Smoke control damper

EK-JZ

according to EN12101-8

Declaration of Performance DoP / EK-JZ / DE / 006

TROX® TECHNIK

The art of handling air

Read the instructions prior to performing any task!

TROX GmbH
Heinrich-Trox-Platz
47504 Neukirchen-Vluyn
Germany
Phone: +49 (0) 2845 202-0
Fax: +49 (0) 2845 202-265
E-mail: trox-de@troxgroup.com
Internet: http://www.troxtechnik.com

Translation of the original
A00000061302, 3, GB/en
01/2024

Valid from 01/2024

General information

About this manual

This operating and installation manual enables operating or service personnel to correctly install the TROX product described below and to use it safely and efficiently.

This operating and installation manual is intended for use by fitting and installation companies, in-house technicians, technical staff, instructed persons, and qualified electricians or air conditioning technicians.

It is essential that these individuals read and fully understand this manual before starting any work. The basic prerequisite for safe working is to comply with the safety notes and all instructions in this manual.

The local regulations for health and safety at work and general safety regulations also apply.

This manual must be given to the system owner when handing over the system. The system owner must include the manual with the system documentation. The manual must be kept in a place that is accessible at all times.

Illustrations in this manual are mainly for information and may differ from the actual design.

Copyright

TROX Technical Support

To ensure that your request is processed as quickly as possible, please keep the following information ready:

- Product name
- TROX order number
- Delivery date
- Brief description of defect or issue

Online	*www.trox.de*
Phone	+49 2845 202-0

Limitation of liability

The information in this manual has been compiled with reference to the applicable standards and guidelines, the state of the art, and our expertise and experience of many years.

The manufacturer does not accept any liability for damages resulting from:

- Non-compliance with this manual
- Incorrect use
- Operation or handling by untrained individuals
- Unauthorised modifications
- Technical changes
- Use of non-approved replacement parts

The actual scope of delivery may differ from the information in this manual for bespoke constructions, additional order options or as a result of recent technical changes.

The obligations agreed in the order, the general terms and conditions, the manufacturer's terms of delivery, and the legal regulations in effect at the time the contract is signed shall apply.

We reserve the right to make technical changes.

Warranty claims

The provisions of the respective general delivery terms apply to warranty claims. For purchase orders placed with TROX GmbH, these are the regulations in section "VI. Warranty claims" of the Delivery Terms of TROX GmbH, see *www.trox.de/en/* .

Safety notes

Symbols are used in this manual to alert readers to areas of potential hazard. Signal words express the degree of the hazard.

Comply with all safety instructions and proceed carefully to avoid accidents, injuries and damage to property.

DANGER!
Imminently hazardous situation which, if not avoided, will result in death or serious injury.

WARNING!
Potentially hazardous situation which, if not avoided, may result in death or serious injury.

CAUTION!
Potentially hazardous situation which, if not avoided, may result in minor or moderate injury.

NOTICE!
Potentially hazardous situation which, if not avoided, may result in property damage.

ENVIRONMENT!
Environmental pollution hazard.

Tips and recommendations

Useful tips and recommendations as well as information for efficient and fault-free operation.

Safety notes as part of instructions

Safety notes may refer to individual instructions. In this case, safety notes will be included in the instructions and hence facilitate following the instructions. The above listed signal words will be used.

Example:

1. Loosen the screw.
2. **CAUTION!**
   Danger of finger entrapment when closing the lid.
   Be careful when closing the lid.
3. Tighten the screw.

Specific safety notes

The following symbols are used in safety notes to alert you to specific hazards:

Warning signs	Type of danger
	Warning – danger zone.

1 Safety

1.1 General safety notes

Sharp edges, sharp corners and thin sheet metal parts

CAUTION!

Danger of injury from sharp edges, sharp corners and thin sheet metal parts!

Sharp edges, sharp corners and thin sheet metal parts may cause cuts or grazes.

– Be careful when carrying out any work.
– Wear protective gloves, safety shoes and a hard hat.

Electrical voltage

DANGER!

Danger of electric shock! Do not touch any live components! Electrical equipment carries a dangerous electrical voltage.

– Only skilled qualified electricians are allowed to work on the electrical system.
– Switch off the power supply before working on any electrical equipment.

1.2 Correct use

Smoke control dampers type EK-JZ are used to remove smoke or heat and to supply air in the event of an incident within smoke and heat exhaust systems.
Daily use for room air change is possible within the described operating conditions (ambient temperature, humidity).

- Smoke control dampers type EK-JZ may be used in the following systems:
  – in pressure differential systems
  – in mechanical (i.e. powered) smoke exhaust systems
  – in heat exhaust systems
- Suitable for use in combined systems (combination damper) for ventilation.
- Operation of smoke control dampers is allowed only in compliance with the Declaration of Performance (DoP) and these installation and operating instructions.
- Modifying the smoke control damper or using replacement parts that have not been approved by TROX is not permitted.

Incorrect use

WARNING!

Danger due to incorrect use!

Incorrect use of the smoke control damper can lead to dangerous situations.

Never use the smoke control damper:

– in areas with potentially explosive atmospheres
– outdoors without sufficient protection against the effects of weather and outside of temperature limits
– in atmospheres where chemical reactions, whether planned or unplanned, may cause damage to the smoke control damper or lead to corrosion

1.3 Qualified staff

WARNING!

Danger of injury due to insufficiently qualified individuals!

Incorrect use may cause considerable injury or damage to property.

– Only specialist personnel must carry out work.

The following degrees of qualification are required for the work described in the operating manual:

Skilled qualified electrician
Skilled qualified electricians are individuals who have sufficient professional or technical training, knowledge and actual experience to enable them to work on electrical systems, understand any potential hazards related to the work under consideration, and recognise and avoid any risks involved.

Trained personnel
Trained personnel are individuals who have sufficient professional or technical training, knowledge and actual experience to enable them to carry out their assigned duties, understand any potential hazards related to the work under consideration, and recognise and avoid any risks involved.

2 Technical data

2.1 General data

Nominal sizes B × H	200 × 230 to 1200 × 2030 mm
Casing length	250 mm
Flow rate range at maximum upstream velocity	up to 920 l/s or 3310 m³/h up to 29230 l/s or 105235 m³/h
Differential pressure range	Pressure level 2, -1000...500 Pa
Operating temperature	-30 °C – 50 °C without temperatures below the dew point
Upstream velocity with uniform upstream and downstream flow	■ ≤ 20 m/s up to B 1200 × H 1830 mm ■ ≤ 12 m/s at maximum dimension, otherwise technical clarification required.
Closed damper blade air leakage	EN 1751, Class 3
Casing air leakage	EN 1751, Class C
Normative basics	■ EU Construction Products Regulation No. 305/2011 ■ EN 12101-8 – Smoke and heat control systems – Part 8: Smoke control dampers ■ EN 1366-10 – Fire resistance tests for service installations – Part 10: Smoke control dampers ■ EN 1366-2 – Fire resistance tests for service installations – Part 2: Fire dampers ■ EN 13501-4 – Classification - Part 4: Fire resistance tests of smoke control systems ■ EN 1751 – Ventilation of buildings - devices of the air distribution system
Declaration of performance	DoP / EK-JZ / DE / 006

Type plate

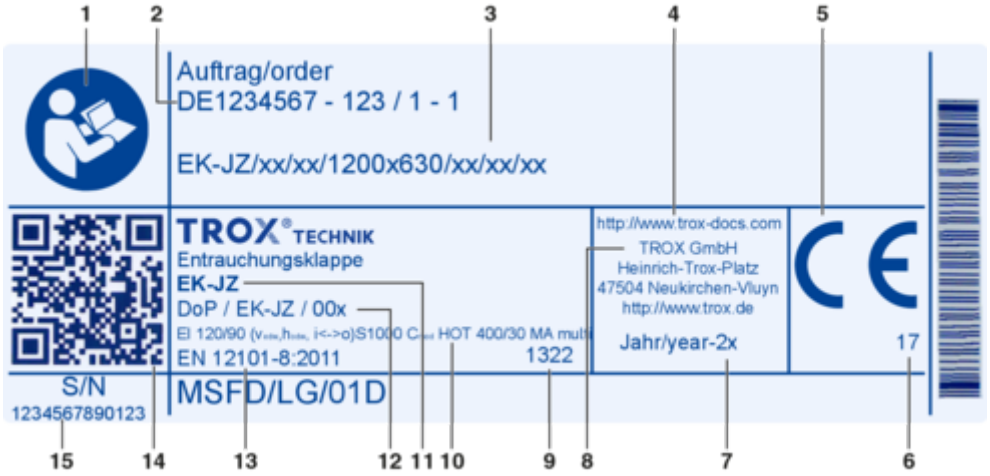


Fig. 1: Smoke control damper type plate (example)

1 Note on observing the operating instructions
2 Order number
3 Order code
4 Website from which the documentation can be downloaded
5 CE mark
6 The last two digits of the year in which the CE marking was affixed
7 Year of manufacture
8 Manufacturer's address
9 Notified body
10 Details of all regulated characteristics. The fire resistance class depends on the application and may vary ↳ *5 'Installation' on page 17*
11 Type
12 No. of the Declaration of Performance
13 Number of the European standard and year of its publication
14 QR code to access the documentation
15 Product identification number

2.2 Dimensions and weights

EK-JZ with standard cover

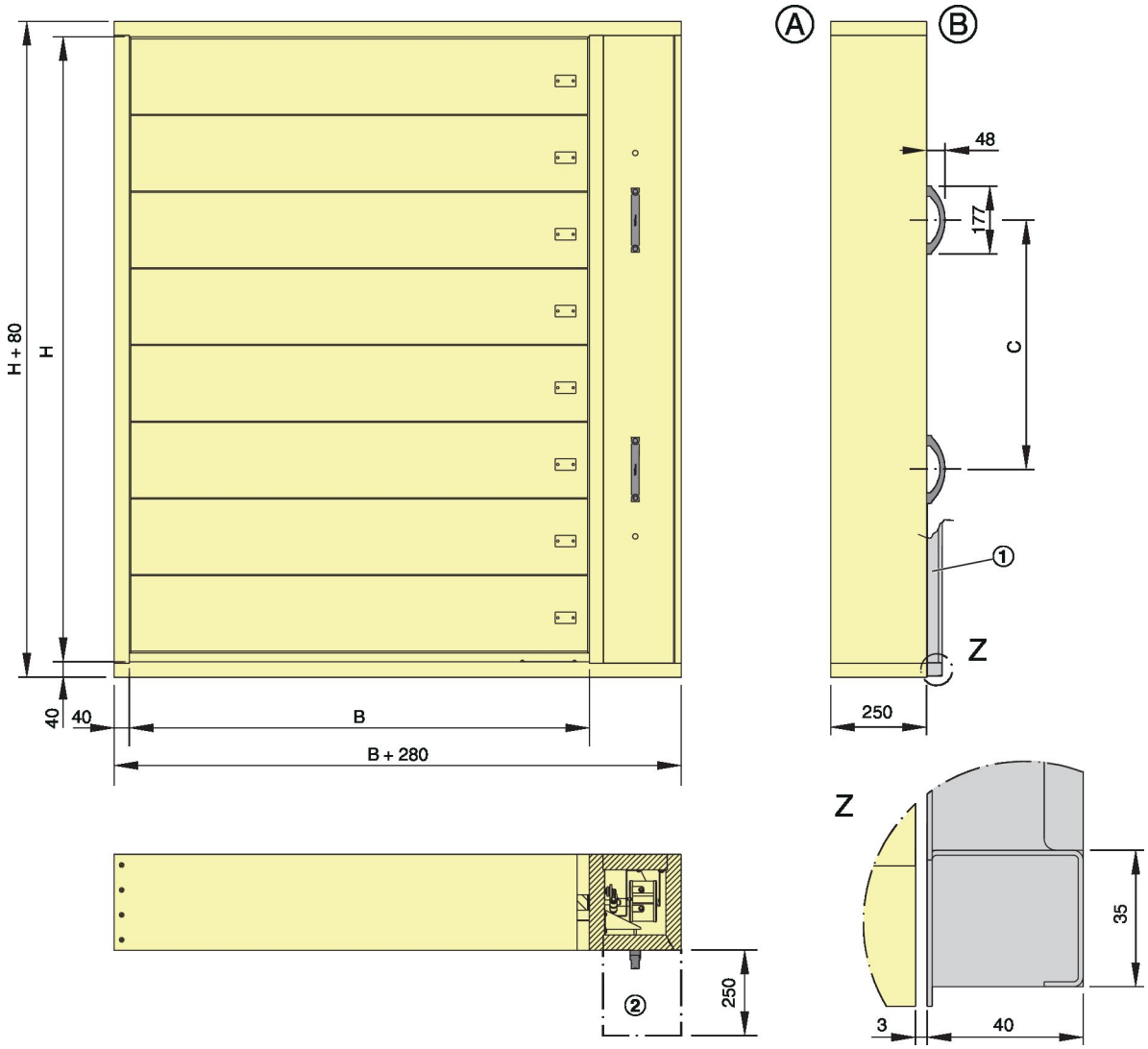


Fig. 2: Dimensions

B x H = nominal size = area exposed to the airflow
① Connecting subframe for smoke extract duct (steel, optional)
② Keep clear to provide access to the actuator encasing
Ⓐ Installation side
Ⓑ Operating side

EK-JZ with side cover

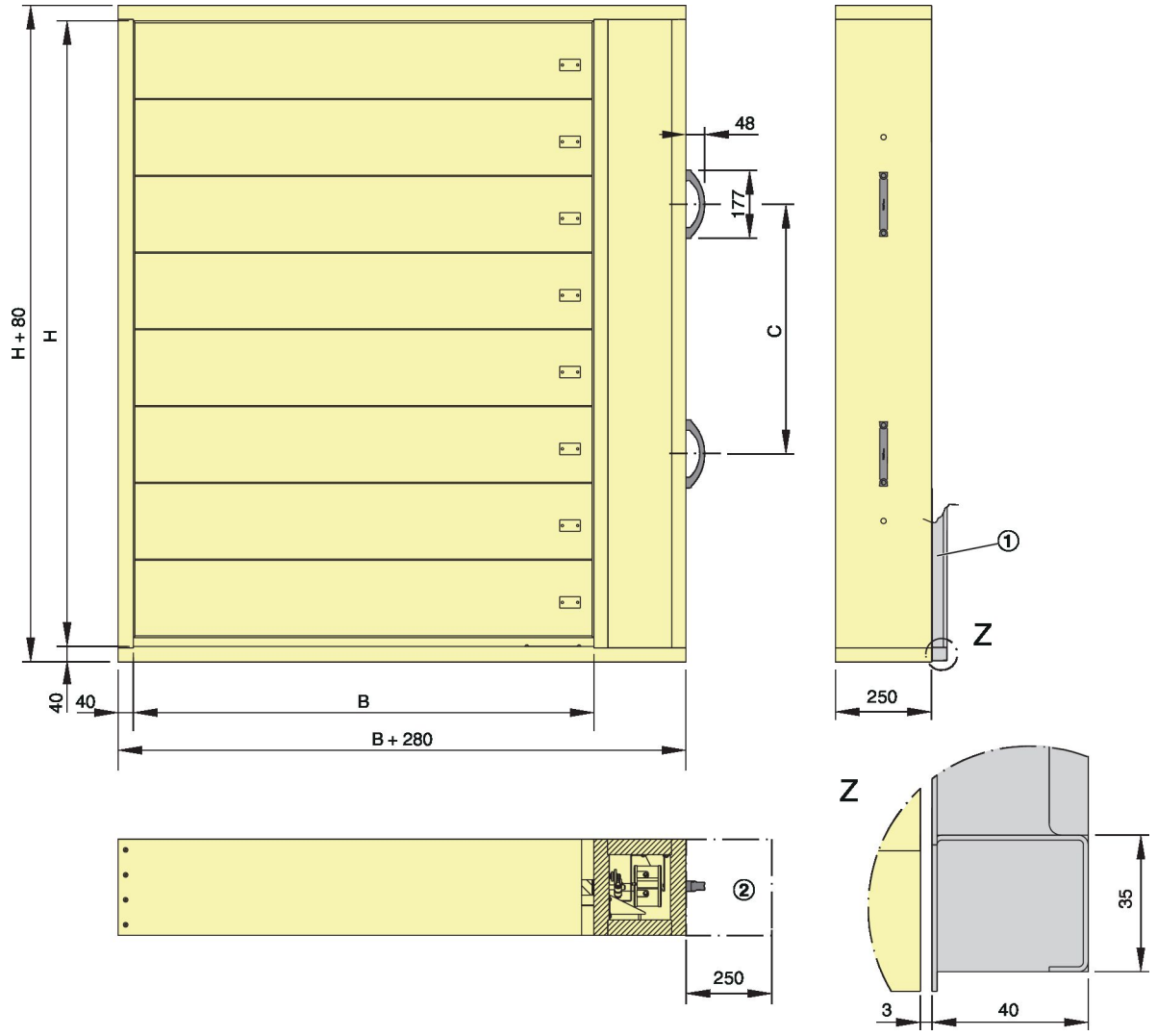


Fig. 3: Dimensions

B x H = nominal size = area exposed to the airflow
① Connecting subframe for smoke extract duct (steel, optional)
② Keep clear to provide access to the actuator encasing

External encasing

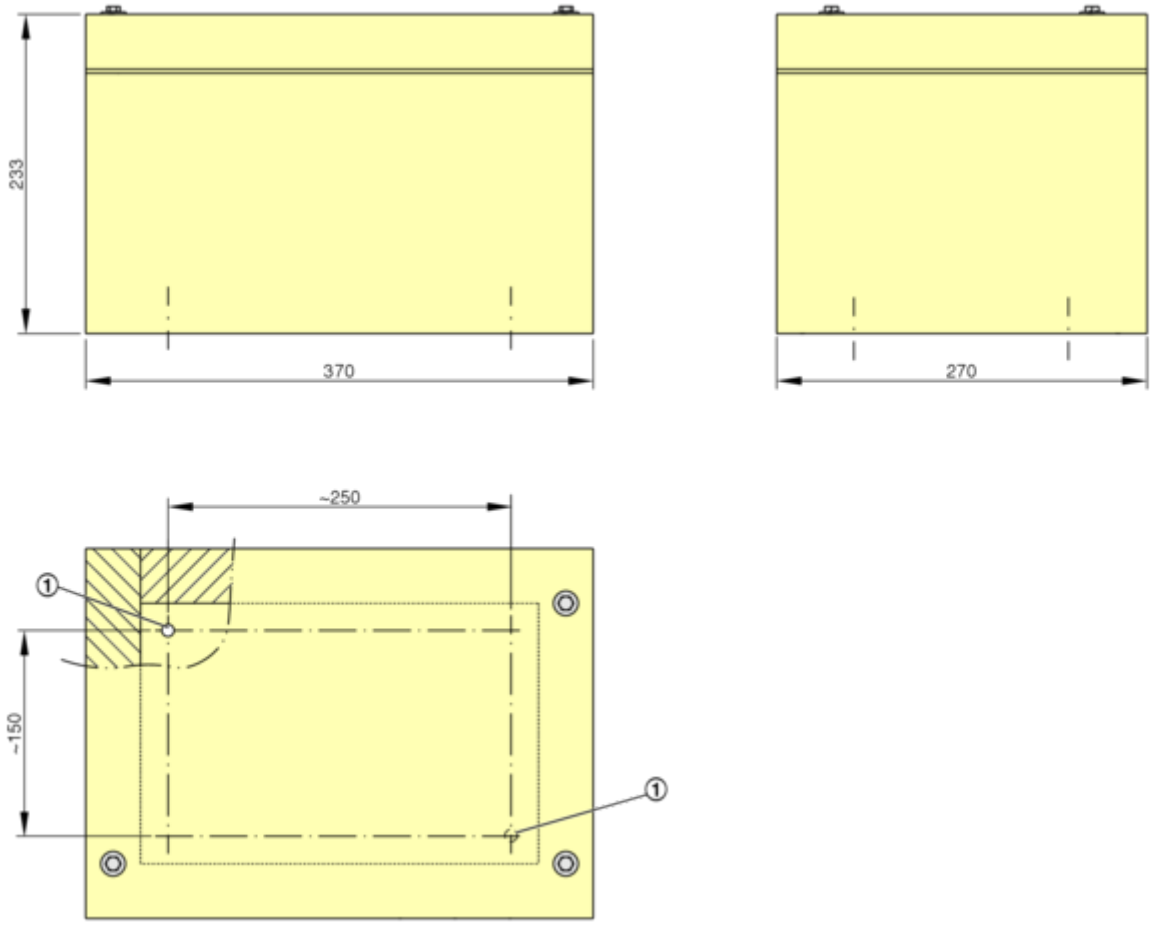


Fig. 4: External encasing for control module, always required for dampers with H=230 mm, optional for other sizes

The external encasing is fixed to the wall with at least 2 screws (diagonally), screw dimensions Ø6 x 100 mm with washers.

Drill a hole (Fig. 4 /1) for fastening on site to fit the screw exactly.

Dimensions [mm]			Number	
B	H	C	Damper blade	Handles
200 – 1200 *	230[1)]	–	1	1
	430		2	1
	630		3	1
	830		4	1
	1030		5	1
	1230		6	1
	1430	550	7	2
	1630	650	8	2
	1830		9	2
	2030		10	2

* B grid size possible in 10 mm steps, 1) for control module external encasing, see Fig. 4

Weight [kg]										
B	H [mm]									
[mm]	230	430	630	830	1030	1230	1430	1630	1830	2030
200	21	29	37	46	54	62	71	79	87	95
250	22	31	39	48	56	65	73	82	91	99
300	23	32	41	50	59	67	76	85	94	103
350	24	33	43	53	61	70	79	88	98	107
400	25	35	44	54	63	73	82	92	101	111
450	27	36	46	56	66	75	85	95	105	114
500	28	38	48	58	68	78	88	98	108	118
550	29	39	50	61	70	81	91	101	112	122
600	30	41	51	62	73	83	94	105	115	126
650	31	42	53	64	75	86	97	108	119	130
700	32	44	55	66	77	89	100	111	122	134
750	34	45	57	69	80	91	103	114	126	137
800	35	47	58	70	82	94	106	118	129	141
850	36	48	60	72	84	97	109	121	133	145
900	37	49	62	75	87	99	112	124	136	149
950	38	51	64	77	89	102	115	127	140	153
1000	39	52	65	78	91	104	117	130	143	156
1050	40	54	67	80	94	107	120	134	147	160
1100	42	55	69	83	96	110	123	137	150	164
1150	43	57	71	85	98	112	126	140	154	168
1200	44	58	72	87	101	115	129	143	158	172

3 Transport and storage

Delivery check

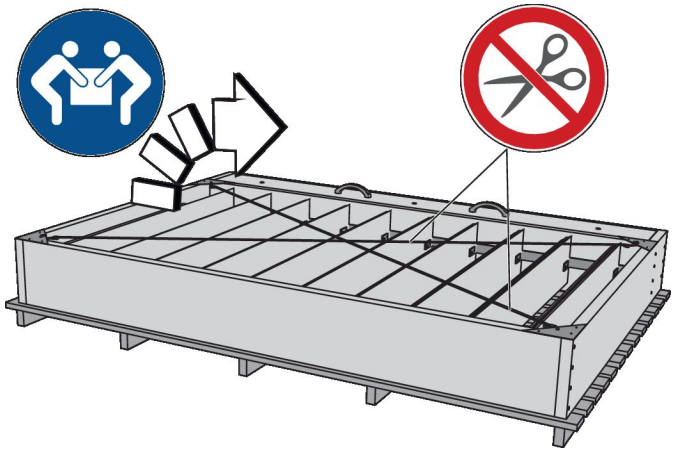
Check delivered items immediately after arrival for transport damage and completeness. In case of any damage or an incomplete shipment, contact the shipping company and your supplier immediately.

A complete shipment includes:

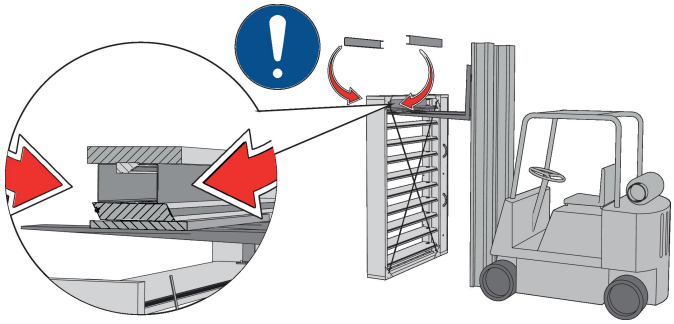
- Smoke control damper(s)
  - Attachments/accessories, if any
- Installation and operating manual (one per shipment)

Transport on site

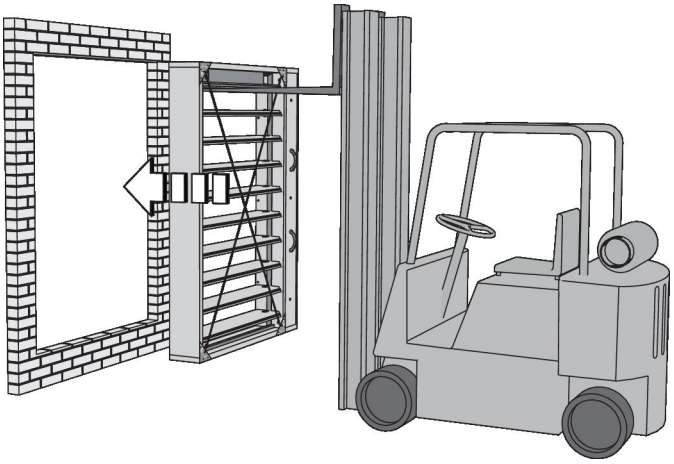
- If possible, take the product in its transport packaging up to the installation location.
- Smaller dampers can be lifted and placed in the installation opening by two people. Ask someone to give you a hand.
- Dampers which are supplied with U channel sections as a transport aid have to be moved with suitable lifting equipment, e.g. a forklift truck.



1. Unpack the damper and place it upright on the floor. Do not remove the straps yet.
   Diagonal tension straps from H≥1230 x B≥700

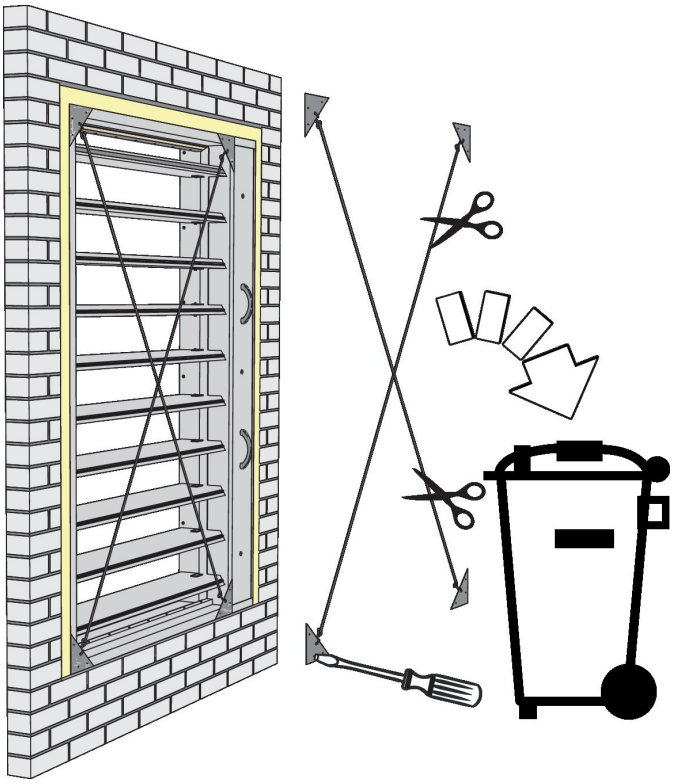


2. Place the U channel sections between the uppermost damper blade and the casing.



3. Move the fork carefully underneath the uppermost damper blade, then lift it. Put a piece of wood or anything similar between the damper blade and the fork so as not to damage the damper blade.

   Carefully lift the smoke control damper with the forklift truck and place it in the installation opening.



4. Once you have installed the smoke control damper, remove the straps; in case of mortar-based installation, remove the straps only after the mortar has cured. Remove the corner protectors. Dispose of the straps and corner protectors.

Bearing

For temporary storage please note:

- Remove any plastic wrapping.
- Protect the product from dust and contamination.

- Store the product in a dry place and away from direct sunlight.
- Do not expose the unit to the effects of weather (not even in its packaging).
- Do not store the product below -30 °C or above 50 °C.

Packaging

Properly dispose of packaging material.

4 Parts and function

4.1 Overview

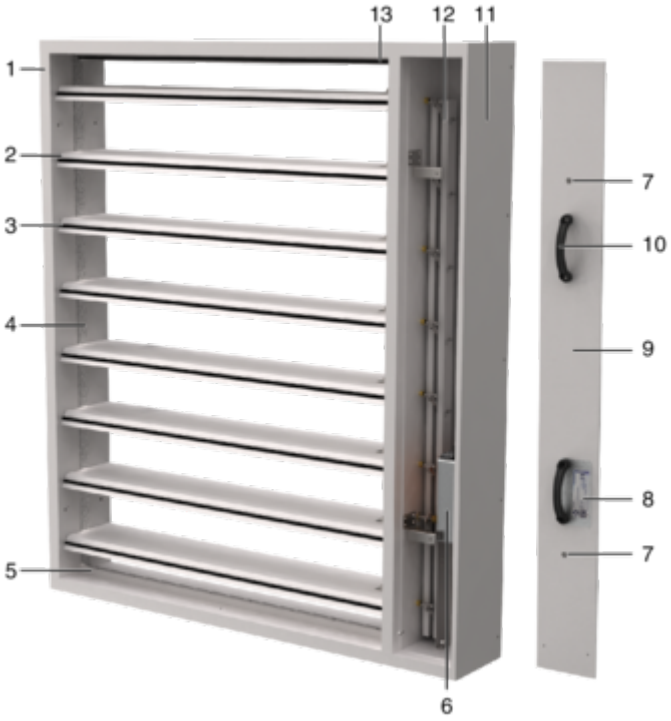


Fig. 5: EK-JZ smoke control damper

1 Casing
2 Damper blades
3 Damper blade profile seal
4 Side seal
5 Travel stop, bottom
6 Actuator
7 Cover fixing
8 Rating plate
9 Cover of the actuator encasing (cover removed)
10 Handle (to remove the cover)
11 Actuator encasing
12 Linkage
13 Travel stop, top

4.2 Functional description

Smoke control dampers are used in mechanical smoke extract systems. They are used for extracting smoke gases and for providing additional supply air to one or more fire compartments.

Smoke control dampers are essentially made from calcium silicate boards, and the electric actuator and the optional control module are encased so that the functional reliability is ensured even in the event of a fire.

Regular maintenance of the smoke control damper is required to ensure its functional reliability *9 'Maintenance' on page 115*.

Smoke extract

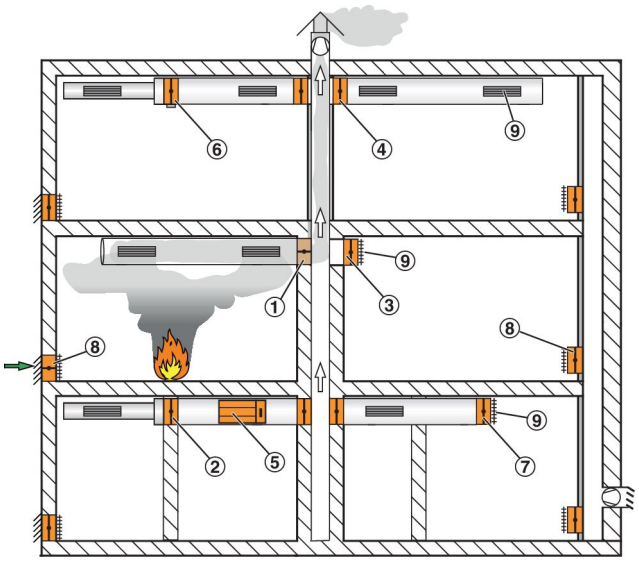


Fig. 6: Smoke extract system

① **EK-JZ** or EK2-EU in solid shaft wall
② **EK-JZ** or EK2-EU in solid wall or duct
③ **EK-JZ** or EK2-EU on solid shaft wall
④ **EK-JZ** or EK2-EU on a vertical smoke extract duct (shaft)
⑤ **EK-JZ** or EK2-EU on a horizontal smoke extract duct
⑥ EK-JS in a horizontal smoke extract duct
⑦ EK-JS at the end of a horizontal smoke extract duct
⑧ **EK-JZ**, EK-JS or EK2-EU as additional supply air inlet
⑨ Cover grilles

Smoke control dampers are completely closed during normal operation. In smoke extraction mode, the smoke control dampers in the affected fire compartment are opened to extract smoke from it. All other smoke control dampers remain closed.

In the event of a fire, smoke control dampers that are used as additional supply air inlets in the affected fire compartment also open so that smoke can be extracted. To ensure the creation of a layer that is nearly free from smoke, smoke control dampers used as additional supply air inlets should be installed near the ground.

The control input signal for the actuator may come from a duct smoke detector or from the central fire alarm system. Using cables with specific circuit integrity for the supply voltage ensures that the actuator is supplied with voltage even in the event of a fire and hence that its function and the communication are maintained.

Supply air and smoke extraction in ventilation systems

When authorised by building authorities or authorised bodies, smoke extract and supply air applications as well as ventilation can be enabled in combined systems with smoke control dampers. Depending on the system layout, the damper blade can be fully opened, fully closed or in the intermediate position. Depending on where the dampers are installed, country-specific regulations may apply to ventilation applications.

5 Installation

5.1 Safety notes regarding installation

Sharp edges, sharp corners and thin sheet metal parts

CAUTION!

Danger of injury from sharp edges, sharp corners and thin sheet metal parts!

Sharp edges, sharp corners and thin sheet metal parts may cause cuts or grazes.

– Be careful when carrying out any work.
– Wear protective gloves, safety shoes and a hard hat.

5.2 General installation information

5.2.1 Occupancy of the installation opening

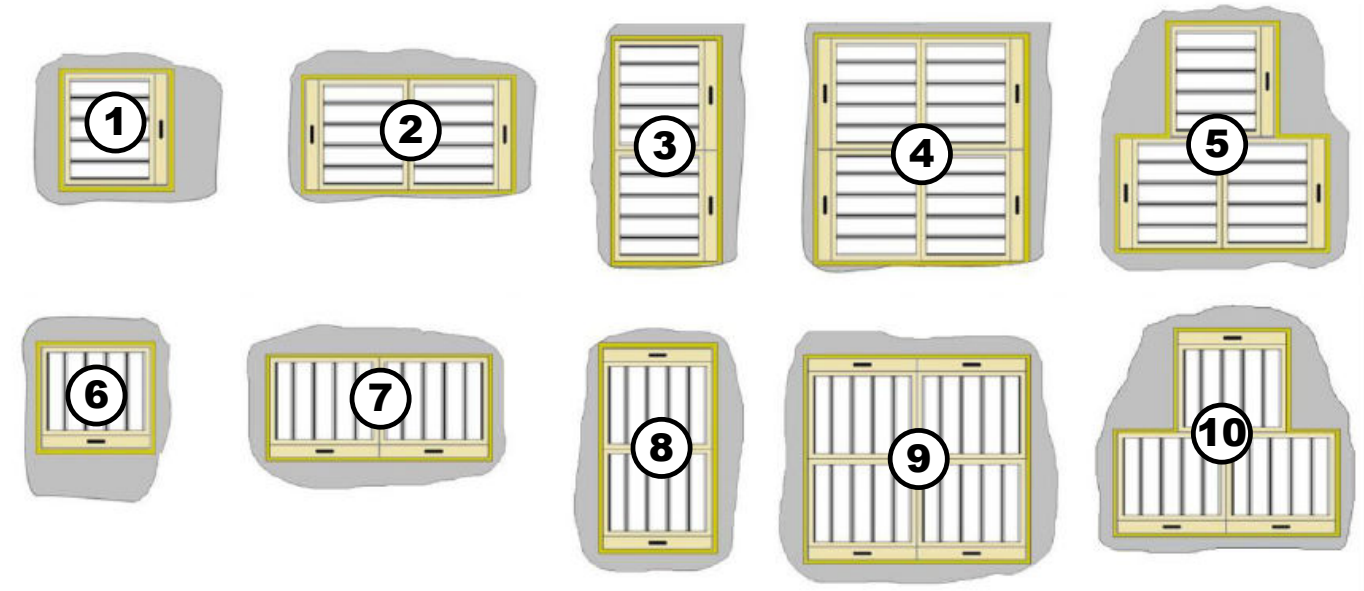


Fig. 7: EK-JZ Occupancy of the installation opening

Occupancy of the installation opening according to supporting structure and installation type

Supporting construction	Classification	Mortar-based / dry mortarless installation	Dry mortar-less instal-lation	Coated board system	Wall instal-lation
Solid wall	EI 120 S	1-10	1-10	–	1-4, 6-9
	EI 90 S			1-10	
Solid shaft wall and external wall	EI 120 S	1-10	1-10	–	1-4, 6-9
	EI 90 S				
Lightweight partition wall, 1-sided clad-ding (lightweight shaft wall)	EI 90 S	1 and 6	–	–	–
Lightweight shaft wall, 1-sided cladding Manufacturer: British Gypsum GypWall Shaft	EI 120 S	–	1-4, 6-9	–	–
Lightweight shaft wall, 2-sided cladding (for accessible shaft)	EI 120 S	1-10	1-10	–	–
	EI 90 S				
Lightweight partition wall, 2-sided clad-ding	EI 120 S	1-10	1-10	–	–
	EI 90 S			1-10	
Concrete ceilings	EI 120 S	1 * and 6 *			

1 and 6 = single damper; 2 to 4 and 7 to 10 = multiple occupancy of the installation opening; * mortar-based installation only

- The installation opening can be occupied by one or more dampers.
- For multiple occupancy, dampers must be screwed together, ↬ *5.2.1.1 'Connecting the dampers' on page 20* .
- Dimensioning of the installation opening and installation gap according to the specific installation descriptions.

Occupancy of the smoke extract duct

Type of duct	Classification	Smoke extract duct (Fig. 7)
Independent smoke extract ducts (Multi)	EI 120 S	1 and 6 (2, 3, 7, 8) *
Thermally insulated sheet steel smoke extract duct (Multi)	EI 120 S	1 and 6
Sheet steel smoke extract duct (single)	E600 S	1 and 6

1 and 6 = single damper; * Occupancies with small distances to each other after technical clarification.

Note on the axis position: Before installation, check whether the damper is intended for the intended installation position. This is indicated on the order code of the type plate:

Order characteristic 0 - Installation only in horizontal axis position, damper can be rotated by 180°, position of actuator encasing left or right as desired.

Order characteristic V - Installation in vertical axis position, damper can be rotated by 180°, position of actuator encasing top or bottom as desired. Installation also possible in horizontal axis position.

Please note:

- The smoke control damper must always be installed vertically and horizontally without torsion.
- Forces imposed on the casing can impair the function of the smoke control damper.
- Smoke control damper and electric actuator (encasing) must remain accessible for maintenance.
- For mortar-based installation, the installation gap must must be dimensioned so that mortaring is possible even with thicker walls/ceilings.

! NOTICE!

Damage of smoke control damper

During installation, protect the smoke control damper from contamination and damage.

5.2.1.1 Connecting the dampers

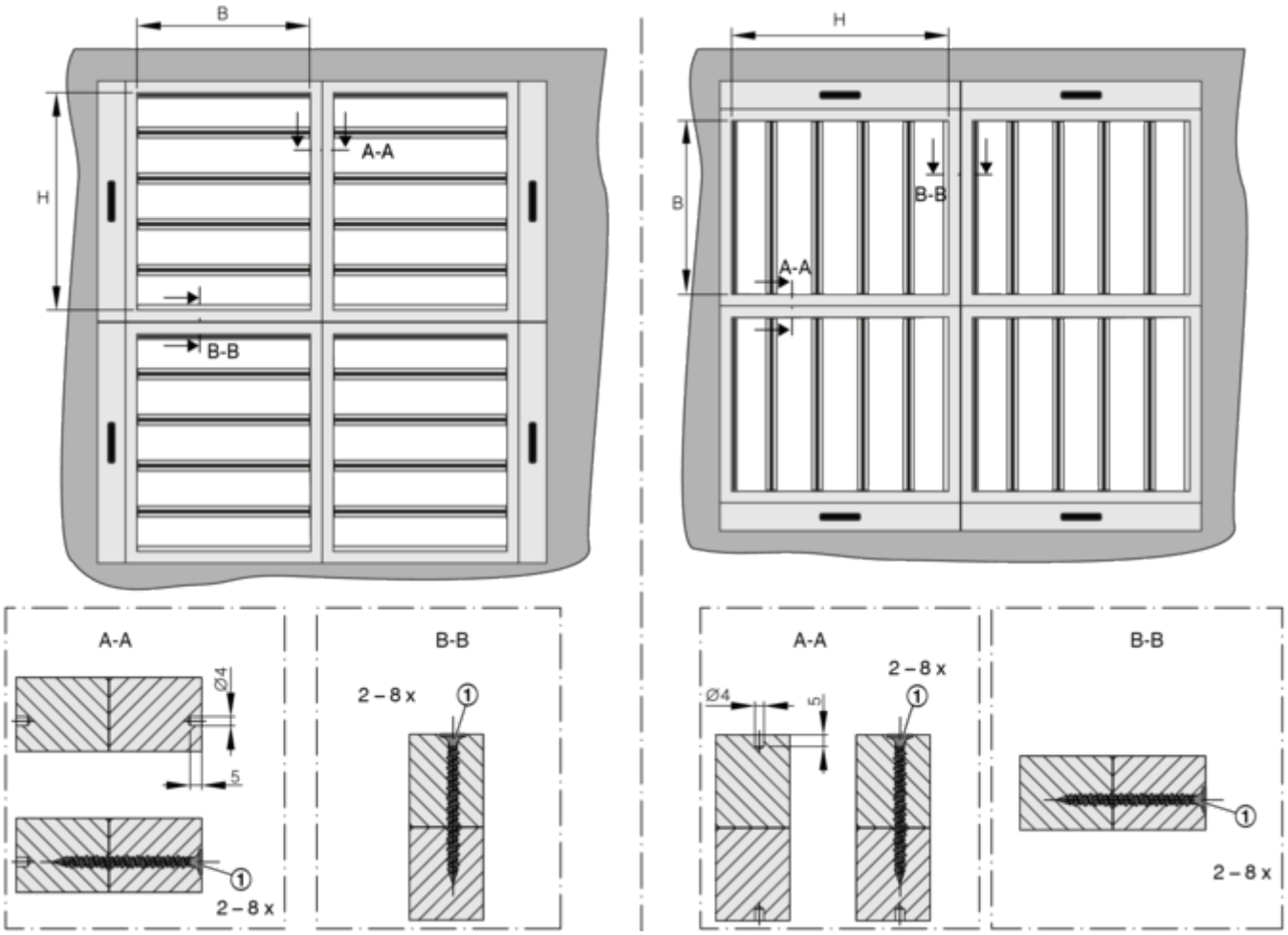


Fig. 8: EK-JZ damper to damper, multiple, horizontal and vertical damper blade axis position

1 Drywall screw 4.5 × 70 mm or 5.0 × 70 mm

For multiple occupancy, dampers must be screwed together.

Detail A-A / B-B:
The damper casing, opposite the actuator box, has marking holes where the dampers must be screwed together. In the damper casing, the screw connections can be freely positioned with edge distance approx. 40 mm and screw distance approx. 200 mm. Pre-drill the holes. Screw in the screws in a staggered way and from both dampers.

NOTICE!

Damage of smoke control damper

The fixing elements must not protrude on the inside of the casing. Any contact with the damper blade will cause damage so that the entire damper unit will need to be replaced.

5.2.2 Notes on installation materials

Installation accessories

The following installation accessories can be selected in the order code (order characteristic 11) to facilitate installation or for smaller installation spaces:
Otherwise, no installation material is included in the scope of delivery.

BS	Description	damper blade shaft
01	Wall fixing tabs (quantity depends on B × H)	H / V
02	Bottom HT seal	H
03	HT seal at bottom, wall fixing tabs (quantity depends on B × H)	H
04	Side HT seal	H
05	Bottom and side HT seals	H
06	HT seal at bottom and side, wall fixing tabs, quantity depends on B × H)	H
07	HT seal on the side, wall fixing tabs, quantity depends on B × H)	H
08	Top HT seal (special)	H
09	HT seal on top (special) and HT seal on the side	H
10	HT seal on top (special), wall fixing tabs (quantity depends on B × H)	H
11	HT seal on top (special) and HT seal on the side, wall fixing tabs (quantity depends on B × H)	H
12	Ceiling fixing tabs (double quantity according to B × H)	H
13	Top HT seal (special)	V
14	Side HT seal and top HT seal (special)	V
15	HT seal on top (special), wall fixing tabs (quantity depends on B × H)	V
16	HT seal on the side and HT seal on top (special), wall fixing tabs (quantity depends on B × H)	V
20	HT seal at bottom, wall fixing tabs (quantity depends on B × H)	V
21	HT seal at bottom and side, wall fixing tabs, quantity depends on B × H)	V

BS = order code detail, H = horizontal, V = vertical

Fixing tab for wall installation

For mortar bed widths of s ≥ 20 mm, attach wall fixing tab to the damper casing and spread them out before mortaring. Wall fixing tabs are not required for smaller installation gaps < 20 mm.

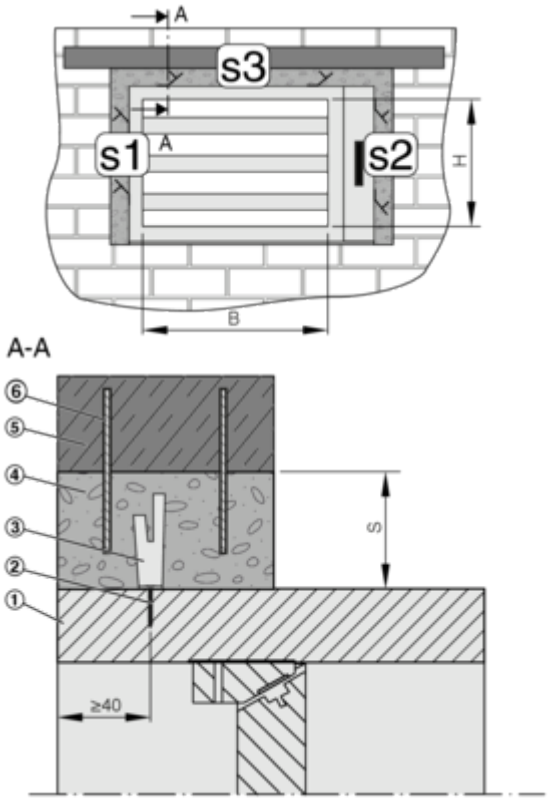


Fig. 9: EK-JZ mortar-based installation with wall fixing tabs

1 EK-JZ
2 Chipboard screw ∅3 × 25 mm (accessory)
3 Wall fixing tab (accessories)
4 Mortar bed
5 Solid shaft wall or solid wall
6 Reinforcement (on site) *
s Mortar bed width (installation gap)

* Recommended minimum thickness of the reinforcement bars > 6 mm at a distance of < 300 mm, with smooth cast concrete surfaces.

The structural safety of the ceiling construction including the connection to the mortar / concrete and any required reinforcement must be evaluated and ensured by the customer.

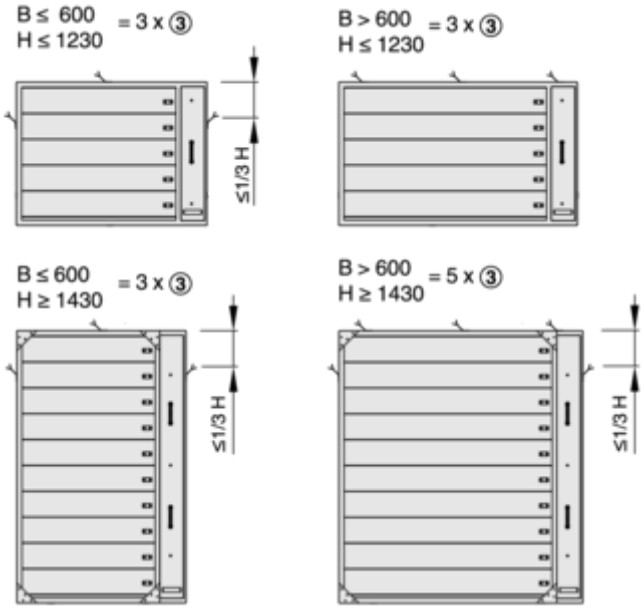


Fig. 10: EK-JZ wall fixing tab positioning

3 Wall fixing tab (accessories)

In case of multiple occupancy, the number of wall fixing tabs according to the individual dampers. Use the same number for vertical axis position, positioning always refers to the installation opening.

Fixing tab for ceiling slab installation

Before mortaring in, attach the wall fixing tabs to the casing and spread them open.

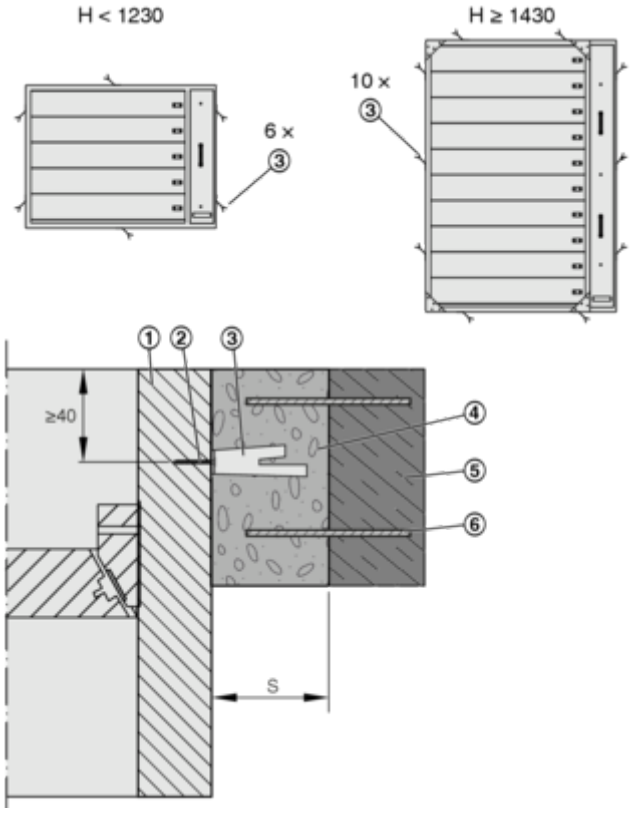


Fig. 11: EK-JZ mortar-based installation with wall fixing tabs

1 EK-JZ
2 Chipboard screw ∅3 × 25 mm (accessory)
3 Wall anchor (accessory), for H ≥ 1430 mm, installation accessories 01 is supplied twice
4 Mortar bed
5 Solid ceiling slab
6 Reinforcement (on site) *
s Mortar bed width (installation gap)

* Recommended minimum thickness of the reinforcement bars > 6 mm at a distance of < 300 mm, with smooth cast concrete surfaces.

The structural safety of the ceiling construction including the connection to the mortar / concrete and any required reinforcement must be evaluated and ensured by the customer.

High-temperature sealing tape

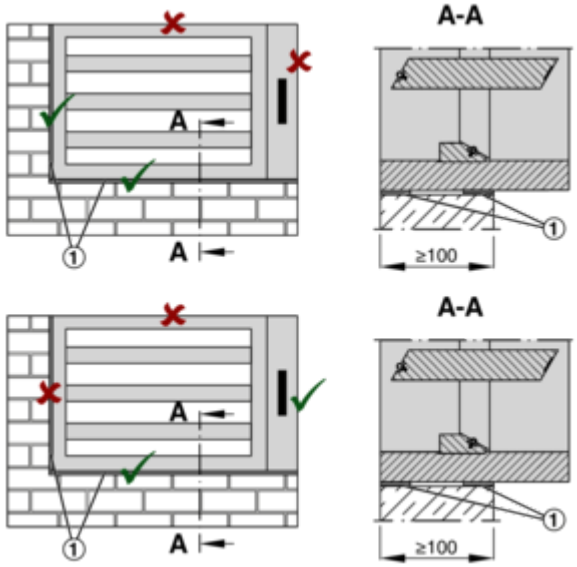


Fig. 12: Affixing the sealing tape

Affix the high-temperature sealing tape (Fig. 12 /1) to the casing in the reveal thickness (flush at front and rear side). If necessary, mark the reveal thickness beforehand.

Permitted use (depending on installation situation)

- S4 down (bottom)
- S1 (left) or S2 (right)

Installation accessories must be ordered separately.

Special high-temperature sealing tape

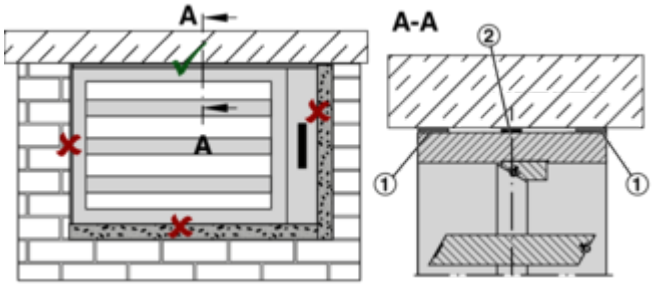


Fig. 13: Affixing the sealing tape

Adhere the high-temperature sealing tape (Fig. 13 /1) in the width of the casing, stick the intumescent seal (Fig. 13 /2) centrally on the damper casing. **Do not glue into the reveal!**

The HT sealing tape special is to be used exclusively in the upper area gap S3.

Installation accessories must be ordered separately.

Mineral wool infill

As filling material, use mineral wool with a bulk density or tamping density ≥ 100 kg/m³ and a melting point ≥ 1000 °C.

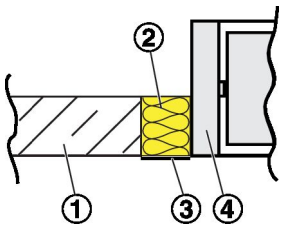


Fig. 14: Installation gap

① Wall
② Mineral wool up to max. 40 mm
③ Firestop coating (if required)
④ EK-JZ

The installation gap (mineral wool) can be filled with a firestop coating from various manufacturers:

- Hilti:
  - Firestop coating CFS-CT
- HENSEL:
  - Firestop coating HENSOMASTIK 5 KS Farbe
- Promat:
  - Firestop coating Promastop-CC

Mortars for mortar-based installation

In case of mortar-based installation, the cavities between the fire damper casing and the wall or ceiling must be completely filled with mortar. Entrapped air must be avoided. The mortar bed depth must be at least 100 mm; we recommend filling the mortar bed to the wall thickness.

The following mortars are acceptable:

- DIN 1053: Groups II, IIa, III, IIIa; or fire protection mortar of groups II, III
- EN 998-2: Classes M 2.5 to M 10 or fire protection mortar of classes M 2.5 to M 10
- Alternatively, use equivalent mortar to the above standards, gypsum mortar or concrete, such as FirePro® FireStop Compound mortar tested to BS 476 Part 20:1987

Impregnation and coating

Impregnation (included in the supply package unless otherwise agreed) or coating of the smoke control damper for colour adjustment is acceptable if:

- The mass per unit area ≤ 1.0 kg/m²
- or coating thickness ≤ 1.0 mm
- Apply only to calcium silicate surfaces, do not coat seals!
- **Impregnation:**
  - Promat GmbH - SR Impregnation (order code C1)
- **Coating**
  - commercially available dispersion paint
  - silicate paint (breathable)
  - clay paint (breathable)

5.2.3 Fixing points

The casing of the smoke control damper has pre-drilled screw points that are used to screw the damper to the wall.

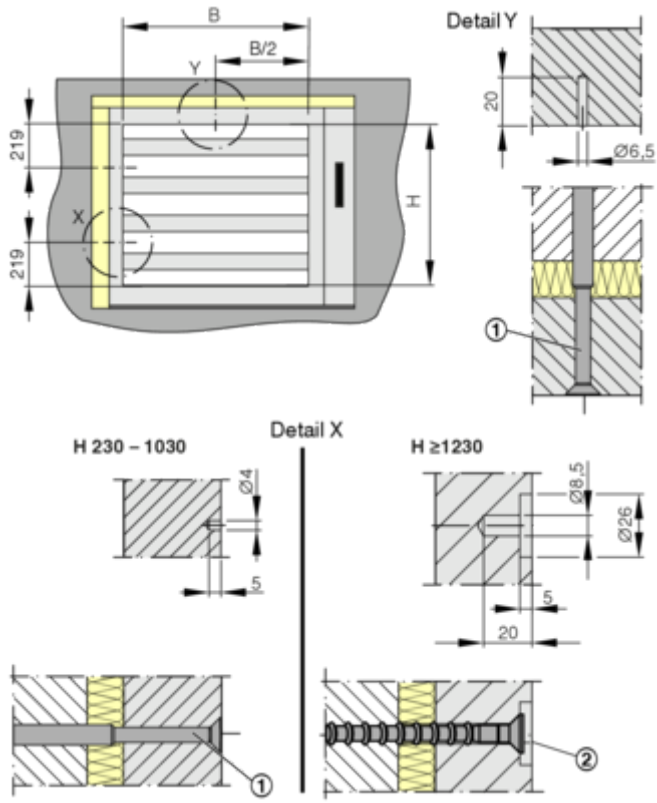


Fig. 15: EK-JZ pre-drilled attachment options

1 e.g. concrete screw with countersunk head
2 Screw anchor with countersunk head, e.g. Hilti HUS-CR 8 or equivalent

! NOTICE!

Damage of smoke control damper

The fixing elements must not protrude on the inside of the casing. Any contact with the damper blade will cause damage so that the entire damper unit will need to be replaced.

Additional fixing points

If the pre-drilled fixing points cannot be used or additional drilled holes in the casing are needed, these must be provided as follows.

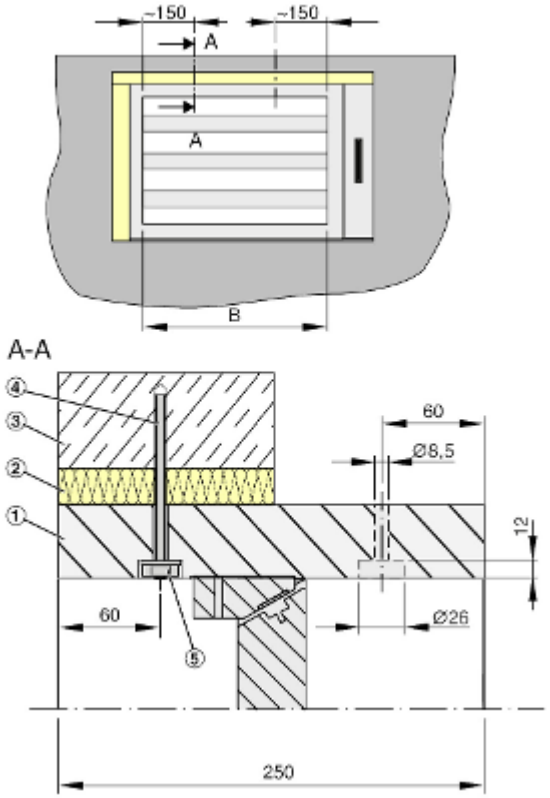


Fig. 16: Create additional fixing options

1 EK-JZ
2 Mineral wool up to max. 40 mm or high temperature sealing tape (HT)
3 Solid shaft wall or solid wall
4 Fire protection approved wall plug with threaded bolt M8
5 Washer, nut M8

Number of fixing points

B < 800 mm - 1 Fixing point

B ≥ 800 mm - 2 Fixing points

! NOTICE!

Damage of smoke control damper

The fixing elements must not protrude on the inside of the casing. Any contact with the damper blade will cause damage so that the entire damper unit will need to be replaced.

5.3 Solid walls, shaft walls and exterior walls

5.3.1 General information

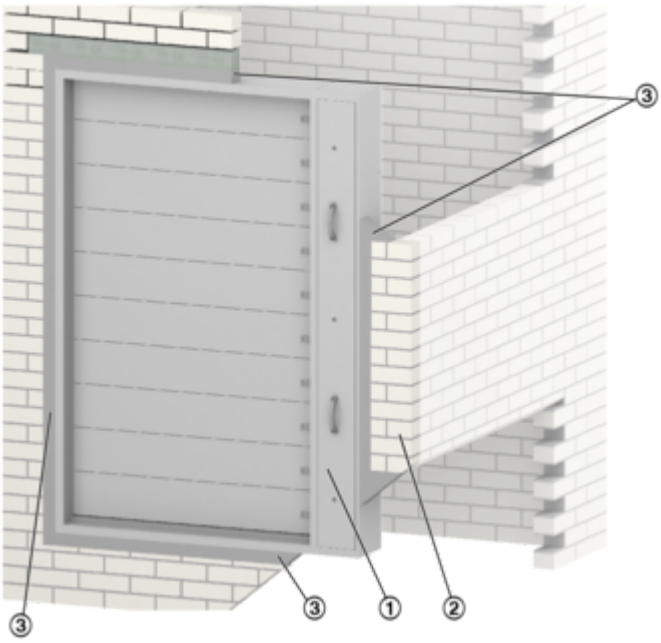


Fig. 17: Installation example EK-JZ in solid shaft wall, installation type mortar-based

1 EK-JZ
2 solid shaft wall
3 Installation gap, for example mortar

Arrangement of the damper(s) in the installation opening ↳ *Chapter 5.2.1 ‘ Occupancy of the installation opening’ on page 18*

Solid walls or solid shaft walls

- Solid walls or solid shaft walls made of, for example, concrete, aerated concrete, brickwork gross density ≥ 500 kg/m³.
- Wall thickness W ≥ 100 mm.
- Provide each installation opening according to the local and structural conditions and with regard to the dimensions of the smoke control damper.

For installation applications with the HT sealing tape installation accessory, the reveal of the installation opening must be level and plumb on the relevant sides. Calcium silicate boards or plasterboard fire protection panels can be used to meet this requirement.

Installation opening

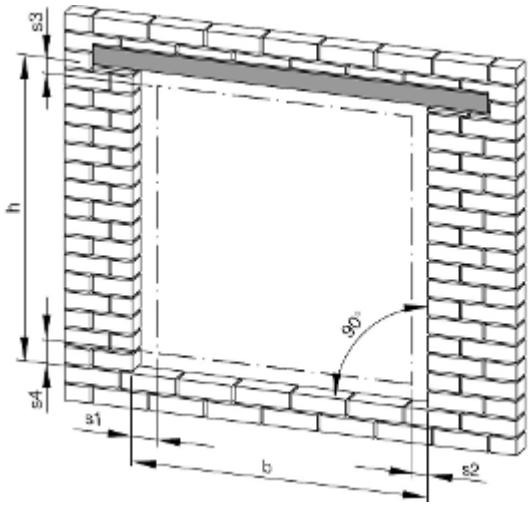
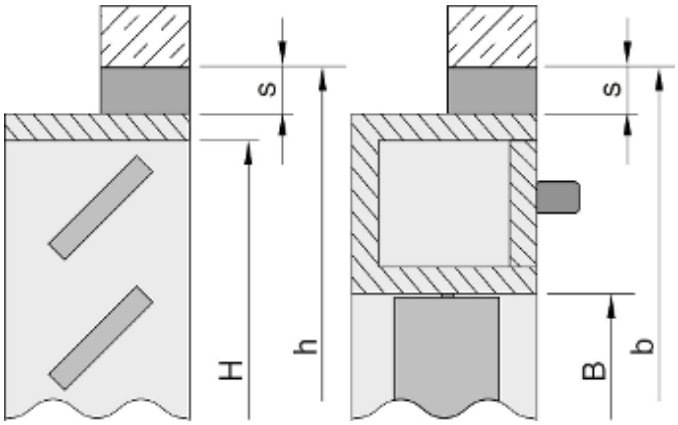
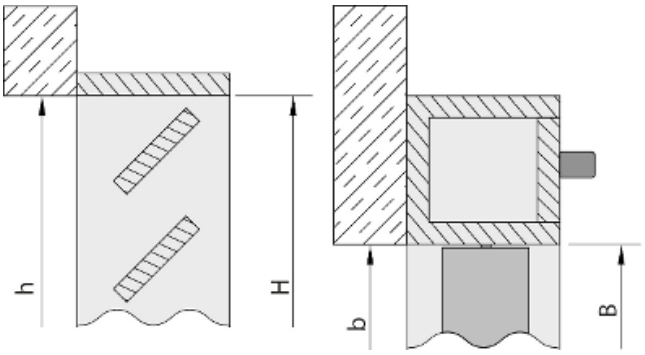


Fig. 18: Ideal installation opening

in **solid wall or shaft wall**	**on** **solid wall, shaft wall or fire-resistant smoke extract duct**
	
b = [B + 280 mm] + s1 + s2	b = nominal width B
h = [H + 80 mm] + s3 + s4	h = nominal height H
b / h= [nominal dimension B / H + damper casing] + installation gap The installation gap (s) depends on the filling material used: ■ HT sealing tape or HT sealing tape special: 3-5 mm ■ Mortar: up to 150 mm ■ Mineral wool: 10 to 40 mm	Normally, the installation opening is equal to the nominal size of the smoke control damper. However, the installation opening can also be smaller than the nominal dimension of the damper, e.g. because the height grid does not exactly correspond to the installation opening. In these cases, make sure that there is enough clearance to install the damper.

Adapting the installation opening in solid walls and shaft walls

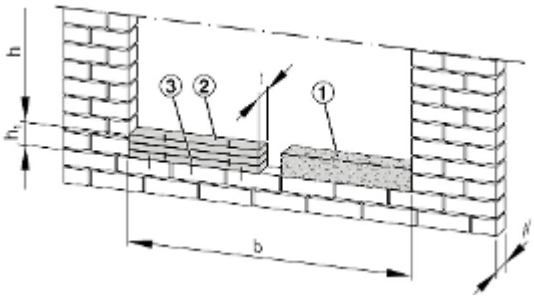


Fig. 19: Installation opening with concrete or calcium silicate boards for height adjustment

t = W (100 mm min., 250 mm max.)
h1 See Table

To adapt the height of the installation opening you can fill in concrete (Fig. 19 /1) or calcium silicate boards (Fig. 19 /2) at the bottom.

Be sure to attach the boards to each other and also to attach them to the brick structure. To do so, use glue or screws (Fig. 19 /3); screws should be at ≤200 mm from each other.

Boards	Thickness [mm]	h_1 [mm]
Promatect MT	40	40 - 200
Promatect LS	35	35 - 210
Promatect H	25	25 - 200
Promatect H	10 - 20	10 - 100

Glue: Promat K84

Additional information upon request.

Installation depths EK-JZ in solid wall or solid shaft wall

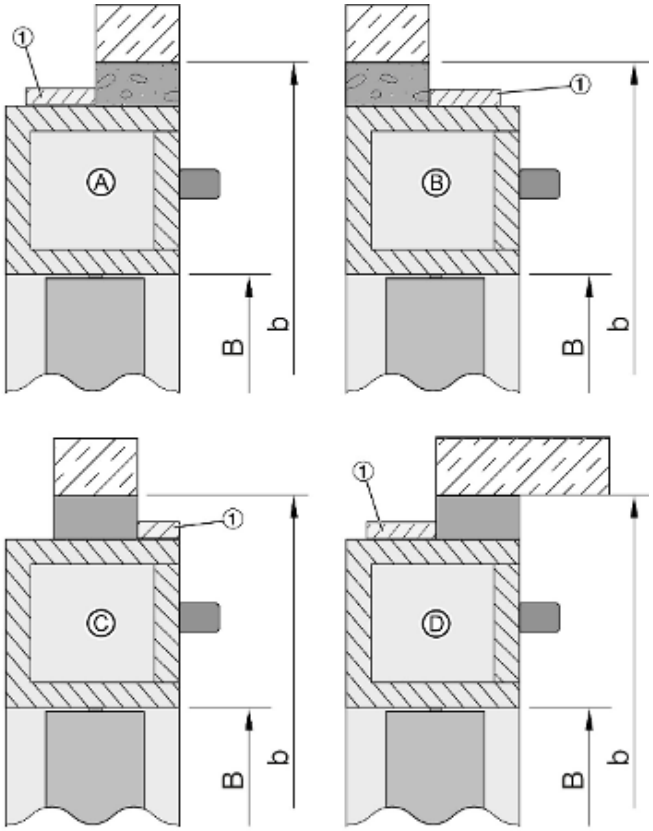


Fig. 20: Installation depths (drawn: section from above)

A Operating side flush
B Rear side flush
C Central position
D Mortar bed flush with operating side
1 **PROMATECT®-LS fire protection panel 20 x 100 mm circumferential, only required for EI 120 S**

5.3.2 Mortar-based / dry mortarless installation

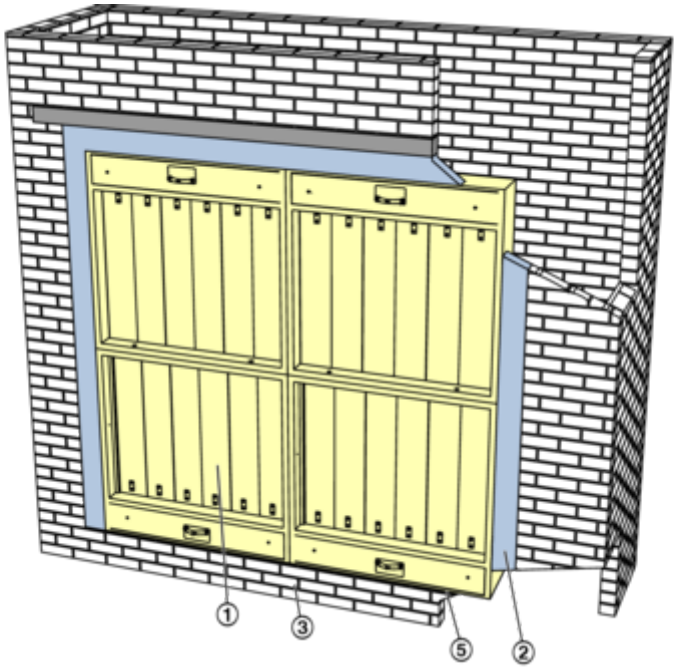
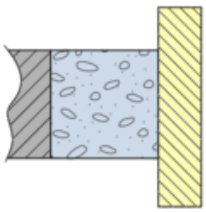
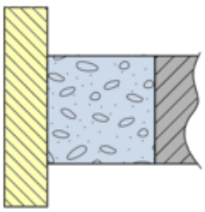
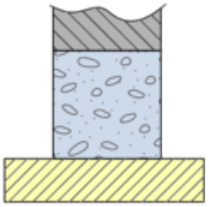
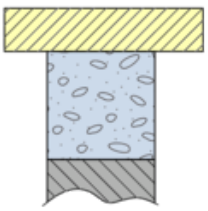


Fig. 21: EK-JZ in solid shaft wall, combined mortar-based/dry mortarless installation EI 120 S

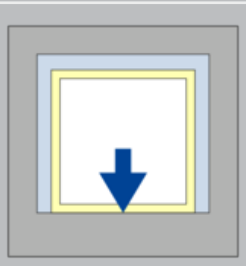
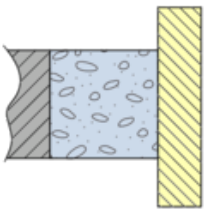
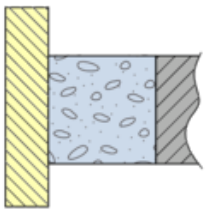
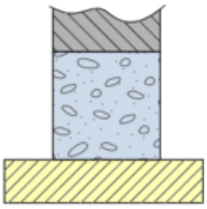
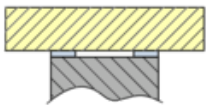
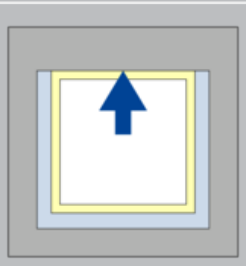
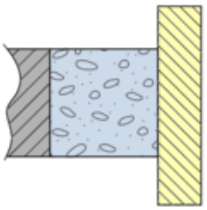
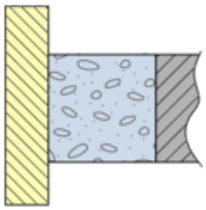
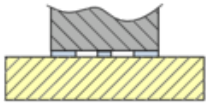
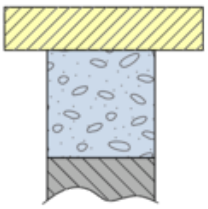
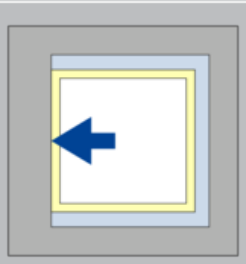
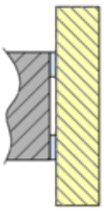
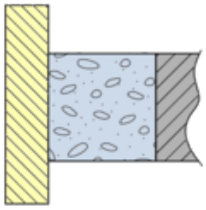
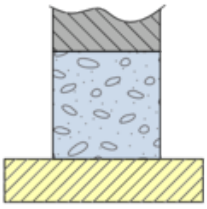
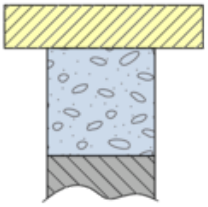
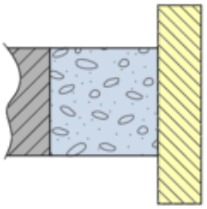
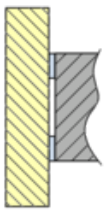
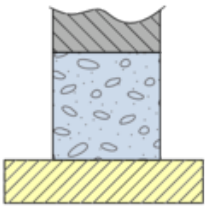
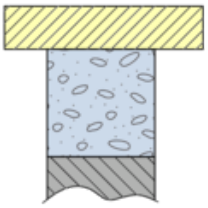
1 EK-JZ *Chapter 5.2.1 ‘ Occupancy of the installation opening’ on page 18*
2 Mortar
3 Solid shaft wall
5 HT sealing tape

Connection of independent smoke extract duct, Fig. 50 , Fig. 51 ,
Sheet steel smoke extract duct *Chapter 5.8.5 ‘Installation details’ on page 94*

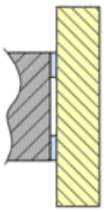
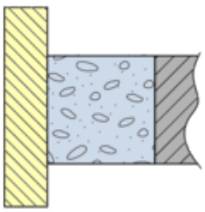
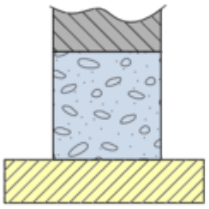
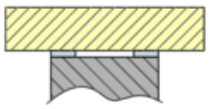
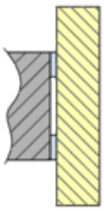
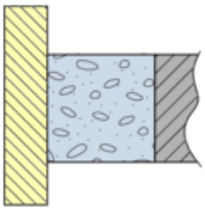
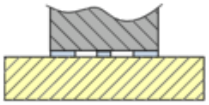
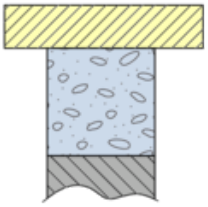
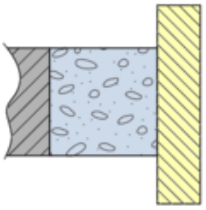
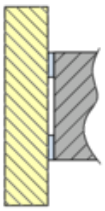
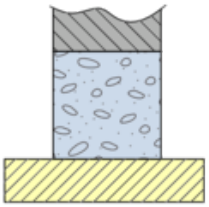
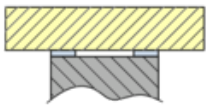
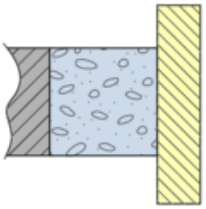
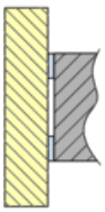
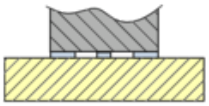
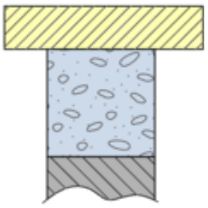
Installation gap 4-sided, mortar-based installation

Position of damper(s) in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Mortar 10 to 150 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm

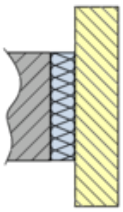
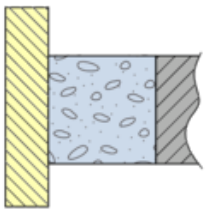
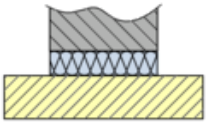
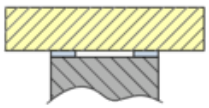
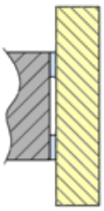
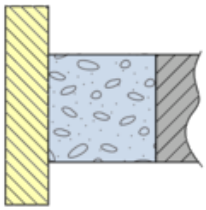
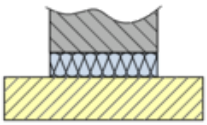
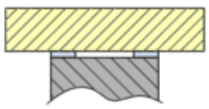
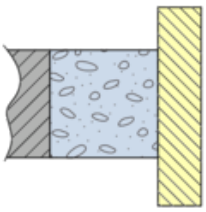
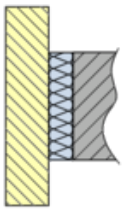
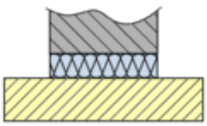
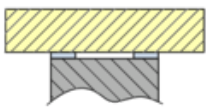
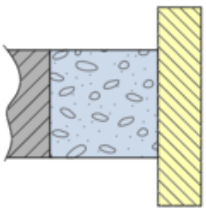
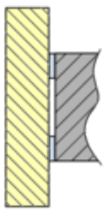
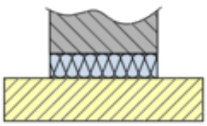
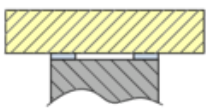
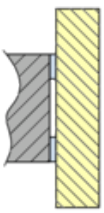
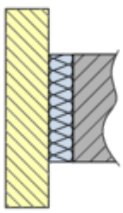
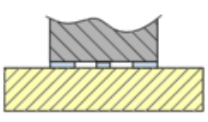
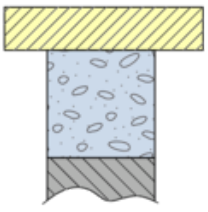
Installation gap 3-sided, mortar-based installation

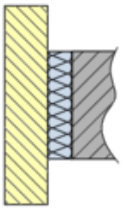
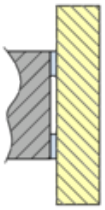
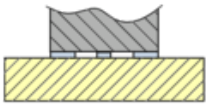
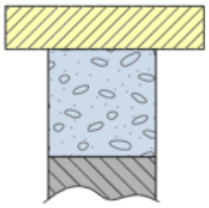
Position of damper(s) in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Mortar 10 to 150 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm
				
	Mortar 10 to 150 mm	Mortar 10 to 150 mm	HT sealing tape special 3 to 5 mm	Mortar 10 to 150 mm
				
	HT sealing tape 3 to 5 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm
				
	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm

Installation gap 2-sided, mortar-based installation

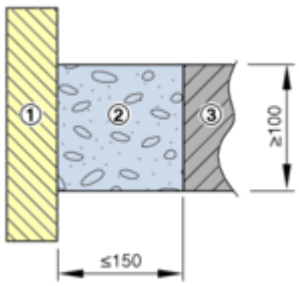
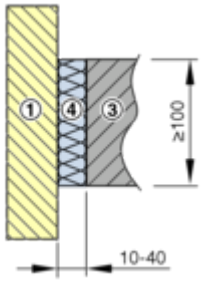
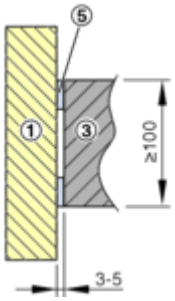
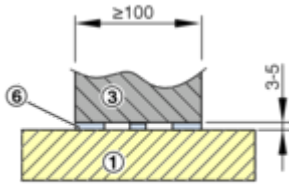
Position of damper(s) in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
	 HT sealing tape 3 to 5 mm	 Mortar 10 to 150 mm	 Mortar 10 to 150 mm	 HT sealing tape 3 to 5 mm
	 HT sealing tape 3 to 5 mm	 Mortar 10 to 150 mm	 HT sealing tape special 3 to 5 mm	 Mortar 10 to 150 mm
	 Mortar 10 to 150 mm	 HT sealing tape 3 to 5 mm	 Mortar 10 to 150 mm	 HT sealing tape 3 to 5 mm
	 Mortar 10 to 150 mm	 HT sealing tape 3 to 5 mm	 HT sealing tape special 3 to 5 mm	 Mortar 10 to 150 mm

Installation gap 1-sided, mortar-based installation

Position of damper(s) in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
in solid wall: EI90 S in shaft wall: EI120 S	Mineral wool 10 to 40 mm	Mortar 10 to 150 mm	Mineral wool 10 to 40 mm*	HT sealing tape 3 to 5 mm
				
	HT sealing tape 3 to 5 mm	Mortar 10 to 150 mm	Mineral wool 10 to 40 mm*	Mortar 10 to 150 mm
				
	Mortar 10 to 150 mm	Mineral wool 10 to 40 mm	Mineral wool 10 to 40 mm*	HT sealing tape 3 to 5 mm
				
	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm	Mineral wool 10 to 40 mm*	HT sealing tape 3 to 5 mm
				

Position of damper(s) in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
	HT sealing tape 3 to 5 mm	Mineral wool 10 to 40 mm	HT sealing tape special 3 to 5 mm	Mortar 10 to 150 mm
				
	Mineral wool 10 to 40 mm	HT sealing tape 3 to 5 mm	HT sealing tape special 3 to 5 mm	Mortar 10 to 150 mm

Installation details

Mortar	Mineral wool	HT sealing tape	HT sealing tape special
			

1 EK-JZ
2 Mortar
3 Solid wall or solid shaft wall
4 Mineral wool*
5 High temperature sealing tape (HT sealing tape)
6 High-temperature sealing tape special (HT sealing tape special)

* **Attention:** In the case of multiple occupancy (damper to damper), from a width of > 1600 mm of the installation opening, the installation gap S3 may be a maximum of 20 mm for mineral wool filling.

5.3.3 Dry mortarless installation

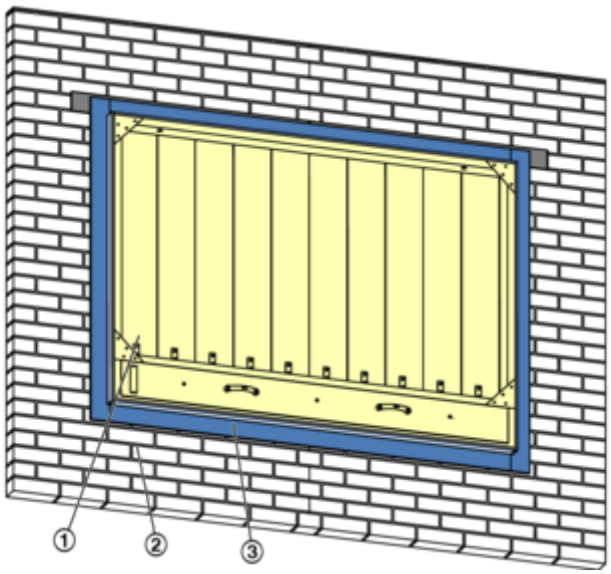
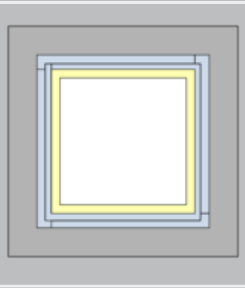
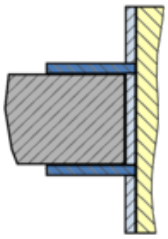
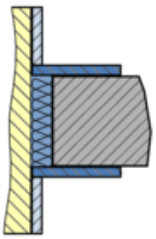
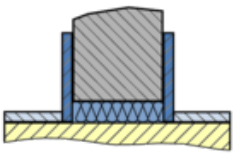
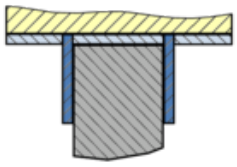
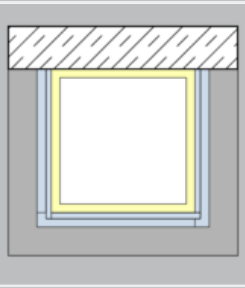
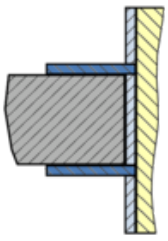
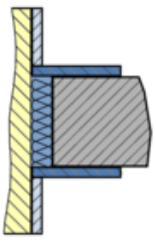
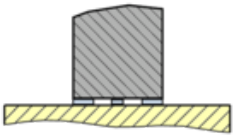
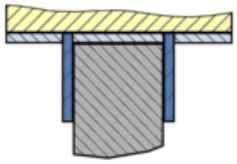


Fig. 22: Installation example EK-JZ Dry mortarless installation in solid wall, solid shaft wall EI 120 S

1 EK-JZ ↳ *Chapter 5.2.1 ‘ Occupancy of the installation opening’ on page 18*
2 Solid wall or solid shaft wall
3 fire-rated plasterboard strips (on site)

Installation variants

Position damper(s)	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Angle section ↳ Fig. 23 , Fig. 24			
				
below the ceiling	Angle section ↳ Fig. 23 , Fig. 24		HT sealing tape special	Angle section ↳ Fig. 23 , Fig. 24

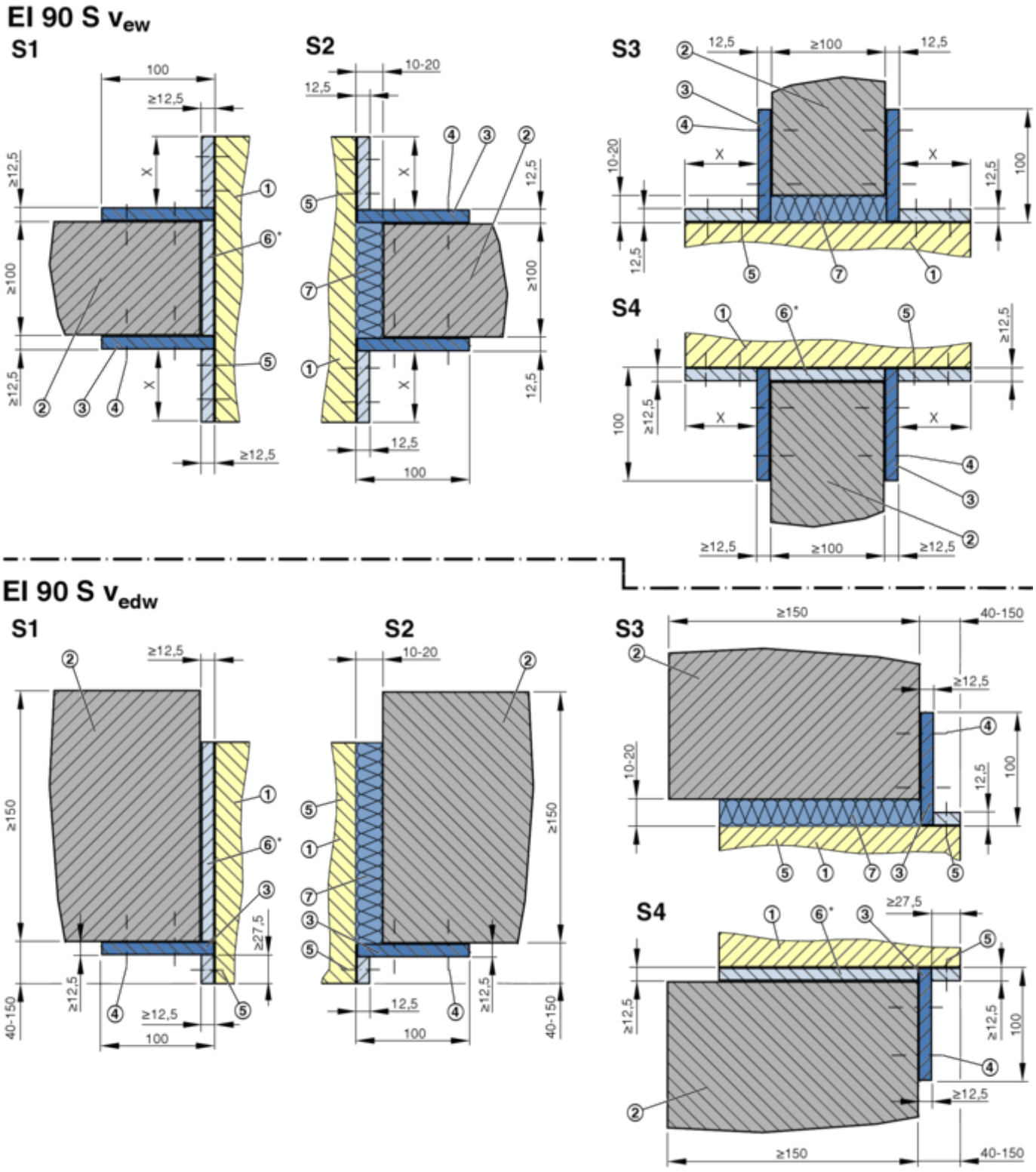


Fig. 23: Details EK-JZ dry mortarless installation in solid wall, solid shaft wall EI 90 S

S1 Installation gap left
S2 Installation gap right
S3 Installation gap top
S4 Installation gap bottom
1 EK-JZ
2 Solid wall or solid shaft wall
3 Fire-rated plasterboard strips
4 Screw connection, depending on wall type (on site)
5 Fast construction/chipboard screw Ø3.9/4 x 45 mm (pre-drill) or clamp
6* Plate material ≥12.5 mm, only if required, e.g. for levelling out unevenness
7* Mineral wool / rock wool stuffed
X 100 mm or to the end of the damper

* The installation gaps S1 and S2 can be exchanged (mirror-inverted arrangement).

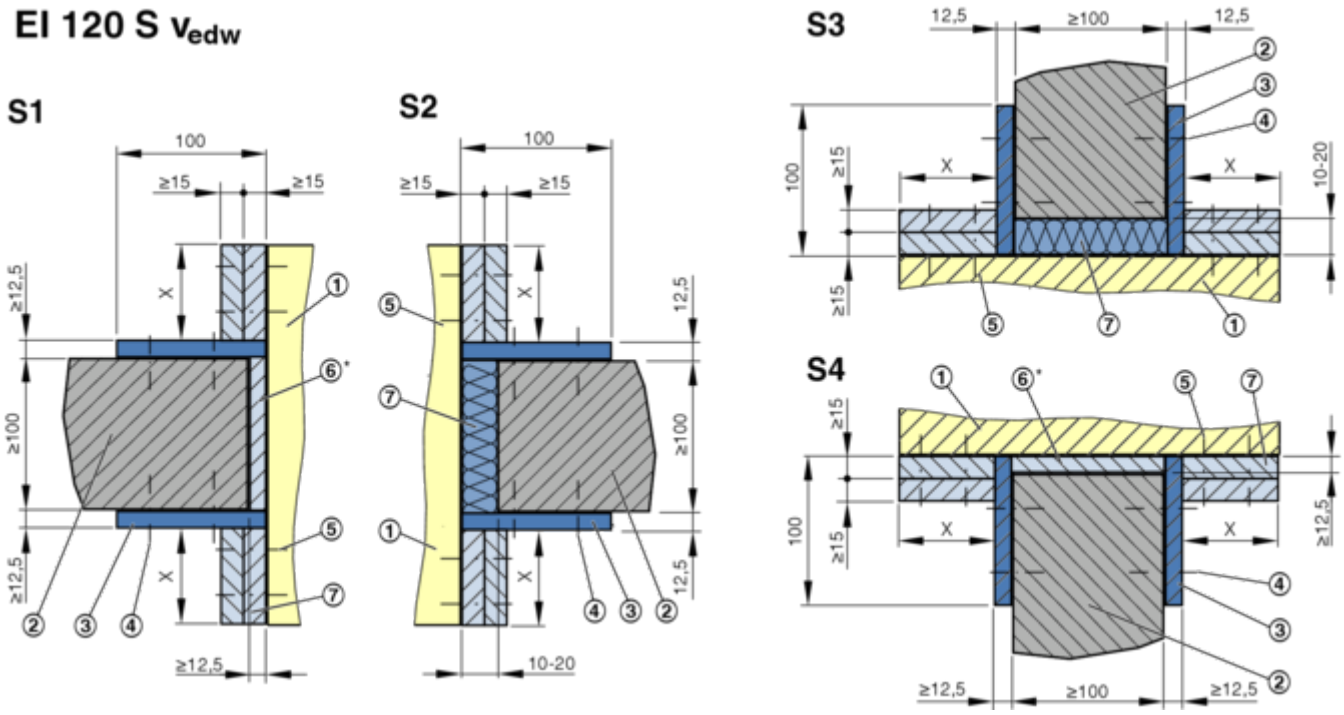


Fig. 24: Details EK-JZ Dry mortarless installation in solid wall, solid shaft wall EI 120 S, legend ↳ Fig. 23

Notes on dry mortarless installation in solid wall or solid shaft wall

- The damper is placed flush on the reveal at the bottom **S4**. At the installation gaps on the left **S2** or on the right **S3**, the damper is also set flush to the reveal.
  If the installation opening is uneven or too large, the reveal must be filled with board material (6), ↳ *'Adapting the installation opening in solid walls and shaft walls' on page 28*
- Connect damper and wall with angle section (3) made of plate material, glued to each other at joints and to the damper frame e.g. with K84 or equivalent
  The angle sections are to be fixed to the wall (4) and damper (5), distance ≤150 mm
  - EI 90 S v_{ew} : angle sections on both sides of the wall, 1 strips ≥12.5 mm, ↳ Fig. 23
  - EI 90 S v_{edw} : angle section on operating side (shaft wall), 1 strip ≥12.5 mm, ↳ Fig. 23
  - EI 120 S v_{ew} : angle sections on both sides of the wall, 2 strips ≥15 mm, ↳ Fig. 24
- Distance to ceiling ≥100 mm
- Cavities are stuffed with mineral wool or rock wool (7).

5.3.4 Wall-mounted - single occupancy of the installation opening

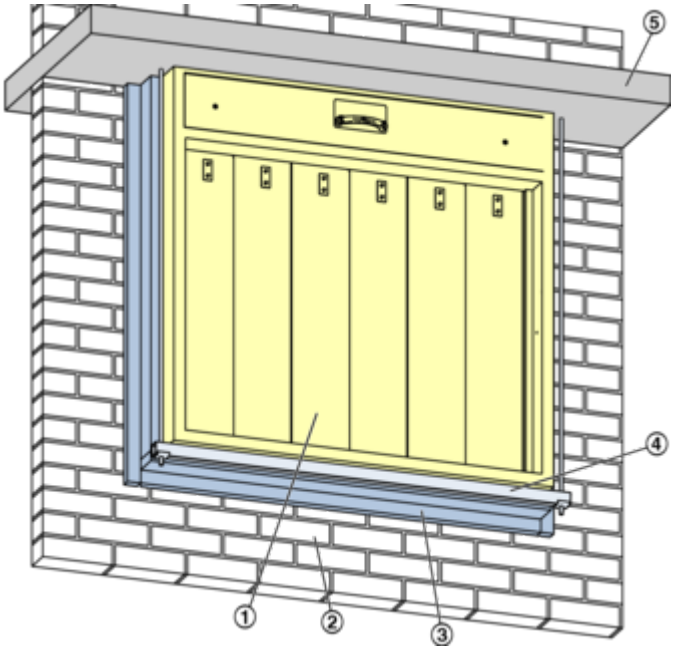
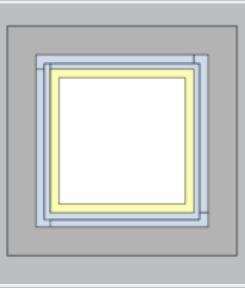
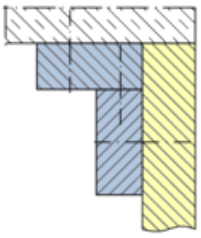
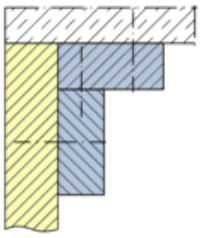
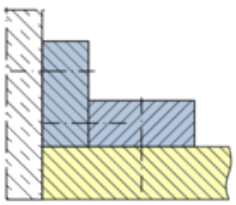
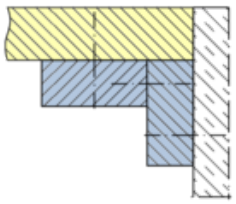


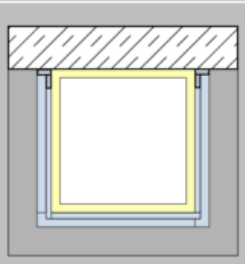
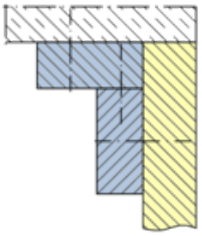
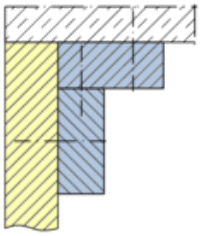
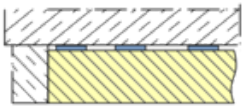
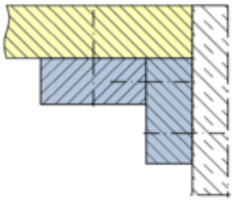
Fig. 25: Dry mortarless installation on solid wall EI 90 S v_{ew} , solid external wall or solid shaft wall EI 120 S v_{edw} - Single occupancy of the installation opening

1 EK-JZ ↳ *Chapter 5.2.1 ‘ Occupancy of the installation opening’ on page 18*
2 Solid wall (single damper only), external wall or solid shaft wall (damper to damper possible)
3 Angle section (on site) ↳ Fig. 26
4 Suspension (on site), to be designed statically according to the damper weights and the local conditions, ↳ *Chapter 5.9 ‘Suspending the smoke control damper’ on page 96* .
5 Ceiling, mounting directly below ceilings possible

As an alternative to suspension, installation directly on a concrete floor, on a concrete base, or full-surface brick lining to the shaft wall is also possible. With full-surface support, the lower angle section can be omitted. In this case, the corresponding installation accessories must be ordered.

Installation variants

Position damper(s)	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
Damper in front of wall	Angle section 80 x 80 mm	Angle section 80 x 80 mm	Angle section 80 x 80 mm	Angle section 80 x 80 mm

Position damper(s)	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
Damper in front of wall below the ceiling	Angle section 80 x 80 mm	Angle section 80 x 80 mm	HT sealing tape special	Angle section 80 x 80 mm

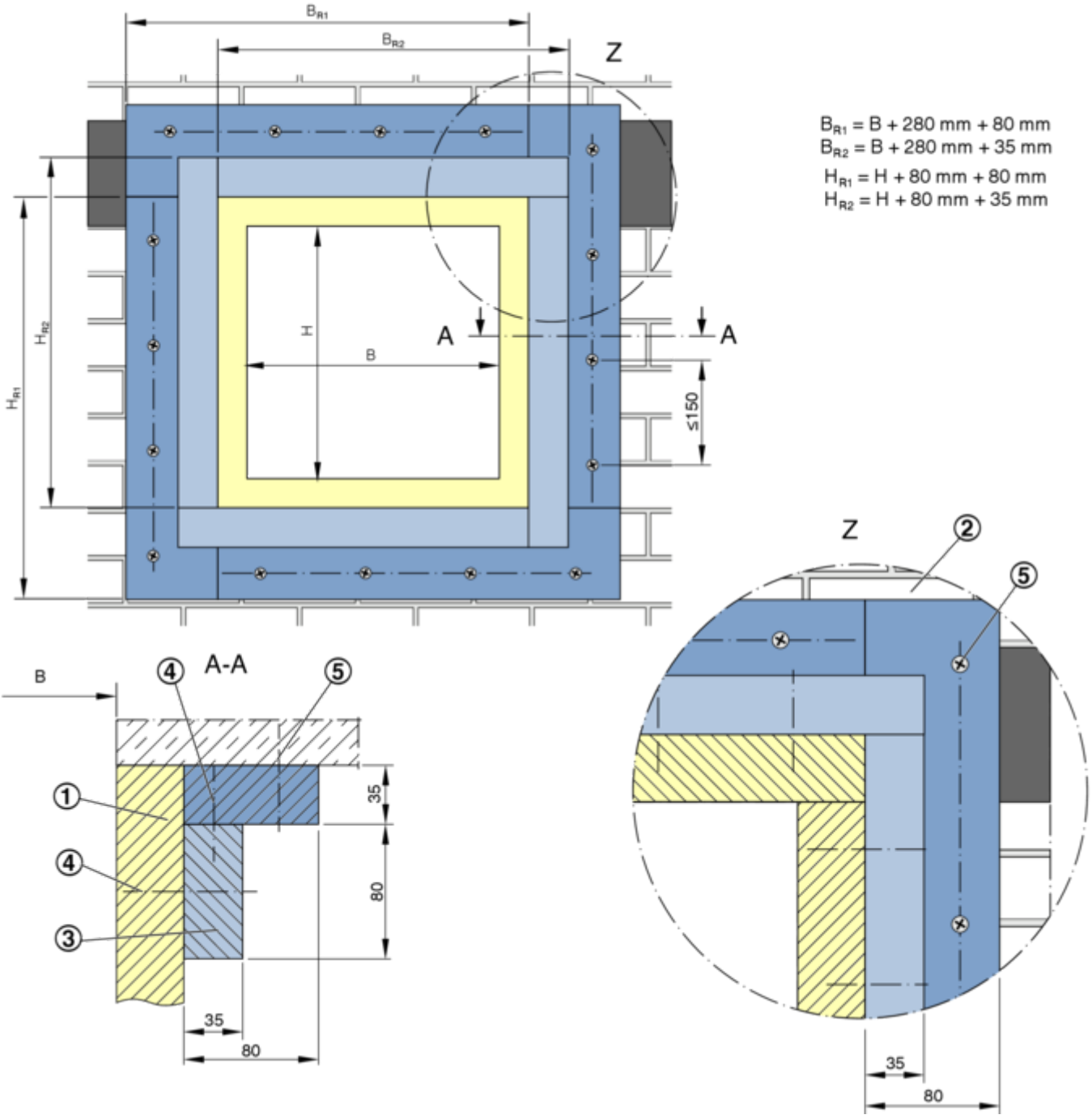


Fig. 26: Angle section detail

1 EK-JZ
2 Wall
3 Angle section made of PROMATECT®-LS fire protection board d = 35 mm or equivalent, glued to each other at joints and to the damper frame, e.g. with K84 or equivalent
4 Steel wire clamp ≤ 63/11.2/1.5 mm, or drywall screw 4 × 70 mm (on site)
5 Screw connection with approved metal anchor ∅ 6 or 8 mm (on-site), screw spacing ≤ 150 mm

5.3.5 Wall mounting - multiple occupancy of the installation opening

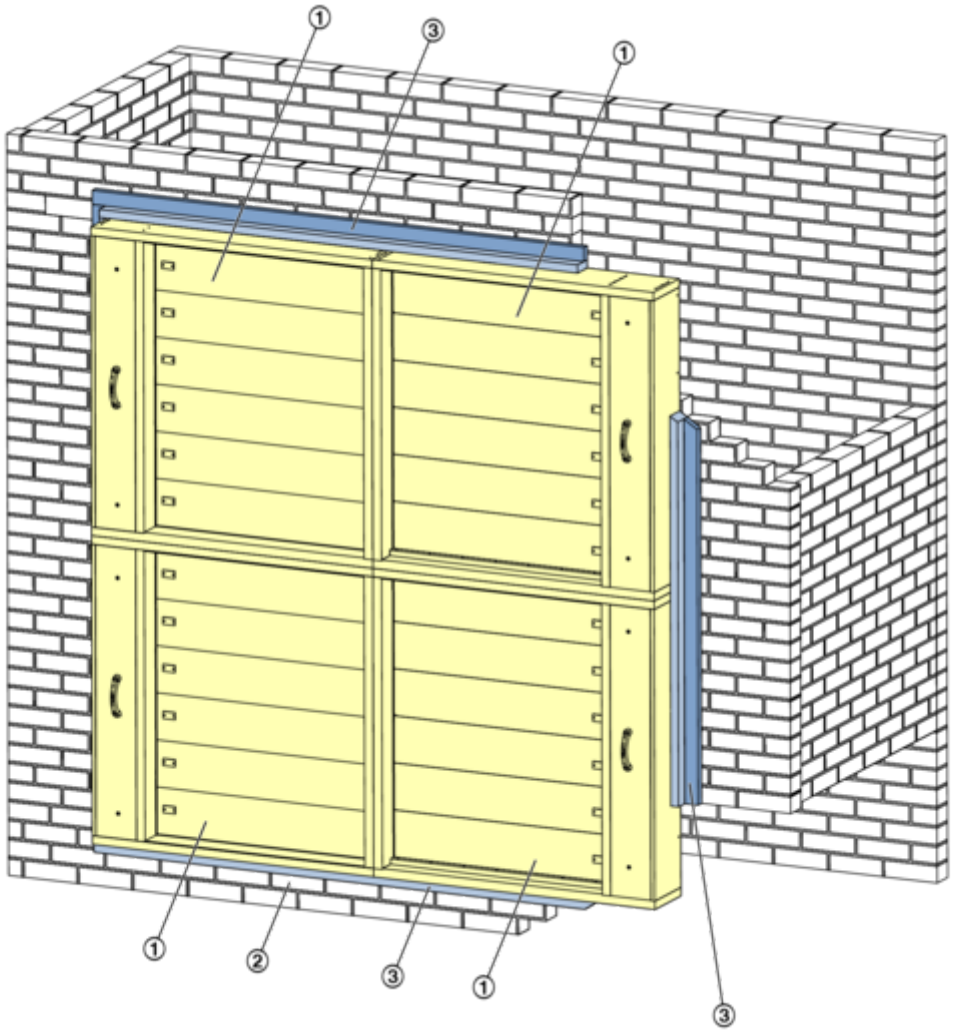


Fig. 27: Dry mortarless installation on solid wall or solid shaft wall EI 120 S v_{edw} - Multiple occupancy of the installation opening

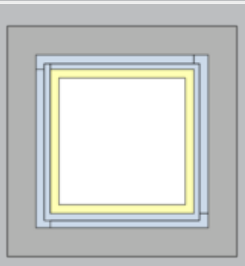
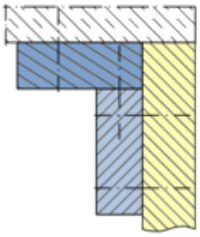
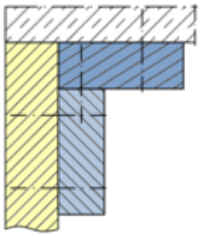
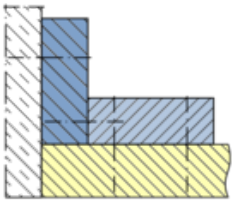
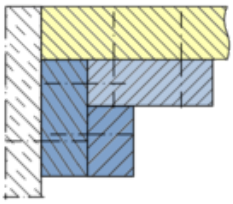
1 EK-JZ ↳ *Chapter 5.2.1 ‘ Occupancy of the installation opening’ on page 18*
2 Solid wall or solid shaft wall
3 Angle section (on site) ↳ Fig. 28

Note on installation:

- Damper to damper on solid walls or solid shaft walls
- ve-axis position and ho-axis position possible
- units of 4 possible
- Several units next to each other possible, if a distance ≥ 200 mm is guaranteed
- Distance ≤ 3 mm to load-bearing structural elements

Damper to damper on top of each other must not exceed a maximum total height of 2960 mm. This applies to both horizontal and vertical damper alignment.
For assembled dampers, an additional Promatect angle section ≥ 35 mm must be placed on the underside S4 at the front of the wall angle to ensure improved damper support.

Installation variants

Damper position	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
Dampers in front of wall	Angle section 80 x 80 mm	Angle section 80 x 80 mm	Angle section 80 x 80 mm	Angle section 80 x 80 mm + reinforcement 35 x 45 mm

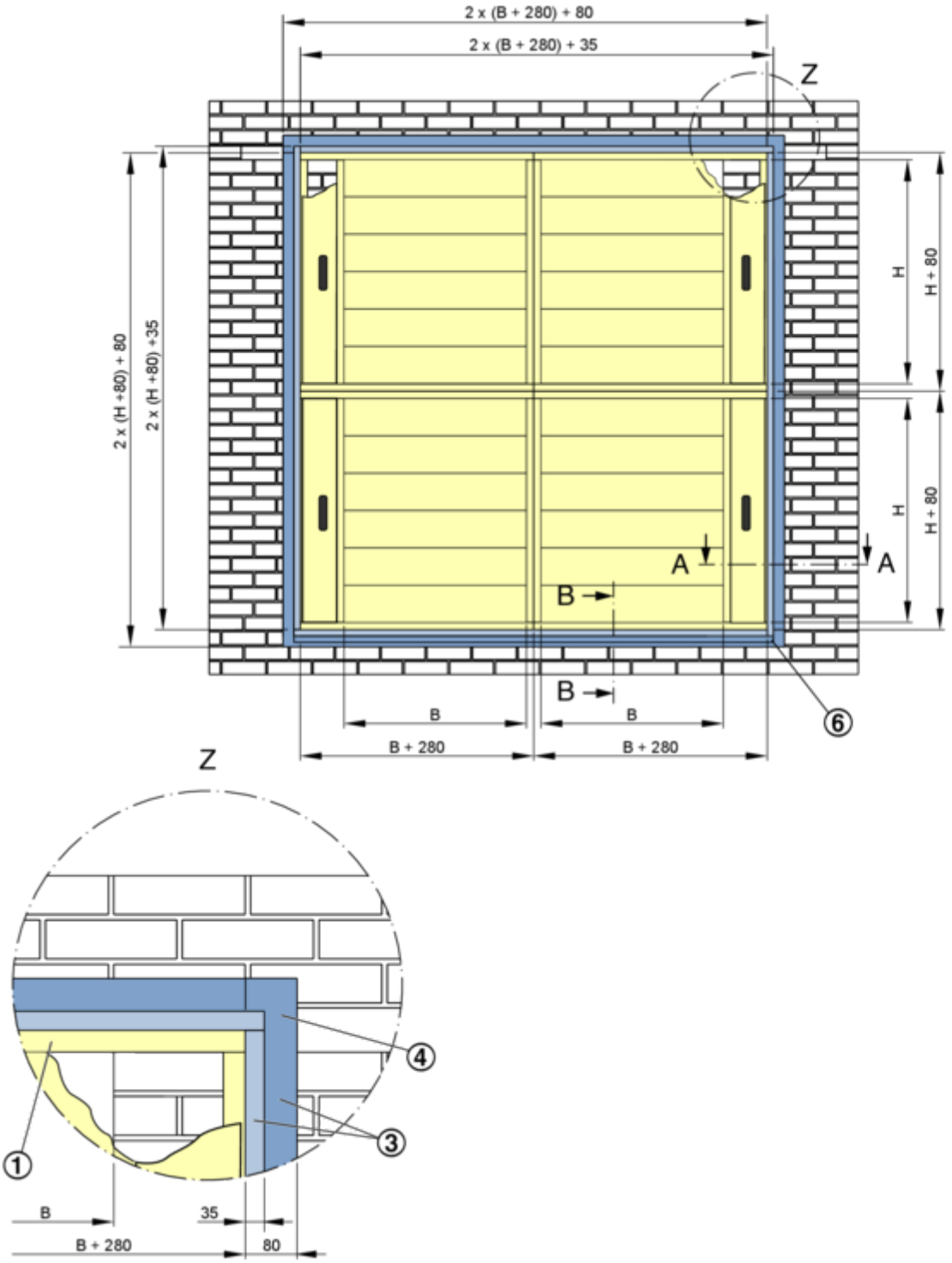


Fig. 28: Angle section detail

1 EK-JZ
2 Wall
3 Angle section made of PROMATECT®-LS fire protection board d = 35 mm or equivalent, glued to each other at joints and to the damper frame, e.g. with K84 or equivalent
4 Stagger the joints of the inner and outer angle sections.
6 Reinforcement at the bottom, see section B-B

Sections A-A and B-B see Fig. 29

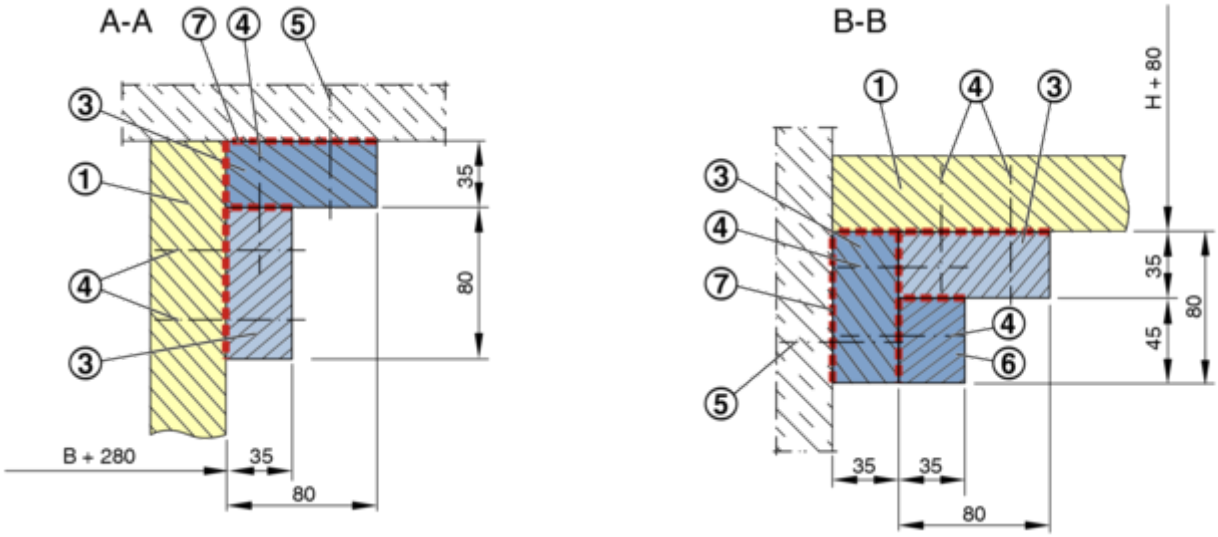


Fig. 29: Angle section detail

1 EK-JZ
2 Wall
3 Angle section made of PROMATECT®-LS fire protection board d = 35 mm or equivalent, glued to each other at joints and to the damper frame, e.g. with K84 or equivalent
4 Steel wire clamp ≤ 63/11.2/1.5 mm, or drywall screw 4 × 70 mm (on site)
5 Screw connection with approved metal anchor ∅ 6 or 8 mm (on-site), screw spacing ≤ 150 mm, see also Fig. 26
6 Reinforcement on the lower angle section
7 Glue, Promat K48 or equivalent

5.3.6 Coated board system (soft bulkhead)

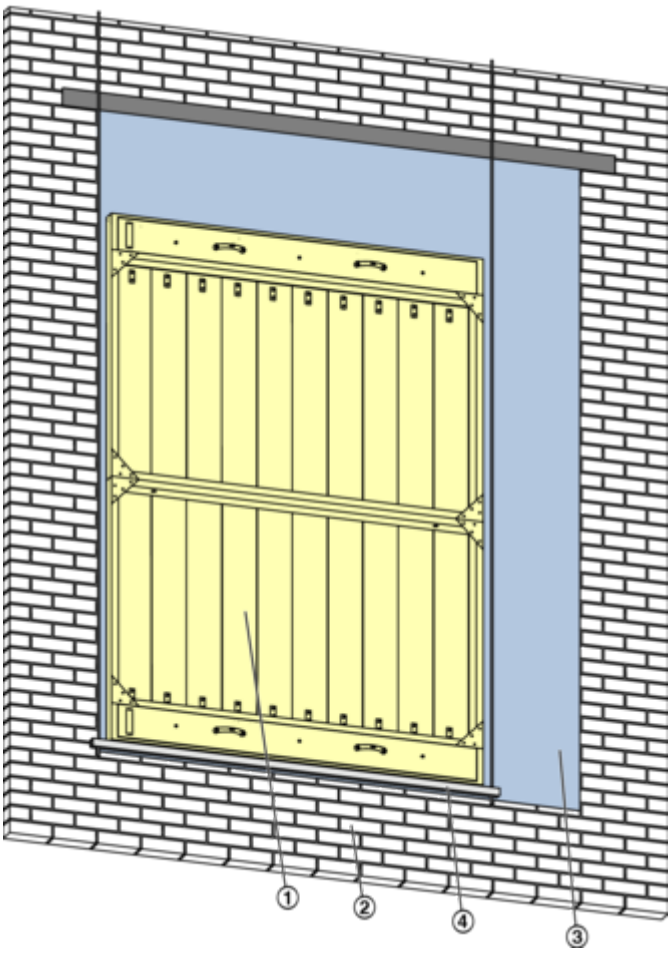


Fig. 30: EK-JZ Coated board system installation in solid wall EI 90 S

1 EK-JZ ↳ *Chapter 5.2.1 ‘ Occupancy of the installation opening’ on page 18*
2 Solid wall, solid shaft wall
3 Coated board system (on site)
4 Suspension (on site), dimensioning according to local conditions, ↳ *Chapter 5.9 ‘Suspending the smoke control damper’ on page 96*

Installation in coated board system

- Coated board systems consist of two or more layers of mineral wool boards, bulk density ≥ 140 kg/m³.
- The mineral wool boards must be glued tightly into the installation opening with fire protection sealant. Any gaps between the panels and the installation opening, gaps between cut surfaces of fitting pieces as well as gaps between panels and smoke damper are to be coated with sealing compounds / coatings suitable for the coated board system and thereby sealed.
- Apply firestop coating to the mineral wool panels, joints, transitions and to any damage on the pre-coated mineral wool panels; coating thickness ≥ 2.5 mm.
- Smoke control dampers shall be suspended on both sides of the wall if
  - the wall thickness (support) is <170 mm, or
  - if coated board system is used in installation gap S4 (below the damper).
- Dampers must be suspended if coated board system is used underneath the damper.
- If the wall thickness is ≤150 mm and there is no coated board system used underneath the damper, the wall thickness must be increased to at least 150 mm below the damper in order to improve the standing surface of the damper. It is possible to thicken the wall using wall building material, fire-rated plasterboard, or calcium silicate panels.
- The HT seal special (installation accessories 8-11, or 13 - 16) must be used for connecting to ceiling components with a spacing of 3-5 mm (Kerafix + intumescent seal).

Dimensions and distances for coated board system for wall installation

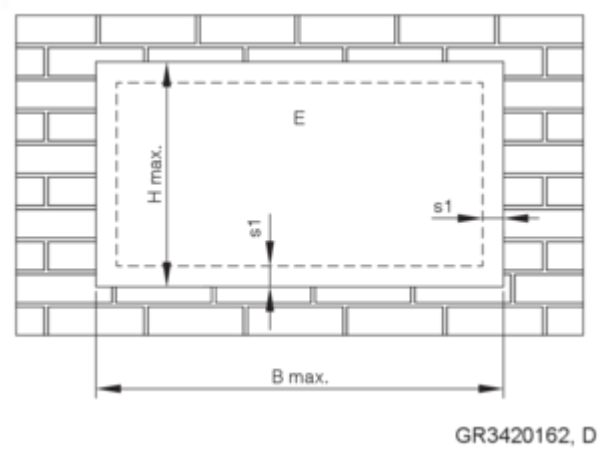


Fig. 31: Coated board system - installation in solid walls

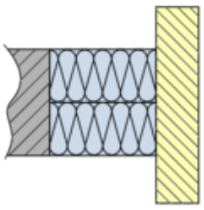
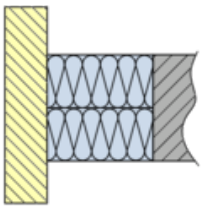
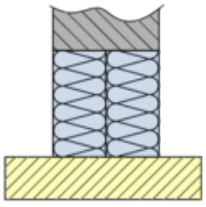
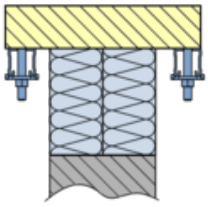
E Installation area

The installation of several dampers up to multiple units is possible if the maximum coated board system size is not exceeded and the minimum bulkhead ring gap is ≥ 50 mm but ≤ 600 mm.

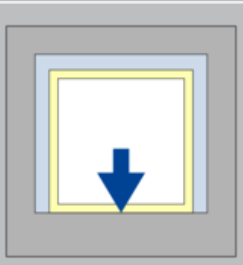
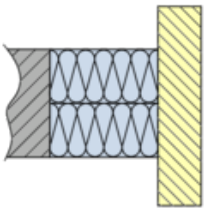
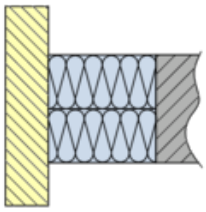
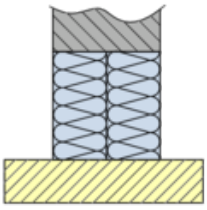
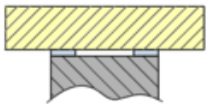
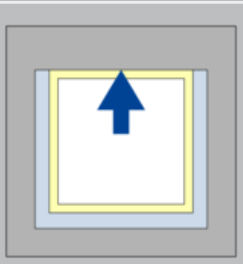
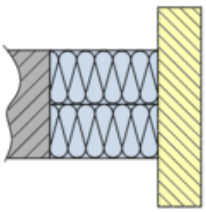
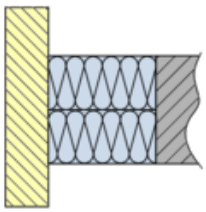
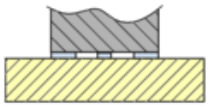
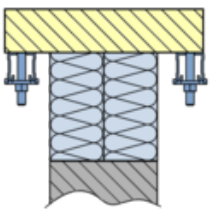
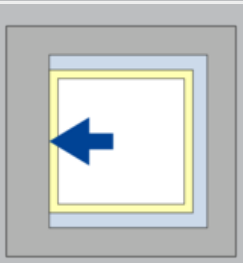
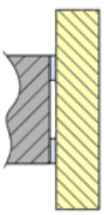
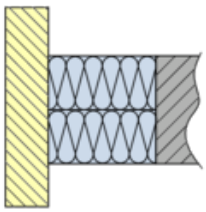
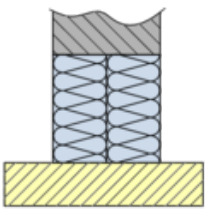
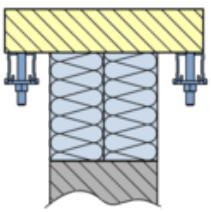
Coated board system	B max. [mm]	H max. [mm]
e.g. Hilti	≤ 3410	≤ 3300

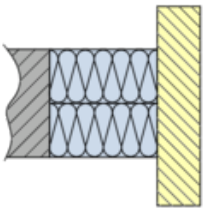
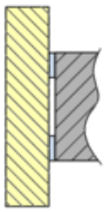
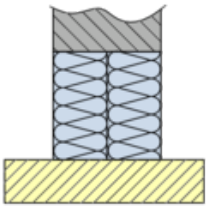
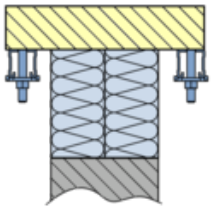
Damper combination up to EI 90 S	s1 min. [mm]	s1 max. [mm]
EK-JZ	50	600

Installation gap 4-sided, coated board system

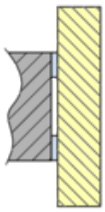
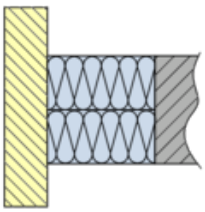
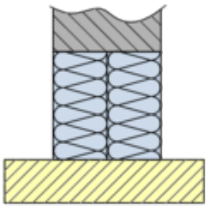
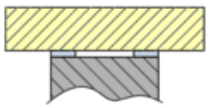
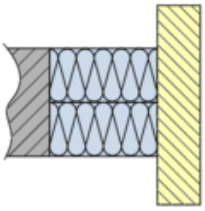
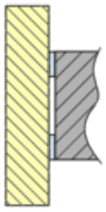
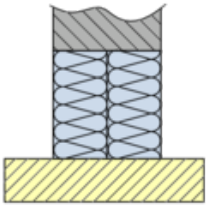
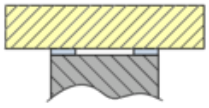
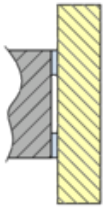
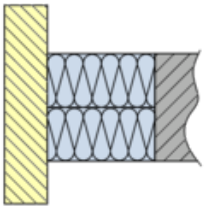
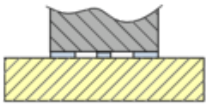
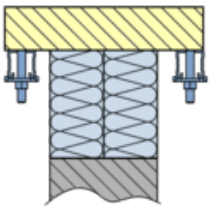
Position of the EK-JZ in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm

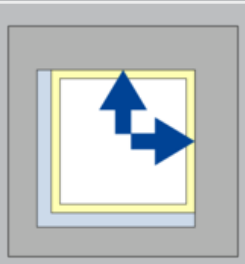
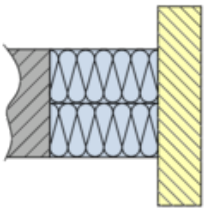
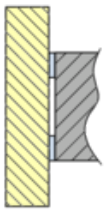
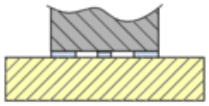
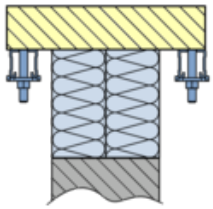
Installation gap 3-sided, coated board system

Position EK-JZ in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm
				
	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	HT sealing tape special 3 to 5 mm	Coated board system 50 to 600 mm
				
	HT sealing tape 3 to 5 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm

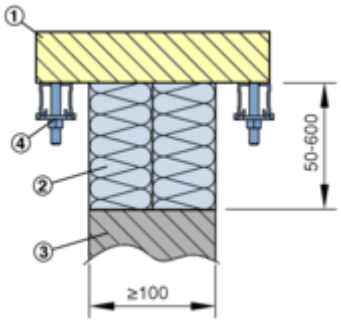
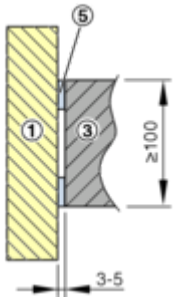
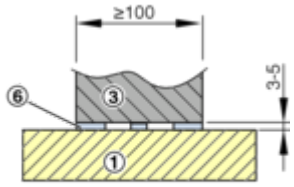
Position EK-JZ in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm

Installation gap 2-sided, coated board system

Position EK-JZ in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	HT sealing tape 3 to 5 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm
				
	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm
				
	HT sealing tape 3 to 5 mm	Coated board system 50 to 600 mm	HT sealing tape special 3 to 5 mm	Coated board system 50 to 600 mm

Position EK-JZ in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm	HT sealing tape special 3 to 5 mm	Coated board system 50 to 600 mm

Installation details

	HT sealing tape	HT sealing tape special
		 only permissible in installation gap S3 (top)

1 EK-JZ
2 Coated board system
3 Solid wall or solid shaft wall
4 Suspension, only required if coated board system is used in installation gap S4 (below)
5 High temperature sealing tape (HT sealing tape)
6 High-temperature sealing tape special (HT sealing tape special)

5.4 Lightweight wall 1-sided planked (lightweight shaft wall)

5.4.1 General information

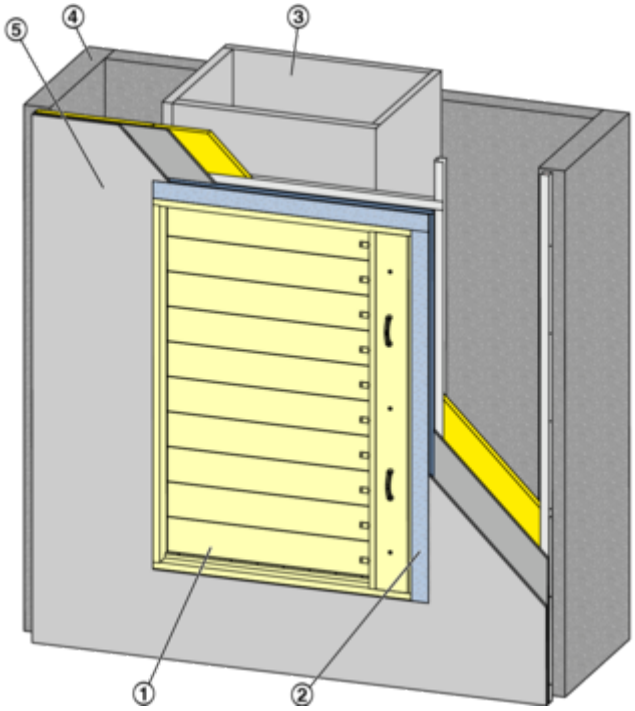


Fig. 32: Installation example EK-JZ in shaft wall, combined mortar-based/dry mortarless installation

1 EK-JZ
2 Installation gap, e. g. Mortar
3 Smoke extract duct in the installation shaft
4 Installation shaft
5 Shaft wall with metal support structure

Shaft walls with metal support structure

- Shaft walls or facing shells with metal support structure or steel substructure and European classification according to EN 13501-2 or comparable national classification.
- Cladding on one side made of plasterboard fire protection panels.
- Wall thickness W ≥ 90 mm (cladding according to installation details).
- Distance between metal support structures ≤ 625 mm.
- Be sure to follow the manufacturers' instructions for the height, width and thickness of walls.
- Create an installation opening with trimmer and angle section.
- Reveals and a support extension must be provided and screw-fixed to the support structure.
- The structural safety of the wall must be ensured (by others). Compensation measures, especially with regard to large installation openings (such as for multiple installation), must be determined on a case to case basis (by others).

Frame work and installation opening

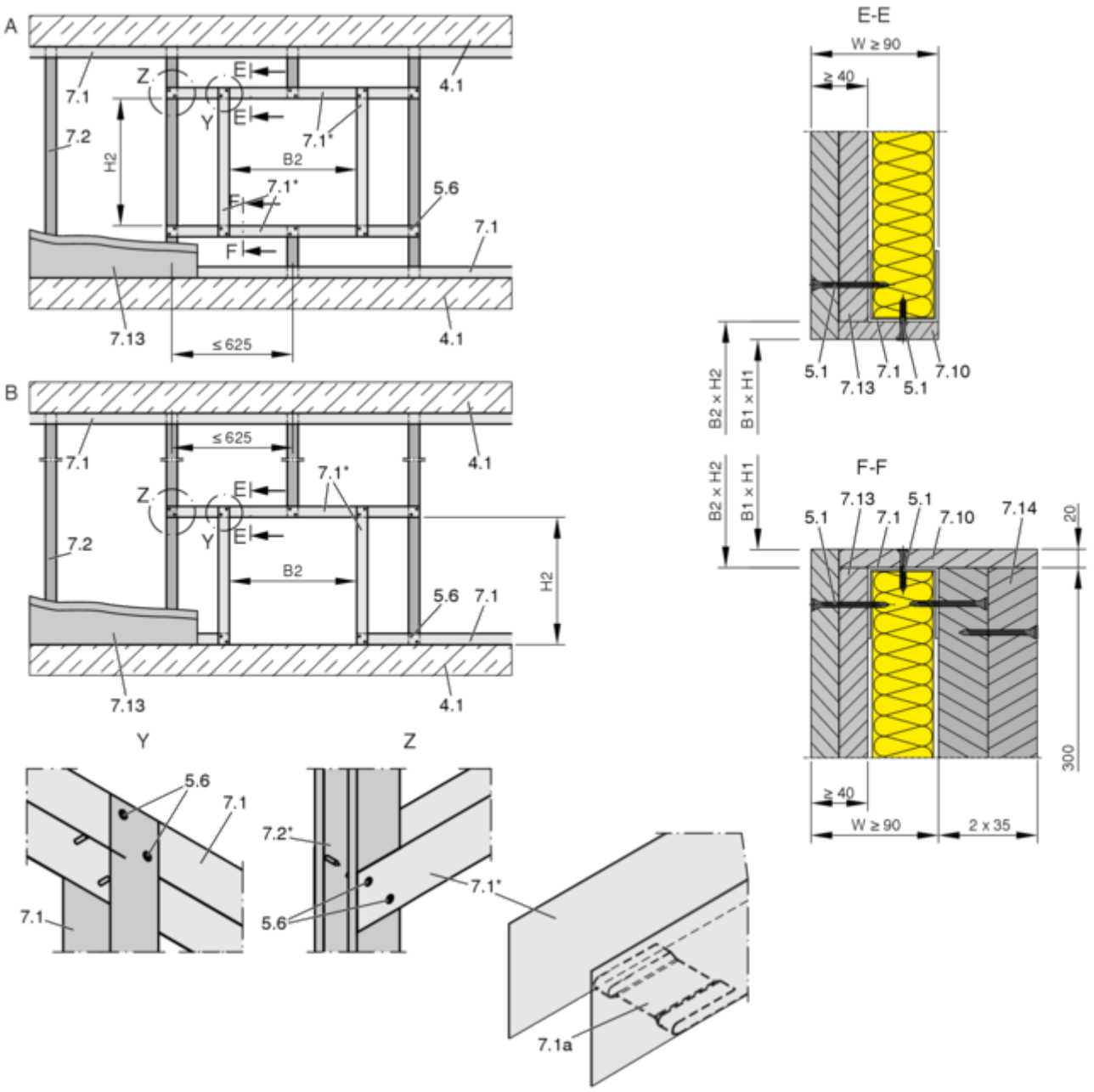


Fig. 33: Shaft wall with metal support structure and cladding on one side (detailed views shown as an example for W = 90 mm)

A	Shaft wall
B	Shaft wall, installation near the floor
C	Shaft wall, installation near the ceiling
4.1	Solid ceiling slab / solid floor
5.1	Dry wall screw
5.6	Screw or steel rivet
7.1	UW section
7.1a	UW section, either cut in and bent, or cut off
7.2	CW section
7.10	Reveal, optionally according to installation details
7.13	Cladding
7.14	Support made of wall-building materials, L + 200 mm as width of installation opening
B1 × H1	Installation opening
B2 × H2	Opening in metal support structure (without reveal: B2 = B1, H2 = H1) * closed side in direction of installation opening

5.4.2 Mortar-based / dry mortarless installation

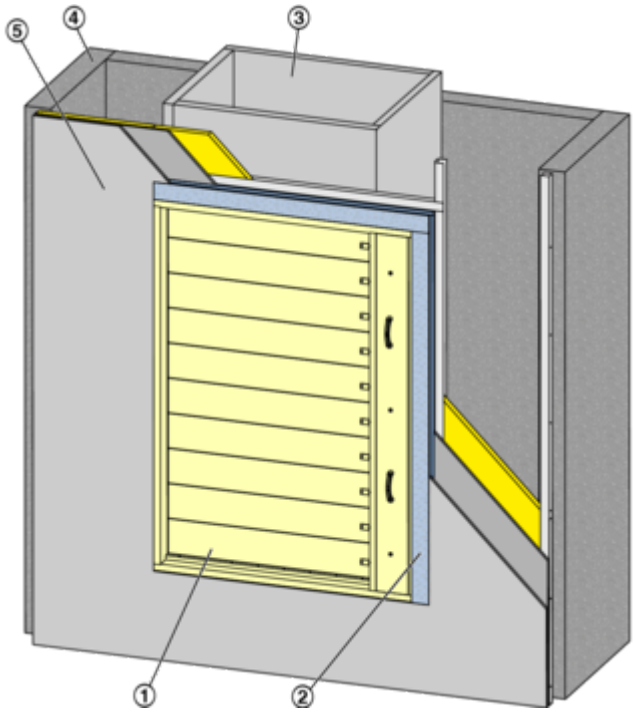
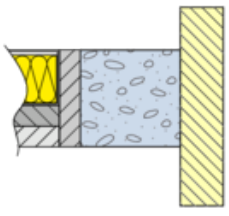
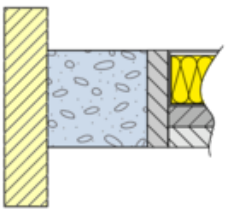
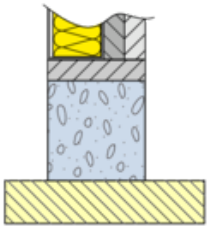
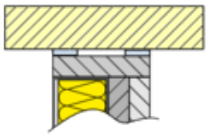


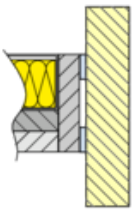
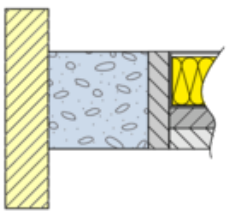
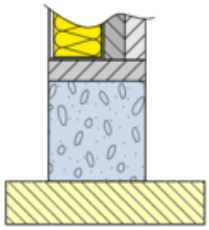
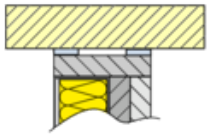
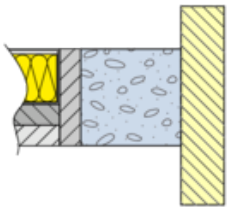
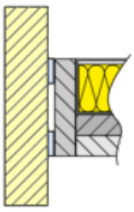
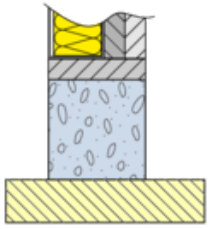
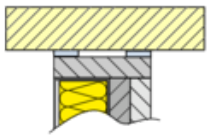
Fig. 34: Installation example EK-JZ in lightweight partition wall, combined mortar-based/dry mortarless EI 90 S

1 EK-JZ ↳ *Chapter 5.2.1 ‘ Occupancy of the installation opening’ on page 18*
2 Installation gap, for example mortar
3 Smoke extract duct in the installation shaft
4 Installation shaft
5 Shaft wall with metal support structure

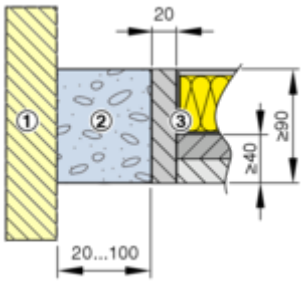
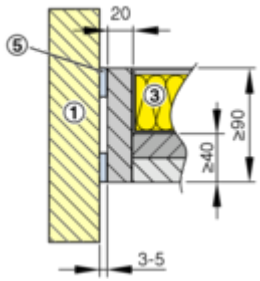
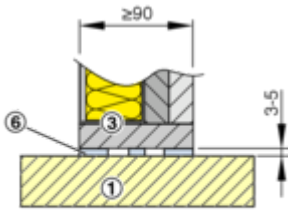
Installation gap 3-sided, mortar-based installation

Position of damper(s) in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
At lower reveal	Mortar 10 to 150 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm

Installation gap 2-sided, mortar-based installation

Position of damper(s) in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	HT sealing tape 3 to 5 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm
				
	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm

Installation details

Mortar	HT sealing tape	HT sealing tape special
		

1 EK-JZ
2 Mortar
3 Lightweight partition wall with planking on both sides, details ↳ *Chapter 5.5.1 'General information' on page 56*
5 High temperature sealing tape (HT sealing tape)
6 High-temperature sealing tape special (HT sealing tape special)
Details on the design of the installation opening ↳ *'Frame work and installation opening' on page 50*

5.4.3 Dry installation (GypWall Shaft)

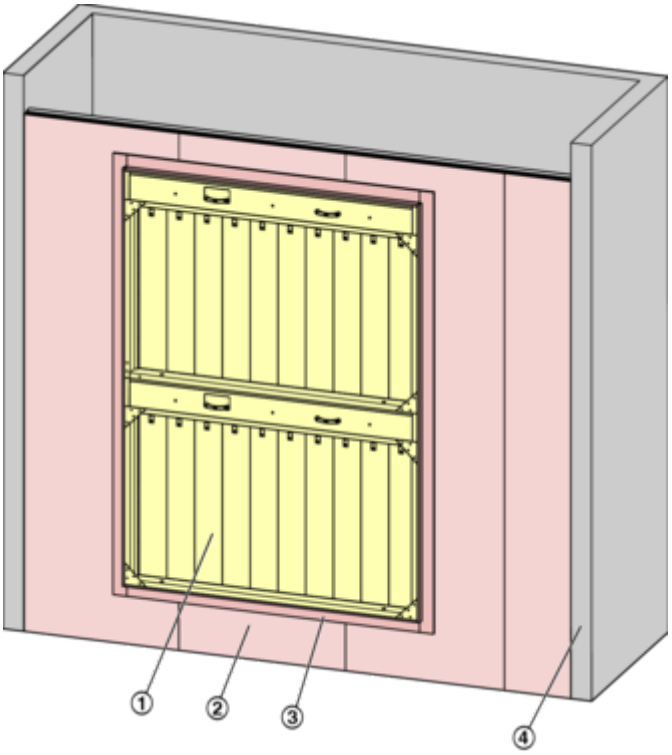
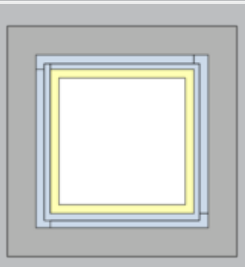
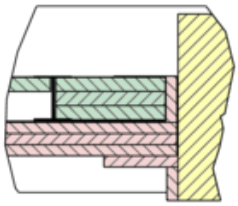
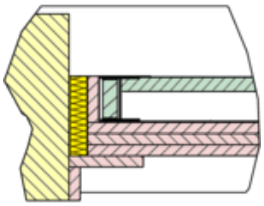
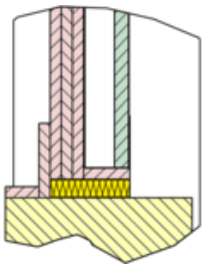
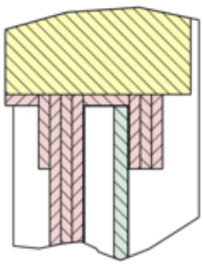
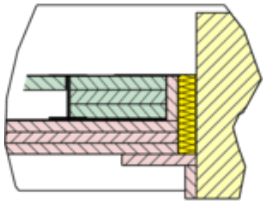
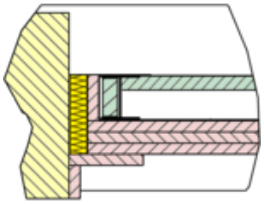
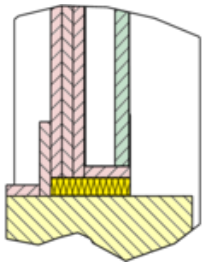
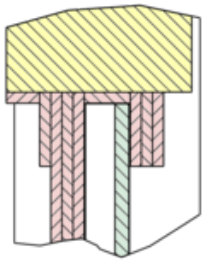


Fig. 35: Installation example EK-JZ Dry installation in lightweight wall (Gypsum only) with planking on one side EI 120 S

1 EK-JZ ↳ *Chapter 5.2.1 ‘ Occupancy of the installation opening’ on page 18*
2 Lightweight wall (GypWall Shaft) with planking on one side (approval only manufacturer Britsh Gypsum)
3 Dry installation according to the following description
4 Ventilation shaft

Installation variants

Position damper(s)	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	S1 and S2 can be exchanged			

Position damper(s)	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Details ↳ Fig. 37			

Create trimmer

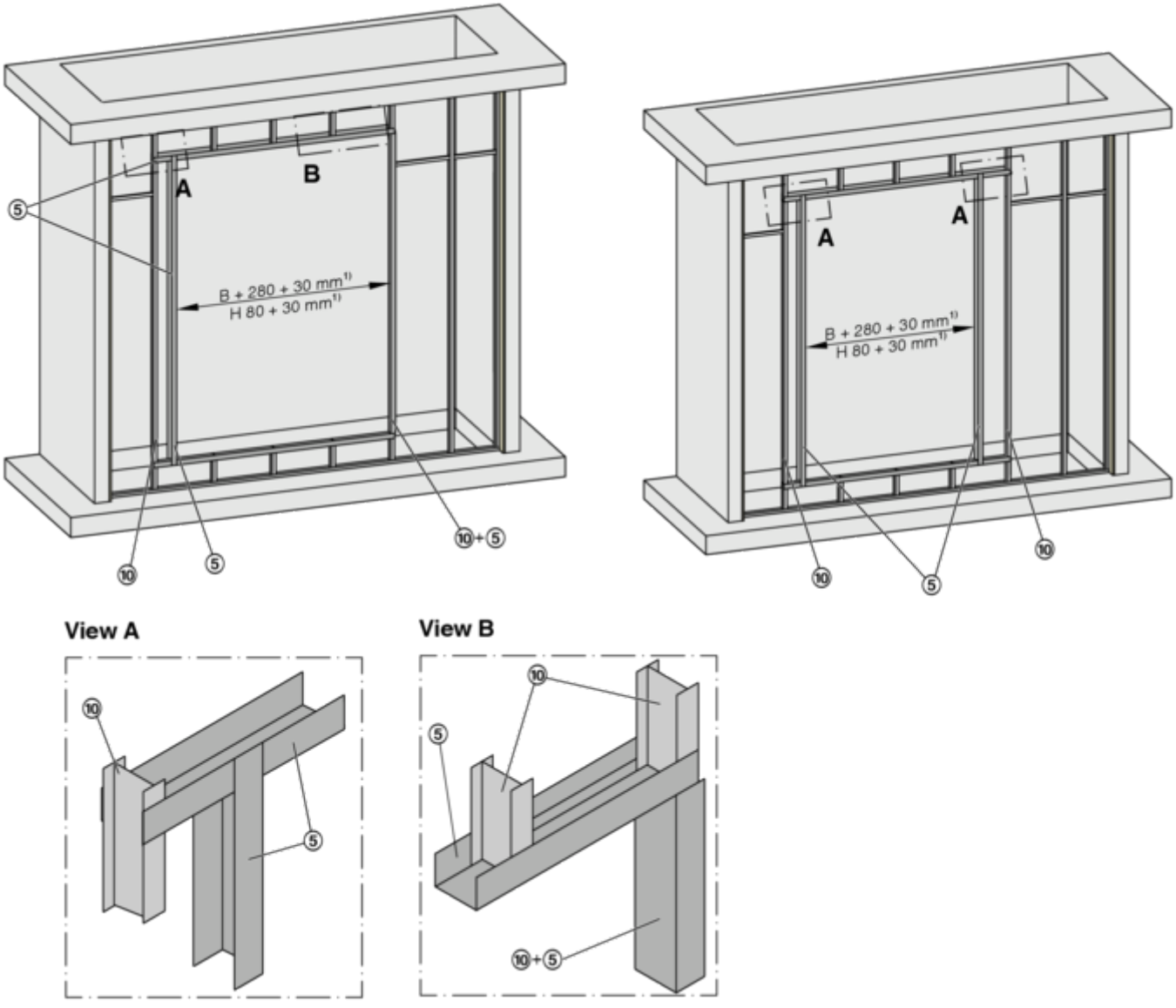


Fig. 36: GypWall Shaft Replacement Studwork

5 Gypframe U-profile 62 x 70 x 50 mm, 70 mm on shaft side
10 Gypframe I profile
1) add 30 mm for reveal to installation opening.

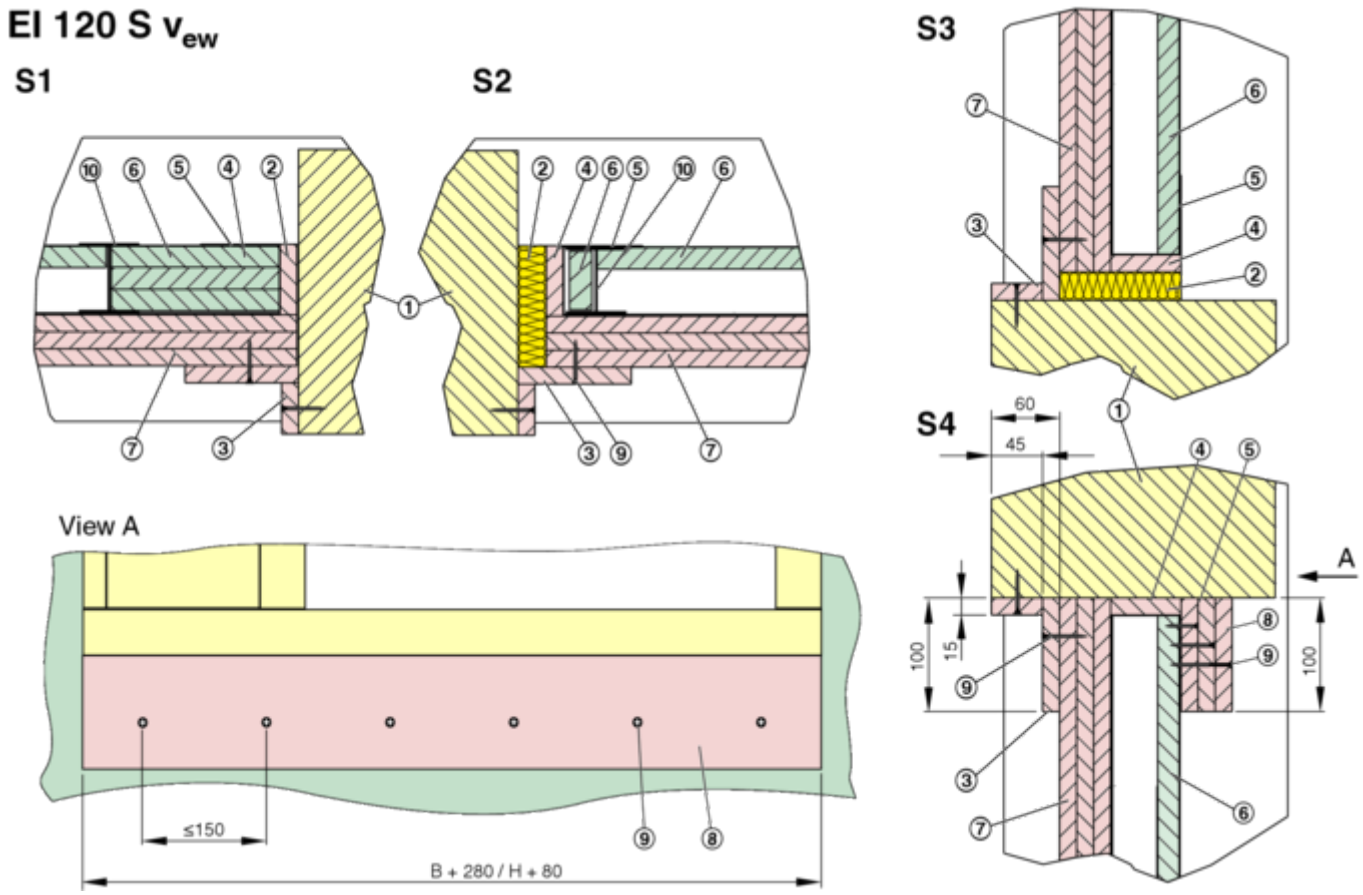


Fig. 37: Details EK-JZ Dry installation in Gypsum Wall with metal stud EI 120 S

S1 Installation gap left
S2 Installation gap right
S3 Installation gap top
S4 Installation gap bottom
1 EK-JZ
2 Mineral wool / rock wool stuffed
3 Angle section, made of Gyproc FireLine 15 mm (Pink)
4 Soffit, made of Gyproc FireLine 15 mm (Pink)
5 Gypframe 62 JC 70 'J' Channel 62 x 70 x 50 mm, 70 mm on shaft side
6 Gyproc CoreBoard 19 mm (Green)
7 Gyproc FireLine 15 mm (Pink)
8 Support widening made of 3 x Gyproc FireLine 15 mm (pink)
9 Jack-Point Screws 35 mm, 41 mm, 60 mm
10 Gypframe I profile

The installation gaps S1 and S2 can be made with mineral/rock wool (2) on one or both sides.

Notes on dry installation in GypWall Shaft

- Wall construction according to manufacturer's instructions. Prepare the installation opening according to Fig. 37 .
- Seal all joints between panels and metal with Gyproc Sealant, see the construction details manufacturer's instructions.
- Place the bottom damper **S4** with 60 mm projection on the reveal. At the installation gaps on the left **S1** or on the right **S2** also place the damper directly (without spacing) against the reveal. Stuff the opposite side with mineral or rock wool. Alternatively, both sides can be finished with mineral or rock wool.
- Stuff the installation gap **S3** with mineral or rock wool.
- Connect damper and wall with angle section (3) made of sheet material by means of (Jack-Point Screws 41 mm)
  The angle sections are to be fixed to the wall (7) and damper (1), screw spacing ≤ 150 mm
- Distance to ceiling ≥100 mm

5.5 Lightweight partition walls or lightweight shaft walls 2-sided planked

5.5.1 General information

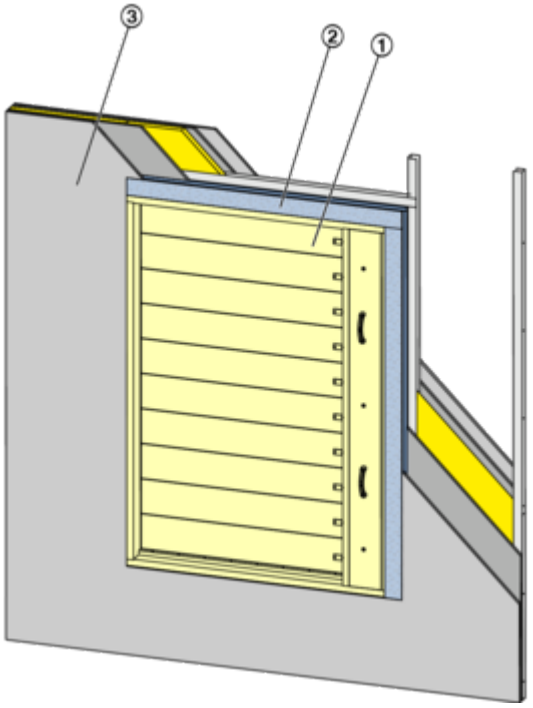


Fig. 38: Installation example EK-JZ in lightweight partition wall, combined mortar-based/dry mortarless installation

1 EK-JZ
2 Installation gap, for example mortar
3 Lightweight partition wall with metal support structure

Lightweight partition walls with metal support structure

- Lightweight partition and fire walls with metal frame structure or steel support structure, with European classification according to EN 13501-2 or comparable national classification.
- Cladding on both sides, made of fire-rated plasterboard.
- Wall thickness W ≥ 100 mm.
- Distance between metal support structures ≤ 625 mm.
- Create an installation opening with trimmer and angle section.
- Reveals and a support extension must be provided and screw-fixed to the support structure.
- Additional layers of cladding and double stud constructions (if covered by the usability certificate for the wall) are approved.
- Connect the metal sections near the installation opening according to the installation details in this manual.
- The structural safety of the wall must be ensured (by others). Compensation measures, especially with regard to large installation openings (such as for multiple installation), must be determined on a case to case basis (by others).

Frame work and installation opening

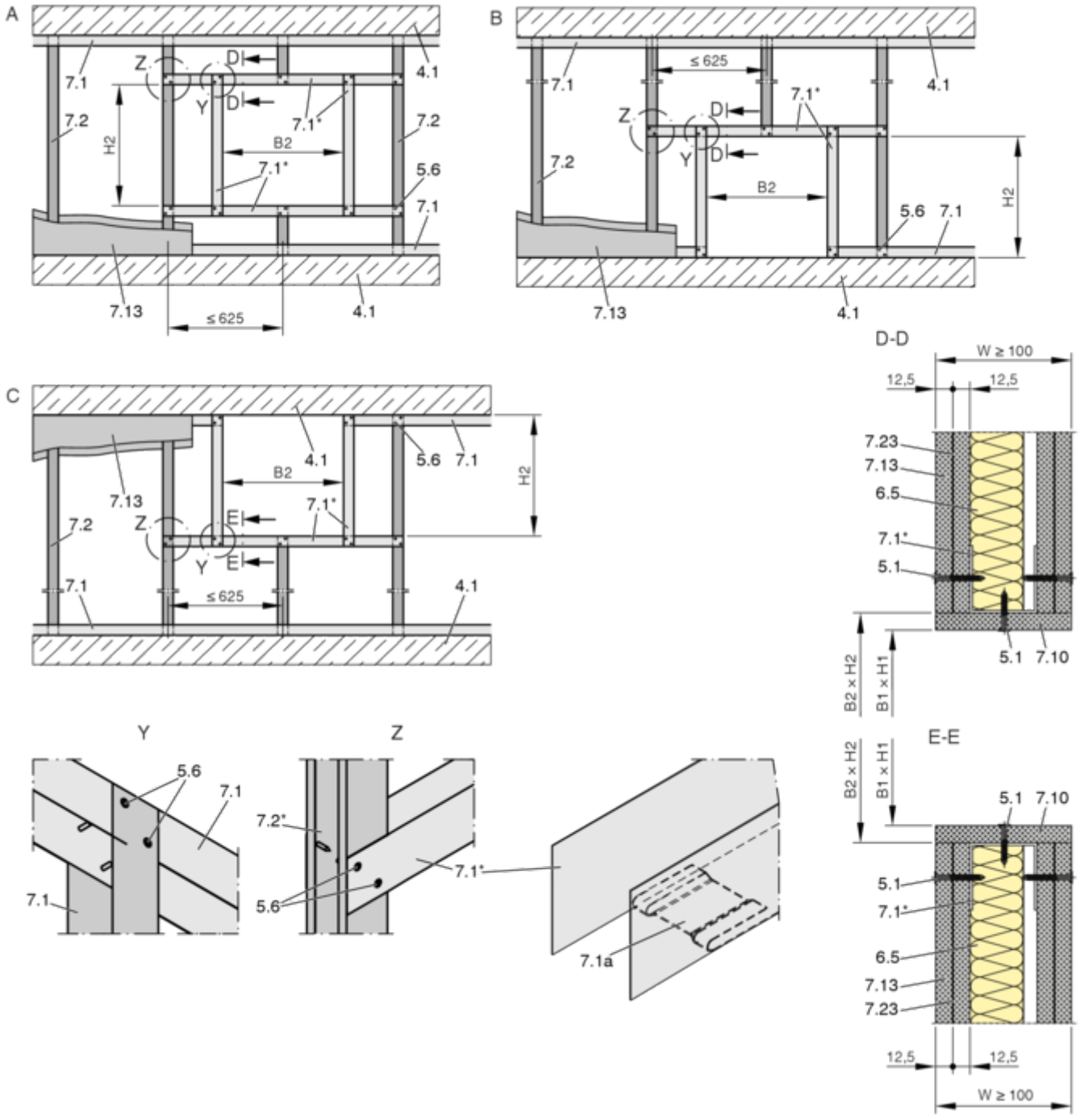


Fig. 39: Lightweight partition wall with metal support structure and cladding on both sides, picture caption see

A	Lightweight partition wall with metal support structure	7.1a	UW section, cut and bent
B	Lightweight partition wall with metal support structure, installation close to the floor	7.2	CW section
C	Lightweight partition wall with metal support structure, installation close to the ceiling	7.10	Reveal
4.1	Solid ceiling slab/solid floor	7.13	Cladding/wall cladding
5.1	Dry wall screw	7.23	Sheet steel insert depending on wall manufacturer
5.6	Screw or rivet, galvanised steel (see respective installation detail)	B1 x H1	Installation dimension (B + 280 mm x H + 80 mm + S1 + S2)
6.5	Mineral wool depending on wall or ceiling construction, mineral wool filling if required	B2 x H2	Opening in metal support structure (without reveal)

7.1 UW section

Calculation of installation dimensions

Damper blade shaft horizontal

B1 - B + 280 + S1 +S2

H1 - H + 80 + S3 + S4

Damper blade shaft vertical

B1 - H + 80 + S3 + S4

H1 - B + 280 + S1 +S2

EK-JZ Installation depth in lightweight partition walls with metal support structure and planking on both sides

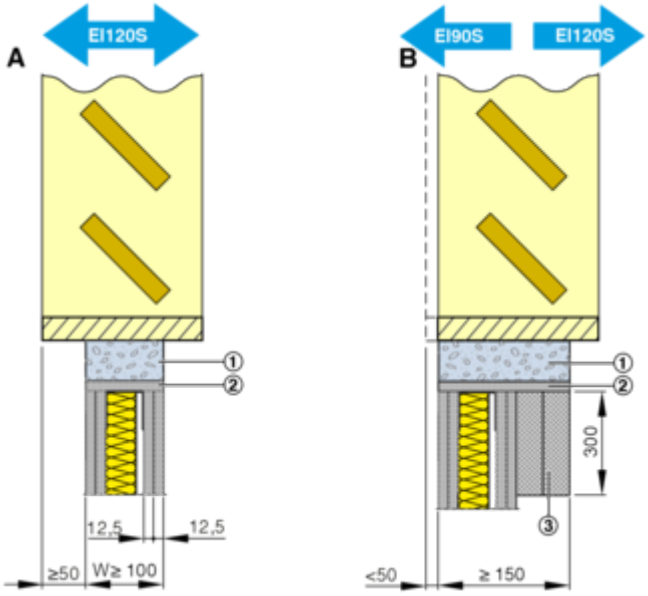


Fig. 40: EK-JZ Installation centred or flush on one side (overhang <50 mm)

A Installation centred: Classification EI120 S
B Installation flush on one side (operating side/room side), classification according to inflow direction
1 Installation gap, mortar, or sealing tape
2 Reveal
3 Damper support

Flush on one side (Fig. 40 /B)

- In case of flush installation or an overhang of <50 mm, the classification depends on the smoke extract air direction, see illustration.
- From a damper height of ≥1030 mm and a wall thickness <150 mm, provide a rear or shaft-side damper support (Fig. 40 /3), e.g. with PROMATECT LS35, L500, AD40.

5.5.2 Mortar-based / dry mortarless installation

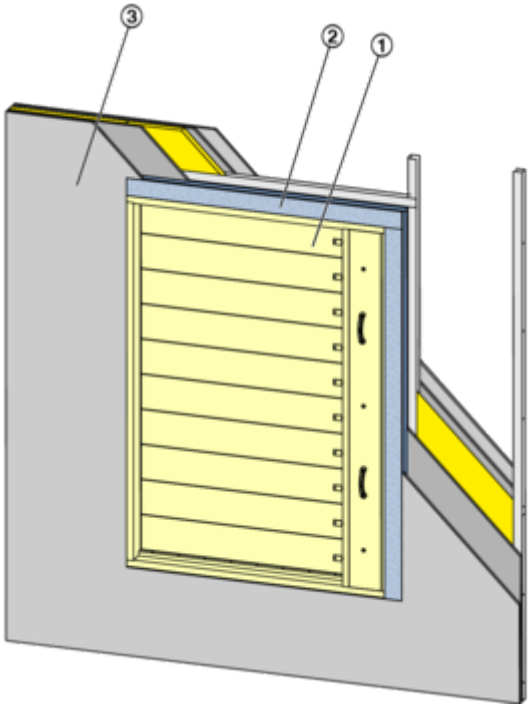
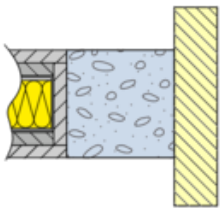
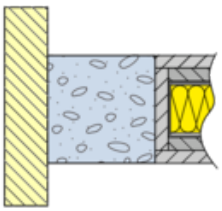
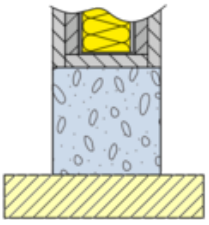
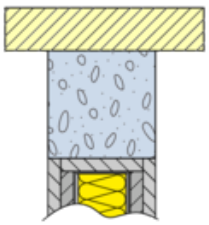


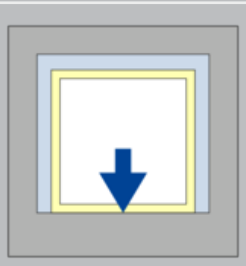
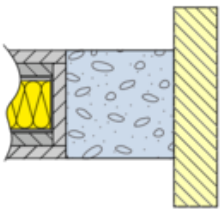
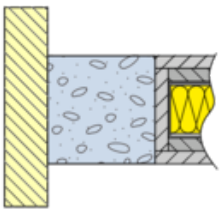
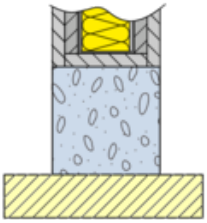
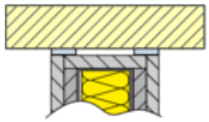
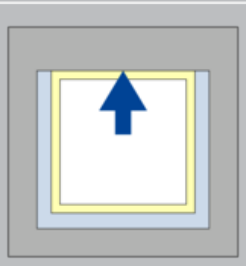
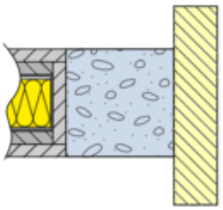
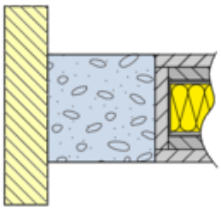
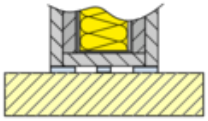
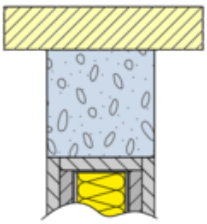
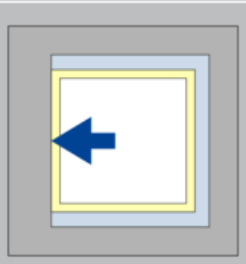
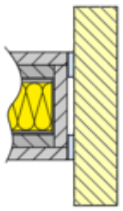
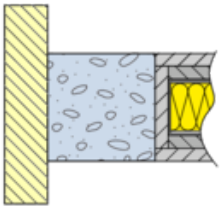
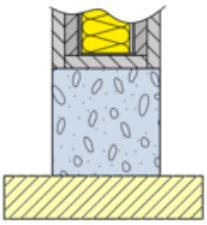
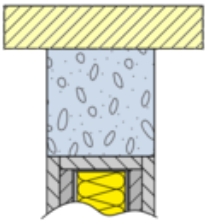
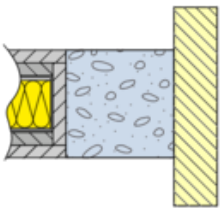
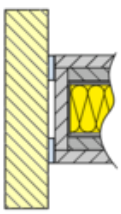
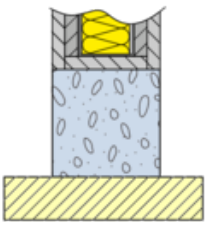
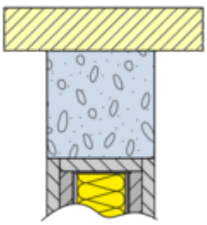
Fig. 41: Installation example EK-JZ in lightweight partition wall, combined mortar-based/dry mortarless EI 120 S

1 EK-JZ *Chapter 5.2.1 ‘ Occupancy of the installation opening’ on page 18*
2 Installation gap, for example mortar
3 Lightweight partition wall with planking on both sides

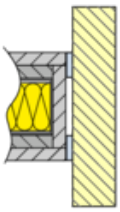
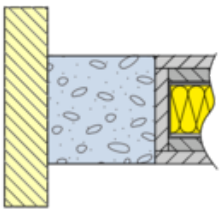
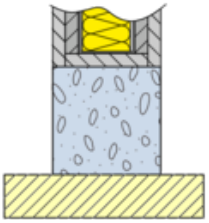
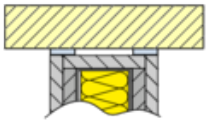
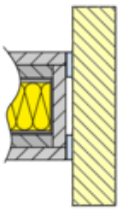
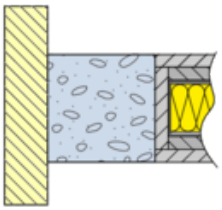
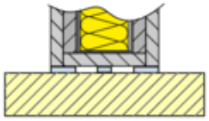
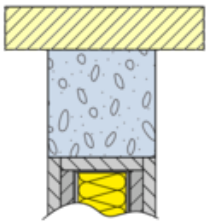
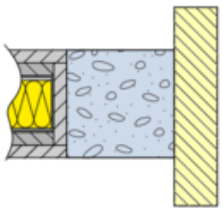
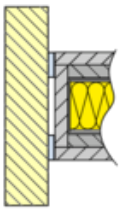
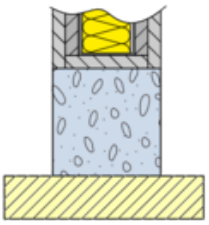
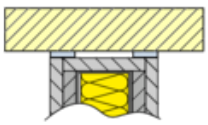
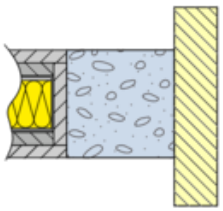
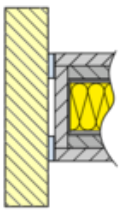
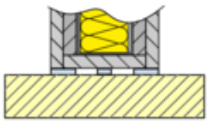
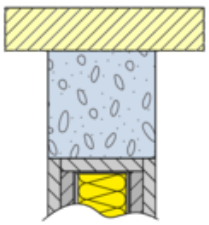
Installation gap 4-sided, mortar-based installation

Position of damper(s) in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Mortar 10 to 150 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm

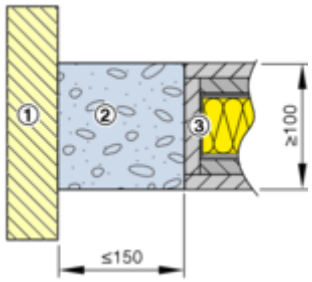
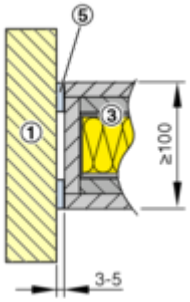
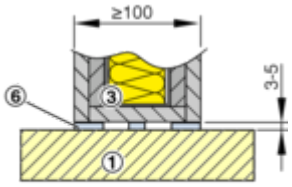
Installation gap 3-sided, mortar-based installation

Position of damper(s) in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Mortar 10 to 150 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm
				
	Mortar 10 to 150 mm	Mortar 10 to 150 mm	HT sealing tape special 3 to 5 mm	Mortar 10 to 150 mm
				
	HT sealing tape 3 to 5 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm
				
	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm

Installation gap 2-sided, mortar-based installation

Position of damper(s) in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	HT sealing tape 3 to 5 mm	Mortar 10 to 150 mm	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm
				
	HT sealing tape 3 to 5 mm	Mortar 10 to 150 mm	HT sealing tape special 3 to 5 mm	Mortar 10 to 150 mm
				
	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm
				
	Mortar 10 to 150 mm	HT sealing tape 3 to 5 mm	HT sealing tape special 3 to 5 mm	Mortar 10 to 150 mm

Installation details

Mortar	HT sealing tape	HT sealing tape special
		

1 EK-JZ
2 Mortar
3 Lightweight partition wall with planking on both sides, details *Chapter 5.5.1 'General information ' on page 56*
5 High temperature sealing tape (HT sealing tape)
6 High-temperature sealing tape special (HT sealing tape special)
Details on the design of the installation opening, *'Frame work and installation opening' on page 57*

5.5.3 Dry mortarless installation

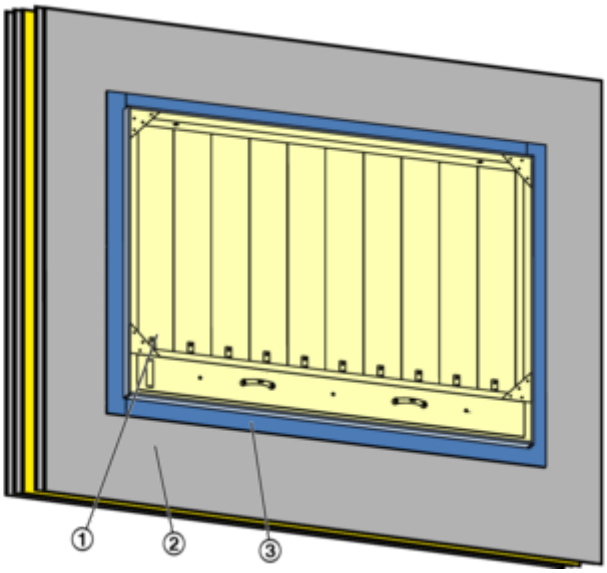
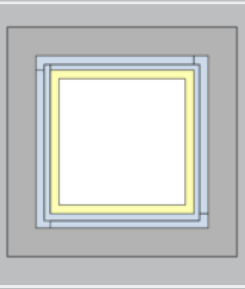
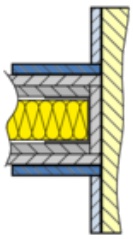
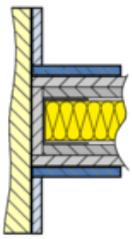
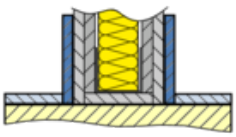
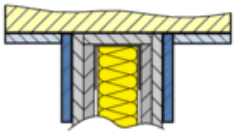


Fig. 42: Installation example EK-JZ dry mortarless installation in lightweight partition wall with planking on both sides EI 120 S

1 EK-JZ ↳ *Chapter 5.2.1 ‘ Occupancy of the installation opening’ on page 18*
2 Lightweight partition wall with planking on both sides
3 fire-rated plasterboard strips (on site)

Installation variants

Position damper(s)	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Angle section ↳ Fig. 43 , Fig. 44			

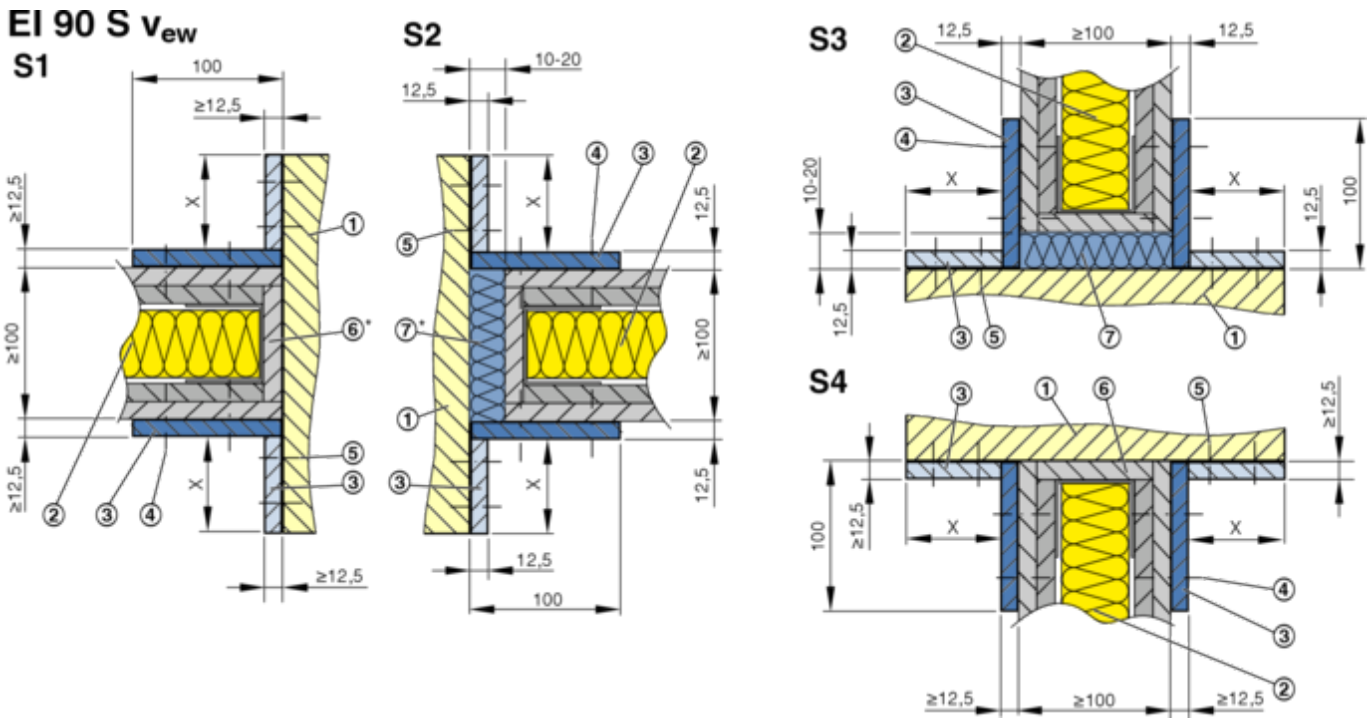


Fig. 43: Details EK-JZ dry mortarless installation in solid wall, solid shaft wall EI 90 S

S1	Installation gap left	3	Fire-rated plasterboard strips
S2	Installation gap right	4	Drywall screws Ø 3.9 x 55 mm depending on wall type
S3	Installation gap top		
S4	Installation gap bottom	5	Fast construction/chipboard screw Ø3.9/4 x 45 mm (pre-drill) or clamp
1	EK-JZ	6	Reveal
2	Lightweight partition wall with metal support structure	7	Mineral wool / rock wool stuffed
		X	100 mm or to the end of the damper

*The installation gaps S1 and S2 can be exchanged (mirror-inverted arrangement).

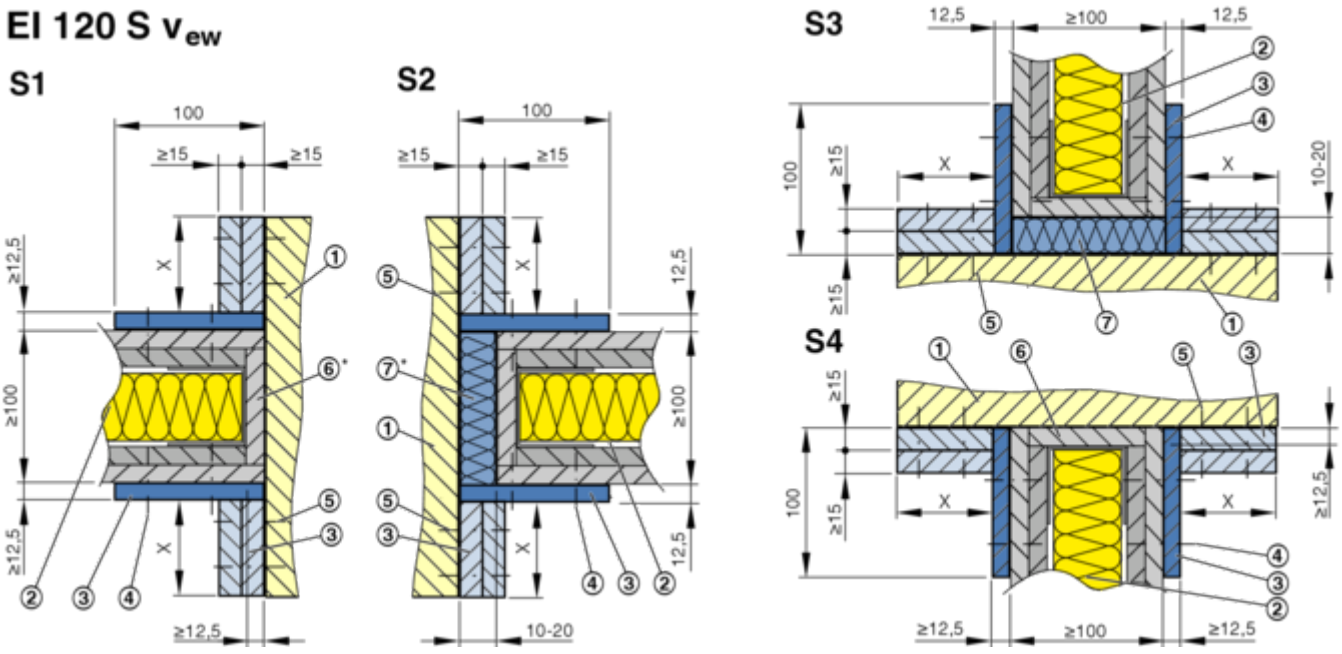


Fig. 44: Details EK-JZ Dry mortarless installation in solid wall, solid shaft wall EI 120 S, legend ↳ Fig. 43

Notes on dry installation in lightweight partition wall

- The damper is placed flush on the reveal at the bottom **S4**. At the installation gaps on the left **S2** or on the right **S3**, the damper is also set flush to the reveal.
  If the installation opening is uneven or too large, the reveal must be filled with board material (6), ↳ *'Adapting the installation opening in solid walls and shaft walls' on page 28*
- Connect damper and wall with angle section (3) made of plate material, glued to each other at joints and to the damper frame e.g. with K84 or equivalent
  The angle sections are to be fixed to the wall (4) and damper (5), distance ≤ 150 mm
  – EI 90 S v_{ew} : angle sections on both sides of the wall, 1 strip ≥12.5 mm, ↳ Fig. 43
  – EI 120 S v_{ew} : angle sections on both sides of the wall, 2 strip ≥15 mm, ↳ Fig. 44
- Distance to ceiling ≥100 mm
- Cavities are stuffed with mineral wool or rock wool (7).

5.5.4 Coated board system (not for lightweight shaft walls)

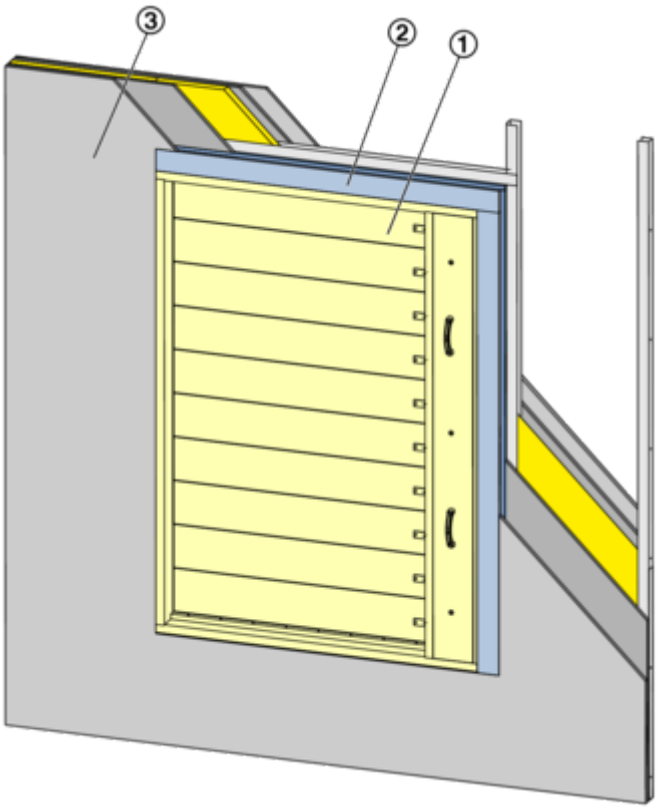


Fig. 45: EK-JZ coated board system installation in lightweight partition wall with metal support structure EI 90 S

1 EK-JZ ↯ *Chapter 5.2.1 ‘ Occupancy of the installation opening’ on page 18*
2 Coated board system (on site)
3 Lightweight partition wall with metal support structure

Installation in coated board system

- Coated board systems consist of two or more layers of mineral wool boards, bulk density ≥ 140 kg/m³.
- The mineral wool boards must be glued tightly into the installation opening with fire protection sealant. Any gaps between the panels and the installation opening, gaps between cut surfaces of fitting pieces as well as gaps between panels and smoke damper are to be coated with sealing compounds / coatings suitable for the coated board system and thereby sealed.
- Apply firestop coating to the mineral wool panels, joints, transitions and to any damage on the pre-coated mineral wool panels; coating thickness ≥ 2.5 mm.
- Smoke control dampers shall be suspended on both sides of the wall if
  – the wall thickness (support) is <170 mm, or
  – if coated board system is used in installation gap S4 (below the damper).
- Dampers must be suspended if coated board system is used underneath the damper.
- If the wall thickness is ≤150 mm and there is no coated board system used underneath the damper, the wall thickness must be increased to at least 150 mm below the damper in order to improve the standing surface of the damper. It is possible to thicken the wall using wall building material, fire-rated plasterboard, or calcium silicate panels.
- The HT seal special (installation accessories 8-11, or 13 - 16) must be used for connecting to ceiling components with a spacing of 3-5 mm (Kerafix + intumescent seal).

Dimensions and distances for coated board system for wall installation

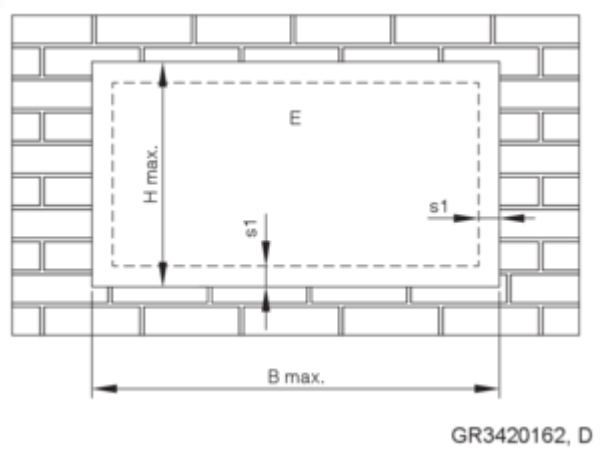


Fig. 46: Coated board system - installation in solid walls

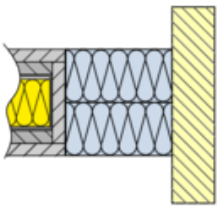
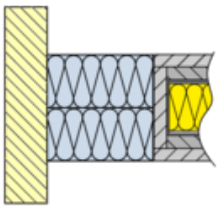
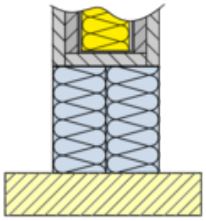
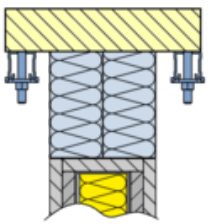
E Installation area

The installation of several dampers up to multiple units is possible if the maximum coated board system size is not exceeded and the minimum bulkhead ring gap is ≥ 50 mm but ≤ 600 mm.

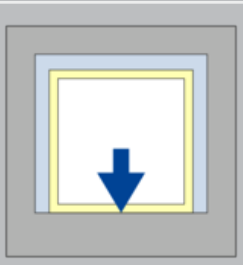
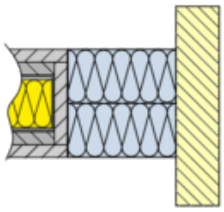
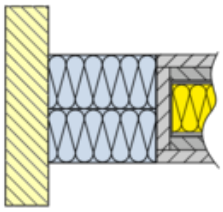
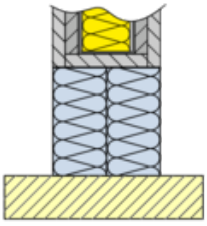
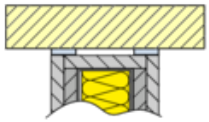
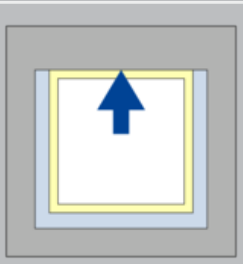
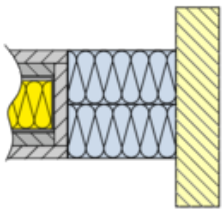
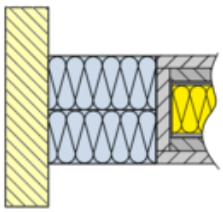
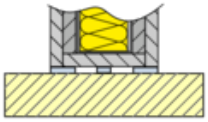
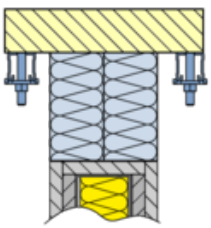
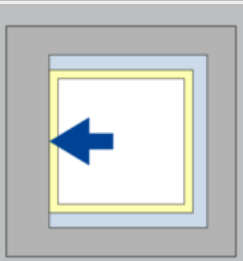
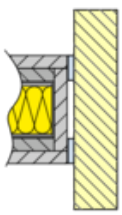
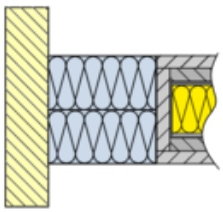
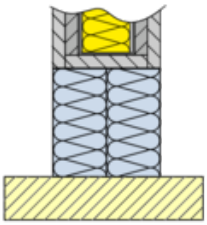
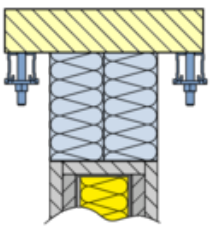
Coated board system	B max. [mm]	H max. [mm]
e.g. Hilti	≤ 3410	≤ 3300

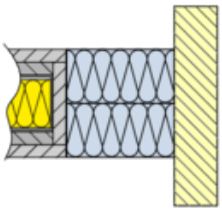
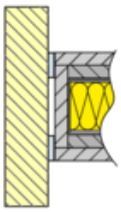
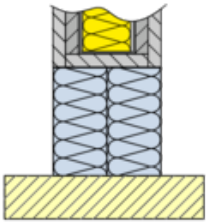
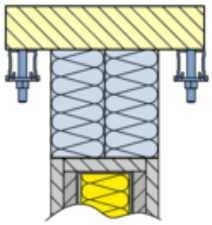
Damper combination up to EI 90 S	s1 min. [mm]	s1 max. [mm]
EK-JZ	50	600

Installation gap 4-sided, coated board system

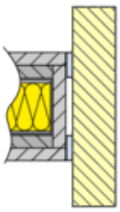
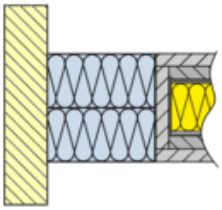
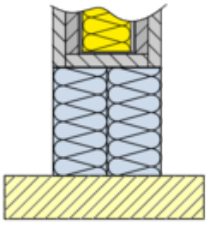
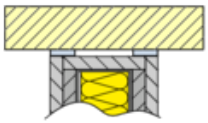
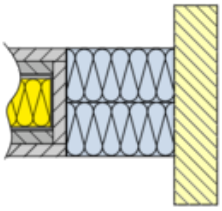
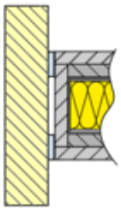
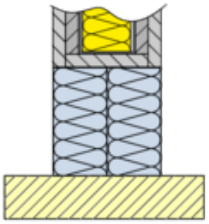
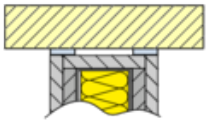
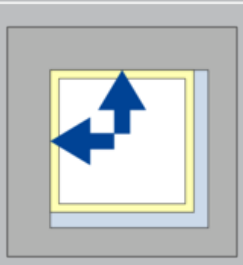
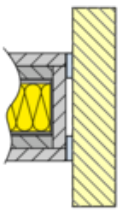
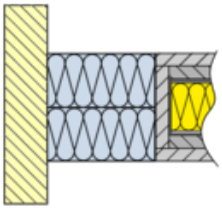
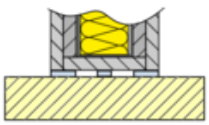
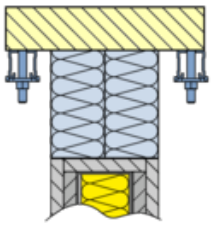
Position of the EK-JZ in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm

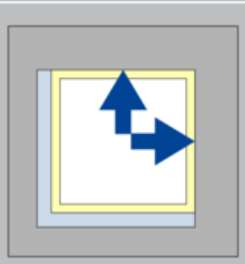
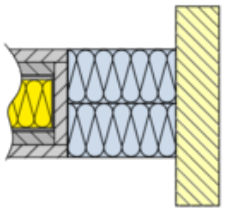
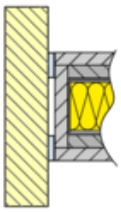
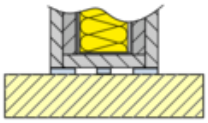
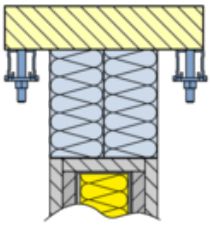
Installation gap 3-sided, coated board system

Position EK-JZ in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm
				
	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	HT sealing tape special 3 to 5 mm	Coated board system 50 to 600 mm
				
	HT sealing tape 3 to 5 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm

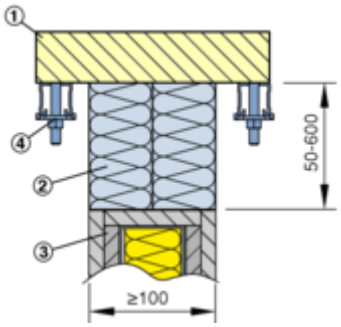
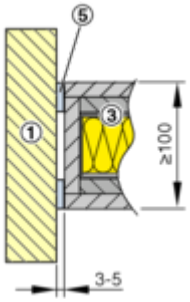
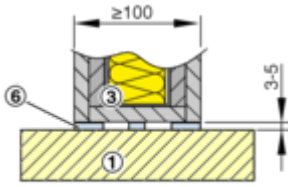
Position EK-JZ in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm

Installation gap 2-sided, coated board system

Position EK-JZ in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	HT sealing tape 3 to 5 mm	Coated board system 50 to 600 mm	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm
				
	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm
				
	HT sealing tape 3 to 5 mm	Coated board system 50 to 600 mm	HT sealing tape special 3 to 5 mm	Coated board system 50 to 600 mm

Position EK-JZ in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Coated board system 50 to 600 mm	HT sealing tape 3 to 5 mm	HT sealing tape special 3 to 5 mm	Coated board system 50 to 600 mm

Installation details

	HT sealing tape	HT sealing tape special
		 only permissible in installation gap S3 (top)

1 EK-JZ
2 Coated board system
3 Lightweight partition wall with metal support structure
4 Suspension, only required if coated board system is used in installation gap S4 (bottom)
5 High temperature sealing tape (HT sealing tape)
6 High-temperature sealing tape special (HT sealing tape special)

5.6 Solid ceiling slabs

5.6.1 Installation type, mortar-based

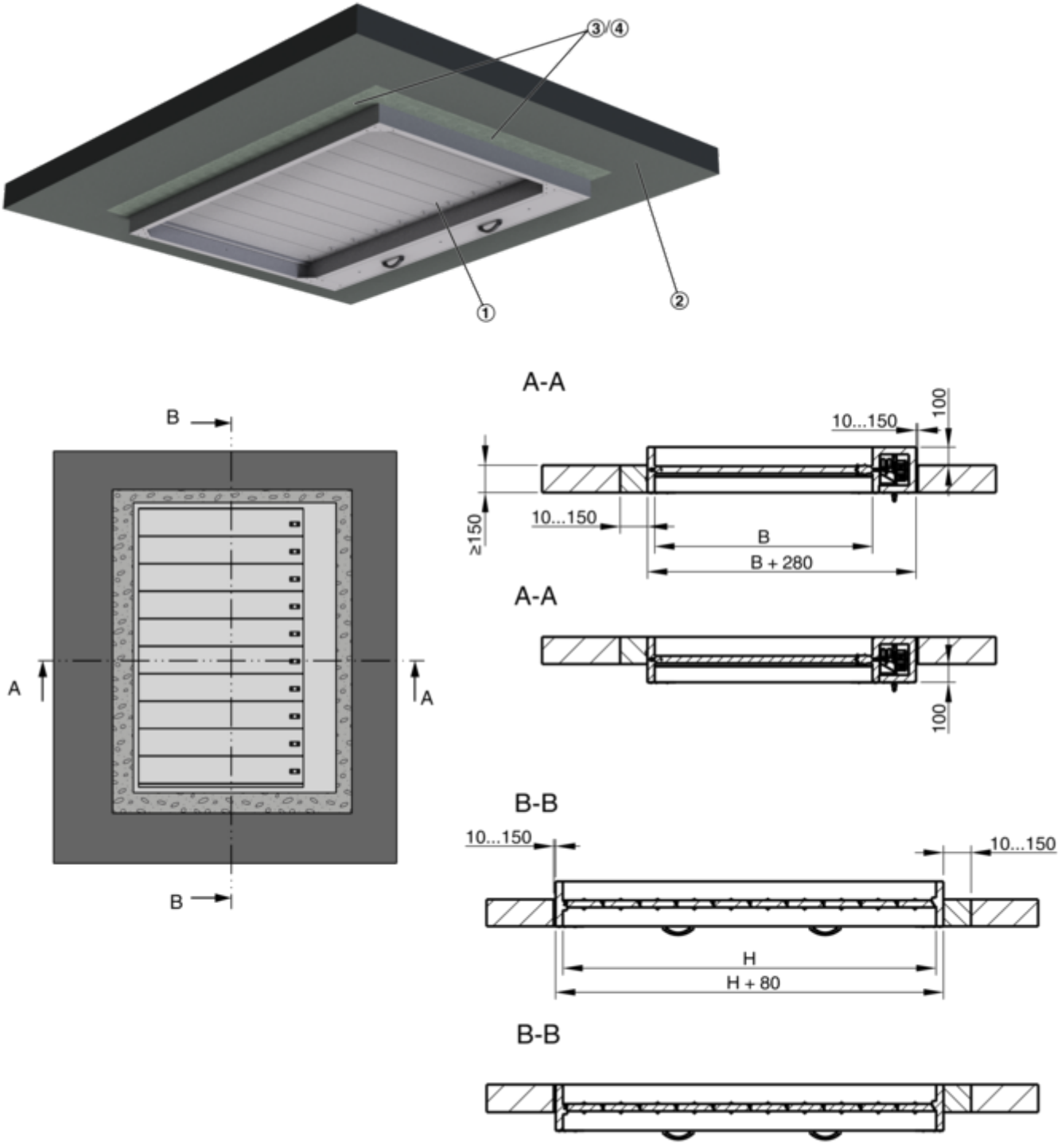
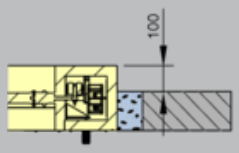
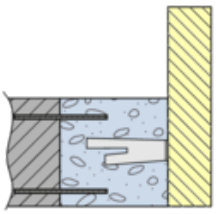
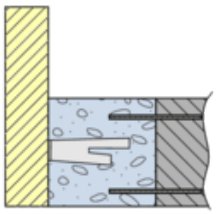
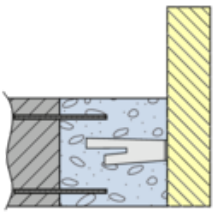
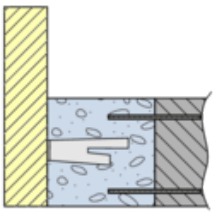
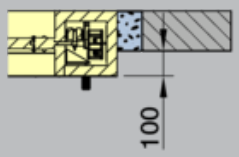
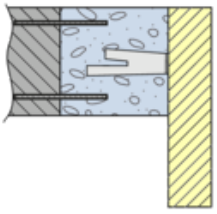
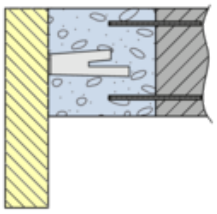
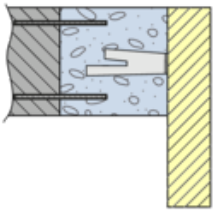
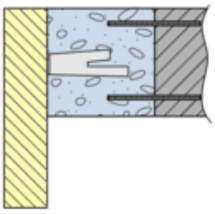


Fig. 47: Mortar-based installation in solid ceiling EI 120 S

1 EK-JZ (operating side above or below the ceiling)
2 Solid concrete or aerated concrete ceiling
3 Mortar, ↪ *'Mortars for mortar-based installation' on page 24*
4 Fixing tab

1) The minimum gap can be reduced to such an extent that there is still sufficient space for mortaring. We recommend a gap of at least 20 mm.

Installation gap, mortar-based installation

Position of damper(s) in the installation opening	S1 (left)	S2 (right)	S3 (top)	S4 (bottom)
				
	Mortar 10 to 150 mm			
				
	Mortar 10 to 150 mm			

Personnel:

- Trained personnel

Material:

- Mortar

Requirements:

- Solid ceilings, e.g. made of concrete, aerated concrete, gross density ≥ 550 kg/m³ and D ≥ 150 mm
- The structural safety of the ceiling construction including the connection to the mortar / concrete and any required reinforcement must be evaluated and ensured by the customer.
- Distance to load-bearing structural elements ≥ 40 mm
- Distance EK-JZ to EK-JZ, to each other ≥ 200 mm

Installation:

1. Prepare a professional installation opening in the ceiling, dimensions Fig. 47 , provide reinforcement bars between the supporting structure and the mortar bed.
2. Attach fixing tabs to the smoke damper, .
3. Prepare a ceiling formwork below the installation opening to support the ring gap filling (of the mortar).
4. Insert the smoke control damper into the installation opening (operating side above or below the ceiling) and secure it against falling. Insert the damper housing vertically without torsion (observe the diagonal dimension, permissible deviation 2 mm).
5. Completely close the installation gap with mortar. Fill the gap depth in the ceiling thickness, but at least 150 mm.

   No cavities must remain between the smoke control damper and the ceiling. Any fixing materials used (e.g. wooden wedges) must be removed. Completely fill cavities with mortar.
6. Do not remove the ceiling formwork until the mortar has hardened.
7. Connect the smoke extract ducts (installation and/or operating side) to the smoke control damper, *5.7 'Smoke extract ducts (multi)' on page 73* .

   If no cable is connected to one side, an end grille must be fitted to the damper, *6 'Connection frame, end grille, inspection access' on page 97* .

5.7 Smoke extract ducts (multi)

5.7.1 Independent fire-resistant smoke extract ducts

5.7.1.1 Construction of the duct

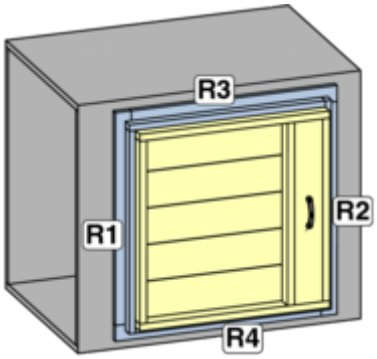
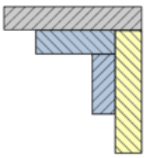
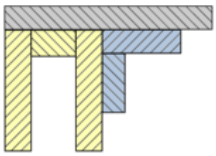
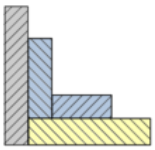
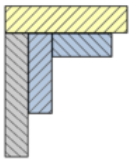
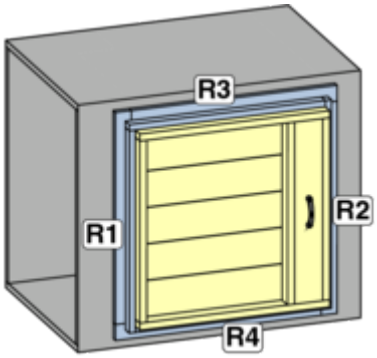
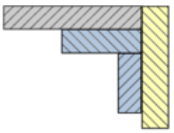
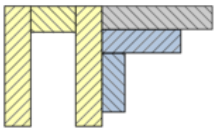
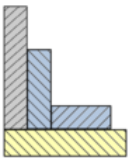
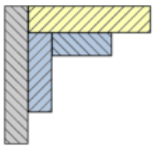
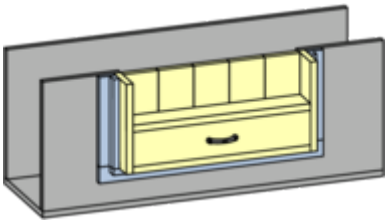
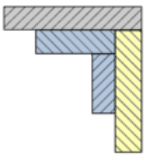
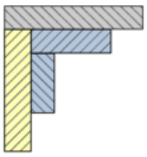
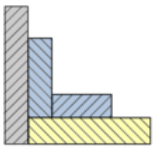
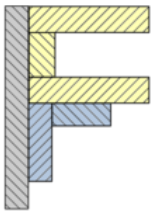
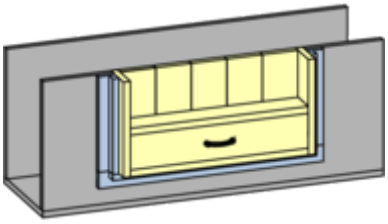
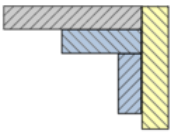
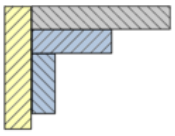
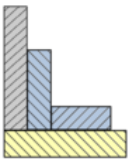
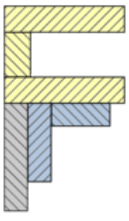
Self-contained smoke extract ducts tested according to EN 1366-8 (smoke extract ducts for a multiple section).

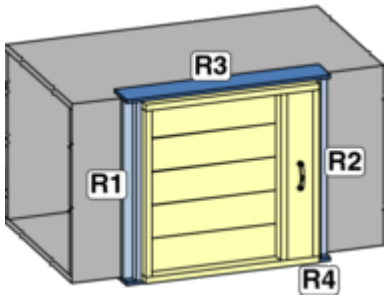
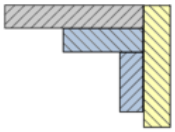
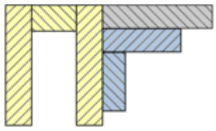
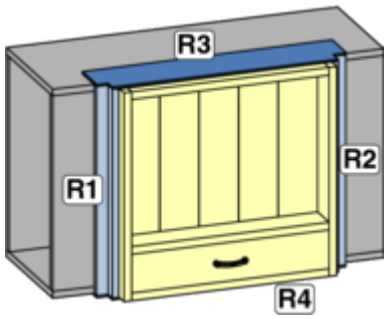
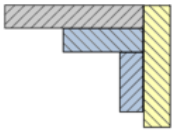
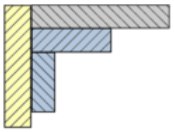
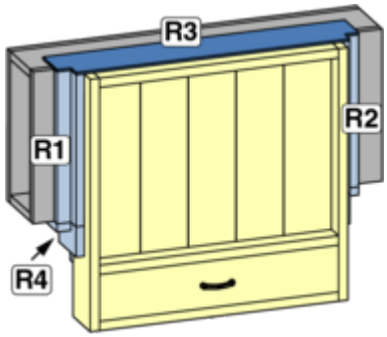
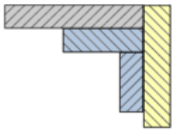
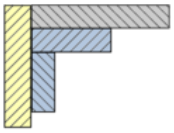
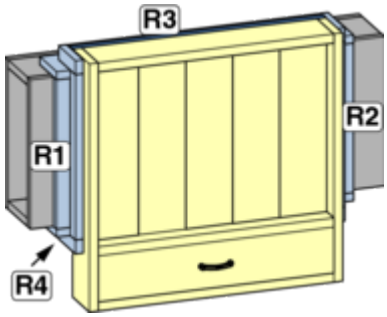
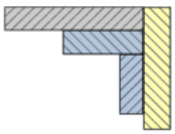
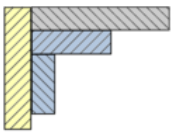
- Consisting of tested material and density ρ ≈ 520 kg/m³, or consisting of the same material with a greater density or thickness.
- Smoke extract ducts consisting of board material type Promat AD 40 and L 500 (ρ ≈ 500 kg/m³) can also be used.

Smoke extract ducts with national general building inspectorate licences

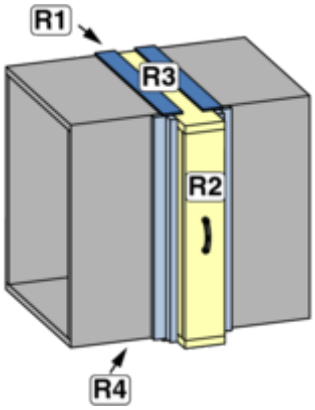
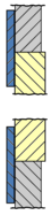
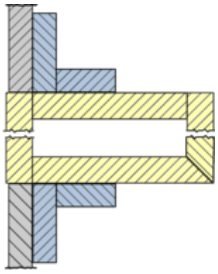
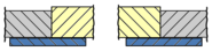
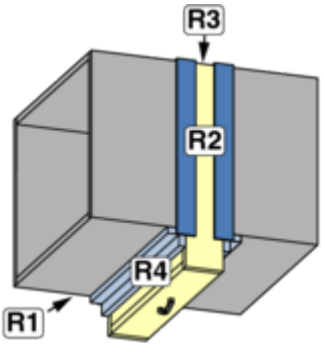
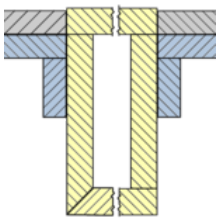
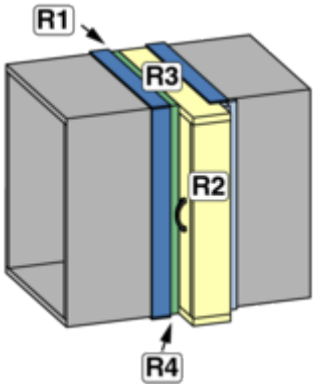
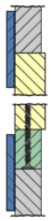
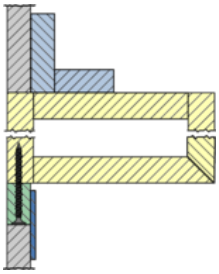
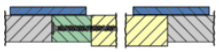
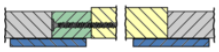
Smoke extract ducts with a national general building inspectorate licence or a national general appraisal certificate can also be connected. If the smoke control damper is not exposed to mechanical forces, the functional stability of the smoke control damper is not affected (connection according to assembly and operating manual of the smoke control damper). The sizing of the smoke extract duct used remains the responsibility of the system installer and the system owner and must be approved by the respective national authority.

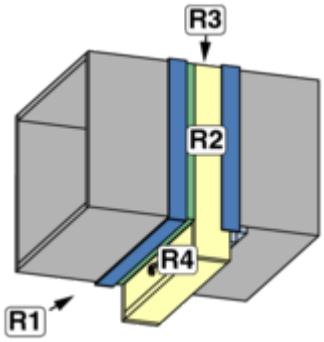
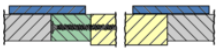
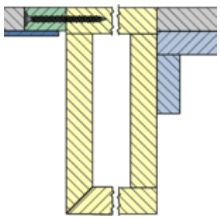
5.7.1.2 On a horizontal duct

Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Axis position horizontal, on duct				
	Details of angle sections, ↳ Fig. 52			
 Axis position horizontal, in duct				
	Details of angle sections, ↳ Fig. 53			
 Axial position vertical, on duct				
	Details of angle sections, ↳ Fig. 52			
 Axial position vertical, in duct				
	Details of angle sections, ↳ Fig. 53			

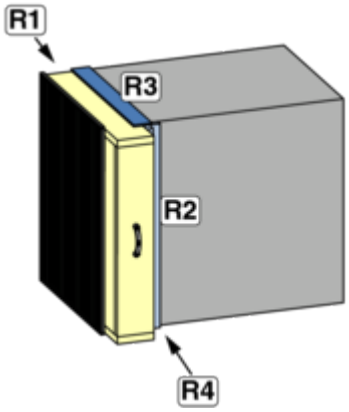
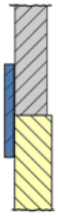
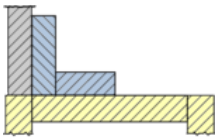
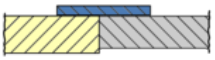
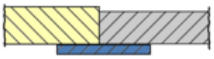
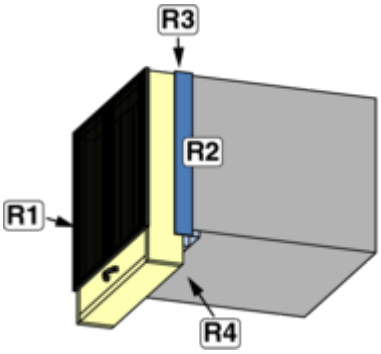
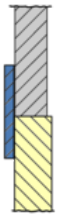
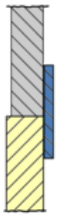
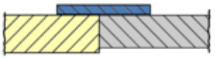
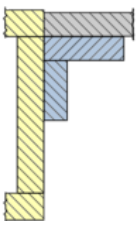
Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Axial position horizontal, in duct, Damper casing = duct size			Details of angle sections, ↳ Fig. 53	↳ Fig. 48 - Fig. 50
 Axial position vertical, in duct, Damper casing = duct size			Details of angle sections, ↳ Fig. 53	↳ Fig. 48 - Fig. 50
 Axial position vertical, in duct, Damper casing > duct size			Details of angle sections, ↳ Fig. 53	↳ Fig. 48 - Fig. 49
 Axial position vertical, in duct, Damper casing > duct size			Details of angle sections, ↳ Fig. 53	↳ Fig. 54

5.7.1.3 In a horizontal duct

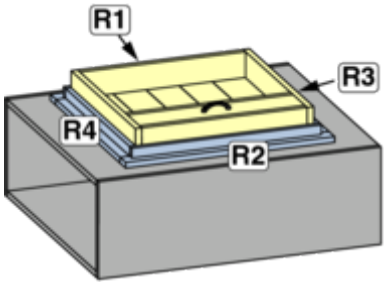
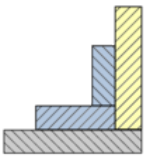
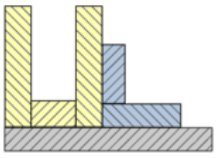
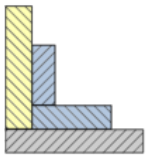
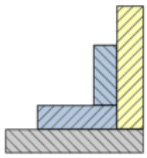
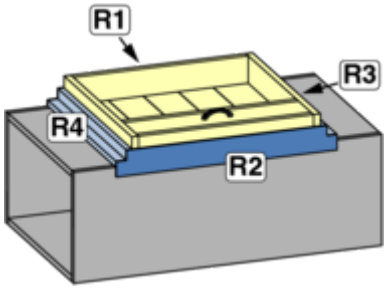
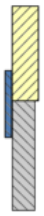
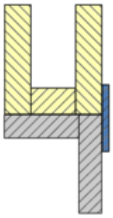
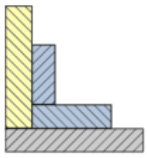
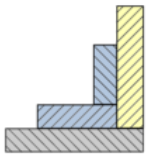
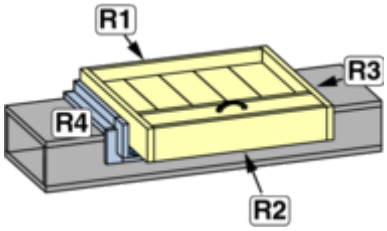
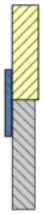
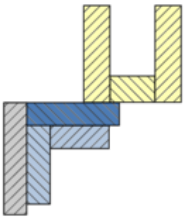
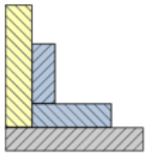
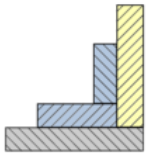
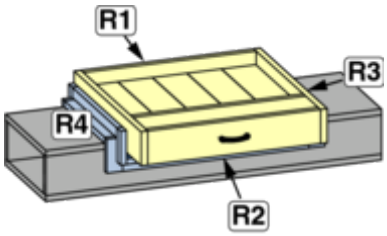
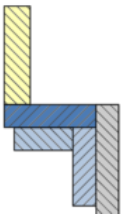
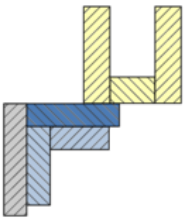
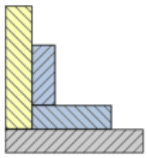
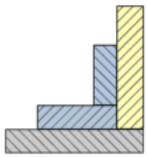
Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Cover on the front side (recommended) Axial position horizontal				
	↳ Fig. 48 - Fig. 49	↳ Fig. 52	↳ Fig. 48 - Fig. 49	
 Cover on the front side (recommended) Axial position vertical				
	↳ Fig. 48 - Fig. 49 Suspension system ↳ Fig. 58			↳ Fig. 52
 Cover standard Axial position horizontal				
	Additional connecting subframe required on the operating side (shown in green, on site) ↳ Fig. 48 – Fig. 52			

Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Cover standard Axial position vertical				
Additional connecting subframe required on the operating side (shown in green, on site) ↳ Fig. 48 – Fig. 52 Suspension system ↳ Fig. 57				

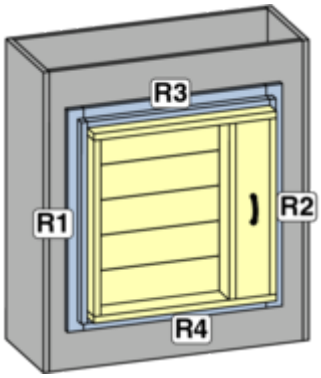
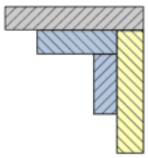
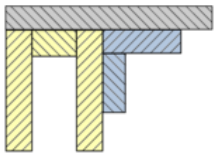
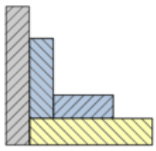
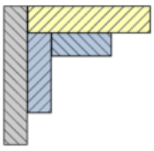
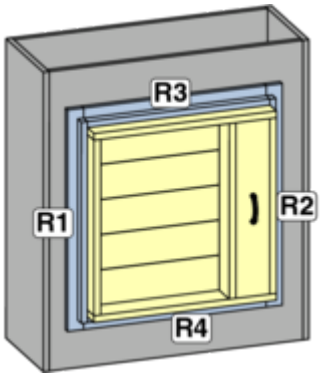
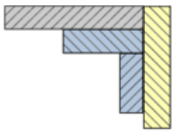
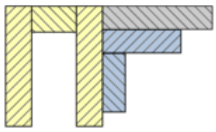
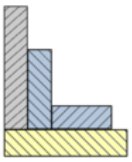
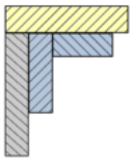
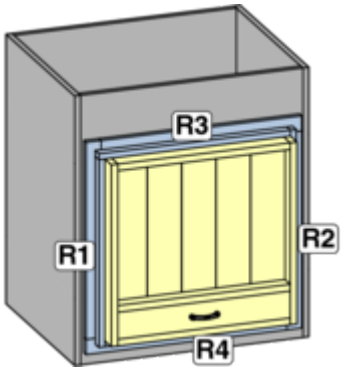
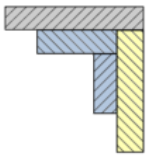
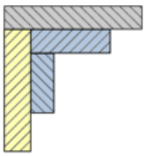
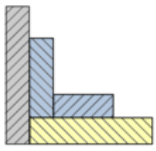
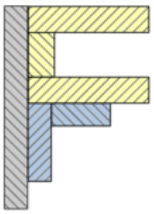
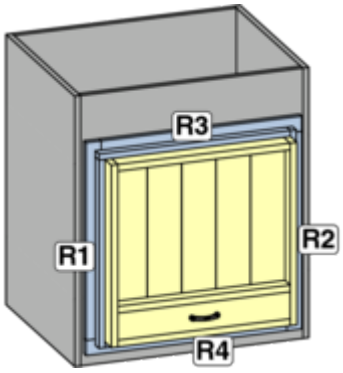
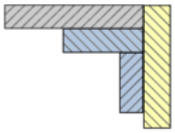
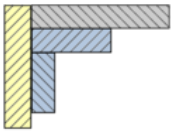
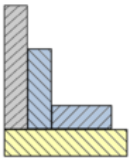
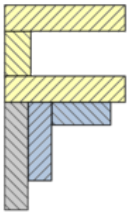
5.7.1.4 At the end of horizontal line

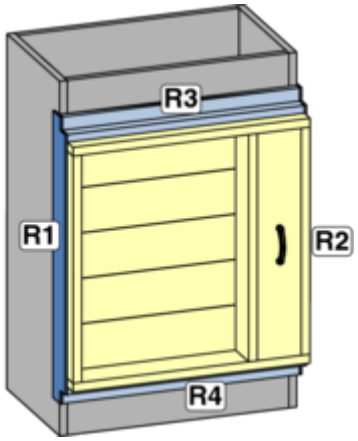
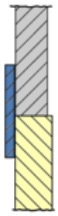
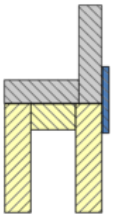
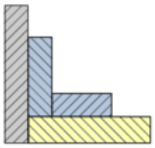
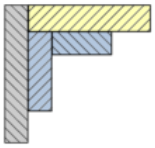
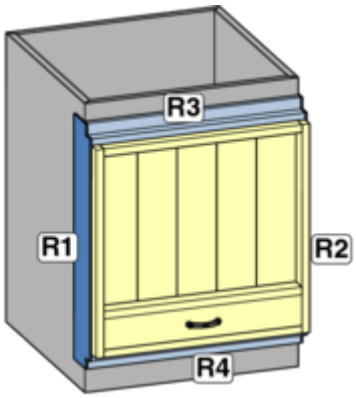
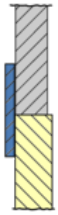
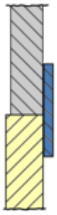
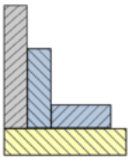
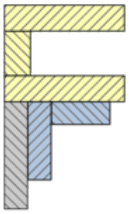
Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Cover on the front side (recommendation), vertical axis position Cover grille required				
	↳ Fig. 48 - Fig. 49	↳ Fig. 52	↳ Fig. 48 - Fig. 49	
 Standard cover (recommendation), vertical axis position Cover grille required				
		↳ Fig. 48 - Fig. 49		↳ Fig. 52

5.7.1.5 On horizontal duct

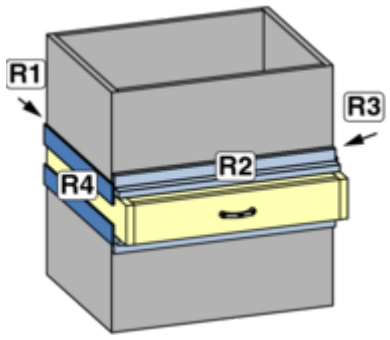
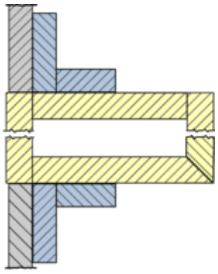
Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 on duct				
	Details of angle sections, ↳ Fig. 52			
 Damper casing flush with cable on both sides (R1+R2)				
	↳ Fig. 48 - Fig. 49		Details of angle sections, ↳ Fig. 52	
 Damper casing flush with cable on one side (R1)				
	↳ Fig. 48 - Fig. 49	↳ Fig. 55	Details of angle sections, ↳ Fig. 52	
 Damper housing with overhang on both sides (R1+R2)				
	↳ Fig. 54	↳ Fig. 55	Details of angle sections, ↳ Fig. 52	

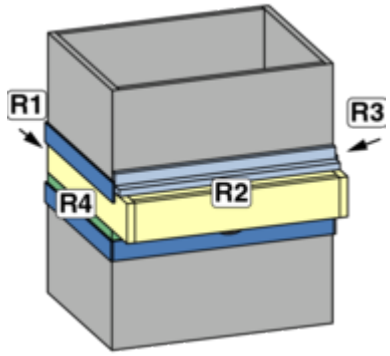
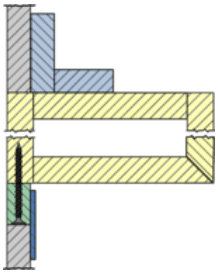
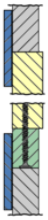
5.7.1.6 On vertical duct

Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Axis position horizontal, on duct				
	Details of angle sections, ↳ Fig. 52			
 Axis position horizontal, in duct				
	Details of angle sections, ↳ Fig. 53			
 Axial position vertical, on duct				
	Details of angle sections, ↳ Fig. 52			
 Axial position vertical, in duct				
	Details of angle sections, ↳ Fig. 53			

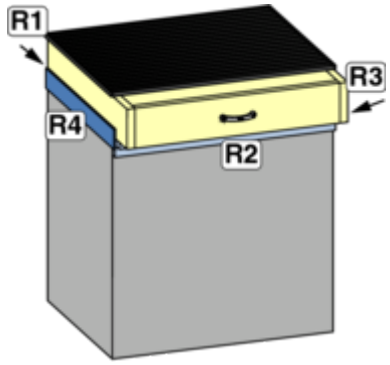
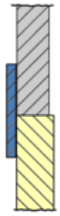
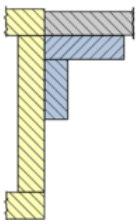
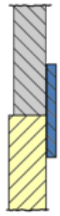
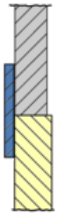
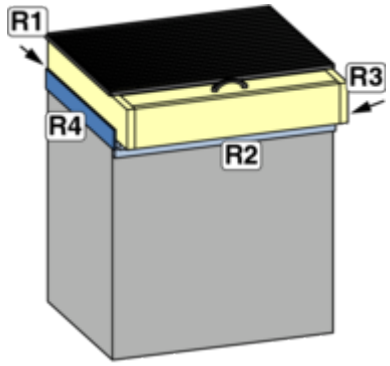
Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Axis position horizontal, on duct Damper casing = duct size				
	↳ Fig. 48 - Fig. 49		Details of angle sections, ↳ Fig. 52	
 Axial position vertical, in duct, Damper casing = duct size				
	↳ Fig. 48 - Fig. 49		Details of angle sections, ↳ Fig. 53	

5.7.1.7 In vertical line

Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Cover on the front side (recommendation)				
	↳ Fig. 48 - Fig. 49	↳ Fig. 52	↳ Fig. 48 - Fig. 49	

Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Cover standard Operating side can be arranged at the bottom or top				
	Additional connection frame required on the operating side (shown in green, on site)			
	↳ Fig. 48 - Fig. 52			

5.7.1.8 At the end of vertical line

Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Cover on front side (recommended), Cover grille required				
 Cover standard, Cover grille required	↳ Fig. 48 - Fig. 49	↳ Fig. 52	↳ Fig. 48 - Fig. 49	

5.7.1.9 Installation details

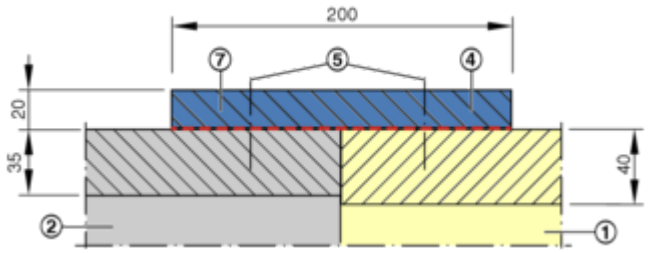


Fig. 48: Installation detail A1 (flush outside)

1 EK-JZ
2 Smoke extract duct
4 Promat connection
5 Steel wire clamp 63/11.2/1.5
7 Glue, Promat K48 or equivalent

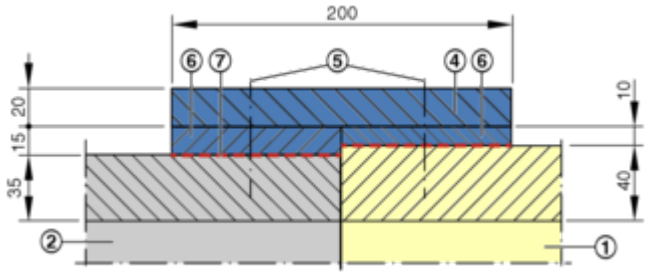


Fig. 49: Installation detail A2 (flush inside)

1 EK-JZ
2 Smoke extract duct
4 Promat connection
5 Steel wire clamp 63/11.2/1.5
6 Reinforcement
7 Glue, Promat K48 or equivalent

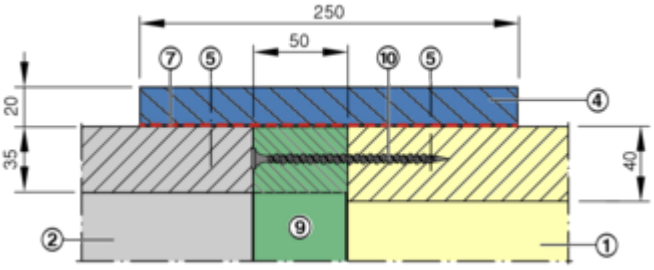


Fig. 50: Installation detail B1: Connecting subframe on operating side (flush outside)

1 EK-JZ
2 Smoke extract duct
4 Promat connection
5 Steel wire clamp 63/11.2/1.5
7 Glue, Promat K48 or equivalent
9 Connecting subframe (to be provided by the customer)
10 Chipboard screw 5 x 90 mm; pre-drilled Ø 3.5 mm

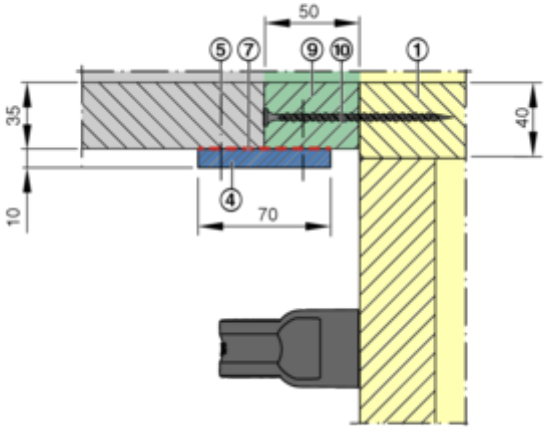


Fig. 51: Installation detail B1: Connecting subframe on operating side (flush on inside), required with standard cover

1 EK-JZ
2 Smoke extract duct
4 Promat connection
5 Steel wire clamp 63/11.2/1.5
7 Glue, Promat K48 or equivalent
9 Connecting subframe (to be provided by the customer)
10 Chipboard screw 5 x 90 mm; pre-drilled Ø 3.5 mm

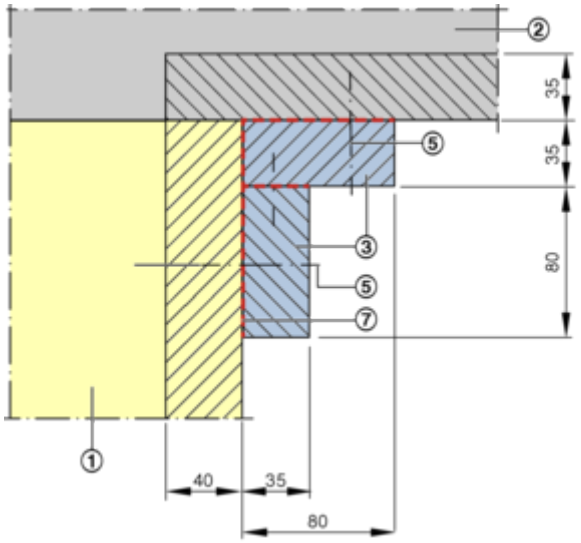


Fig. 52: Installation detail C1: angle section connection

1 EK-JZ
2 Smoke extract duct
3 Angle section, calcium silicate: Promatect fire protection board LS35, AD40, L500 or equivalent
5 Steel wire clamp 63/11.2/1.5 mm and/or drywall screws ~4x70 mm
7 Glue, Promat K48 or equivalent

First make the angle section, then glue the joints together, and fasten them together with steel wire clamps and/or drywall screws. Then glue the angle section between the smoke extract duct and smoke control damper, and fix it with steel wire clamps and/or drywall screws. Glue joints between two adjacent angle sections.

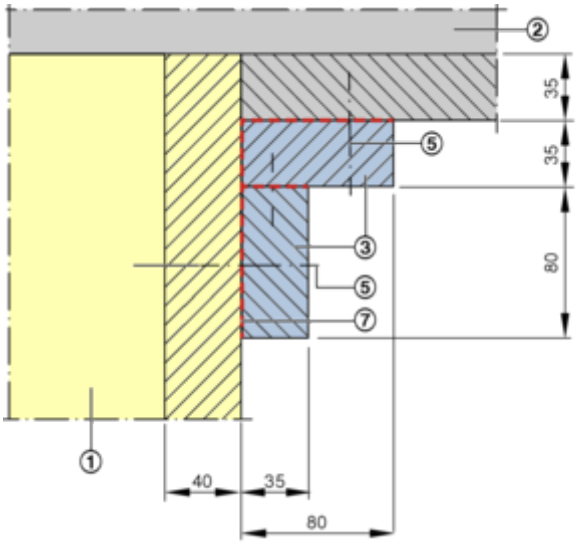


Fig. 53: Installation detail C2: Angle section connection, damper in duct

1 EK-JZ
2 Smoke extract duct
3 Angle section, calcium silicate: Promatect fire protection board LS35, AD40, L500 or equivalent
5 Steel wire clamp 63/11.2/1.5 mm and/or drywall screws ~4x70 mm
7 Glue, Promat K48 or equivalent

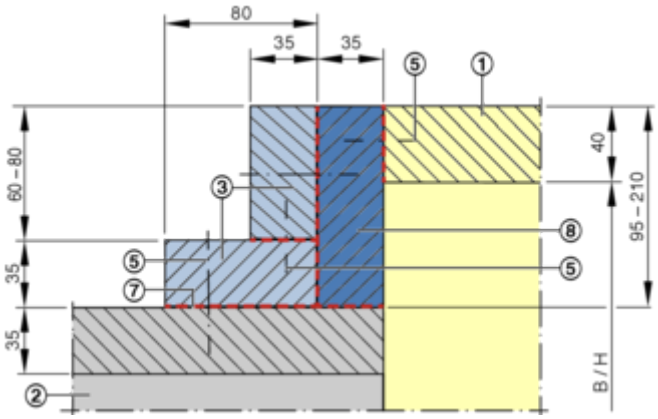


Fig. 54: Installation detail D: damper overhang

1 EK-JZ
2 Smoke extract duct
3 Angle section, calcium silicate: Promatect fire protection board LS35, AD40, L500 or equivalent
5 Steel wire clamp 63/11.2/1.5 mm and/or drywall screws ~4x70 mm
7 Glue, Promat K48 or equivalent
8 Closure strips width 95 - 210 mm, calcium silicate: Promatect fire protection board LS35, AD40, L500 or equivalent

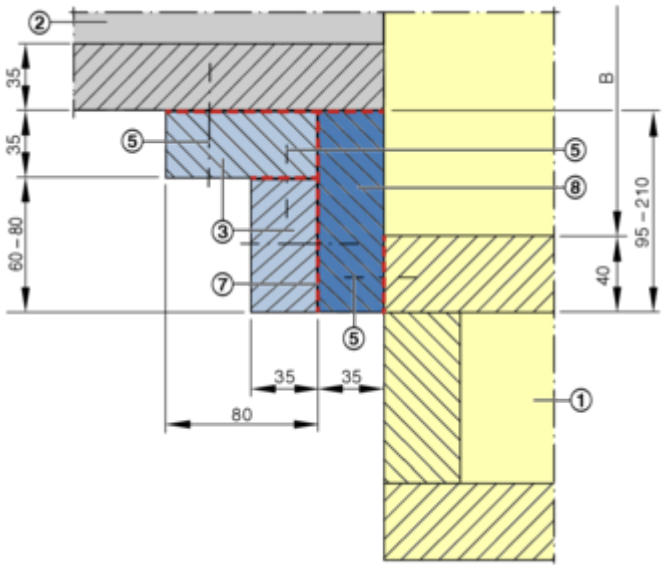


Fig. 55: Installation detail E: Damper overhang on actuator side

1 EK-JZ (actuator box)
2 Smoke extract duct
3 Angle section, calcium silicate: Promatect fire protection board LS35, AD40, L500 or equivalent
5 Steel wire clamp 63/11.2/1.5 mm and/or drywall screws ~4x70 mm
7 Glue, Promat K48 or equivalent
8 Closure strips width 95 - 210 mm, calcium silicate: Promatect fire protection board LS35, AD40, L500 or equivalent

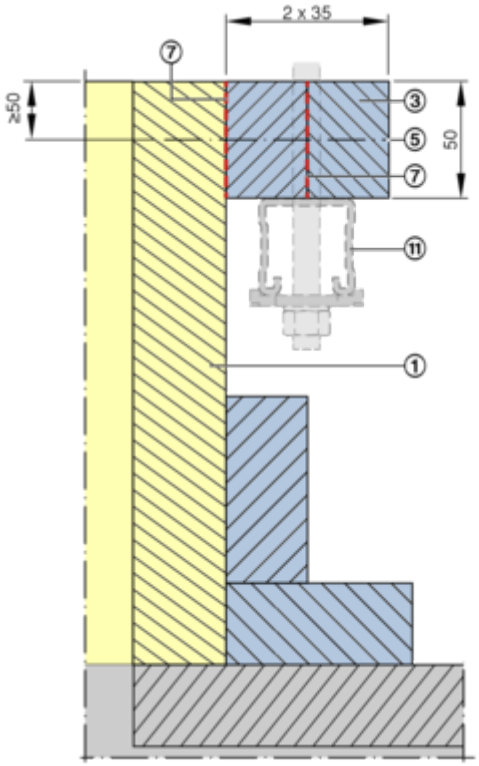


Fig. 56: Installation detail H: Fastening the suspension for horizontal damper position

1 EK-JZ
3 Calcium silicate: Promatect fire protection board LS35, AD40, L500 or equivalent
5 Steel wire clamp 63/11.2/1.5 mm and/or drywall screws ~4x70 mm
7 Glue, Promat K48 or equivalent
11 Suspension, *5.9 'Suspending the smoke control damper' on page 96*

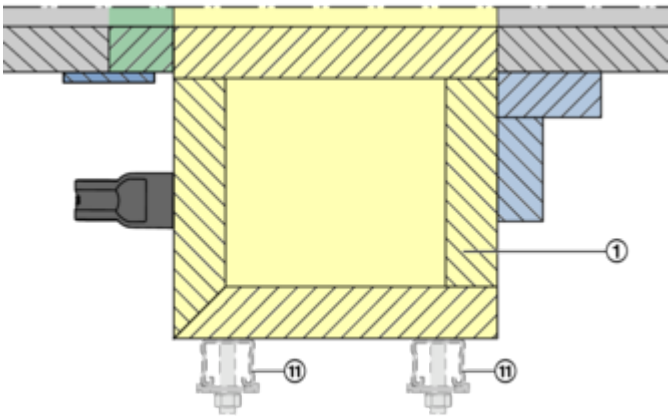


Fig. 57: Installation detail F1: Suspension actuator box cover standard

1 EK-JZ (actuator box)
3 Calcium silicate: Promatect fire protection board LS35, AD40, L500 or equivalent
5 Steel wire clamp 63/11.2/1.5 mm and/or drywall screws ~4x70 mm
7 Glue, Promat K48 or equivalent
11 Suspension, *5.9 'Suspending the smoke control damper' on page 96*

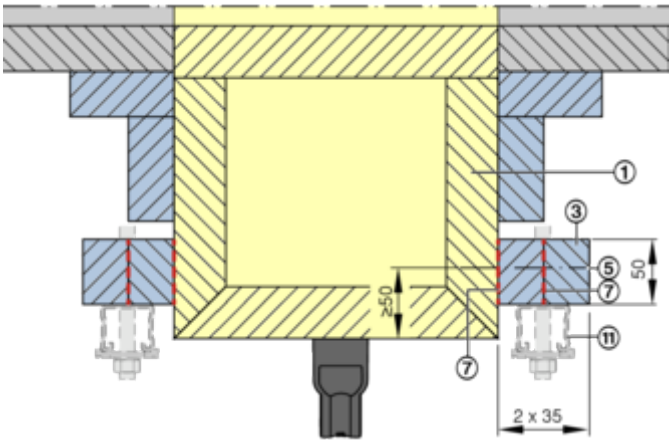


Fig. 58: Installation detail F2: Suspension actuator box cover (order feature S)

1 EK-JZ (actuator box)
3 Calcium silicate: Promatect fire protection board LS35, AD40, L500 or equivalent
5 Steel wire clamp 63/11.2/1.5 mm and/or drywall screws ~4x70 mm
7 Glue, Promat K48 or equivalent
11 Suspension, *5.9 'Suspending the smoke control damper' on page 96*

5.7.2 Sheet steel smoke extract duct (thermally insulated)

5.7.2.1 Construction of the duct

Thermally insulated smoke extract ducts tested according to EN 1366-8 (smoke extract ducts for a multiple section).

The following products can be used for this purpose.

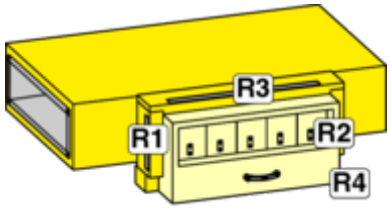
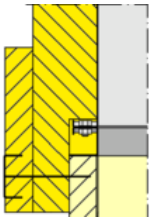
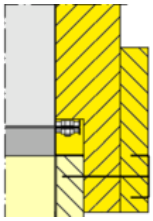
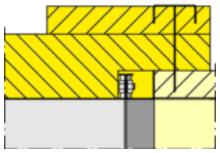
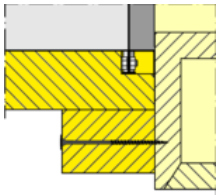
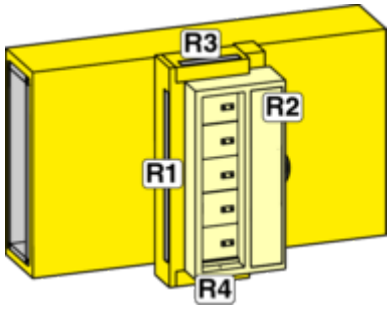
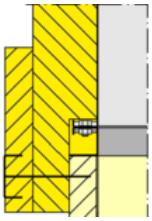
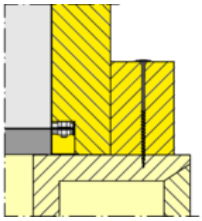
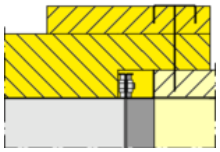
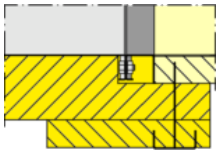
Smoke extract duct	-	Sheet steel duct tested according to EN 1366-8, e.g. from Flame Shield
Insulation	-	Conlit® DuctBoard, Conlit® FireBoard, ROCKWOOL® Fire Duct Panel
Glue	-	Conlit® Fix, Conlit® Fix Cold, FIREPRO® Glue
Covering	-	FIREPRO® DuctRock Black Alu Foil Tape

The smoke control damper is connected in accordance with the manufacturer's documentation Flame Shield or ROCKWOOL.

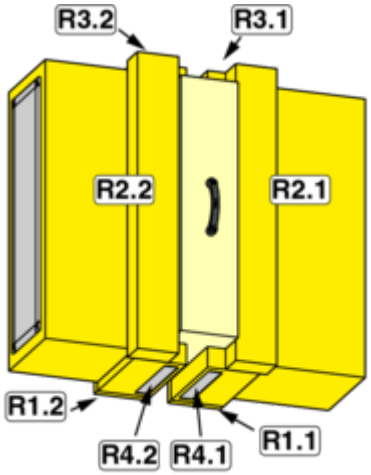
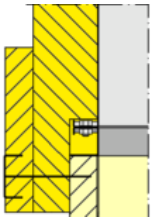
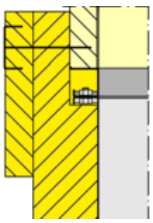
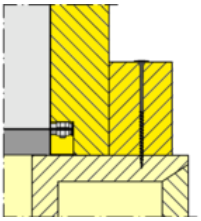
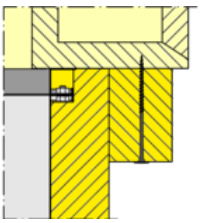
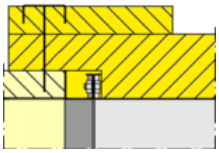
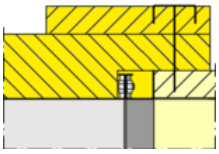
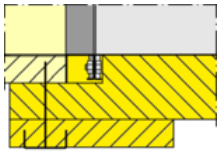
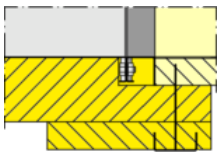
Smoke extract ducts with national general building inspectorate licences

Smoke extract ducts with a national general building inspectorate licence or a national general appraisal certificate can also be connected. If the smoke control damper is not exposed to mechanical forces, the functional stability of the smoke control damper is not affected (connection according to assembly and operating manual of the smoke control damper). The sizing of the smoke extract duct used remains the responsibility of the system installer and the system owner and must be approved by the respective national authority.

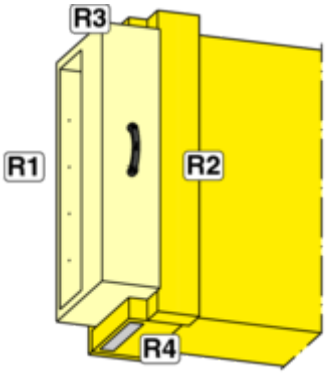
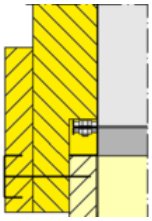
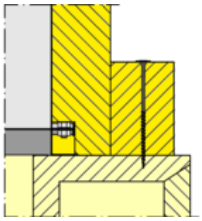
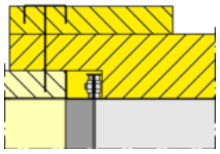
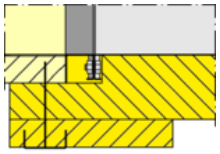
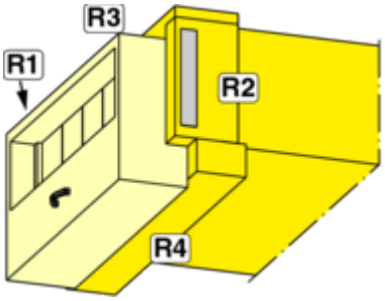
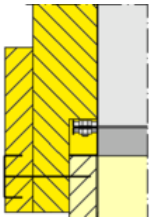
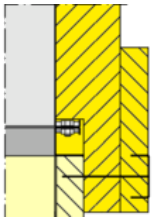
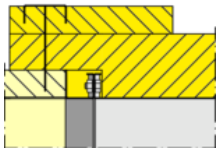
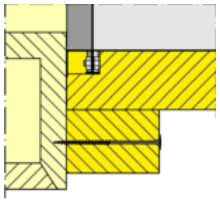
5.7.2.2 On a horizontal duct

Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Axis position horizontal, on duct				
	↳ – ↳ Fig. 59 – Fig. 60			↳ Fig. 61
 Axial position vertical, on duct				
	↳ – ↳ Fig. 59 – Fig. 60	↳ Fig. 61	↳ – ↳ Fig. 59 – Fig. 60	

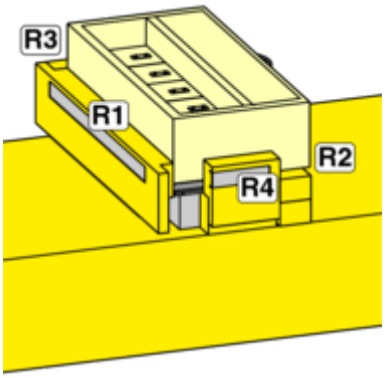
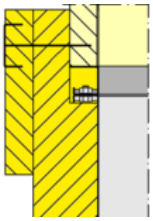
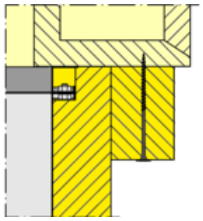
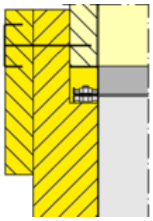
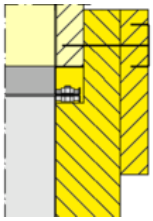
5.7.2.3 In a horizontal duct

Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Horizontal installation	  ↳ – ↳ Fig. 59 – Fig. 60	  ↳ Fig. 61	  ↳ – ↳ Fig. 59 – Fig. 60	 

5.7.2.4 At the end of a horizontal duct

Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
 Horizontal installation				
	↳ – ↳ Fig. 59 – Fig. 60	↳ Fig. 61	↳ – ↳ Fig. 59 – Fig. 60	
 Vertical installation				
	↳ – ↳ Fig. 59 – Fig. 60			↳ Fig. 61

5.7.2.5 On horizontal duct

Variant	Angle section R1	Angle section R2	Angle section R3	Angle section R4
				
↳ – ↳ Fig. 59 – Fig. 60	↳ Fig. 61	↳ – ↳ Fig. 59 – Fig. 60		

5.7.2.6 Installation details

Detail A

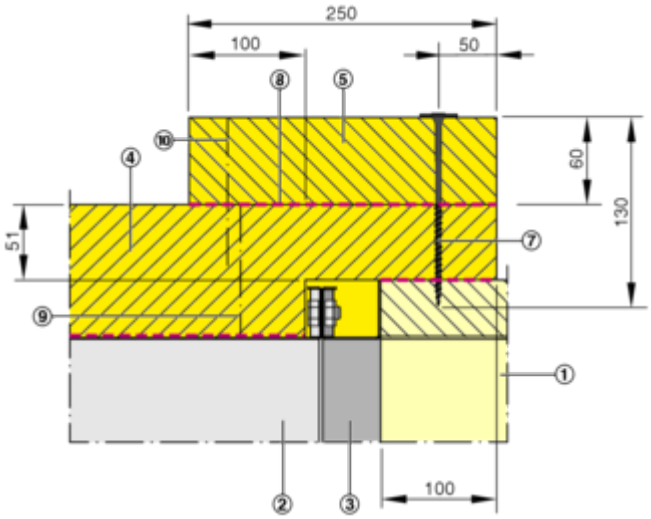


Fig. 59: Detail A1 all sides except actuator box

1 EK-JZ
2 Steel smoke extract duct, connection ↳ Fig. 62
3 Connecting subframe
4 Insulation smoke extract duct
5 Insulation EK-JZ
7 Chipboard screw 5x130 with washer
8 Glue
9 Welding pin (Clip-Pin 30 D / 2.7 L/ 92.0 v / v /Sl) or equivalent
10 Mineral wool screw

Detail A2

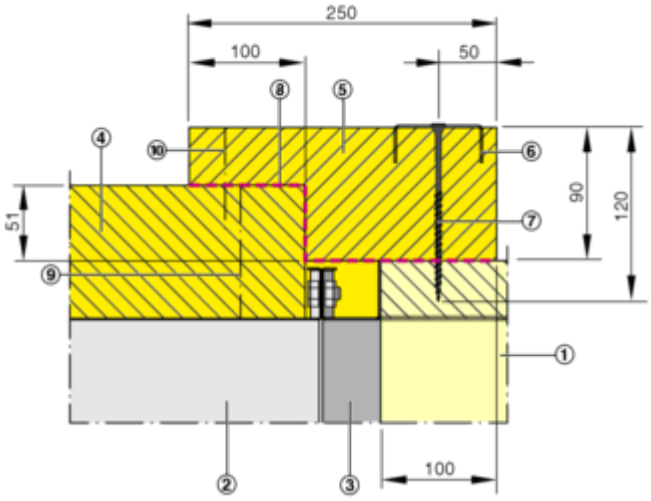


Fig. 60: Detail A2 (alternative)

1 EK-JZ
2 Steel smoke extract duct, connection ↳ Fig. 62
3 Connecting subframe
4 Insulation smoke extract duct
5 Insulation EK-JZ
6 U-profile 60x25x1.5
7 Chipboard screw 5x120
8 Glue
9 Welding pin (Clip-Pin 30 D / 2.7 L/ 92.0 v / v /Sl) or equivalent
10 Mineral wool screw

Detail B

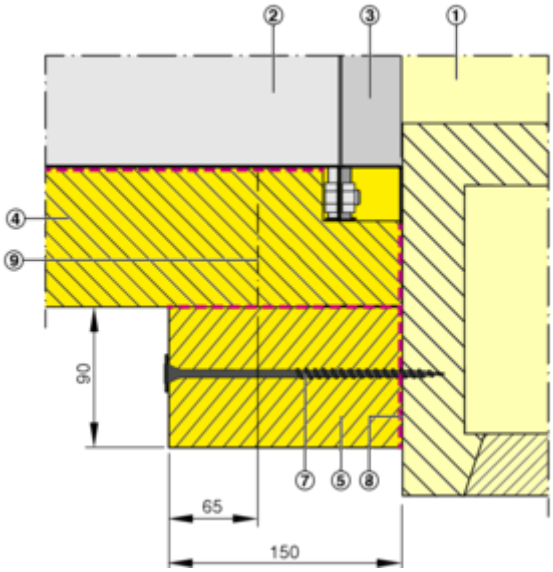


Fig. 61: Detail B, actuator box connection

1 EK-JZ (cover on front side)
2 Steel smoke extract duct, connection ↳ Fig. 62
3 Connecting subframe
4 Insulation smoke extract duct
5 Insulation EK-JZ
7 Chipboard screw 6x180 mm with washer
8 Glue
9 Welding pin (Clip-Pin 30 D / 2.7 L/ 92.0 v / v /Sl) or equivalent

Detail C

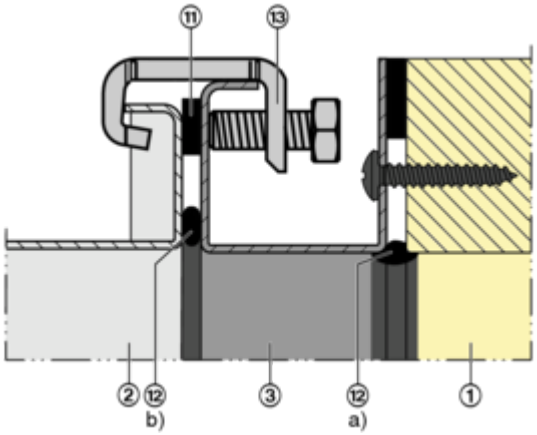


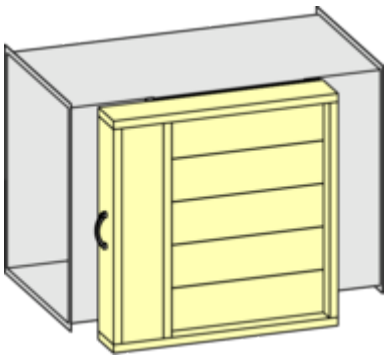
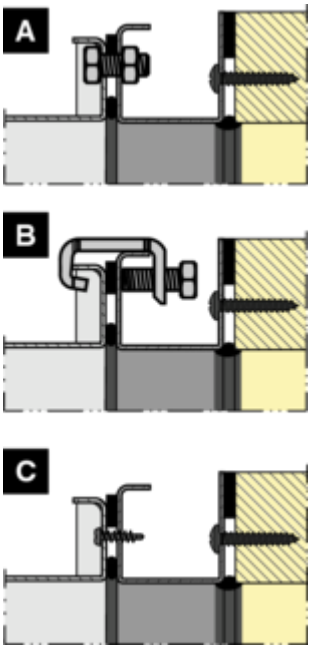
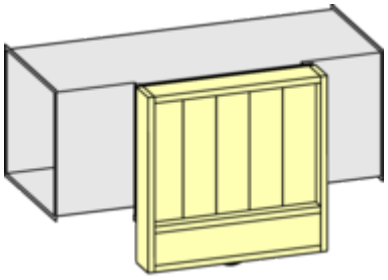
Fig. 62: Detail C, connection steel smoke extract duct, (drawn without insulation)

1 EK-JZ
2 sheet steel smoke extract duct
3 Connecting subframe (accessory)
11 Kerafix sealing strip t=2
12 intumescent seal (sprayable)
13 Screw connection, duct clamp or drill screw
↳ *5.8.5 'Installation details' on page 94*

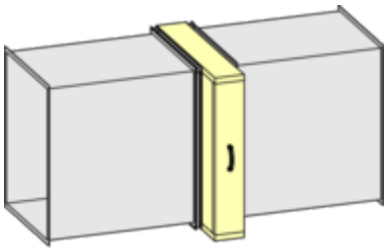
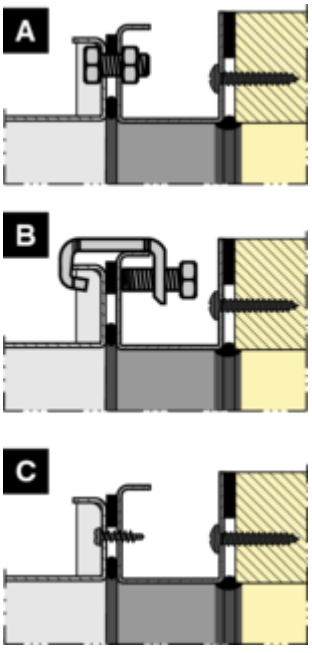
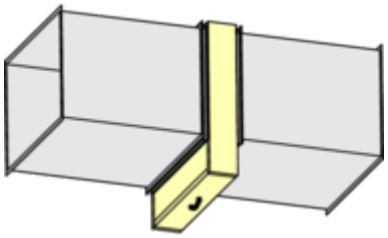
1. Stick Kerafix sealing strip (11) to the flange of the connection frame.
2. Apply the intumescent seal (12a) between the EK-JZ and the connection frame before connecting the smoke extract ducts. Then apply the intumescent seal (12b) all around the flange of the connection frame. Make sure that it is tightly sealed!
3. Connect and screw the smoke extract duct.

5.8 Smoke extract duct (single)

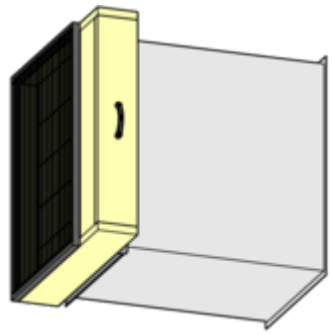
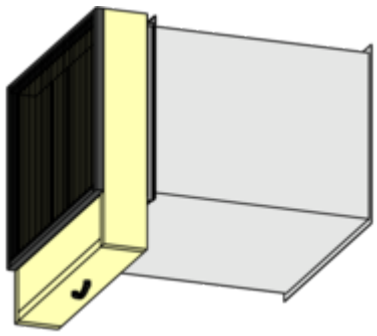
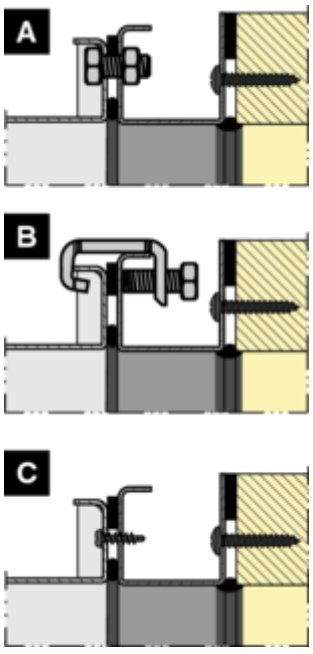
5.8.1 On a horizontal duct

Variant	Connection options
 Horizontal installation	
 Vertical installation Suspension system ↳ Fig. 67	Further information ↳ *5.8.5 'Installation details' on page 94*

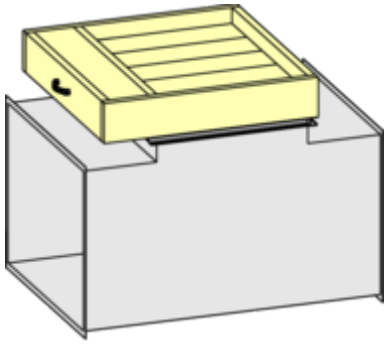
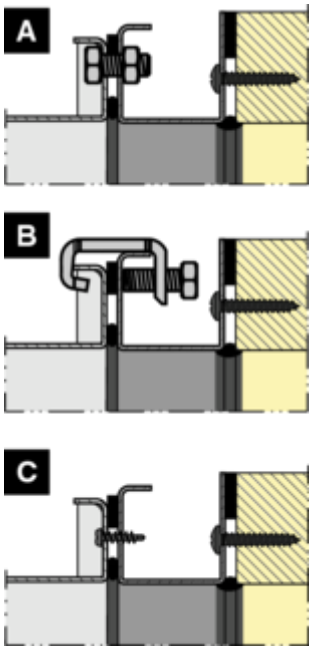
5.8.2 In a horizontal duct

Variant	Connection options
 Horizontal installation	
 Vertical installation Suspension system ↳ Fig. 67	Further information ↳ *5.8.5 'Installation details' on page 94*

5.8.3 At the end of horizontal line

Variant	Connection options
 Horizontal installation  Vertical installation Suspension system ↳ Fig. 67	 Further information ↳ *5.8.5 'Installation details' on page 94*

5.8.4 On horizontal duct

Variant	Connection options
	 Further information ↳ *5.8.5 'Installation details' on page 94*

5.8.5 Installation details

We recommend construction using the line's own design.

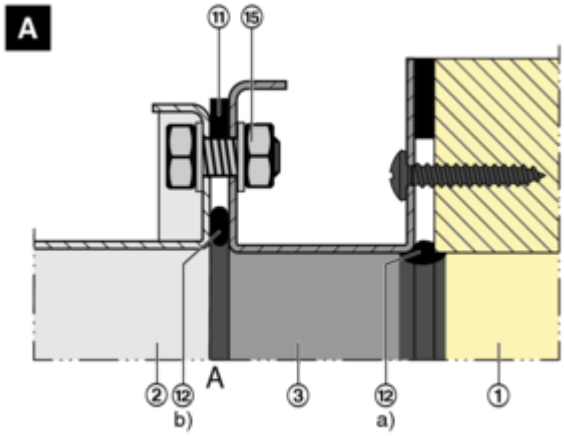


Fig. 63: Connecting subframe corner joint

1 EK-JZ
2 Sheet steel smoke extract duct
3 Connecting subframe (accessory)
11 Kerafix sealing strip t=2
12 Intumescent seal (sprayable), optionally according to specifications of duct manufacturer
13 Screw, washers, nut M8

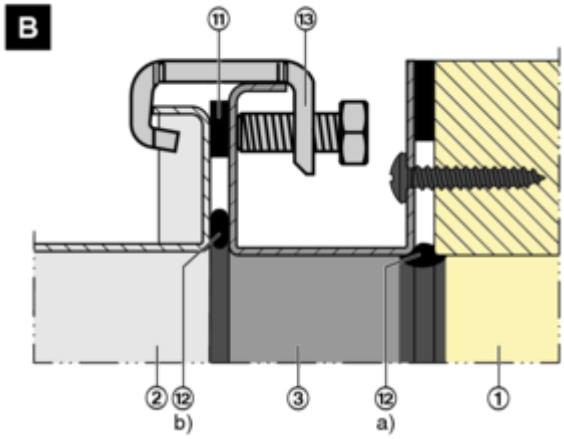


Fig. 64: Connection of connecting subframe - smoke extract duct

1 EK-JZ
2 Sheet steel smoke extract duct
3 Connecting subframe (accessory)
11 Kerafix sealing strip t=2
12 Intumescent seal (sprayable), optionally according to specifications of duct manufacturer
13 Duct clamp

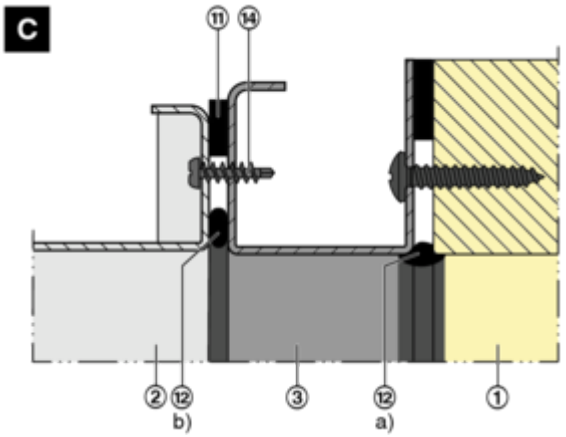


Fig. 65: Connection of connecting subframe - smoke extract duct

1 EK-JZ
2 Sheet steel smoke extract duct
3 Connecting subframe (accessory)
11 Kerafix sealing strip t=2
12 Intumescent seal (sprayable, on site), optionally according to specifications of duct manufacturer
13 Duct clamp

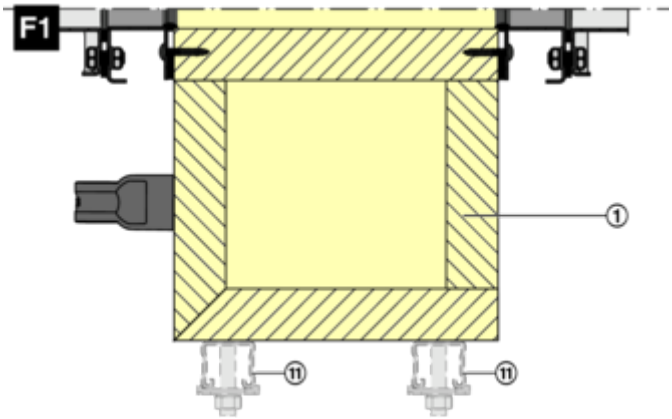


Fig. 66: Installation detail F1: Suspension actuator box cover standard

1 EK-JZ (actuator box)
3 Calcium silicate: Promatect fire protection board LS35, AD40, L500 or equivalent
5 Steel wire clamp 63/11.2/1.5 mm and/or drywall screws ~4x70 mm
7 Glue, Promat K48 or equivalent
11 Suspension, *5.9 'Suspending the smoke control damper' on page 96*

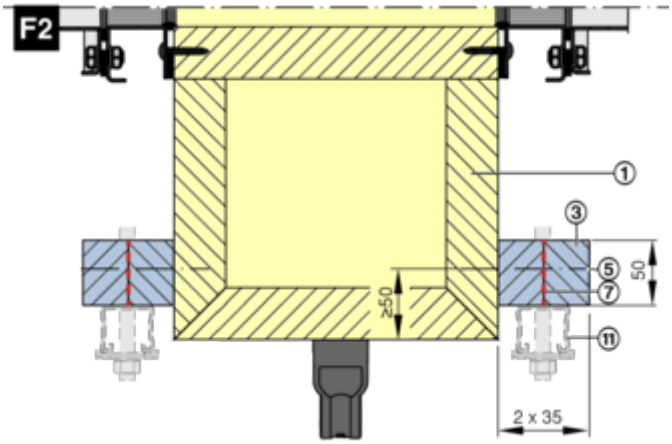


Fig. 67: Installation detail F2: Suspension actuator box cover (order feature S)

1 EK-JZ (actuator box)
3 Calcium silicate: Promatect fire protection board LS35, AD40, L500 or equivalent
5 Steel wire clamp 63/11.2/1.5 mm and/or drywall screws ~4x70 mm
7 Glue, Promat K48 or equivalent
11 Suspension, *5.9 'Suspending the smoke control damper' on page 96*

5.9 Suspending the smoke control damper

5.9.1 General information

Smoke control dampers can be suspended from solid ceiling slabs using adequately sized threaded rods. Load the suspension system only with the weight of the smoke control damper.

Ducts must be suspended separately.

Suspension systems longer than 1.5 m require fire-resistant insulation.

Size of threaded rods

Thread	M8	M10	M12	M14	M16	M20
Fmax [N] per threaded rod	219	348	505	690	942	1470
Maximum loading [kg] per threaded rod	22	35	52	70	96	150

5.9.2 Fixing the unit to the ceiling slab

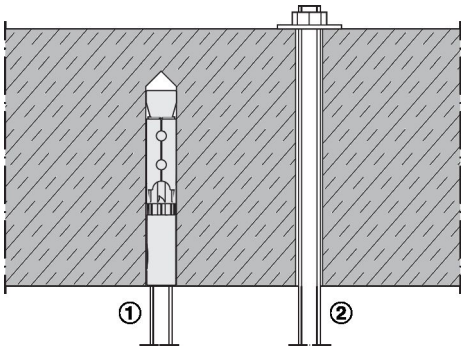


Fig. 68: Fixing to the ceiling slab

1 Fire-rated anchor (with suitability certificate)
2 Push through installation

Use only fire-rated steel anchors with suitability certificate. Instead of anchors, you can use threaded rods and secure them using nuts and washers.

5.9.3 Suspending the smoke control damper

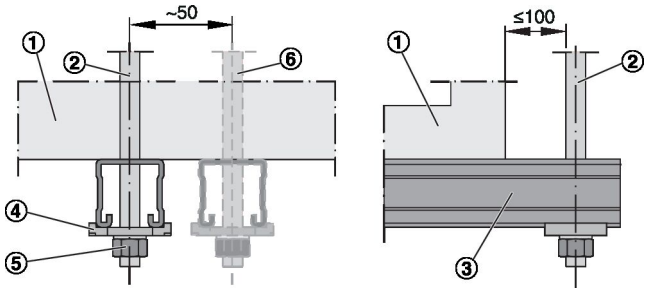


Fig. 69: Suspending the smoke control damper

① Smoke control damper
② Threaded rod ↳ *'Size of threaded rods' on page 96*
③ Hilti profile rail MT 50, MQ 41/3 or equivalent
④ Fixing plate Hilti MQZ-L or equivalent
⑤ Nut steel galvanised
⑥ 2nd suspension (only if necessary)

6 Connection frame, end grille, inspection access

6.1 Connecting the subframe

Place the connecting subframe on EK-JZ and mark or drill directly. Fix the connecting subframe with screws ∅5 x 50 mm (supply package) to EK-JZ (pre-drill ∅3.5 mm).

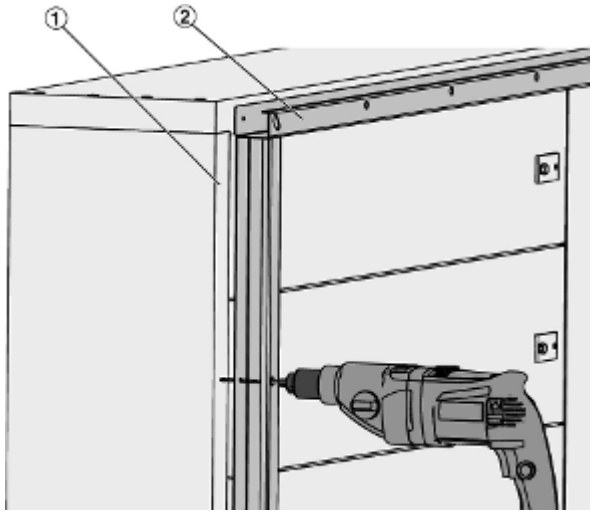


Fig. 70: Connecting the subframe

① EK-JZ
② Connecting subframe (optional), see order code for Attachments 1 (F)

As ducts may expand and walls may become deformed in the event of a fire, we recommend using flexible connectors when connecting the damper to sheet steel smoke extract ducts. Therefore, use flexible connectors with the same specifications as for the sheet steel smoke extract duct. Be sure to follow the manufacturer's instructions.

6.2 Inspection access

The interior of the smoke control damper must remain accessible for maintenance. Depending on the installation configuration, it may be necessary to provide additional inspection panels in the connecting ducts.

6.3 Cover grille (attachment)

If no smoke extract duct is connected to the smoke control damper, a cover grille is required to protect that side of the damper. Cover grilles in the nominal size of the smoke control damper are available as an attachment. Grilles covering the actuator box or the installation opening are available as accessories *Chapter 6.4 'Cover grille (accessory components)' on page 101* .

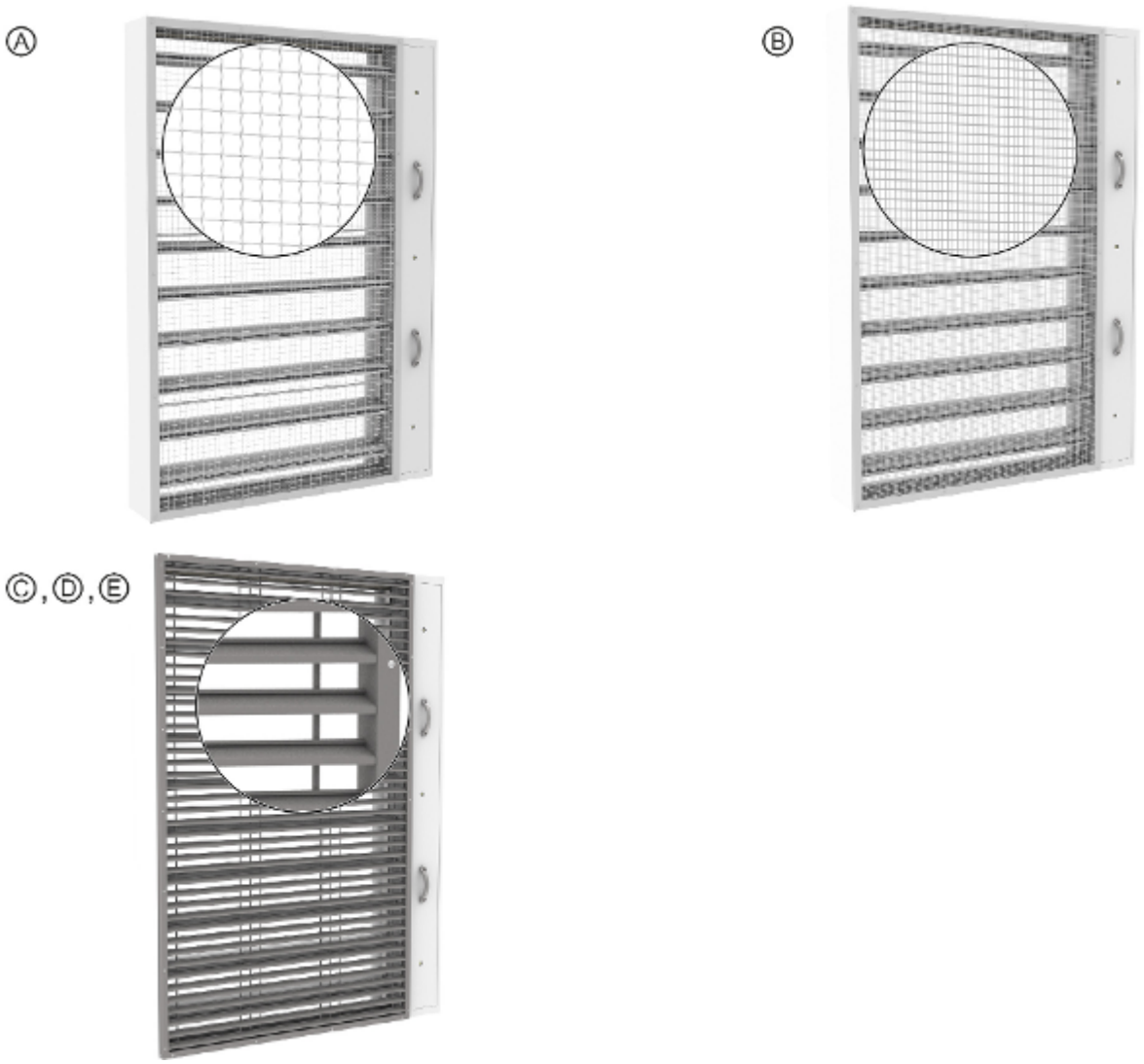


Fig. 71: EK.-JZ Cover grille (connecting subframe included in scope of delivery)

Cover grille	Description	Free cross section
A[1)]	Crimped wire mesh 20 x 20 mm	85%
B[1)]	Perforated plate 10 x 10 mm	70%
C[2)]	Aluminium grille with slanted blades	70%
D[2)]	Aluminium grille with crimped wire mesh 20 x 20 mm	60%
E[2)]	Aluminium grille with welded wire mesh 6 x 6 mm	55%

1) no temperature limit

2) Aluminium mesh: up to the strength limit of the aluminium, as the temperature rises the strength drops. Cold supply air flowing in counteracts the loss of strength.

Further grilles are available as accessories

6.3.1 Crimped wire mesh (A) and perforated plate (B)

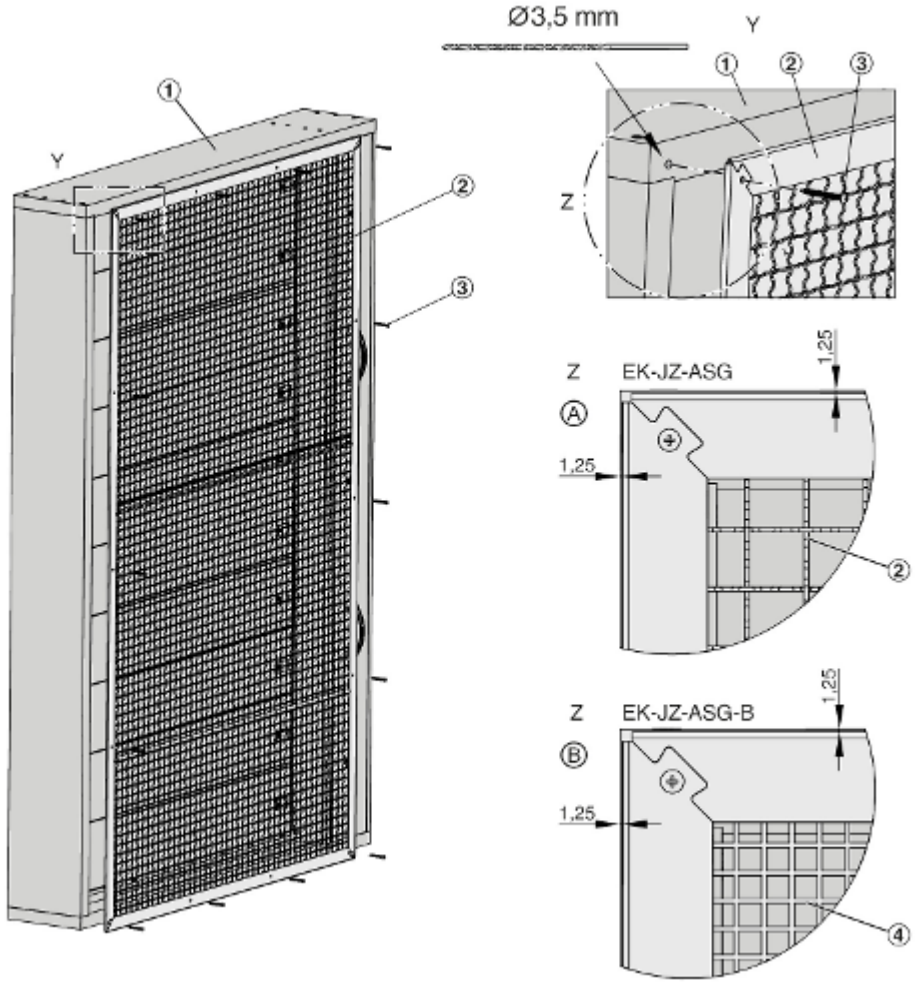


Fig. 72: Mounting crimped wire grille or perforated plate grille on EK-JZ

1 EK-JZ
2 Crimped wire mesh (A)
3 Pre-drill chipboard screws Ø5 × 50 mm, screws with Ø3.5 mm
4 Perforated plate grille (B)

6.3.2 Aluminium grille with slanted blades (C, D, E)

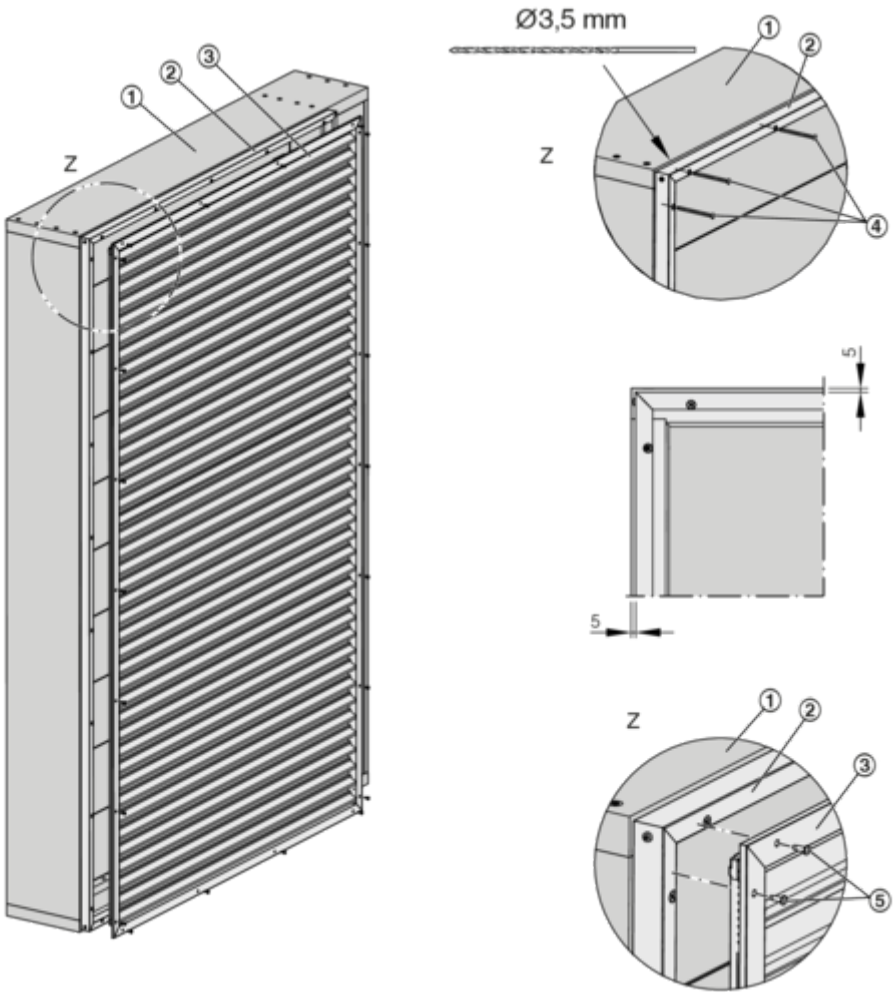


Fig. 73: Mounting aluminium grille with slanted blades on EK-JZ

1 EK-JZ
2 Mounting frame
3 Aluminium grille
4 Pre-drill chipboard screw Ø5 × 80 mm, screws with Ø 3.5 mm
5 Drilling screw Ø4,2 × 13

6.4 Cover grille (accessory components)

Cover grilles can be supplied as accessory components if the grilles have been ordered separately or if the grilles do not correspond to the size of the smoke control damper, e.g. for installation in the installation opening of a reveal. AFG grilles must always be ordered as accessory components as a special item.

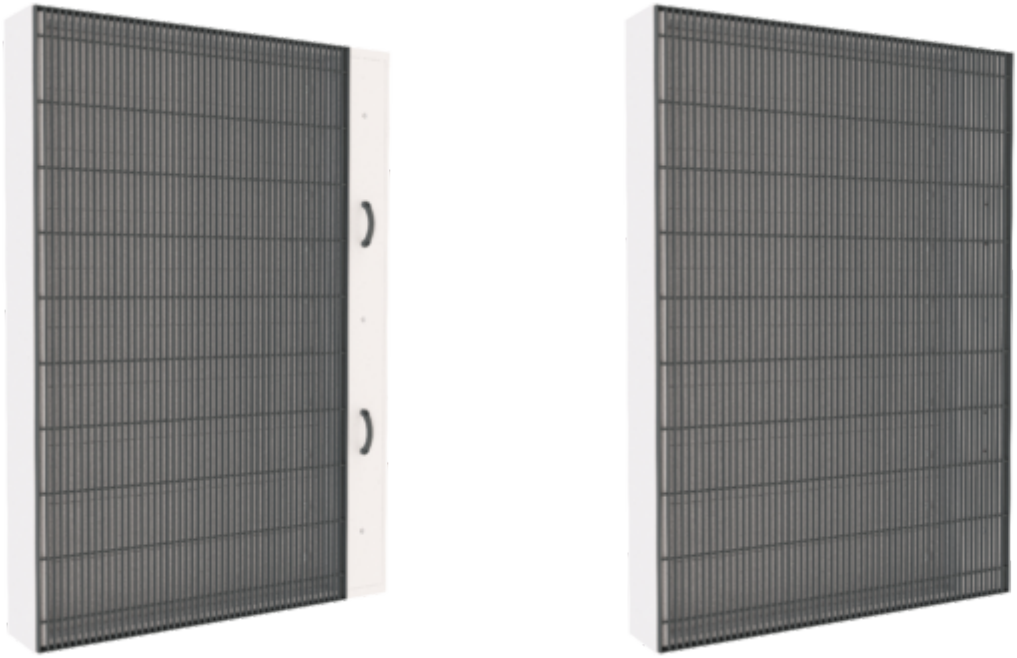


Fig. 74: EK-JZ with AFG grille with vertical blades

EK-JZ - free cross section

H - Dimension EK-JZ	Number of blades EK-JZ	EK-JZ without grille	EK-JZ with grille (type)						
			CG- W	CG-L	CGS	CGS-W	ECGS-S	AFG	AFG
			corresponds to Fig. 71 :					Fig. 74	
			Ⓐ	Ⓑ	Ⓒ	Ⓓ	Ⓔ	25*	16.7*
430	2	70.70%	59.50%	49.10%	49.23%	41.44%	39.70%	55.71%	47.28%
630	3	73.65%	61.99%	51.15%	51.29%	43.17%	41.36%	58.04%	49.25%
830	4	75.18%	63.28%	52.21%	52.35%	44.06%	42.22%	59.24%	50.28%
1030	5	76.12%	64.07%	52.86%	53.00%	44.61%	42.75%	59.98%	50.90%
1230	6	76.75%	64.60%	53.30%	53.44%	44.98%	43.10%	60.48%	51.33%
1430	7	77.20%	64.98%	53.61%	53.76%	45.25%	43.36%	60.84%	51.63%
1630	8	77.55%	65.27%	53.85%	54.00%	45.45%	43.55%	61.11%	51.86%
1830	9	77.81%	65.49%	54.04%	54.19%	45.61%	43.70%	61.32%	52.04%
2030	10	78.03%	65.68%	54.19%	54.34%	45.73%	43.82%	61.49%	52.18%

* Blade spacing [mm]

6.4.1 Mounting AFG grille on EK-JZ

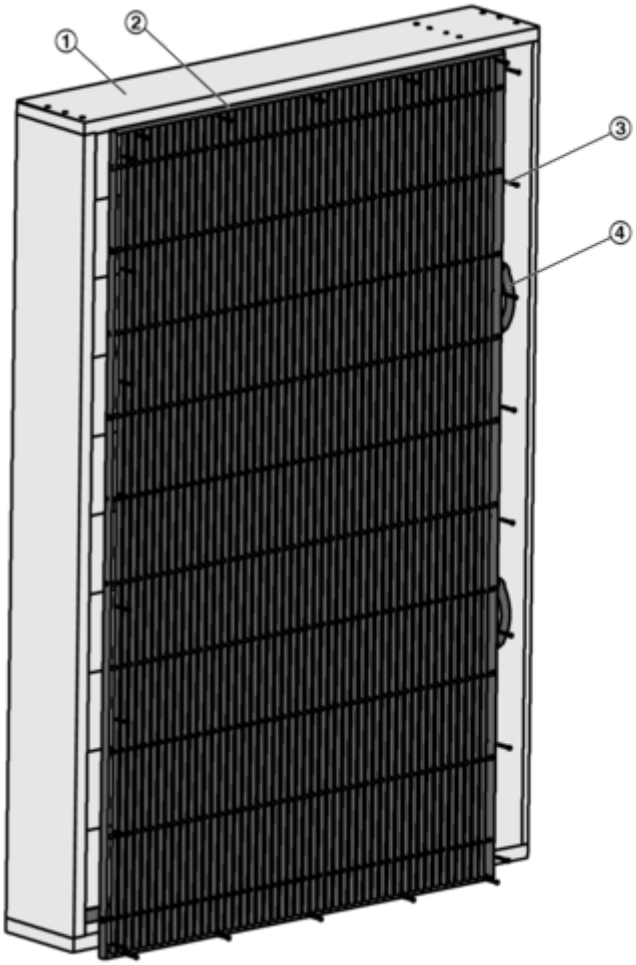


Fig. 75: EK-JZ+grille AFG

1 EK-JZ
2 AFG grille
3 Pre-drill holes for chipboard screws Ø5 × 50 mm, screws with Ø3.5 mm.
4 Handle, for grilles covering the actuator box, dismantle the handle.

Grille for installation opening

Grilles for covering the installation opening, are to be fixed in the reveal opening. For this purpose, fixings must be provided by the customer, e.g. aluminium or sheet steel brackets. Elongated holes on the brackets ensure that they are flush with the wall surface layer. The reveal of the installation opening can be finished with plaster rails, for example. Distance grille to reveal ≥2 mm.

7 Electrical connection

7.1 General safety notes

Personnel:

- Skilled qualified electrician

DANGER!

Danger of electric shock! Do not touch any live components! Electrical equipment carries a dangerous electrical voltage.

– Only skilled qualified electricians are allowed to work on the electrical system.
– Switch off the power supply before working on any electrical equipment.

7.2 General notes on wiring and connection to the central BMS

Supply voltage

- The smoke control damper may be equipped with a 230 V AC or a 24 V AC/DC actuator. See the performance data on the actuator rating plate.
- Several actuators can be connected in parallel as long as the performance specifications and switching thresholds are taken into consideration.
- Make electrical connections according to the examples below.

Auxiliary switch

- During application, it must be ensured that the contacts of the auxiliary switches can no longer be used in the milliampere range after one-time wiring with higher current.
- A combination of mains and safety extra-low voltage is not permitted for the auxiliary switches.

Functional integrity of electrical wiring systems

Electrical wiring systems for the power supply of smoke control dampers, for example in mechanical smoke extract systems and pressurisation systems, must be designed with a functional integrity of at least 90 minutes. If electrical wiring systems are installed in safety stairwells, functional integrity must be ensured for at least 30 minutes.

Actuators with 24 V AC/DC

Safety transformers must be used for actuators. The connecting cables are fitted with plugs. This ensures quick and easy connection to the TROX AS-i bus system. For connection to the terminals, shorten the connecting cable.

Feeding the cable into the actuator encasing

To feed the cable into the actuator encasing, a drilled hole of the exact size is required (∅cable +1 mm). Do not drill a hole into the cover. Before you start drilling, remove the cover and make sure that no parts (e.g. control module) can be damaged by the drill.

Strain relief must be provided.

For manual release (MA), we recommend using a ceramic terminal to connect the AS-i cable to the actuator cable or to the cable of the AS-i module.

External encasing for control module

The external encasing (Fig. 4) can be attached to a wall at a suitable location. The wiring between control module and actuator of the damper is done on site. Insert the electrical cables with a precisely fitting hole (cable diameter +1 mm) into the actuator encasing. Do not drill a hole into the cover. The electrical connection lines between the external encasing and the smoke control damper must comply with the requirements for the functional integrity of electrical wiring systems.

Strain relief must be provided.

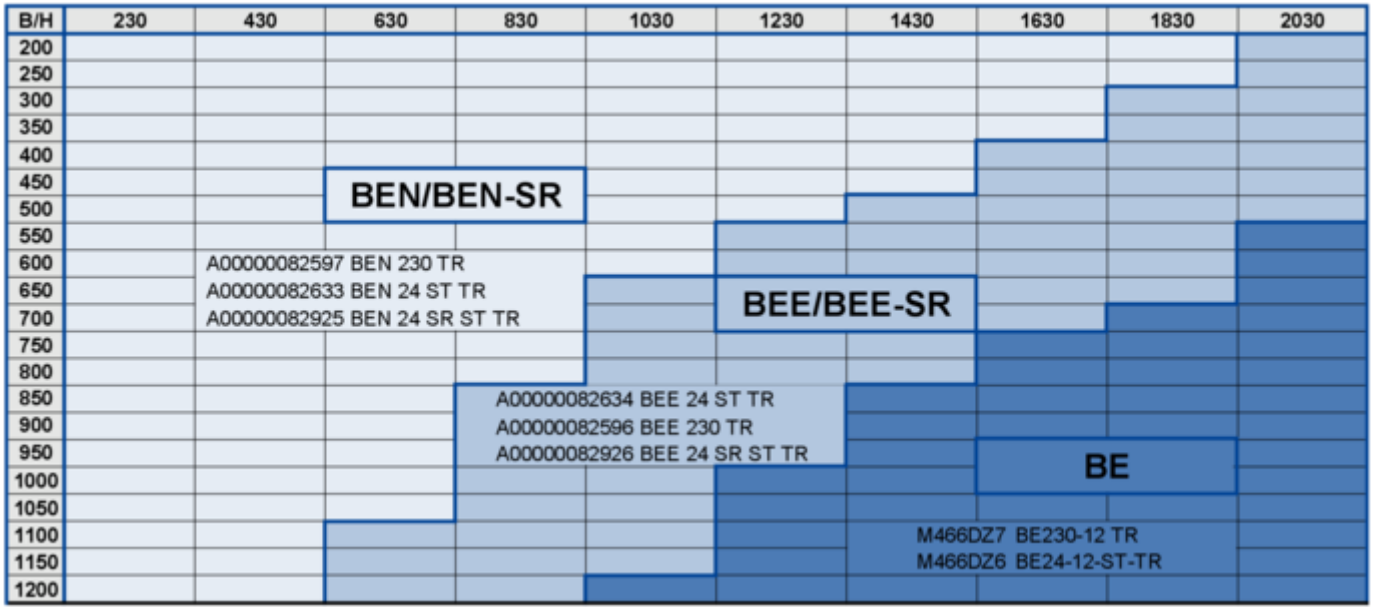
For manual release (MA), we recommend using a ceramic terminal to connect the AS-i cable to the actuator cable or to the cable of the AS-i module.

7.3 Actuators

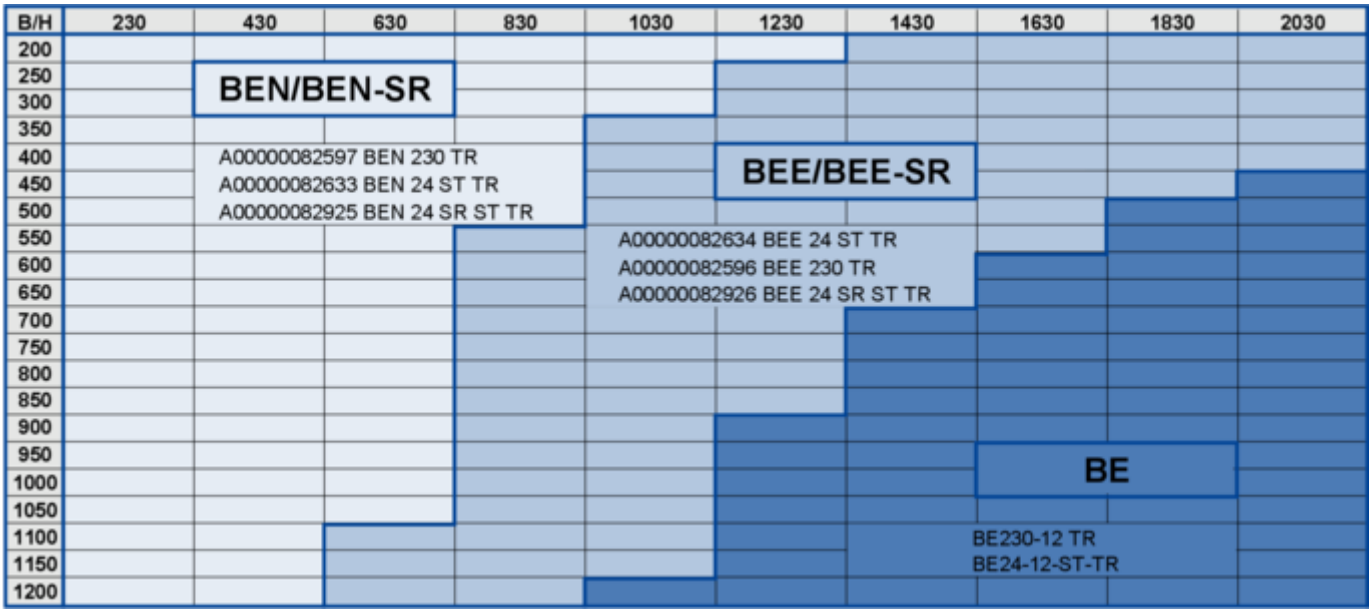
Torque table

The EK-JZ actuators are designed according to the size depending on the torque and the order option (order key detail). The following tables can be used to identify the corresponding actuator. Select the next larger dimension for intermediate sizes.
For wiring examples and technical data, see the following pages.

Upstream velocity 15 m/s



Upstream velocity 20 m/s



7.3.1 B24

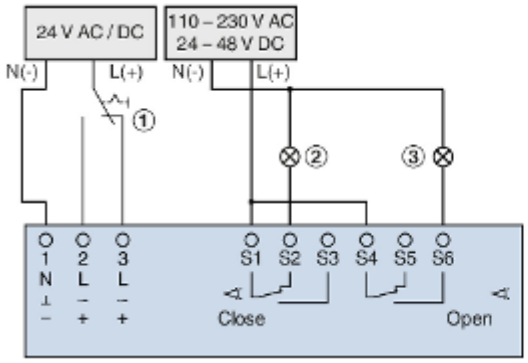


Fig. 76: Wiring example 24 V AC / DC

① Switch for opening and closing, to be provided by others
② Indicator light for CLOSED position, to be provided by others
③ Indicator light for OPEN position, to be provided by others

Technical data for open/close actuators

Order code detail		B24		
Actuator		**BEN24-ST TR**	**BEE24-ST TR**	**BE24-ST TR**
Supply voltage		AC 19.2...28.8 V, 50/60 Hz / DC 21.6...28.8 V, 50/60 Hz		
Power consumption – when running		3 W	2.5 W	12 W
Power consumption – when idle		0.1 W		0.5 W
Power consumption rating		6 VA	5 VA	18 VA
		8.2 A, Imax. (5 ms)		8.2 A, Imax. (5 ms)
Torque		15 Nm	25 Nm	40 Nm
Run time		< 30 s (90°)	< 60 s (90°)	< 60 s (90°)
Limit switch	Type of contact	2 changeover contacts		
	Switch rating	1 mA...3 A (0.5 A inductive),		1 mA...6 (0.5 A inductive),
	Switching voltage	5 VDC...250 VAC		
	Open	5°		3°
	Close	80°		87°
IEC protection class		III (SELV)		
Protection level		IP 54		
Operating temperature		-30...55 °C		
Connecting cable	Actuator	1 m, 3 x 0.75 mm², halogen-free		
	Limit switch	1 m, 6 x 0.75 mm², halogen-free		
CE conformity according to		2014/30/EU, 2014/35/EU		

7.3.2 B230

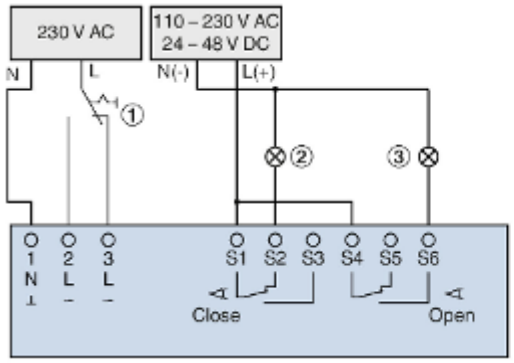


Fig. 77: Wiring example 230 V AC

① Switch for opening and closing, to be provided by others
② Indicator light for CLOSED position, to be provided by others
③ Indicator light for OPEN position, to be provided by others

Technical data for open/close actuators

Order code detail		**B230**		
Actuator		**BEN230 TR**	**BEE230 TR**	**BE230 TR**
Supply voltage		AC 198 … 264 V 50/60 Hz		
Power consumption – when running		4 W	3.5 W	8 W
Power consumption – when idle		0.4 W		0.5 W
Power consumption rating		7 VA	6 VA	15 VA
		4 A, Imax. (5 ms)		7.9 A, Imax. (5 ms)
Torque		15 Nm	25 Nm	40 Nm
Run time		< 30 s (90°)	< 60 s (90°)	< 60 s (90°)
Limit switch	Type of contact	2 changeover contacts		
	Switch rating	1 mA...3 A (0.5 A inductive),		1 mA...6 A (0.5 A inductive),
	Switching voltage	5 V DC...250 V AC		
	Open	5°		3°
	Close	80°		87°
IEC protection class		II		
Protection level		IP 54		
Operating temperature		-30...55 °C		-30...50 °C
Connecting cable	Actuator	1 m, 3 x 0.75 mm², halogen-free		
	Limit switch	1 m, 6 x 0.75 mm², halogen-free		
CE conformity according to		2014/30/EU, 2014/35/EU		

7.3.3 B24-SR

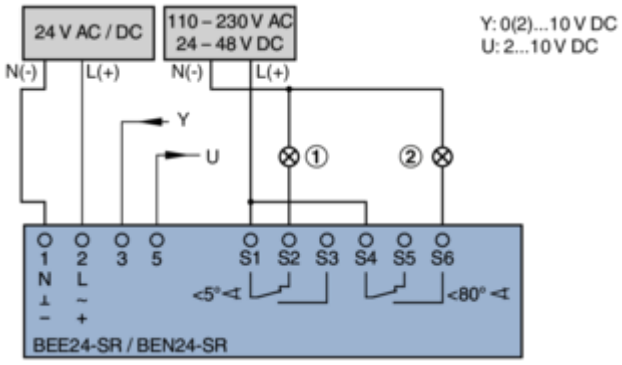


Fig. 78: Wiring example 24 V AC / DC, modulating

① Indicator light for CLOSED position, to be provided by others
② Indicator light for OPEN position, to be provided by others

Y Working range (target value)
U Position feedback (actual value)

Attention:

- An input voltage of 0(2)...10 V DC at the operating range Y (terminal 3) is essential as the control input signal for the actuator!
  - 0(2) V DC = closed
  - 10 V DC = opened
- Terminal 1 is used as a common earth contact for the operating range Y as well as the position feedback U.
- The current must be limited to max. 0.5 mA for measuring the position feedback (actual value)!
- In addition, observe the following instructions ↳ *Chapter 7.2 'General notes on wiring and connection to the central BMS' on page 103*

Technical data of continuously controlled actuators

Order code detail		**B24-SR**	
Actuator		**BEN24-SR TR**	**BEE24-SR TR**
Supply voltage supply with safety transformer		AC 19.2...28.8 V, 50/60 Hz / DC 21.6...28.8 V, 50/60 Hz	
Power consumption – when running		3 W	3 W
Power consumption – when idle		0.3 W	
Power consumption rating		6.5 VA	5.5 VA
		8.2 A, Imax. (5 ms)	
Torque		15 Nm	25 Nm
Run time		< 30 s (90°)	< 60 s (90°)
Work area Y		2...10 V DC	
Input resistance		100 kΩ	
Position feedback signal		2...10 V DC, max. 0.5 mA	
Positional accuracy		±5%	
Limit switch	Type of contact	2 changeover contacts	
	Switch rating	1 mA...3 A (0.5 A inductive), AC 250 V	
IEC protection class		III (SELV)	
Protection level		IP 54	

Order code detail		B24-SR	
Actuator		**BEN24-SR TR**	**BEE24-SR TR**
Operating temperature		-30...55 °C	
Connecting cable	Actuator	1 m, 4 x 0.75 mm², halogen-free	
	Limit switch	1 m, 6 x 0.75 mm², halogen-free	
CE conformity according to		2014/30/EU, 2014/35/EU	

7.4 Actuator with control module

Smoke control dampers in a smoke extract system can be activated individually or as part of an overall system and according to the control matrix set up for the event of a fire. In this case the control system of the mechanical smoke extract system or pressurisation system also controls and monitors the status of the dampers. If there are integral communication modules fitted inside the encasing, they can be connected to the actuator and establish the communication with the control system as well as the power supply.

7.4.1 TROXNETCOM B24A, B24AM, B24AS

- A controller (master) communicates with the control modules (slaves, up to 31 per master)
- Free bus topology of the two-wire cable for data and energy
- Simple and intelligent wiring system

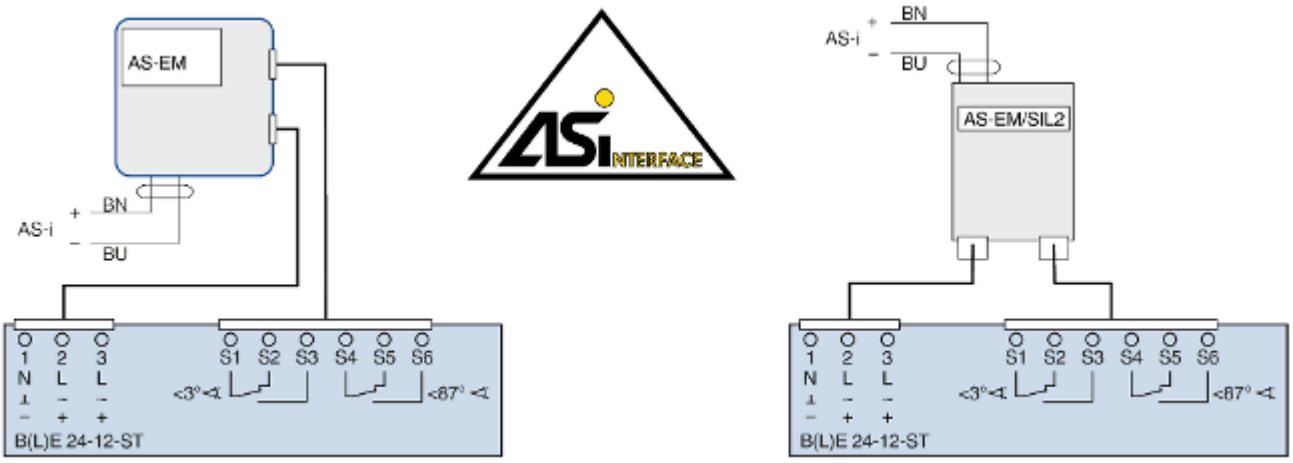


Fig. 79: Wiring example for attachments B24A and B24AS

BN Brown (+)
BU Blue (–)

The actuator and the AS-i control module are factory wired.

An AS-i bus (+/–) is used for both voltage supply and signals.

The connecting cables of the AS-EM/SIL module are fitted with wire end ferrules.

Technical data of the actuator, ↳ *7.3.2 'B230 ' on page 106* , ↳ *Chapter 7.3.1 'B24 ' on page 105* .

Technical data for the control module

Order code detail	B24A	B24AM	B24AS
Control module	**AS-EM/EK**	**AS-EM/M**	**AS-EM/SIL2**
Supply voltage	26.5 – 31.6 V DC		
Current consumption	450 mA	450 mA	< 400 mA from AS-i
Max. current load per output	400 mA	400 mA	340 mA
Max. current load per module	400 mA	400 mA	340 mA
Interfaces	4 inputs/3 outputs	4 inputs/3 outputs	2 outputs with transistor (typically 24 V DC from AS-i, voltage range 18 – 30 V)
Operating temperature	-5 to 75 °C	-5 to 75 °C	-20 to 70 °C
Storage temperature	-5 to 75 °C	-5 to 75 °C	-20 to 75 °C
Protection level, IEC protection class	IP 42	IP 42	IP 54
AS-i profile	S7.A.E	S7.A.E	S-7.B.E (Safety at Work) and S7.A.E (motor module)

7.4.2 B24BKNE

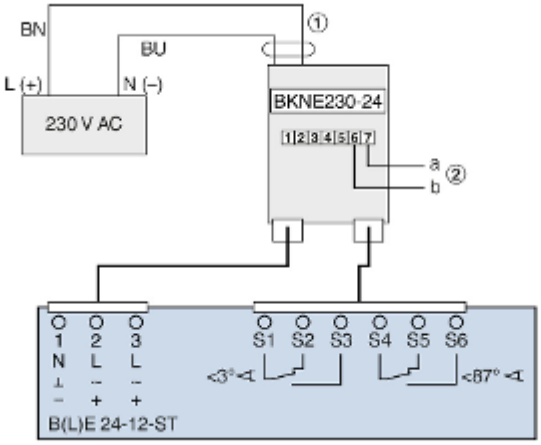


Fig. 80: Wiring example for attachment B24BKNE

BN Brown L (+)
BU Blue N (–)

① Supply voltage
② 2-wire cable (signal)

The actuator and the control module are factory wired.

Connect the supply voltage to the connecting cable (approx. 1 m, with ferrules). 2-wire cable for signals (terminals 6 and 7).

Technical data of the actuator, ↳ *7.3.2 'B230 ' on page 106* , ↳ *Chapter 7.3.1 'B24 ' on page 105* .

Technical data for the control module

Order code detail	B24BKNE
Control module	**BKNE230-24**
Nominal voltage	AC 230 V 50/60 Hz
Functional range	AC 198...264 V
Rating	19 VA (including actuator)
Power consumption	10 W (including actuator)
Mains cable	Cable, 1 m (free of halogens, without plug)
2-wire cable	Screw terminals for wires, 2 x 1.5 mm²
Recommended cable	JE-H (St) Bd FE180/E30-E90
IEC protection class	II (protective insulation)
Ambient temperature (normal operation)	–30...+50 °C
Storage temperature	–40...+80 °C

7.4.3 SLC technology - B24C

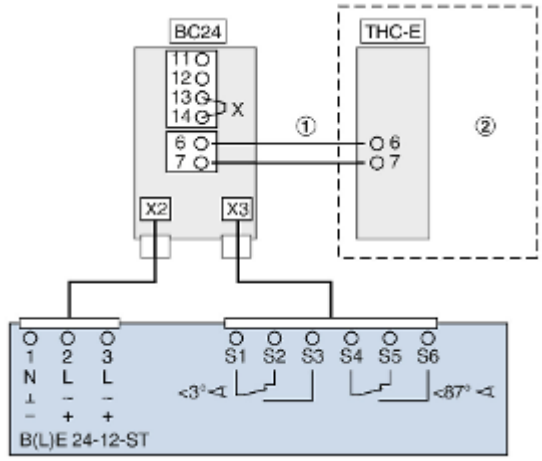


Fig. 81: B24C module

1 2-wire cable for supply voltage and signal
2 (THC-E, by others)
X2 Socket for an actuator
X3 Sockets for limit switches
6 / 7 2-wire cable to THC-E control module for signals and supply voltage, 2 x 1.5 mm², 150 m max., interchangeable cores
11 Not to be used
12 GND
13 24…27 V DC (30 mA max.)
14 IN

Terminals 12, 13 and 14 – duct smoke detector:

- If you want to connect a duct smoke detector, remove wire link X between terminals 13 and 14.
- You may use terminals 13 and 14 to connect a duct smoke detector or any other volt-free control contact, e.g. a fire alarm system. When the contact opens, the damper blades move to the defined safe position. For this case the terminals 13 and 14 of several BC24 modules can be switched in parallel.

The actuator and the control module are factory wired.

Technical data of the actuator, ↳ *7.3.2 'B230 ' on page 106* , ↳ *Chapter 7.3.1 'B24 ' on page 105* .

Connection data

Order code detail	B24C
Control module	**BC24-G2**
Supply voltage	Provided by the SLC control module
Power consumption	1 W
Contact load, terminals 13/14	30 mA max.
IEC protection class	III (protective extra-low voltage)

SLC wiring examples (THC-E)

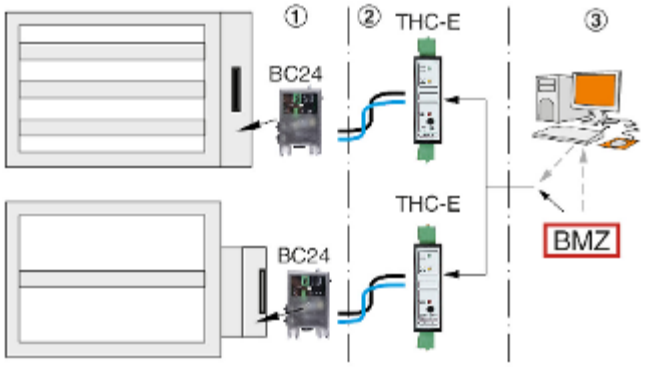


Fig. 82: Control signal from the central BMS

1 EK-JZ with integral control module B24C
2 THC-E (switch cabinet)
3 Fire alarm system and central BMS (if any)

Advantages

- Control of one damper or many dampers simultaneously (in parallel)

Disadvantages

- Wiring is comparatively time consuming

SLC wiring examples (SLC24-8E)

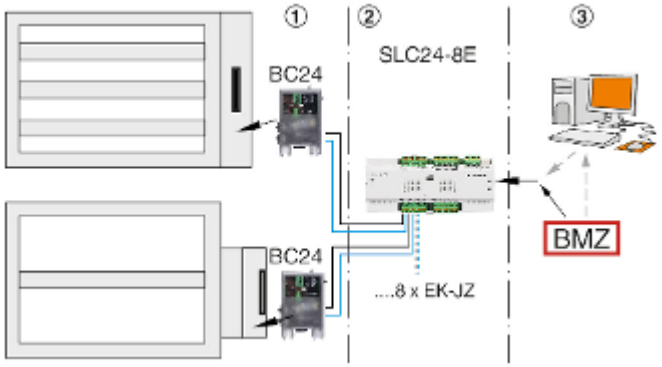


Fig. 83: Control signal from the central BMS

1 EK-JZ with integral control module B24C
2 SLC24-8E (switch cabinet)
3 Fire alarm system and central BMS (if any)

Advantages

- Quick and easy wiring

Disadvantages:

- Only parallel control of several dampers

7.4.4 B24D and B230D

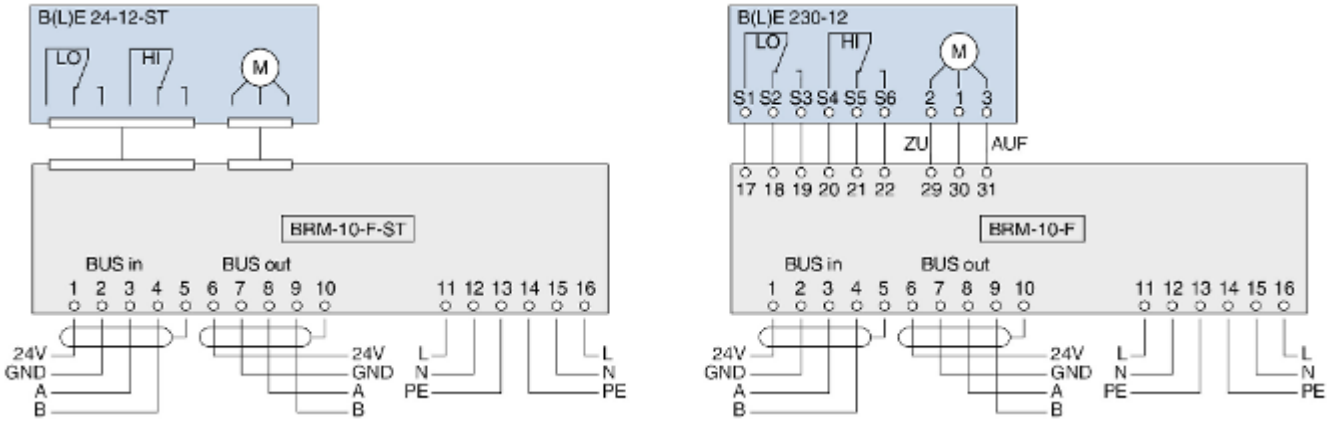


Fig. 84: Wiring example for attachments B24D and B230D

Check whether the damper blades move correctly from OPEN to CLOSED during commissioning.

The mode switch allows you to choose one of the following operating modes:

- Automatic (damper is controlled via the bus; status LEDs are not active)
- Maintenance (damper is controlled via the bus; status LEDs are not active)
- NC contact, manual (bus commands are overridden)
- NO contact, manual (bus commands are overridden)

The actuator and the control module are factory wired.

Technical data for the actuator, *7.3.2 'B230 ' on page 106* , *Chapter 7.3.1 'B24 ' on page 105* .

Technical data

Order code detail		**B24D**	**B230D**
Control module		**BRM-10-F-ST**	**BRM-10-F**
Electrical data	Supply voltage	18 – 32 V DC (typically 24 V)	
	Current consumption	5 mA (typically), 26 mA max. (for 100 ms when relays close)	
	Protection level	IP 20 (EN 60529)	
	IEC protection class	II	
Construction	Digital inputs	2 for feedback from limit switches (volt-free)	
	Digital outputs	1 for signalling to the fire damper	
Outputs	Actuator	24 V DC	24 / 230 V AC
	Permanent current, max.	AC 5 A	DC 5 A
	Switch-on current, max. (< 15 ms)	AC 8 A	DC 8 A
	Switch rating	1250 VA / 150 W	
Terminals for damper input	Max. cross-sectional area of conductors	Solid core: 0.08 – 2.5 mm² Multi-strand (without ferrule): 0.08 – 2.5 mm² Multi-strand (insulated ferrule): 0.25 – 1.5 mm² Multi-strand (non-insulated ferrule): 0.25 – 2.5 mm²	
	Max. current, terminals	10A	
	Pre fuse	MCB, 10 A, characteristic B	

Order code detail		B24D	B230D
Control module		**BRM-10-F-ST**	**BRM-10-F**
Terminals for bus, feedback, damper output	Cross-sectional areas of conductors	Solid core: 0.2 – 1.5 mm² Multi-strand (without ferrule): 0.2 – 1.5 mm² Multi-strand (insulated ferrule): 0.25 – 0.75 mm² Multi-strand (non-insulated ferrule): 0.25 – 1.5 mm²	
Ambient conditions	Ambient temperature	0 to 45 °C	
	Ambient humidity	0 to 90 %	

8 Commissioning/functional test

8.1 Commissioning

Before commissioning, each smoke control damper must be inspected to determine and assess its actual condition, ↳ *'Inspection, maintenance and repair measures' on page 116* .

The movement of the blades may over time lead to grooves in the side seals (where the blades meet the casing); this does not impair the function of the damper. Once installed, the damper blades adapt themselves to the seals so that the smallest deviations are compensated for.

8.2 Functional test

General

Smoke control dampers must be checked regularly. A functional test involves closing the smoke control damper and opening it again. This is typically done with an input signal from a central system, e.g. from the central fire alarm system.

9 Maintenance

General safety notes

⚠ DANGER!

Danger of electric shock! Do not touch any live components! Electrical equipment carries a dangerous electrical voltage.

- Only skilled qualified electricians are allowed to work on the electrical system.
- Switch off the power supply before working on any electrical equipment.

⚠ CAUTION!

Danger due to inadvertently actuating the smoke control damper. Inadvertent actuation of the damper blade can lead to injuries.

Make sure that the damper blade cannot be operated inadvertently.

Regular care and maintenance ensure operational readiness, functional reliability, and long service life of the smoke control dampers.

The system owner is responsible for the maintenance of the smoke control damper. The system owner is responsible for creating a maintenance plan, for defining the maintenance goals, and for the functional reliability of the equipment.

Functional test

The functional reliability of the smoke control damper must be tested at least every six months; this has to be arranged by the owner or operator of the system . If two consecutive tests, one 6 months after the other, are successful, the next test can be conducted one year later.

The functional test must be carried out in compliance with the basic maintenance principles of the following standards:

- EN 12101-8
- EN 13306
- EN 15423
- Depending on where dampers are installed, country-specific regulations may apply.

Maintenance

The smoke control damper and the actuator are maintenance-free with regard to wear but smoke control dampers must still be included in the regular cleaning of the smoke extract system.

Inspection

Smoke control dampers must be inspected before commissioning. After commissioning, the function has to be tested in regular intervals. Local requirements and building regulations must be complied with.

The inspection measures to be taken are listed in ↳ *'Inspection, maintenance and repair measures' on page 116* .

The test of each smoke control damper must be documented and evaluated. If the requirements are not fully met, suitable remedial action must be taken.

Repair

For safety reasons, repair work must only be carried out by expert qualified personnel or the manufacturer. Only original replacement parts are to be used. A functional test is required after any repair work ↳ *'Inspection, maintenance and repair measures' on page 116* .

Any repair must be documented.

Cleaning

All surfaces of TROX components and systems, with the exception of electronic parts, may be wiped with a dry or damp cloth. All surfaces may also be cleaned with an industrial vacuum cleaner. To avoid any scratches, a soft brush should be used on the suction inlet. Use a soft brush to clean the seals. Do not use cleaning agents that contain chlorine. The use of cleaning utensils such as scouring sponges or scouring milk may damage the surfaces and is not permitted for cleaning.

Inspection, maintenance and repair measures

Interval	Maintenance work	Personnel
A	Accessibility of the smoke control damper ■ Internal and external accessibility – Provide access	Trained personnel
	Installation of the smoke control damper ■ Installation according to the operating manual 5 'Installation' on page 17 – Install the smoke control damper correctly	Trained personnel
	Connection of smoke extract ducts/cover grille/flexible connector 5.7 ' Smoke extract ducts (multi)' on page 73 ■ Connection according to this manual – Establish correct connection	Trained personnel
	Supply voltage for the actuator ■ Power supply according to the actuator rating plate – Supply correct voltage	Skilled qualified electrician
A / B	Check of the smoke control damper for damage ■ Smoke control damper, damper blades and seal must be intact – Repair or replace the smoke control damper	Trained personnel
	Functional test of the smoke control damper 8.2 'Functional test' on page 114 ■ Drive function OK (damper blades close and open) – Determine and eliminate the cause of the fault – Replace actuator – Repair or replace the smoke control damper	Trained personnel
C	Cleaning the smoke control damper ■ No contamination in the interior or on the exterior of the smoke control damper – Remove contamination	Trained personnel

Interval

A = Commissioning

B = Regularly

The functional reliability of smoke control dampers must be tested at least every six months. If two consecutive tests are successful, the next test can be conducted one year later.

C = As required, depending on the degree of contamination

Maintenance work

Item to be checked

- Required condition
  - Remedial action if necessary

10 Decommissioning, removal and disposal

Final decommissioning

- Switch off the ventilation system.
- Switch off the power supply.

Removal

DANGER!

Danger of electric shock! Do not touch any live components! Electrical equipment carries a dangerous electrical voltage.

– Only skilled qualified electricians are allowed to work on the electrical system.
– Switch off the power supply before working on any electrical equipment.

1. ▸ Disconnect the wiring.
2. ▸ Remove the smoke extract ducts.
3. ▸ Remove the smoke control damper.

Disposal

ENVIRONMENT!

Risk of harm to the environment due to incorrect disposal of goods and packaging!

Incorrect disposal can harm the environment.

Have electronic waste and electronic components disposed of by an approved specialist disposal company.

For disposal the smoke control damper must be completely disassembled.

11 Index

TROX® TECHNIK

The art of handling air

TROX GmbH
Heinrich-Trox-Platz
47504 Neukirchen-Vluyn
Germany

Phone: +49 (0) 2845 202-0
+49 (0) 2845 202-265
E-mail: trox-de@troxgroup.com
http://www.troxtechnik.com

Valid from 01/2024