



Fire damper

Type FKS-EU

according to Declaration of Performance
DoP / FKS-EU / DE / 003



Read the instructions prior to performing any task!

TROX GmbH
Heinrich-Trox-Platz
47504 Neukirchen-Vluyn
Germany
Phone: +49 (0) 2845 2020
Fax: +49 (0) 2845 202-265
E-mail: trox@trox.de
Internet: <http://www.troxtechnik.com>

Translation of the original
M375EE9, 3, GB/en
04/2018

© 2017

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, properly trained 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

This document, including all illustrations, is protected by copyright and pertains only to the corresponding product.

Any use without our consent may be an infringement of copyright, and the violator will be held liable for any damage.

This applies in particular to:

- Publishing content
- Copying content
- Translating content
- Microcopying content
- Saving content to electronic systems and editing it

TROX Technical Service

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 the fault

Online	www.troxtechnik.com
Phone	+49 2845 202-400

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.

Defects liability

For details regarding defects liability please refer to Section VI, Warranty Claims, of the Delivery and Payment Terms of TROX GmbH.

The Delivery and Payment Terms of TROX GmbH are available at www.troxtechnik.com.

Safety notes

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

DANGER!

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

WARNING!

Potentially hazardous situation which, if not avoided, could 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. ▶ Untighten 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	6	5.10.1 Mortar-based installation.....	59
	1.1 General safety notes.....	6	5.10.2 Dry mortarless installation.....	61
	1.2 Correct use.....	6	6	Connecting the ductwork
	1.3 Qualified staff.....	6	6.1 Ducts.....	62
2	Technical data	7	6.2 Transport and installation protection.....	62
	2.1 General data.....	7	6.3 Limiting duct expansion.....	62
	2.2 FKS-EU with fusible link.....	8	6.4 Fire damper accessories.....	63
	2.3 FKS-EU with spring return actuator.....	9	6.5 Inspection access.....	64
	2.4 FKS-EU as air transfer damper.....	11	7	Making electrical connections
3	Transport and storage	12	7.1 Connecting the limit switches (fire dampers with fusible link).....	65
4	Parts and function	13	7.2 Connecting the spring return actuator.....	65
	4.1 FKS-EU with fusible link.....	13	7.3 Equipotential bonding.....	66
	4.2 FKS-EU with spring return actuator.....	13	8	Functional test
	4.3 FKS-EU with fusible link and cover grille used as an air transfer unit.....	14	8.1 Fire damper with fusible link.....	67
	4.4 FKS-EU with spring return actuator and duct smoke detector as air transfer damper.....	14	8.2 Fire damper with spring return actuator....	68
5	Installation	15	8.3 Functional test with automatic control unit.....	70
	5.1 Installation situations.....	15	9	Commissioning
	5.2 Safety notes regarding installation.....	16	10	Maintenance
	5.3 General installation information.....	16	10.1 General.....	72
	5.3.1 After installation.....	18	10.2 Lubricating points.....	72
	5.4 Solid walls.....	19	10.3 Replacing the fusible link.....	73
	5.4.1 Mortar-based installation.....	19	10.4 Maintenance.....	74
	5.4.2 Dry mortarless installation.....	22	11	Decommissioning, removal and disposal
	5.5 Solid ceiling slabs.....	23	12	Index
	5.5.1 Mortar-based installation into solid ceiling slabs.....	23		
	5.5.2 Mortar-based installation into wooden beam ceilings.....	25		
	5.5.3 Mortar-based installation into lightweight ceilings.....	26		
	5.5.4 Mortar-based installation into concrete base.....	27		
	5.6 Lightweight partition walls with metal sup- port structure and cladding on both sides.....	29		
	5.6.1 Mortar-based installation.....	31		
	5.6.2 Dry mortarless installation.....	36		
	5.7 Lightweight partition walls with timber sup- port structure.....	38		
	5.7.1 Mortar-based installation.....	40		
	5.7.2 Dry mortarless installation.....	45		
	5.8 Solid wood walls.....	47		
	5.8.1 Mortar-based installation.....	48		
	5.8.2 Dry mortarless installation.....	50		
	5.9 Compartment walls.....	51		
	5.9.1 Mortar-based installation.....	54		
	5.9.2 Dry mortarless installation.....	56		
	5.10 Shaft walls with metal support structure..	57		

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

- The fire damper is used as an automatic shut-off device to prevent fire and smoke from spreading through ducting.
- The fire damper is suitable for use in the supply air and extract air systems of heating, ventilation and air conditioning systems (room air conditioning systems).
- Operation of the fire dampers is allowed only in compliance with installation regulations and the technical data in this installation and operating manual.
- Modifying the fire 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 fire damper can lead to dangerous situations.

Never use the fire damper

- in areas with potentially explosive atmospheres
- as a smoke control damper
- outdoors without sufficient protection against the effects of weather
- in atmospheres where chemical reactions, whether planned or unplanned, may cause damage to the fire 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 skilled qualified 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.

Specialist personnel

Specialist 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 × 100 mm – 800 × 200 mm
Casing lengths L	300 mm
Volume flow rate range	up to 1600 l/s up to 5760 m³/h
Differential pressure range	up to 1500 Pa
Temperature range ^{1, 3}	-20 °C ... 50 °C
Release temperature	72 °C or 95 °C for warm air ventilation systems
Upstream velocity ²	≤ 8 m/s with fusible link, ≤ 10 m/s with spring return actuator
Closed blade air leakage	EN 1751, Class 3; (B + H) ≤ 600, Class 2
Casing air leakage	EN 1751, Class C
EC conformity	<ul style="list-style-type: none"> ■ Construction Products Regulation (EU) no. 305/2011 ■ EN 15650 – Ventilation for buildings – Fire dampers ■ EN 1366-2 – Fire resistance tests for service installations – Part 2: Fire dampers ■ EN 13501-3 – Classification – Part 3: Fire resisting ducts and fire dampers ■ EN 1751 Ventilation for buildings – Air terminal devices
Declaration of performance	DoP / FKS-EU / DE / 003

¹⁾ Temperatures may differ for units with attachments. Details for other applications are available on request.

²⁾ Data applies to uniform upstream and downstream conditions for the fire damper

³⁾ Condensation and the intake of humid fresh air have to be avoided as otherwise operation will be impaired or not possible.

Rating plate



Fig. 1: Rating plate (example)

- | | | | |
|---|---|----|---|
| 1 | CE mark | 6 | Year of manufacture |
| 2 | Manufacturer's address | 7 | No. of the declaration of performance |
| 3 | Number of the European standard and year of its publication | 8 | Website from which the DoP can be downloaded |
| 4 | Notified body | 9 | Regulated characteristics; the fire resistance class depends on the application and may vary ↪ 5.1 'Installation situations' on page 15 |
| 5 | The last two digits of the year in which the CE marking was affixed | 10 | Type |

2.2 FKS-EU with fusible link

Dimensions and weight

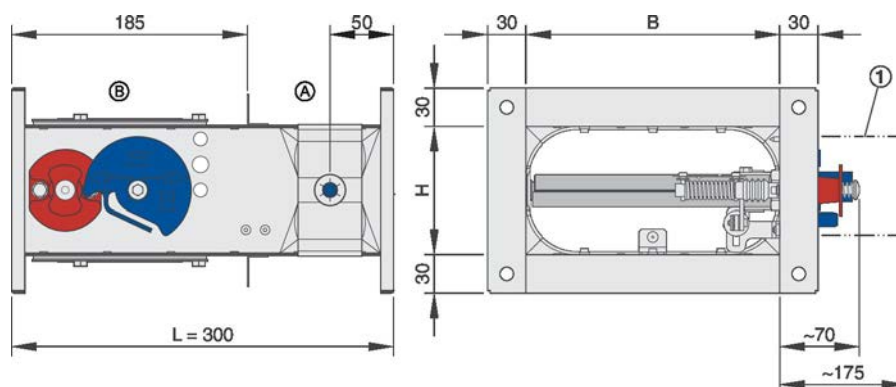


Fig. 2: FKS-EU with fusible link

- 1 Keep clear to provide access for operation
- Ⓐ Installation side
- Ⓑ Operating side

- B Width of the fire damper (side B)
- H Height of the fire damper (side H)
- L Length of the fire damper (casing length)

FKS-EU with fusible link / FKS-EU with fusible link and installation block

H [mm]	Weight [kg]						
	B [mm]						
	200	300	400	500	600	700	800
100	3.3 / 7.7	4.1 / 9.7	4.9 / 11.6	5.7 / 13.7	6.5 / 15.8	7.4 / 17.8	8.2 / 19.8
125	3.6 / 8.5	4.5 / 10.5	5.3 / 12.4	6.2 / 14.4	7.0 / 16.4	7.8 / 18.5	8.6 / 20.6
150	3.7 / 8.8	4.7 / 10.9	5.6 / 12.9	6.6 / 15.1	7.5 / 17.3	8.4 / 19.4	9.2 / 21.4
160	3.8 / 8.9	4.8 / 11.0	5.7 / 13.1	6.7 / 15.4	7.7 / 17.7	8.6 / 19.7	9.4 / 21.7
200	4.1 / 9.7	5.3 / 12.1	6.5 / 14.5	7.5 / 16.6	8.4 / 18.7	9.4 / 21.0	10.3 / 23.2

Limit switches

Connecting cable length / cross section	1 m / 3 × 0.34 mm ²
Protection level	IP 66
Type of contact	1 changeover contact, gold-plated
Maximum switching current	0.5 A
Maximum switching voltage	30 V DC, 250 V AC
Contact resistance	approx. 30 mΩ

2.3 FKS-EU with spring return actuator

Dimensions and weight

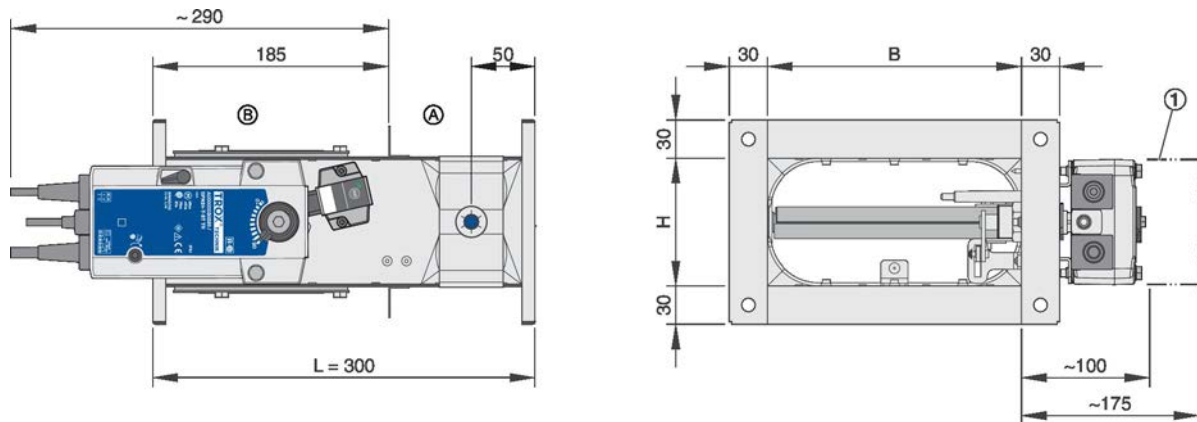


Fig. 3: FKS-EU with Belimo spring return actuator BFN

- 1 Keep clear to provide access for operation
- Ⓐ Installation side
- Ⓑ Operating side

- B Width of the fire damper (side B)
- H Height of the fire damper (side H)
- L Length of the fire damper (casing length)

FKS-EU with Belimo spring return actuator:

- Weight of FKS-EU with fusible link + 2 kg, see table 8.

Spring return actuator BFN...			
Construction variant		230-T TR	24-T-ST TR
Supply voltage		230 V AC, 50/60 Hz	24 V AC/DC, 50/60 Hz
Functional range		198 ... 264 V AC	19.2 ... 28.8 V AC 21.6 ... 28.8 V DC
Power rating	Spring compression	5 W	4 W
	Hold position	2,1 W	1,4 W
	Rating	10 VA (I _{max} 4 A @ 5 ms)	6 VA (I _{max} 8.3 A @ 5 ms)
Running time	Actuator / spring return	< 60 s / < 20 s	
Limit switch	Type of contact	2 changeover contacts	
	Switching voltage	5 ... 120 V DC / 5 ... 250 V AC	
	Switching current	1 mA ... 3 (0.5 inductive) A	
	Contact resistance	< 1 Ω (when new)	
IEC protection class		II	
Protection level		IP 54	
Storage temperature		-40 ... 55 °C	
Ambient temperature		-30 ... 55 °C ¹	
Ambient humidity		≤ 95% rh, no condensation	
Connecting cable	Actuator	1 m / 2 × 0.75 mm ² (free of halogens)	
	Limit switch	1 m / 6 × 0.75 mm ² (free of halogens)	

¹ Up to 75 °C the safe position will definitely be reached.

Dimensions and weight

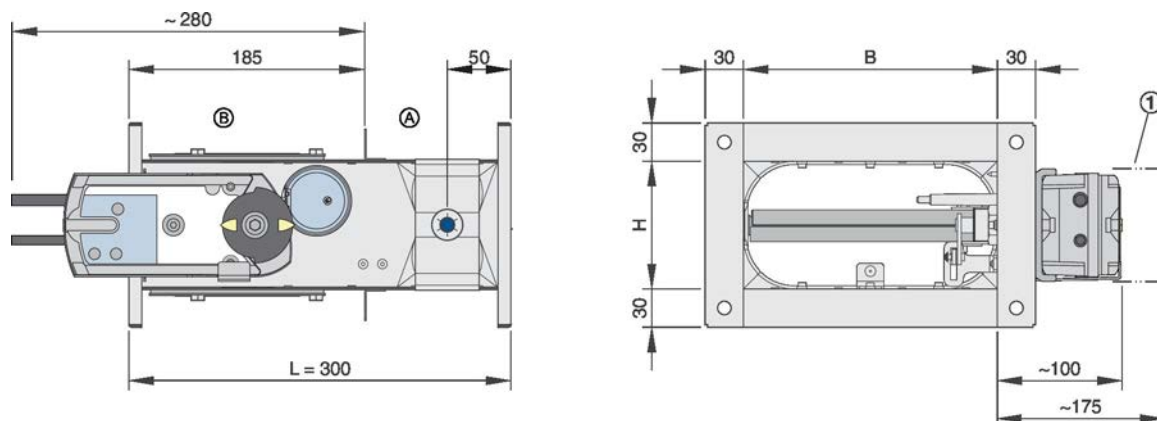


Fig. 4: FKS-EU with Siemens spring return actuator GNA

- 1 Keep clear to provide access for operation
- A Installation side
- B Operating side
- B Width of the fire damper (side B)
- H Height of the fire damper (side H)
- L Length of the fire damper (casing length)

FKS-EU with Siemens spring return actuator:

- GNA 326.1E: weight of FKS-EU with fusible link + 1.3 kg, see table 8.
- GNA 126.1E: weight of FKS-EU with fusible link + 1.2 kg, see table 8.

Spring return actuator GNA...			
Construction variant		326.1E	126.1E
Supply voltage		230 V AC, 50/60 Hz	24 V AC, 50/60 Hz / 24 ... 48 V DC
Functional range		198 ... 264 V AC	19.2 ... 28.8 V AC 19.2 ... 57.6 V DC
Power rating	Spring compression	7 VA / 4.5 W	5 VA / 3.5 W
	Hold position	3,5 W	2 W
Running time	Actuator / spring return	90 s / 15 s	
Limit switch	Type of contact	2 changeover contacts	
	Switching voltage	24 ... 230 V AC / 12 ... 30 V DC	
	Switching current	AC: 6 (2 inductive) A / DC: 2 A	
IEC protection class		II	III
Protection level		IP 54	
Storage temperature		-20 ... 50 °C	
Ambient temperature		-20 ... 50 °C	
Ambient humidity		< 95 % rh, no condensation	
Connecting cable	Actuator	0.9 m / 6 × 0.75 mm ² (free of halogens)	
	Limit switch	0.9 m / 6 × 0.75 mm ² (free of halogens)	

¹ Up to 75 °C the safe position will definitely be reached.

2.4 FKS-EU as air transfer damper

Dimensions and weight

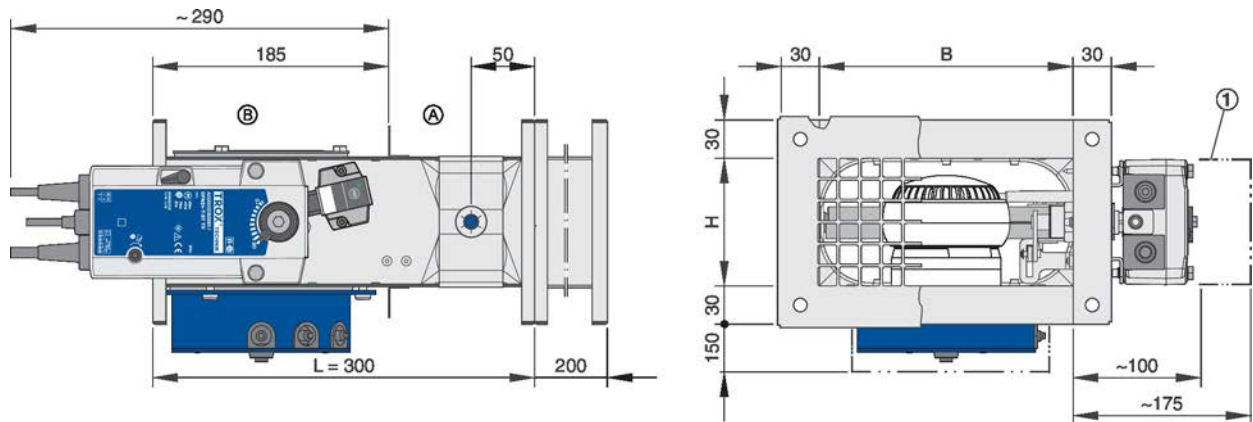


Fig. 5: FKS-EU as air transfer damper

- 1 Keep clear to provide access for operation
- Ⓐ Installation side
- Ⓑ Operating side

- B Width of the fire damper (side B)
- H Height of the fire damper (side H)
- L Length of the fire damper (casing length)

FKS-EU as air transfer damper:

- Weight of FKS-EU with fusible link + 3 kg, see table 8.
- Technical data of spring return actuator BFN... see table 9
- The duct smoke detector RM-O-3-D is fitted in the lower inspection access of the FKS-EU and, like the spring return actuator, is thus an integral component of the fire damper. For technical information on the duct smoke detector, see the "Operating and installation manual for the RM-O-3-D duct smoke detector"

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.

- Fire damper
 - Attachments/accessories, if any
- Operating manual (1 per shipment)



Colour hues on the damper blade

The blades of fire dampers are treated with a greenish impregnating agent. Resulting colour hues on the damper blade are due to technical reasons and do not constitute a defect of any kind.

Transport on site

If possible, take the fire damper in its transport packaging up to the installation location.

Storage

If the unit has to be stored temporarily:

- Remove any plastic wrapping.
- Protect the unit from dust and contamination.
- Store the unit 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 unit below -40 °C or above 50 °C.

Packaging

Properly dispose of packaging material.

4 Parts and function

Fire dampers are used as safety related components in ventilation systems. The fire damper is used as a shut-off device to prevent fire and smoke from spreading through ducting. During normal operation the damper blade is open to enable air passage through the ventilation system.

If the temperature increases in the event of a fire, the damper blade closes. Release is triggered at 72 °C (95 °C in warm air ventilation systems). If the damper blade closes due to a temperature increase (i.e. in the event of a fire), it must not be reopened.

To ensure proper functioning of the fire damper, a test can be carried out. ↪ 67

4.1 FKS-EU with fusible link

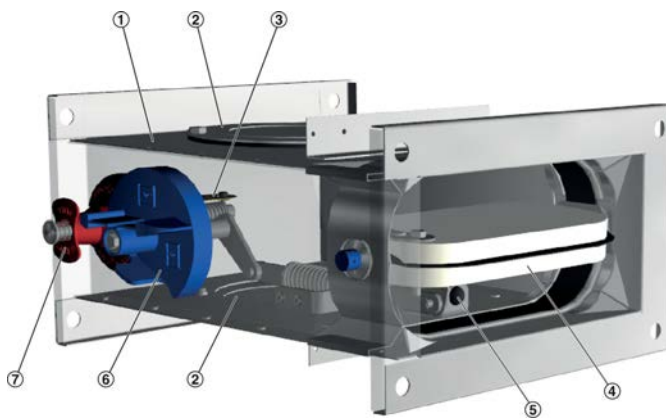


Fig. 6: FKS-EU with fusible link

- 1 Casing
- 2 Inspection access
- 3 Fusible link
- 4 Damper blade with seal
- 5 Travel stop
- 6 Handle with interlock and damper blade position indicator
- 7 Release mechanism

Functional description

In fire dampers with a fusible link, damper closure is triggered by the fusible link. If the temperature inside the fire damper rises to 72 °C or 95 °C, the fusible link triggers a coil spring mechanism. The coil spring mechanism then causes the fire damper to close.

As an option, the fire damper can be either supplied or subsequently fitted with one or two limit switches. The limit switches can signal the damper blade position to the central BMS or fire alarm system. One limit switch each is required for damper blade positions OPEN and CLOSED.

4.2 FKS-EU with spring return actuator

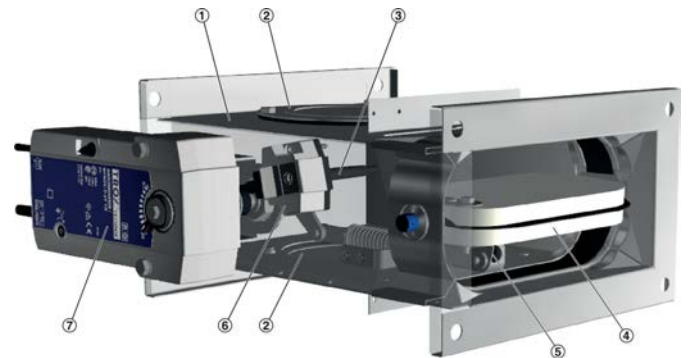


Fig. 7: FKS-EU with spring return actuator (drawing BFN)

- 1 Casing
- 2 Inspection access
- 3 Temperature sensor
- 4 Damper blade with seal
- 5 Travel stop
- 6 Thermoelectric release mechanism
- 7 Spring return actuator

Functional description

The spring return actuator enables the motorised opening and closing of the damper blade; it can be activated by the central BMS. As long as power is supplied to the actuator, the damper blade remains open. In the event of a fire, the internal thermoelectric release mechanism closes the damper blade when at least one of the following is true:

- Temperature in the fire damper > 72 °C or > 95 °C
- Ambient temperature outside the release mechanism > 72 °C
- The power supply is interrupted (power off to close)

As standard, the spring return actuator is equipped with limit switches that can be used to indicate the damper blade position.

FKS-EU with spring return actuator and duct smoke detector as air transfer damp...

4.3 FKS-EU with fusible link and cover grille used as an air transfer unit

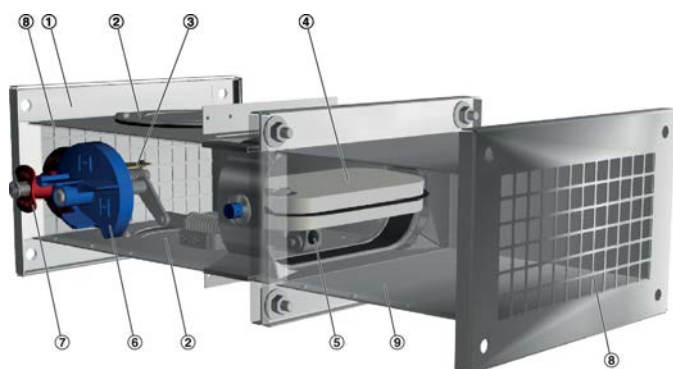


Fig. 8: FKS-EU with fusible link and cover grille used as an air transfer unit

- 1 Casing
- 2 Inspection access
- 3 Fusible link
- 4 Damper blade with seal
- 5 Travel stop
- 6 Handle with interlock and damper blade position indicator
- 7 Release mechanism
- 8 Cover grille
- 9 Extension piece

Functional description

Air transfer units prevent fire and smoke from spreading in buildings. The thermal release mechanism closes the air transfer unit when the release temperature (72 °C) is reached. Smoke can, however, spread below this temperature. Air transfer units are installed in places where the general building inspectorate sees no risk, for example:

- As an inlet for additional supply air in the walls of required corridors (escape routes) if the inlet is near the ground (centre line up to 500 mm above floor surface)
- In installation shafts as long as they have sufficient fire resistance where they penetrate compartment floors
- In installation ducts as long as they have sufficient fire resistance where they penetrate compartment floors or walls (except for necessary corridors or escape routes)

The air transfer unit consists of the FKS-EU fire damper with general building inspectorate licence Z-19.18-2127, with a thermal release mechanism for 72 °C and with cover grilles on both sides, but without a duct smoke detector.

For further information on the installation and use, see general building inspectorate licence Z-19.18-2127.

4.4 FKS-EU with spring return actuator and duct smoke detector as air transfer damper

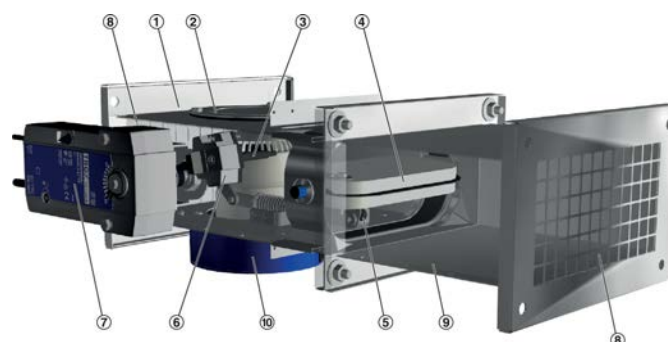


Fig. 9: FKS-EU with spring return actuator and duct smoke detector as air transfer damper

- 1 Casing
- 2 Inspection access
- 3 Temperature sensor
- 4 Damper blade with seal
- 5 Travel stop
- 6 Thermoelectric release mechanism
- 7 Spring return actuator
- 8 Cover grille
- 9 Extension piece
- 10 Duct smoke detector RM-O-3-D

Functional description

If the duct smoke detector detects smoke, the spring return actuator closes the damper blade. This prevents smoke from being transferred via ductwork into adjacent fire compartments even before it reaches a temperature that would trigger the thermoelectric release mechanism.

As long as power is supplied to the actuator, the damper blade remains open. In the event of a fire, the damper closes when at least one of the following occurs:

- The duct smoke detector detects smoke
- Temperature in the fire damper > 72 °C
- Ambient temperature outside the release mechanism > 72 °C
- The power supply is interrupted (power off to close)

For further information on the installation and use, see general building inspectorate licence Z-6.50-2231.

5 Installation

5.1 Installation situations

Note

The performance classes of the fire damper and the wall or ceiling slab may differ. The lower performance class determines the performance class of the overall system.

Supporting construction	Installation location	Minimum thickness [mm]	Class of performance EI TT (ve-ho, i ↔ o) S	Installation type	Installation details on page
Solid walls	in	100	EI 120 S	N	↪ 19
		100	EI 90 S	E ³	↪ 22
Solid ceiling slabs 3, 4	in	100 ²	EI 120 S	N	↪ 23
		100 ²	EI 90 S	N	↪ 23
		125	EI 90 S	N	↪ 23
		150	EI 120 S	N	↪ 23
	in, combined with wooden beam ceilings	100	EI 90 S	N	↪ 25
	in, combined with modular ceilings ¹	100	EI 120 S	N	↪ 26
	in, with concrete base	100	EI 120 S	N	↪ 27
Lightweight partition walls	in, with metal support structure, cladding on both sides	98	EI 120 S	N	↪ 31
			EI 90 S	E ³	↪ 36
	in, with timber stud wall (also timber panel construction), cladding on both sides	75	EI 30 S	N / E ³	↪ 31 /
					↪ 36
	in, half-timbered constructions, cladding on both sides	140	EI 90 S	N / E ³	↪ 40 /
					↪ 45
in, with timber stud wall (also timber panel construction), cladding on both sides	105	EI 30 S	N / E ³	↪ 40 /	
				↪ 45	
in, half-timbered constructions, cladding on both sides	115	EI 30 S	N / E ³	↪ 40 /	
				↪ 45	
Solid wood walls	in	95	EI 90 S	N / E ³	↪ 48 /
					↪ 50
Compartment walls	in, with metal support structure, cladding on both sides	100	EI 120 S	N	↪ 54
		100	EI 90 S	E ³	↪ 56

¹⁾ Cadolto system

³⁾ not allowed for FKS-EU used as an air transfer unit

N = Mortar-based installation

²⁾ Thickness increased near the installation opening

⁴⁾ for FK-EU as air transfer damper, only up to B = 500 mm

E = Installation block

Supporting construction	Installation location	Minimum thickness [mm]	Class of performance EI TT (ve-ho, i ↔ o) S	Installation type	Installation details on page
Shaft walls	in, with metal support structure or steel sub-structure, cladding on one side	90	EI 90 S	N / E ³	↳ 59 / ↳ 61
	in, with metal support structure / additional safety board, cladding on one side	90	EI 30 S	N	↳ 59

¹⁾ Cadolto system

³⁾ not allowed for FKS-EU used as an air transfer unit

N = Mortar-based installation

²⁾ Thickness increased near the installation opening

⁴⁾ for FK-EU as air transfer damper, only up to B = 500 mm

E = Installation block

5.2 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.

- The construction variants with stainless steel or powder-coated casing and additional impregnated damper blade meet even more critical requirements for corrosion protection.
- A maximum of two FKS-EU units may be installed in a single installation opening.
- If several fire dampers are operated on a common air duct, it is necessary to ensure that when one fire damper is closed, the maximum permitted face velocity is not exceeded in the fire dampers that are still open. This must be ensured by other means, e.g. by switching off the fan or mutually interlocking in a construction variant with spring return actuator.

5.3 General installation information

NOTICE!

Risk of damage to the fire damper

- Protect the fire damper from contamination and damage.
- Cover openings and release mechanism (e.g. with plastic foil) to protect them from mortar and dripping water.
- Do not remove the transport and installation protection (if any) until installation is complete.

Please note:

- Control elements, electric actuator and inspection access panel must remain accessible for maintenance.
- Loads imposed on the casing may impair the function of the fire damper. Install and connect the damper in such a way that no loads will be imposed on the installed damper.
- Before installation: Perform a functional test, then close the fire damper. ↳ 67
- Protect the fire damper from humidity and condensation as they will damage the fire damper.

Thermal insulation

Thermal insulation may be required to prevent the formation of condensation, especially in the intake of fresh air. Suitable insulating materials include AF/Armaflex with Armaflex RS850 glue or Armaflex Ultima with Armaflex Ultima RS850 glue from Armacell – with surfaces fully glued.

The insulation is non-hazardous in terms of fire safety if the following aspects are observed:

- The insulation must not affect the functioning of the fire damper.
- The accessibility of the fire damper must be ensured.
- The inspection accesses must be accessible.
- The insulation must not be laid through the wall / ceiling.

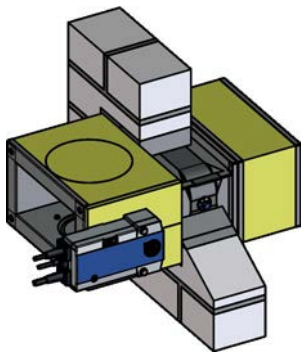


Fig. 10: Thermal insulation

Extension pieces

To simplify connection of the fire damper to the ductwork after installation, the fire damper should be extended with a suitable extension piece on the installation side for a wall or ceiling thickness of > 100 mm.

Installation position

The fire damper may be installed such that the damper blade shaft is horizontal or vertical. The position of the release mechanism is not critical but the mechanism must remain accessible for maintenance (consider application-specific restrictions).

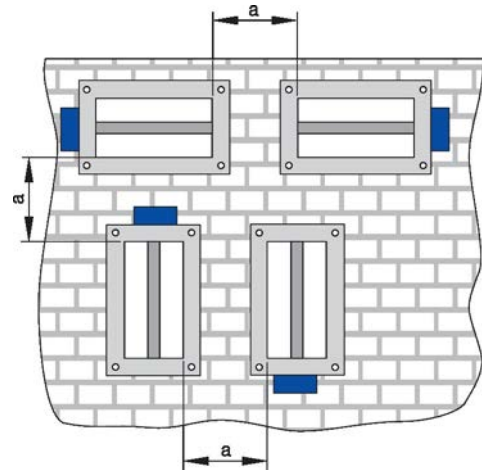


Fig. 11: Blade shaft horizontal or vertical

- a Minimum distance between two fire dampers. The distance depends on the installation situation and is given in the installation details.

Perimeter gap »s«

With mortar-based installation the perimeter gap »s« must not exceed 150 mm (wall) or 60 mm (ceiling). The perimeter gap »s« must be large enough such that mortar can be filled in even in case of thicker walls. The gap must be large enough such that mortar can be filled in. We recommend a gap of at least 20 mm.

Maximum gap widths are based on EN 15882-2. Larger gaps do not have an adverse effect with regard to fire protection and are in our opinion not critical.

Installation when erecting the solid wall

- If the fire damper is installed as the wall is being erected, the perimeter gap »s« is not required. The open spaces between the fire damper and the wall must be closed off with mortar. Entrapped air is to be avoided. The mortar bed depth should be equal to the thickness of the wall.

Installation while completing the ceiling slab

- If the fire damper is installed as the ceiling slab is being completed, the perimeter gap »s« is not required.

Mortar-based installation

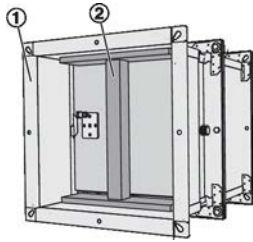


Fig. 12: Fire damper with prop

In case of mortar-based installation, protect the sides of the fire damper casing ① against deformation, e.g. with a prop ②.

Mortars for mortar-based installation

In case of mortar-based installation, the open spaces between the fire damper casing and the wall or ceiling slab must be closed off with mortar. Entrapped air is to be avoided. The mortar bed depth should be equal to the thickness of the wall but must be at least 100 mm.

The following mortars are acceptable:

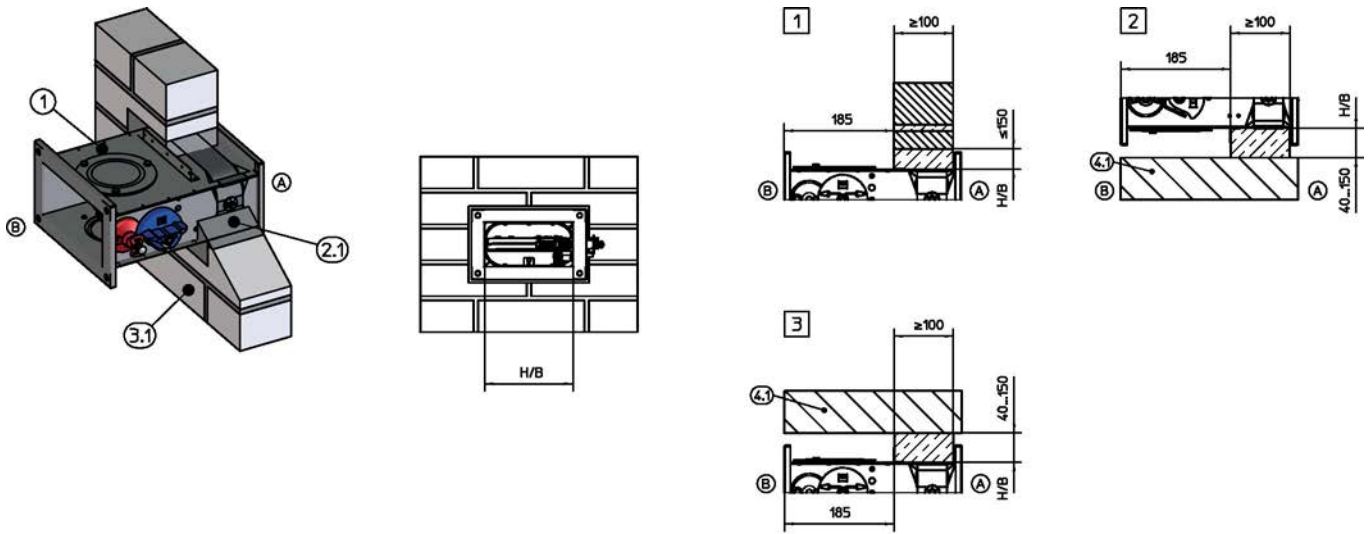
- DIN 1053: Groups II, IIa, III, IIIa; fire protection mortar of groups II, III
- EN 998-2: Classes M 2.5 to M 10 or fire protection mortar of classes M 2.5 to M 10
- Equivalent mortars that meet the requirements of the above standards, gypsum mortar or concrete

5.3.1 After installation

- Clean the fire damper.
- Remove transport and installation protection, if any. In case of mortar-based installation this protection must not be removed until the mortar has hardened.
- Test the function of the fire damper.
- Connect the ductwork.
- Make electrical connections.

5.4 Solid walls

5.4.1 Mortar-based installation

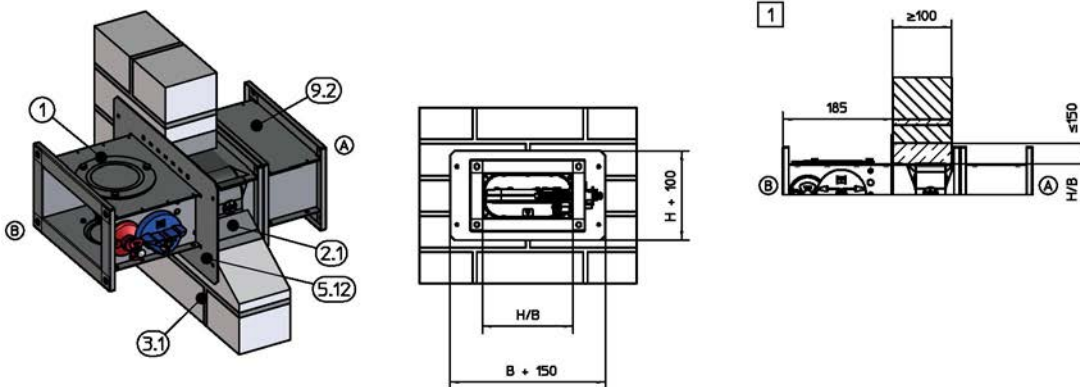


GR2258769

Fig. 13: Mortar-based installation into a solid wall

- 1 FKS-EU
- 2.1 Mortar
- 3.1 Solid wall
- 4.1 Solid floor / solid ceiling slab

- 1 up to 3 Up to EI 120 S
- A Installation side
- B Operating side

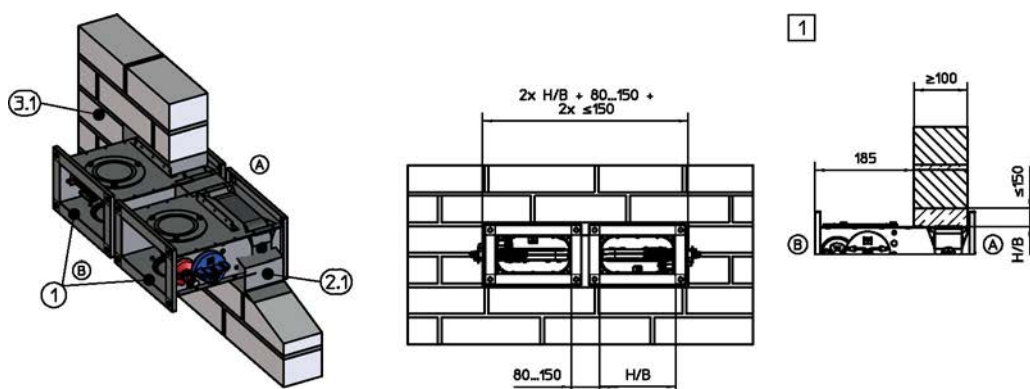


GR2600706

Fig. 14: Mortar-based installation with cover plate in solid wall

- 1 FKS-EU
- 2.1 Mortar
- 3.1 Solid wall
- 5.12 Cover plate, optional

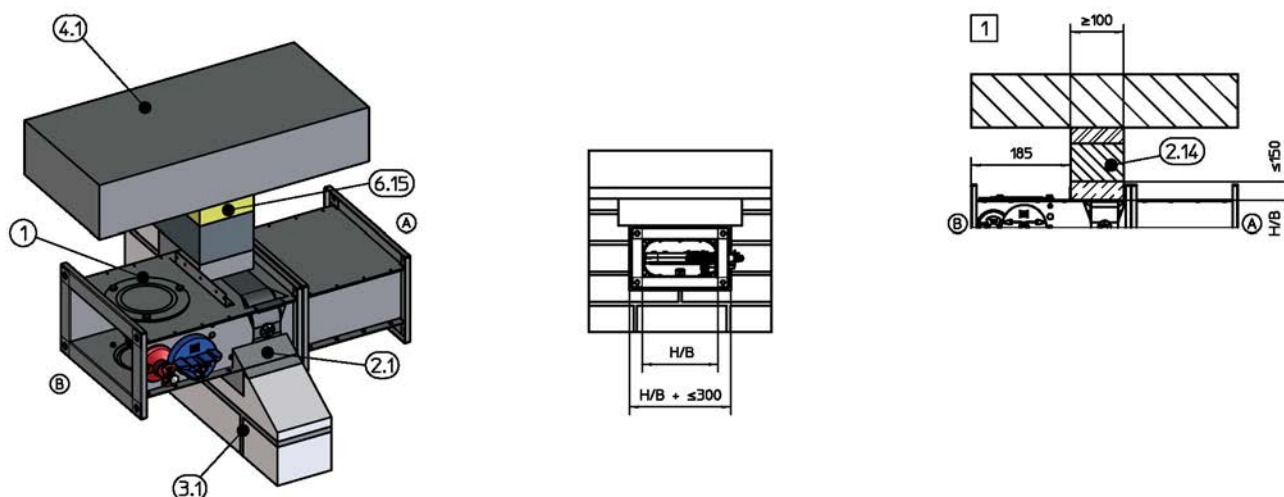
- 9.2 Extension piece or duct
- 1 Up to EI 120 S
- A Installation side
- B Operating side



GR2505070

Fig. 15: Mortar-based installation in solid wall, "flange to flange", side by side (drawing) or one below the other

- | | | | |
|-----|------------|---|-------------------|
| 1 | FKS-EU | 1 | Up to EI 120 S |
| 2.1 | Mortar | A | Installation side |
| 3.1 | Solid wall | B | Operating side |



GR2693277

Fig. 16: Installation in non-load-bearing solid wall with flexible ceiling joint

- | | | | |
|------|-------------------------------|------|--|
| 1 | FKS-EU | 6.15 | Mineral wool (depending on the flexible ceiling joint) |
| 2.1 | Mortar | 1 | EI 120 S |
| 2.14 | Lintel (if required) | A | Installation side |
| 3.1 | Solid wall (non-load-bearing) | B | Operating side |
| 4.1 | Solid ceiling slab | | |

Personnel:

- Specialist personnel

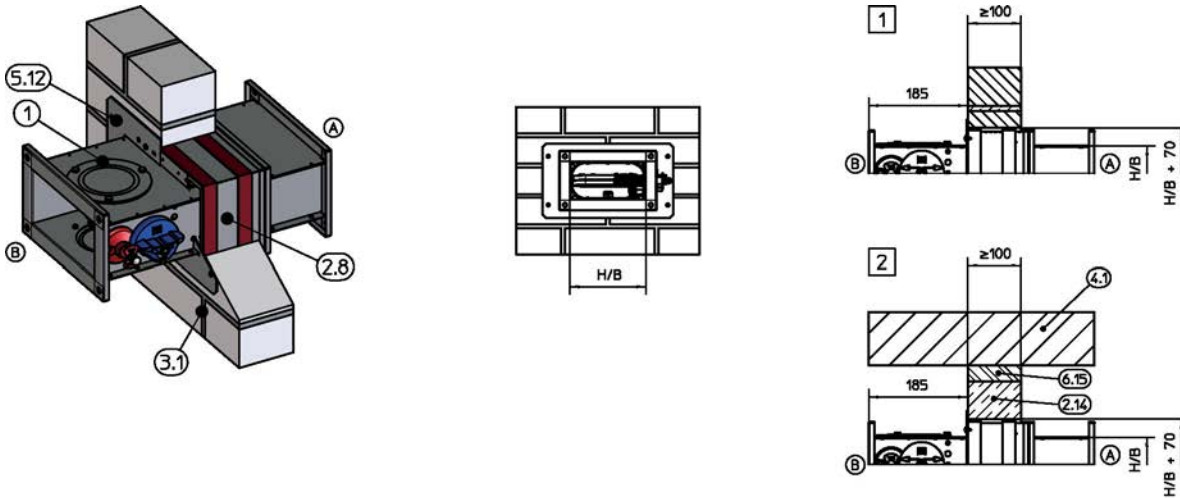
Materials:

- Mortar ↪ *'Mortars for mortar-based installation'* on page 18

Requirements

- Performance class up to EI 120 S
 - Solid walls or compartment walls made of, for example, concrete, aerated concrete, masonry, or solid gypsum wallboards according to EN 12859 (without open spaces), gross density $\geq 350 \text{ kg/m}^3$ and $W \geq 100 \text{ mm}$
 - $\geq 40 \text{ mm}$ distance from the fire damper to load-bearing structural elements; with cover plate $\geq 50 \text{ mm}$ on side H, $\geq 75 \text{ mm}$ on side B (depending on construction)
 - $\geq 80 \text{ mm}$ distance between two fire dampers; $\geq 100 \text{ mm}$ when a cover plate is used, and the two fire dampers are installed on top of each other; $\geq 150 \text{ mm}$ when the two fire dampers are installed side by side. When you install two FKS-EU units in the same opening, the mortar bed between the two fire dampers must not exceed 150 mm .
1. ▶ An installation opening is required with a maximum size of $B + 300 \text{ mm}$, $H + 300 \text{ mm}$. (For an FKS-EU with cover plate, the installation opening should measure $B + 80 \text{ mm}$ / $H + 80 \text{ mm}$ so that the cover plate can be fixed properly).
 2. ▶ Push the fire damper into the installation opening and secure it. Make sure that the distance from the flange on the operating side to the wall is 185 mm (bracket is flush with the wall).
When using the optional cover plate: Push the fire damper into the installation opening until the cover plate touches the wall. Use wallplugs and screws to fix the cover plate to the wall.
 3. ▶ If the wall thickness is $> 100 \text{ mm}$, extend the fire damper with an extension piece on the installation side (attachment or provided by others).
 4. ▶ Close off the perimeter gap »s« with mortar. The depth of mortar bed is not allowed to be less than 100 mm (close larger installation openings according to the wall structure, e.g. masonry work).

5.4.2 Dry mortarless installation



GR2695629

Fig. 17: Installation with installation block

- 1 FKS-EU
- 2.8 Installation block E
- 2.14 Lintel
- 3.1 Solid wall
- 4.1 Solid ceiling slab

- 5.12 Cover plate
- 6.15 Mineral wool (depending on the flexible ceiling joint)
- 1 2 EI 90 S
- A Installation side
- B Operating side

Personnel:

- Specialist personnel

Requirements

- Performance class up to EI 90 S
 - Solid walls or compartment walls made of, for example, concrete, aerated concrete, masonry, or solid gypsum wallboards according to EN 12859 (without open spaces), gross density $\geq 350 \text{ kg/m}^3$ and $W \geq 100 \text{ mm}$
 - $\geq 50 \text{ mm}$ distance to load-bearing structural elements on side H, $\geq 75 \text{ mm}$ on side B (depending on construction)
 - Distance between two fire dampers, $\geq 150 \text{ mm}$ horizontally, $\geq 100 \text{ mm}$ vertically (installation of each fire damper in a separate installation opening).
1. ▶ Create an installation opening with $H + 70 \text{ mm}$ and $B + 70 \text{ mm}$.
 2. ▶ Position the fire damper with the installation block in the centre of the installation opening and push it in up to the cover plate.
 3. ▶ If the wall thickness is $> 100 \text{ mm}$, extend the fire damper on the installation side with an extension piece (attachment or provided by others).
 4. ▶ Fix the cover plate with at least four M8 screws. For solid walls and solid ceiling slabs, fire-rated steel anchors (with suitability certificate) must be used. Instead of anchors, threaded rods can be used and can be secured using nuts and washers.

5.5 Solid ceiling slabs

5.5.1 Mortar-based installation into solid ceiling slabs

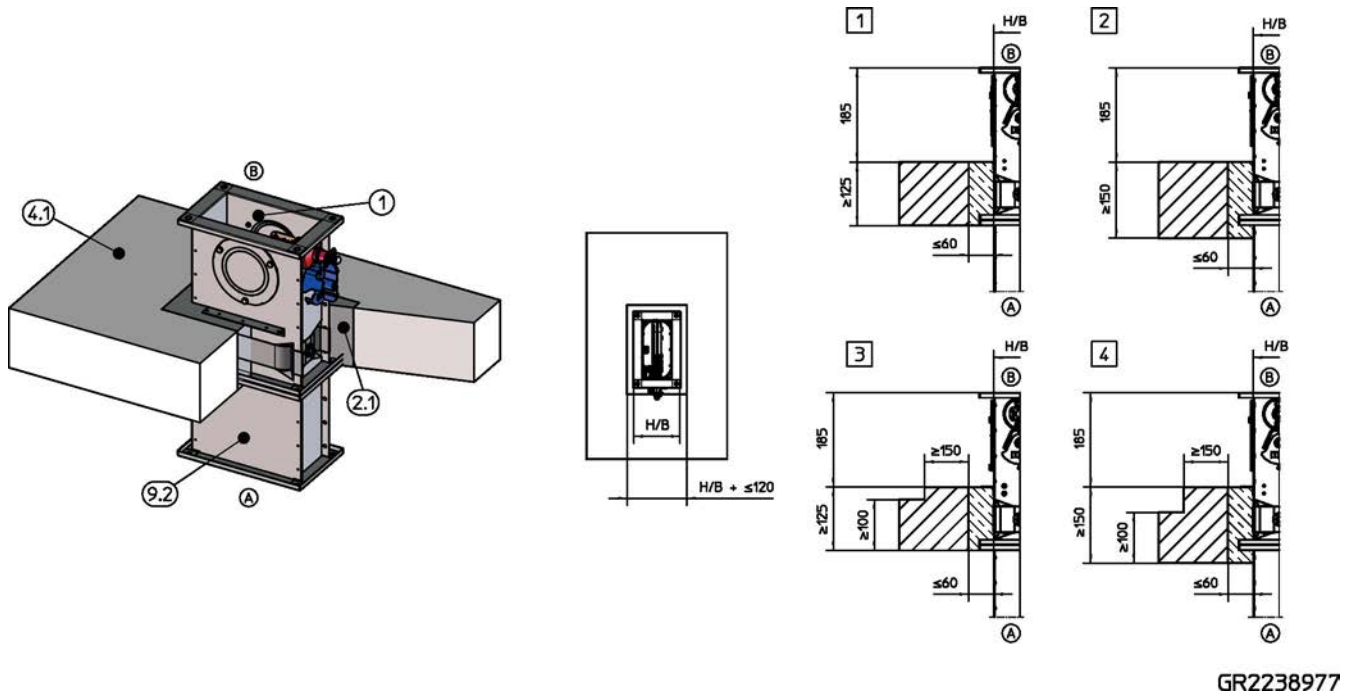


Fig. 18: Mortar-based installation into solid ceiling slab, upright

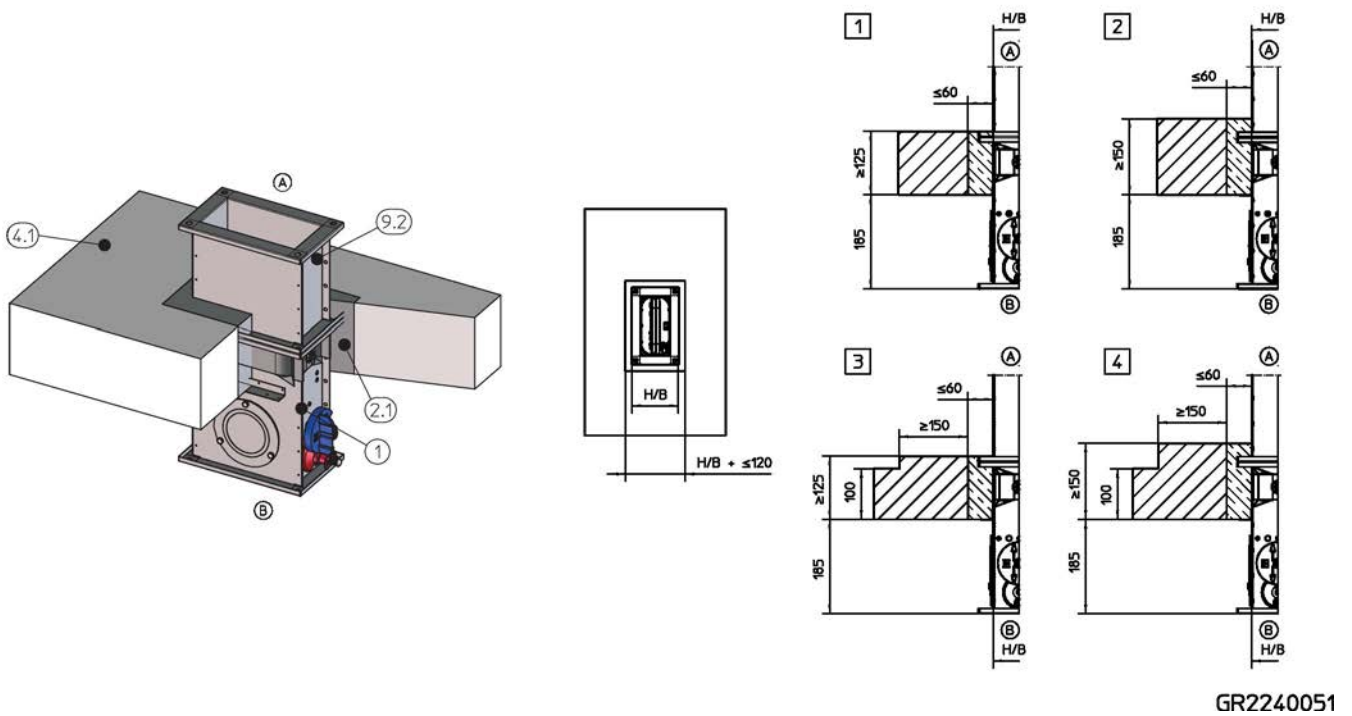
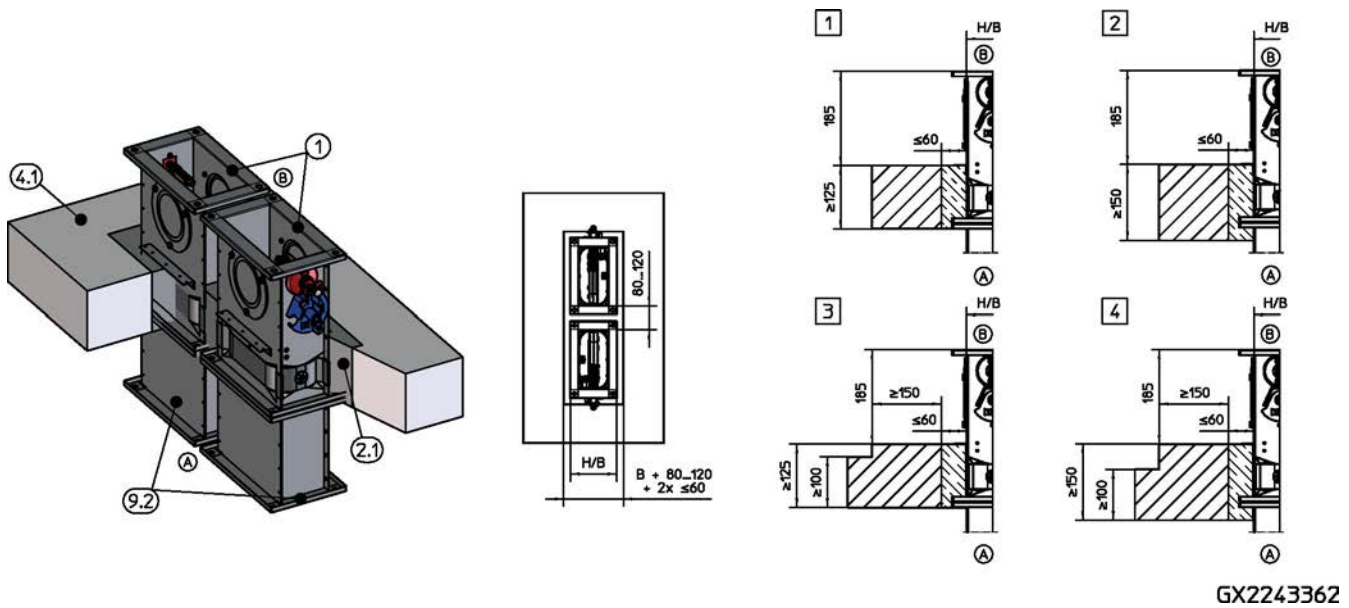


Fig. 19: Mortar-based installation into solid ceiling slab, suspended

- | | | | |
|-----|-------------------------|------------|-------------------|
| 1 | FKS-EU | 1 3 | EI 90 S |
| 2.1 | Mortar or concrete | 2 4 | EI 120 S |
| 4.1 | Solid ceiling slab | Ⓐ | Installation side |
| 9.2 | Extension piece or duct | Ⓑ | Operating side |



GX2243362

Fig. 20: Mortar-based installation in solid ceiling slab, upright (drawing) or suspended, "flange to flange"

- 1 FKS-EU
- 2.1 Mortar or concrete
- 4.1 Solid ceiling slab
- 9.2 Extension piece or duct

- | | |
|----|-------------------|
| 13 | EI 90 S |
| 24 | EI 120 S |
| A | Installation side |
| B | Operating side |

Personnel:

- Specialist personnel

Materials:

- Mortar ↪ 'Mortars for mortar-based installation' on page 18

Requirements

- Performance class up to EI 120 S
 - Solid walls made of concrete or aerated concrete, without open spaces, gross density $\geq 600 \text{ kg/m}^3$ and $D \geq 150 \text{ mm}$ (the performance class of solid walls with $D \geq 125 \text{ mm}$ is EI 90 S)
 - $\geq 75 \text{ mm}$ distance to load-bearing structural elements
 - $\geq 80 \text{ mm}$ distance between two fire dampers. When you install two FKS-EU units in the same opening, the mortar bed between the two fire dampers must not exceed 120 mm (reinforcement according to structural requirements).
1. ▶ Create an installation opening in compliance with the local structural requirements. Installation opening maximum $B + 120 \text{ mm}$ and $H + 120 \text{ mm}$. (For an FKS-EU with cover plate, the installation opening should measure $B + 80 \text{ mm} / H + 80 \text{ mm}$ so that the cover plate can be fixed properly).
 2. ▶ Push the fire damper into the installation opening and secure it. Make sure that the distance from the flange on the operating side to the ceiling slab is 185 mm (bracket is flush with the ceiling).

When using the optional cover plate: Push the fire damper into the installation opening until the cover plate touches the ceiling. Use wallplugs and screws to fix the cover plate to the ceiling.
 3. ▶ Extend the fire damper with an extension piece on the installation side (attachment or provided by others).
 4. ▶ Close off the perimeter gap »s« with mortar. The mortar bed depth must be at least 100 mm.

5.5.2 Mortar-based installation into wooden beam ceilings

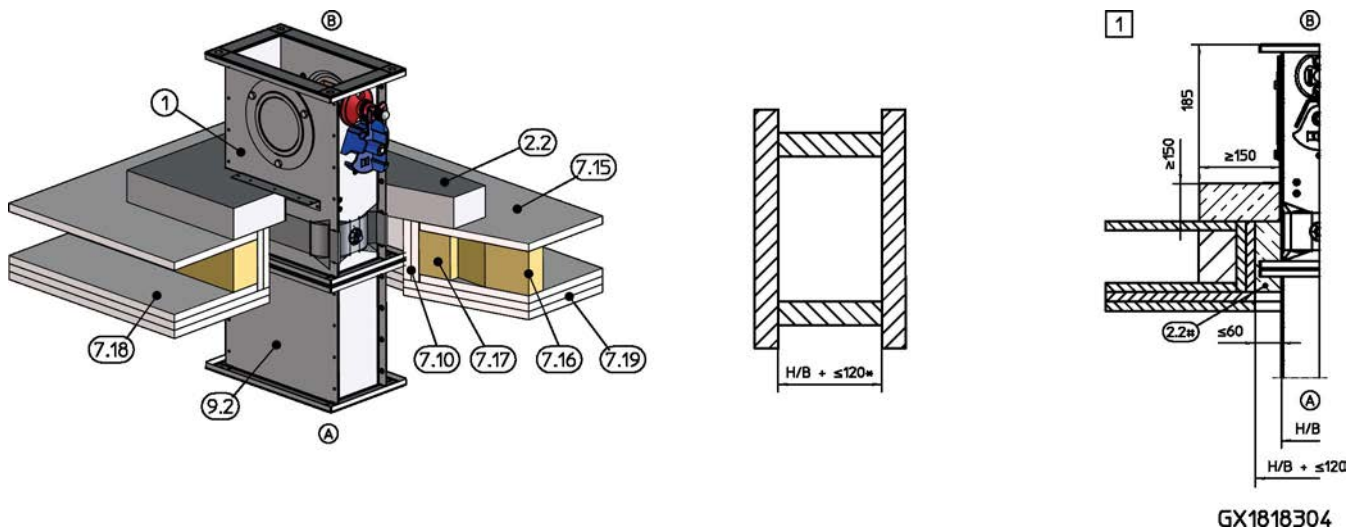


Fig. 21: Mortar-based installation into a wooden beam ceiling up to EI 90 S, upright installation (shown; other structures upon request)

1	FKS-EU	7.19	Fire-resistant cladding (according to the local structural conditions)
2.2	Reinforced concrete	9.2	Extension piece or duct
7.10	Trim panels	#	optional
7.15	Wooden floorboard / floor tile	*	Can be increased to account for the thickness of the trim panels
7.16	Wooden beams (distances between beams have to be reduced to fit the size of the installation opening)	1	Up to EI 90 S
7.17	Trimmers, wooden beams	A	Installation side
7.18	Formwork	B	Operating side

Personnel:

- Specialist personnel

Materials:

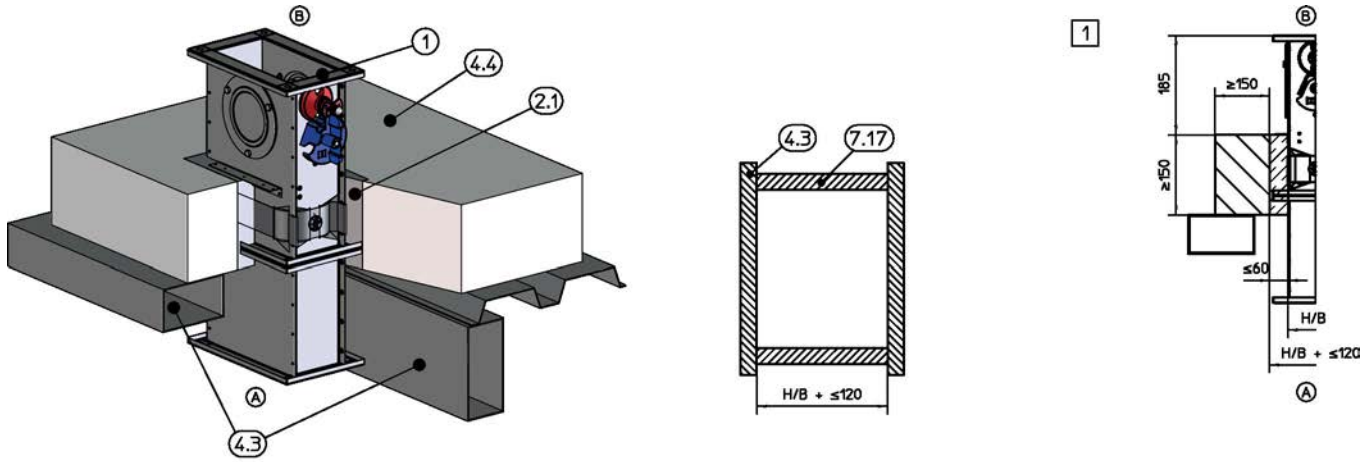
- Concrete

Requirements

- Performance class up to EI 90 S
 - Wooden beam ceiling with fire-resistant cladding
 - ≥ 75 mm distance to load-bearing structural elements
 - ≥ 80 mm distance between two fire dampers. When you install two dampers next to each other into the same opening, the concrete bed between the two fire dampers must not exceed 120 mm.
- ▶ Create an installation opening, maximum size $B + 120$ mm and $H + 120$ mm, in compliance with the local structural requirements. Professionally connect the trimmers of the wooden beams.
 - ▶ Create a partial concrete ceiling around the installation opening, ≥ 150 mm, ≥ 150 mm thick.
 - ▶ Push the fire damper into the installation opening and secure it. Make sure that the distance from the flange on the operating side to the concrete is 185 mm (bracket is flush with the ceiling).
Extend the fire damper with an extension piece on the installation side (attachment or provided by others).
 - ▶ Close off the perimeter gap »s« with mortar. The mortar bed depth must be at least 100 mm.
 - ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete, have to be evaluated and ensured by others.

Instead of subsequently creating a mortar-mix, the fire damper can also be installed directly in a reinforced concrete bed, ≥ 150 mm around the perimeter, ≥ 150 mm thick.

5.5.3 Mortar-based installation into lightweight ceilings



GX1784862

Fig. 22: Mortar-based installation into a lightweight ceiling up to EI 120 S, upright installation

1	FKS-EU	7.17	Steel sections
2.1	Mortar	1	Up to EI 120 S
4.3	Lightweight ceiling (Cadolto modular ceiling system), installation according to manufacturer's instructions and general appraisal certificate	A	Installation side
4.4	Partial concrete ceiling with reinforcement	B	Operating side

Personnel:

- Specialist personnel

Materials:

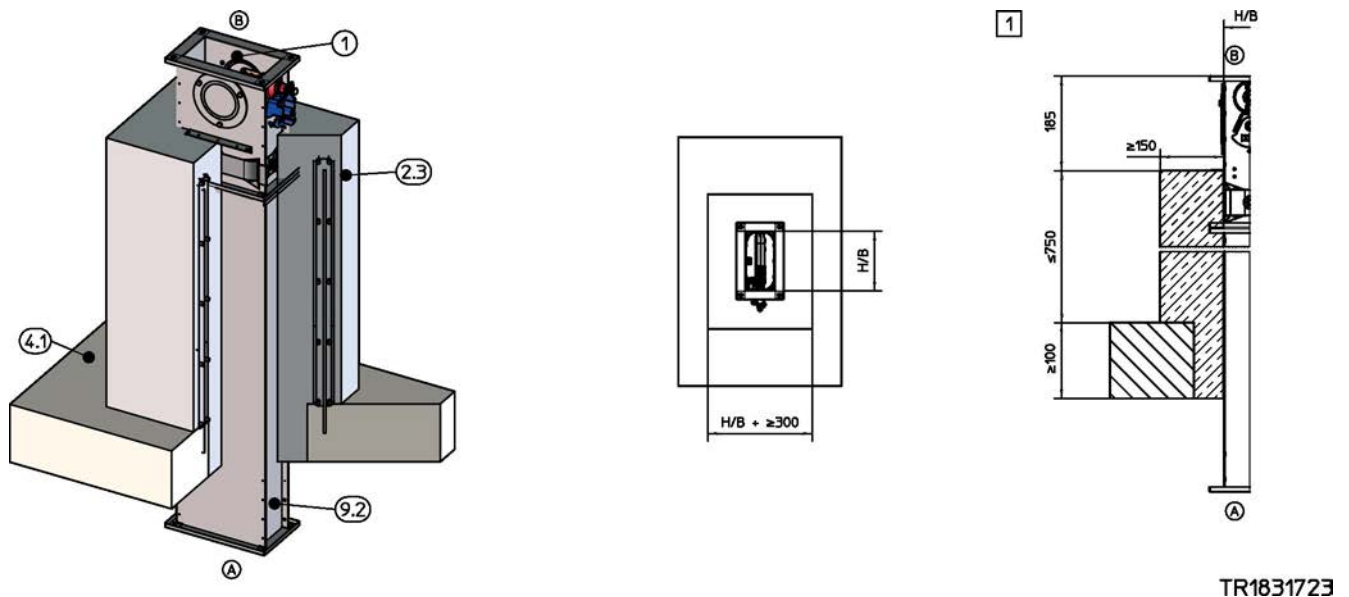
- Mortar or concrete ↗ 'Mortars for mortar-based installation' on page 18

Requirements

- Performance class up to EI 120 S
 - Modular ceiling (Cadolto)
 - ≥ 75 mm distance to load-bearing structural elements
 - ≥ 80 mm distance between two fire dampers. When you install two fire dampers next to each other into the same opening, the concrete bed between the two fire dampers must not exceed 120 mm.
- ▶ Create an installation opening, maximum size B + 120 mm and H + 120 mm, in compliance with the local structural requirements. Provide and professionally connect the steel sections in the lightweight ceiling.
 - ▶ Create a partial concrete ceiling around the installation opening, ≥ 150 mm, ≥ 150 mm thick.
 - ▶ Push the fire damper into the installation opening and secure it. Make sure that the distance from the flange on the operating side to the concrete bed is 185 mm (bracket is flush with the ceiling).
Extend the fire damper with an extension piece on the installation side (attachment or provided by others).
 - ▶ Close off the perimeter gap »s« with mortar. The mortar bed depth must be at least 100 mm.
 - ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete, have to be evaluated and ensured by others.

Instead of subsequently creating a mortar-mix, the fire damper can also be installed directly in a reinforced concrete bed, ≥ 150 mm around the perimeter, ≥ 150 mm thick.

5.5.4 Mortar-based installation into concrete base



TR1831723

Fig. 23: Mortar-based installation with concrete base into a solid ceiling slab, up to EI 120 S

1	FKS-EU	1	Up to EI 120 S
2.3	Reinforced concrete base	A	Installation side
4.1	Solid ceiling slab	B	Operating side
9.2	Duct		

Personnel:

- Specialist personnel

Requirements

- Performance class up to EI 120 S
 - Solid ceiling slabs without open spaces, made of concrete or aerated concrete, gross density $\geq 600 \text{ kg/m}^3$ and $D \geq 100 \text{ mm}$
 - $\geq 75 \text{ mm}$ distance to load-bearing structural elements
 - $\geq 80 \text{ mm}$ distance between two fire dampers
- Screw the new fire damper to the existing fire damper or to the ducting; attach a flange to the ducting if necessary.

Note: If the fire damper is to be attached to an existing but dysfunctional fire damper, all interior parts of the dysfunctional fire damper, e.g. damper blade, travel stop and control elements, have to be removed. Tightly seal any opening in the old fire damper casing with a sheet metal plate.

- Create concrete base, for a reinforcement plan (or similar, e.g. with steel fabric) see Fig. 24.

No reinforcement is required for bases with a height of $\leq 100 \text{ mm}$.

If the distance to adjacent solid walls is $< 150 \text{ mm}$ and if the concrete base has been correctly attached, no reinforcement is required on the wall side.

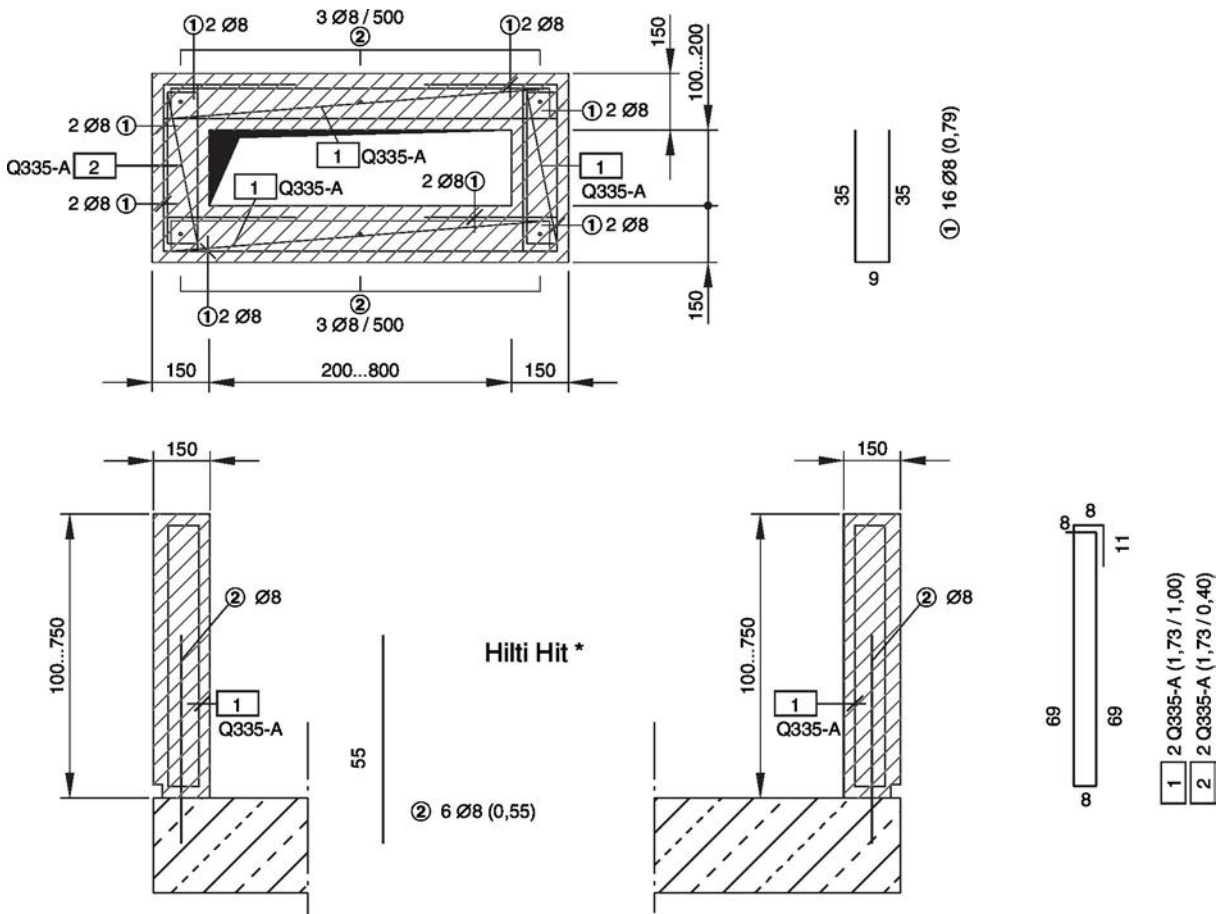


Fig. 24: Reinforcement plan for concrete bases with a height of 100 to 750 mm

* or equivalent, e.g. steel anchor or threaded rods

5.6 Lightweight partition walls with metal support structure and cladding on both sides

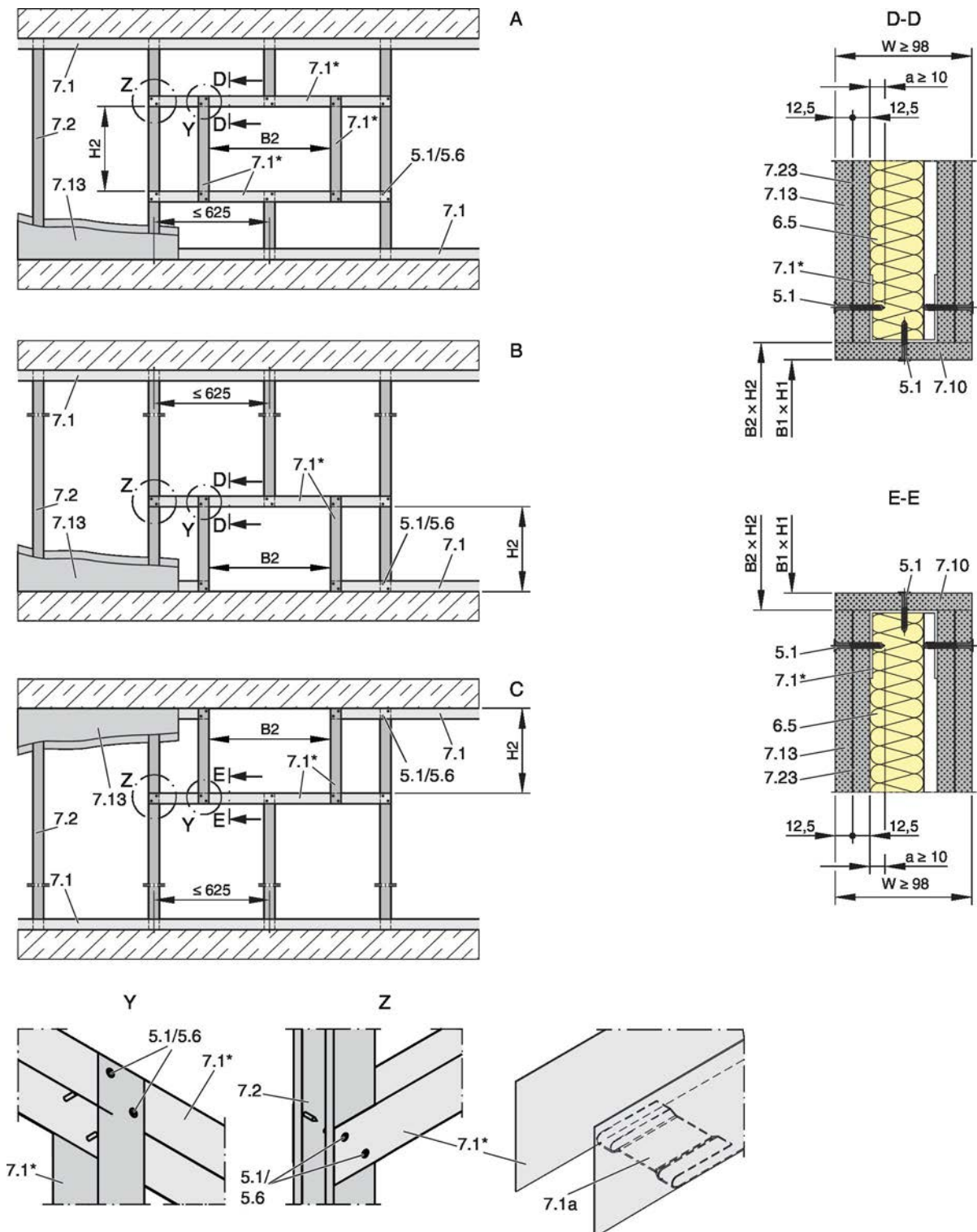


Fig. 25: Lightweight partition wall with metal support structure and cladding on both sides

A	Lightweight partition wall	7.2	CW profile (alternatively a square profile for steel substructure)
B	Lightweight partition wall, installation near the floor	7.10	Trim panels (according to installation details)
C	Lightweight partition wall, installation near the ceiling	7.13	Double layer cladding, on both sides of the metal stud system
5.1	Dry wall screw	7.23	Sheet steel insert (according to usability certificate, e.g. for a safety partition wall)
5.6	Steel rivet		

Lightweight partition walls with metal support structure and cladding on both s...

6.5	Mineral wool (depending on wall construction)	B1×H1	Installation opening
7.1	UW profile (alternatively a square profile for steel substructure)	B2×H2	Opening in the metal support structure (without trim panels: B2 = B1, H2 = H1)
7.1a	UW profile, cut and bent	*	Closed end must face installation opening

Requirements

- Lightweight partition wall, safety partition wall or wall to provide radiation protection, with metal support structure or steel substructure and cladding on both sides, with or without mineral wool filling, with European classification to EN 13501-2 or equivalent national classification
- Cladding on both sides made of gypsum bonded or cement bonded panel materials, of fibre-reinforced gypsum or of fire-rated calcium silicate boards, wall thickness $W \geq 98$ mm
- ≤ 625 mm distance between metal studs
- Additional layers of cladding (up to two layers if stated in the usability certificate for the wall) and double stud constructions are approved.
- Duct connection with flexible connector (recommended)
- Trim panels have to be screw-fixed to the support structure

Erecting a wall and creating an installation opening

- Erect the lightweight partition wall according to the manufacturer's instructions.
- Provide the installation opening in the metal support structure with suitable metal sections, see Fig. 25.

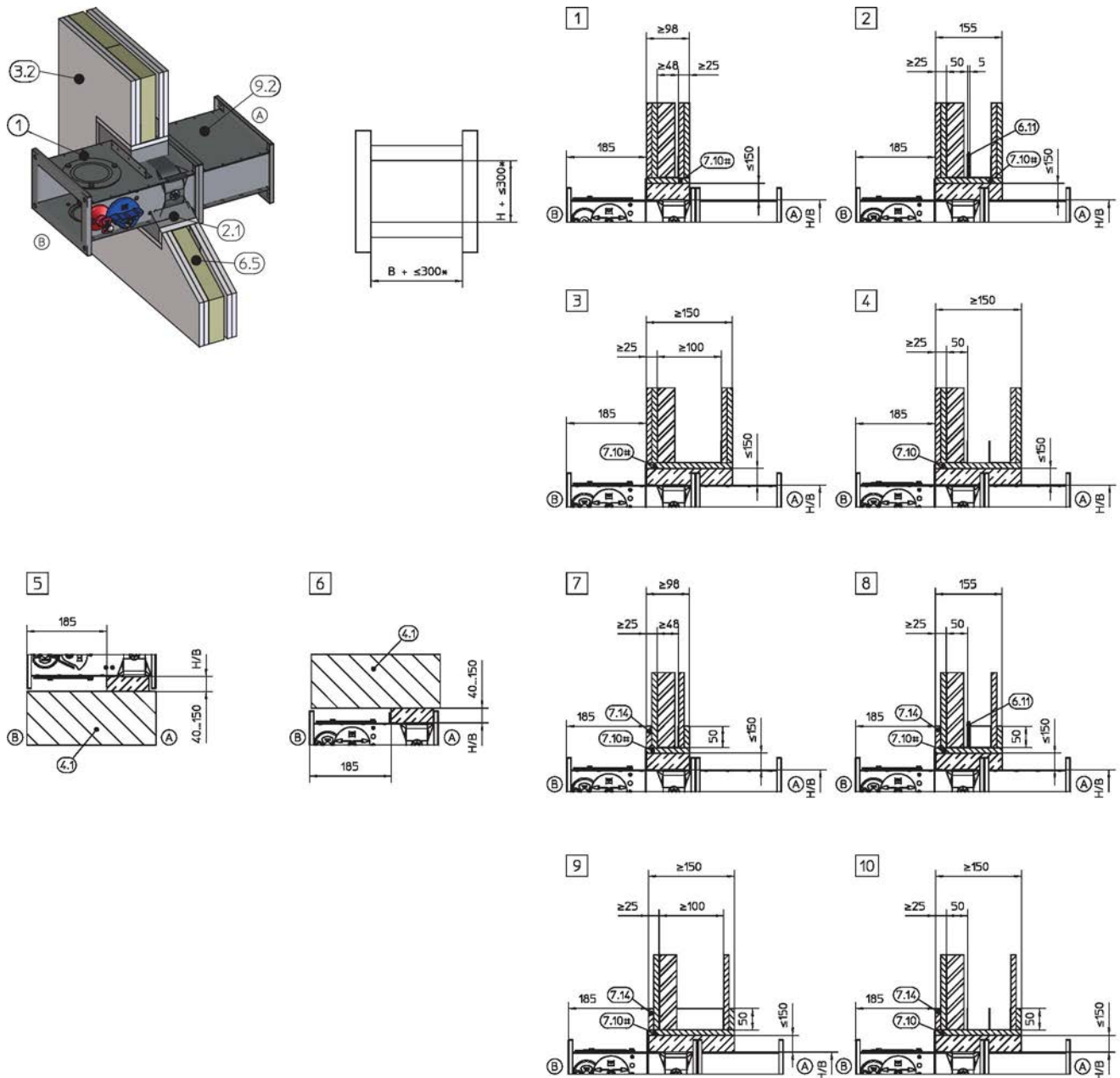
Installation type	Installation opening [mm]			
	B1	H1	B2	H2
Mortar-based installation ^{1,3}	B + 300 mm max.	H + 300 mm max.	B1 + (2 × trim panels)	H1 + (2 × trim panels)
Dry mortarless installation with installation block ^{1,2}	B + 70 mm	H + 70 mm		

¹⁾ Optional trim panels

²⁾ Installation opening tolerance + 2 mm

³⁾ For an FKS-EU with cover plate, the installation opening should measure approx. B + 80 mm / H + 80 mm so that the cover plate can be fixed properly.

5.6.1 Mortar-based installation

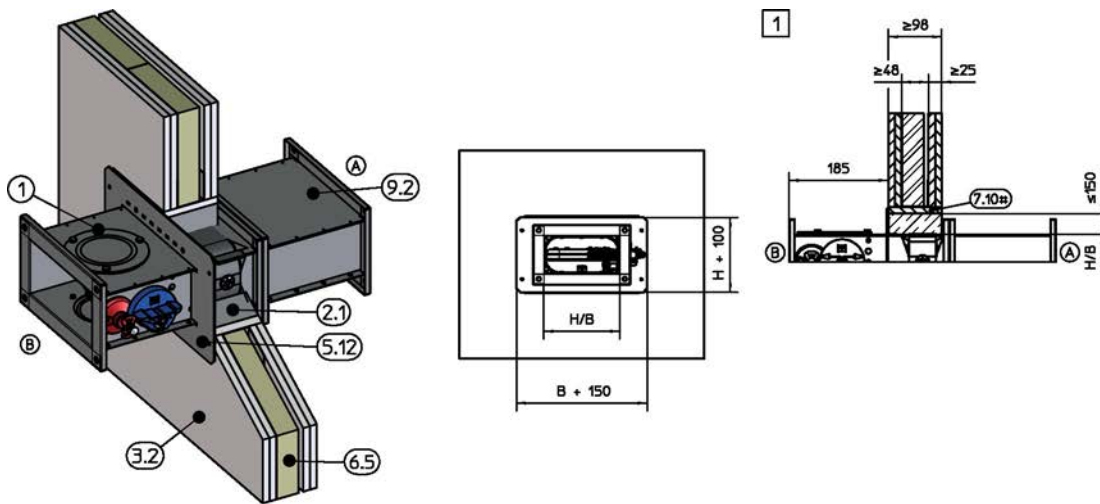


GR2231986

Fig. 26: Mortar-based installation into a lightweight partition wall

1	FKS-EU	9.2	Extension piece or duct
2.1	Mortar	*	Can be increased to account for the thickness of the trim panels optional
3.2	Lightweight partition wall with metal support structure, cladding on both sides	#	
4.1	Solid ceiling slab / solid floor	1	Up to EI 120 S
6.5	Mineral wool (depending on wall construction)	7	Up to EI 30 S
6.11	Insulating strip	A	Installation side
7.10	Trim panels	B	Operating side
7.14	Reinforcing board of the same material as the wall		

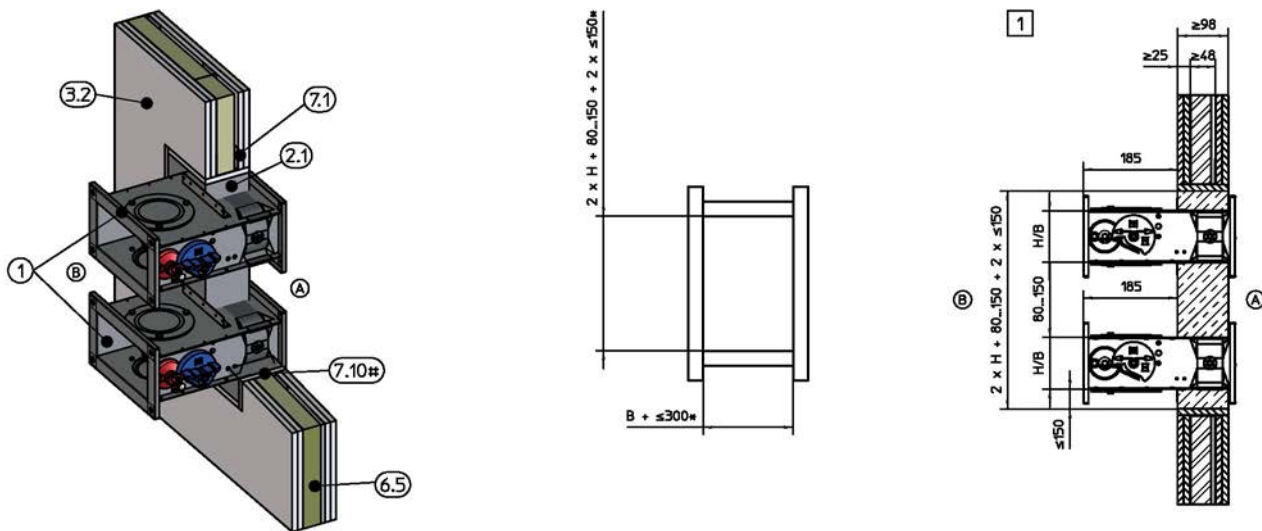
Lightweight partition walls with metal support structure and cladding on both s... > Mortar-based installation



GR2604720

Fig. 27: Mortar-based installation with cover plate in a lightweight partition wall

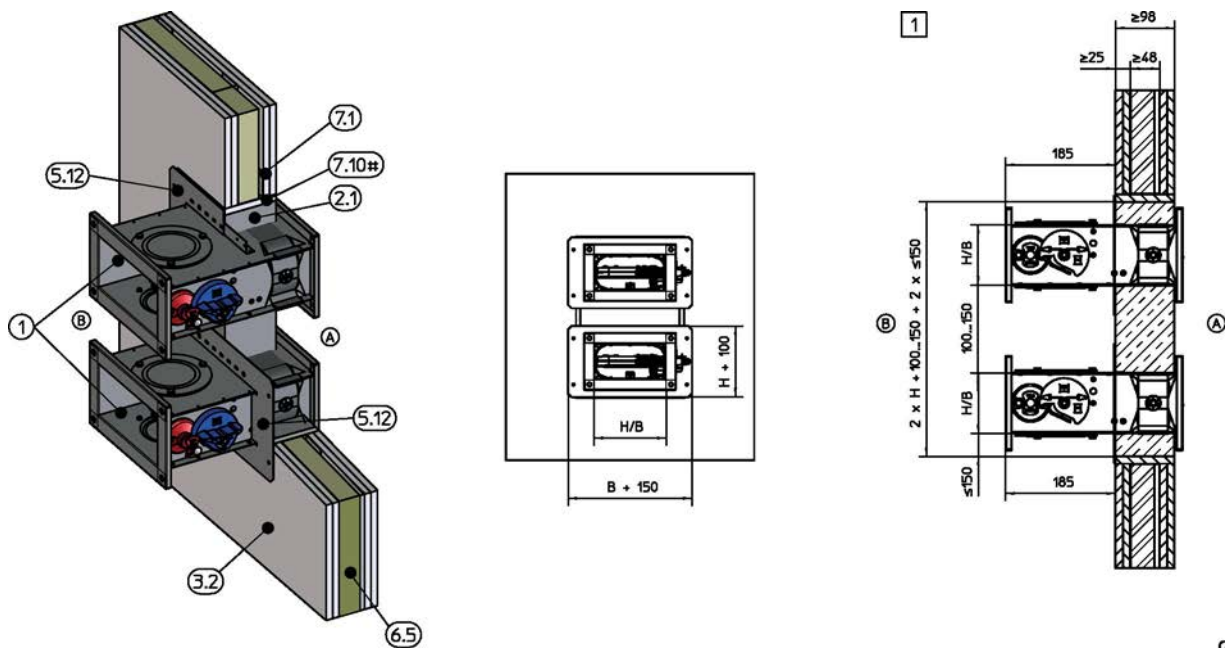
- | | | | |
|------|---|-----|-------------------------|
| 1 | FKS-EU | 9.2 | Extension piece or duct |
| 2.1 | Mortar | # | optional |
| 3.2 | Lightweight partition wall with metal support structure, cladding on both sides | 1 | Up to EI 120 S |
| 5.12 | Cover plate, optional | A | Installation side |
| 6.5 | Mineral wool (depending on wall construction) | B | Operating side |
| 7.10 | Trim panels | | |



TR1853215

Fig. 28: Mortar-based installation in lightweight partition wall, "flange to flange", one below the other (drawing) or side by side

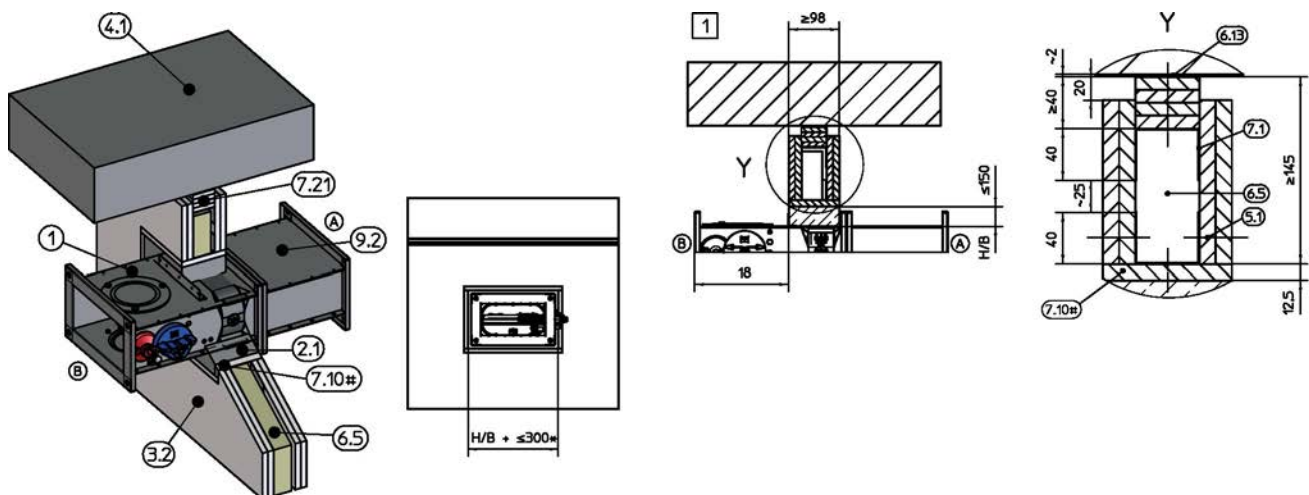
- | | | | |
|------|---|---|--|
| 1 | FKS-EU | * | Can be increased to account for the thickness of the trim panels |
| 2.1 | Mortar | # | optional |
| 3.2 | Lightweight partition wall with metal support structure, cladding on both sides | 1 | Up to EI 120 S |
| 6.5 | Mineral wool (depending on wall construction) | A | Installation side |
| 7.1 | UW section | B | Operating side |
| 7.10 | Trim panels | | |



GR2606126

Fig. 29: Mortar-based installation with cover plate in lightweight partition wall, "flange to flange", one below the other (drawing) or side by side

- | | | | |
|------|---|------|-------------------|
| 1 | FKS-EU | 7.10 | Trim panels |
| 2.1 | Mortar | # | optional |
| 3.2 | Lightweight partition wall with metal support structure, cladding on both sides | 1 | Up to EI 120 S |
| 5.12 | Cover plate, optional | A | Installation side |
| 6.5 | Mineral wool (depending on wall construction) | B | Operating side |
| 7.1 | UW section | | |

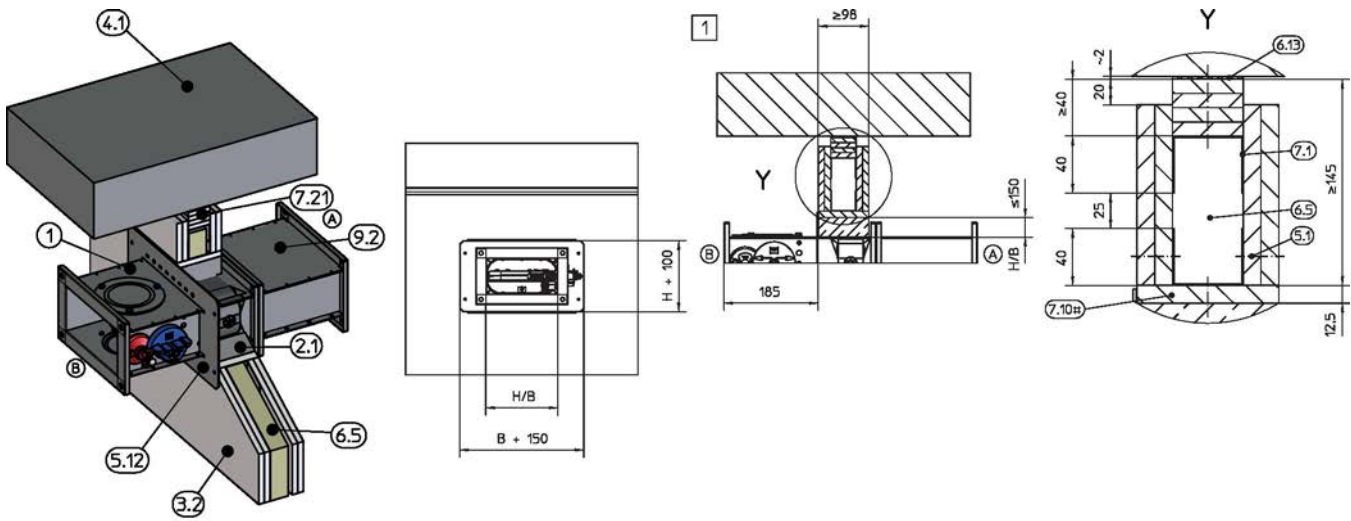


GR2103230

Fig. 30: Mortar-based installation in lightweight partition wall with flexible ceiling joint (drawing shows flexible ceiling joint acc. to DIN 4102)

- | | | | |
|------|---|------|--|
| 1 | FKS-EU | 7.10 | Trim panels |
| 2.1 | Mortar | 7.21 | Ceiling joint strips, e.g. 4 × ≥ 10 mm |
| 3.2 | Lightweight partition wall with metal support structure, cladding on both sides | 9.2 | Extension piece or duct |
| 4.1 | Solid ceiling slab | * | Can be increased to account for the thickness of the trim panels |
| 5.1 | Dry wall screw | # | optional |
| 6.5 | Mineral wool (depending on wall construction) | 1 | Up to EI 120 S |
| 6.13 | Mineral fibre strips, A1, alternatively filling material (depending on the wall construction) | A | Installation side |
| 7.1 | UW section | B | Operating side |

Lightweight partition walls with metal support structure and cladding on both s... > Mortar-based installation



GR2703692

Fig. 31: Mortar-based installation with cover plate in lightweight partition wall with flexible ceiling joint (drawing shows flexible ceiling joint acc. to DIN 4102)

- | | | | |
|------|---|------|--|
| 1 | FKS-EU | 7.1 | UW section |
| 2.1 | Mortar | 7.10 | Trim panels |
| 3.2 | Lightweight partition wall with metal support structure, cladding on both sides | 7.21 | Ceiling joint strips, e.g. 4 × ≥ 10 mm |
| 4.1 | Solid ceiling slab | 9.2 | Extension piece or duct |
| 5.1 | Dry wall screw | # | optional |
| 5.12 | Cover plate, optional | 1 | Up to EI 120 S |
| 6.5 | Mineral wool (depending on wall construction) | A | Installation side |
| 6.13 | Mineral fibre strips, A1, alternatively filling material (depending on the wall construction) | B | Operating side |

Personnel:

- Specialist personnel

Materials:

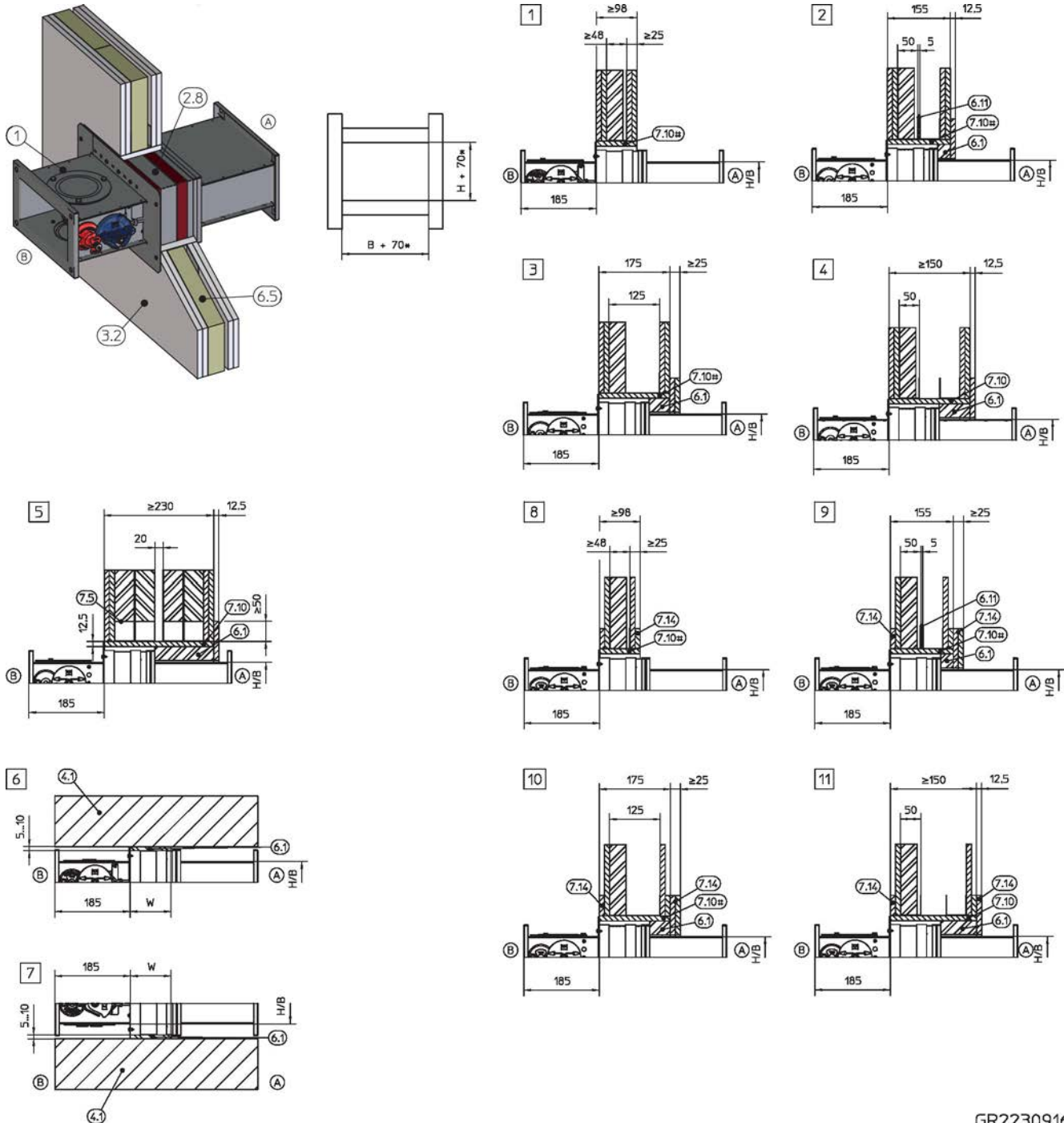
- Mortar ↪ *'Mortars for mortar-based installation'* on page 18

Requirements

- Class of performance up to EI 120 S (class of performance EI 30 S for wall thickness $W \geq 75$ mm with wall thickness increased to $W \geq 98$ mm; details ↪ on page 31)
 - Lightweight partition walls with metal support structure and cladding on both sides, $W \geq 98$ mm; detailed specification ↪ on page 29
 - ≥ 40 mm distance from fire damper to load-bearing structural elements; with cover plate ≥ 50 mm on side H, ≥ 75 mm on side B (depending on construction)
 - Fire dampers to be installed in individual installation openings, distance ≥ 200 mm. For flange to flange installation in the same installation opening, the distance between two dampers is 80...150 mm; when a cover plate is used, and the dampers are installed on top of each other 100...150 mm, when the dampers are installed side by side 150 mm (depending on construction).
 - Flange-to-flange installation of two FKS-EU units in one installation opening is only possible if both dampers are of the same size (deviations upon request)
 - Duct connection with flexible connector (recommended)
1. ▶ Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening
 2. ▶ Push the fire damper into the installation opening and secure it. Make sure that the distance from the flange on the operating side to the wall is 185 mm (bracket is flush with the wall).

When using the optional cover plate: Push the fire damper into the centre of the installation opening until the cover plate touches the wall. Fix the cover plate with screws.
 3. ▶ If the wall thickness is > 100 mm, extend the fire damper on the installation side with an extension piece (attachment or provided by others).
 4. ▶ Close off the perimeter gap »s« with mortar. If trim panels with appropriate fire resistance are used, a mortar bed depth of 100 mm suffices.

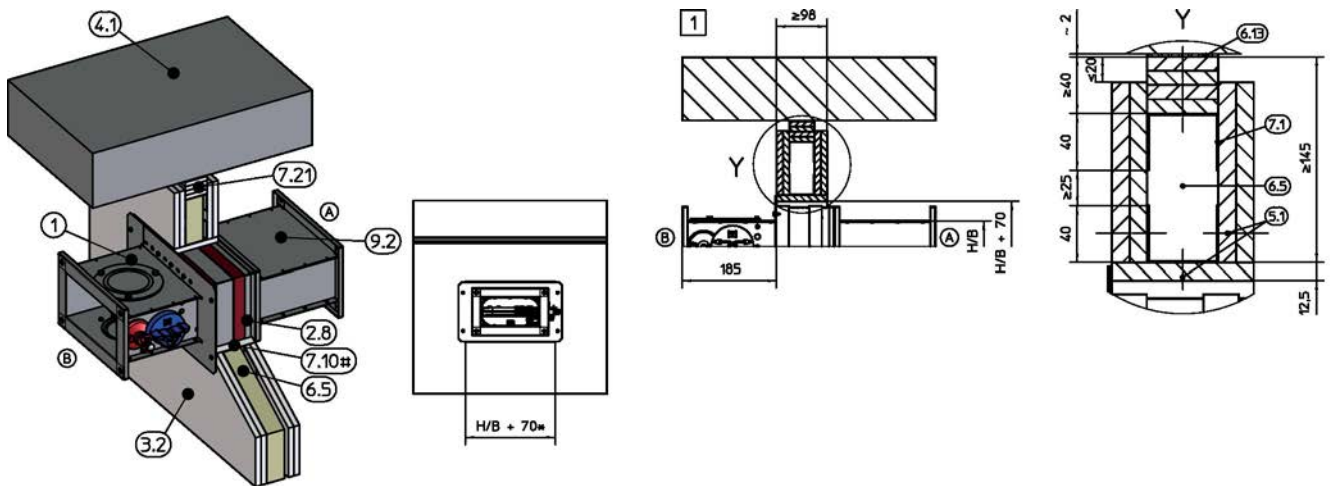
5.6.2 Dry mortarless installation



GR2230916

Fig. 32: Dry mortarless installation in lightweight partition wall with installation block E

1	FKS-EU	7.10	Trim panels
2.8	Installation block E	7.14	Reinforcing board of the same material as the wall
3.2	Lightweight partition wall with metal support structure, cladding on both sides	*	Can be increased to account for the thickness of the trim panels
4.1	Solid ceiling slab	#	optional
6.1	Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 40\text{ kg/m}^3$	1	Up to EI 90 S
6.5	Mineral wool (depending on wall construction)	8	EI 30 S
6.11	Insulating strip	A	Installation side
7.2	Metal sections	B	Operating side
7.5	Steel support structure		



GR2100616

Fig. 33: Dry mortarless installation in lightweight partition wall with installation block E and flexible ceiling joint (drawing shows flexible ceiling joint acc. to DIN 4102)

1	FKS-EU	7.10	Trim panels (≤ 12.5 mm)
2.8	Installation block E	7.21	Ceiling joint strips (e.g. $4 \times \geq 10$ mm)
3.2	Lightweight partition wall with metal support structure, cladding on both sides	9.2	Extension piece or duct
4.1	Solid ceiling slab	#	optional
5.1	Dry wall screw	1	Up to EI 90 S
6.5	Mineral wool (depending on wall construction)	A	Installation side
6.13	Mineral fibre strips, A1, alternatively filling material (depending on the wall construction)	B	Operating side
7.1	UW section		

Personnel:

- Specialist personnel

Requirements

- Performance class EI 90 S (EI 30 S for wall thickness $W \geq 75$ mm if the wall thickness is increased to $W \geq 98$ mm; details ↪ on page 36)
 - Lightweight partition walls with metal support structure and cladding on both sides, $W \geq 98$ mm; detailed specification ↪ on page 29.
 - Distance to load-bearing structural elements ≥ 40 mm (in conjunction with shortened cover plate)
 - ≥ 150 mm distance between two fire dampers
 - Duct connection with flexible connector (recommended)
- ▶ Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening ↪ on page 29
 - ▶ Position the fire damper with the installation block in the centre of the installation opening and push it in up to the cover plate.
 - ▶ If the wall thickness is > 100 mm, extend the fire damper on the installation side with an extension piece (attachment or provided by others).
 - ▶ Fix the cover plate to the perimeter metal section with four screws (dry wall screws $\varnothing \geq 4.2 \times 70$ mm).
 - ▶ If the wall thickness is ≥ 125 mm, fill the rear gap with mineral wool or gypsum mortar and seal it with reinforcing board made of the same material as the wall Fig. 32. As an alternative to reinforcing board, the wall cladding can also be laid up to the damper casing or the extension piece.

5.7 Lightweight partition walls with timber support structure

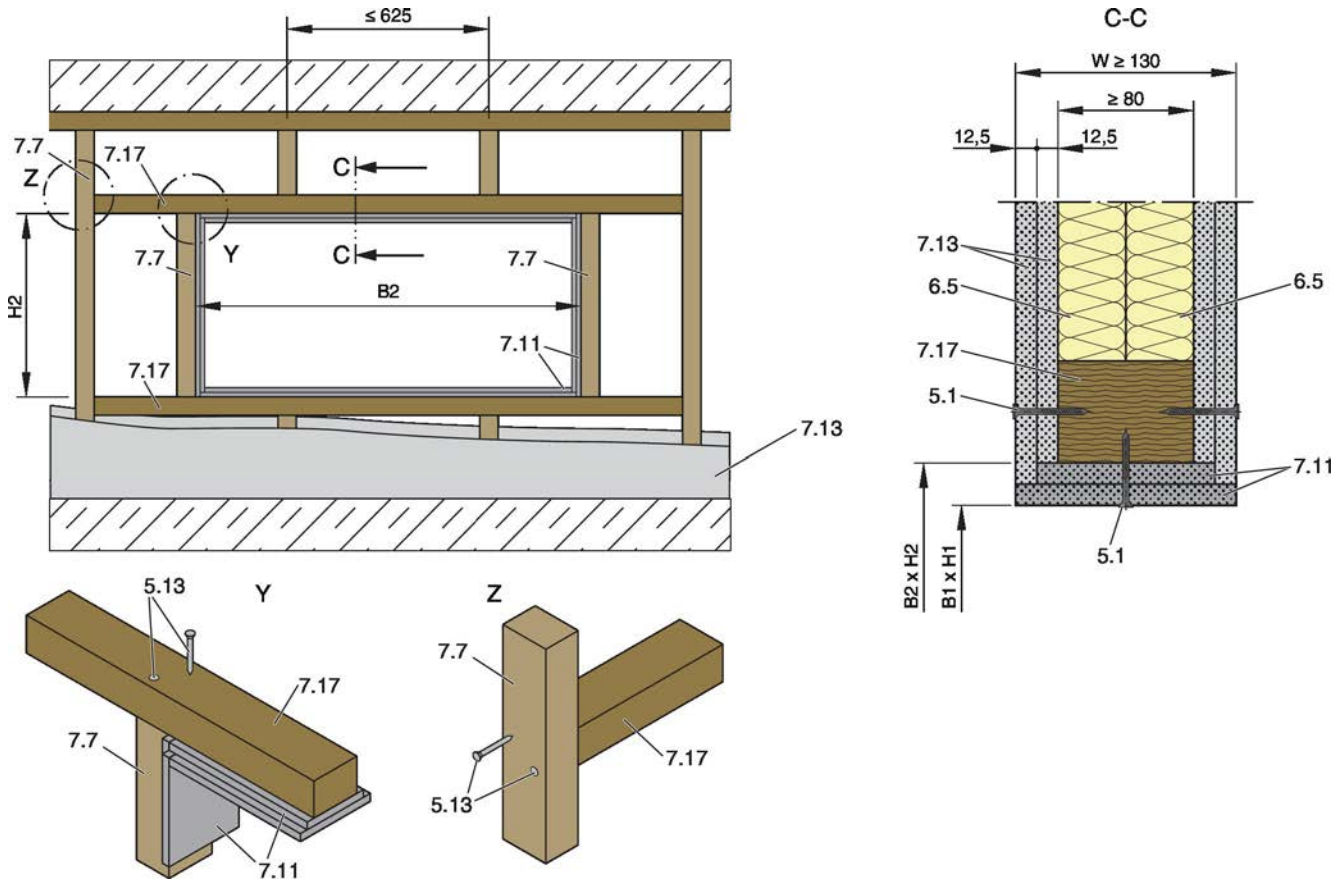


Fig. 34: Lightweight partition wall with timber support structure and cladding on one side

5.1	Dry wall screw	7.13	Double layer cladding on both sides of the timber support structure
5.13	Wooden screw or pin	7.17	Trimmer, wooden beam min. 60 x 80 mm
6.5	Mineral wool (depending on wall construction)	B1 x H1	Clear installation opening
7.7	Timber stud, at least 60 x 80 mm	B2 x H2	Opening in the timber support structure
7.11	Trim panels, double layer, staggered joints		

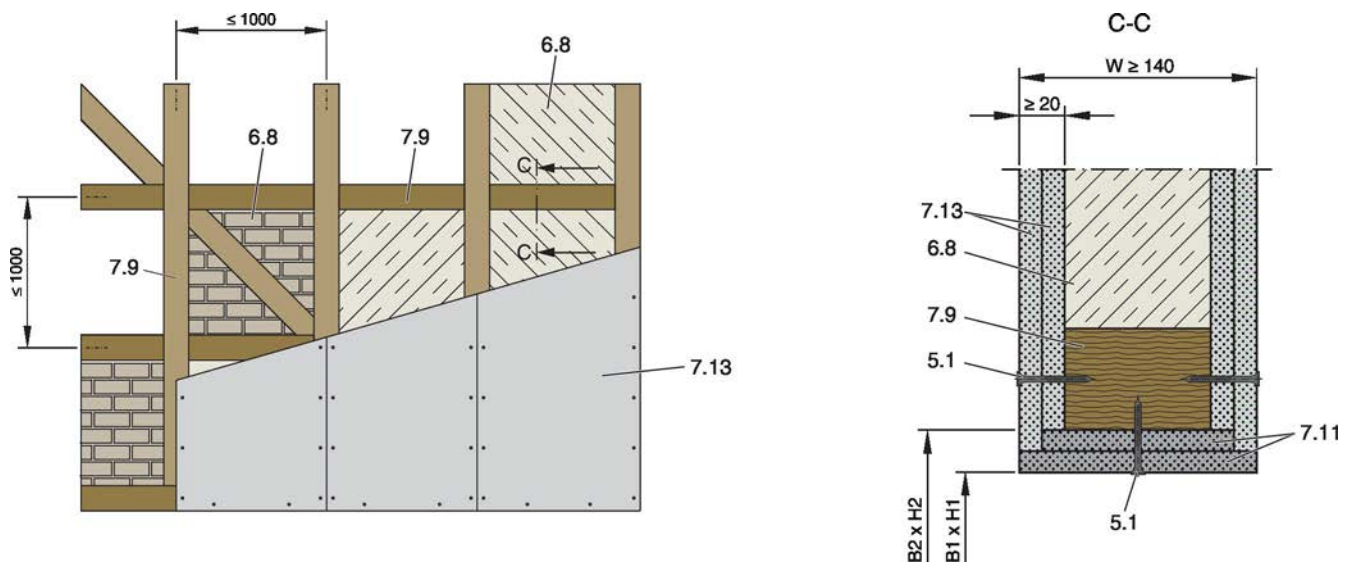


Fig. 35: Lightweight partition wall, half-timbered construction with cladding on both sides

5.1	Dry wall screw	7.13	Single or double layer cladding, on both sides of the half-timbered construction
6.8	Infilling*	*	Cavities completely filled with mineral wool $\geq 50 \text{ kg/m}^3$, bricks, aerated concrete, lightweight concrete, reinforced concrete or clay
7.9	Half-timbered construction		
7.11	Trim panels, double layer, staggered joints	B1 × H1	Clear installation opening
		B2 × H2	Opening in the half-timbered construction

Requirements

- Lightweight partition walls, either timber stud walls or half-timbered constructions, with cladding on both sides, with European classification to EN 13501-2 or equivalent national classification
- Cladding on both sides made of gypsum bonded or cement bonded panel materials, of fibre-reinforced gypsum or of fire-rated calcium silicate boards, wall thickness $W \geq 130 \text{ mm}$; for half-timbered constructions: wall thickness $W \geq 140 \text{ mm}$
- $\leq 625 \text{ mm}$ distance between timber studs; half-timbered construction after the wall has been erected
- Additional layers of cladding (up to two layers if stated in the usability certificate for the wall) and double stud constructions (details on request) are approved.
- Duct connection with flexible connector (recommended)
- Trim panels and reinforcing boards have to be made of cladding material and have to be fixed to the frame.

Erecting a wall and creating an installation opening

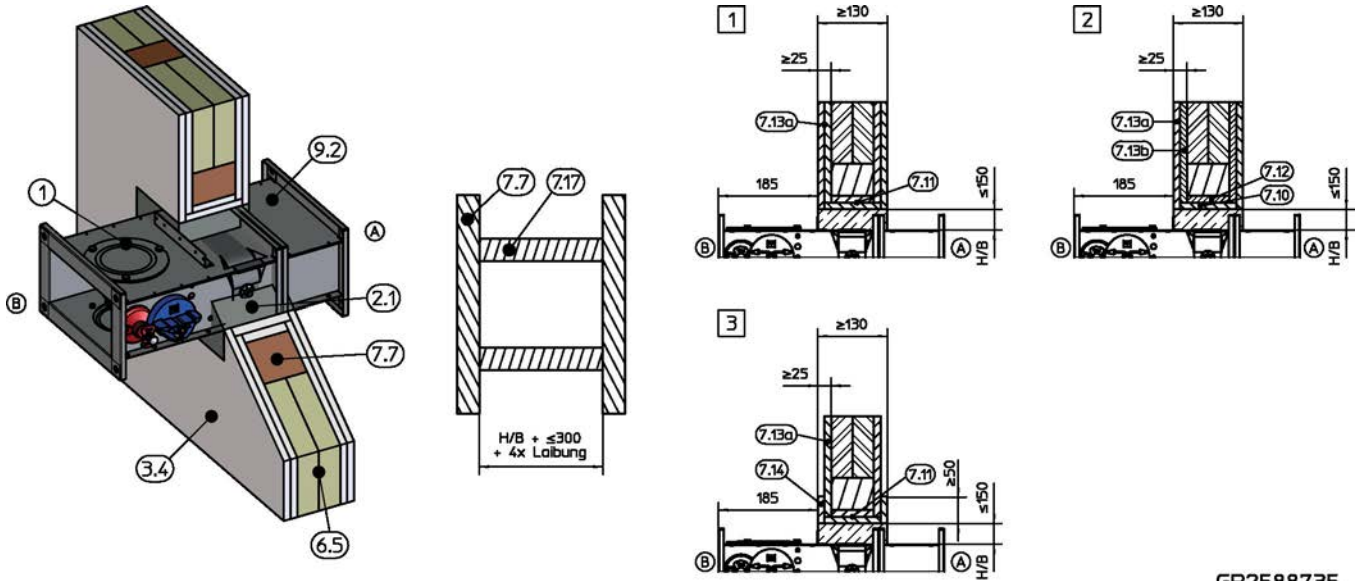
- Erect the timber stud wall according to the manufacturer's instructions.
- Create an installation opening in the timber support structure with timber studs 7.7, trimmers 7.17 and trim panels 7.11 or in the half-timbered construction 7.9 with trim panels 7.11, see Fig. 34 or Fig. 35.

Installation type	Installation opening [mm]			
	B1	H1	B2	H2
Mortar-based installation ²	B + 300 mm max.	B + 300 mm max.	B1 + (4 × trim panels)	H1 + (4 × trim panels)
Dry mortarless installation with installation block E ¹	B + 70 mm	H + 70 mm		

¹⁾ Installation opening tolerance + 2 mm

²⁾ For an FKS-EU with cover plate, the installation opening should measure approx. B + 80 mm / H + 80 mm so that the cover plate can be fixed properly.

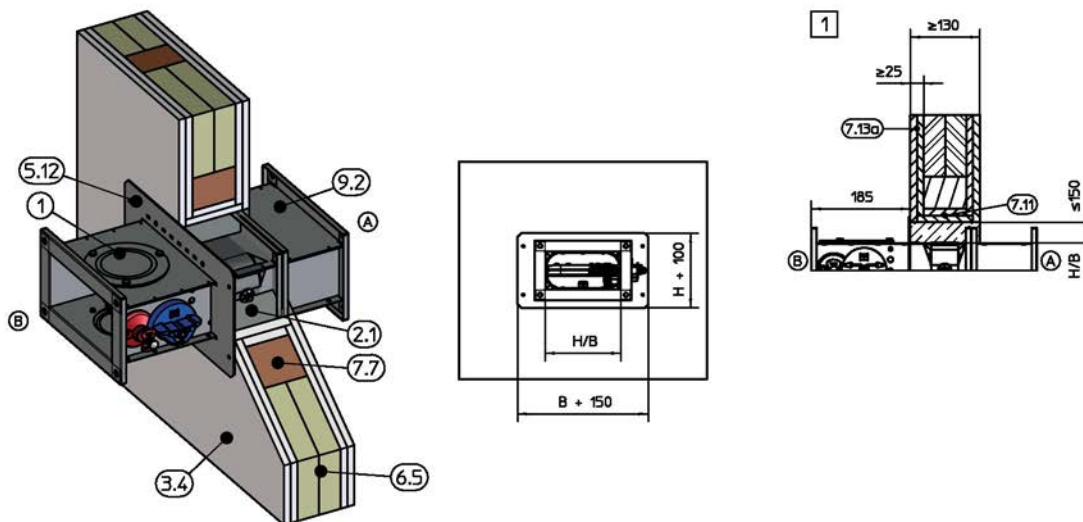
5.7.1 Mortar-based installation



GR2588735

Fig. 36: Mortar-based installation into a lightweight partition wall with timber support structure

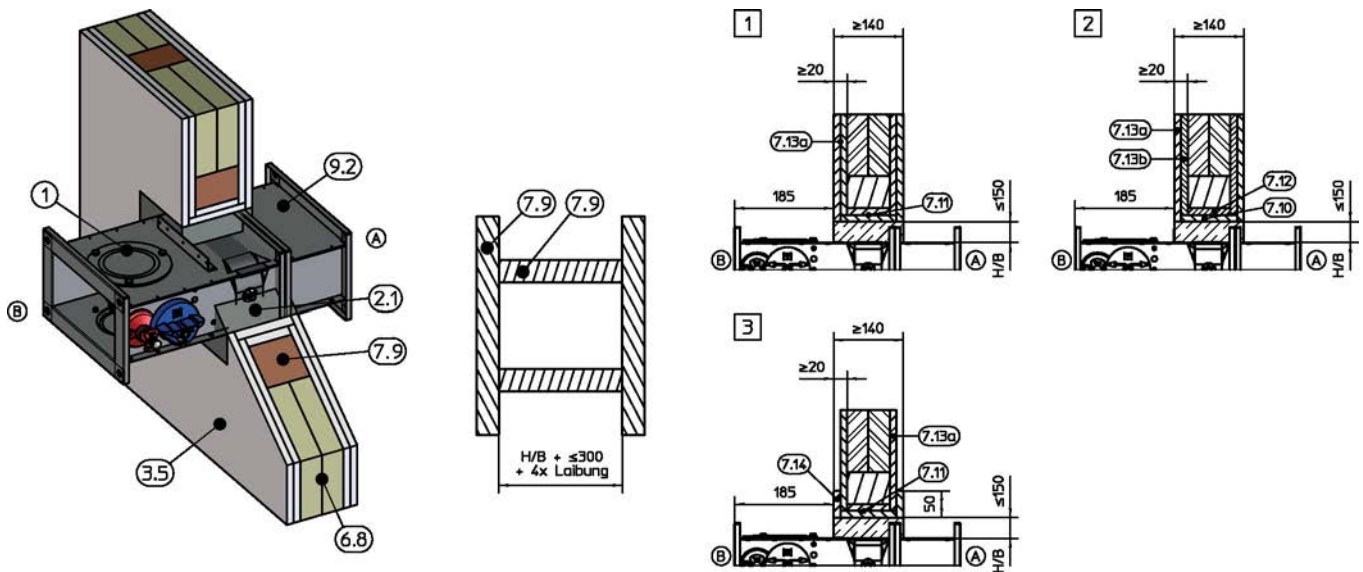
- | | | | |
|-------|--|------------|--|
| 1 | FKS-EU | 7.13b | Cladding, wood sheet, at least 600 kg/m ³ |
| 2.1 | Mortar | 7.14 | Reinforcing board of the same material as the wall |
| 3.4 | Timber stud wall (including wood panel construction), cladding on both sides | 7.17 | Trimmer, wooden beam min. 60 x 80 mm |
| 6.5 | Mineral wool (depending on wall construction) | 9.2 | Extension piece or duct |
| 7.7 | Timber studs, min. 60 x 80 mm | 1 | Up to EI 90 S |
| 7.10 | Trim panels (fire-resistant) | 2/3 | EI 30 S |
| 7.11 | Trim panels (fire-resistant), double layer, staggered joints | A | Installation side |
| 7.12 | Trim panels, wood sheet, at least 600 kg/m ³ | B | Operating side |
| 7.13a | Cladding (fire-resistant) | | |



GR2606788

Fig. 37: Mortar-based installation with cover plate in a lightweight partition wall with timber support structure

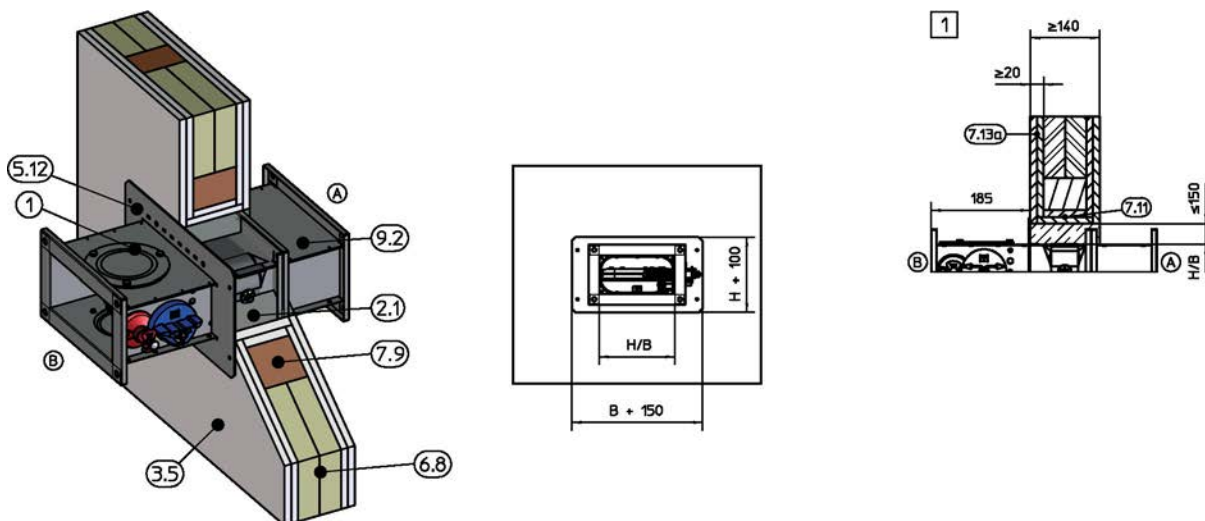
- | | | | |
|------|--|----------|--|
| 1 | FKS-EU | 7.11 | Trim panels (fire-resistant), double layer, staggered joints |
| 2.1 | Mortar | 7.13a | Cladding (fire-resistant) |
| 3.4 | Timber stud wall (including wood panel construction), cladding on both sides | 9.2 | Extension piece or duct |
| 5.12 | Cover plate, optional | 1 | Up to EI 90 S |
| 6.5 | Mineral wool (depending on wall construction) | A | Installation side |
| 7.7 | Timber studs, min. 60 x 80 mm | B | Operating side |



GR2588163

Fig. 38: Mortar-based installation into a lightweight partition wall, half-timbered construction

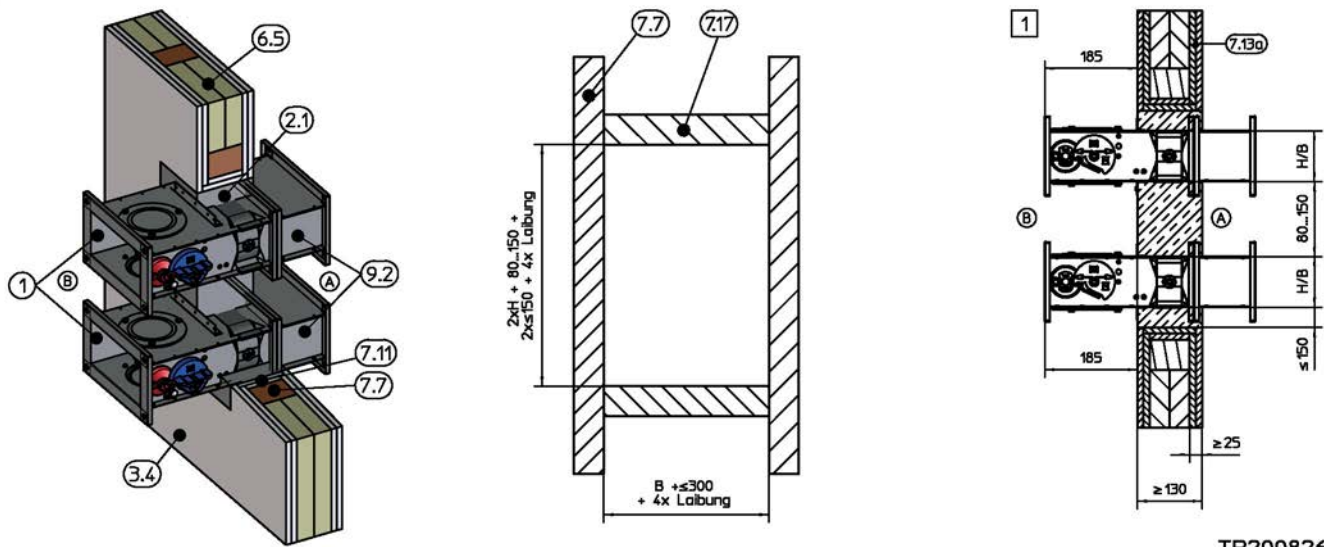
- | | | | |
|------|--|-------|--|
| 1 | FKS-EU | 7.13a | Cladding (fire-resistant) |
| 2.1 | Mortar | 7.13b | Cladding, wood sheet, at least 600 kg/m ³ |
| 3.5 | Half-timbered wall, cladding on both sides | 7.14 | Reinforcing board of the same material as the wall |
| 6.8 | Wall filling (cavities completely filled with mineral wool $\ge 1000\text{ }^{\circ}\text{C}$, $\ge 40\text{ kg/m}^3$ or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay) | 9.2 | Extension piece or duct |
| 7.9 | Half-timbered construction | 1 | Up to EI 90 S |
| 7.10 | Trim panels (fire-resistant) | 2 3 | EI 30 S |
| 7.11 | Trim panels (fire-resistant), double layer, staggered joints | A | Installation side |
| 7.12 | Trim panels, wood sheet, at least 600 kg/m ³ | B | Operating side |



GR2610439

Fig. 39: Mortar-based installation with cover plate in a lightweight partition wall, half-timbered construction

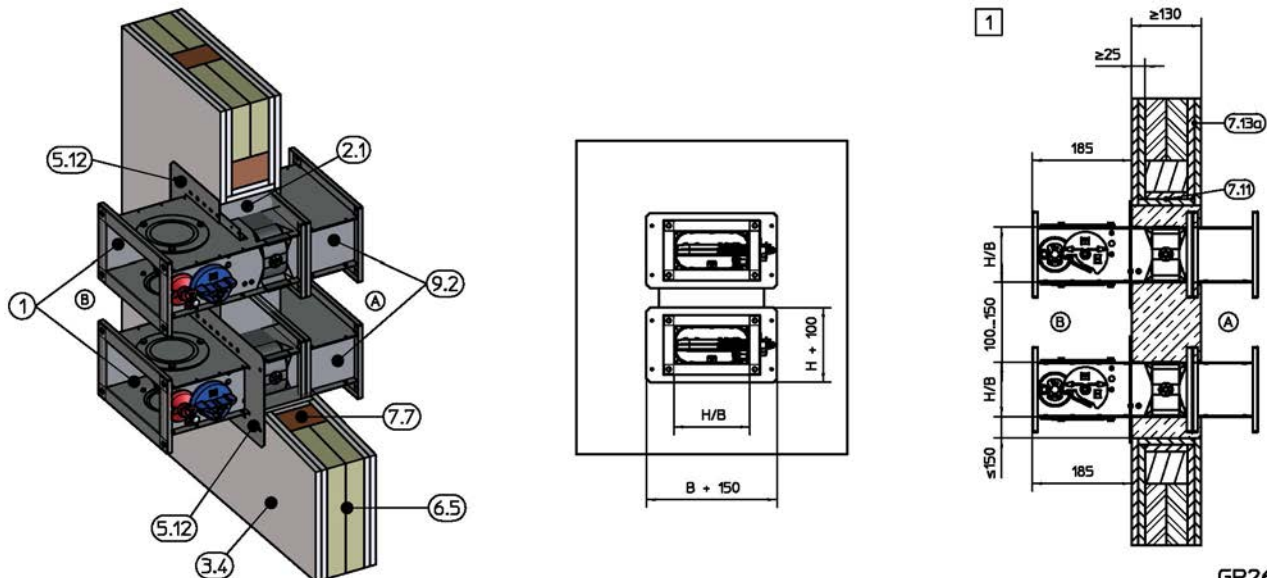
- | | | | |
|------|--|-------|--|
| 1 | FKS-EU | 7.11 | Trim panels (fire-resistant), double layer, staggered joints |
| 2.1 | Mortar | 7.13a | Cladding (fire-resistant) |
| 3.5 | Half-timbered wall, cladding on both sides | 9.2 | Extension piece or duct |
| 5.12 | Cover plate, optional | 1 | Up to EI 90 S |
| 6.8 | Wall filling (cavities completely filled with mineral wool $\ge 1000\text{ }^{\circ}\text{C}$, $\ge 40\text{ kg/m}^3$ or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay) | A | Installation side |
| 7.9 | Half-timbered construction | B | Operating side |



TR2008268

Fig. 40: Mortar-based installation in lightweight partition wall with timber support structure, "flange to flange", one below the other

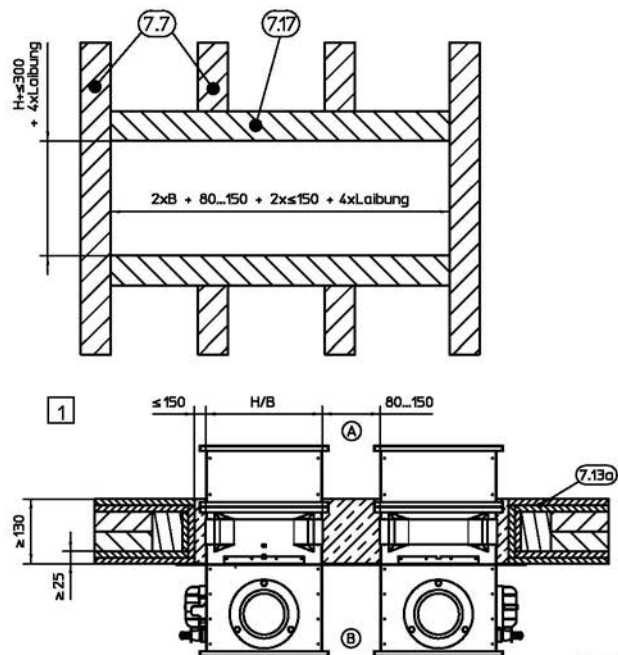
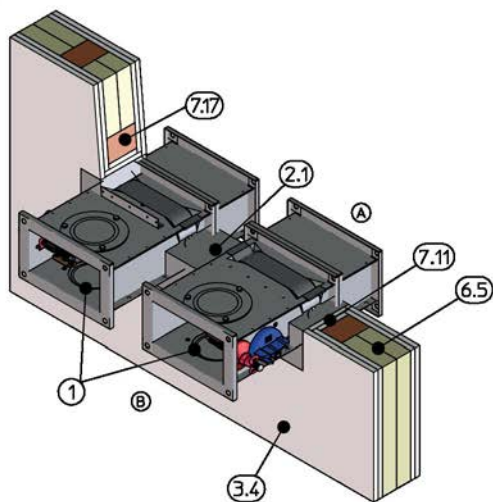
- | | | | |
|------|--|-------|--------------------------------------|
| 1 | FKS-EU | 7.13a | Cladding, fire-resistant |
| 2.1 | Mortar | 7.17 | Trimmer, wooden beam min. 60 x 80 mm |
| 3.4 | Timber stud wall (including wood panel construction), cladding on both sides | 9.2 | Extension piece or duct |
| 6.5 | Mineral wool (depending on wall construction) | 1 | Up to EI 90 S |
| 7.7 | Timber stud, at least 60 x 80 mm | A | Installation side |
| 7.11 | Trim panels, double layer, staggered joints | B | Operating side |



GR2608578

Fig. 41: Mortar-based installation with cover plate in lightweight partition wall with timber support structure, "flange to flange", one below the other

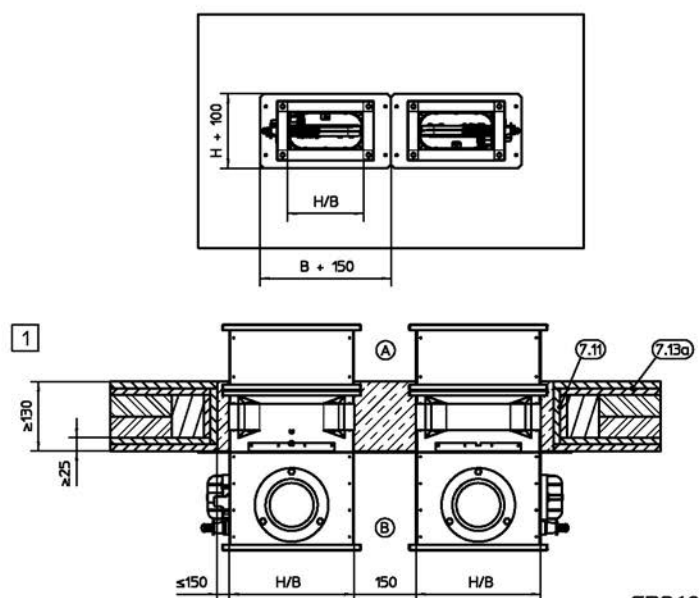
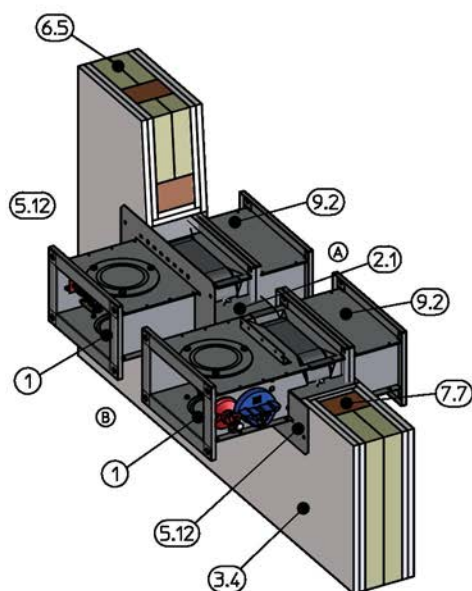
- | | | | |
|------|--|-------|--|
| 1 | FKS-EU | 7.11 | Trim panels (fire-resistant), double layer, staggered joints |
| 2.1 | Mortar | 7.13a | Cladding (fire-resistant) |
| 3.4 | Timber stud wall (including wood panel construction), cladding on both sides | 9.2 | Extension piece or duct |
| 5.12 | Cover plate, optional | 1 | Up to EI 90 S |
| 6.5 | Mineral wool (depending on wall construction) | A | Installation side |
| 7.7 | Timber stud, at least 60 x 80 mm | B | Operating side |



TR1983827

Fig. 42: Mortar-based installation in lightweight partition wall with timber support structure, "flange to flange", side by side

- | | | | |
|------|--|-------|--------------------------------------|
| 1 | FKS-EU | 7.13a | Cladding, fire-resistant |
| 2.1 | Mortar | 7.17 | Trimmer, wooden beam min. 60 x 80 mm |
| 3.4 | Timber stud wall (including wood panel construction), cladding on both sides | 1 | Up to EI 90 S |
| 6.5 | Mineral wool (depending on wall construction) | A | Installation side |
| 7.7 | Timber stud, at least 60 x 80 mm | B | Operating side |
| 7.11 | Trim panels, double layer, staggered joints | | |



GR2607731

Fig. 43: Mortar-based installation with cover plate in lightweight partition wall with timber support structure, "flange to flange", side by side

- | | | | |
|------|--|-------|--|
| 1 | FKS-EU | 7.11 | Trim panels (fire-resistant), double layer, staggered joints |
| 2.1 | Mortar | 7.13a | Cladding (fire-resistant) |
| 3.4 | Timber stud wall (including wood panel construction), cladding on both sides | 9.2 | Extension piece or duct |
| 5.12 | Cover plate, optional | 1 | Up to EI 90 S |

6.5	Mineral wool (depending on wall construction)	Ⓐ	Installation side
7.7	Timber stud, at least 60 × 80 mm	Ⓑ	Operating side

Personnel:

- Specialist personnel

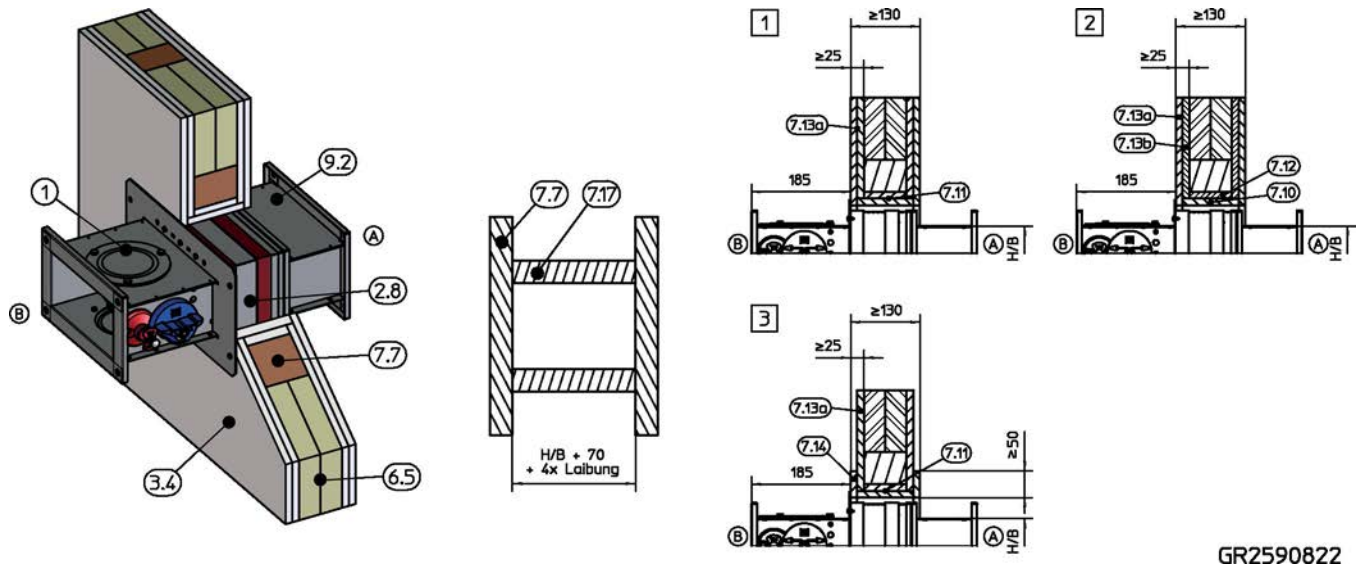
Materials:

- Mortar ↪ *'Mortars for mortar-based installation'* on page 18

Requirements

- Class of performance up to EI 90 S (class of performance EI 30 S with $W \geq 105$ mm with wall thickness increased to $W \geq 130$ mm (timber stud wall) or $W \geq 115$ mm with wall thickness increased to $W \geq 140$ mm (half-timbered wall), details from ↪ 40)
 - Lightweight partition walls with timber support structure and cladding on both sides, $W \geq 130$ mm; half-timbered construction $W \geq 140$ mm; other specifications ↪ 38.
 - ≥ 40 mm distance from fire damper to load-bearing structural elements; with cover plate ≥ 50 mm on side H, ≥ 75 mm on side B (depending on construction)
 - ≥ 150 mm distance between two fire dampers (separate installation opening) For flange to flange installation, the distance between two dampers is 80...150 mm (one installation opening); when a cover plate is used, and the dampers are installed on top of each other 100...150 mm, when the dampers are installed side by side 150 mm (depending on construction). For an FKS-EU with cover plate, the installation opening should measure approx. $B + 80$ mm / $H + 80$ mm so that the cover plate can be fixed properly.
 - Only installation of two equally sized FKS-EU units into one installation opening (deviations upon request)
 - Duct connection with flexible connector (recommended)
1. ▶ Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening ↪ on page 38.
 2. ▶ Push the fire damper into the installation opening and secure it. Make sure that the distance from the flange on the operating side to the wall is 185 mm (bracket is flush with the wall).
Extend the fire damper with an extension piece on the installation side (attachment or provided by others).
 3. ▶ Close off the perimeter gap »s« with mortar.

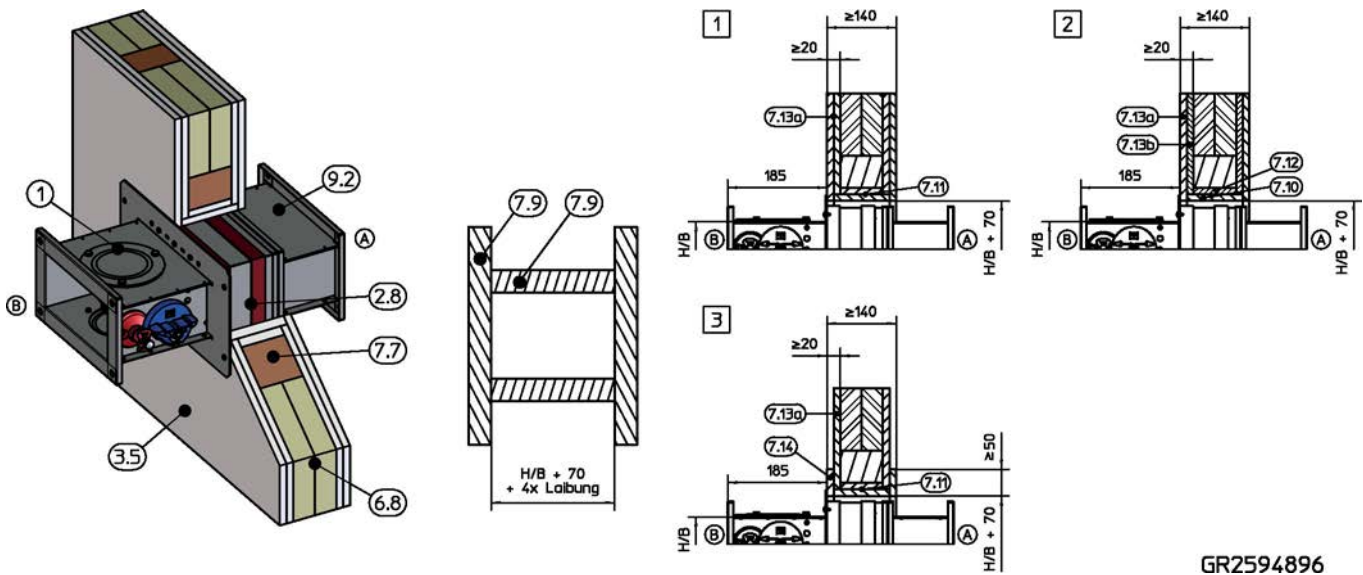
5.7.2 Dry mortarless installation



GR2590822

Fig. 44: Dry mortarless installation in a lightweight partition wall and installation block E

1	FKS-EU	7.13b	Cladding, wood sheet, min. 600 kg/m ³
2.8	Installation block E	7.14	Reinforcing board of the same material as the wall
3.4	Timber stud wall (including wood panel construction), cladding on both sides	7.17	Trimmer, wooden beam min. 60 x 80 mm
6.5	Mineral wool (depending on wall construction)	9.2	Extension piece or duct
7.7	Timber studs, min. 60 x 80 mm	1	Up to EI 90 S
7.10	Trim panels (fire-resistant)	2 3	EI 30 S
7.11	Trim panels, 2 layers (fire-resistant)	A	Installation side
7.12	Trim panels, wood sheet, at least 600 kg/m ³	B	Operating side
7.13a	Cladding (fire-resistant)		



GR2594896

Fig. 45: Dry mortarless installation in a lightweight partition wall, with half-timbered construction and installation block E

1	FKS-EU	7.13a	Cladding (fire-resistant)
2.8	Installation block E	7.13b	Cladding, wood sheet, min. 600 kg/m ³
3.5	Half-timbered wall, cladding on both sides	7.14	Reinforcing board of the same material as the wall
6.8	Wall filling (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 40 kg/m ³ or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)	9.2	Extension piece or duct
7.9	Half-timbered construction	1	Up to EI 90 S
7.10	Trim panels (fire-resistant)	2 3	EI 30 S
7.11	Trim panels, 2 layers (fire-resistant)	A	Installation side
7.12	Trim panels, wood sheet, at least 600 kg/m ³	B	Operating side

Personnel:

- Specialist personnel

Requirements

- Class of performance up to EI 90 S (class of performance EI 30 S with $W \geq 105$ mm with wall thickness increased to $W \geq 130$ mm (timber stud wall) or $W \geq 115$ mm with wall thickness increased to $W \geq 140$ mm (half-timbered wall), details from 45)
 - Lightweight partition walls with timber support structure and cladding on both sides, $W \geq 130$ mm; half-timbered construction $W \geq 140$ mm; other specifications 38.
 - ≥ 40 mm distance from the fire damper to load-bearing structural elements (in connection with shortened cover plate)
 - ≥ 150 mm distance between two fire dampers (separate installation opening)
 - Duct connection with flexible connector (recommended)
1. ▶ Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening 38 on page 38.
 2. ▶ Position the fire damper with the installation block in the centre of the installation opening and push it in up to the cover plate.
 3. ▶ If the wall thickness is > 100 mm, extend the fire damper on the installation side with an extension piece (attachment or provided by others).
 4. ▶ Fix the cover plate to the surrounding timber support structure with four screws (dry wall screws $\varnothing \geq 4.2$ mm \times 70 mm).

5.8 Solid wood walls

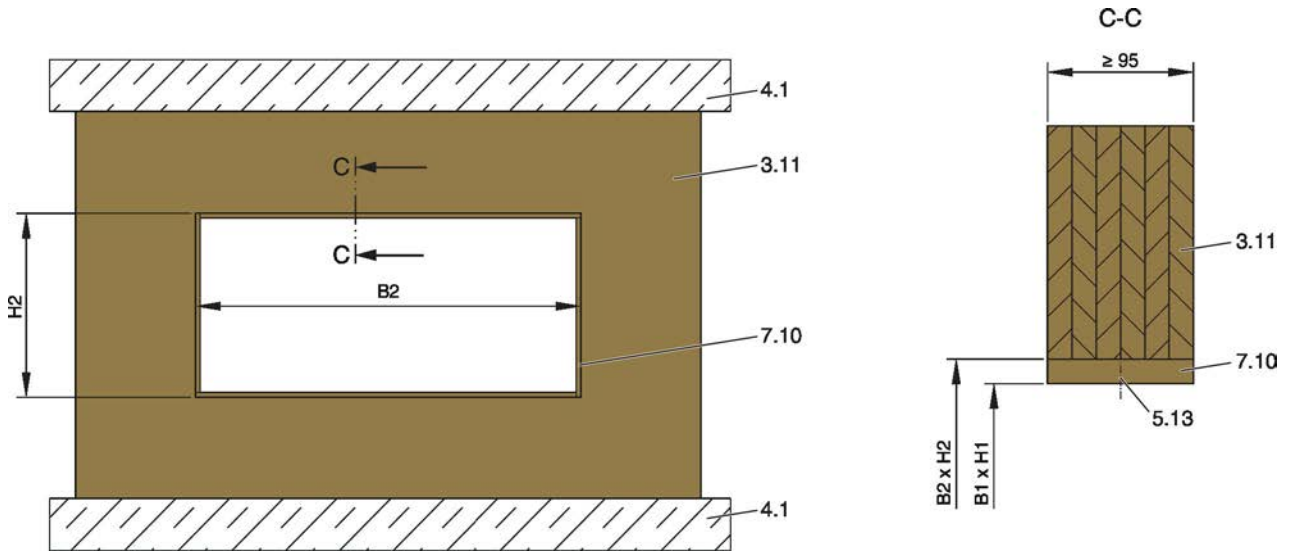


Fig. 46: Solid wood wall with cladding on both sides

- | | | | |
|------|----------------------------------|---------|--|
| 3.11 | Solid wood wall / plywood wall | 7.10 | Trim panels (optional) |
| 4.1 | Solid ceiling slab / solid floor | B1 × H1 | Clear installation opening |
| 5.13 | Wooden screw or pin | B2 × H2 | Opening in solid wood wall /plywood wall
(without trim panels B2 = B1, H2 = H1) |

Requirements

- Solid wood walls /plywood walls with European classification or equivalent national classification
- Wall thickness $W \geq 95$ mm, if necessary with additional fire protection cladding

Erecting a wall and creating an installation opening

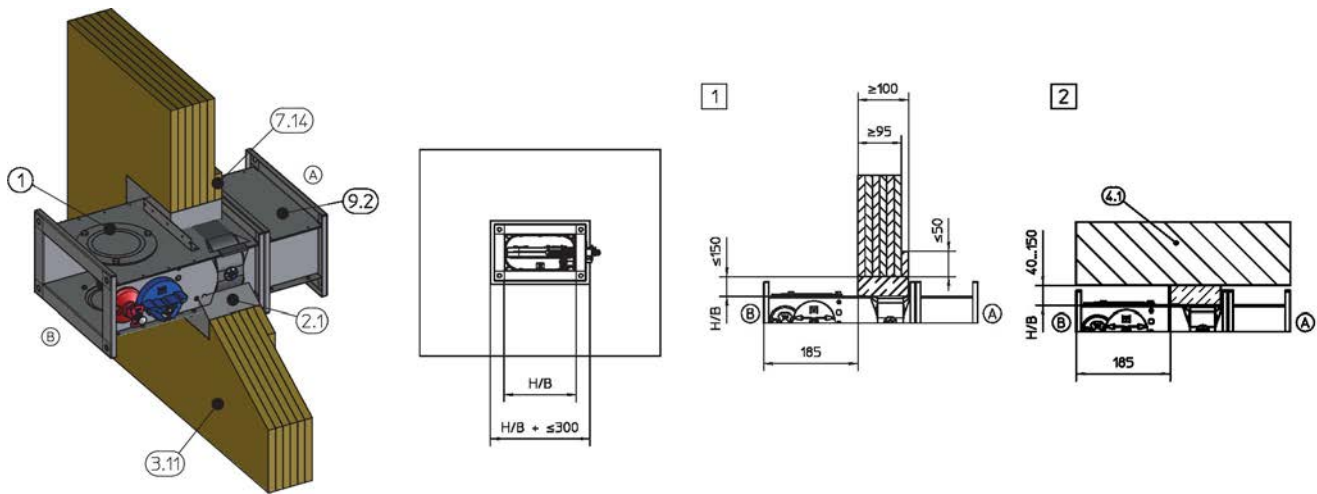
- Erect the solid wood wall according to the manufacturer's instructions and create an installation opening, see Fig. 46

Installation type	Installation opening [mm]			
	B1	H1	B2	H2
Mortar-based installation ²	B + 300 mm max.	B + 300 mm max.	B1 + (2 × trim panels)	H1 + (2 × trim panels)
Dry mortarless installation with installation block E ¹	B + 70 mm	H + 70 mm		

¹⁾ Installation opening tolerance + 2 mm

²⁾ For an FKS-EU with cover plate, the installation opening should measure approx. B + 80 mm / H + 80 mm so that the cover plate can be fixed properly.

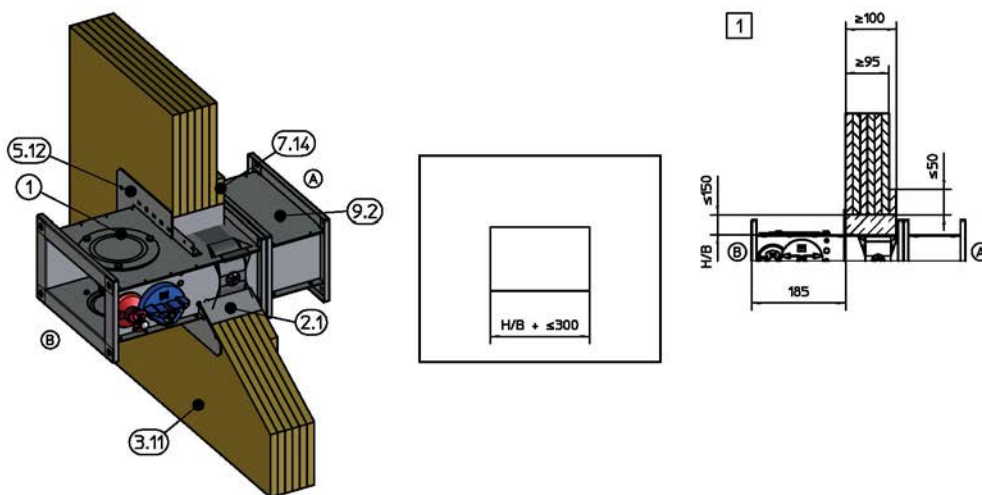
5.8.1 Mortar-based installation



GR2703262

Fig. 47: Mortar-based installation in plywood wall

- | | | | |
|------|--|-----|-------------------------|
| 1 | FKS-EU | 9.2 | Extension piece or duct |
| 2.1 | Mortar | 1 2 | Up to EI 90 S |
| 3.11 | Solid wood wall / plywood wall | A | Installation side |
| 4.1 | Solid ceiling slab | B | Operating side |
| 7.14 | Reinforcing board of the same material as the wall (with $W < 100$ mm) | | |



GR2638428

Fig. 48: Mortar-based installation with cover plate in plywood wall

- | | | | |
|------|--------------------------------|------|--|
| 1 | FKS-EU | 7.14 | Reinforcing board of the same material as the wall (with $W < 100$ mm) |
| 2.1 | Mortar | 9.2 | Extension piece or duct |
| 3.11 | Solid wood wall / plywood wall | 1 | Up to EI 90 S |
| 4.1 | Solid ceiling slab | A | Installation side |
| 5.12 | Cover plate, optional | B | Operating side |

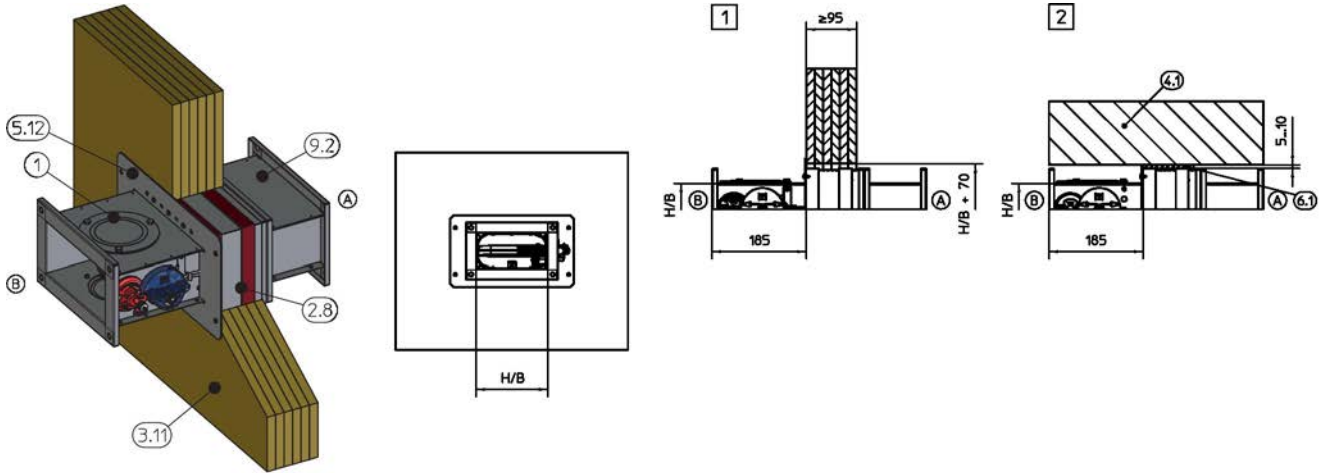
Personnel:

- Specialist personnel

Requirements

- Performance class up to EI 90 S
 - Solid wood walls / plywood walls with European or national certificate
 - Wall thickness ≥ 95 mm (with reinforcing board to $W \geq 100$ mm)
 - ≥ 40 mm distance from fire damper to load-bearing structural elements; with cover plate ≥ 50 mm on side H, ≥ 75 mm on side B (depending on construction) For FKS-EU with cover plate, the installation opening should measure approx. $B + 80$ mm / $H + 80$ mm so that the cover plate can be fixed properly.
 - Fire dampers to be installed in individual installation openings. ≥ 150 mm distance between two fire dampers, one below the other
 - Duct connection with flexible connector (recommended)
1. ▶ Erect the solid wood wall / plywood wall according to the manufacturer's instructions and create an installation opening. With a wall thickness of < 100 mm, a surrounding reinforcing board should be created from the same material as the wall. The trim panels, if available, must be connected with the wall ↪ *on page 47*.
 2. ▶ Push the fire damper into the installation opening and secure it. Make sure that the distance from the flange on the operating side to the wall is 185 mm (bracket is flush with the wall).
If the wall thickness is > 100 mm, extend the fire damper on the installation side with an extension piece (attachment or provided by others).
 3. ▶ Close off the perimeter gap »s« with mortar.

5.8.2 Dry mortarless installation



GR2576550

Fig. 49: Dry mortarless installation in plywood wall with installation block E

1	FKS-EU	6.1	Gypsum mortar, mineral wool ≥ 1000 °C or equivalent to compensate for an uneven ceiling or floor
2.8	Installation block E	9.2	Extension piece or duct
3.11	Solid wood wall / plywood wall	1 2	Up to EI 90 S
4.1	Solid ceiling slab	A	Installation side
5.12	Cover plate	B	Operating side

Personnel:

- Specialist personnel

Requirements

- Performance class up to EI 90 S
 - Solid wood walls / plywood walls with European or national certificates
 - Wall thickness ≥ 95 mm
 - Distance to load-bearing structural elements ≥ 40 mm (with shortened cover plate)
 - Fire dampers to be installed in individual installation openings. ≥ 150 mm distance between two fire dampers, one below the other
 - Duct connection with flexible connector (recommended)
- ▶ Erect the plywood wall according to the manufacturer's instructions and create an installation opening. The trim panels, if available, must be connected with the wall *on page 47*.
 - ▶ Position the fire damper with the installation block in the centre of the installation opening and push it in up to the cover plate.
 - ▶ If the wall thickness is > 100 mm, extend the fire damper on the installation side with an extension piece (attachment or provided by others).
 - ▶ Fix the cover plate to the wall with four screws (dry wall screws $\varnothing \geq 4.2$ mm).

5.9 Compartment walls

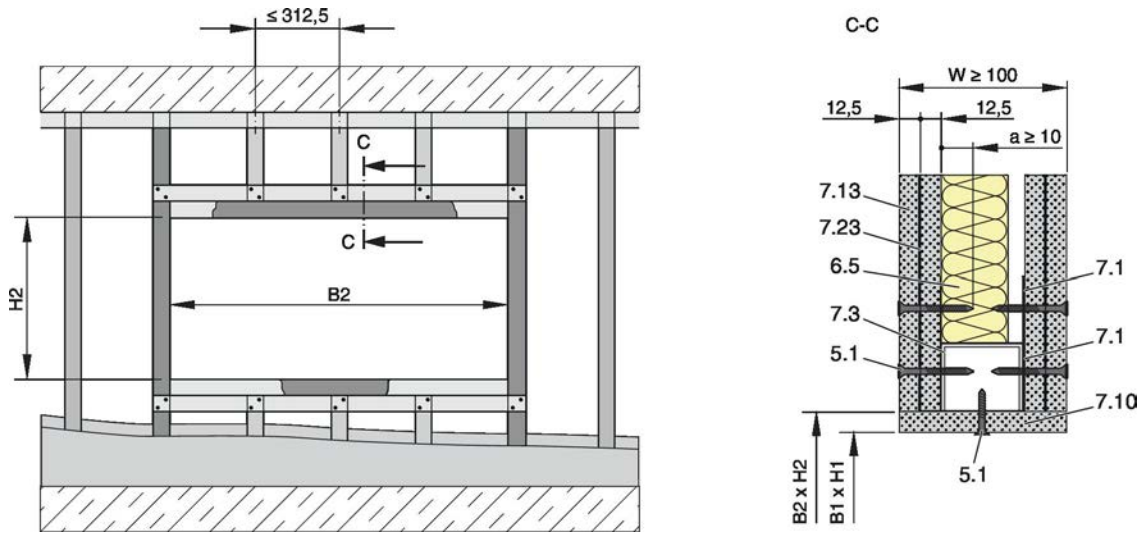


Fig. 50: Compartment wall

- | | | | |
|------|---|---------|---|
| 5.1 | Dry wall screw | 7.13 | Double layer cladding, on both sides of the metal stud system |
| 6.5 | Mineral wool (depending on wall construction) | 7.23 | Sheet steel insert |
| 7.1 | UW section | B1 × H1 | Installation opening ↪ <i>Table on page 51</i> |
| 7.3 | UA section | B2 × H2 | Opening in the metal support structure (without trim panels: B2 = B1, H2 = H1) ↪ <i>'Metal stud system' on page 52 and 53</i> |
| 7.10 | Optional trim panels | | |

Requirements

- Compartment walls, safety partition walls or walls to provide radiation protection with metal support structure and cladding on both sides with European classification to EN 13501-2 or equivalent national classification
- Cladding on both sides made of gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum, wall thickness $W \geq 100$ mm
- Additional steel inserts, additional layers of cladding (up to two layers if stated in the usability certificate for the wall) and double stud constructions are approved
- ≤ 312.5 mm distance between metal studs
- Wall construction according to the manufacturer's instructions
- Duct connection with flexible connector (recommended)
- Trim panels have to be screw-fixed to the support structure

Installation type	Installation opening [mm]			
	B1	H1	B2	H2
Mortar-based installation ^{1, 3}	B + 300 mm max.	H + 300 mm max.	B1 + (2 × trim panels)	H1 + (2 × trim panels)
Dry mortarless installation with installation block ^{1, 2}	B + 70 mm	H + 70 mm		

¹⁾ Optional trim panels

²⁾ Installation opening tolerance + 2 mm

³⁾ For an FKS-EU with cover plate, the installation opening should measure approx. B + 80 mm / H + 80 mm so that the cover plate can be fixed properly.

Metal stud system

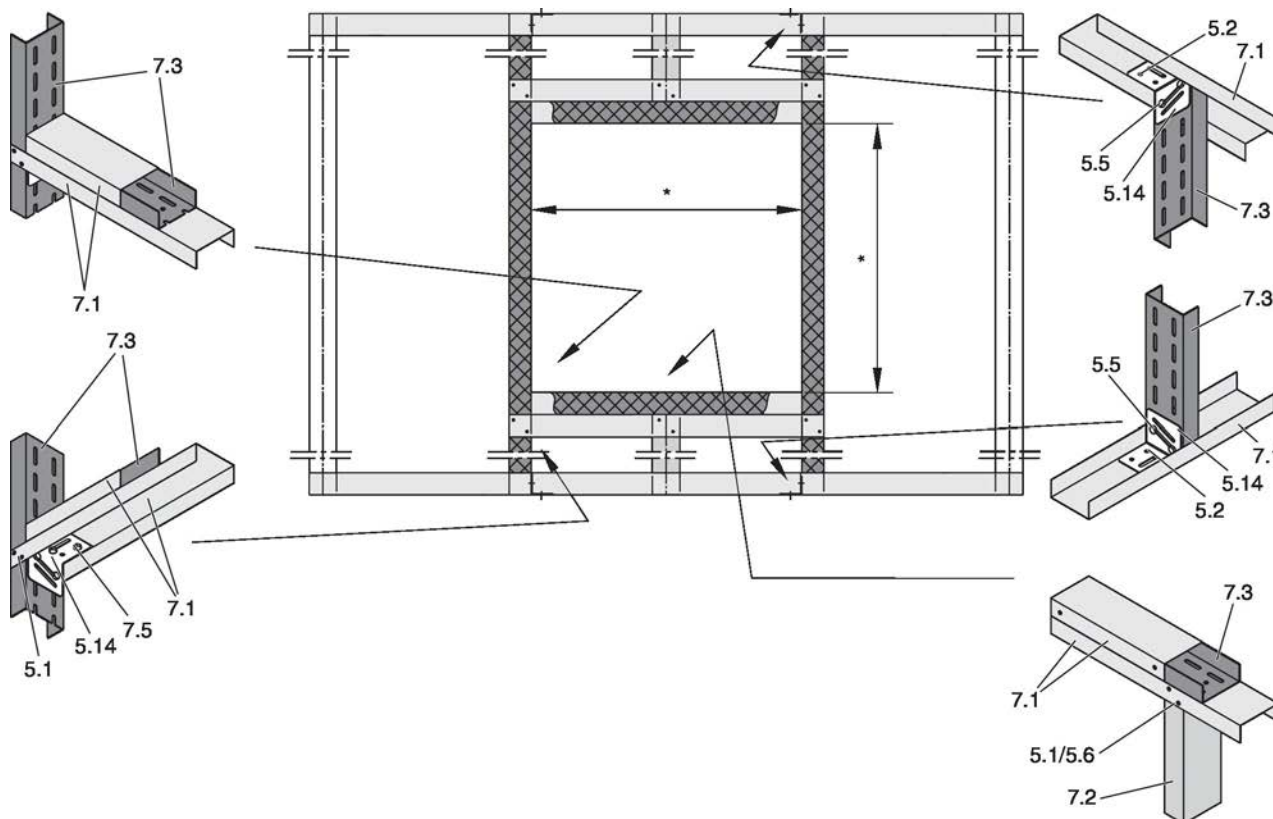


Fig. 51: Single stud system

- | | | | |
|------|---|-----|---|
| 5.1 | Dry wall screw | 7.1 | UW section |
| 5.2 | Hexagon head screw Ø 6 mm | 7.2 | CW section |
| 5.5 | Carriage bolt, L ≤ 50 mm, with nut and washer | 7.3 | UA section |
| 5.6 | Steel rivet | * | Installation opening depending on installation type |
| 5.14 | Bracket | | ↪ on page 51 |

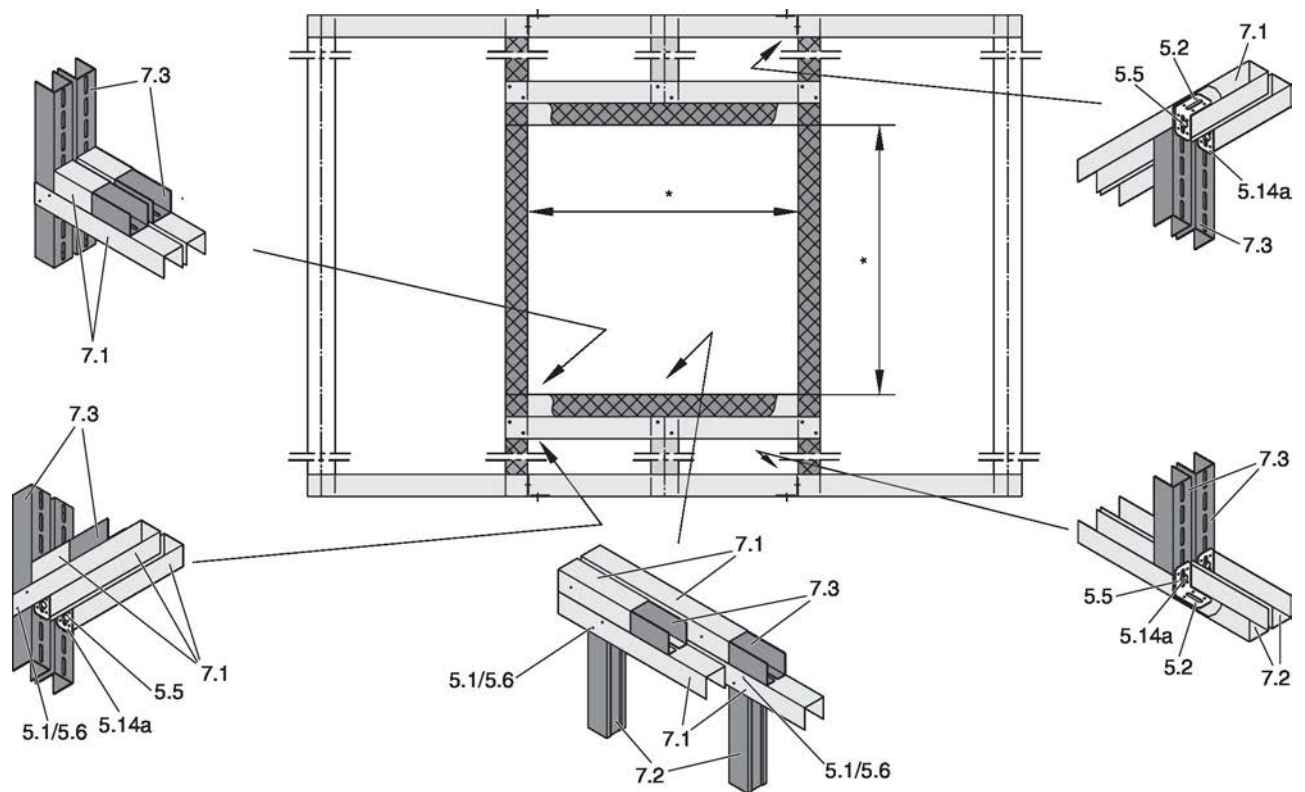
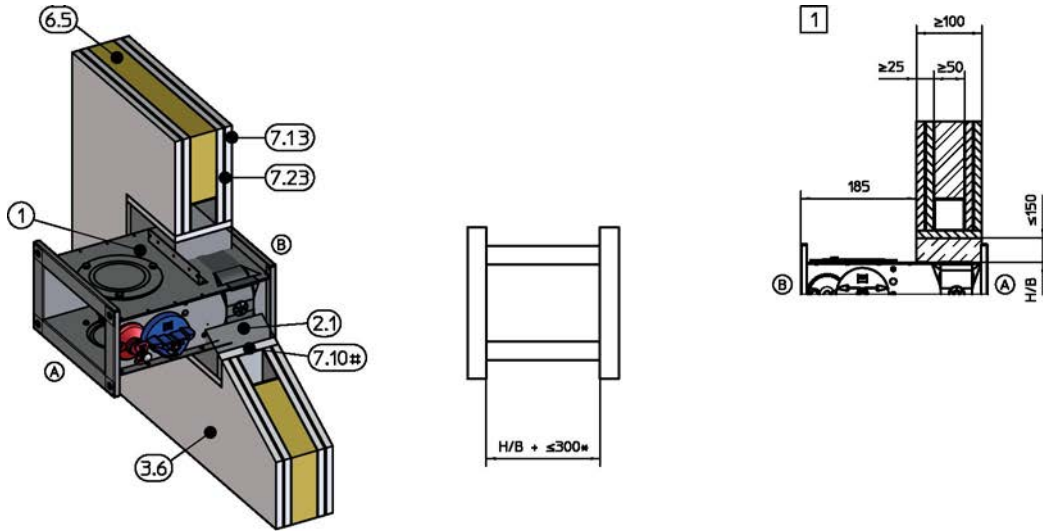


Fig. 52: Double stud system

- | | | | |
|-------|---|-----|---|
| 5.1 | Dry wall screw | 7.1 | UW section |
| 5.2 | Hexagon head screw Ø 6 mm | 7.2 | CW section |
| 5.5 | Carriage bolt, L ≤ 50 mm, with nut and washer | 7.3 | UA section |
| 5.6 | Steel rivet | * | Installation opening depending on installation type |
| 5.14a | UA bracket | | ↪ on page 51 |

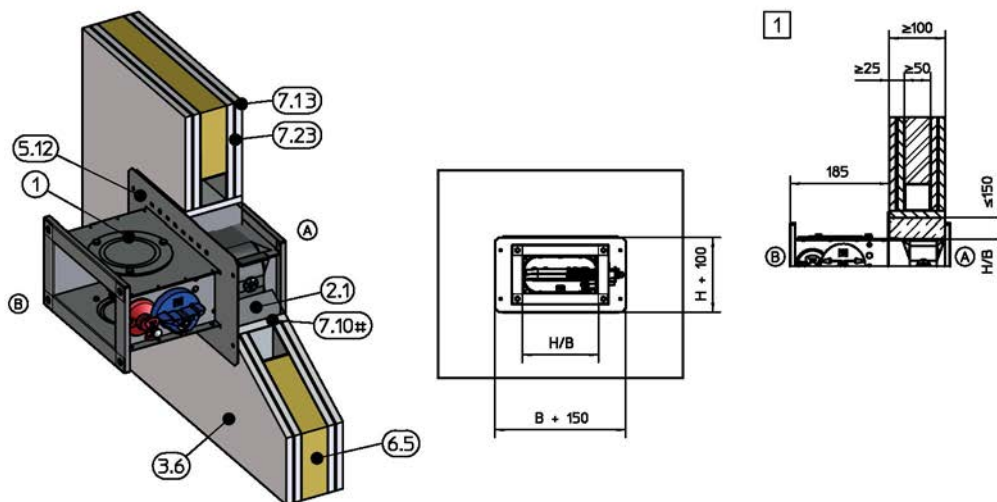
5.9.1 Mortar-based installation



TR1816116

Fig. 53: Mortar-based installation in fire or safety partition wall

1	FKS-EU	7.23	Sheet steel insert (depending on wall construction)
2.1	Mortar	*	Can be increased to account for the thickness of the trim panels
3.6	Fire or safety partition wall with metal support structure, cladding on both sides	#	optional
6.5	Mineral wool (depending on wall construction)	1	Up to EI 120 S
7.10	Trim panels	A	Installation side
7.13	Double layer cladding, on both sides of the metal stud system	B	Operating side



GR2605167

Fig. 54: Mortar-based installation with cover plate in fire or safety partition wall

1	FKS-EU	7.13	Double layer cladding, on both sides of the metal stud system
2.1	Mortar	7.23	Sheet steel insert (depending on wall construction)
3.6	Fire or safety partition wall with metal support structure, cladding on both sides	#	optional
5.12	Cover plate, optional	1	Up to EI 120 S
6.5	Mineral wool (depending on wall construction)	A	Installation side
7.10	Trim panels	B	Operating side

Ⓑ Operating side

Personnel:

- Specialist personnel

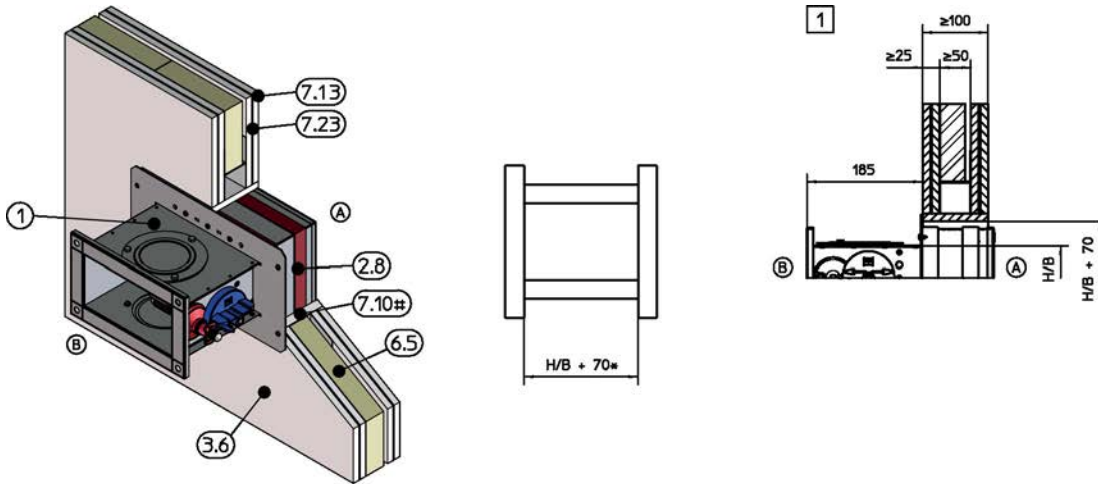
Materials:

- Mortar ↗ 'Mortars for mortar-based installation' on page 18

Requirements

- Performance class up to EI 120 S
 - Compartment walls, safety partition walls or walls to provide radiation protection with metal support structure and cladding on both sides, $W \geq 100$ mm; other specifications ↗ on page 51.
 - ≥ 40 mm distance to load-bearing structural elements
 - Fire dampers to be installed in individual installation openings. ≥ 200 mm distance between two fire dampers, one below the other.
For installation in an installation opening where the fire dampers are side by side or one below the other, the distance between the two dampers is 80...150 mm. 100...150 mm distance between two fire dampers when a cover plate is used, and the two fire dampers are installed on top of each other; 150 mm when the two fire dampers are installed side by side (depending on construction). For side by side installation into an installation opening, only fire dampers with $B \leq 350$ mm are permitted. For an FKS-EU with cover plate, the installation opening should measure approx. $B + 80$ mm / $H + 80$ mm so that the cover plate can be fixed properly.
 - Duct connection with flexible connector (recommended)
1. ▶ Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening Fig. 50 to Fig. 52.
 2. ▶ Push the fire damper into the installation opening and secure it. Make sure that the distance from the flange on the operating side to the wall is 185 mm (bracket is flush with the wall).
 3. ▶ Extend the fire damper with an extension piece on the installation side.
 4. ▶ Close off the perimeter gap »s« with mortar.

5.9.2 Dry mortarless installation



TR1816374

Fig. 55: Dry mortarless installation in fire or safety partition wall with installation block E

1	FKS-EU	7.23	Sheet steel insert depending on wall manufacturer
2.8	Installation block E	*	Can be increased to account for the thickness of the trim panels
3.6	Fire or safety partition wall with metal support structure, cladding on both sides	#	optional
6.5	Mineral wool (depending on wall construction)	1	Up to EI 90 S
7.10	Trim panels (≤ 12.5 mm)	A	Installation side
7.13	Double layer cladding, on both sides of the metal stud system	B	Operating side

Personnel:

- Specialist personnel

Requirements

- Performance class up to EI 90 S
 - Compartment walls with metal support structure and cladding on both sides, $W \geq 100$ mm; detailed specification ↪ on page 51.
 - Distance to load-bearing structural elements ≥ 40 mm (in conjunction with shortened cover plate)
 - ≥ 150 mm distance between two fire dampers
 - Duct connection with flexible connector (recommended)
1. ▶ Erect the compartment wall according to the manufacturer's instructions and create an installation opening Fig. 50 to Fig. 52.
 2. ▶ Extend the fire damper with an extension piece on the installation side.
 3. ▶ Position the fire damper with the installation block in the centre of the installation opening and push it in up to the cover plate.
 4. ▶ Fix the cover plate to the metal support structure with four screws (dry wall screws $\varnothing \geq 4.2 \times 70$ mm).
 5. ▶ If the wall thickness is ≥ 125 mm, fill the rear gap with mineral wool or gypsum mortar and seal it with reinforcing board made of the same material as the wall. As an alternative to reinforcing board, the wall cladding can also be laid up to the damper casing or the extension piece.

5.10 Shaft walls with metal support structure

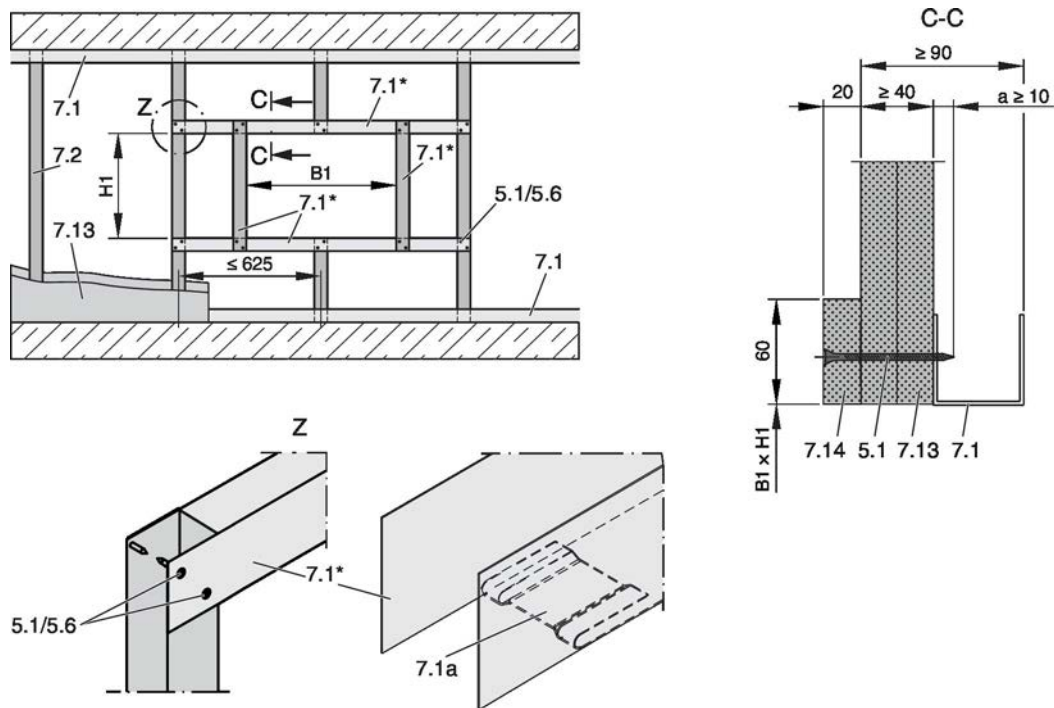


Fig. 56: Shaft walls with metal support structure and cladding on one side

- | | | | |
|------|--|------|--|
| 5.1 | Dry wall screw | 7.2 | CW profile (alternatively a square profile for steel substructure) |
| 5.6 | Steel rivet | 7.13 | Double layer cladding, on one side of the metal stud system |
| 7.1 | UW profile (alternatively a square profile for steel substructure) | 7.14 | Reinforcing board |
| 7.1a | UW profile, cut and bent | * | Closed end must face installation opening |

Requirements

- Shaft walls with metal support structure or steel substructure and cladding on one side, with European classification according to EN 13501-2 or equivalent national classification
- Cladding on one side made of gypsum bonded or cement bonded panel materials, of fibre-reinforced gypsum or of fire-rated calcium silicate boards, wall thickness $W \geq 90$ mm with additional reinforcing board near the fire damper, 20 mm thick.
- ≤ 625 mm distance between metal studs
- Duct connection with flexible connector (recommended)
- Trim panels (according to the installation details) have to be screw-fixed to the support structure.

Erecting a wall and creating an installation opening

- Erect the shaft wall according to the manufacturer's instructions.
- Create the installation opening in the metal support structure with suitable metal sections and reinforcing board.

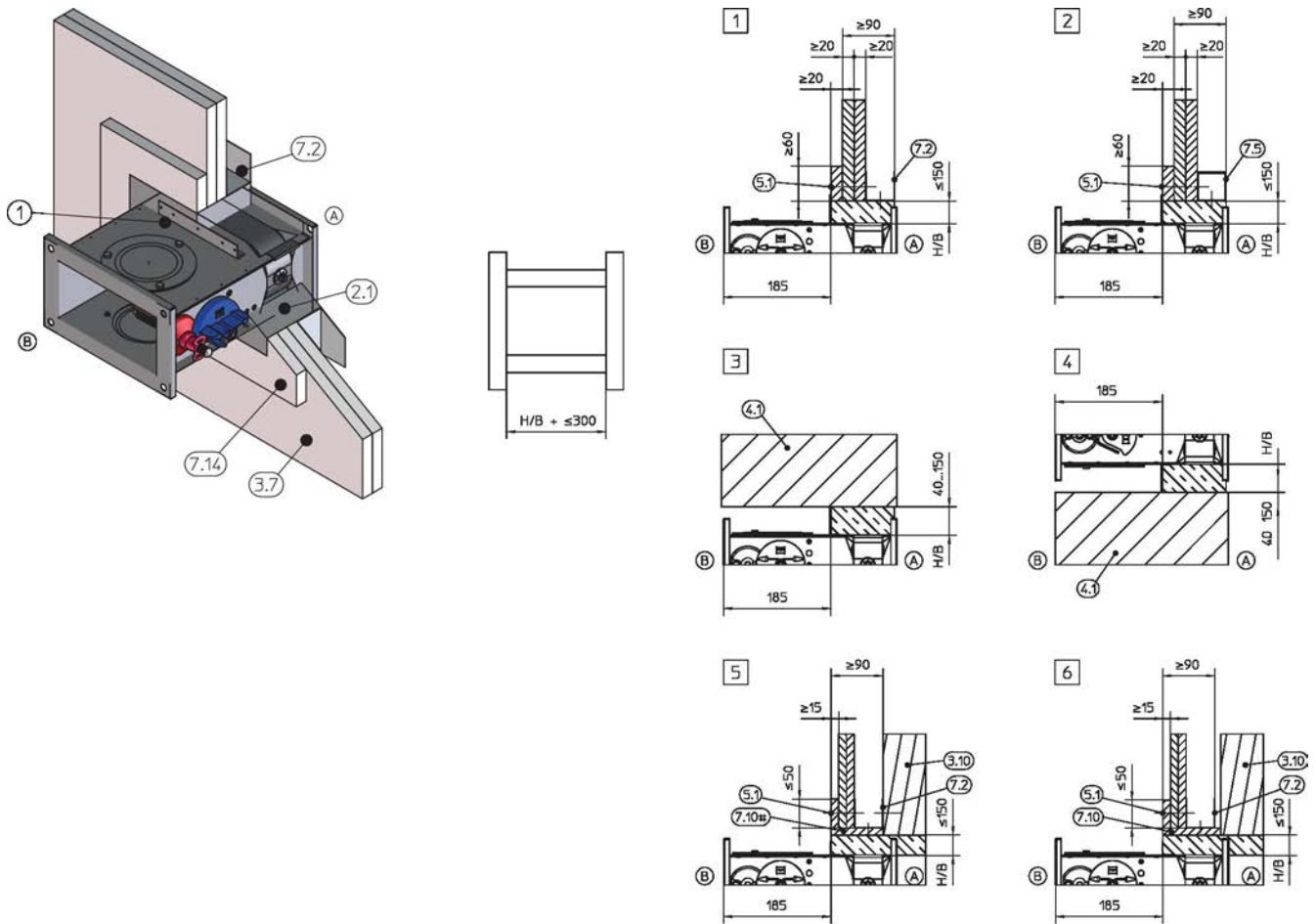
Installation type	Installation opening [mm]	
	B1	H1
Mortar-based installation ²	B + 300 mm max.	H + 300 mm max.
Dry mortarless installation with installation block ¹	B + 70 mm	H + 70 mm

¹) Installation opening tolerance + 2 mm

²) For an FKS-EU with cover plate, the installation opening should measure approx. B + 80 mm / H + 80 mm so that the cover plate can be fixed properly.

Shaft walls with metal support structure

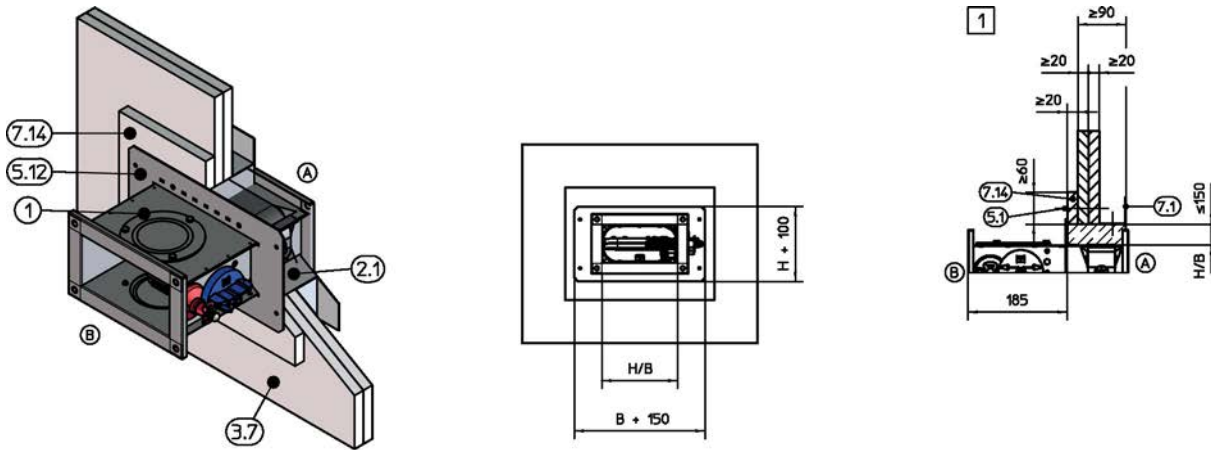
5.10.1 Mortar-based installation



GR2196075

Fig. 57: Mortar-based installation into shaft wall with metal support structure

1	FKS-EU	7.10	Trim panels
2.1	Mortar	7.14	Reinforcing board of the same material as the wall
3.7	Shaft wall with metal support structure, cladding on one side	#	optional
3.10	Wall without adequate fire resistance rating	1	up to 4
4.1	Solid ceiling slab / solid floor	5	and 6
5.1	Dry wall screw	A	Installation side
7.1	UW section	B	Operating side
7.5	Steel support structure		



GR2610036

Fig. 58: Mortar-based installation with cover plate into shaft wall with metal support structure

1	FKS-EU	7.1	UW section
2.1	Mortar	7.14	Reinforcing board of the same material as the wall
3.7	Shaft wall with metal support structure, cladding on one side	1	Up to EI 90 S
5.1	Dry wall screw	A	Installation side
5.12	Cover plate, optional	B	Operating side

Personnel:

- Specialist personnel

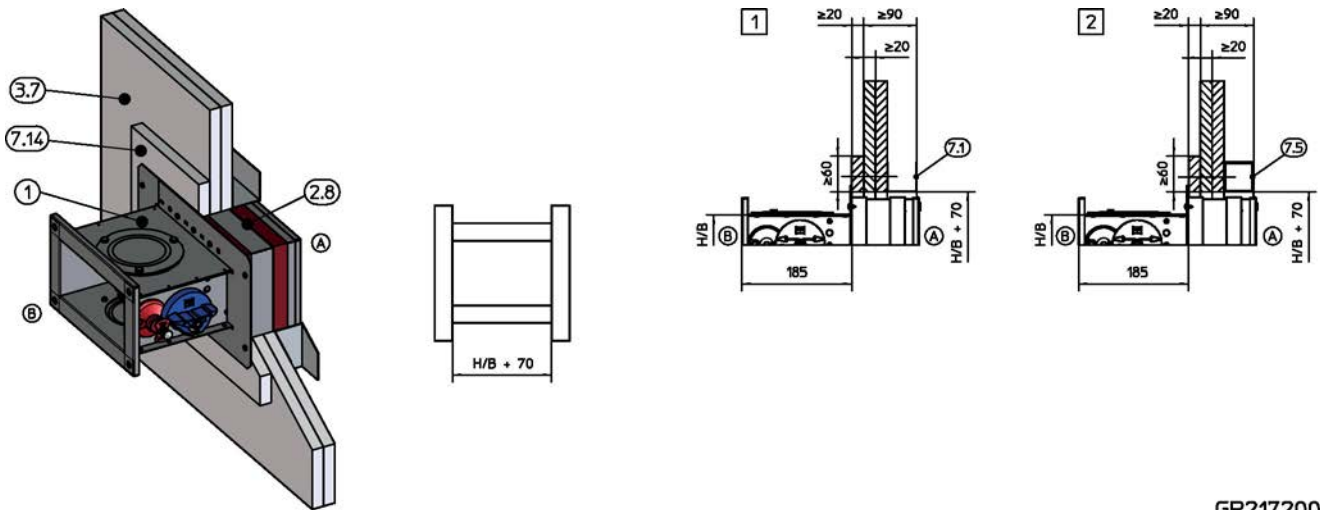
Materials:

- Mortar ↗ 'Mortars for mortar-based installation' on page 18

Requirements

- Class of performance up to EI 90 S (class of performance EI 30 S with wall thickness increased to $W \geq 90$ mm, details from ↗ 59)
 - Shaft walls with metal support structure or with steel support structure and cladding on one side, $W \geq 90$ mm; detailed specification ↗ on page 57
 - ≥ 40 mm distance to load-bearing structural elements
 - ≥ 150 mm distance between two fire dampers (separate installation opening)
 - Duct connection with flexible connector (recommended)
1. ▶ Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening with reinforcing board and trim panels if necessary (according to installation details) Fig. 56.
 2. ▶ If the wall thickness is > 100 mm, extend the fire damper on the installation side with an extension piece (attachment or provided by others).
 3. ▶ Push the fire damper into the installation opening and secure it. Make sure the distance from the flange on the operating side to the wall (reinforcing board) is 185 mm (bracket is flush with the wall/reinforcing board).
 4. ▶ Close off the perimeter gap »s« with mortar.

5.10.2 Dry mortarless installation



GR2172004

Fig. 59: Dry mortarless installation in the shaft wall with installation block E

1	FKS-EU	7.14	Reinforcing board of the same material as the wall
2.8	Installation block E	1	Up to EI 90 S
3.7	Shaft wall with metal support structure, cladding on one side	2	Up to EI 90 S
7.1	UW section	A	Installation side
7.5	Steel support structure	B	Operating side

Personnel:

- Specialist personnel

Requirements

- Performance class up to EI 90 S
 - Shaft walls with metal support structure or with steel support structure and cladding on one side, $W \geq 90$ mm; detailed specification ↪ on page 57
 - Distance to load-bearing structural elements ≥ 75 mm
 - ≥ 150 mm distance between two fire dampers (separate installation opening)
 - Duct connection with flexible connector (recommended)
1. ▶ Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening with a reinforcing board Fig. 56
 2. ▶ Position the fire damper with the installation block in the centre of the installation opening and push it in up to the cover plate.
 3. ▶ If the wall thickness is > 100 mm, extend the fire damper with an extension piece on the installation side.
 4. ▶ Fix the cover plate to the metal support structure with four screws (dry wall screws $\varnothing \geq 4.2 \times 70$ mm).

6 Connecting the ductwork

6.1 Ducts

Ducts of combustible or non-combustible materials may be connected to fire dampers.

6.2 Transport and installation protection

Fire dampers with a width of 400 mm or more and without an installation block are shipped with a transport/installation protection.

In case of mortar-based installation this protection must not be removed until the mortar has cured.

To remove the transport/installation protection, pull it out of the fire damper on the operating side Fig. 60.

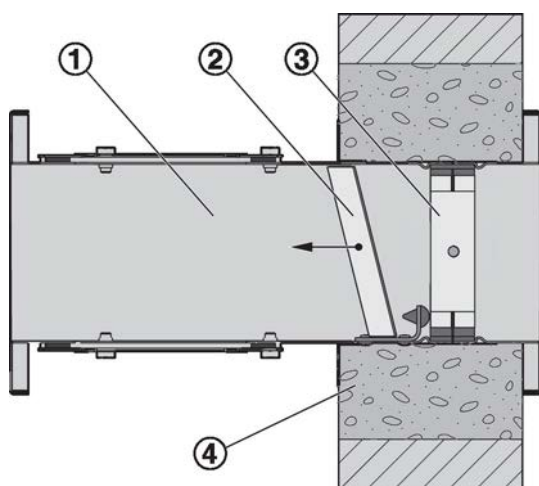


Fig. 60: Removing the transport/installation protection

- 1 Fire damper
- 2 Transport and installation protection
- 3 Damper blade
- 4 Mortar

6.3 Limiting duct expansion

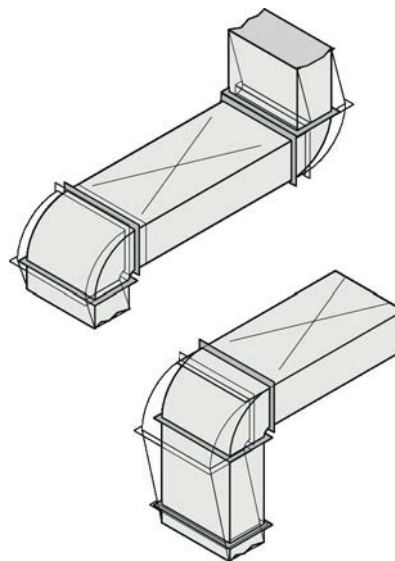


Fig. 61: Limiting loads

Ducting must be installed in such a manner that it does not impose any significant loads on the fire damper in the event of a fire.

The expansion of ducts in the event of a fire can be compensated by brackets and turns, Fig. 61.

Note

For further information please refer to the guideline regarding fire protection requirements on ventilation systems (Lüftungsanlagen-Richtlinie, LüAR).

As ducts may expand and walls may become deformed in the event of a fire, we recommend for the following applications using flexible connectors when connecting the fire damper to rigid ducts:

- in lightweight partition walls
- in lightweight shaft walls

6.4 Fire damper accessories

Extension piece

Depending on the design, when using cover grilles, flexible connectors, circular duct bends, etc., an extension piece may be required on the installation side.

Note

The movement of the damper blade must not be obstructed by any accessory. The distance between the tip of the open damper blade and any accessory must be at least 50 mm.

Flexible connectors

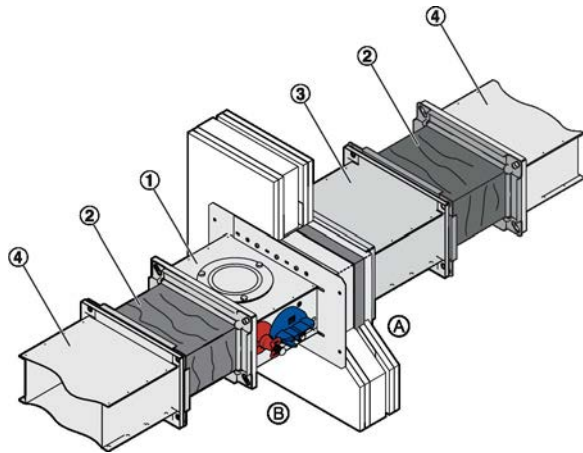


Fig. 62: Fire damper with flexible connectors

- 1 FKS-EU
- 2 Flexible connector
- 3 Extension piece
- 4 Duct
- (A) Installation side
- (B) Operating side

Install the flexible connectors in such a way that they can compensate both tension and compression. Flexible ducts can be used as an alternative. If flexible connectors are used, equipotential bonding must be ensured → Chapter 7.3 'Equipotential bonding' on page 66.

To ensure that the open fire damper blade is contained within the fire damper casing on the installation side, an extension piece is required.

Cover grille

If only one end is to be ducted on site, the other end must have a cover grille (galvanised steel, mesh aperture ≤ 20 mm).

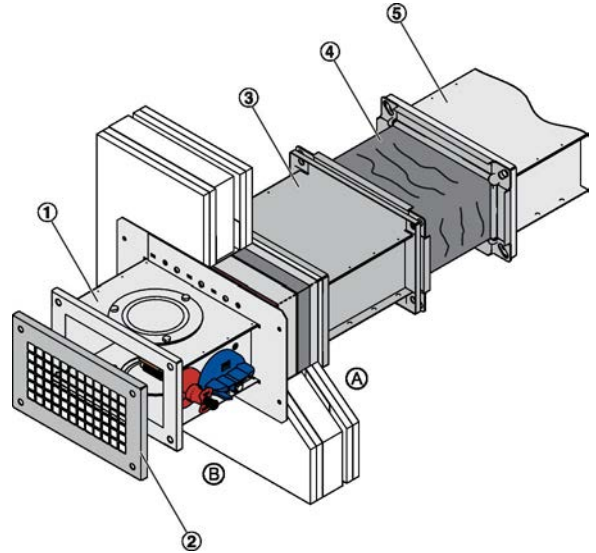


Fig. 63: Fire damper with cover grille on the operating side

- 1 FKS-EU
- 2 Cover grille
- 3 Extension piece
- 4 Flexible connector
- 5 Duct
- (A) Installation side
- (B) Operating side

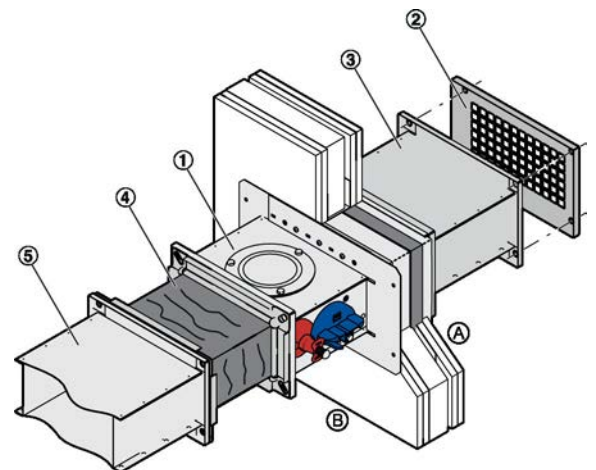


Fig. 64: Fire damper with cover grille on the installation side

- 1 FKS-EU
- 2 Cover grille
- 3 Extension piece
- 4 Flexible connector
- 5 Duct
- (A) Installation side
- (B) Operating side

To ensure that the open fire damper blade is contained within the fire damper casing on the installation side, an extension piece is required.

6.5 Inspection access

The interior of the fire damper must remain accessible for maintenance work and cleaning. For this purpose, FKS-EU fire dampers have two inspection panels

↳ *Chapter 4 'Parts and function' on page 13.*

Depending on the installation configuration it may be necessary to provide additional inspection access points in the connecting ducts.

7 Making electrical connections

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.

7.1 Connecting the limit switches (fire dampers with fusible link)

Personnel:

- Skilled qualified electrician

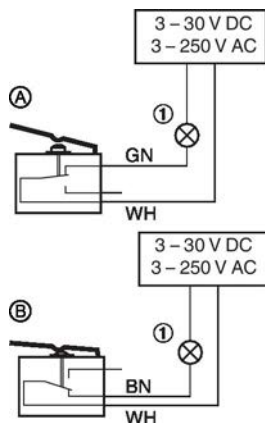


Fig. 65: Wiring of limit switches, example

- 1 Indicator light or relay, to be provided by others
- The limit switches must be connected according to the wiring example Fig. 65
 - Indicator lights or relays may be connected as long as the performance specifications are taken into consideration.
 - Connection boxes must be fixed to the adjoining structure (wall or ceiling slab). They must not be fixed to the fire damper.

Type of connection	Limit switch	Damper blade	Electric circuit
Ⓐ NC contact	not actuated	CLOSED or OPEN position is <u>not</u> reached	closed

Type of connection	Limit switch	Damper blade	Electric circuit
Ⓑ NO contact	actuated	CLOSED or OPEN position is reached	closed

7.2 Connecting the spring return actuator

Personnel:

- Skilled qualified electrician

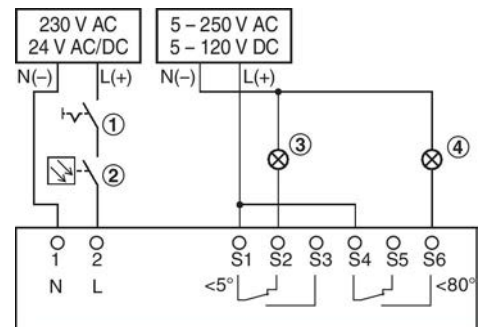


Fig. 66: Actuator connection, example

- 1 Switch for opening and closing, to be provided by others
 - 2 Optional release mechanism, e.g. TROX duct smoke detector Type RM-O-3-D or RM-O-VS-D
 - 3 Indicator light for CLOSED position, to be provided by others
 - 4 Indicator light for OPEN position, to be provided by others
- The fire damper may be equipped with a spring return actuator for a supply voltage of 230 V AC or 24 V AC/DC. See the performance data on the rating plate.
 - The spring return actuator must be connected according to the wiring example shown. Several actuators can be connected in parallel as long as the performance specifications are taken into consideration.
 - Connection boxes must be fixed to the adjoining structure (wall or ceiling slab). They must not be fixed to the fire damper.

Actuators with 24 V AC/DC

Safety transformers must be used. 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.

7.3 Equipotential bonding

If equipotential bonding is a requirement, there must be an electrical earth connection from the fire damper to the duct. In the event of a fire, mechanical loads from the equipotential bonding must not affect the fire damper.

- Fire dampers with flange: The flange of the fire damper is used for equipotential bonding; no drilled holes are required in the damper casing.
- Fire dampers without flange (circular): Suitable clamps or similar parts may be used for equipotential bonding. It is possible to make drilled holes near the spigot.

8 Functional test

General

During operation at normal temperatures, the damper blade is open. A functional test involves closing the damper blade and opening it again.

8.1 Fire damper with fusible link

Close the damper blade

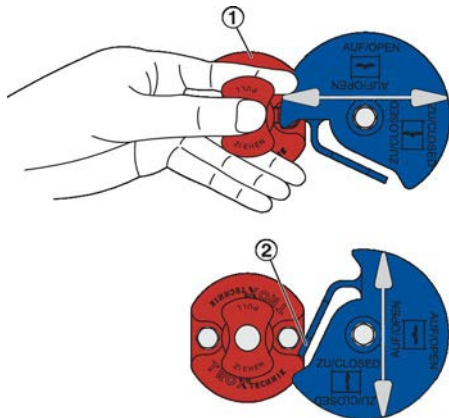


Fig. 67: Close the damper blade

CAUTION!

Danger of injury when reaching into the fire damper while the damper blade is moving. Do not reach into the fire damper while actuating the release mechanism.

Requirement

- The damper blade is OPEN
- 1. ▶ Grasp the release mechanism ① as shown with the thumb and middle fingers.
- 2. ▶ Pull the release mechanism towards you with both fingers.
 - ⇒ The damper blade closes and the tab ② on the handle locks into the CLOSED position.

Opening the damper blade

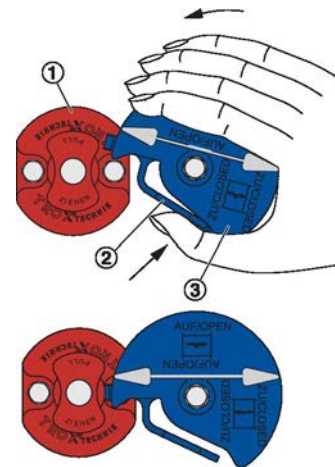


Fig. 68: Opening the damper blade

CAUTION!

The handle will break if handled improperly. Be sure to press the tab ② as otherwise the handle ③ will be damaged.

Requirement

- The damper blade is CLOSED
- 1. ▶ With your right hand, grasp the handle ③ as shown and press down the tab ② with your thumb.
- 2. ▶ Then turn the handle anti-clockwise to the travel stop.
 - ⇒ The handle locks into the OPEN position.

Damper blade position indicator

The position of the damper blade is indicated by the position of the handle.

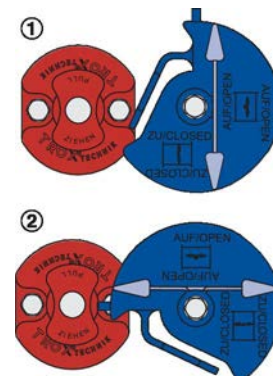


Fig. 69: Damper blade position indicator

- 1 Damper blade is closed
- 2 Damper blade is open

8.2 Fire damper with spring return actuator

Status indicator

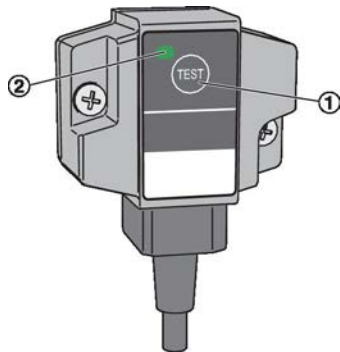


Fig. 70: Thermoelectric release mechanism BAT

- 1 Toggle switch for functional test
- 2 LED

The indicator light ② for the thermoelectric release mechanism is illuminated when all of the following conditions apply:

- Power is supplied.
- The thermoelectric release is in order.
- The toggle switch is not being pushed.

Damper blade position indicator

The position of the damper is indicated by the pointer on the actuator.

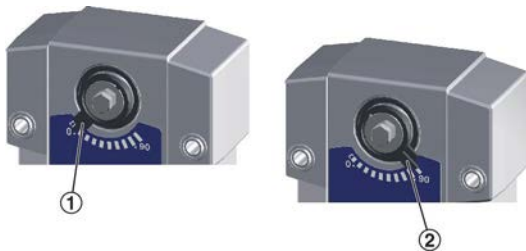


Fig. 71: Damper blade position indicator

- 1 Damper blade is closed
- 2 Damper blade is open

Closing/opening the damper blade with spring return actuator

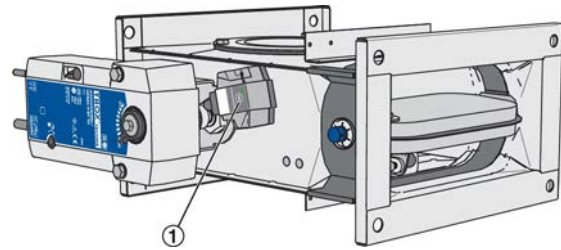


Fig. 72: Functional test

⚠ CAUTION!

Danger of injury when reaching into the fire damper while the damper blade is moving. Do not reach into the fire damper while actuating the release mechanism.

Requirement

- Power is being supplied
1. ▶ Push toggle switch ① and keep it pushed.
 - ⇒ This interrupts the power supply, and the damper blade closes.
 2. ▶ Check if the damper blade is CLOSED, check running time.
 3. ▶ Release the toggle switch ①.
 - ⇒ Voltage is supplied again, and the damper blade opens.
 4. ▶ Check if the damper blade is OPEN, check running time.

Opening the damper blade using the crank handle



Fig. 73: Functional test (without power supply)


⚠ DANGER!

Danger due to malfunction of the fire damper.

If the damper blade has been opened by means of the crank handle (without power supply), it will no longer be triggered by a temperature increase, i.e. in the event of a fire. In other words, the damper blade will not close.

To re-establish its function, connect the power supply.

Requirement

- The damper blade is CLOSED
- 1. ▶ Insert the crank handle ① into the opening for the spring-winding mechanism.
- 2. ▶ Turn the crank handle into the direction of the arrow ② to just short of the travel stop and hold it.
- 3. ▶ Set the interlock ③ to 
 - ⇒ The damper blade remains in the OPEN position.
- 4. ▶ Remove the crank handle.

Closing the damper blade




Fig. 74: Functional test (without power supply)

⚠ CAUTION!

Danger of injury when reaching into the fire damper while the damper blade is moving. Do not reach into the fire damper while actuating the release mechanism.

Requirement

- The damper blade is OPEN
 - ▶ Set the interlock ③ to 
 - ⇒ The damper blade is released and closes.

8.3 Functional test with automatic control unit

Functional test with automatic control unit

The function of fire dampers with a spring return actuator can also be tested with an automatic control unit. The control unit should have the following functions:

- Opening and closing fire dampers in regular intervals (intervals to be set by the owner or operator)
- Monitoring of the actuator running times
- Issuing an alarm when the running times are exceeded and when fire dampers close
- Recording the test results

TROXNETCOM systems such as TNC-EASYCONTROL or AS-interface meet all these requirements. For details on these products please refer to the TROX Fire and Smoke Protection catalogue.

TROXNETCOM systems allow for automatic functional tests; they do not replace maintenance and cleaning, which have to be carried out in regular intervals or depending on the condition of the product. The documentation of test results makes trends visible, e.g. the running time of actuators. They may also indicate the need for additional measures which help to maintain the system's function, e.g. cleaning of heavy contamination (dust in extract air systems).

9 Commissioning

Before commissioning

Before commissioning, each fire damper must be inspected to determine and assess its actual condition. The inspection measures to be taken are listed in the table on .

Operation

During normal operation the damper blade is open to enable air passage through the ventilation system.

If the temperature in the duct or the ambient temperature rises in the event of a fire ($\geq 72\text{ °C}$ / $\geq 95\text{ °C}$), the thermal release mechanism is triggered and closes the damper blade.



CLOSED fire dampers

Fire dampers which close while the ventilation and air conditioning system is running must be inspected before they are opened again in order to ensure their correct function ↪ 'Inspection' on page 72.

10 Maintenance

10.1 General

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 fire damper. Inadvertent actuation of the damper blade or other parts can lead to injuries.

Make sure that the damper blade cannot be released inadvertently.

Regular care and maintenance ensure operational readiness, functional reliability, and long service life of the fire damper.

The owner or operator of the system is responsible for the maintenance of the fire damper. The operator is responsible for creating a maintenance plan, for defining the maintenance objectives, and for the functional reliability of the fire damper.

Functional test

The functional reliability of the fire damper must be tested at least every six months; this has to be arranged by the owner or operator. 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 13306
- DIN 31051
- EN 15423

The function of fire dampers with a spring return actuator can also be tested with an automatic control unit 'Functional test with automatic control unit' on page 70.

Maintenance

The fire damper and the spring return actuator are maintenance-free with regard to wear but fire dampers must still be included in the regular cleaning of the ventilation system.

Cleaning

The fire damper may be cleaned with a dry or damp cloth. Sticky dirt or contamination may be removed with a commercial, non-aggressive cleaning agent. Do not use abrasive cleaners or tools (e.g. brushes).

Inspection

The fire damper 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 under . The test of each fire 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 67 is required after any repair work.

10.2 Lubricating points

Only lubricate the lubricating points if the damper blade cannot be opened or closed easily. Use only oil or grease that is free of resins or acids.

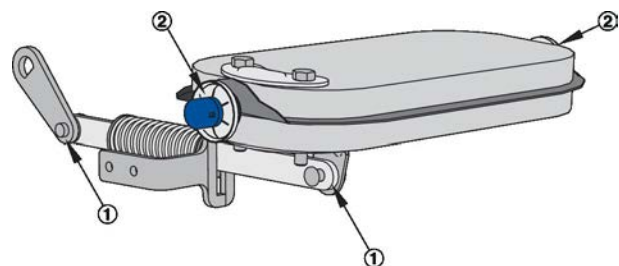


Fig. 75: FKS-EU lubricating points

- 1 Push rod bearings
- 2 Damper blade bearings (both sides)

10.3 Replacing the fusible link

Replacing the fusible link

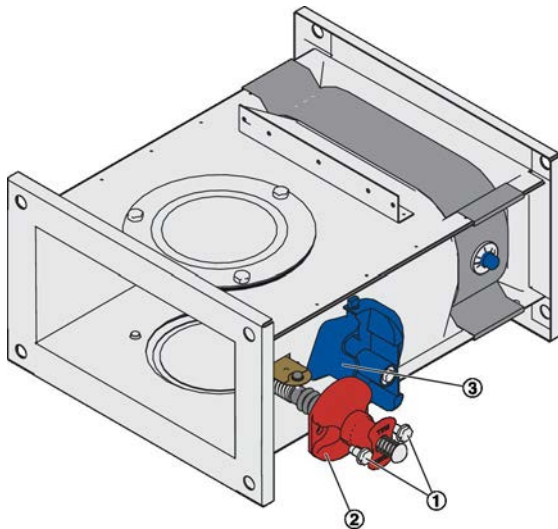


Fig. 76: Removing the fusible link holder

1. ▶ Close the damper blade.
2. ▶ Release screws ① on the fusible link holder ②.
3. ▶ Remove fusible link holder ② from the fire damper. While doing so, slightly press down the tab ③ of the handle.

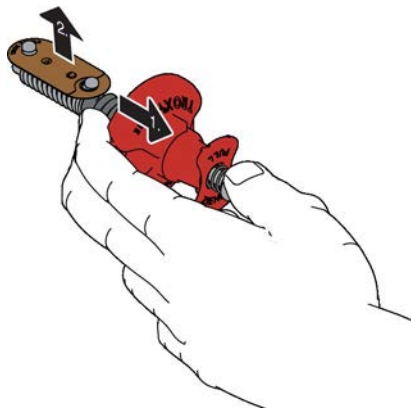


Fig. 77: Removing fusible link holder

4. ▶ Grasp the fusible link holder as shown. Move your middle fingers into the direction of the arrow.
5. ▶ Remove the used fusible link.
6. ▶ Insert the new fusible link.
7. ▶ Put the fusible link holder back into the fire damper and fix it with screws ①.
8. ▶ Carry out functional test.

10.4 Maintenance

Interval	Measure	Staff
A	Access to the fire damper <ul style="list-style-type: none"> ■ Internal and external accessibility <ul style="list-style-type: none"> – Provide access 	Specialist personnel
	Installation of the fire damper <ul style="list-style-type: none"> ■ Installation according to the operating manual ↗ 16 <ul style="list-style-type: none"> – Install the fire damper correctly. 	Specialist personnel
	Transport and installation protection, if any <ul style="list-style-type: none"> ■ Transport/installation protection removed <ul style="list-style-type: none"> – Remove transport/installation protection 	Specialist personnel
	Connection of ductwork/cover grille/flexible connector ↗ 62 <ul style="list-style-type: none"> ■ Connection according to this manual <ul style="list-style-type: none"> – Establish correct connection 	Specialist personnel
	Power supply to the spring return actuator <ul style="list-style-type: none"> ■ Power supply according to spring return actuator rating plate <ul style="list-style-type: none"> – Provide correct voltage 	Skilled qualified electrician
A / B	Check fire damper for damage <ul style="list-style-type: none"> ■ Fire damper, damper blade and seal must be intact <ul style="list-style-type: none"> – Replace the damper blade – Repair or replace the fire damper. 	Specialist personnel
	Function of the release mechanism <ul style="list-style-type: none"> ■ Function OK ■ Fusible link intact/no corrosion <ul style="list-style-type: none"> – Replace the fusible link – Replace the release mechanism 	Specialist personnel
	Functional test of the fire damper (with fusible link) ↗ 67 <ul style="list-style-type: none"> ■ Fire damper can be opened manually ■ Handle can be locked in the OPEN position ■ Damper blade closes when triggered manually <ul style="list-style-type: none"> – Determine and eliminate the cause of the fault – Repair or replace the fire damper. – Replace the release mechanism 	Specialist personnel
	Functional test of the fire damper (with spring return actuator) ↗ 68 <ul style="list-style-type: none"> ■ Actuator function OK ■ Damper blade closes ■ Damper blade opens <ul style="list-style-type: none"> – Determine and eliminate the cause of the fault – Replace the spring return actuator – Repair or replace the fire damper. 	Specialist personnel
	Function of external smoke detector <ul style="list-style-type: none"> ■ Function OK ■ Fire damper closes when triggered manually or when smoke is detected ■ Fire damper opens after reset <ul style="list-style-type: none"> – Determine and eliminate the cause of the fault – Repair or replace smoke detector 	Specialist personnel

Interval	Measure	Staff
C	Cleaning the fire damper <ul style="list-style-type: none"> ■ No contamination in the interior or on the exterior of the fire damper ■ No corrosion <ul style="list-style-type: none"> – Remove contamination with a damp cloth – Remove corrosion or replace part 	Specialist personnel
	Function of limit switches <ul style="list-style-type: none"> ■ Function OK <ul style="list-style-type: none"> – Replace the limit switches 	Specialist personnel
	Function of the external signalling (damper blade position indicator) <ul style="list-style-type: none"> ■ Function OK <ul style="list-style-type: none"> – Determine and eliminate the cause of the fault 	Specialist personnel

Interval**A = Commissioning****B = Regularly**

The functional reliability of fire dampers must be tested at least every six months. If two consecutive tests are successful, the next test can be conducted one year later. The function of fire dampers with a spring return actuator can also be tested with an automatic control unit (remote controlled). The system owner can then set the intervals for local tests.

C = As required, depending on the degree of contamination**Item to be checked**

- Required condition
 - Remedial action if necessary

11 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 ducts.
3. ▶ Close the damper blade.
4. ▶ Remove the fire damper.

Disposal

For disposal, the fire damper must be disassembled.

ENVIRONMENT!

Dispose of electronic components according to the local electronic waste regulations.

12 Index

C

Casing.....	13, 14
Cleaning.....	72
Commissioning.....	71
Compartment walls.....	51
Concrete base.....	27
Copyright.....	3
Correct use.....	6
Cover grille.....	14, 63

D

Damper blade.....	13, 14
Damper blade position indicator.....	67, 68
Decommissioning.....	76
Defects liability.....	3
Dimensions.....	8, 9, 10, 11
Disposal.....	76
Duct.....	62
Duct expansion.....	62
Duct smoke detector.....	14

E

Equipotential bonding.....	66
----------------------------	----

F

Flexible connectors.....	63
Functional description.....	13, 14
Functional test.....	67
Fusible link.....	13, 14, 73

H

Handle.....	13, 14
Hotline.....	3

I

Inspection.....	72
Inspection access.....	13, 14, 64
Installation position.....	17
Installation situations.....	15

L

Lightweight partition walls with metal support structure and cladding on both sides.....	29
Lightweight partition walls with metal support structure and cladding on one side.....	57

Lightweight partition walls with timber support structure and cladding on one side.....	38
Limitation of liability.....	3
Limit switch.....	65
Lubricating points.....	72

M

Maintenance.....	72, 74
------------------	--------

O

Operation.....	71
----------------	----

P

Packaging.....	12
----------------	----

R

Rating plate.....	7
Release mechanism.....	13, 14
Removal.....	76
Repair.....	72

S

Service.....	3
Shaft walls.....	57
Solid ceiling slabs.....	23, 27
Solid walls.....	19
Solid wood walls.....	47
Spring return actuator.....	9, 10, 13, 14, 65
Staff.....	6
Storage.....	12
Symbols.....	4

T

Technical data.....	7
Technical service.....	3
Temperature sensor.....	13, 14
Thermoelectric release mechanism.....	13, 14
Transport.....	12
Transport damage.....	12

W

Weights.....	8, 9, 10, 11
--------------	--------------

