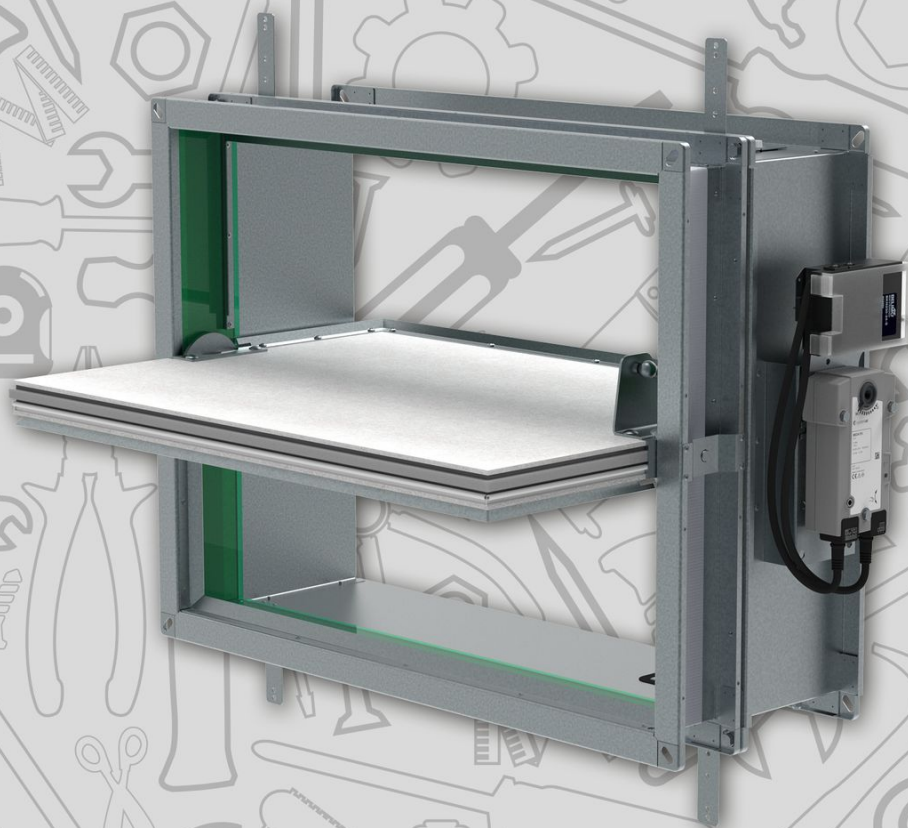


# S-SA2

## Smoke Control Damper - AAmulti

Handbook



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## Description

S-SA2 smoke control dampers operate with mechanical or natural smoke and heat extraction systems. They remove poisonous gases, smoke and fire and can also supply clean air to fire compartments.

S-SA2 dampers have an actuator without a spring. Thus, they have two safety positions: an "open" position and a "closed" position. Power is necessary for the smoke control dampers.

The "Installation Methods" section shows the types of installations that are permitted.

### Special Properties

- The pressure level is 3 (-1500 Pa ... 500 Pa).
- The blade leakage class 3 (compliant with EN 1751).
- The casing leakage class C (compliant with EN 1751).
- The S-SA2 dampers classified "multi" can also operate in compartments that are identified as "single".
- AA – automatic activation (sets the safety position within 60 seconds). No thermal insulation around the actuator needed.

### Fire Resistivity

S-SA2 smoke control dampers have a CE certification that meets the EU's Construction Products Regulation and complies with standard EN 12101-8:2011, EN 1366-10:2011, A1:2017, and EN 1366-2:2015 are the reference standards for the tests. EN 13501-4:2016 is the reference standard for product Classification. The smoke control damper and its installation counts as one unit for fire resistivity rating:

- Damper installed within a wall or ceiling using "Wet" installation:

EI 120 ( $v_{ew}$  -  $h_{ow}$  -  $i \leftrightarrow o$ ) S1500C<sub>mod</sub> AA<sub>multi</sub>

- Damper installed within a wall up to size W=1000 & H=800 using "Soft" installation:

EI 90 ( $v_{ew}$  -  $i \leftrightarrow o$ ) S1500C<sub>mod</sub> AA<sub>multi</sub>

### Types of Activation

- **B230** - Smoke control damper with an activation mechanism with a Belimo actuator (230V AC) and auxiliary switches
- **G230** - Smoke control damper with an activation mechanism with a Gruner actuator (230V AC) and auxiliary switches
- **B24** - Smoke control damper with an activation mechanism with a Belimo actuator (24V AC/DC) and auxiliary switches

- **G24** - Smoke control damper with an activation mechanism with a Gruner actuator (24V AC/DC) and auxiliary switches
- **B24-W** - Smoke control damper with an activation mechanism with a Belimo actuator (24V AC/DC) and auxiliary switches, with provided cable connectors for the supply and communication unit (communication unit not part of the mechanism)
- **G24-W** - Smoke control damper with an activation mechanism with a Gruner actuator (24V AC/DC) and auxiliary switches, with provided cable connectors for the supply and communication unit (communication unit not part of the mechanism)
- **B24-SR** - Smoke control damper with an activation mechanism with a modulating Belimo actuator (24V AC/DC; 0(2) V...10 V DC) and auxiliary switches. Modulating actuators have the possibility to open the blade at a desired angle
- **BST0** - Smoke control damper with an activation mechanism with a Belimo actuator (AC/DC 24 V) with a supply and communication unit (AC 230 V) BKNE230-24 (2-wire to BKSE...)
- **GST0** - Smoke control damper with an activation mechanism with a Gruner actuator (AC/DC 24 V) with a supply and communication unit (AC 24 V) FS-UFC24-2 (Modbus/BACnet)
- **BST1** - Smoke control damper with an activation mechanism with a Belimo actuator (AC/DC 24 V) with a supply and communication unit (SLC powered) BC24-G2 (THC)
- **BST10** - Smoke control damper with an activation mechanism with a Belimo actuator (AC/DC 24 V) with a supply and communication unit (AC 230 V) BKNE230-24-PL (Powerline)

### Accessories

Detailed information about accessories is available in [design.systemair.com](https://design.systemair.com)

- D1-S-SA2: Duct Extension with Mesh for S-SA2.
- LEAS: Damper Extension for Thick-wall Installations.

## Design

The casing of the S-SA2 is made of a galvanized sheet metal. Blades are made from calcium silicate boards. A foam seal, silicone rubber gasket with an intumescent seal prevent leaks of heat or smoke. The casing has flanges on two sides with holes for screws to attach to sheet-metal duct flanges. The damper casing has inspection openings. The mechanisms actuator of the S-SA2 is accesible from the outside.

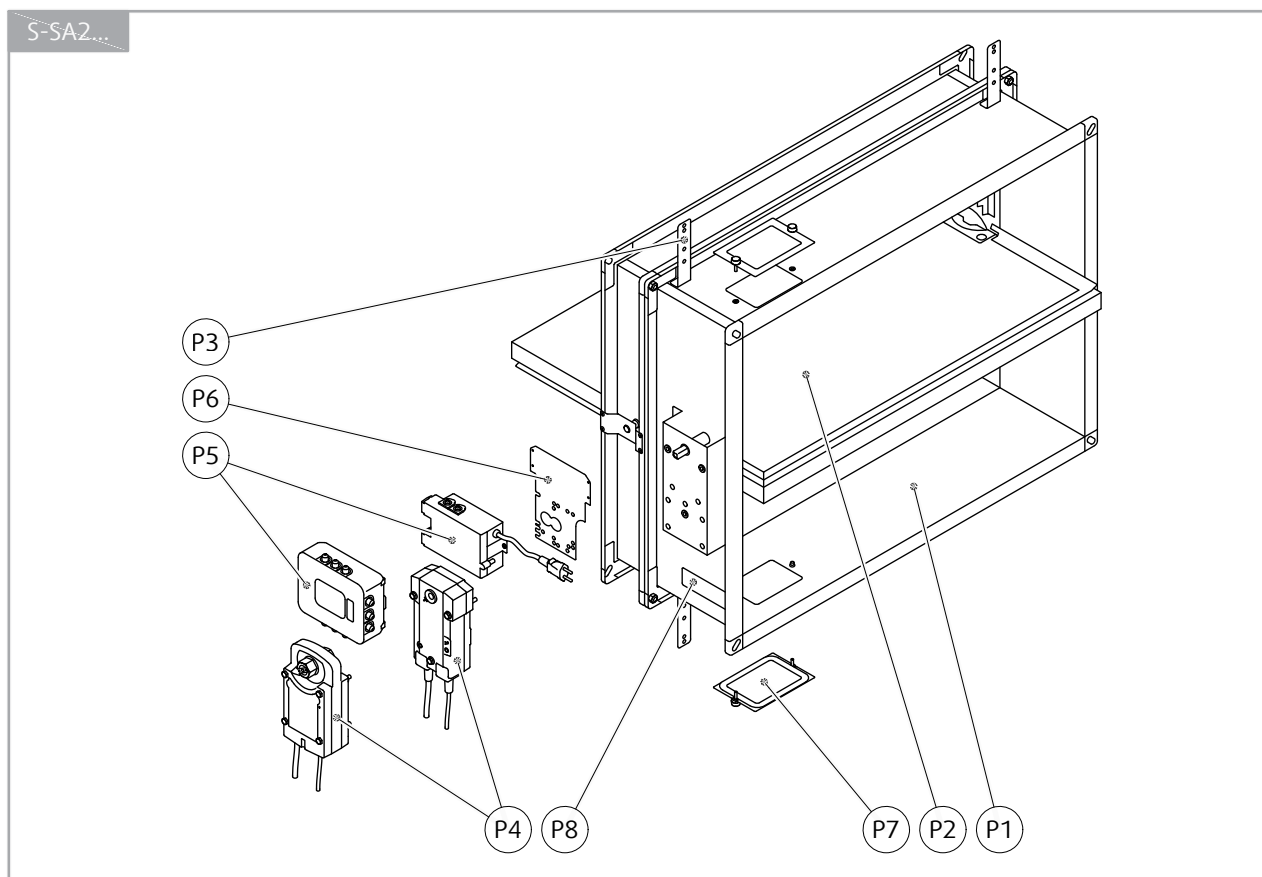
### Composition of materials

The product contains these materials:

- Galvanized sheet metal
- Calcium silicate board
- Fireproof carbon fiberglass
- Polyurethane foam
- Intumescent strips
- Bound silicone in extruded gasket
- Ethylene-propylene rubber
- PE tapes and foil
- Galvanized steel fasteners
- Acrylic sealant

The manufacturing processes of these materials agree with local regulations. The product does not contain dangerous materials. No silicone caulks are used in the manufacturing processes.

## Product Parts



## Legend

**P1** - Damper casing

**P2** - Damper blade

**P3** - Bendable hanger

**P4** - Actuator

**P5** - Supply and communication unit (only for BST0, GST0, BST1, BST10 activation type)

**P6** - Holder for communication unit (without unit installed only for B24-W activation type)

**P7** - Inspection lid

**P8** - Product label

# Technical Parameters

## Durability Test

- Test procedure with 10000 cycles and actuator control (rotation from 0° to 90°)
- Test procedure with 10000 cycles and actuator control for "mod" classification (rotation from 30° to 60°)
- No change of the necessary properties.
- No change of the necessary properties.

## Tested Pressures

Maximum underpressure	1500 Pa
Maximum overpressure	500 Pa

**Safe Position** Open or closed

**Possible Installations** Refer to the "Installation" 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: <60 s / 90°

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

## Environmental Conditions for Operation

The temperatures must be:	-20 °C ... 50 °C
Relative humidity:	Less than 95% (3K21, 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

Through opening of inspection lid.

**Maintenance** Maintenance is not necessary. A dry-cleaning procedure can be mandatory in some countries or when needed.

## Inspections

Obey local laws for the minimum time between inspection procedures. When not specified the maximum interval between inspections is 6 months

**Tightness of the Blade** Class 3 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 BEN..., BEE..., BE..., (BLE...)	...230; ...24; ...24-ST; ...24-SR
Gruner 342-..., 362-...	...230-15, -20, -40...; ...024-15, -20, -40...; ...024-15-ST01, -20-ST01, -40-ST01...

**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 smoke control damper must be indoors.

# Assessed Performance

15 CE 1396

## Systemair Production a.s.

Hlavná 371, 900 43 Kalinkovo, Slovakia

1396-CPR-0112

S-SA2

### EN 12101-8 : 2011

Smoke control damper

#### Nominal Activation Conditions/Sensitivity

Pass

#### Response Delay (Response Time)

Opening/closure time proven. Duration: &lt;60 s / 90°

#### Operational Reliability

C<sub>mod</sub>: 20.000 cycles (modulated)

#### Fire Resistance:

Wet installation: EI 120 (v<sub>ew</sub> - h<sub>ow</sub> - i↔o) S1500C<sub>mod</sub>  
AAmulti

Soft installation: EI 90 (v<sub>ew</sub> - i↔o) S1000C<sub>mod</sub> AAmulti

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

AA - Automatic Activation. Opening/closure time proven.  
Duration: <60 s / 90°

#### Durability of Operational Reliability

C<sub>mod</sub>: 20.000 cycles. Cycle duration: <120 s

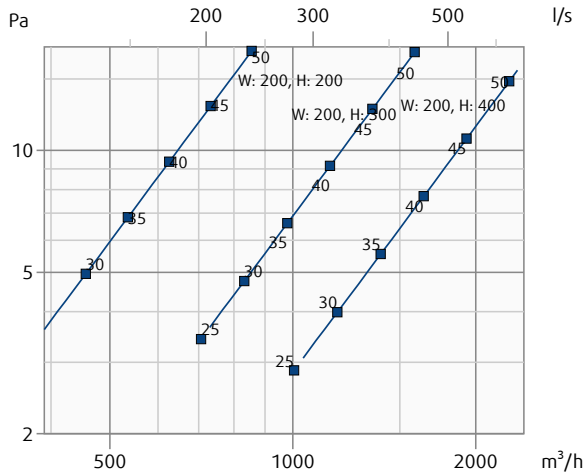
# Diagrams

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

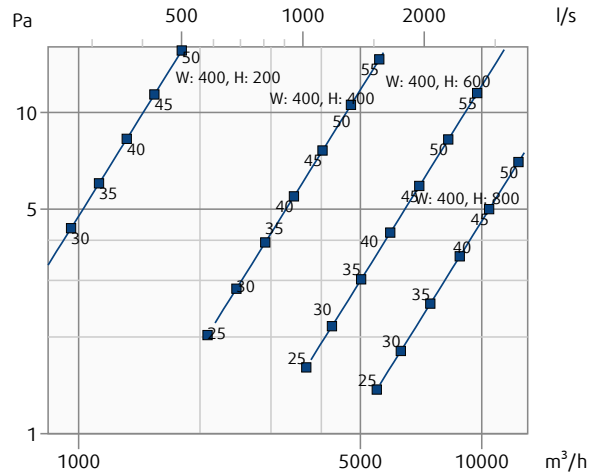
S-SA2-...-

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



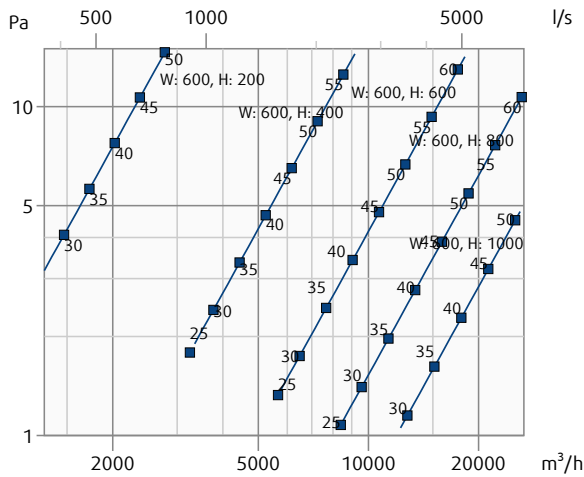
S-SA2-...-

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



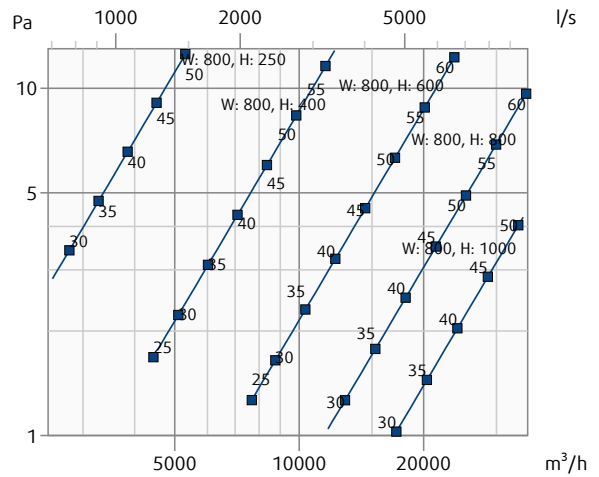
S-SA2-...-

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



S-SA2-...-

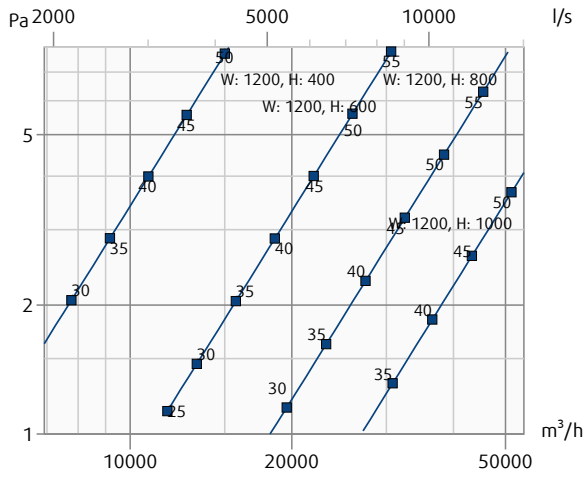
Pressure drop & A-weighted sound power level in dB(A)





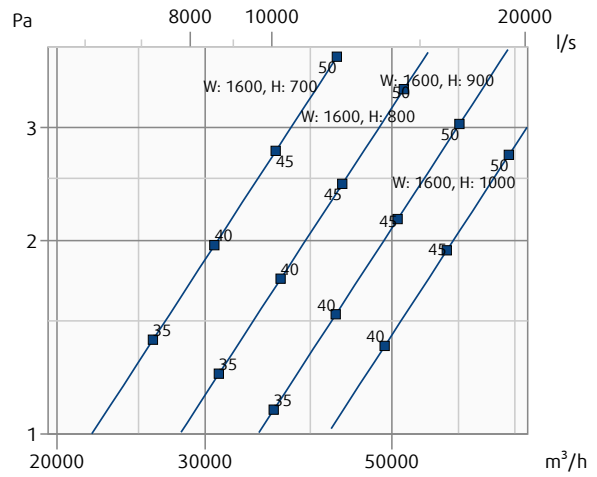
S-SA2-...-

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



S-SA2-...-

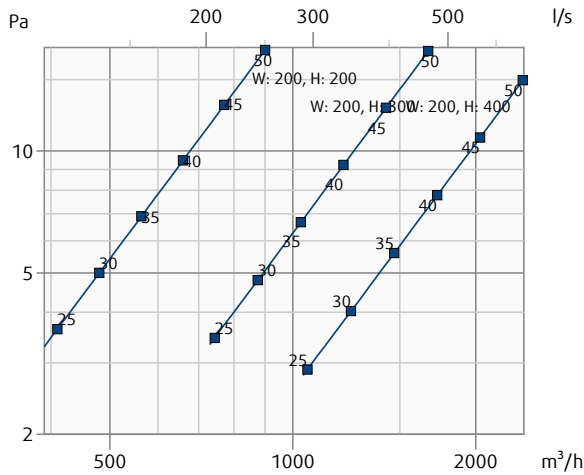
Pressure drop & A-weighted sound power level in dB(A)



Diagrams for Supply Air

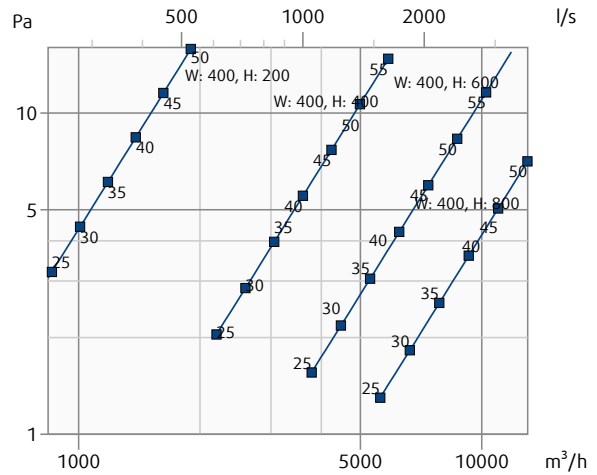
S-SA2-...-

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



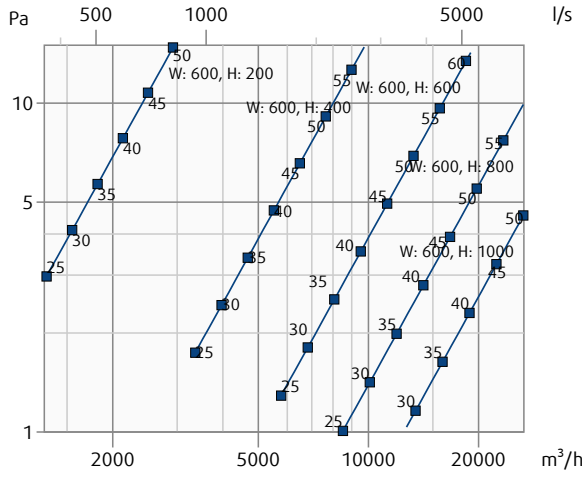
S-SA2-...-

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



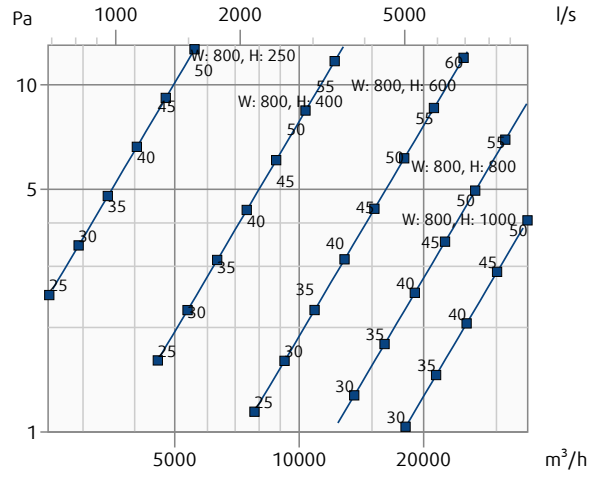
S-SA2-...-

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



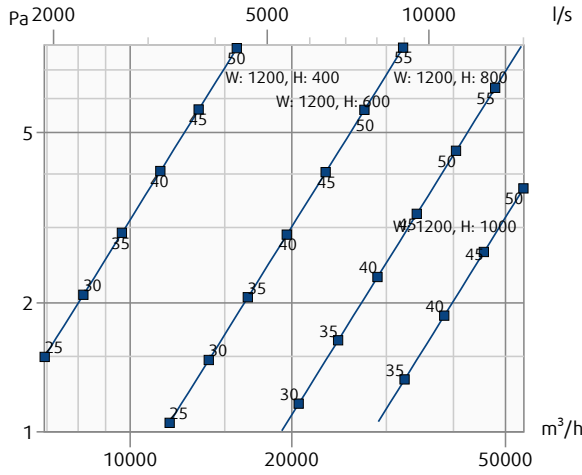
S-SA2-...-

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



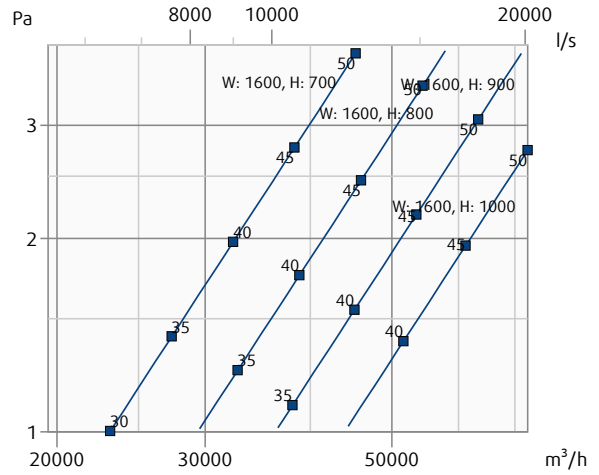
S-SA2-...-

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



S-SA2-...-

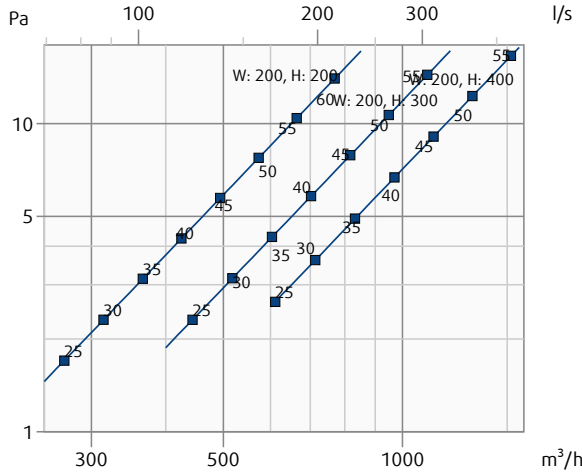
Pressure drop & A-weighted sound power level in dB(A)



Diagrams for Extract Air With D1-S-SA2 Accessory

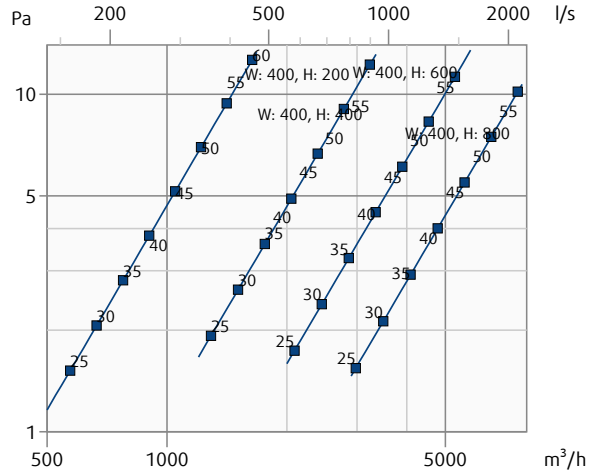
S-SA2-...-

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



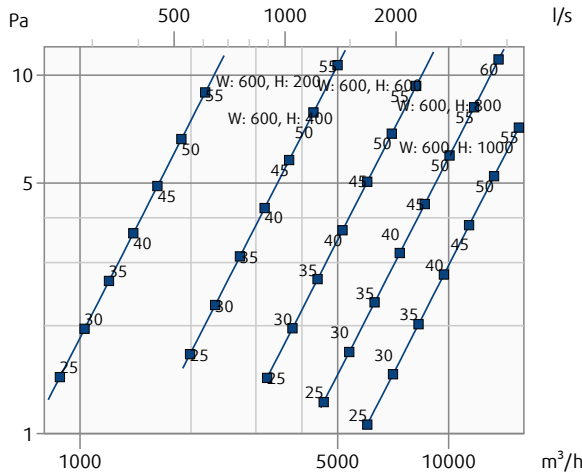
S-SA2-...-

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



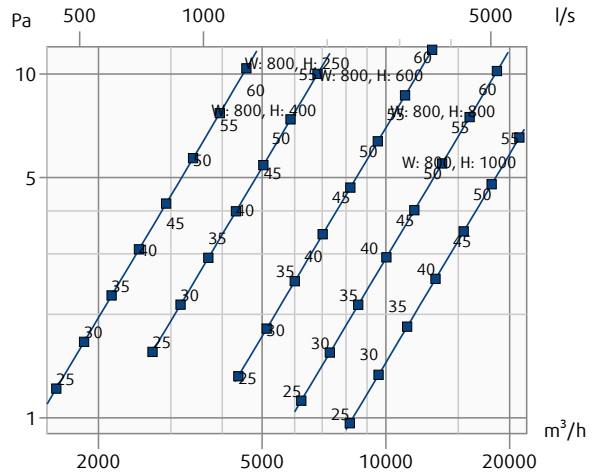
S-SA2-...-

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



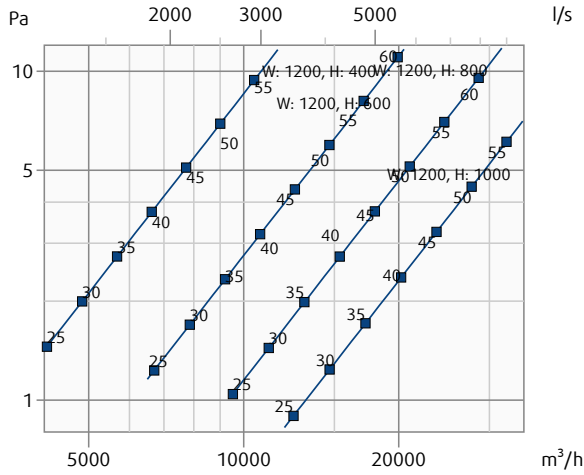
S-SA2-...-

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



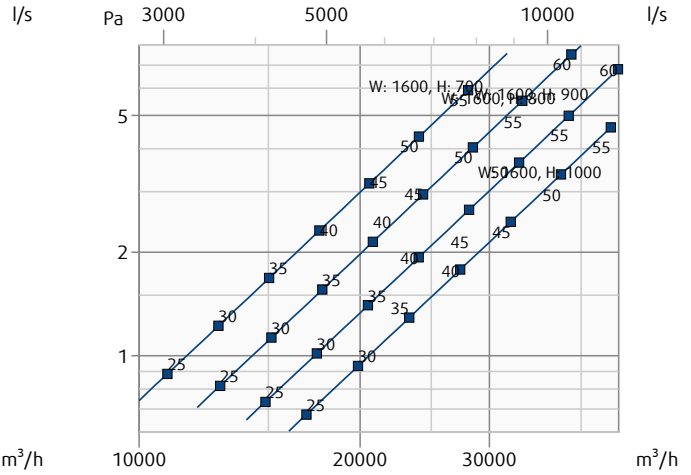
S-SA2-...-

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



S-SA2-...-

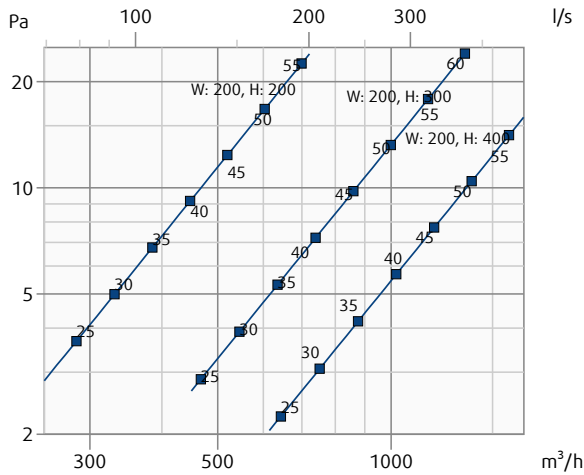
Pressure drop & A-weighted sound power level in dB(A)



Diagrams for Supply Air With D1-S-SA2 Accessory

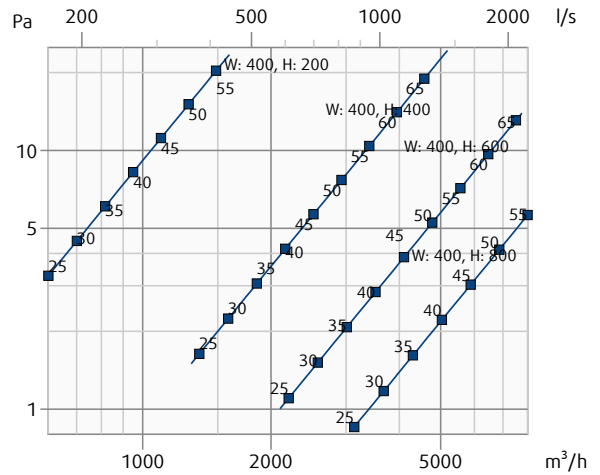
S-SA2-...-

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



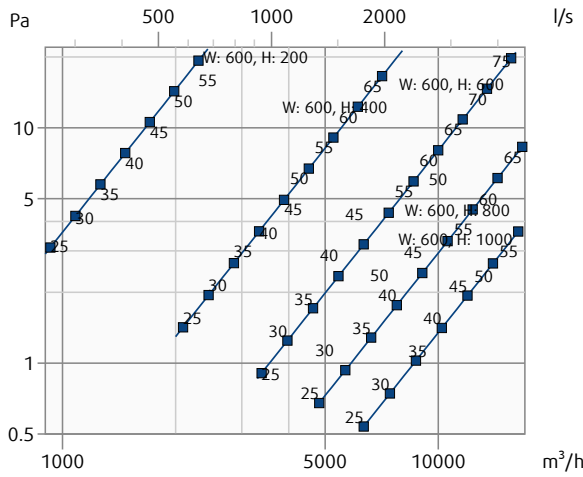
S-SA2-...-

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



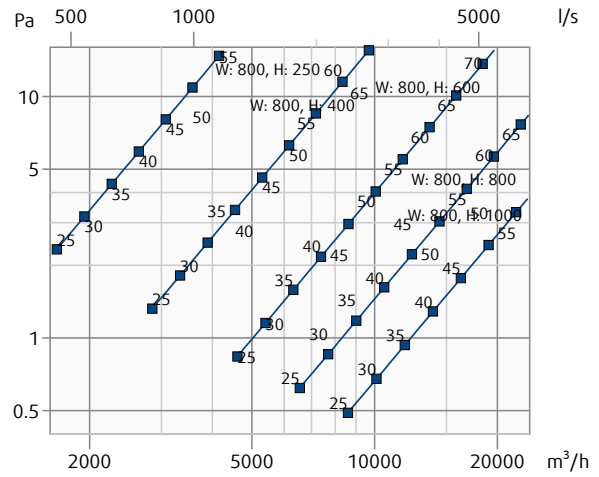
S-SA2-...-

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



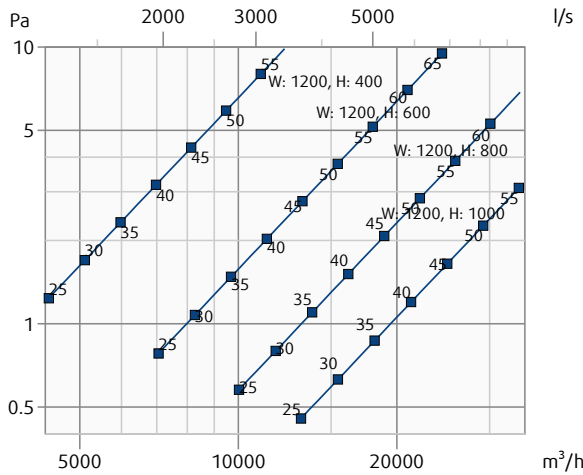
S-SA2-...-

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



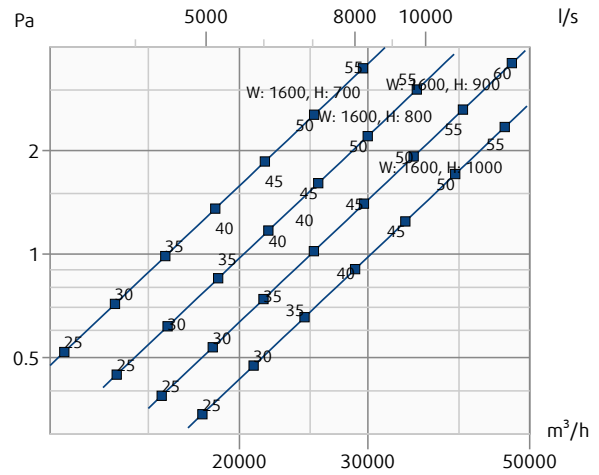
S-SA2-...-

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



S-SA2-...-

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



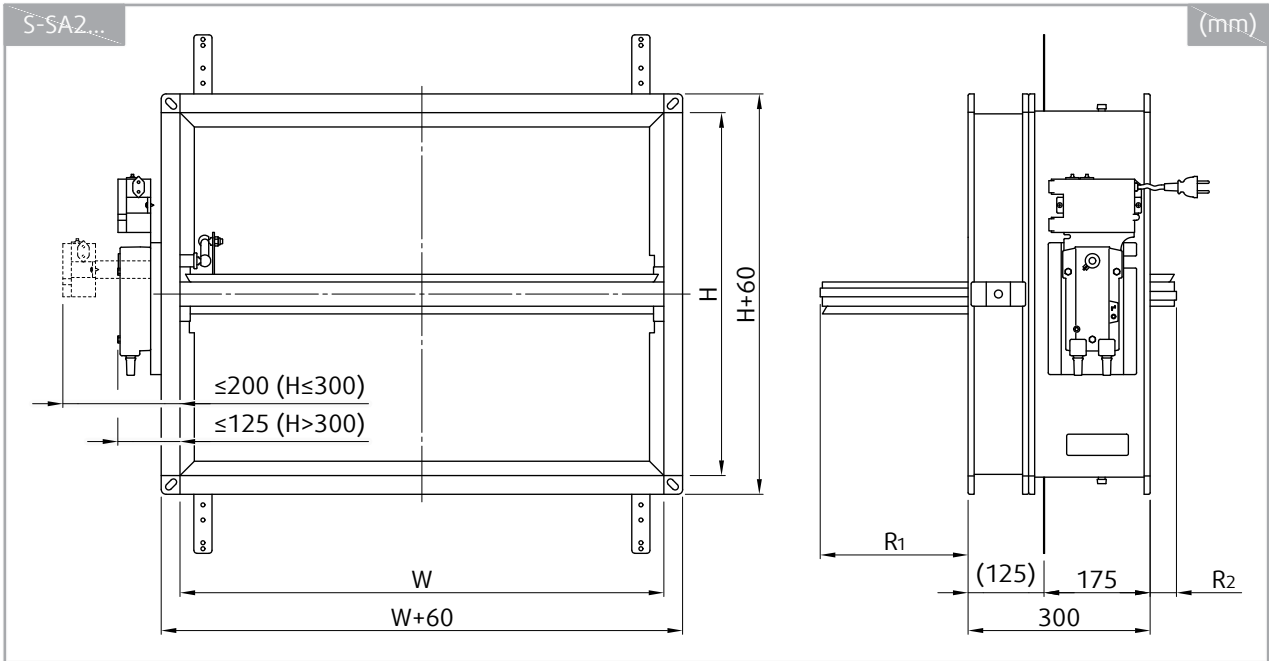
Legend:

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

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

# Dimensions & Weights

## Dimensions



H (mm)	200	250	300	350	400	450	500	600	700	800	900	1000
$R_1$	45	70	95	120	145	170	195	245	295	345	395	445
$R_2$	-155	-130	-105	-80	-55	-30	-5	45	95	145	195	245

## Free Area

$A_v$ (m <sup>2</sup> )	W (mm)																		
	200	250	300	350	400	450	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	
H (mm)	200	0,025	0,031	0,037	0,044	0,050	0,057	0,063	0,076	0,089	-	-	-	-	-	-	-	-	-
	250	0,034	0,043	0,052	0,061	0,070	0,079	0,088	0,106	0,124	0,141	-	-	-	-	-	-	-	-
	300	0,044	0,055	0,066	0,078	0,089	0,101	0,112	0,135	0,158	0,181	0,204	-	-	-	-	-	-	-
	350	0,053	0,067	0,081	0,095	0,109	0,123	0,137	0,165	0,193	0,220	0,248	0,276	-	-	-	-	-	-
	400	0,063	0,079	0,095	0,112	0,128	0,145	0,161	0,194	0,227	0,260	0,293	0,326	0,359	0,392	-	-	-	-
	450	-	0,091	0,110	0,129	0,148	0,167	0,186	0,224	0,262	0,299	0,337	0,375	0,413	0,451	0,489	-	-	-
	500	-	0,103	0,124	0,146	0,167	0,189	0,210	0,253	0,296	0,339	0,382	0,425	0,468	0,511	0,553	0,596	-	-
	600	-	-	0,153	0,180	0,206	0,233	0,259	0,312	0,365	0,418	0,471	0,524	0,577	0,630	0,682	0,735	0,788	-
	700	-	-	-	0,214	0,245	0,277	0,308	0,371	0,434	0,497	0,560	0,623	0,686	0,749	0,811	0,874	0,937	1,000
	800	-	-	-	-	0,284	0,321	0,357	0,430	0,503	0,576	0,649	0,722	0,795	0,868	0,940	1,013	1,086	1,159
900	-	-	-	-	-	0,365	0,406	0,489	0,572	0,655	0,738	0,821	0,904	0,987	1,069	1,152	1,235	1,318	
1000	-	-	-	-	-	-	0,455	0,548	0,641	0,734	0,827	0,920	1,013	1,106	1,198	1,291	1,384	1,477	

## Weights

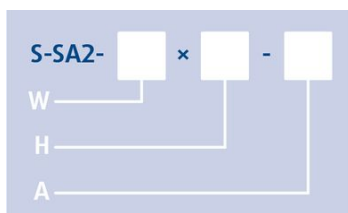
m (kg)	W (mm)																		
	200	250	300	350	400	450	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	
H (mm)	200	9,3	10,2	11,0	11,9	12,7	13,7	14,5	16,3	18,0	-	-	-	-	-	-	-	-	
	250	10,2	11,1	12,1	13,0	14,0	15,0	16,0	17,9	19,8	21,7	-	-	-	-	-	-	-	
	300	11,0	12,1	13,2	14,2	15,3	16,4	17,4	19,5	21,6	23,7	25,8	-	-	-	-	-	-	
	350	12,2	13,3	14,5	15,6	16,8	18,0	19,1	21,4	23,7	26,0	28,3	31,5	-	-	-	-	-	
	400	13,1	14,3	15,6	16,8	18,0	19,4	20,6	23,1	25,6	28,1	30,8	33,2	35,7	38,3	-	-	-	
	450	-	15,3	16,7	18,0	19,3	20,8	22,1	24,8	27,7	30,3	33,0	36,4	38,4	41,1	43,8	-	-	
	500	-	16,3	17,8	19,2	20,6	22,1	23,8	26,6	29,5	32,4	35,2	38,1	41,0	43,9	46,8	52,7	-	
	600	-	-	19,9	21,5	23,4	25,1	26,7	29,9	33,2	36,4	39,7	42,9	46,2	49,4	52,7	57,8	60,6	
	700	-	-	-	24,1	25,9	27,8	29,6	33,2	36,8	40,5	44,1	47,7	51,3	56,3	60,0	64,1	67,3	71,0
	800	-	-	-	-	28,4	30,5	32,5	36,5	40,5	44,5	48,6	52,6	57,9	61,9	66,0	70,5	74,0	78,0
	900	-	-	-	-	-	33,2	35,4	39,7	44,1	48,5	53,0	58,7	63,1	67,5	71,9	76,8	80,7	85,1
	1000	-	-	-	-	-	-	38,2	43,0	47,8	52,5	58,7	63,4	68,2	73,0	77,8	83,2	87,4	92,2

BST.../GST...	m +0,7 kg
---------------	-----------

## NOTE:

For activation types BST.../GST... add communication unit weight of 0,7 kg to the weight of S-SA2 (see table).

# Ordering Codes



## W - Width Dimension

200 mm, 250 mm, 300 mm, 350 mm, 400 mm, 450 mm, 500 mm, 600 mm, 700 mm, 800 mm, 900 mm, 1000 mm, 1100 mm, 1200 mm, 1300 mm, 1400 mm, 1500 mm, 1600 mm

## H - Height Dimensions

200 mm, 250 mm, 300 mm, 350 mm, 400 mm, 450 mm, 500 mm, 600 mm, 700 mm, 800 mm, 900 mm, 1000 mm

## A - Type of Activation

**B230** - 230 V AC Belimo actuator

**G230** - 230 V AC/DC Gruner Actuator

**B24** - 24 V AC/DC Belimo actuator

**G24** - 24 V AC/DC Gruner Actuator

**B24-W** - 24 V AC/DC Belimo actuator & wire connector for supply and communication unit

**G24-W** - 24 V AC/DC Gruner actuator & wire connector for supply and communication unit

**B24-SR** - 24 V AC/DC Belimo actuator, modulated (0) 2 V ... 10 V

**BST0** - 230 V AC supply and communication unit BKNE230-24 (2-wire to BKSE...) & 24 V AC/DC Belimo actuator

**GST0** - 24 V AC supply and communication unit FS-UFC24-2 (Modbus/BACnet) & 24 V AC/DC Belimo actuator

**BST1** - SLC powered supply and communication unit BC24-G2 (THC) & 24 V AC/DC Belimo actuator

**BST10** - 230 V AC supply and communication unit BKNE230-24-PL (Powerline) & 24 V AC/DC Belimo actuator

## Example of the Ordering Code

S-SA2-800×450-B24-SR

Smoke control damper with width of 800 mm and height of 450 mm, without a grille. Activated by a 24 V modulated Belimo actuator (0) 2 V ... 10 V.



# 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 S-SA2 is made of boards and sheet metal. Thus considered fragile. Be careful when you move the smoke control damper. Two persons are necessary to move the 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

### 2. Functionality check:

- Perform damper's functionality check (see "Operation Manual" section).

### 3. Placing the damper:

- Prepare the opening and/or duct connection surfaces as per the desired installation type.
- Place a support in the opening or create the support from the filling per chosen installation.
- Carefully lift the smoke control damper with the forklift, crane or manually.
- Place the damper in the opening and on duct connection surfaces (when already available).

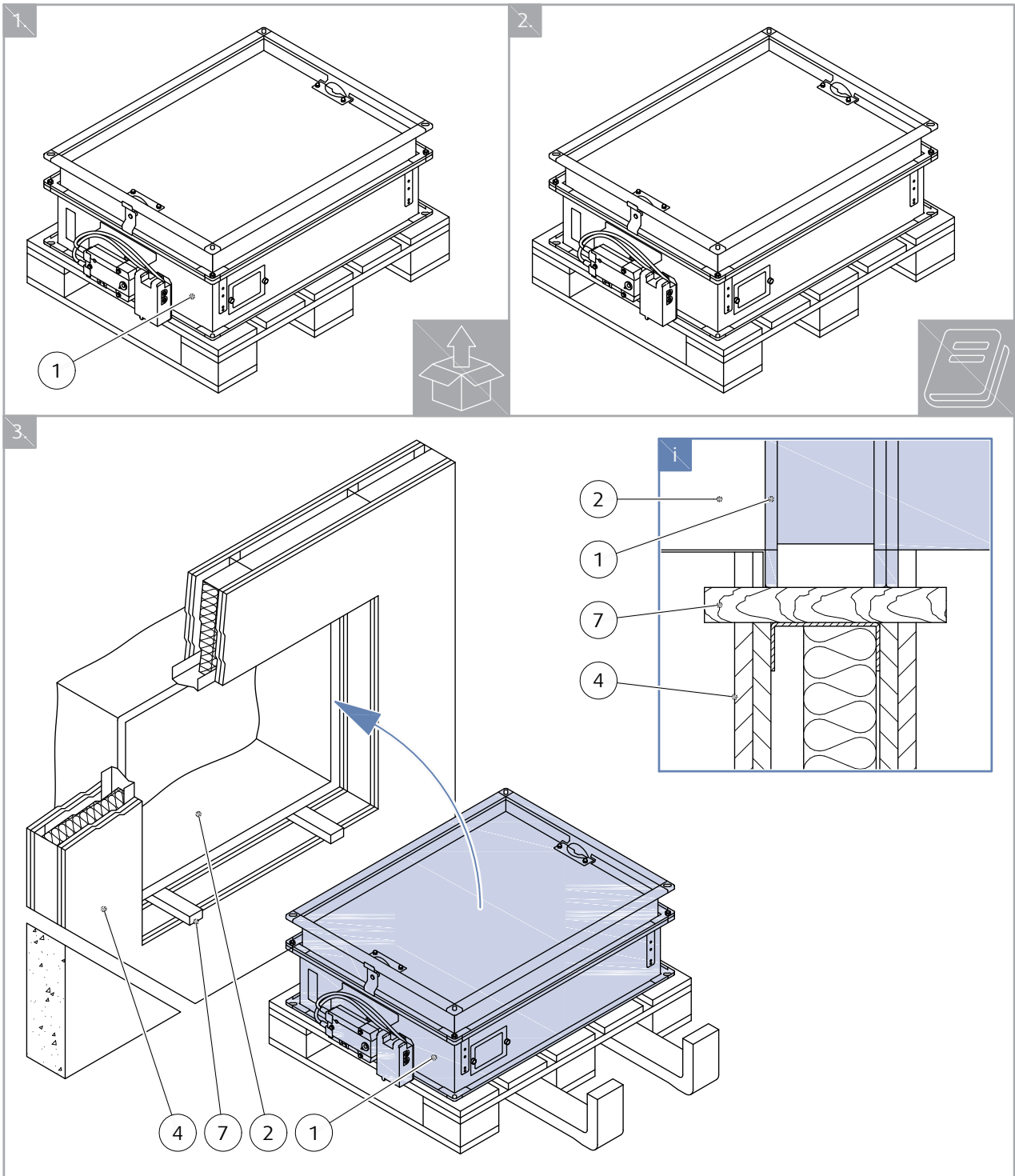
### 4. Fixing the damper:

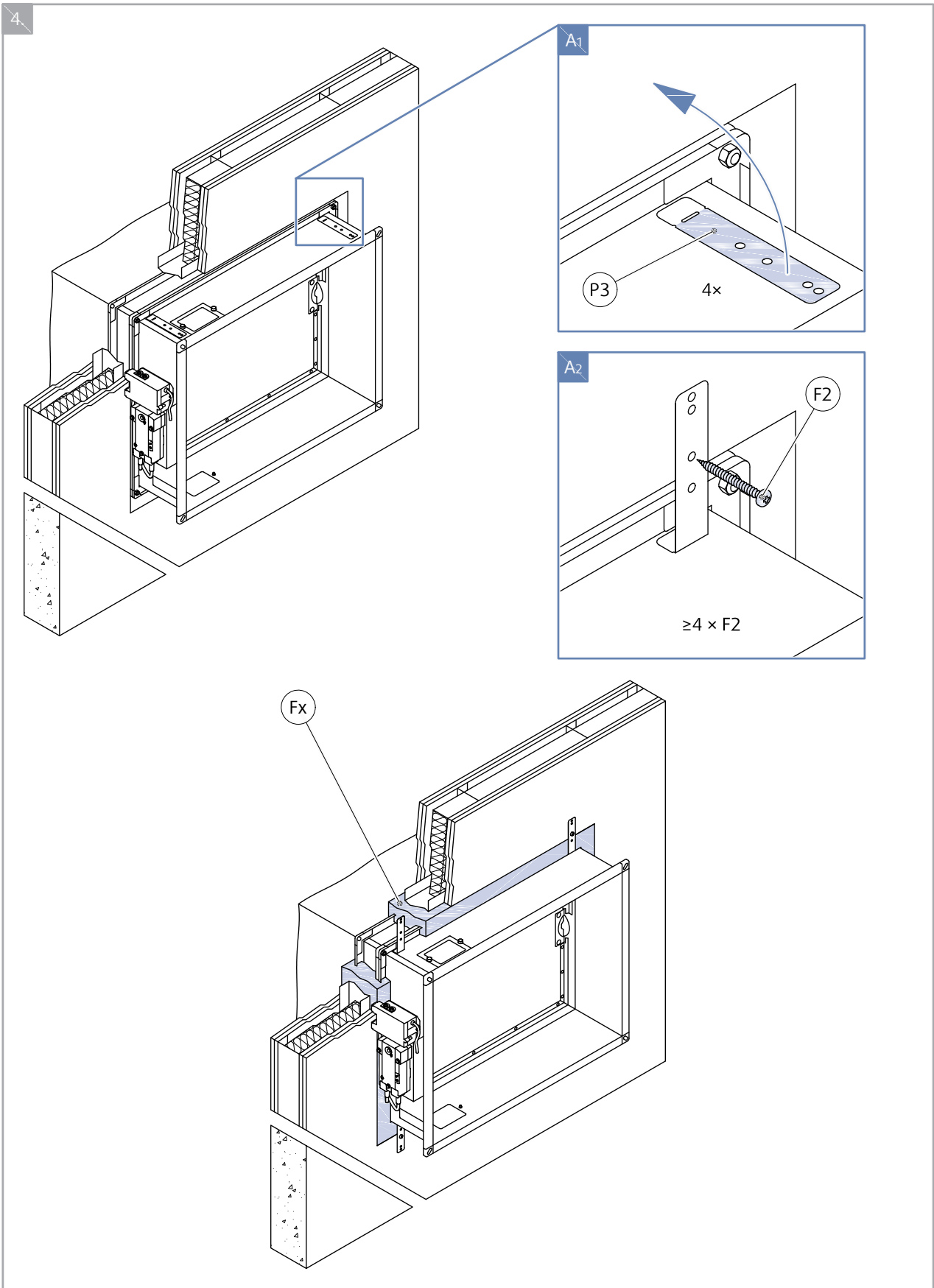
NOTE: Make sure to continually check the alignment of the damper against the supporting construction, opening or against the duct connection when performing the next steps.

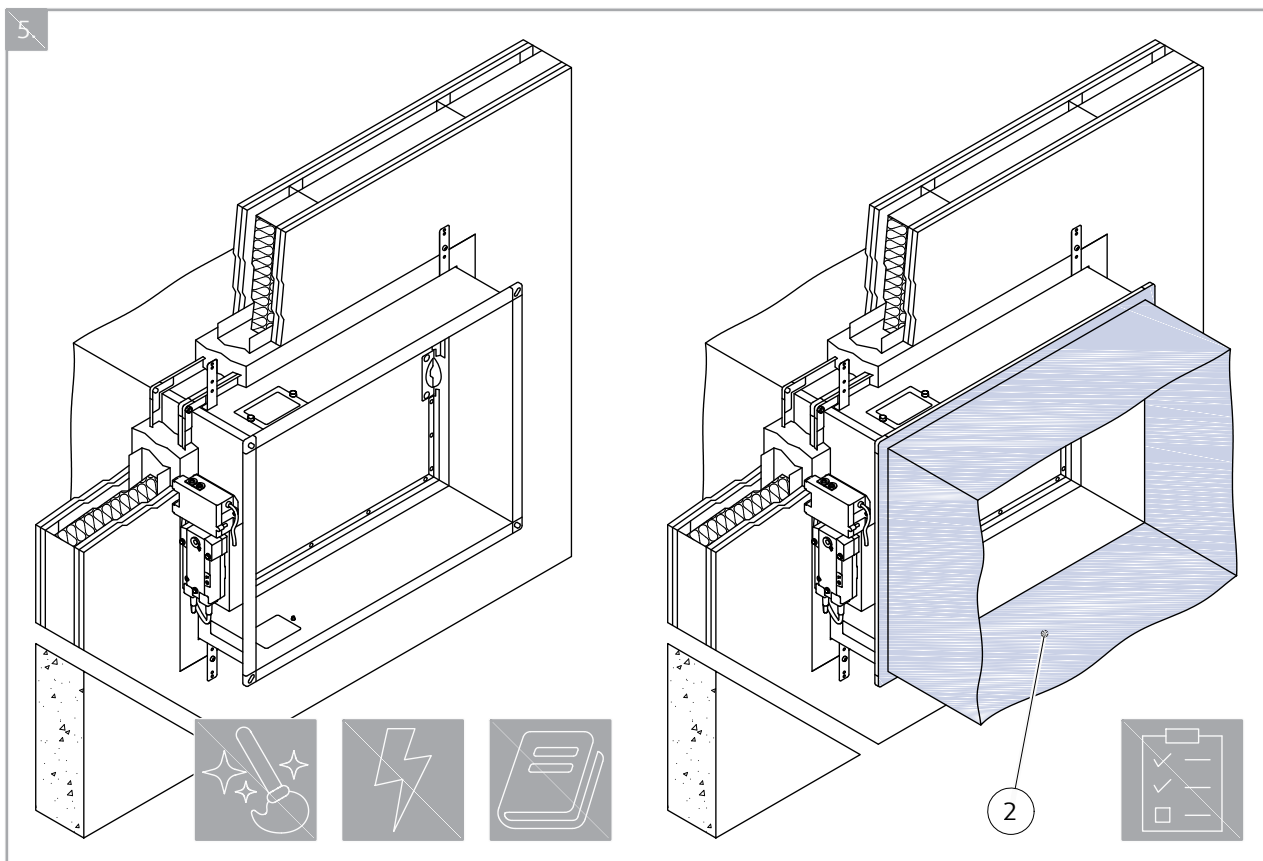
- Bend-out the bendable hangers.
- Fix the damper with supporting construction using suitable screws through the bendable hangers. When the connecting duct is in place, also fix the damper using duct flange connections.
- Verify there is no skewing of the damper body by measuring diagonal dimensions 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.

### 5. Finishing:

- Clean the damper from the debris and excess material from the filling or insulation.
- Connect the dampers actuator as per activation type wiring diagram in the "electrical connection" section.
- Perform damper's functionality check (see "Operation Manual" section).
- Connect the continuous duct and/or mount a grille.
- Create and/or fill out the Operating Journal included with the smoke control damper (Operating Journal can be also downloaded at [design.systemair.com](http://design.systemair.com))







#### Legend for Product Handling

**1** - Smoke control damper S-SA2

**2** - Connected ductwork tested according to EN 1366-9

**4** - Supporting construction

**7** - Support/brick, metal stud or wood stud (not part of damper)

**F2** - Screw with minimum dimensions of 5,5 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)

**Fx** - Filling as per chosen installation

**P3** - Bendable hanger

# Installation Methods

## Warning


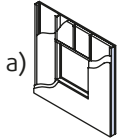
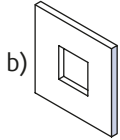

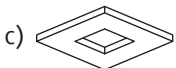

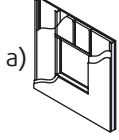
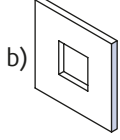

- Obey the applicable regulations and standards of the country that this product will be installed in.
- Make sure that only approved personnel performs the installation.
- Obey the written instructions and the illustrations in selected installation method.

## Installation Rules

- The duct connected to the smoke control 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 smoke control damper bodies must be 200 mm (refer to Standard EN 1366-2).
- The minimum distance between the smoke control damper and the adjacent wall or ceiling must be 75 mm.
- If you install the S-SA2 in a smoke and 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 smoke control 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 accessories, 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.

 <b>1 Wet</b> 1A 1B 1C	S-SA2 200 × 200 ... ... 1600 × 1000	EI 120 ( $v_{ew}$ i ↔ o) S1500 $C_{MOD}$ AAmulti	a)  $\geq 150$ mm	b)  $\geq 150$ mm	
		EI 120 ( $h_{ow}$ i ↔ o) S1500 $C_{MOD}$ AAmulti	c)  $\geq 125$ mm $\geq 620$ kg/m <sup>3</sup>		
 <b>3 Soft</b> 3A 3B 3C	S-SA2 200 × 200 ... ... 1000 × 800	EI 90 ( $v_{ew}$ i ↔ o) S1500 $C_{MOD}$ AAmulti	a)  $\geq 150$ mm	b)  $\geq 150$ mm	

**NOTES:**

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

**1A, 1B, 1C** - Wet installation, using plaster/mortar/concrete filling and damper connected to duct made of boards

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

**3A, 3B, 3C** - Soft Installation, using mineral wool filing and damper connected to duct made of boards

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

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

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

$v_{ew}$  - Wall placement, vertically oriented damper

$h_{ow}$  - Floor/ceiling placement, horizontally oriented damper

# Installation 1. Wet

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

1. Prepare the opening in the supporting construction:

**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  $W_1$  and  $H_1$ .

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 when in closed position 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 from 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.


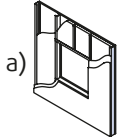
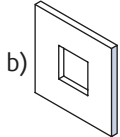
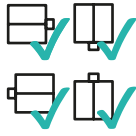
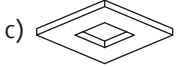
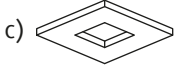
**NOTE:** Before you do the next steps, make sure that the plaster, mortar, or concrete filling becomes hard.

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.

 S-SA2 200 × 200 ... ... 1600 × 1000 1 Wet 1A 1B 1C	EI 120 ( $v_{ew}$ i ↔ o) S1500 C <sub>MOD</sub> AAmulti	 a)	 b)	
	EI 120 ( $h_{ow}$ i ↔ o) S1500 C <sub>MOD</sub> AAmulti	 c)	$\geq 150$ mm	$\geq 150$ mm
		 c)		
		$\geq 125$ mm $\geq 620$ kg/m <sup>3</sup>		

## NOTES:

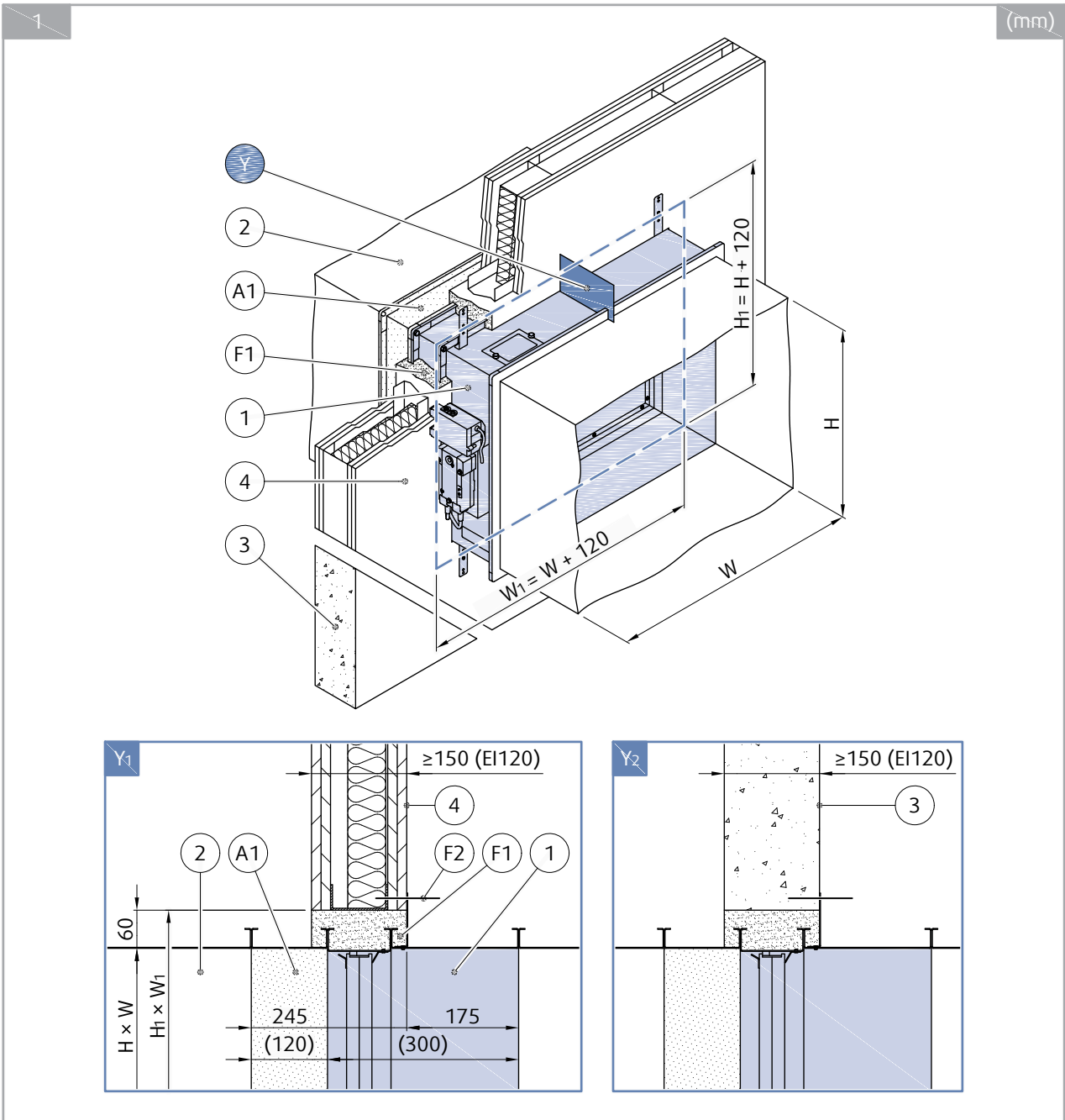
**1 Wet** - Wet installation, using plaster/mortar/concrete Filling

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

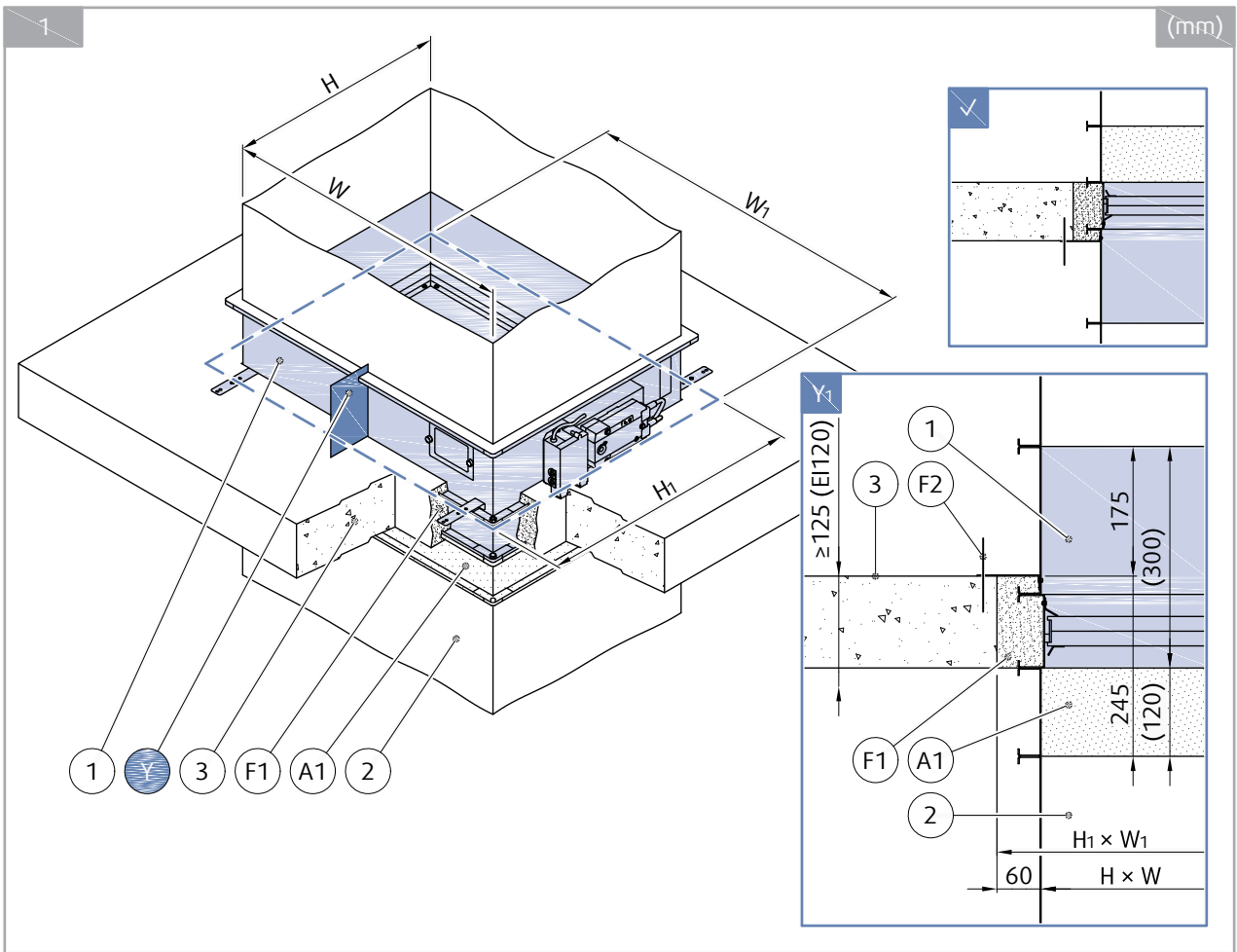
**b)** - Concrete/masonry/cellular concrete (rigid) wall/ceiling

$v_{ew}$  - Wall placement, vertically oriented damper

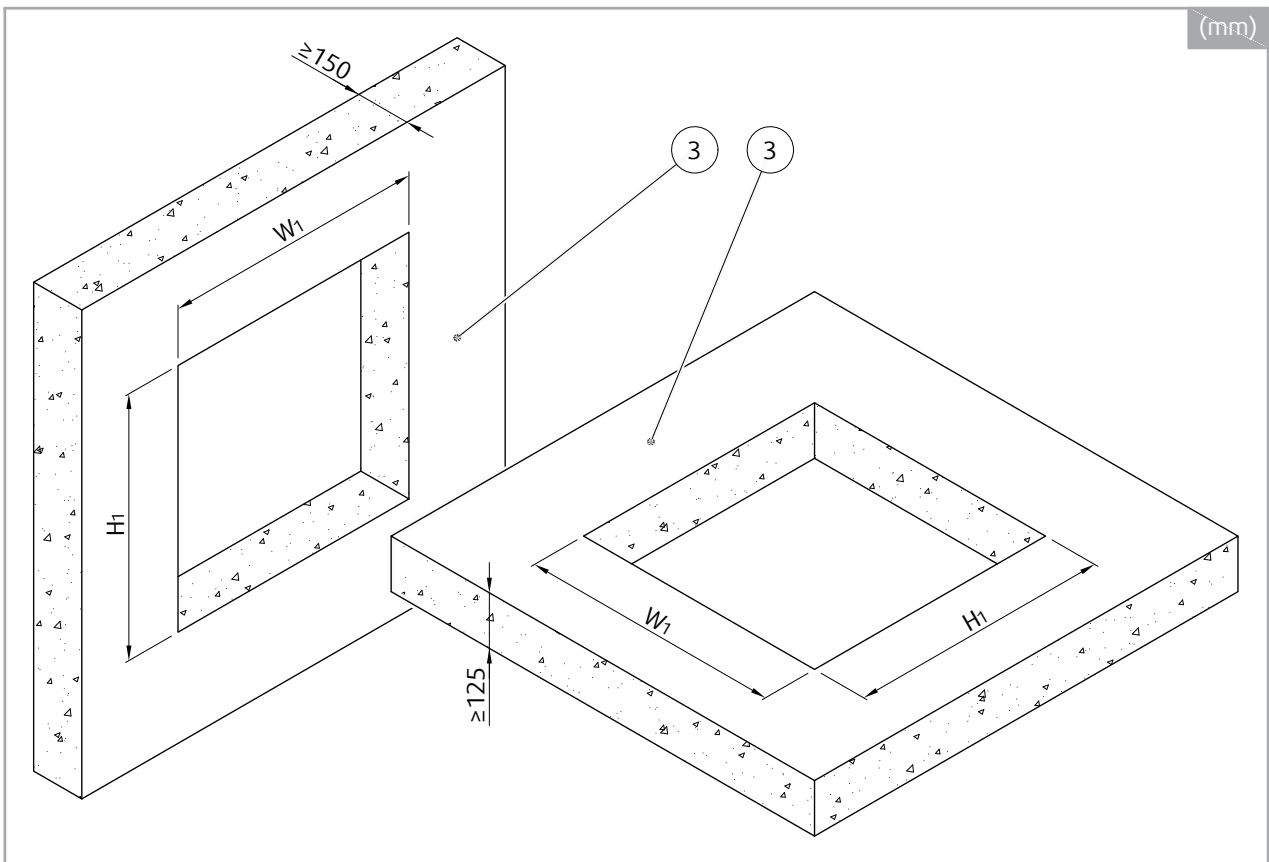
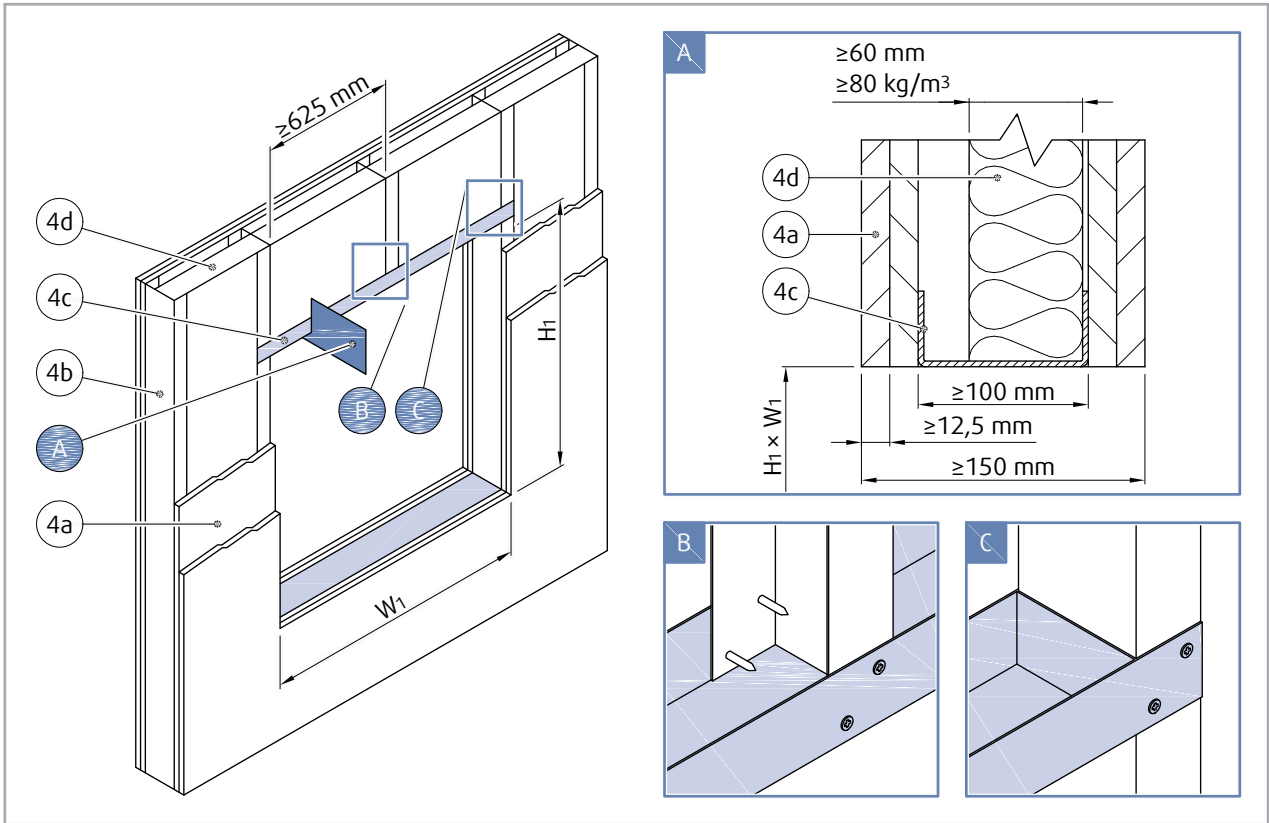
$h_{ow}$  - Wall placement, horizontally oriented damper



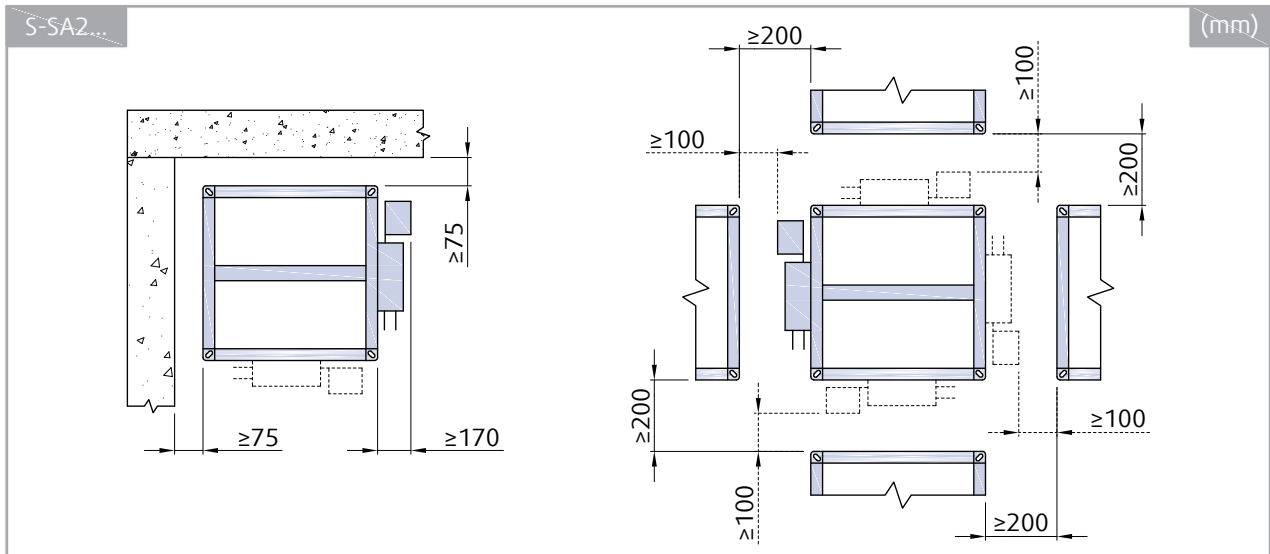




Opening and Wall/Ceiling Preparation



## Damper Minimum Distances



### Legend for Installation 1. Wet

- 1** - Smoke control damper S-SA2
- 2** - Connected ductwork tested according to EN 1366-9
- 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
- A1** - Accessory LEAS (can be replaced by ductwork tested according to EN 1366-9)
- F1** - Gypsum plaster; Mortar; Concrete filling - minimal category M2.5, EN 998-2
- F2** - Screw with minimum dimensions of 5,5 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

# Connecting S-SA2 Damper to Ductwork Made of Boards

The S-SA2 smoke damper can be connected to “multi” classified ductwork made of calcium silicate boards tested according to EN 1366-8. If mounted on a duct classified with lower fire resistivity, the fire resistivity of the S-SA2 smoke control damper will be decreased to the duct level. This section does not depict duct hanger rules as those are dependent on the weight of the duct itself and must be statically approved.

## Procedure for Board Duct Connection Using 1. Wet Installation

**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.

1. Perform installation of S-SA2 damper into the wall following "1.WET" installation instructions.

**CAUTION:** Obey the procedure of duct manufacturer's original “Installation manual” for connecting duct to the supporting construction.

2. Clean the surfaces of the wall or ceiling. Make sure that the surfaces are even.

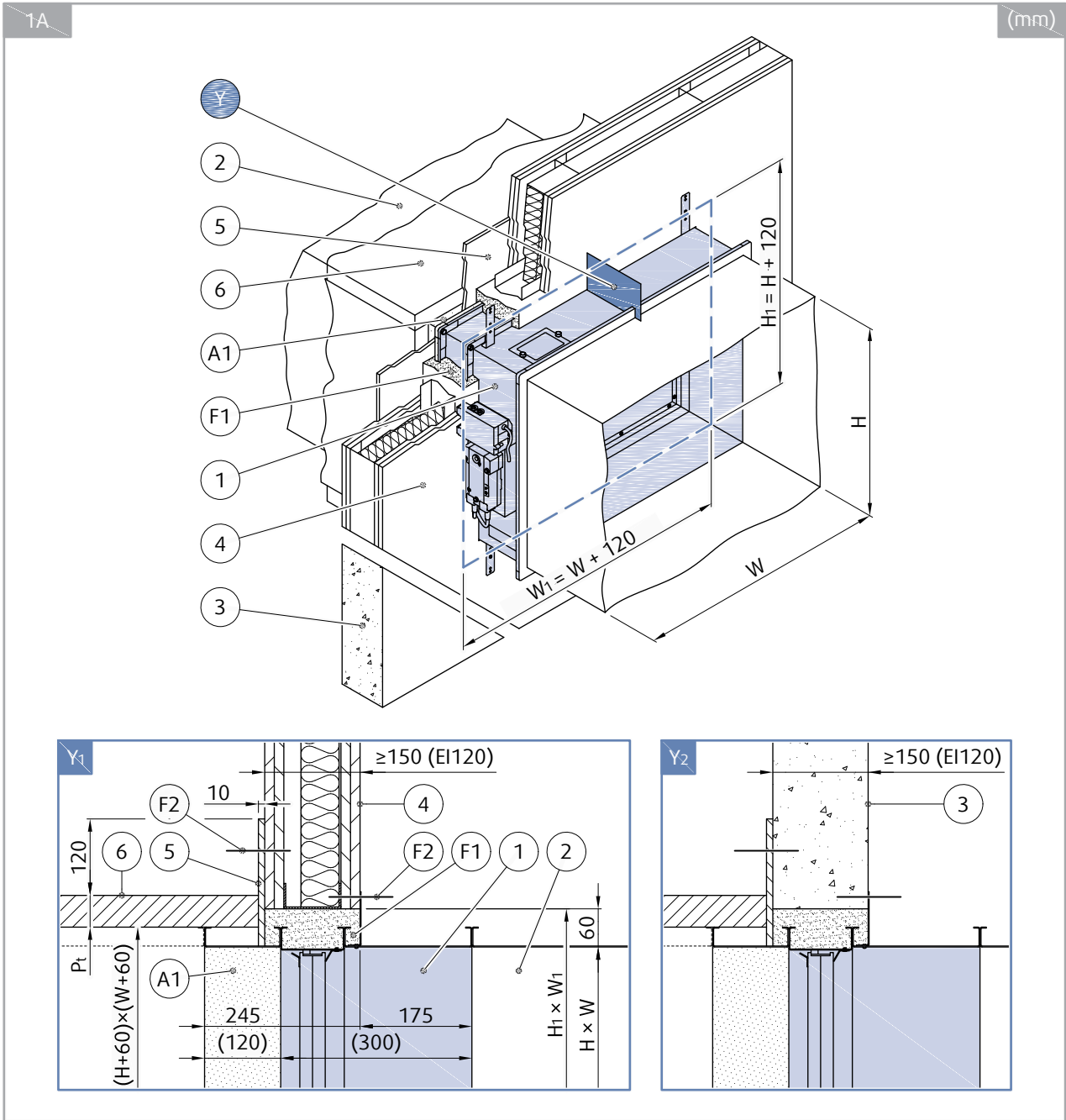
3. Fix cover boards (5) to the supporting construction using suitable screws based on the structure type.

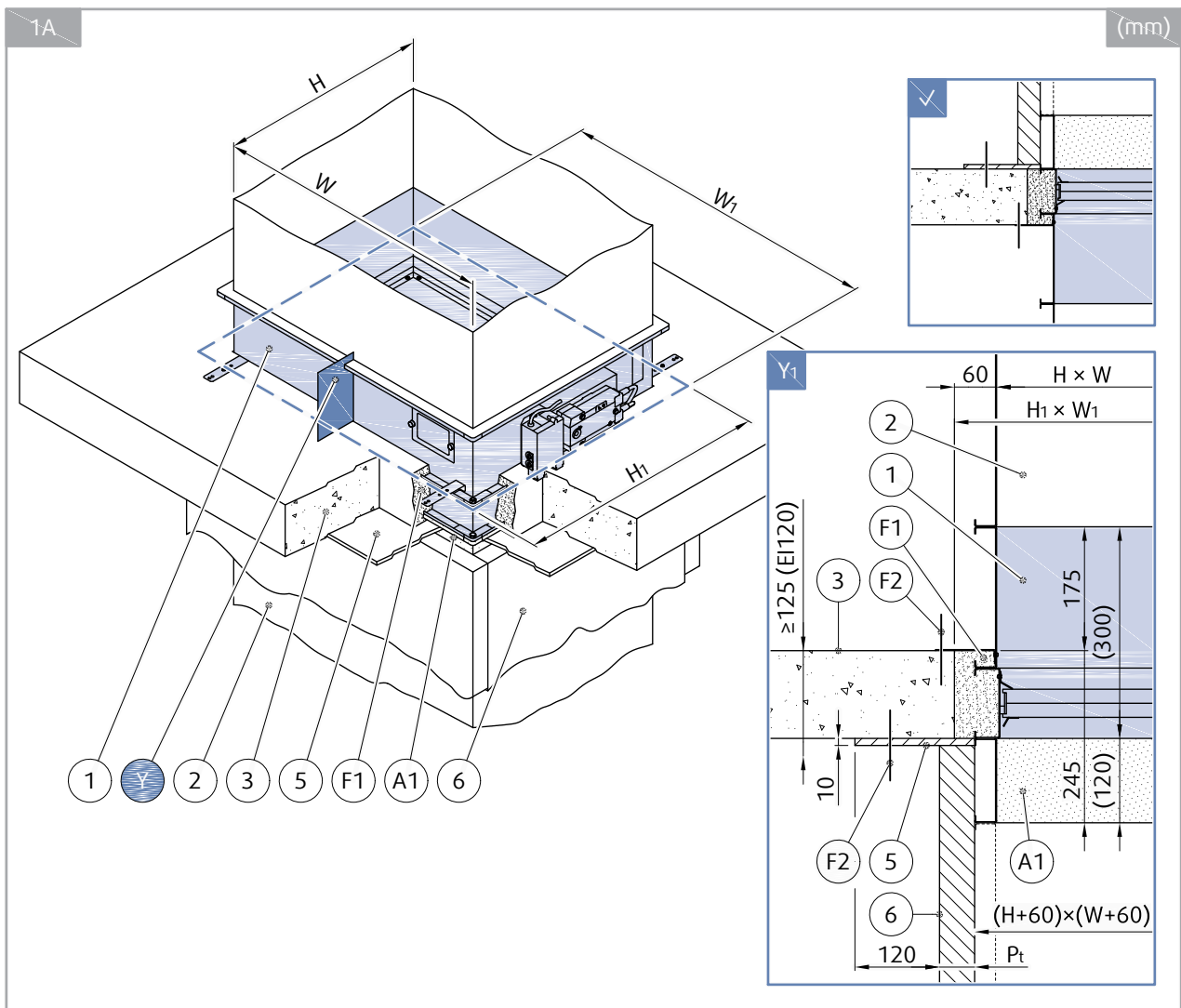
**CAUTION:** The interior of the S-SA2 damper must remain accessible for maintenance. Depending on the installation configuration, it may be necessary to create additional inspection panels in the board duct.

4. Construct board duct around the damper following duct manufacturer's original “Installation manual”.

**NOTE:** The internal board duct dimensions are based on damper nominal dimension with added clearance and can be increased by up to 50 mm.

1A - Board Ductwork Connected to Damper Side Without Actuator

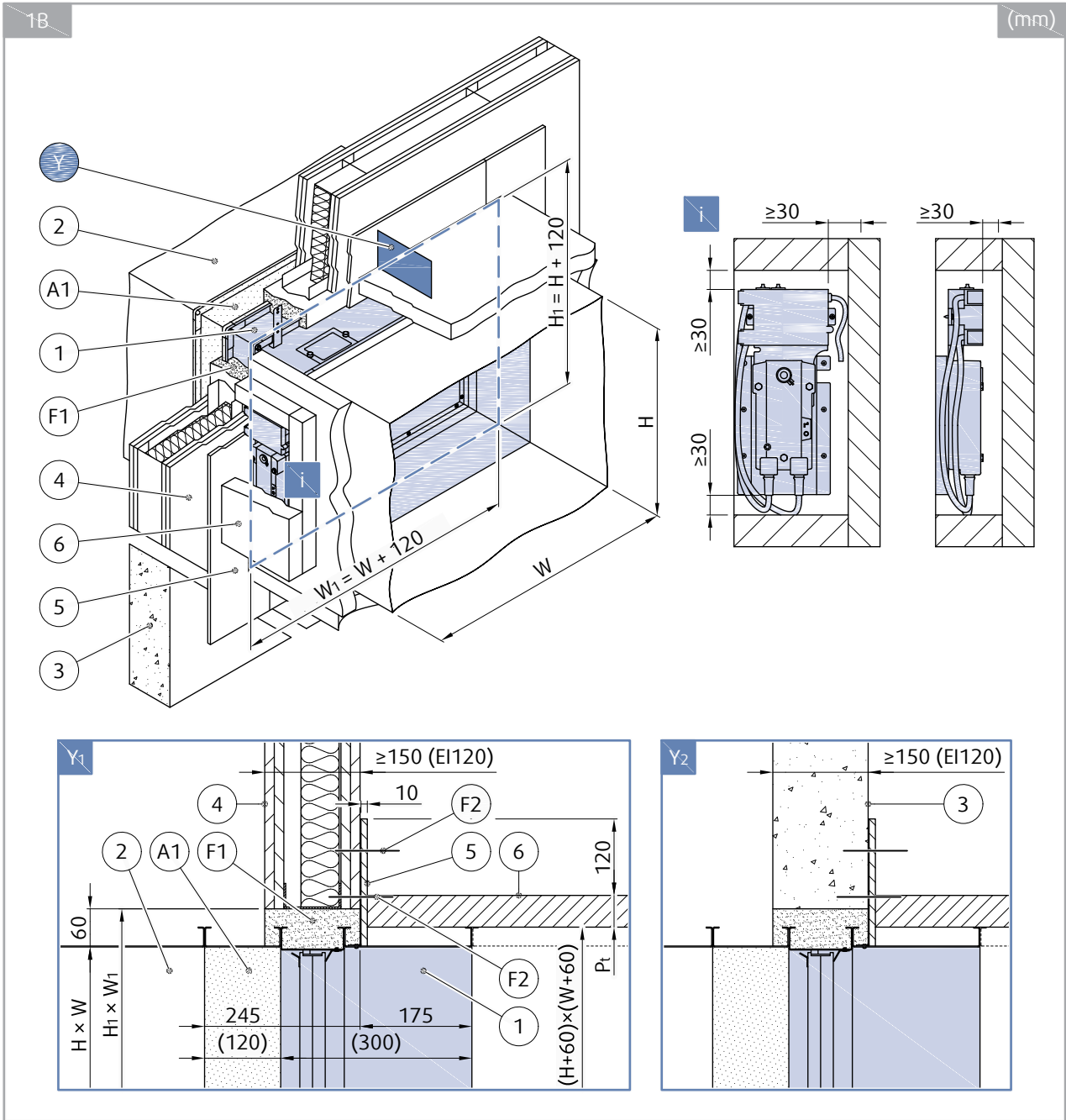


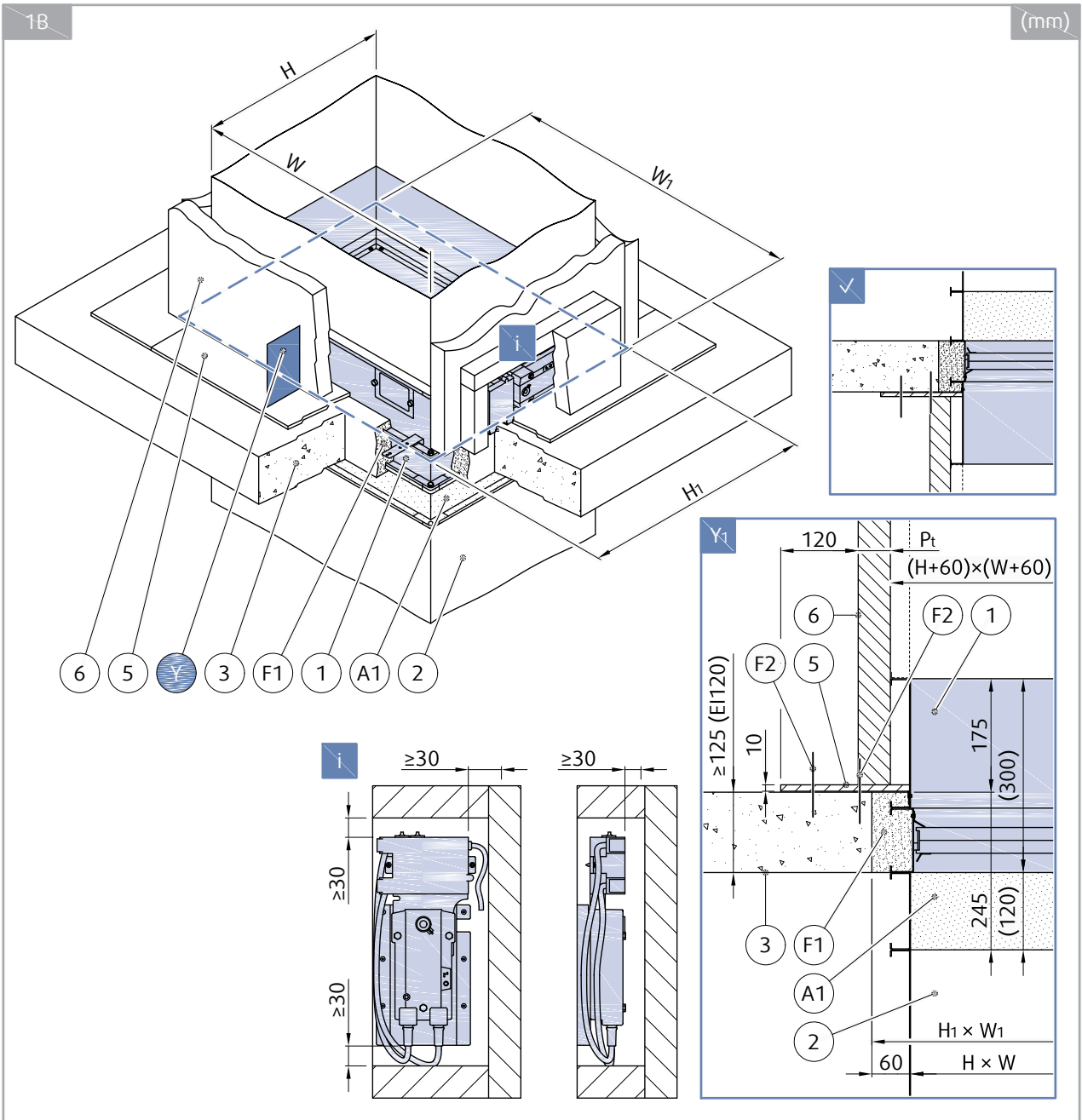


#### Legend for Installation 1A Wet, Connected to Board Duct

- 1** - Smoke control damper S-SA2
- 2** - Connected ductwork tested according to EN 1366-9
- 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** - Cover plates thickness 10 mm placed on the opening circumference made of Promatect H (Promat)
- 6** - Ductwork made of Promatect-L500 boards (Promat).  
Thickness of boards (Pt) depends on the desired fire resistivity
- A1** - Accessory LEAS (can be replaced by ductwork tested according to EN 1366-9)
- F1** - Gypsum plaster; Mortar; Concrete filling - minimal category M2.5, EN 998-2
- F2** - Screw with minimum dimensions of 5,5 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

1B - Board Ductwork Connected to Damper Side With Actuator



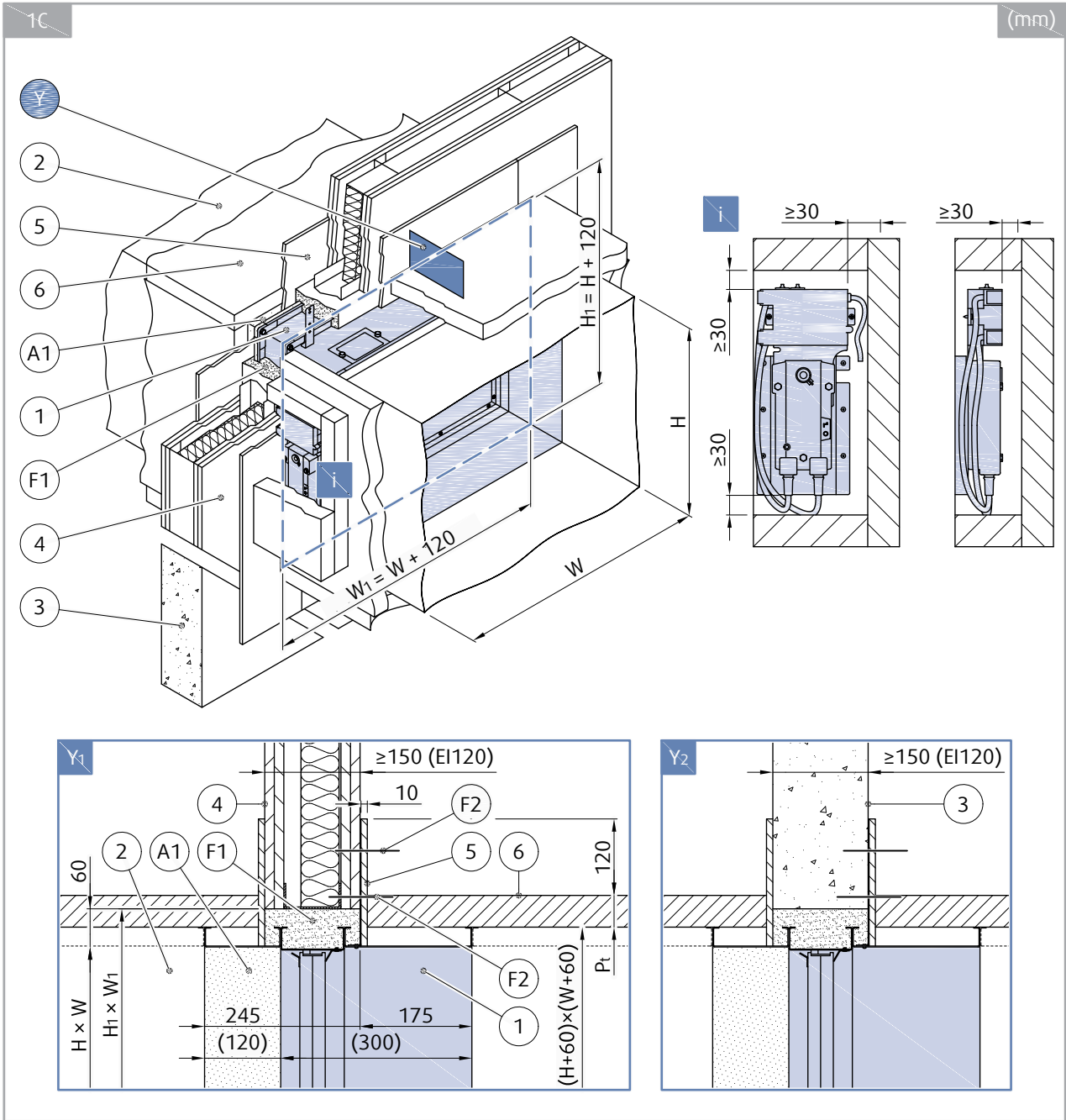


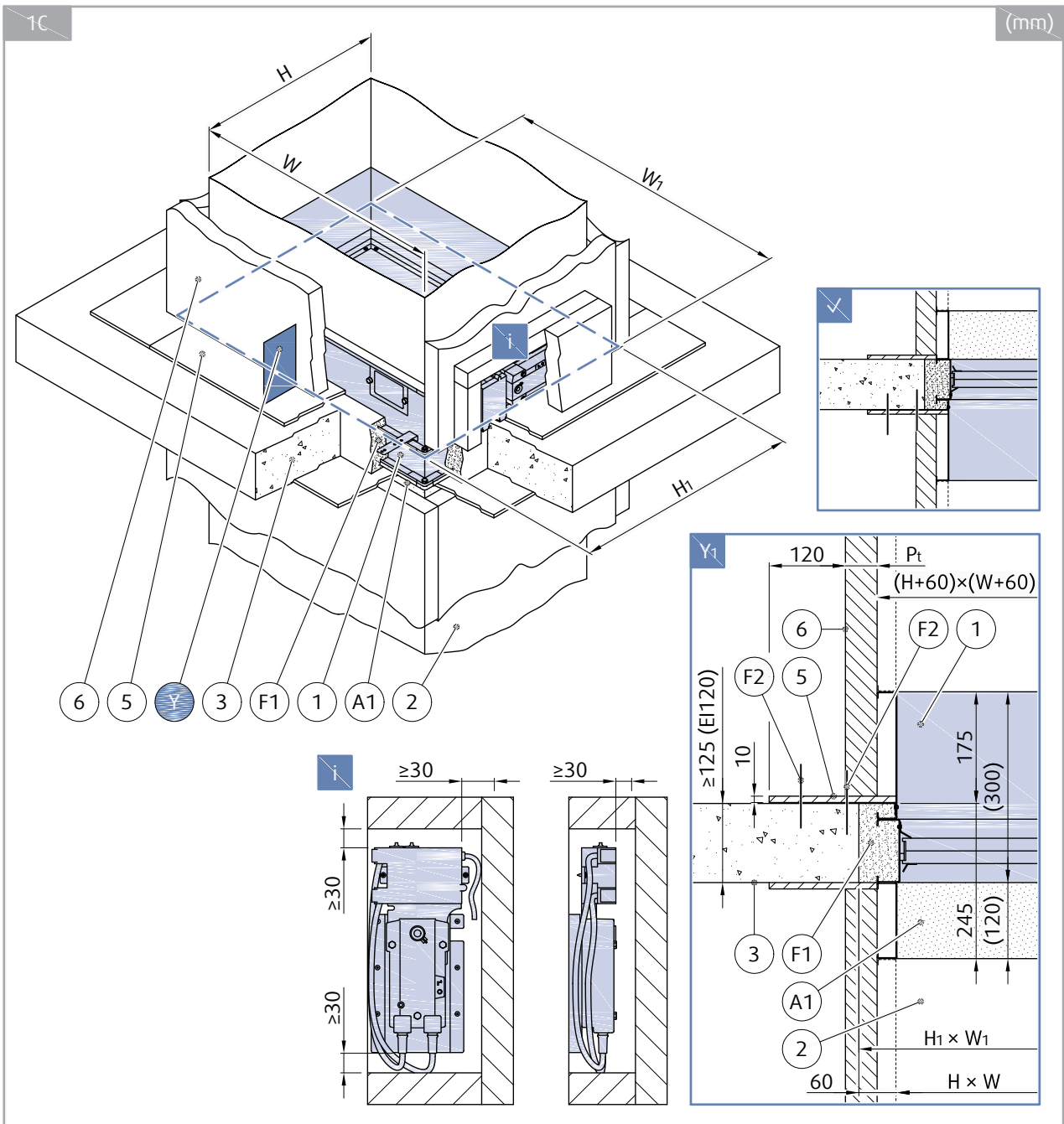


Legend for Installation 1B Wet, Connected to Board Duct

- 1** - Smoke control damper S-SA2
- 2** - Connected ductwork tested according to EN 1366-9
- 3** - Concrete/masonry/cellular concrete wall
- 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** - Cover plates thickness 10 mm placed on the opening circumference made of Promatect H (Promat)
- 6** - Ductwork made of Promatect-L500 boards (Promat).  
Thickness of boards (Pt) depends on the desired fire resistivity
- A1** - Accessory LEAS (can be replaced by ductwork tested according to EN 1366-9)
- F1** - Gypsum plaster; Mortar; Concrete filling - minimal category M2.5, EN 998-2
- F2** - Screw with minimum dimensions of 5,5 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

1C - Board Ductwork Connected to Damper Side With/Without Actuator





Legend for Installation 1C Wet, Connected to Board Duct

- 1** - Smoke control damper S-SA2
- 2** - Connected ductwork tested according to EN 1366-9
- 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** - Cover plates thickness 10 mm placed on the opening circumference made of Promatect H (Promat)
- 6** - Ductwork made of Promatect-L500 boards (Promat).  
Thickness of boards (Pt) depends on the desired fire resistivity
- A1** - Accessory LEAS (can be replaced by ductwork tested according to EN 1366-9)
- F1** - Gypsum plaster; Mortar; Concrete filling - minimal category M2.5, EN 998-2
- F2** - Screw with minimum dimensions of 5,5 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 - Installation in the Wall

## Procedure to Fill with Mineral Wool (up to Size 1000 × 800 mm)

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.

- Clean the surfaces of the opening. Make sure that the surfaces are even.
- 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.

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



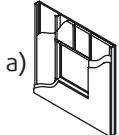
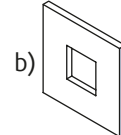

**CAUTION:** Make sure that the filling will not cause deformation to the damper.

6. Use fire resistive coating (F5) on the wool segments and the wall surfaces as follows:

- Mineral wool segments must be completely covered by the fire resistive coating.
- All gaps between the mineral wool segments and damper casing or wall opening must be covered by the fire resistive coating

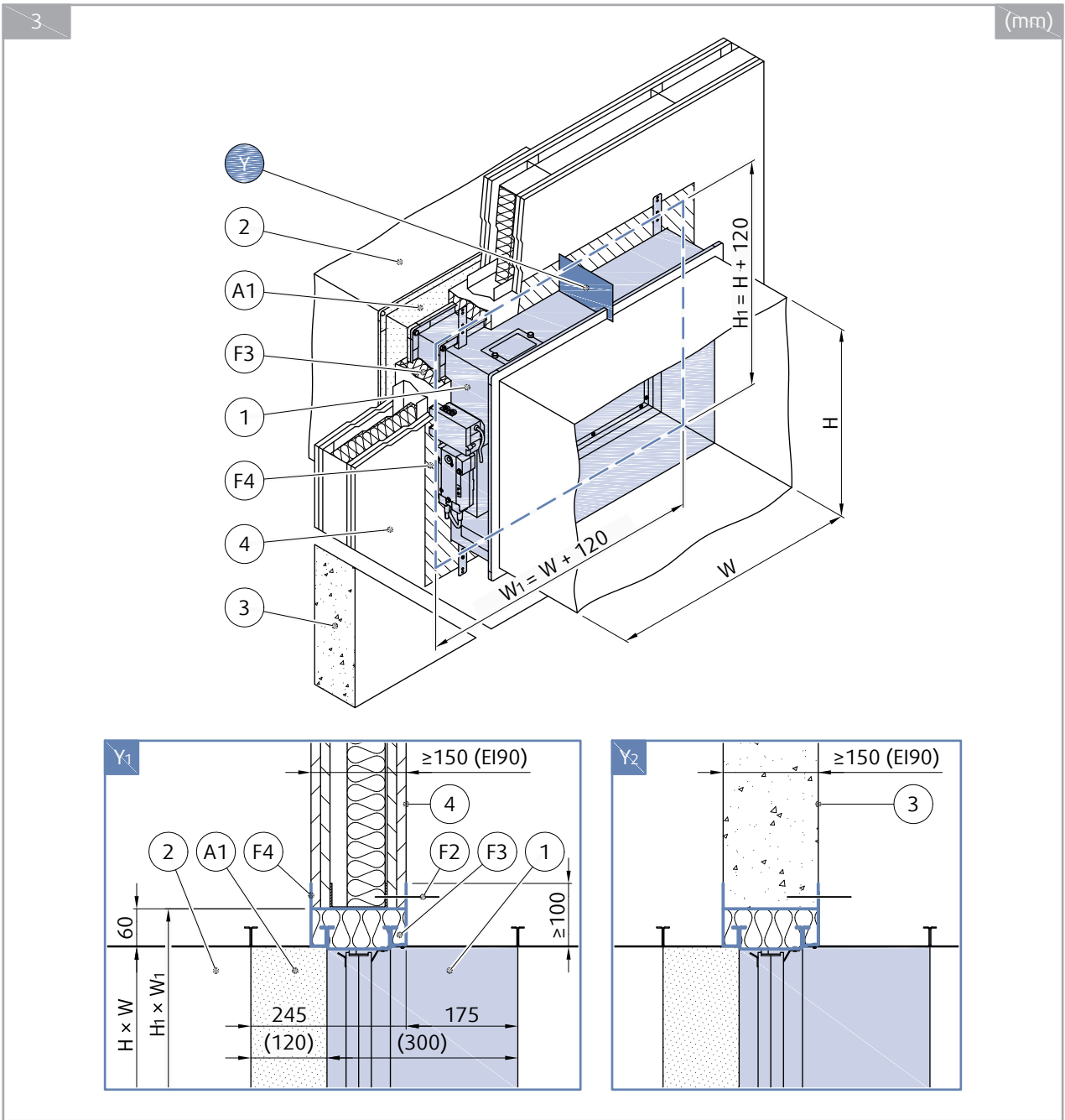
## Installation Distances

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.

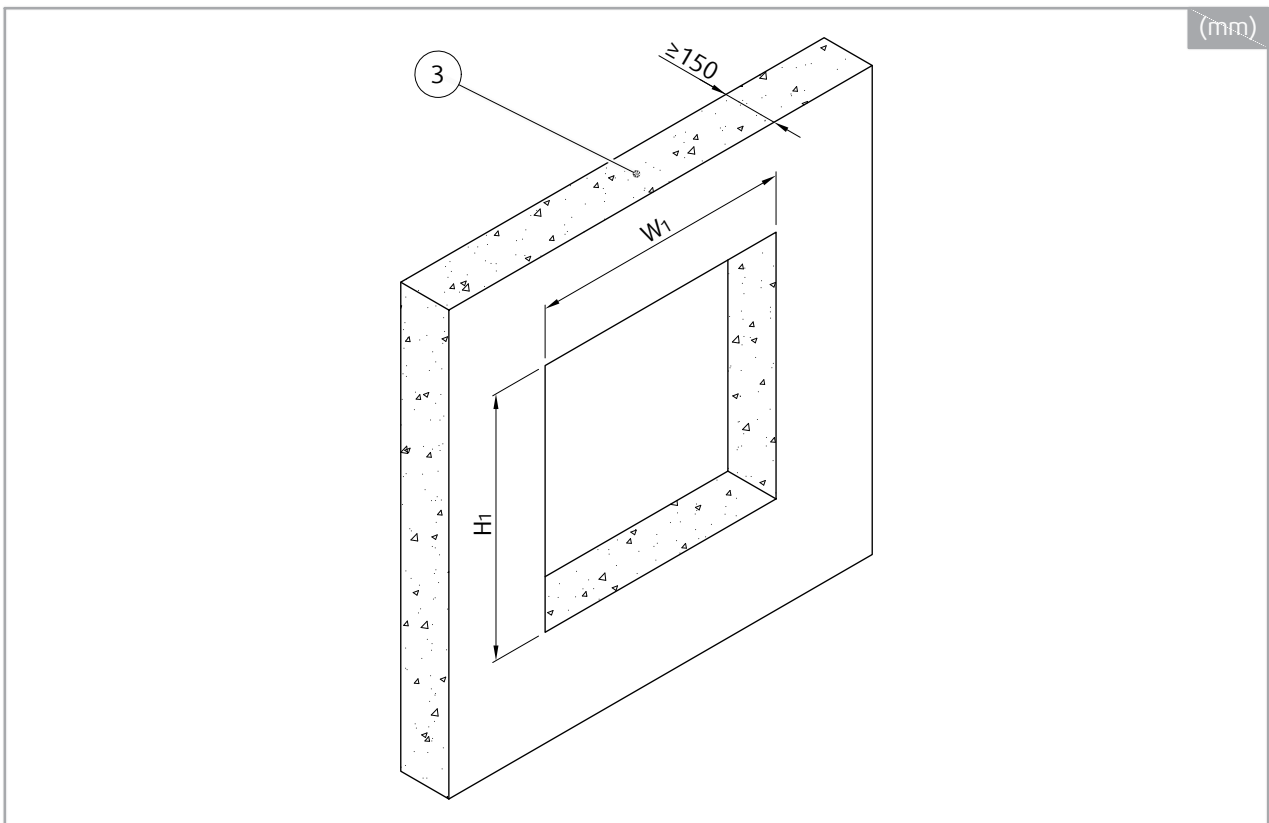
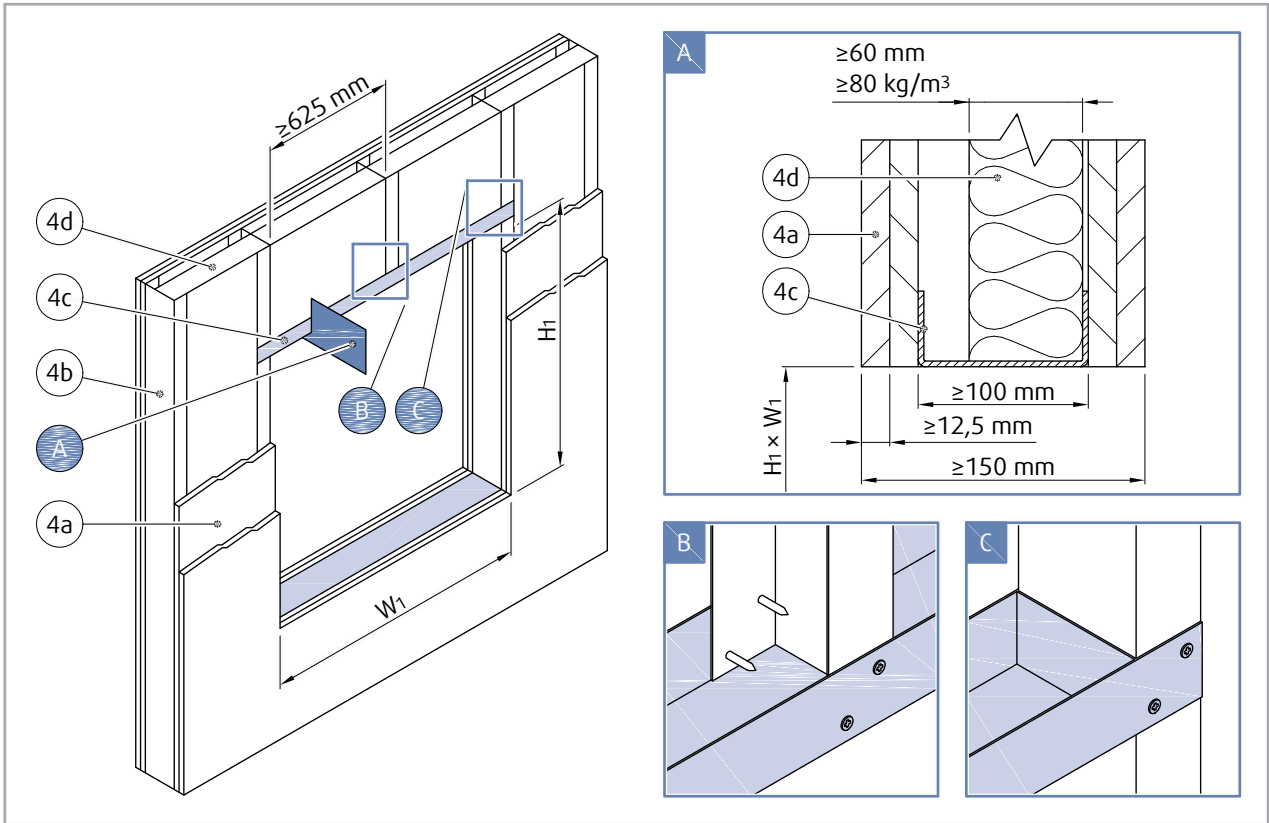
 S-SA2 3 Soft 	S-SA2 200 × 200 ... ... 1000 × 800	EI 90 ( $v_{ew} i \leftrightarrow o$ ) S1500 C <sub>MOD</sub> AAmulti	 a) $\geq 150$ mm	 b) $\geq 150$ mm	
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## NOTES:

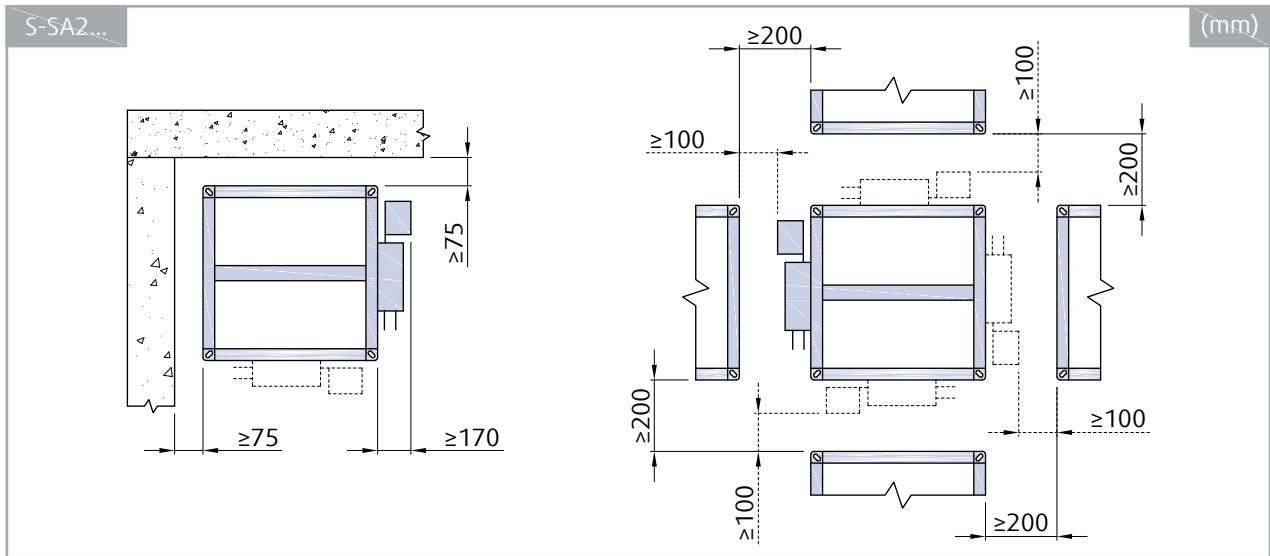
- Flexible (plasterboard) wall
  - Concrete/masonry/cellular concrete (rigid) wall
- $v_{ew}$  - Wall placement, vertically oriented damper



Opening and Wall/Ceiling Preparation



## Damper Minimum Distances



### Legend for Installation 3. Soft

- 1** - Smoke control damper S-SA2
- 2** - Connected ductwork tested according to EN 1366-9
- 3** - Concrete/masonry/cellular concrete wall
- 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
- F2** - Screw with minimum dimensions of 5,5 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)
- F3** - Mineral wool filling (min. 140 kg/m<sup>3</sup>)
- F4** - Fire resistive coating Isover BSF (ISOVER)
- Y** - Cutting plane



# Connecting S-SA2 Damper to Ductwork Made of Boards

The S-SA2 smoke damper can be connected to "multi" classified ductwork made of calcium silicate boards tested according to EN 1366-8. If mounted on a duct classified with lower fire resistivity, the fire resistivity of the S-SA2 smoke control damper will be decreased to the duct level. This section does not depict duct hanger rules as those are dependent on the weight of the duct itself and must be statically approved.

## Procedure for Board Duct Connection Using 3. Soft Installation

**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.

1. Perform installation of S-SA2 damper into the wall following "1. Soft" installation instructions.

**CAUTION:** Obey the procedure of duct manufacturer's original "Installation manual" for connecting duct to the supporting construction.

2. Clean the surfaces of the wall or ceiling. Make sure that the surfaces are even.

3. Apply fire resistive coating (F5) to the cover boards, duct boards and connection surfaces on the wall.

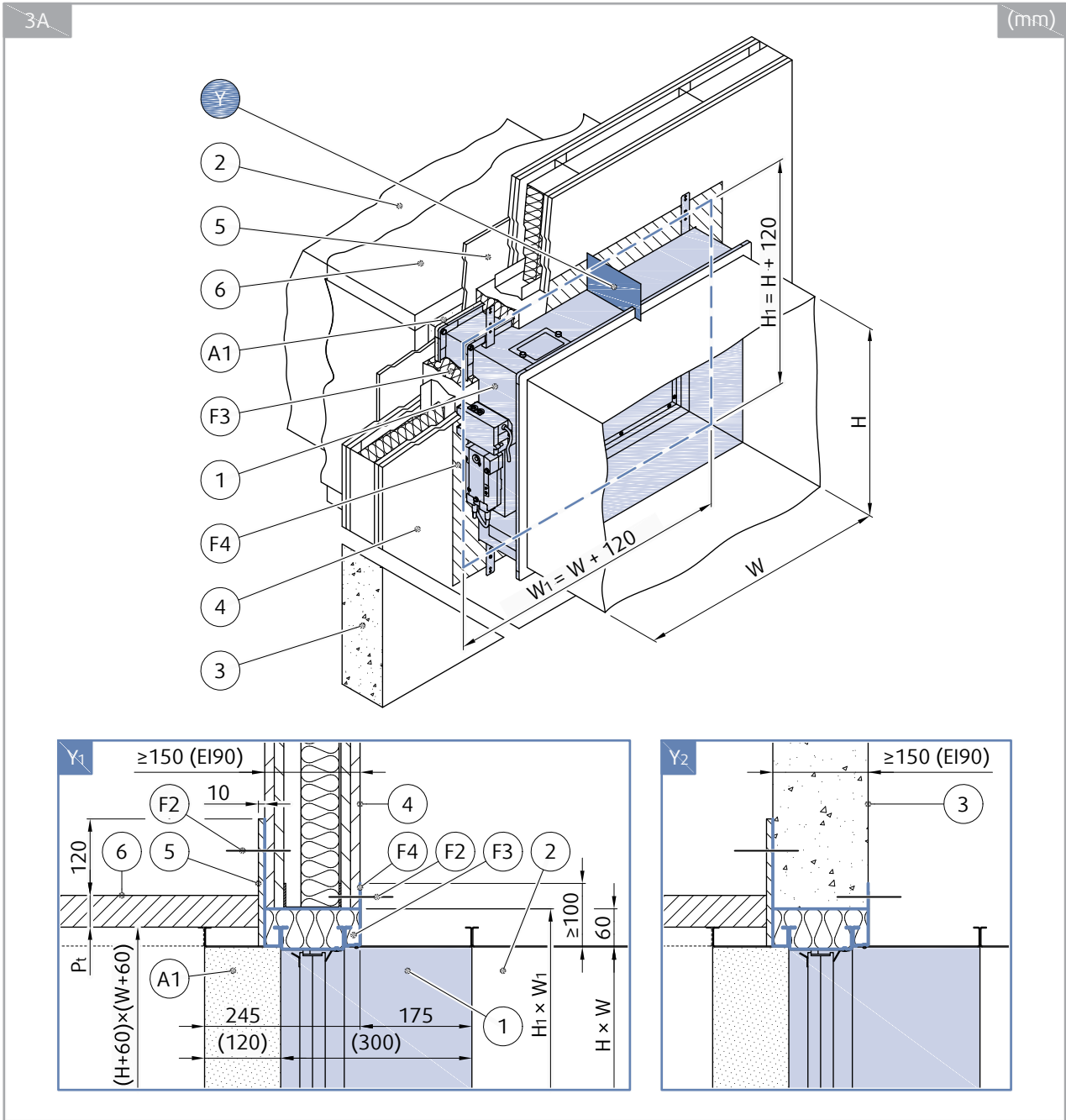
4. Fix cover boards (5) to the supporting construction using suitable screws based on the structure type.

**CAUTION:** The interior of the S-SA2 damper must remain accessible for maintenance. Depending on the installation configuration, it may be necessary to create additional inspection panels in the board duct.

5. Construct board duct around the damper following duct manufacturer's original "Installation manual".

**NOTE:** The internal board duct dimensions are based on damper nominal dimension with added clearance and can be increased by up to 50 mm.

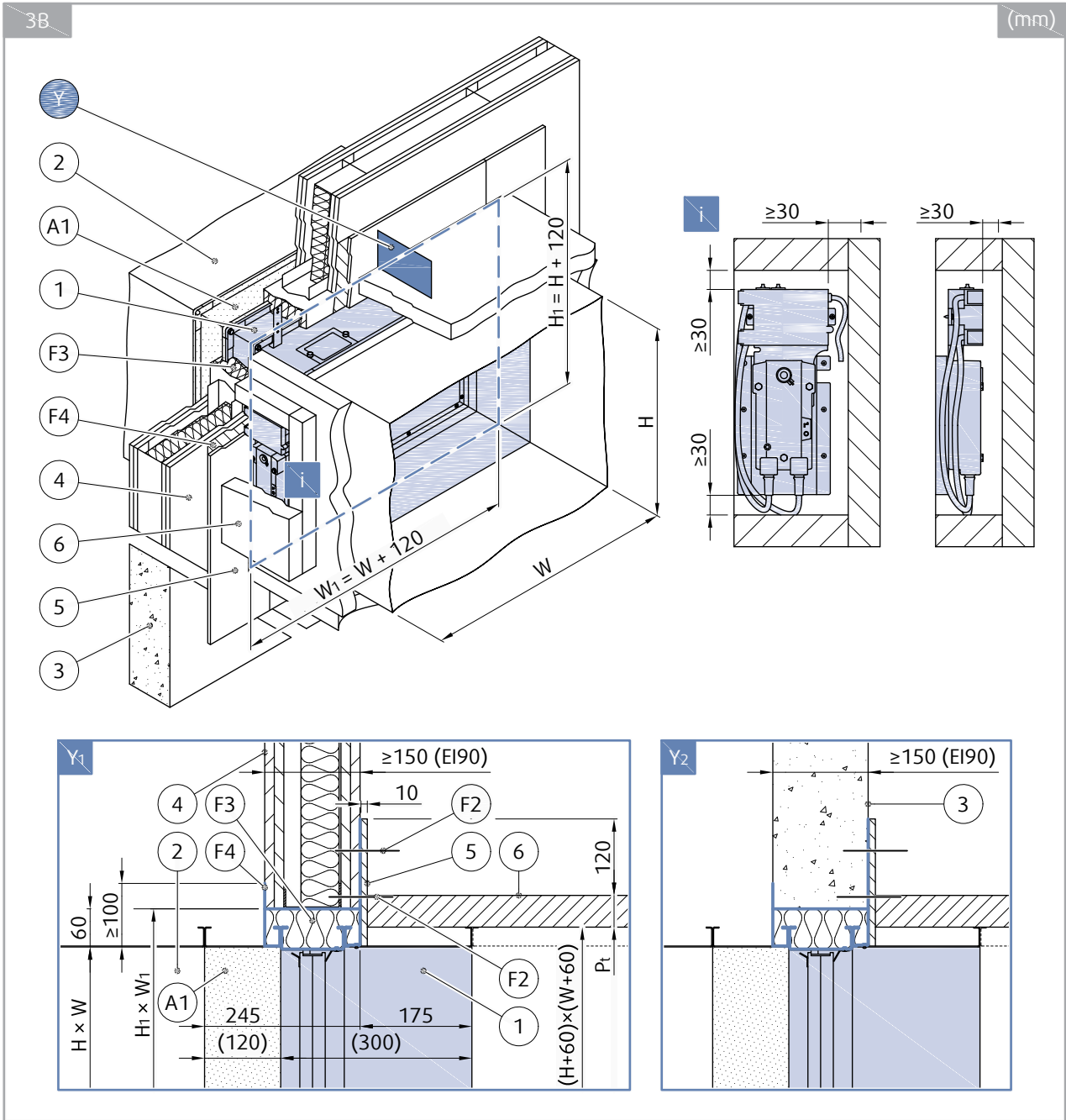
3A - Board Ductwork Connected to Damper Side Without Actuator



Legend for Installation 3A Soft

- 1** - Smoke control damper S-SA2
- 2** - Connected ductwork tested according to EN 1366-9
- 3** - Concrete/masonry/cellular concrete wall
- 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** - Cover plates thickness 10 mm placed on the opening circumference made of Promatect H (Promat)
- 6** - Ductwork made of Promatect-L500 boards (Promat)  
Thickness of boards (Pt) depends on the desired fire resistivity
- A1** - Accessory LEAS (can be replaced by ductwork tested according to EN 1366-9)
- F2** - Screw with minimum dimensions of 5,5 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)
- F3** - Mineral wool filling (min. 140 kg/m<sup>3</sup>)
- F4** - Fire resistive coating Isover BSF (ISOVER)
- Y** - Cutting plane

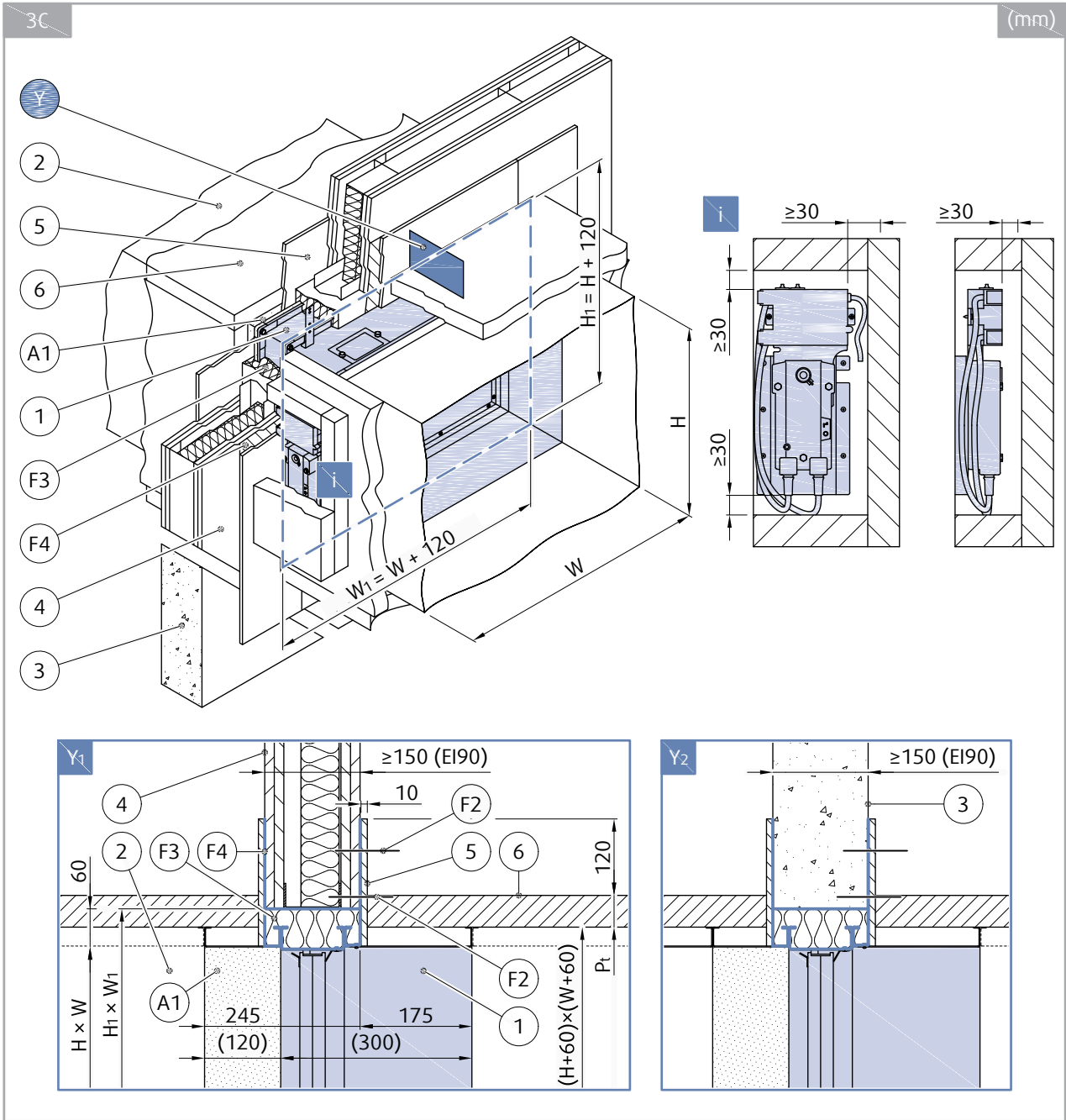
3B - Board Ductwork Connected to Damper Side With Actuator



Legend for Installation 3B Soft

- 1** - Smoke control damper S-SA2
- 2** - Connected ductwork tested according to EN 1366-9
- 3** - Concrete/masonry/cellular concrete wall
- 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** - Cover plates thickness 10 mm placed on the opening circumference made of Promatect H (Promat)
- 6** - Ductwork made of Promatect-L500 boards (Promat)  
Thickness of boards (Pt) depends on the desired fire resistivity
- A1** - Accessory LEAS (can be replaced by ductwork tested according to EN 1366-9)
- F2** - Screw with minimum dimensions of 5,5 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)
- F3** - Mineral wool filling (min. 140 kg/m<sup>3</sup>)
- F4** - Fire resistive coating Isover BSF (ISOVER)
- Y** - Cutting plane

3C - Board Ductwork Connected to Damper Side With/Without Actuator



Legend for Installation 3C Soft

- 1** - Smoke control damper S-SA2
- 2** - Connected ductwork tested according to EN 1366-9
- 3** - Concrete/masonry/cellular concrete wall
- 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** - Cover plates thickness 10 mm placed on the opening circumference made of Promatect H (Promat)
- 6** - Ductwork made of Promatect-L500 boards (Promat).  
Thickness of boards (Pt) depends on the desired fire resistivity
- A1** - Accessory LEAS (can be replaced by ductwork tested according to EN 1366-9)
- F2** - Screw with minimum dimensions of 5,5 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)
- F3** - Mineral wool filling (min. 140 kg/m<sup>3</sup>)
- F4** - 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.

### Actuator Size Map of S-SA2

		W (mm)																		
		200	250	300	350	400	450	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	
H (mm)	200										-	-	-	-	-	-	-	-	-	
	250										-	-	-	-	-	-	-	-	-	
	300										-	-	-	-	-	-	-	-	-	
	350												-	-	-	-	-	-	-	
	400													-	-	-	-	-	-	
	450	-																		
	500	-																		
	600	-	-																	
	700	-	-	-																
	800	-	-	-	-															
	900	-	-	-	-	-														
1000	-	-	-	-	-	-														
		BEN... (15 Nm)																		
		BEE... (25 Nm)																		
		BE... (40 Nm)																		

		W (mm)																		
		200	250	300	350	400	450	500	600	700	800	900	1000	1100	1200	1300	1400	1500	1600	
H (mm)	200										-	-	-	-	-	-	-	-	-	
	250										-	-	-	-	-	-	-	-	-	
	300										-	-	-	-	-	-	-	-	-	
	350											-	-	-	-	-	-	-	-	
	400												-	-	-	-	-	-	-	
	450	-																		
	500	-																		
	600	-	-																	
	700	-	-	-																
	800	-	-	-	-															
	900	-	-	-	-	-														
1000	-	-	-	-	-	-														
		342-...-15... (15 Nm)																		
		362-...-20... (25 Nm)																		
		362-...-40... (40 Nm)																		



## Electrical Parameters for Type of Activation and Actuator

AT	B	T (Nm)	NV (V)	F (Hz)	CO (W)	CR (W)	WS (VA)	WN	
B230	BEN230	15	AC 230	50/60	4	0,4	7	I <sub>max</sub> 4 A @ 5 ms	
	BEE230	25			3,5	0,4	6	I <sub>max</sub> 4 A @ 5 ms	
	BE230	40			8	0,5	15	I <sub>max</sub> 7,9 A @ 5 ms	
B24	BEN24	15	AC/DC 24	50/60	3	0,1	6	I <sub>max</sub> 8,2 A @ 5 ms	
	BEE24	25			2,5	0,1	5	I <sub>max</sub> 8,2 A @ 5 ms	
	BE24	40			12	0,5	18	I <sub>max</sub> 8,2 A @ 5 ms	
B24-W	BEN24-ST	15	AC/DC 24	50/60	3	0,1	6	I <sub>max</sub> 8,2 A @ 5 ms	
	BEE24-ST	25			2,5	0,1	5	I <sub>max</sub> 8,2 A @ 5 ms	
	BE24-ST	40			12	0,5	18	I <sub>max</sub> 8,2 A @ 5 ms	
B24-SR	BEN24-SR	15	AC/DC 24	50/60	3	0,3	6,5	I <sub>max</sub> 8,2 A @ 5 ms	
	BEE24-SR	25			3	0,3	5,5	I <sub>max</sub> 8,2 A @ 5 ms	
	-	-	-	-	-	-	-	-	
BST0	BEN24-ST & BKNE230-24 <sup>(a)</sup>	15	AC 230	50/60	10	0,1	19	I <sub>max</sub> 8,2 A @ 5 ms	
	BEE24-ST & BKNE230-24 <sup>(a)</sup>	25							
	BE24-ST & BKNE230-24 <sup>(a)</sup>	40							
BST1	BEN24-ST & BC24-G2 <sup>(a)</sup>	15	(SLC®)	-	3,5	0,5	12,5	-	
	BEE24-ST & BC24-G2 <sup>(a)</sup>	25			3		12,5	-	
	BE24-ST & BC24-G2 <sup>(a)</sup>	40			12,5		20	-	
BST10	BEN24-ST & BKNE230-24-PL <sup>(a)</sup>	15	AC 230 (Powerline)	50/60	5	0,5	20	-	
	BEE24-ST & BKNE230-24-PL <sup>(a)</sup>	25			4,5		20	-	
	BE24-ST & BKNE230-24-PL <sup>(a)</sup>	40			14		20	-	
AT	G			T (Nm)	NV (V)	F (Hz)	CO (W)	CR (W)	WS (VA)
G230	342-230-15-...			15	AC 230	50/60	7	1,5	12
	362-230-20-...			20			3	1,5	7
	362-230-40-...			40			8,5	1,5	14
G24	342-024-15-...			15	AC/DC 24	50/60	7,5	1,5	9
	362-024-20-...			20			4	1,5	5,5
	362-024-40-...			40			8	1,5	10
G24-W	342-024-15-.../ST03			15	AC/DC 24	50/60	7,5	1,5	9
	362-024-20-.../ST03			20			4	1,5	5,5
	362-024-40-.../ST03			40			8	1,5	10
GST0	342-024-15-.../ST03 & FS-UFC24-2 <sup>(a)</sup>			15	AC 24	50/60	9,5	3,5	11
	362-024-20-.../ST03 & FS-UFC24-2 <sup>(a)</sup>			20			6	3,5	7,5
	362-024-40-.../ST03 & FS-UFC24-2 <sup>(a)</sup>			40			10	3,5	12

### Legend for Electrical Parameters

**AT** - Activation type

**B** - Belimo actuator type

**(a)** - Supply and communication unit

**G** - Gruner actuator type

**T** - Torque

**NV** - Nominal voltage

**F** - Frequency

**CO** - Consumption in operation

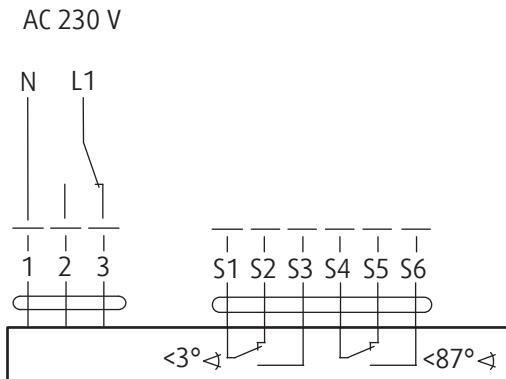
**CR** - Consumption in rest

**WS** - Wire sizing consumption

**WN** - Wire sizing consumption note

### Type of Activation B230

- The circuit switch between wires 2 and 3 is not part of the damper supply.
- When the power supply is connected to wires 1 and 3, the actuator moves to the OPEN position.
- When the power supply is connected to wires 1 and 2, the actuator moves to the CLOSED position.



#### CAUTION:

- Main power supply voltage! Danger of electric shock!
- Parallel connection of more actuators possible when the power consumption and switching threshold is observed!

#### Legend for Activation Type B230

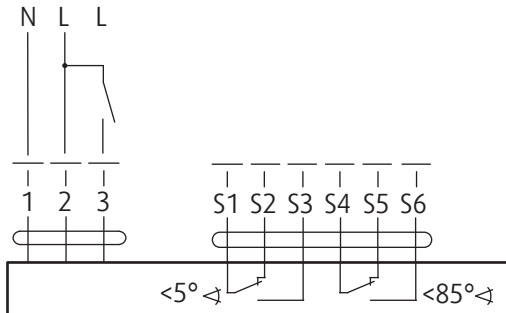
- 1** - Blue
- 2** - Brown
- 3** - White
- S1** - Violet
- S2** - Red
- S3** - White
- S4** - Orange
- S5** - Pink
- S6** - Grey

The Belimo BE230 actuator has wires without colours.

### Type of Activation G230

- Circuit switch for wire 3 is not part of the damper delivery.
- Connect power supply to wire 1+2, actuator drives to position OPEN (1). Is also wire 3 connected to the power supply, actuator drives to position CLOSED (0).

AC 230 V



#### CAUTION:

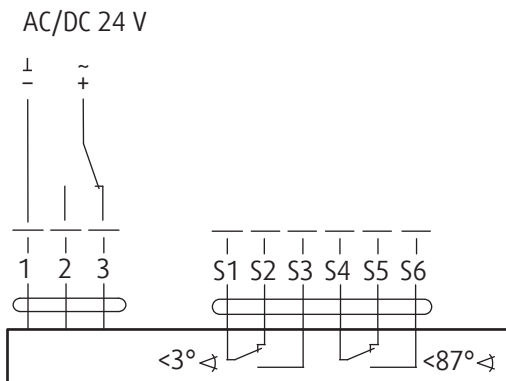
- Main power supply voltage! Danger of electric shock!
- Parallel connection of more actuators possible when the power consumption and switching threshold is observed!

#### Legend for Activation Type G230

- 1** - Blue
- 2** - Brown
- 3** - Black
- S1** - Violet
- S2** - Red
- S3** - White
- S4** - Orange
- S5** - Pink
- S6** - Grey

### Type of Activation B24

- The circuit switch between wires 2 and 3 is not part of the damper supply.
- When the power supply is connected to wires 1 and 3, the actuator moves to the OPEN position.
- When the power supply is connected to wires 1 and 2, the actuator moves to the CLOSED position.



#### CAUTION:

- Connect via safety isolation transformer!
- Parallel connection of more actuators possible when the power consumption and switching threshold is observed!

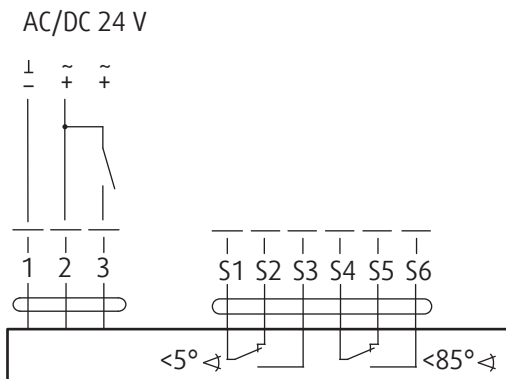
#### Legend for Activation Type B24

- 1** - Black
- 2** - Red
- 3** - White
- S1** - Violet
- S2** - Red
- S3** - White
- S4** - Orange
- S5** - Pink
- S6** - Grey

The Belimo BE24 actuator has wires without colours.

### Type of Activation G24

- Circuit switch for wire 3 is not part of the damper delivery.
- Connect power supply to wire 1+2, actuator drives to position OPEN (1). Is also wire 3 connected to the power supply, actuator drives to position CLOSED (0).



#### CAUTION:

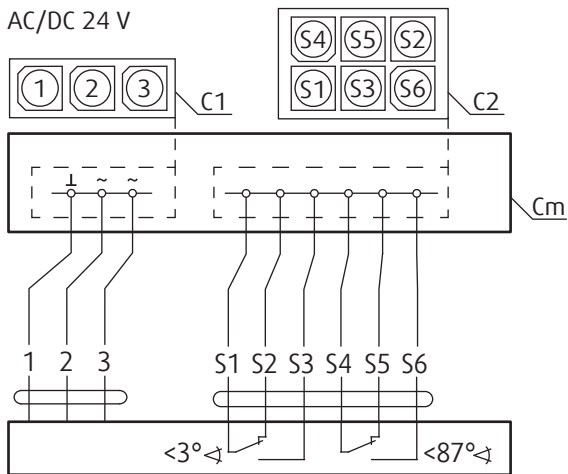
- Connect via safety isolation transformer!
- Parallel connection of more actuators possible when the power consumption and switching threshold is observed!

#### Legend for Activation Type G24

- 1** - Black
- 2** - Red
- 3** - White
- S1** - Violet
- S2** - Red
- S3** - White
- S4** - Orange
- S5** - Pink
- S6** - Grey

### Type of Activation B24-W

This type of activation has cable connectors (C1 and C2) for the supply and communication unit (the communication unit is not part of the mechanism).



#### CAUTION:

- Connect via safety isolation transformer!

#### Legend for Activation Type B24-W

The actuator has connection plugs C1 and C2.

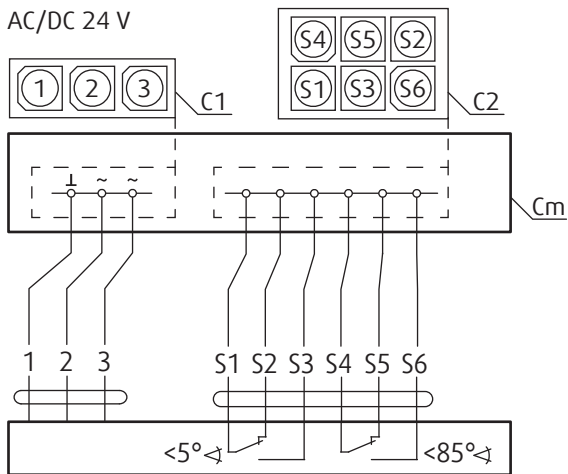
**Cm** - Communication Module - not part of the delivery

**C1** - Supply: 3-pole plug that is applicable, for example to BKNE... or fs-UFC...

**C2** - Auxiliary switch: 6-pole plug that is applicable, for example to BKNE... or fs-UFC...

### Type of Activation G24-W

This type of activation has cable connectors (C1 and C2) for the supply and communication unit (the communication unit is not part of the mechanism).



#### CAUTION:

- Connect via safety isolation transformer!

#### Legend for Activation Type G24-W

The actuator has connection plugs C1 and C2.

**Cm** - Communication Module - not part of the delivery

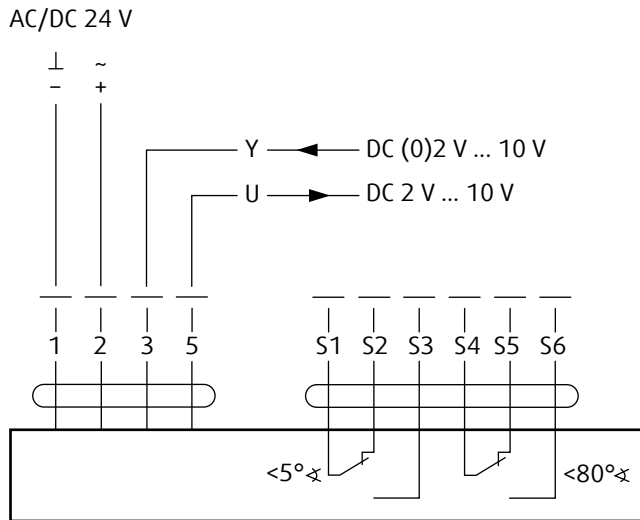
**C1** - Supply: 3-pole plug that is applicable, for example to BKNE... or fs-UFC...

**C2** - Auxiliary switch: 6-pole plug that is applicable, for example to BKNE... or fs-UFC...



### Type of Activation B24-SR

This type of activation has modulating actuator that can be used for balancing/air flow control.



#### CAUTION:

- Connect via safety isolation transformer!
- Parallel connection of other actuators possible. Observe the performance data and the switching thresholds.
- Combination of power supply voltage and safety extra-low voltage not permitted at the both auxiliary switches.

#### Legend for Activation Type B24-SR

- 1 - Black
- 2 - Red
- 3 - White
- 5 - Orange
- S1 - Violet
- S2 - Red
- S3 - White
- S4 - Orange
- S5 - Pink
- S6 - Grey

Modulating function not available for belimo BE24 actuator.

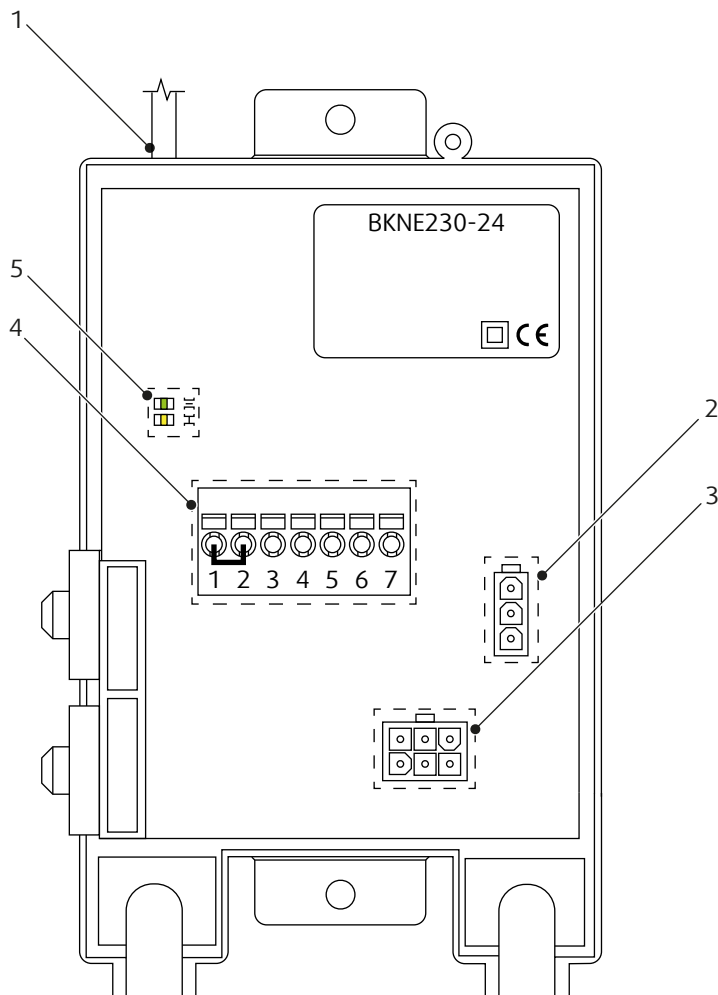
## Type of Activation BSTO

- The actuator and the control module are factory wired.
- Connect the supply voltage to the connecting cable (approx. 1 m, with ferrules).
- The 2-wire cable a|b to the BKSE24-6 is connected to terminals 6 and 7 (screw terminals for 2 x 1.5 mm<sup>2</sup> wire). Terminals 1 and 5 may not be assigned.
- The BKNE230-24 transmits the damper position OPEN|CLOSED and fault messages to the BKSE24-6. It receives the commands from the control unit BKSE24-6 and controls the actuator to the desired position.

## Two LEDs in the Device Indicate the Function Status

### LED | Status | Function

Yellow	Flashing	Damper moves OPEN
Yellow	On	Damper OPEN
Green	Flashing	Damper moves CLOSED
Green	On	Damper CLOSED
Yellow and Green	Flashing at double frequency	Fault
Yellow and Green	Off	Power failure



### CAUTION:

- Main power supply voltage! Danger of electric shock!
- Parallel connection of more actuators possible when the power consumption and switching threshold is observed!
- Combination of power supply voltage and safety extra-low voltage not permitted at the both auxiliary switches.

### Legend for Activation Type BST0

**L (+)** - Brown

**N (-)** - Blue

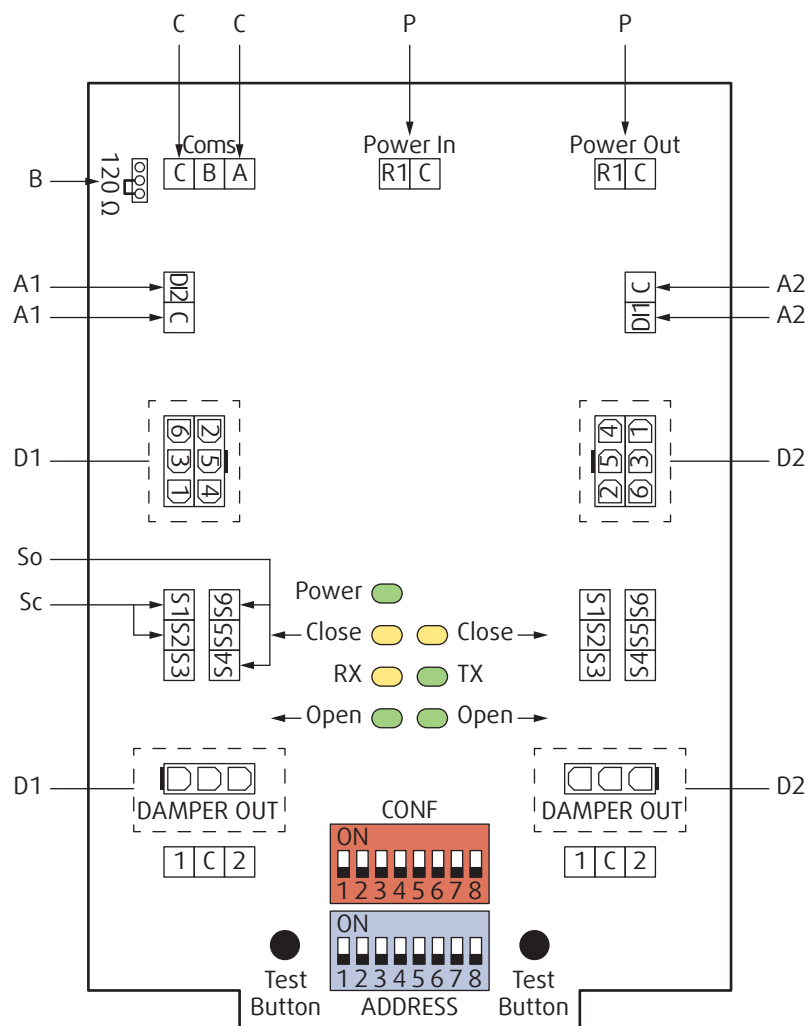
**1)** - Supply voltage cable

**2)** - 2-wire cable

**a/b** - Connection to e.g. BKSE24-6

## Type of Activation GST0

- The actuator and the control module are factory wired.



### CAUTION:

- Main power supply voltage! Danger of electric shock!
- Parallel connection of more actuators possible when the power consumption and switching threshold is observed!

### Legend for Activation Type GST0

**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.

**NOTE:** Connection scheme for fitted communication and supply unit BC24-G2 (THC).

## LEDs Status Indication (BST1)

### LED colour | LED state | Status

Green | ON | Damper open

Green | Blinks | Damper is opening

Yellow | ON | Damper closed

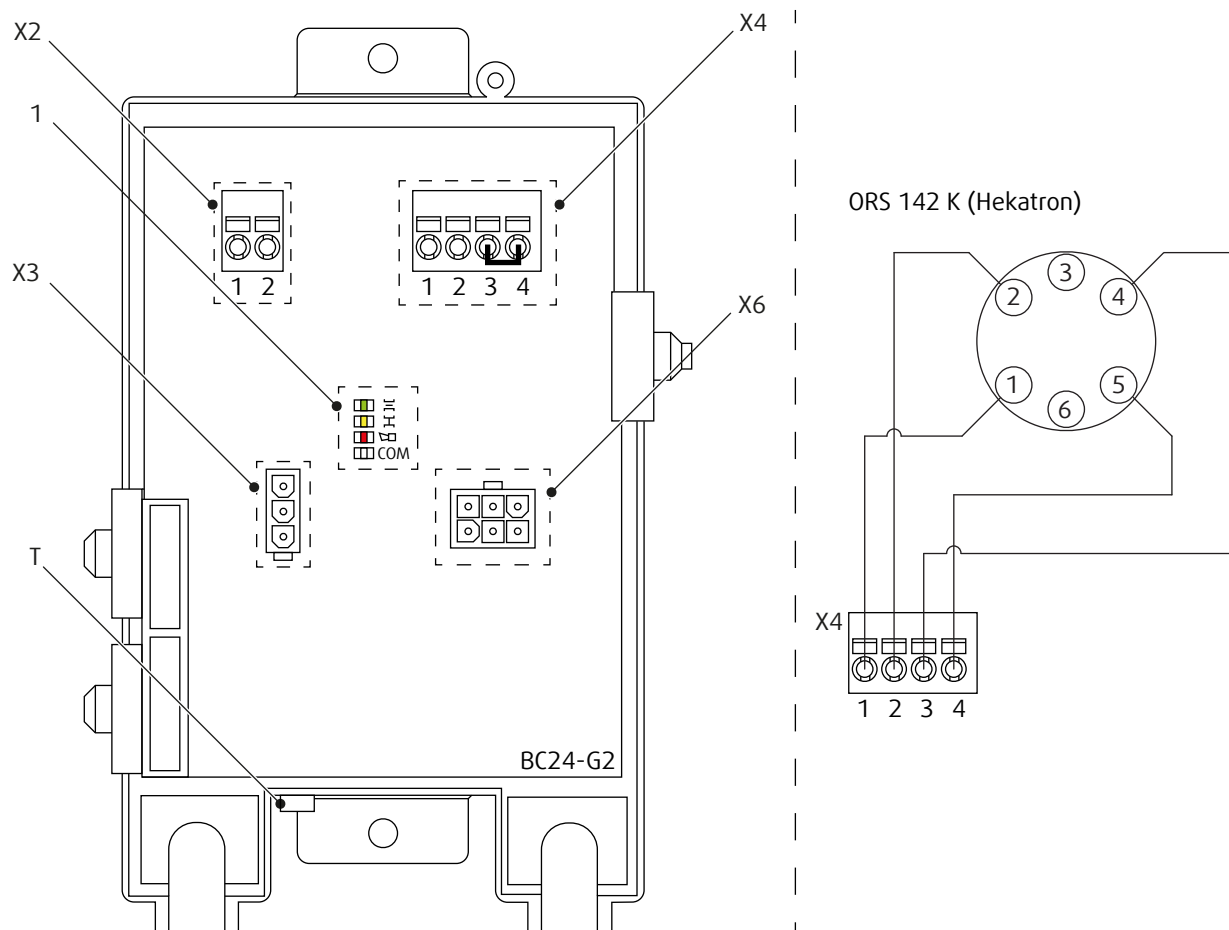
Yellow | Blinks | Damper is closing

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 for Activation Type BST1

**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 mm<sup>2</sup>.

**X3** - 3-pin connector: damper actuator (motor 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 BST10

**IMPORTANT:** Danger of electric shock! The BKNE230-24-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

**NOTE:** Connection scheme for fitted communication and supply unit BKNE230-24-PL (Powerline) with example of connection with ORS 142 K from Hekatron (smoke detector not part of delivery).

## LEDs status indication (BST10)

### LED colour | LED state | Status

Green | ON | Damper open

Green | Blinks | Damper is opening

Yellow | ON | Damper closed

Yellow | Blinks | Damper is closing

White TX | ON | PL data sent

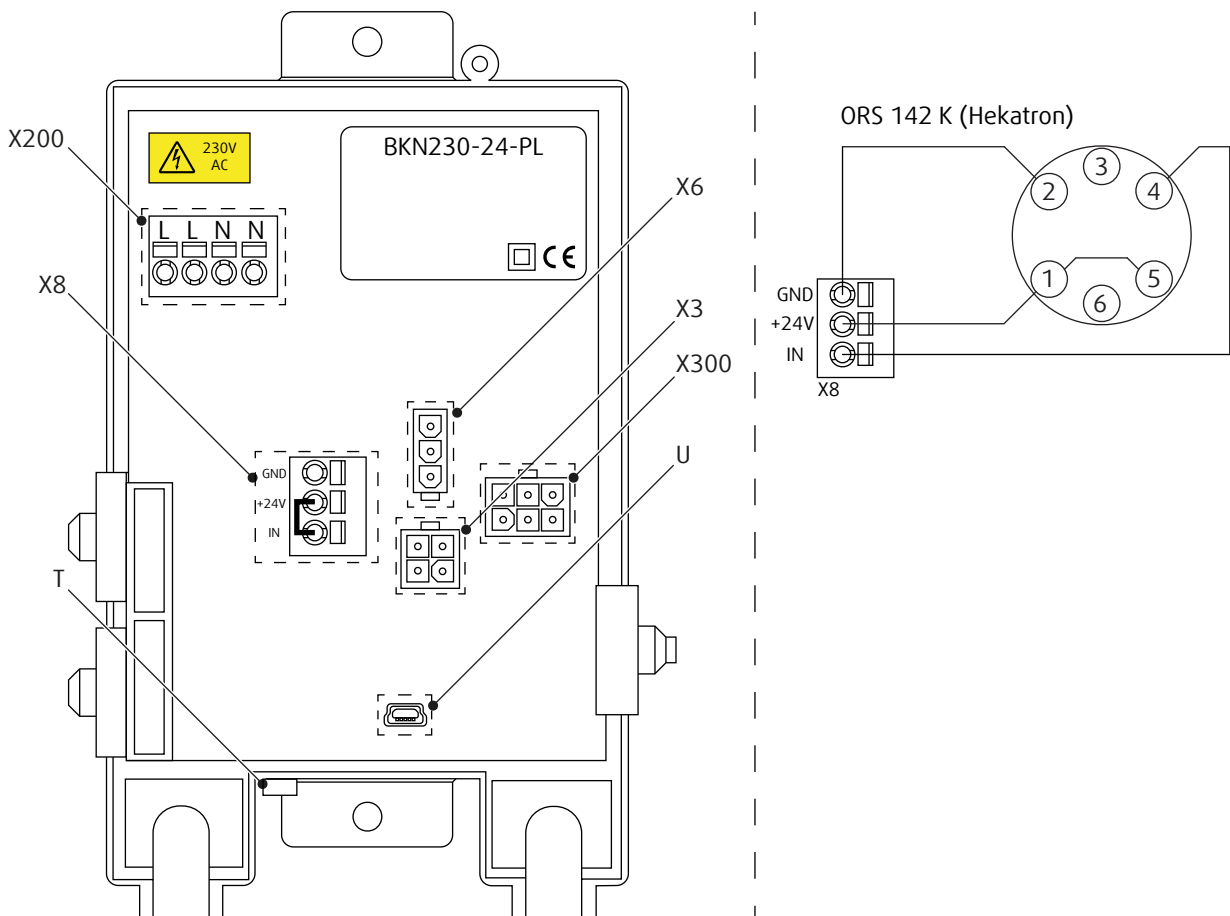
White RX | ON | PL data received

Red | ON | Error saved

Red | Blinks | Error present

Blue | ON | Device in Bootloader mode

Blue | Blinks | Identified by the master



### Legend for Activation Type BST10

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 (motor 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

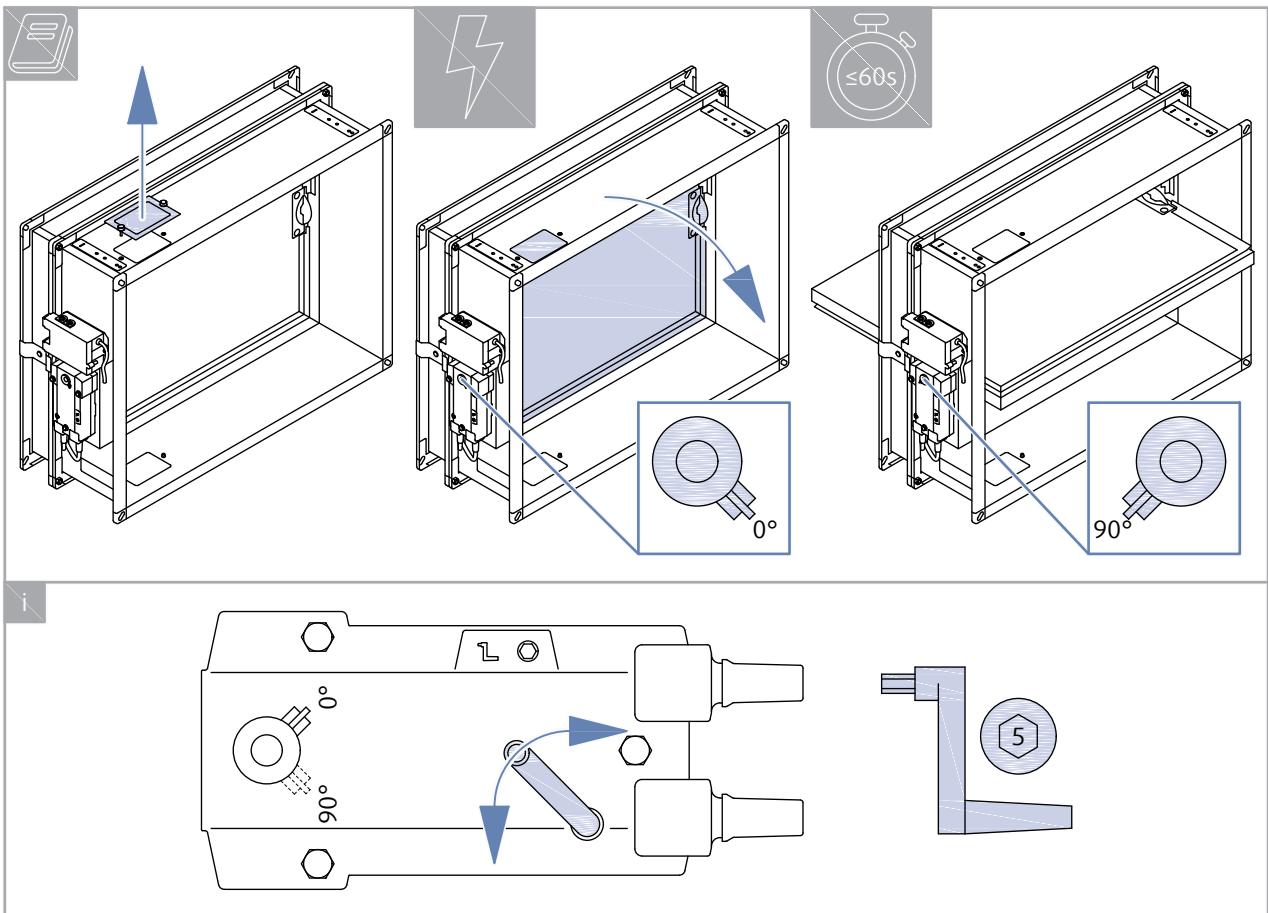
## Functionality Check

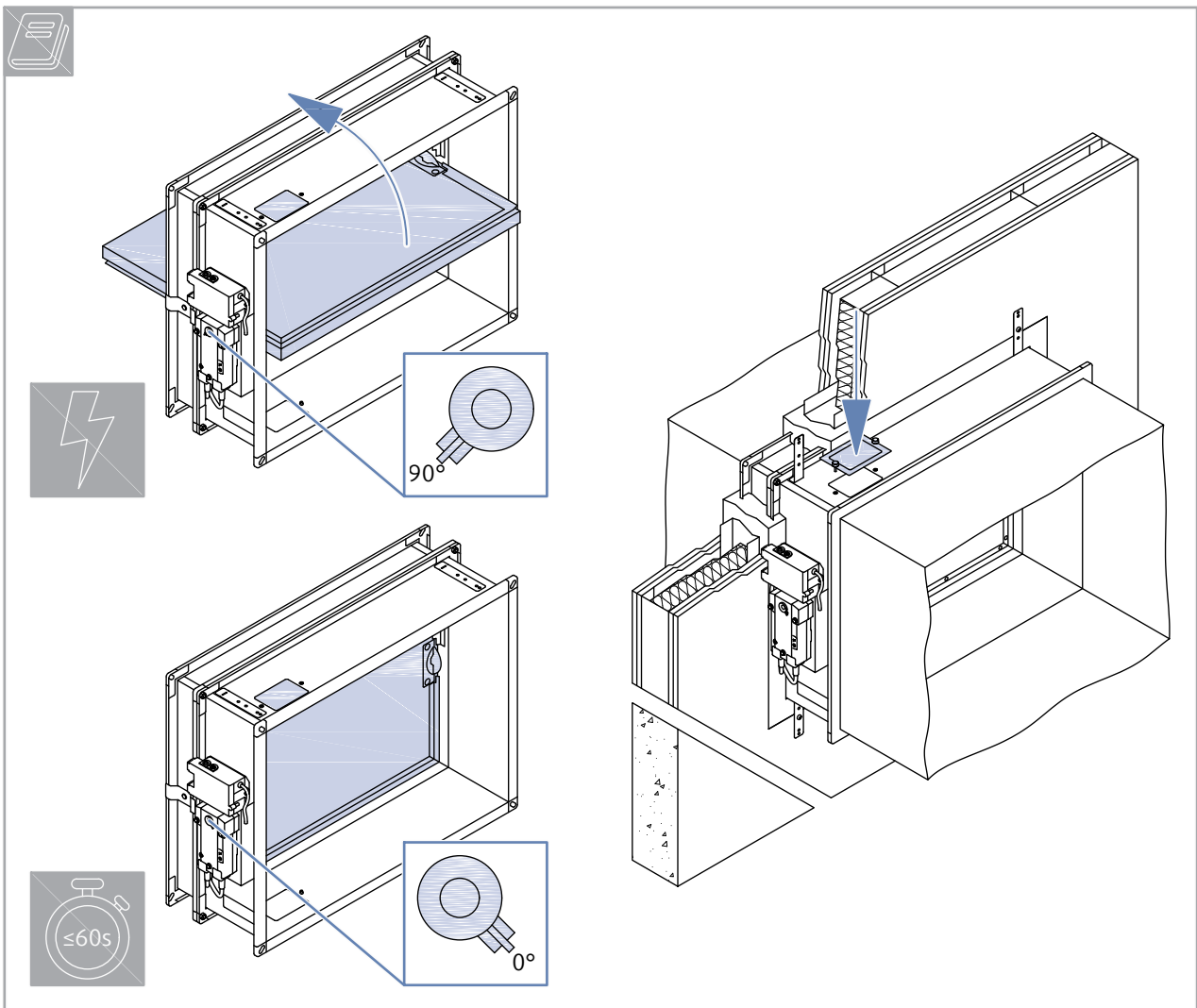
Before and after you install the damper, make sure that the damper's functionality is checked. The functionality is checked by:

1. Refer to the "Electrical connections" section to prepare the actuator connection.
2. Opening the damper:
  - Remove the inspection opening lid by unscrewing two screws.
  - Depending on the activation type the opening follows based on the correct signal from e.g. BKSE24-6, correct voltage ( $Y = 10\text{ V}$ ) or by connecting supply wires as per wiring diagram, the actuator moves to the OPEN position.
  - The blade must move to the fully open position in 60 seconds or less. Then, the blade must stay locked.
  - After the blade is in its end position, the related signaling circuit sets to on. Make sure that you receive the open signal or wires S1 and S2 are connected.

**NOTE:** The actuator can be moved to open position with manual crank supplied with the actuator.

3. Closing the damper:
  - Depending on the activation type the closing follows based on the correct signal from e.g. BKSE24-6, correct voltage ( $Y = 2\text{ V}$ ) or by connecting supply wires as per wiring diagram, the actuator moves to the OPEN position.
  - The blade must move to the fully closed position in 60 seconds or less.
  - After the blade is in closed position, the related signaling circuit sets to on. Make sure that wires S4 and S6 are connected.
4. Put the damper into its operating position - "open" or "closed" based on the use of the product.
5. After the installation close the inspection opening with the removed lid with previously removed screws.





## Damper Inspection

**CAUTION:** Never perform inspection when there is air flowing in the duct connected to the smoke control 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 6 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 smoke control 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 an initial check. This check obeys the same conditions as the six-month inspections.

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

- The damper housing
- The actuator 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 12101)

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 "Smoke Damper 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 SHEVS (Smoke and Heat Exhaust Ventilation 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

Any deviations from the technical specifications contained on our website, handbook 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. Current information on all products is available on [design.systemair.com](http://design.systemair.com).

