F-B90

Multiblade Fire Damper

Handbook

systemair

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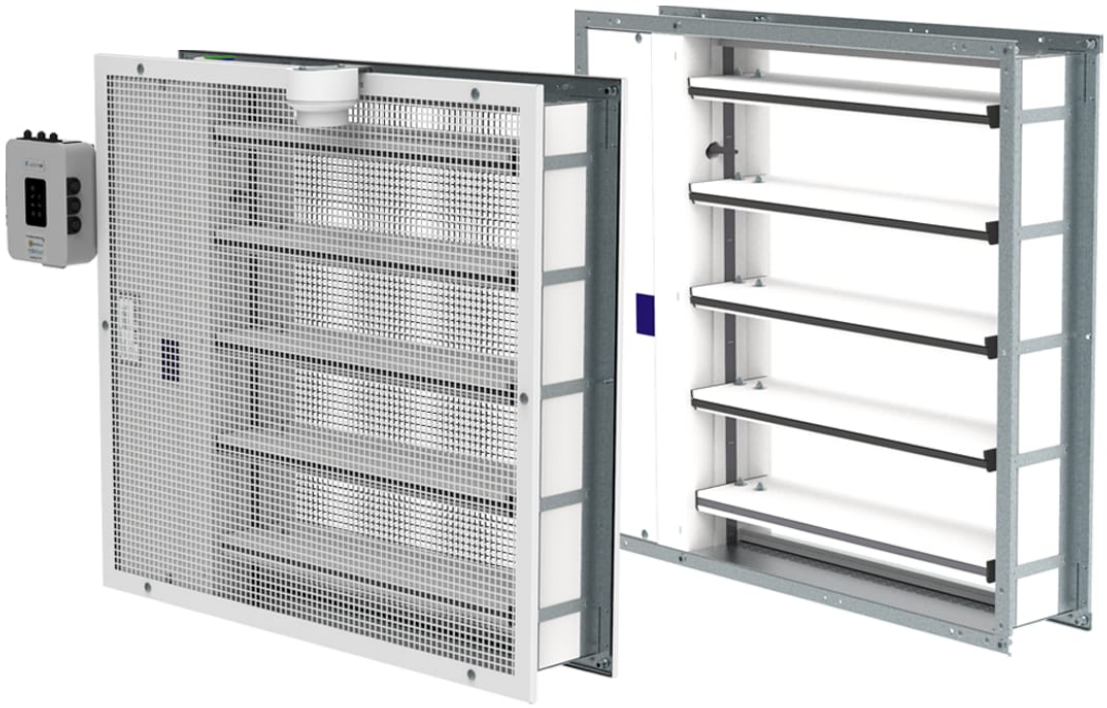


Description

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

Manual activation mechanism - cannot be used for stand-alone activation at cold smoke detection.

- **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.

Actuator activation mechanism - cannot be used for stand-alone activation at cold smoke detection.

- **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.

- **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).

Activation mechanism with strand-alone smoke detection and actuator - suitable for cold smoke detection.

- **BSD230T** or **GSD230T** (Only for Grille types 11 and 22 & GSD230T not available for sizes H=250 mm)

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 LRZ-Basis (Hekatron) supply and communication unit (AC 230 V). Actuator and Smoke Detector is DC 24 V and powered from LRZ-Basis (Hekatron).

Actuator activation mechanism without smoke detection and with various communication modules.

- **GST0** (not available for sizes H=250)

Fire damper with an activation mechanism with a Gruner (GST0) 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 (supply through unit: AC 24 V, communication: 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.

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.

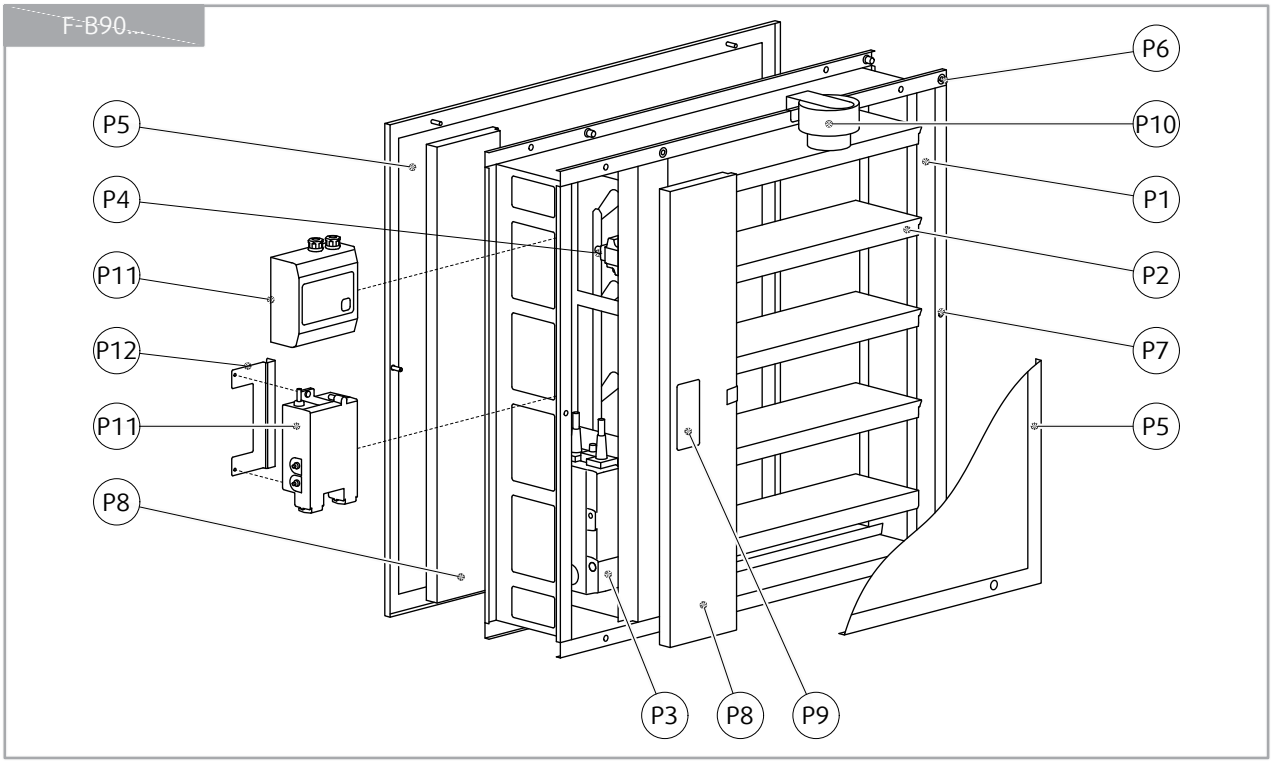
Composition of materials

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 from Hekatron (only for BSD230T and GSD230T activation types)

P11 - Supply and communication unit (only for GST0 activation type); LRZ Basis (only for BSD230T and GSD230T 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°)	• No change of the necessary properties.
• Test procedure with 10000 cycles and actuator control (rotation from 0° to 90°)	• No change of the necessary properties.
• Test procedure with 10000 cycles and actuator control for “mod” classification (rotation from 45° to 60°)	• 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

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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 wihin 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↔o)S** Grille on both sides: **EI90 (v_e - i↔o)S** & **EI120 (v_e - i↔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)

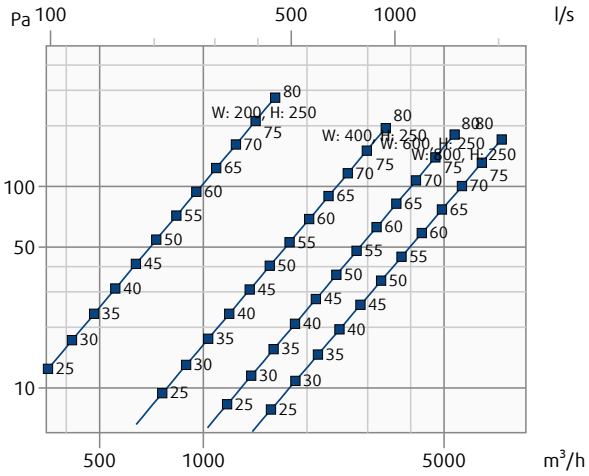
Diagrams

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

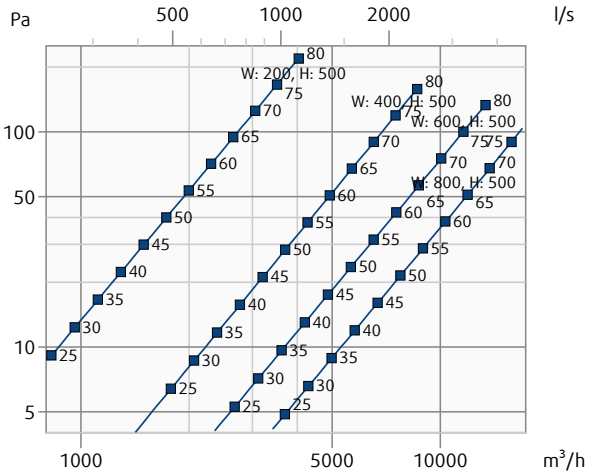
F-B90-...-00

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



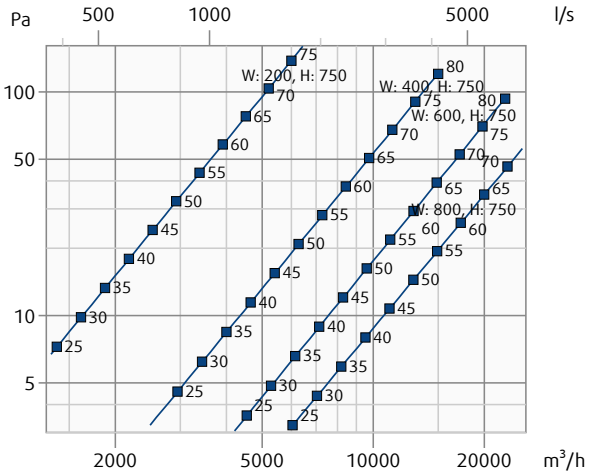
F-B90-...-00

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



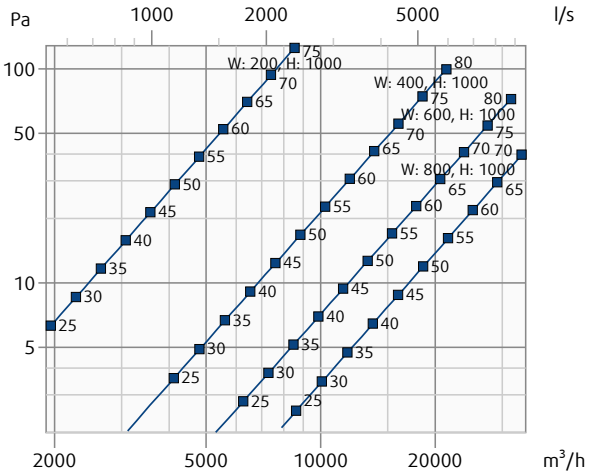
F-B90-...-00

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



F-B90-...-00

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



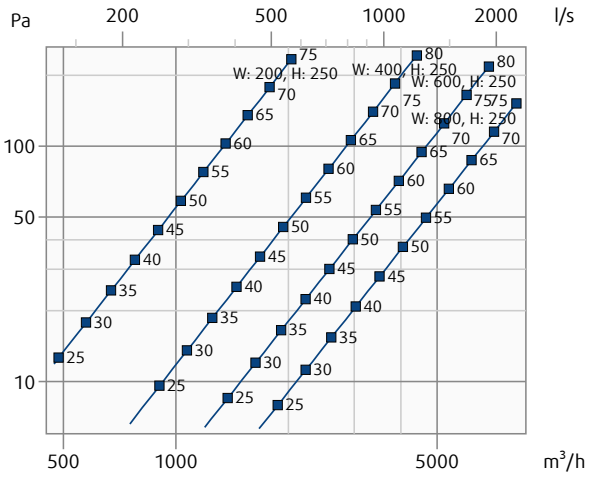
Legend:

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

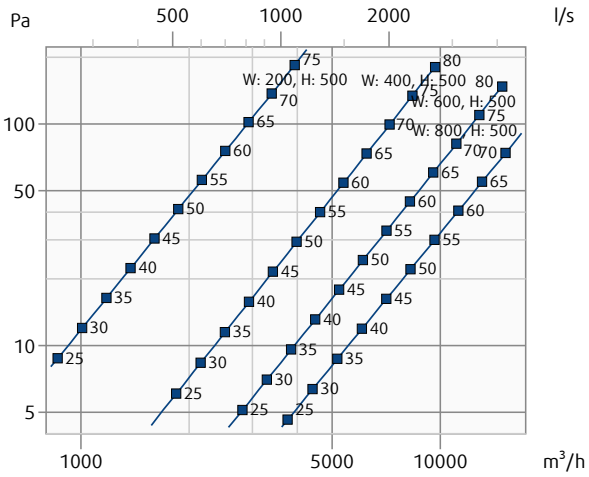
F-B90-...-00

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



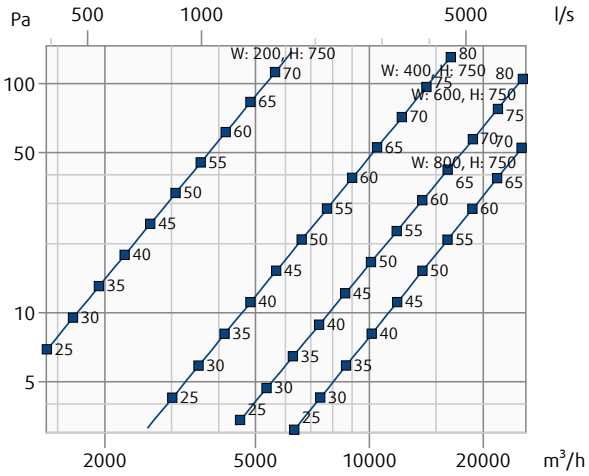
F-B90-...-00

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



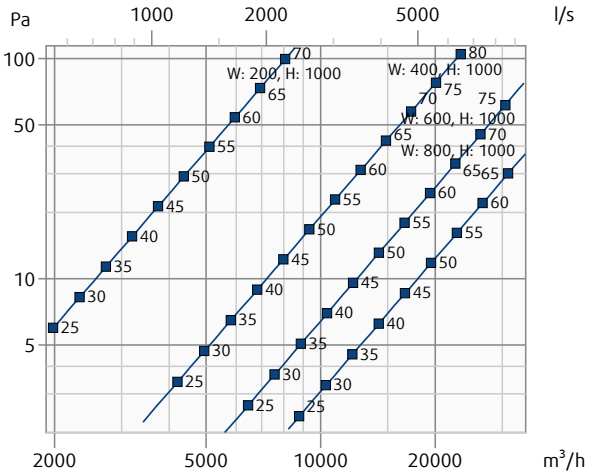
F-B90-...-00

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



F-B90-...-00

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



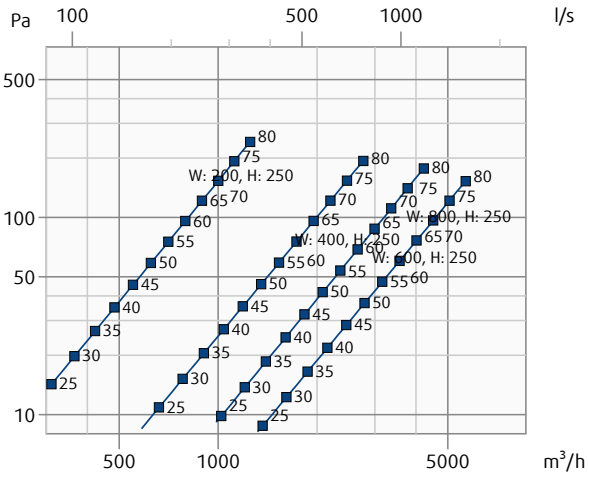
Legend:

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

Diagrams for Extract Air, Grille Types: 01 & 02

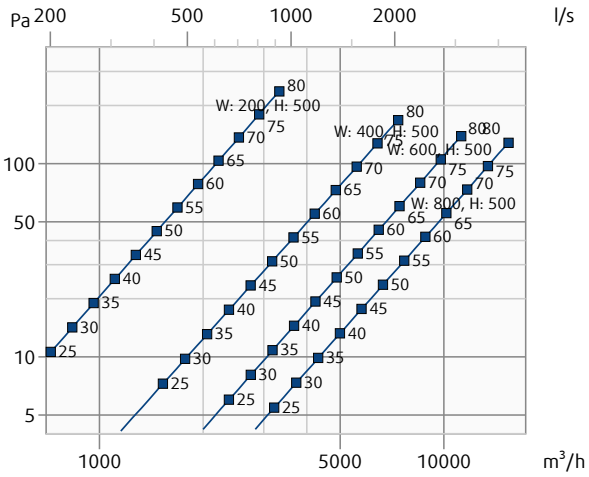
F-B90-...-01

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



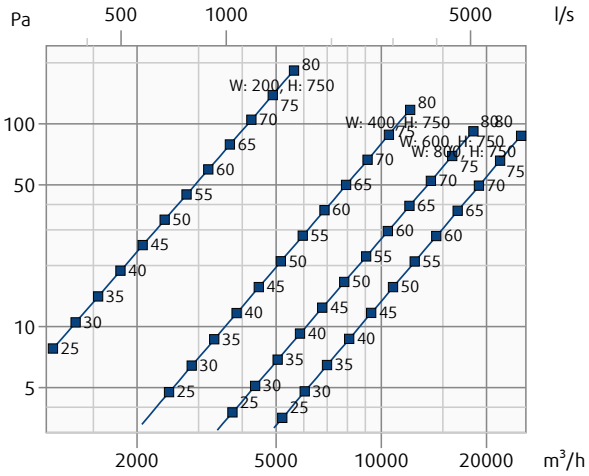
F-B90-...-01

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



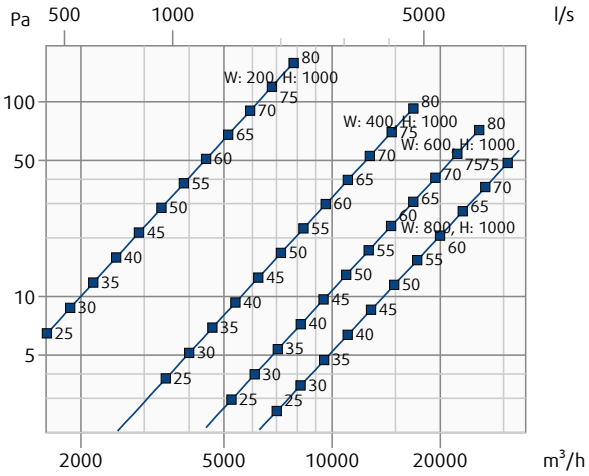
F-B90-...-01

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



F-B90-...-01

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



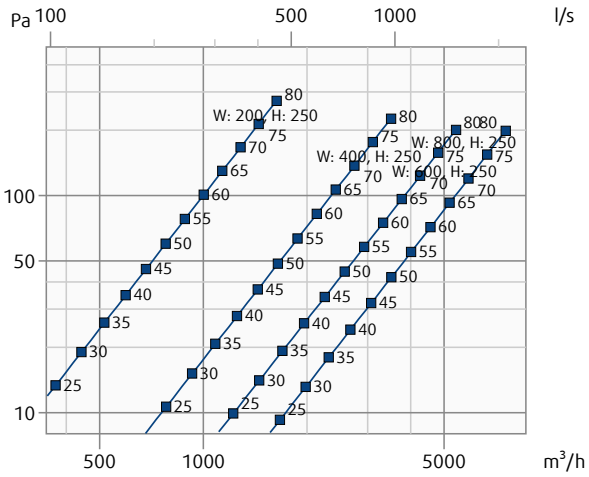
Legend:

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

Diagrams for Supply Air, Grille Types: 01 & 02

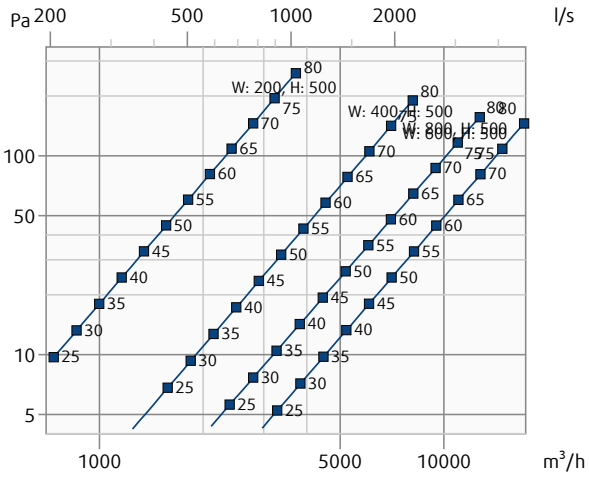
F-B90-...-01

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



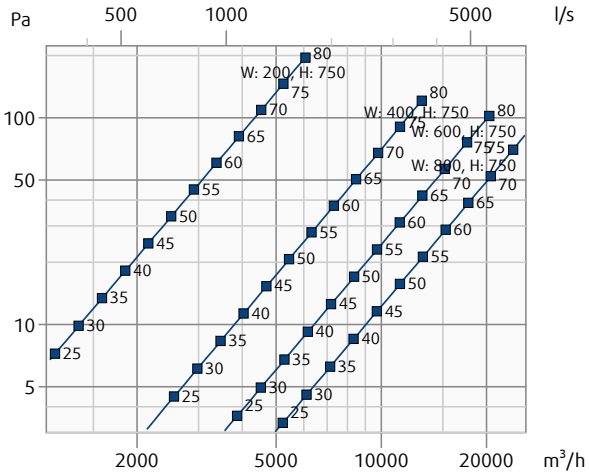
F-B90-...-01

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



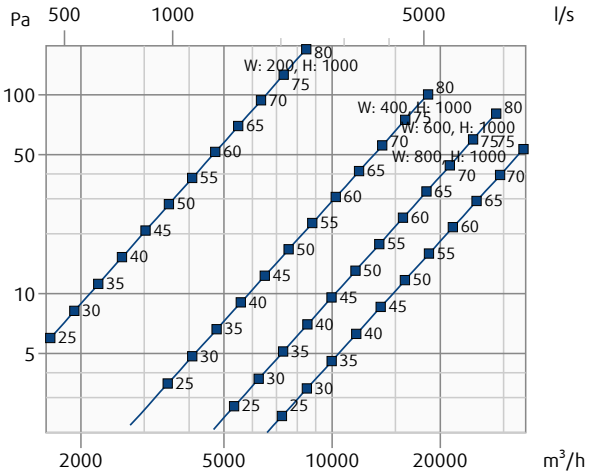
F-B90-...-01

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



F-B90-...-01

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



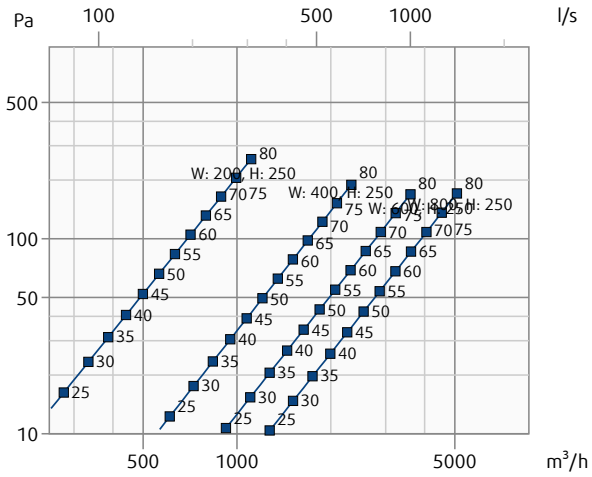
Legend:

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

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

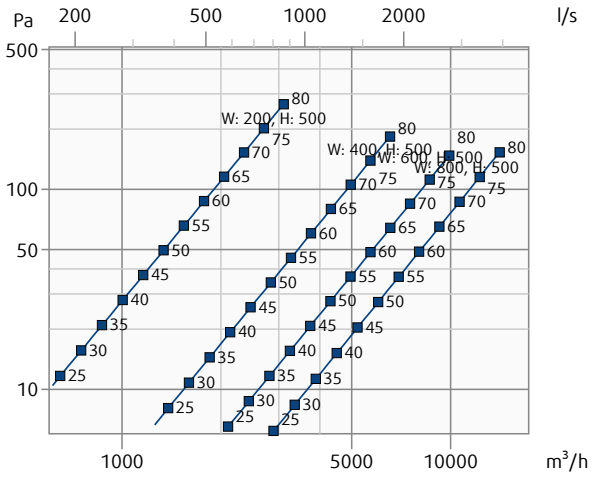
F-B90-...-11

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



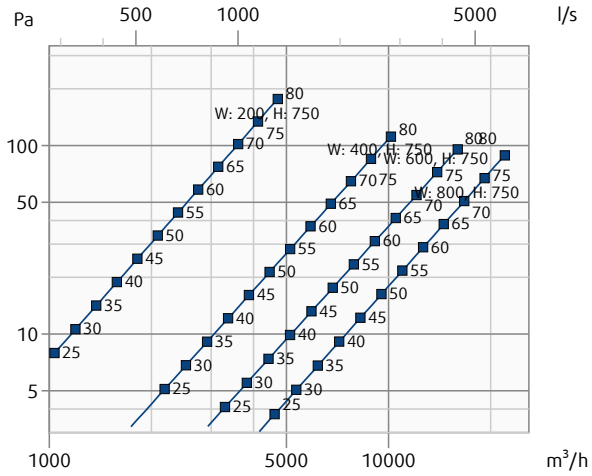
F-B90-...-11

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



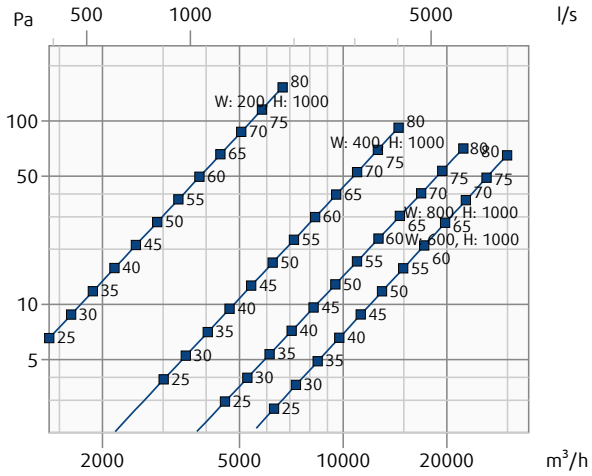
F-B90-...-11

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



F-B90-...-11

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)

Dimensions & Weights

Free area of F-B90 Without Grille

F-B90...00		W (mm)																						
A_v (m^2)		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

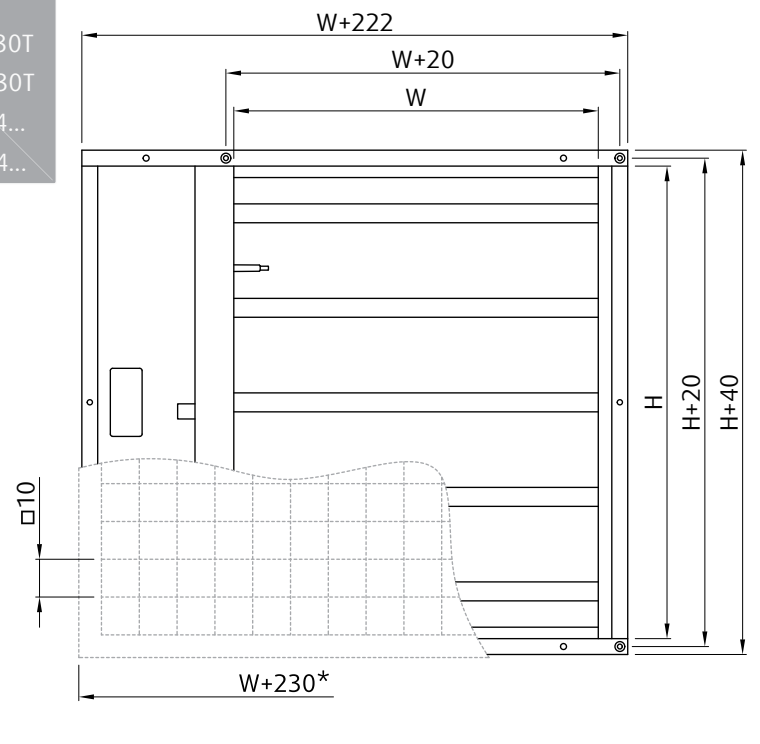
Free Area of Grille

		W (mm)																						
A_v (m^2)		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

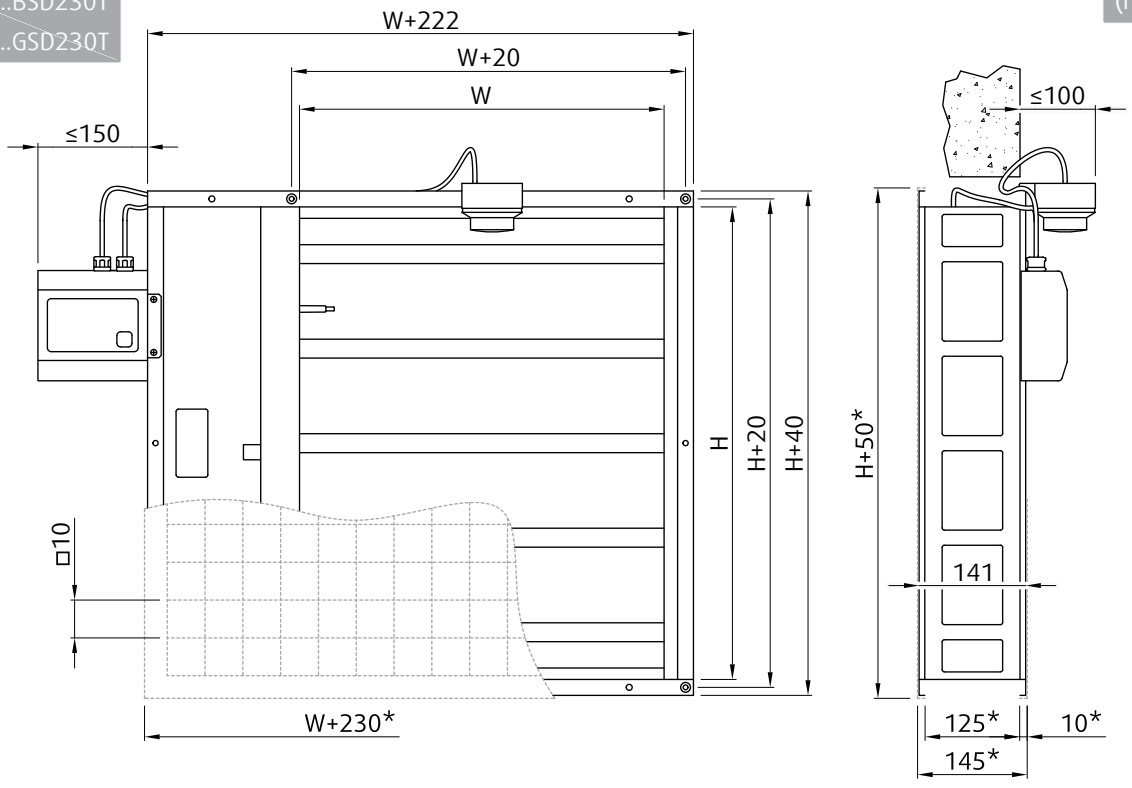
F-B90...H...
F-B90...B230T
F-B90...G230T
F-B90...B24...
F-B90...G24...

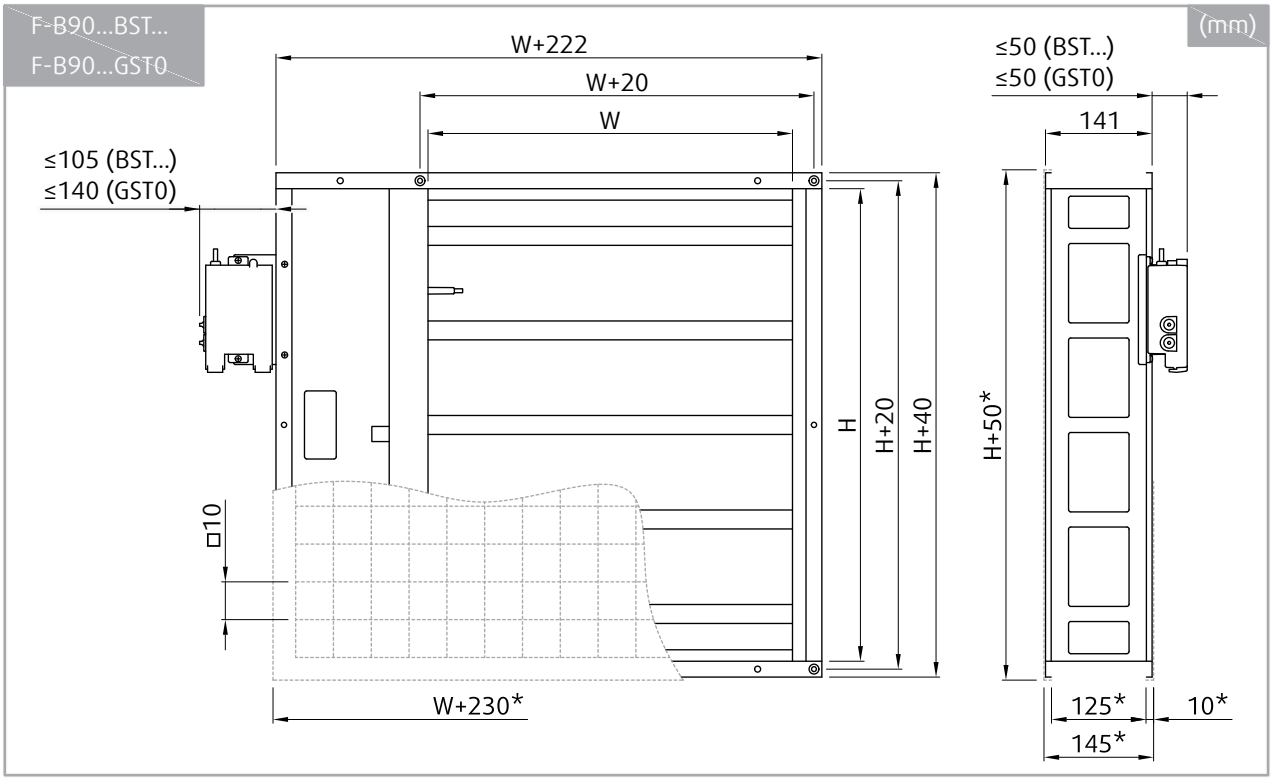
(mm)



F-B90...BSD230T
F-B90...GSD230T

(mm)





NOTE: *Inclusive grille

Weights of F-B90 Without Grille

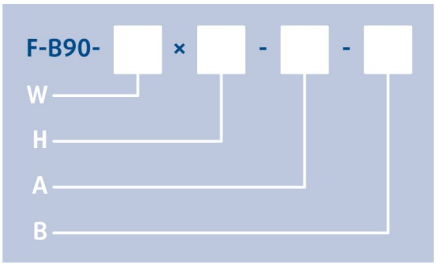
F-B90...00 m (kg)		W (mm)																						
		150	175	200	225	250	280	300	315	350	355	400	450	500	550	560	600	630	650	700	710	750	800
H (mm)	250	6,0	6,2	6,5	6,7	6,9	7,1	7,3	7,4	7,7	7,8	8,2	8,6	9,0	9,4	9,5	9,9	10,2	10,3	10,7	10,8	11,2	11,6
		6,9	7,1	7,4	7,6	7,8	8,0	8,2	8,3	8,6	8,7	9,1	9,5	9,9	10,3	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

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	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 spring return actuator

G230T - 230V AC Gruner spring return actuator (not available for sizes H=250)

B24T - 24V AC/DC Belimo spring return actuator

G24T - 24V AC/DC Gruner spring return actuator (not available for sizes H=250)

GST0 - 24V AC/DC supply and communication unit FSC-UFC24-2 (Modbus/BACnet) & 24V AC/DC Gruner spring return Actuator (not available for sizes H=250)

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

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. (Not available for sizes H=250)

Available only with type 11 and 22:

BSD230T - 230 V AC Supply unit LRZ-Basis with reset button & Smoke detector 24 V AC/DC & 24 V AC/DC Belimo Actuator

GSD230T - 230 V AC Supply unit LRZ-Basis with reset button & Smoke detector 24 V AC/DC & 24 V AC/DC Gruner Actuator (not available for sizes H=250)

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:

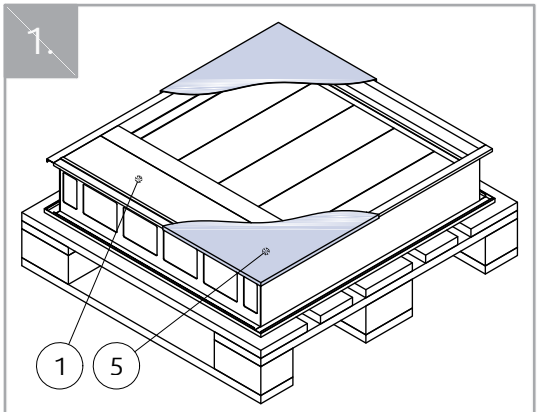
Note: Make sure to continually check the alignment of the damper against the supporting construction, opening or against the duct connection when performing the next steps.

- 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)

1.



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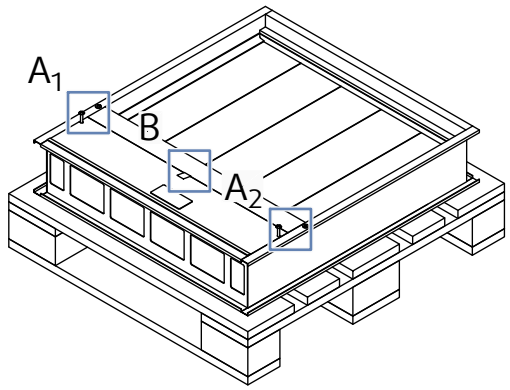

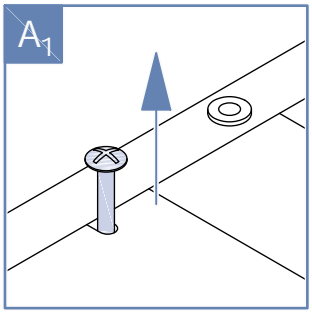

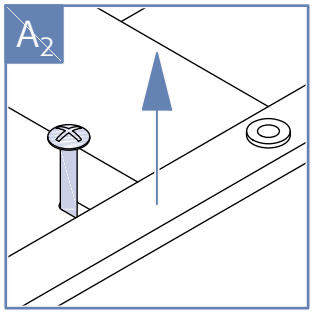

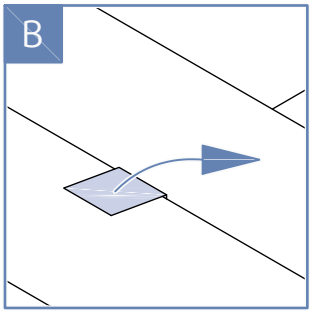

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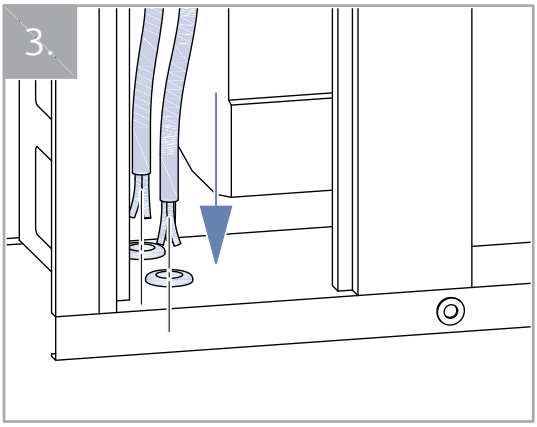
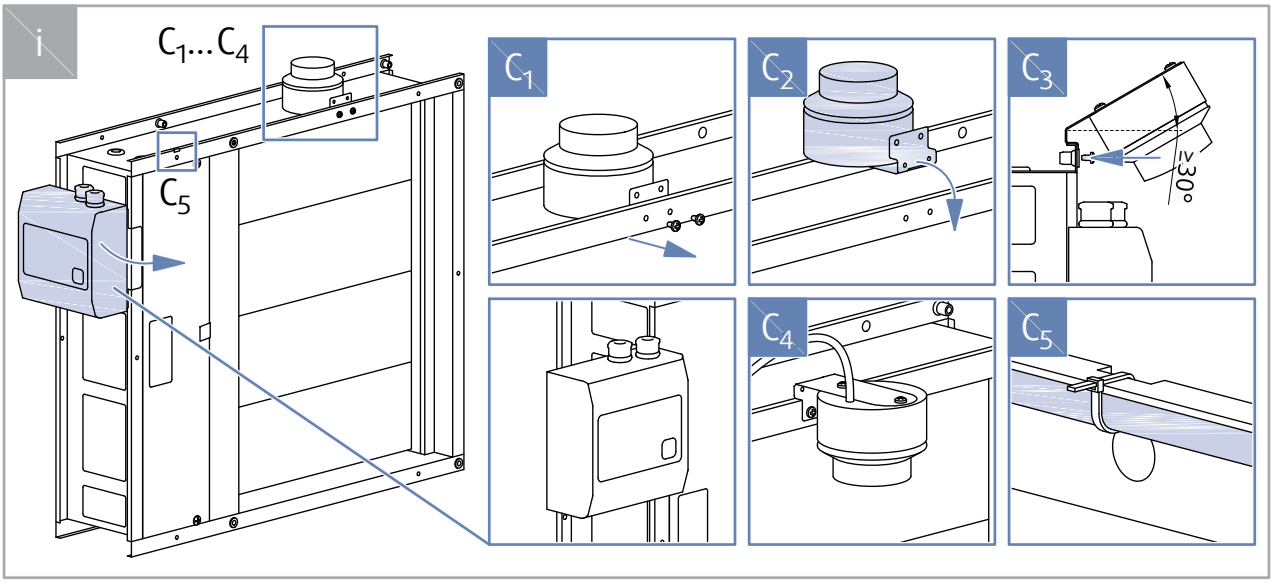
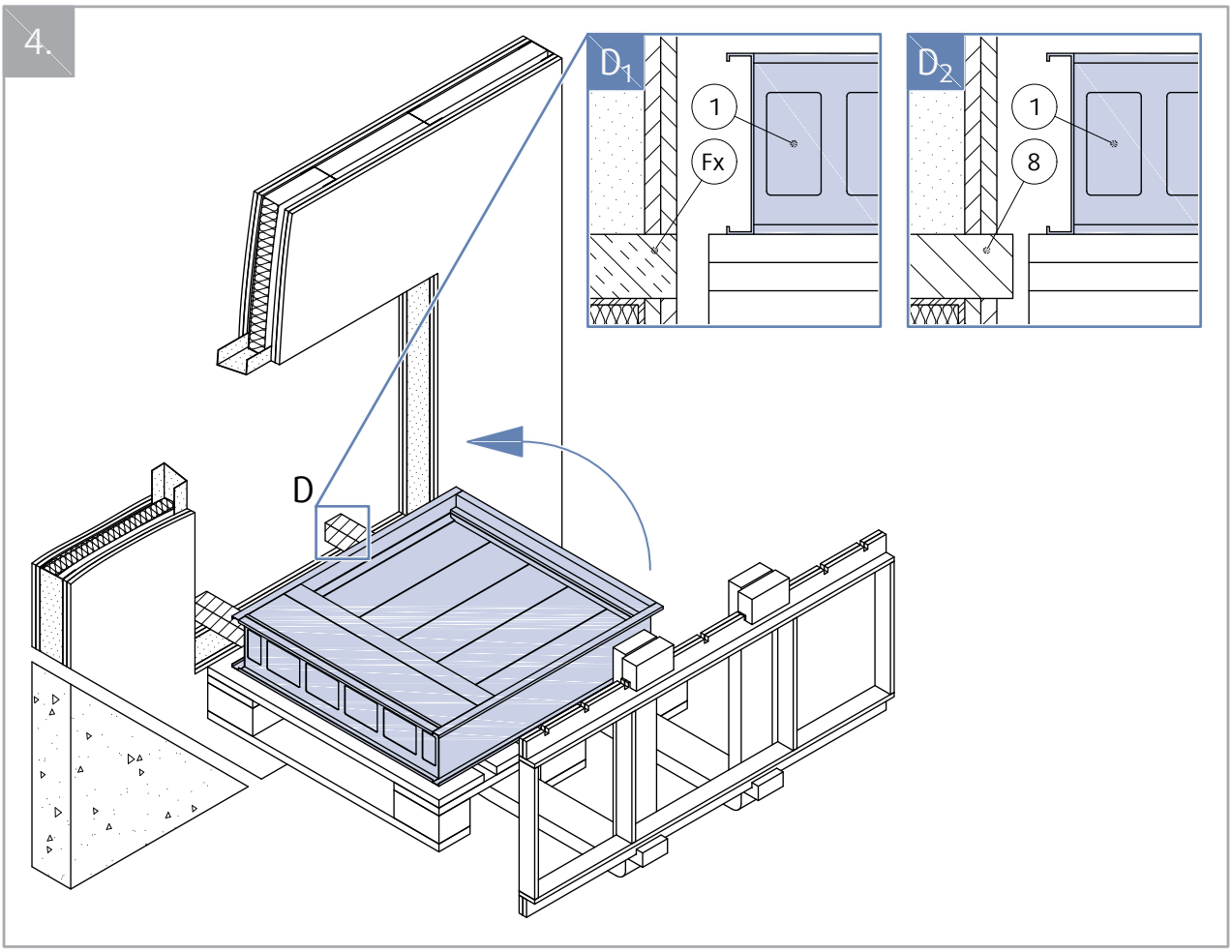
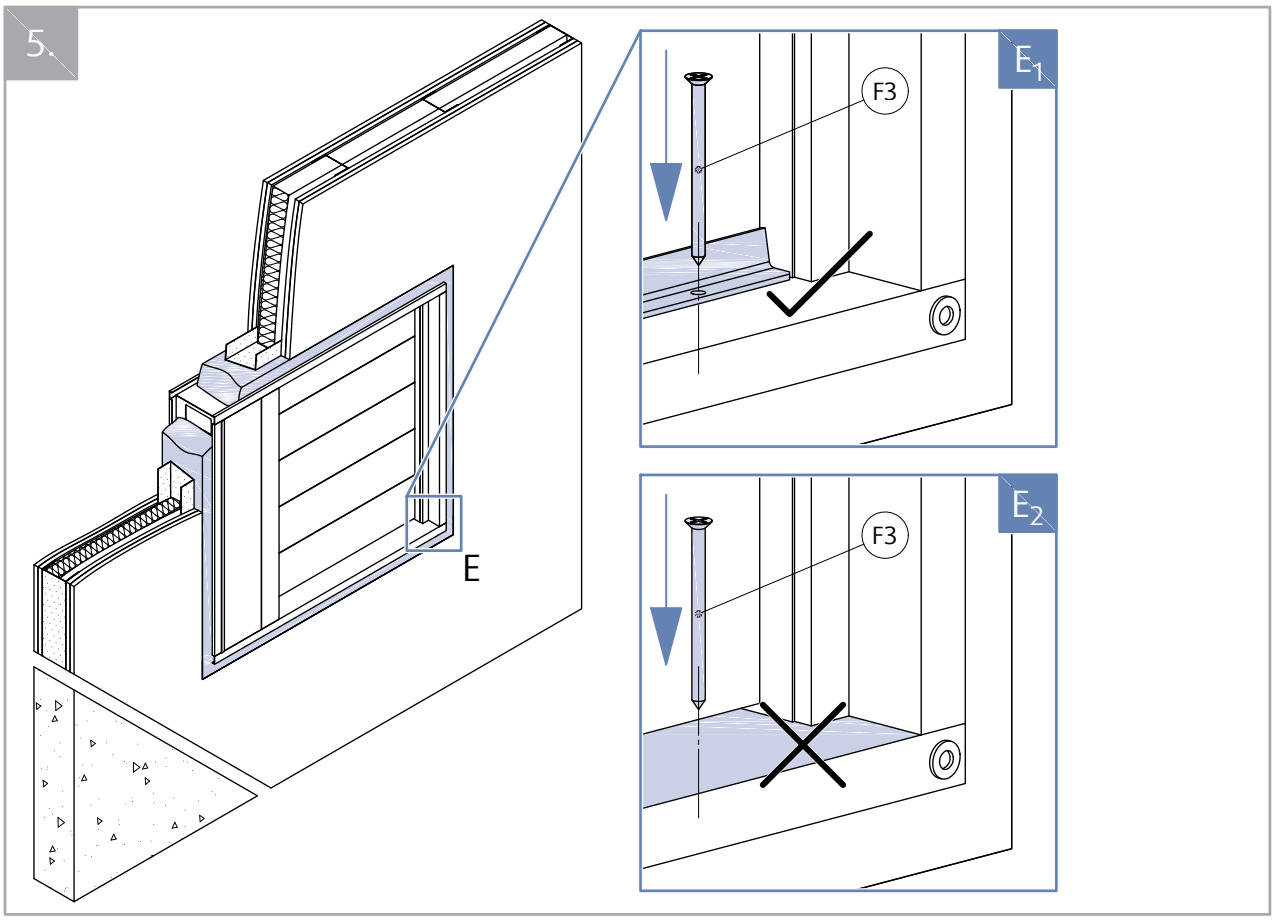
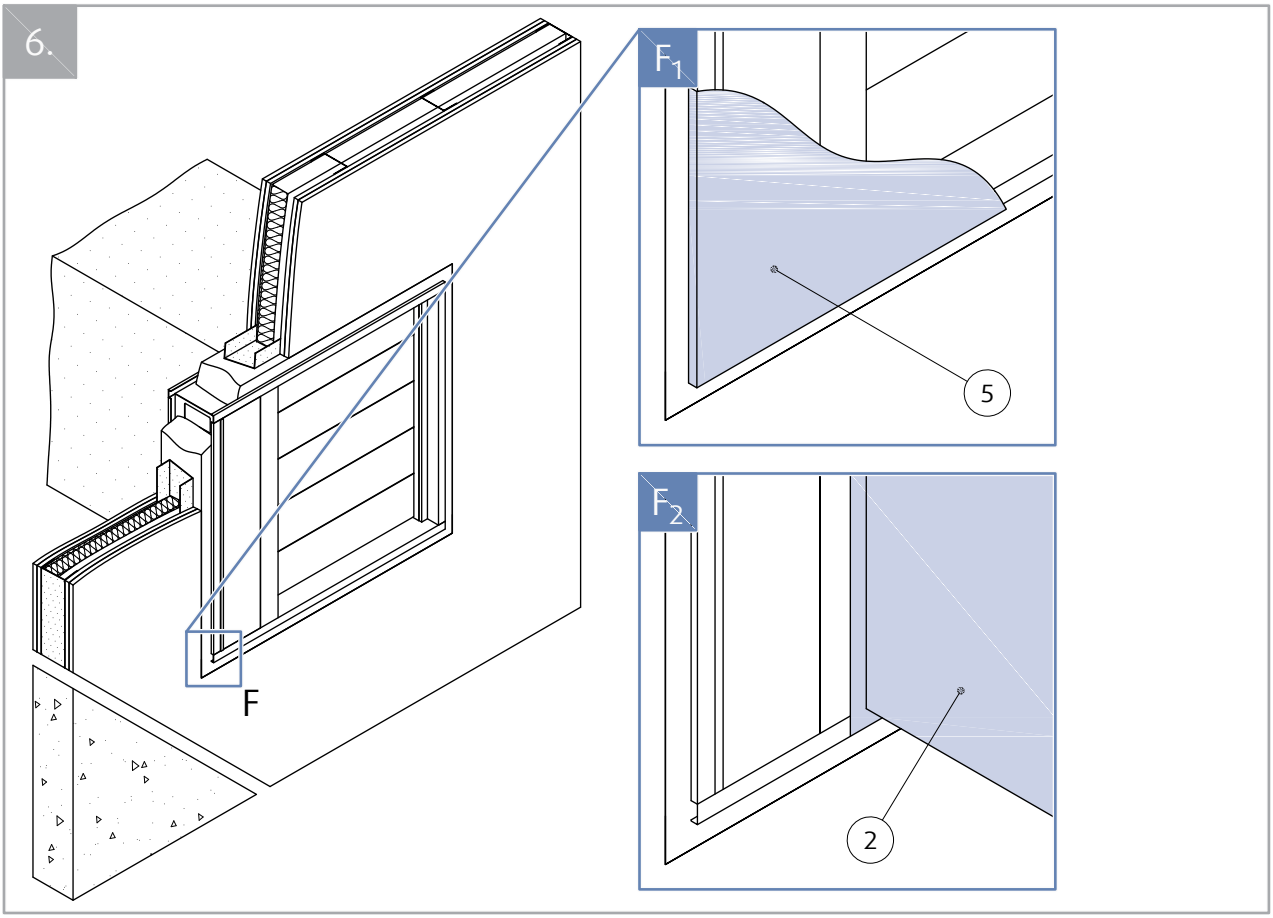



i
C1...C4
C5
C1
C2
C3
≥ 30°
C4
C5


4.
D1
1
Fx
D2
1
8
D


5.
E
E1
F3
E2
F3


6.
F
F1
5
F2
2

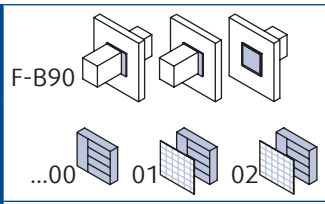
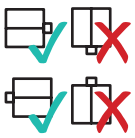
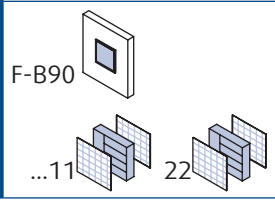
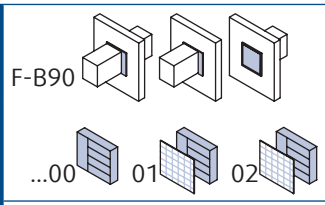
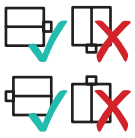
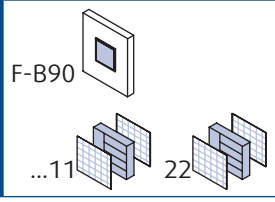
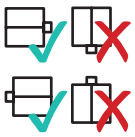
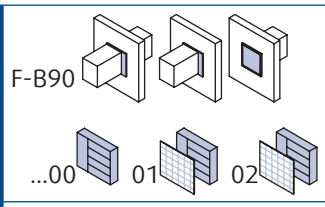
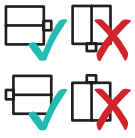
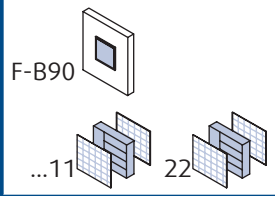
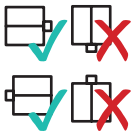
Legend for Product Handling

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 - Screw with minimum dimensions of 4,2 mm diameter and 80 mm length based on the structure type, (e.g.: DIN 7981C/DIN 7982C; Fischer ULTRACUT FBS II; or equal and greater size metal wall plug + screw).

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.

1 Wet		EI 60 (v_e h_o i ↔ o) S EI 90 (v_e h_o i ↔ o) S	a) ≥ 125 b) ≥ 125 c) ≥ 125 ≥ 620 (kg/m³)		
		EI 60 (v_e i ↔ o) S EI 90 (v_e i ↔ o) S EI 120 (v_e i ↔ o)	a) ≥ 125	b) ≥ 125	
3 Soft		EI 60 (v_e h_o i ↔ o) S EI 90 (v_e h_o i ↔ o) S	a) ≥ 125 b) ≥ 125 c) ≥ 125 ≥ 620 (kg/m³)		
		EI 60 (v_e i ↔ o) S EI 90 (v_e i ↔ o) S EI 120 (v_e i ↔ o)	a) ≥ 125	b) ≥ 125	
3F Fit		EI 60 (v_e i ↔ o) S EI 90 (v_e i ↔ o) S	a) ≥ 125		
		EI 60 (v_e i ↔ o) S EI 90 (v_e i ↔ o) S EI 120 (v_e i ↔ o)	a) ≥ 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 damper with smoke detector (activation types BSD.../GSD...) must be oriented with smoke detector on the highest place when installed.
- 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.

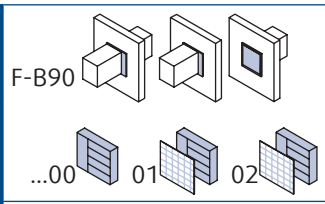
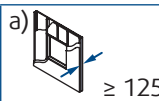
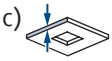
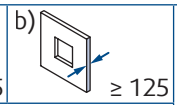
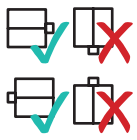
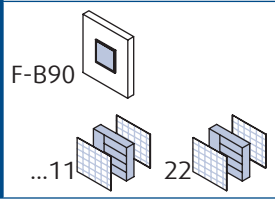
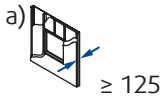
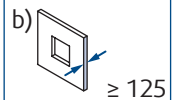
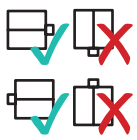
NOTE: Before you do the next steps, make sure that the plaster, mortar, or concrete filling becomes hard.

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.

1 Wet		EI 60 (v_e h_o i ↔ o) S EI 90 (v_e h_o i ↔ o) S	 		
		EI 60 (v_e i ↔ o) S EI 90 (v_e i ↔ o) S EI 120 (v_e i ↔ o)			

NOTES:

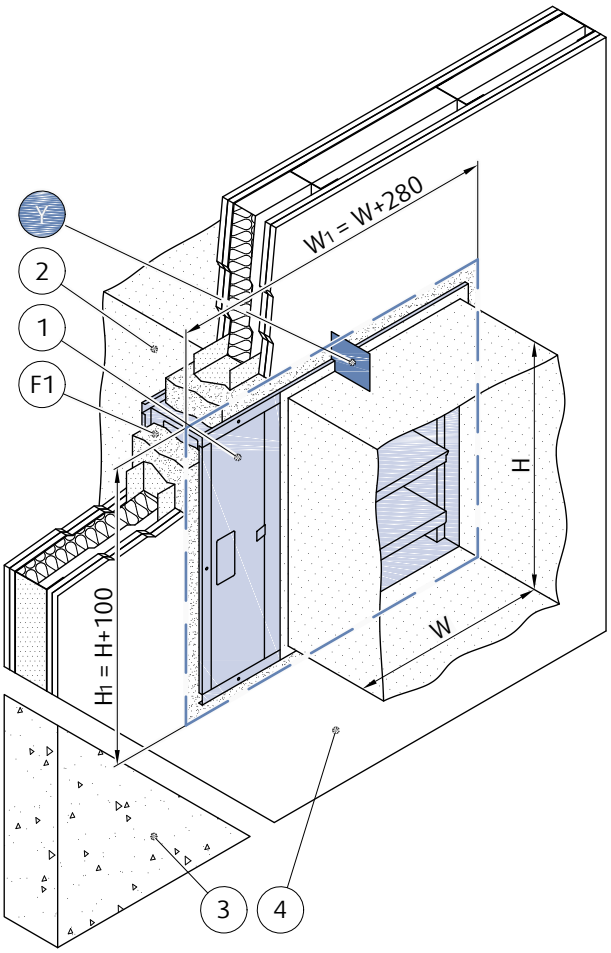
a) - Flexible (plasterboard) wall

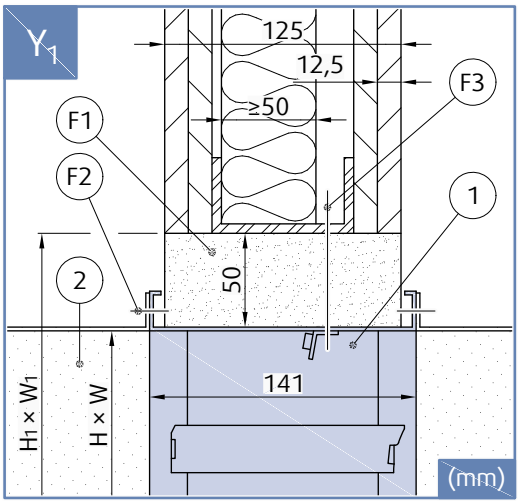
b) - Concrete/masonry/cellular concrete (rigid) wall

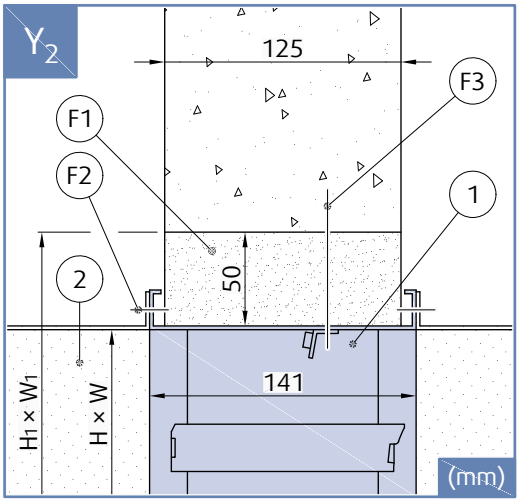
v_e - Vertically oriented damper

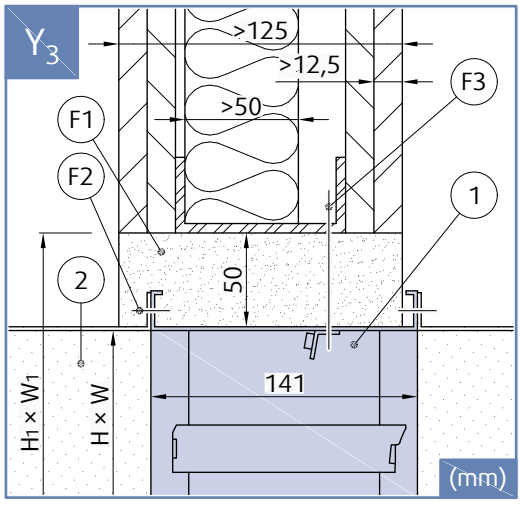
h_o - Horizontally oriented damper

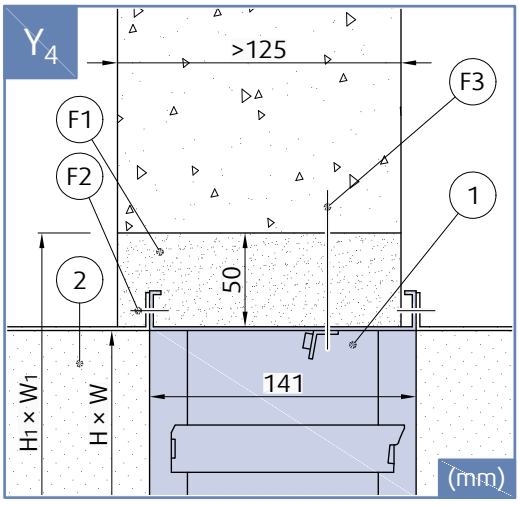
Types 00, 01, 02 Installed in the Wall - Max Resistivity: EI90S

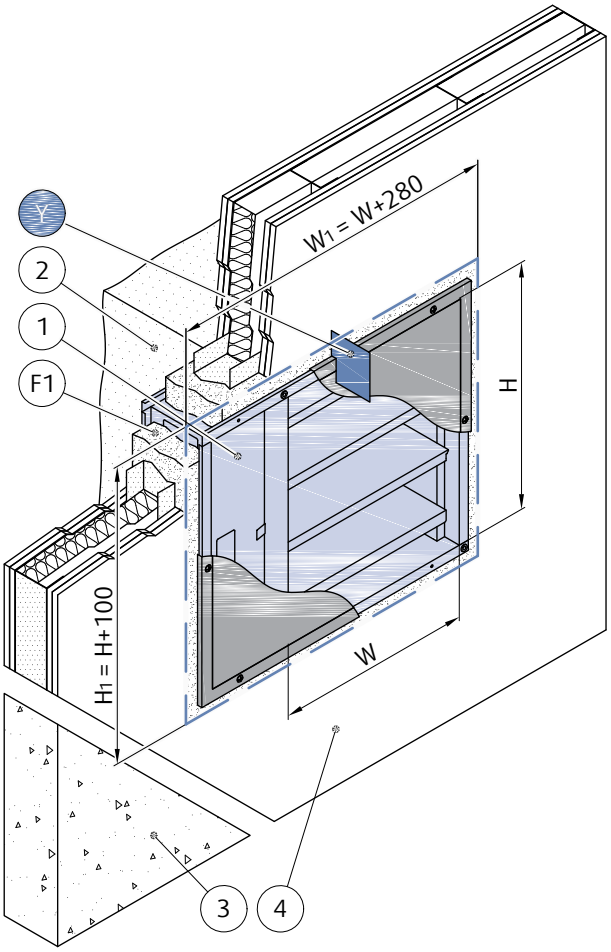








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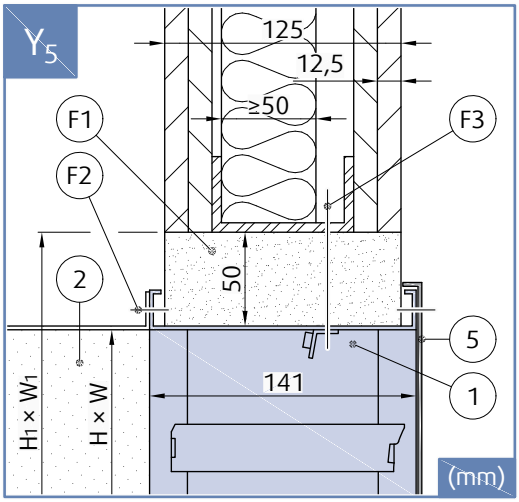
F1
W1 = W+280
H
H1 = H+100
W
3
4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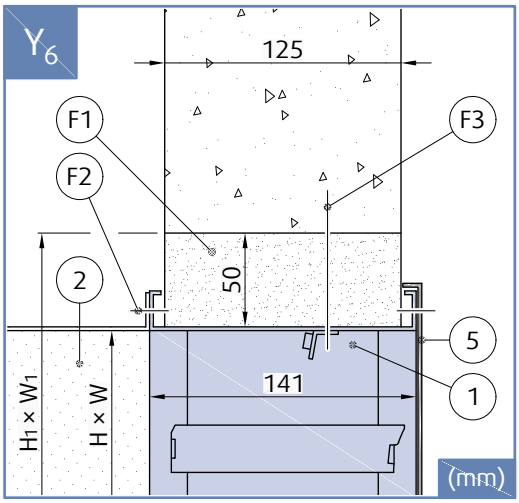
12,5
≥50
F1
F2
F3
2
50
5
1
141
H1 x W1
H x W
(mm)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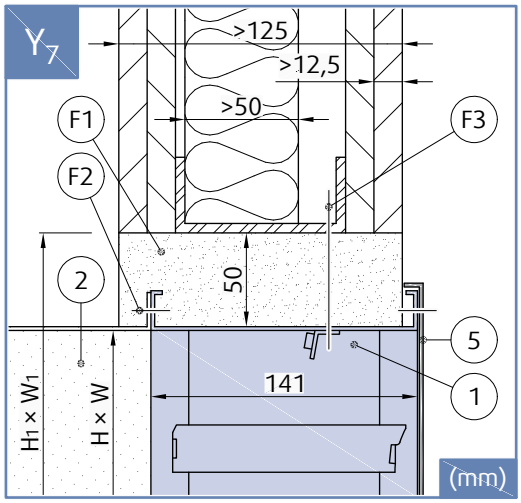
F1
F2
F3
2
50
5
1
141
H1 x W1
H x W
(mm)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>50
F1
F2
F3
2
50
5
1
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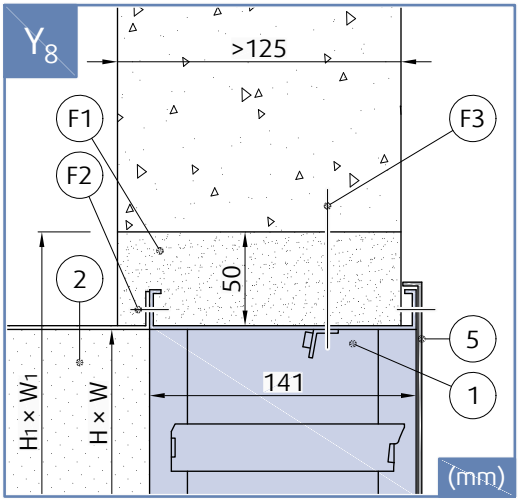
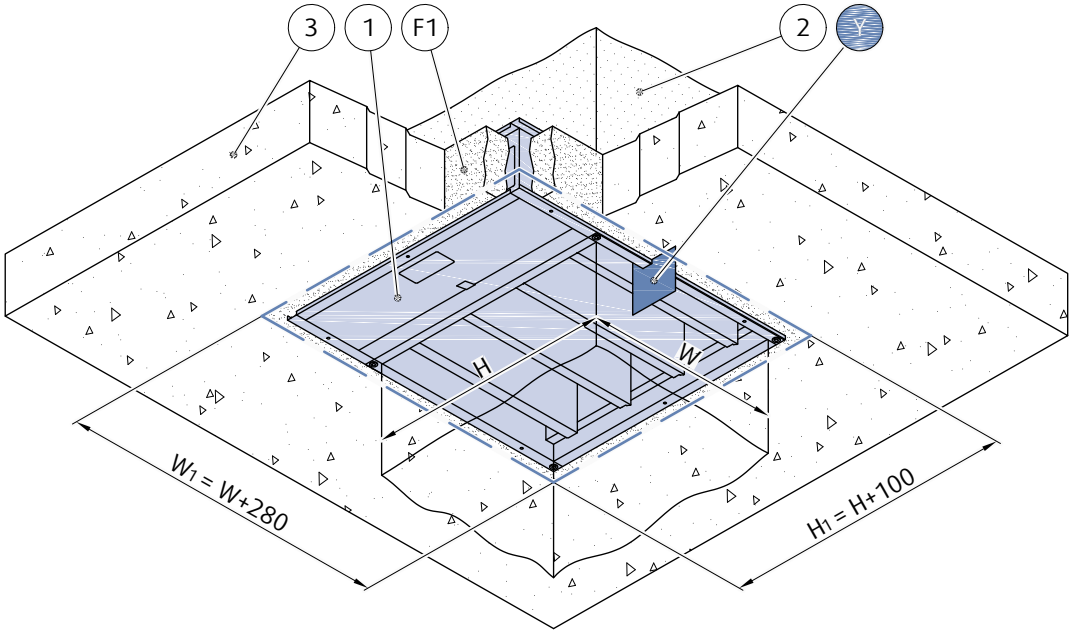
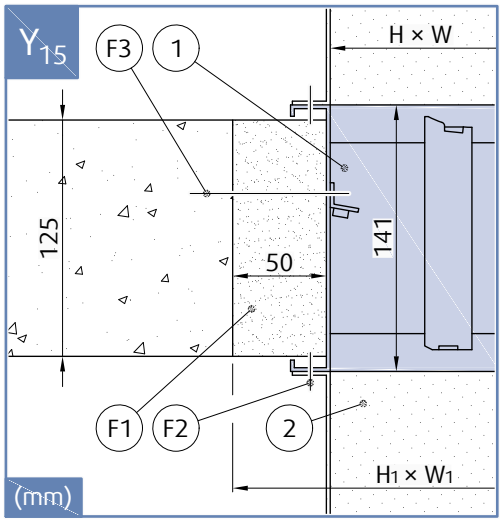
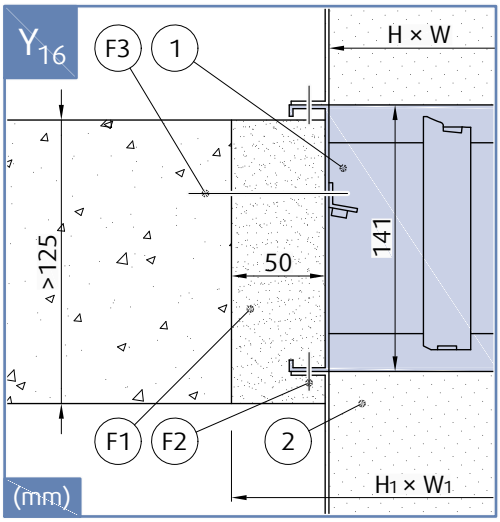
H1 x W1
H x W
(mm)


Y8
>125
F1
F2
F3
2
50
5
1
141
H1 x W1
H x W
(mm)

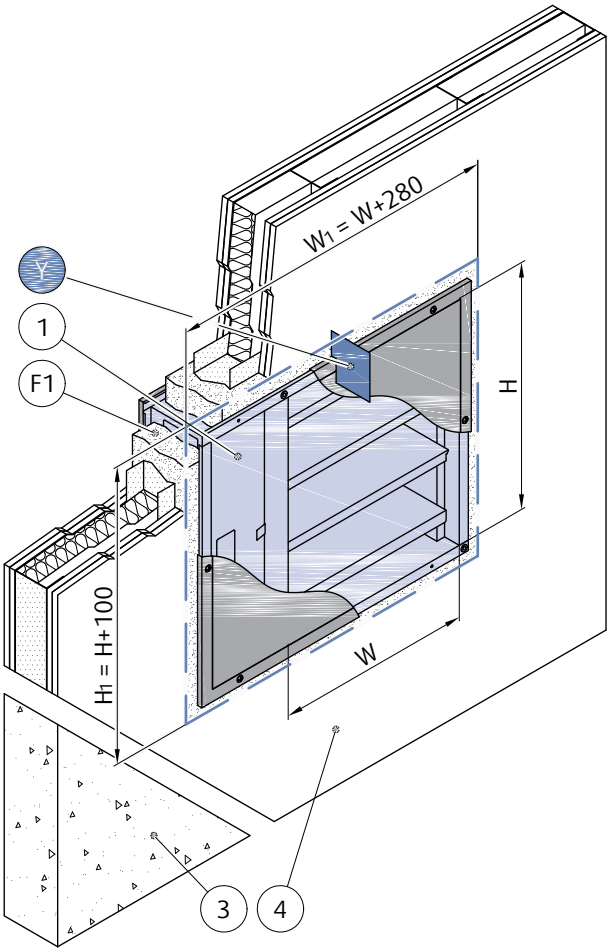
Types 00 Installed in the Ceiling, Floor - Max Resistivity: EI90S

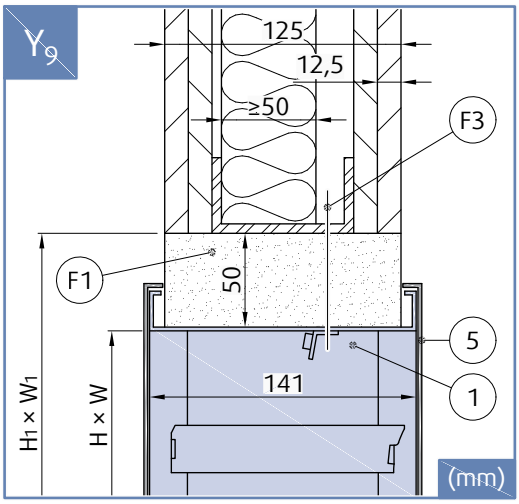


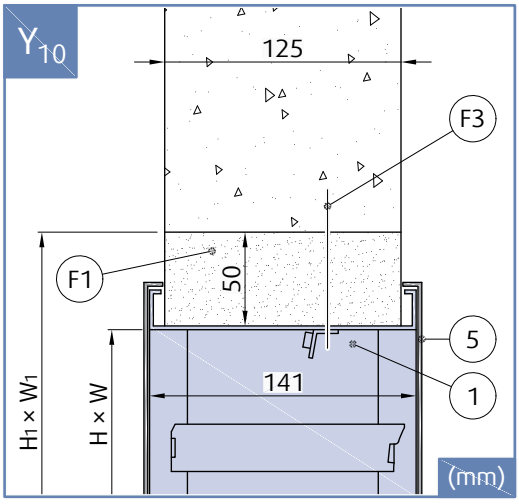


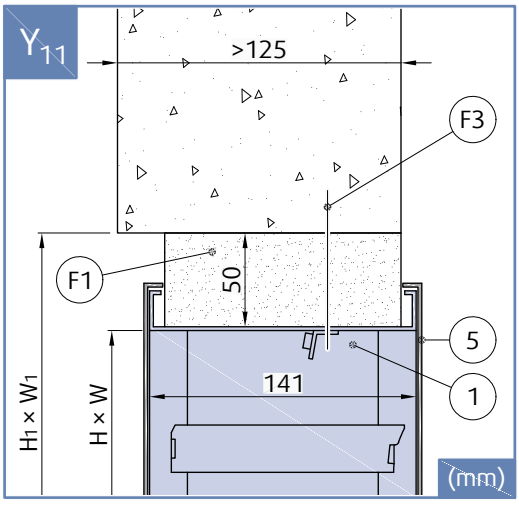


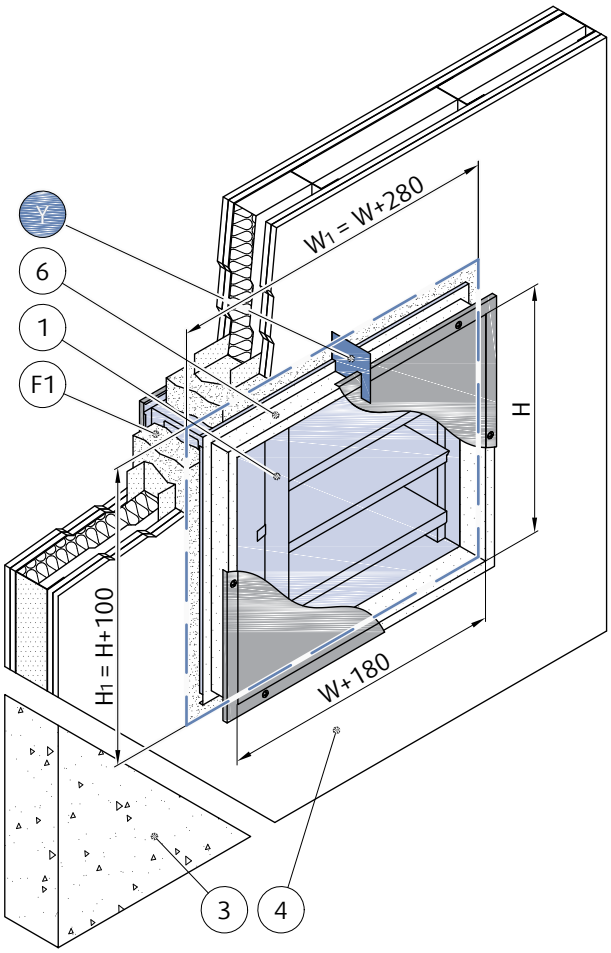
Types 11, 22 Installed in the Wall - Max Resistivity: EI90S, EI120

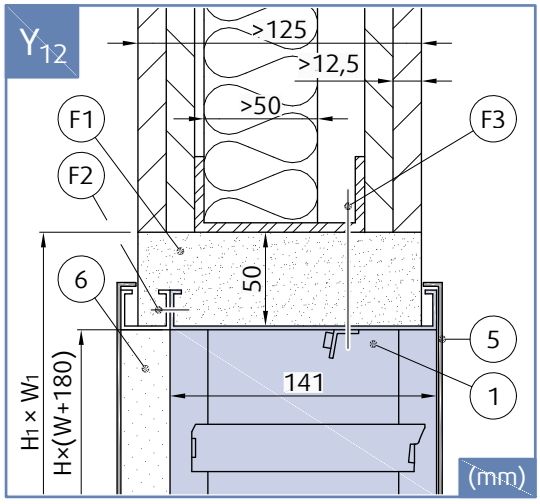


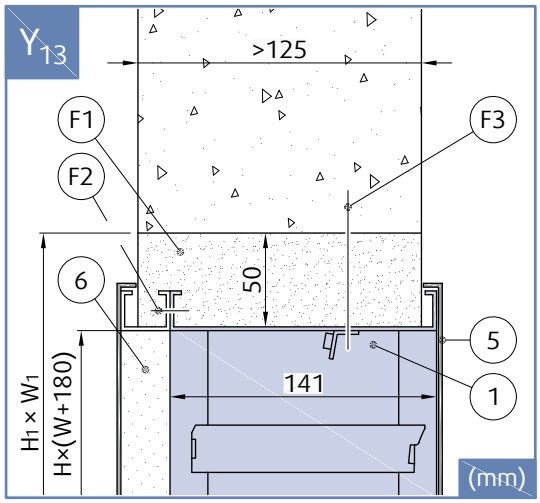


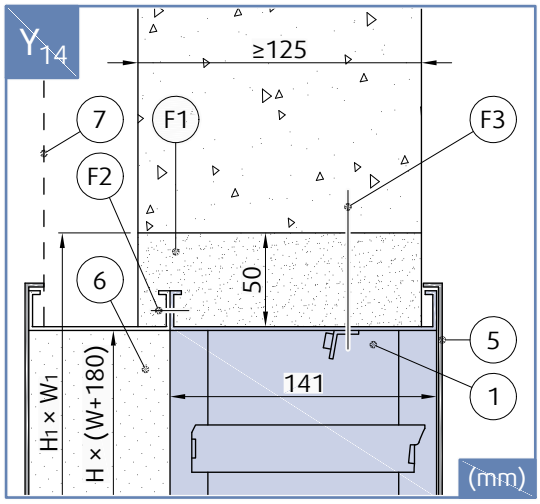




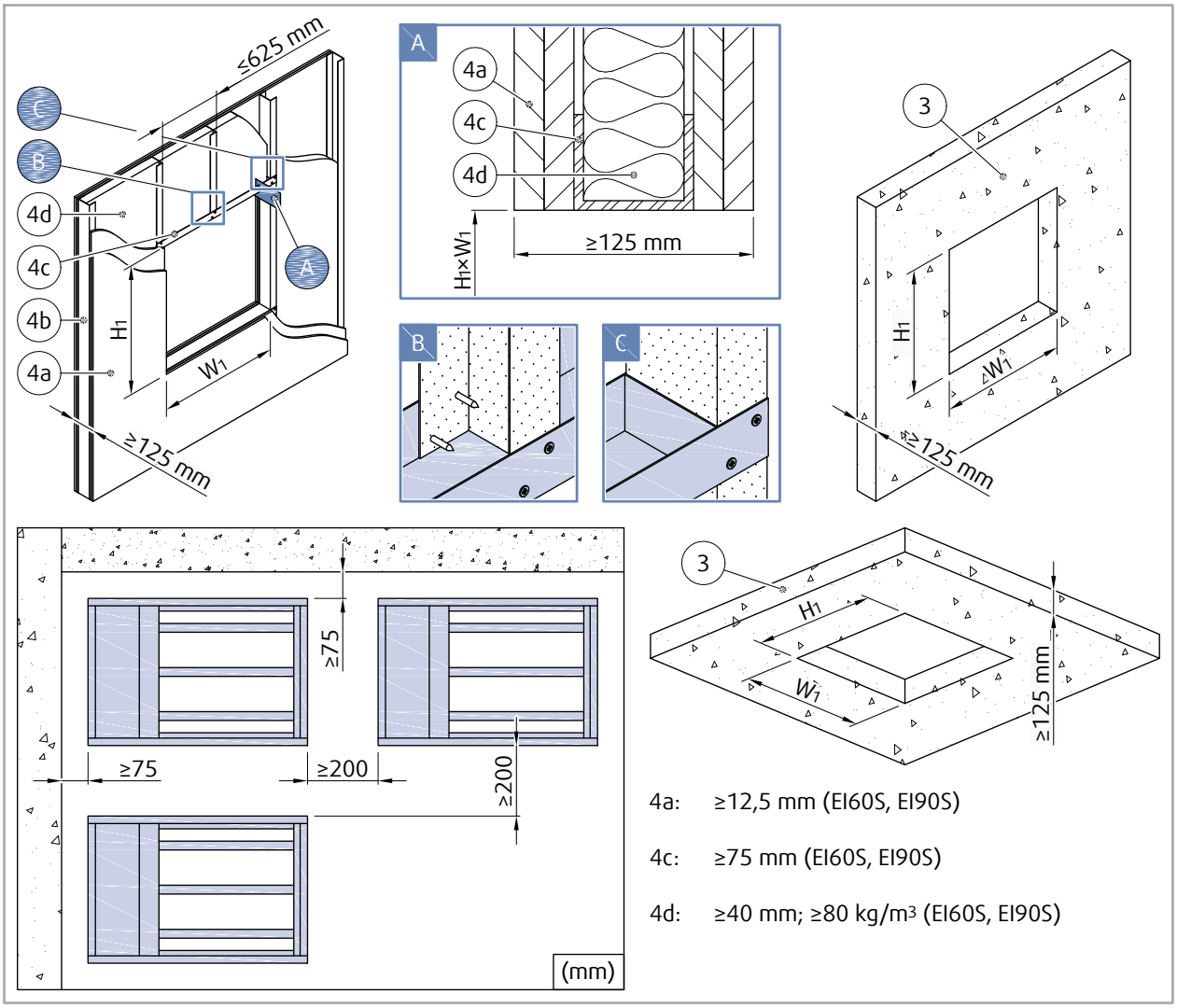

Y
6
1
F1
W1 = W+280
H
H1 = H+100
W+180
3
4


Y12
>125
>12,5
>50
F1
F2
F3
6
50
5
141
1
H1 × W1
H×(W+180)
(mm)


Y13
>125
F1
F2
F3
6
50
5
141
1
H1 × W1
H×(W+180)
(mm)


Y14
≥125
7
F1
F2
F3
6
50
5
141
1
H1 × W1
H × (W+180)
(mm)

Wall and/or Ceiling Opening Preparation and Minimum Distances



Legend for Installation 1. Wet

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)
F1 - Plaster/mortar/concrete filling
F2 - Screw M6×20-25 mm, maximum fixing torque is 4,5 Nm
F3 - Screw with minimum dimensions of 4,2 mm diameter and 80 mm length based on the structure type, (e.g.: DIN 7981C/DIN 7982C; Fischer ULTRACUT FBS II; or equal and greater size metal wall plug + screw).
Y - Cutting plane

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.

3 Soft	F-B90 ...00 01 02	EI 60 (v_e h_o i ↔ o) S EI 90 (v_e h_o i ↔ o) S	a) ≥ 125 c) ≥ 125 ≥ 620 (kg/m³)	b) ≥ 125	
	F-B90 ...11 22	EI 60 (v_e i ↔ o) S EI 90 (v_e i ↔ o) S EI 120 (v_e i ↔ o)	a) ≥ 125	b) ≥ 125	

NOTES:

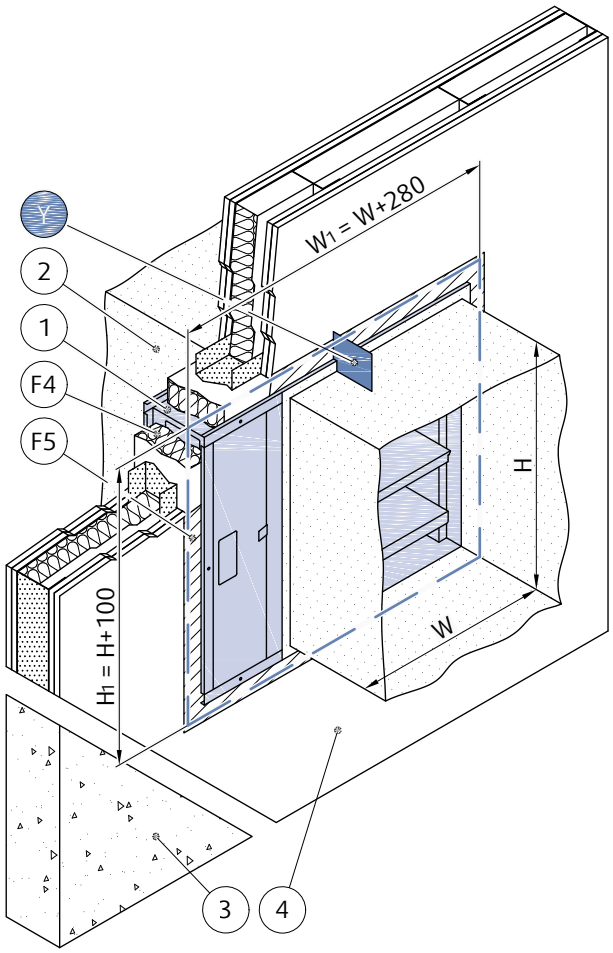
a) - Flexible (plasterboard) wall

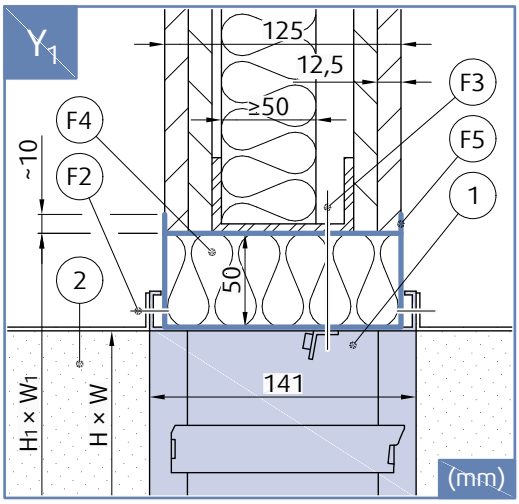
b) - Concrete/masonry/cellular concrete (rigid) wall

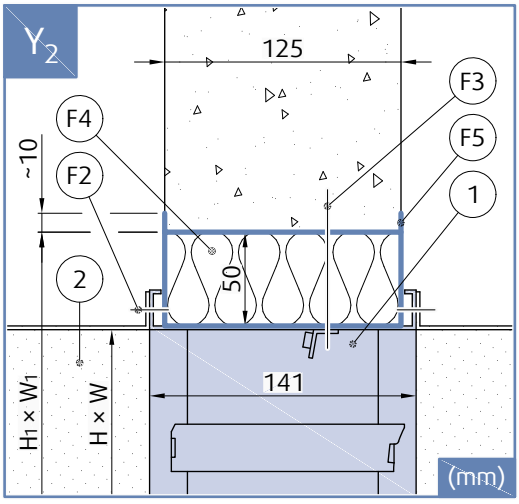
v_e - Vertically oriented damper

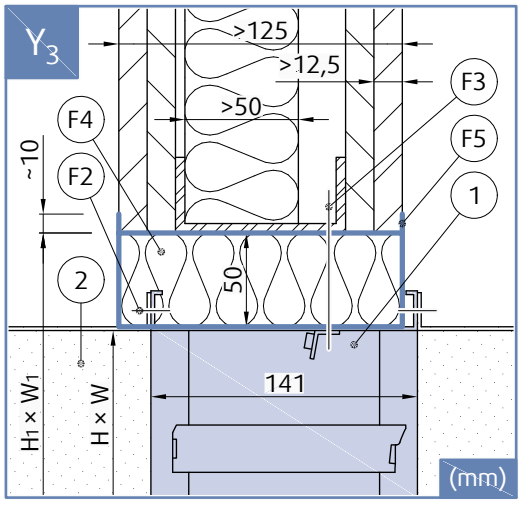
h_o - Horizontally oriented damper

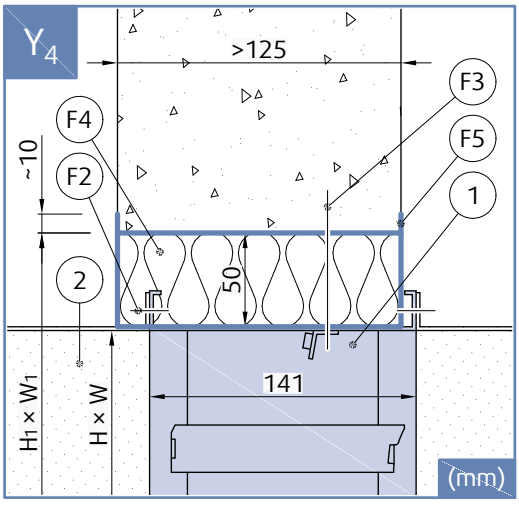
Types 00, 01, 02 Installed in the Wall - Max Resistivity: EI90S

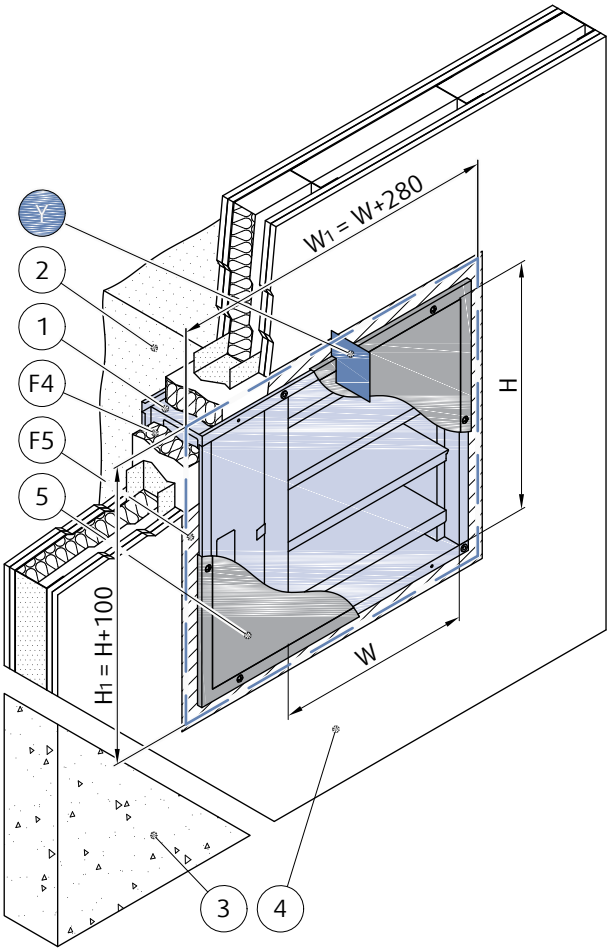








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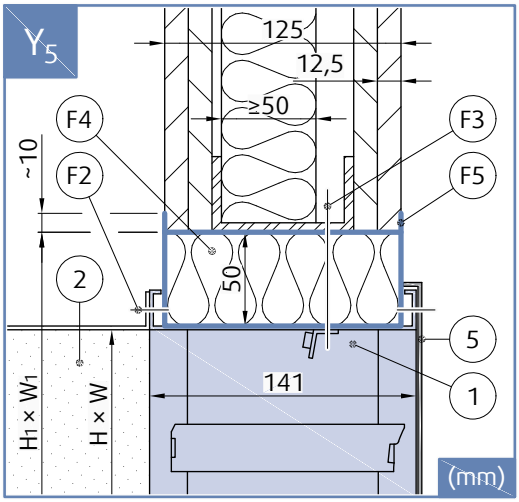
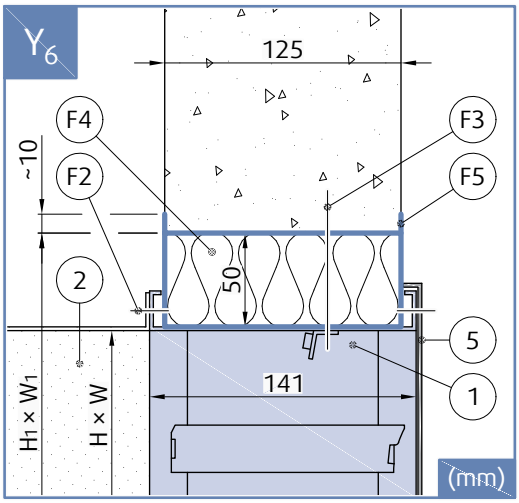
F4
F5
5
W1 = W+280
H
H1 = H+100
W
3
4


Y5
125
12,5
≥50
F4
F2
F3
F5
~10
2
50
5
1
141
H1 x W1
H x W
(mm)


Y6
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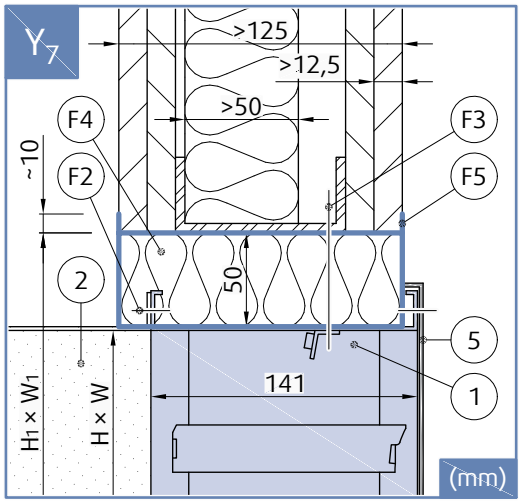
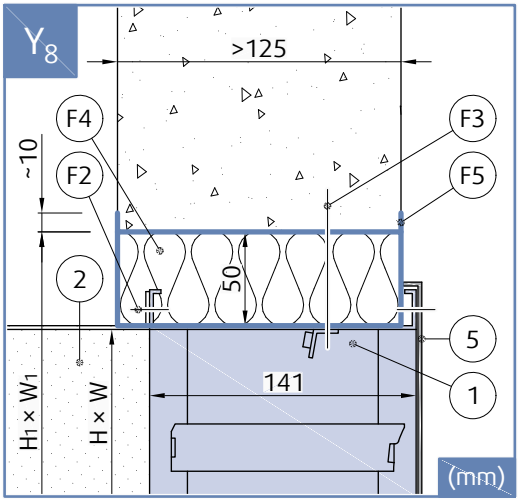
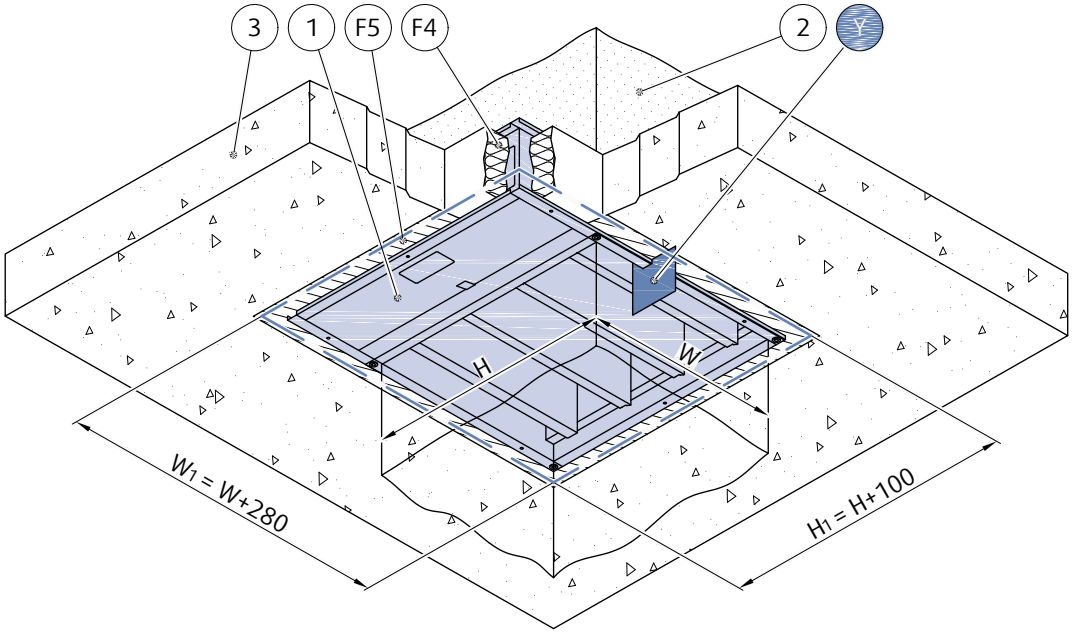
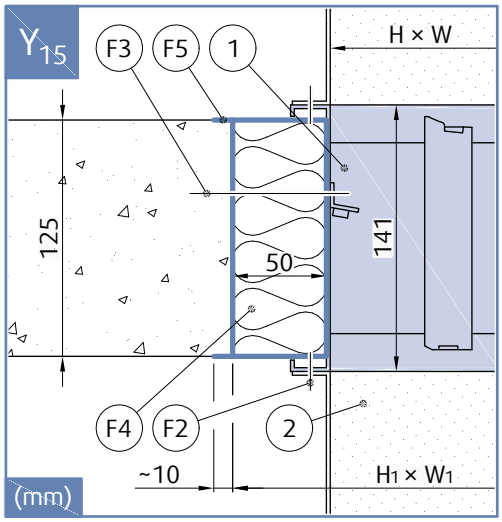
F4
F2
F3
F5
~10
2
50
5
1
141
H1 x W1
H x W
(mm)

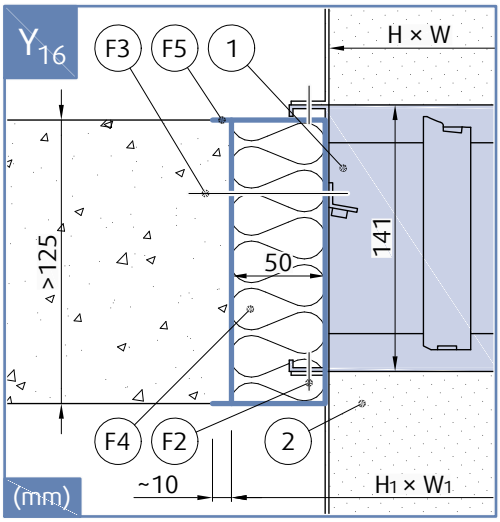

Y7
>125
>12,5
>50
F4
F2
F3
F5
~10
2
50
5
1
141
H1 x W1
H x W
(mm)


Y8
>125
F4
F2
F3
F5
~10
2
50
5
1
141
H1 x W1
H x W
(mm)

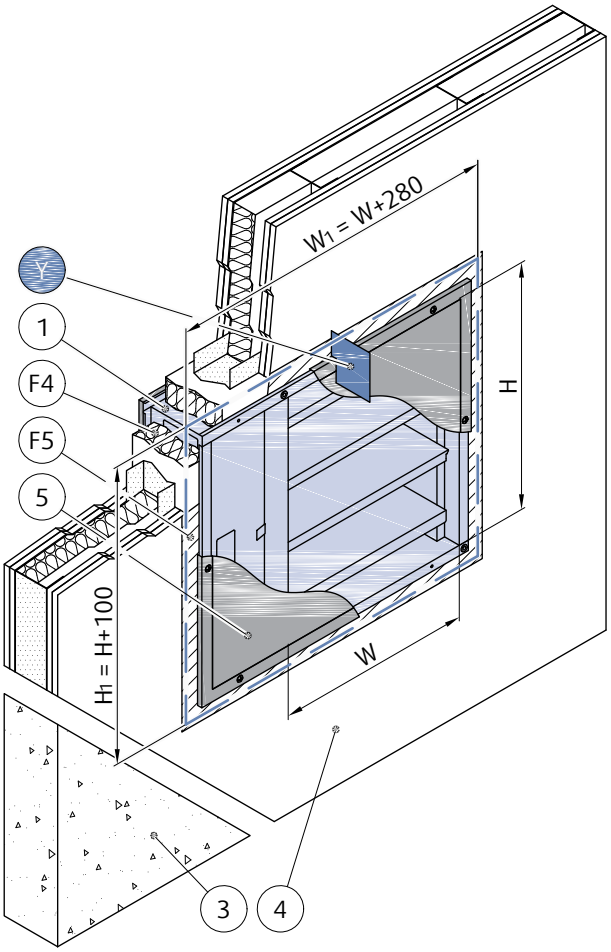
Types 00 Installed in the Ceiling, Floor - Max Resistivity: EI90S

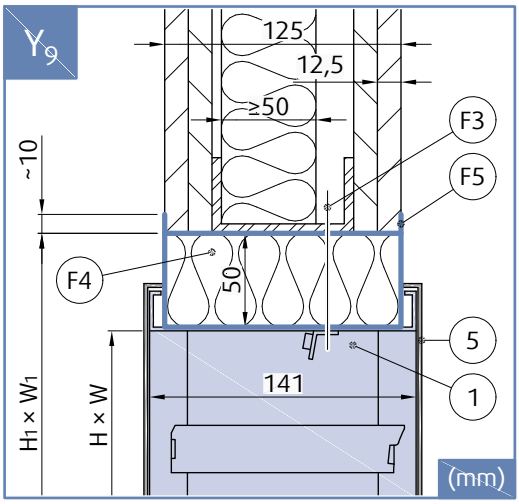


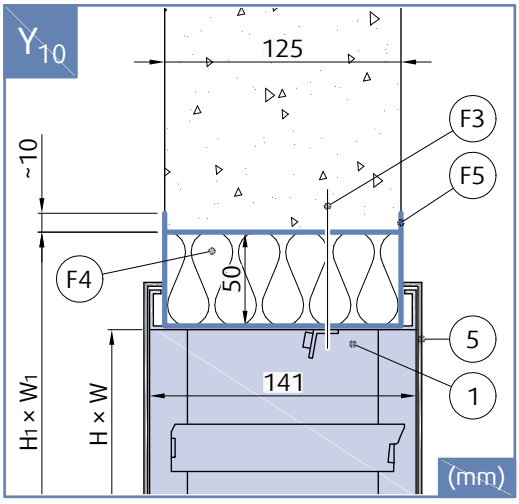


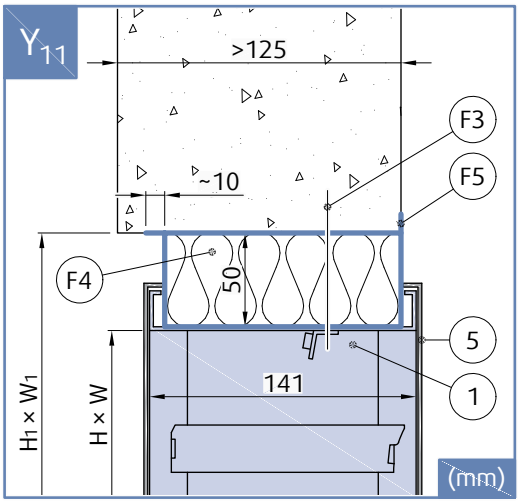


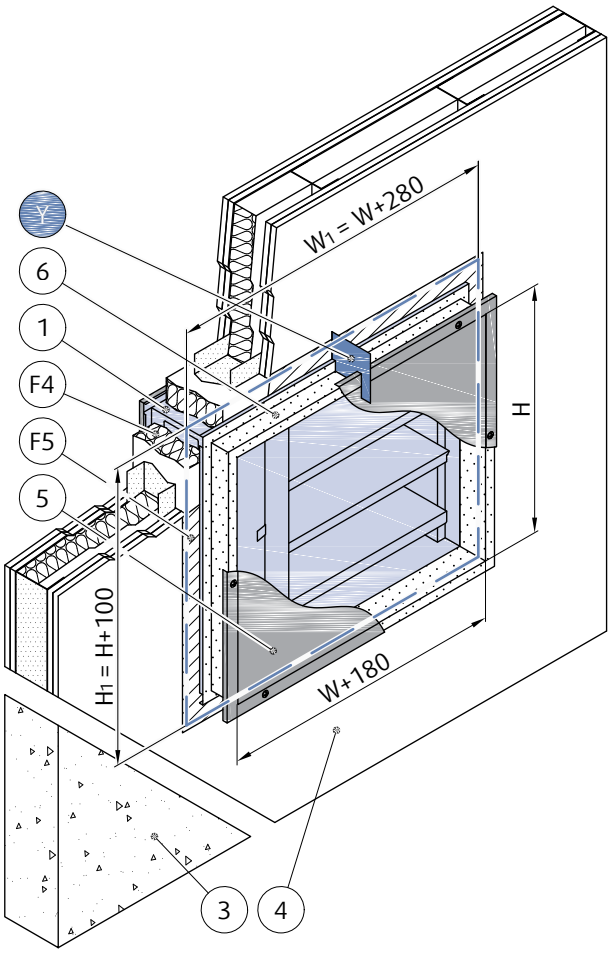
Types 11, 22 Installed in the Wall - Max Resistivity: EI90S, EI120

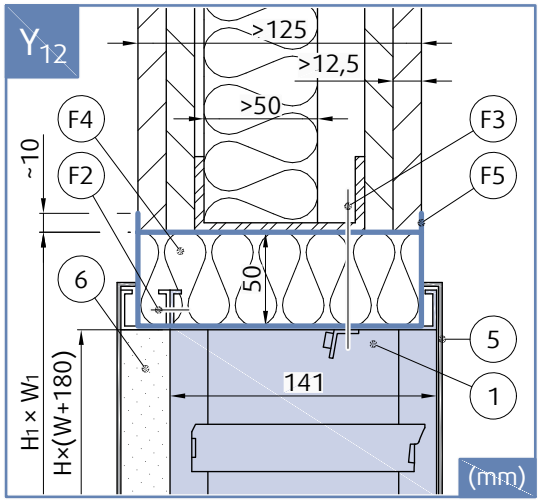


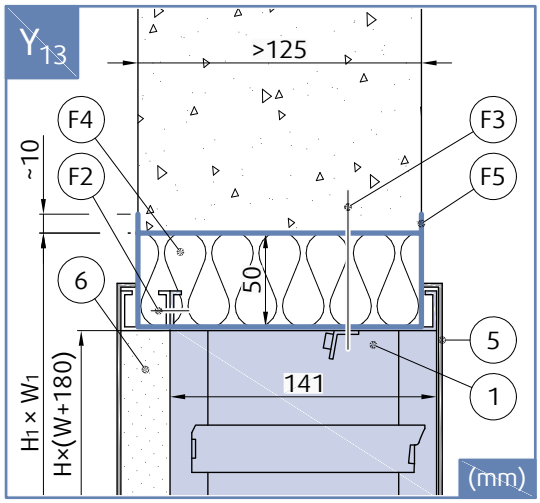


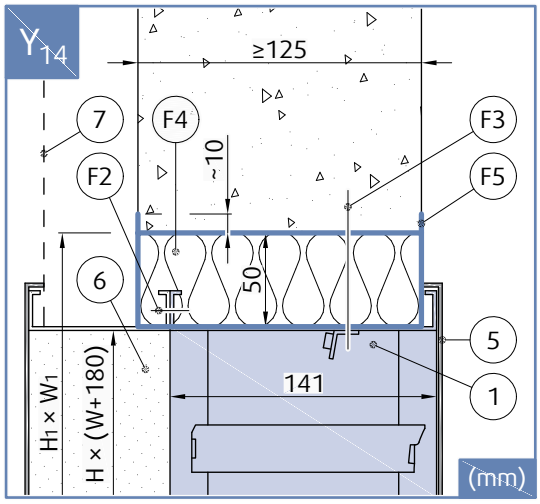




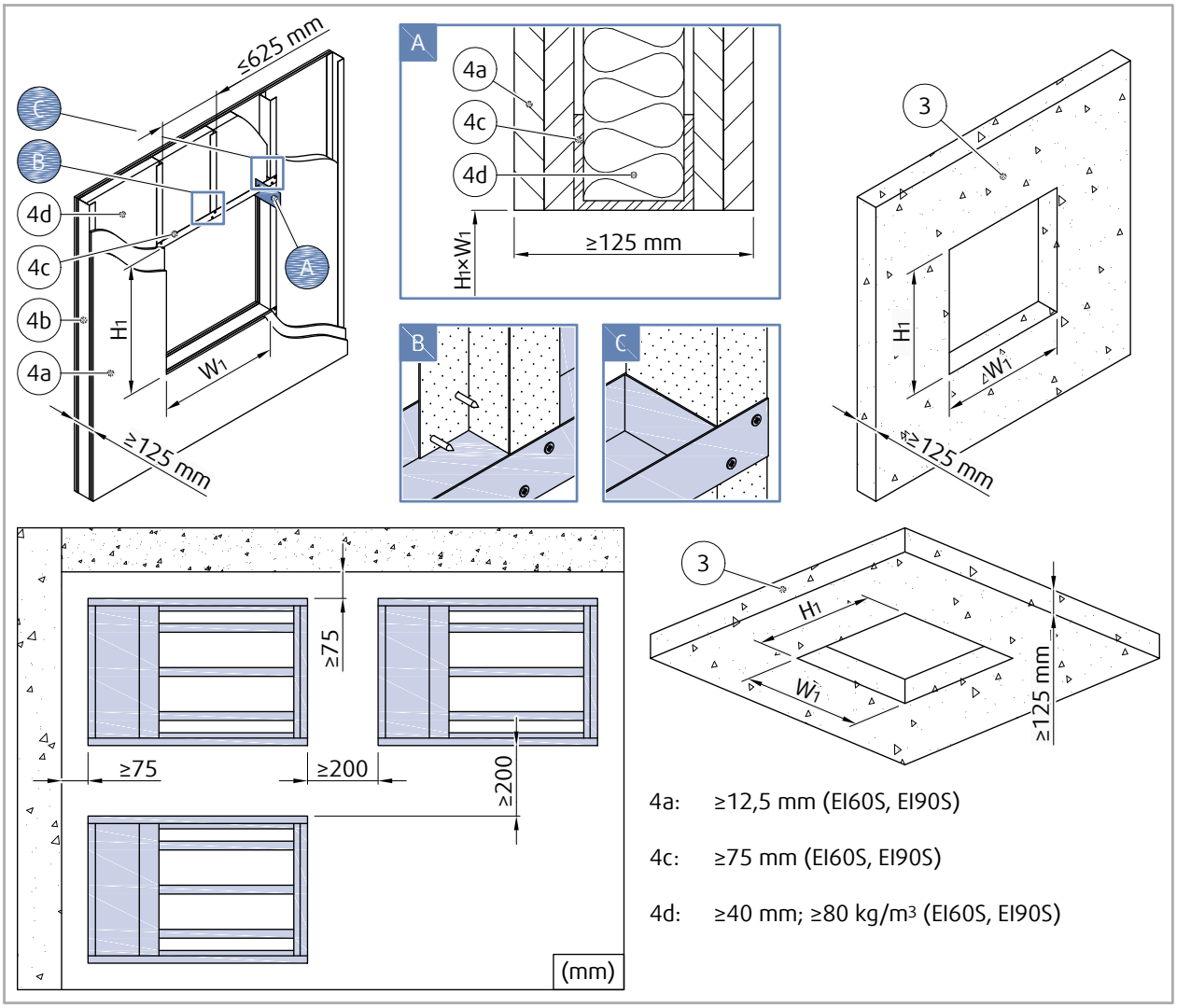

Y
6
1
F4
F5
5
W1 = W+280
H
H1 = H+100
W+180
3
4


Y12
>125
>12,5
>50
F4
F3
F2
F5
~10
6
50
5
141
1
H1 x W1
H×(W+180)
(mm)


Y13
>125
F4
F3
F2
F5
~10
6
50
5
141
1
H1 x W1
H×(W+180)
(mm)


Y14
≥125
7
F4
F3
F2
F5
~10
6
50
5
141
1
H1 x W1
H x (W+180)
(mm)

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 - Screw with minimum dimensions of 4,2 mm diameter and 80 mm length based on the structure type, (e.g.: DIN 7981C/DIN 7982C; Fischer ULTRACUT FBS II; or equal and greater size metal wall plug + screw).
F4 - Mineral wool filling (min. 140 kg/m3)
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. Than 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.

3F Fit	F-B90 ...00 01 02	EI 60 (v_e i ↔ o) S EI 90 (v_e i ↔ o) S	a) ≥ 125	
	F-B90 ...11 22	EI 60 (v_e i ↔ o) S EI 90 (v_e i ↔ o) S EI 120 (v_e i ↔ o)	a) ≥ 125	

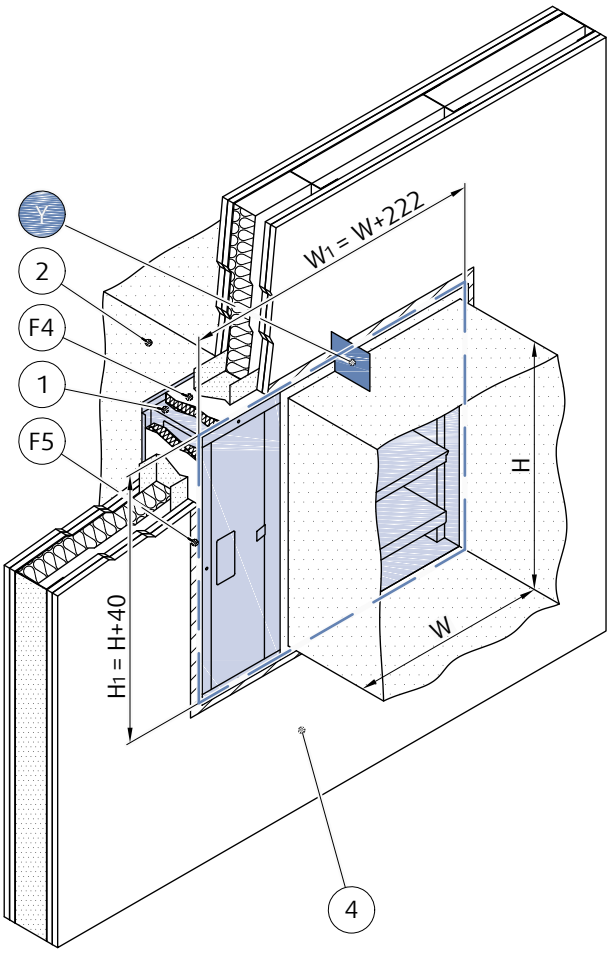
NOTES:

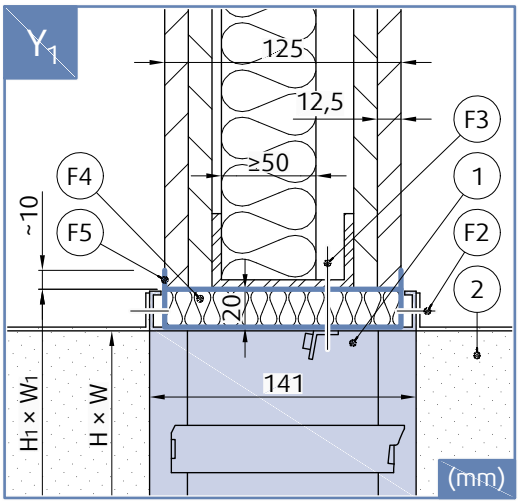
a) - Flexible (plasterboard) wall

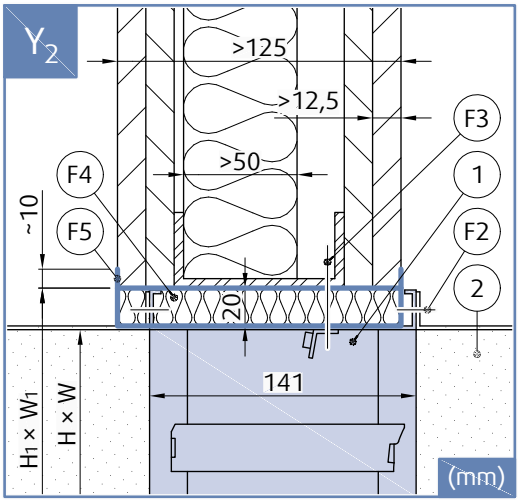
b) - Concrete/masonry/cellular concrete (rigid) wall

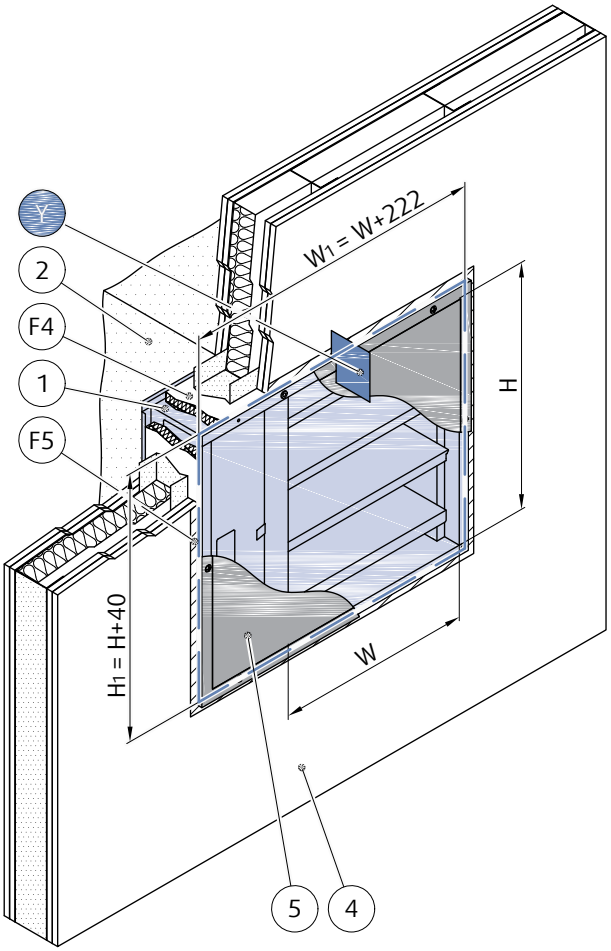
v_e - Vertically oriented damper

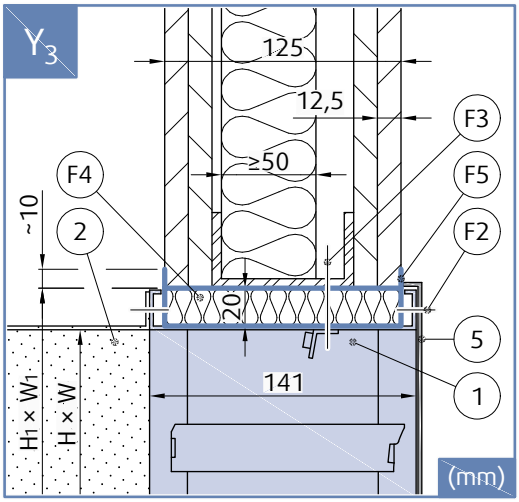
Types 00, 01, 02 Installed in the Wall - Max Resistivity: EI90S

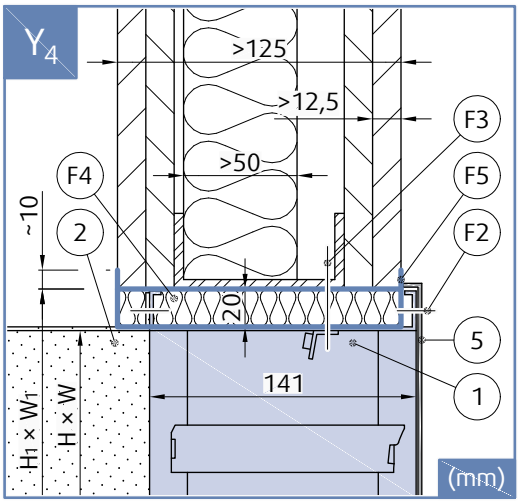




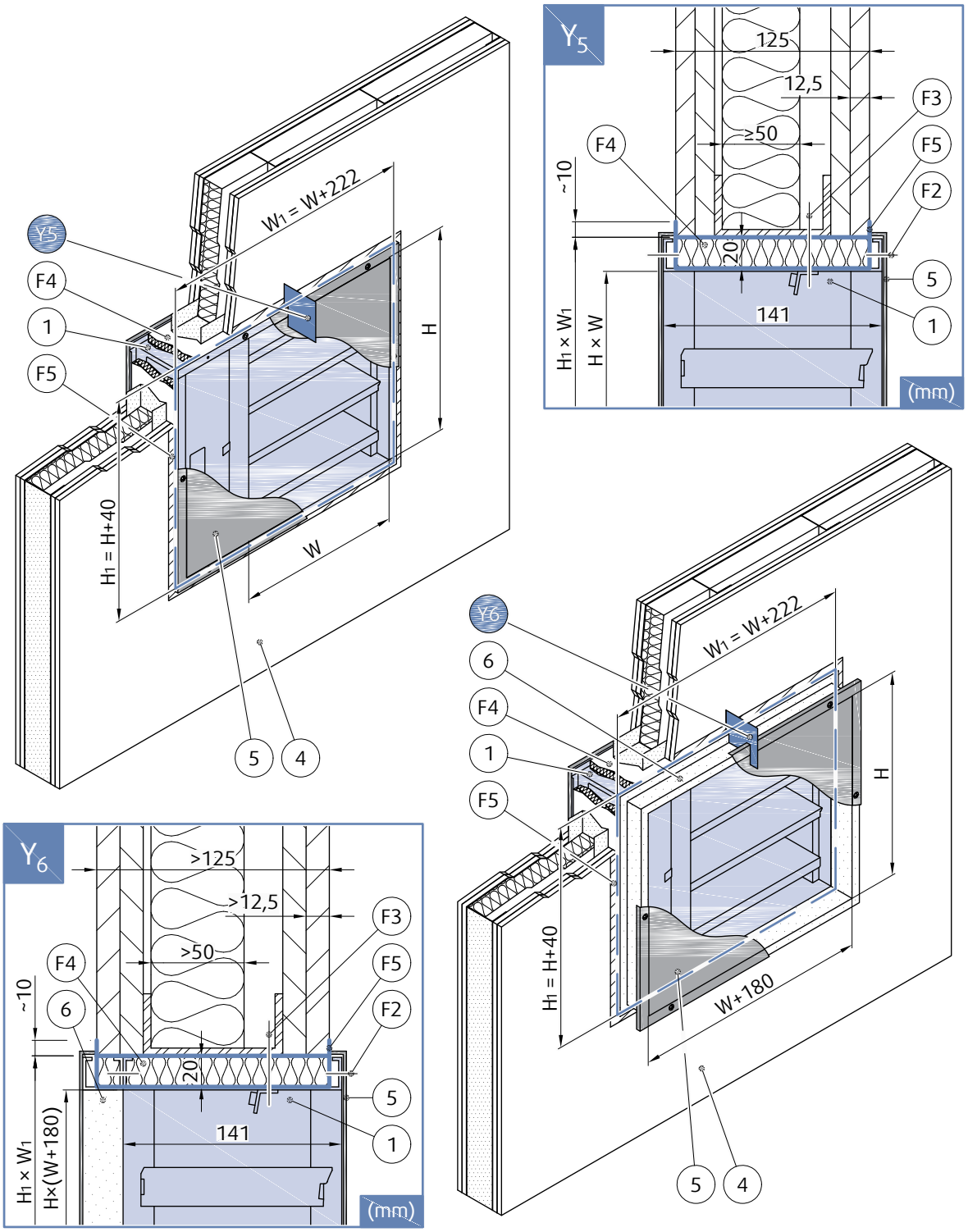



Y
2
F4
1
F5
W1 = W+222
H
H1 = H+40
W
5
4

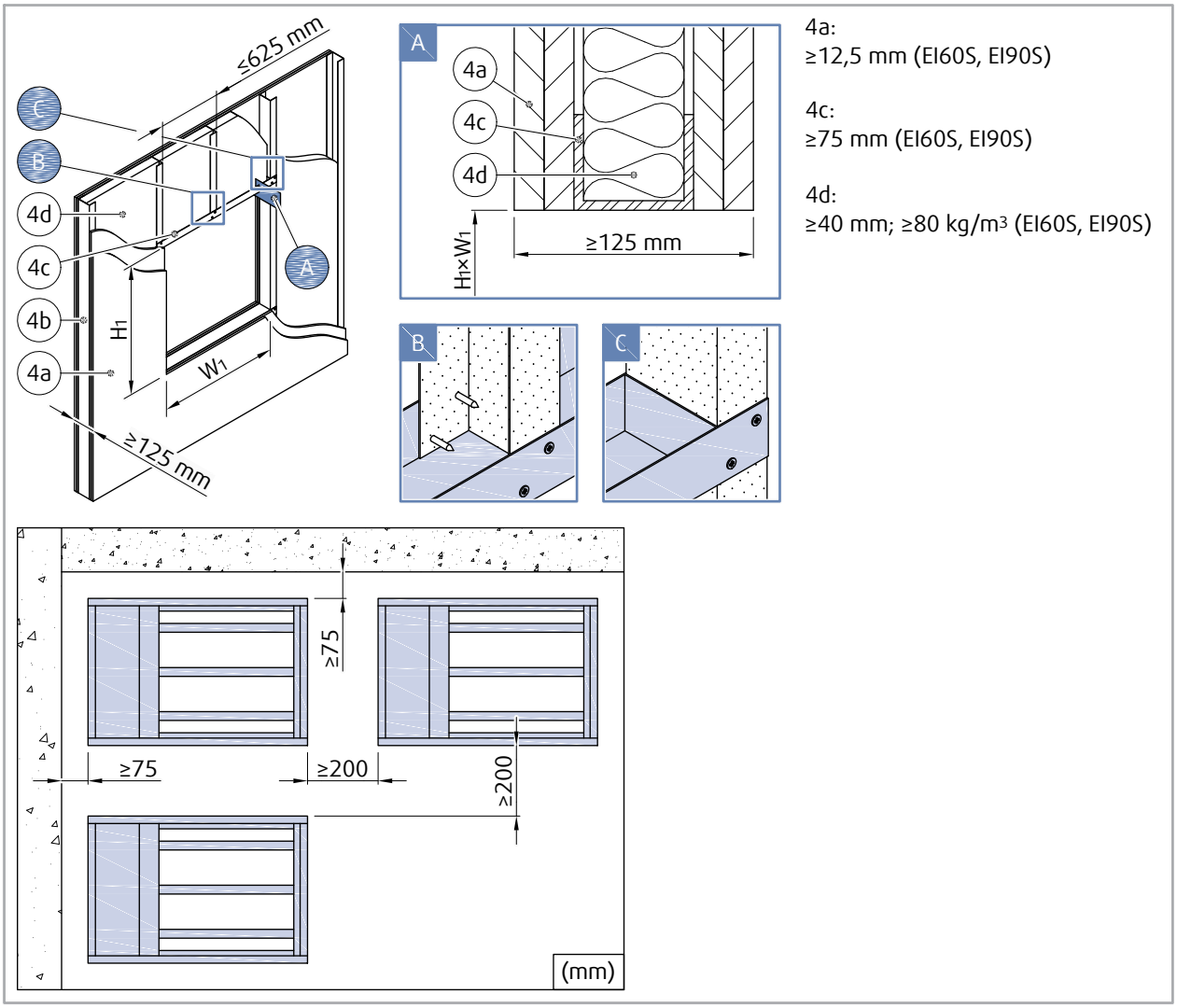

Y3
125
12,5
≥50
F3
F5
F2
F4
2
~10
20
5
1
141
H1 x W1
H x W
(mm)


Y4
>125
>12,5
>50
F3
F5
F2
F4
2
~10
20
5
1
141
H1 x W1
H x W
(mm)

Types 11, 22 Installed in the Wall - Max Resistivity: EI90S, EI120



Wall and/or Ceiling Opening Preparation and Minimum Distances



4a:
≥12,5 mm (EI60S, EI90S)

4c:
≥75 mm (EI60S, EI90S)

4d:
≥40 mm; ≥80 kg/m³ (EI60S, EI90S)

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 - Screw with minimum dimensions of 4,2 mm diameter and 80 mm length based on the structure type, (e.g.: DIN 7981C/DIN 7982C; Fischer ULTRACUT FBS II; or equal and greater size metal wall plug + screw).
F4 - Mineral wool filling (min. 140 kg/m3)
F5 - Fire resistive coating Isover BSF (ISOVER)
Y - Cutting plane

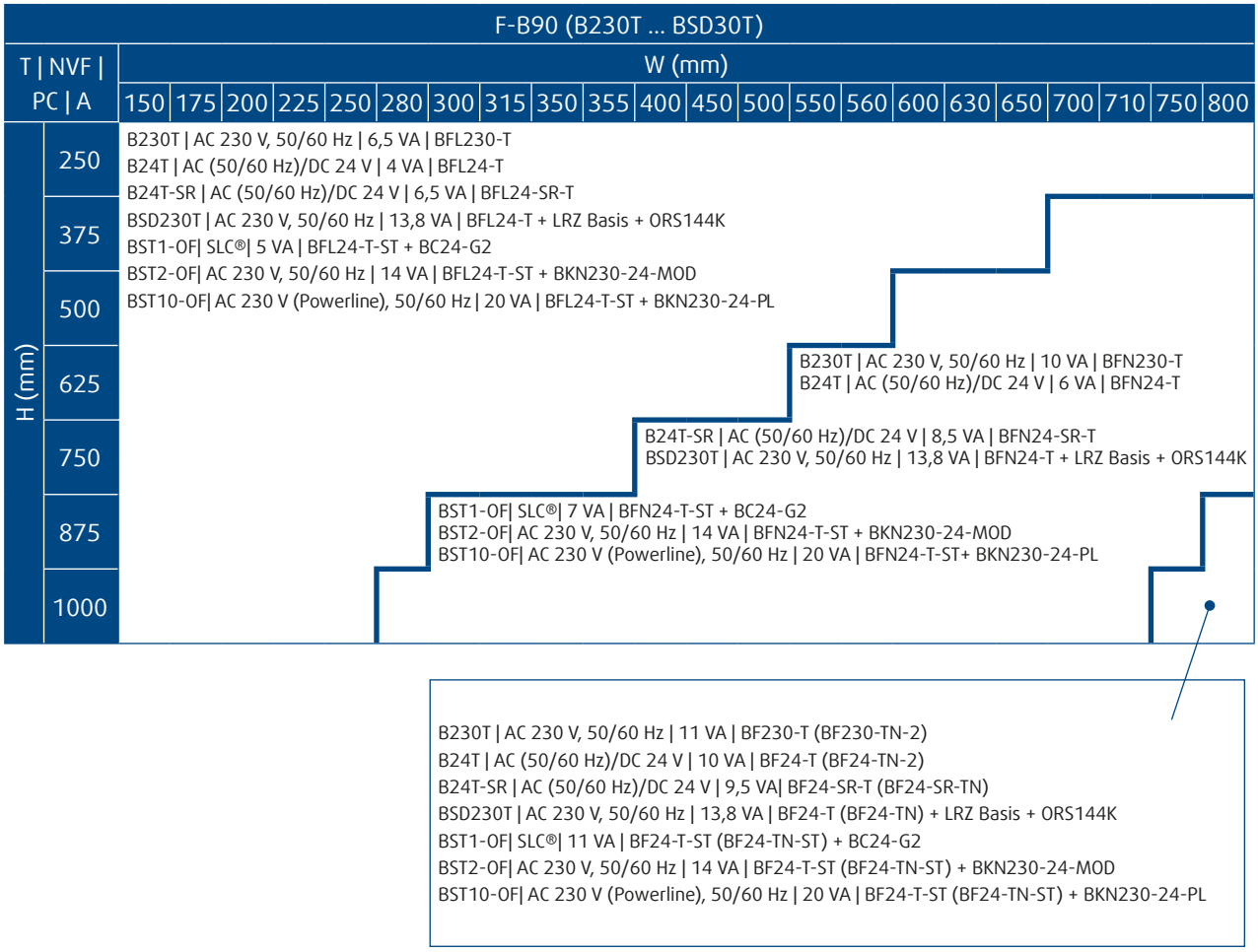
Electrical Connections

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



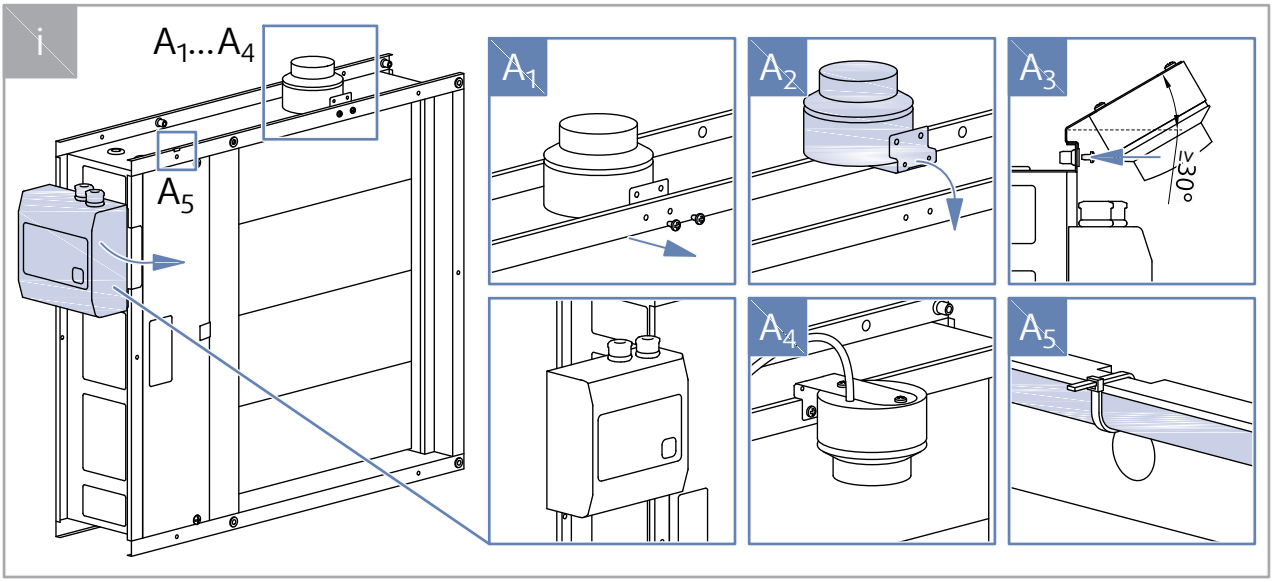
B230T | AC 230 V, 50/60 Hz | 11 VA | BF230-T (BF230-TN-2)
B24T | AC (50/60 Hz)/DC 24 V | 10 VA | BF24-T (BF24-TN-2)
B24T-SR | AC (50/60 Hz)/DC 24 V | 9,5 VA| BF24-SR-T (BF24-SR-TN)
BSD230T | AC 230 V, 50/60 Hz | 13,8 VA | BF24-T (BF24-TN) + LRZ Basis + ORS144K
BST1-OF| SLC®| 11 VA | BF24-T-ST (BF24-TN-ST) + BC24-G2
BST2-OF| AC 230 V, 50/60 Hz | 14 VA | BF24-T-ST (BF24-TN-ST) + BKN230-24-MOD
BST10-OF| AC 230 V (Powerline), 50/60 Hz | 20 VA | BF24-T-ST (BF24-TN-ST) + BKN230-24-PL

F-B90 (G230T ... GSD230T)																							
T | NVF | 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 ...																					
		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																					
		G24T-SR | AC (50/60 Hz)/DC 24 V | 7,5 VA | 340CTA-024-05 ...																					
	625	GSD230T | AC 230 V, 50/60 Hz | 13,8 VA | 340TA-024-05 ... + LRZ Basis + ORS144K																					
	750	G230T | AC 230 V, 50/60 Hz | 11,5 VA | 360TA-230-12 ...																					
		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																					
		G24T-SR | AC (50/60 Hz)/DC 24 V | 7 VA | 360CTA-024-12 ...																					
	1000	GSD230T | AC 230 V, 50/60 Hz | 13,8 VA | 360TA-024-12 ... + LRZ Basis + ORS144K																					

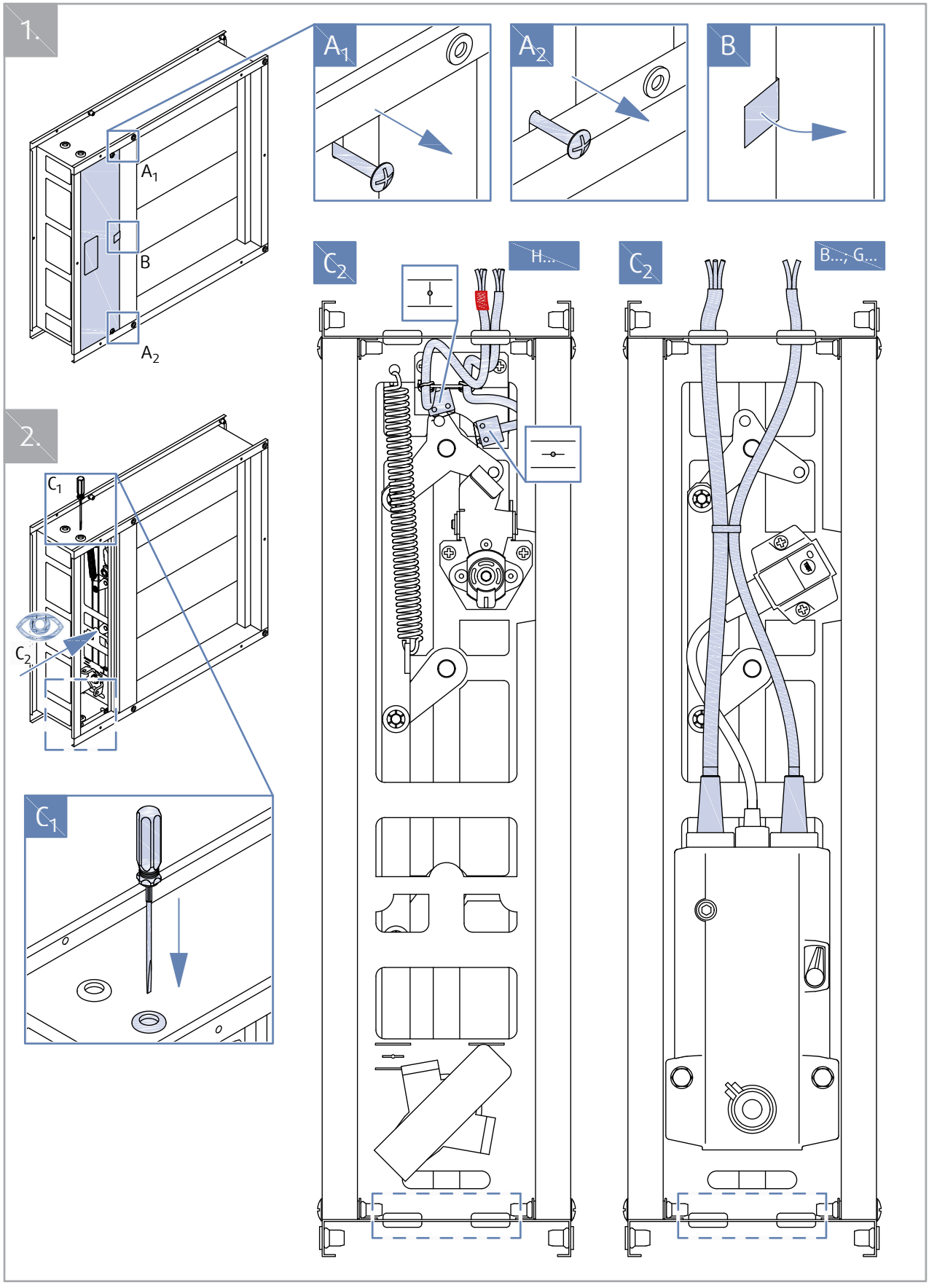
Notes:

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

Placing the smoke detector into position



Wire preparation

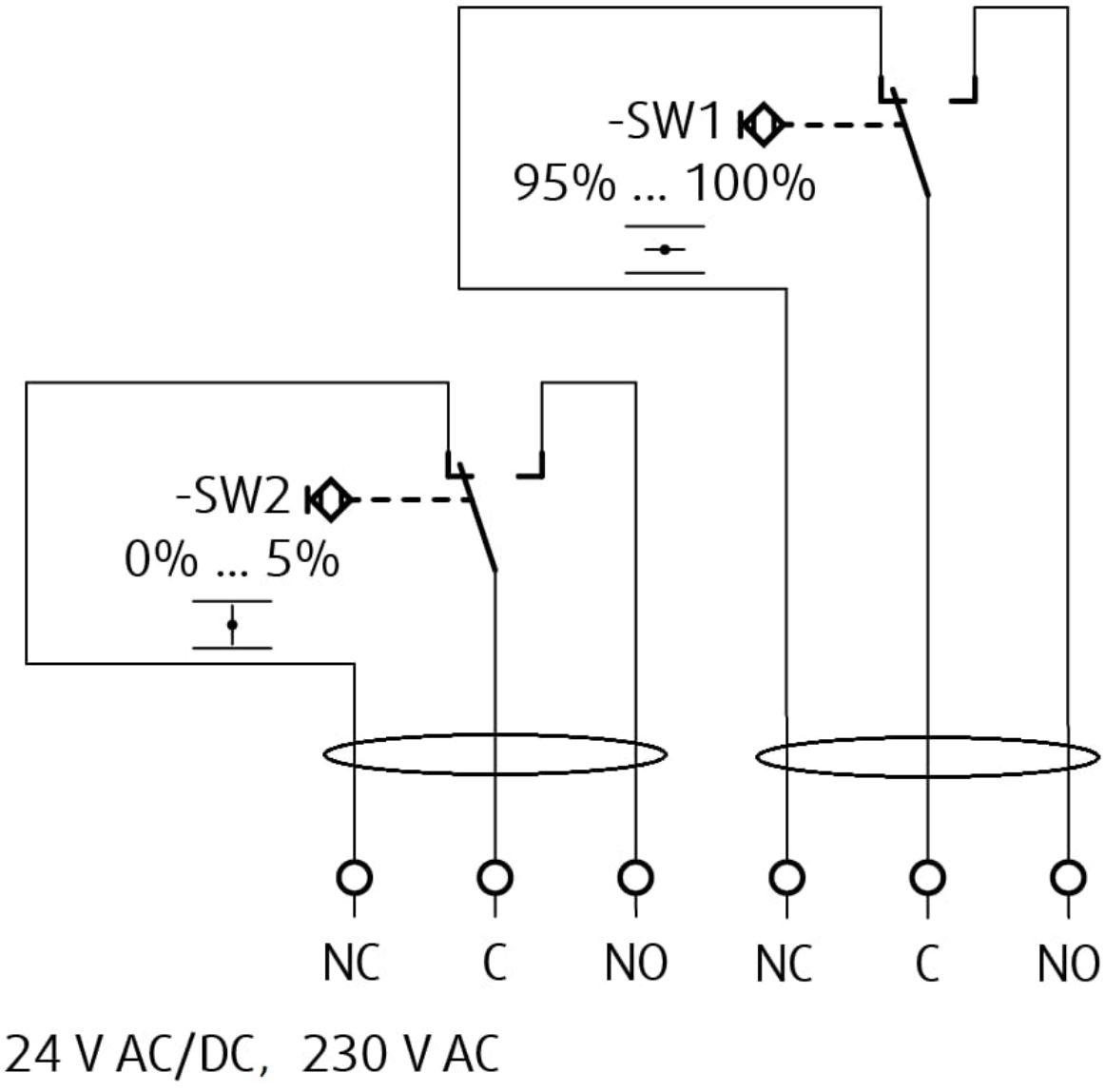


Type of activation H0

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!



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

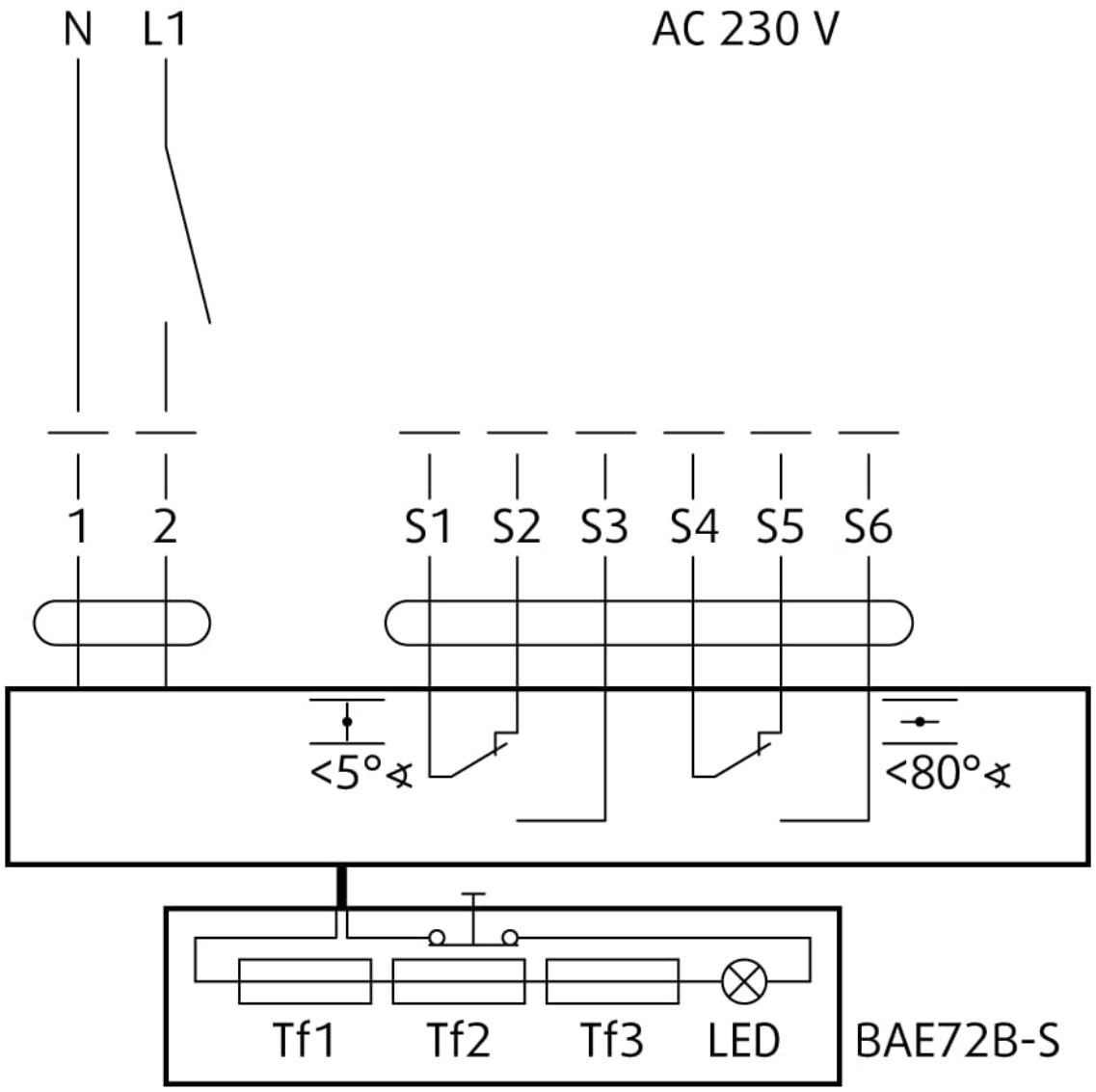
Type of Activation B230T

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.
- 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 G230T

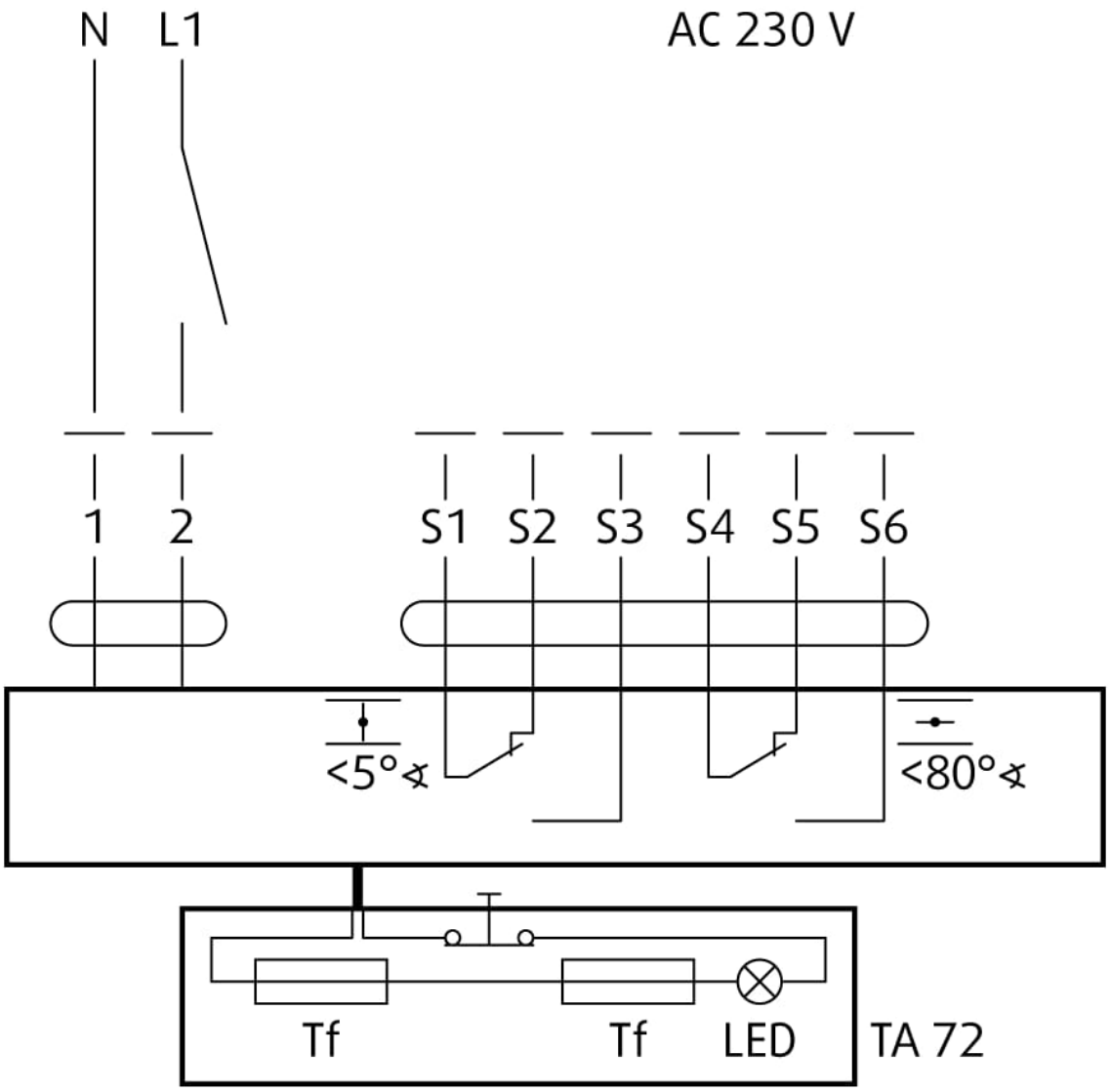
IMPORTANT: Danger of electric shock!

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 B24T

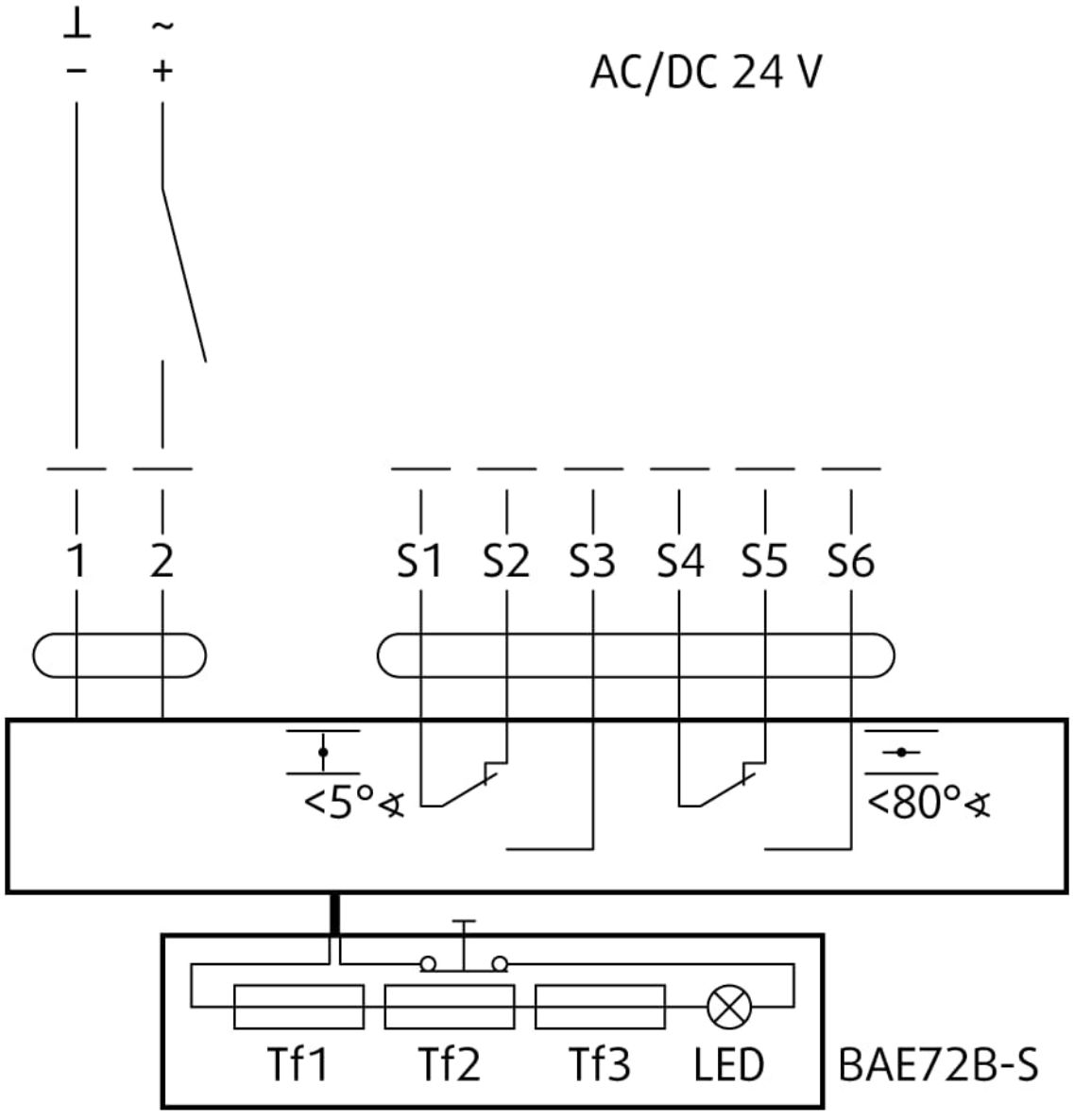
IMPORTANT: Danger of electric shock!

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.
- Paralell 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 G24T

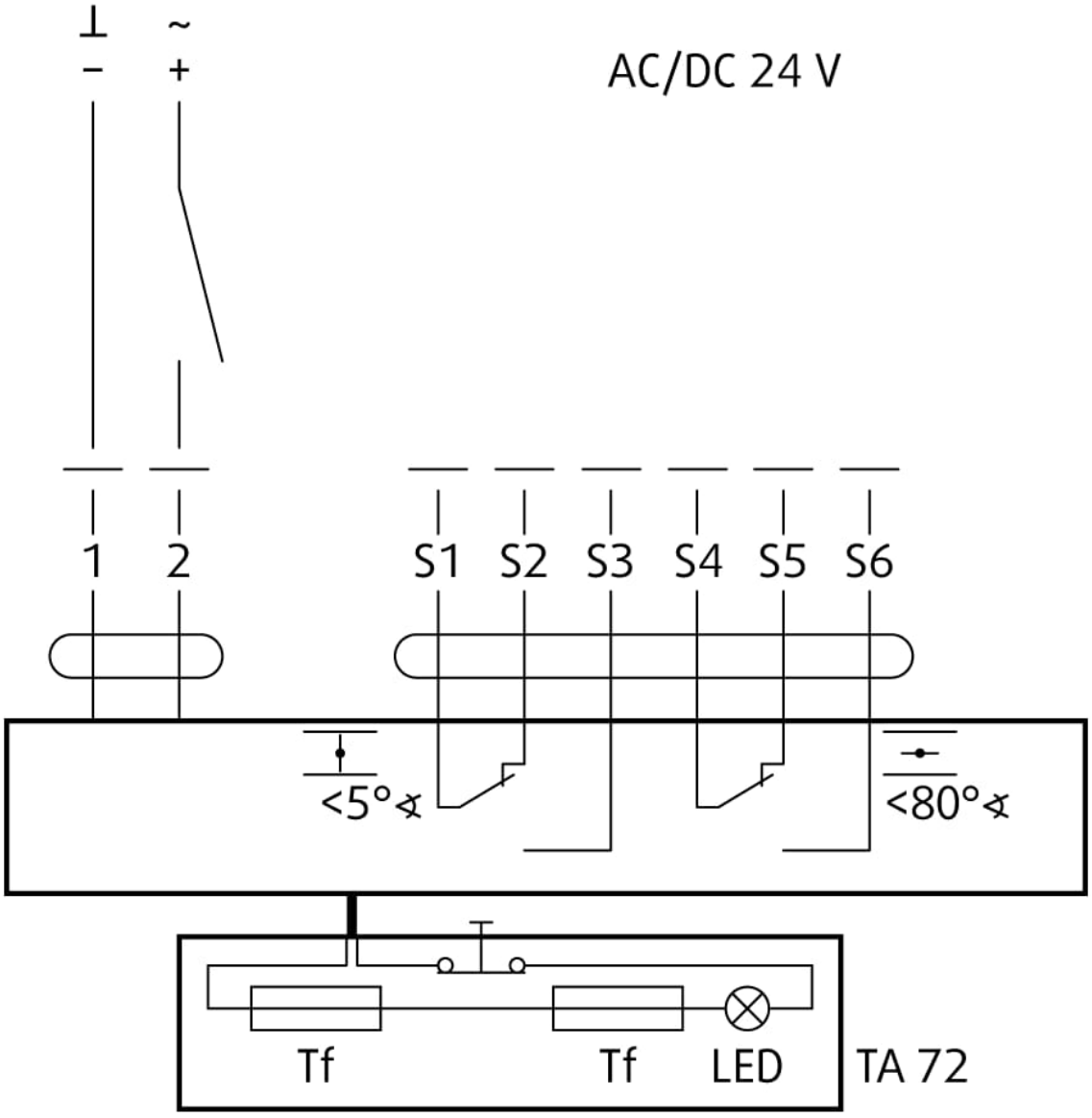
IMPORTANT: Danger of electric shock!

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.
- 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 B24T-SR

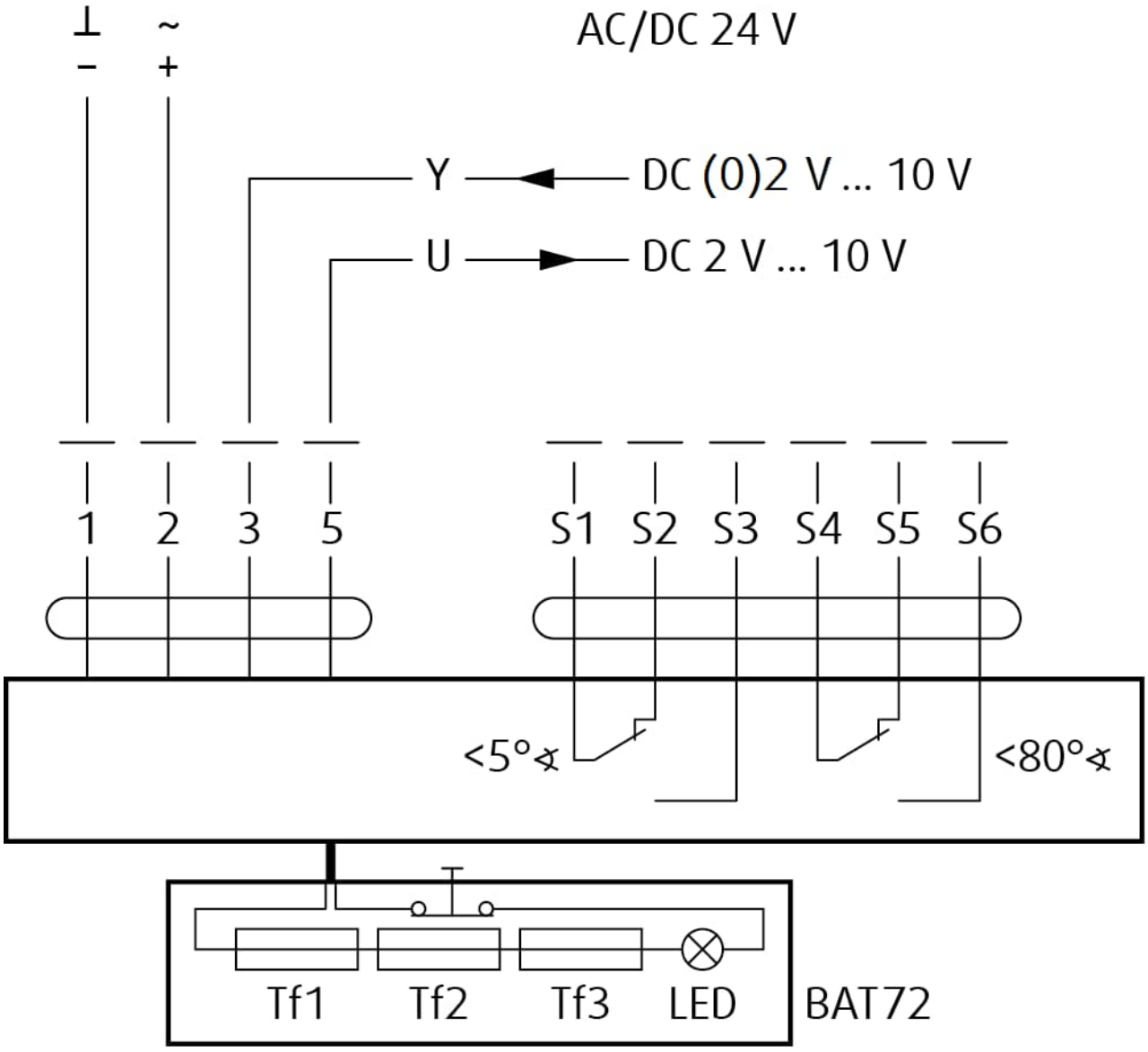
IMPORTANT: Danger of electric shock!

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 G24T-SR

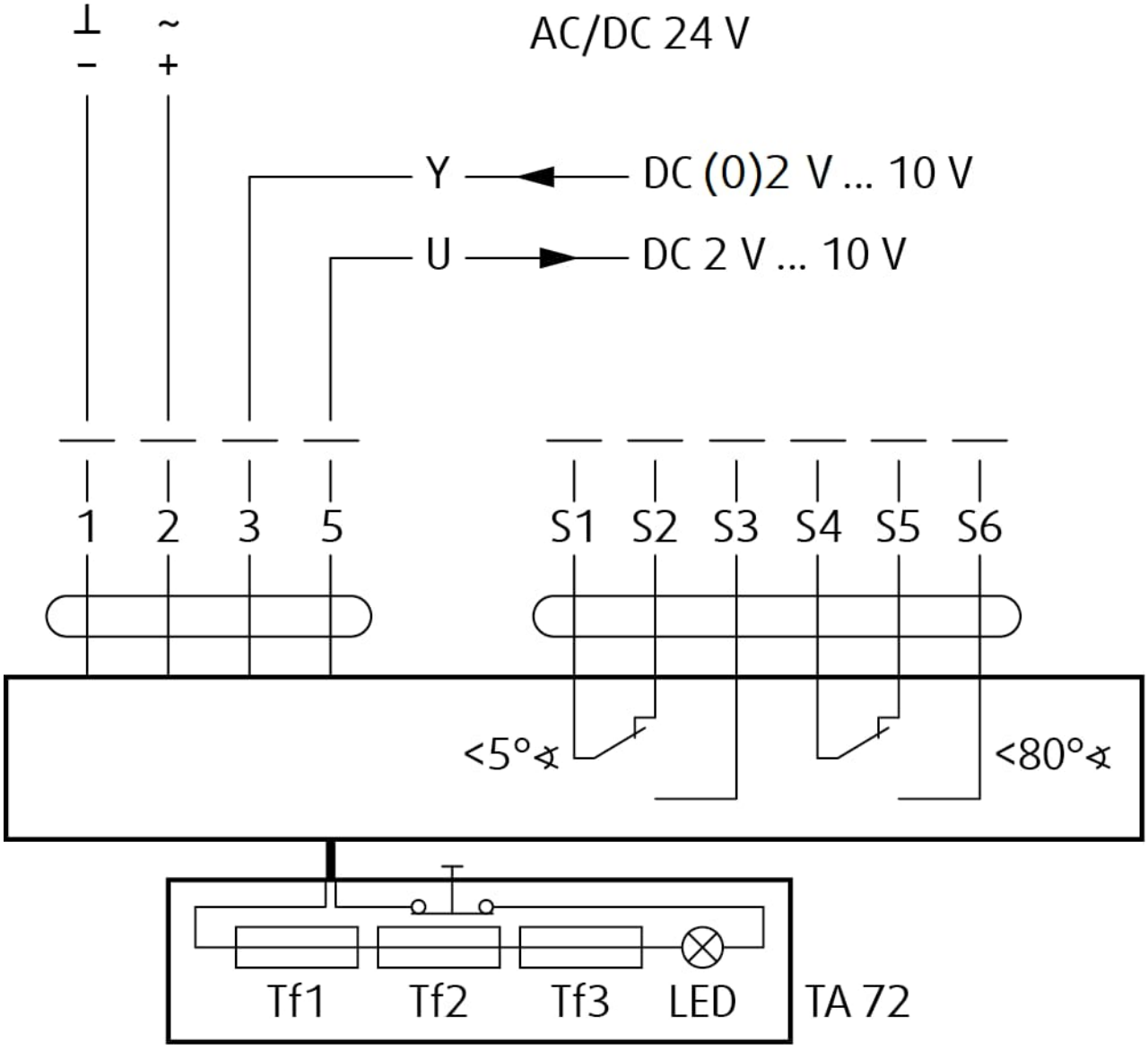
IMPORTANT: Danger of electric shock!

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

IMPORTANT: Danger of electric shock!

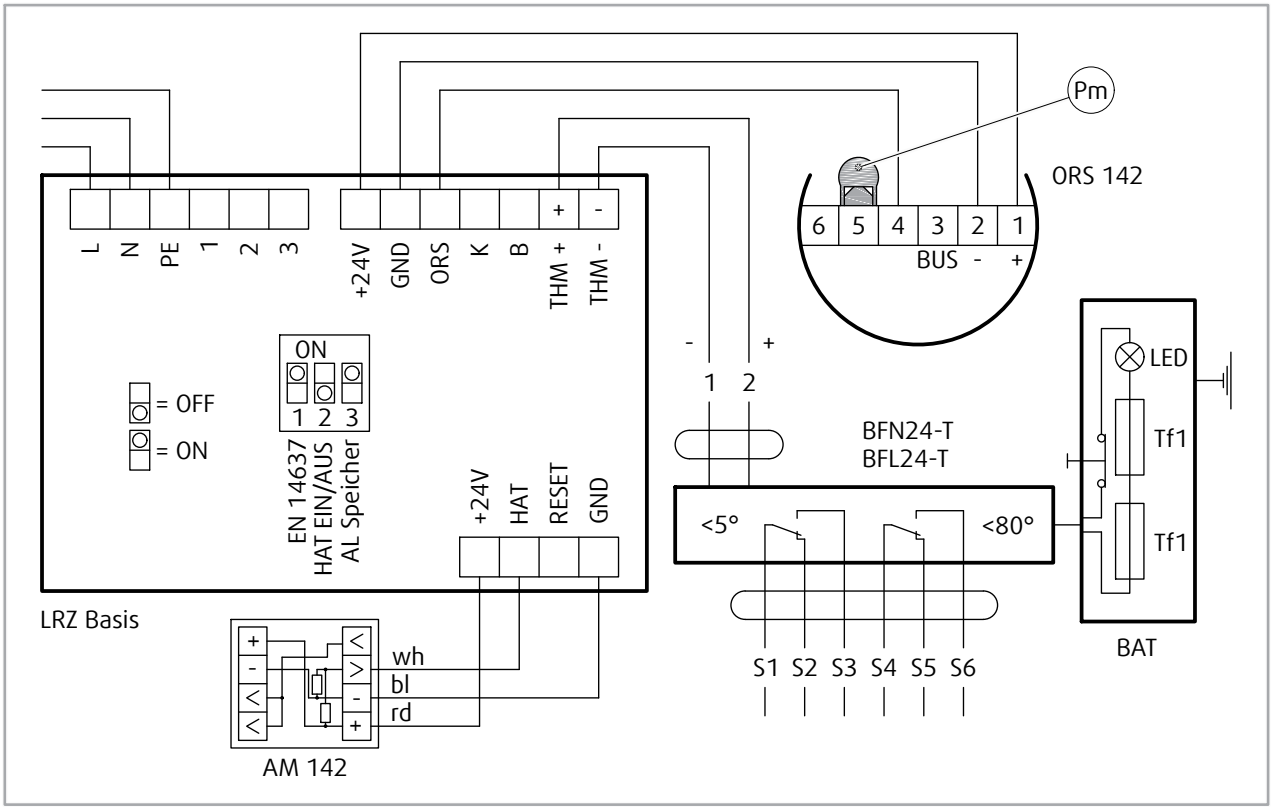
Switch off the power supply before working on any electrical equipment.

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

Power consumption must observed and cannot exceed 400 mA.

NOTES:

• Caution! Main power supply voltage!



Legend

Actuator position indication switches:

S1 Violet cable colour

S2 Red cable colour

S3 White cable colour

S4 Orange cable colour

S5 Pink cable colour

S6 Grey cable colour

LED signalization of LRZ Basis

Three LED's on LRZ Basis signal the current state

Note: Flashing sequence starts with long ON state (for 1,5 seconds) following with one short OFF state (for 0,5 seconds) or several short OFF/ON state (for 0,5 seconds)

Green LED	Orange LED	Red LED	24 V Output	Relay	State
ON	OFF	OFF	ON	ON	In operation
ON	OFF	ON	OFF	OFF	Alarm - smoke switch
ON	OFF	Flashing 1x	OFF	OFF	Alarm - internal manual release button
ON	OFF	Flashing 2x	OFF	OFF	Alarm - external manual release button
ON	ON	OFF	OFF	OFF	Fault - LRZ Basis (needs replacing)
ON	Flashing 2x	OFF	OFF	OFF	Fault - smoke switch (ORS)
ON	Flashing 3x	OFF	OFF	OFF	Fault - manual release button loop
ON	Flashing 4x	OFF	OFF	OFF	Fault - high temperature in LRZ Basis
ON	Flashing 5x	OFF	OFF	OFF	Fault - short circuit (output 24 V)
ON	Flashing 6x	Flashing 6x	OFF	OFF	Fault - membrane keyboard
ON	Flashing 9x	OFF	OFF	OFF	Fault - power output limit exceeded
ON	Flashing 10x	OFF	OFF	OFF	Fault - short circuit in LRZ Basis (input 24 V)

Type of Activation GSD230T

IMPORTANT: Danger of electric shock!

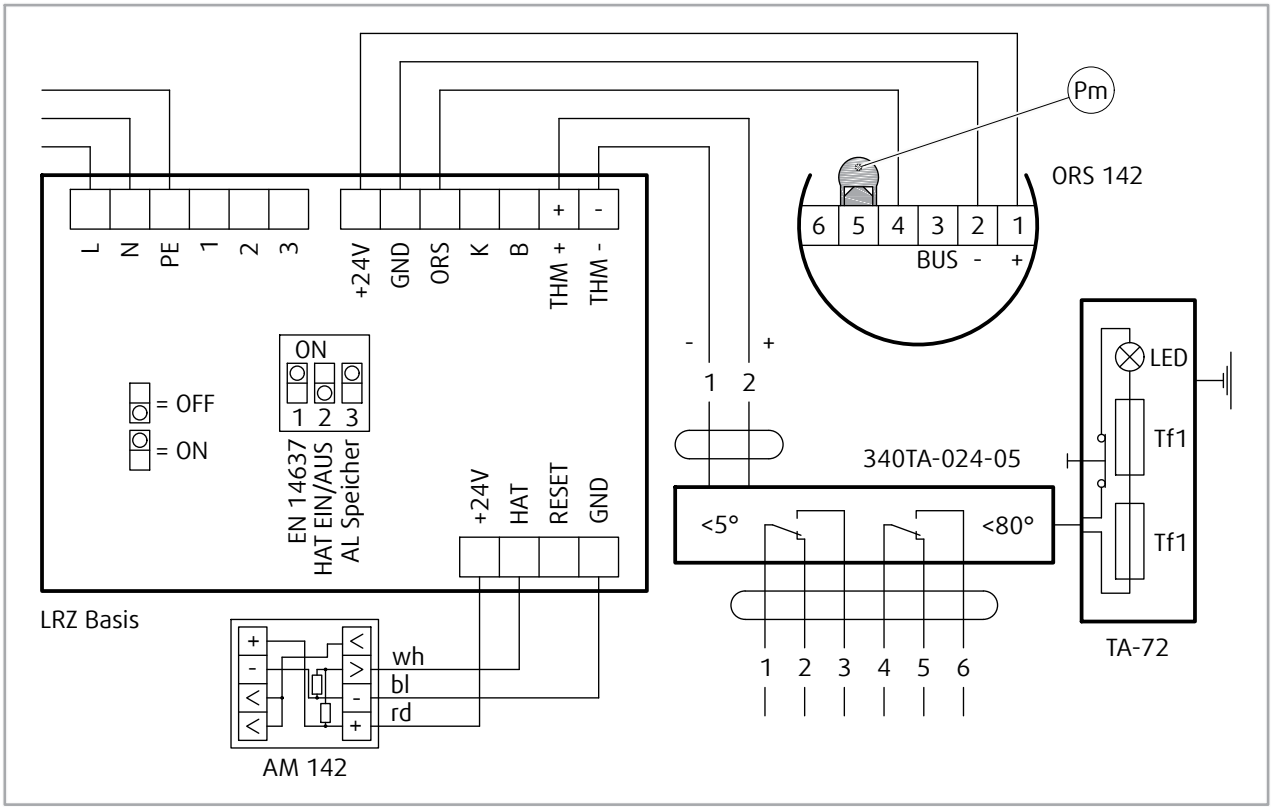
Switch off the power supply before working on any electrical equipment.

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

Power consumption must observed and cannot exceed 400 mA.

NOTES:

• Caution! Main power supply voltage!



Legend

Actuator position indication switches:

1 White

2 White

3 White

4 White

5 White

6 White

LED signalization of LRZ Basis

Three LED's on LRZ Basis signal the current state

Note: Flashing sequence starts with long ON state (for 1,5 seconds) following with one short OFF state (for 0,5 seconds) or several short OFF/ON state (for 0,5 seconds)

Green LED	Orange LED	Red LED	24 V Output	Relay	State
ON	OFF	OFF	ON	ON	In operation
ON	OFF	ON	OFF	OFF	Alarm - smoke switch
ON	OFF	Flashing 1x	OFF	OFF	Alarm - internal manual release button
ON	OFF	Flashing 2x	OFF	OFF	Alarm - external manual release button
ON	ON	OFF	OFF	OFF	Fault - LRZ Basis (needs replacing)
ON	Flashing 2x	OFF	OFF	OFF	Fault - smoke switch (ORS)
ON	Flashing 3x	OFF	OFF	OFF	Fault - manual release button loop
ON	Flashing 4x	OFF	OFF	OFF	Fault - high temperature in LRZ Basis
ON	Flashing 5x	OFF	OFF	OFF	Fault - short circuit (output 24 V)
ON	Flashing 6x	Flashing 6x	OFF	OFF	Fault - membrane keyboard
ON	Flashing 9x	OFF	OFF	OFF	Fault - power output limit exceeded
ON	Flashing 10x	OFF	OFF	OFF	Fault - short circuit in LRZ Basis (input 24 V)

Type of activation GST0

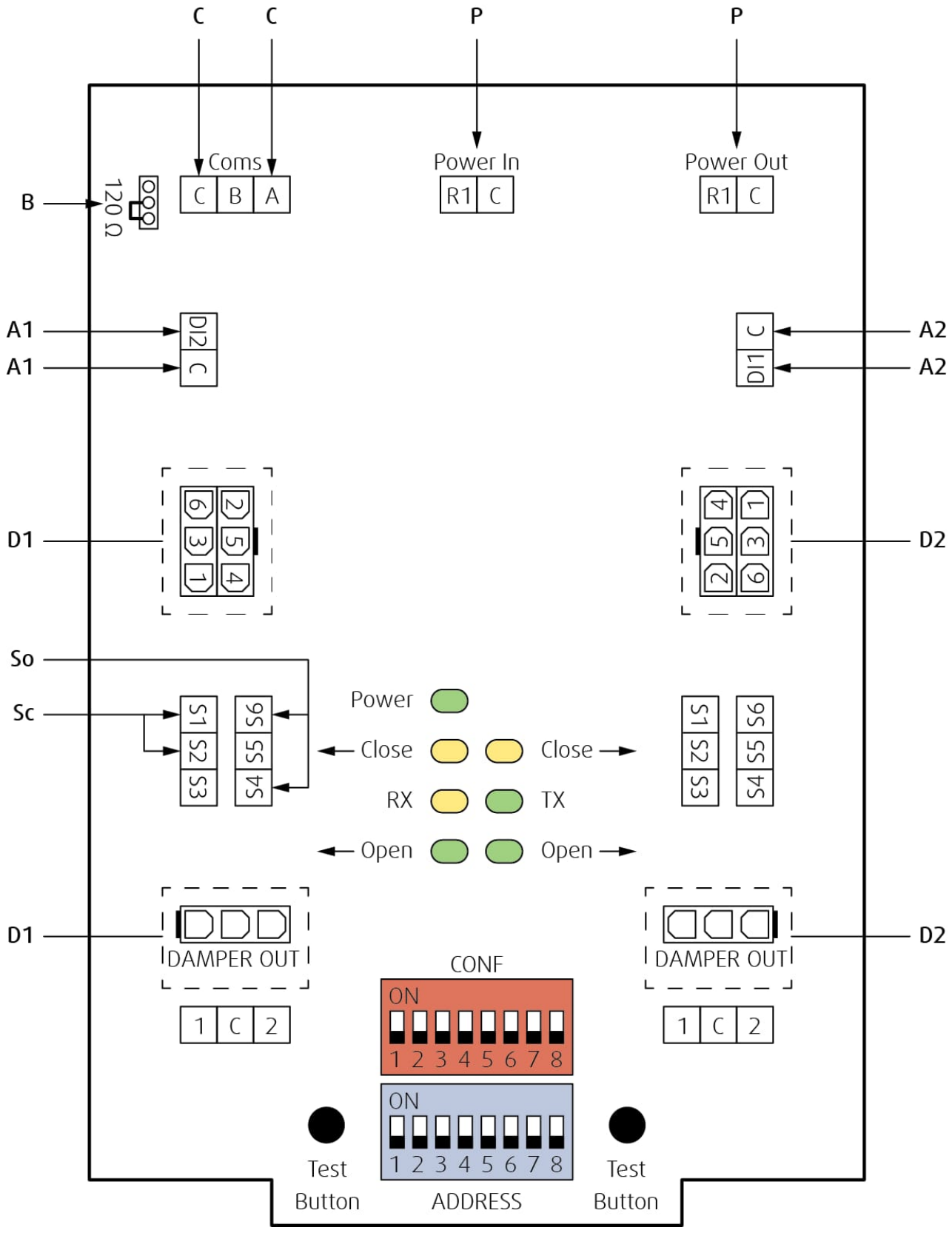
IMPORTANT: Risk of electric shock!
Switch off the power supply before working on any electrical equipment.
Only qualified electricians are allowed to work on the electrical system.
This type of activation is with a Gruner supply and communication unit fs-UFC24-2.
Actuator power supply: AC (50/60 Hz)/DC 24 V
NOTES:

- 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

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



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

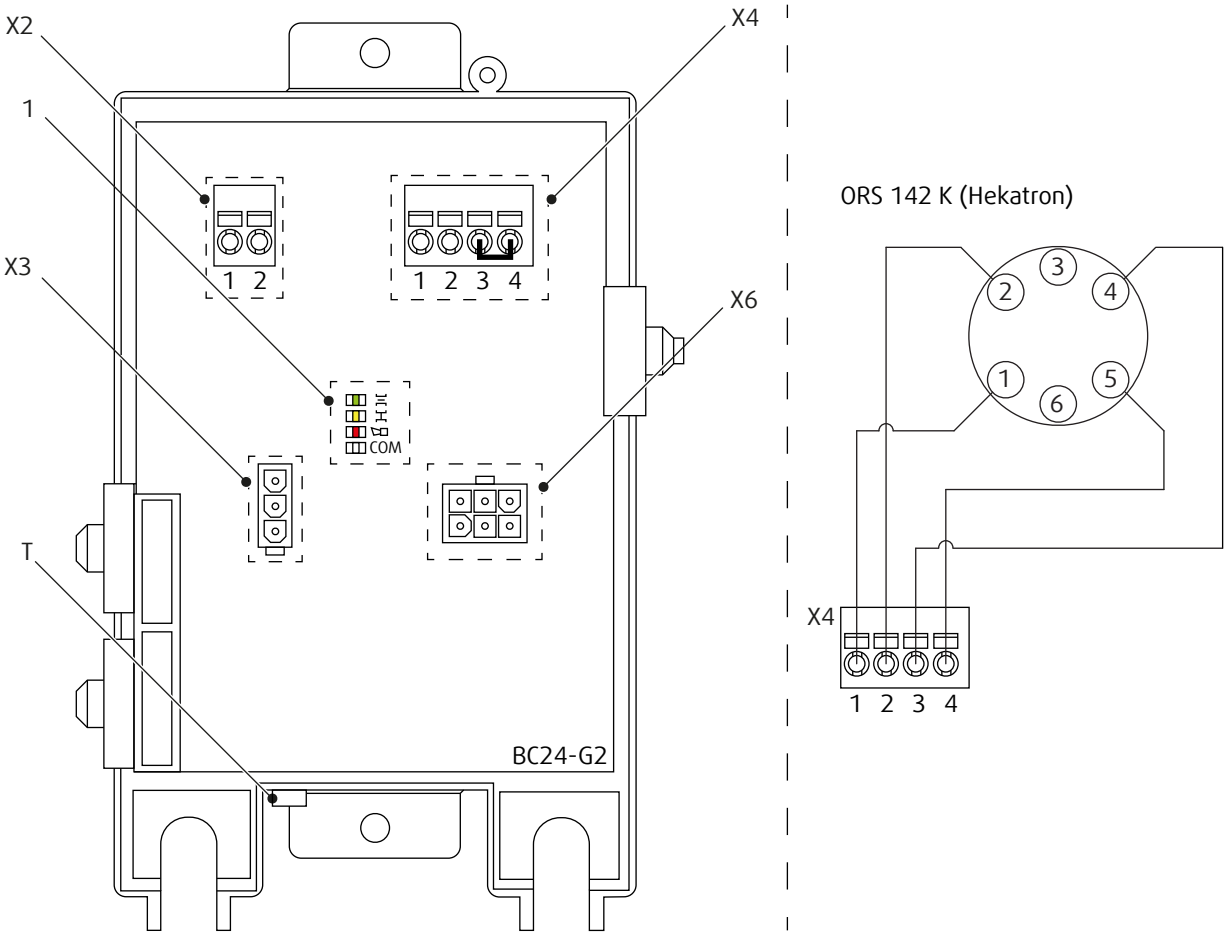
P Main power 24 V AC/DC; Daisy chain from and to other FS-UFC24-2

So Contact open

Sc Contact closed

Type of activation 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.
{product_electrical_connections}



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!

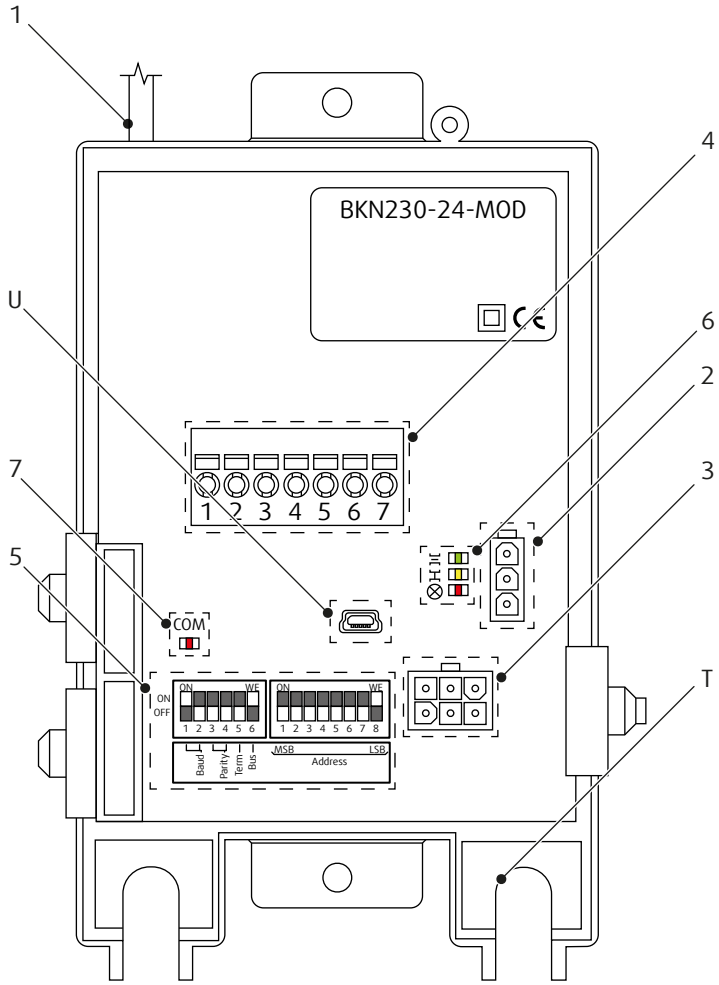
Switch off the power supply before working on any electrical equipment.

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).



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

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

{product_electrical_connections_BST2_table1}

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

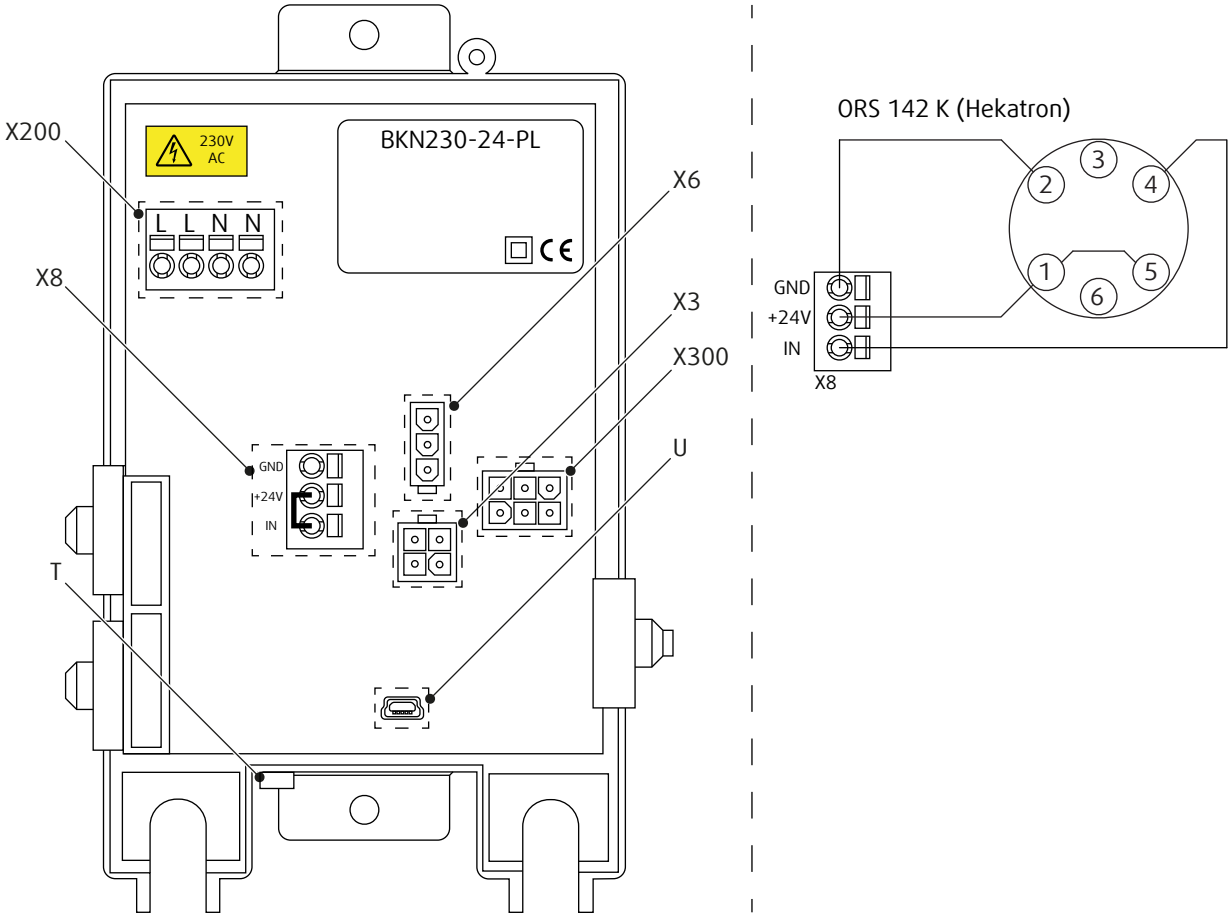
Red | Blinks | Internal device fault (BKN230-24-MOD)

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.

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).

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.

Spring return actuator activation mechanism fitted with LRZ Basis and smoke detector:

• Simulate physical smoke parameters by spraying the smoke detector with test aerosol (e.g. 918/5). The smoke detector led will signal red light. This will close the damper.
• Make sure the proper signaling is displayed from LRZ Basis (refer to LED signalization of LRZ Basis in BSD... and GSD... wiring diagram) and that the damper blade is in its closed position.

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

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.

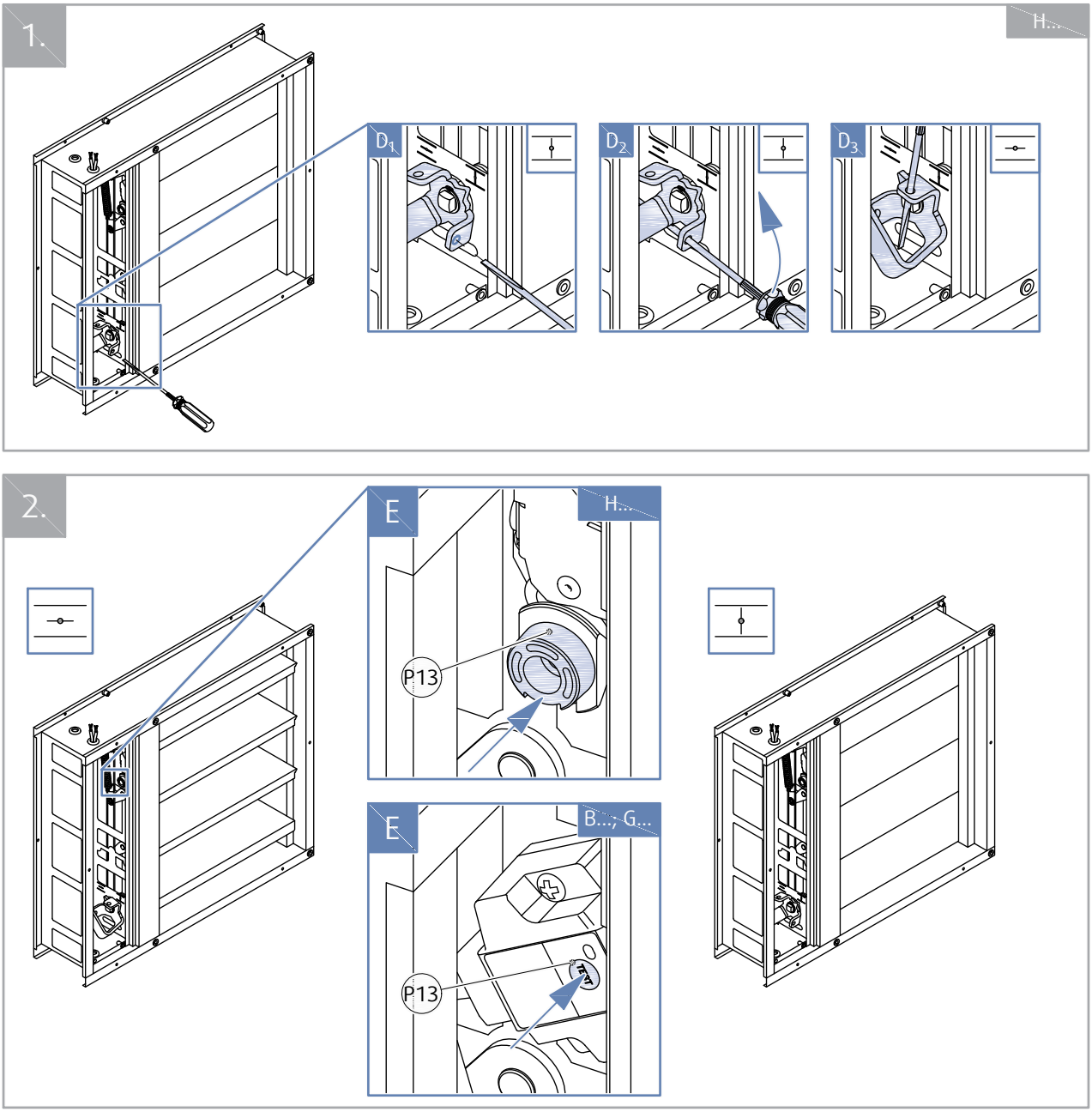
Spring return actuator activation mechanism:

• 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°.

Spring return actuator activation mechanism fitted with LRZ Basis and smoke detector:

• When the smoke detector is free of aerosol the led on the smoke detector will signal green light.
• Press "Reset" button on the LRZ Basis to put the damper into operation.
• 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 tvelwe-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.

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