,6 | 32,7 | 32,8 | 35,3 | 36,4 |
|                      |      | 20,3   | 20,8 | 21,4 | 21,9 | 22,5 | 23,1 | 24,2 | 24,4 | 25,4 | 25,5 | 26,5 | 27,6 | 28,7 | 29,8 | 29,9 | 30,9 | 31,7 | 32,0 | 33,1 | 33,2 | 34,3 | 35,4 |

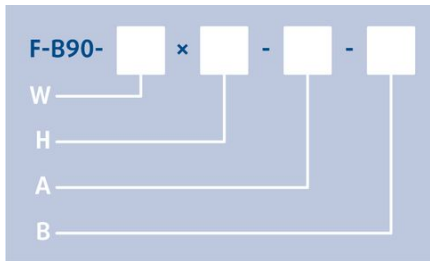
|  |   |
|--|---|
|  | H0, H2  |
|  | B230T, B24T, B24T-SR; (+ 0,6 kg = B24T-ST); (+ 1 kg = BSD230T); (+ 0,4 kg = BSD24T) |
|  | G230T, G24T, G24T-SR; (+ 0,6 kg = G24T-ST); (+ 1 kg = GSD230T); (+ 0,4 kg = GSD24T) |



Weights of Grille

| <div><div></div><div>m (kg)</div></div> |      | W (mm) |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |  |  |
|---|------|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
|   |      | 150    | 175 | 200 | 225 | 250 | 280 | 300 | 315 | 350 | 355 | 400 | 450 | 500 | 550 | 560 | 600 | 630 | 650 | 700 | 710 | 750 | 800 |  |  |
| H (mm)                                  | 250  | 0,5    | 0,5 | 0,5 | 0,6 | 0,6 | 0,6 | 0,6 | 0,7 | 0,7 | 0,7 | 0,7 | 0,8 | 0,9 | 0,9 | 0,9 | 1,0 | 1,0 | 1,0 | 1,1 | 1,1 | 1,1 | 1,2 |  |  |
|   | 375  | 0,6    | 0,7 | 0,7 | 0,7 | 0,8 | 0,8 | 0,8 | 0,9 | 0,9 | 0,9 | 1,0 | 1,0 | 1,1 | 1,2 | 1,2 | 1,2 | 1,3 | 1,3 | 1,4 | 1,4 | 1,4 | 1,5 |  |  |
|   | 500  | 0,8    | 0,8 | 0,9 | 0,9 | 1,0 | 1,0 | 1,0 | 1,1 | 1,1 | 1,1 | 1,2 | 1,3 | 1,3 | 1,4 | 1,4 | 1,5 | 1,5 | 1,6 | 1,7 | 1,7 | 1,7 | 1,8 |  |  |
|   | 625  | 0,9    | 1,0 | 1,0 | 1,1 | 1,1 | 1,2 | 1,2 | 1,2 | 1,3 | 1,3 | 1,4 | 1,5 | 1,6 | 1,7 | 1,7 | 1,8 | 1,8 | 1,9 | 2,0 | 2,0 | 2,1 | 2,1 |  |  |
|   | 750  | 1,1    | 1,1 | 1,2 | 1,3 | 1,3 | 1,4 | 1,4 | 1,4 | 1,5 | 1,5 | 1,6 | 1,7 | 1,8 | 1,9 | 2,0 | 2,0 | 2,1 | 2,2 | 2,3 | 2,3 | 2,4 | 2,5 |  |  |
|   | 875  | 1,2    | 1,3 | 1,4 | 1,4 | 1,5 | 1,6 | 1,6 | 1,6 | 1,7 | 1,7 | 1,8 | 2,0 | 2,1 | 2,2 | 2,2 | 2,3 | 2,4 | 2,4 | 2,6 | 2,6 | 2,7 | 2,8 |  |  |
|   | 1000 | 1,4    | 1,5 | 1,5 | 1,6 | 1,7 | 1,7 | 1,8 | 1,8 | 1,9 | 1,9 | 2,1 | 2,2 | 2,3 | 2,5 | 2,5 | 2,6 | 2,7 | 2,7 | 2,9 | 2,9 | 3,0 | 3,1 |  |  |

# Ordering Codes



## W - Width Dimension

150 mm, 175 mm, 200 mm, 225 mm, 250 mm, 280 mm, 300 mm, 315 mm, 350 mm, 355 mm, 400 mm, 450 mm, 500 mm, 550 mm, 560 mm, 600 mm, 630 mm, 650 mm, 700 mm, 710 mm, 750 mm, 800 mm.

## H - Height Dimensions

250 mm, 375 mm, 500 mm, 625 mm, 750 mm, 875 mm, 1000 mm.

## A - Product type

- 00** - No Grille, duct connectable on both sides
- 01** - Grille on one side /Zinc/ + connection for duct available on either side
- 02** - Grille on one side /RAL 9003/ + connection for duct available on either side
- 11** - Grille on both sides /Zinc/
- 22** - Grille on both sides /RAL 9003/

## B - Type of Activation

- H0** - (Manual crank, no switches)
- H2** - (Manual crank, 2 switches 230V AC or 24V AC/DC)
- B230T** - (230V AC Belimo Actuator)
- B24T** - (24V AC/DC Belimo Actuator)
- BST0** - (230V AC Supply comm. unit & 24V AC/DC Belimo Actuator)
- B24T-SR** - (24V AC/DC Belimo Actuator, modulated 0...10 V)
- G230T** - (230V AC Gruner Actuator)
- G24T** - (24V AC/DC Gruner Actuator)
- GST0** - (24V AC/DC Supply comm. unit & 24V AC/DC Gruner Actuator)
- G24T-SR** - (24V AC/DC Gruner Actuator, modulated 0...10 V)

Available only with type 11 and 22:

- BSD230T** - (230V AC Supply unit & 24V AC/DC Smoke detector & 24V AC/DC Belimo Actuator)
- GSD230T** - (AC/DC 230 V Transformer & 24V AC/DC Smoke detector & 24V AC/DC Gruner Actuator)
- BSD24T** - (24V AC/DC Smoke detector & 24V AC/DC Belimo Actuator)
- GSD24T** - (24V AC/DC Smoke detector & 24V AC/DC Gruner Actuator)

NOTE:

Supply and communication units are placed outside of the damper body. When installing the damper into supporting construction the supply and communication unit must be mounted near the damper on the supporting construction.

### Example of the Ordering Code

F-B90-315×375-00-B230T

Multiblade fire damper with width of 315 mm and height of 375 mm, without a grille. Activated by a 230 V Belimo actuator.

# Product Handling

## Warning

Some damper parts can have sharp edges. To prevent injuries, use gloves when you install or move the damper. If you use or operate the damper incorrectly, there is a risk of:

- electric shock.
- fire.
- other damage.

Ensure that installation is performed by a trained person. The damper is made of boards and sheet metal. Thus considered fragile. Be careful when you move the damper. Two persons are necessary to move the smaller dampers and put them in the installation opening. It is necessary to move the bigger dampers with suitable lifting equipment (forklift, crane). Please follow both textual and graphic instructions.

### 1. Unpacking:

- Remove the packaging
- Remove the grille (if installed).

### 2. Functionality check:

- Unscrew two screws from mechanism cover.
- Pull the textile eyelet.
- Remove the mechanism cover.
- Perform damper's functionality check (see "Operation Manual" section).

### 3. Electrical connection:

- Make a hole in the rubber crossing for the wires as needed in top or bottom.
- Push the wires through the rubber crossing.
- Insert the mechanism cover back into its place.
- Fix the mechanism cover by previously removed screws.

### 4. Placing the damper:

- Prepare the opening and/or duct connection surfaces as per the desired installation type.
- Carefully lift the damper with the forklift, crane or manually.
- Place the damper in the opening or on duct connection surfaces.

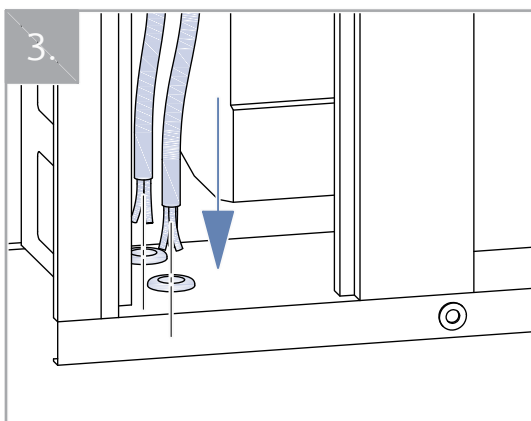
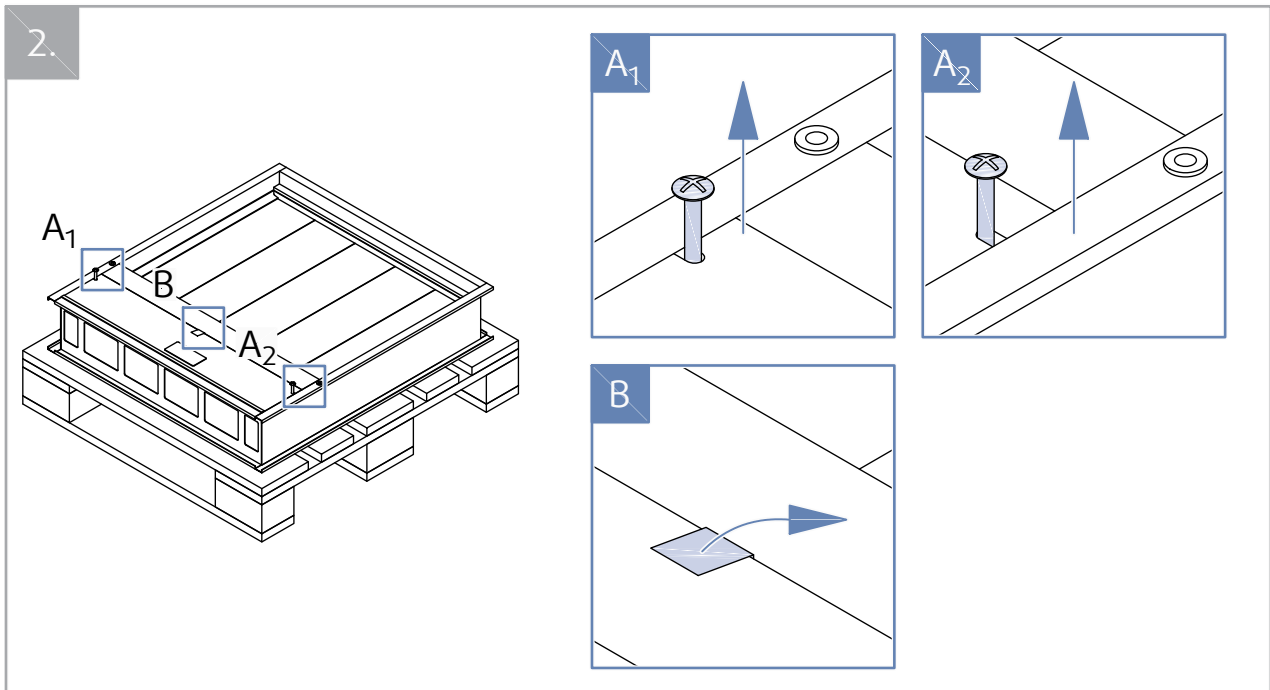
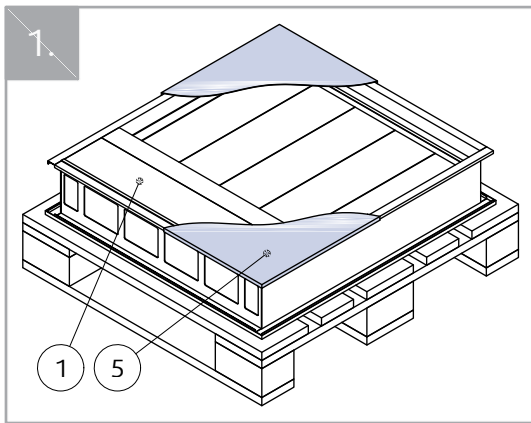
### 5. Fixing the damper:

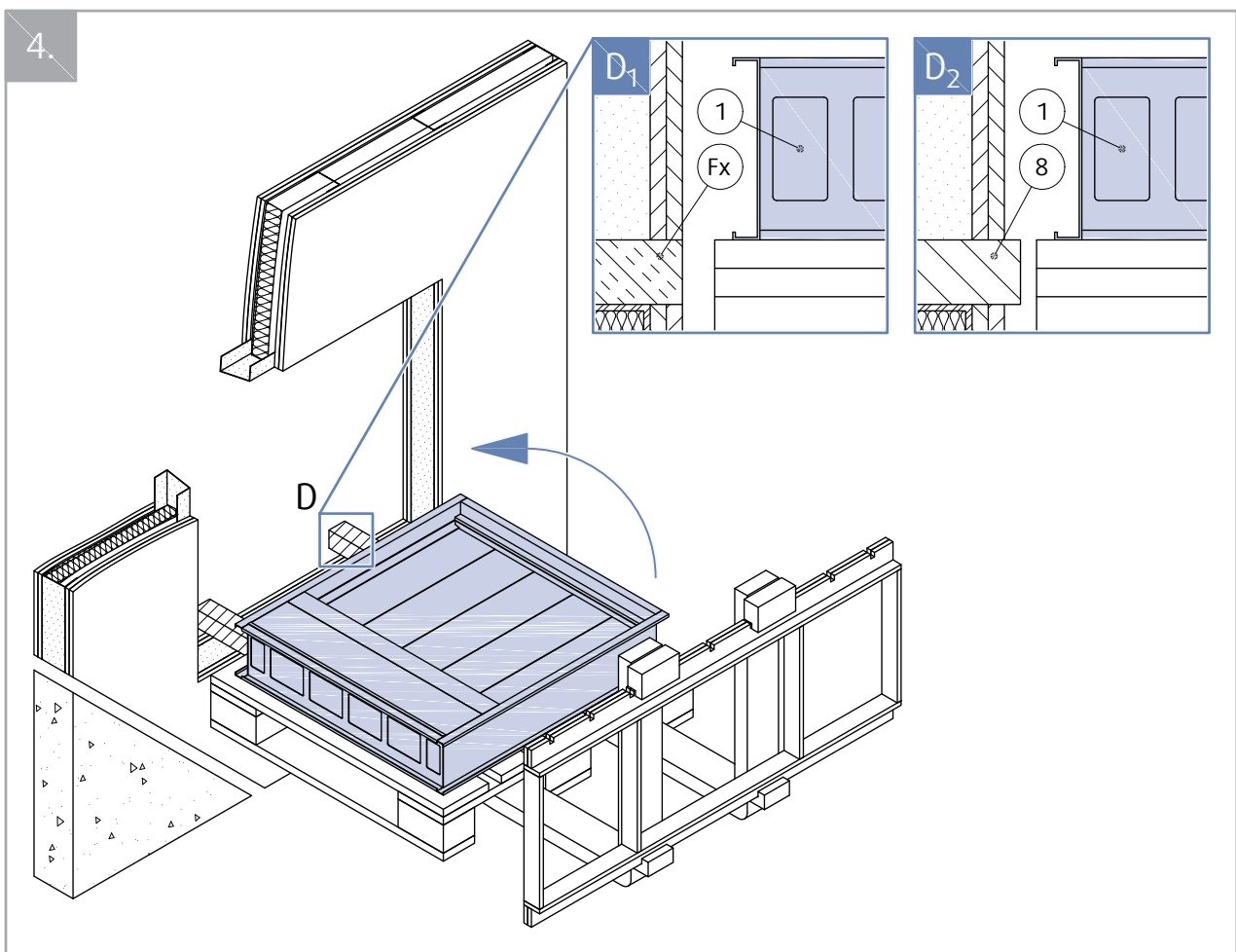
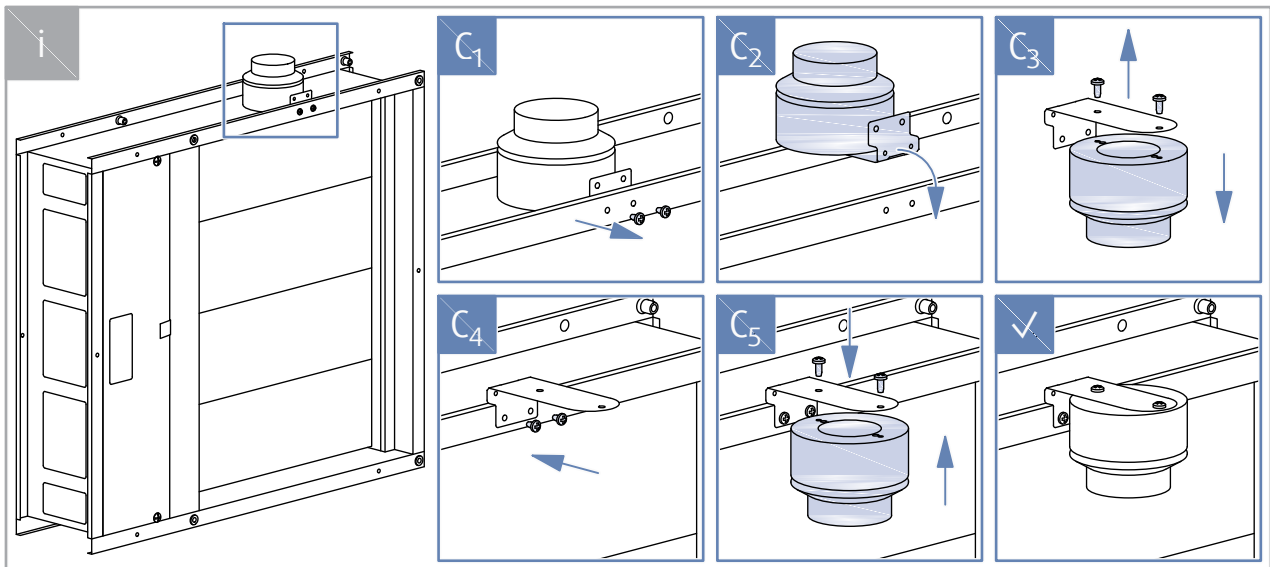
Note: Make sure to continually check the alignment of the damper against the supporting construction, opening or against the duct connection when performing the next steps.

- Fix the damper with supporting construction using suitable screws through the blade end-stop. For duct installations fix the damper using duct flange connections.
- Verify there is no skewing of the damper body by measuring diagonal dimensions of the blade area or the nominal dimension.
- As per chosen installation add filling to the gap between the damper body and the opening. For duct installations perform insulation around damper.

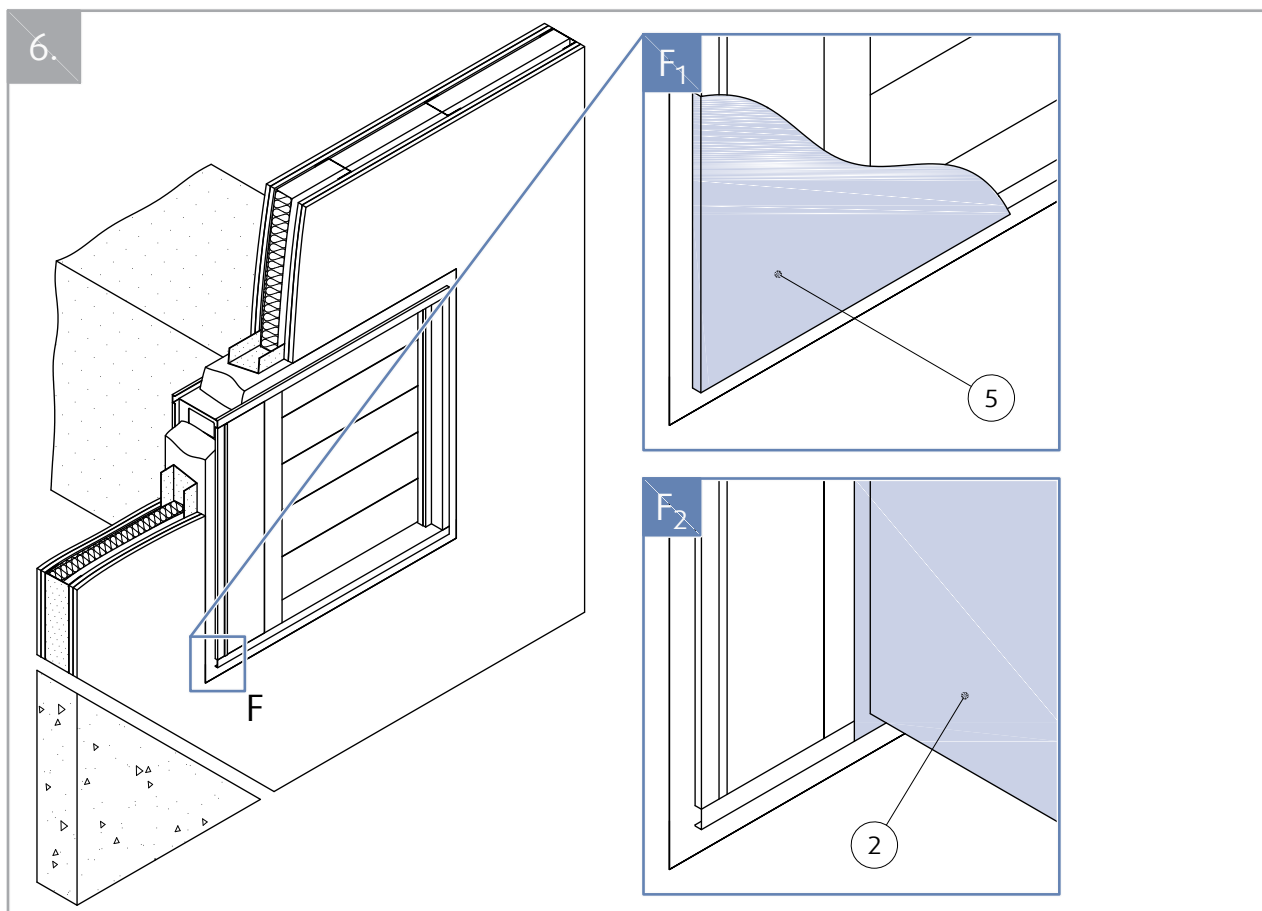
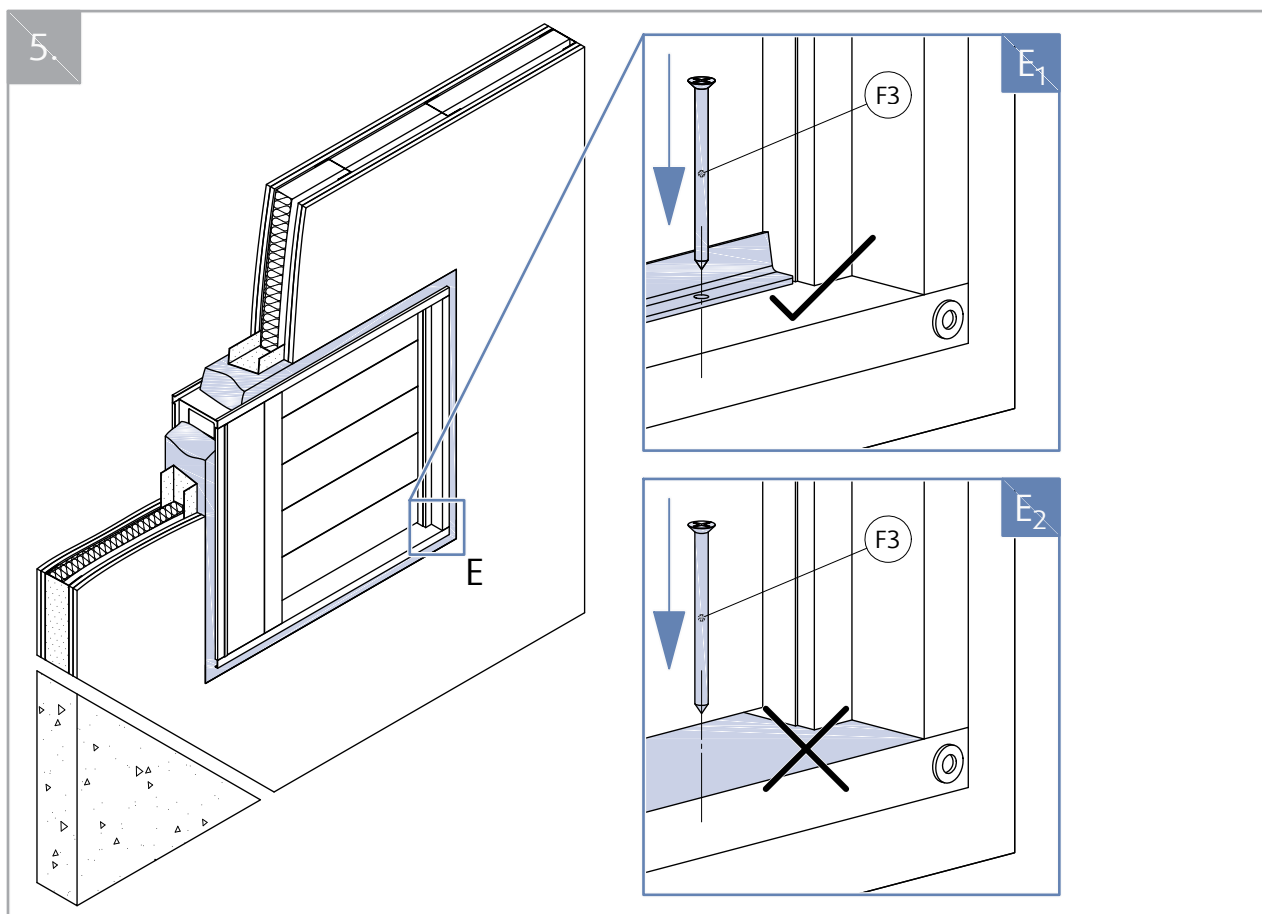
### 6. Finishing:

- Clean the damper from the debris and excess material from the filling or insulation.
- Perform damper's functionality check (see "Operation Manual" section).
- Connect the continuous duct or mount the removed grille.
- Create and/or fill out the Operating Journal included with the damper (Operating Journal can be also downloaded at [design.systemair.com](http://design.systemair.com))










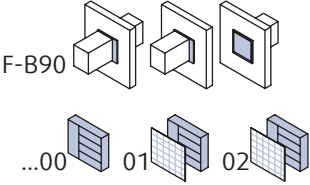
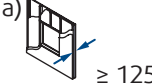
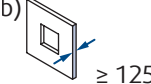
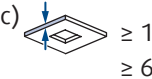
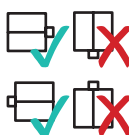
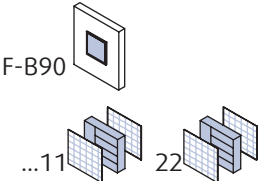
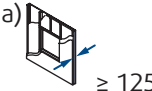
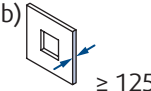
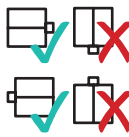

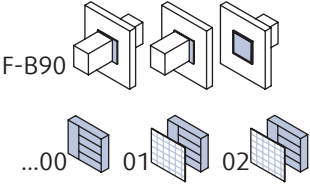
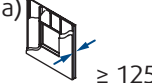
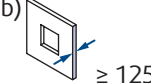
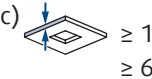
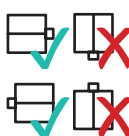
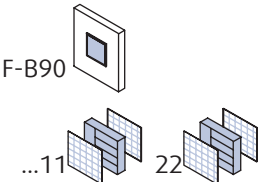
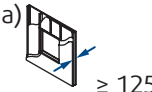
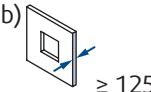
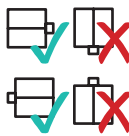

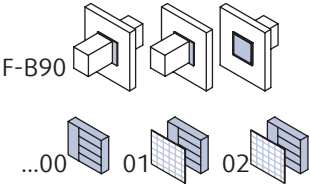
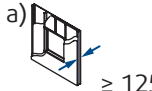
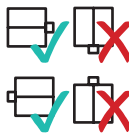
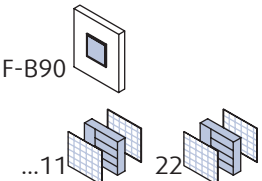
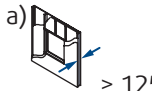
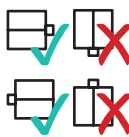
#### Legend for Product Handling

- 1** - Fire damper F-B90
- 2** - Connected sheet metal ductwork tested according to EN 1366-8 or EN 1366-9
- 3** - Filling
- 5** - Grille
- 8** - Support - brick, metal delivery or wood stud (not part of damper)
- Fx** - Filling per chosen installation
- F3** - Self-tapping screw size 4,2 ... 4,8; length 80 mm (e.g. DIN 7981C/DIN 7982C)

# Installation Methods

## Warning

- Obey the applicable regulations and standards of the country that this product will be installed in.
- Make sure that only approved/trained personnel performs the installation.
- Obey the written instructions and the illustrations in selected installation method.

|  |  |  |  |   |
|--|--|--|--|---|
| <br><b>1 Wet</b>    | <br>...00 01 02   | EI 60 ( $v_e h_o i \leftrightarrow o$ ) S<br>EI 90 ( $v_e h_o i \leftrightarrow o$ ) S                                 | a)  $\geq 125$<br>b)  $\geq 125$<br>c)  $\geq 125$<br>$\geq 620 \text{ (kg/m}^3\text{)}$  |    |
|  | <br>...11 22      | EI 60 ( $v_e i \leftrightarrow o$ ) S<br>EI 90 ( $v_e i \leftrightarrow o$ ) S<br>EI 120 ( $v_e i \leftrightarrow o$ ) | a)  $\geq 125$<br>b)  $\geq 125$  |    |
| <br><b>3 Soft</b> | <br>...00 01 02  | EI 60 ( $v_e h_o i \leftrightarrow o$ ) S<br>EI 90 ( $v_e h_o i \leftrightarrow o$ ) S                                 | a)  $\geq 125$<br>b)  $\geq 125$<br>c)  $\geq 125$<br>$\geq 620 \text{ (kg/m}^3\text{)}$ |   |
|  | <br>...11 22    | EI 60 ( $v_e i \leftrightarrow o$ ) S<br>EI 90 ( $v_e i \leftrightarrow o$ ) S<br>EI 120 ( $v_e i \leftrightarrow o$ ) | a)  $\geq 125$<br>b)  $\geq 125$  |  |
| <br><b>3F Fit</b> | <br>...00 01 02 | EI 60 ( $v_e i \leftrightarrow o$ ) S<br>EI 90 ( $v_e i \leftrightarrow o$ ) S   | a)  $\geq 125$  |  |
|  | <br>...11 22    | EI 60 ( $v_e i \leftrightarrow o$ ) S<br>EI 90 ( $v_e i \leftrightarrow o$ ) S<br>EI 120 ( $v_e i \leftrightarrow o$ ) | a)  $\geq 125$  |  |

## NOTES:

**1 Wet** - Wet Installation, using plaster/mortar/concrete filling

**3 Soft** - Soft installation, using mineral wool filing

**3F Fit** - Using mineral wool filing with no gap

**a)** - Flexible (plasterboard) wall

**b)** - Concrete/masonry/cellular concrete (rigid) wall

**c)** - Concrete/cellular concrete (rigid) floor/ceiling

$v_e$  - Vertically oriented damper

$h_o$  - Horizontally oriented damper

### Installation Rules

- The duct connected to the fire damper must be supported or hung in such a way that the damper does not carry its weight. The damper must not support any part of the surrounding construction or wall which could cause damage and consequent damper failure.
- Easy access to mechanism and internal parts during inspection must be considered during damper placement.
- The minimum distance between the fire damper bodies must be 200 mm (refer to Standard EN 1366-2).
- The minimum distance between the fire damper and the adjacent wall or ceiling must be 75 mm.
- If you install the F-B90 in a fire partition structure, do a check of the damper blades. Make sure that the damper blades in its closed position are in this structure.

There is a gap between the fire damper and the wall or ceiling opening:

- It is permitted to increase the gap size up to 1,5 times, but up to maximum of additional 30 mm. It is permitted to increase the mortar filled gap (Wet installation) up to 4 times, but up to maximum of 150 mm
- You can also decrease it to the smallest value possible that gives sufficient space to install the seal.
- If the grilles are not original, there must be a minimum clearance between the damper blade in its open position and self-standing grille. The clearance between the damper blade and these components must be 200 mm (refer to EN 1366-10).
- Lists of all permitted installation methods are provided in Handbook.

# Installation 1. Wet

## Procedure to Fill with Plaster, Mortar, or Concrete

1. Prepare the opening in the Wall:

**NOTE:** The dimensions of the openings are the result of the nominal dimensions of the damper with added clearance. The dimensions of the opening will be W1 and H1.

- a. Clean the surfaces of the opening. Make sure that the surfaces are even.
- b. Make sure that the flexible wall opening is reinforced (refer to Standards for plasterboard walls).

2. Obey the procedure in the "Product Handling" section to put the damper into the middle of the opening. Make sure that the damper blade is in the wall.

**CAUTION:** If the width of the damper is more than 600 mm, use a duct support in the damper during the installation procedure. This will prevent damage to the housing of the damper because of the weight of the filling.

3. Fill the area between the wall and the damper with gypsum plaster or mortar or concrete filling (F1).

**CAUTION:** Make sure that the primary parts of the damper do not become dirty. If they become dirty, they will not operate correctly.


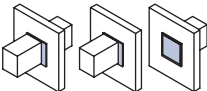
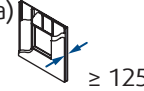
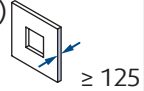
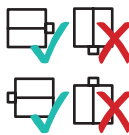
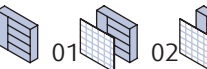
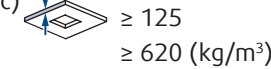


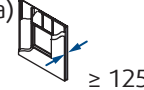
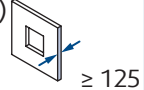
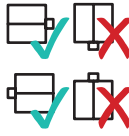
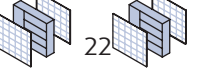
- a. To prevent damage, cover the primary parts during filing installation.
- b. To prevent leakage of the filling material, use paneling boards.

**NOTE:** Before you do the next steps, make sure that the plaster, mortar, or concrete filling becomes hard.

4. Remove the duct support from the damper when installed.
5. Perform damper's functionality check (see "Operation Manual" section).

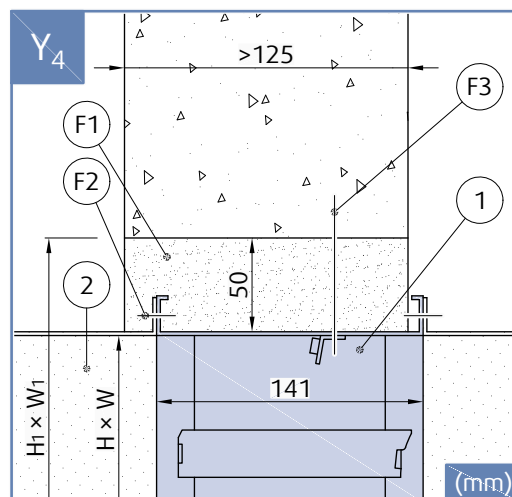
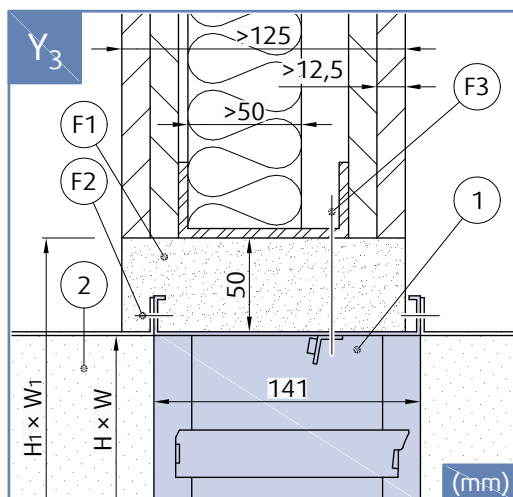
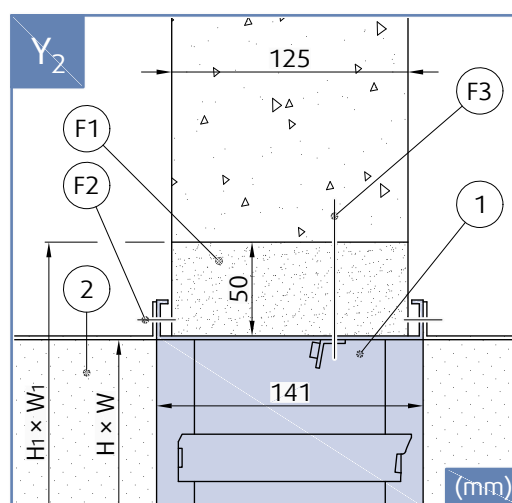
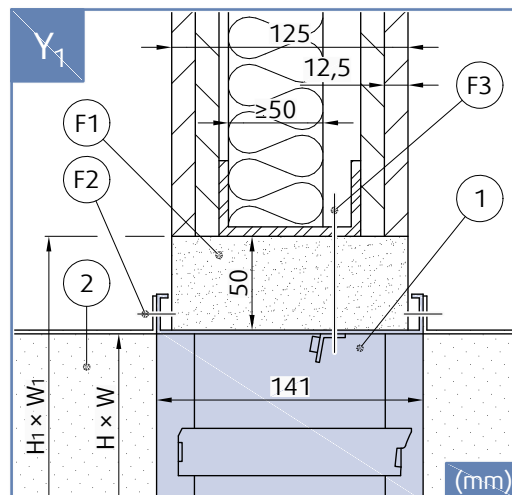
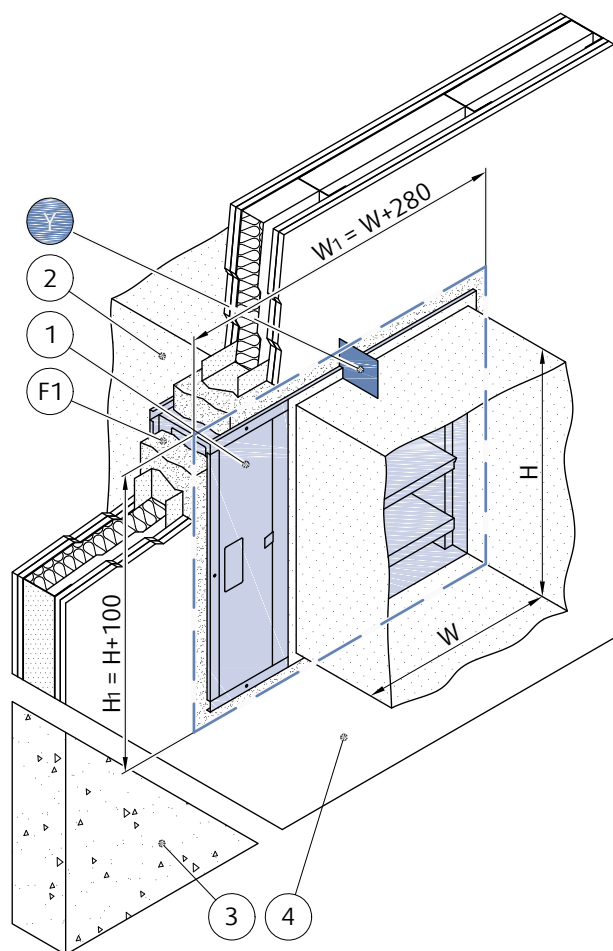
### Installation Distances:

The minimum distance between the damper body and the wall or ceiling must be 75 mm (refer to Standard EN 1366-2). If there is more than one component that go through a fire resistive wall, the minimum distance between the two damper bodies is 200 mm. This is applicable to distances between the damper body and foreign objects that are near and that go through the fire resistive wall.

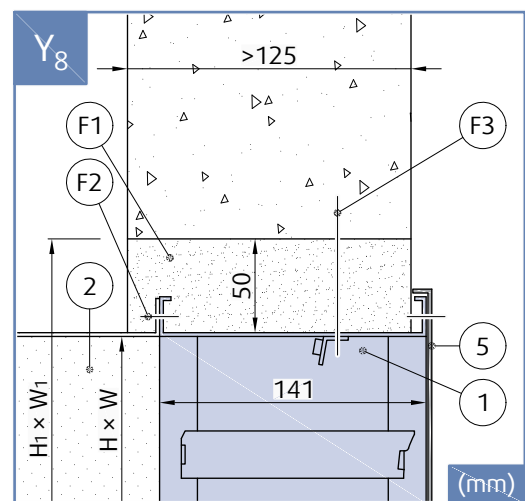
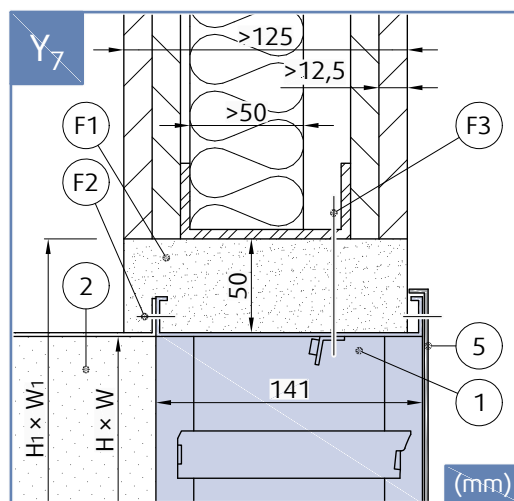
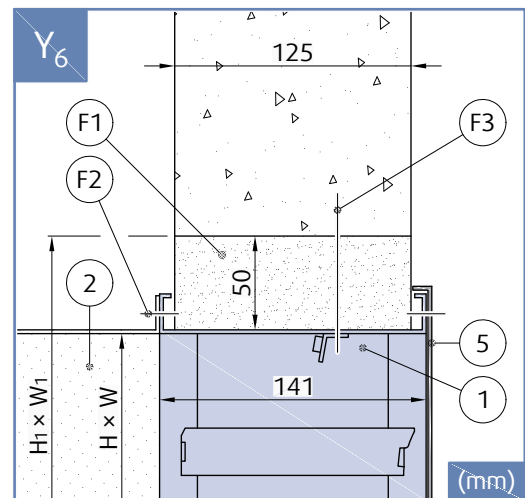
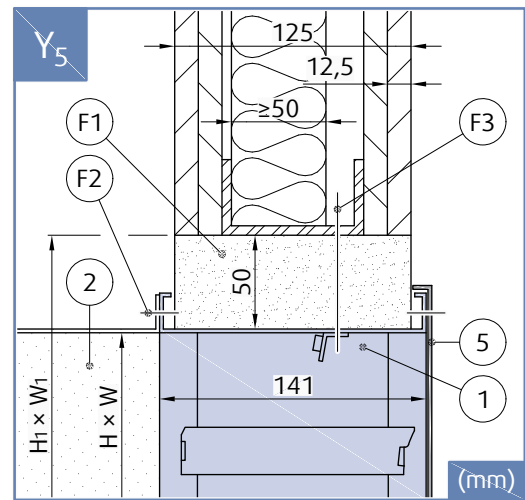
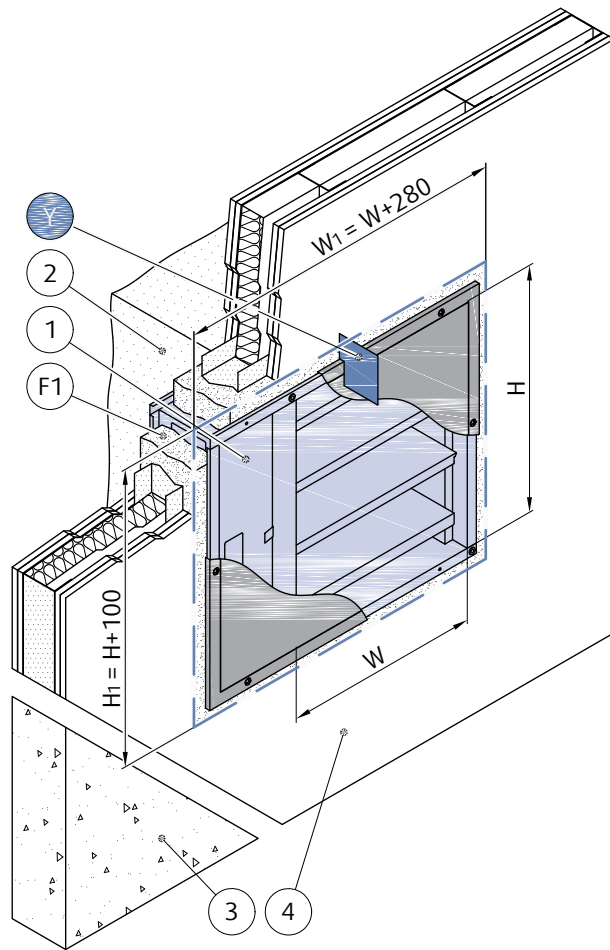
|  |  |  |  |   |   |
|--|--|--|--|---|---|
| <br>1 Wet | <br>F-B90       | EI 60 ( $v_e h_o i \leftrightarrow o$ ) S<br>EI 90 ( $v_e h_o i \leftrightarrow o$ ) S                                   |  a) $\geq 125$                                       |  b) $\geq 125$ |  |
|  | <br>...00 01 02 |  |  c) $\geq 125$<br>$\geq 620 \text{ (kg/m}^3\text{)}$ |   |   |
| <br>1 Wet | <br>F-B90       | EI 60 ( $v_e i \leftrightarrow o$ ) S<br>EI 90 ( $v_e i \leftrightarrow o$ ) S<br>EI 120 ( $v_e i \leftrightarrow o$ ) S |  a) $\geq 125$                                       |  b) $\geq 125$ |  |
|  | <br>...11 22    |  |  |   |   |

### NOTES:

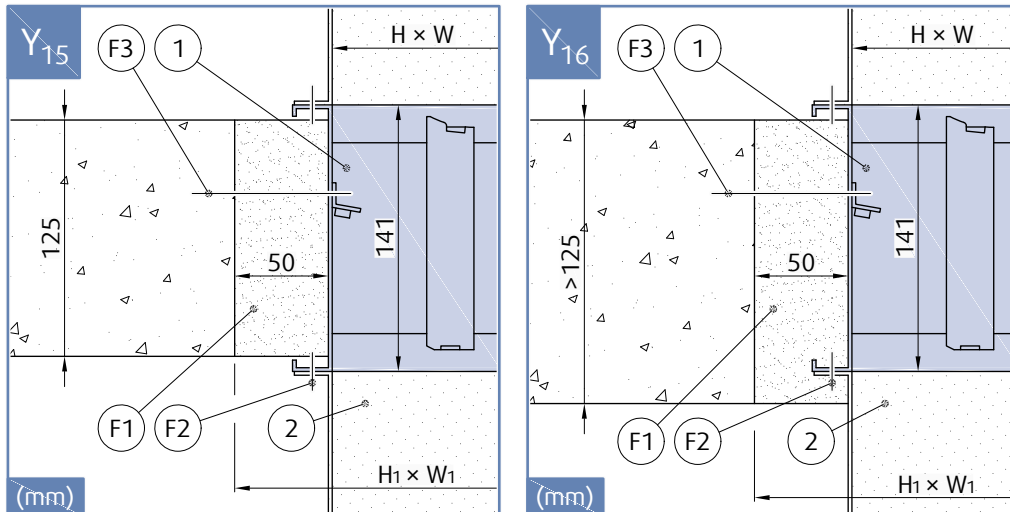
- a) - Flexible (plasterboard) wall  
 b) - Concrete/masonry/cellular concrete (rigid) wall  
 $v_e$  - Vertically oriented damper  
 $h_o$  - Horizontally oriented damper

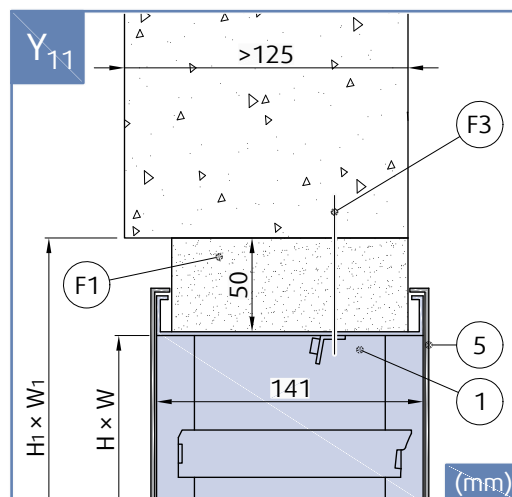
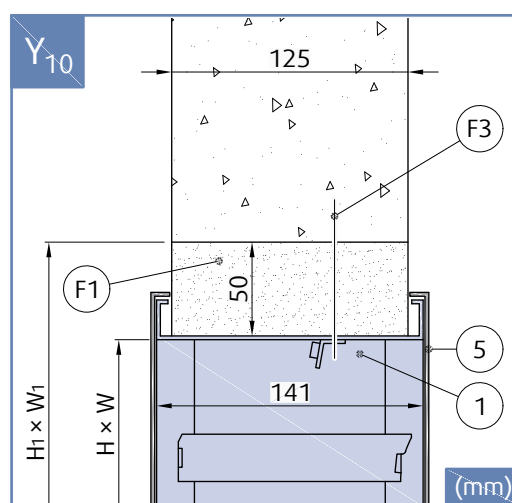
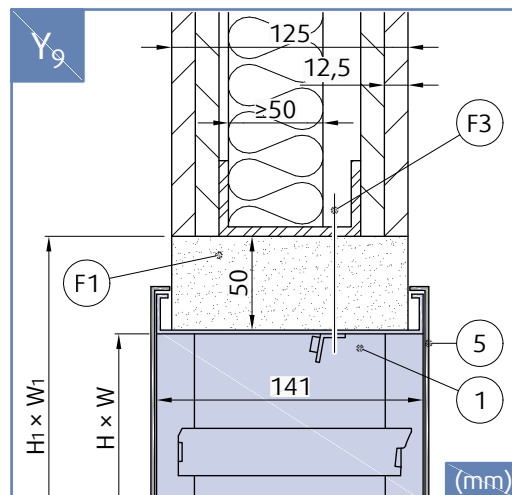
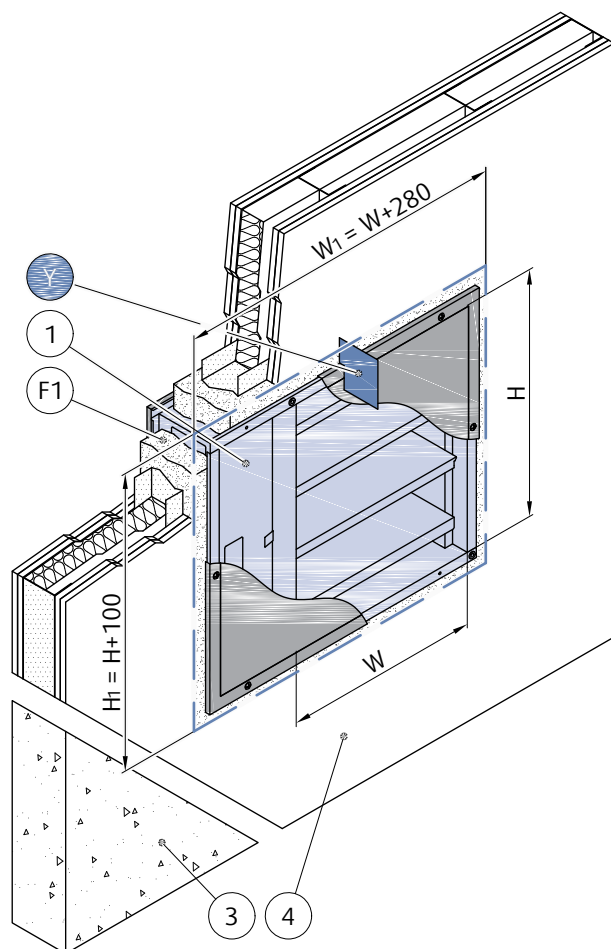


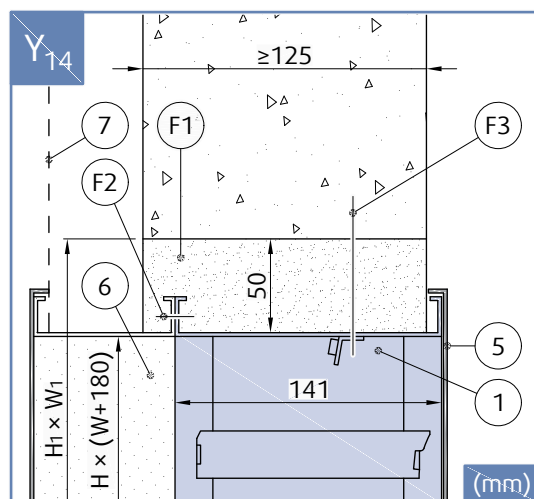
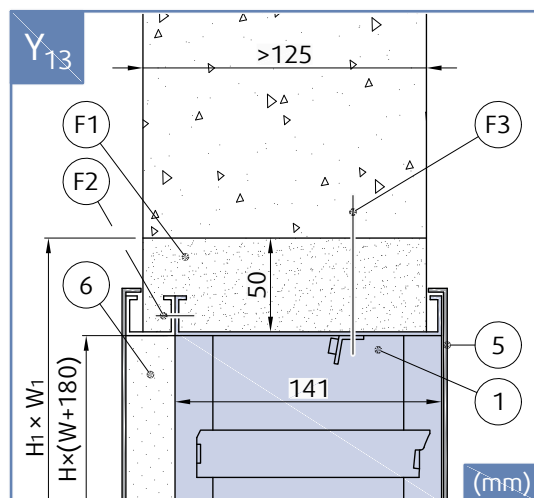
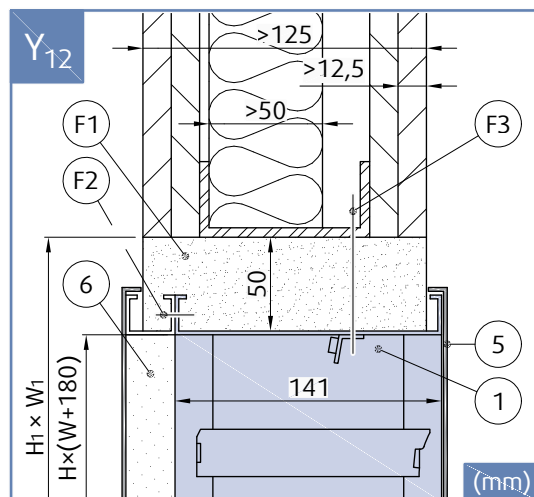




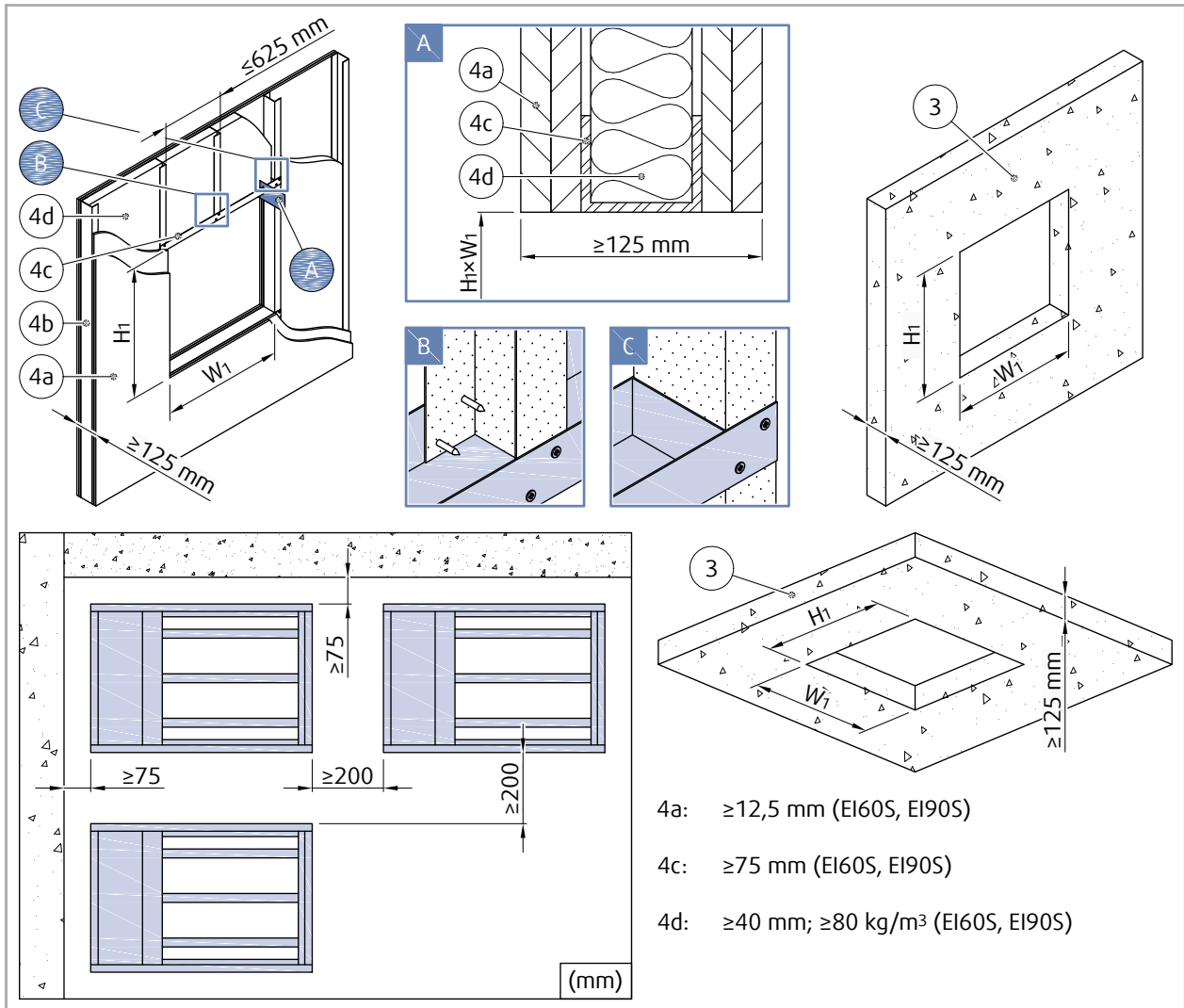
## Types 00 Installed in the Ceiling, Floor - Max Resistivity: EI90S







## Wall and/or Ceiling Opening Preparation and Minimum Distances



# Installation 3. Soft

## Procedure to Fill with Mineral Wool

1. Prepare the opening in the Wall:

**NOTE:** The dimensions of the openings are the result of the nominal dimensions of the damper with added clearance. The dimensions of the opening will be W1 and H1.

- a. Clean the surfaces of the opening. Make sure that the surfaces are even.
  - b. Make sure that the flexible wall opening is reinforced (refer to Standards for plasterboard walls).
2. Obey the procedure in the "Product Handling" section to put the damper into the middle of the opening. Make sure that the damper blade is in the wall.

**CAUTION:** If the width of the damper is more than 600 mm, use a duct support in the damper during the installation procedure. This will prevent damage to the housing of the damper because of the weight of the filling.


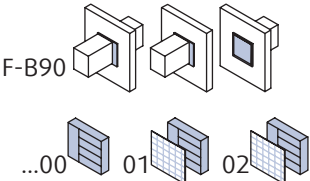
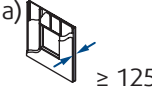
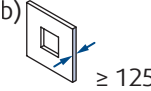
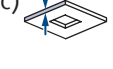
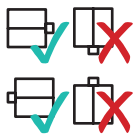
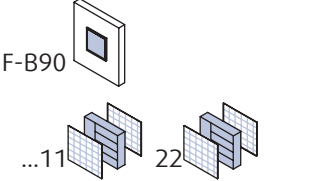

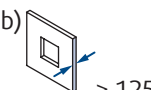
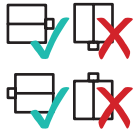
3. Prepare mineral wool segments (F4) with equal or higher density.
4. Use fire resistive coating (F5) on the wool segments.
5. Fill the area between the wall and the damper with mineral wool segments (F4).

**CAUTION:** Make sure that the filling will not cause deformation to the damper.

6. Use fire resistive coating (F5) on the wool segments and the wall surfaces as follows:
  - a. Mineral wool segments must be completely covered by the fire resistive coating.
  - b. All gaps between the mineral wool segments and damper casing or wall opening must be covered by the fire resistive coating

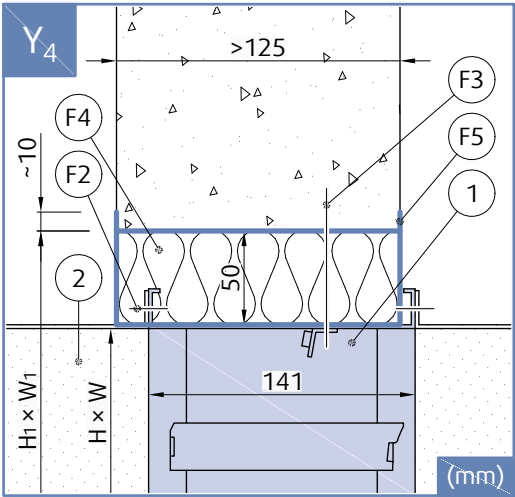
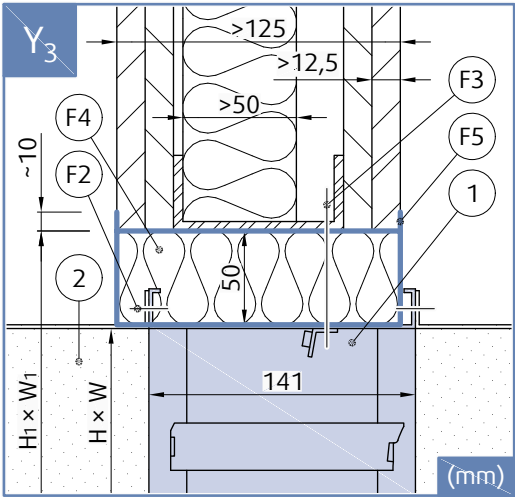
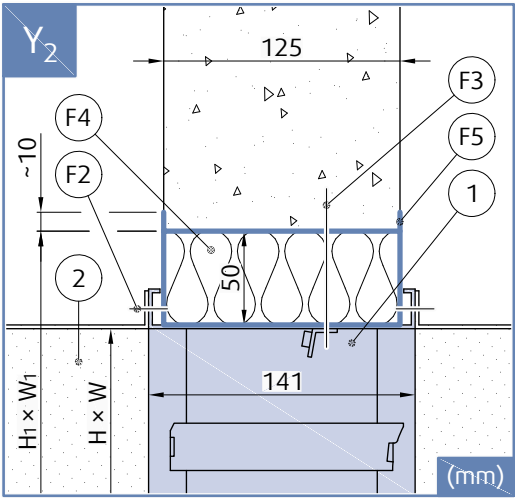
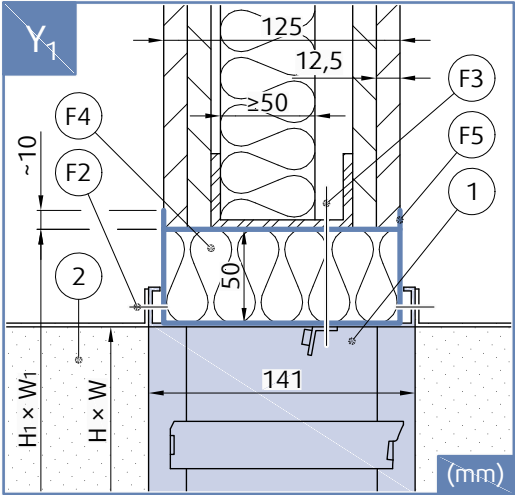
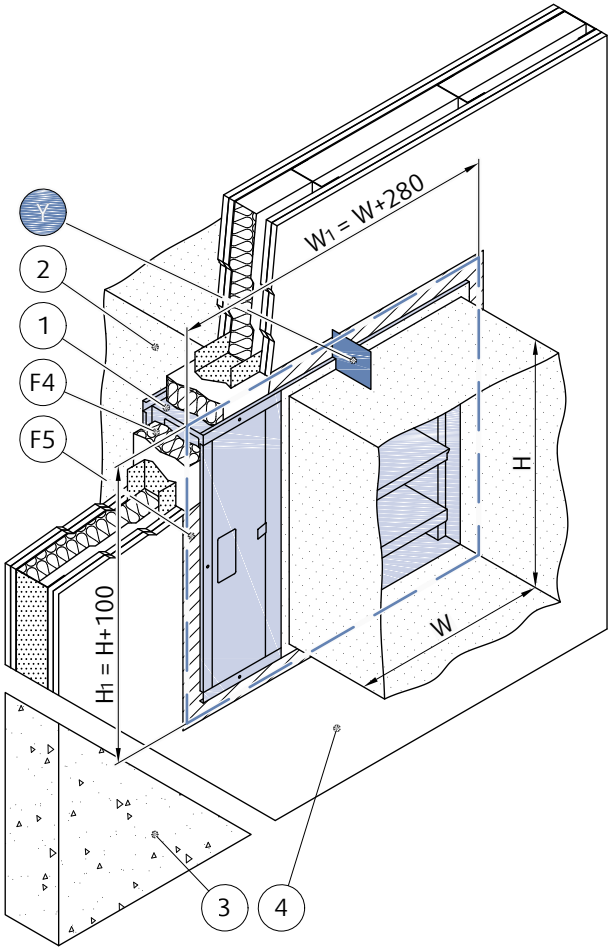
### Installation Distances:

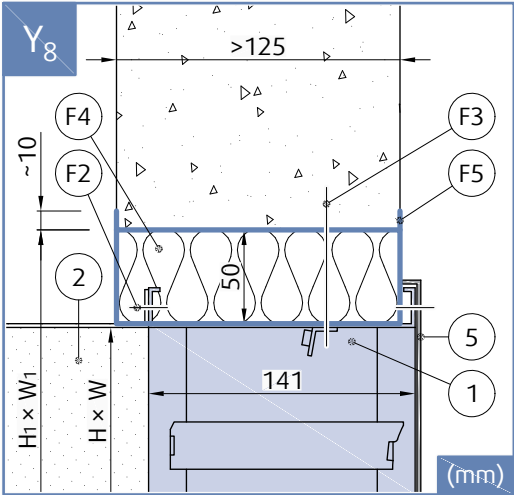
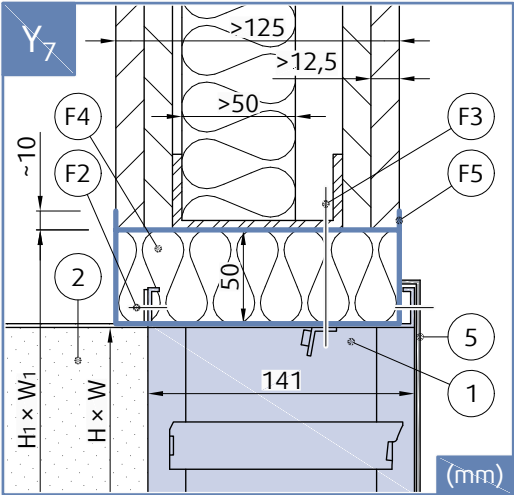
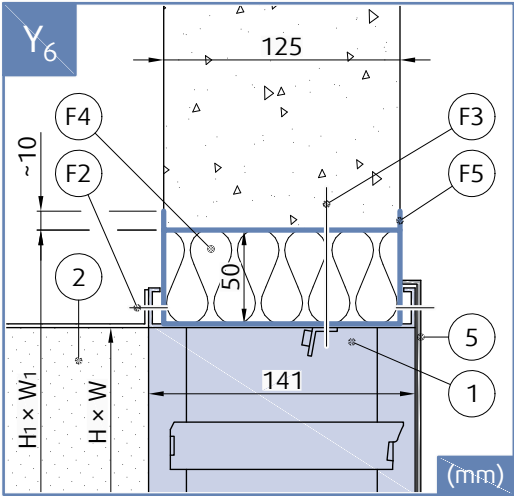
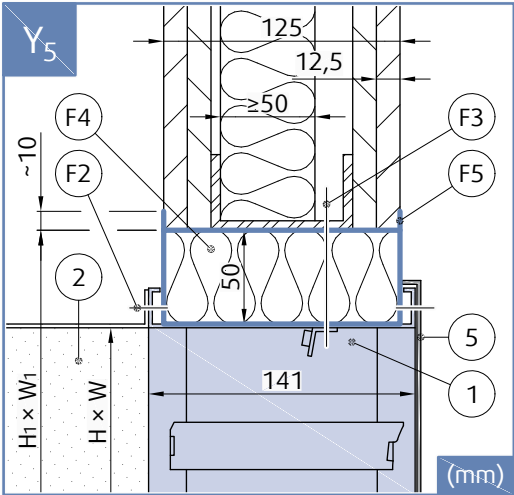
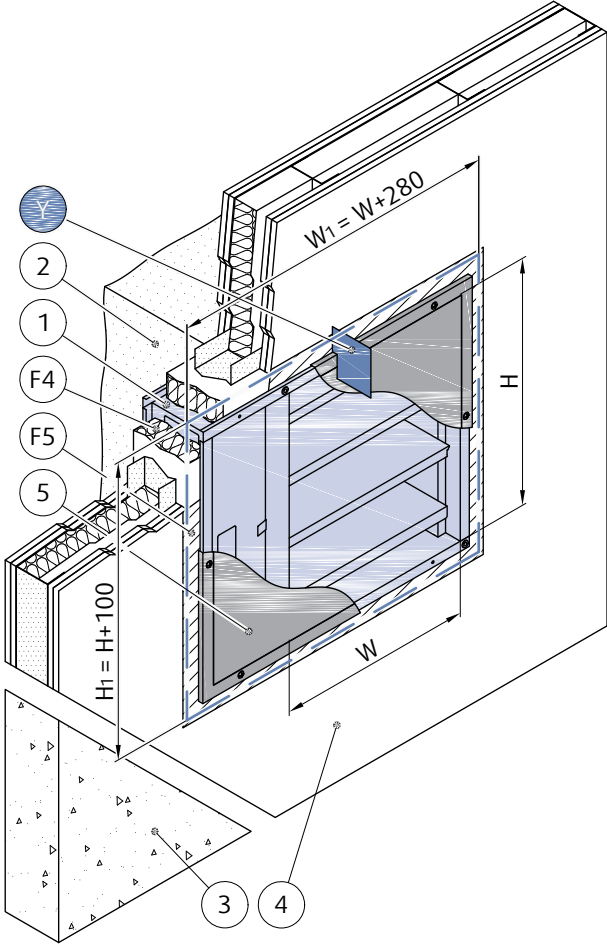
The minimum distance between the damper body and the wall or ceiling must be 75 mm (refer to Standard EN 1366-2). If there is more than one component that go through a fire resistive wall, the minimum distance between the two damper bodies is 200 mm. This is applicable to distances between the damper body and foreign objects that are near and that go through the fire resistive wall.

|   |   |  |   |   |
|---|---|--|---|---|
| <br>3 Soft | <br>F-B90<br>...00 01 02<br>...11 22 | EI 60 ( $v_e h_o i \leftrightarrow o$ ) S<br>EI 90 ( $v_e h_o i \leftrightarrow o$ ) S                                   | a)  $\geq 125$<br>b)  $\geq 125$<br>c)  $\geq 125$<br>$\geq 620 \text{ (kg/m}^3\text{)}$ |  |
|   | <br>F-B90<br>...11 22                | EI 60 ( $v_e i \leftrightarrow o$ ) S<br>EI 90 ( $v_e i \leftrightarrow o$ ) S<br>EI 120 ( $v_e i \leftrightarrow o$ ) S | a)  $\geq 125$<br>b)  $\geq 125$   |  |

### NOTES:

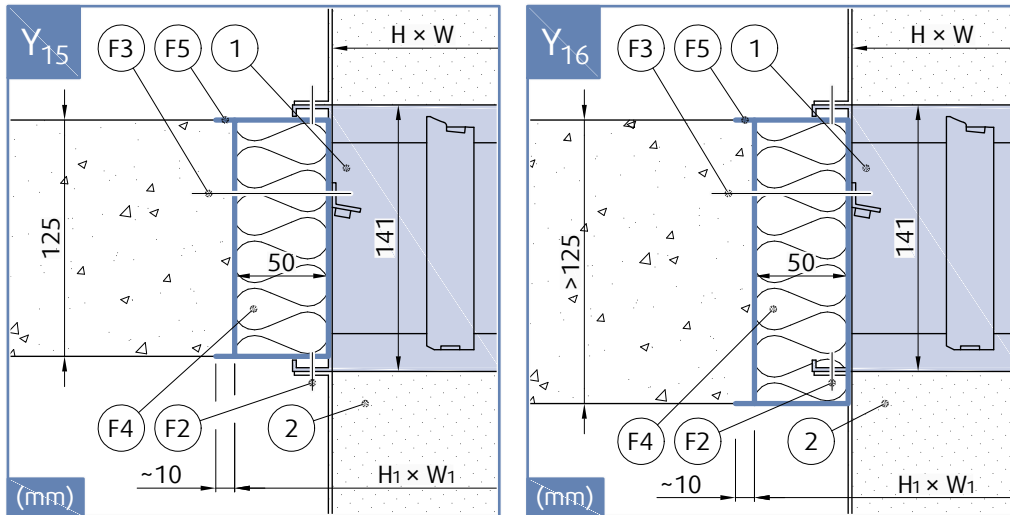
- a) - Flexible (plasterboard) wall
  - b) - Concrete/masonry/cellular concrete (rigid) wall
- $v_e$  - Vertically oriented damper  
 $h_o$  - Horizontally oriented damper

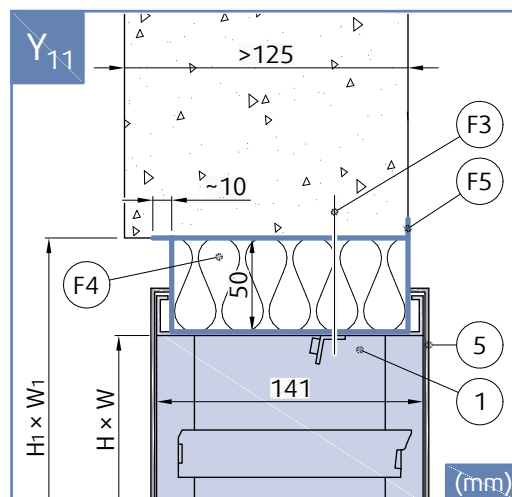
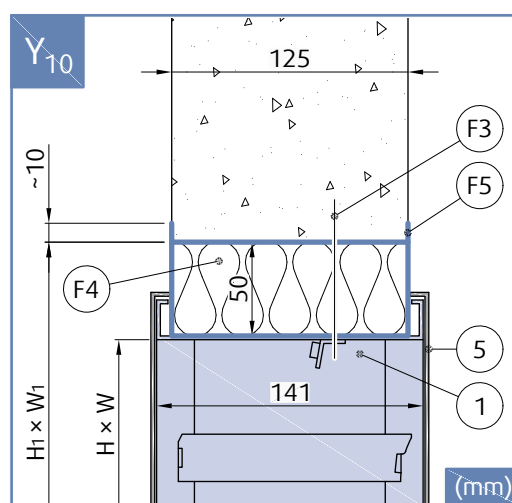
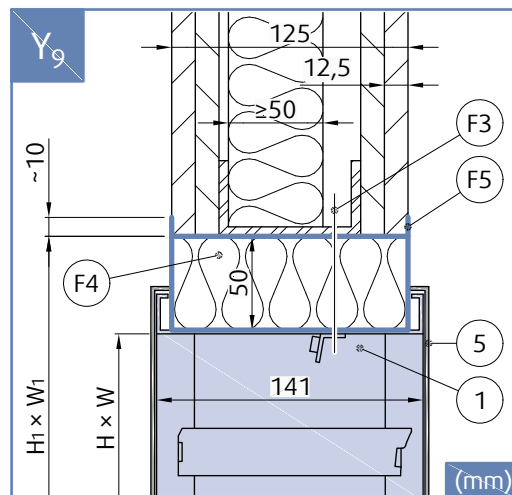
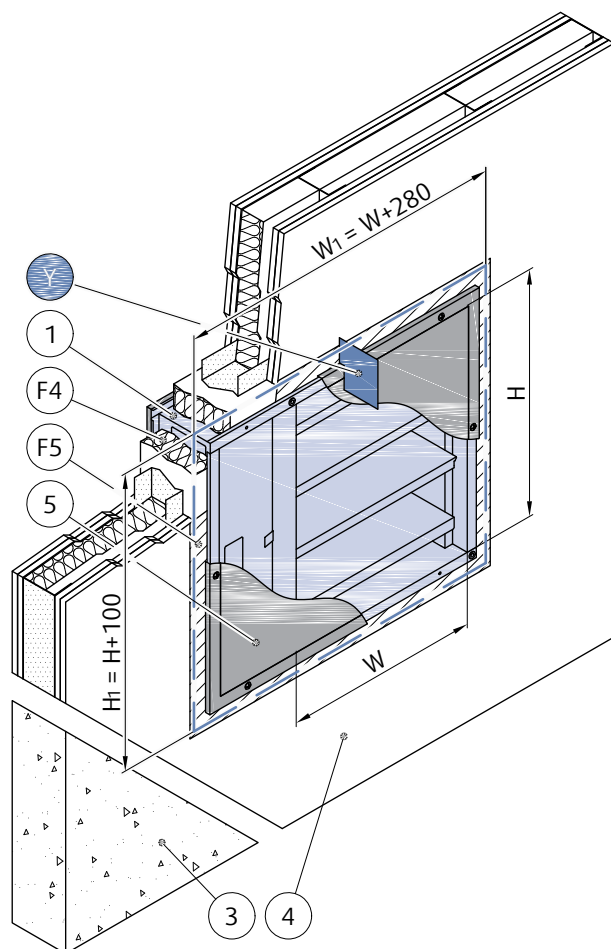


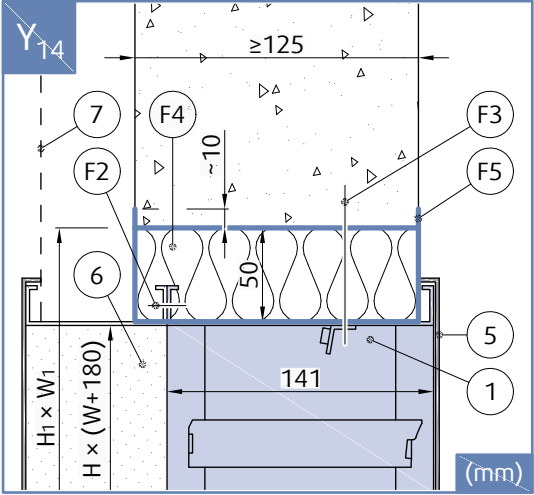
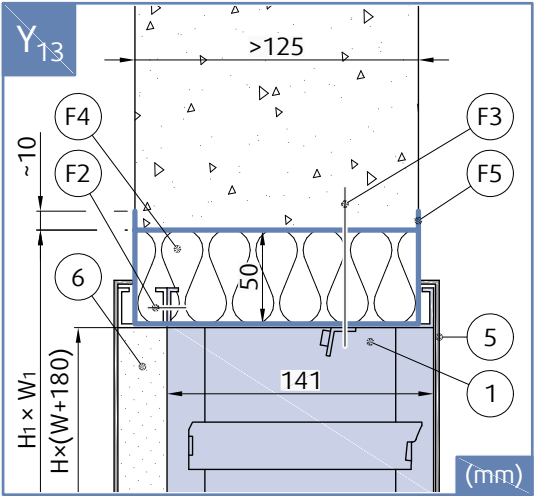
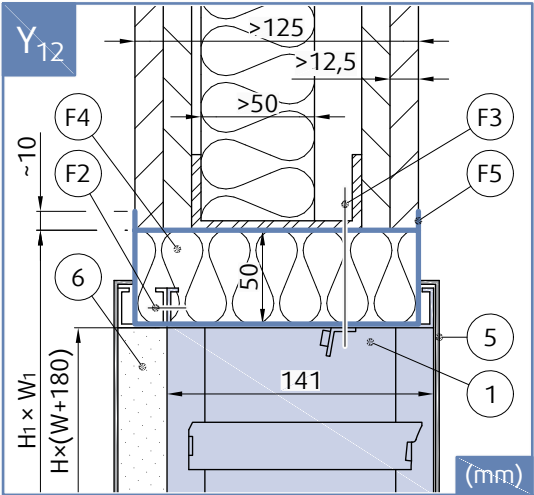
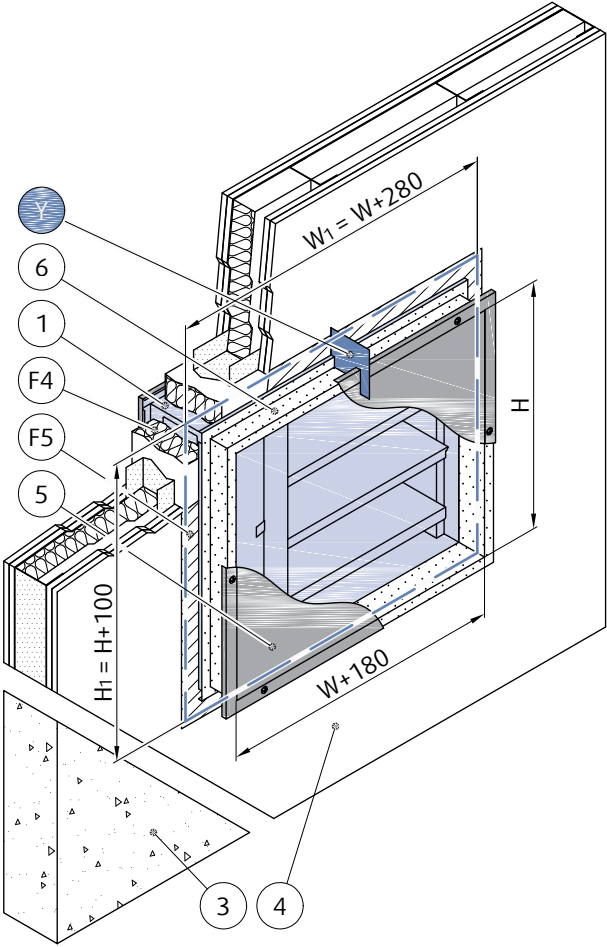




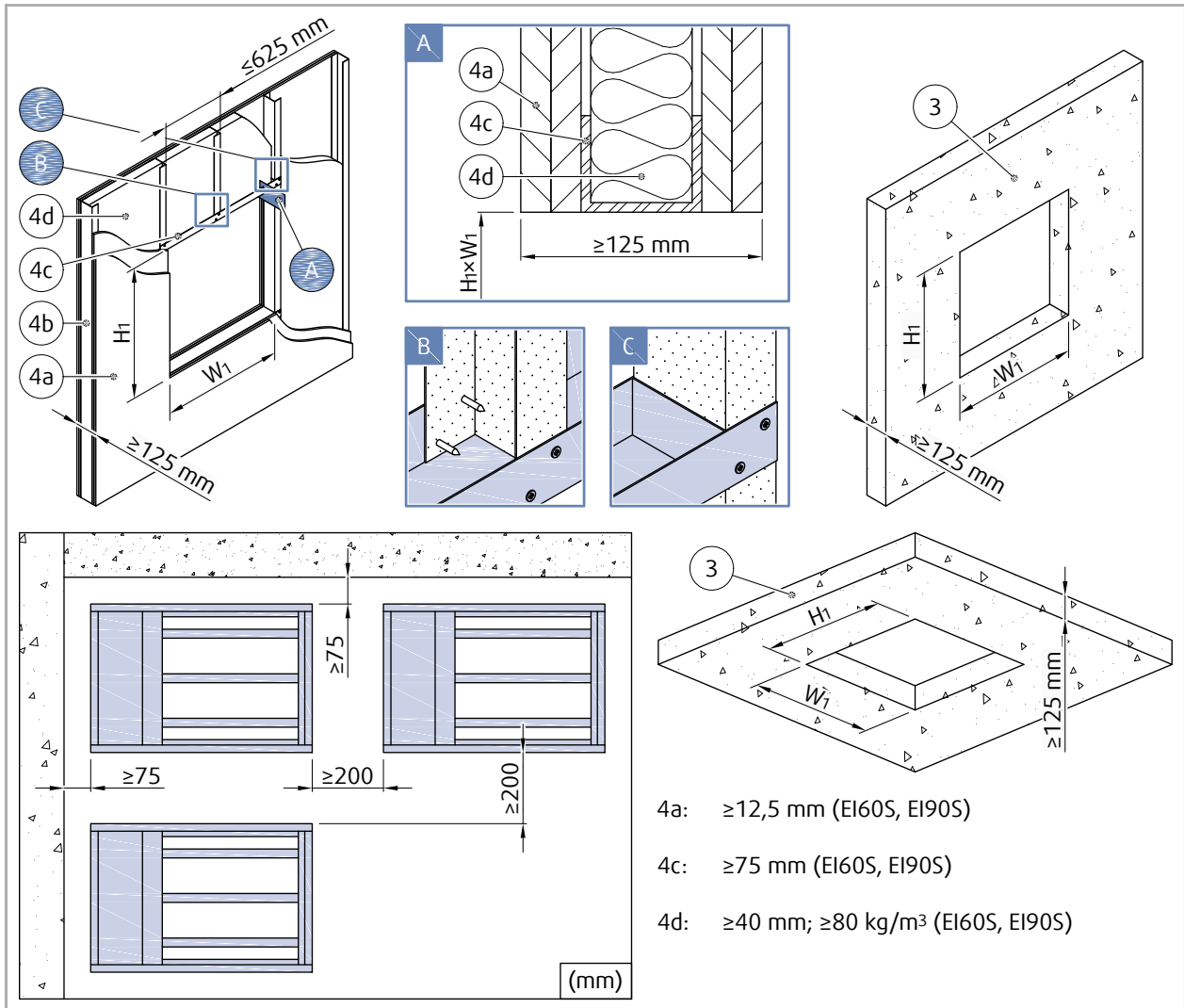
## Types 00 Installed in the Ceiling, Floor - Max Resistivity: EI90S







## Wall and/or Ceiling Opening Preparation and Minimum Distances



### Legend for Installation 3. SOFT

- 1** - Fire damper F-B90
- 2** - Connected metal ductwork
- 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
- 5** - Grille
- 6** - Connected extension piece
- 7** - Façade surface (noncombustible at least 200 mm around duct/damper)
- F2** - Screw M6×20-25 mm, maximum fixing torque is 4,5 Nm
- F3** - Self-tapping screw size 4,2 ... 4,8; length 80 mm (e.g. DIN 7981C/DIN 7982C)
- F4** - Mineral wool filling (min. 140 kg/m<sup>3</sup>)
- F5** - Fire resistive coating Isover BSF (ISOVER)
- Y** - Cutting plane

# Installation 3F. Fit

## Procedure to Install the Damper with No Gap and Fill with Mineral Wool

1. Prepare the opening in the Wall:

**NOTE:** The dimensions of the openings are the result of the nominal dimensions of the damper with added clearance. The dimensions of the opening will be W1 and H1.

- a. Clean the surfaces of the opening. Make sure that the surfaces are even.
- b. Make sure that the flexible wall opening is reinforced (refer to Standards for plasterboard walls).

2. Obey the procedure in the "Product Handling" section to put the damper into the middle of the opening. Make sure that the damper blade is in the wall.

**CAUTION:** If the width of the damper is more than 600 mm, use a duct support in the damper during the installation procedure. This will prevent damage to the housing of the damper because of the weight of the filling.


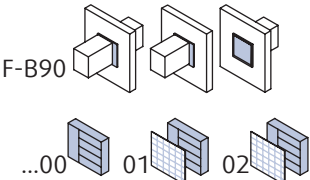
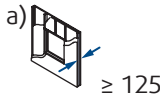
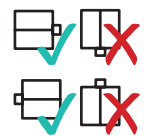
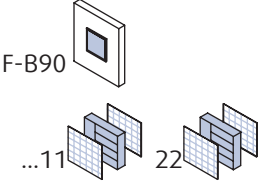
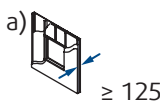
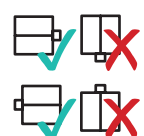
3. Prepare mineral wool segments (F4) with equal or higher density.
4. Use fire resistive coating (F5) on the wool segments.
5. Fill the area between the metal beams and the damper with mineral wool segments (F4).

**CAUTION:** Make sure that the filling will not cause deformation to the damper. Then fix the wall metal beams in place.

6. Mineral wool segments must be completely covered by the fire resistive coating (F5).
7. Apply gypsum board panels in two layers on both sides of the metal beams with edges starting from the damper flanges.
8. All gaps between the mineral wool segments and damper casing or gypsum boards must be covered by the fire resistive coating

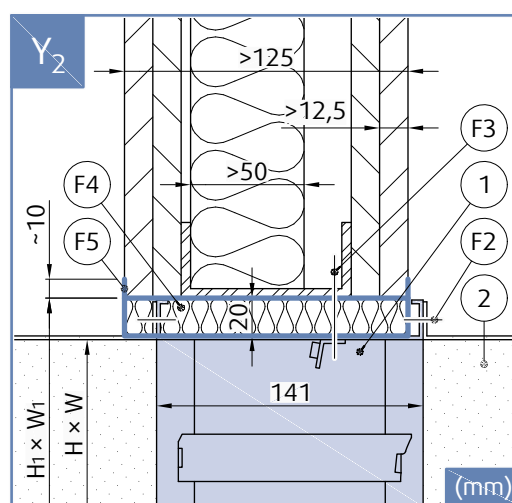
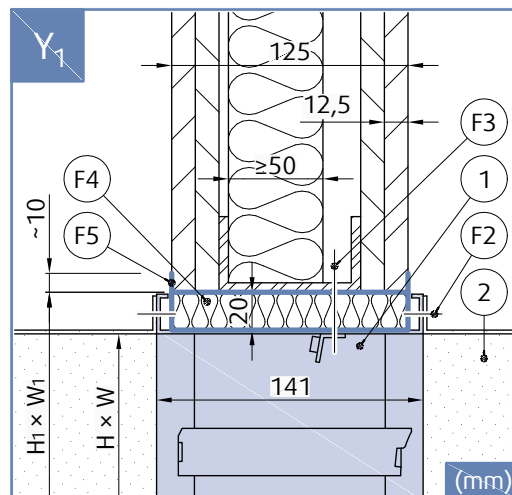
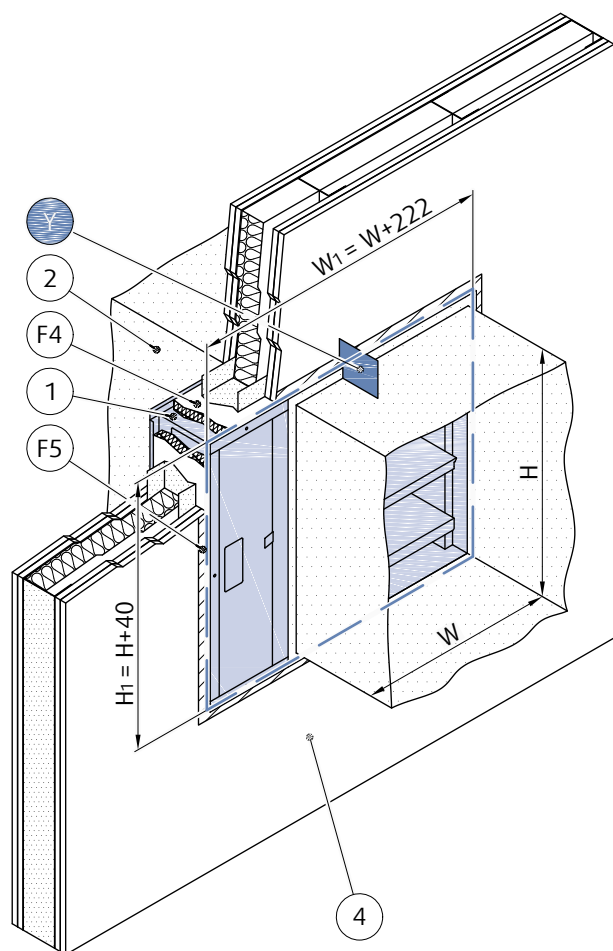
### Installation Distances:

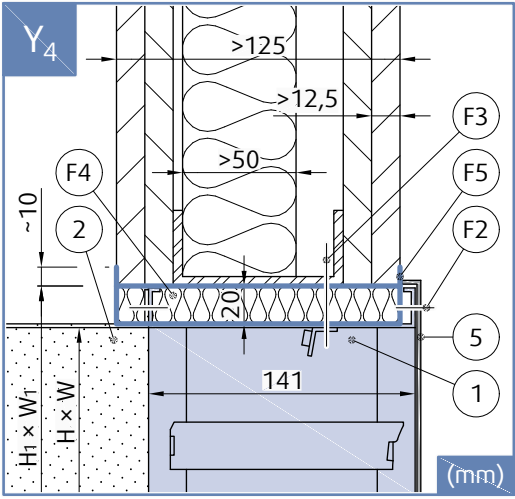
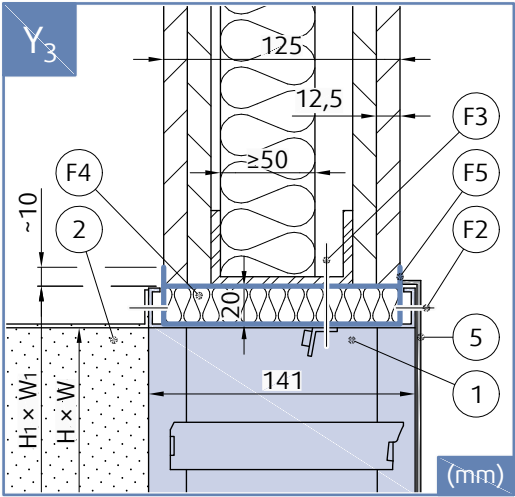
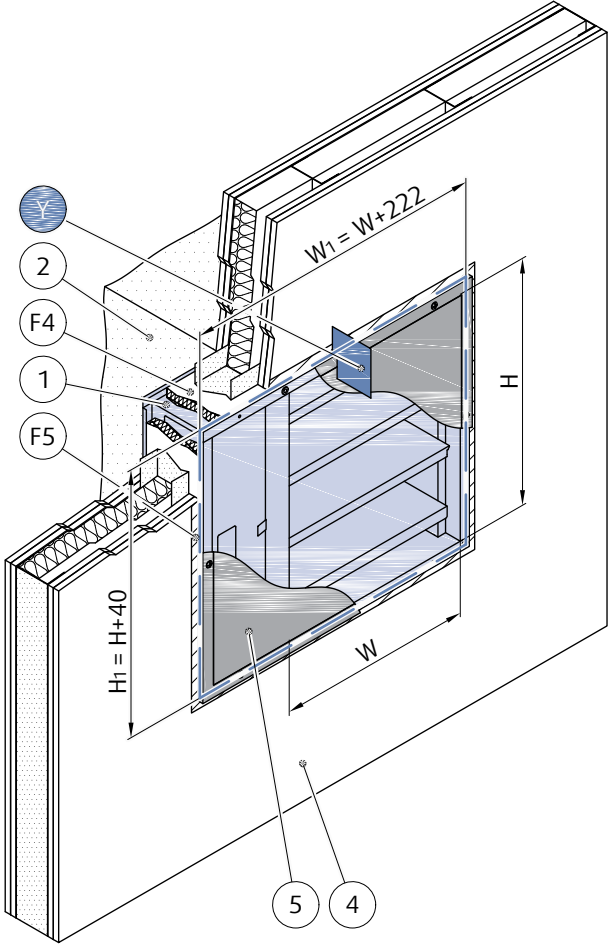
The minimum distance between the damper body and the wall or ceiling must be 75 mm (refer to Standard EN 1366-2). If there is more than one component that go through a fire resistive wall, the minimum distance between the two damper bodies is 200 mm. This is applicable to distances between the damper body and foreign objects that are near and that go through the fire resistive wall.

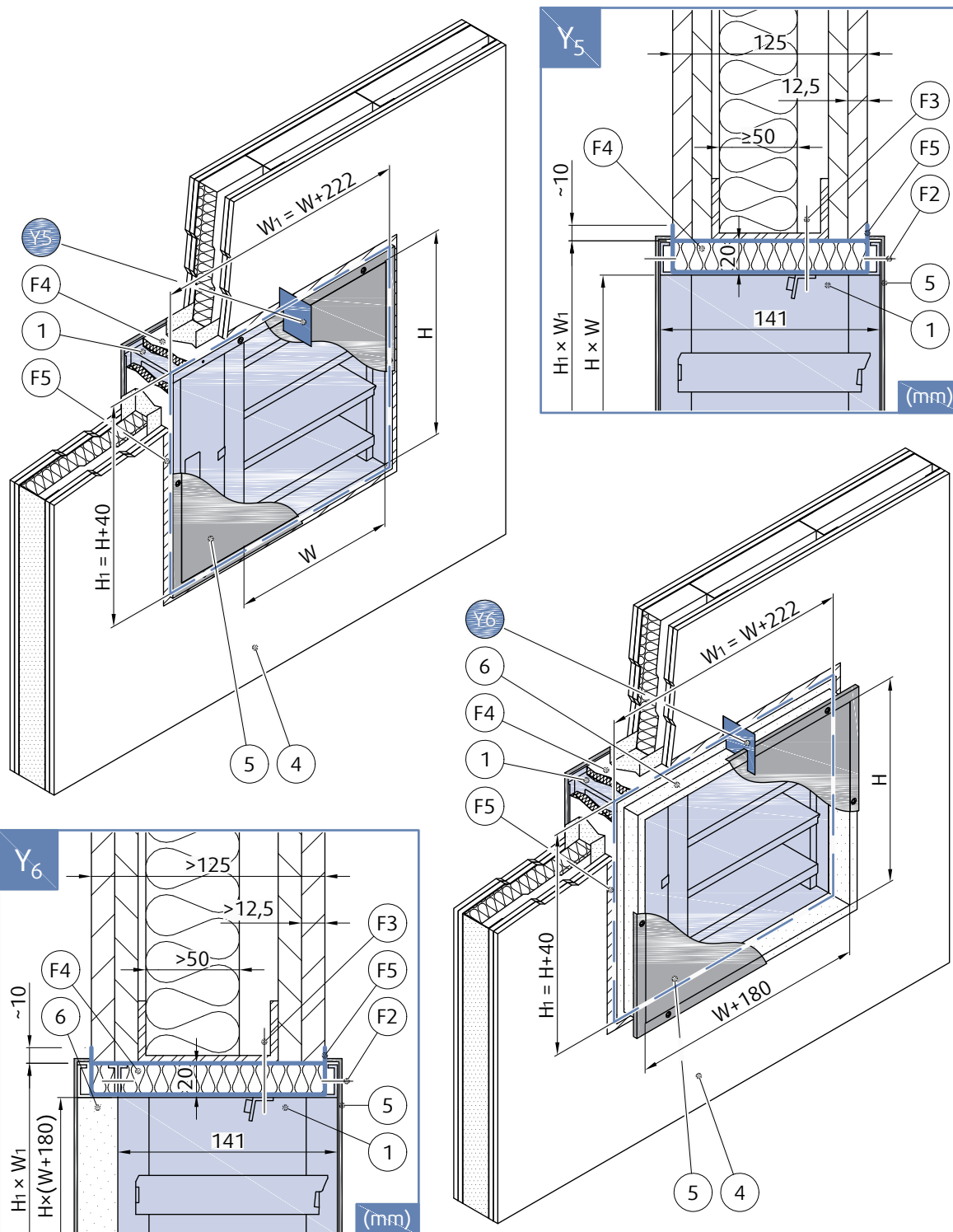
|   |   |  |  |   |
|---|---|--|--|---|
| <br>3F Fit | <br>F-B90<br>...00 01 02 | EI 60 ( $v_e i \leftrightarrow o$ ) S<br>EI 90 ( $v_e i \leftrightarrow o$ ) S   | <br>a) $\geq 125$ |  |
|   | <br>F-B90<br>...11 22    | EI 60 ( $v_e i \leftrightarrow o$ ) S<br>EI 90 ( $v_e i \leftrightarrow o$ ) S<br>EI 120 ( $v_e i \leftrightarrow o$ ) | <br>a) $\geq 125$ |  |

### NOTES:

- a) - Flexible (plasterboard) wall
  - b) - Concrete/masonry/cellular concrete (rigid) wall
- $v_e$  - Vertically oriented damper

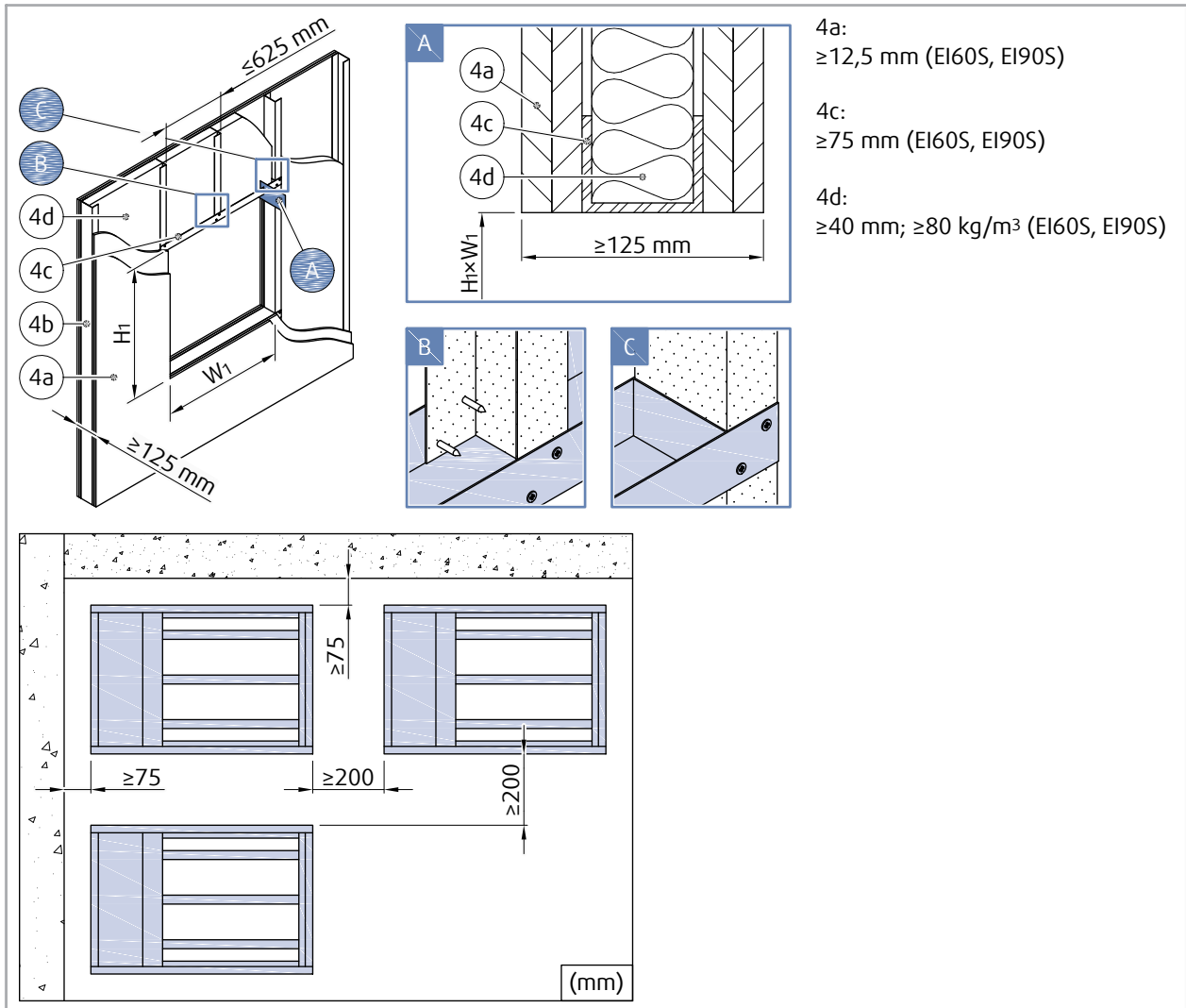








## Wall and/or Ceiling Opening Preparation and Minimum Distances



### Legend for Installation 3F. Fit

- 1 - Fire damper F-B90
- 2 - Connected metal ductwork
- 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
- 5 - Grille
- 6 - Connected extension piece
- 7 - Façade surface (noncombustible at least 200 mm around duct/damper)
- F2 - Screw M6×20-25 mm, maximum fixing torque is 4,5 Nm
- F3 - Self-tapping screw size 4,2 ... 4,8; length 80 mm (e.g. DIN 7981C/DIN 7982C)
- F4 - Mineral wool filling (min. 140 kg/m<sup>3</sup>)
- F5 - Fire resistive coating Isover BSF (ISOVER)
- Y - Cutting plane

# Electrical Connections

## WARNING

- Risk of electric shock.
- Stop the power supply before you do work on electrical equipment.
- Only approved electricians can do work on the electrical system.

To access the electrical parts of this product follow instructions in "Product Handling" section.

## Electrical parameters for type of activation and actuator

| F-B90 (B230T ... BSD24T)                      |  |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|---|--|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| T   NVF  <br>PC   A                           |  | W (mm)   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|   |  | 150  | 175 | 200 | 225 | 250 | 280 | 300 | 315 | 350 | 355 | 400 | 450 | 500 | 550 | 560 | 600 | 630 | 650 | 700 | 710 | 750 | 800 |
| H (mm)  | 250  | B230T   AC 230 V, 50/60 Hz   6,5 VA   BFL230-T                               |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|   |  | B24T   AC (50/60 Hz)/DC 24 V   4 VA   BFL24-T                                |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|   | 375  | BST0   AC 230 V, 50/60 Hz   11 VA   BFL24-T-ST + BKN230-24                   |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|   |  | B24T-SR   AC (50/60 Hz)/DC 24 V   6,5 VA   BFL24-SR-T                        |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|   | 500  | BSD230T   AC 230 V, 50/60 Hz   11 VA   BFL24-T-ST + BKN230-24-C-MP + ORS144K |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|   |  | BSD24T   AC (50/60 Hz)/DC 24 V   6 VA   BFL24-T + ORS144K                    |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|   | 625  |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|   | 750  | B230T   AC 230 V, 50/60 Hz   10 VA   BFN230-T                                |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| B24T   AC (50/60 Hz)/DC 24 V   6 VA   BFN24-T |  |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 875   | BST0   AC 230 V, 50/60 Hz   11 VA   BFN24-T-ST + BKN230-24                   |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|   | B24T-SR   AC (50/60 Hz)/DC 24 V   8,5 VA   BFN24-SR-T                        |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
| 1000  | BSD230T   AC 230 V, 50/60 Hz   11 VA   BFN24-T-ST + BKN230-24-C-MP + ORS144K |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|   | BSD24T   AC (50/60 Hz)/DC 24 V   8 VA   BFN24-T + ORS144K                    |  |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |

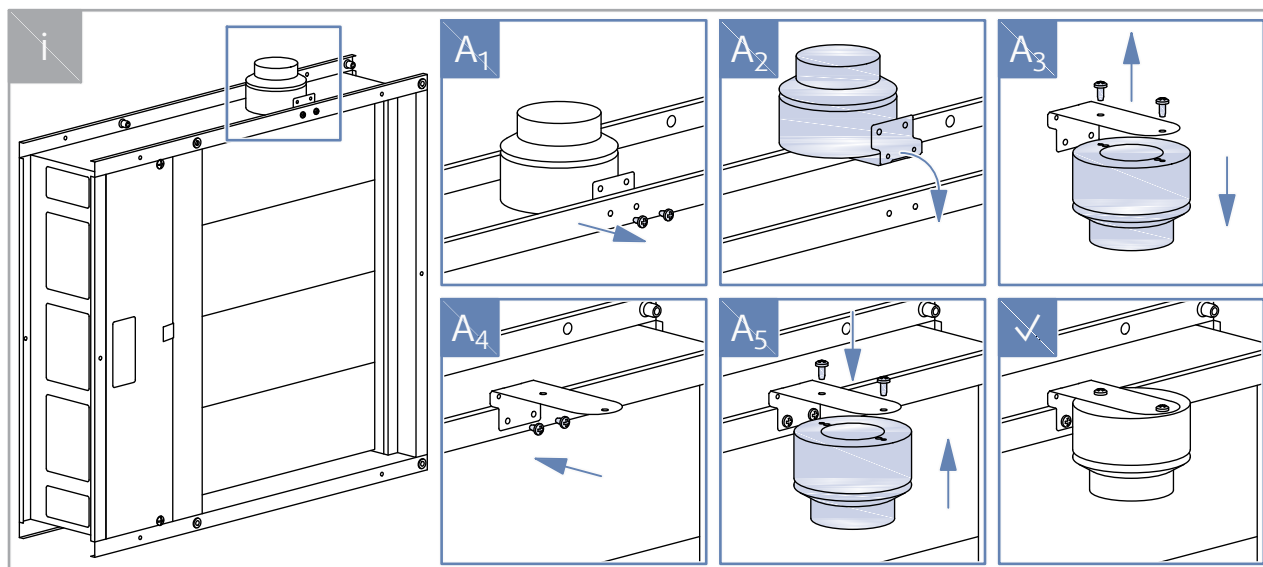
B230T | AC 230 V, 50/60 Hz | 11 VA | BF230-T (BF230-TN-2)  
 B24T | AC (50/60 Hz)/DC 24 V | 10 VA | BF24-T (BF24-TN-2)  
 BST0 | AC 230 V, 50/60 Hz | 11 VA | BF24-T-ST (BF24-TN-ST) + BKN230-24  
 B24T-SR | AC (50/60 Hz)/DC 24 V | 9,5 VA | BF24-SR-T (BF24-SR-TN)  
 BSD230T | AC 230 V, 50/60 Hz | 11 VA | BF24-T-ST (BF24-TN-ST) + BKN230-24-C-MP + ORS144K  
 BSD24T | AC (50/60 Hz)/DC 24 V | 11 VA | BF24-T (BF24-TN-2) + ORS144K

| F-B90 (G230T ... GSD24T) |   |  |     |     |     |     |     |     |     |     |     |   |     |     |     |     |     |     |     |     |     |     |     |  |  |
|--------------------------|---|--|-----|-----|-----|-----|-----|-----|-----|-----|-----|---|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|--|
| T   NVF  <br>PC   A      |   | W (mm)   |     |     |     |     |     |     |     |     |     |   |     |     |     |     |     |     |     |     |     |     |     |  |  |
|                          |   | 150  | 175 | 200 | 225 | 250 | 280 | 300 | 315 | 350 | 355 | 400   | 450 | 500 | 550 | 560 | 600 | 630 | 650 | 700 | 710 | 750 | 800 |  |  |
| H (mm)                   | 250   | -  | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   |  |  |
|                          | 375   | G230T   AC 230 V, 50/60 Hz   9,5 VA   340TA-230-05 ...<br>G24T   AC (50/60 Hz)/DC 24 V   9 VA   340TA-024-05 ...                         |     |     |     |     |     |     |     |     |     |   |     |     |     |     |     |     |     |     |     |     |     |  |  |
|                          | 500   | GST0   AC (50/60 Hz)/DC 24 V   11 VA   340TA-24-05 ... ST01 + fs-UFC24-2<br>G24T-SR   AC (50/60 Hz)/DC 24 V   7,5 VA   340CTA-024-05 ... |     |     |     |     |     |     |     |     |     |   |     |     |     |     |     |     |     |     |     |     |     |  |  |
|                          | 625   | GSD230T   AC 230 V, 50/60 Hz   11 VA   340TA-024-05 ... ST01 + BKN230-24-C-MP + ORS144K  |     |     |     |     |     |     |     |     |     |   |     |     |     |     |     |     |     |     |     |     |     |  |  |
|                          | 750   | GSD24T   AC (50/60 Hz)/DC 24 V   11 VA   340TA-024-05... + ORS144K   |     |     |     |     |     |     |     |     |     | G230T   AC 230 V, 50/60 Hz   11,5 VA   360TA-230-12 ...<br>G24T   AC (50/60 Hz)/DC 24 V   7 VA   360TA-024-12 ... |     |     |     |     |     |     |     |     |     |     |     |  |  |
|                          | 875   | GST0   AC (50/60 Hz)/DC 24 V   11 VA   360TA-024-12 ... ST01 + fs-UFC24-2<br>G24T-SR   AC (50/60 Hz)/DC 24 V   7 VA   360CTA-024-12 ...  |     |     |     |     |     |     |     |     |     |   |     |     |     |     |     |     |     |     |     |     |     |  |  |
| 1000                     | GSD230T   AC 230 V, 50/60 Hz   11 VA   360TA-024-12 ... ST01 + BKN230-24-C-MP + ORS144K<br>GSD24T   AC (50/60 Hz)/DC 24 V   9 VA   360TA-024-12 ... + ORS144K |  |     |     |     |     |     |     |     |     |     |   |     |     |     |     |     |     |     |     |     |     |     |  |  |

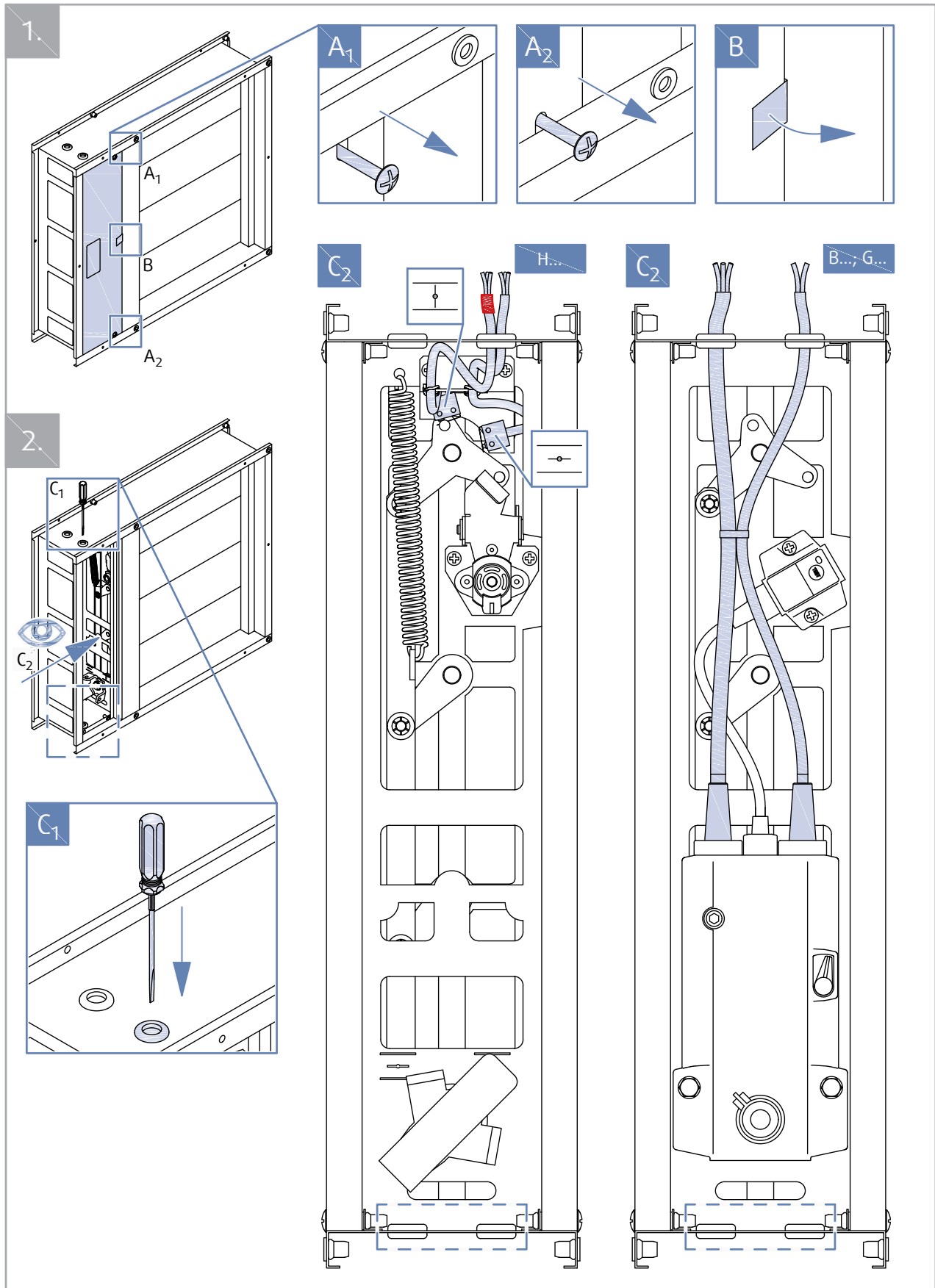
Notes:

T | NVF | PC | A - Activation Type | Nominal Voltage and Frequency | Power Consumption for wire sizing | Actuator

Placing the smoke detector into position



# Wire preparation



### Type of activation H0

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

### Type of activation H2

IMPORTANT: Danger of electric shock!

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

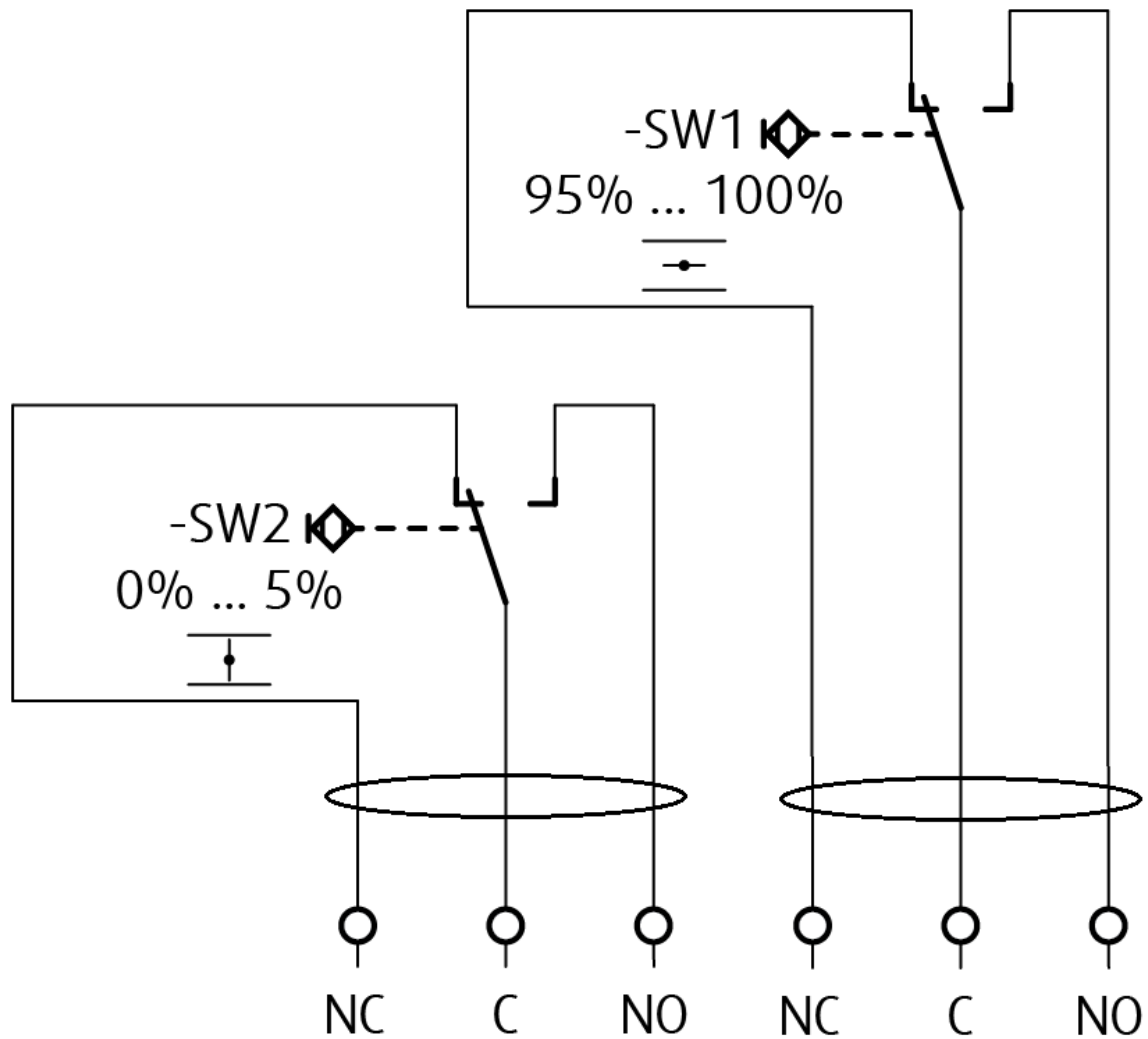
Allow only qualified electricians to work on the electrical system.

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

Electric Parameters: 3A

NOTES:

- Supply via safety isolation transformer!



24 V AC/DC, 230 V AC

### Legend

OPEN

**NO** Blue cable colour

**NC** Grey cable colour

**C** Black cable colour

**CLOSED**

**NO** Blue cable colour

**NC** Grey cable colour

**C** Black cable colour

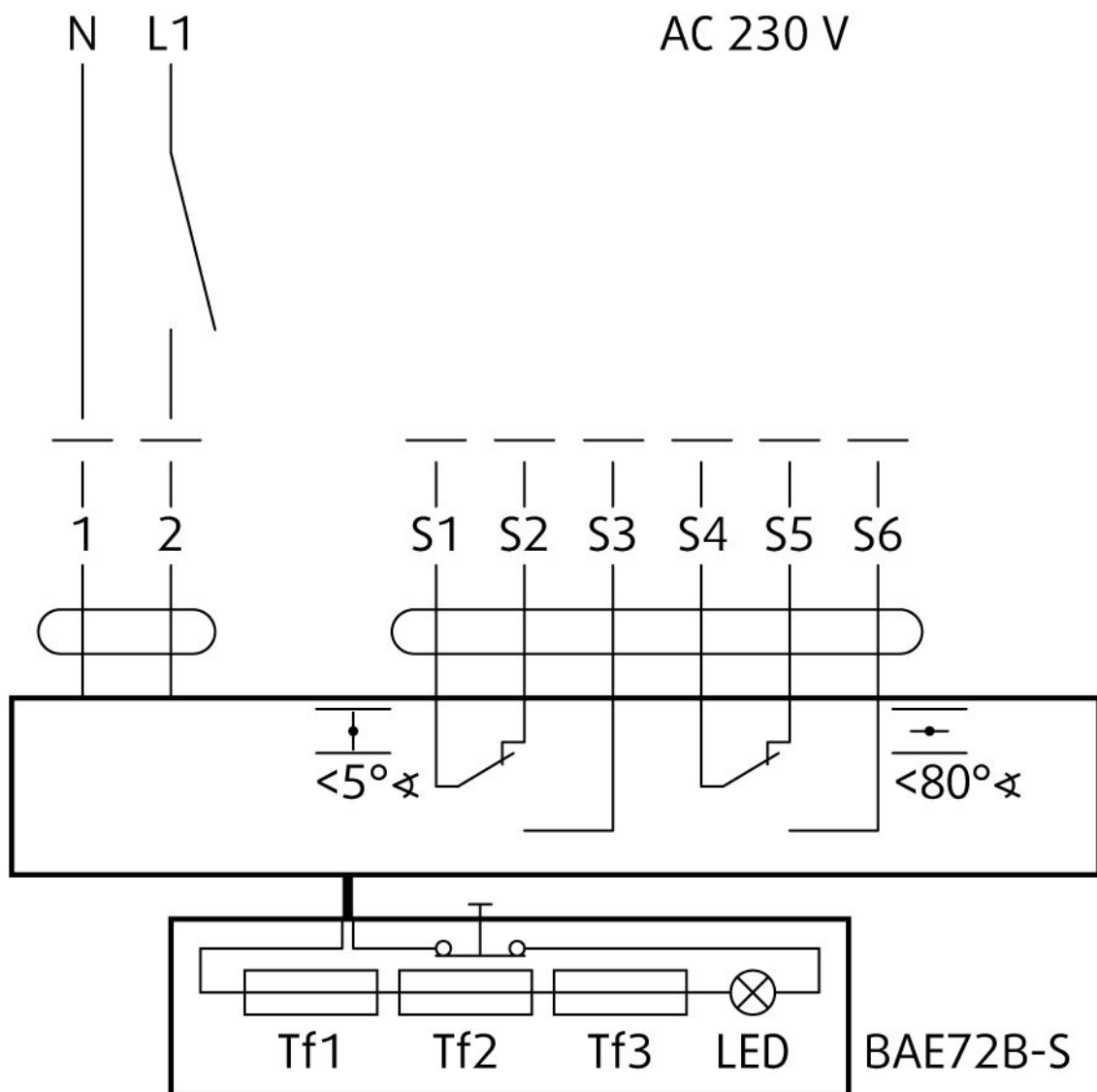
## Type of Activation B230T

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.
- Parallel connection of several actuators possible.
- Power consumption must be observed!



## 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

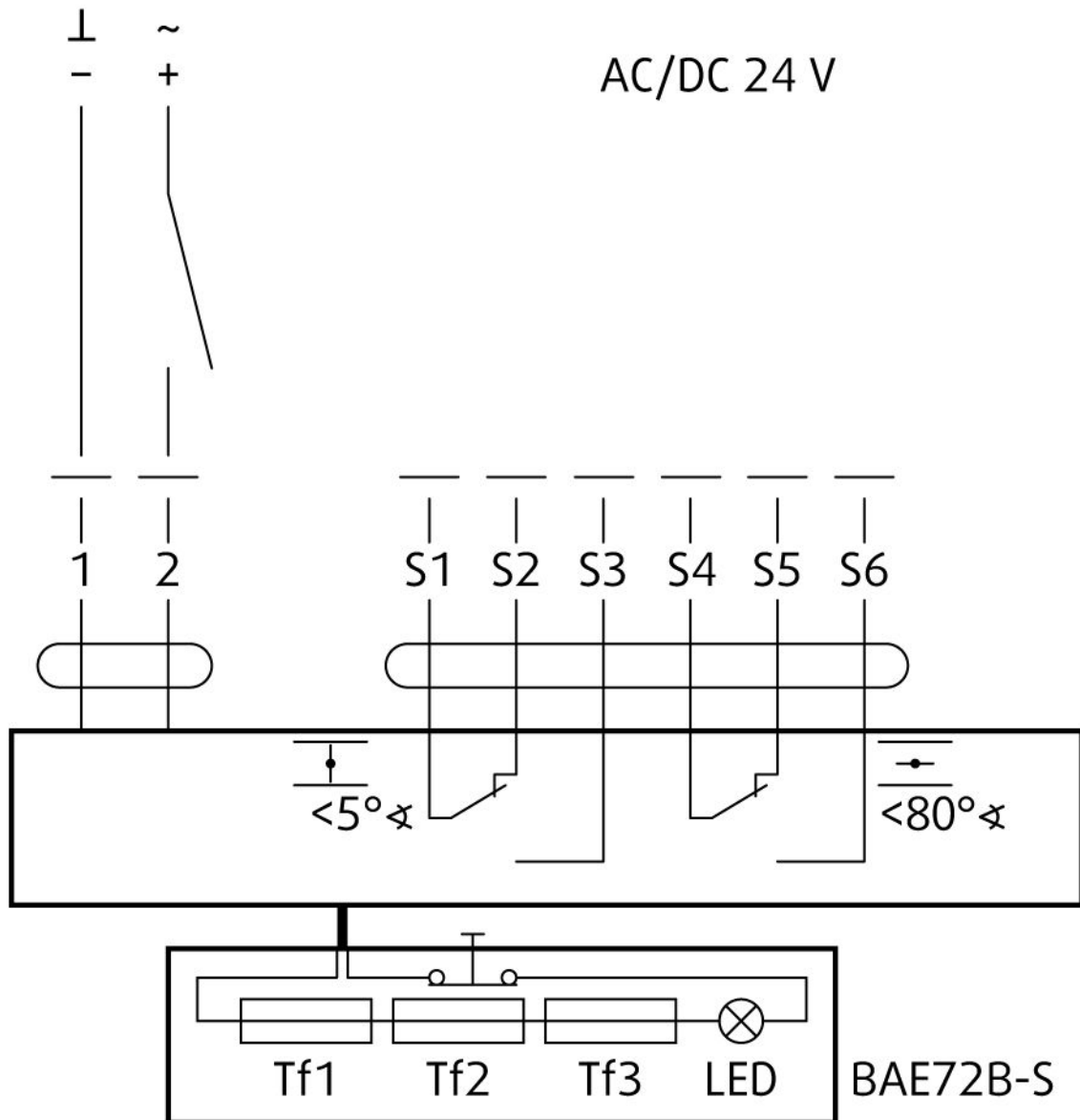
IMPORTANT: Danger of electric shock!

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:

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



## 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 BST0

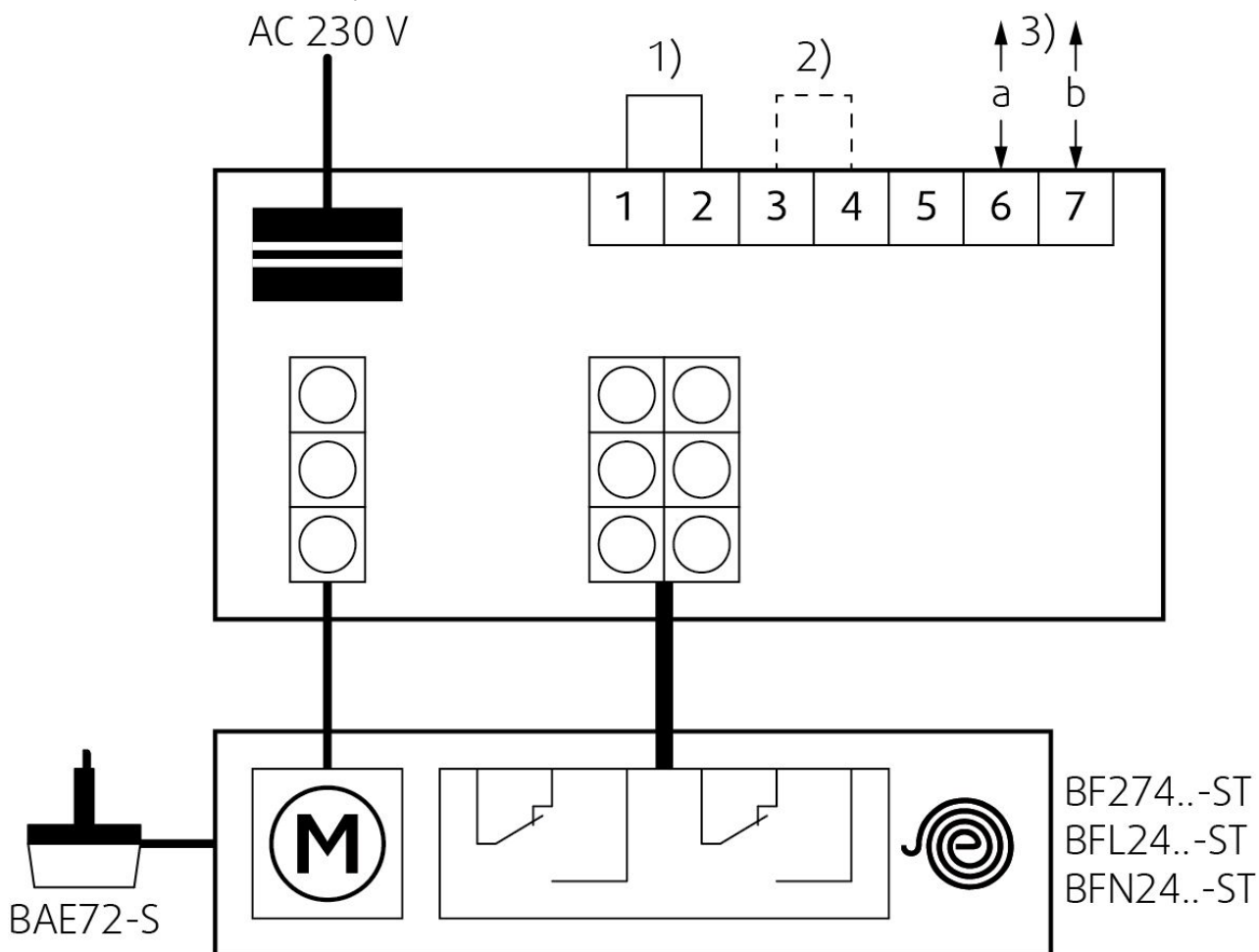
**IMPORTANT:** Danger of electric shock!

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:

Connection scheme for standardly fitted BKN230-24.



## 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 B24T-SR

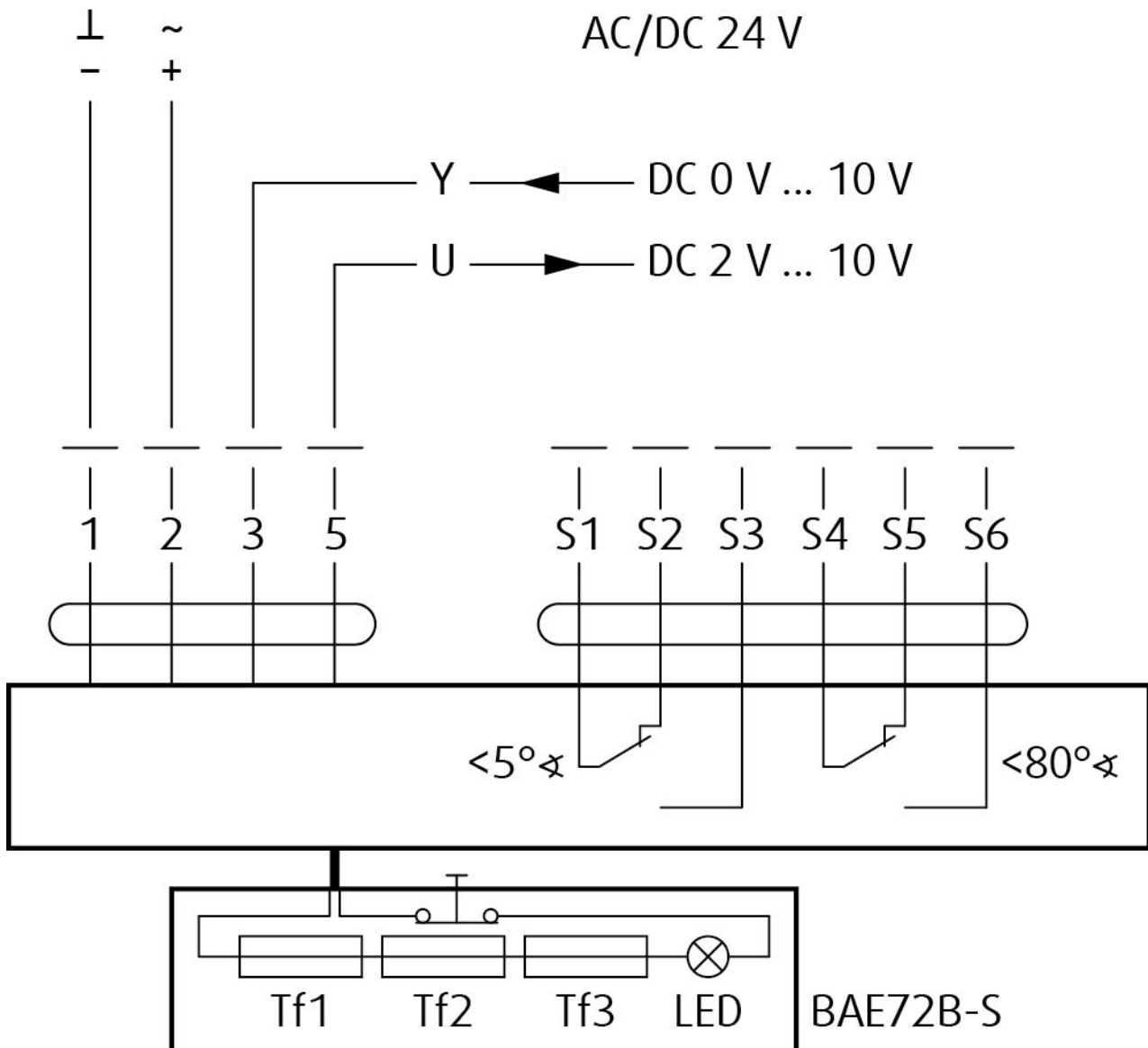
IMPORTANT: Danger of electric shock!

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:

- Supply via safety isolation transformer.
- Power consumption must be observed!



## Legend

- 1 Blue cable colour
- 2 Brown cable colour
- 3 White cable colour
- 5 Orange 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

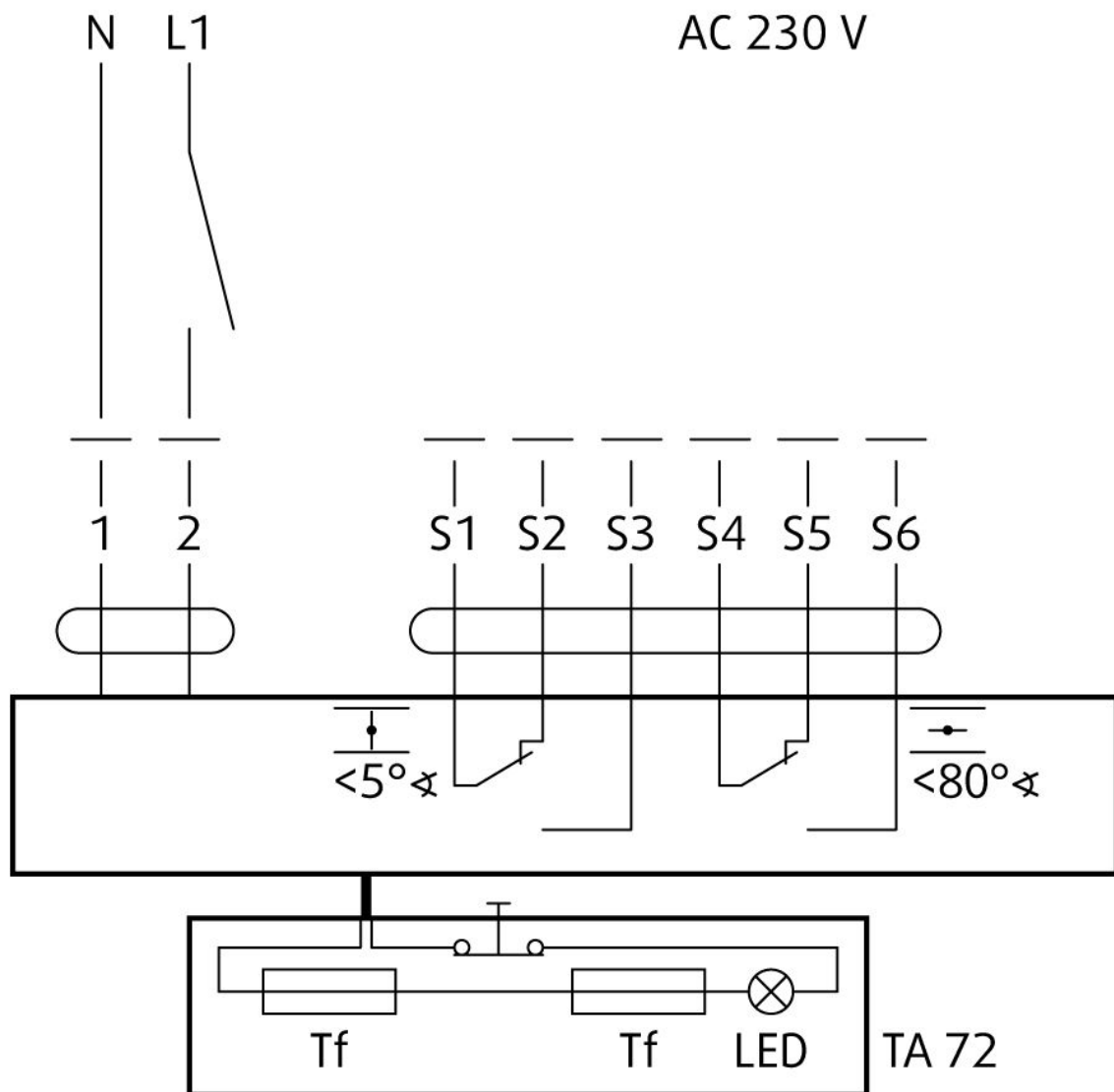
IMPORTANT: Danger of electric shock!

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.
- Paralell connection of several actuators possible.
- Power consumption must be observed!



## 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 G24T

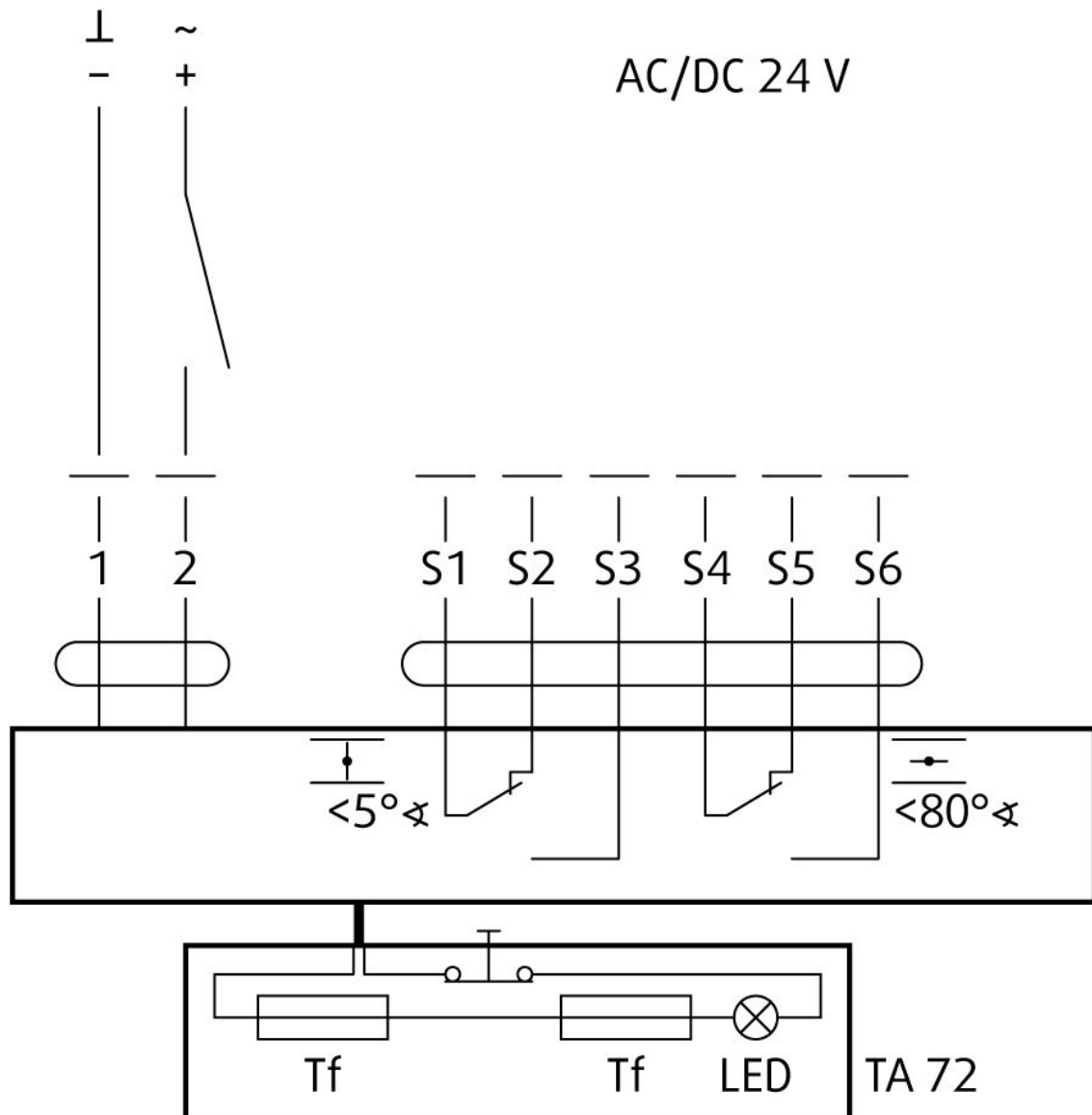
IMPORTANT: Danger of electric shock!

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:

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



## 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 GST0

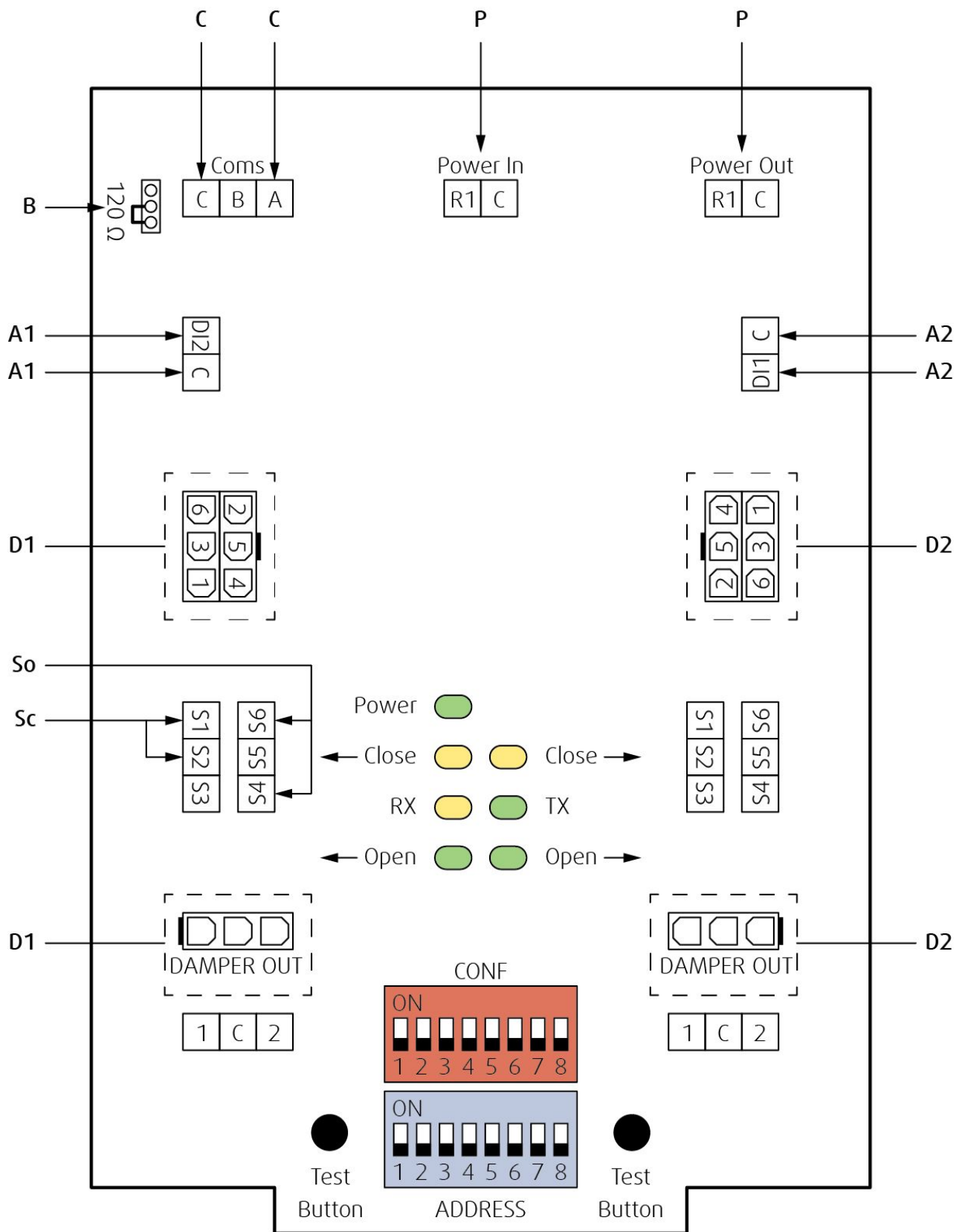
IMPORTANT: Danger of electric shock!

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:

- Supply via safety isolation transformer.
- Power consumption must be observed!



#### Legend

**A1, A2** Analog Application; Digital input for manual override can be selected via bus as „Normally Open“ (= standard open) or „Normally Closed“ (= standard closed) Default: „Normally Open“

**B** Position of line termination 120 ohm if FS-UFC24-2 is last Modbus or BACnet device in line

**C** RS-485 Coms; Modbus RTU or BACnet MS/TP dip switch selectable

**D1, D2** Damper 1, Damper 2; Fire or smoke extraction application

**P** Main power 24 V AC/DC; Daisy chain from and to other FS-UFC24-2

**So** Contact open

**Sc** Contact closed

## Type of Activation G24T-SR

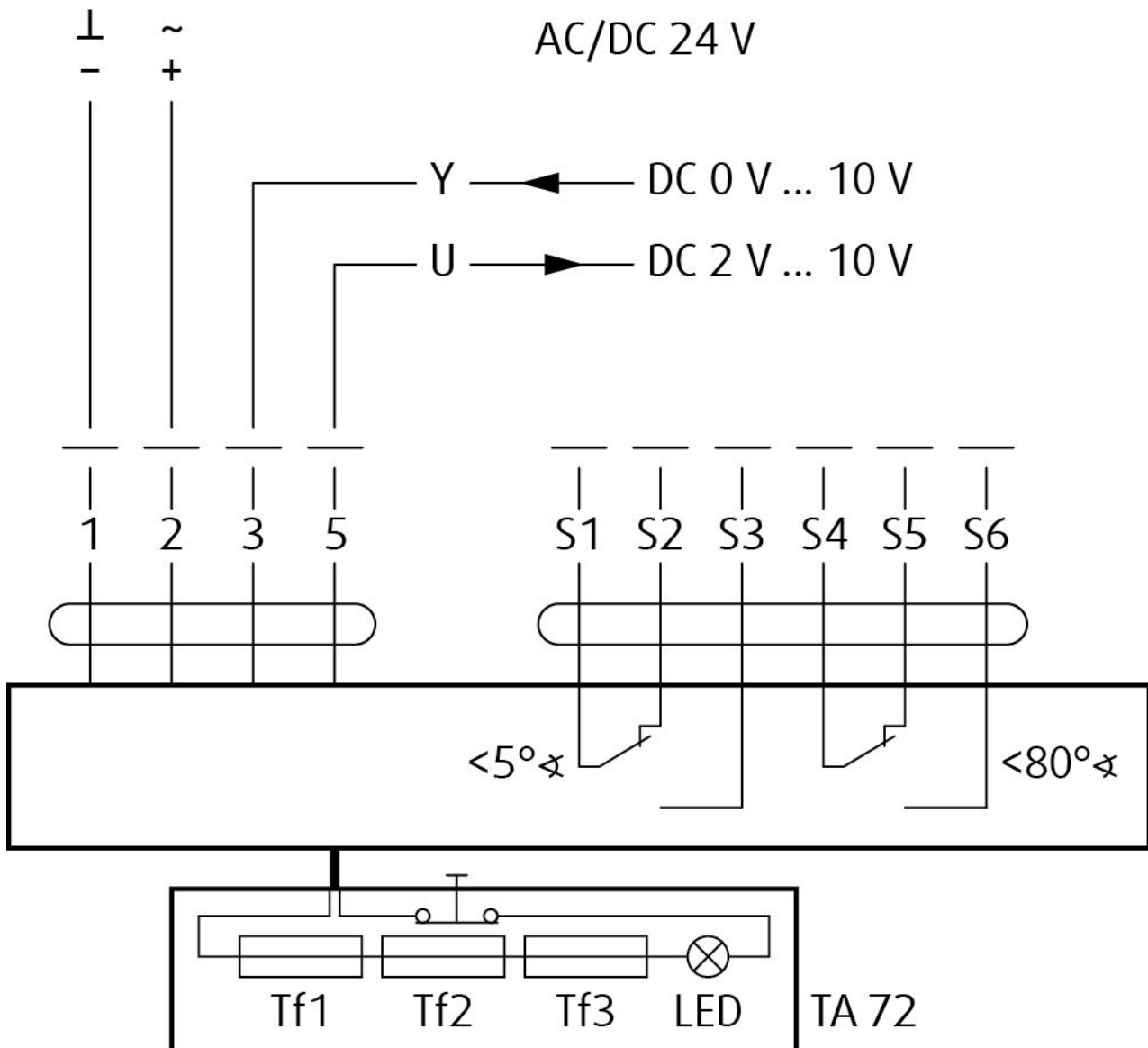
IMPORTANT: Danger of electric shock!

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:

- Supply via safety isolation transformer.
- Power consumption must be observed!



## Legend

- 1 Blue cable colour
- 2 Brown cable colour
- 3 Black cable colour
- 4 Grey 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

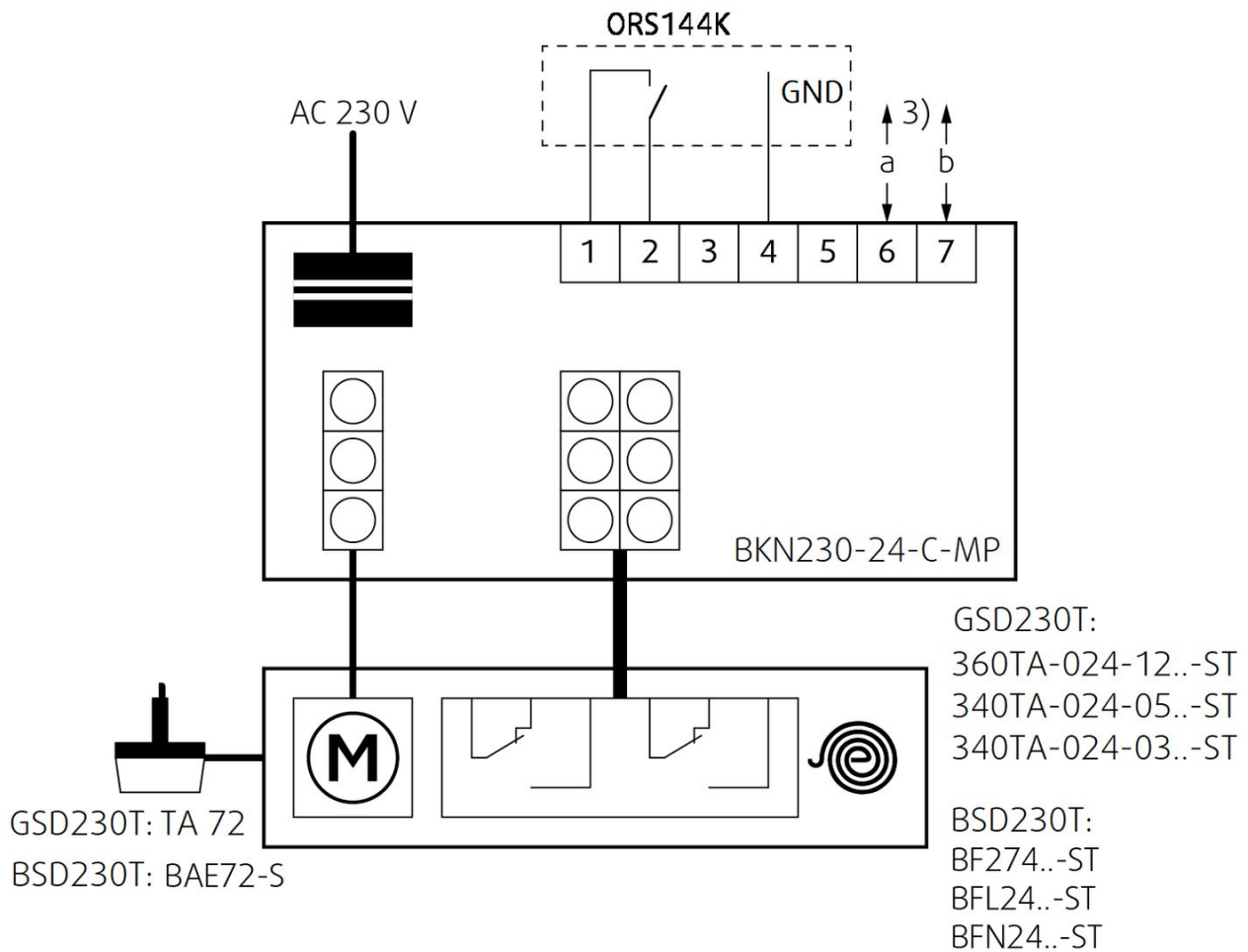
### Type of Activation BSD230T and GSD230T

**IMPORTANT:** Danger 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

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

## Type of Activation BSD24T and GSD24T

IMPORTANT: Danger of electric shock!

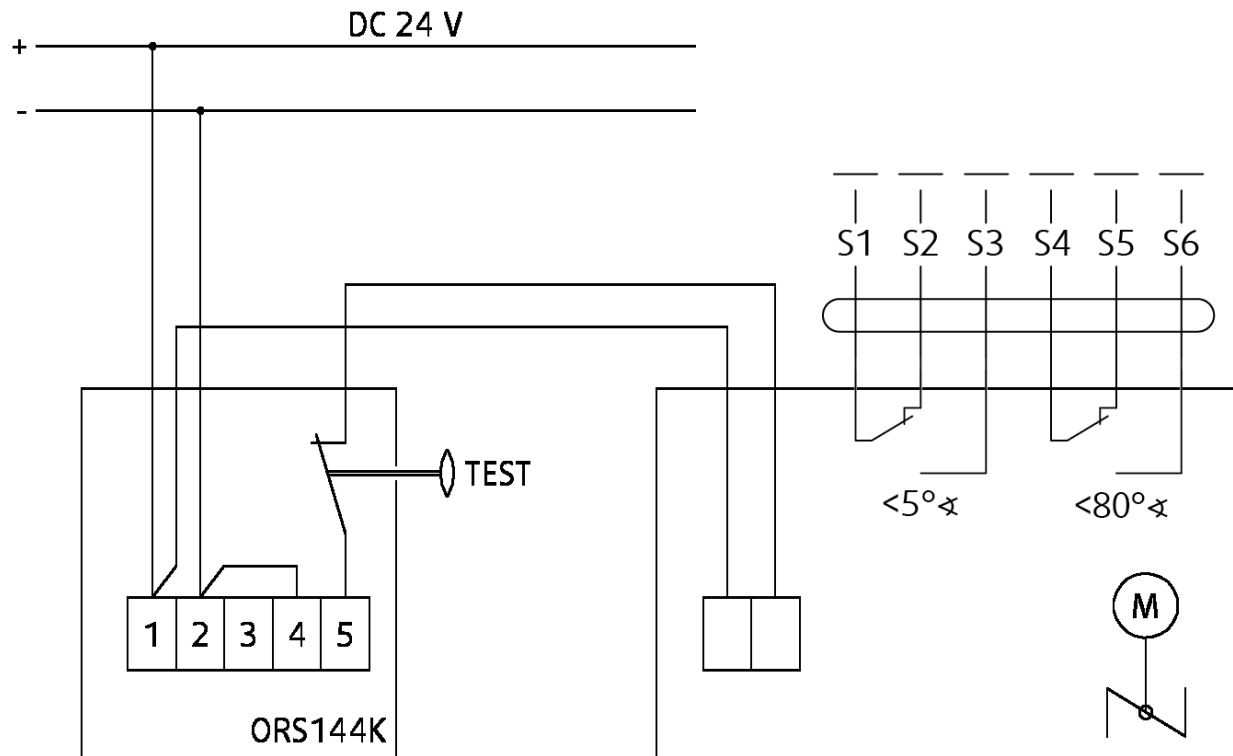
Switch off the power supply before working on any electrical equipment.

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

Power consumption must be observed.

NOTES:

- 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



# Operation Manual

## Functionality Check

Before and after you install the damper, make sure that the dampers functionality is checked. The functionality is checked by:

### 1. Opening the damper:

- Remove the Grille (if fitted) and remove the mechanism housing doors by unscrewing bottom and top door screws.

#### Manual crank activation mechanism:

- Manually open the damper by rotating the metal handle approximately 95° until the indication arrow points to and remains on "open" symbol.

**Note:** You can do it by hand or it is possible to use screw driver shank as a lever by inserting into available handle with arrow.

#### Spring return actuator activation mechanism:

- Connect the actuator to the related electric power supply (refer to the "Electrical connections" section).
- The blade must move to the fully open position. Then, the blade must stay locked. The arrow on the actuator axis must show the position 90°.

### 2. Testing the dampers closing ability:

#### Manual crank activation mechanism:

- By pressing the test button (P13). This will close the damper.

#### Spring return actuator activation mechanism:

- By pressing and holding the test button on the thermal fuse (P13). This will close the damper.

**Note:** When you release the test button the actuator will move automatically back to open position.

- After the blade is in closed position, the related signaling circuit sets to on. Make sure that wires S4 and S6 are connected.

### 3. Put the damper into its operating position - "open":

#### Manual crank activation mechanism:

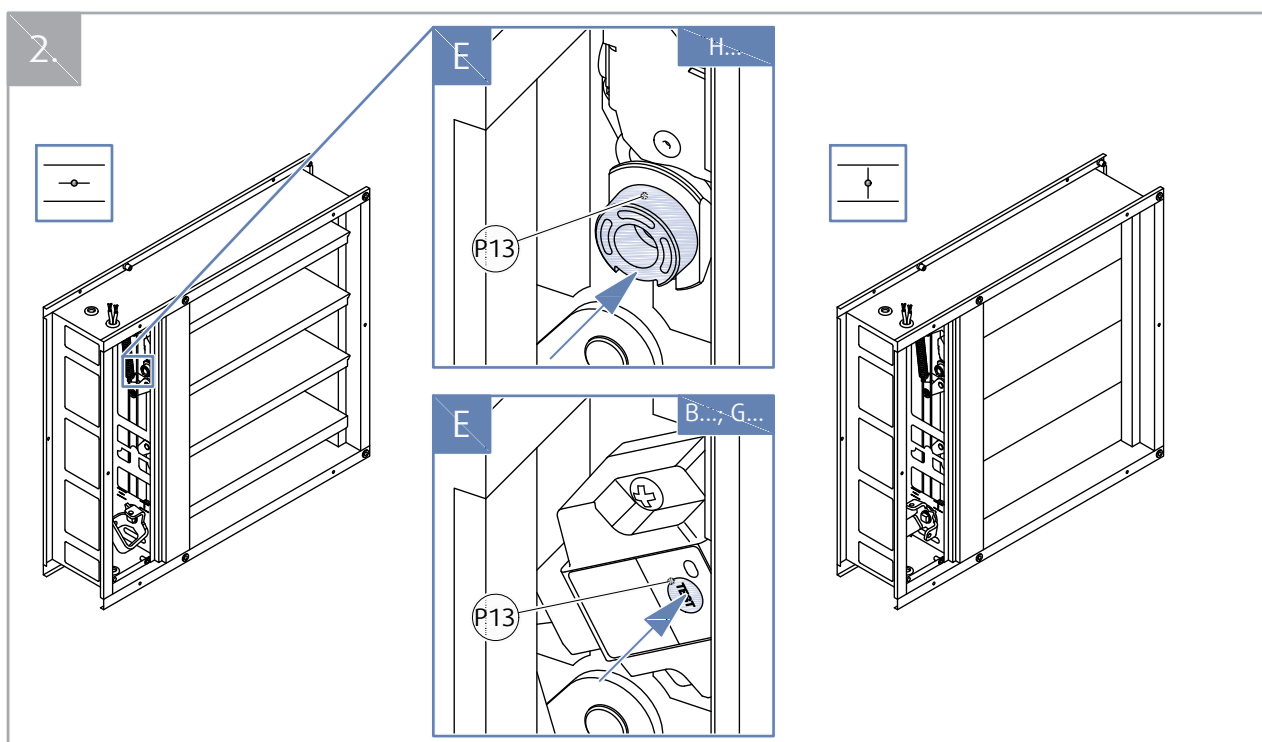
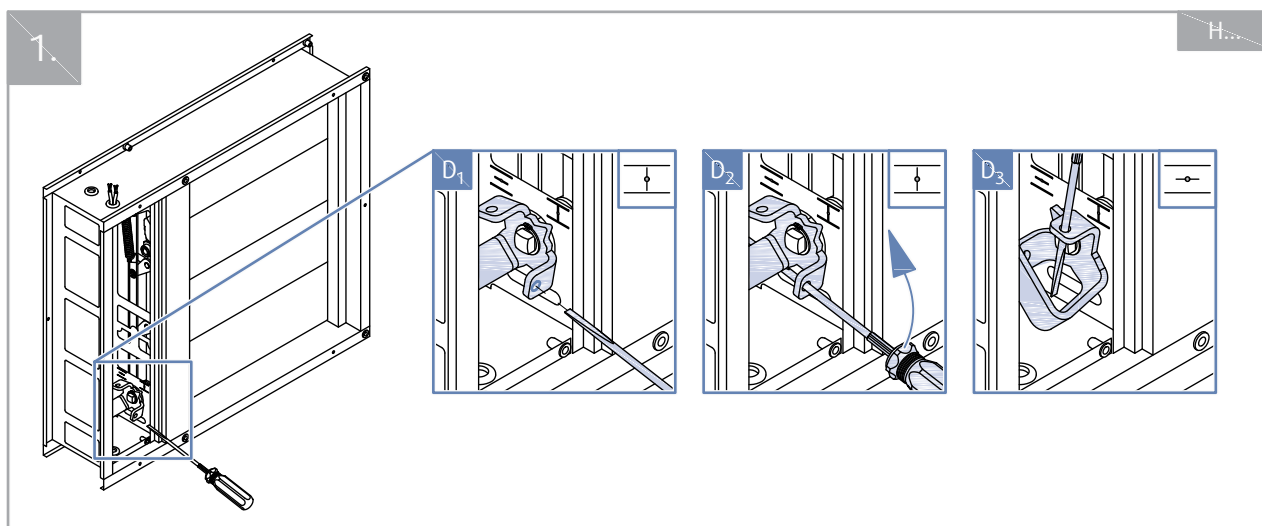
- Manually open the damper by rotating the metal handle approximately 95° until the indication arrow points to and remains on "open" symbol.

**Note:** You can do it by hand or it is possible to use screw driver shank as a lever by inserting into available handle with arrow.

#### Spring return actuator activation mechanism:

- Connect the actuator to the related electric power supply (refer to the "Electrical connections" section).
- The blade must move to the fully open position. Then, the blade must stay locked. The arrow on the actuator axis must show the position 90°.

After the installation close the mechanism housing doors and fasten them with screws through bottom and top holes. Mount the Grille, if previously removed.



## Damper Inspection

**CAUTION:** Never perform inspection when there is air flowing in the duct connected to the damper.

**Do not change the dampers or their structure without the approval of the manufacturer.**

The actuator keeps the dampers on stand-by during their life cycle. The operator obeys the applicable regulations and standards to do regular checks of the dampers. The recommended minimum interval for the inspection checks is 12 months. The manufacturer and/or government authorities must approve the inspecting person and/or process for this inspection. Operating Journal must be kept during the lifecycle of the damper. The damper's Operating Journal includes a copy of the approval/s of the inspecting person. If the inspecting person finds differences, the operator must write these differences in the Operating Journal. Then, he must recommend action to remove these differences.

After you install and start the damper, immediately do initial damper inspection. This inspection obeys the same conditions as the twelve-month inspections.

Do a check of these elements of the external side of the damper:

- The damper housing.
- The blade movement.

**NOTE:** To do a visual check of the internal parts of the damper, dismount the inspection lid or the grille. This will give you access to the internal parts. Also, if the damper has an mechanism lid, you can open the lid to access the internal parts.

Do a check of these items of the internal side of the damper:

- Make sure that there are no foreign objects or layers of contamination in the air distribution systems of the damper.
- The internal casing of the damper
- The sealings
- The foaming material
- The condition of the damper blade
- How accurately the damper blade closes when it is against the backstop in the closed position.

### Recommended Procedure for the Inspection Log (refer to EN 15650)

1. Find the identification of the damper.
2. Write the date of the inspection.
3. Examine the actuator wiring for damage.
4. Examine the wiring of the end switches for damage.
5. Make sure that the damper is clean. If necessary, clean the damper.
6. Do a check of the inspection lid and of the tightness of the cover.
7. Do a check of the blade and of the sealings. If necessary, correct the defects and record the results (where applicable).
8. Do a functional test of the damper (open and close) (refer to the "Functionality Check" chapter).
9. Confirm the operation of the damper with the control system:
  - a. Monitor the physical performance of the damper
  - b. Monitor the signals of the end positions.
  - c. If necessary, correct and record the defect (where applicable).
10. The damper is part of the HVAC System (Heating Ventilation and Air-conditioning System). Thus, you must do a check of the full system (refer to the Operational and Maintenance Requirements).
11. Set the system to the operating position (refer to the "Operation Manual").
12. Record the result in the "Operating Journal" with the name and the signature of the Inspection Technician.

After the inspection, the inspecting person must write the data that follows in the "Operating Journal":

- Condition of the damper
- Date of the inspection
- Name, Surname and Signature of the employee that did the inspection (make sure that you can read this data).

# Supplement

If you find differences from the terms and the technical specifications that are in this manual, speak to the manufacturer. We reserve the right to make changes to the product without notice.

