F-R60

Fire Damper

Handbook

systemair

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Fire Damper F-R60

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
- Fire resistivity EI60S
- Interchangeable mechanism and actuator
- Manual mechanism with end position switches
- Casing leakage according to EN 1751, class C
- Blade leakage according to EN 1751, class 3

Fire Resistivity

F-R60 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-R60 fire dampers are designed for the installations listed and described in their Handbook.

- Damper with standard supporting construction in accordance with EN 1366-2:2015: **EI60 (v_e - h_o i↔o)S**

Accessory

Detailed information about accessories is available at design.systemair.com

- FCR: Flexible Duct Connection

Design

Material Composition

The F-R60 damper has a galvanized sheet metal casing, blades from non-asbestos calcium silicate board with polyurethane foam seals for cold smoke and an intumescent seal that expands in case of fire. Ethylene-propylene rubber as duct seal. The product contains no hazardous substances, except for the solder in the thermal fuse, which contains a milligram of lead. All materials are processed in accordance with local regulations.

Activation Types

Manually Operated Fire Dampers

By default, manually operated fire dampers are supplied with manual control, optionally with micro switches. In case of fire, the fire damper is closed automatically The actuating mechanism is activated when the temperature of the air in the duct reaches 74 °C and the damper closes within 10 seconds after fuse melts.

- **H0**

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

- **H2**

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

Actuator Operated Fire Dampers

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

- **B230T** or **G230T**

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

- **B24T** or **G24T**

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

- **B24T-W** or **G24T-W**

Fire damper with an activation mechanism with a Belimo or Gruner spring return actuator (AC/DC 24 V) with an 72 °C electro-thermal fuse and auxiliary switches, with provided cable connectors for the supply and communication unit (communication unit not part of the mechanism).

- **B24T-SR** or **G24T-SR**

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

- **GST0**

Fire damper with an activation mechanism with a Gruner spring return actuator (AC/DC 24 V) with an electro-thermal fuse 72°C and auxiliary switches, with a Gruner supply and communication unit FSC-UFC24-2 (Modbus/BACnet).

- **BST1**

Fire damper with an activation mechanism with a Belimo spring return actuator (AC/DC 24 V) with an electro-thermal fuse 72°C and auxiliary switches, with a supply and communication unit (SLC powered) BC24-G2 (THC).

- **BST2**

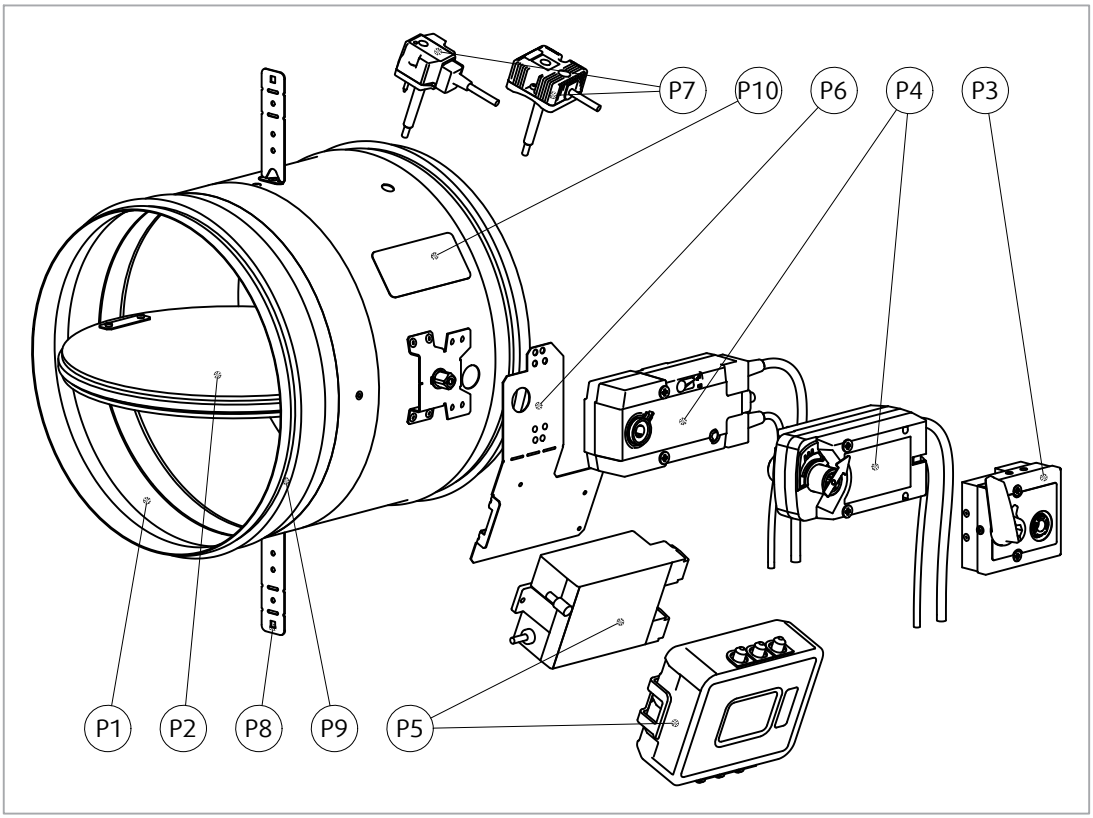
Fire damper with an activation mechanism with a Belimo spring return actuator (AC/DC 24 V) with an electro-thermal fuse 72°C and auxiliary switches, with a Belimo supply and communication unit (AC 230 V) BKN230-24-MOD (Modbus/BACnet).

- **BST10**

Fire damper with an activation mechanism with a Belimo spring return actuator (AC/DC 24 V) with an electro-thermal fuse 72°C and auxiliary switches, with a Belimo supply and communication unit (AC 230 V) BKN230-24-PL (Powerline).

Other communication units are possible on demand.

Product Parts



Note:

Depicting all mechanism types. Damper is delivered only with one of them.

Legend:

P1 Damper casing
P2 Damper blade
P3 Manual mechanism
P4 Actuator
P5 Communication unit (only GST0 activation type)
P6 Holder for communication unit (only for B24T-W and G24T-W activation types)
P7 Thermal fuse
P8 Bendable hangers
P9 Duct connection sealings
P10 Product label

Technical Parameters

Durability Test

50 cycles with no change to the required properties
10000 cycles, actuator controlled (0 ... 90 degrees rotation) – with no change to the required properties
10000 cycles, actuator controlled for modular possibility (45 ... 60 degrees rotation) - with no change of the required properties

Testing Pressure

Under-pressure up to 300 Pa

Safe Position

Closed. (in case of fire the damper closes via a spring in the actuator or a spring in the manual mechanism)

Airflow Direction

Both directions

Allowed Air Velocity

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

Side with Fire Protection

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

Repeated Opening

Suitable for daily check procedure in a suitable environment

Closing/Opening Time

Manually operated < 10 s, actuator operated < 20 s

Indicator Closed/Open

Manually operated - Activation type H0 visually (arrow on the mechanism) and H2 with microswitches
Actuator operated - built-in microswitches

Activation Temperature for the fire damper closing

Manually operated: 74 °C by means of a spring after the melting of the thermal fuse
Actuator operated: 72 °C by means of a spring after current interruption in the electro-thermal fuse

Temperature of transported air

Minimum: 0 °C, for all types of mechanism
Maximum: 60 °C for 74 °C and 72 °C thermofuse (all mechanism types)

Environment suitability

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

Inspection possibility

Inspection of blade and gaskets can be done through electro thermal fuse opening with an endoscopic camera. Manually operated additionally by removal of the mechanism through opening for its thermal fuse. In order to access the damper's internal parts a flexible connection or duct with access doors must be connected to the damper.

Maintenance

Not required. Dry cleaning if legaly required in the country in which the dampers are installed.

Revisions

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

Allowed pressure

1200 Pa

Declared blade tightness (EN 1751)

Class 3 as standard up to 500 Pa

Declared housing tightness (EN 1751)

Class C as standard up to 500 Pa

Conformity with EC directives

2006/42/EC Machinery Directive
2014/35/EU Low Voltage Directive
2014/30/EU Electromagnetic Compatibility Directive

Driving actuator types

Belimo BFL, BFN; Gruner 340-...-05, 360-...-12

Transport and Storage

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

Assessed Performance

21 CE 1396

Systemair Production a.s.

90043 Kalinkovo 371, Slovakia

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1396-CPR-0196

EN 15650:2010

Circular fire dampers

F-R60

Nominal activation conditions/sensitivity

- Sensing element load bearing capacity - **Pass**
- Sensing element response temperature - **Pass**

Closure during test at correct time and in allowable time

- Closure time and in allowable time - **Pass**

Operational reliability

- Manual mechanism = 50 cycles - **Pass**
- Actuator mechanism = 10 200 cycles: 0° to 90° - **Pass** 10 000 cycles: 45° to 60° - **Pass**

Fire resistance:

Resistivity depending on installation method and situation

- Integrity **E**
- EI60(v_e-h_o-i↔o)S
- Insulation **I**
- Smoke leakage **S**
- Mechanical stability (under E)
- Maintenance of the cross section (under E)

Durability of response delay

- Sensing element response temperature and load bearing capacity - **Pass**

Durability of operational reliability

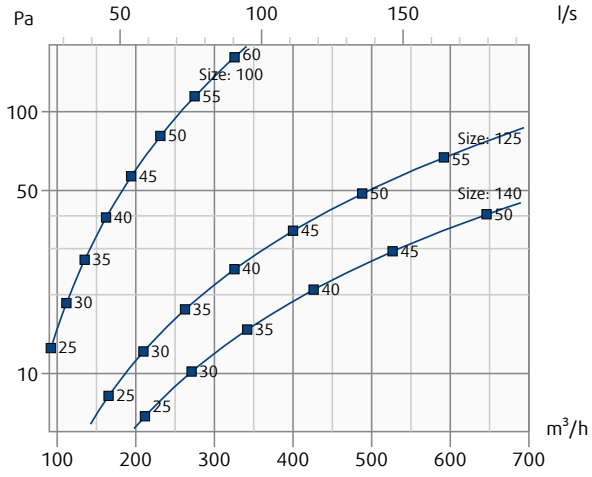
- Opening and closing cycle - **Pass**

Diagrams

The pressure drop and A-weighted total discharged sound power level depend on the nominal diameter of the damper and air flow volume at different duct pressures.

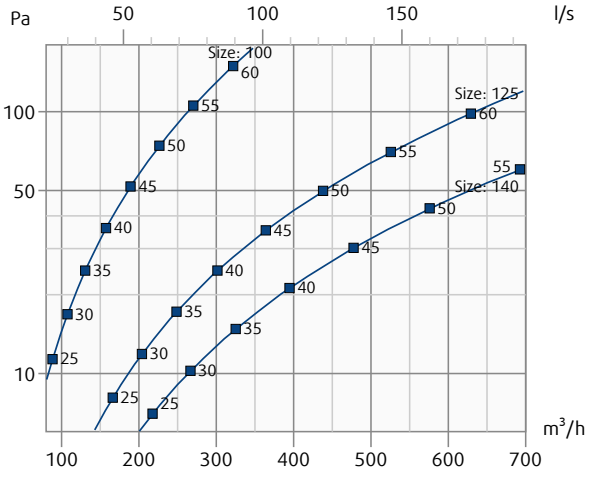
F-R60-...-H0

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



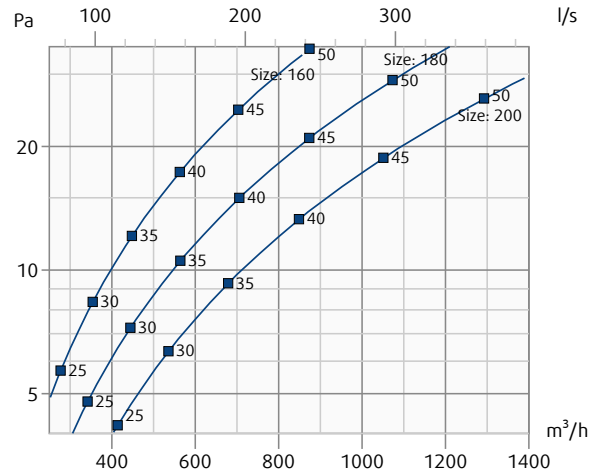
F-R60-...-B230T

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



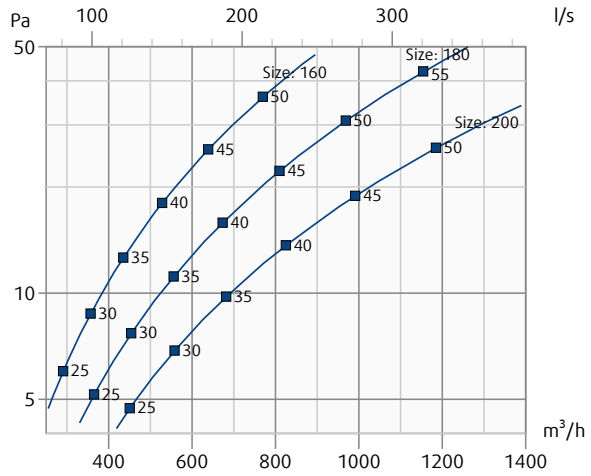
F-R60-...-H0

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



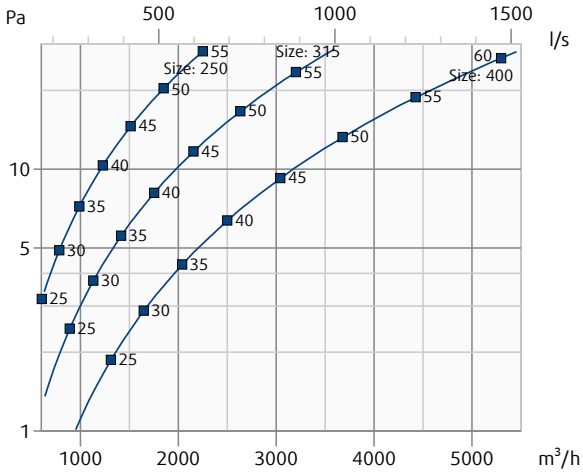
F-R60-...-B230T

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



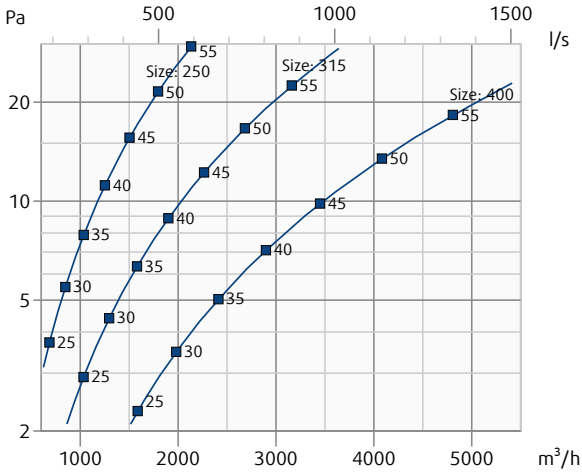
F-R60-...-H0

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



F-R60-...-B230T

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



Legend:

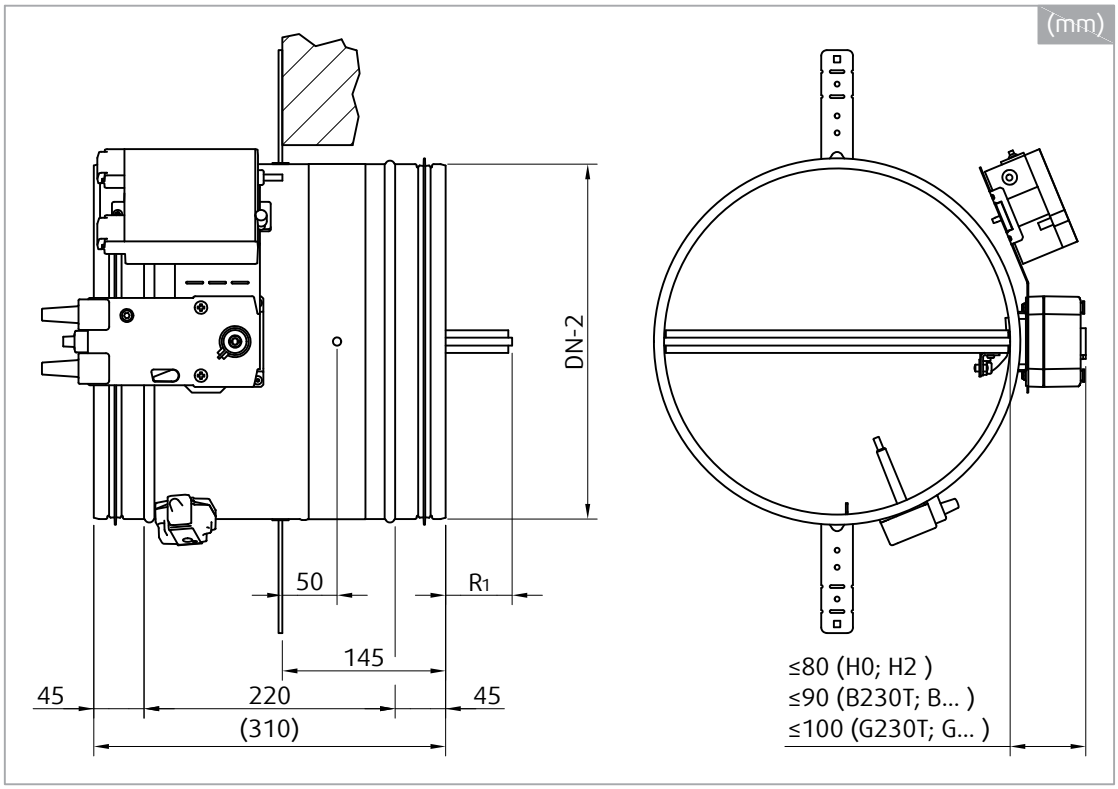
p_s (Pa) - Pressure drop
q_v (m3^/h), (l/s) - Air flow volume
±Δ (%) - Deviation from measured value
L_{wa} (dB(A)) - A-weighted total sound power level
v (m/s) - Face air velocity

Dimensions & Weights

Free Area

A_v (m^2)	DN (mm)												
	100	125	140	150	160	180	200	225	250	280	315	355	400
	0,065	0,069	0,072	0,074	0,076	0,081	0,087	0,094	0,103	0,115	0,130	0,150	0,176

Dimensions



Note:

H0, **H2** - Manual activation types

B... - Belimo activation types

G... - Gruner activation types

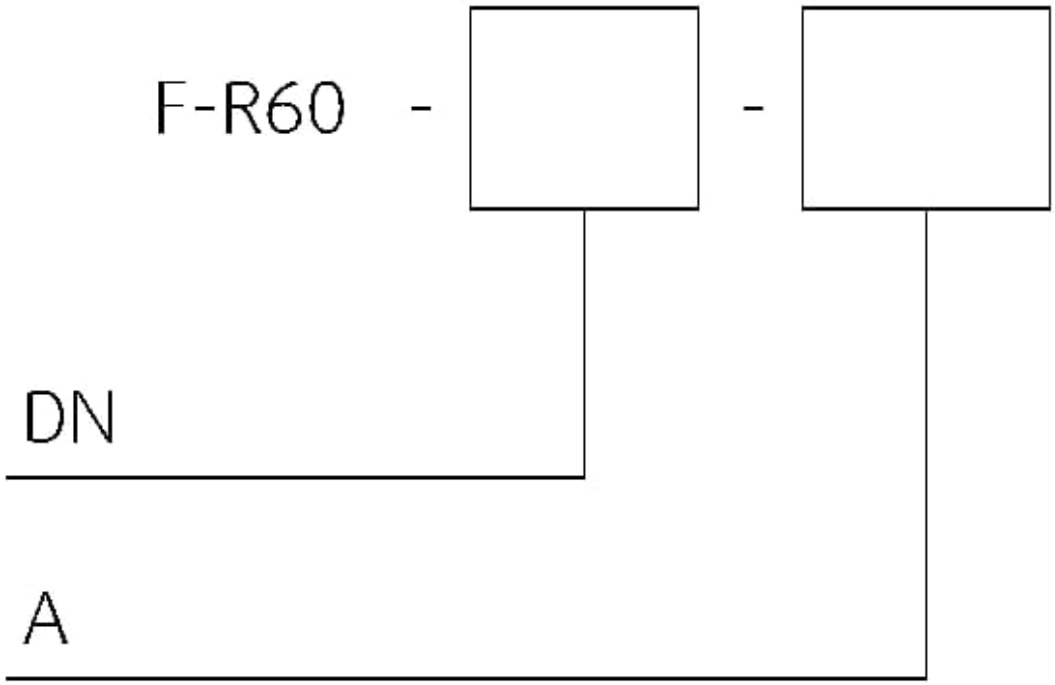
Overhangs

R1 (mm)	DN (mm)												
	100	125	140	150	160	180	200	225	250	280	315	355	400
	-45,0	-32,5	-25,0	-20,0	-15,0	-5,0	5,0	17,5	30,0	45,0	62,5	82,5	105,0

Weights

m (kg)	DN (mm)												
	100	125	140	150	160	180	200	225	250	280	315	355	400
H0, H2	2,0	2,2	2,5	2,5	2,5	2,8	3,0	3,4	3,8	4,3	5,1	6,2	7,8
B230T	3,5	3,7	4,0	4,0	4,0	4,3	4,5	4,9	5,3	5,8	6,6	7,7	9,3
G230T	3,6	3,8	4,1	4,1	4,1	4,4	4,6	5,0	5,4	5,9	6,7	7,8	9,4
GST0	4,8	5,0	5,3	5,3	5,3	5,6	5,8	6,2	6,6	7,1	7,9	9,0	10,6
B24T, B24T-W, B24T-SR	3,5	3,7	4,0	4,0	4,0	4,3	4,5	4,9	5,3	5,8	6,6	7,7	9,3
G24T, G24T-W, G24T-SR	3,6	3,8	4,1	4,1	4,1	4,4	4,6	5,0	5,4	5,9	6,7	7,8	9,4

Ordering Code



DN

Dimension, øDN:
100, 125, 140, 150, 160, 180, 200, 225, 250, 280, 315, 355, 400 mm

A - Type of Activation

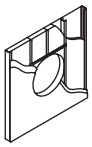
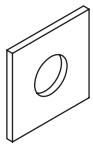
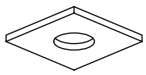
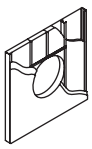
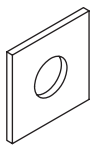
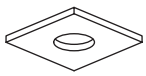
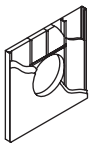
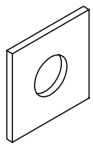
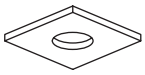
H0 - Manual crank, no switches
H2 - Manual crank, 2 switches 230V AC or 24V AC/DC
B230T - 230V AC Belimo spring return actuator
G230T - 230V AC Gruner spring return actuator
B24T - 24V AC/DC Belimo spring return actuator
G24T - 24V AC/DC Gruner spring return actuator
B24T-W - 24V AC/DC Belimo actuator & wire connector for comm.unit
G24T-W - 24V AC/DC Gruner spring return actuator & wire connector for comm.unit
B24T-SR - 24V AC/DC Belimo spring return actuator, modulated (0)2 V ... 10 V
G24T-SR - 24V AC/DC Gruner spring return actuator, modulated (0)2 V ... 10 V
GST0 - 24V AC/DC supply and communication unit FSC-UFC24-2 (Modbus/BACnet) & 24V AC/DC Gruner spring return Actuator
BST1 - SLC powered supply and communication unit BC24-G2 (THC) & 24V AC/DC Belimo spring return actuator
BST2 - 230 V AC supply and communication unit BKN230-24-MOD (Modbus/BACnet) & 24V AC/DC Belimo spring return actuator
BST10 - 230 V AC supply and communication unit BKN230-24-PL (Powerline) & 24V AC/DC Belimo spring return actuator

Example of the F-R60 Fire Damper Ordering Code

F-R60-400-B24T-SR

Fire damper with nominal diameter 400 mm, with in-wall EI60S installation. Activated by thermal fuse and a 24 V Modulated Belimo actuator (0 V ... 10 V) that can be used for airflow balancing.

Installation Methods

1 Wet	F-R60 DN100 ... DN400	EI 60 (v_e - i ↔ o) S	a)  ≥ 100 mm	b)  ≥ 100 mm	 360°
		EI 90 (h_o - i ↔ o) S	c)  ≥ 125 mm (≥ 620 kg/m³)		
3 Soft	F-R60 DN100 ... DN400	EI 60 (v_e - i ↔ o) S	a)  ≥ 100 mm	b)  ≥ 100 mm	 360°
		EI 60 (h_o - i ↔ o) S	c)  ≥ 125 mm (≥ 620 kg/m³) ≥ 110 mm (≥ 2200 kg/m³)		
3H Hilti	F-R60 DN100 ... DN400	EI 60 (v_e - i ↔ o) S	a)  ≥ 100 mm	b)  ≥ 100 mm	 360°
		EI 60 (h_o - i ↔ o) S	c)  ≥ 125 mm (≥ 620 kg/m³)		

Notes:

a) - Flexible (plasterboard) wall
b) - Concrete/masonry/cellular concrete (rigid) wall
c) - Concrete/cellular concrete (rigid) floor/ceiling
v_e - Vertical wall placement
h_o - Horizontal floor/ceiling placement

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.
- According to the EN 1366-2 standard, the distance between the smoke control damper bodies must be at least 200 mm.
- The distance between the adjacent wall/ceiling and the damper must be at least 75 mm.
- When the damper is installed into a fire partition structure, it must be placed so that the damper blades in its closed position are located inside this structure.
- The gap in the installation opening between the damper and the wall/ceiling can be increased by up to 50% of the gap area or decreased to the smallest amount possible that still provides sufficient space for the installation of the seal.
- The damper must be earthed after being installed into the duct.
- Installation in a thinner wall is permitted under the following conditions:

  a) That, the alternative thinner wall should be classified in accordance with EN 13501-2:2007 + A1: 2009 for the fire resistance required for product applications.

  b) That the same length (thickness) of penetration seal (filling) as approved is achieved. This can be done by adding wall thickness around the damper to at least 200 mm from the opening.

  c) That this added thickness will have the same wall construction or additional layer/layers of fire protective board are fixed to a flexible wall. For a protruding/shaft wall, the additional layers must be fixed to the steel supporting construction of the wall.
- Lists of all permitted installation methods are provided in Handbook.

Installation, Maintenance & Operation

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

1. Ensure that installation is performed by a trained person.
2. Follow the written and depicted instructions provided within the Handbook closely.
3. Perform damper inspection in accordance with the Handbook.
4. Check the damper's functionality as per the chapter "Functionality Check" before you install the damper. This procedure prevents the installation of a damper that has been damaged during transportation or handling.

Information about installation, maintenance and operation is available in the "Handbook_F-R60" document or more can be found at design.systemair.com.

Installation 1 - Wet

Using Plaster/Mortar/Concrete Filling

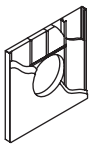
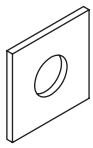
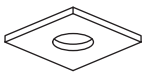
1. The supporting construction's opening must be prepared as depicted in the Opening and Wall Preparation section. Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls.
2. The opening dimension D1 is driven by the nominal dimensions of the damper with added clearance.
3. Insert the closed damper into the middle of the opening so that the damper blade is in the wall. Use the bendable hanger (2) to secure the damper against the wall using a suitable screw (F1).
4. Avoid any damage or bend to the damper housing from the weight of the filling.
5. Fill in the area between the wall and the damper with plaster, mortar or concrete filling (F2)

Note: Prevent the fouling of the damper's functional parts, which could limit its correct functioning. The best way is to cover the functional parts during installation. The seepage of the filling material can be prevented by using plaster boards. However, these are not required for wet installation.

6. If necessary, uncover and clean the damper after installation.
7. Check the damper's functionality

Installation Distances

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

<table>
<tr><td rowspan="2"> 
1 Wet</td><td rowspan="2">F-R60
DN100 ... DN400</td><td>EI 60 (v_e - i ↔ o) S</td><td>a) 
≥ 100 mm</td><td>b) 
≥ 100 mm</td><td> 
360°</td></tr>
<tr><td>EI 90 (h_o - i ↔ o) S</td><td colspan="3">c) 
≥ 125 mm
(≥ 620 kg/m³)</td></tr>
</table>

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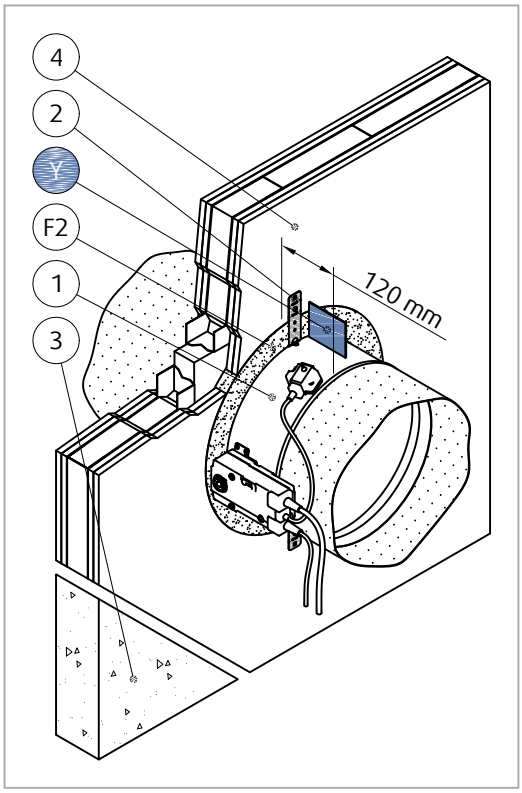
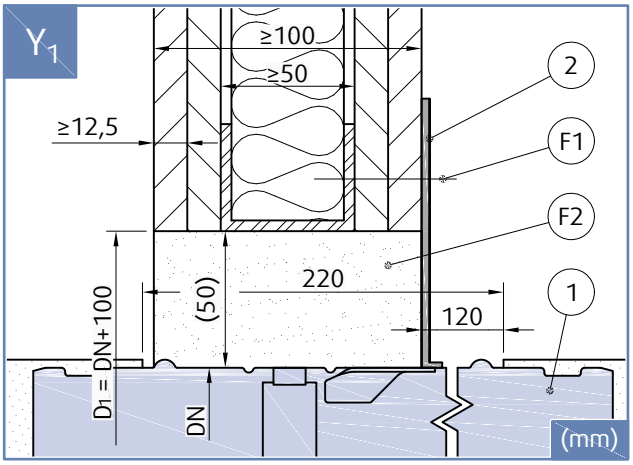
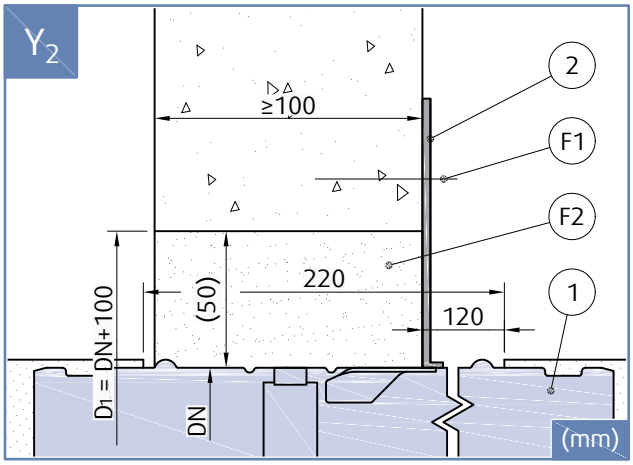
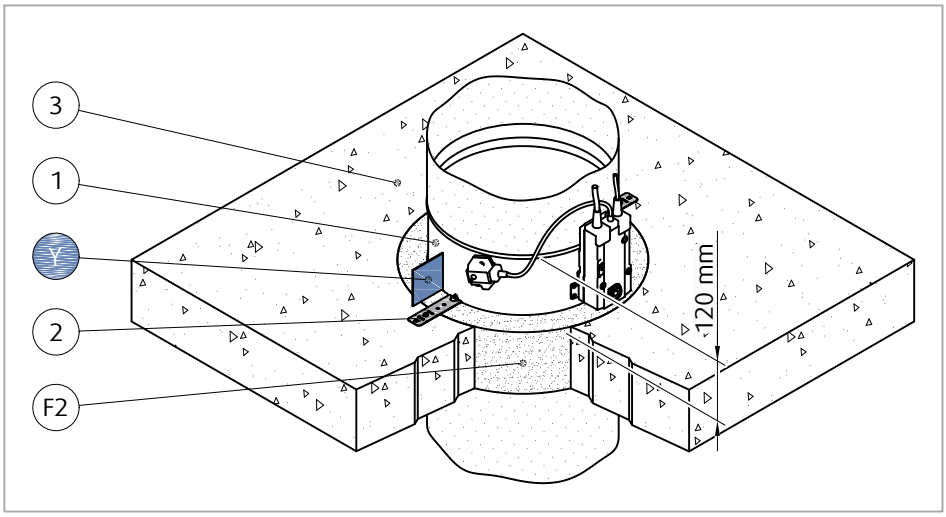
v_e - Vertical wall placement

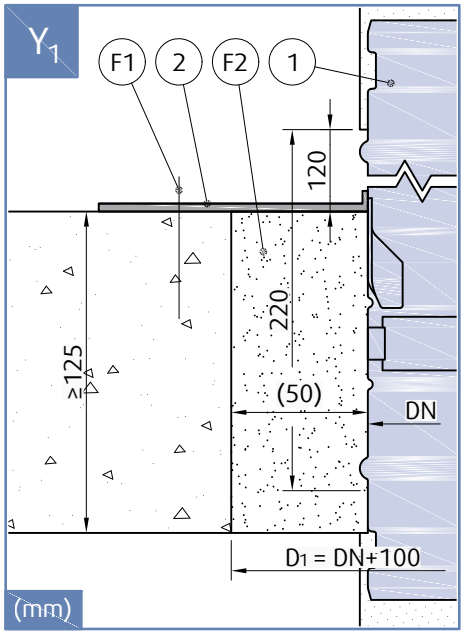
h_o - Horizontal floor/ceiling placement

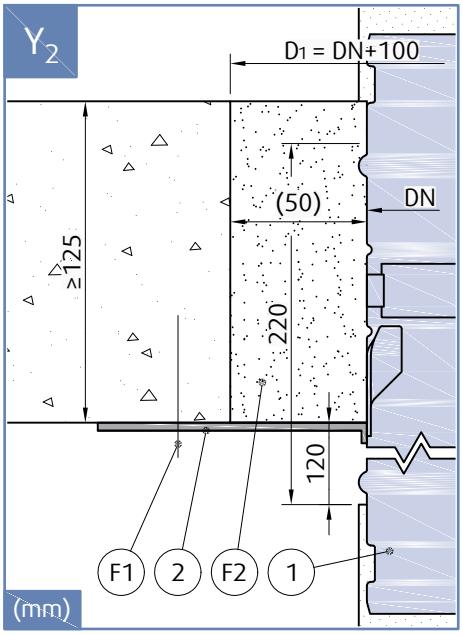

4
2
Y
F2
1
3
120 mm


Y1
≥100
≥50
≥12,5
2
F1
F2
1
220
120
(50)
D1 = DN+100
DN
(mm)

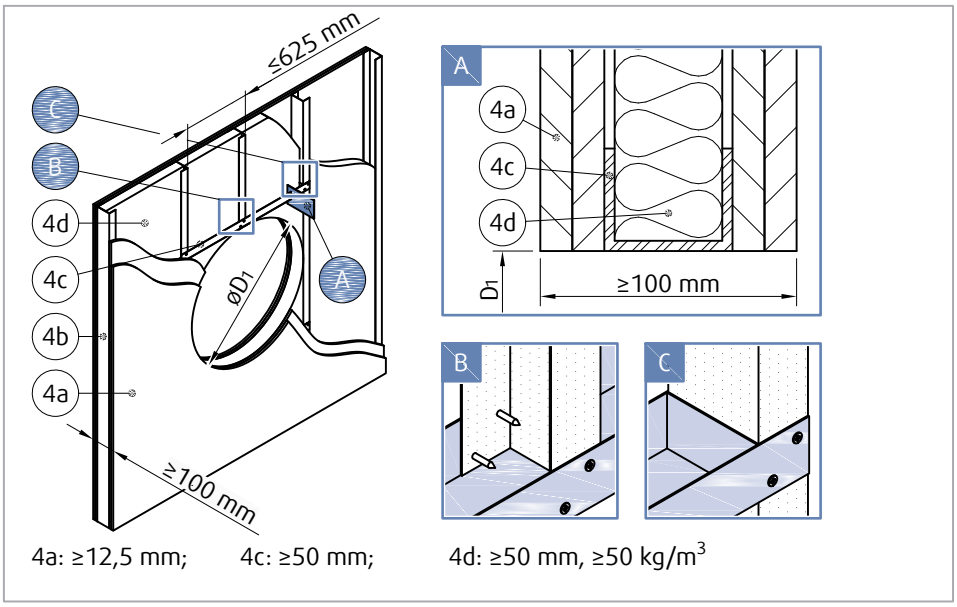

Y2
≥100
2
F1
F2
1
220
120
(50)
D1 = DN+100
DN
(mm)


3
1
Y
2
F2
120 mm

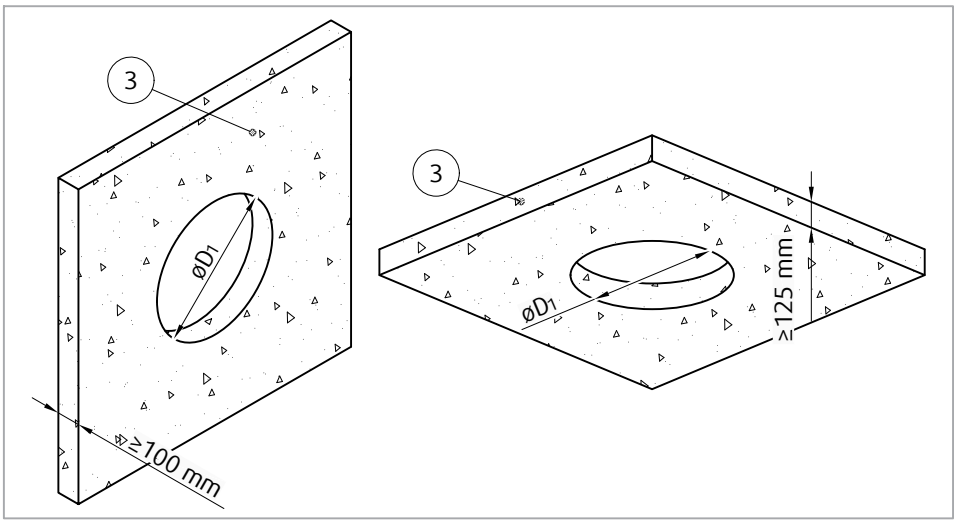

Y1
F1
2
F2
1
120
220
≥125
(50)
DN
D1 = DN+100
(mm)


Y2
D1 = DN+100
(50)
DN
≥125
220
120
F1
2
F2
1
(mm)

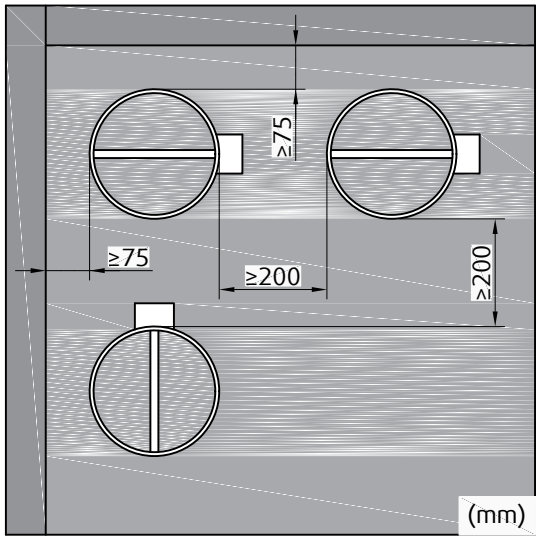
Opening and Wall and/or Ceiling Preparations



4a: ≥12,5 mm; 4c: ≥50 mm; 4d: ≥50 mm, ≥50 kg/m^3



Damper Minimum Distances



Legend for installation 1 - Wet

F1 - Screw ≥ 5,5 DIN7981 or suitable wall plug and screw size 6.
F2 - Plaster/mortar/concrete filling
1 - Fire damper (F-R60)
2 - Bendable hanger (part of the damper)
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; for thickness/cubic density see picture.

Installation 3 - Soft

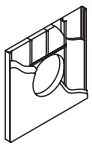
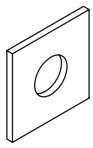
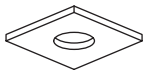
Installation in a Soft Crossing with Fire Resistive Coating

With this installation we recommend using a flexible connection (see accessory FCR) due to thermal expansion of connected ducts during a fire. Install the compensator so that the flexible part has a minimum distance of 50 mm from the edge of a damper's blade in open position.

1. The supporting construction's opening must be prepared as depicted in the Opening and Wall Preparation section. Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls.
2. The opening dimension D1 is driven by the nominal dimensions of the damper with added clearance.
3. Prepare mineral wool installation segments with the thickness of the opening height (F3).
4. Apply a suitable fire resistive coating (F4) onto the damper at the place of its future placement; assemble and glue the filling of the future installation with the same fire resistive coating.
5. Insert the closed damper into the middle of the opening so that the damper blade is in the wall. Use the bendable hanger (2) to secure the damper against the wall using a suitable screw (F1).
6. Avoid any damage or bend to the damper housing from the pressure of filling insertion.
7. Apply fire resistive coating (F6), at least 2 mm thick and 100 mm wide, onto the exposed filling and wall edges evenly from both sides of the wall. Do not apply this layer in the place where the mechanism, inspection openings or manufacturer's label are located.
8. If necessary, uncover and clean the damper after installation.
9. Check the damper's functionality.

Installation Distances

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

<table>
<tr><td rowspan="2"> 
3 Soft</td><td rowspan="2">F-R60
DN100 ... DN400</td><td>EI 60 (v_e - i ↔ o) S</td><td>a)
 
≥ 100 mm</td><td>b)
 
≥ 100 mm</td><td> 
360°</td></tr>
<tr><td>EI 60 (h_o - i ↔ o) S</td><td colspan="3">c)
 
≥ 125 mm (≥ 620 kg/m³)
≥ 110 mm (≥ 2200 kg/m³)</td></tr>
</table>

Notes:

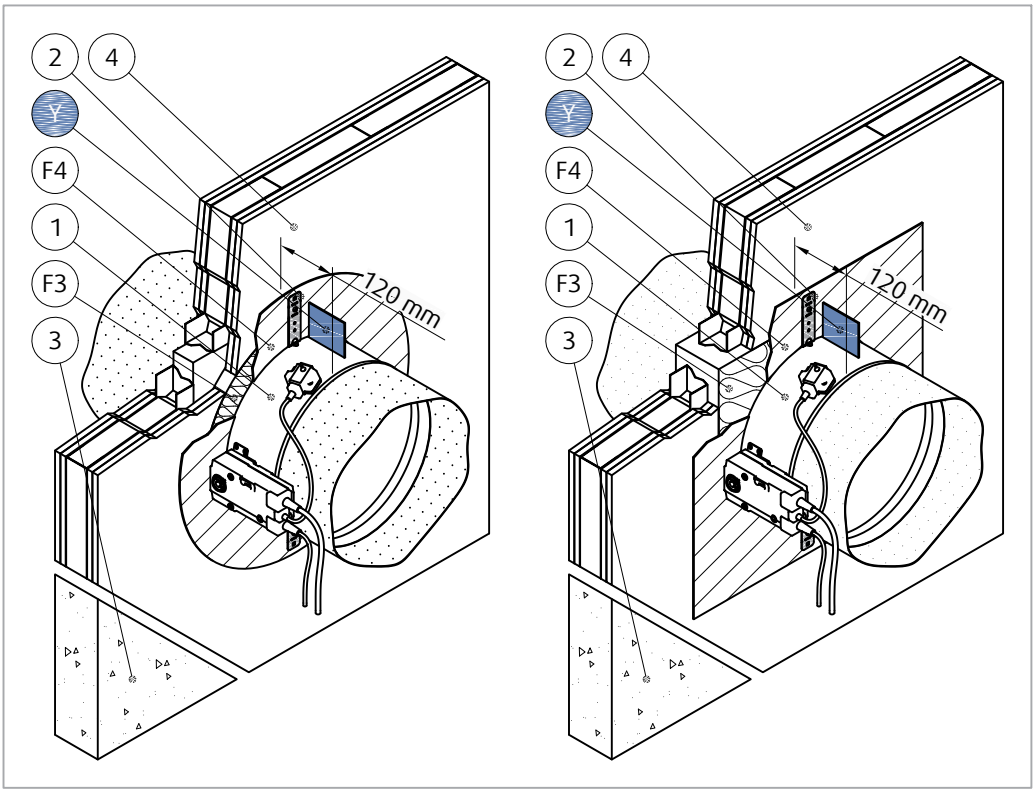
a) - Flexible (plasterboard) wall

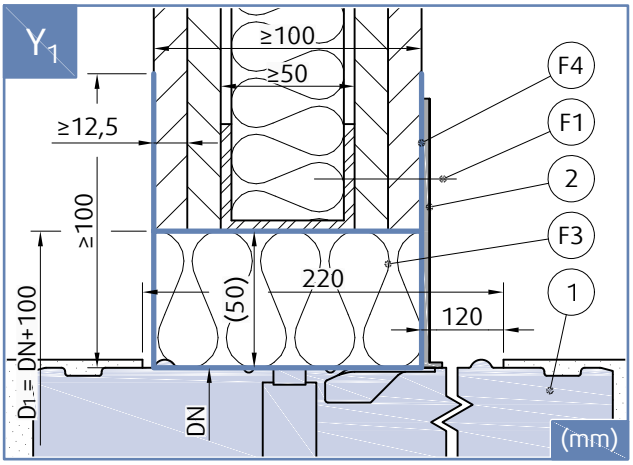
b) - Concrete/masonry/cellular concrete (rigid) wall

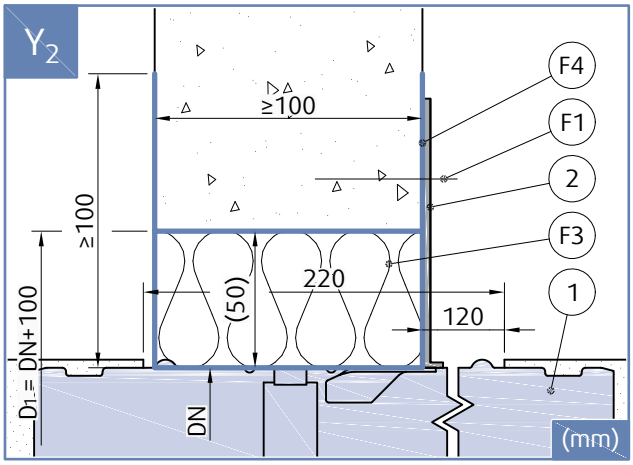
c) - Concrete/cellular concrete (rigid) floor/ceiling

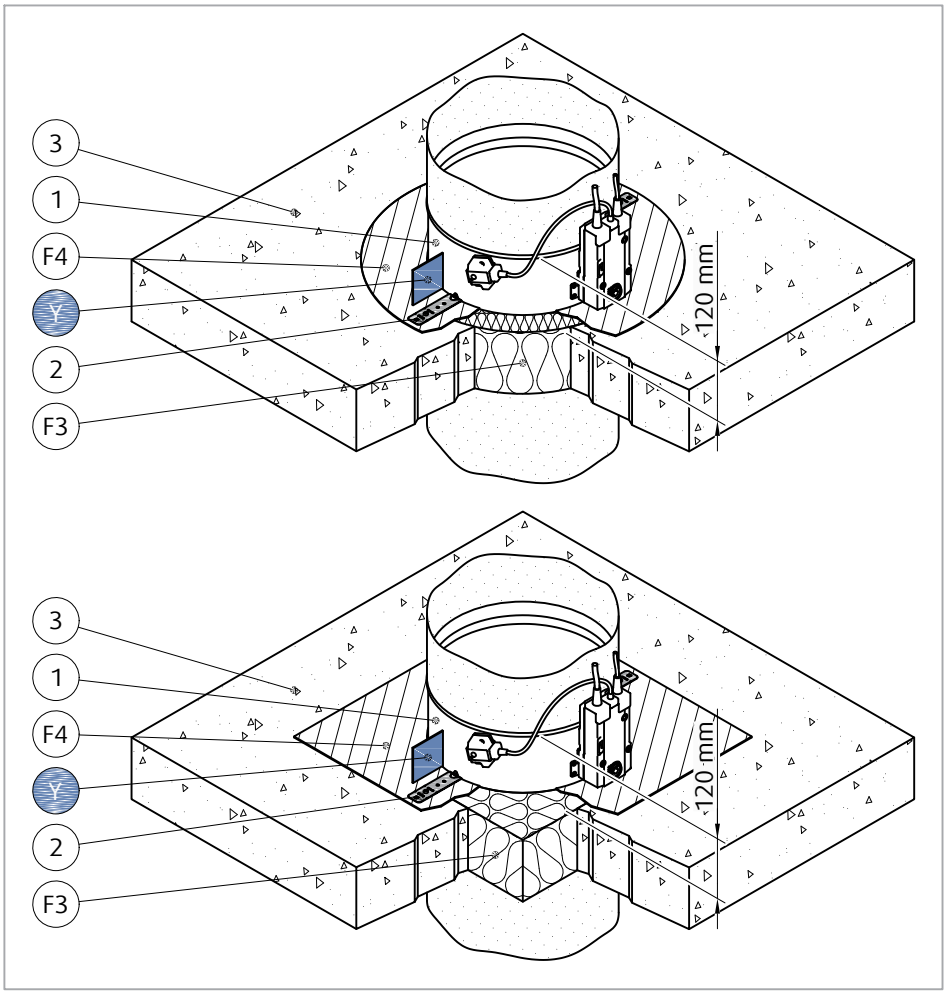
v_e - Vertical wall placement

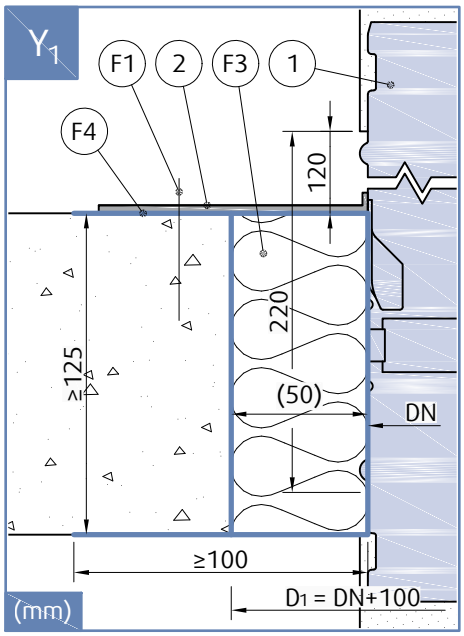
h_o - Horizontal floor/ceiling placement

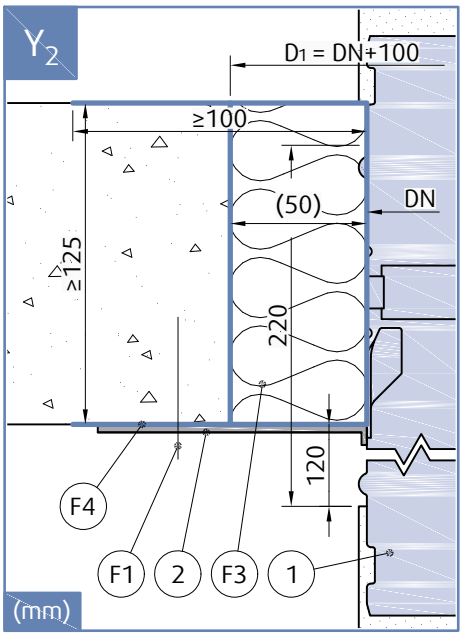

2
4
Y
F4
1
F3
3
120 mm
2
4
Y
F4
1
F3
3
120 mm


Y1
≥100
≥50
≥12,5
≥100
F4
F1
2
F3
1
220
120
(50)
D1= DN+100
DN
(mm)

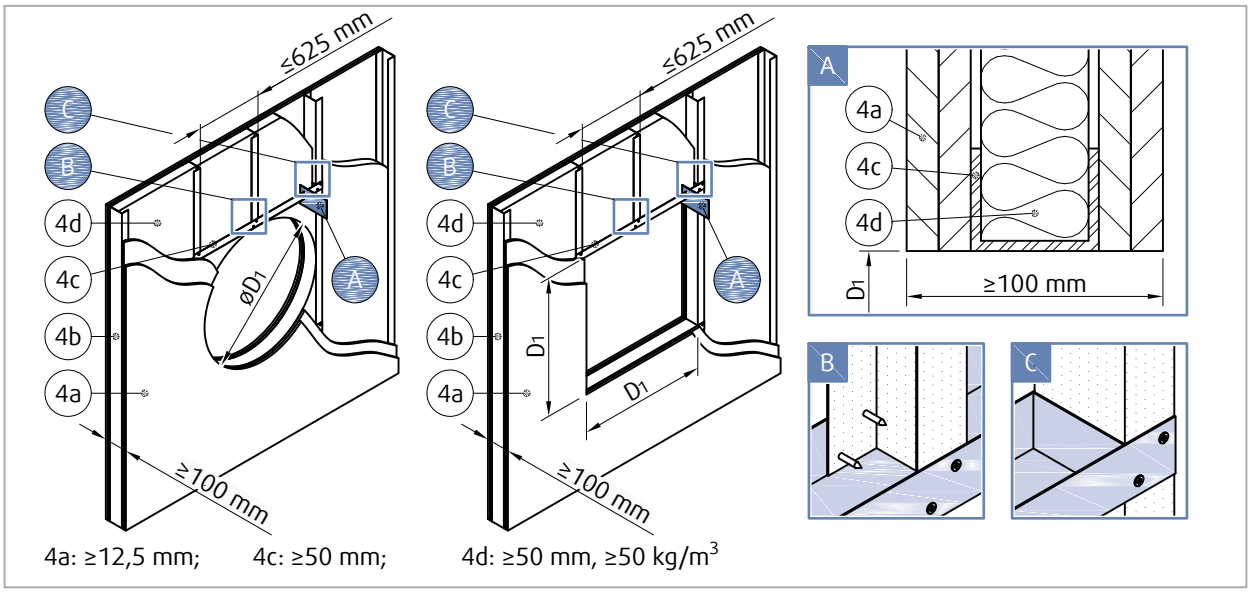

Y2
≥100
≥100
F4
F1
2
F3
1
220
120
(50)
D1= DN+100
DN
(mm)


3
1
F4
Y
2
F3
120 mm
3
1
F4
Y
2
F3
120 mm

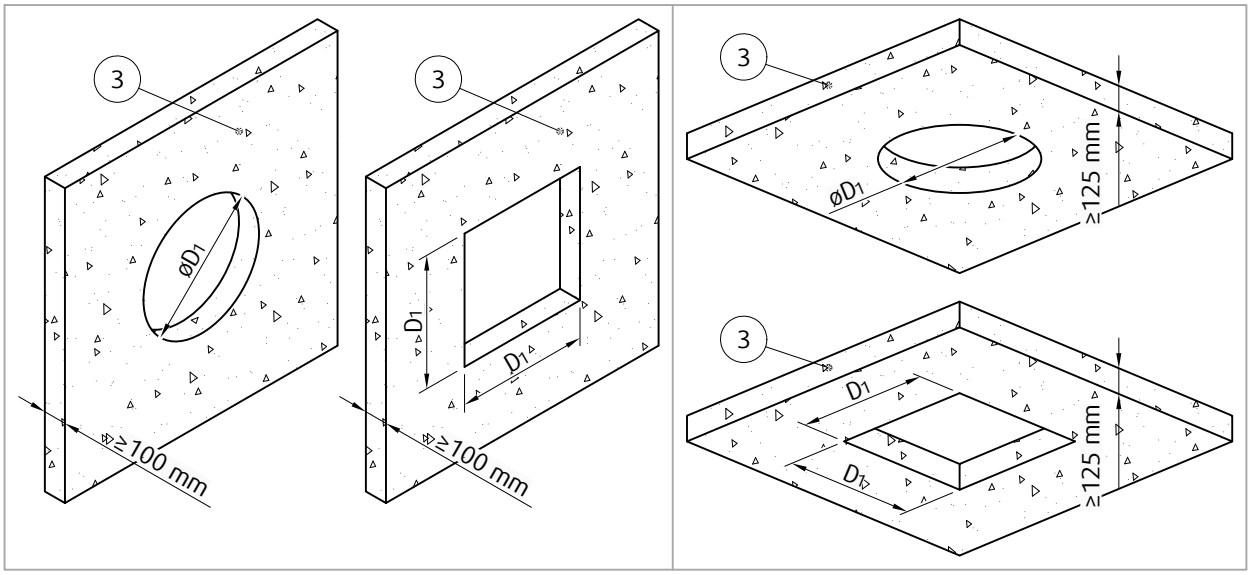

Y1
F1
2
F3
1
F4
120
220
≥125
(50)
DN
≥100
D1 = DN+100
(mm)


Y2
D1 = DN+100
≥100
(50)
DN
≥125
220
120
F4
F1
2
F3
1
(mm)

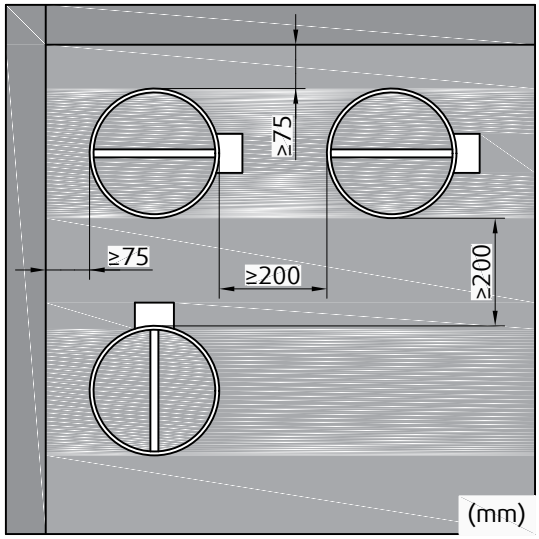
Opening and Wall and/or Ceiling Preparations



4a: ≥12,5 mm; 4c: ≥50 mm; 4d: ≥50 mm, ≥50 kg/m^3



Damper Minimum Distances



Legend for installation 3 - Soft

F1 - Screw ≥ 5,5 DIN7981 or suitable wall plug and screw size 6.
F3 - Mineral wool segment (minimum 150 kg/m3).
F4 - Layer of fire resistive coating (Promastop-CC/Promat) at least 2 mm thick for exposed surfaces.
1 - Fire damper (F-R60)
2 - Bendable hanger (part of the damper)
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; for thickness/cubic density see picture.

Installation 3H - Hilti

Filling Made Only from Hilti Foam

With this installation we recommend using a flexible connection (see accessory FCR) due to thermal expansion of connected ducts during a fire. Install the compensator so that the flexible part has a minimum distance of 50 mm from the edge of a damper's blade in open position.

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

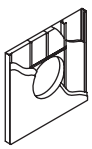
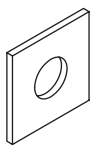
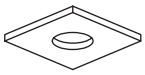
1. The supporting construction's opening must be prepared as depicted in the Opening and Wall Preparation section. Opening surfaces must be even and cleaned off. The flexible wall opening must be reinforced as per the standards for plasterboard walls.
2. The opening dimension D1 is driven by the nominal dimensions of the damper with added clearance.
3. Insert the closed damper into the middle of the opening so that the damper blade is in the wall. Use the bendable hanger (2) to secure the damper against the wall using a suitable screw (F1).

Wear protective gloves when handling the foam.

4. Insert the barrel of the foam gun into the middle of the cavity between the damper and the opening and fill it completely with foam (F5) pushed out foam can be quickly hand pushed back into the cavity.
5. After the filling (F5) solidifies, though it will always remain partly flexible, you can cut the excess foam that stands out from the wall.
6. If necessary, uncover and clean the damper after installation.
7. Check the damper's functionality.

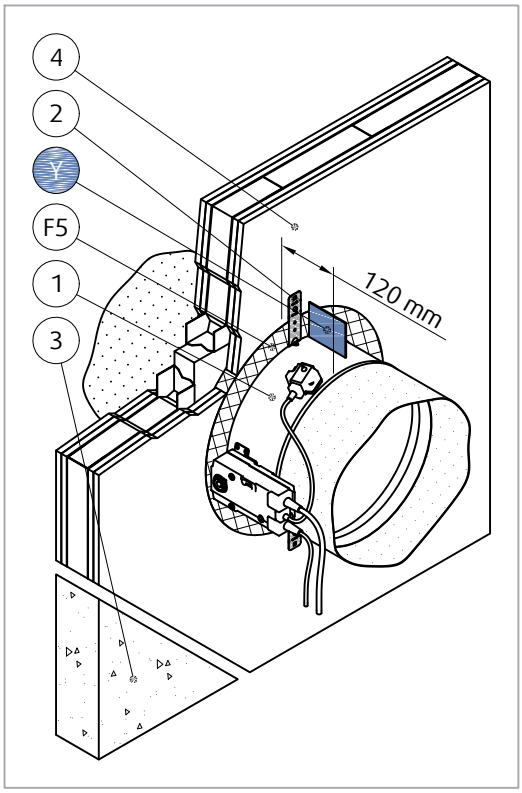
Installation Distances

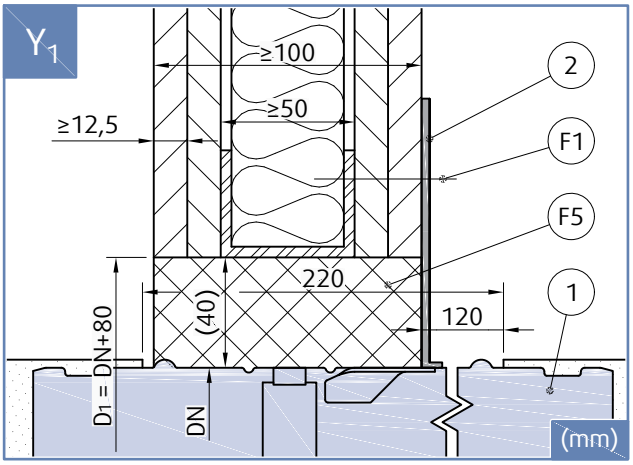
According to the EN 1366-2 standard, the minimum distance from the wall or ceiling to the damper body is 75 mm. For multiple crossings through a fire-resistive wall the minimum distance between two damper bodies is 200 mm. This applies to distances between the damper and other nearby objects crossing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

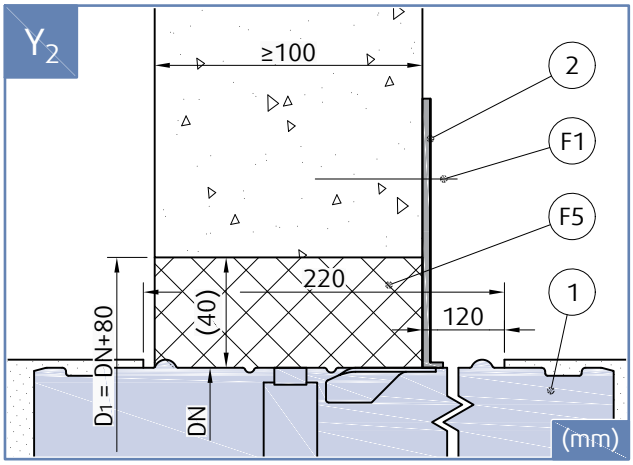
<table>
<tr><td rowspan="2"> 
3H Hilti</td><td rowspan="2">F-R60
DN100 ... DN400</td><td>EI 60 (v_e - i ↔ o) S</td><td>a)
 
≥ 100 mm</td><td>b)
 
≥ 100 mm</td><td> 
360°</td></tr>
<tr><td>EI 60 (h_o - i ↔ o) S</td><td colspan="3">c)
 
≥ 125 mm
(≥ 620 kg/m³)</td></tr>
</table>

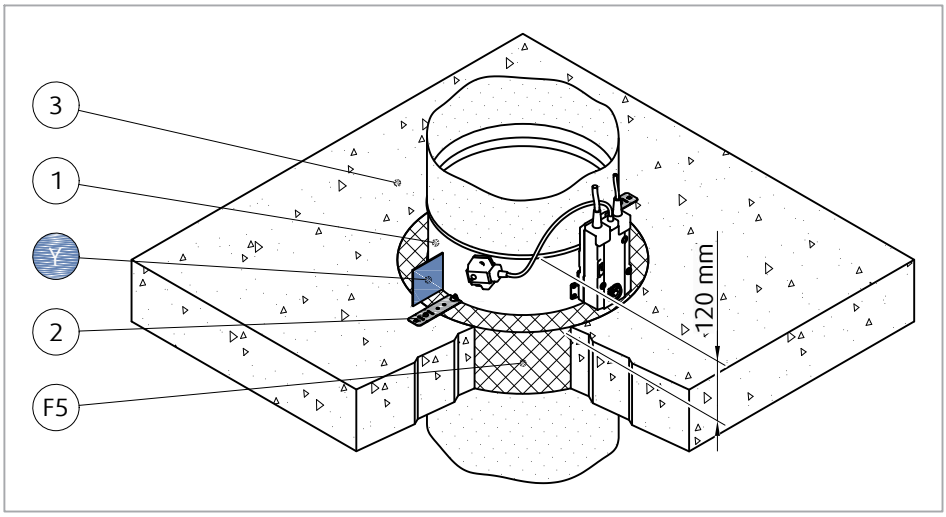
Notes:

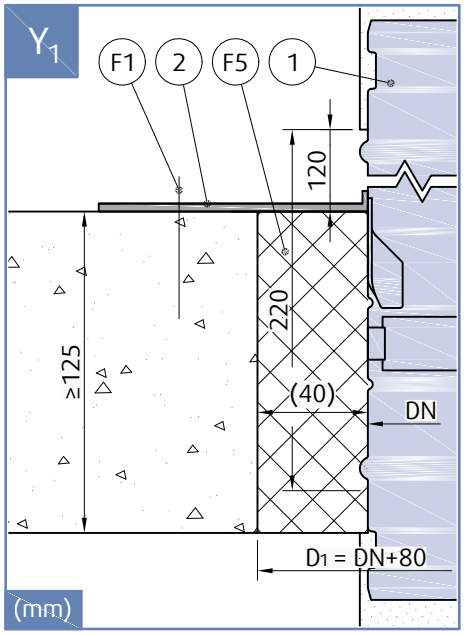
a) - Flexible (plasterboard) wall
b) - Concrete/masonry/cellular concrete (rigid) wall
c) - Concrete/cellular concrete (rigid) floor/ceiling
v_e - Vertical wall placement
h_o - Horizontal floor/ceiling placement

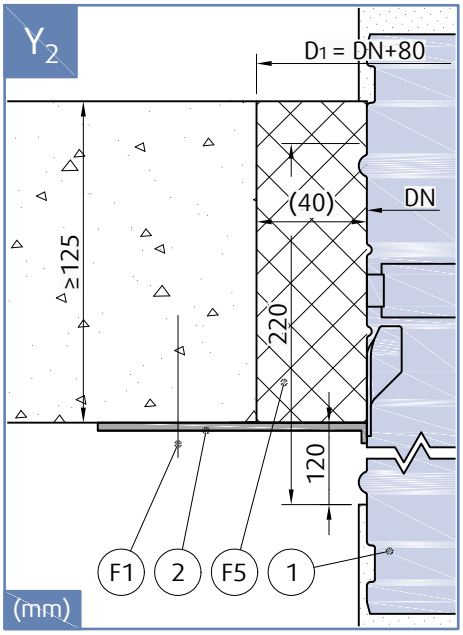

4
2
Y
F5
1
3
120 mm


Y1
≥100
≥50
≥12,5
2
F1
F5
1
220
120
(40)
D1 = DN+80
DN
(mm)

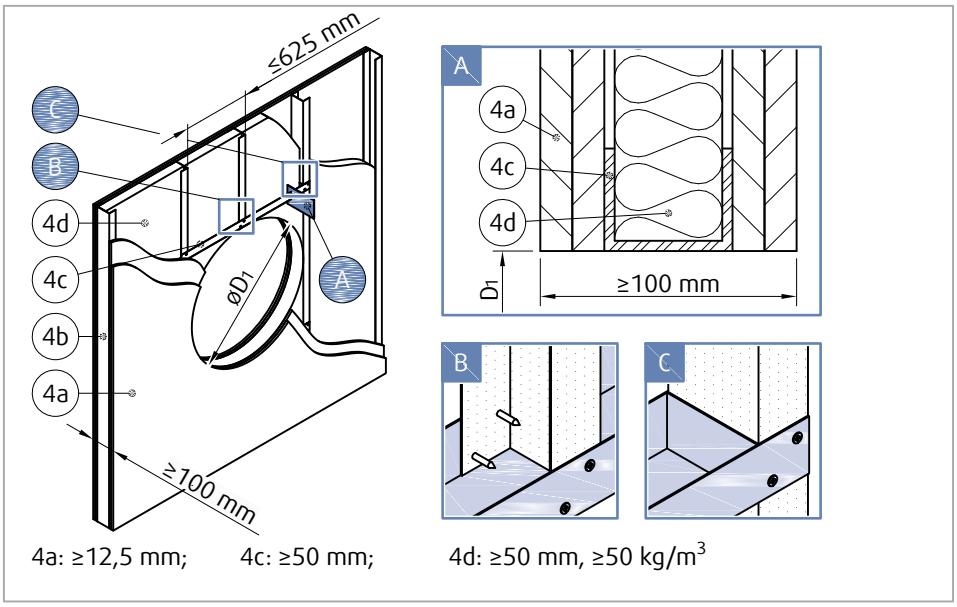

Y2
≥100
2
F1
F5
1
220
120
(40)
D1 = DN+80
DN
(mm)


3
1
Y
2
F5
120 mm

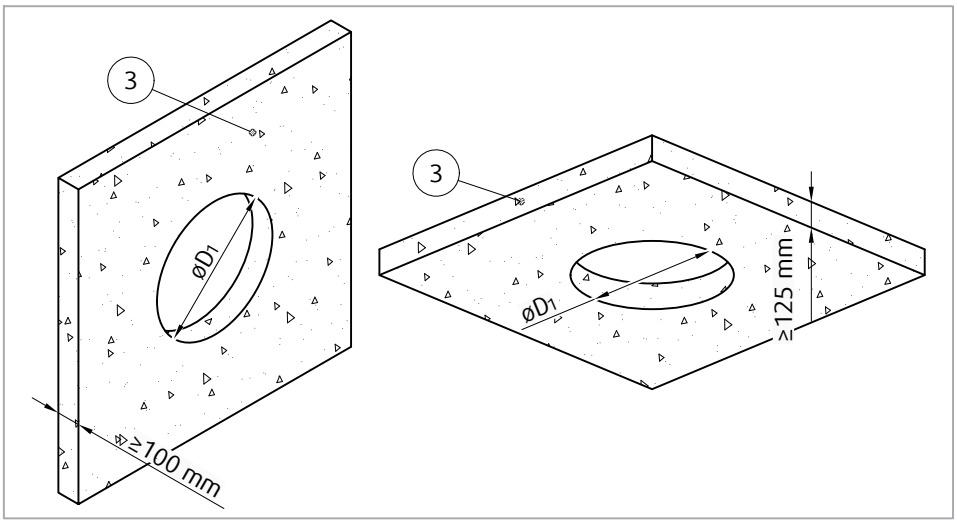

Y1
F1
2
F5
1
120
220
≥125
(40)
DN
D1 = DN+80
(mm)


Y2
D1 = DN+80
(40)
DN
≥125
220
120
F1
2
F5
1
(mm)

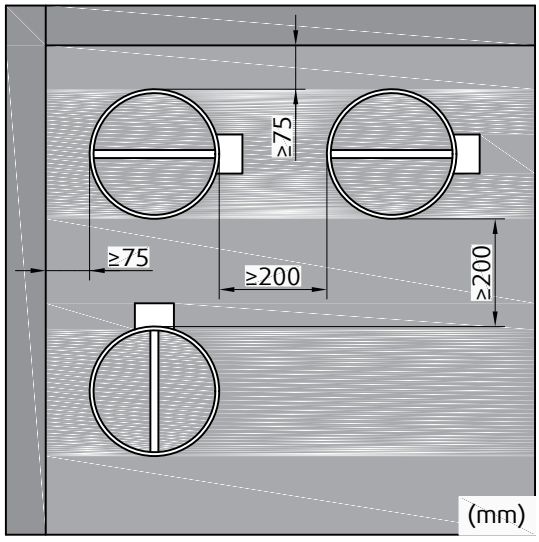
Opening and Wall and/or Ceiling Preparations



4a: ≥12,5 mm; 4c: ≥50 mm; 4d: ≥50 mm, ≥50 kg/m^3



Damper Minimum Distances



Legend for installation 3H - Hilti

F1 Screw ≥ 5,5 e.g. DIN7981 or suitable wall plug and screw size 6.
F5 Foam CFS-F FX/HILTI.
1 - Fire damper (F-R60)
2 - Bendable hanger (part of the damper)
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; for thickness/cubic density see picture

Electrical Connections

IMPORTANT

- Danger of electric shock!
- Switch off the power supply before working on any electrical equipment.
- Only qualified electricians are permitted to work on the electrical system.

Electrical Parameters per Activation and Actuator Type

A	DN (mm)												
	100	125	140	150	160	180	200	225	250	280	315	355	400
	Belimo BFL... / Gruner 340TA-...-05												

Actuator Size Map of F-R60

AT	A	T (Nm)	NV (V)	F (Hz)	CO (W)	CR (W)	WS (VA)	WN
H0, H2	-	-	DC 12/24 AC 150/250	50/60	-	-	-	3A
B230T	BFL230-T	4	AC 230		3,5	1,1	6,5	Imax 4 A @ 5 ms
G230T	340TA-230-...-05-...	5	AC 230		5,5	2	9,5	Imax 5.2 A @ 5 ms
GST0	340TA-24-...-05-.../ST01 & FSC-UFC24-2	5	AC/DC 24		8,5	4	11	Imax 5.6 A @ 5 ms
B24T, B24T-W	BFL24-T, BFL24-T-ST	4	AC/DC 24		2,5	0,8	4	Imax 8,3 A @ 5 ms
G24T, G24T-W	340TA-24-...-05-... 340TA-24-...-05-.../ST01	5	AC/DC 24		6,5	2	9	Imax 5.6 A @ 5 ms
B24T-SR	BFL24-SR-T	4	AC/DC 24		3	1	6,5	Imax 8,3 A @ 5 ms
G24T-SR	340CTA-24-...-05-...	5	AC/DC 24		6,5	2	7,5	DC (0)2 V ...10 V / Ri > (100 kΩ) 50 kΩ (0)4 ... 20 mA

Notes

AT - Activation type
A - Belimo Actuator type
T - Torque
NV - Nominal Voltage
F - Frequency
CO - Consumption in Operation
CR - Consumption in Rest
WS - Wire sizing consumption
WN - Wire sizing consumption Note

Type of Activation H0

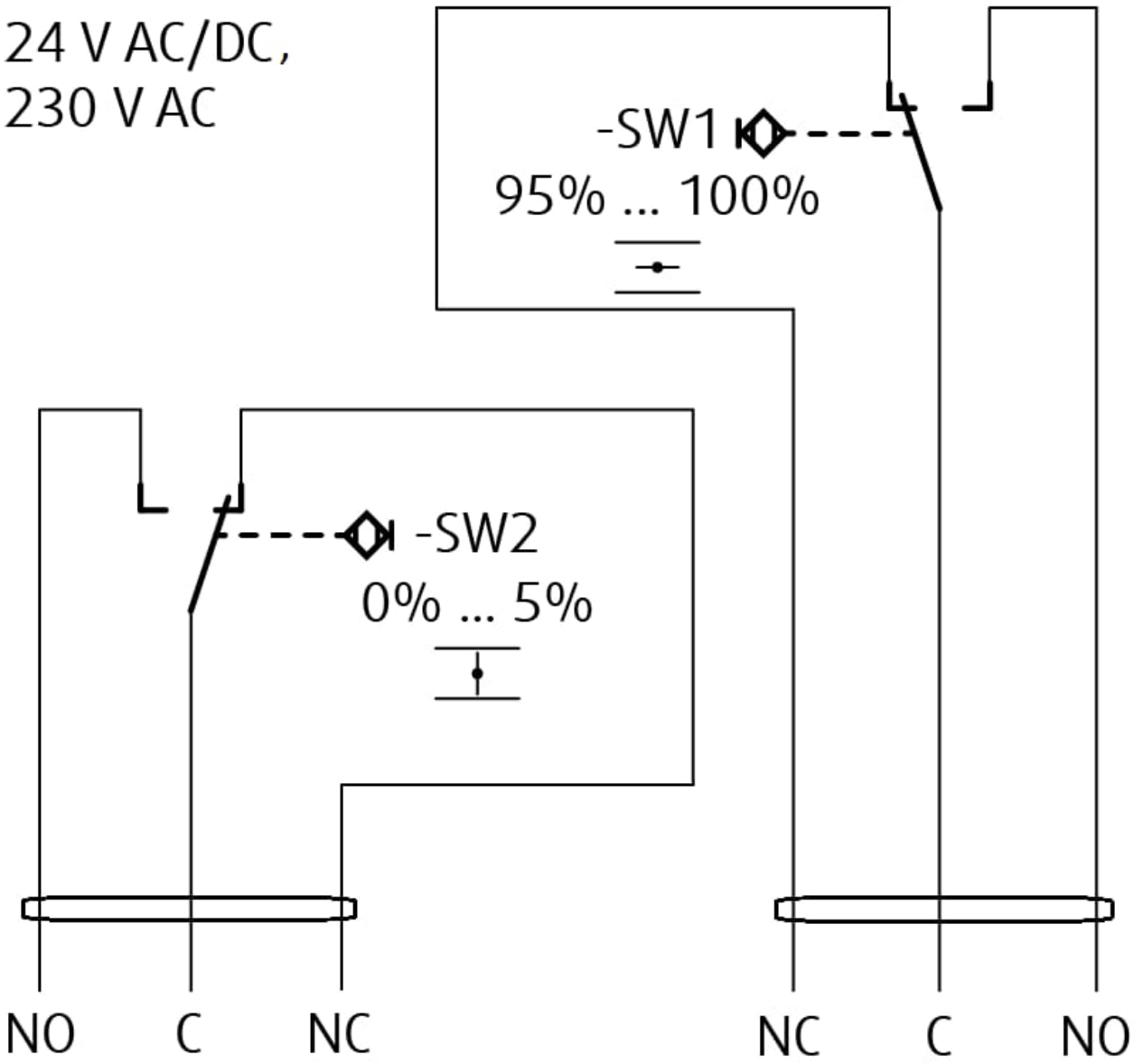
This type of activation mechanism does not have any electrical equipment.

Type of Activation H2

IMPORTANT: Risk of electric shock!

Microswitch:

Power Supply: 125/250V AC or 12/24V DCElectric Parameters: 3A



Notes:

- Switch off the power supply before working on any electrical equipment.
- Only qualified electricians are permitted to work on the electrical system.
- Power consumption must be observed!

Legend

NO Blue cable colour

C Black cable colour

NC Grey cable colour

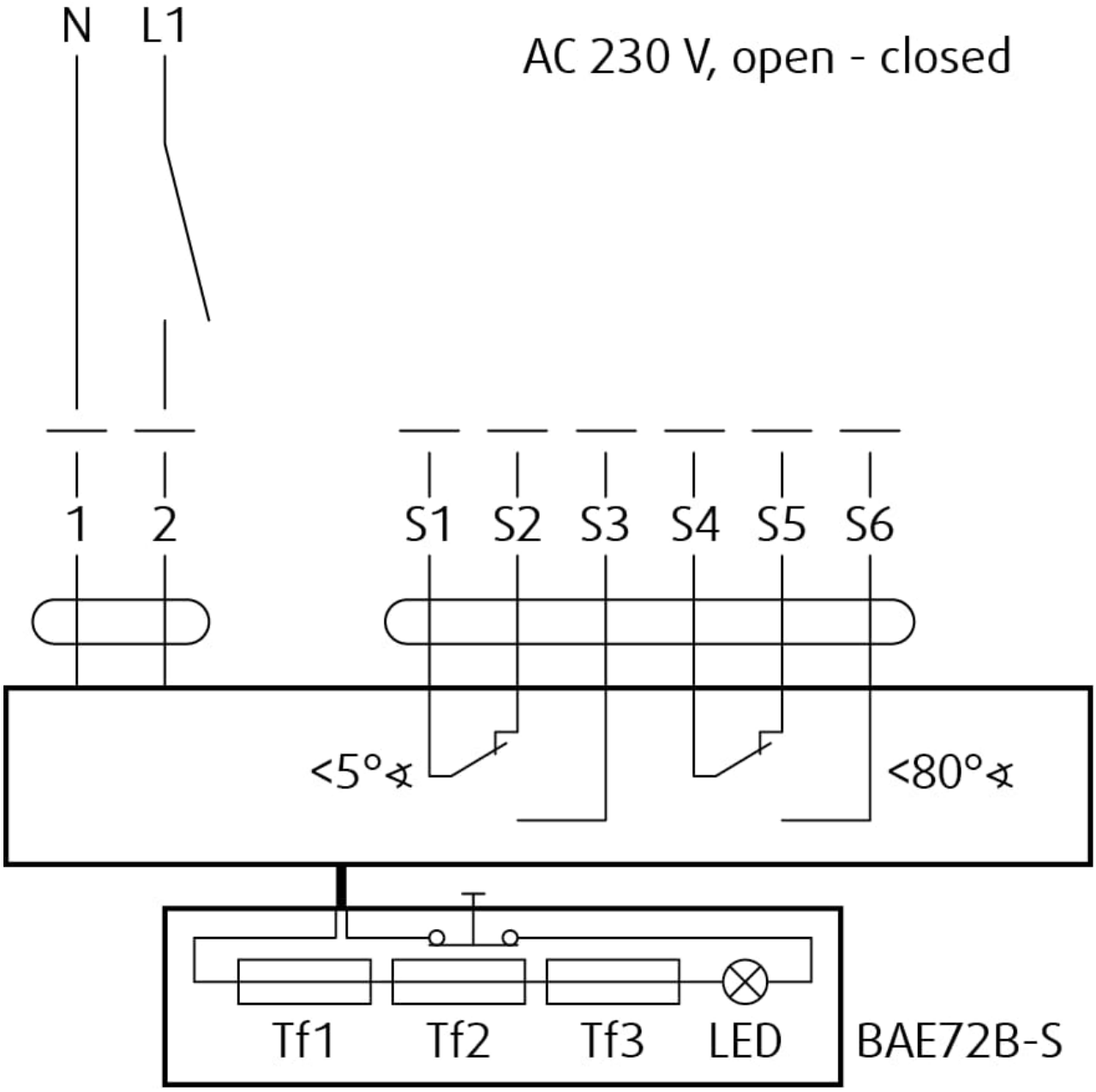
Type of Activation B230T

IMPORTANT: Risk of electric shock!

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

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

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



Notes:

- 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

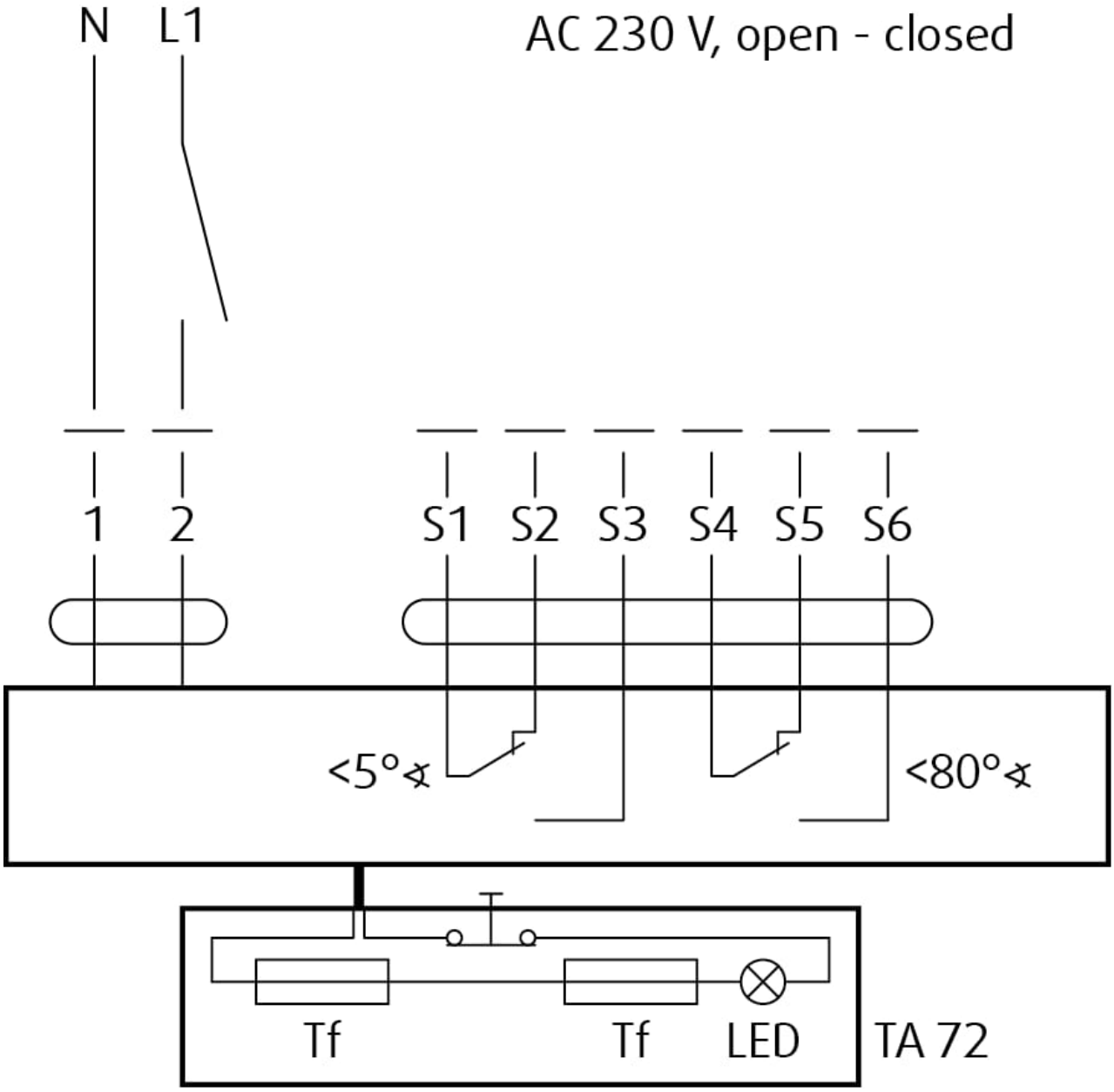
Type of Activation G230T

IMPORTANT: Risk of electric shock!

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

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

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



Notes:

- 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

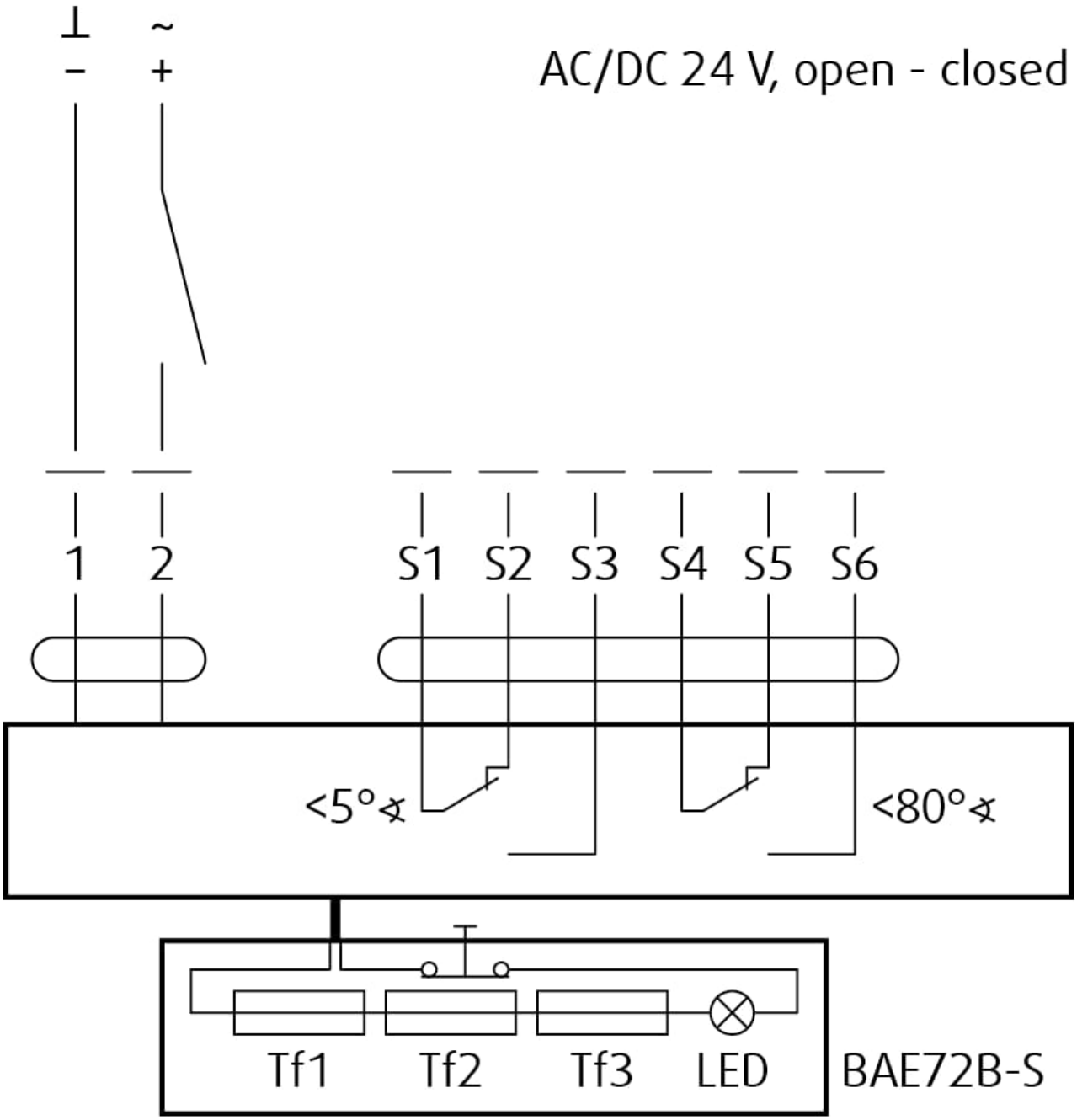
2 - Brown cable colour

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: Risk of electric shock!
Switch off the power supply before working on any electrical equipment.
Only qualified electricians are permitted to work on the electrical system.
Actuator power supply: AC (50/60 Hz)/DC 24 V



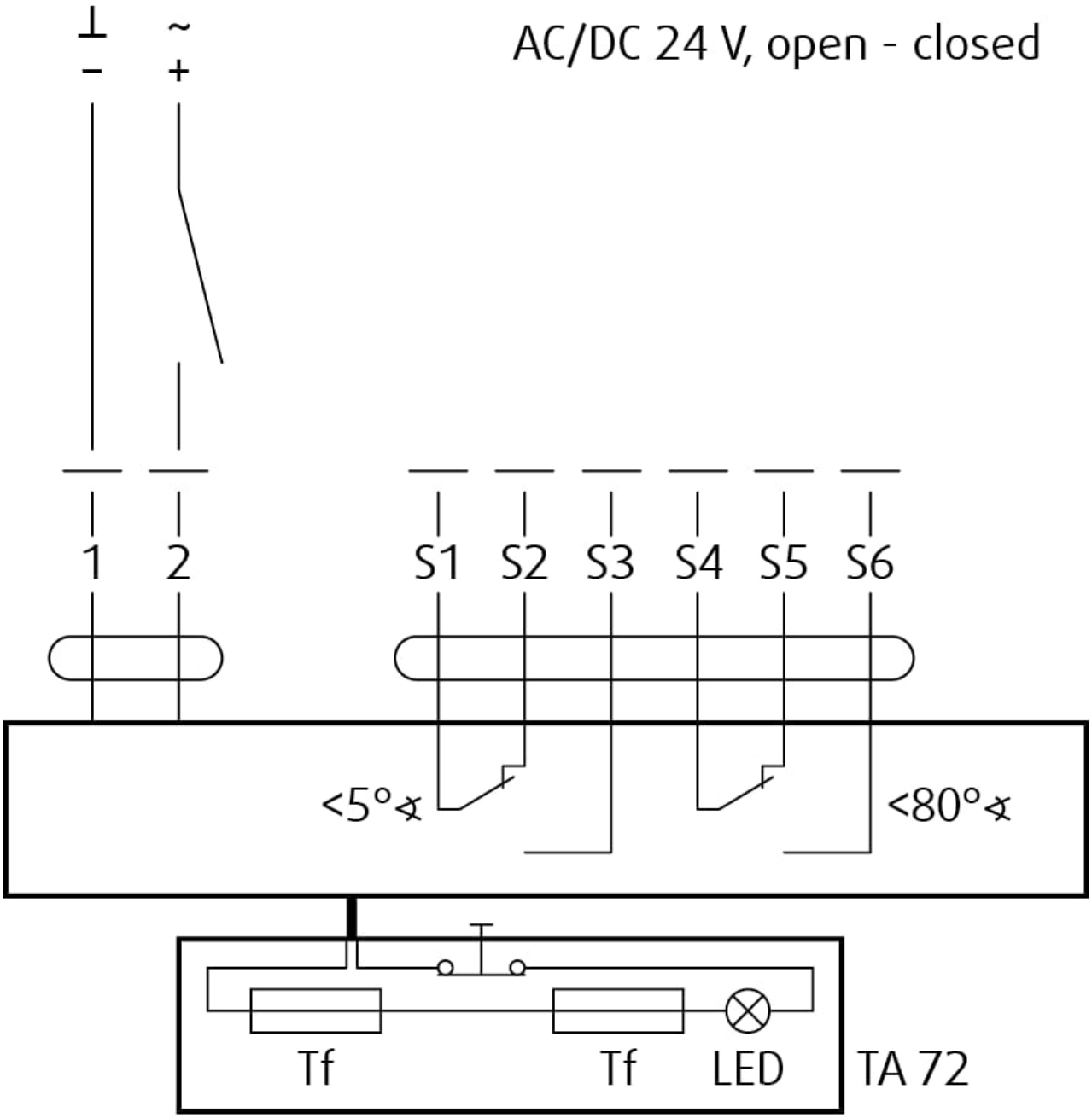
Legend

1 - Blue cable colour (black for BF24-T)
2 - Red cable colour (white for BF24-T)
S1 - Violet cable colour (white for BF24-T)
S2 - Red cable colour (white for BF24-T)
S3 - White cable colour (white for BF24-T)
S4 - Orange cable colour (white for BF24-T)
S5 - Pink cable colour (white for BF24-T)

S6 - Grey cable colour (white for BF24-T)
Tf - Thermal fuse

Type of Activation G24T

IMPORTANT: Risk of electric shock!
Switch off the power supply before working on any electrical equipment.
Only qualified electricians are permitted to work on the electrical system.
Actuator power supply: AC (50/60 Hz)/DC 24 V



Notes:

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

Legend

1 - Black cable colour
2 - Red cable colour

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

Type of Activation GST0

- The actuator and the control module are factory wired.
- Individual control of 2 fire dampers
- Bus protocols (RS-485): BACnet MS/TP and Modbus RTU
- Automatic baud rate detection with BACnet
- Bus monitoring function

LEDs status indication (GST0)

LED color and type | LED state | Status

Yellow (Closed) | ON | Damper closed

Green (Open) | ON | Damper open

Yellow and green | Blinks in parallel | Damper is moving

Yellow and green | Alternately blinks - interval 0.5 sec | Actuator did not reach the end switch position within set time

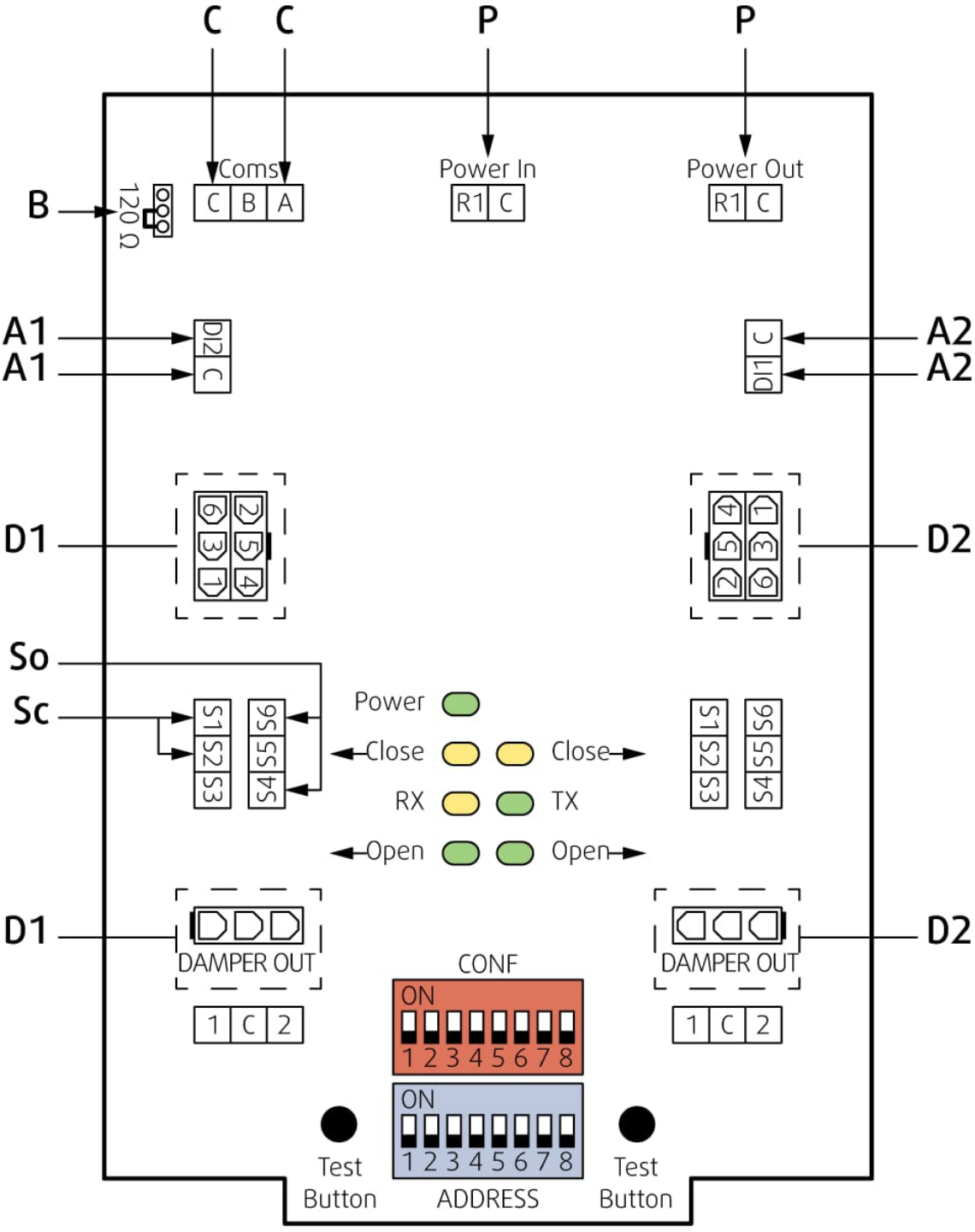
Yellow and green | Alternately blinks - interval 3 sec | Alarm active at damper: bus command = actuator open, actuator = in closed position

Power green | OFF | Power failure

Power green | ON | Power is connected

Yellow Rx | Blinks | Receive data

Green Tx | Blinks | Transmit data



Notes:

- Caution! Main power supply voltage!
- Power consumption and switching thresholds must be observed!
- Combination of power supply voltage and safety extra-low voltage not permitted at both auxiliary switches.

IMPORTANT: If only one actuator is connected to the FSC-UFC24-2, the LED's of the side where no actuator is connected will indicate an alarm. A jumper has to be installed between S4 and S6 in the terminal where there is no actuator connected, to indicate an “opened” position in the LED. If the second connection is not activated via bus, there will be no alarm signal in the bus system.

Legend

A1, A2 Analogue Application; Digital input for manual override is default: "Normally Open" or selected via bus as: "Normally Open" (= standard open) or "Normally Closed" (= standard closed)

B Position of line termination 120 ohm if FSC-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 FSC-UFC24-2

So Contact open

Sc Contact closed

Type of Activation B24T-W

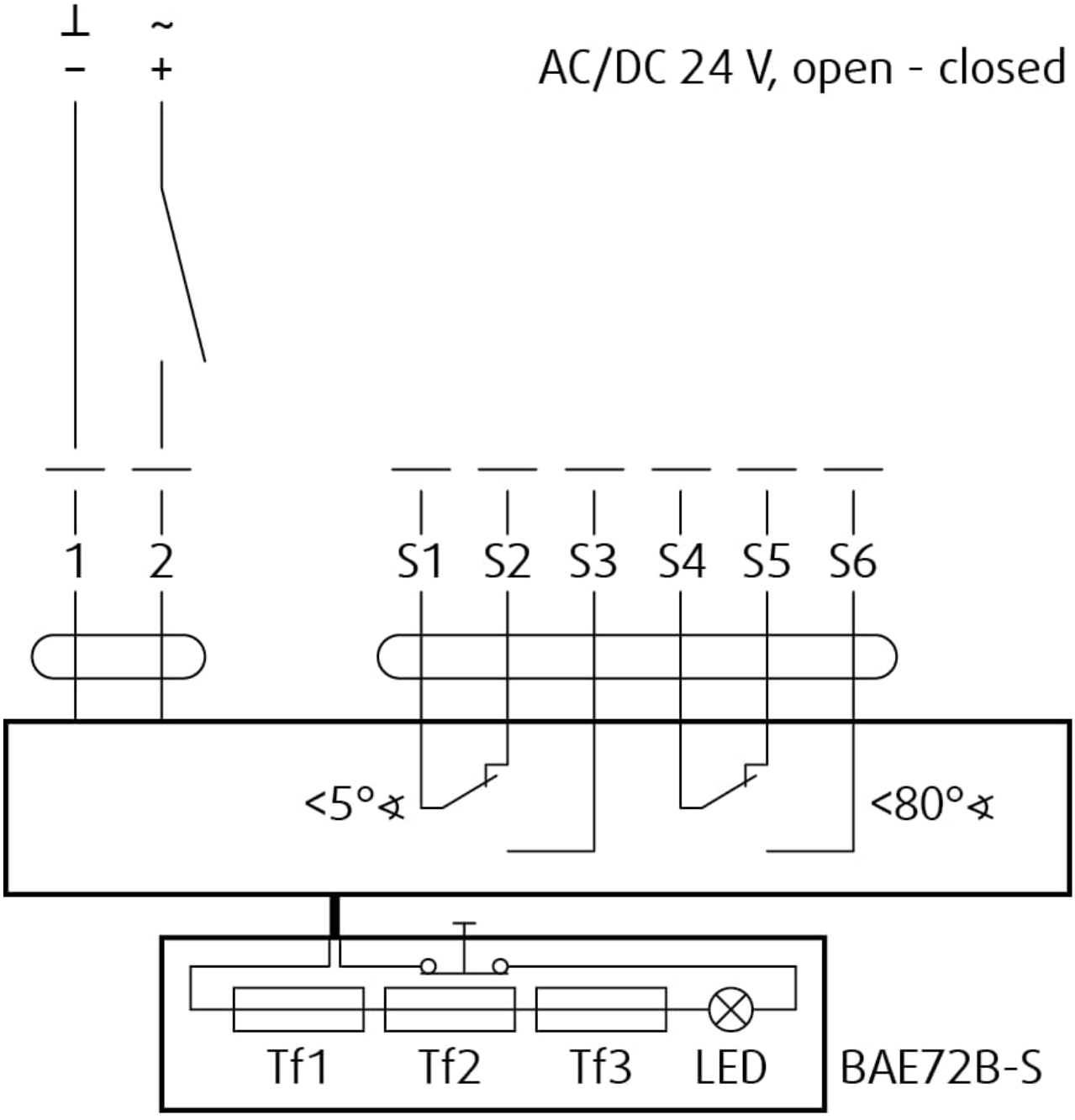
IMPORTANT: Risk of electric shock!

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

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

This type of activation comes with provided cable connectors for the supply and communication unit (communication unit not part of the mechanism).

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



Notes:

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

Legend

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

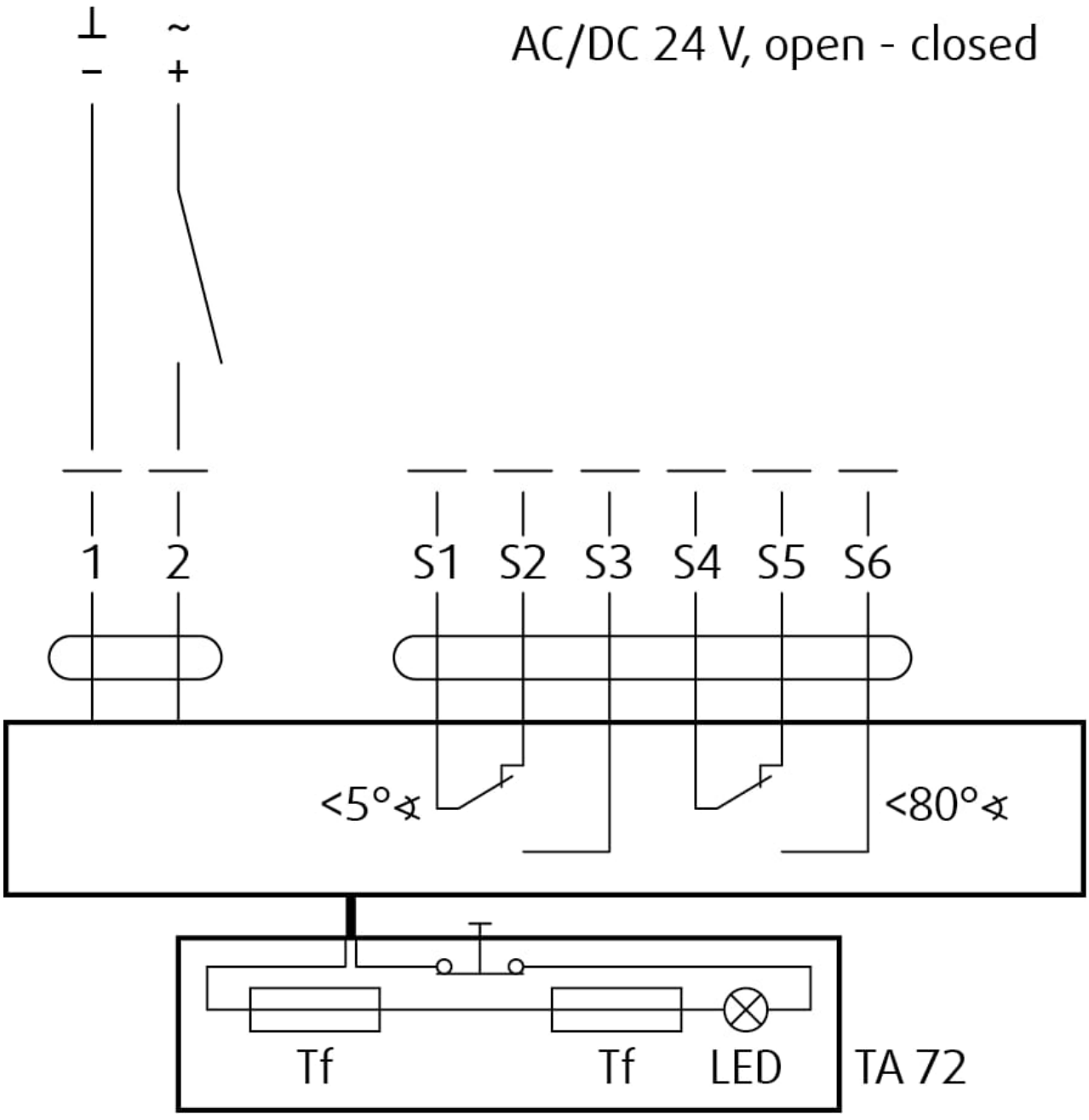
Type of Activation G24T-W

IMPORTANT: Risk of electric shock!

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

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

This type of activation comes with provided cable connectors for the communication and power supply unit (communication unit not part of the mechanism).



Notes:

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

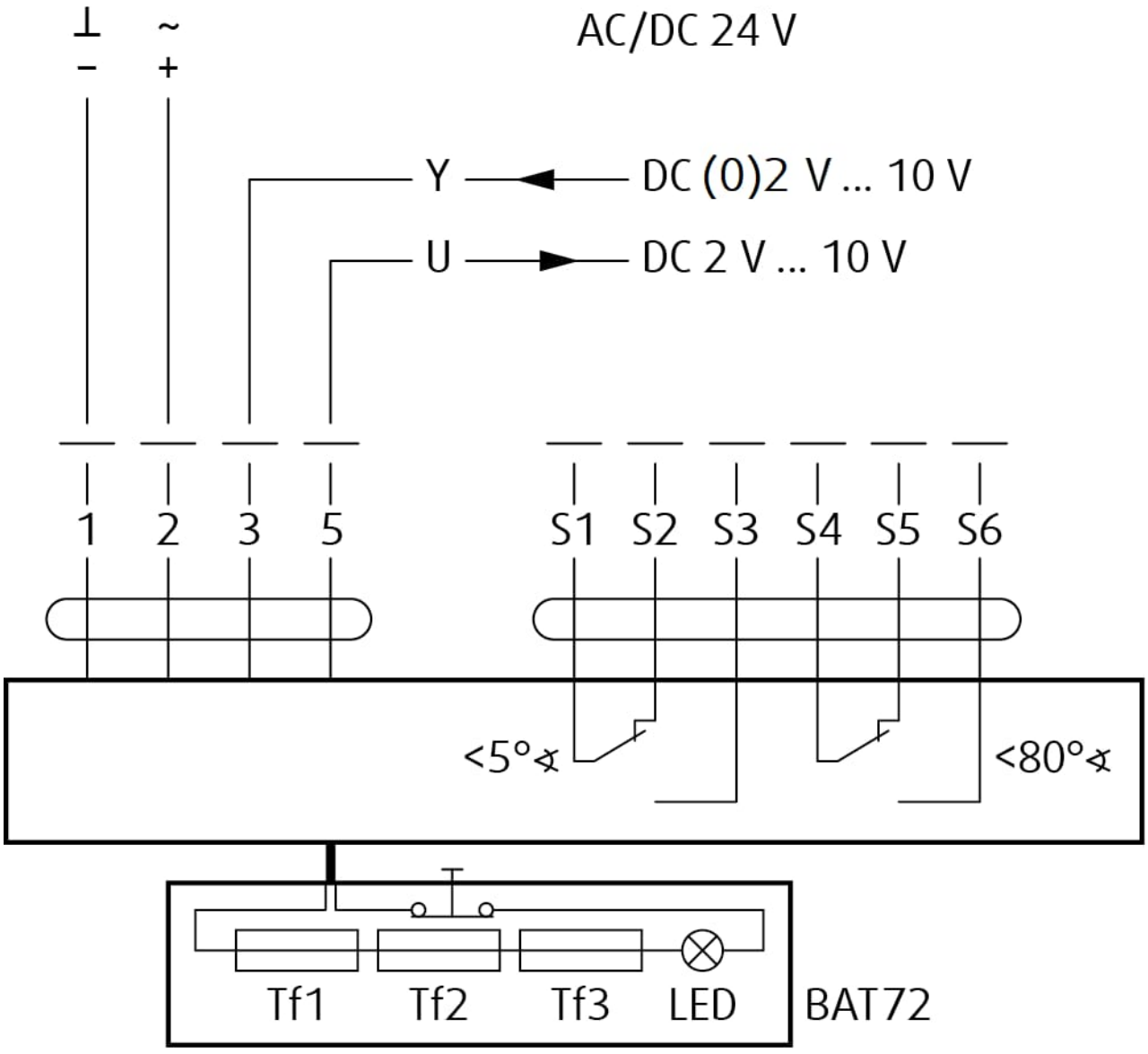
Legend

1 Black cable colour (black for BF24-T) in connector 1

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

Type of Activation B24T-SR

IMPORTANT: Risk of electric shock!
Switch off the power supply before working on any electrical equipment.
Only qualified electricians are permitted to work on the electrical system.
Actuator power supply: AC (50/60 Hz)/DC 24 V



Notes:

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

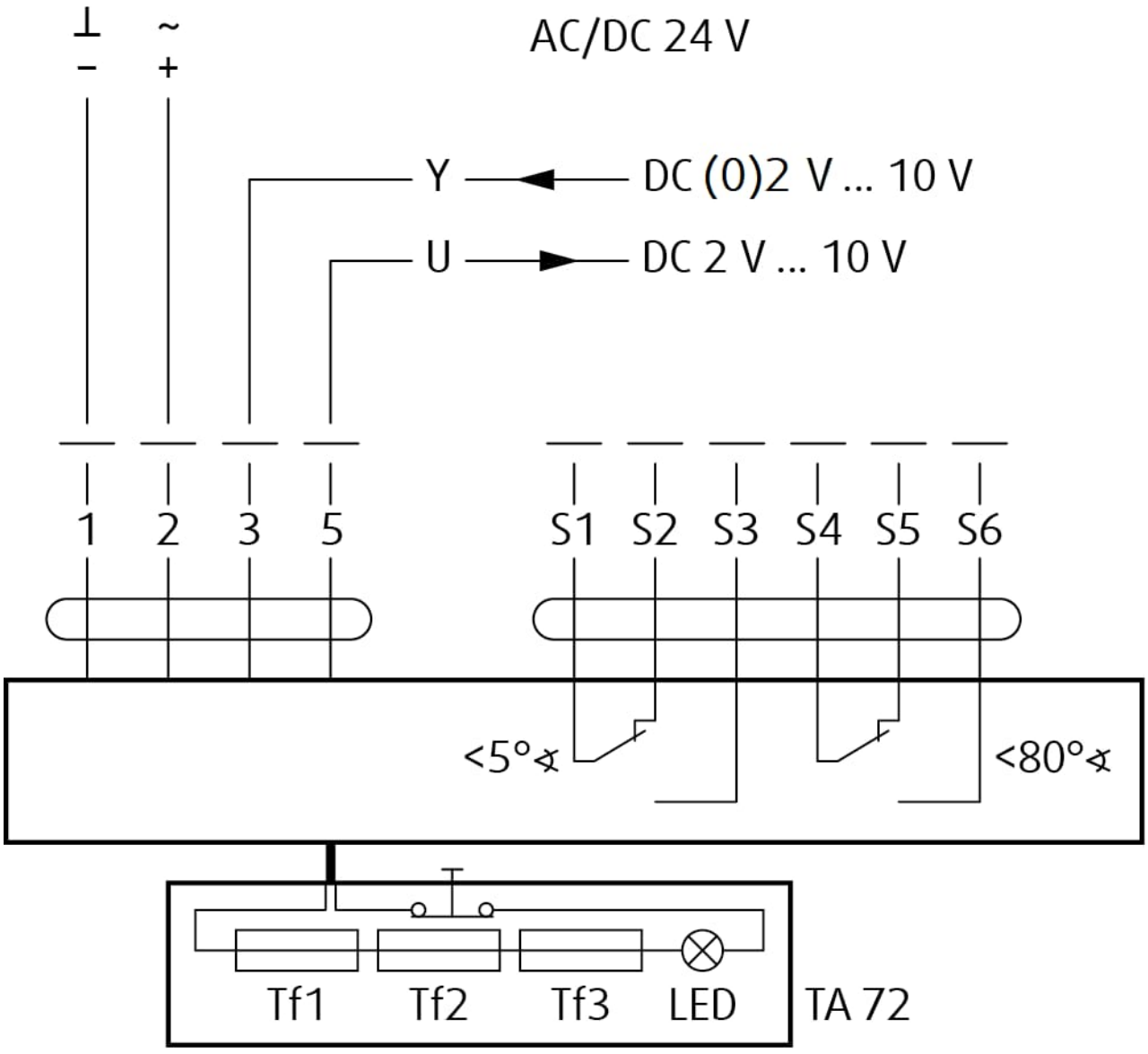
Legend

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 G24T-SR

IMPORTANT: Risk of electric shock!
Switch off the power supply before working on any electrical equipment.
Only qualified electricians are permitted to work on the electrical system.
Actuator power supply: AC (50/60 Hz)/DC 24 V



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

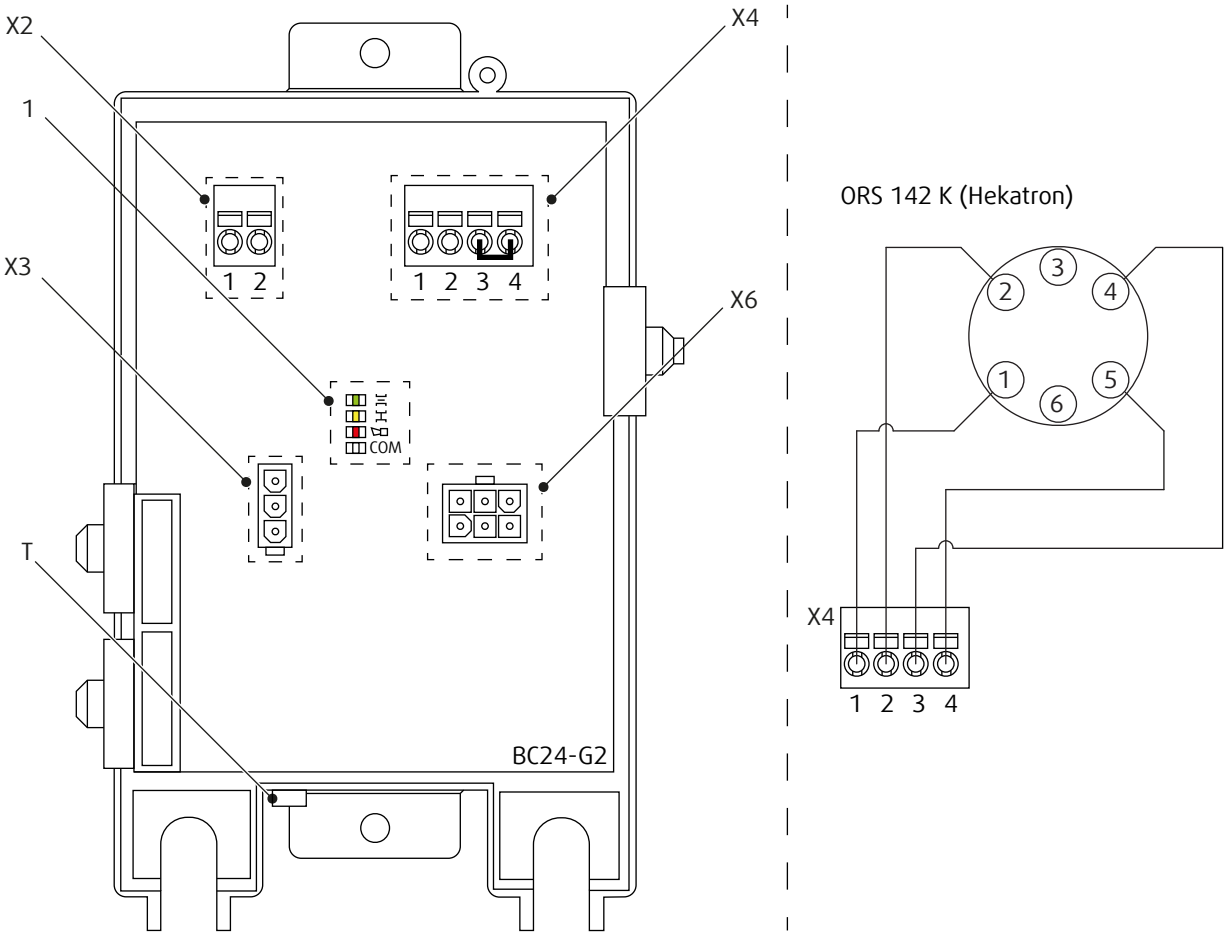
S3 White cable colour
S4 Orange cable colour
S5 Pink cable colour
S6 Grey cable colour
Tf Thermal fuse

Type of activation BST1

IMPORTANT: Danger of electric shock! Parallel circuits, i.e. a smoke detector on multiple slave devices are not allowed!
Switch off the power supply before working on any electrical equipment.
Allow only qualified electricians to work on the electrical system.
Actuator power supply via fitted communication unit: DC 24 V
NOTES:
• Left: Connection scheme for fitted communication and supply unit BC24-G2 (THC).
• Right: Example connection scheme for smoke detector ORS 142 K from Hekatron - not part of the delivery.

LEDs status indication (BST1)

LED colour| LED state | Status
Green | ON | Damper open
Green | Blinks | Damper is opening
Yellow | ON | Damper closed
Yellow | Blinks | Damper is closing
White | Blinks | SLC-communication ok – control command „close damper“
White | Flashes | SLC-communication ok – control command „open damper“
Red | ON | Safety element triggered (at X4)
Red | Blinks | self-test active; error: communication loss; error: actuator not connected; error: thermoelectric tripping device of actuator triggered; runtime monitoring error; mechanical error triggered



Legend

1 - LEDs for status indication

T - Test button: This allows the simple function test on site of the damper. The button operation causes an error message at the control device which must be reset.

X2 - 2-pin spring terminal: 1/2 - connection for SLC two-wire line, wires interchangeable. Maximum cable lengths can be calculated with the SLC Planning Tool. Rule of thumb: 300m@1.5 mm2

X3 - 3-pin connector: damper actuator (DC 24 V)

X4 - 4-pin spring terminal: Connection for smoke detector

- 1- (+) DC 24 V / max. 30 mA
- 2- GND
- 3- IN1 (external relay contact 1)
- 4- IN2 (external relay contact 2)

X6 - 6-pin connector: damper actuator (position limit switches)

Type of activation BST2

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.

Actuator power supply via fitted communication unit: DC 24 V

NOTES:

• Depiction of parts for fitted communication and supply unit BKN230-24-MOD (Modbus/BACnet).

6 - LEDs status indication of actuator

LED colour| LED state | Status

Green | ON | Damper open

Green | Blinks | Damper is opening

Yellow | ON | Damper closed

Yellow | Blinks | Damper is closing

Red | Blinks | Internal device fault (BKN230-24-MOD)

Red | Blinks | External fault: smoke detector triggered; nominal position not reached

Red | Flashes | External fault: If an error is stored (i.e. no longer pending, but not yet acknowledged), then this is displayed on the device by a periodic flash of the red LED.

7 - LED signalization of communication unit (BKN230-24-MOD)

LED colour| LED state | Status

Command OPEN / limit position not reached:

Green | ON | -

Yellow | ON | Damper closed

Yellow | OFF | Damper blade is between close and open

Yellow | Flickering | BACnet/Modbus communication is illuminated during RX and TX

Red | Blinks | Error message after 180 seconds

Command CLOSE / limit position not reached:

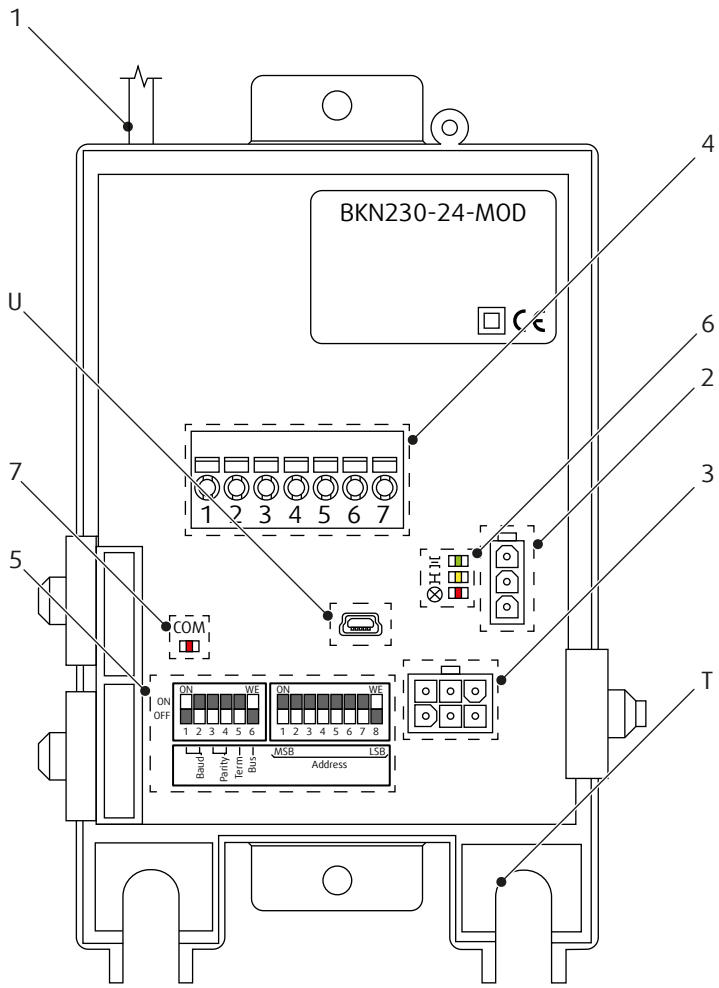
Green | ON | Damper open

Green | OFF | Damper blade is between open and close

Yellow | Blinks | -

Yellow | Flickering | BACnet/Modbus communication is illuminated during RX and TX

Red | Blinks | Error message after 60 seconds



A1	1	2
9’600	OFF	OFF
19’200	OFF	ON
38’400	ON	OFF
76’800	ON	ON

A2	3	4
1-8-N-1	OFF	OFF

A3	5
150 Ω	ON
OFF	OFF

A4	6
BACnet	ON
Modbus	OFF

B	1	2	3	4	5	6	7	8
0	-	OFF	OFF	OFF	OFF	OFF	OFF	OFF
1	-	OFF	OFF	OFF	OFF	OFF	OFF	ON
2	-	OFF	OFF	OFF	OFF	OFF	ON	OFF
...	-	-	-	-	-	-	-	-
127	-	ON	ON	ON	ON	ON	ON	ON

Legend

U - USB mini socket: BKN-MOD-BAC Update Tool

T - Test button: Test run / fault acknowledgement. Press the button for longer than one second to trigger the start of test run or to trigger a reset of present error message.

1 - Power supply: cable and plug, AC 230 V

2 - 3-pin connector: damper actuator (DC 24 V)

3 - 6-pin connector: damper actuator (position limit switches)

4 - 7-pin spring terminal:

- 1External smoke detector, +24 V, max. 50 mA

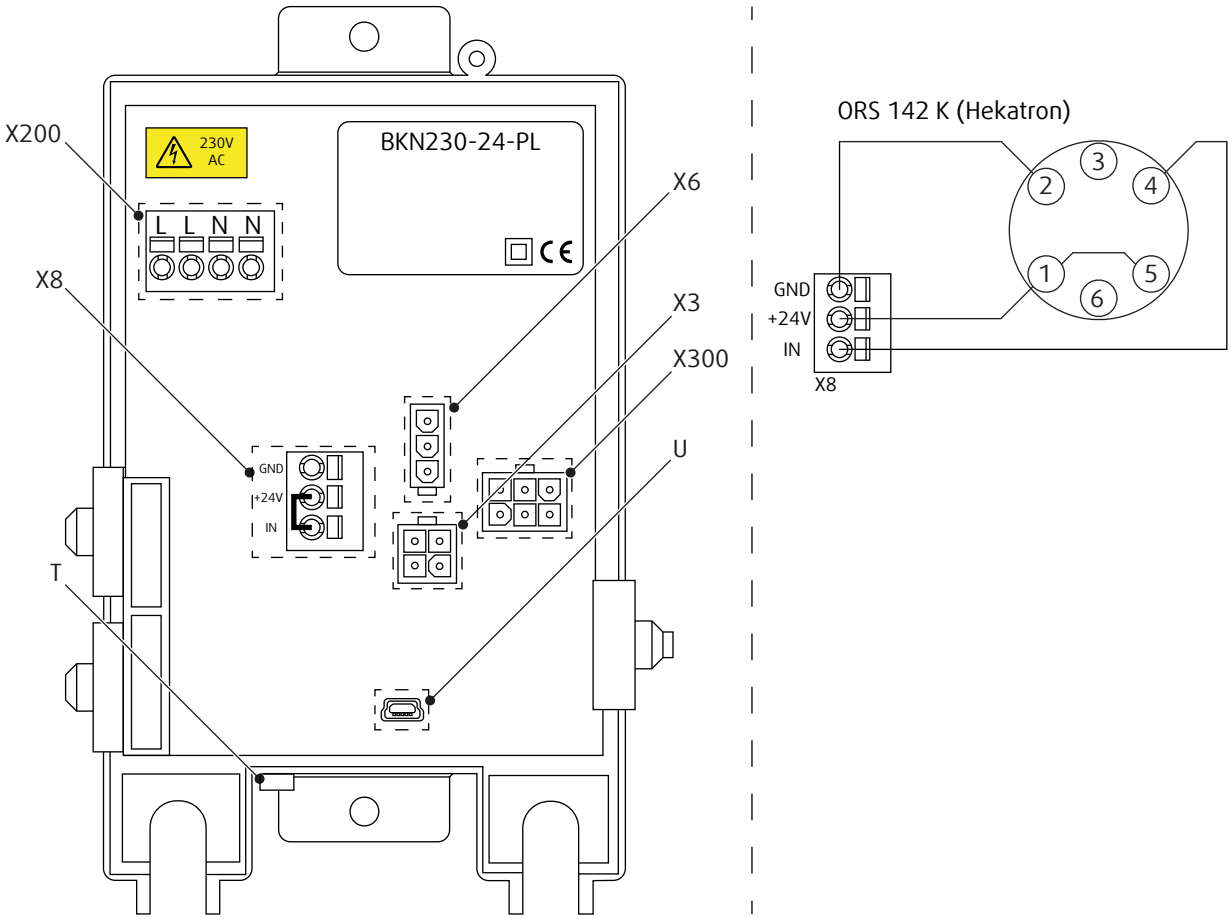
- 2External smoke detector, control input
- 3 GND
- 4 BKN Direct Control, override control input
- 5 Modbus GND
- 6 Modbus D+
- 7 Modbus D–

5 - Parametrization: DIL switch

- A1:Baud rate
- A2:Parity
- A3: Termination (on with 150 Ω)
- A4: Bus: BACnet (ON) or Modbus (OFF)
- B:Modbus address

Type of activation BST10

IMPORTANT: Danger of electric shock! The BKN230-24-PL may only be used with a designated master (e.g. BKS64-PL).
Switch off the power supply before working on any electrical equipment.
Allow only qualified electricians to work on the electrical system.
Actuator power supply via fitted communication unit: DC 24 V
NOTES:
• Left: Connection scheme for fitted communication and supply unit BKN230-24-PL (Powerline)
• Right: Example connection scheme for smoke detector ORS 142 K from Hekatron - not part of the delivery.



Legend

U - USB mini socket: reading of the MAC address, optionally setting the BUS-ID (1..64) and a device identifier in plain text

T - Test button: Test run / fault erase. Press the button for longer than one second to trigger the start of test run or short press to erase stored error.

X6 and X300 connector terminals are arranged so that only either a conventional actuator or a Belimo Top-Line actuator can be connected.

X200 - 2+2-pin spring terminal: (50/60Hz) AC 230 V with Powerline signal

X3 - 3-pin connector: damper actuator (DC 24 V)

X4 - 4-pin spring terminal: connection for smoke detector

X6 - 6-pin connector: damper actuator (position limit switches)

X8 - 3-pin spring terminal: connection for smoke detector (without smoke detector: connect +24 V and IN)

- 1- GND
- 2- (+) DC 24 V
- 3- IN

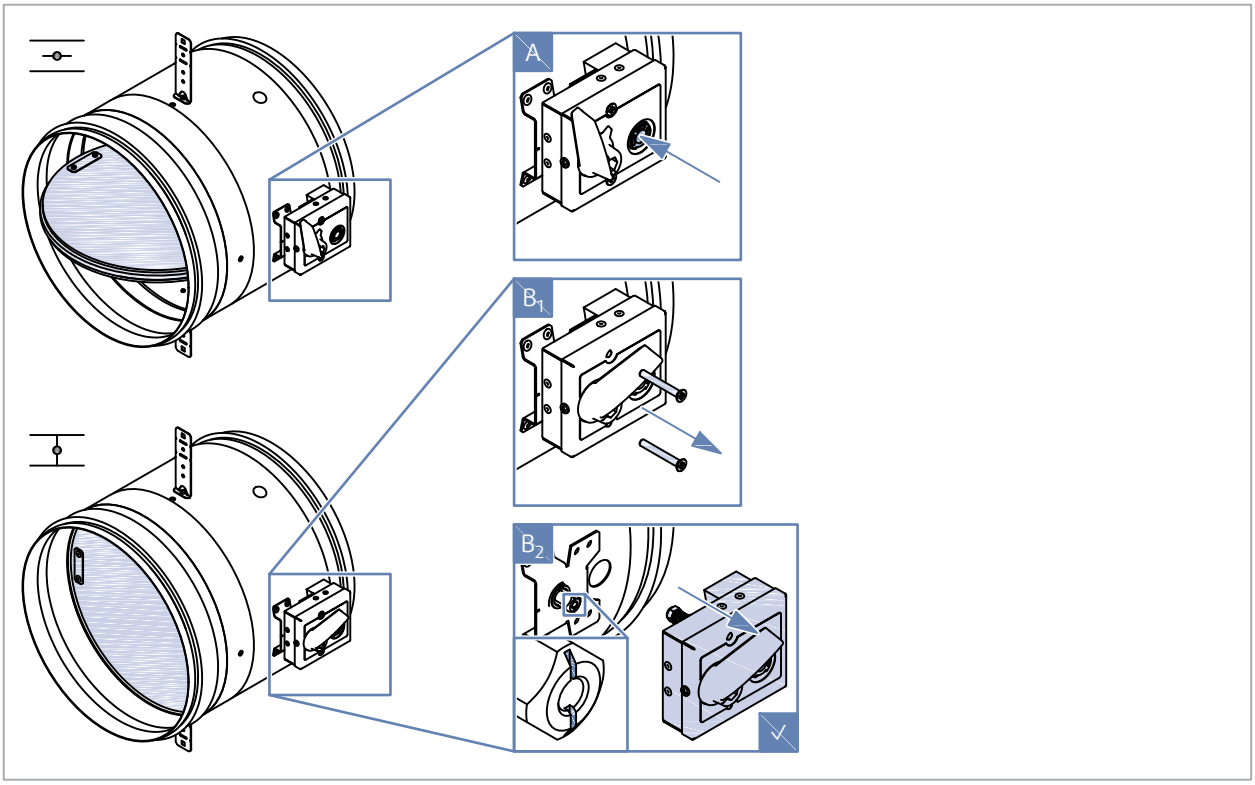
X300 - 4-pin connector: connection for belimo top-line actuator (not used)

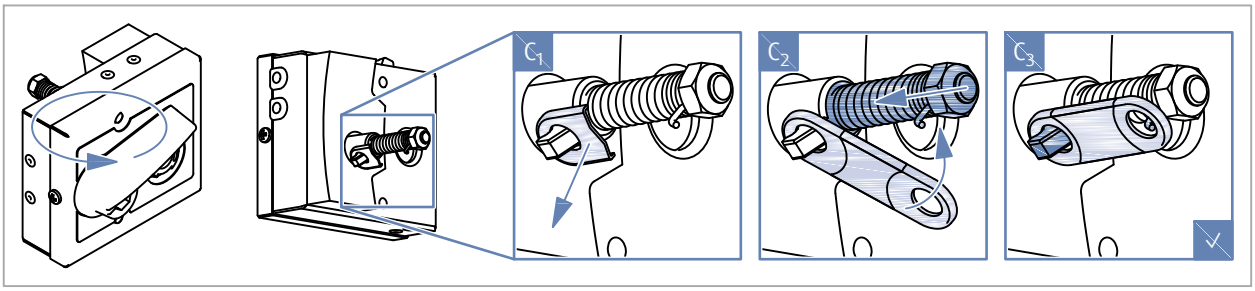
Handling & Manipulation

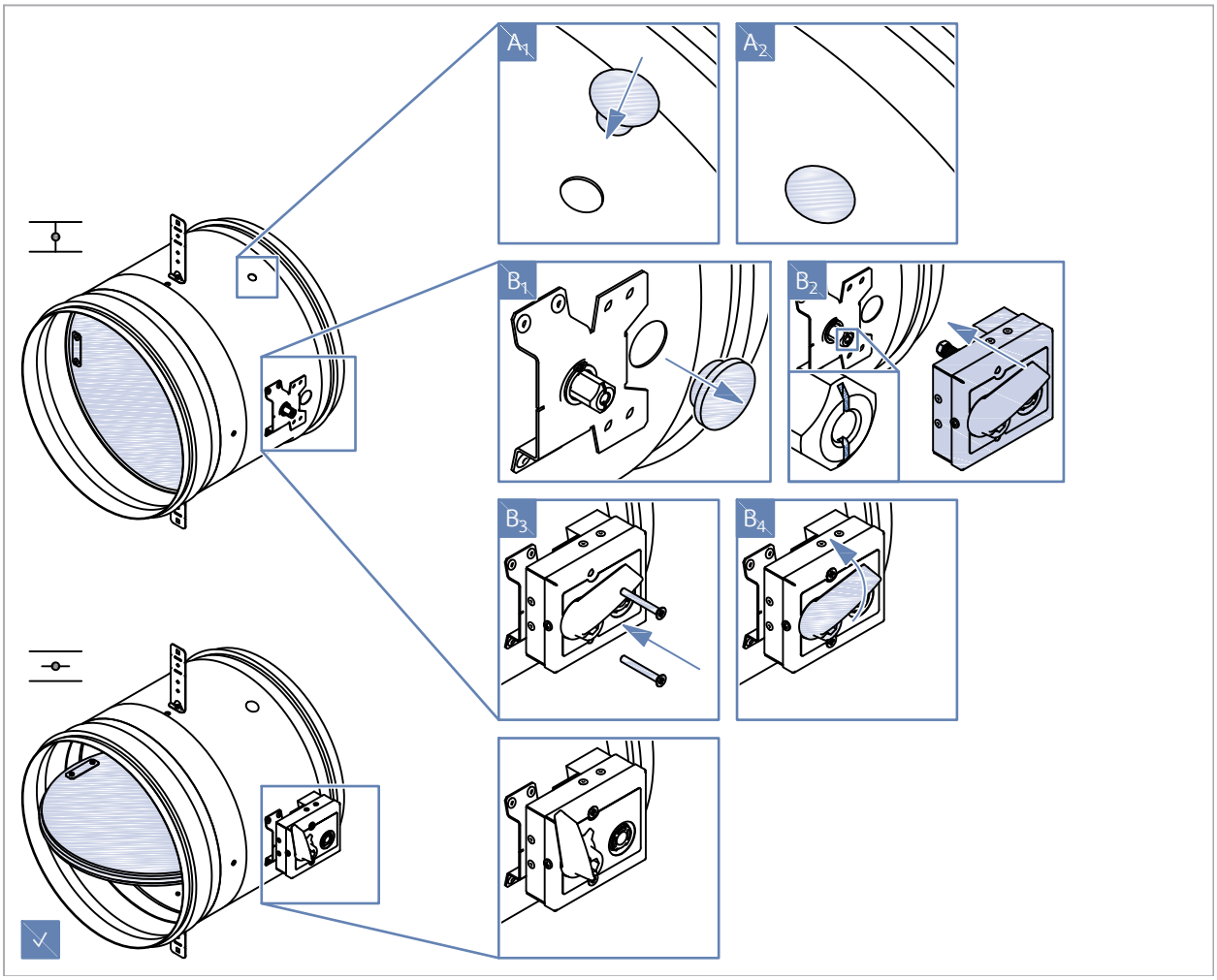
Handling and manipulation must be done with care. For safety reasons, manipulate the damper in its closed position and whilst wearing gloves.

Fusible Thermal Link Replacement on Manual Activation Mechanism

- Press the test button
- Check the damper is in closed position
- Remove two front mechanism screws
- Remove the mechanism from the damper body
- Remove the remaining parts of the thermal link you wish to replace
- Press the spring with the nut against the mechanism
- Place the new thermal link on plastic hook and the spring hook simultaneously
- Check that the blade remained in closed position and that the axle indication is aligned
- Place the mechanism onto the dampers axis and base plate
- Fix the two top screws slightly (avoid damage to threads and bends to mechanism cover)
- Perform dampers functionality check







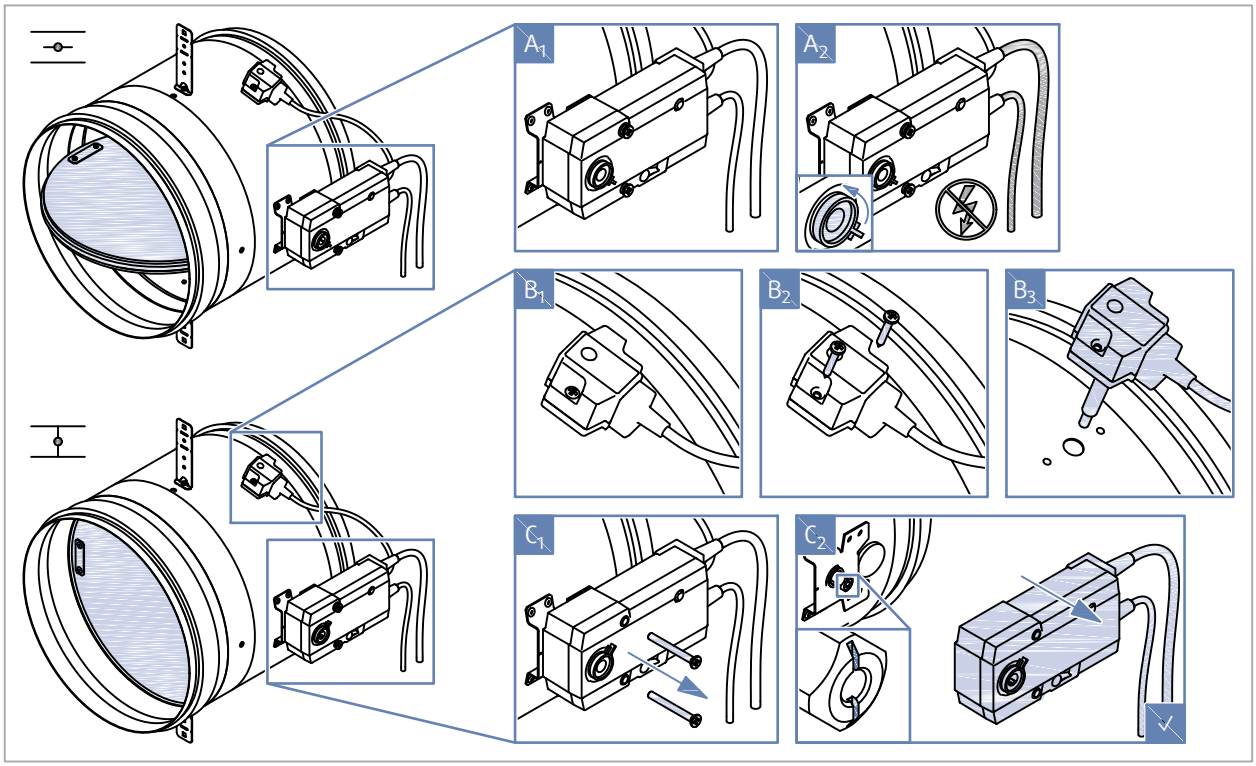
Actuator Replacement and Thermal Fuse Replacement

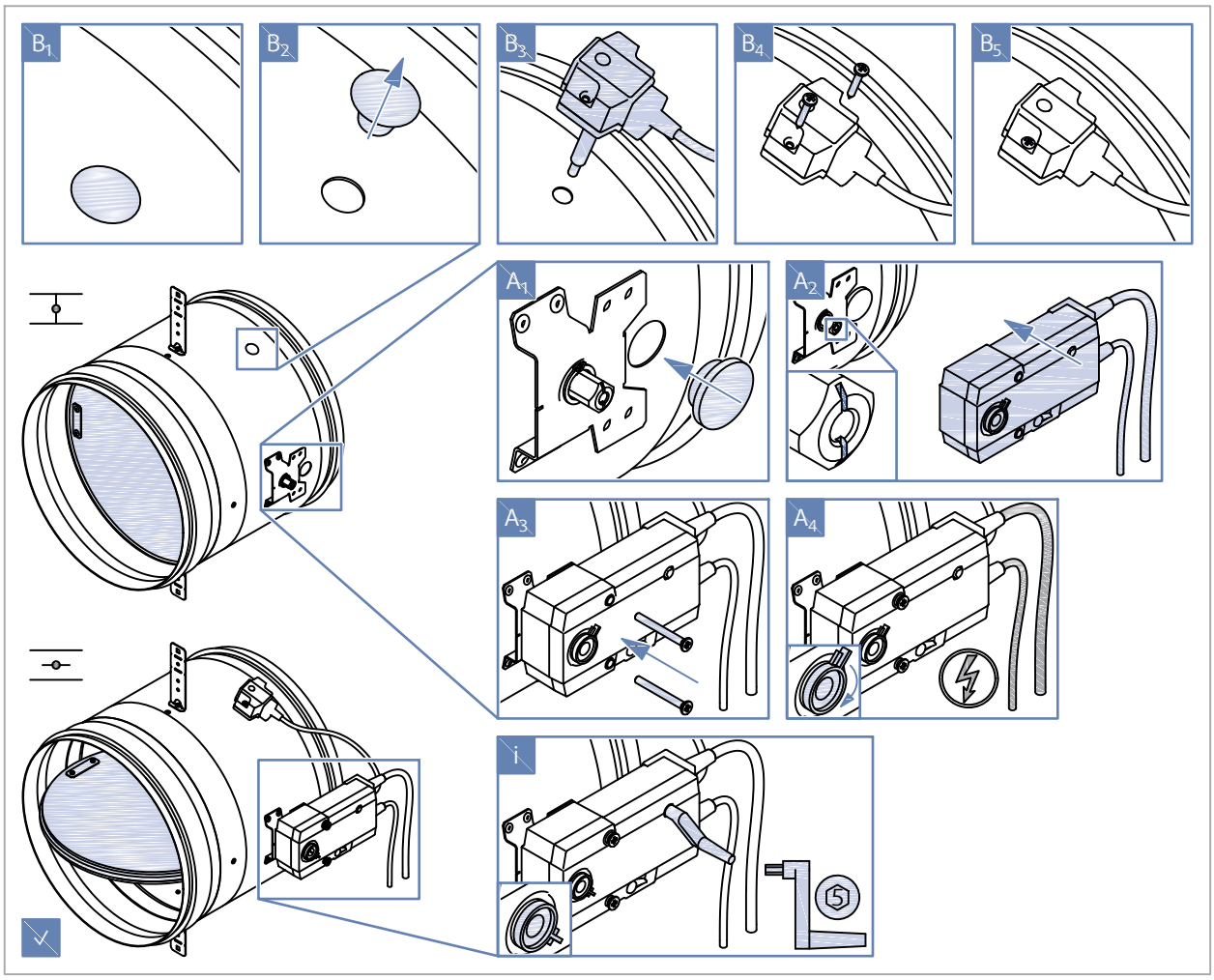
Disconnect main power supply

- Remove two screws from the thermal fuse and remove the fuse from the damper body
- Check if the blade is in the closed position if not drive actuator manually to closed position
- Mark the upwards facing (visible) actuator side "L" or "R"
- Remove two front actuator screws
- Remove the actuator from the mechanism base plate
- Mark the shafts groove position

Check the thermal fuse for damage and test. If needed un-click and replace the fuses bottom replaceable part

- insert the fuse's bottom part into the cavity on dampers body
- Fix the two fuse screws
- Check that the blade remained in closed position and that the axle indication is aligned
- Place the actuator with the same side pointing upwards (as previously marked side "L" or "R") onto the dampers axis and base plate
- Fix the two top screws slightly (avoid damage to threads)
- Perform dampers functionality check


A1
A2
B1
B2
B3
C1
C2


B1
B2
B3
B4
B5
A1
A2
A3
A4
i

Operation Manual

Warning: Damper blades are spring loaded in the open position and are closing rapidly. To avoid injury, make sure to keep the blade movement area clear while manipulating the fire damper.

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

Manually Operated Activation Mechanism

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

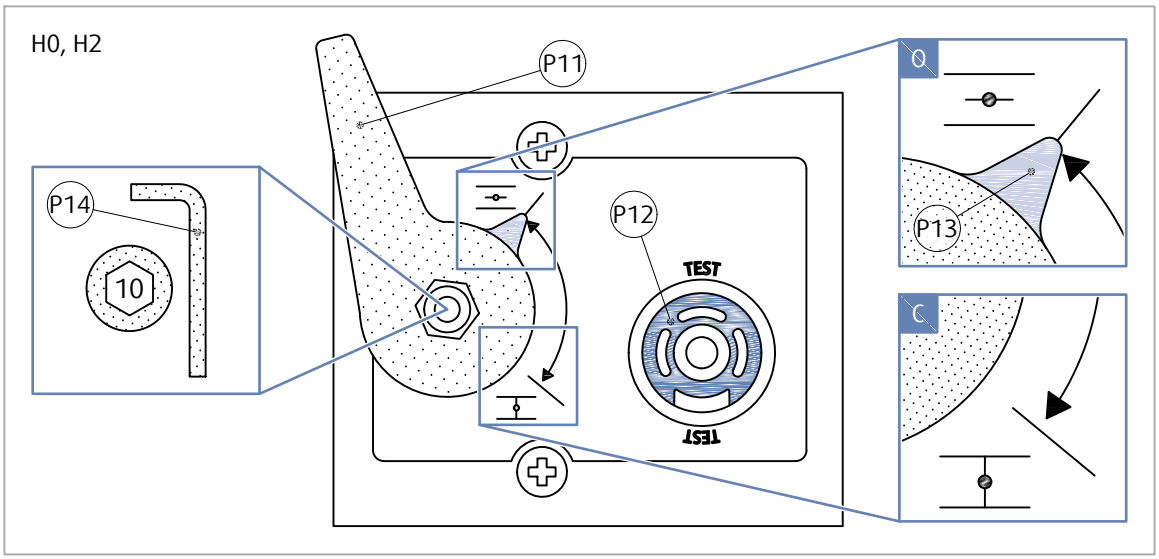
Spring Return Actuator Operated Activation Mechanism

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

Functionality Check

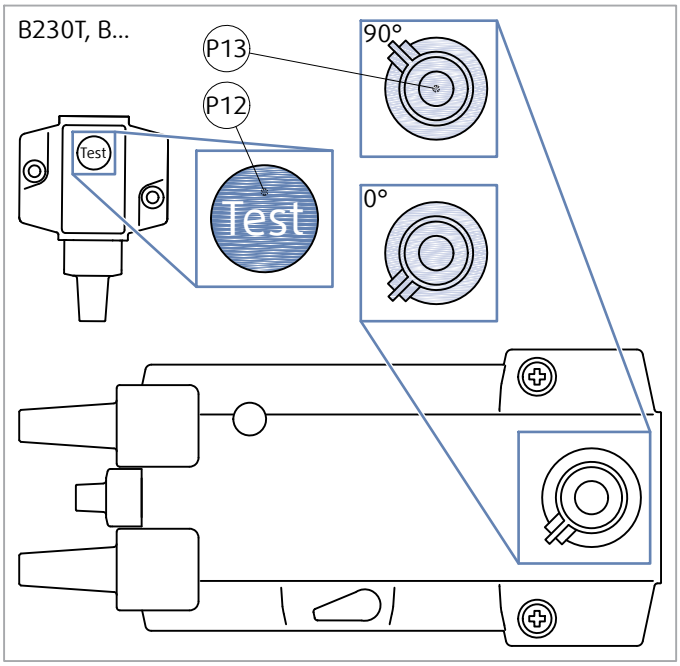
Manually Operated Activation Mechanism

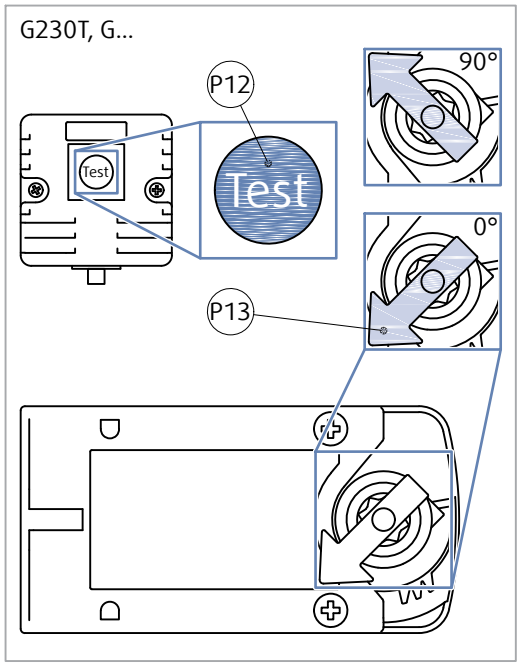
- While performing the check, focus on the thermal fuse link's integrity and the correct position of the damper blades after their retention in the OPEN and CLOSED positions.
- Open the damper - turn the red crank (P11) by hand or by using a hexagonal bent wrench No. 10 (P14). Turn the red crank so that the indicator arrow (P13) is pointing to the OPEN position (O), the red crank needs to remain in the "OPEN" position, and the microswitch for the open position indication must be pushed (if installed).
- Close the damper – release the mechanism by pressing the release button (P12), the red crank will adjust its indicator arrow (P13) to point to the CLOSED position (C) and remain locked in this position, then the microswitch for the closed position indication must be pushed (if installed).
- Open the damper - turn the red crank (P11) using a hexagonal bent wrench No. 10. (P14) Turn the red crank so that the indicator arrow is pointing to the OPEN position (O), the red crank needs to remain in the "OPEN" position, and the microswitch for the open position indication must be pushed (if installed).



Spring Return Actuator Operated Activation Mechanism

- While performing the check, focus on the thermal fuse link's integrity and the correct position of the damper blades after their retention in the OPEN and CLOSED positions.
- The fire damper must open automatically after the actuator receives power – the arrow (P13) on the actuator axis in open position must point to 90°.
- Press and hold the control switch (P12) on the Thermo electric fuse until the fire damper is fully closed – the arrow (P13) on the actuator axis in closed position must point to 0° - the safety position.
- Release the control switch (P12) on the Thermo electric fuse. The fire damper must become fully open – the arrow (P13) on the actuator axis in open position must point to 90° - the operating position.





Damper Inspection

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

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

If any discrepancies are discovered, these need to be entered into the Operating Journal along with a proposal for their removal. The Operating Journal can be found in product's "Documents" section at design.systemair.com. Immediately after the installation and activation of the damper, it needs to be checked under the identical conditions as apply to the above mentioned 12-month inspections.

The visual check ensures that visible damage to the inspected damper parts are seen. Externally, the damper housing and the activation mechanism are checked. Due to the need to perform a visual check of the damper's internal parts, open the inspection lid connected to the damper or remove the flexible connection connected to the damper. Visual checks can be performed with an endoscopic camera through the hole where the thermal fuse is installed.

The damper's internal casing, thermal fuse, seals, foaming substance, the damper blade's condition and the accuracy of its closure during its leaning against the backstop in the closed position must all be checked. There must not be any strange objects or a layer of impurities from the air distribution systems inside the damper.

NEVER INSPECT THE DAMPERS WHEN THERE IS AIR FLOWING IN THE DUCT SYSTEM!

Recommended Inspection Steps According to EN 15 650:

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

Supplement

Any deviations from the technical specifications contained in SystemairDESIGN and the terms should be discussed with the manufacturer. We reserve the right to make any changes to the product without prior notice, provided that these changes do not affect the quality of the product and the required parameters.

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