



Fire damper

Type FKRS-EU

according to Declaration of Performance
DoP / FKRS-EU / DE / 004



Read the instructions prior to performing any task!

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Translation of the original
M375EE7, 5, GB/en
07/2020

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General information

About this manual

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

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

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

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

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

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

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- Publishing content
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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 Terms of TROX GmbH.

The General Delivery Terms of TROX GmbH can be found on the Internet at www.trox.de.

Safety notes

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

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

DANGER!

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

WARNING!

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

CAUTION!

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

NOTICE!

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

ENVIRONMENT!

Environmental pollution hazard.

Tips and recommendations



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

Safety notes as part of instructions

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

Example:

1. ▶ Loosen the screw.

2. ▶

CAUTION!

Danger of finger entrapment when closing the lid.

Be careful when closing the lid.

3. ▶ Tighten the screw.

Specific safety notes

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

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	Warning – danger zone.

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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 supply and extract air in HVAC systems.
- The fire damper may be used in potentially explosive atmospheres if appropriate special accessories are used with it and if the product bears the CE conformity marking according to Directive 94/9/EC. Fire dampers for use in potentially explosive atmospheres are marked for the zones for which they have been approved.
- 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.

If this fire damper is used in Germany:

- Do not use it in extract air systems in commercial kitchens.
- Not to be used as an air transfer damper.
- Do not use in combined penetration seal.
- Do not use in fire protection block bulkhead.
- Approvals under building regulations may be required for the use of air transfer units. This must be checked and applied for by others.
- Flame-resistant, non-dripping building materials (elastomeric foams) must at least correspond to building material class C - s2, d0 according to the specifications of M-VV TB (2019/1). The applicable local building regulations must be observed.

Incorrect use

WARNING!

Danger due to incorrect use!

Incorrect use of the fire damper can lead to dangerous situations.

Never use the fire damper

- without specially approved attachments 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 specialist personnel must carry out work.

Personnel:

- Skilled qualified electrician
- Specialist personnel

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	100 – 315 mm
Casing length L	400 mm
Volume flow rate range	Up to 770 l/s or 2770 m³/h
Differential pressure range	Up to 1500 Pa
Temperature range ^{1, 3, 4}	-20 °C to 50 °C
Release temperature	72 °C or 95 °C (for warm air ventilation systems)
Upstream velocity ^{2, 3}	≤ 8 m/s with fusible link, ≤ 10 m/s with spring return actuator
Closed blade air leakage	EN 1751, Class 3
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 13501-3 – Classification: Fire resistant ducts and fire dampers ■ EN 1366-2 – Fire resistance tests for installations: Fire dampers ⁵ ■ EN 1751 Ventilation for buildings – Air terminal devices ■ 2006/42/EG - Machinery Directive
Declaration of performance	DoP / FKRS-EU / DE / 004

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 dampers.

³⁾ For explosion-proof constructions of the FK-EU see the corresponding operating manual.

⁴⁾ Condensation and the intake of humid fresh air have to be avoided as otherwise operation will be impaired or not possible.

⁵⁾ Leakage rate of the fire damper system tested at 300 Pa and 500 Pa negative pressure.

Product sticker

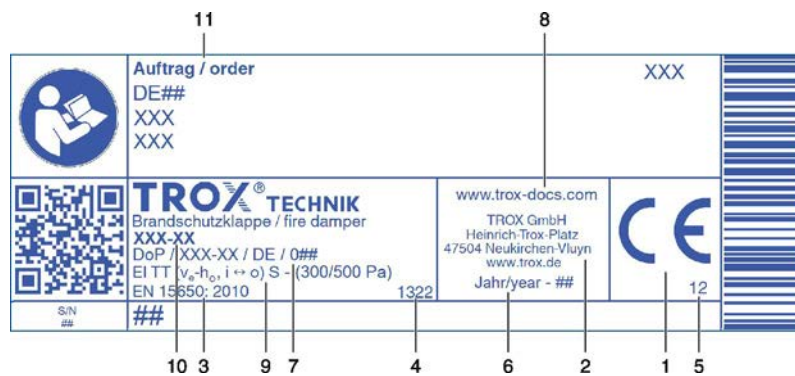


Fig. 1: Product sticker (example)

- | | | | |
|---|---|----|---|
| 1 | CE mark | 7 | No. of the declaration of performance |
| 2 | Manufacturer's address | 8 | Website from which the DoP can be downloaded |
| 3 | Number of the European standard and year of its publication | 9 | Regulated characteristics; the fire resistance class depends on the application and may vary ↪ Chapter 5.1 'Installation situations' on page 18 |
| 4 | Notified body | 10 | Type |
| 5 | The last two digits of the year in which the CE marking was affixed | 11 | Order number |
| 6 | Year of manufacture | | |

2.2 FKRS-EU with fusible link

Dimensions and weight

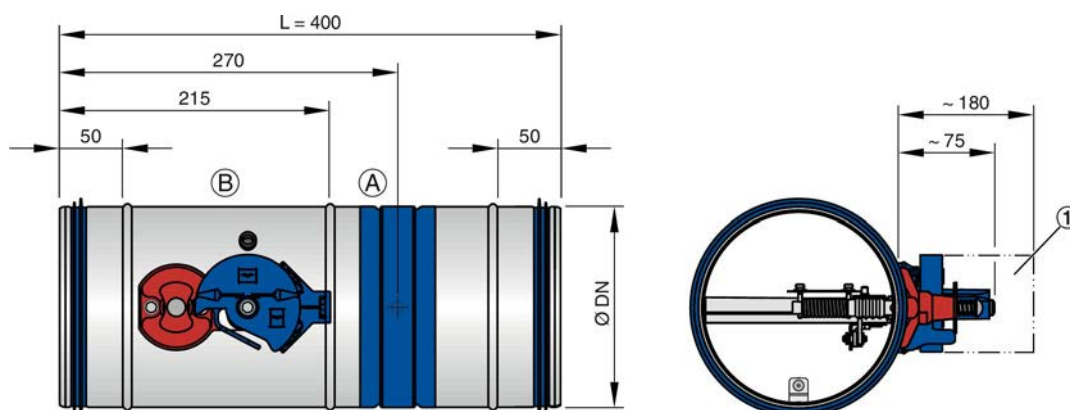


Fig. 2: FKRS-EU with fusible link

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

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

Weight [kg]										
Nominal size [mm]	100	125	150	160	180	200	224	250	280	315
ØDN [mm]	99	124	149	159	179	199	223	249	279	314
FKRS-EU with fusible link	1.3	1.6	1.8	2.0	2.3	2.5	2.7	3.3	3.8	4.4
... and installation block ER	5.7	8.6	7.6	7.3	11.0	9.8	13.5	12.1	16.0	15.0
... and installation kit TQ / TQ2	5.4	6.1	7.0	7.9	8.8	9.7	10.6	12.0	13.7	15.8
... and installation kit WA / WA2	4.4	5.2	6.1	6.6	7.4	8.2	9.0	10.2	11.7	13.6
... and installation kit WE / WE2	4.4	5.2	6.1	6.6	7.4	8.2	9.0	10.2	11.7	13.6
... and installation kit GL / GL2	4.4	5.2	6.1	6.6	7.4	8.2	9.0	10.2	11.7	13.6

2.3 FKRS-EU with spring return actuator

Dimensions and weight

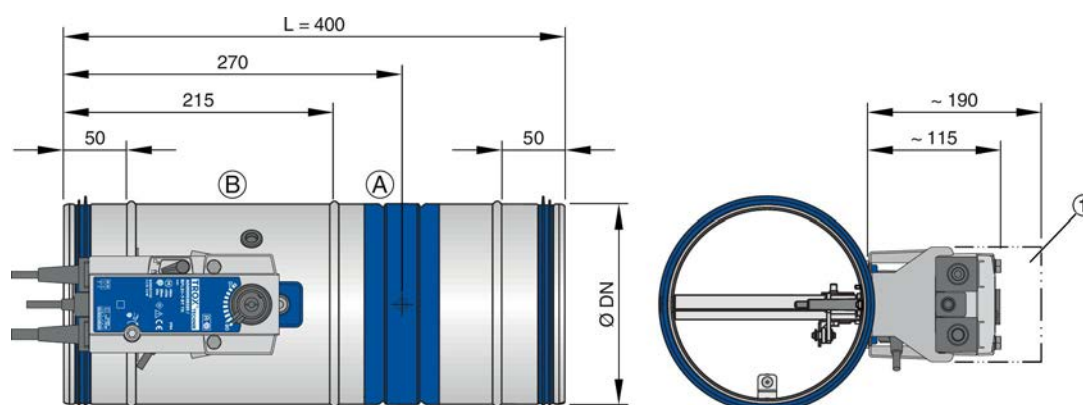


Fig. 3: FKRS-EU with Belimo spring return actuator

1 Keep clear to provide access for operation

A Installation side

B Operating side

- Weight of FKRS-EU with fusible link + approx. 1 kg, see table 11.

Spring return actuator BFL...

Construction		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 winding mechanism / hold position	3.5 W / 1.1 W	2.5 W / 0.8 W
	Rating	6.5 VA	4 VA
Run 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 / IP protection		II / IP 54	
Storage temperature / ambient temperature		-40 to 55 °C / -30 to 55 °C ¹	
Ambient humidity		≤ 95% rh, no condensation	
Connecting cable	Actuator / limit switch	1 m, 2 × 0.75 mm ² / 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

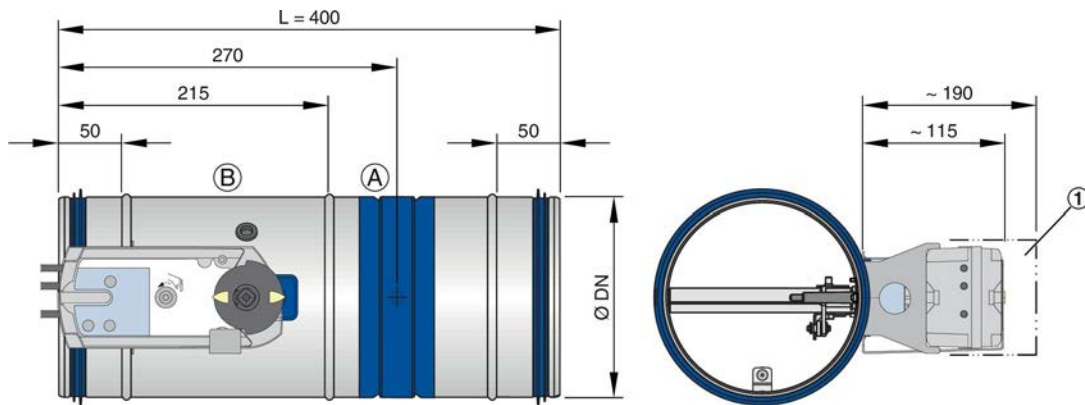


Fig. 4: FKRS-EU with Siemens spring return actuator

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

- Weight of FKRS-EU with fusible link + approx. 1 kg, see table 11.

Spring return actuator GRA...			
Construction		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 winding mechanism	7 VA / 4.5 W	5 VA / 3.5 W
	Hold position	3.5 W	2 W
Run 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 A (inductive 2 A) / DC: 2 A	
IEC protection class / IP protection		II / IP 42 or IP 54*	III / IP 42 or IP 54*
Storage temperature / ambient temperature		-20 to 50 °C / -20 to 50 °C	
Ambient humidity		< 95% rh, no condensation	
Connecting cable	Actuator / limit switch	0.9 m, 6 × 0.75 mm ² (free of halogens)	

FKRS-EU with Schischek explosion-proof spring return actuator

The FKRS-EU can also be supplied with Schischek explosion-proof spring return actuator on request:

- ExMax-15-BF-TR
- RedMax-15-BF-TR

For further information, see "Supplementary operating manual for explosion-proof fire dampers Type FKRS-EU".

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. ↻ 160

4.1 FKRS-EU with fusible link

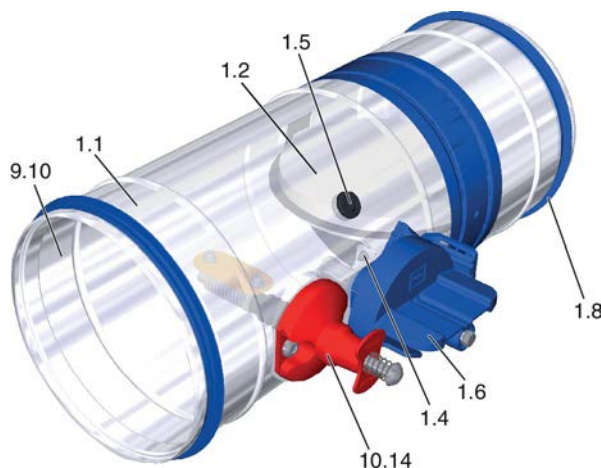


Fig. 5: FKRS-EU with fusible link

- 1.1 Casing
- 1.2 Damper blade with seal
- 1.4 Travel stop for CLOSED position
- 1.5 Inspection access (12 mm)
- 1.6 Handle/damper blade position indicator
- 1.8 Lip seal
- 10.14 Thermal release mechanism with fusible link

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 FKRS-EU with spring return actuator

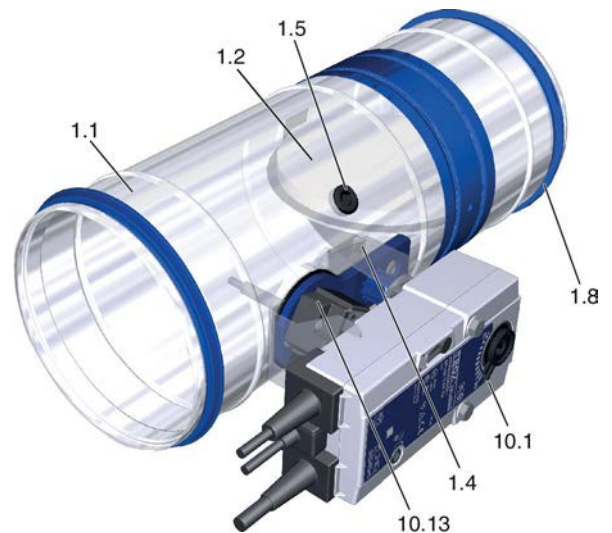


Fig. 6: FKRS-EU with spring return actuator

- 1.1 Casing
- 1.2 Damper blade with seal
- 1.4 Travel stop for CLOSED position
- 1.5 Inspection access (12 mm)
- 1.8 Lip seal
- 10.1 Spring return actuator
- 10.13 Thermoelectric release mechanism with temperature sensor

Functional description

The spring return actuator enables the motorised opening and closing of the damper blade; it can be activated by the central BMS. Motorised fire dampers can be used to shut off ducts on a regular basis. As long as power is supplied to the actuator, the damper blade remains open. The spring return actuator closes the fire damper when one of the following events occur:

- 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.

4.3 FKRS-EU with spring return actuator and duct smoke detector

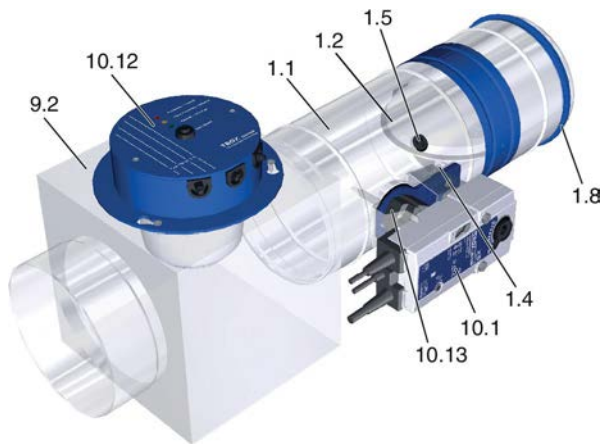


Fig. 7: FKRS-EU with spring return actuator and duct smoke detector

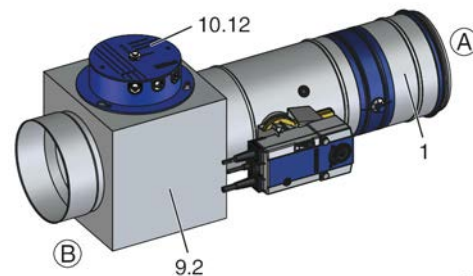
- 1.1 Casing
- 1.2 Damper blade with seal
- 1.4 Travel stop for CLOSED position
- 1.5 Inspection access (12 mm)
- 1.8 Lip seal
- 9.2 Rectangular duct, by others
- 10.1 Spring return actuator
- 10.12 Duct smoke detector RM-O-3-D (Fastening in the rectangular duct)
- 10.13 Thermoelectric release mechanism with temperature sensor

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. The spring return actuator closes the fire damper when one of the following events occur:

- 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)
- The duct smoke detector must be installed in a rectangular duct at the top by the others, see Fig. 8.

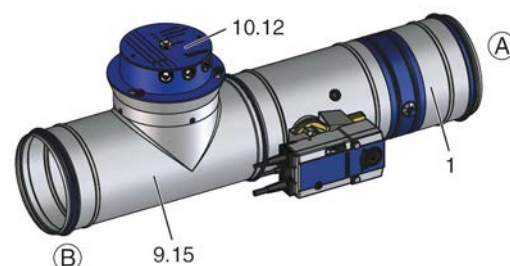


GR3479819, A

Fig. 8: FKRS-EU with spring return actuator and duct smoke detector in a rectangular duct

- 1 FKRS-EU
- 9.2 Rectangular duct, by others
- 10.12 Duct smoke detector

- Alternatively, the duct smoke detector must be arranged in a circular duct, by others, in a T-piece at the top, see Fig. 9.



GR3622853, A

Fig. 9: FKRS-EU with spring return actuator and duct smoke detector in a circular duct

- 1 FKRS-EU
- 9.15 T-piece or saddle connector, by others
- 10.12 Duct smoke detector

4.4 FKRS-EU with fusible link and cover grille used as an air transfer unit

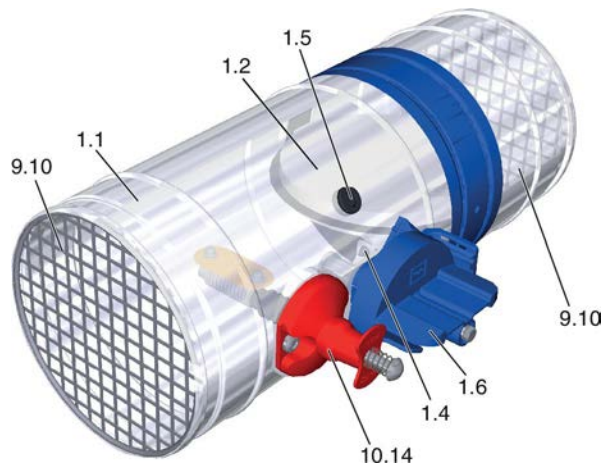


Fig. 10: FKRS-EU with fusible link and cover grille used as an air transfer unit

- 1.1 Casing
- 1.2 Damper blade with seal
- 1.4 Travel stop for CLOSED position
- 1.5 Inspection access (12 mm)
- 1.6 Handle/damper blade position indicator
- 9.10 Cover grille
- 10.14 Thermal release mechanism with fusible link

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.

The air transfer unit consists of the FKRS-EU fire damper with a thermal release mechanism for 72 °C and with cover grilles on both sides, but without a duct smoke detector.

The following applies to Germany:

If fire dampers with a purely mechanical shut-off element are to be used as an air transfer unit, the local building regulations must be observed. As a rule, the use of such air transfer units is limited to pressure ventilation systems.

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.

Installation situations						
Supporting construction	Installation location	Minimum thickness [mm]	Class of performance EI TT (v _e -h _o , i ↔ o) S up to	Installation type	Installation information	
Solid walls	in	100	EI 120 S	N	☞ 41	
		100	EI 90 S	N	☞ 41	
	in, combined assembly	100	EI 90 S	N	☞ 42	
	in, multiple mounting	100	EI 90 S	N	☞ 43	
	in, partly with mineral wool	100	EI 120 S	N	☞ 44	
	in, underneath flexible ceiling joint	100	EI 90 S	N	☞ 45	
	in, installation block ER	100	EI 90 S	E	☞ 46	
	in, installation kit TQ / TQ2	100	EI 120 S	E	☞ 47	
	on the face of, installation kit WA / WA2	100	EI 90 S	E	☞ 48	
	remote from, wall attachment, installation kit WE / WE2	100	EI 120 S	E	☞ 49	
	remote from, wall penetration, installation kit WE / WE2	100	EI 120 S	E	☞ 53	
	remote from, mineral wool insulation	100	EI 60 S	T	☞ 58	
	in, fire batt	100	EI 120 S	W ¹	☞ 59	
		100	EI 90 S	W ¹	☞ 59	
		in, combined penetration seal	100	EI 90 S	W ¹	☞ 30
		in, fire protection block bulk-head	100	EI 90 S	T	☞ 31
Metal stud walls	in	94	EI 120 S	N ¹	☞ 67	
		94	EI 90 S	N ¹	☞ 67	
		80	EI 60 S	N ¹	☞ 67	
		75	EI 30 S	N ¹	☞ 68	

¹⁾ The class of performance depends on the installation details

²⁾ Thickness increased near the installation opening

³⁾ Cadolto system

⁴⁾ Depending on local conditions

N = Mortar-based installation

E = Installation kit

W = Fire batt

T = Dry mortarless installation

Installation situations						
Supporting construction	Installation location	Minimum thickness [mm]	Class of performance EI TT (v _e -h _o , i ↔ o) S up to	Installation type	Installation information	
	in, combined assembly	94	EI 90 S	N ¹	☞ 70	
	in, without installation kit	94	EI 60 S	T	☞ 72	
	in, installation kit TQ / TQ2		94	EI 120 S	E ¹	☞ 73
			94	EI 90 S	E ¹	☞ 73
			80	EI 60 S	E ¹	☞ 73
			75	EI 30 S	E	☞ 73
	remote from, installation kit WE / WE2	94	EI 90 S	E	☞ 77	
	remote from, mineral wool insulation	130	EI 60 S	T	☞ 81	
	in, direct installation, installation kit GL / GL2	94	EI 90 S	T	☞ 82	
	in, flexible ceiling joint, installation kit GL / GL2	100	EI 90 S	E	☞ 83	
	in, fire batt		94	EI 120 S	W ¹	☞ 84
			94	EI 90 S	W ¹	☞ 84
			80	EI 60 S	W ¹	☞ 84
			75	EI 30 S	W ¹	☞ 84
	in, combined penetration seal	100	EI 90 S	W ¹	☞ 30	
in, fire protection block bulk-head	100 – 200	EI 90 S	T	☞ 31		
Timber stud walls	in	130	EI 120 S	N	☞ 91	
		130	EI 90 S	N	☞ 91	
		110	EI 60 S	N	☞ 91	
		105	EI 30 S	N	☞ 91	
	in, installation kit TQ / TQ2		130	EI 120 S	E	☞ 95
			110	EI 60 S	E	☞ 95
			105	EI 30 S	E	☞ 95
	remote from, mineral wool insulation	130	EI 60 S	T	☞ 97	
	in, fire batt		130	EI 120 S	W	☞ 99
			130	EI 90 S	W	☞ 99
			110	EI 60 S	W	☞ 99
			105	EI 30 S	W	☞ 99

¹⁾ The class of performance depends on the installation details

²⁾ Thickness increased near the installation opening

³⁾ Cadolto system

⁴⁾ Depending on local conditions

N = Mortar-based installation

E = Installation kit

W = Fire batt

T = Dry mortarless installation

Installation situations					
Supporting construction	Installation location	Minimum thickness [mm]	Class of performance EI TT (v _e -h _o , i ↔ o) S up to	Installation type	Installation information
	in, combined penetration seal	100	EI 90 S	W ¹	☞ 30
	in, fire protection block bulk-head	100 – 200	EI 90 S	T	☞ 31
Half-timbered constructions	in	140	EI 120 S	N	☞ 93
		140	EI 90 S	N	☞ 93
		110	EI 30 S	N	☞ 93
	in, installation kit TQ / TQ2	140	EI 120 S	E	☞ 96
		140	EI 90 S	E	☞ 96
		110	EI 30 S	E	☞ 96
	remote from, mineral wool insulation	140	EI 60 S	T	☞ 97
	in, fire batt	140	EI 120 S	W	☞ 103
		140	EI 90 S	W	☞ 103
		110	EI 30 S	W	☞ 103
	in, combined penetration seal	100	EI 90 S	W ¹	☞ 30
in, fire protection block bulk-head	100 – 200	EI 90 S	T	☞ 31	
Solid wood / cross laminated timber walls	in	95	EI 90 S	N	☞ 107
	in, installation kit TQ / TQ2	95	EI 90 S	E	☞ 109
	remote from, mineral wool insulation	95	EI 60 S	T	☞ 110
	in, fire batt	95	EI 30 S	W	☞ 111
	in, combined penetration seal	100	EI 90 S	W	☞ 30
	in, fire protection block bulk-head	100 – 200	EI 90 S	T	☞ 31
Shaft wall with metal support structure	in	90	EI 90 S	N	☞ 115
		90	EI 30 S	N	☞ 115
	in, combined assembly	90	EI 90 S	N	☞ 118
	in, installation kit TQ / TQ2	90	EI 90 S	E	☞ 119
	on, installation kit WA / WA2	90	EI 90 S	E	☞ 120
Shaft wall without metal support structure	in, installation kit TQ / TQ2	90	EI 90 S	E	☞ 122
	on, installation kit WA / WA2	90	EI 90 S	E	☞ 123
Sandwich panel walls	in	100 – 200	EI 90 S	T	☞ 124

¹⁾ The class of performance depends on the installation details

²⁾ Thickness increased near the installation opening

³⁾ Cadolto system

⁴⁾ Depending on local conditions

N = Mortar-based installation

E = Installation kit

W = Fire batt

T = Dry mortarless installation

Installation situations					
Supporting construction	Installation location	Minimum thickness [mm]	Class of performance EI TT (v _e -h _o , i ↔ o) S up to	Installation type	Installation information
	in, fire protection block bulk-head	100 – 200	EI 90 S	T	↳ 125
Solid ceiling slabs	in	100 (150) ²	EI 120 S	N	↳ 127
	in, with concrete base	100	EI 90 S	N	↳ 129
	in, with concrete base, multiple mounting	100	EI 90 S	N	↳ 130
	in, with concrete base, combined assembly	100	EI 90 S	N	↳ 131
	in, hollow stone ceilings	150	EI 90 S	N	↳ 133
	in, hollow chamber ceilings	150	EI 90 S	N	↳ 134
	in, ribbed ceilings	150 ²	EI 90 S	N	↳ 135
	in, composite ceilings	150	EI 90 S	N	↳ 136
	in, combined with wooden beam ceilings	150	EI 90 S	N	↳ 137
	in, combined solid wood ceiling	150	EI 90 S	N	↳ 138
	in, combined lightweight ceiling ³	150	EI 120 S	N	↳ 139
	in, installation block ER	100 (150) ²	EI 90 S	E	↳ 140
	underneath (horizontal duct), installation kit WE / WE2	125	EI 120 S	E	↳ 141
	above (horizontal duct), installation kit WE / WE2	125	EI 120 S	E	↳ 141
	in, fire batt	100 (150) ²	EI 120 S	W ¹	↳ 144
100 (150) ²		EI 90 S	W ¹	↳ 144	
Solid wood ceilings	in	140	EI 90 S	N	↳ 146
		112.5	EI 90 S	N	↳ 146
	in, installation kit TQ / TQ2	140	EI 90 S	E	↳ 147
		112.5	EI 90 S	E	↳ 147
Wooden beam ceilings	in	167.5	EI 90 S	N	↳ 148
		155	EI 60 S	N	↳ 148
		142.5	EI 30 S	N	↳ 148
	in, installation kit TQ / TQ2	167.5	EI 90 S	E	↳ 150
		155	EI 60 S	E	↳ 150

¹⁾ The class of performance depends on the installation details

²⁾ Thickness increased near the installation opening

³⁾ Cadolto system

⁴⁾ Depending on local conditions

N = Mortar-based installation

E = Installation kit

W = Fire batt

T = Dry mortarless installation

Installation situations					
Supporting construction	Installation location	Minimum thickness [mm]	Class of performance EI TT (v _e -h _o , i ↔ o) S up to	Installation type	Installation information
		142.5	EI 30 S	E	🔗 150
	in, historical wooden beam ceilings	– ⁴	EI 30 S	N	🔗 152

¹⁾ The class of performance depends on the installation details

²⁾ Thickness increased near the installation opening

³⁾ Cadolto system

⁴⁾ Depending on local conditions

N = Mortar-based installation

E = Installation kit

W = Fire batt

T = Dry mortarless installation

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.

- Before installation: Perform a functional test, then close the fire damper 🔗 160.
- The adhesive tape in the installation area must NOT be removed.
- Protect the fire damper from humidity and condensation as they will damage the fire damper.
- The construction variants with stainless steel or powder-coated casing and additionally with an impregnated damper blade meet more critical requirements for corrosion protection.
- When installing the FKRS-EU, the statics of the supporting construction (wall / ceiling) must be ensured by others, even in the event of a fire.
- Unless stated otherwise for a particular installation situation:
 - Each fire damper must be installed in a separate installation opening. The distance between two fire dampers is ≥ 200 mm.
 - The distance from load-bearing structural elements is ≥ 75 mm.
 - A maximum of two fire dampers must be installed in a single installation opening.
 - Fire dampers are allowed to be in mortar-based installation at a distance of ≥ 40 mm from steel beams, wooden beams or wooden ceilings with fire protection claddings.
- If several fire dampers are used on the same duct, the following has to be ensured: If one damper closes, the maximum permitted upstream velocity for the other fire dampers that remain open must not be exceeded. This has to be ensured by others; it can be ensured, for example, by switching off the fan or by using actuators with limit switches that ensure that not too many dampers close at the same time.

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) to protect them from mortar and dripping water.
 - Do not remove the transport and installation protection (if any) until installation is complete.
- 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. Ducts of combustible or non-combustible materials may be connected to fire dampers if the ducts have been installed straight and without any torsion.

- As ducts may expand and exert forces, and walls may become deformed, in the event of a fire, we recommend using flexible connectors for the following installation situations:
 - Lightweight partition walls
 - Lightweight shaft walls
 - Installation into fire batt and HILTI CFS-BL fire stop block

The flexible connectors should be installed in such a way that they absorb both tension and compression. Flexible ducts can be used as an alternative.

Ducting must be installed in such a way that it does not impose any significant loads on the fire damper in the event of a fire. This can be achieved by a non-straight duct, i.e. by bends or elbows, for example. Be sure to comply with the relevant national guidelines and regulations.

- The interior of the fire damper must be accessible for maintenance work and cleaning. For this purpose, Type FKRS-EU fire dampers have an inspection access that is closed with a rubber stopper ☞ 15. Depending on the installation configuration it may be necessary to provide additional inspection access points in the connecting ducts. As an alternative to the inspection access, we recommend connecting the duct using flexible connectors (fastened with hose clamp) or sliding connectors.
- Load-bearing components
Solid ceiling slabs and concrete beams as well as load-bearing solid walls are called load-bearing components.

After installation

- Clean the fire damper if required.
- Fire dampers of nominal size 315 mm and without installation block are shipped with a transport and installation protection. In case of mortar-based installation this protection must not be removed until the mortar has hardened. To remove the transport/installation protection, pull it out of the fire damper on the operating side.
- Test the function of the fire damper.
- Make electrical connections.

Connecting duct and extension piece

It is possible to insert screws near the spigot for fixing.

Equipotential bonding

The equipotential bonding is fixed, for example, with suitable clamps. Alternatively, it is allowable for drilled holes to be made near the spigot.

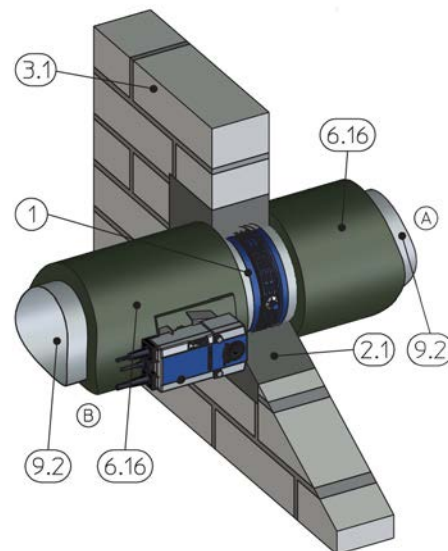
In the event of a fire, loads from the equipotential bonding must not affect the fire damper.

Thermal insulation

When using thermal insulation, especially for outside or exhaust air, fully bonded panel insulation materials made of elastomeric foams (synthetic rubber) of fire rating class B - S3,D0 can be used (e.g. AF / Armaflex or Armaflex Ultima from Armacell). Be sure to comply with the relevant national guidelines and regulations for combustible building materials and smoke formation classes.

Insulation is non-hazardous in terms of fire safety if the following requirements are met:

- the insulation does not impair the function of the fire damper,
- The fire damper remains accessible.
- the inspection accesses and the rating plate are accessible and
- The insulation does not penetrate walls or ceilings.



GR3287862

Fig. 11: Thermal insulation

- 1 FKRS-EU
- 2.1 Mortar
- 3.1 Solid wall
- 6.16 Insulation (elastomeric foam, flame-resistant, non-dripping), around the perimeter, actuator and release mechanism as well as inspection accesses must be accessible
- 9.2 Extension piece or duct

Note: The installation situation shown is representative of all supporting constructions.

The following applies to Germany:

For notes on the use of elastomeric foams, see ☞ 7. In Germany, only insulation materials of smoke formation class "s2" are to be used, according to the specifications of MVV TB (2019/1). This requirement is met by Armaflex Ultima insulation material from Armacell, for example. The applicable local building regulations must be observed.

General installation information

Extension pieces

To ensure that the fire damper can be connected to the ducting after installation even if the wall or ceiling is fairly thick, the fire damper should be extended with a suitable extension piece (attachment or extension by others) on the installation side, see also extension pieces ↻ 158.

Installation positions

The fire damper can be installed with the damper blade shaft in any position (0 to 360°). The position of the release mechanism is not critical but the mechanism must remain accessible for maintenance.

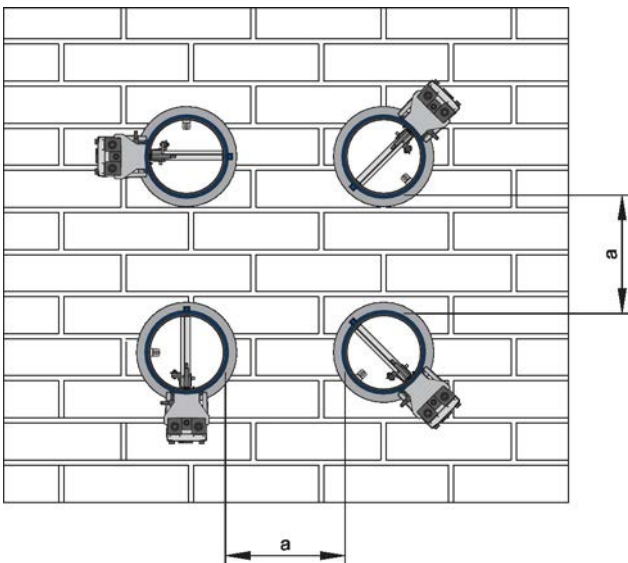


Fig. 12: Installation positions and distances

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

If a duct smoke detector is installed in the connected duct, it must be arranged at the top (deviations on request, independent of the installation position of the fire damper).

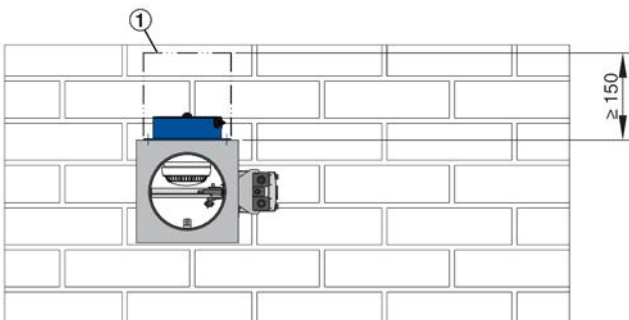
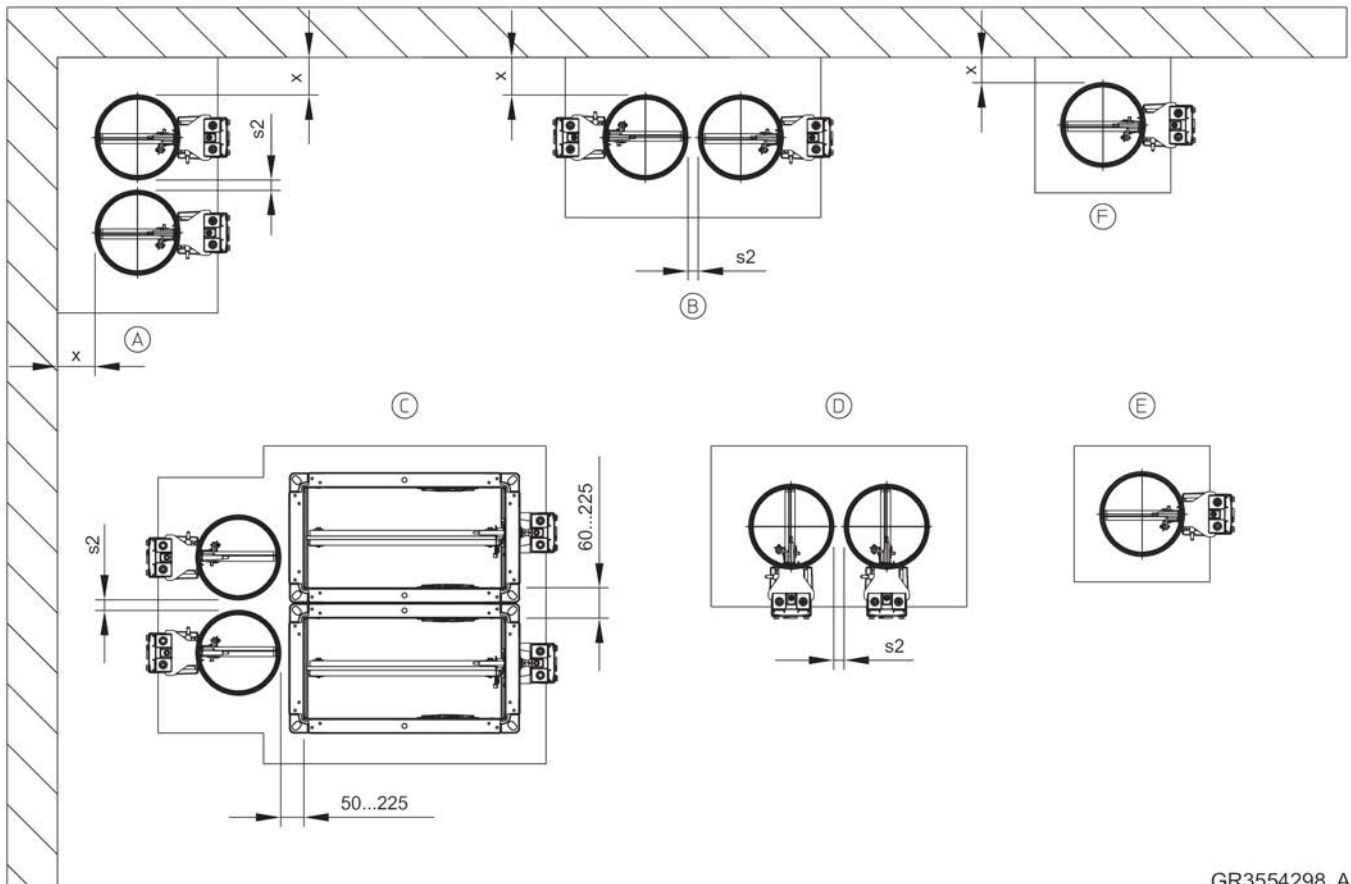


Fig. 13: Any installation position (0 – 360°), duct smoke detector always at top

- 1 Keep clear to provide access for operation

Distances



GR3554298, A

Fig. 14: Overview of distances

- x Distance to load-bearing components (solid walls and ceiling slabs, concrete beams as well as steel girders, wooden beams and solid wood ceilings with fire-rated cladding)
- s2 Distance between the fire dampers

Note: Distances are valid unless otherwise specified in the respective installation details.

Installation type	x [mm]	s2 [mm]
Mortar-based installation	40 – 225	10 ³ – 225
Mortar-based installation with partial mortaring ⁴	40 – 50	40 – 225
Dry mortarless installation with installation block ER ^{1, 2}	≥ 75 ⁶	≥ 200 ⁶
Dry mortarless installation with installation kit TQ / TQ2 ^{1, 2}	100 / 55 ⁵	≥ 200
Dry mortarless installation with installation kit WA / WA2	≥ 75	≥ 200
Dry mortarless installation with fire batt	40 – 600	10 ³ – 600

¹ See "Installation openings" table under the respective installation details

² Installation into separate installation openings

³ Minimum distance depending on fire resistance duration and supporting construction. Supporting construction, see ↪ 26

⁴ Solid wall only

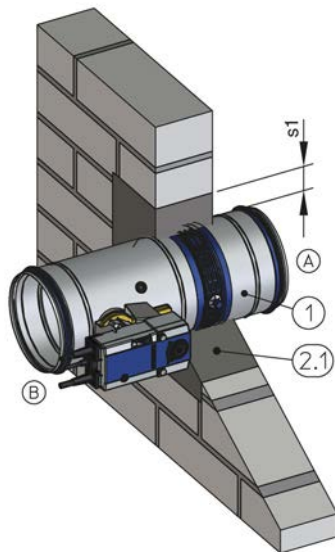
⁵ With shortened cover plate

⁶ Distance between installation block(s)

Supporting construction	Installation type		
	Mortar-based installation	Dry mortarless installation	Fire batt installation
Solid wall	A – F	E	A, B, D – F
Lightweight partition wall with metal support	A – F	E, F	A, B, D – F
Timber support structure / half-timbered construction	A, B, D – F	E, F	A, B, D – F
Solid wood wall / cross-laminated timber wall	A, B, D – F	E, F	E, F
Shaft wall	B – F	E, F	
Solid ceiling slab, hollow chamber ceiling, hollow stone ceiling, composite ceiling, ribbed ceiling	A, B, D – F	E, F	E, F
Lightweight ceiling (Cadolto system)	A, B, D – F		
Solid wood ceiling	A, B, D – F		
Wooden beam ceiling	A, B, D – F		

Perimeter gap »s1«

- With mortar-based installation the perimeter gap »s1« must not exceed 225 mm (wall and ceiling). The perimeter gap »s« must be large enough so that mortar can be filled in even in case of thicker walls or ceilings. Be sure to close larger wall openings or holes beforehand and in a suitable way, i.e. depending on the type of wall. When there are larger openings in the solid ceiling slabs, the dampers must be encased in concrete when the ceiling section is created. The gap must be large enough so that mortar can be filled in. We recommend a gap of at least 20 mm (note the minimum installation opening size). Reinforcement should meet structural requirements.



GR1680245, D

Fig. 15: Perimeter gap

- 1 FKRS-EU
2.1 Mortar
s1 Perimeter gap

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.

Mortar-based installation

- Cover all openings and control elements of the fire damper (e.g. with plastic) to protect them from contamination.
- If the wall thickness is >115 mm, extend the fire damper on the installation side with an extension piece or a spiral duct.
- 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.
- If you install the fire damper as the solid wall or ceiling slab is being completed, perimeter gap »s1« is not required. The open spaces between the fire damper and the wall must be closed off with mortar; for installation into solid ceiling slabs, concrete can be used. Reinforcements should meet structural requirements.
- The mortar bed depth should be equal to the thickness of the wall. If trim panels with appropriate fire resistance are used, a mortar bed depth of 100 mm suffices.

Mortar

- 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

Mineral wool as filling material

Unless otherwise stated in the installation details, mineral wool with a gross density of $\geq 80 \text{ kg/m}^3$ and a melting point of $\geq 1000 \text{ °C}$ must be used.

Fire-resistant cladding

When you use installation kit WE / WE2, the following materials are acceptable for the cladding of fire dampers and ducts:

- Promatect® LS35
- Promatect® L500
- Promatect® AD40

Paroc mineral wool

Paroc Hvac Fire Mat 80BLC (80 kg/m³)

General installation information

Installation with installation block / installation kit

- For installation without mortar-mix, installation blocks or installation kits can be used:
 - in walls and ceiling slabs: ER, TQ / TQ2
 - on walls: WA / WA2
 - remote from walls and ceiling slabs: WE / WE2

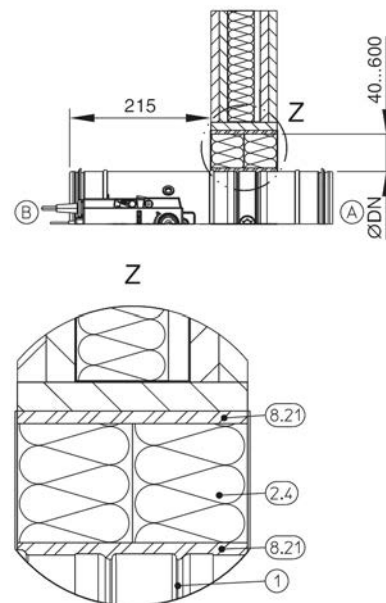
If required, the installation kits must be assembled by others in accordance with the planned use. The installation kits are fixed according to the installation details. In lightweight partition walls, the fixing screws must always be screwed into the metal support structure / wood support structure. The dry wall screws must be long enough so that the damper can be firmly fastened.

- **Installation block ER, installation kit TQ / TQ2**
 - The installation block and the installation kits are always installed centred in the installation opening.
 - Circular installation opening ER: $\varnothing D1$, see ☞ 34
 - Square installation opening TQ / TQ2: DN + 110 mm
 - If specified in the installation details, the cover plates of the installation kits TQ / TQ2 can be proficiently shortened on one side for installation near the ceiling and floor.
- **Installation kit WE / WE2**
 - Installation is carried out on sheet steel ducts without any openings, with fire-resistant cladding.
 - If Promat building materials are used, the wall / ceiling connections must be clad in accordance with this manual and the supplementary installation manual WE / WE2. Fittings must be configured according to Promat® specifications.
 - If building materials from Paroc are used, the wall connections must be made according to this manual. Fittings must be configured according to Paroc specifications.
 - Enough clear space is required to attach the installation kit to the fire damper.
 - Fire dampers remote from walls and ceiling slabs must be suspended or fixed. Suspension systems with $L \geq 1.5$ m require fire-resistant insulation. This is done with panel materials or mineral wool insulation according to the respective manufacturer's specifications.
 - For more installation details and for components to be provided by others, see the supplementary installation manual WE / WE2.

Installation with fire batt

- The distance from the operating side spigot to the wall has to be 215 mm for installation into fire batt systems.
- Fire batt systems consist of two layers of mineral wool slabs, gross density ≥ 140 kg/m³.

- Apply fire-resistant sealant to the cut faces of the mineral wool slabs and fit them tightly into the installation opening. Seal any gaps between the mineral wool slabs and the installation opening, gaps between the cut faces of cut-to-size pieces, and gaps between slabs and the fire damper by applying fire-resistant sealant or coating. Use only sealant or coating that is suitable for the fire batt system.
- Apply ablative coating to the mineral wool slabs, joints, transitions and any imperfections on the coated mineral wool slabs; coating thickness ≥ 2.5 mm.
- Depending on the selected installation situation and fire resistance duration, the fire damper casings must be partially coated, thickness ≥ 2.5 mm. The actuator and release unit must not be coated. Permitted alternatives:
 - Mineral wool strips > 1000 °C, > 80 kg/m³, thickness = 20 mm
 - Sleeves (can be ordered separately)
 - Elastomer foam strips (flame-resistant, non-dripping)
 The following applies in Germany: For notes on the use of elastomeric foams, see ☞ 7.
- Fix fire dampers on both sides of the wall, see ☞ 154.
- If the wall/ceiling is fairly thick, you must use additional layers of mineral wool slabs on side A.
- Fire batt systems are not suitable for use below flexible ceiling joints.



GR3376159, A

Fig. 16: Fire-resistant sealant

- 1 FKRS-EU
- 2.4 Fire batt with ablative coating
- 8.21 Fire-resistant sealant

Fire batt systems

The following fire batt systems are acceptable (fire batt systems have to be provided by others). As for mineral wool slabs, all slabs that are part of the system and have been approved by the manufacturer may be used.

Promat®

- Ablative coating Promastop®-CC
- Ablative coating Promastop®-I
- Ablative coating Intumex-CSP
- Ablative coating Intumex-AC

Hilti

- Ablative coating CFS-CT
- Ablative coating CP 673
- Fire-resistant sealant CFS-S ACR

HENSEL

- Ablative coating HENSOMASTIK® 5 KS Farbe
- Fire-resistant sealant HENSOMASTIK® 5 KS Spachtel

SVT

- Ablative coating PYRO-SAFE FLAMMOTECT-A Farbe
- Fire-resistant sealant PYRO-SAFE FLAMMOTECT-A Spachtel

OBO Bettermann

- Ablative coating PYROCOAT® ASX Farbe
- Fire-resistant sealant PYROCOAT® ASX Spachtel

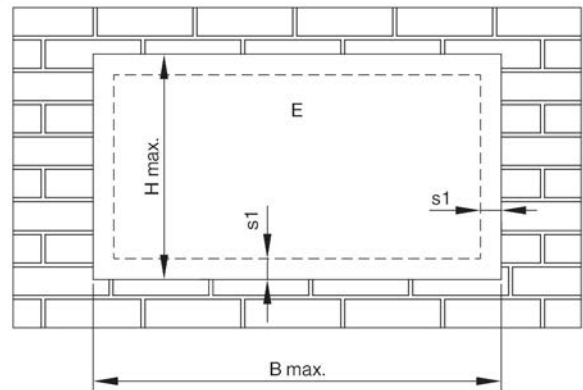
Würth

- Ablative coating Würth Ablationsbeschichtung I ('Ablation coating I')

AGI

- Ablative coating PYRO-SAFE Flammotect Combi S90
- Fire-resistant sealant AGI Flammotect COMBI S90

Fire batt system	B max. [mm]	H max. [mm]
SVT		
OBO Bettermann		
Würth		
AGI		



GR3420162

Fig. 17: Fire batt – installation in a solid wall, lightweight partition wall or timber stud wall

E Installation area

Dimensions and distances for fire batt systems for wall installation

Damper combination up to EI 90 S	s1 min. [mm]	s1 max. [mm]
FKRS-EU	40	600

Fire batt system	B max. [mm]	H max. [mm]
Promat®	≤ 3750	≤ 1840
Hilti	≤ 3000	≤ 2115
Hensel	≤ 1900	≤ 1400

General installation information

Installation into combined penetration seal

- Mixed installation of fire dampers FK-EU and FKRS-EU together with cables and tubes in a fire batt system: Hilti-CFS-CT, CP 670 and CP 673.
- Installation is in solid walls, lightweight partition walls with metal or timber support structure and solid wood / cross-laminated timber.
- The maximum penetration seal dimensions $B1 \times H1 = 3000 \times 2000$ mm.
The penetration seal size depends on the configuration, see the separate installation and operating manual for the combined penetration seal.
- The minimum distance between the casings of the FKRS-EU is ≥ 40 mm.
- The minimum distance between fire damper casing and cable penetrations is ≥ 100 mm.
- The minimum distance between fire damper casing and pipe penetrations is ≥ 50 mm.
- Distance from FKRS-EU to fire dampers FK-EU ≥ 50 mm.
- The position of the fire dampers, tubes and cable in the combined penetration seal is irrelevant, but must comply with the specified minimum distances.
- Fire dampers, cable, cable bundles, cable trays, conduits and plastic pipes can be laid individually or in multiples.
- The fire dampers must be suspended on both sides, see ↪ 154

- 1a FKRS-EU with ablative coating around the perimeter, thickness = min. 2.5 mm
Alternatively:
 - Mineral wool > 1000 °C,
 - > 80 kg/m³, thickness = 20 mm
 - Sleeve (can be ordered separately)
 - Elastomeric foam (flame-resistant, non-dripping, see ↪ 7)
- 1b FK-EU
- 2.4 Fire batt with ablative coating
- 3.2 Solid wall, lightweight partition wall with metal or timber support structure (cladding on both sides), solid wood or cross-laminated timber
- 6.5 Mineral wool (depending on wall construction)
- 7.10 Trim panels
- 7.13 Cladding, fire-resistant, also with sheet steel insert
- 11.1 Cable tray
- 11.2 Cable set
- 11.3 Pipe collar
- 11.6 Cable penetration

If this fire damper is used in Germany:

- Use in the combined penetration seal in Germany requires official approval by others.
- Hilti provides additional information on cable and pipe penetrations and the fire batt system.

Note: Further information about the combined penetration seal is provided in the installation and operating manual for the combined penetration seal.

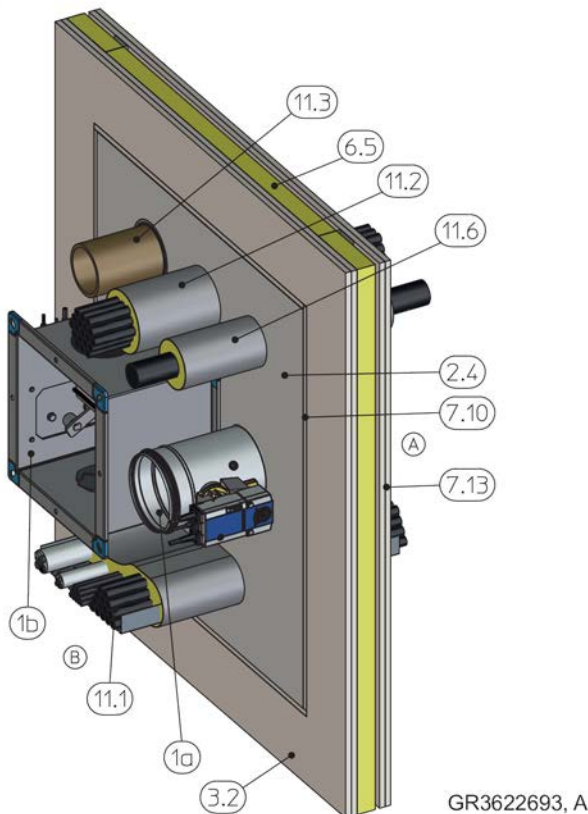


Fig. 18: Combined penetration seal

Installation into fire protection block bulkhead

- Combinations of fire dampers FKRS-EU with cable and cable trays in one fire protection block system: Hilti CFS-BL.
- Installation is in solid walls, lightweight partition walls with metal or timber support structure (cladding on both sides), solid wood / cross-laminated timber and sandwich panel walls.
- The maximum penetration seal dimensions $B1 \times H1 = 1000 \times 1000$ mm. The penetration seal size depends on the configuration, see the separate installation and operating manual for the fire protection block bulkhead.
- The minimum distance between the casings of the fire dampers and the cable penetrations is ≥ 200 mm.
- The minimum distance between the fire damper and the penetration seal is 50 mm.
- The position of the fire dampers and cables in the fire protection block seal is irrelevant, but must comply with the specified minimum distances.
- Fire dampers, cable, cable bundles and cable trays can be laid individually or in multiples.
- The fire dampers must be suspended on both sides, see ↪ 154

Alternatively:

- Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm
- Sleeve (can be ordered separately)
- Elastomeric foam (flame-resistant, non-dripping, see ↪ 7)

- 2.17 Fire protection block Hilti CFS-BL
- 3.2 Lightweight partition wall with metal support structure, cladding on both sides
- 7.10 Trim panels, double layer, fire-resistant
- 11.1 Cable tray
- 11.2 Cable set

If this fire damper is used in Germany:

- Use in fire protection block bulkheads in Germany requires official approval by others.
- Hilti company provides additional information on the cable penetrations and the fire protection block CFS-BL.

Note: Further information about the fire protection block bulkhead is provided in the installation and operating manual for the fire protection block bulkhead.

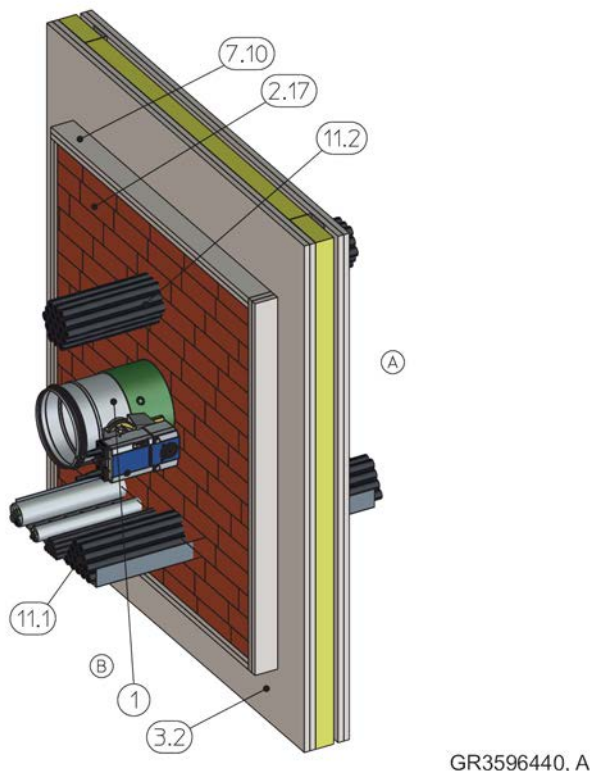


Fig. 19: Fire protection block bulkhead

- 1 FKRS-EU with ablative coating around the perimeter, thickness = min. 2.5 mm

Requirements for wall and ceiling systems

FKRS-EU fire dampers must be installed in wall and ceiling systems if these walls and ceiling slabs have been erected in compliance with the relevant regulations and according to the manufacturers' instructions, and if the information on the respective installation situation applies and the following requirements are met.

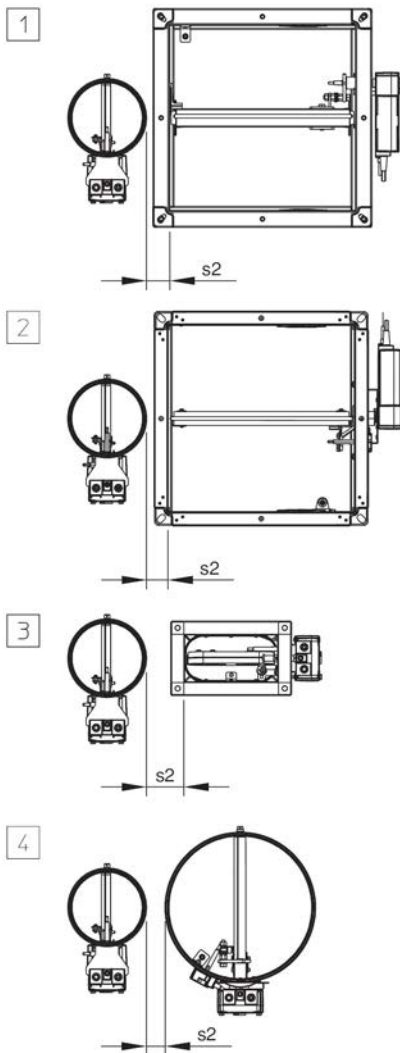
Provide any installation openings according to the installation details in this manual.

Solid walls

- 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 $\geq 350 \text{ kg/m}^3$.
- Wall thickness $W \geq 100 \text{ mm}$.
- Provide each installation opening and core drilled holes according to the local and structural conditions and with regard to the dimensions of the fire damper.

Distance between different TROX fire dampers – mortar-based installation into solid walls

Item no.	Damper combination up to EI 90 S	s2 [mm]
1	FKRS-EU – FK-EU	≥ 50
2	FKRS-EU – FK2-EU	≥ 50
3	FKRS-EU – FKS-EU	≥ 80
4	FKRS-EU – FKR-EU	≥ 40



GR3375347, C

Fig. 20: Distance from the FKRS-EU to other TROX fire dampers in mortar-based installation

Lightweight partition walls with metal support structure

- Lightweight partition walls, safety partition walls or walls to provide radiation protection, with metal support structure or steel support structure, with European classification to EN 13501-2 or equivalent national classification.
- Cladding on both sides made of gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards.
- Wall thickness $W \geq 94 \text{ mm}$, for compartment walls or safety partition walls $W \geq 100 \text{ mm}$.
- Distance between metal support structures $\leq 625 \text{ mm}$; distance between metal support structures in compartment walls $\leq 312.5 \text{ mm}$.
- Compartment walls and safety partition walls may be provided with sheet steel inserts and may require less space between the metal studs.
- Create an installation opening with trimmers (studs and noggings).
- If necessary, provide trim panels and screw-fix them to the support structure
- Additional layers of cladding (if stated in the usability certificate for the wall) and double stud constructions are approved.
- Connect the metal sections near the installation opening according to the installation details in this manual.
- If reinforcing boards are required, they must be screwed to the metal support structure at intervals of approx. 100 mm.

Lightweight partition walls with timber support structure / half-timbered construction

- Lightweight partition walls, either timber stud walls or half-timbered constructions, 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 boards.
- Wall thickness $W \geq 130$ mm ($W \geq 105$ for F30); wall thickness of half-timbered constructions $W \geq 140$ mm.
- Erect the timber support structure or half-timbered construction according to the manufacturer's instructions.
- Additional layers of cladding (if stated in the usability certificate for the wall) and double stud constructions are approved.
- Create an opening in the timber support structure with studs and trimmers.
- Trim panels and reinforcing boards have to be made of cladding material and have to be fixed to the frame.

Solid wood walls

- Fire-resistant solid wood walls or cross laminated timber walls with European or national certificate.
- Wall thickness $W \geq 95$ mm (with reinforcing board $W \geq 100$ mm near the installation opening).
- If required, additional gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum board are permitted.

Shaft walls with metal support structure

- Shaft walls or additional leaves with metal support structure or steel support structure, with European classification to EN 13501-2 or equivalent national classification.
- Cladding on one side made of gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards.
- Wall thickness $W \geq 90$ mm (cladding / reinforcing boards according to installation details).
- ≤ 625 mm distance between metal studs.
- Be sure to follow the manufacturers' instructions for the height, width and thickness of walls.
- Create an installation opening with trimmers (studs and noggings).
- If necessary, provide trim panels and screw-fix them to the support structure
- Installation is carried out with the actuator on the outside of the shaft.
- If reinforcing boards are required, they must be screwed to the metal support structure at intervals of approx. 100 mm.

Shaft walls without metal support structure

- Shaft walls without metal support structure, 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, fibre-reinforced gypsum or fire-rated calcium silicate boards.
- Wall thickness $W \geq 50$ mm.
- If reinforcing boards are required, they must be screwed on at intervals of approx. 100 mm.

Sandwich panel walls

- Sandwich panel wall consisting of self-supporting sandwich panels / sandwich boards
- Sheet steel ≥ 0.5 mm, both sides, mineral wool fill, ≥ 1000 °C, ≥ 150 kg/m³
- Wall thickness ≥ 100 mm – 200 mm

Solid ceiling slabs

- Solid ceiling slabs without open spaces, made of concrete or aerated concrete, gross density ≥ 450 kg/m³.
- Ceiling thickness $D \geq 100$ mm, thickness increased to $D \geq 150$ mm.
- Partial solid ceiling slab thickness ≥ 150 mm as combination with fire-resistant wooden beam ceilings (gluelam also), solid wood ceilings and lightweight ceilings (Cadolto module ceiling system only).
- Provide each installation opening and core drilled holes according to the local and structural conditions and with regard to the dimensions of the fire damper.
- Other ceiling types:
 - Hollow stone ceilings, $D \geq 150$ mm
 - Hollow chamber ceilings, $D \geq 150$ mm
 - Ribbed ceilings, thickness increased to $D \geq 150$ mm
 - Composite ceilings, $D \geq 150$ mm

Solid wood ceilings

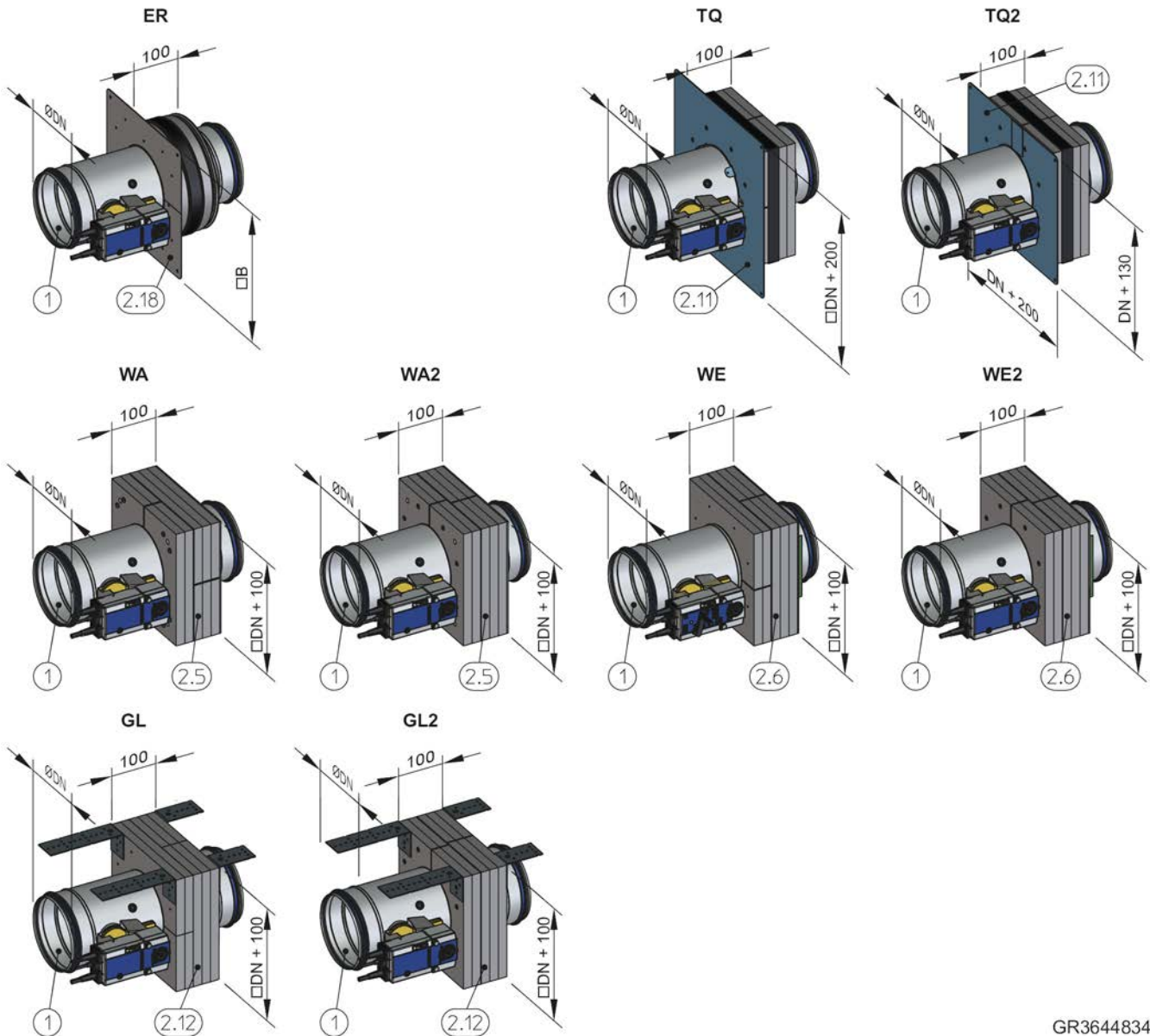
- Solid wood or cross-laminated timber ceilings.
- Ceiling thickness $D \geq 140$ mm or $D \geq 112.5$ mm with supplementary fire-resistant cladding.

Wooden beam ceilings

- Wooden beam or gluelam construction.
- Ceiling thickness $D \geq 142.5$ mm (ceiling-dependent) with supplementary fire-resistant cladding.
- Historical wooden beam ceilings F30.

5.3.1 Installation block and installation kits

5.3.1.1 Overview of installation block and installation kits



GR3644834, A

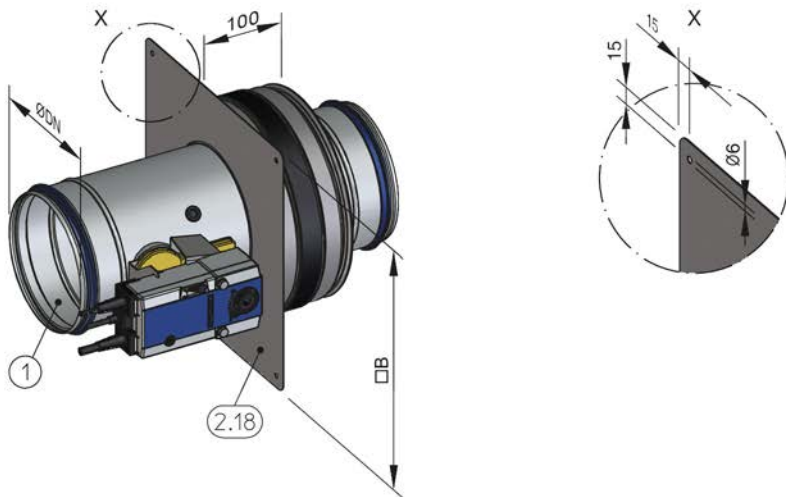
Fig. 21: Overview of installation block and installation kits

- | | | | |
|-----|---------------------------|------|--|
| 1 | FKRS-EU | 2.11 | Installation kit TQ / TQ2 |
| 2.5 | Installation kit WA / WA2 | 2.12 | Installation kit GL / GL2 |
| 2.6 | Installation kit WE / WE2 | 2.18 | Installation block ER with cover plate |

5.3.1.2 Installation block ER

Installation block ER for dry mortarless installation into cut holes in solid walls and ceiling slabs

- The installation block ER is an integral component of the fire damper and must be ordered together with the damper.



GR3644834, A

Fig. 22: Supply package and installation of installation block ER for dry mortarless installation

- 1 FKRS-EU
- 2.18 Installation block ER with cover plate

Installation opening/cover plate dimensions [mm]										
Nominal size	100	125	150	160	180	200	224	250	280	315
ØD1*	200	250	250	250	300	300	350	350	400	400
□B	250	300	300	300	350	350	400	400	450	450

Installation opening tolerance ±2 mm

* Diameter of the core drill hole in solid walls and ceiling slabs

5.3.1.3 Installation kit TQ / TQ2

Installation kit TQ / TQ2 for dry mortarless installation into walls

- The installation kit TQ is an integral component of the fire damper and must be ordered together with the damper.
- The installation kit TQ2 is supplied separately and must be installed by the customer. The installation kit can also be supplied subsequently and mounted on the fire damper.

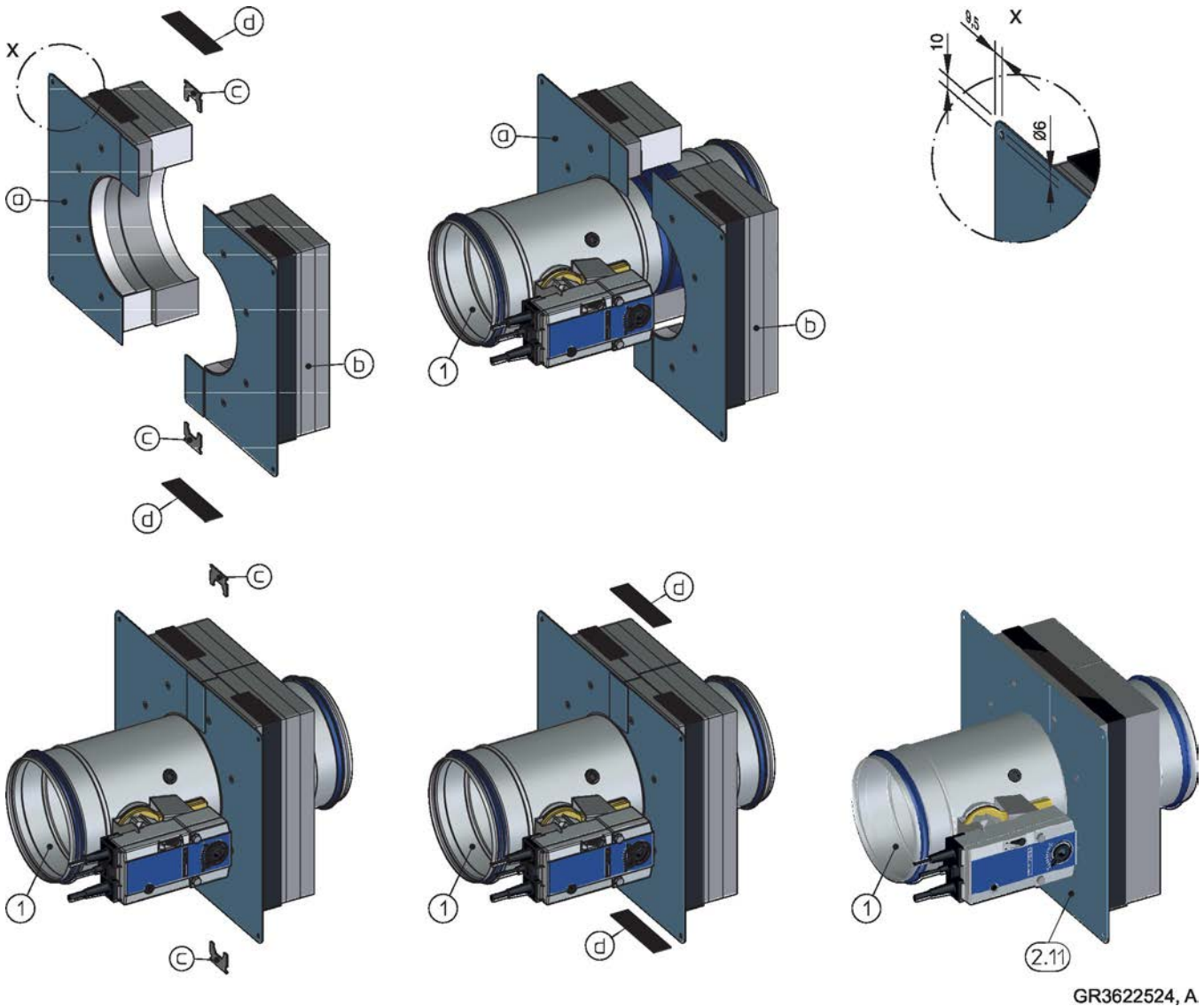


Fig. 23: Supply package and installation of installation kit TQ2 for dry mortarless installation

- | | | | |
|------|--------------------------------------|---|-----------------------------|
| 1 | FKRS-EU | b | Half-shell 2 |
| 2.11 | Installation kit TQ2, consisting of: | c | Bracket |
| a | Half-shell 1 | d | Intumescent seal (2 strips) |

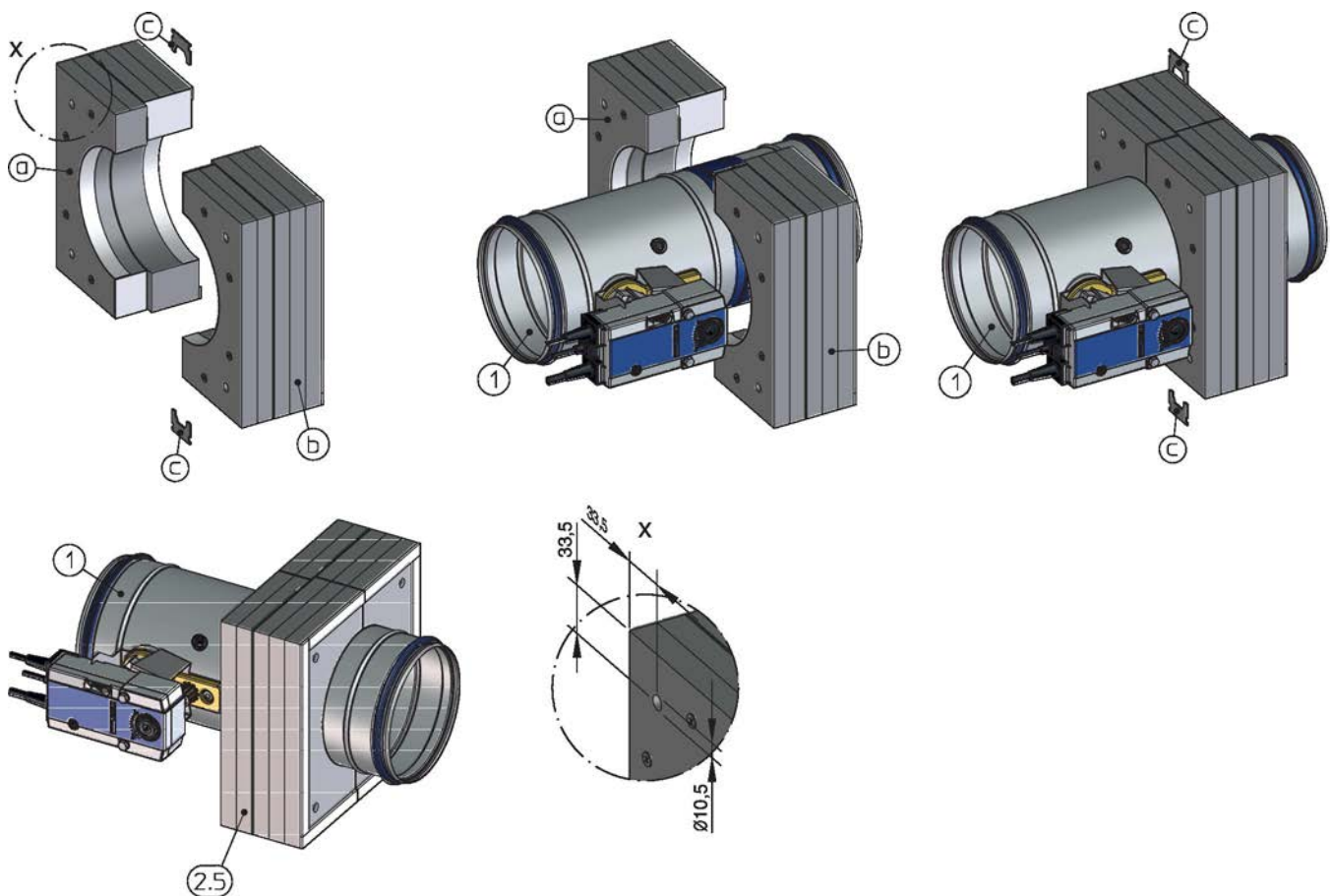
Installation of installation kit TQ2

1. ▶ Lay half-shells (2.11a) and (2.11b) of the installation kit (2.11) around the FKRS-EU and fix with two brackets (2.11c) (installation position of the FKRS-EU as required).
2. ▶ Affix intumescent seal (2.11d).

5.3.1.4 Installation kit WA / WA2

Installation kit WA / WA2 for dry mortarless installation on solid walls

- The installation kit WA is an integral component of the fire damper and must be ordered together with the damper.
- The installation kit WA2 is supplied separately and must be installed by the customer. The installation kit can also be supplied subsequently and mounted on the fire damper.



GR3639914, A

Fig. 24: Supply package and installation of installation kit WA2 for dry mortarless installation

- | | | | |
|-----|--|---|--|
| 1 | FKRS-EU | b | Half-shell 2 with Kerafix sealing tape |
| 2.5 | Installation kit WA2, consisting of: | c | Bracket |
| a | Half-shell 1 with Kerafix sealing tape | | |

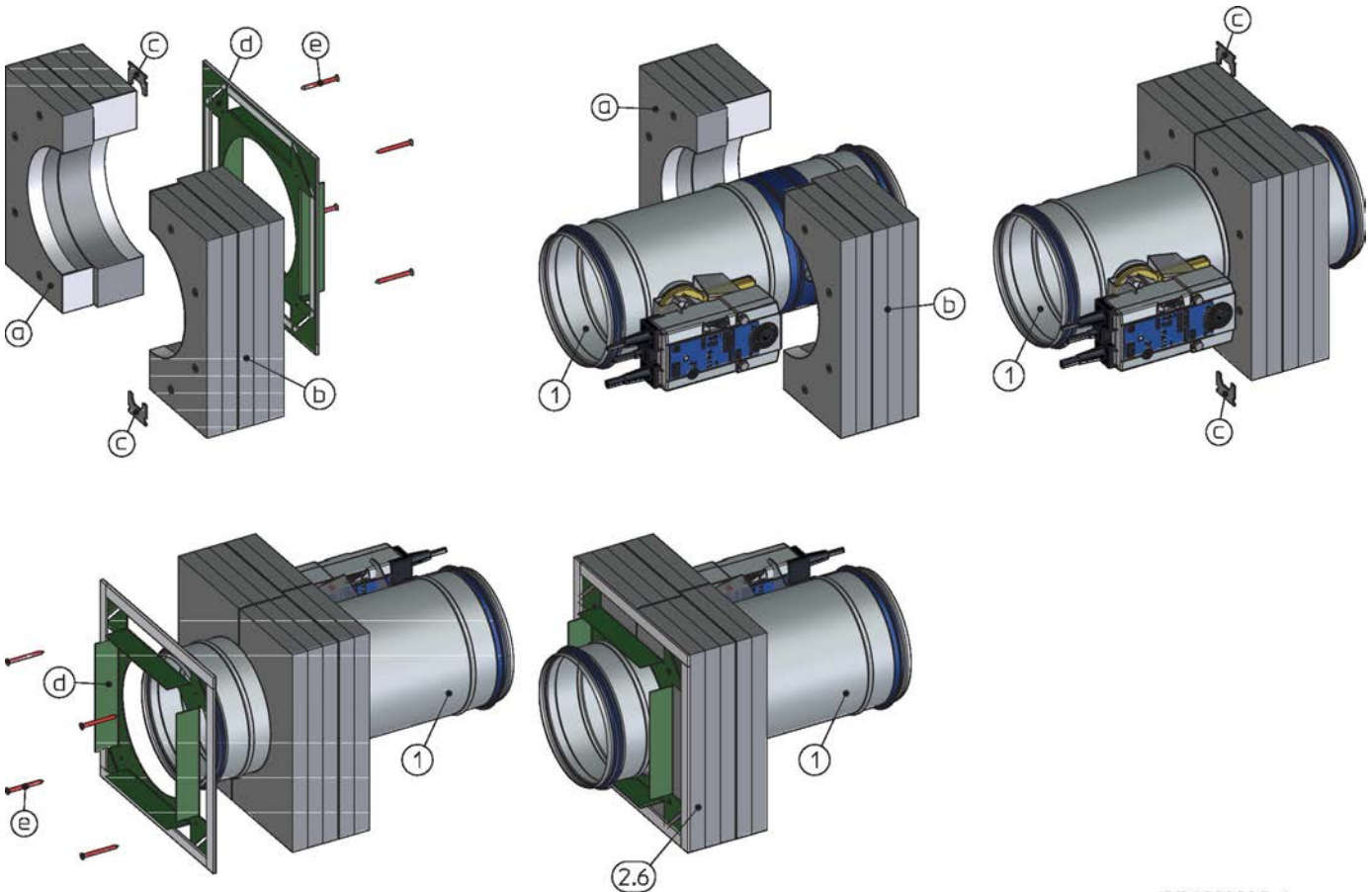
Installation of installation kit WA2

1. ▶ Lay half-shells (2.5a) and (2.5b) of the installation kit (2.5) around the FKRS-EU and
2. ▶ fix with two brackets (2.5c) (installation position of the FKRS-EU as required).

5.3.1.5 Installation kit WE / WE2

Installation kit WE / WE2 for installation remote from solid walls and ceiling slabs as well as remote from lightweight partition walls

- The installation kit WE is an integral component of the fire damper and must be ordered together with the damper.
- The installation kit WE2 is supplied separately and must be installed by the customer. The installation kit can also be supplied subsequently and mounted on the fire damper.



GR3632695, A

Fig. 25: Supply package and installation of installation kit WE2 for dry mortarless installation

- | | | | |
|-----|--------------------------------------|---|---|
| 1 | FKRS-EU | c | Bracket |
| 2.6 | Installation kit WE2, consisting of: | d | Sheet metal cover plate with Kerafix sealing tape |
| a | Half-shell 1 | e | Dry wall screw |
| b | Half-shell 2 | | |

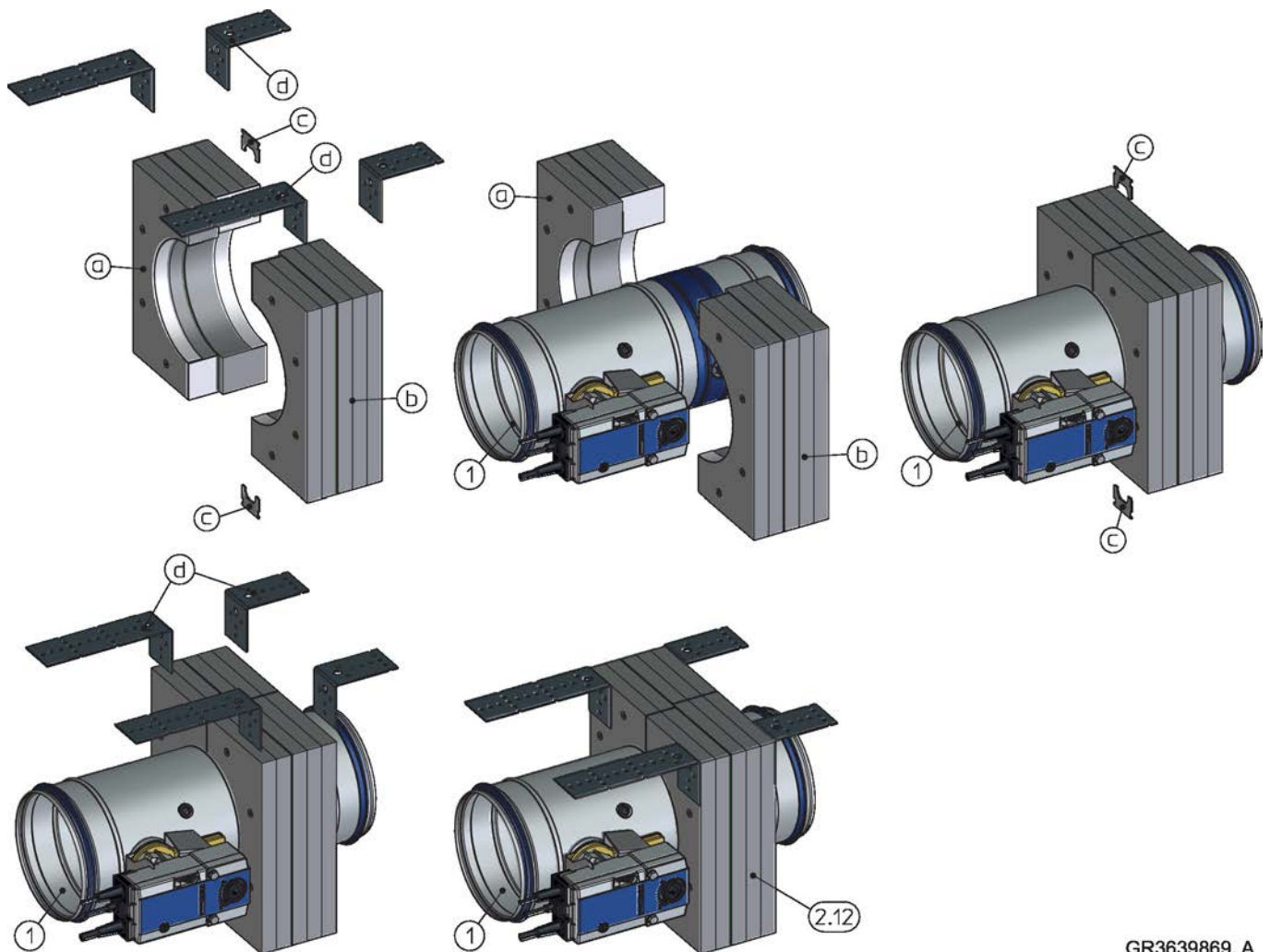
Installation of installation kit WE2

1. ▶ Lay half-shells (2.6a) and (2.6b) of the installation kit (2.6) around the FKRS-EU and fix with two brackets (2.6c) (installation position of the FKRS-EU as required).
2. ▶ On the rear of the installation kit (2.6), fix the sheet metal cover plate (2.6d) with 4 dry wall screws (2.6e).

5.3.1.6 Installation kit GL / GL2

Installation kit GL / GL2 for installation in conjunction with a flexible ceiling joint for metal stud walls with cladding on both sides

- The installation kit GL is an integral component of the fire damper and must be ordered together with the damper.
- The installation kit GL2 is supplied separately and must be installed by the customer. The installation kit can also be supplied subsequently and mounted on the fire damper.



GR3639869, A

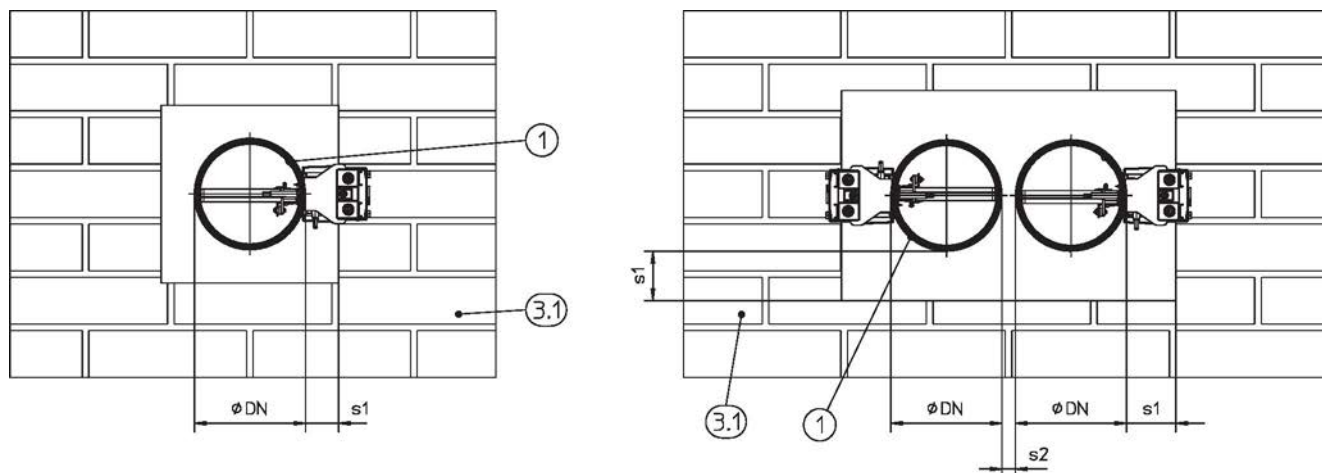
Fig. 26: Supply package and installation of installation kit GL2 for dry mortarless installation

- | | | | |
|------|--------------------------------------|---|--------------|
| 1 | FKRS-EU | b | Half-shell 2 |
| 2.12 | Installation kit GL2, consisting of: | c | Bracket |
| a | Half-shell 1 | d | Bracket |

Installation of installation kit GL2

1. ▶ Lay half-shells (2.12a) and (2.12b) of the installation kit (2.12) around the FKRS-EU and fix with two brackets (2.12c) (installation position of the FKRS-EU as required).
2. ▶ Fix bracket (2.12d).

5.4 Solid walls



GR3610079, A

Fig. 27: Solid walls – arrangement / distances, side by side arrangement also applies to arrangement under one another

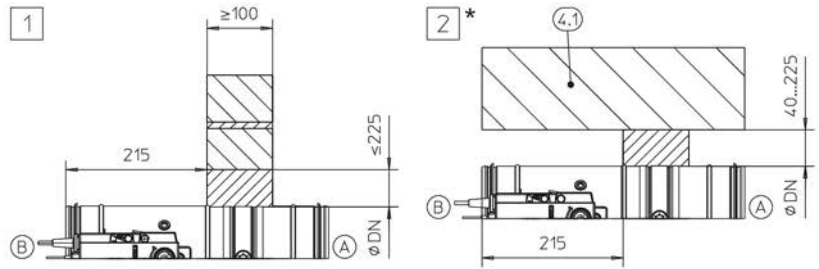
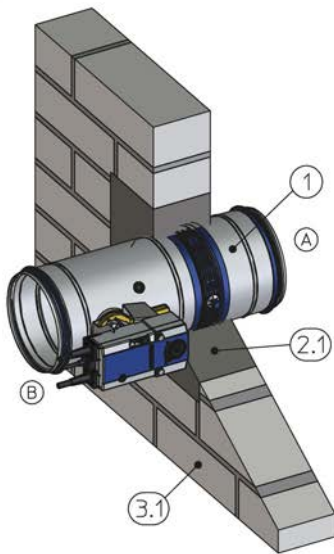
- 1 FKRS-EU
- 3.1 Solid wall

- s1 Perimeter gap, see ↗ 27
- s2 Distance between the fire dampers, see ↗ 25

Additional requirements: solid walls

- Solid wall ↗ 32
- Distances and installation orientations, see ↗ 25

5.4.1 Mortar-based installation

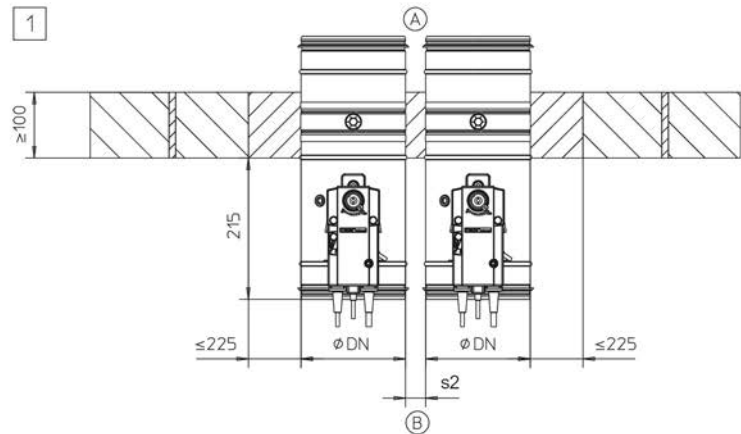
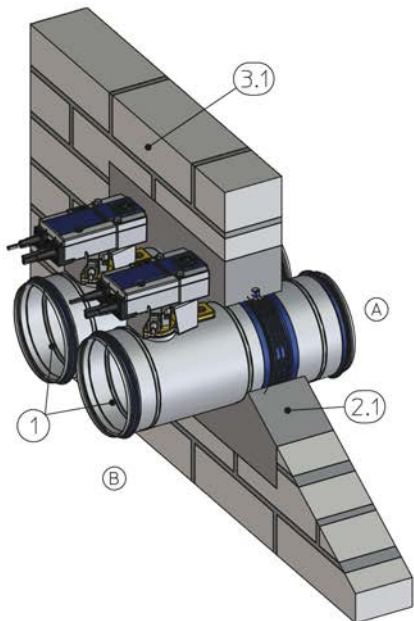


GR1680245, D

Fig. 28: Mortar-based installation into a solid wall

- 1 FKRS-EU
- 2.1 Mortar
- 3.1 Solid wall

- 4.1 Solid ceiling slab / solid floor
- * Installation near the floor analogous to 2
- 1 2 Up to EI 120 S

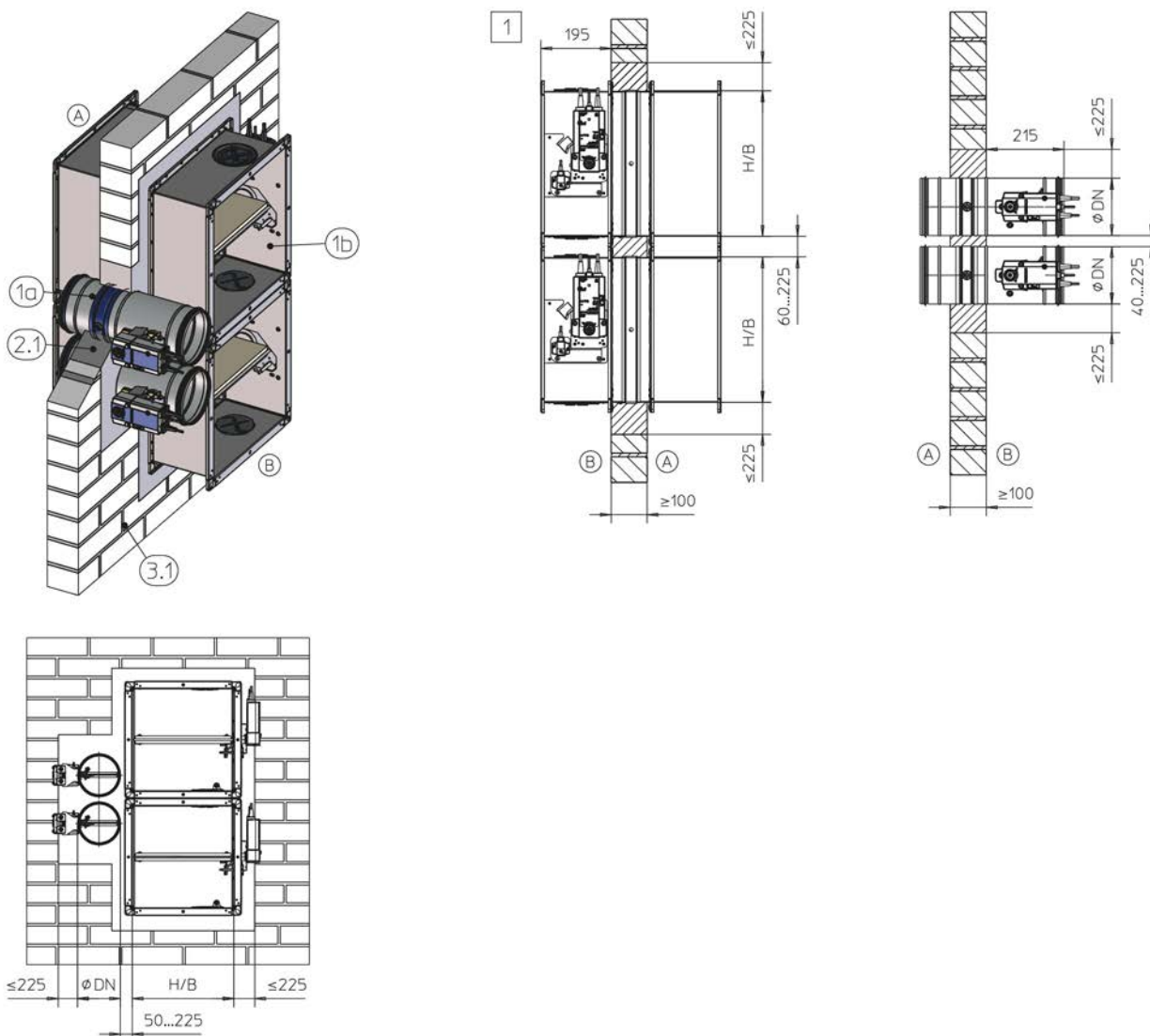


GR3175128, C

Fig. 29: Mortar-based installation into a solid wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

- 1 FKRS-EU
- 2.1 Mortar
- 3.1 Solid wall

- 1 Up to EI 120 S for s2 = 40 – 225 mm
- Up to EI 90 S for s2 = 10 – 225 mm



GR3479483, C

Fig. 30: Mortar-based installation into a solid wall, combined, FKRS-EU and FK-EU / FK2-EU

- | | | | |
|-----|--|-----|---------------|
| 1a | FKRS-EU | 3.1 | Solid wall |
| 1b | FK-EU / FK2-EU up to $W \times H \leq 800 \times 400$ mm | 1 | Up to EI 90 S |
| 2.1 | Mortar | | |

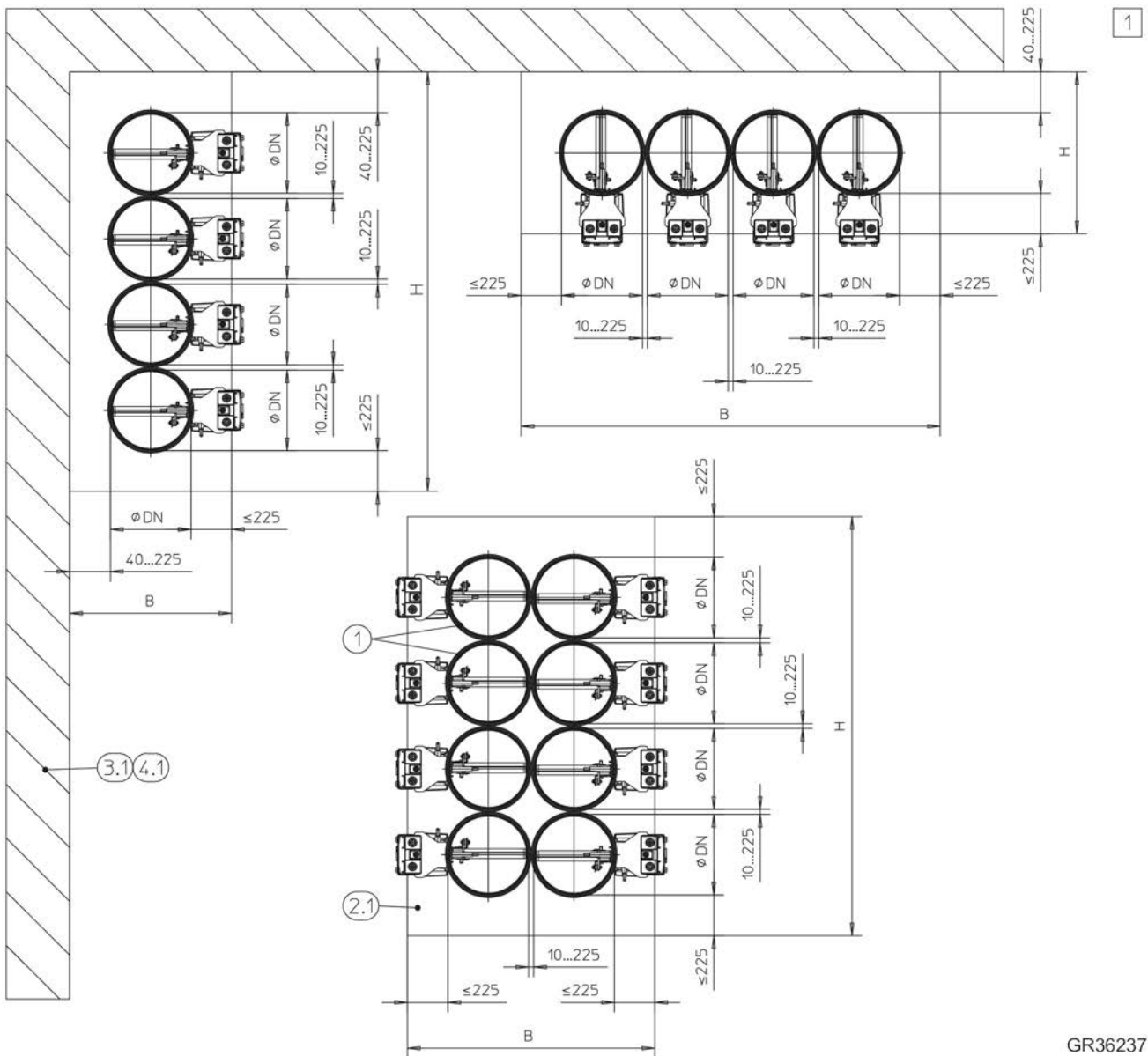
Note: Alternative installation orientations of side-by-side, under or on top of one another possible. Details are available upon request.

For installation details FK-EU and FK2-EU, see the installation and operating manual for these fire damper types.

Additional requirements: mortar-based installation into solid walls

- Solid wall ↪ 32

5.4.2 Mortar-based installation – multiple occupancy of an installation opening



GR3623711, A

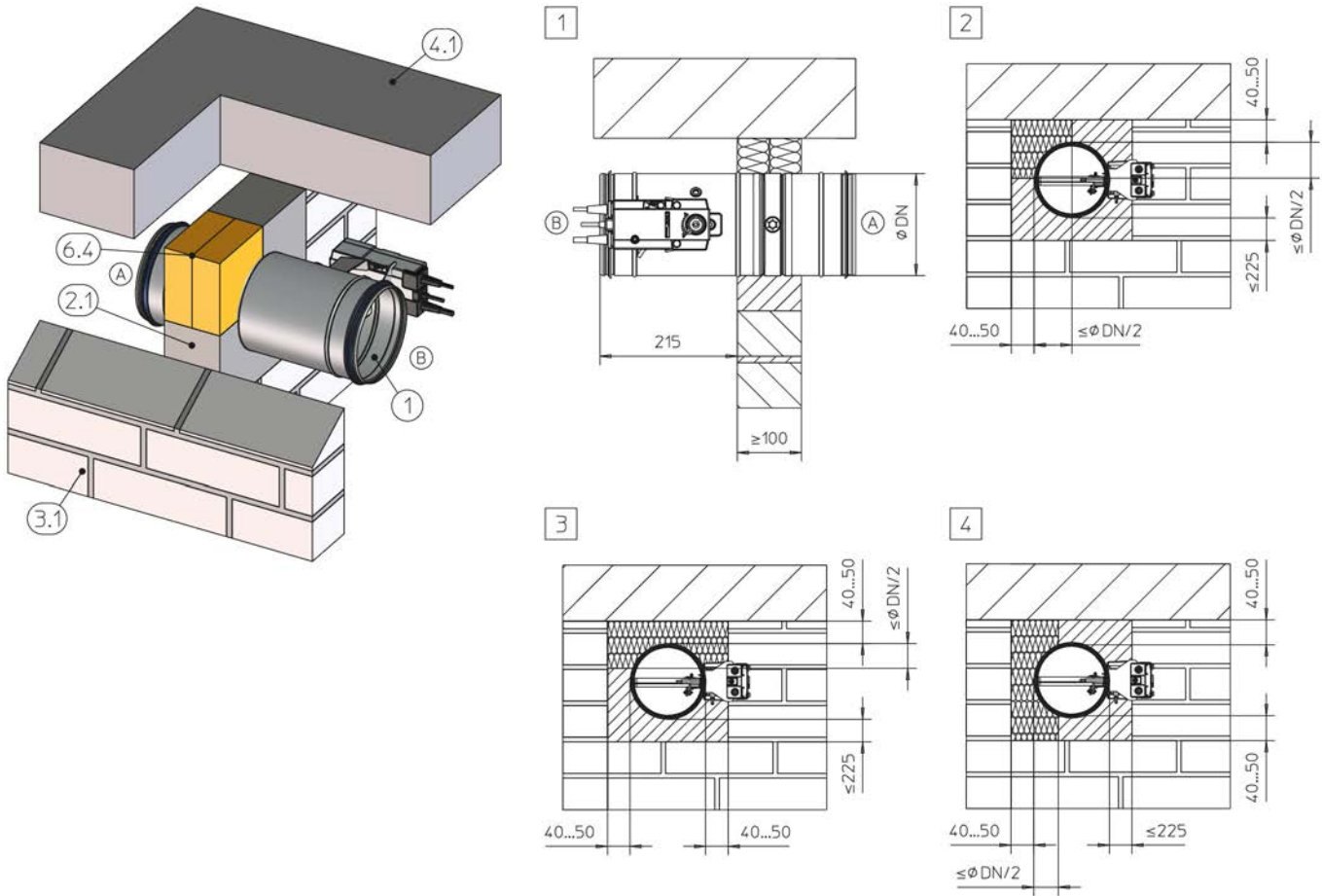
Fig. 31: Mortar-based installation – multiple occupancy of an installation opening

- | | | | |
|-----|-------------------------------------|----------|---|
| 1 | FKRS-EU | 4.1 | Solid ceiling slab (load-bearing component) |
| 2.1 | Mortar | 1 | Up to EI 90 S |
| 3.1 | Solid wall (load-bearing component) | | |

Additional requirements: mortar-based installation – multiple occupancy of an installation opening

- Solid wall ≤ 32
- Size of the installation opening $W \times H \leq 1.2 \text{ m}^2$
- The number of fire dampers is limited to 10 units in single or double-row arrangement

5.4.3 Mortar-based installation with partial mortaring



GR3479359, B

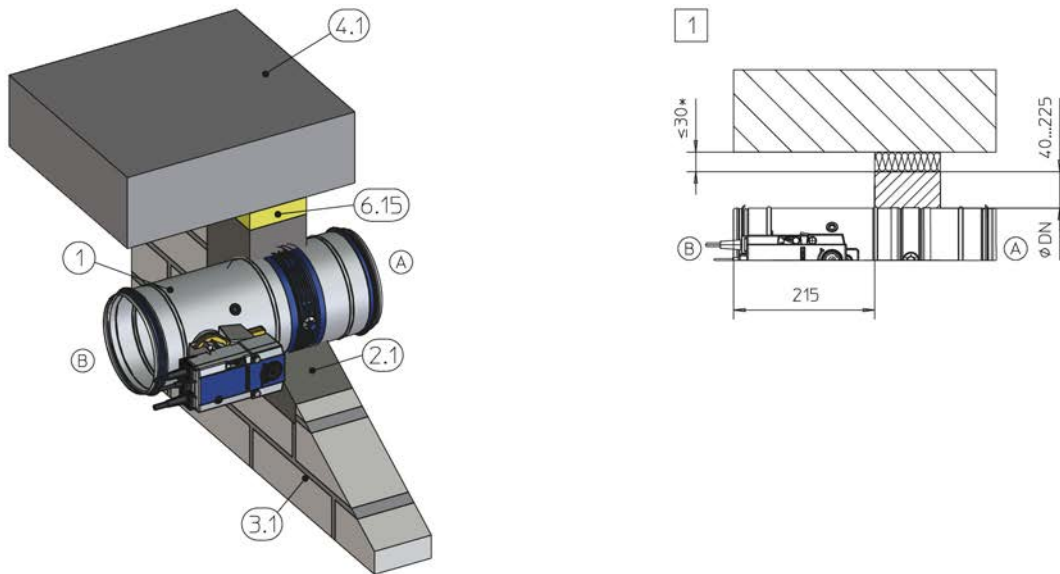
Fig. 32: Mortar-based installation into a solid wall, with partial mortaring

1	FKRS-EU	4.1	Solid ceiling slab
2.1	Mortar	6.4	Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 140\text{ kg/m}^3$
3.1	Solid wall	1 – 4	Up to EI 120 S

Additional requirements: mortar-based installation into solid walls with partial mortaring

- Solid wall ↻ 32
 - 40 – 50 mm distance to load-bearing structural elements
 - Distance between two FKRS-EU in one installation opening 40 – 225 mm
1. ▶ The difficult-to-access installation gap between the FKRS-EU and the wall / ceiling slab must be completely filled in the wall area.
 2. ▶ Completely close off the remaining gaps »s« (on 2 or 3 sides) with mortar.

5.4.4 Mortar-based installation underneath flexible ceiling joint



GR1680254, E

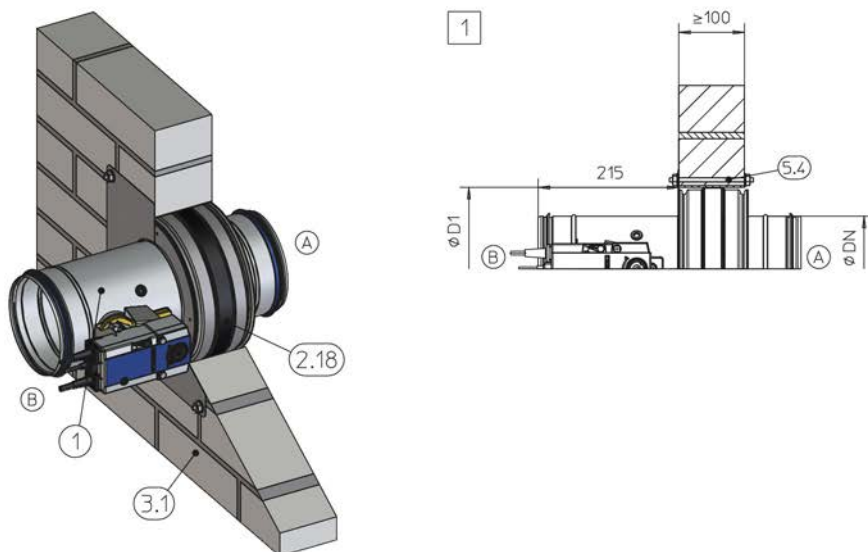
Fig. 33: Mortar-based installation into a solid wall with flexible ceiling joint

1	FKRS-EU	6.15	Mineral wool, depending on the flexible ceiling joint
2.1	Mortar		
3.1	Solid wall		
4.1	Solid ceiling slab		
		1	Up to EI 90 S
		*	After subsidence of the ceiling slab

Additional requirements: mortar-based installation into solid walls underneath flexible ceiling joint

- Solid wall \varnothing 32
 - Distance from the fire damper to the top edge of the wall 40 – 225 mm
 - ≥ 40 mm distance between two fire dampers
1. ▶ Create an appropriate installation opening, \varnothing DN + maximum 450 mm.
 2. ▶ Push the fire damper into the installation opening and secure it. Make sure that the distance from the connecting spigot on the operating side to the wall is 215 mm.
If the wall thickness is >115 mm, extend the fire damper on the installation side with an extension piece or a spiral duct.
 3. ▶ Close off the perimeter gap »s1« with mortar. The mortar bed depth must be at least 100 mm.

5.4.5 Dry mortarless installation with installation block ER



GR1680410, C

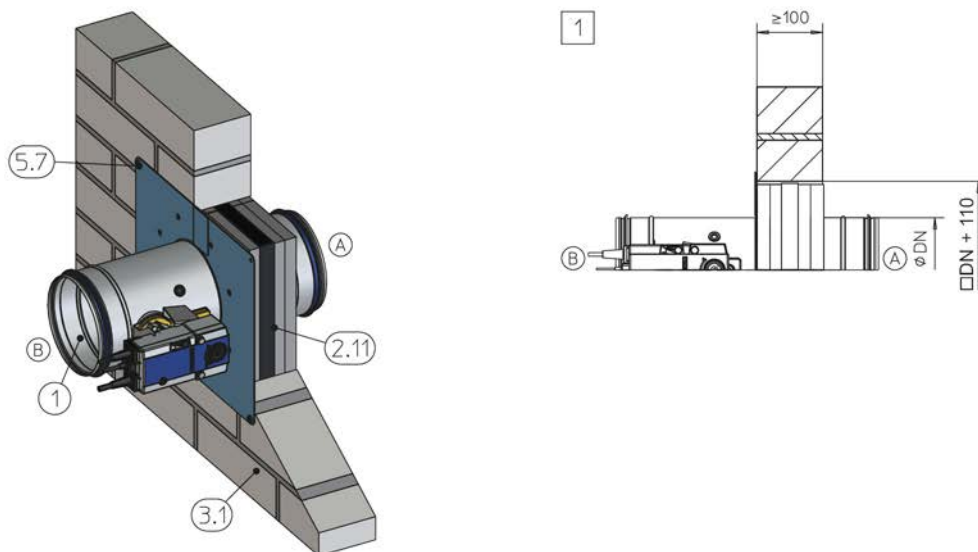
Fig. 34: Dry mortarless installation with installation block ER

1	FKRS-EU	5.4	Threaded rod as push through installation or suitable metal anchors, min. M6
2.18	Installation block ER with cover plate	1	Up to EI 90 S
3.1	Solid wall		

Additional requirements: dry mortarless installation with installation block ER in solid walls

- Solid wall ↪ 32
 - Installation block ER, see ↪ 35
 - ≥ 75 mm distance between installation block and load-bearing structural elements
 - ≥ 200 mm distance between two installation blocks
1. ▶ Create an appropriate opening with $\varnothing D1$, see ↪ 35
 2. ▶ Position the fire damper in the centre of the installation opening and push it in up to the cover plate. If the wall thickness is >115 mm, extend the fire damper on the installation side with an extension piece or a spiral duct.
 3. ▶ Fix the cover plate with four threaded rods (push through installation) or with at least four M6 screws. Screw fixings in solid walls must be made using tested anchors appropriate for the construction material of the particular wall.

5.4.6 Dry mortarless installation with installation kit TQ / TQ2



GR3609657, B

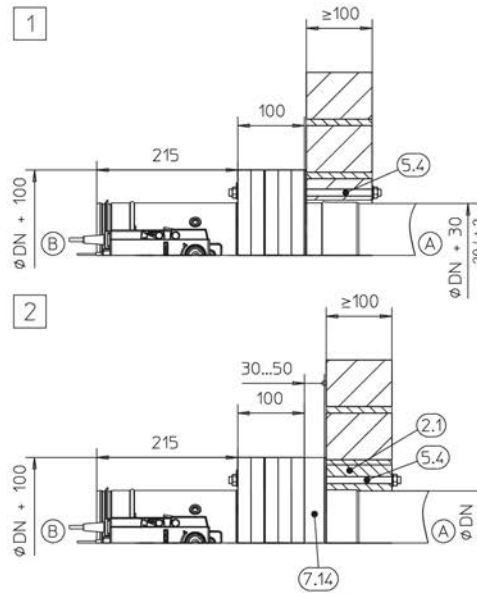
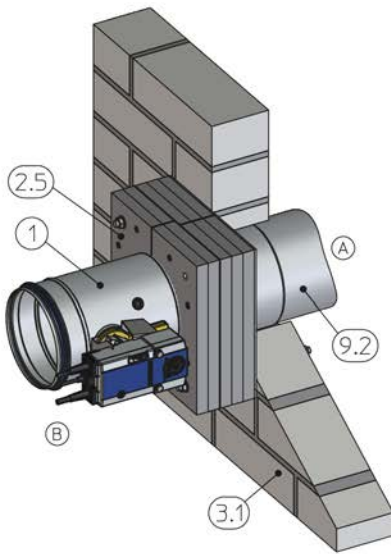
Fig. 35: Dry mortarless installation with installation kit TQ / TQ2

1	FKRS-EU	5.7	Anchor bolt Hilti® HUS-6 or equivalent, appropriate for the wall material, alternatively push through installation
2.11	Installation kit TQ / TQ2 with cover plate (two-part with TQ2)	1	Up to EI 120 S
3.1	Solid wall		

Additional requirements: dry mortarless installation with installation kit TQ / TQ2 into solid walls

- Solid wall ☞ 32
 - Installation kit TQ / TQ2, see ☞ 36
 - ≥ 75 mm distance from fire damper to load-bearing structural elements
 - ≥ 200 mm distance between two fire dampers
1. ▶ Make a square installation opening, size $\varnothing DN + 110$ mm
 2. ▶ Position the fire damper with the installation kit in the centre of the installation opening and push it in up to the cover plate.
If the wall thickness is >115 mm, extend the fire damper on the installation side with an extension piece or a spiral duct.
 3. ▶ Fix the cover plate with four threaded rods (push through installation) or with at least four M6 screws. Screw fixings in solid walls must be made using tested anchors appropriate for the construction material of the particular wall.

5.4.7 Dry mortarless installation with installation kit WA / WA2



GR3614176, A

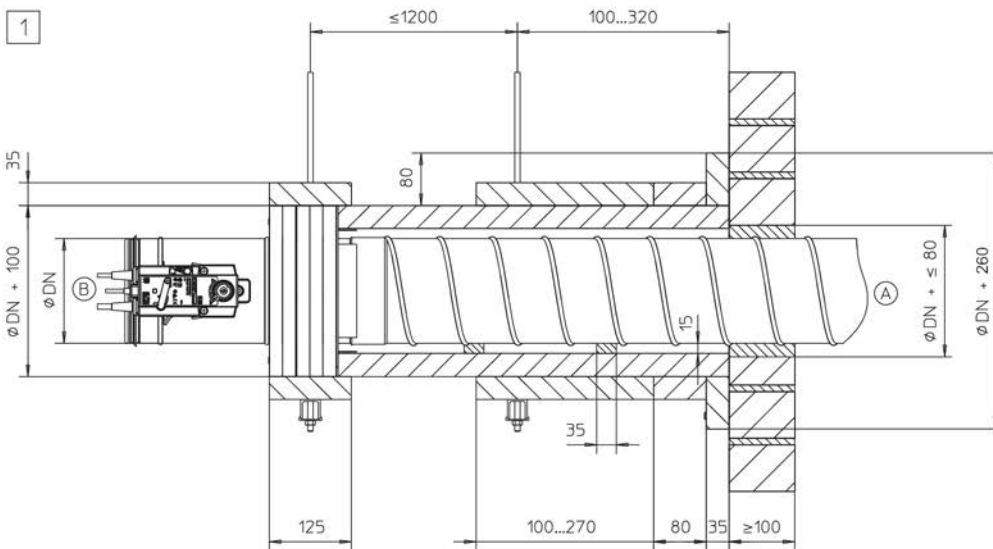
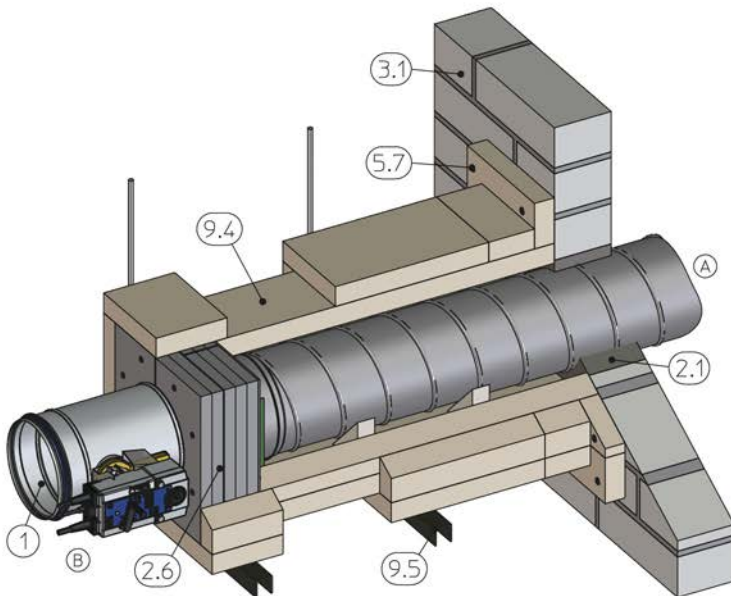
Fig. 36: Dry mortarless installation on a solid wall, with installation kit WA / WA2

1	FKRS-EU	5.4	Threaded rod as push through installation with washers and nuts
2.1	Mortar	7.14	Reinforcing board, calcium silicate, thickness = 30 – 50 mm or mineral wool, ≥ 1000 °C, ≥ 140 kg/m ³ , thickness = 50 mm
2.5	Installation kit WA / WA2	9.2	Extension piece / duct with [2] shortened flush with the wall
3.1	Solid wall	[1][2]	Up to EI 90 S

Additional requirements: dry mortarless installation with installation kit WA / WA2 on solid walls

- Solid wall ↪ 32
 - Installation kit WA / WA2, see ↪ 37
 - ≥ 75 mm distance from fire damper to load-bearing structural elements
 - ≥ 200 mm distance between two fire dampers
1. ▶ [1] Create an appropriate opening with \varnothing DN + 30 [-20 / +2] mm, compensate for wall unevenness and fix the installation kit by means of push through installation (M8 or M10).
 2. ▶ [2] Shorten the mortared-in duct flush with the wall, create a reinforcing board (7.14), compensate for wall unevenness and fix the installation kit by means of push through installation (M8 or M10).

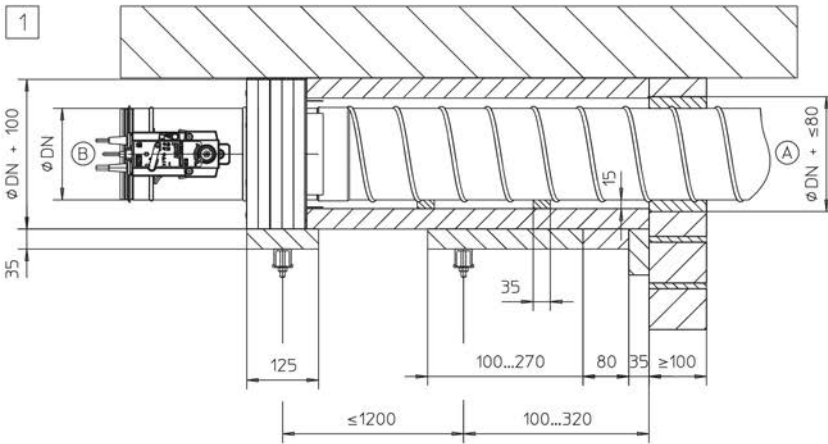
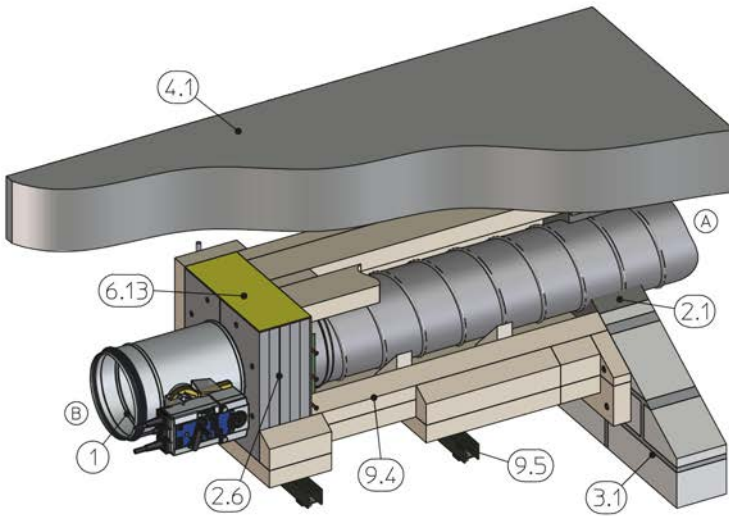
5.4.8 Installation with installation kit WE / WE2 remote from solid walls with wall attachment



GR3614499, A

Fig. 37: Dry mortarless installation remote from a solid wall with wall connection, cladding on four sides

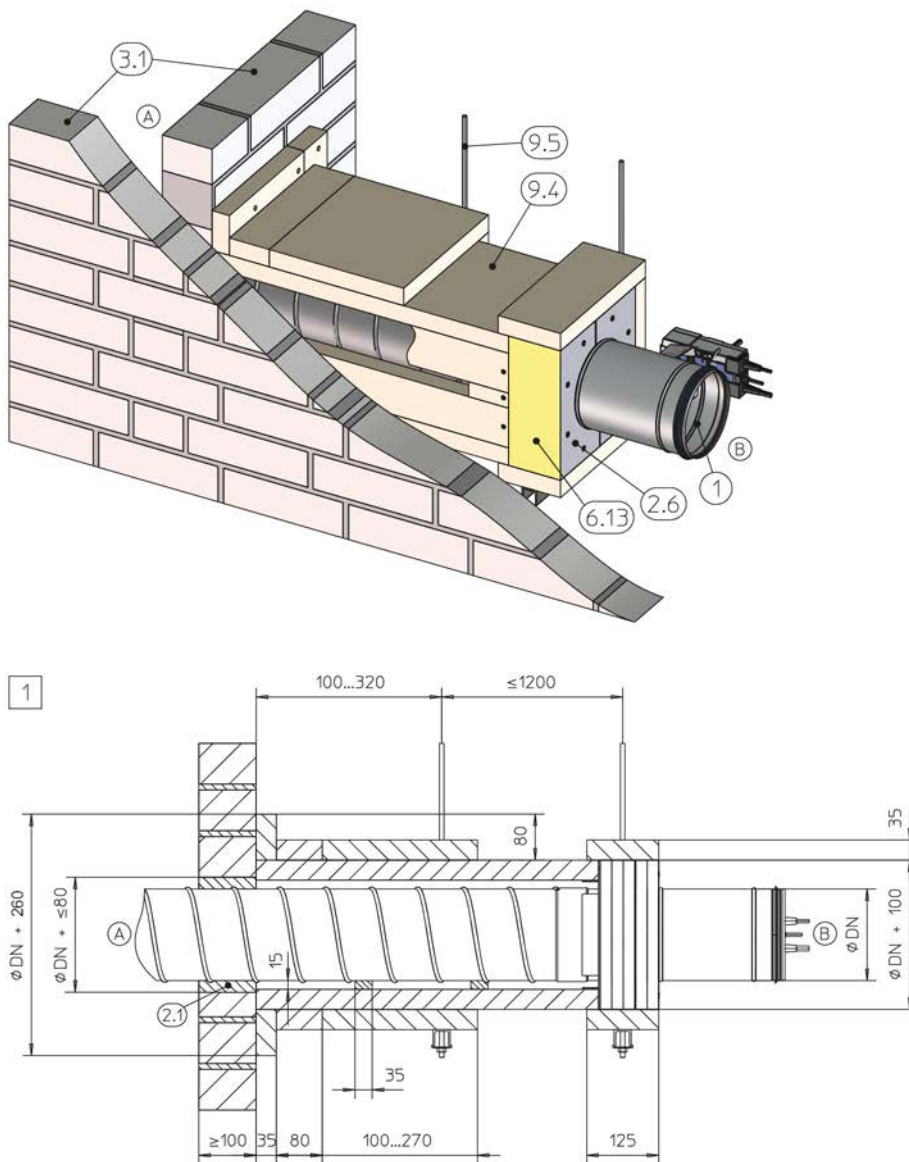
- | | | | |
|-----|---|-----|---|
| 1 | FKRS-EU | 9.5 | Suspension system (by others) consisting of: |
| 2.1 | Mortar | a | Threaded rod M10 |
| 2.6 | Installation kit WE / WE2 | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 3.1 | Solid wall | c | Hilti® drilled plate, MQZ L13 or equivalent |
| 5.7 | Anchor bolt Hilti® HUS-6 or equivalent | d | Hexagon nut M10 with washer |
| 9.4 | Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition | 1 | Up to EI 120 S |



GR3614625, A

Fig. 38: Dry mortarless installation remote from a solid wall with wall connection, cladding on three sides

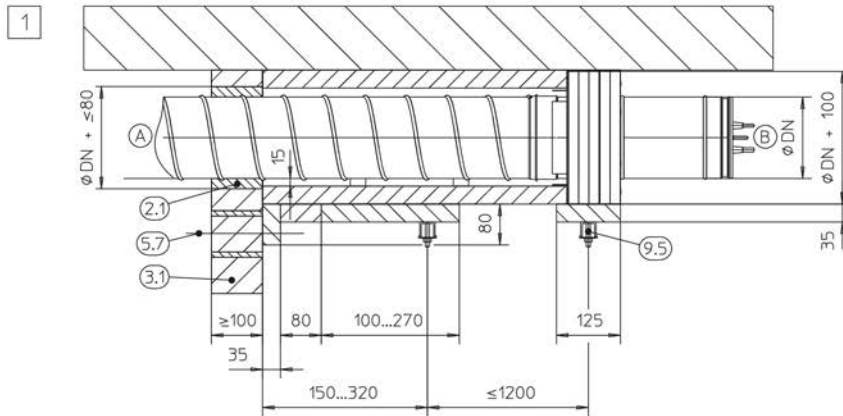
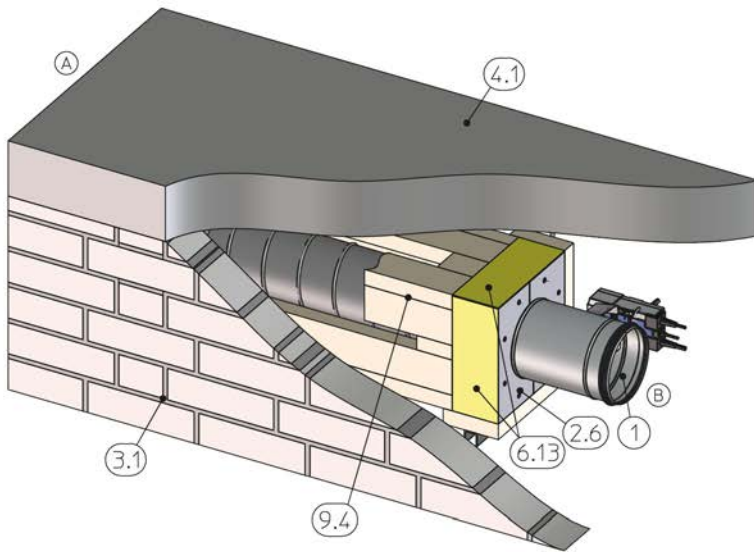
- | | | | |
|------|--|-----|---|
| 1 | FKRS-EU | 9.4 | Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition |
| 2.1 | Mortar | 9.5 | Suspension system (by others) consisting of: |
| 2.6 | Installation kit WE / WE2 | a | Threaded rod M10 |
| 3.1 | Solid wall | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 4.1 | Solid ceiling slab | c | Hilti® drilled plate, MQZ L13 or equivalent |
| 5.7 | Anchor bolt Hilti® HUS-6 or equivalent | d | Hexagon nut M10 with washer |
| 6.13 | Mineral wool, ≥ 1000 °C, ≥ 80 kg/m ³ , or gypsum mortar to even out an uneven ceiling | 1 | Up to EI 120 S |



GR3614537, A

Fig. 39: Dry mortarless installation remote from a solid wall with wall connection, cladding on three sides

- | | | | |
|------|---|-----|---|
| 1 | FKRS-EU | 9.5 | Suspension system (by others) consisting of: |
| 2.1 | Mortar | a | Threaded rod M10 |
| 2.6 | Installation kit WE / WE2 | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 3.1 | Solid wall | c | Hilti® drilled plate, MQZ L13 or equivalent |
| 5.7 | Anchor bolt Hilti® HUS-6 or equivalent | d | Hexagon nut M10 with washer |
| 6.13 | Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 80\text{ kg/m}^3$, or gypsum mortar to even out an uneven wall | 1 | Up to EI 120 S |
| 9.4 | Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition | | |



GR3616792, A

Fig. 40: Dry mortarless installation remote from a solid wall with wall connection, cladding on two sides

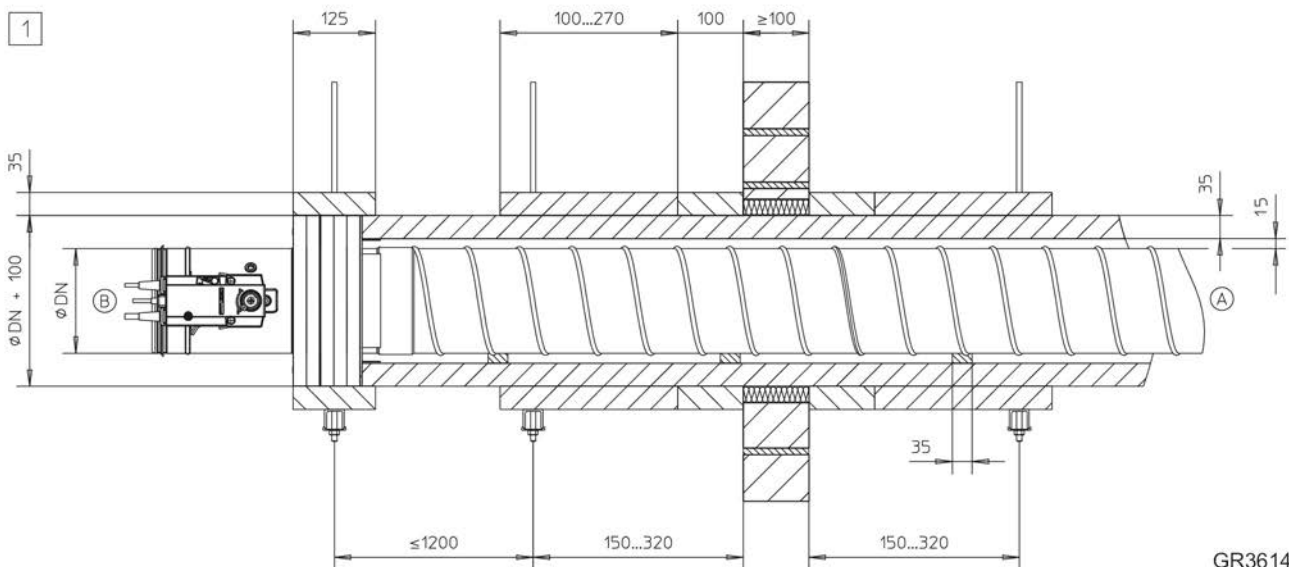
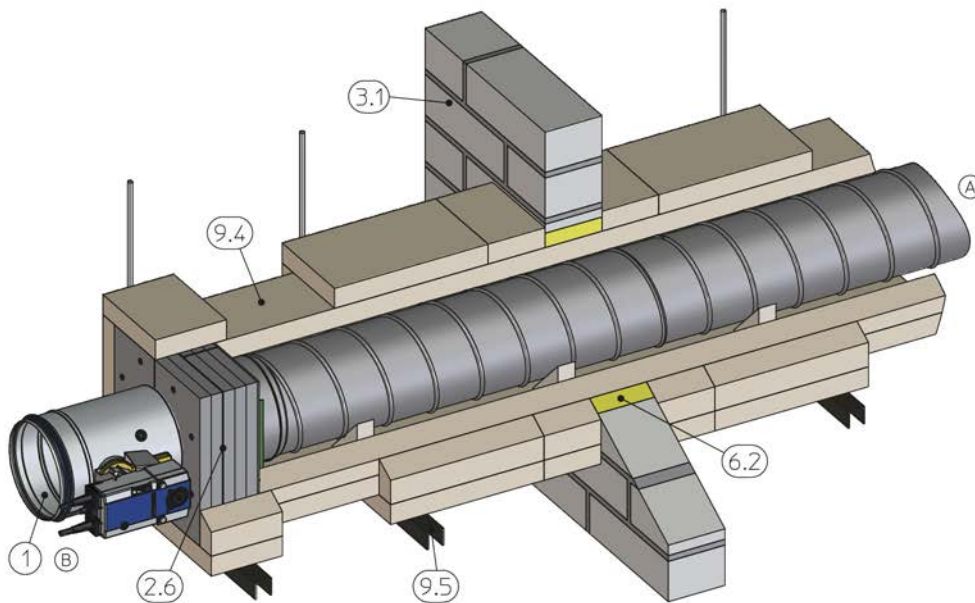
1	FKRS-EU	9.4	Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition
2.1	Mortar	9.5	Suspension system (by others) consisting of:
2.6	Installation kit WE / WE2	a	Threaded rod M10
3.1	Solid wall	b	Hilti® mounting rail MQ 41 × 3 mm or equivalent
4.1	Solid ceiling slab	c	Hilti® drilled plate, MQZ L13 or equivalent
5.7	Anchor bolt Hilti® HUS-6 or equivalent	d	Hexagon nut M10 with washer
6.13	Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, or gypsum mortar to even out an uneven wall or ceiling	1	Up to EI 120 S

Additional requirements: installation with installation kit WE / WE2 remote from solid walls with wall attachment

- Solid wall ↪ 32
- Installation kit WE / WE2, see ↪ 38
- Suspension and fixing, see ↪ 154
- Sheet steel ducts without any openings, with fire-resistant cladding (fittings with cladding according to instructions from Promat®)
- ≥ 130 mm distance from the fire damper to the wall or ceiling slab
- ≥ 260 mm distance between two fire dampers

Note: For more installation details and for components to be provided by others, see the WE / WE2 installation manual.

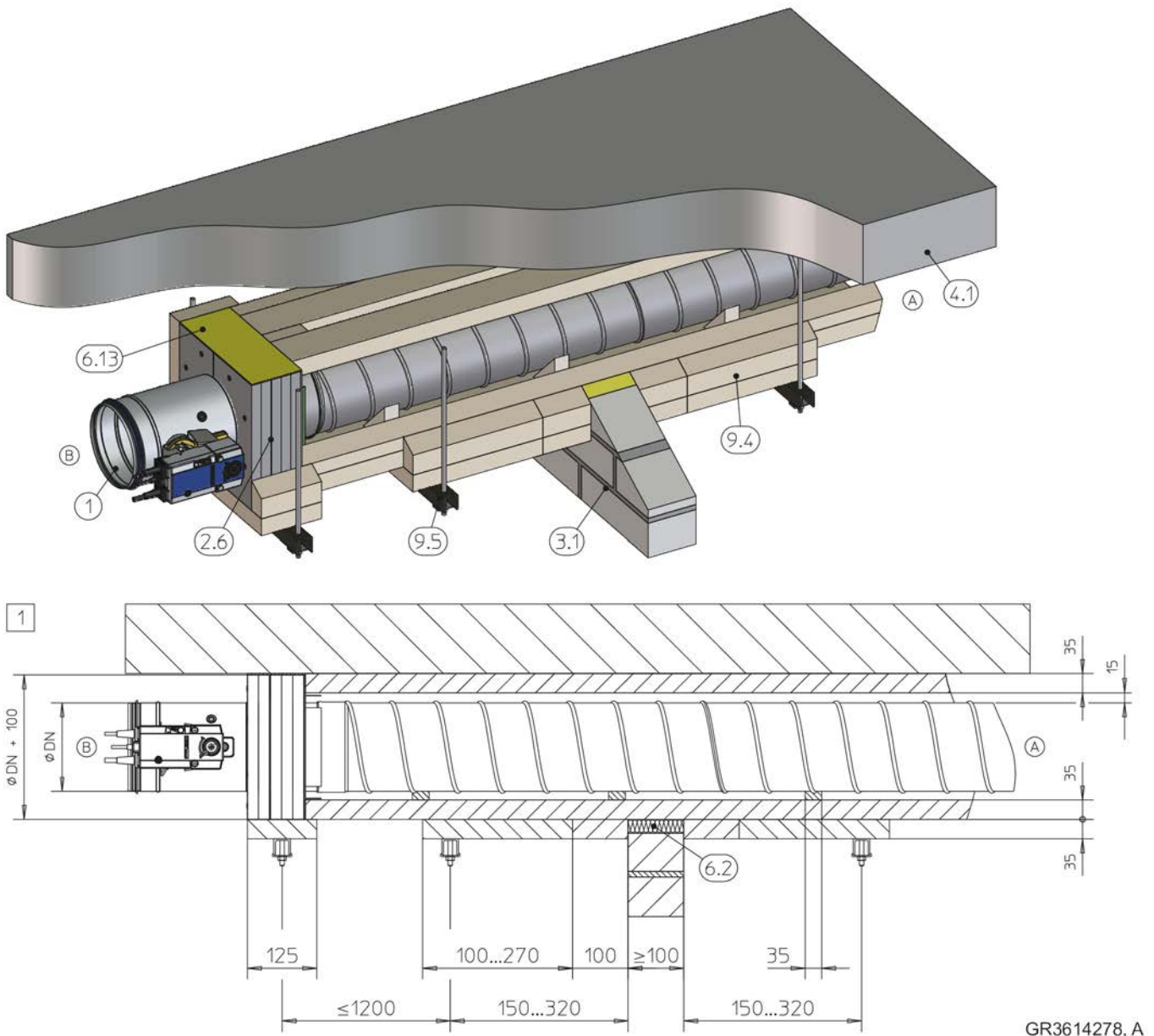
5.4.9 Installation with installation kit WE / WE2 remote from solid walls with wall penetration



GR3614223, A

Fig. 41: Dry mortarless installation remote from a solid wall with wall penetration, cladding on four sides

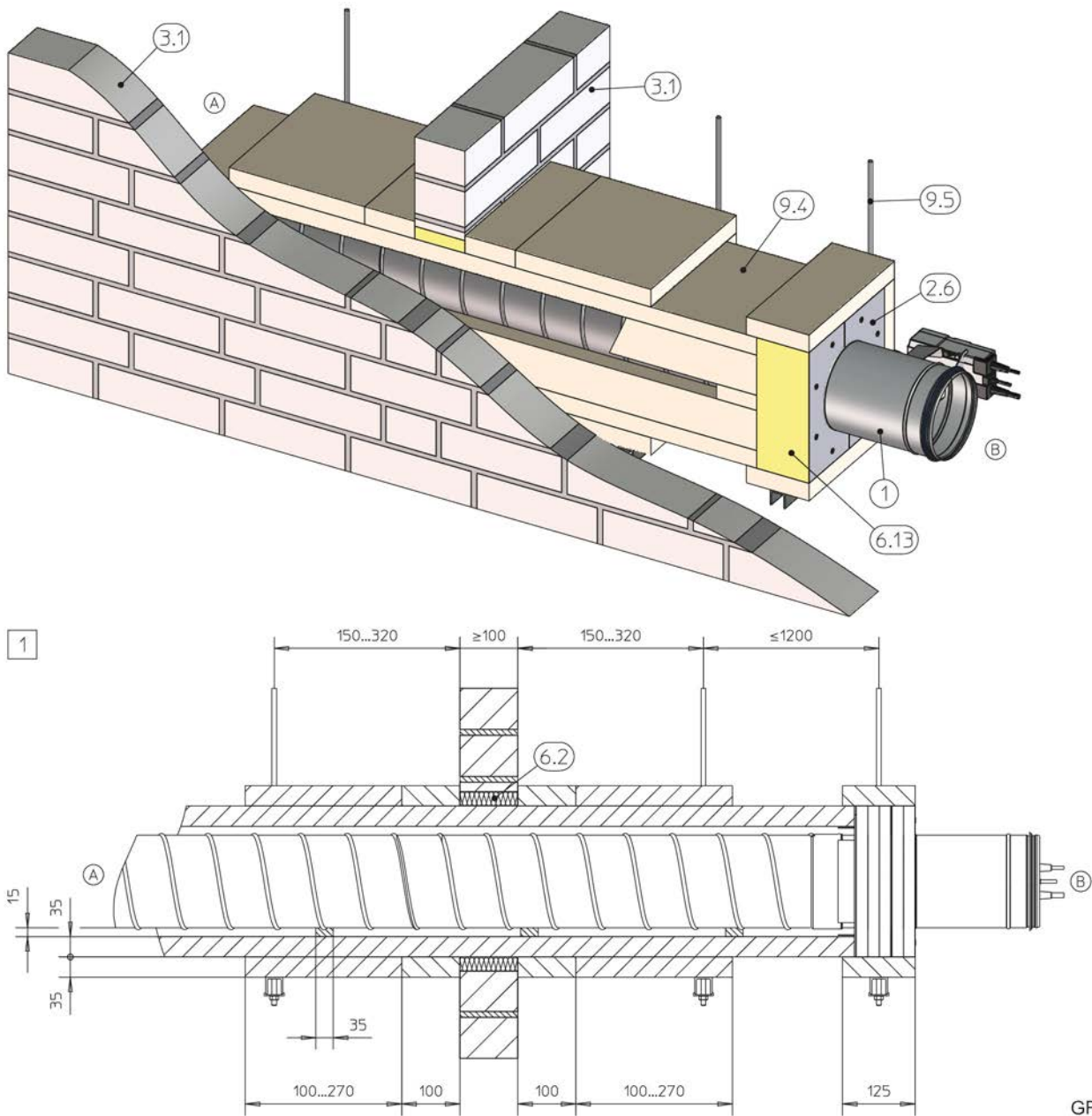
- | | | | |
|-----|---|---|---|
| 1 | FKRS-EU | a | Threaded rod M10 |
| 2.6 | Installation kit WE / WE2 | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 3.1 | Solid wall | c | Hilti® drilled plate, MQZ L13 or equivalent |
| 6.2 | Mineral wool, $\geq 1000\text{ }^\circ\text{C}$, $\geq 80\text{ kg/m}^3$,
thickness $\leq 20\text{ mm}$ | d | Hexagon nut M10 with washer |
| 9.4 | Sheet steel duct with fire-rated cladding and sus-
pension system according to Promat® manual,
construction 478, latest edition | 1 | Up to EI 120 S |
| 9.5 | Suspension system (by others) consisting of: | | |



GR3614278, A

Fig. 42: Dry mortarless installation remote from a solid wall with wall penetration, cladding on three sides

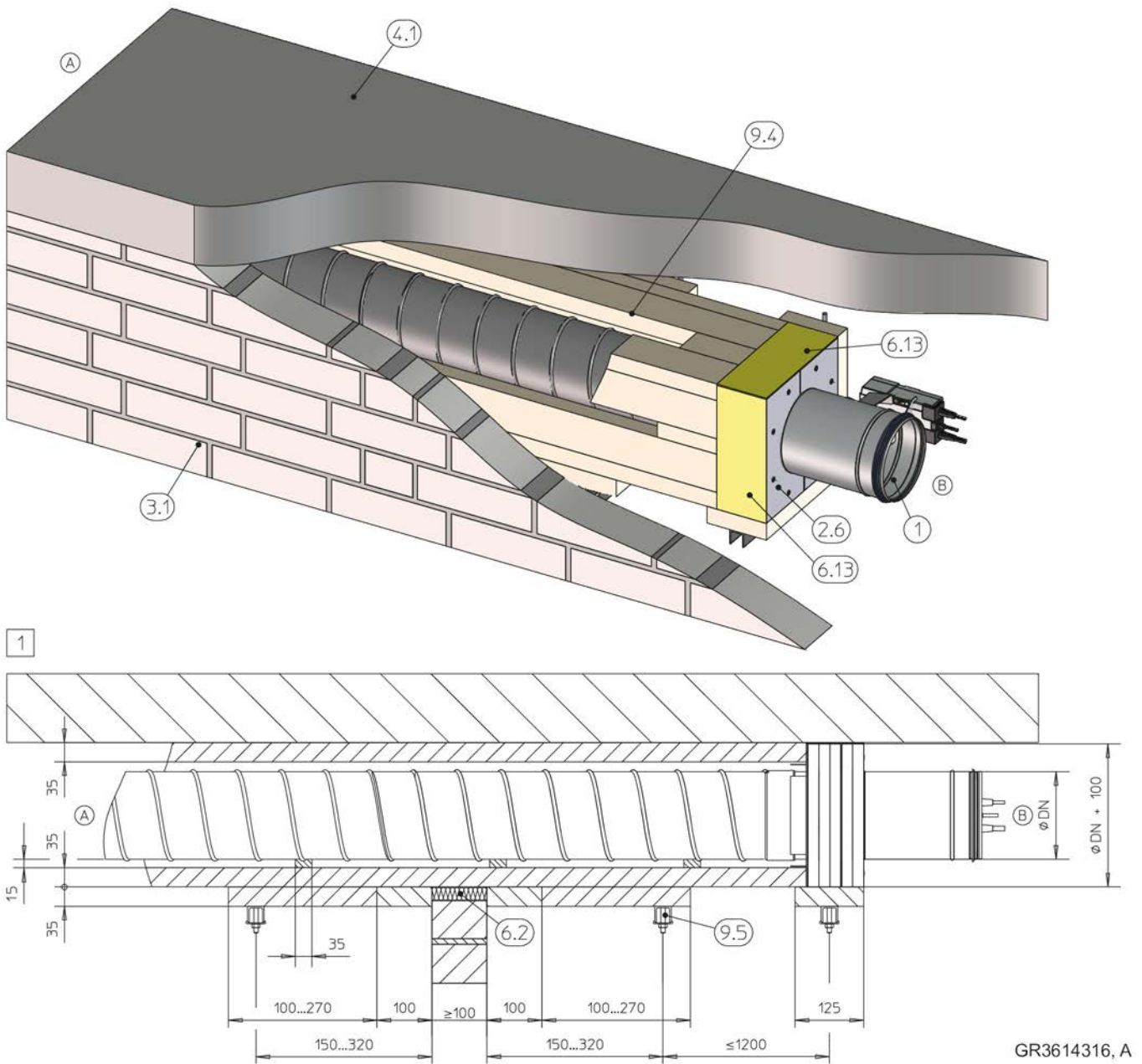
- | | | | |
|------|---|-----|---|
| 1 | FKRS-EU | 9.5 | Suspension system (by others) consisting of: |
| 2.6 | Installation kit WE / WE2 | a | Threaded rod M10 |
| 3.1 | Solid wall | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 4.1 | Solid ceiling slab | c | Hilti® drilled plate, MQZ L13 or equivalent |
| 6.2 | Mineral wool, ≥ 1000 °C, ≥ 80 kg/m ³ ,
thickness ≤ 20 mm | d | Hexagon nut M10 with washer |
| 6.13 | Mineral wool (melting point ≥ 1000 °C) or
gypsum mortar for compensating for uneven ceilings | 1 | Up to EI 120 S |
| 9.4 | Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition | | |



GR3614291, A

Fig. 43: Dry mortarless installation remote from a solid wall with wall penetration, cladding on three sides

- | | | | |
|------|---|-----|---|
| 1 | FKRS-EU | 9.5 | Suspension system (by others) consisting of: |
| 2.6 | Installation kit WE / WE2 | a | Threaded rod M10 |
| 3.1 | Solid wall | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 6.2 | Mineral wool, ≥ 1000 °C, ≥ 80 kg/m ³ ,
thickness ≤ 20 mm | c | Hilti® drilled plate, MQZ L13 or equivalent |
| 6.13 | Mineral wool (melting point ≥ 1000 °C) or
gypsum mortar for compensating for uneven
walls | d | Hexagon nut M10 with washer |
| 9.4 | Sheet steel duct with fire-rated cladding and sus-
pension system according to Promat® manual,
construction 478, latest edition | 1 | Up to EI 120 S |



GR3614316, A

Fig. 44: Dry mortarless installation remote from a solid wall with wall penetration, cladding on two sides

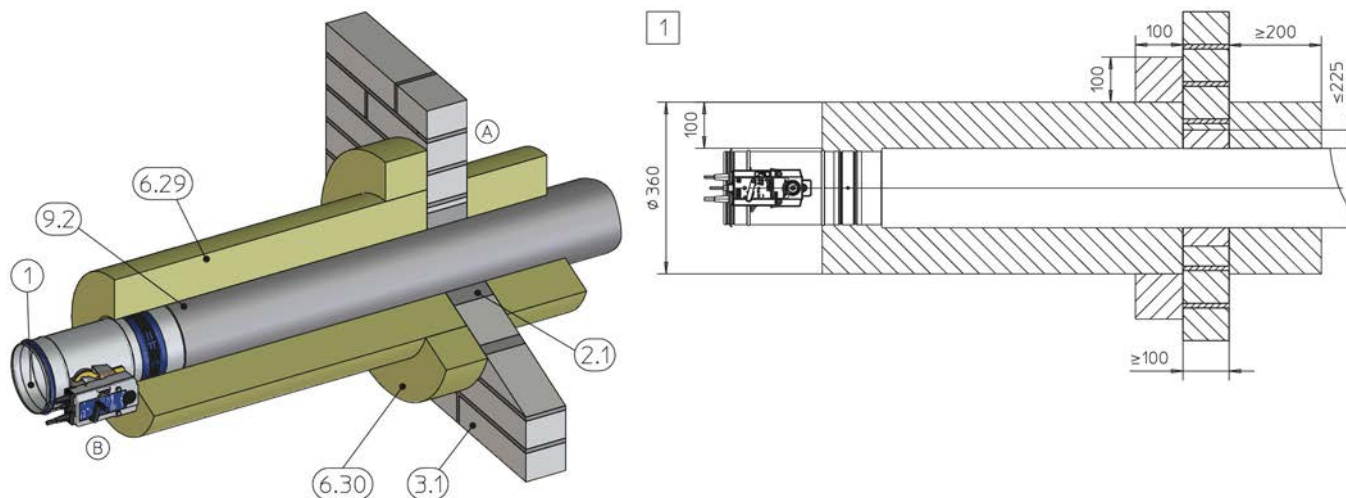
- | | | | |
|------|---|-----|---|
| 1 | FKRS-EU | 9.5 | Suspension system (by others) consisting of: |
| 2.6 | Installation kit WE / WE2 | a | Threaded rod M10 |
| 3.1 | Solid wall | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 4.1 | Solid ceiling slab | c | Hilti® drilled plate, MQZ L13 or equivalent |
| 6.2 | Mineral wool, ≥ 1000 °C, ≥ 80 kg/m ³ ,
thickness ≤ 20 mm | d | Hexagon nut M10 with washer |
| 6.13 | Mineral wool (melting point ≥ 1000 °C) or
gypsum mortar for compensating for uneven
walls and ceilings | 1 | Up to EI 120 S |
| 9.4 | Sheet steel duct with fire-rated cladding and sus-
pension system according to Promat® manual,
construction 478, latest edition | | |

Additional requirements: installation with installation kit WE / WE2 remote from solid walls with wall penetration

- Solid wall ↪ 32
- Installation kit WE / WE2, see ↪ 38
- Suspension and fixing, see ↪ 154
- ≥ 130 mm distance from the fire damper to the wall or ceiling slab
- ≥ 200 mm distance between two fire dampers (wall penetration through separate wall openings)

Note: For more installation details and for components to be provided by others, see the WE / WE2 installation manual.

5.4.10 Installation remote from solid walls with mineral wool



GR3660558, A

Fig. 45: Mortar-based installation remote from a solid wall

1	FKRS-EU	6.30	Reinforcing board mineral wool
2.1	Mortar		Paroc Hvac Fire Mat 80BLC (80 kg/m ³), glued all
3.1	Solid wall		round
6.29	Mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³)	9.2	Sheet steel duct
		1	Up to EI 60 S

Additional requirements: installation remote from solid walls with mineral wool

- Solid wall ↪ 32
- Paroc mineral wool, see ↪ 27

5.4.11 Dry mortarless installation with fire batt

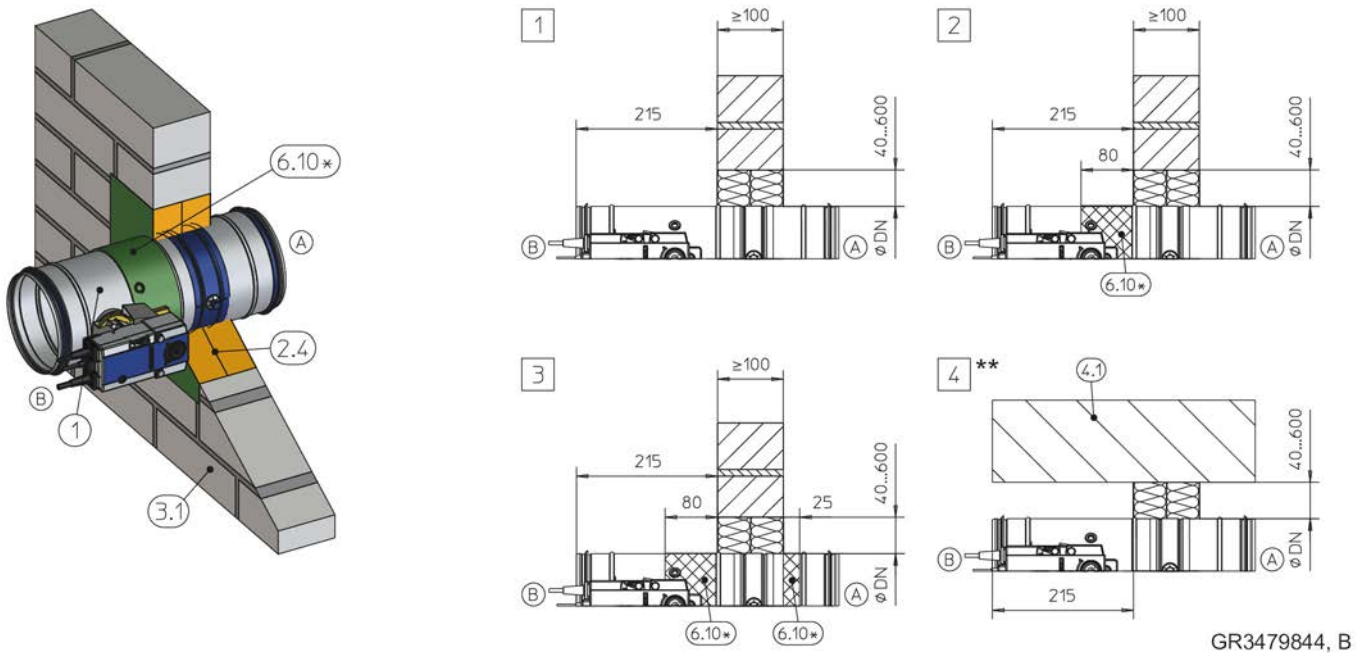
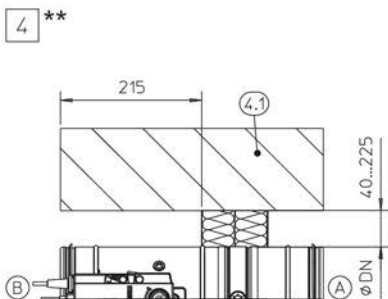
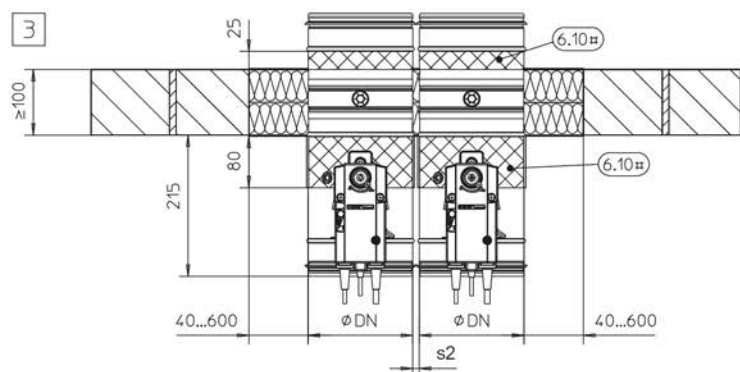
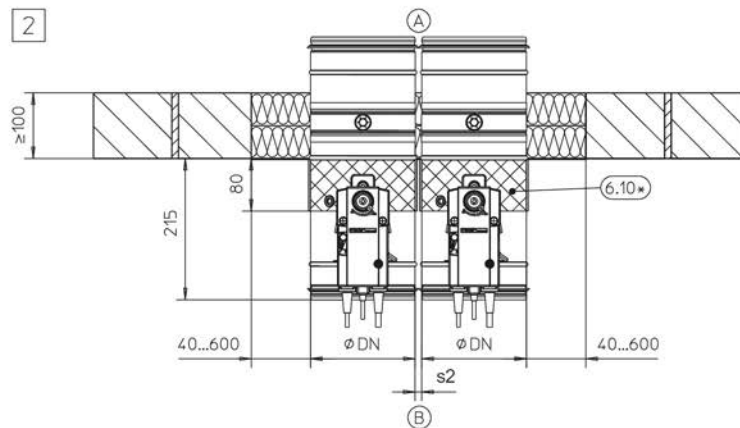
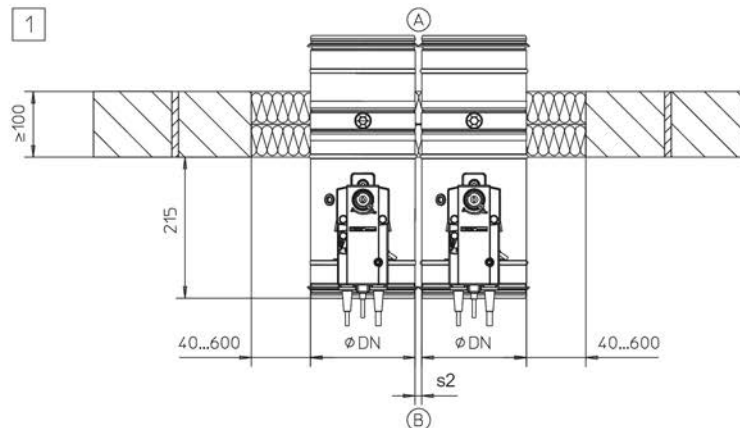
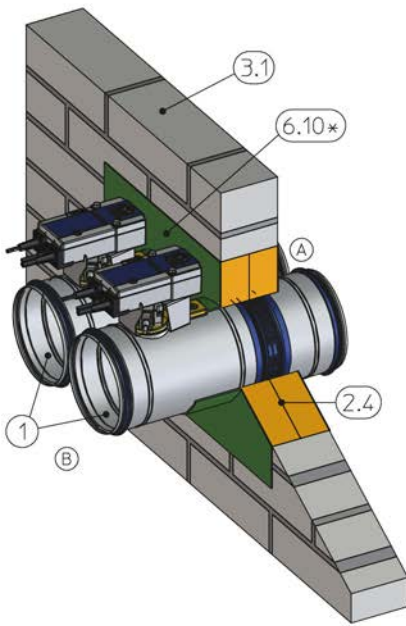


Fig. 46: Dry mortarless installation with fire batt into a solid wall

- | | | | |
|------|--|------|---|
| 1 | FKRS-EU | 6.20 | Sleeve (can be ordered separately) |
| 2.4 | Fire batt with ablative coating | 6.24 | Elastomeric foam (flame-resistant, non-dripping) |
| 3.1 | Solid wall | | The following applies in Germany: For notes on the use of elastomeric foams, see § 7. |
| 4.1 | Solid ceiling slab | | 6.19, 6.20 or 6.24 as an alternative |
| 6.10 | Ablative coating around the perimeter, d = at least 2.5 mm | * | Installation near the floor analogous to [4] |
| 6.19 | Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm, panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible | ** | See table § 59 |

Note: The fire resistance properties of [4] depend on the nominal width and 6.10*.

Solid wall				
NW [mm]	Fire resistance properties to	Coating		Detail
		Installation side A	Operating side B	
100 – 200	EI 90 S	–	–	[1], [4]
100 – 315	EI 90 S	–	x	[2], [4]
100 – 200	EI 120 S	–	x	[2], [4]
100 – 315	EI 120 S	x	x	[3], [4]



GR3177469, B

Fig. 47: Dry mortarless installation into a solid wall, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

- | | | | |
|------|---|-----------|---|
| 1 | FKRS-EU | 6.20 | Sleeve (can be ordered separately) |
| 2.4 | Fire batt with ablative coating | 6.24 | Elastomeric foam (flame-resistant, non-dripping) |
| 3.1 | Solid wall | | |
| 4.1 | Solid ceiling slab | | The following applies in Germany: For notes on the use of elastomeric foams, see ↪ 7. |
| 6.10 | Ablative coating around the perimeter, d = at least 2.5 mm | # | Optional, according to installation details |
| 6.19 | Mineral wool > 1000 °C, > 80 kg/m ³ , thickness = 20 mm, panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible | * | 6.19, 6.20 or 6.24 as an alternative |
| | | ** | Installation near the floor analogous to [4] |
| | | [1] - [4] | See table ↪ 61 |

Note: The fire resistance properties of [4] depend on the nominal width and 6.10*.

Solid wall					
NW [mm]	Fire resistance prop- erties to	Coating		s2 [mm]	Detail
		Installation side A	Operating side B		
100 – 200	EI 90 S	–	–	10 – 600	1 , 4
100 – 315	EI 90 S	–	x	10 – 600	2 , 4
100 – 200	EI 120 S	–	x	40 – 600	2 , 4
100 – 315	EI 120 S	x	x	40 – 600	3 , 4

Additional requirements: dry mortarless installation with fire batt in solid walls

- Solid wall ↪ 32
- Fire batt systems, installation details, distances / dimensions, see ↪ 28 f
- Suspension and fixing, see ↪ 154

5.5 Lightweight partition walls and compartment walls with metal support structure

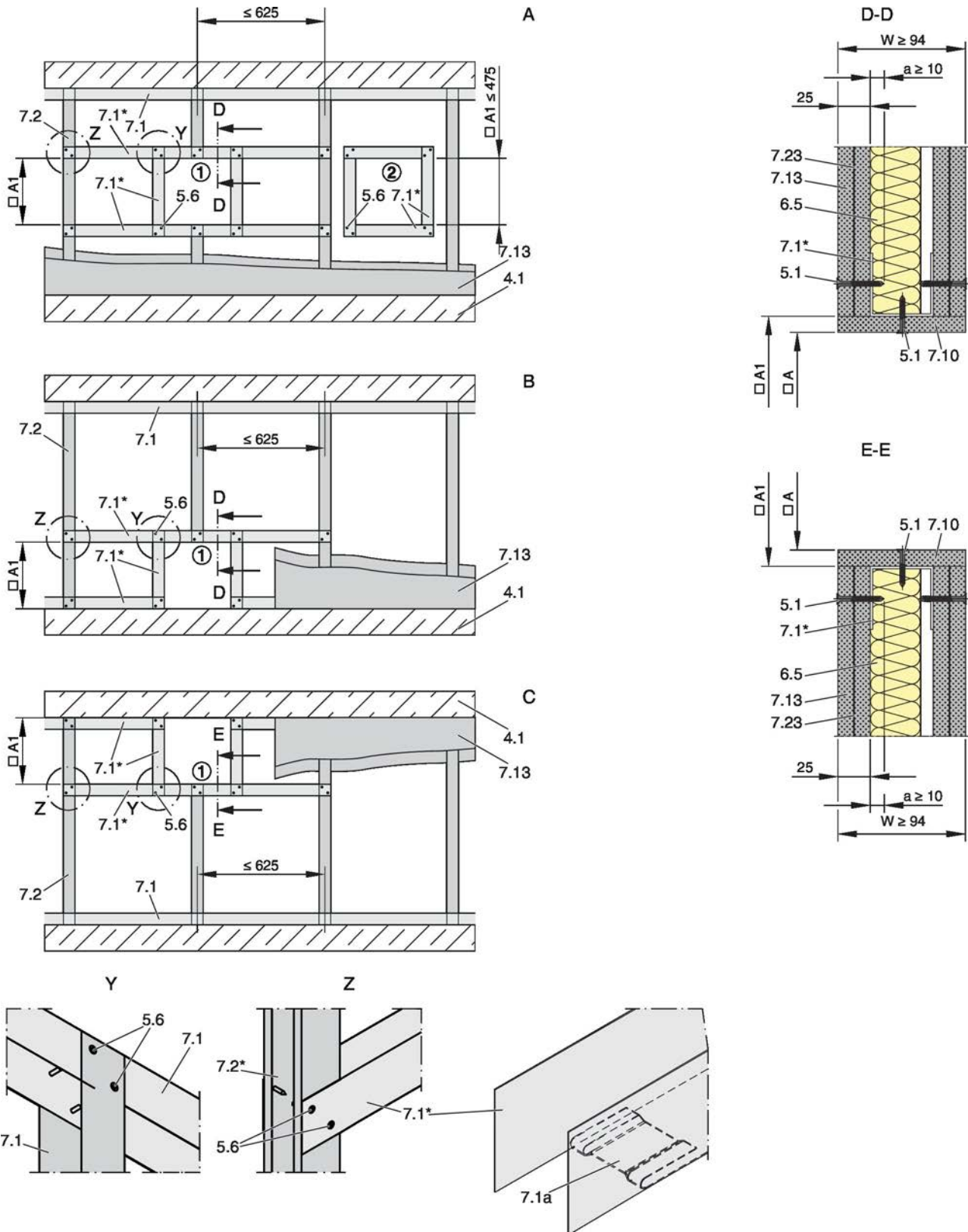


Fig. 48: Lightweight partition wall with metal support structure and cladding on both sides

- | | | | |
|---|---|------|---|
| A | Lightweight partition wall / compartment wall / safety partition wall | 7.1a | UW section, cut in and bent or cut off |
| | | 7.2 | CW section |
| | | 7.10 | Trim panels according to installation details |

Lightweight partition walls and compartment wall... > Dry mortarless installation with fire batt

- | | | | |
|-----|--|-----------------------------|--|
| B | Lightweight partition wall / compartment wall / safety partition wall, installation near the floor | 7.13 | Cladding |
| C | Lightweight partition wall / compartment wall / safety partition wall, installation near the ceiling | 7.23 | Sheet steel insert depending on wall manufacturer (if any) |
| 4.1 | Solid ceiling slab / solid floor | <input type="checkbox"/> A | Installation opening |
| 5.1 | Dry wall screw | <input type="checkbox"/> A1 | Opening in the metal support structure (without trim panels: <input type="checkbox"/> A = <input type="checkbox"/> A1) |
| 5.6 | Screw or steel rivet | * | Closed side of metal section must face the installation opening |
| 6.5 | Mineral wool (depending on wall construction) | | |
| 7.1 | UW section | | |

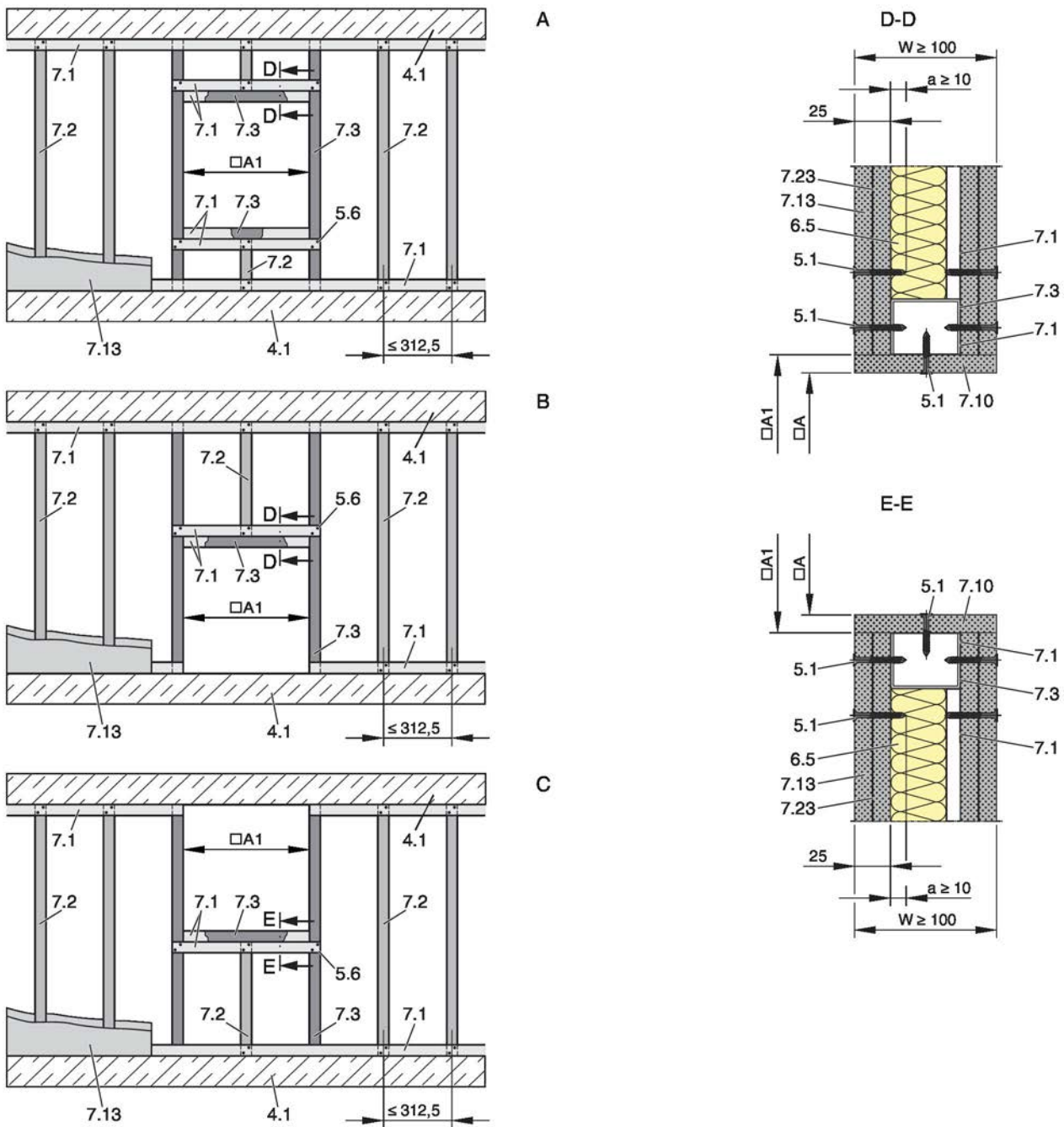


Fig. 49: Compartment wall with metal support structure and cladding on both sides

A	Lightweight partition wall / compartment wall / safety partition wall	7.2	CW section
B	Lightweight partition wall / compartment wall / safety partition wall, installation near the floor	7.3	UA section
C	Lightweight partition wall / compartment wall / safety partition wall, installation near the ceiling	7.10	Trim panels according to installation details
4.1	Solid ceiling slab / solid floor	7.13	Cladding
5.1	Dry wall screw	7.23	Sheet steel insert depending on wall manufacturer (if any)
5.6	Screw or steel rivet	□A	Installation opening
6.5	Mineral wool (depending on wall construction)	□A1	Opening in the metal support structure (without trim panels: □A = □A1)
7.1	UW section	*	Closed side of metal section must face the installation opening
7.1a	UW section, cut in and bent or cut off		

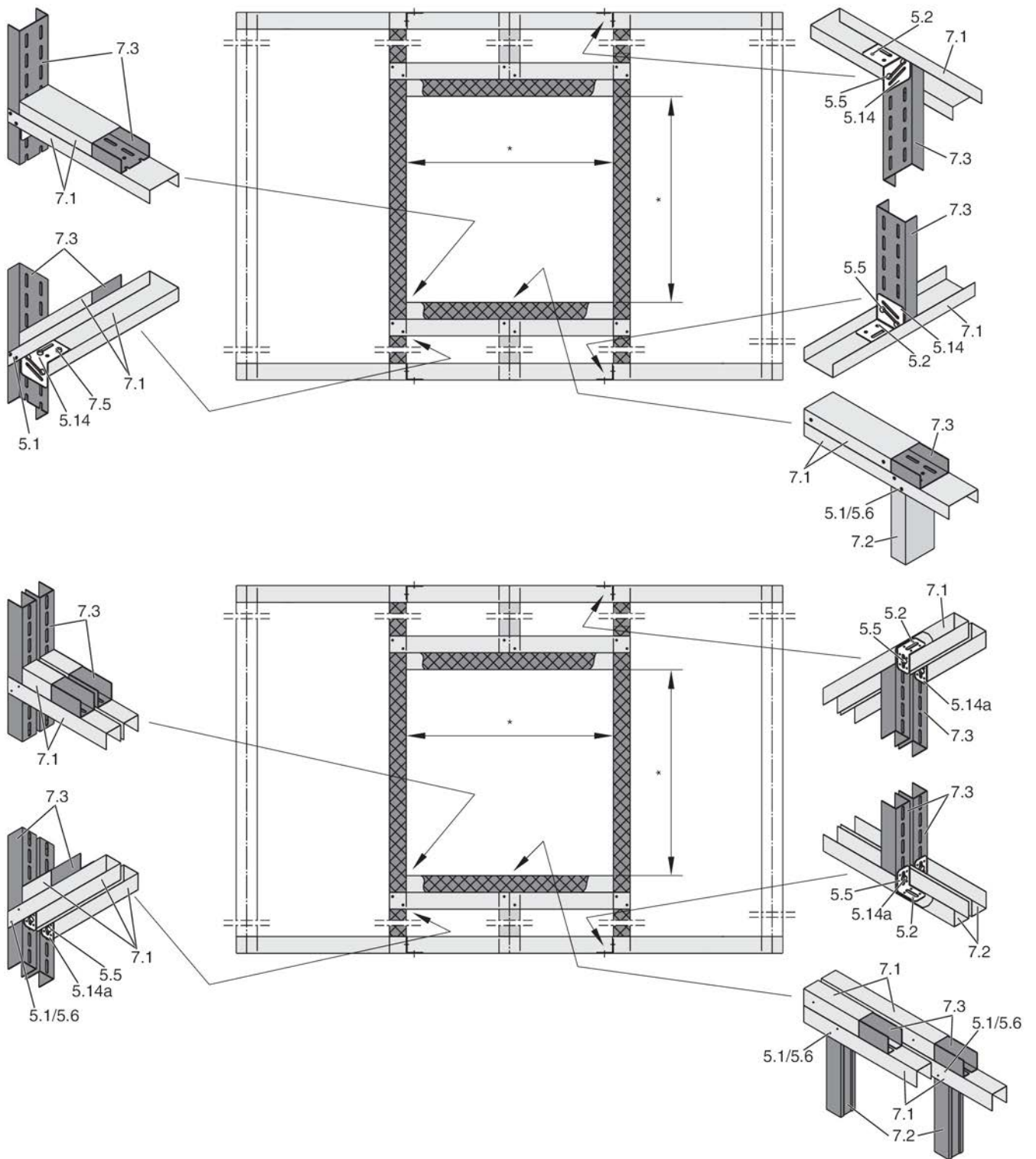


Fig. 50: Metal support structure of compartment wall, single and double stud system

- | | | | |
|------|---|-----|--|
| 5.1 | Dry wall screw | 7.1 | UW section |
| 5.2 | Hexagon head screw M6 | 7.2 | CW section |
| 5.5 | Carriage bolt, L ≤ 50 mm, with washer and nut | 7.3 | UA section |
| 5.6 | Steel rivet | * | Installation opening according to installation details |
| 5.14 | Angle bracket | | |

Installation opening A [mm]										
Installation type	Nominal size									
	100	125	150	160	180	200	224	250	280	315
Mortar-based installation ¹	□A = ØDN + max. 450 mm									
Dry mortarless installation with installation kit TQ / TQ2 ^{1,2}	□A = ØDN + 110 mm									
Dry mortarless installation with fire batt	□A = ØDN + 80 – 1200 mm									

¹⁾ Trim panels, according to installation details

²⁾ Installation opening tolerance ± 2 mm

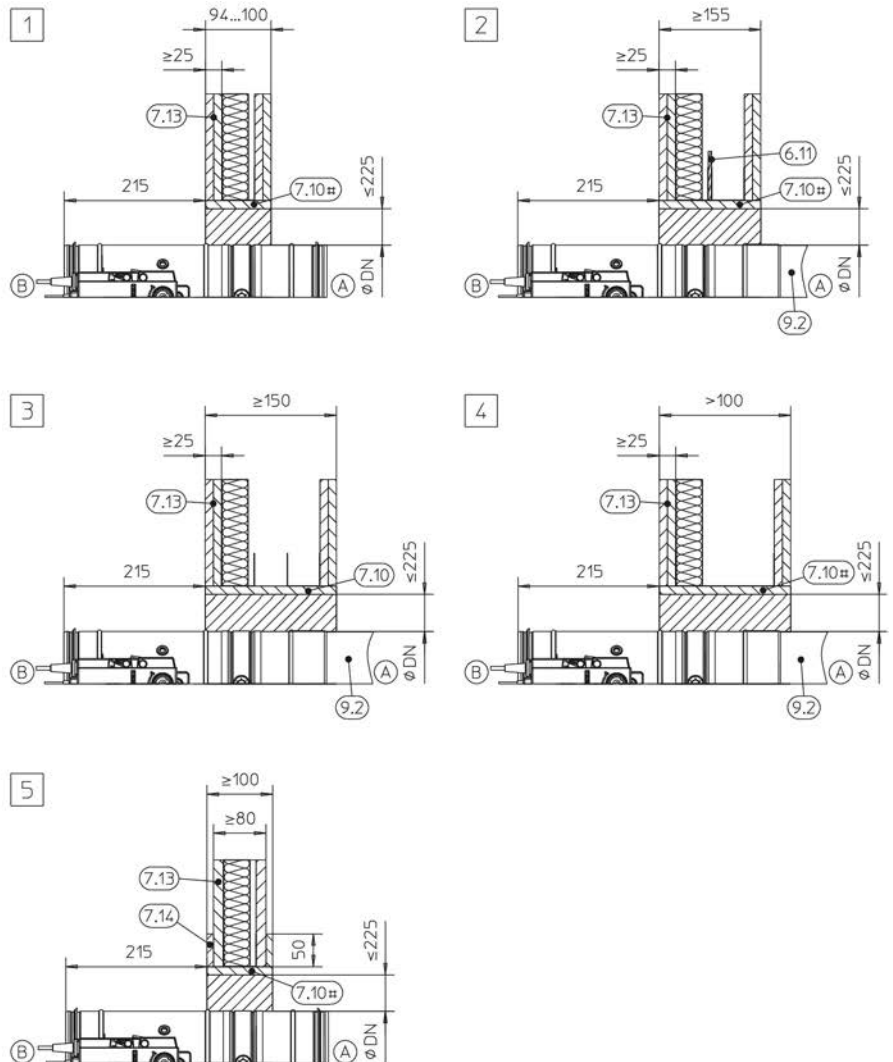
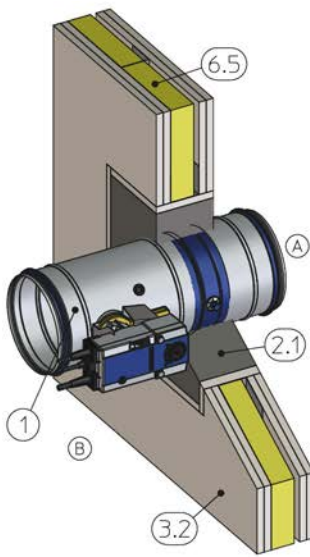
Additional requirements: lightweight partition walls and compartment walls with metal support structure

- Lightweight partition wall or compartment wall, see ↗ 32

Erecting a wall and creating an installation opening

- Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening, see ↗ 62 ff
 - Option 1: Provide the installation opening in the metal support structure with suitable metal sections, then clad the wall.
 - Option 2: After cladding the wall, create a square wall opening (clear installation opening ≤ 475 mm) between the regular studs and brace it with a perimeter metal section. Screw metal sections onto both sides over the cladding, spaced approx. 100 mm apart.

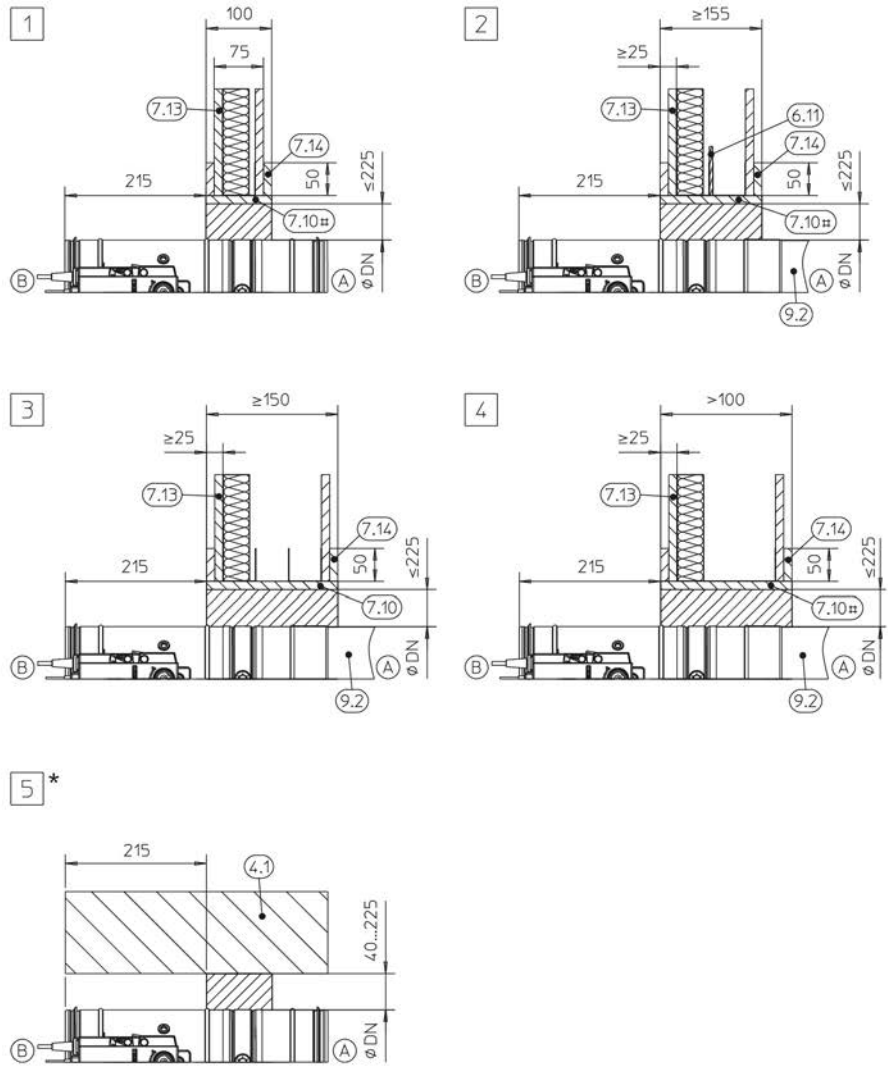
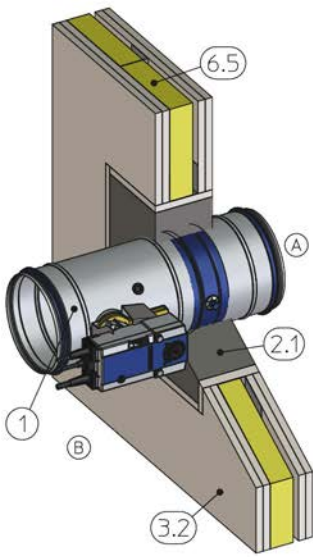
5.5.1 Mortar-based installation



GR3144571, B

Fig. 51: Mortar-based installation into a lightweight partition wall, compartment wall or safety partition wall

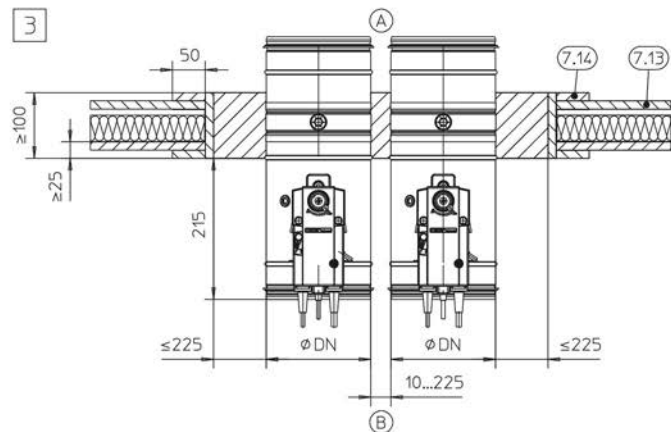
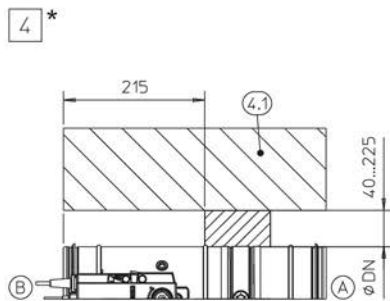
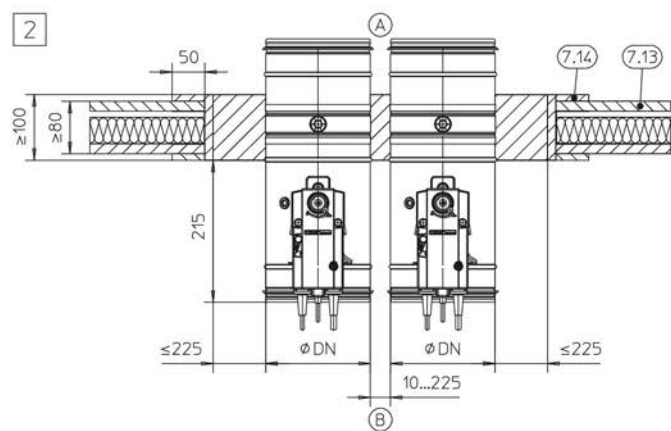
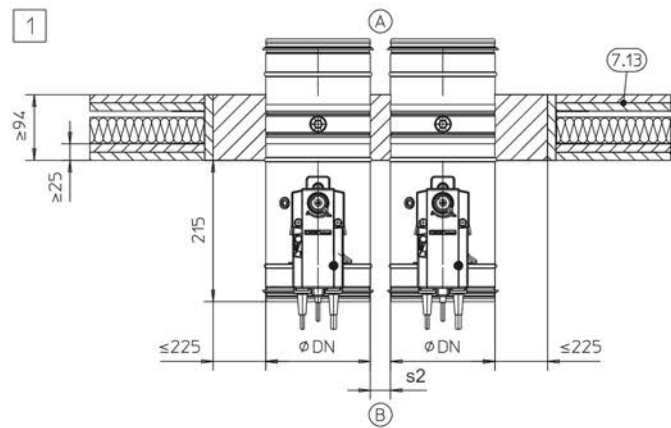
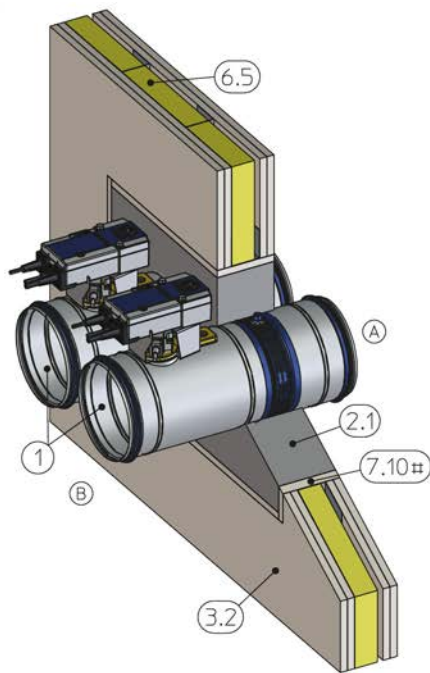
1	FKRS-EU	7.13	Cladding, fire-resistant, also with sheet steel insert
2.1	Mortar	7.14	Reinforcing board of the same material as the wall
3.2	Lightweight partition wall or compartment wall with metal support structure or steel support structure, cladding on both sides	9.2	Extension piece or duct
6.5	Mineral wool (depending on wall construction)	#	optional
6.11	Insulating strip (depending on wall construction)	1 - 4	Up to EI 120 S
7.10	Trim panels	5	Up to EI 60 S



GR3144571, B

Fig. 52: Mortar-based installation into a lightweight partition wall

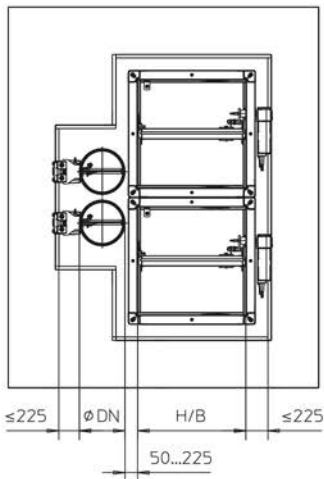
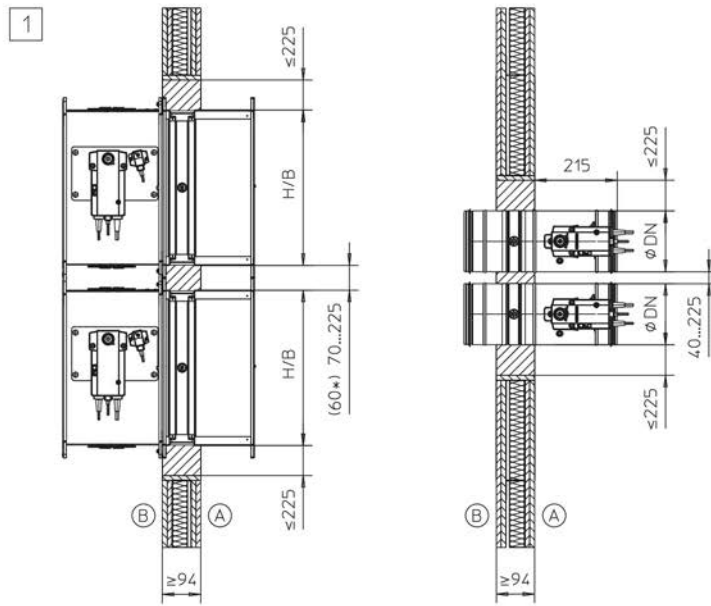
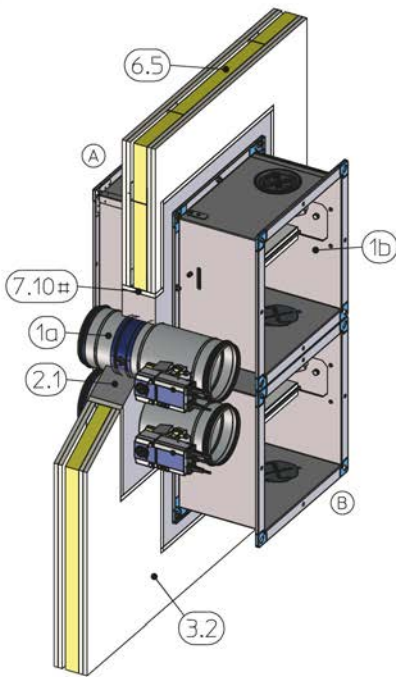
1	FKRS-EU	7.13	Cladding, fire-resistant, also with sheet steel insert
2.1	Mortar	7.14	Reinforcing board of the same material as the wall
3.2	Lightweight partition wall or compartment wall with metal support structure or steel support structure, cladding on both sides	9.2	Extension piece or duct optional
4.1	Solid ceiling slab / solid floor	#	optional
6.5	Mineral wool (depending on wall construction)	*	Installation near the floor analogous to [5]
6.11	Insulating strip (depending on wall construction)	[1] – [4]	EI 30 S
7.10	Trim panels	[5]	EI 30 S – EI 120 S



GR3156481, B

Fig. 53: Mortar-based installation into a lightweight partition wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

- | | | | |
|------|--|----------|---|
| 1 | FKRS-EU | 7.14 | Reinforcing board of the same material as the wall |
| 2.1 | Mortar | # | optional |
| 3.2 | Lightweight partition wall or compartment wall with metal support structure or steel support structure, cladding on both sides | * | Installation near the floor analogous to 4 |
| 4.1 | Solid ceiling slab / solid floor | 1 | Up to EI 120 S for s2 = 40 – 225 mm
Up to EI 90 S for s2 = 10 – 225 mm |
| 6.5 | Mineral wool (depending on wall construction) | 2 | Up to EI 60 S |
| 7.10 | Trim panels | 3 | EI 30 S |
| 7.13 | Cladding, fire-resistant, also with sheet steel insert | 4 | EI 30 S – EI 120 S |



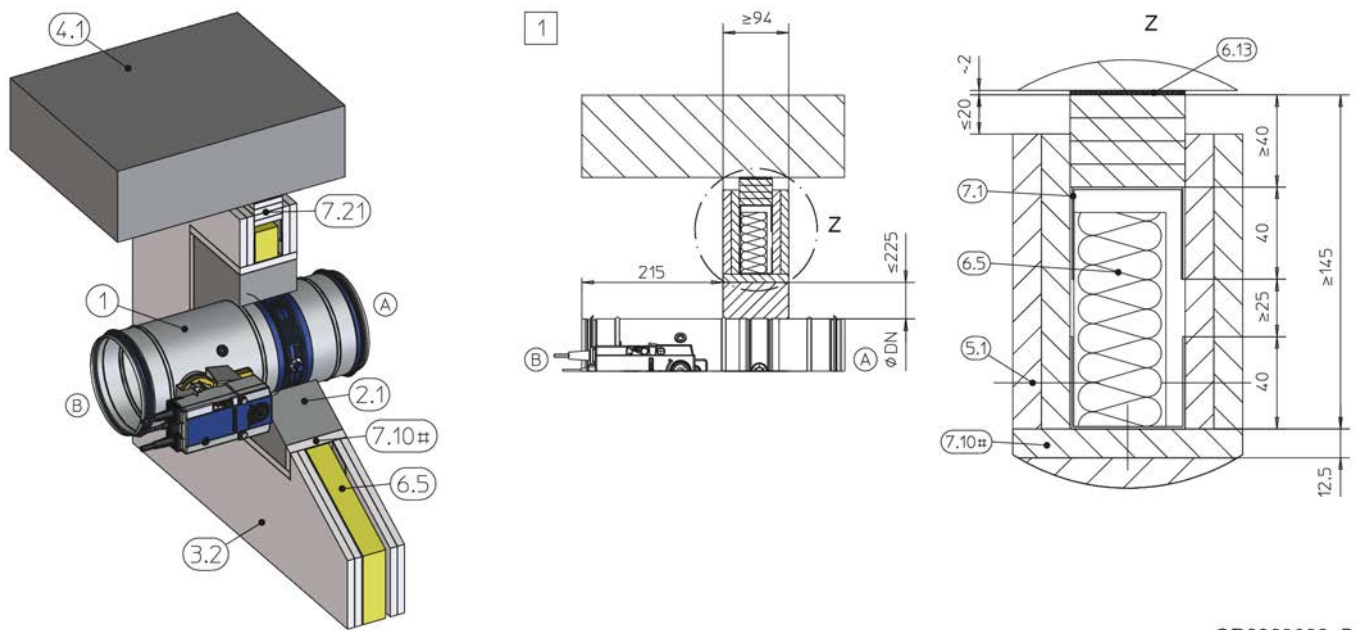
GR3479538, B

Fig. 54: Mortar-based installation into a lightweight partition wall, FK-EU / FK2-EU and FKRS-EU combined

- | | | | |
|-----|--|------|--|
| 1a | FKRS-EU | 7.10 | Trim panels |
| 1b | FK-EU / FK2-EU up to $W \times H \leq 800 \times 400$ mm | # | according to installation details Fig. 51 to Fig. 53 |
| 2.1 | Mortar | * | with FK2-EU |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | 1 | Up to EI 90 S |
| 6.5 | Mineral wool (depending on wall construction) | | |

Note: Alternative installation orientations of side-by-side, under or on top of one another possible. Details are available upon request.

For installation details FK-EU and FK2-EU, see the installation and operating manual for these fire damper types.



GR2283082, B

Fig. 55: Mortar-based installation into a lightweight partition wall, below a flexible ceiling joint

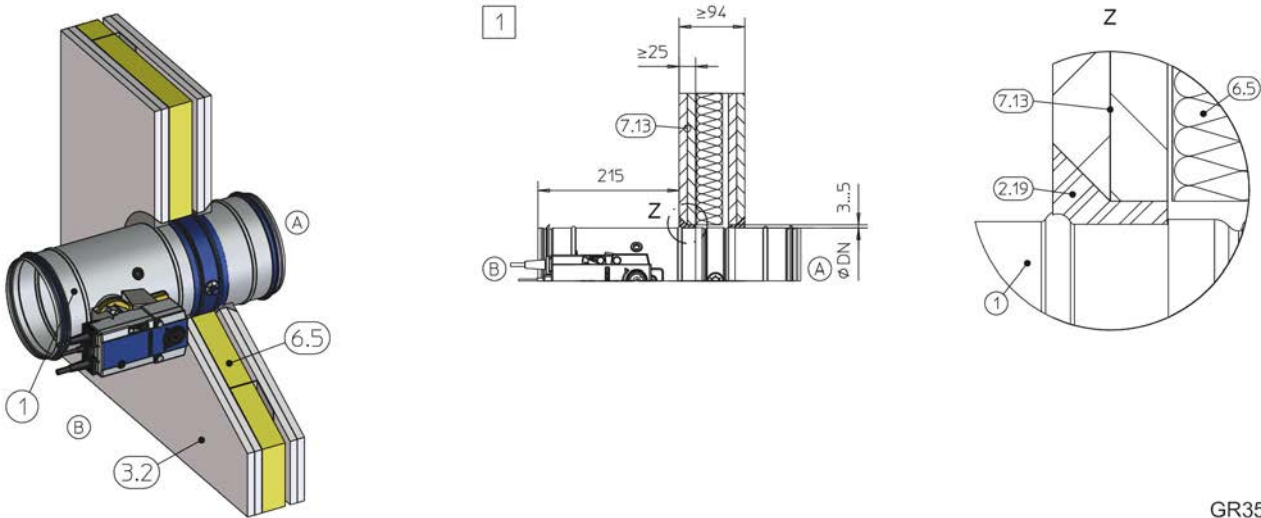
1	FKRS-EU	6.13	Mineral wool strips A1, filler as an alternative (if required to even out an uneven wall)
2.1	Mortar	7.1	UW section (must be left out at detail "Z" in the area of (5.1))
3.2	Lightweight partition wall with metal support structure, cladding on both sides	7.10	Trim panels
4.1	Solid ceiling slab	7.21	Ceiling joint strips (e.g. 4 × ≥ 10 mm)
5.1	Dry wall screw	#	Optional, according to installation details
6.5	Mineral wool (depending on wall construction)	1	Up to EI 120 S

Note: representative illustration. The distance to the ceiling depends on the design of the flexible ceiling joint, the expected ceiling subsidence and the specifications of the wall manufacturer.

Additional requirements: mortar-based installation into lightweight partition and compartment walls

- Lightweight partition wall or compartment wall, see ↗ 32

5.5.2 Dry mortarless installation without installation kit



GR3554599, A

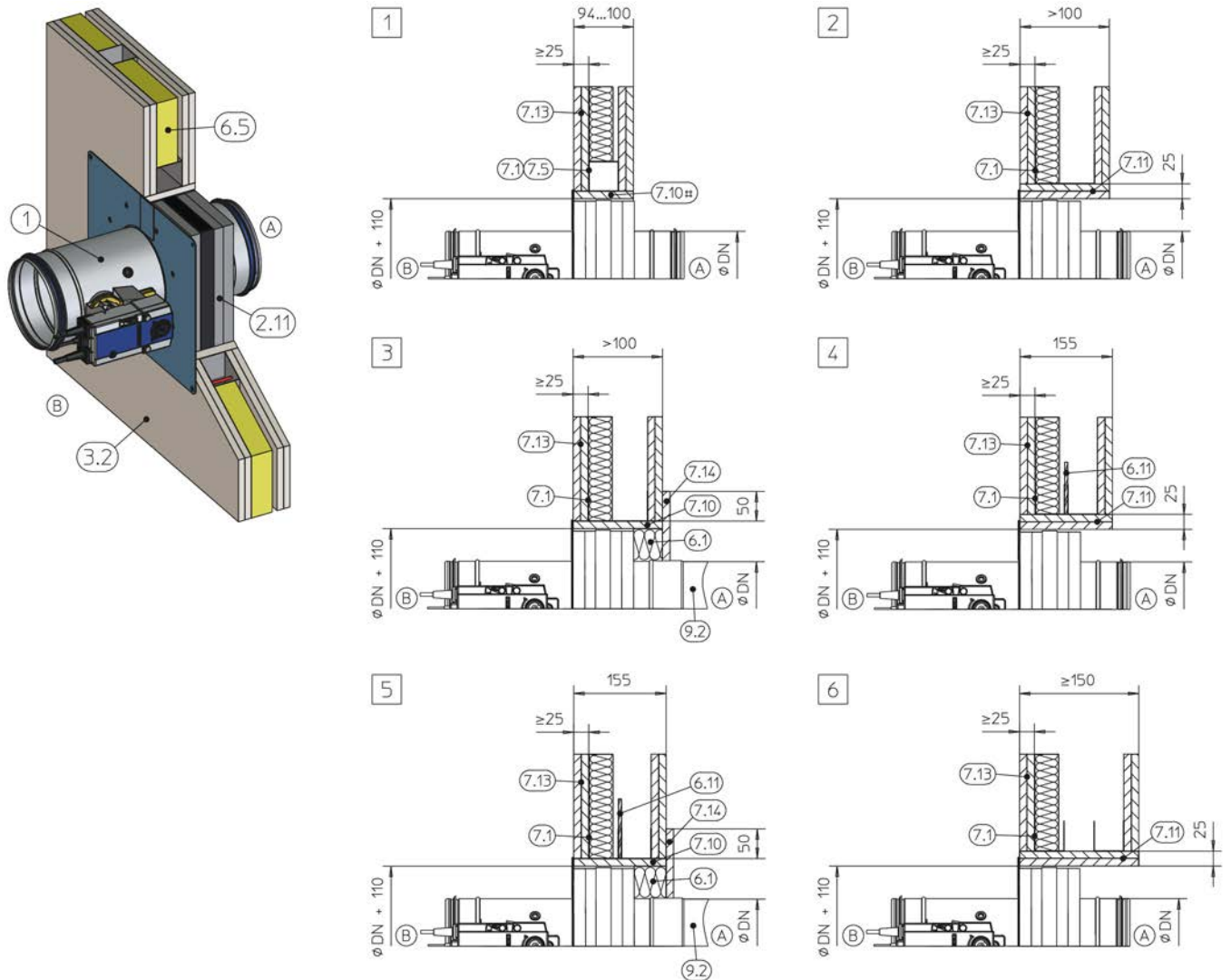
Fig. 56: Dry mortarless installation into a lightweight partition wall, without installation kit

1	FKRS-EU	6.5	Mineral wool (depending on wall construction)
2.19	Joint filler (filler, ready-to-use putty or equivalent)	7.13	Cladding, fire-resistant, also with sheet steel insert
3.2	Lightweight partition wall or compartment wall with metal support structure or steel support structure, cladding on both sides	1	Up to EI 60 S

Additional requirements: dry mortarless installation into lightweight partition walls without installation kit

- Lightweight partition wall ↻ 32
 - ≥ 200 mm distance between two fire dampers
 - ≥ 75 mm distance from fire damper to load-bearing structural elements
1. ▶ Make a circular installation opening DN + 6 – 10 mm between two regular studs.
 2. ▶ Chamfer the outer layer of the cladding all round on both sides and completely fill the surrounding gap on both sides with joint filler to the depth of the cladding.

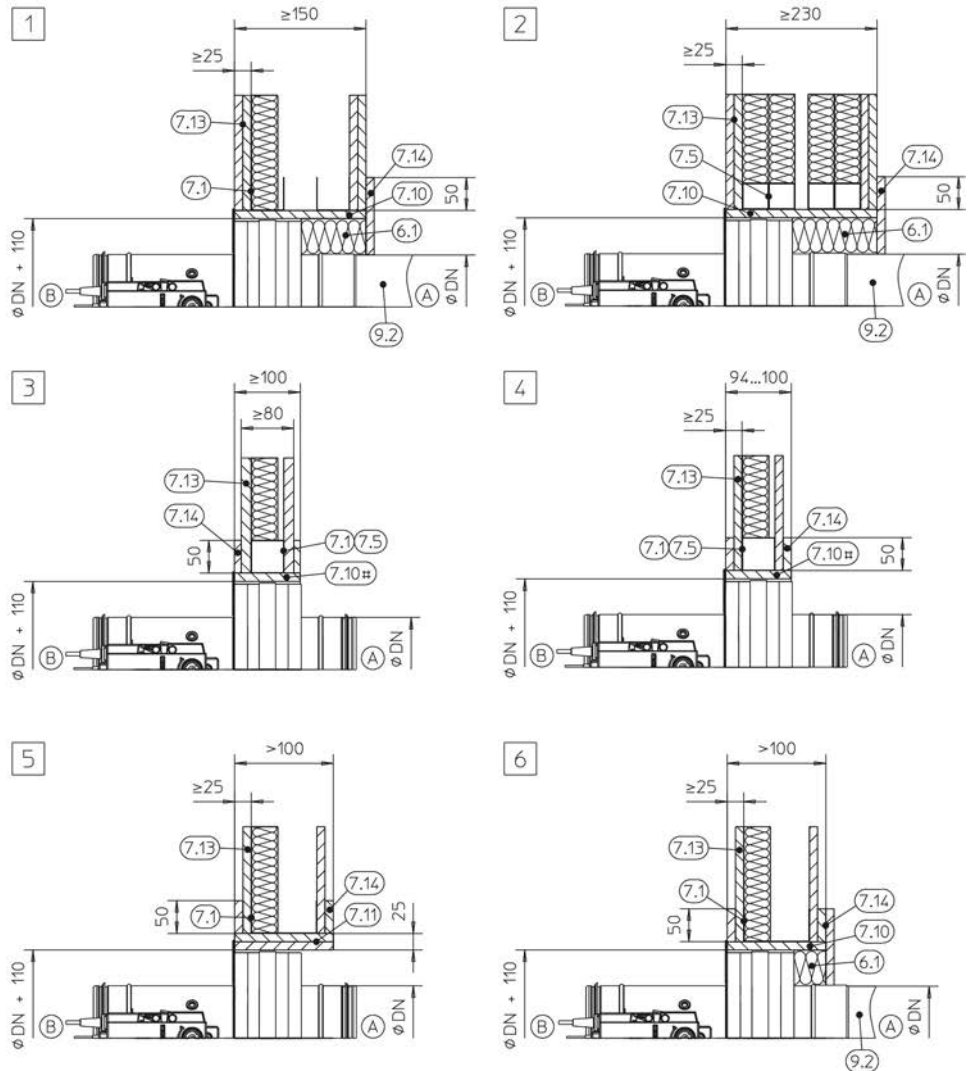
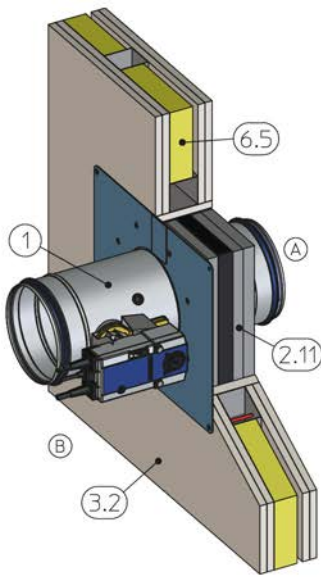
5.5.3 Dry mortarless installation with installation kit TQ / TQ2



GR3611232, A

Fig. 57: Dry mortarless installation into a lightweight partition wall, with installation kit TQ / TQ2

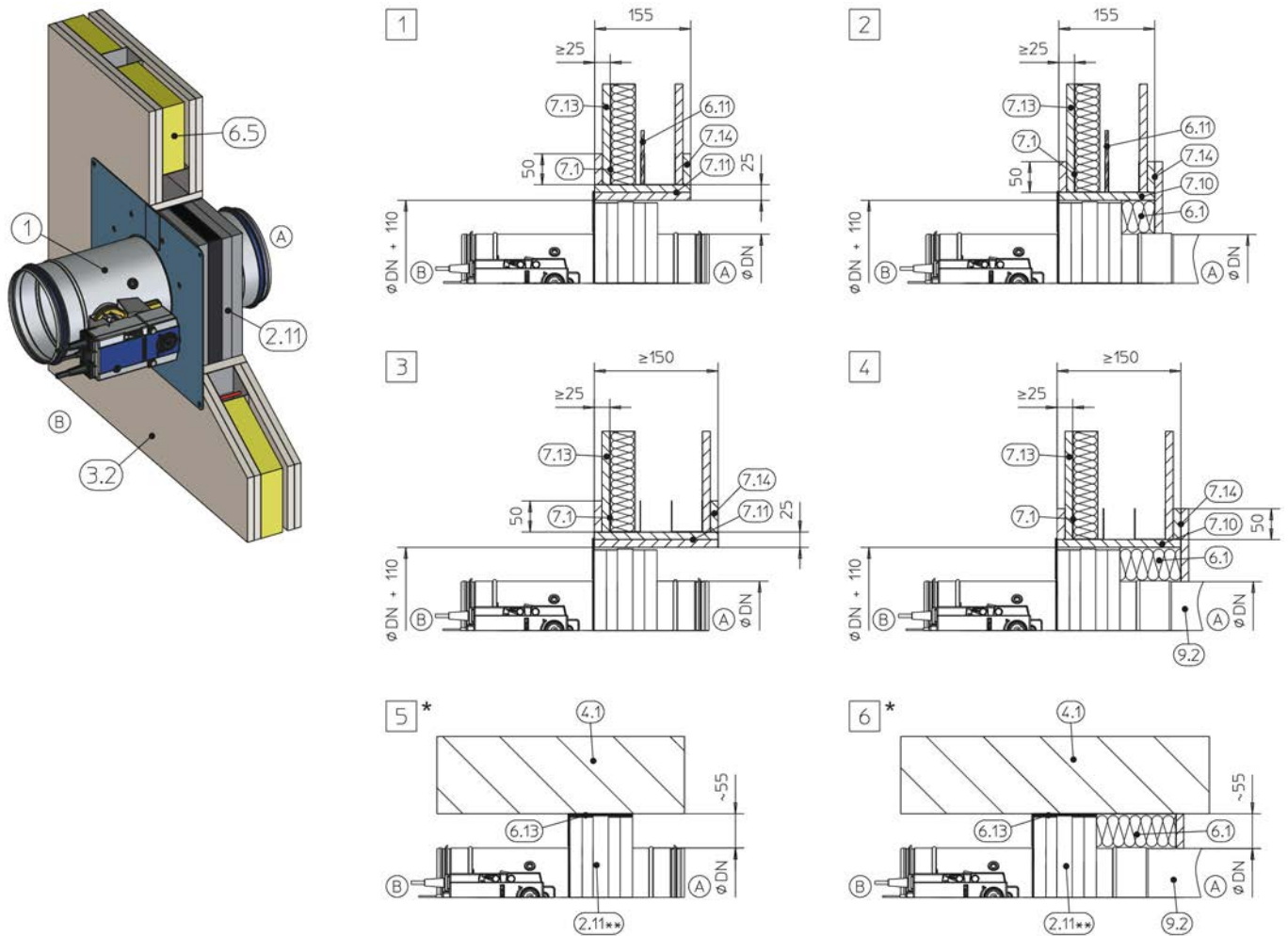
1	FKRS-EU	7.5	Steel support structure (box section)
2.11	Installation kit TQ / TQ2 with cover plate (two-part with TQ2)	7.10	Trim panels (fire-resistant)
3.2	Lightweight partition wall or compartment wall with metal support structure or steel support structure, cladding on both sides	7.11	Fire-resistant trim panels, double
6.1	Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 40\text{ kg/m}^3$	7.13	Cladding, fire-resistant, also with sheet steel insert
6.5	Mineral wool (depending on wall construction)	7.14	Reinforcing board of the same material as the wall
6.11	Insulating strip (depending on wall construction)	9.2	Extension piece or duct
6.13	Mineral wool strips A1, alternatively gypsum mortar	#	optional
7.1	UW section	1 – 6	Up to EI 120 S



GR3611232, A

Fig. 58: Dry mortarless installation into a lightweight partition wall, with installation kit TQ / TQ2

1	FKRS-EU	7.11	Fire-resistant trim panels, double
2.11	Installation kit TQ / TQ2 with cover plate (two-part with TQ2)	7.13	Cladding, fire-resistant, also with sheet steel insert
3.2	Lightweight partition wall or compartment wall with metal support structure or steel support structure, cladding on both sides	7.14	Reinforcing board of the same material as the wall
6.1	Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 40\text{ kg/m}^3$	9.2	Extension piece or duct
6.5	Mineral wool (depending on wall construction)	#	optional
7.1	UW section	1 2	Up to EI 120 S
7.5	Steel support structure (box section)	3	Up to EI 60 S
7.10	Trim panels (fire-resistant)	4 - 6	EI 30 S

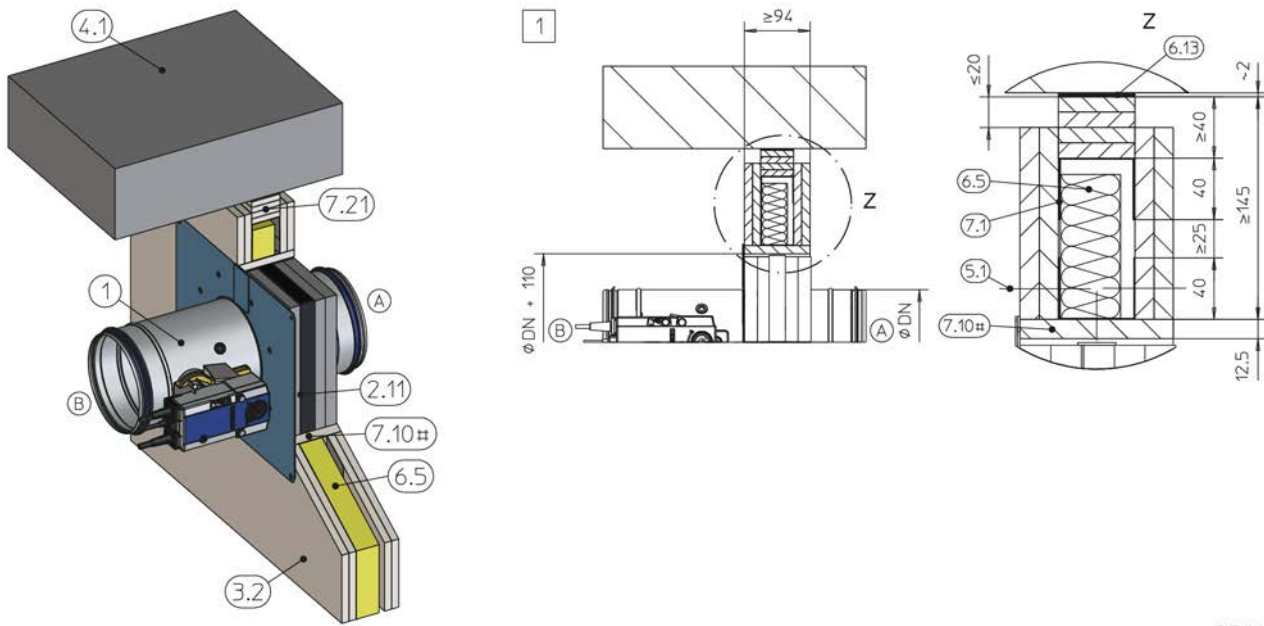


GR3611232, A

Fig. 59: Dry mortarless installation into a lightweight partition wall, with installation kit TQ / TQ2

1	FKRS-EU	7.11	Fire-resistant trim panels, double
2.11	Installation kit TQ / TQ2 with cover plate (two-part with TQ2)	7.13	Cladding, fire-resistant, also with sheet steel insert
3.2	Lightweight partition wall or compartment wall with metal support structure or steel support structure, cladding on both sides	7.14	Reinforcing board of the same material as the wall
4.1	Solid ceiling slab / solid floor	9.2	Extension piece or duct
6.1	Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 40\text{ kg/m}^3$	#	optional
6.5	Mineral wool (depending on wall construction)	*	Installation near the floor analogous to 5 and 6
6.11	Insulating strip (depending on wall construction)	**	Cover plate shortened by others
6.13	Mineral wool strips A1, alternatively gypsum mortar	1 - 4	EI 30 S
7.1	UW section	5 6	EI 30 S – EI 120 S
7.10	Trim panels (fire-resistant)		

Lightweight partition walls and compartment wall... > Dry mortarless installation with installation ...



GR3612519, A

Fig. 60: Dry mortarless installation with installation kit TQ / TQ2 into a lightweight partition wall, below a flexible ceiling joint

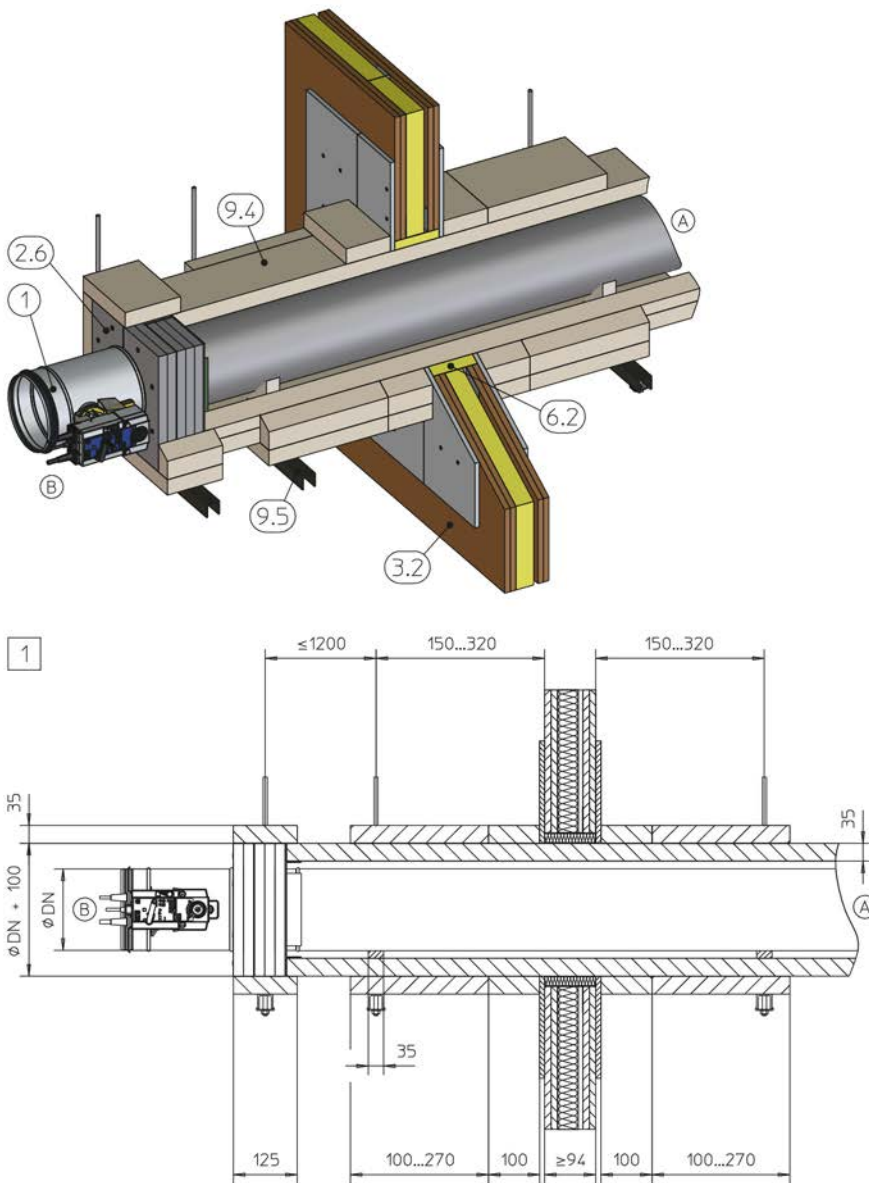
1	FKRS-EU	6.13	Mineral wool strips A1, if required, alternatively gypsum mortar
2.11	Installation kit TQ / TQ2 with cover plate (two-part with TQ2)	7.1	UW section
3.2	Lightweight partition wall with metal support structure, cladding on both sides	7.10	Trim panels
4.1	Solid ceiling slab	7.21	Ceiling joint strips (e.g. 4 × ≥ 10 mm)
5.1	Dry wall screw	#	according to installation details Fig. 57 to Fig. 59
6.5	Mineral wool (depending on wall construction)	1	Up to EI 90 S

Note: representative illustration. The distance to the ceiling depends on the design of the flexible ceiling joint, the expected ceiling subsidence and the specifications of the wall manufacturer.

Additional requirements: dry mortarless installation with installation kit TQ / TQ2 into lightweight partition walls

- Lightweight partition wall or compartment wall, see ↗ 32
- Installation kit TQ / TQ2, see ↗ 36
- ≥ 200 mm distance between two fire dampers in separate installation openings

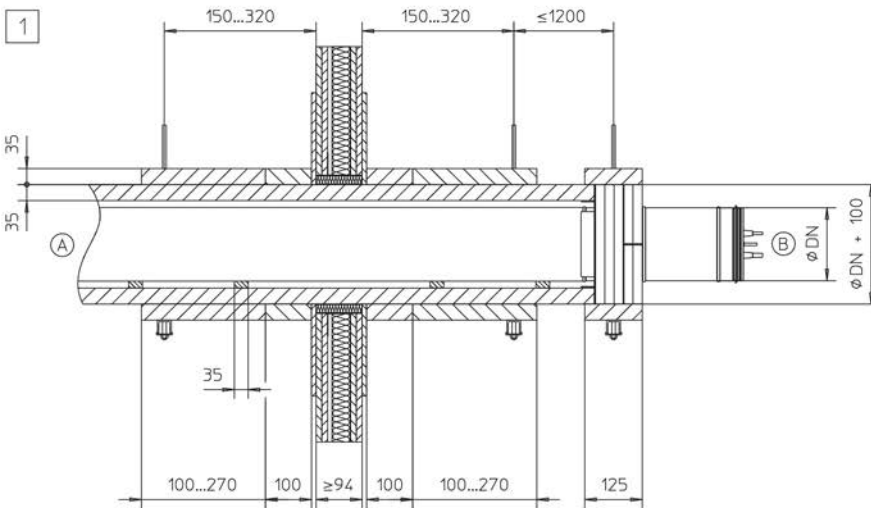
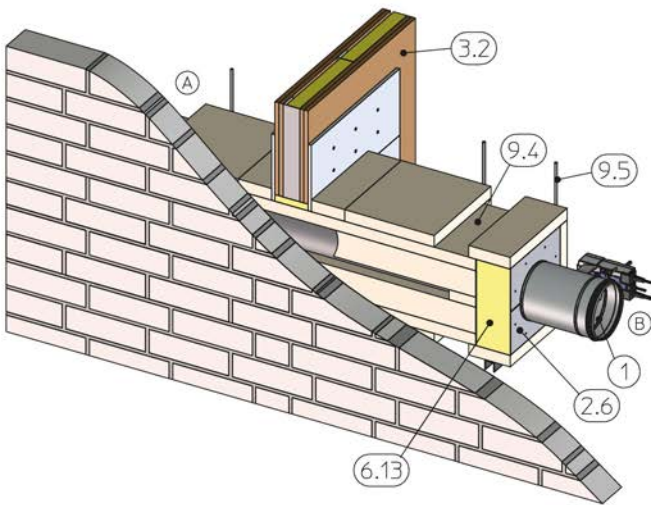
5.5.4 Installation with installation kit WE / WE2 remote from lightweight partition walls with wall penetration



GR3616851, A

Fig. 61: Dry mortarless installation remote from a lightweight partition wall with wall penetration, on four sides with installation kit WE / WE2

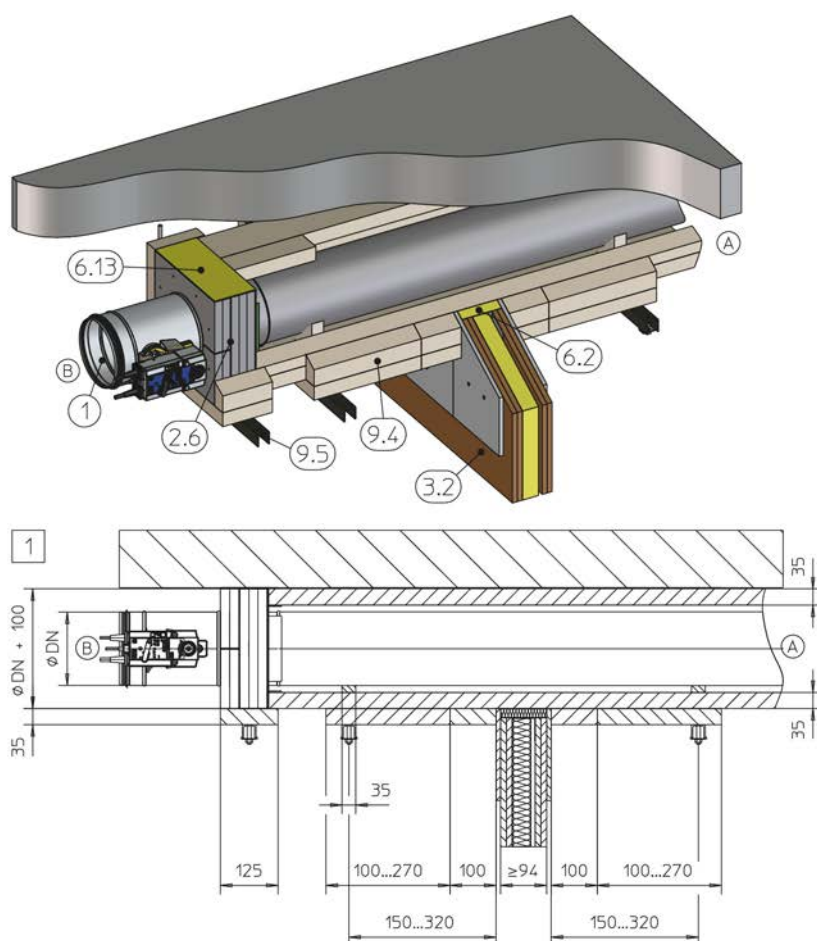
- | | |
|---|---|
| <p>1 FKRS-EU
 2.6 Installation kit WE / WE2
 3.2 Lightweight partition wall with metal support structure, cladding on both sides
 6.2 Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 80\text{ kg/m}^3$
 9.4 Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition
 9.5 Suspension system (by others) consisting of:</p> | <p>a Threaded rod M10
 b Hilti® mounting rail MQ 41 × 3 mm or equivalent
 c Hilti® drilled plate, MQZ L13 or equivalent
 d Hexagon nut M10 with washer
 1 Up to EI 90 S</p> |
|---|---|



GR1727135, B

Fig. 62: Dry mortarless installation remote from a lightweight partition wall with wall penetration, on three sides with installation kit WE / WE2

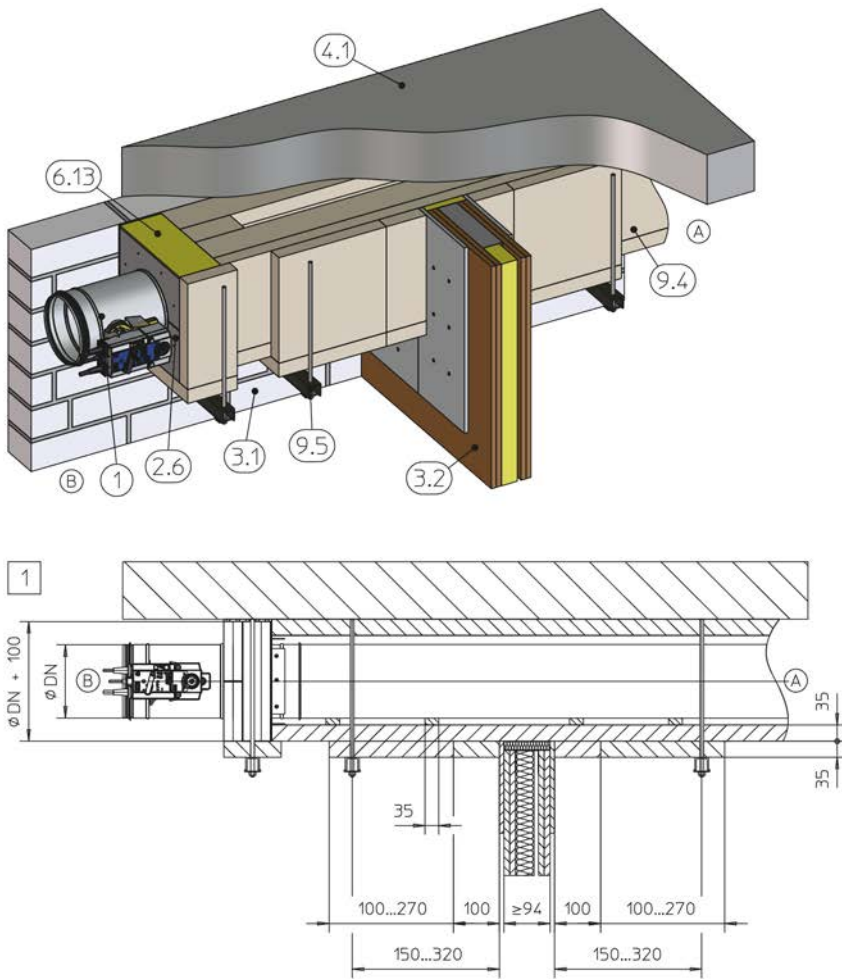
- | | | | |
|------|---|----------|---|
| 1 | FKRS-EU | a | Threaded rod M10 |
| 2.6 | Installation kit WE / WE2 | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 3.2 | Lightweight partition wall with metal support structure, cladding on both sides | c | Hilti® drilled plate, MQZ L13 or equivalent |
| 6.13 | Mineral wool, ≥ 1000 °C or gypsum mortar for compensating unevenness | d | Hexagon nut M10 with washer |
| 9.4 | Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition | 1 | Up to EI 90 S |
| 9.5 | Suspension system (by others) consisting of: | | |



GR3610114, A

Fig. 63: Dry mortarless installation remote from a lightweight partition wall with wall penetration, on three sides with installation kit WE / WE2

- | | | | |
|------|---|-----|---|
| 1 | FKRS-EU | 9.5 | Suspension system (by others) consisting of: |
| 2.6 | Installation kit WE / WE2 | a | Threaded rod M10 |
| 3.2 | Lightweight partition wall with metal support structure, cladding on both sides | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 4.1 | Solid ceiling slab | c | Hilti® drilled plate, MQZ L13 or equivalent |
| 6.2 | Mineral wool, $\geq 1000\text{ °C}$, $\geq 80\text{ kg/m}^3$ | d | Hexagon nut M10 with washer |
| 6.13 | Mineral wool, $\geq 1000\text{ °C}$ or gypsum mortar for compensating unevenness | 1 | Up to EI 90 S |
| 9.4 | Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition | | |



GR3551464, B

Fig. 64: Dry mortarless installation remote from a lightweight partition wall with wall penetration, on two sides with installation kit WE / WE2

- | | | | |
|------|---|----------|---|
| 1 | FKRS-EU | 9.5 | Suspension system (by others) consisting of: |
| 2.6 | Installation kit WE / WE2 | a | Threaded rod M10 |
| 3.1 | Solid wall | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 3.2 | Lightweight partition wall with metal support structure, cladding on both sides | c | Hilti® drilled plate, MQZ L13 or equivalent |
| 4.1 | Solid ceiling slab | d | Hexagon nut M10 with washer |
| 6.13 | Mineral wool, ≥ 1000 °C or gypsum mortar for compensating unevenness | 1 | Up to EI 90 S |
| 9.4 | Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition | | |

Additional requirements: dry mortarless installation with installation kit WE / WE2 remote from lightweight partition walls with wall penetration

- Lightweight partition wall or compartment wall, see ↪ 32
- Installation kit WE / WE2, see ↪ 38
- Suspension and fixing, see ↪ 154
- Sheet steel ducts without any openings, with fire-resistant cladding (fittings with cladding according to instructions from Promat®)
- ≥ 300 mm distance between two fire dampers

Note: For more installation details and for components to be provided by others, see the WE / WE2 installation manual.

5.5.5 Installation remote from lightweight partition and compartment walls with mineral wool

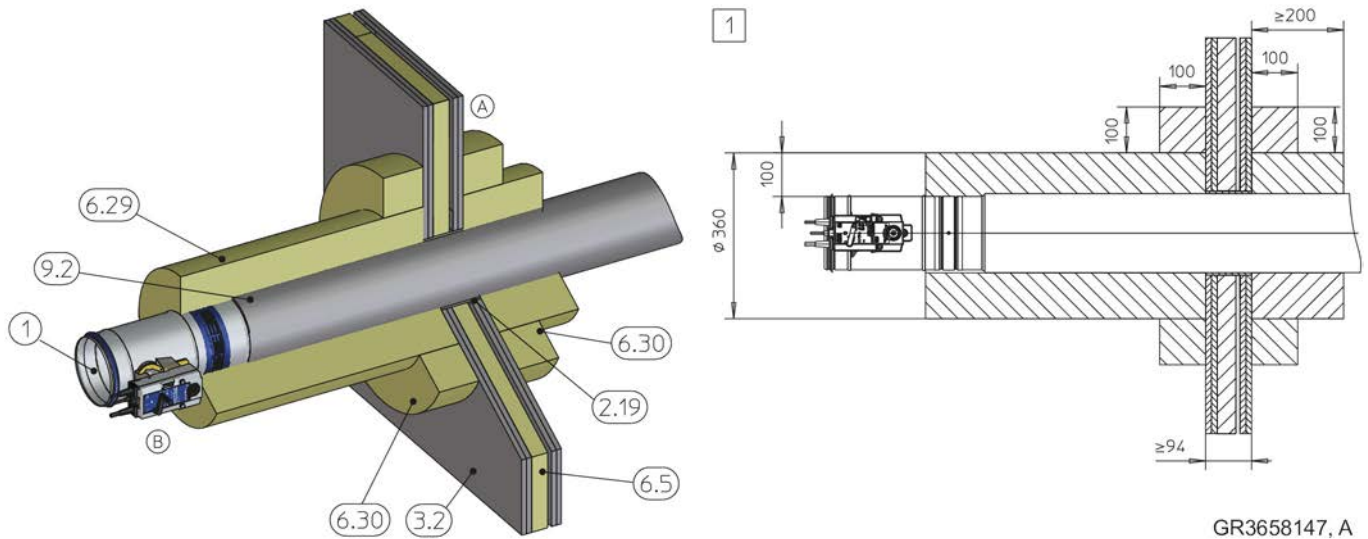


Fig. 65: Installation with joint filler remote from a lightweight partition wall

- | | | | |
|------|---|------|---|
| 1 | FKRS-EU | 6.29 | Mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³) |
| 2.19 | Joint filler | 6.30 | Reinforcing board mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³), glued all round |
| 3.2 | Lightweight partition wall with metal support structure, cladding on both sides | 9.2 | Sheet steel duct |
| 6.5 | Mineral wool (depending on wall construction) | 1 | Up to EI 60 S |

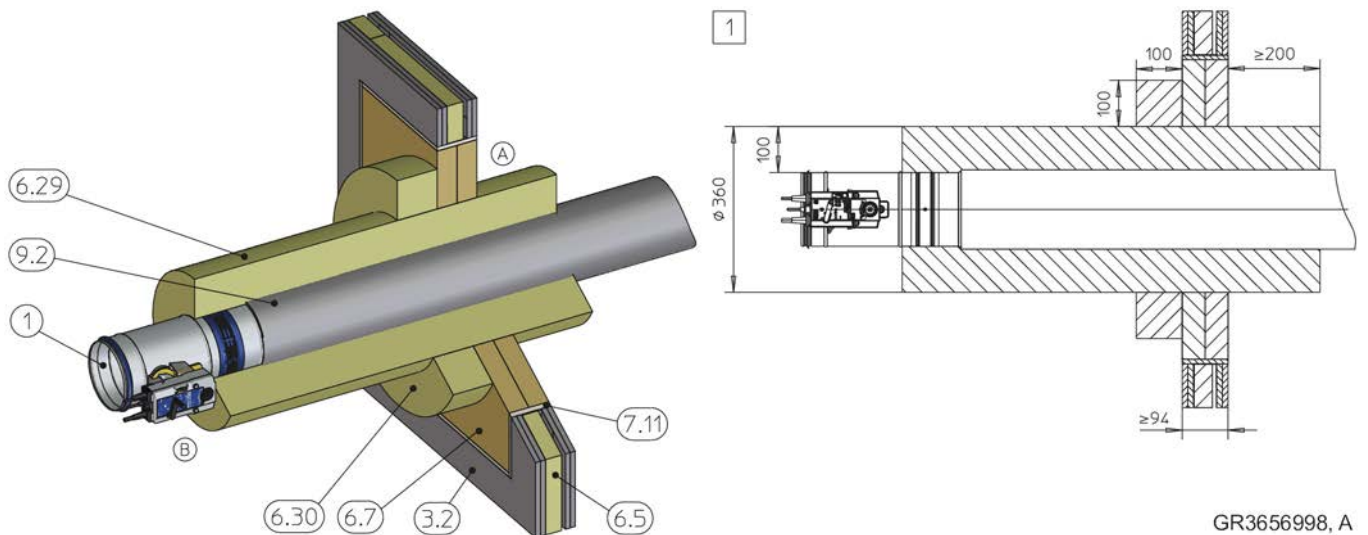


Fig. 66: Dry mortarless installation remote from a lightweight partition wall, with a fire batt

- | | | | |
|------|---|------|---|
| 1 | FKRS-EU | 6.30 | Reinforcing board mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³), glued all round |
| 3.2 | Lightweight partition wall with metal support structure, cladding on both sides | 7.11 | Trim panels, single-layer, fire-resistant |
| 6.5 | Mineral wool (depending on wall construction) | 8.21 | Acrylic or sealing compound (suitable for fire batt system) |
| 6.7 | Fire batt | 9.2 | Sheet steel duct |
| 6.29 | Mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³) | 1 | Up to EI 60 S |

Additional requirements: installation remote from lightweight partition and compartment walls with mineral wool

Lightweight partition walls and compartment wall... > Dry mortarless installation with installation ...

- Lightweight partition wall or compartment wall, see ↗ 32
- Paroc mineral wool, see ↗ 27

5.5.6 Dry mortarless installation with installation kit GL / GL2 during the wall construction

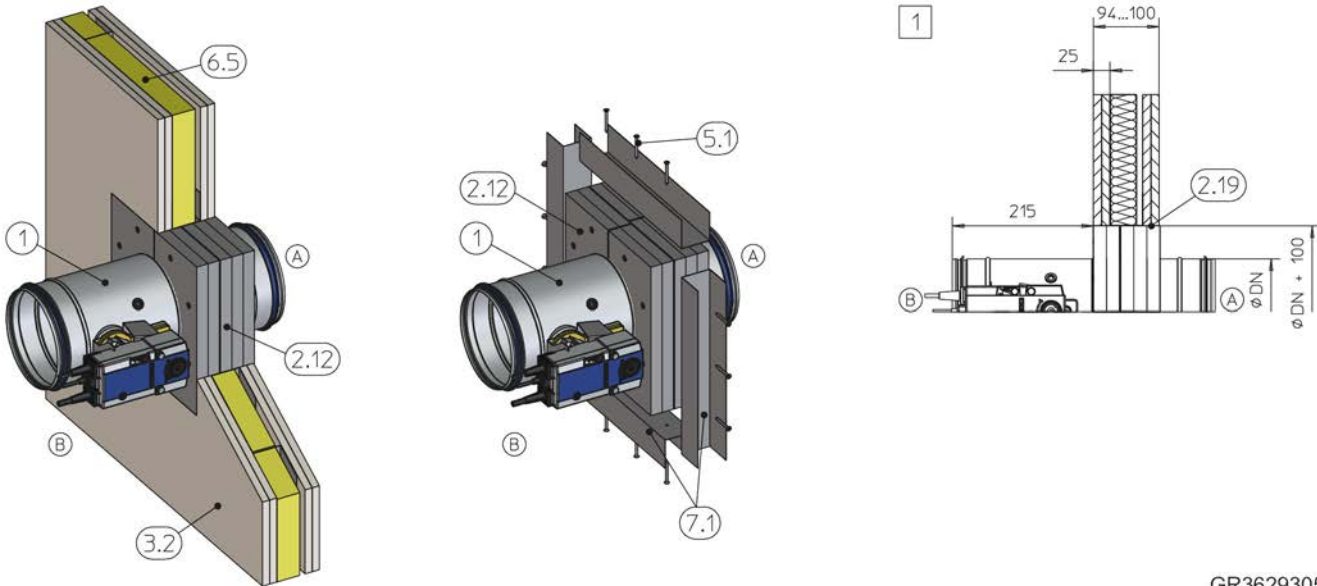


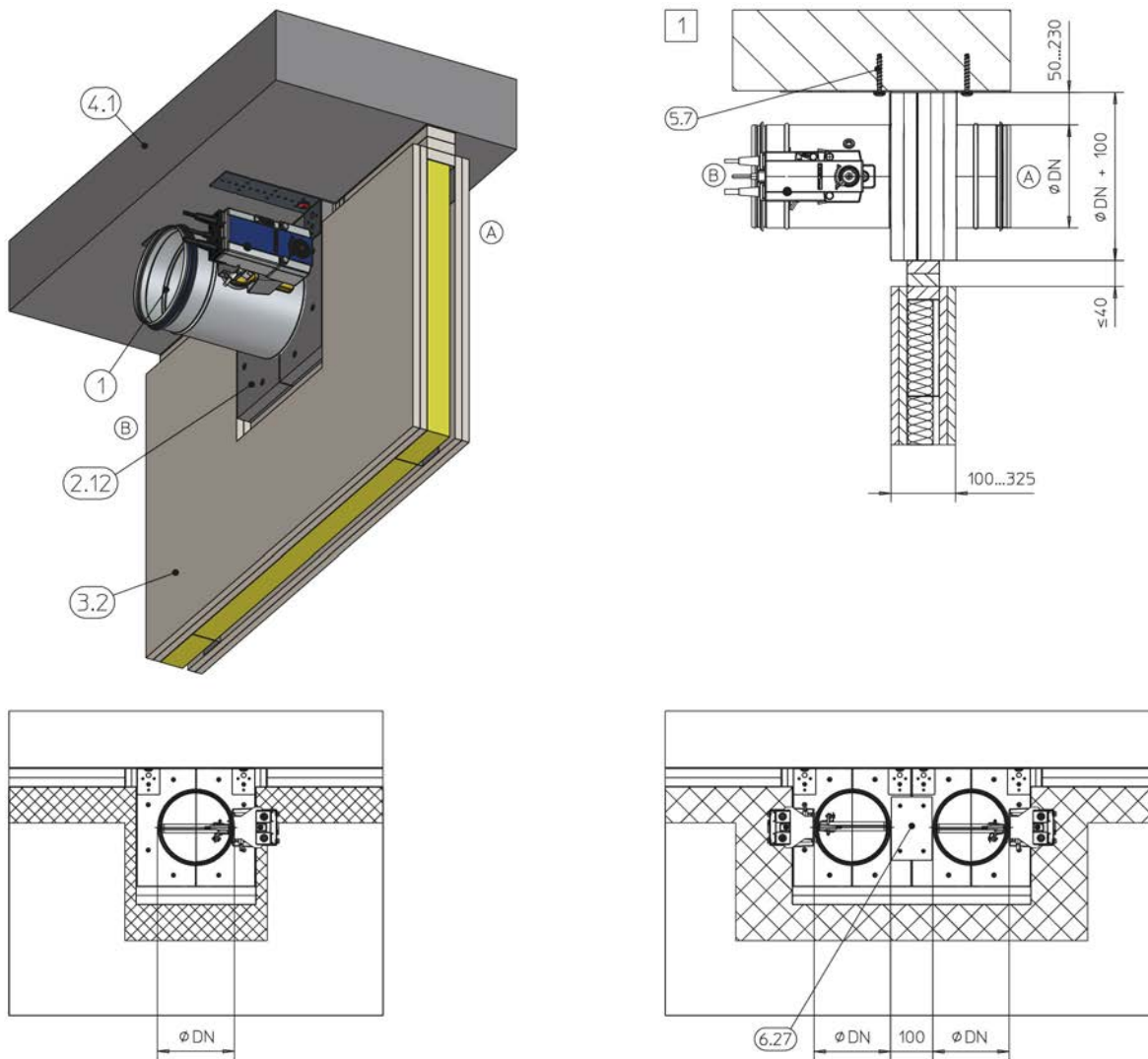
Fig. 67: Direct dry mortarless installation into a lightweight partition wall, with installation kit GL / GL2

1	FKRS-EU	5.1	Pre-drill dry wall screw 4 × 35 mm at a distance of approx. 100 mm with 3 mm
2.12	Installation kit GL / GL2	6.5	Mineral wool (depending on wall construction)
2.19	Joint filler (filler, ready-to-use putty or equivalent)	7.1	U-channel section according to wall construction, W = 44 – 50 mm, H ≥ 40 mm, e.g. UW section
3.2	Lightweight partition wall with metal support structure, cladding on both sides	1	Up to EI 90 S

Note: Gaps between the installation kit GL / GL2 and the wall cladding must be filled with joint filler (2.19), matching the wall cladding.

Additional requirements: dry mortarless installation with installation kit GL / GL2 during the wall construction of lightweight partition and compartment walls

- Lightweight partition wall or compartment wall, see ↗ 32
 - Installation kit GL / GL2, see ↗ 39
 - ≥ 75 mm distance from the fire damper to load-bearing structural elements (structure ≥ 90 mm)
 - ≥ 200 mm distance between two fire dampers
1. ▶ Screw metal sections onto installation kit GL / GL2.
 2. ▶ Fix fire damper and clad the wall up to the installation kit. Make sure that the distance from the connecting spigot on the operating side to the wall is 215 mm.
 3. ▶ Chamfer the outer layer of the cladding all round on both sides and completely fill the surrounding gap on both sides with filler to the depth of the cladding.
 4. ▶ Screw metal sections onto both sides over the cladding, spaced approx. 100 mm apart.



GR3623290, A
GR3625199, A

Fig. 68: Dry mortarless installation with installation kit GL / GL2 into lightweight partition or compartment wall

- | | |
|--|--|
| <p>1 FKRS-EU
2.12 Installation kit GL / GL2
3.2 Lightweight partition wall or compartment wall with metal support structure, cladding on both sides
4.1 Solid ceiling slab</p> | <p>5.7 Anchor bolt Hilti® HUS-6 or equivalent wallplugs with fire protection suitability certificate, adapted to the particular building material, alternatively push through installation
6.27 Holding plate on both sides, 90 × 140 × 1.5 mm
Up to EI 90 S</p> |
|--|--|

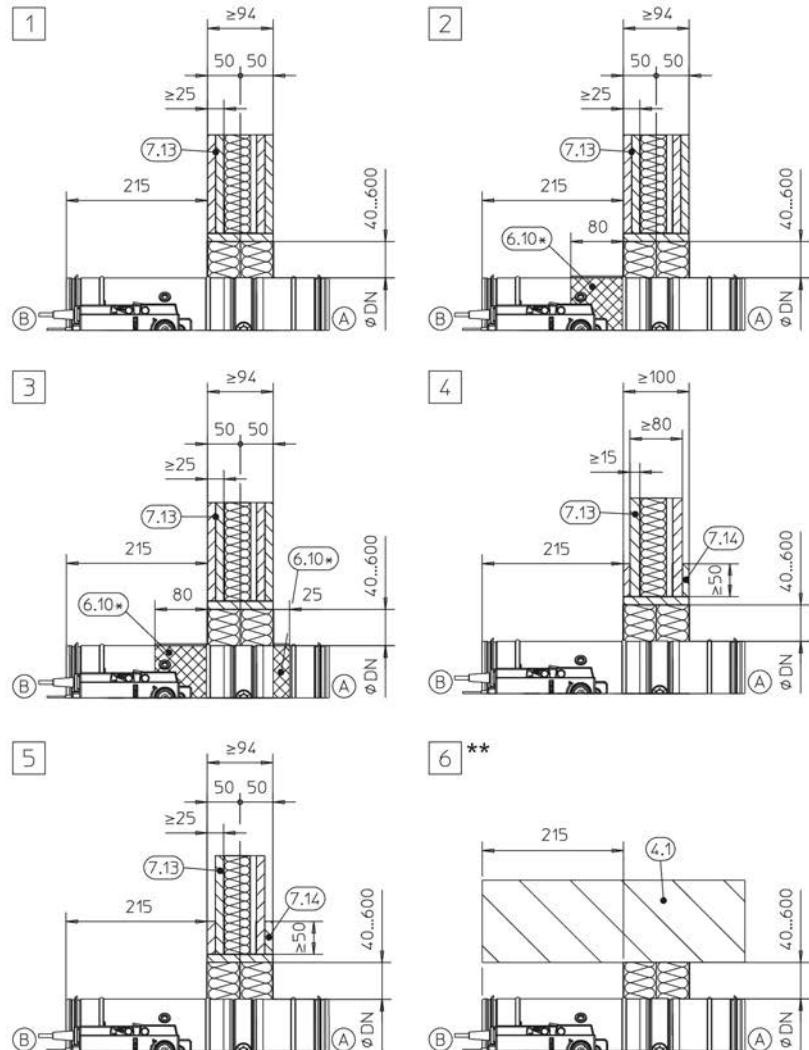
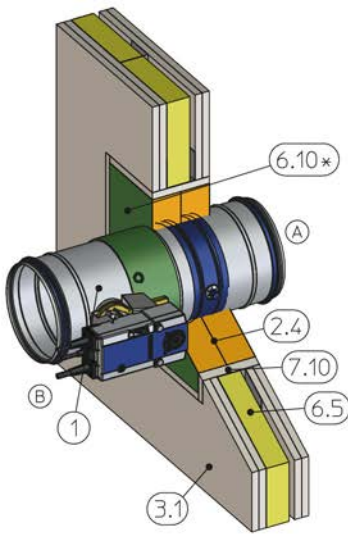
Note: Do not make any screw connections in the hatched area.

Additional requirements: dry mortarless installation with installation kit GL / GL2 into lightweight partition and compartment walls

- Lightweight partition wall or compartment wall, see ↗ 32
- Installation kit GL / GL2, see ↗ 39
- Wall thickness $W = 100 - 235$ mm
- 50 – 230 mm distance from the fire damper to the ceiling slab
- ≥ 125 mm distance from the fire damper to adjacent walls
- ≥ 200 mm distance between two fire dampers, distance = 100 mm when installed in the same installation opening
- Subsidence of the ceiling slab $a \leq 40$ mm
- Installation only under solid ceiling slabs without cavities

Note: For installation, follow the supplied installation manual.

5.5.7 Dry mortarless installation with fire batt



GR3484860, B

Fig. 69: Dry mortarless installation into a lightweight partition wall, with a fire batt

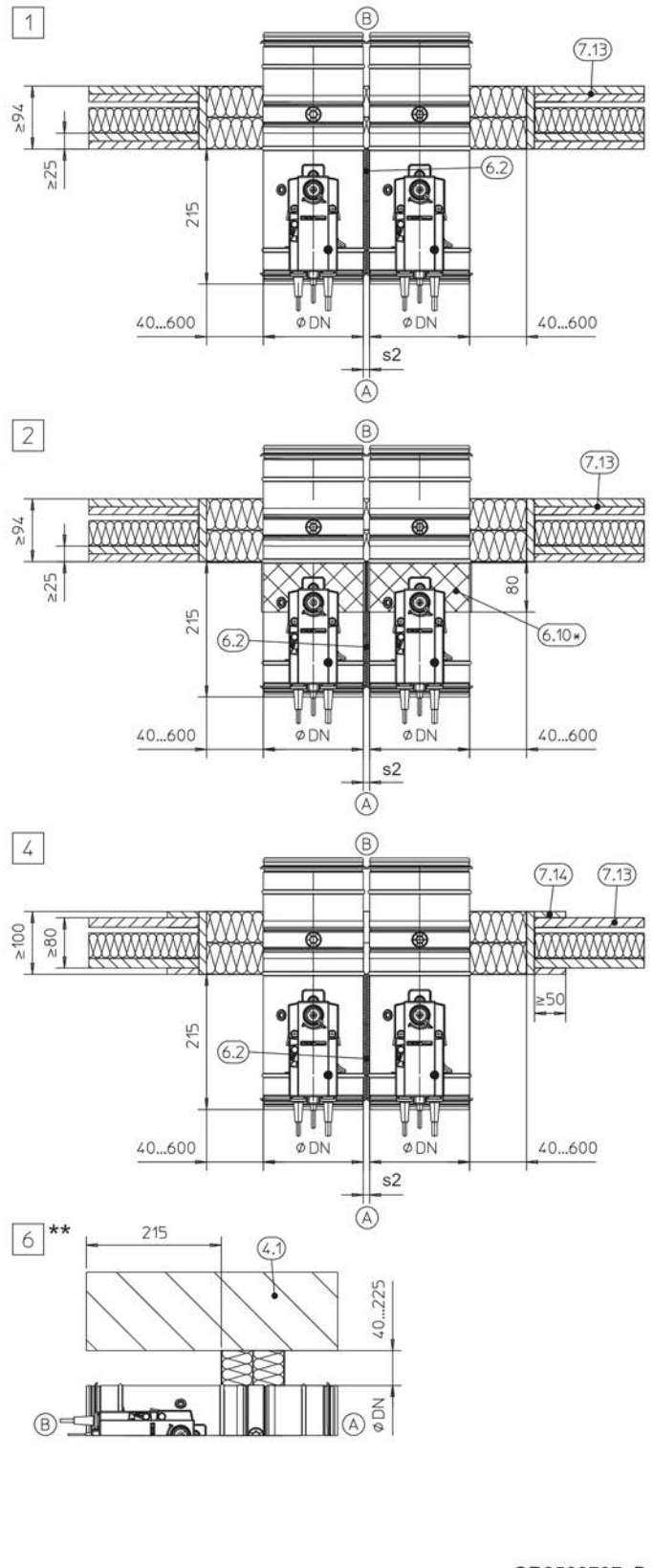
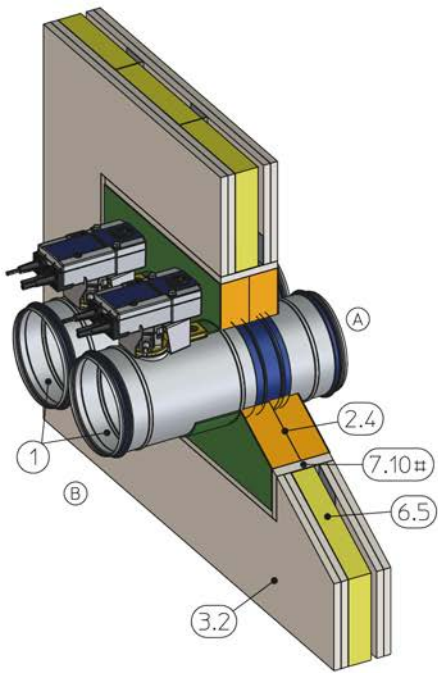
1	FKRS-EU	6.24	Elastomeric foam (flame-resistant, non-dripping)
2.4	Fire batt with ablative coating		
3.2	Lightweight partition wall or compartment wall with metal support structure or steel support structure, cladding on both sides		The following applies in Germany: For notes on the use of elastomeric foams, see ↗ 7.
4.1	Solid ceiling slab	7.10	Trim panels
6.5	Mineral wool (depending on wall construction)	7.13	Cladding, fire-resistant, also with sheet steel insert
6.10	Ablative coating around the perimeter, d = at least 2.5 mm	7.14	Reinforcing board of the same material as the wall
6.19	Mineral wool > 1000 °C, > 80 kg/m ³ , thickness = 20 mm, leave out the actuator and release mechanism; inspection openings must remain accessible	*	6.19, 6.20 or 6.24 as an alternative
6.20	Sleeve (can be ordered separately)	**	Installation near the floor analogous to [6]
		[1] – [6]	See table ↗ 85

Note: The fire resistance properties of [6] depend on the nominal width and 6.10*.

Lightweight partition walls and compartment wall... > Dry mortarless installation with fire batt

Solid wall				
NW [mm]	Fire resistance properties to	Coating		Detail
		Installation side A	Operating side B	
100 – 200	EI 90 S	–	–	1 , 6
100 – 315	EI 90 S	–	x	2 , 6
100 – 200	EI 120 S	–	x	2 , 6
100 – 315	EI 120 S	x	x	3 , 6
100 – 315	EI 60 S	–	–	4 , 6
100 – 315	EI 30 S	–	–	5 , 6

Lightweight partition walls and compartment wall... > Dry mortarless installation with fire batt



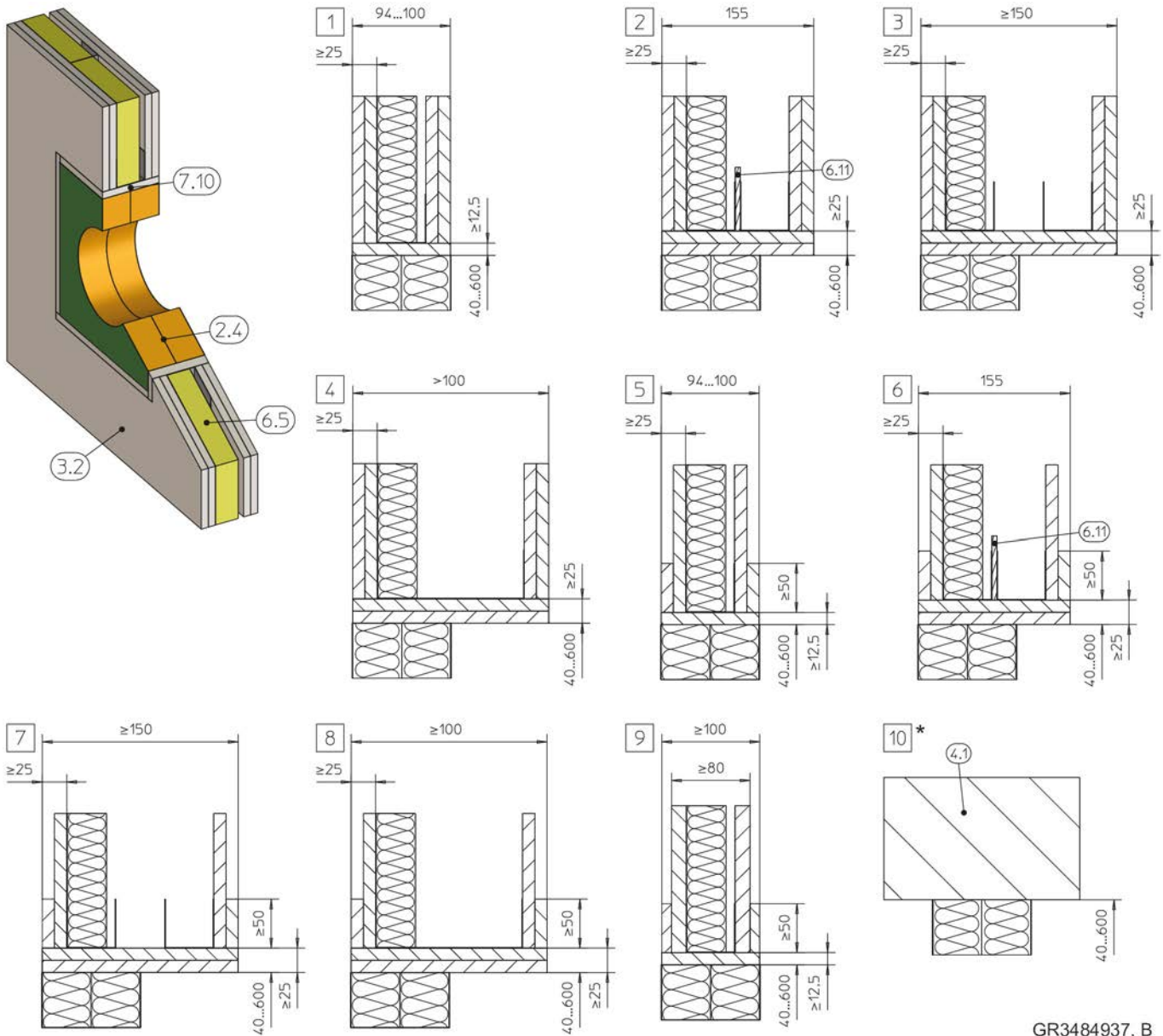
GR3598767, B

Fig. 70: Dry mortarless installation into a lightweight partition wall, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

- 1 FKRS-EU
- 2.4 Fire batt with ablative coating
- 3.2 Lightweight partition wall or compartment wall with metal support structure or steel support structure, cladding on both sides
- 6.2 Mineral wool, $\geq 1000\text{ °C}$, $\geq 80\text{ kg/m}^3$, only in conjunction with ablative coating or sleeve, to be used with damper spacings 10 – 40 mm
- 6.5 Mineral wool (depending on wall construction)
- 6.10 Ablative coating around the perimeter, d = at least 2.5 mm
- 6.19 Mineral wool $> 1000\text{ °C}$, $> 80\text{ kg/m}^3$, thickness = 20 mm, leave out the actuator and release mechanism; inspection openings must remain accessible
- 6.20 Sleeve (can be ordered separately)
- 6.24 Elastomeric foam (flame-resistant, non-dripping)
The following applies in Germany: For notes on the use of elastomeric foams, see ☞ 7.
- 7.10 Trim panels
- 7.13 Cladding, fire-resistant, also with sheet steel insert
- # Optional for W = 94 – 100 mm according to installation details
- * 6.19, 6.20 or 6.24 as an alternative
- ** Installation near the floor analogous to [6]
- [1] – [6] See table ☞ 87

Note: The fire resistance properties of [3] depend on the nominal width and 6.10*.

Lightweight partition wall					
NW [mm]	Fire resistance properties to	Coating		s2 [mm]	Detail
		Installation side A	Operating side B		
100 – 200	EI 90 S	–	–	10 – 600	[1], [6]
100 – 315	EI 90 S	–	x	10 – 600	[2], [6]
100 – 200	EI 120 S	–	x	40 – 600	[2], [6]
100 – 315	EI 120 S	x	x	40 – 600	[3], [6]
100 – 315	EI 60 S	–	–	10 – 600	[4], [6]
100 – 315	EI 30 S	–	–	10 – 600	[5], [6]



GR3484937, B

Fig. 71: Dry mortarless installation into a lightweight partition wall, with a fire batt, approved combinations for thicker walls

- 2.4 Fire batt with ablative coating
- 3.2 Lightweight partition wall or compartment wall with metal support structure or steel support structure, cladding on both sides
- 4.1 Solid ceiling slab / solid floor
- 6.5 Mineral wool (depending on wall construction)
- 6.11 Insulating strip
- 7.10 Trim panels (optional with $W \leq 100$ mm, from $W > 100$ mm double-layered and required)

- * Installation near the floor analogous to **10**
- | | |
|---------------------|-------------|
| 1 – 4 | F 90 |
| 5 – 8 | F 30 |
| 9 | F 60 |
| 10 | F 30 – F 90 |

Additional requirements: dry mortarless installation into lightweight partition walls, with fire batt

- Lightweight partition wall or compartment wall, see ↗ 32
- Fire batt systems, installation details, distances / dimensions, see ↗ 28 f
- Suspension and fixing, see ↗ 154

5.6 Lightweight partition walls with timber support structure

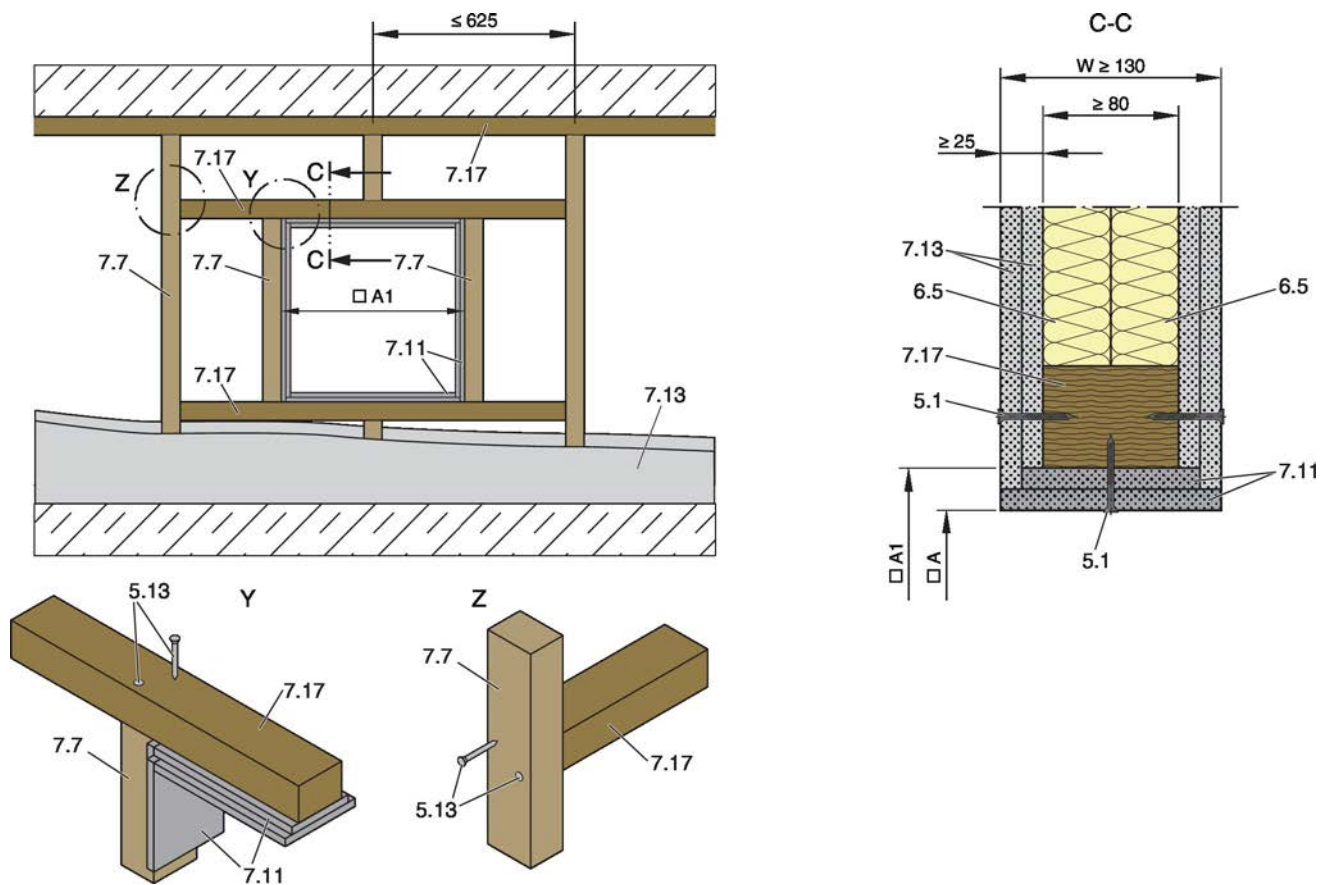


Fig. 72: Lightweight partition wall with timber support structure and cladding on both sides

- | | | | |
|------|---|--------------|---|
| 5.1 | Dry wall screw | 7.13 | Cladding |
| 5.13 | Wood screw or pin | 7.17 | Trimmers, timber stud / nogging, at least 60 × 80 mm |
| 6.5 | Mineral wool (depending on wall construction) | $\square A$ | Clear installation opening |
| 7.7 | Timber stud, at least 60 × 80 mm | $\square A1$ | Opening in the timber support structure, $\square A1 = \square A + (4 \times \text{trim panels})$ |
| 7.11 | Trim panels, double layer, staggered joints | | |

Lightweight partition walls with timber support ... > Dry mortarless installation with fire batt

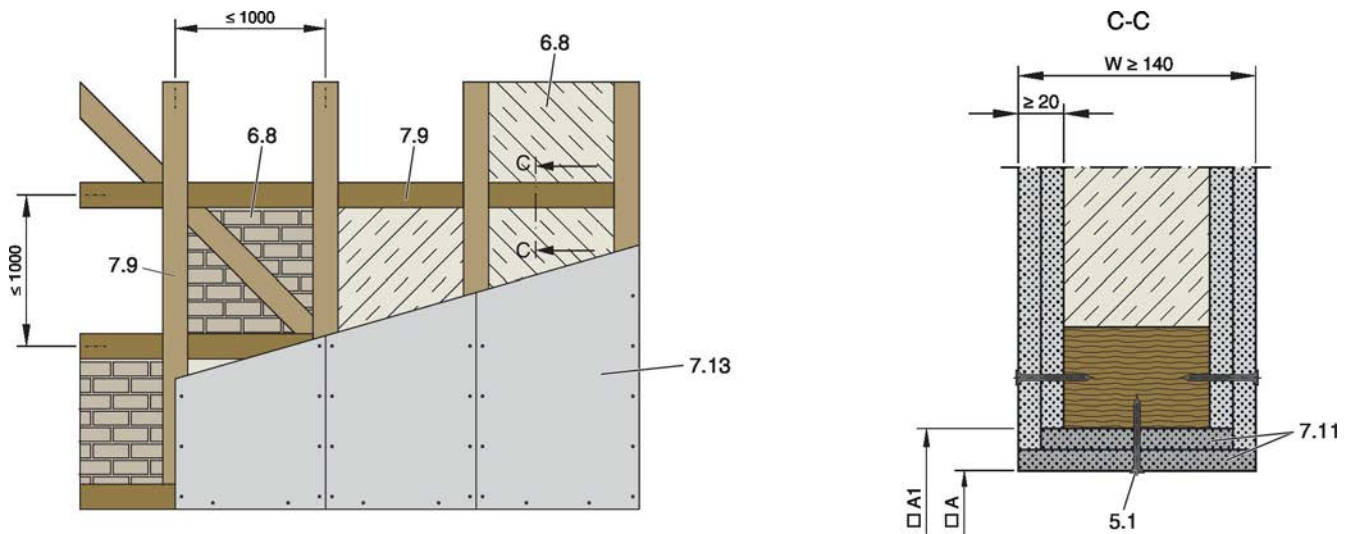


Fig. 73: Lightweight partition wall, half-timbered construction with cladding on both sides

- | | | | |
|------|---|------|---|
| 5.1 | Dry wall screw | 7.13 | Cladding |
| 6.8 | Infill* | * | 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 | □A | Clear installation opening |
| 7.11 | Trim panels, double layer, staggered joints | □A1 | Opening in the half-timbered construction, $\square A1 = \square A + (4 \times \text{trim panels})$ |

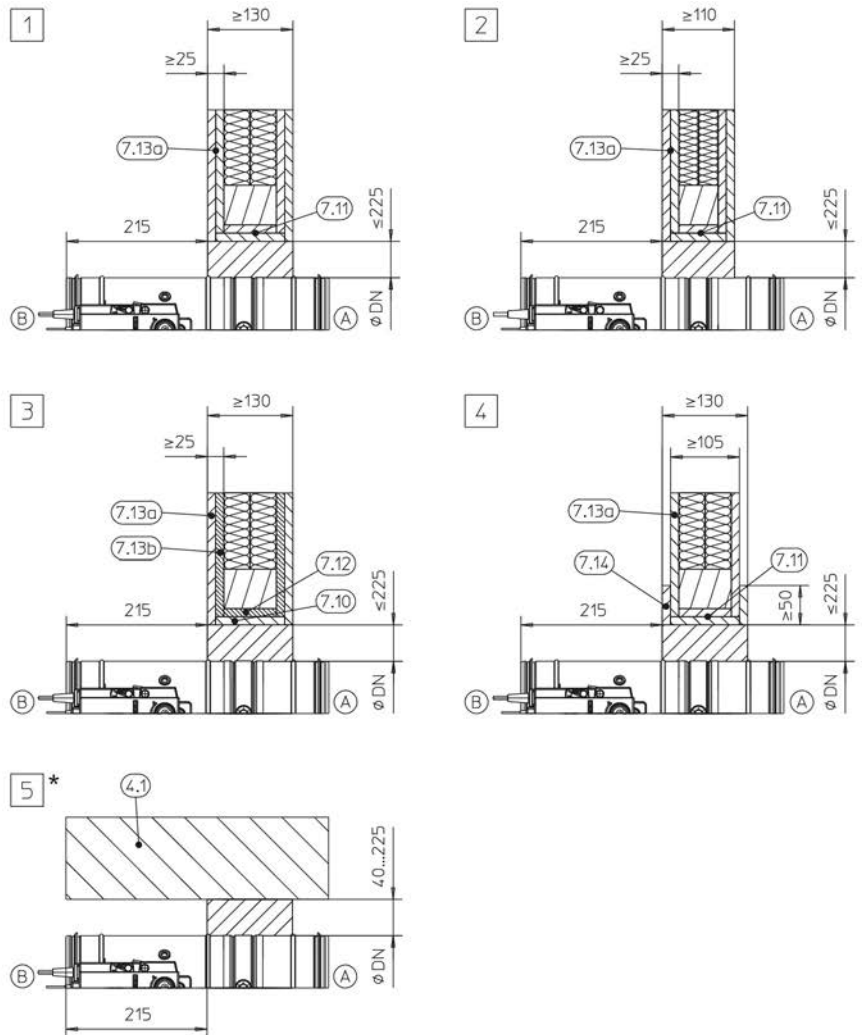
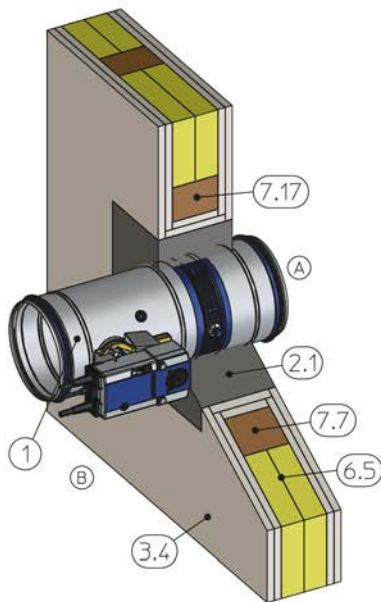
Additional requirements: lightweight partition walls with timber support structure / half-timbered construction

- Timber support structure or half-timbered construction, see 33

Installation type	Installation opening A [mm]									
	Nominal size									
	100	125	150	160	180	200	224	250	280	315
Mortar-based installation	$\square A = \text{DN} + \text{max. } 450 \text{ mm}$									
Dry mortarless installation with installation kit TQ / TQ2 ¹	$\square A = \text{DN} + 110 \text{ mm}$									
Dry mortarless installation with fire batt	$\square A = \text{DN} + 80 - 1200 \text{ mm}$									

¹⁾ Installation opening tolerance $\pm 2 \text{ mm}$

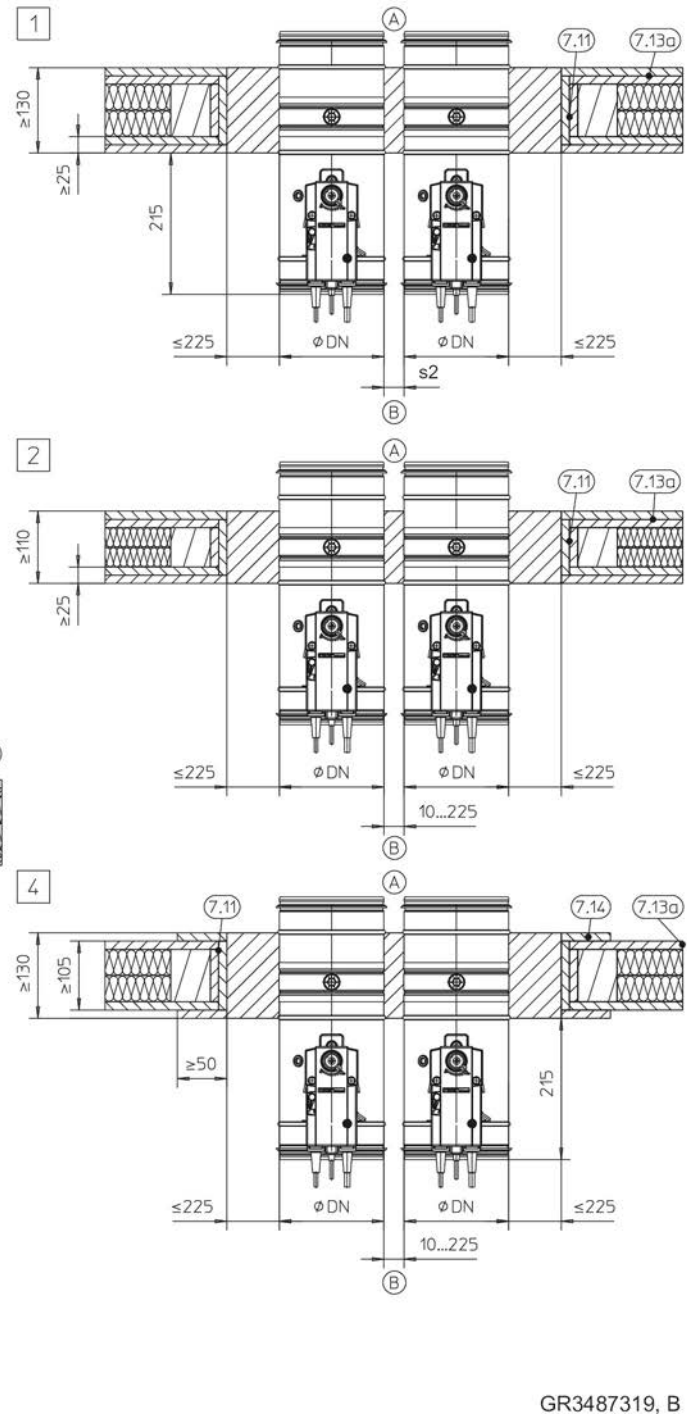
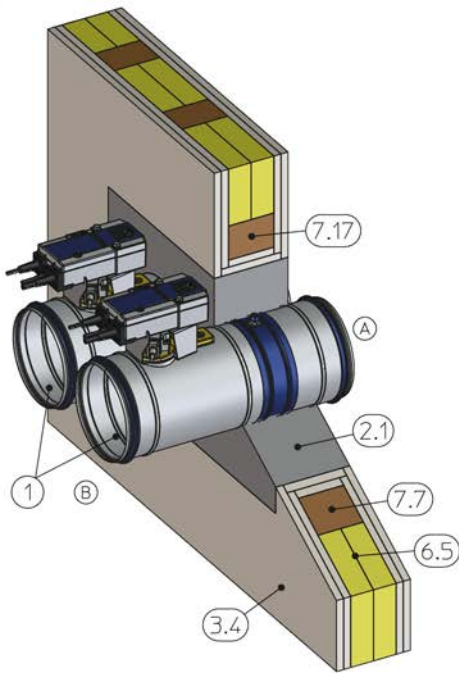
5.6.1 Mortar-based installation



GR3196882, B

Fig. 74: Mortar-based installation into a lightweight partition wall with timber support structure

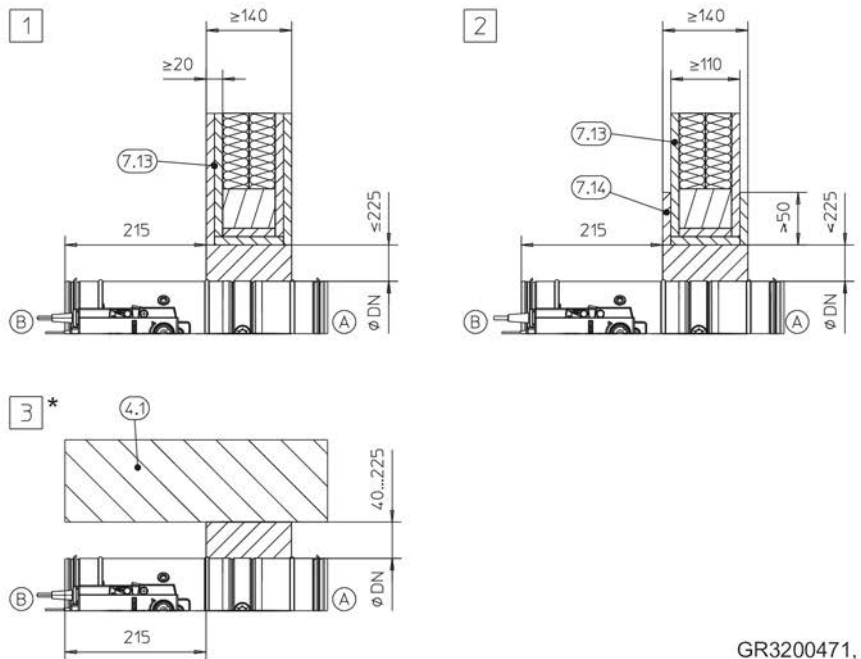
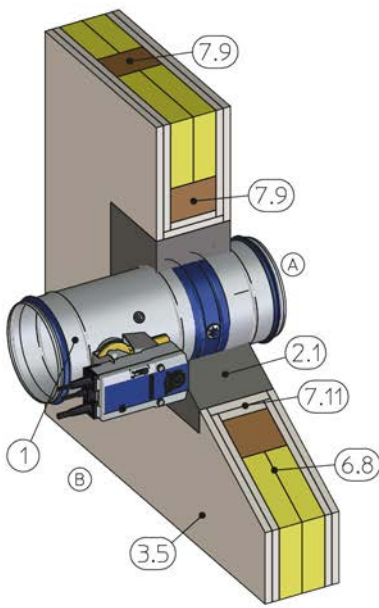
1	FKRS-EU	7.13a	Cladding, fire-resistant
2.1	Mortar	7.13b	Cladding, wood sheet, at least 600 kg/³
3.4	Timber stud wall (also timber panel constructions), cladding on both sides	7.14	Reinforcing board of the same material as the wall
4.1	Solid ceiling slab / solid floor	7.17	Trimmers, timber stud / nogging
6.5	Mineral wool (depending on wall construction)	*	Installation near the floor analogous to [5]
7.7	Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60	[1]	Up to EI 120 S
7.10	Trim panels (fire-resistant)	[2]	Up to EI 60 S
7.11	Trim panels, double layer, staggered joints	[3/4]	EI 30 S
7.12	Trim panels, wood sheet, at least 600 kg/³	[5]	EI 30 to EI 120 S



GR3487319, B

Fig. 75: Mortar-based installation into a lightweight partition wall with timber support structure, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

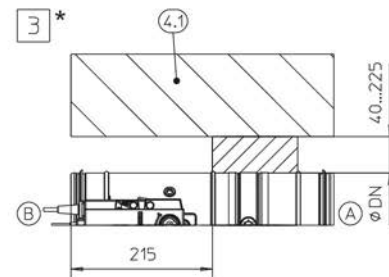
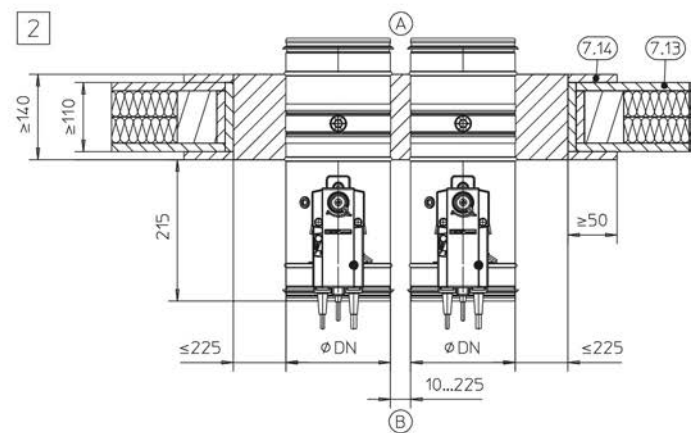
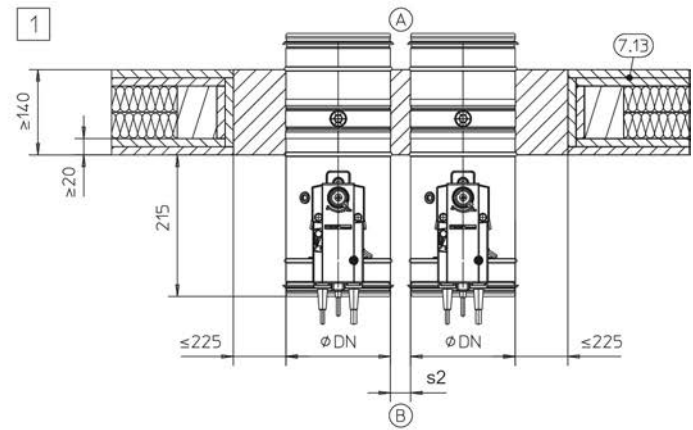
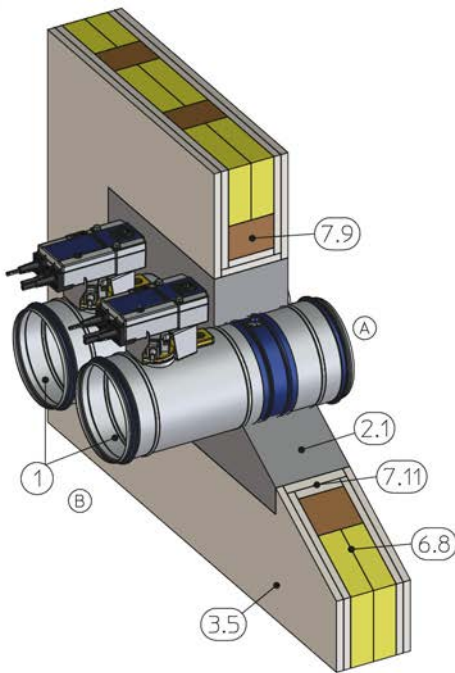
1	FKRS-EU	7.13b	Cladding, wood sheet, at least 600 kg ³
2.1	Mortar	7.14	Reinforcing board of the same material as the wall
3.4	Timber stud wall (also timber panel constructions), cladding on both sides	7.17	Trimmer, wooden beam min. 60 × 80 mm or min. 60 × 60 mm with F60
4.1	Solid ceiling slab / solid floor	*	Installation near the floor analogous to [5]
6.5	Mineral wool (depending on wall construction)	[1]	Up to EI 120 S for s2 = 40 – 225 mm
7.7	Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60	[2]	Up to EI 90 S for s2 = 10 – 225 mm
7.11	Trim panels, double layer, staggered joints	[3][4]	EI 30 S
7.12	Trim panels, wood sheet, at least 600 kg ³	[5]	EI 30 to EI 120 S
7.13a	Cladding, fire-resistant		



GR3200471, B

Fig. 76: Mortar-based installation into a lightweight partition wall, half-timbered construction

- | | | | |
|------|--|----------|--|
| 1 | FKRS-EU | 7.13 | Cladding |
| 2.1 | Mortar | 7.14 | Reinforcing board of the same material as the wall |
| 3.5 | Half-timbered construction, cladding on both sides | * | Installation near the floor analogous to 3 |
| 4.1 | Solid ceiling slab / solid floor | 1 | Up to EI 120 S |
| 6.8 | Infill (cavities completely filled with mineral wool $\geq 1000\text{ }^\circ\text{C}$, $\geq 50\text{ kg/m}^3$, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay) | 2 | EI 30 S |
| 7.9 | Half-timbered construction | 3 | EI 30 to EI 120 S |
| 7.11 | Trim panels, fire-resistant, double layer, staggered joints | | |



GR3487411, C

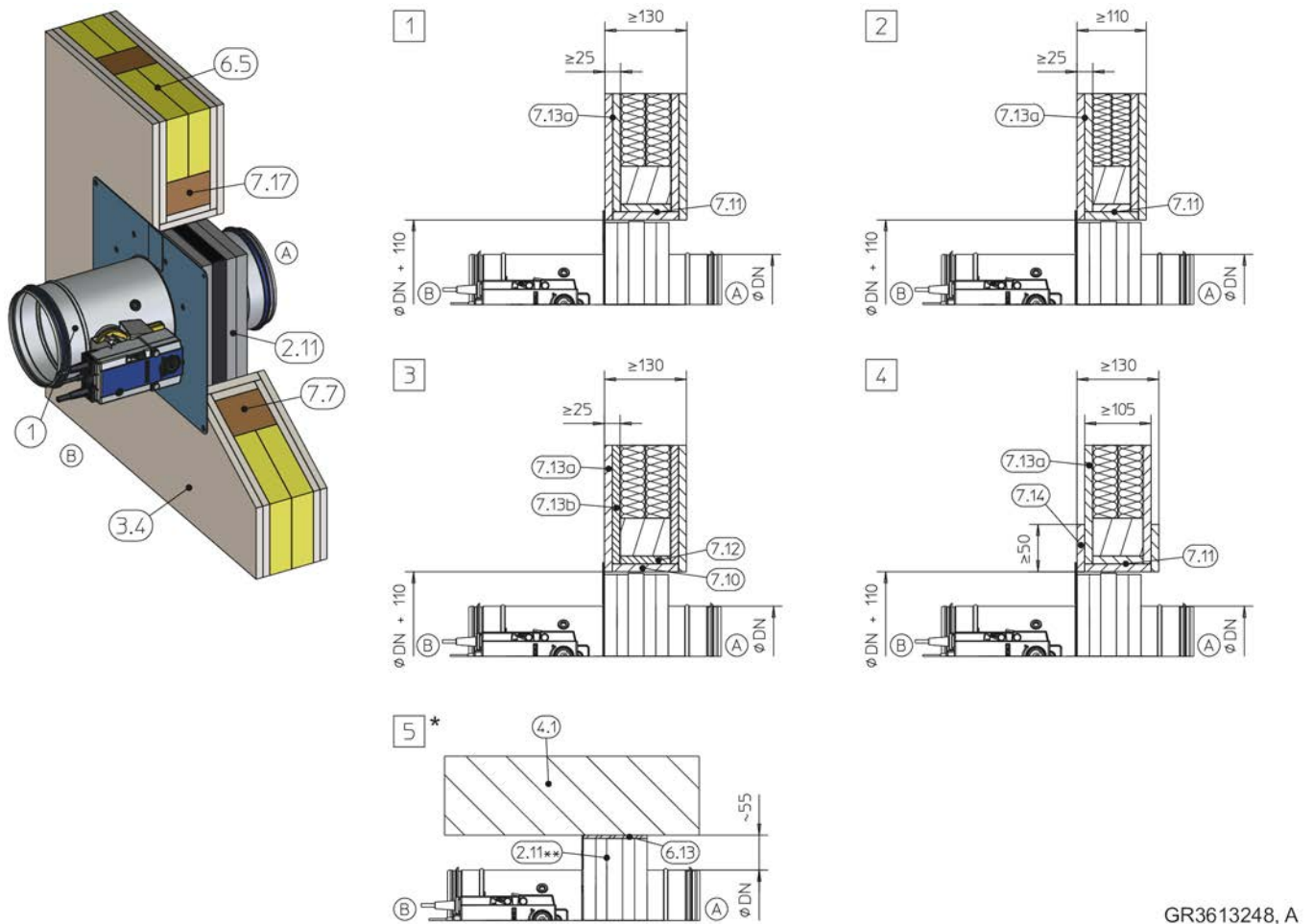
Fig. 77: Mortar-based installation into a lightweight partition wall with half-timbered construction, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

- | | | | |
|------|--|------|--|
| 1 | FKRS-EU | 7.13 | Cladding |
| 2.1 | Mortar | 7.14 | Reinforcing board of the same material as the wall |
| 3.5 | Half-timbered construction, cladding on both sides | * | Installation near the floor analogous to [3] |
| 4.1 | Solid ceiling slab / solid floor | [1] | Up to EI 120 S for $s_2 = 40 - 225$ mm |
| 6.8 | Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m ³ , or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay) | [2] | EI 30 S |
| 7.9 | Half-timbered construction | [3] | EI 30 to EI 120 S |
| 7.11 | Trim panels, fire-resistant, double layer, staggered joints | | |

Additional requirements: lightweight partition walls with timber support structure / half-timbered construction

- Timber support structure or half-timbered construction, see 33

5.6.2 Dry mortarless installation with installation kit TQ / TQ2

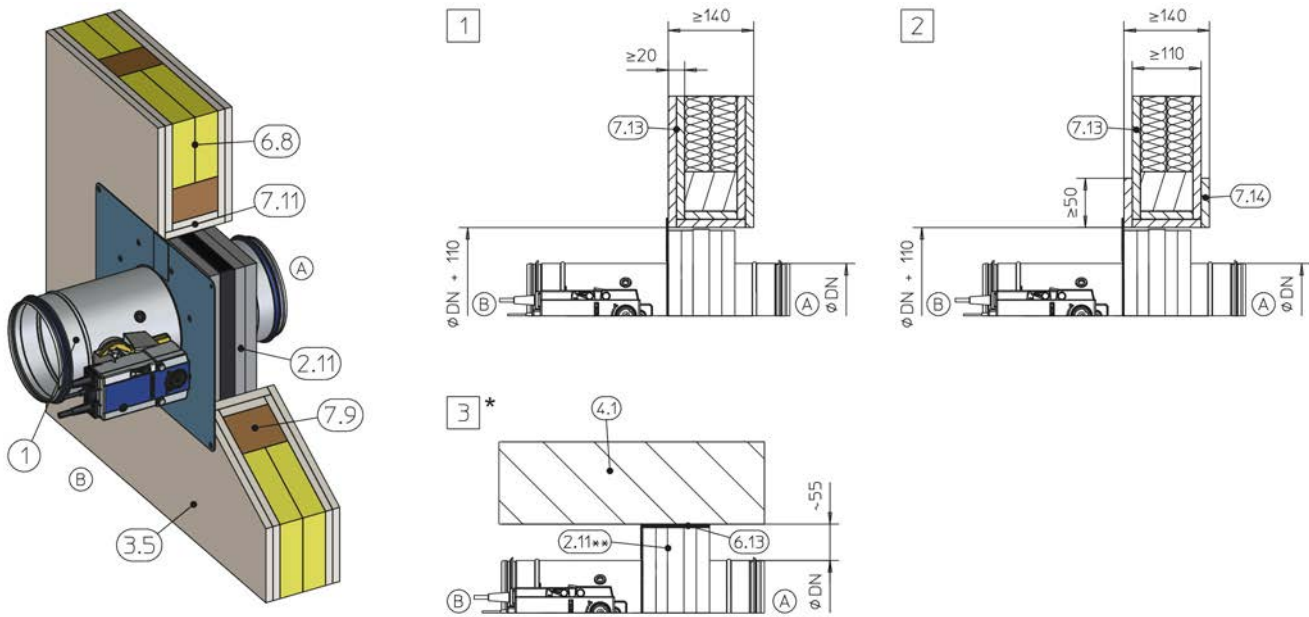


GR3613248, A

Fig. 78: Dry mortarless installation into a lightweight partition wall with timber support structure, with installation kit TQ / TQ2

- | | | | |
|------|--|--------|--|
| 1 | FKRS-EU | 7.13a | Cladding, fire-resistant |
| 2.11 | Installation kit TQ / TQ2 with cover plate (two-part with TQ2) | 7.13b | Cladding, wood sheet, at least 600 kg/m ³ |
| 3.4 | Timber stud wall (also timber panel constructions), cladding on both sides | 7.14 | Reinforcing board of the same material as the wall |
| 4.1 | Solid ceiling slab / solid floor | 7.17 | Trimmer, wooden beam min. 60 × 80 mm or min. 60 × 60 mm with F60 |
| 6.5 | Mineral wool (depending on wall construction) | * | Installation near the floor analogous to [5] |
| 6.13 | Mineral wool strips A1, alternatively gypsum mortar | ** | Cover plate shortened by others |
| 7.7 | Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60 | [1] | Up to EI 120 S |
| 7.10 | Trim panels (fire-resistant) | [2] | Up to EI 60 S |
| 7.11 | Trim panels, double layer, staggered joints | [3][4] | EI 30 S |
| 7.12 | Trim panels, wood sheet, at least 600 kg/m ³ | [5] | EI 30 to EI 120 S |

Lightweight partition walls with timber support ... > Dry mortarless installation with installation ...



GR3613586, A

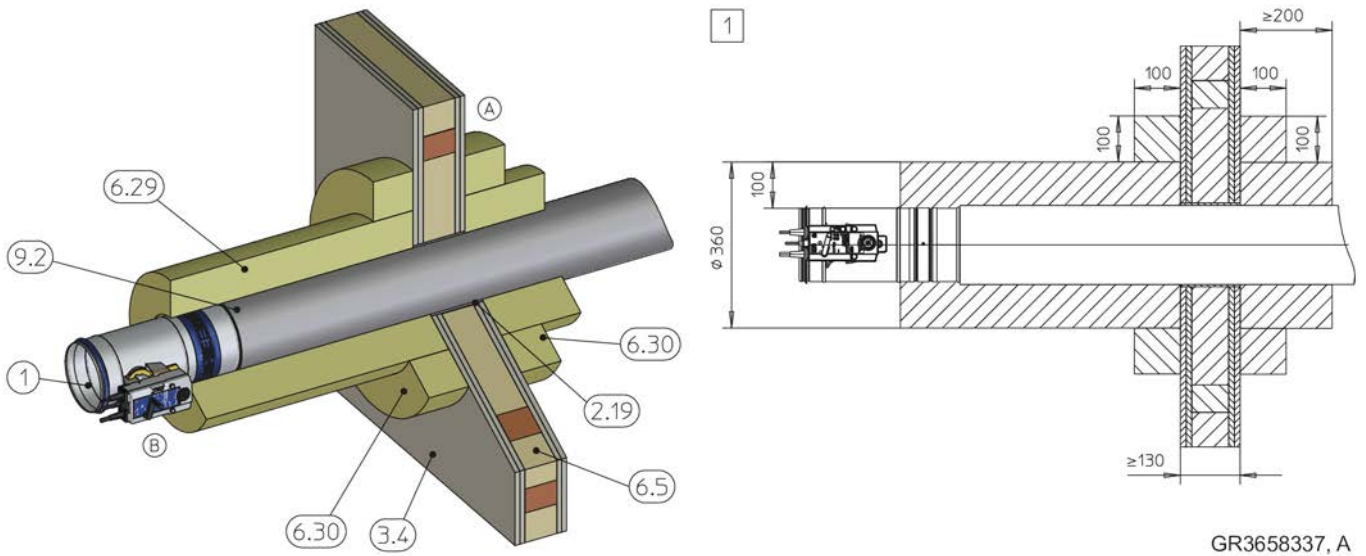
Fig. 79: Dry mortarless installation into a lightweight partition wall with half-timbered construction, with installation kit TQ / TQ2

1	FKRS-EU	7.13	Cladding
2.11	Installation kit TQ / TQ2 with cover plate (two-part with TQ2)	7.14	Reinforcing board of the same material as the wall
3.5	Half-timbered construction, cladding on both sides	*	Installation near the floor analogous to 3
4.1	Solid ceiling slab / solid floor	**	Cover plate shortened by others
6.8	Infill (cavities completely filled with mineral wool $\geq 1000 \text{ }^\circ\text{C}$, $\geq 50 \text{ kg/m}^3$, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)	1	Up to EI 120 S
6.13	Mineral wool strips A1, alternatively gypsum mortar	2	EI 30 S
7.9	Half-timbered construction	3	EI 30 to EI 90 S
7.11	Trim panels, fire-resistant, double layer, staggered joints		

Additional requirements: dry mortarless installation with installation kit TQ / TQ2 into lightweight partition walls with timber support structure / half-timbered construction

- Timber support structure or half-timbered construction, see ↗ 33
- Installation kit TQ / TQ2, see ↗ 36
- $\geq 200 \text{ mm}$ distance between two fire dampers in separate installation openings

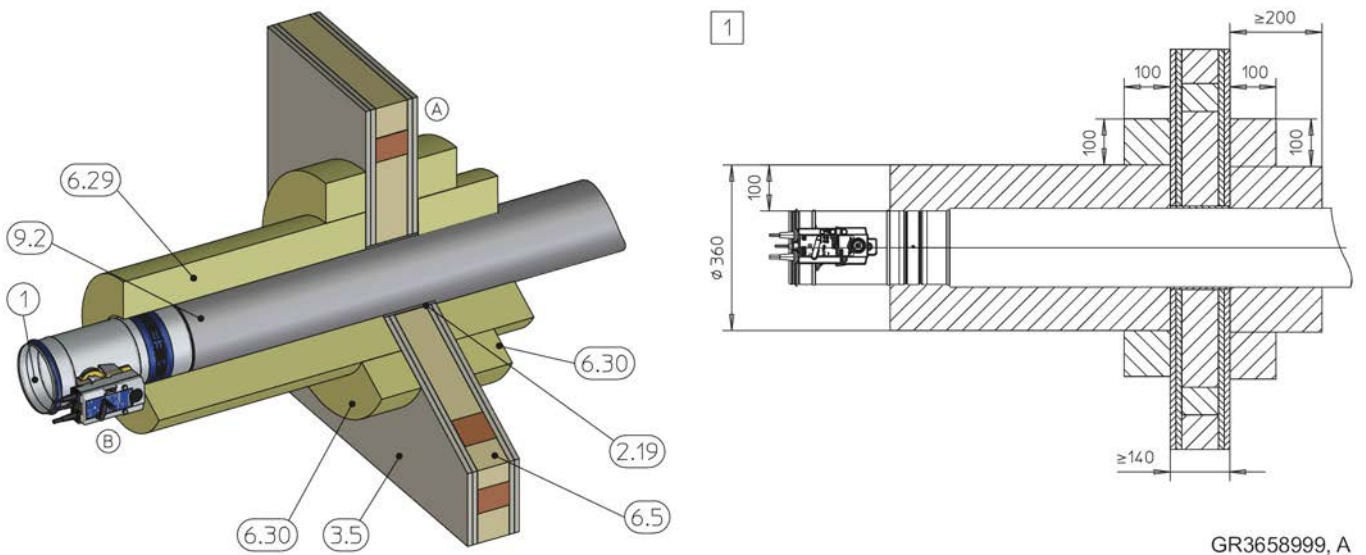
5.6.3 Installation remote from lightweight partition walls with mineral wool



GR3658337, A

Fig. 80: Installation with joint filler remote from a lightweight partition wall with timber support structure

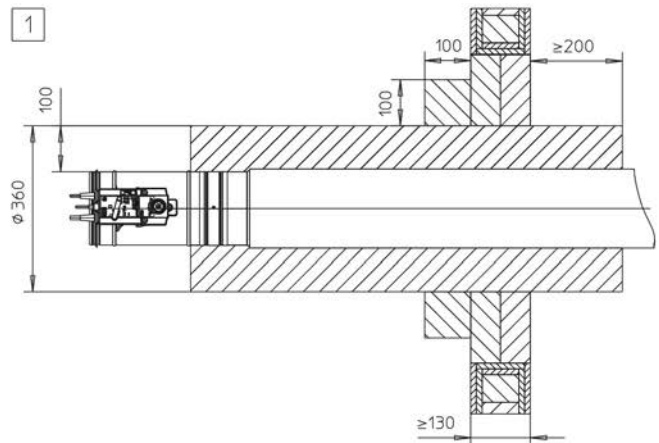
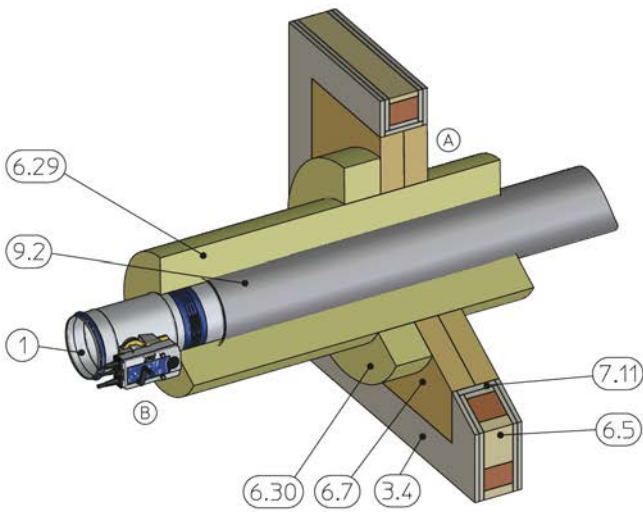
- | | | | |
|------|--|------|--|
| 1 | FKRS-EU | 6.29 | Mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m³) |
| 2.19 | Joint filler | 6.30 | Reinforcing board mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m³), glued all round |
| 3.4 | Timber stud wall (also timber panel constructions), cladding on both sides | 9.2 | Sheet steel duct |
| 6.5 | Mineral wool (depending on wall construction) | 1 | Up to EI 60 S |



GR3658999, A

Fig. 81: Installation with joint filler remote from a half-timbered construction

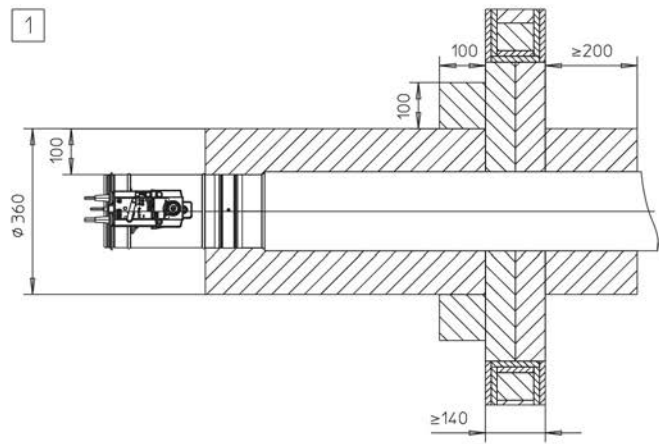
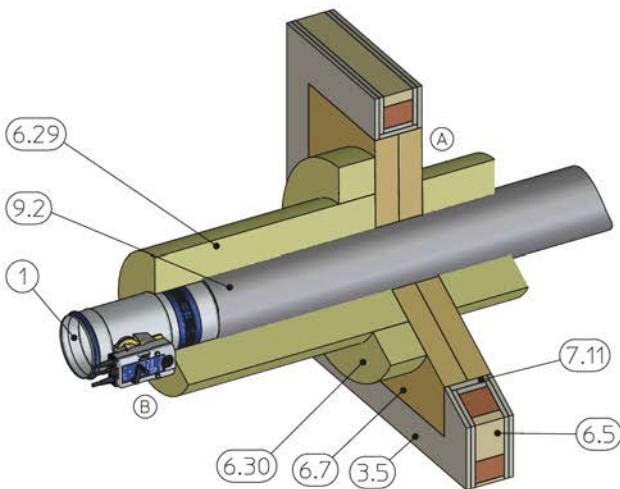
- | | | | |
|------|--|------|--|
| 1 | FKRS-EU | 6.29 | Mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m³) |
| 2.19 | Joint filler | 6.30 | Reinforcing board mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m³), glued all round |
| 3.5 | Half-timbered construction, cladding on both sides | 9.2 | Sheet steel duct |
| 6.5 | Mineral wool (depending on wall construction) | 1 | Up to EI 60 S |



GR3657556, A

Fig. 82: Dry mortarless installation with fire batt remote from a lightweight partition wall with timber support structure

- | | | | |
|------|--|----------|---|
| 1 | FKRS-EU | 6.30 | Reinforcing board mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³), glued all round |
| 3.4 | Timber stud wall, cladding on both sides | 7.11 | Trim panels, single-layer, fire-resistant |
| 6.5 | Mineral wool (depending on wall construction) | 8.21 | Acrylic or sealing compound (suitable for fire batt system) |
| 6.7 | Fire batt | 9.2 | Sheet steel duct |
| 6.29 | Mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³) | 1 | Up to EI 60 S |



GR3657595, A

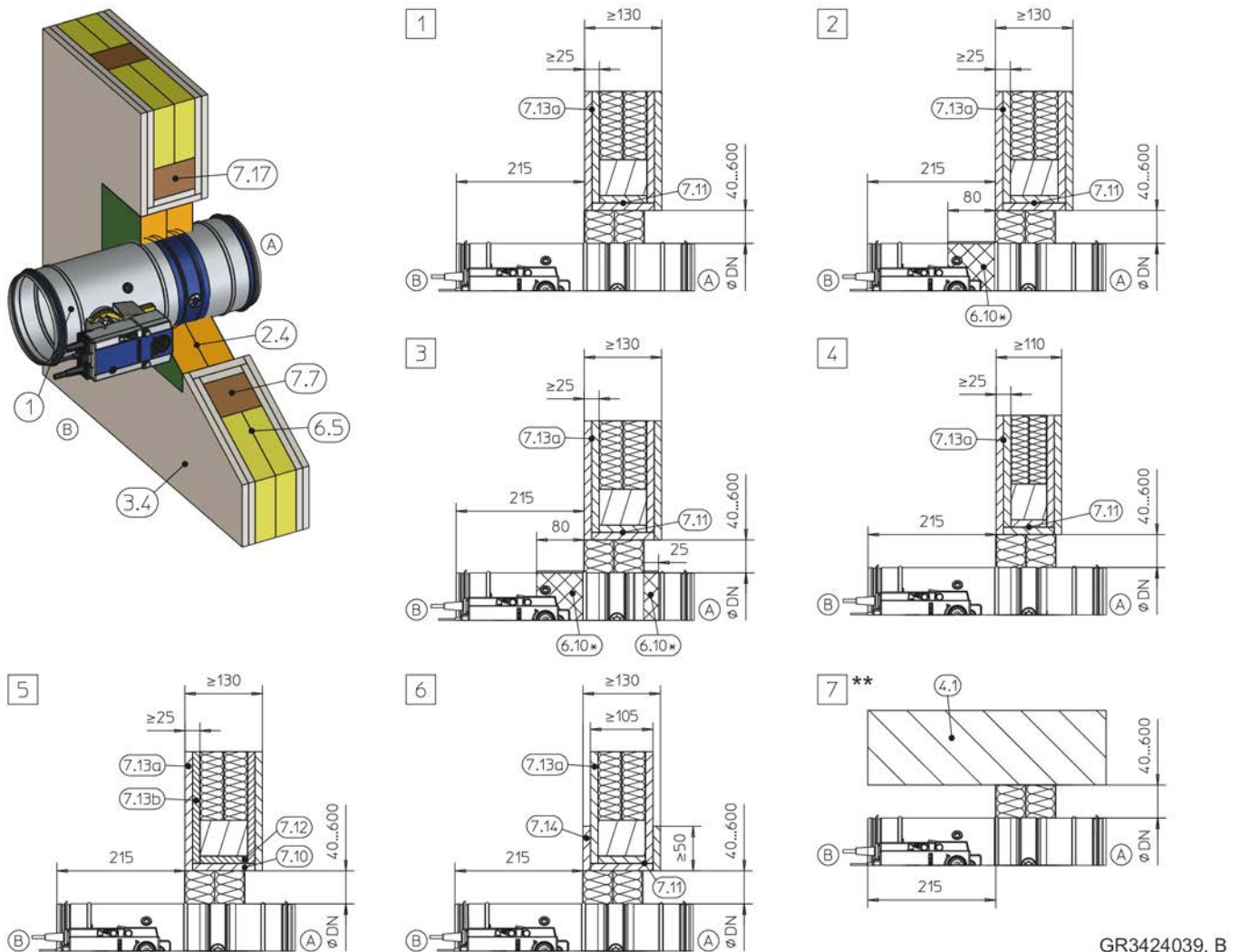
Fig. 83: Dry mortarless installation remote from a half-timbered construction, with a fire batt

- | | | | |
|------|--|----------|---|
| 1 | FKRS-EU | 6.30 | Reinforcing board mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³), glued all round |
| 3.5 | Half-timbered construction, cladding on both sides | 7.11 | Trim panels, single-layer, fire-resistant |
| 6.5 | Mineral wool (depending on wall construction) | 8.21 | Acrylic or sealing compound (suitable for fire batt system) |
| 6.7 | Fire batt | 9.2 | Sheet steel duct |
| 6.29 | Mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³) | 1 | Up to EI 60 S |

Additional requirements: installation remote from lightweight partition walls with timber support structure with mineral wool

- Timber support structure or half-timbered construction, see ↗ 33
- Paroc mineral wool, see ↗ 27

5.6.4 Dry mortarless installation with fire batt



GR3424039, B

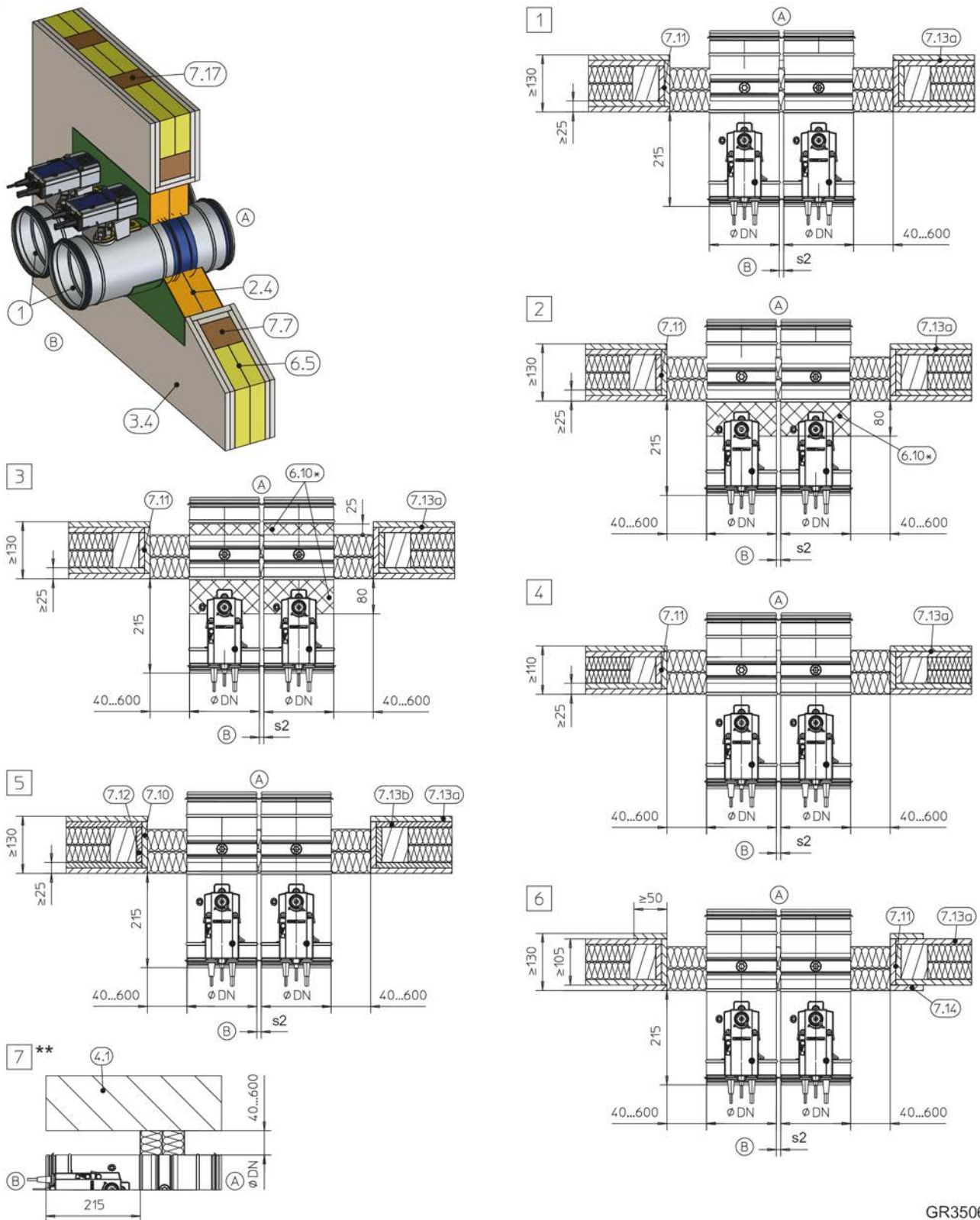
Fig. 84: Dry mortarless installation with fire batt into a lightweight partition wall with timber support structure

1	FKRS-EU	7.10	Trim panels (fire-resistant)
2.4	Fire batt with ablative coating	7.11	Trim panels, fire-resistant, double layer, staggered joints
3.4	Timber stud wall (also timber panel constructions), cladding on both sides	7.12	Trim panels, wood sheet, at least 600 kg ³
4.1	Solid ceiling slab / solid floor	7.13a	Cladding, fire-resistant
6.5	Mineral wool (depending on wall construction)	7.13b	Cladding, wood sheet, at least 600 kg ³
6.10	Ablative coating around the perimeter, d = at least 2.5 mm	7.14	Reinforcing board of the same material as the wall
6.19	Mineral wool > 1000 °C, > 80 kg/m ³ , thickness = 20 mm, panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible	7.17	Trimmer, wooden beam min. 60 × 80 mm or min. 60 × 60 mm with F60
6.20	Sleeve (can be ordered separately)	*	6.19, 6.20 or 6.24 as an alternative
6.24	Elastomeric foam (flame-resistant, non-dripping) The following applies in Germany: For notes on the use of elastomeric foams, see ↻ 7.	**	Installation near the floor analogous to [7]
7.7	Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60	[1] – [7]	See table ↻ 100

Lightweight partition walls with timber support ... > Dry mortarless installation with fire batt

Lightweight partition wall with timber support structure				
NW [mm]	Fire resistance properties to	Coating		Detail
		Installation side A	Operating side B	
100 – 200	EI 90 S	–	–	1 , 7
100 – 315	EI 90 S	–	x	2 , 7
100 – 200	EI 120 S	–	x	2 , 7
100 – 315	EI 120 S	x	x	3 , 7
100 – 315	EI 60 S	–	–	4 , 7
100 – 315	EI 30 S	–	–	5 , 7
100 – 315	EI 30 S	–	–	6 , 7

Lightweight partition walls with timber support ... > Dry mortarless installation with fire batt



GR3506367, B

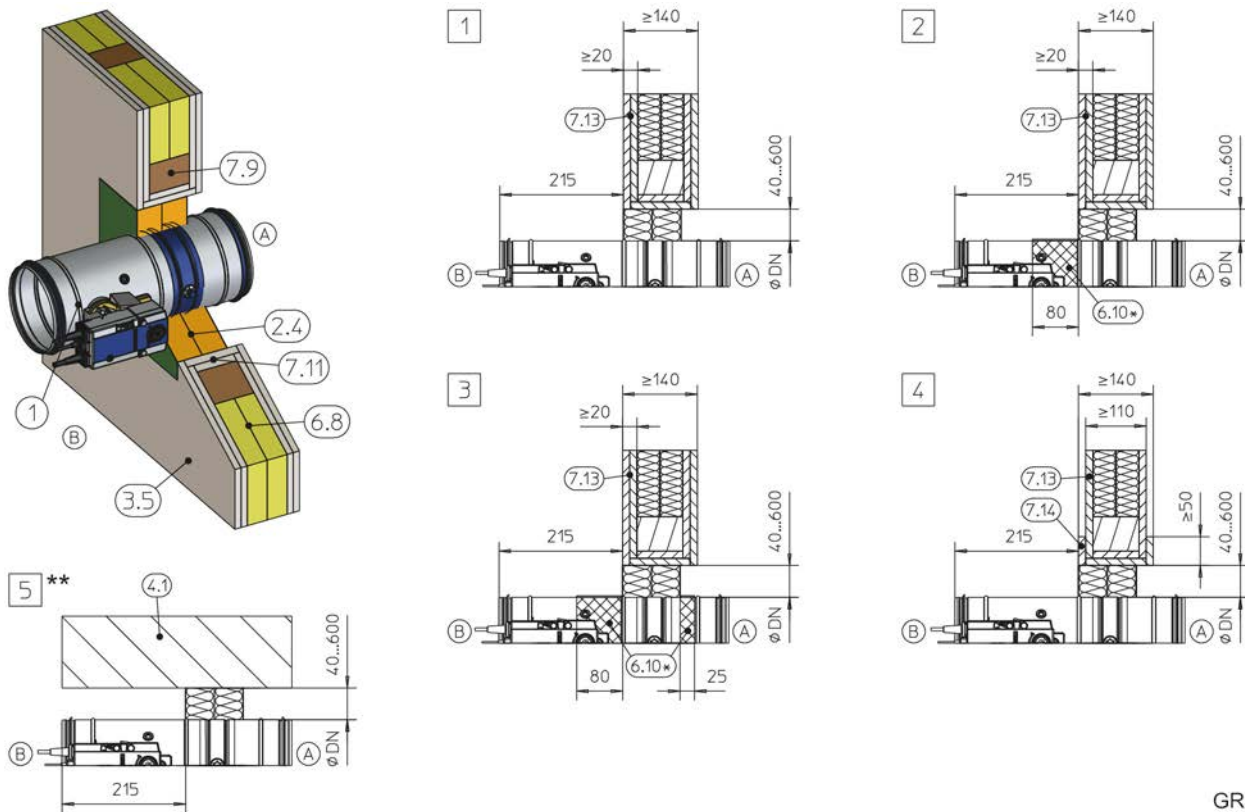
Fig. 85: Dry mortarless installation into a lightweight partition wall with timber support structure, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

Lightweight partition walls with timber support ... > Dry mortarless installation with fire batt

- | | | | |
|------|--|---------------------|--|
| 1 | FKRS-EU | 7.10 | Trim panels (fire-resistant) |
| 2.4 | Fire batt with ablative coating | 7.11 | Trim panels, double layer, staggered joints |
| 3.4 | Timber stud wall (also timber panel constructions), cladding on both sides | 7.12 | Trim panels, wood sheet, at least 600 kg/m ³ |
| 4.1 | Solid ceiling slab / solid floor | 7.13a | Cladding, fire-resistant |
| 6.5 | Mineral wool (depending on wall construction) | 7.13b | Cladding, wood sheet, at least 600 kg/m ³ |
| 6.10 | Ablative coating around the perimeter, d = at least 2.5 mm | 7.17 | Trimmer, wooden beam min. 60 × 80 mm or min. 60 × 60 mm with F60 |
| 6.19 | Mineral wool > 1000 °C, > 80 kg/m ³ , thickness = 20 mm, leave out the actuator and release mechanism; inspection openings must remain accessible | * | 6.19, 6.20 or 6.24 as an alternative |
| 6.20 | Sleeve (can be ordered separately) | ** | Installation near the floor analogous to 7 |
| 6.24 | Elastomeric foam (flame-resistant, non-dripping)
The following applies in Germany: For notes on the use of elastomeric foams, see 7. | 1 – 7 | See table 102 |
| 7.7 | Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60 | | |

Note: The class of performance of **7** depends on 6.10* (see details **1** to **4**).

Lightweight partition wall with timber support structure					
NW [mm]	Fire resistance properties to	Coating		s2 [mm]	Detail
		Installation side A	Operating side B		
100 – 200	EI 90 S	–	–	10 – 600	1 , 7
100 – 315	EI 90 S	–	x	10 – 600	2 , 7
100 – 200	EI 120 S	–	x	40 – 600	2 , 7
100 – 315	EI 120 S	x	x	40 – 600	3 , 7
100 – 315	EI 60 S	–	–	10 – 600	4 , 7
100 – 315	EI 30 S	–	–	10 – 600	5 , 7
100 – 315	EI 30 S	–	–	10 – 600	6 , 7



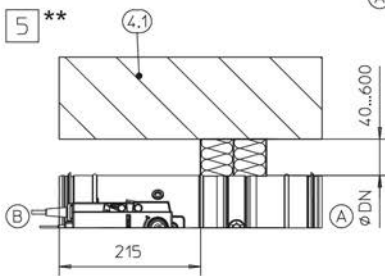
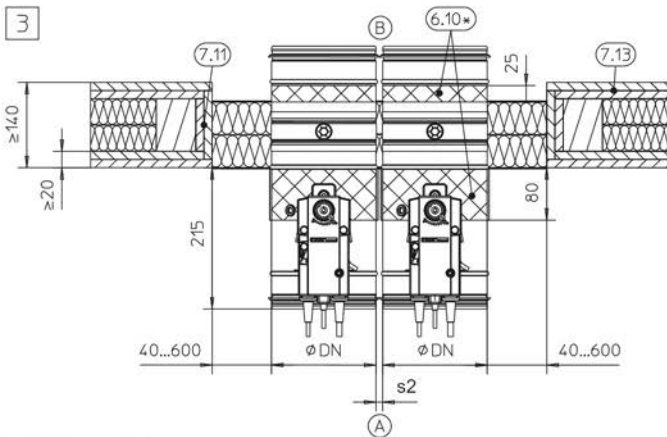
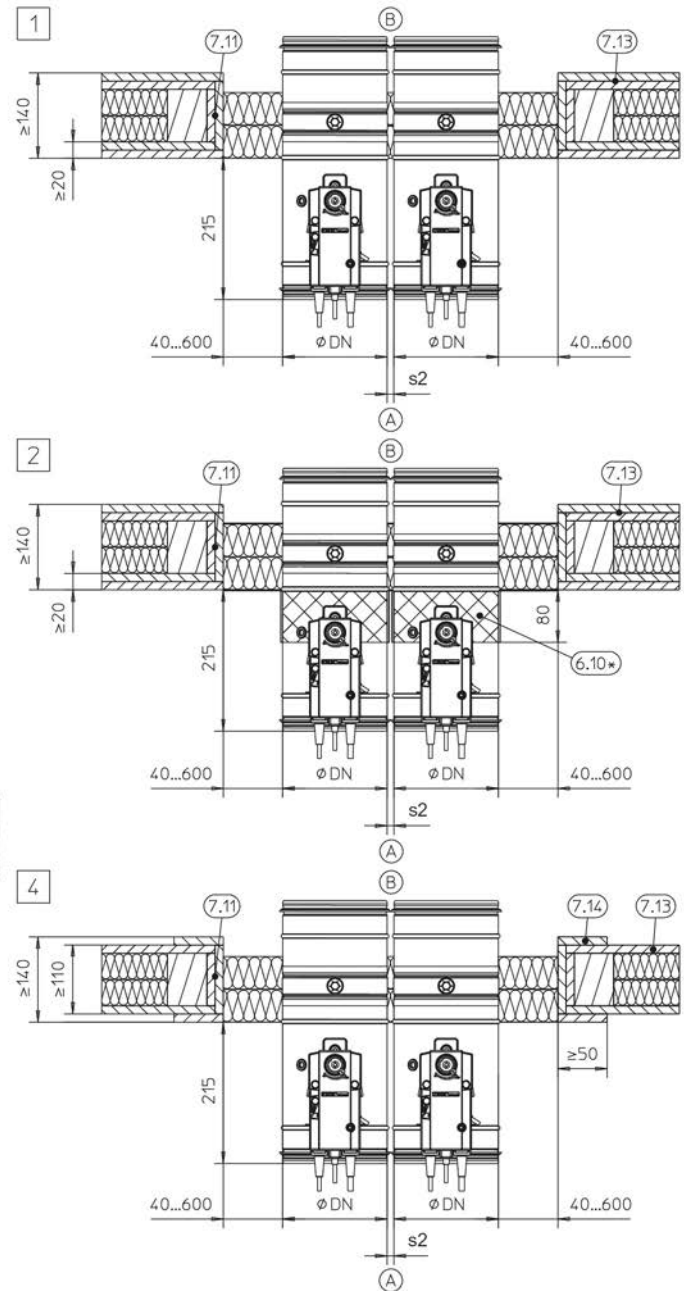
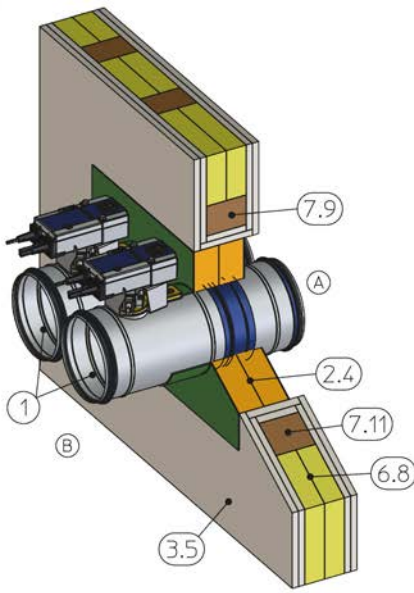
GR3506412, C

Fig. 86: Dry mortarless installation with fire batt into a half-timbered construction

- | | | | |
|------|---|-------|---|
| 1 | FKRS-EU | 6.24 | Elastomeric foam (flame-resistant, non-dripping) |
| 2.4 | Fire batt with ablative coating | | The following applies in Germany: For notes on the use of elastomeric foams, see 7. |
| 3.5 | Half-timbered construction, cladding on both sides | 7.9 | Half-timbered construction |
| 4.1 | Solid ceiling slab / solid floor | 7.11 | Trim panels, fire-resistant, double layer, staggered joints |
| 6.8 | Infill (cavities completely filled with mineral wool $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 50\text{ kg/m}^3$, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay) | 7.13 | Cladding |
| 6.10 | Ablative coating around the perimeter, $d =$ at least 2.5 mm | 7.14 | Reinforcing board of the same material as the wall |
| 6.19 | Mineral wool $> 1000\text{ }^{\circ}\text{C}$, $> 80\text{ kg/m}^3$, thickness = 20 mm, panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible | * | 6.19, 6.20 or 6.24 as an alternative |
| 6.20 | Sleeve (can be ordered separately) | ** | Installation near the floor analogous to 5 |
| | | 1 – 5 | See table 103 |

Half-timbered wall				
NW [mm]	Fire resistance properties to	Coating		Detail
		Installation side A	Operating side B	
100 – 200	EI 90 S	–	–	1, 5
100 – 315	EI 90 S	–	x	2, 5
100 – 200	EI 120 S	–	x	2, 5
100 – 315	EI 120 S	x	x	3, 5
100 – 315	EI 30 S	–	–	4, 5

Lightweight partition walls with timber support ... > Dry mortarless installation with fire batt



GR3597350, A

Fig. 87: Dry mortarless installation into a half-timbered construction, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FKRS-EU	6.24	Elastomeric foam (flame-resistant, non-dripping)
2.4	Fire batt with ablative coating		The following applies in Germany: For notes on the use of elastomeric foams, see 7.
3.5	Half-timbered construction, cladding on both sides	7.9	Half-timbered construction
4.1	Solid ceiling slab / solid floor	7.11	Trim panels, fire-resistant, double layer, staggered joints
6.8	Infill (cavities completely filled with mineral wool $\geq 1000^\circ\text{C}$, $\geq 50\text{ kg/m}^3$, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)	7.13	Cladding
6.10	Ablative coating around the perimeter, $d = \text{at least } 2.5\text{ mm}$	7.14	Reinforcing board of the same material as the wall
		*	6.19, 6.20 or 6.24 as an alternative
		**	Installation near the floor analogous to 5

- 6.19 Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm, panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible 1 – 5 See table
- 6.20 Sleeve (can be ordered separately)

Lightweight partition wall with timber support structure

NW [mm]	Fire resistance properties to	Coating		s2 [mm]	Detail
		Installation side A	Operating side B		
100 – 200	EI 90 S	–	–	10 – 600	1, 5
100 – 315	EI 90 S	–	x	10 – 600	2, 5
100 – 200	EI 120 S	–	x	40 – 600	2, 5
100 – 315	EI 120 S	x	x	40 – 600	3, 5
100 – 315	EI 30 S	–	–	10 – 600	4, 5

Additional requirements: dry mortarless installation with fire batt into lightweight partition walls with timber support structure

- Timber support structure or half-timbered construction, see ☞ 33
- Fire batt systems, installation details, distances / dimensions, see ☞ 28 f
- Suspension and fixing, see ☞ 154

5.7 Solid wood walls

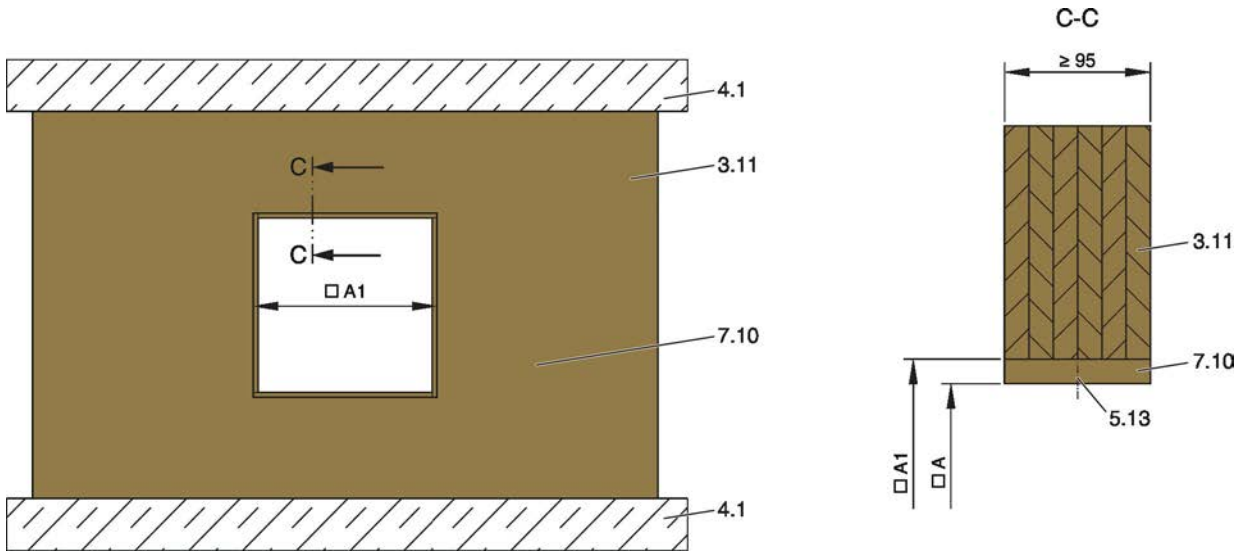


Fig. 88: Solid wood wall

- 3.11 Solid wood wall / CLT wall
- 4.1 Solid ceiling slab / solid floor
- 5.13 Wood screw or pin

- 7.10 Trim panels (optional)
- A Clear installation opening
- A1 Opening in a solid wood wall / CLT wall
(without trim panels: □A1 = □A)

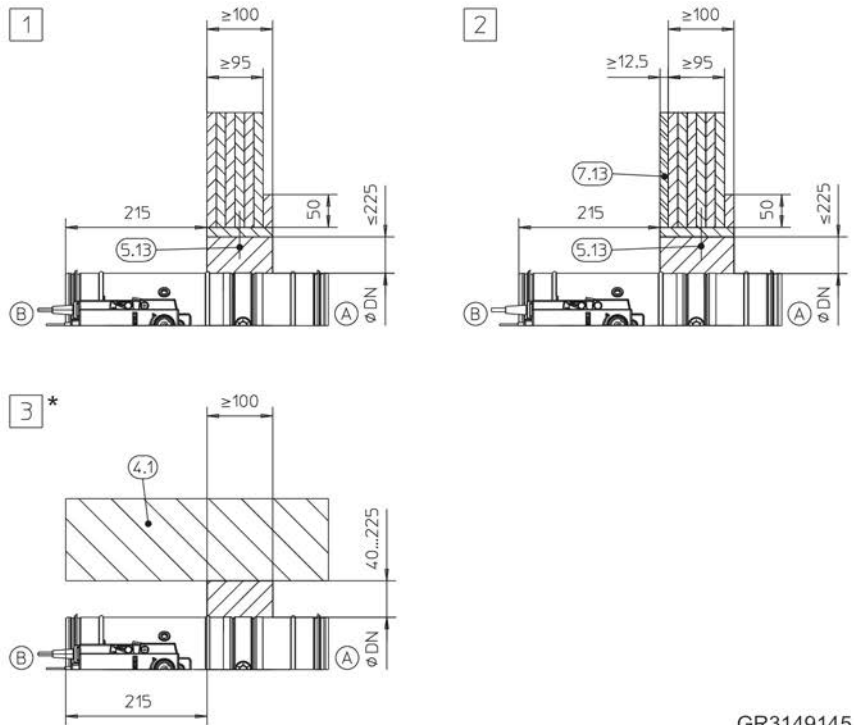
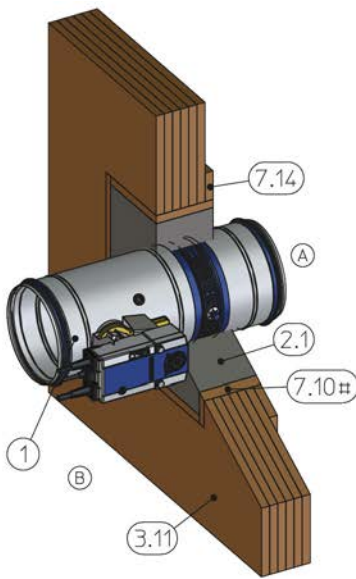
Additional requirements: solid wood walls

- Solid wood wall or CLT wall ↪ 33

Installation opening A [mm]										
Installation type	Nominal size									
	100	125	150	160	180	200	224	250	280	315
Mortar-based installation	□A or ∅A = ∅DN + max. 450 mm									
Dry mortarless installation with installation kit TQ / TQ2 ¹	□A = ∅DN + 110 mm									
Dry mortarless installation with fire batt	□A = ∅DN + 80 – 1200 mm									

¹⁾ Installation opening tolerance ± 2 mm

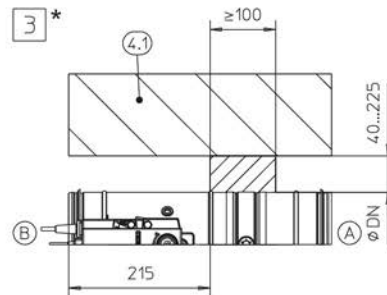
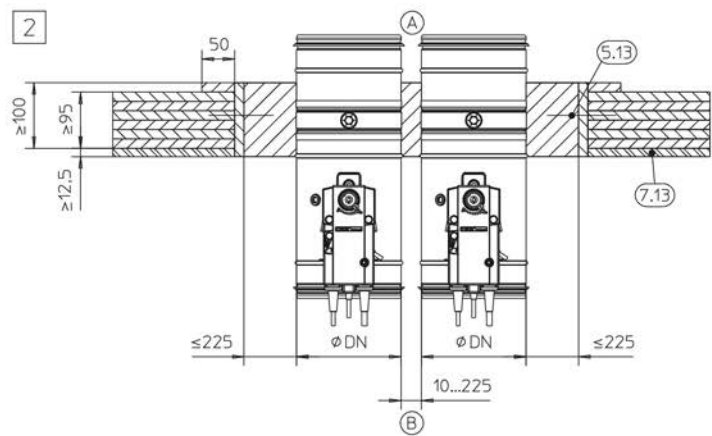
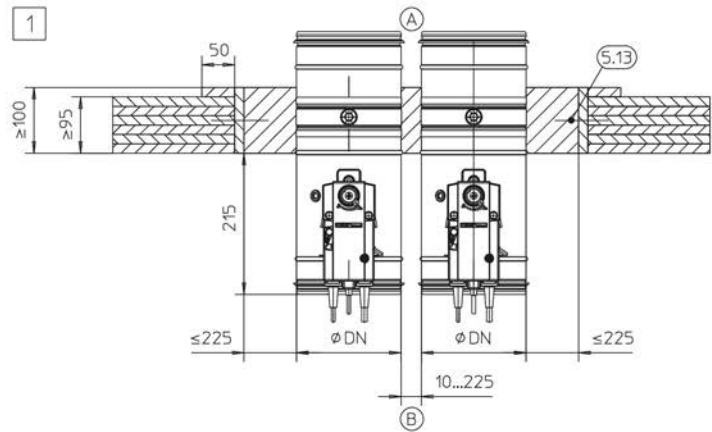
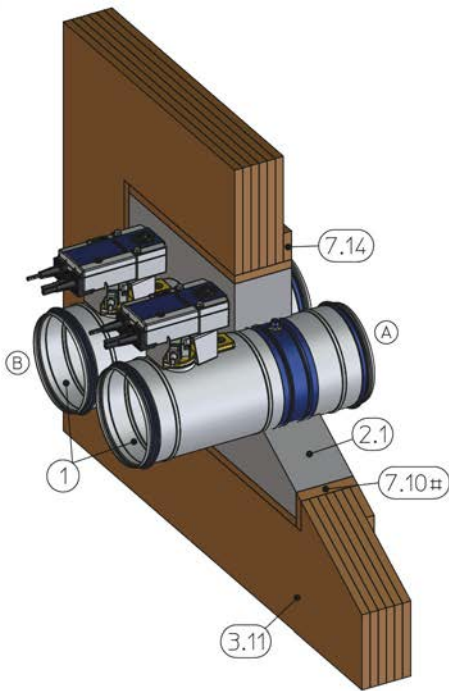
5.7.1 Mortar-based installation



GR3149145, B

Fig. 89: Mortar-based installation into a solid wood wall or CLT wall

1	FKRS-EU	7.13	Cladding, single-layer, fire-resistant
2.1	Mortar	7.14	Reinforcing board of the same material (required if W < 100 mm)
3.11	Solid wood wall / CLT wall	#	optional
4.1	Solid ceiling slab / solid floor	*	Installation near the floor analogous to 3
5.13	Wood screw or pin	1 – 3	Up to EI 90 S
7.10	Trim panels		



GR3487456, C

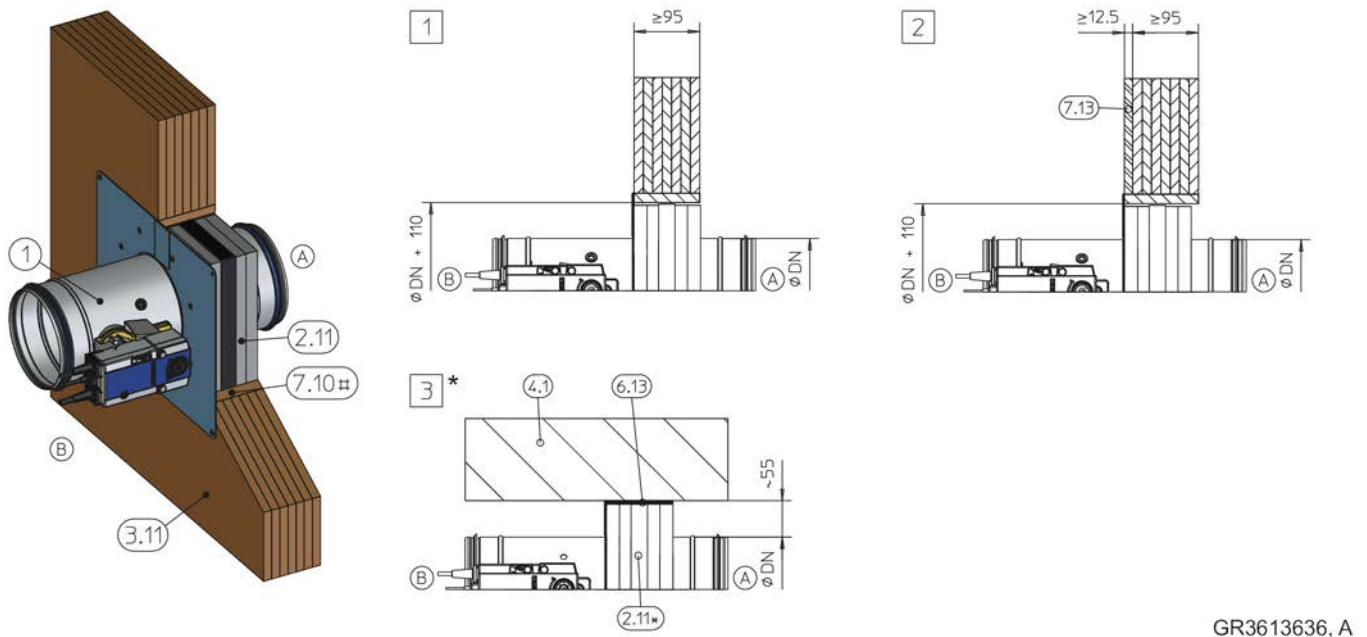
Fig. 90: Mortar-based installation into a solid wood wall or CLT wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FKRS-EU	7.13	Cladding, single-layer, fire-resistant
2.1	Mortar	7.14	Reinforcing board of the same material (required if W < 100 mm)
3.11	Solid wood wall / CLT wall	#	optional
4.1	Solid ceiling slab / solid floor	*	Installation near the floor analogous to [3]
5.13	Wood screw or pin	[1] - [3]	Up to EI 90 S
7.10	Trim panels		

Additional requirements: mortar-based installation into solid wood walls

- Solid wood wall or CLT wall ↗ 33

5.7.2 Dry mortarless installation with installation kit TQ / TQ2



GR3613636, A

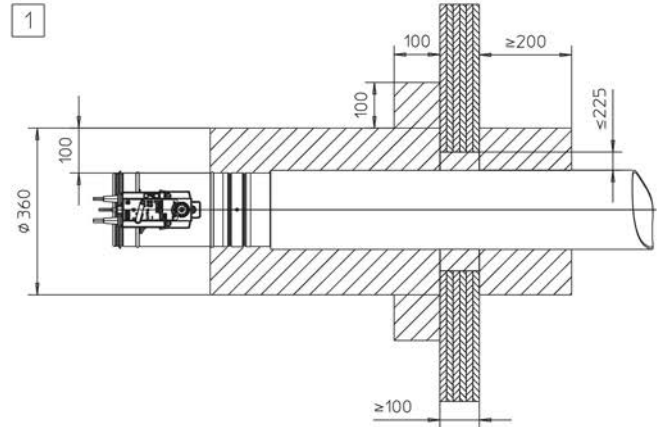
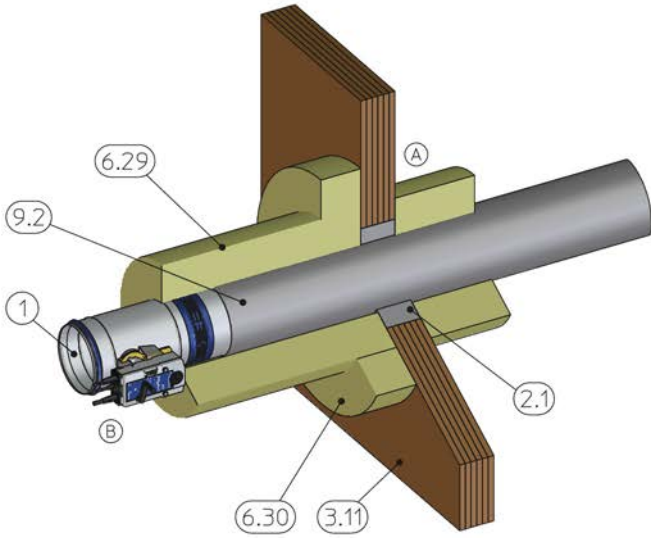
Fig. 91: Dry mortarless installation into a solid wood wall or CLT wall, with installation kit TQ / TQ2

1	FKRS-EU	7.10	Trim panels
2.11	Installation kit TQ / TQ2 with cover plate (two-part with TQ2)	7.13	Cladding, single-layer, fire-resistant
3.11	Solid wood wall / CLT wall	#	optional
4.1	Solid ceiling slab / solid floor	*	Installation near the floor analogous to 3
6.2	Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 80\text{ kg/m}^3$, alternatively gypsum mortar (to even out an uneven ceiling or floor)	1 – 3	Up to EI 90 S

Additional requirements: dry mortarless installation with installation kit TQ / TQ2 into solid wood walls

- Solid wood wall or CLT wall ↪ 33
- Installation kit TQ / TQ2, see ↪ 36
- $\geq 200\text{ mm}$ distance between two fire dampers in separate installation openings

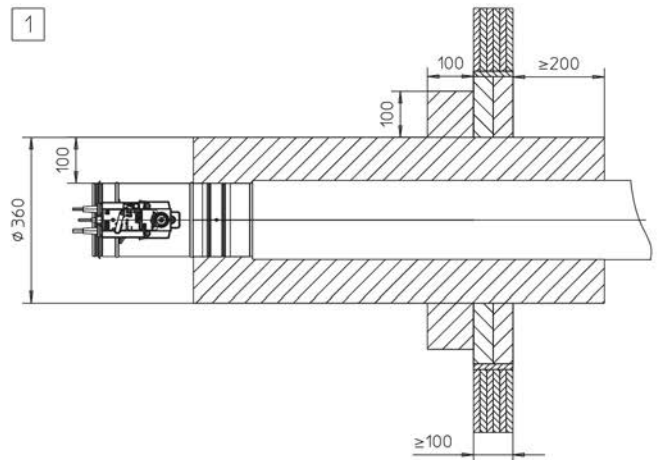
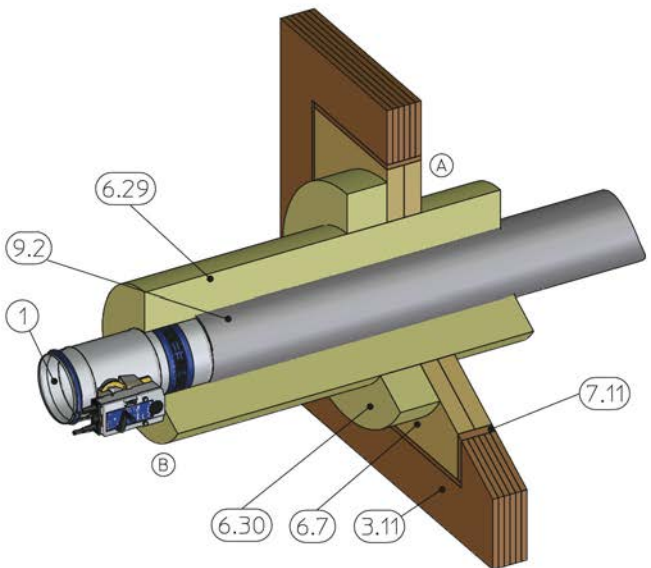
5.7.3 Installation remote from solid wood walls with mineral wool



GR3657839, A

Fig. 92: Mortar-based installation remote from a solid wood wall or CLT wall

- | | | | |
|------|--|------|---|
| 1 | FKRS-EU | 6.30 | Reinforcing board mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³), glued all round |
| 2.1 | Mortar | 9.2 | Sheet steel duct |
| 3.11 | Solid wood wall / CLT wall | 1 | Up to EI 60 S |
| 6.29 | Mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³) | | |



GR3657459, A

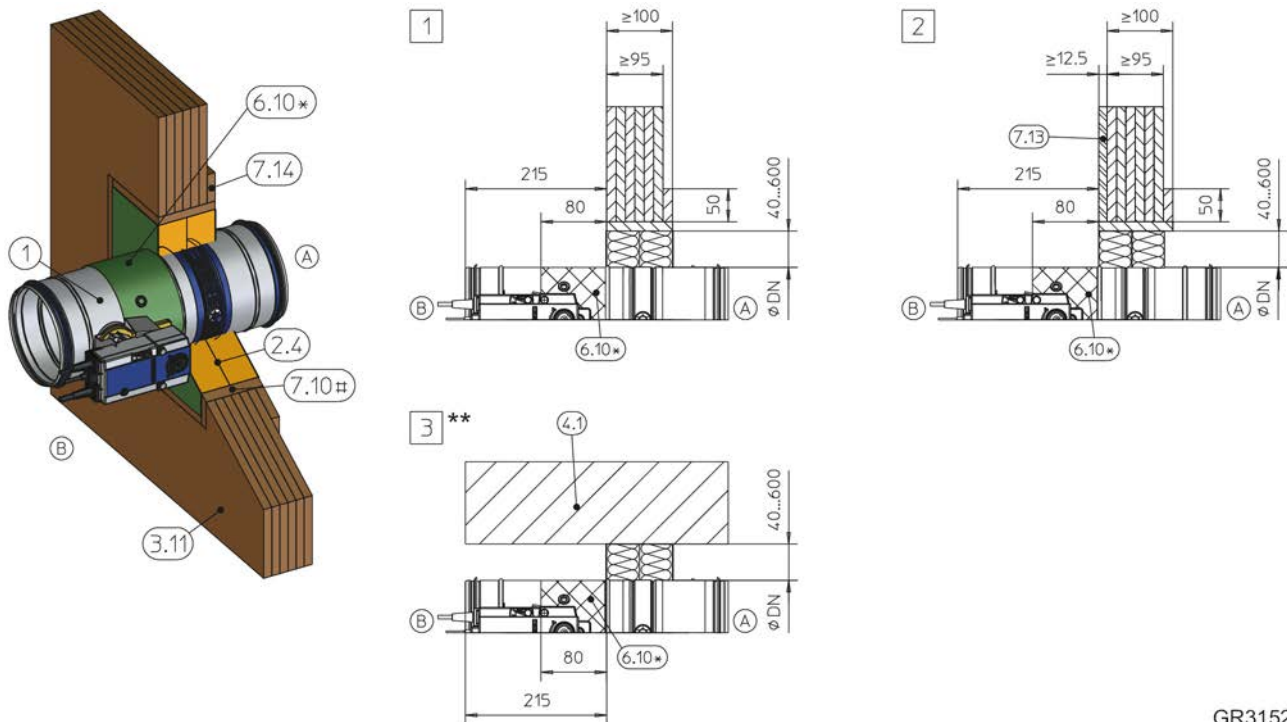
Fig. 93: Dry mortarless installation remote from a solid wood wall or CLT wall, with a fire batt

- | | | | |
|------|---|------|---|
| 1 | FKRS-EU | 7.11 | Trim panels, single-layer, fire-resistant |
| 3.11 | Solid wood wall / CLT wall | 8.21 | Acrylic or sealing compound (suitable for fire batt system) |
| 6.7 | Fire batt | 9.2 | Sheet steel duct |
| 6.29 | Mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³) | 1 | Up to EI 60 S |
| 6.30 | Reinforcing board mineral wool Paroc Hvac Fire Mat 80BLC (80 kg/m ³), glued all round | | |

Additional requirements: installation remote from solid wood walls with mineral wool

- Solid wood wall or CLT wall ↪ 33
- Paroc mineral wool, see ↪ 27

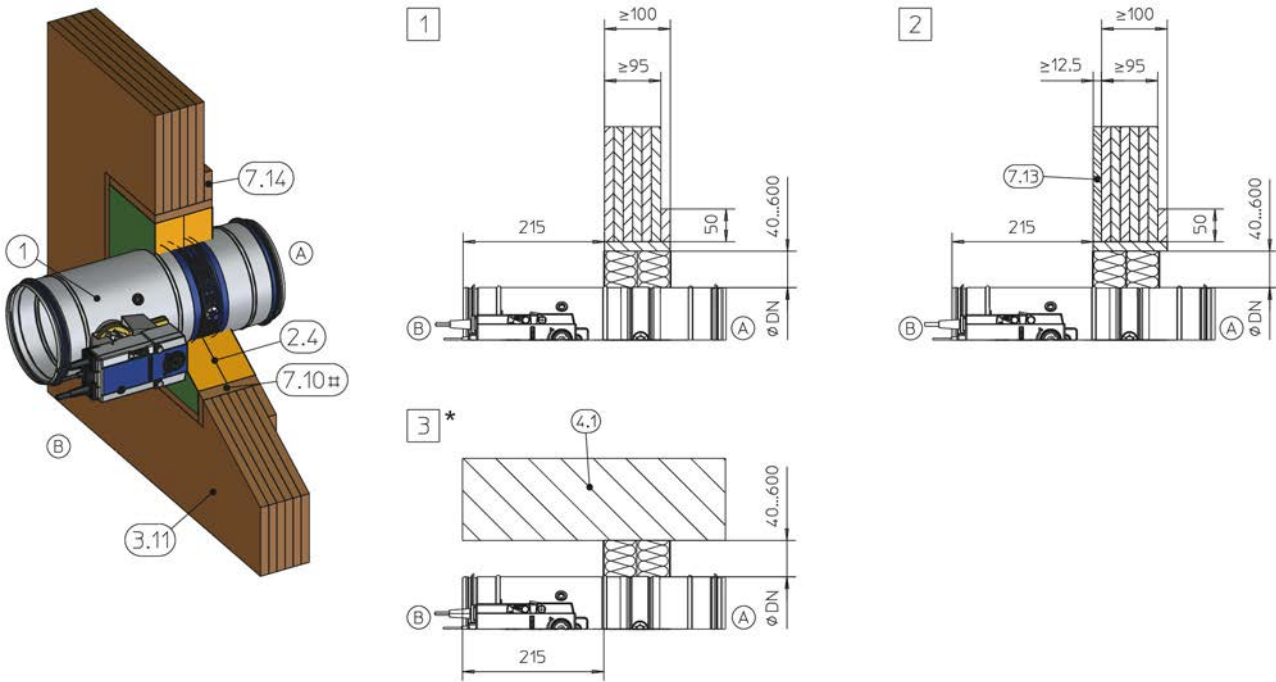
5.7.4 Dry mortarless installation with fire batt



GR3152270, B

Fig. 94: Dry mortarless installation into a timber wall or CLT wall, with a fire batt

1	FKRS-EU	7.10	Trim panels (fire-resistant)
2.4	Fire batt with ablative coating	7.13	Cladding, single-layer, fire-resistant
3.11	Solid wood wall / CLT wall	7.14	Reinforcing board of the same material as the wall
4.1	Solid ceiling slab / solid floor	#	optional
6.10	Ablative coating around the perimeter, d = at least 2.5 mm	*	6.19, 6.20 or 6.24 as an alternative
6.19	Mineral wool > 1000 °C, > 80 kg/m ³ , thickness = 20 mm, panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible	**	Installation near the floor analogous to 3
6.20	Sleeve (can be ordered separately)	1 – 3	Up to EI 90 S
6.24	Elastomeric foam (flame-resistant, non-dripping) The following applies in Germany: For notes on the use of elastomeric foams, see ↗ 7.		



GR3150231, C

Fig. 95: Dry mortarless installation into a timber wall or CLT wall, with a fire batt

1	FKRS-EU	7.13	Cladding, single-layer, fire-resistant
2.4	Fire batt with ablative coating	7.14	Reinforcing board of the same material as the wall
3.11	Solid wood wall / CLT wall	#	optional
4.1	Solid ceiling slab / solid floor	*	Installation near the floor analogous to 3
7.10	Trim panels (fire-resistant)	1 – 3	Up to EI 60 S

Additional requirements: dry mortarless installation with fire batt in solid wood walls

- Solid wood wall or CLT wall ↪ 33
- Fire batt systems, installation details, distances / dimensions, see ↪ 28 f
- Suspension and fixing, see ↪ 154
- ≥ 200 mm distance between two fire dampers in separate installation openings

5.8 Shaft walls with metal support structure

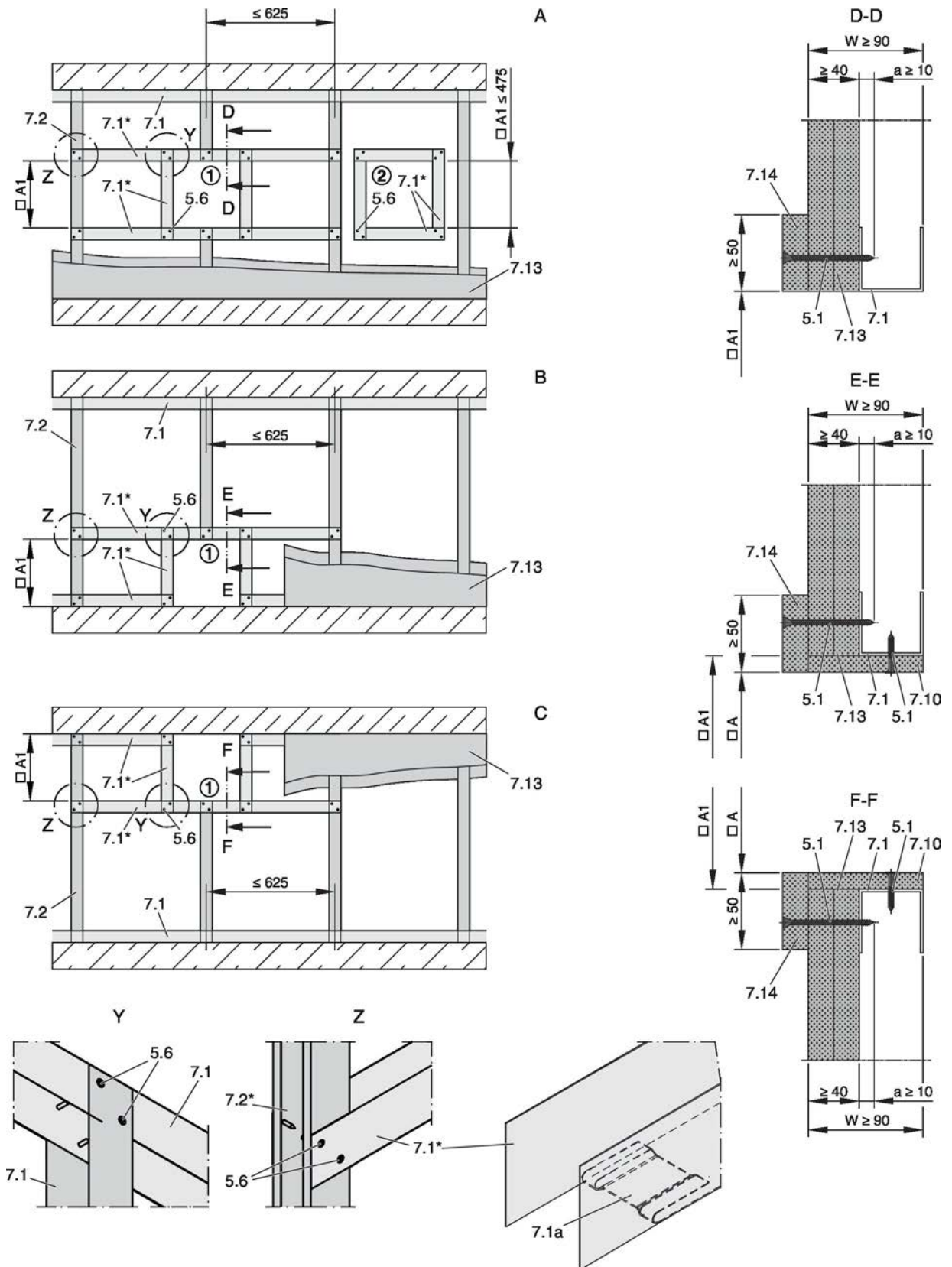


Fig. 96: Shaft walls with metal support structure and cladding on one side

A	Shaft wall	7.10	Trim panels, according to installation details
B	Shaft wall, installation near the floor**	7.13	Double layer cladding, on one side of the metal stud system
C	Shaft wall, installation near the ceiling**	7.14	Reinforcing board of the same material as the wall according to installation details
5.1	Dry wall screw	*	Closed side of metal section must face the installation opening
5.6	Screw or steel rivet	**	Mortar-based installation only
7.1	UW section	□A	Clear installation opening
7.1a	UW section, cut in and bent or cut off	□A1	Opening in the metal support structure (without trim panels: □A = □A1)
7.2	CW section		

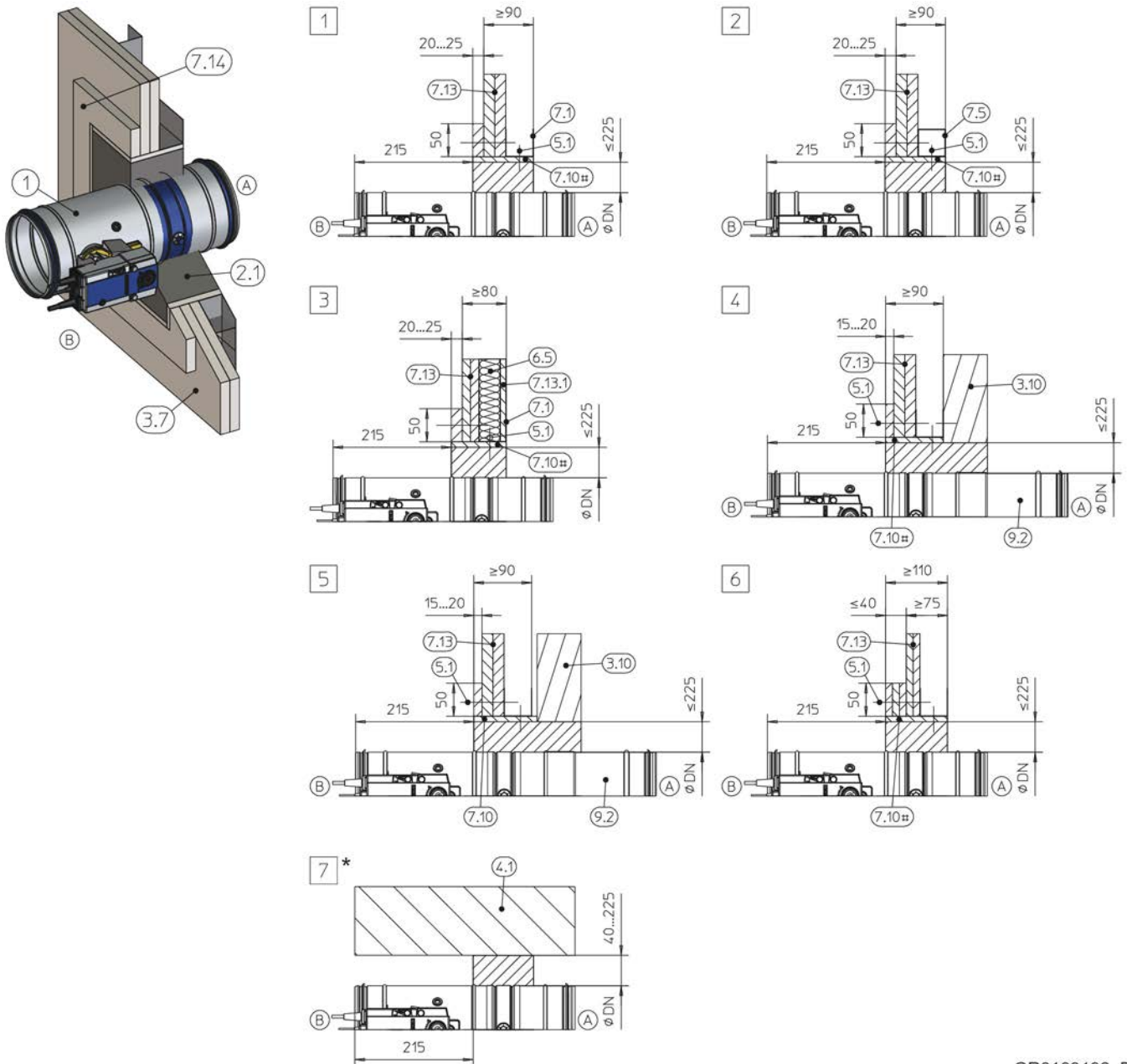
Additional requirements: shaft walls with metal support structure

- Shaft wall with metal support structure, see ↗ 33
- Erect the shaft wall according to the manufacturer's instructions and create an installation opening, see Fig. 96
- – Option 1: Provide the installation opening in the metal support structure with suitable metal sections, then clad the wall.
- Option 2: After cladding the wall, create a square wall opening (clear installation opening ≤ 475 mm) between two regular studs and brace it with a perimeter metal section. Screw metal sections over the cladding, spaced approx. 100 mm apart.

Installation type	Installation opening A [mm]									
	Nominal size									
	100	125	150	160	180	200	224	250	280	315
Mortar-based installation	□A or $\varnothing A = \varnothing DN + \text{max. } 450 \text{ mm}$									
Dry mortarless installation with installation kit TQ / TQ2 ¹⁾	□A = $\varnothing DN + 110 \text{ mm}$									
Dry mortarless installation with installation kit WA / WA2	$\varnothing DN + \text{approx. } 5 \text{ mm}$									

¹⁾ Installation opening tolerance ± 2 mm

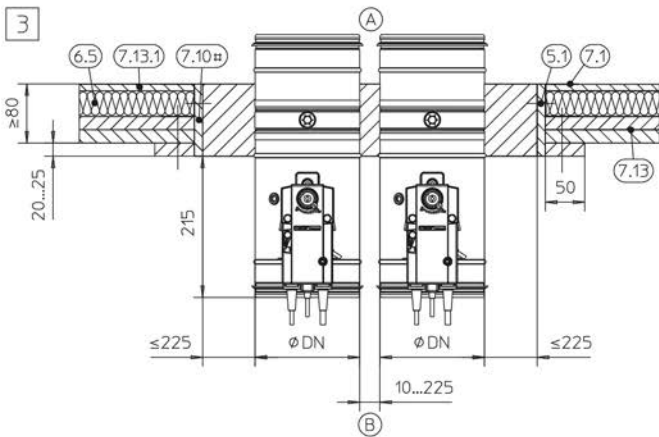
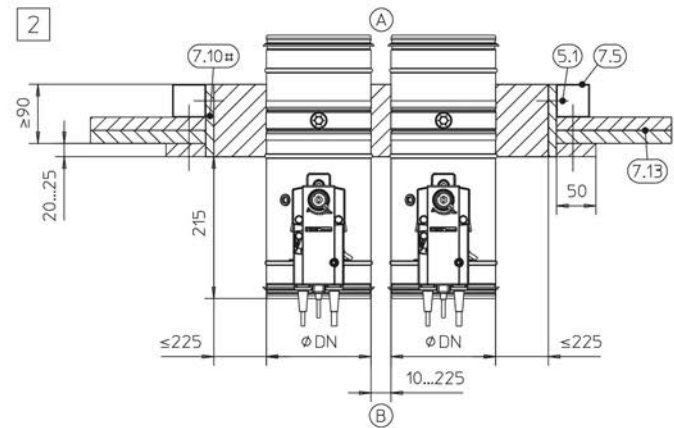
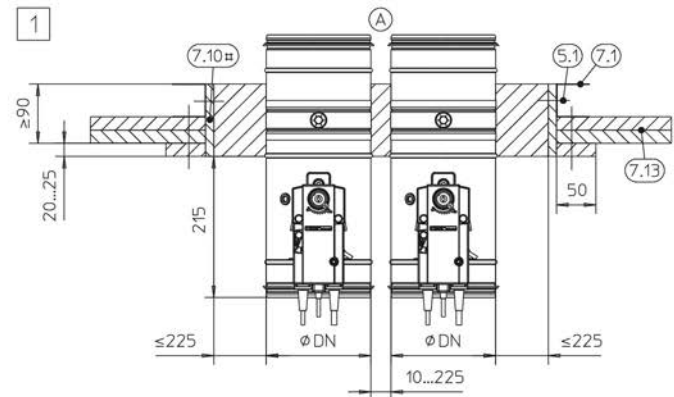
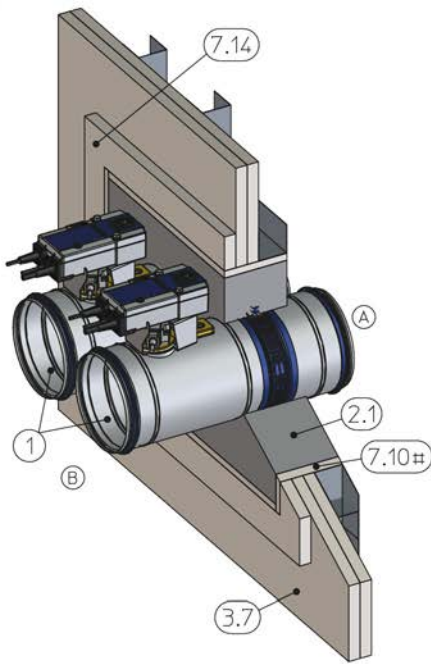
5.8.1 Mortar-based installation



GR3193192, B

Fig. 97: Mortar-based installation into shaft wall with metal support structure

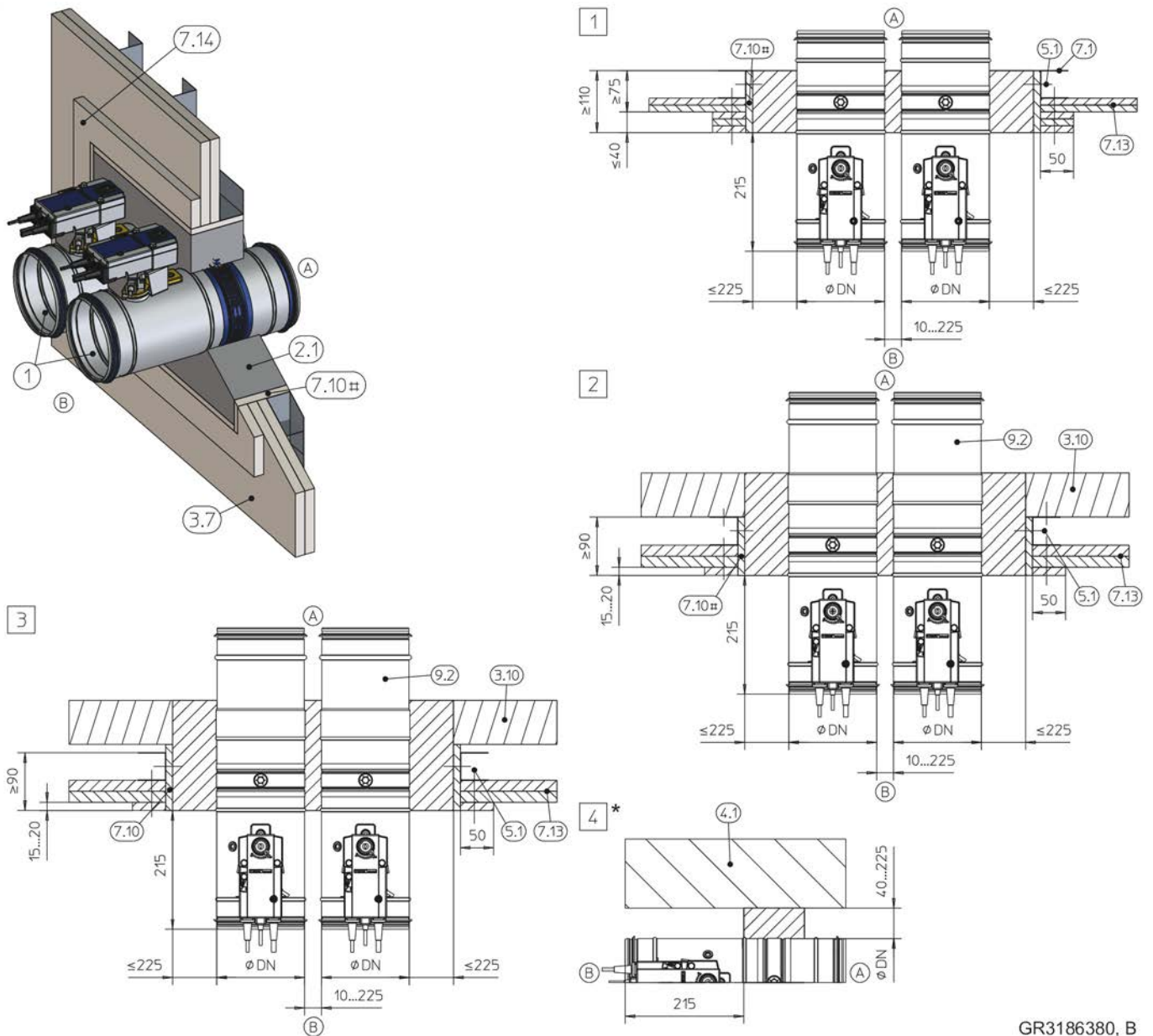
1	FKRS-EU	7.13	Cladding, two layers
2.1	Mortar	7.13.1	Cladding, single-layer, adjusted
3.7	Shaft wall with metal support structure, cladding on one side	7.14	Reinforcing board of the same material as the wall
3.10	Wall without adequate fire resistance rating	9.2	Extension piece or duct
4.1	Solid ceiling slab / solid floor	#	optional
5.1	Dry wall screw	*	Installation near the floor analogous to [7]
6.5	Mineral wool (depending on wall construction)	[1] - [3]	Up to EI 90 S
7.1	UW section	[4] - [6]	Up to EI 90 S
7.5	Steel support structure (box section)	[7]	EI 30 S – EI 90 S
7.10	Trim panels		



GR3186380, B

Fig. 98: Mortar-based installation into a shaft wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

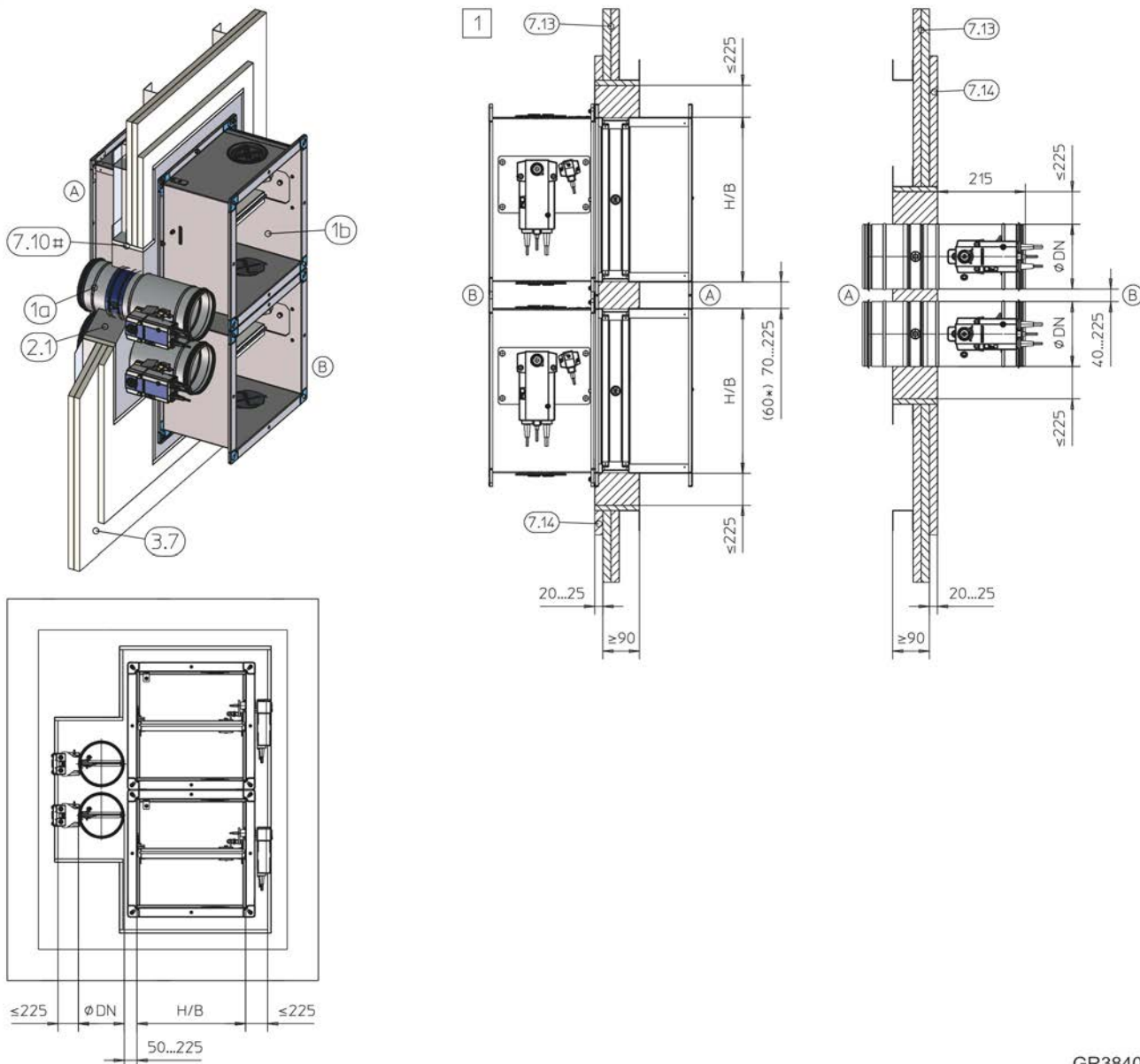
- | | | | |
|-----|---|---------------------|--|
| 1 | FKRS-EU | 7.10 | Trim panels |
| 2.1 | Mortar | 7.13 | Cladding, two layers |
| 3.7 | Shaft wall with metal support structure, cladding on one side | 7.13.1 | Cladding, single-layer, adjusted |
| 5.1 | Dry wall screw | 7.14 | Reinforcing board of the same material as the wall |
| 6.5 | Mineral wool (depending on wall construction) | # | optional |
| 7.1 | UW section | 1 – 3 | Up to EI 90 S |
| 7.5 | Steel support structure (box section) | | |



GR3186380, B

Fig. 99: Mortar-based installation into a shaft wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

- | | | | |
|------|---|---------------------|--|
| 1 | FKRS-EU | 7.13 | Cladding, two layers |
| 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 | 9.2 | Extension piece or duct |
| 3.10 | Wall without adequate fire resistance rating | # | optional |
| 4.1 | Solid ceiling slab / solid floor | * | Installation near the floor analogous to 4 |
| 5.1 | Dry wall screw | 1 – 3 | EI 30 S |
| 7.1 | UW section | 4 | EI 30 S – EI 90 S |
| 7.10 | Trim panels | | |



GR384016, C

Fig. 100: Mortar-based installation into a shaft wall, FKA2-EU and FKRS-EU combined

1a	FKRS-EU	7.13	Cladding, two layers
1b	FK-EU / FK2-EU up to $W \times H \leq 800 \times 400$ mm	7.14	Reinforcing board of the same material as the wall
2.1	Mortar	#	optional
3.7	Shaft wall with metal support structure, cladding on one side	*	with FK2-EU
7.10	Trim panels	1	Up to EI 90 S

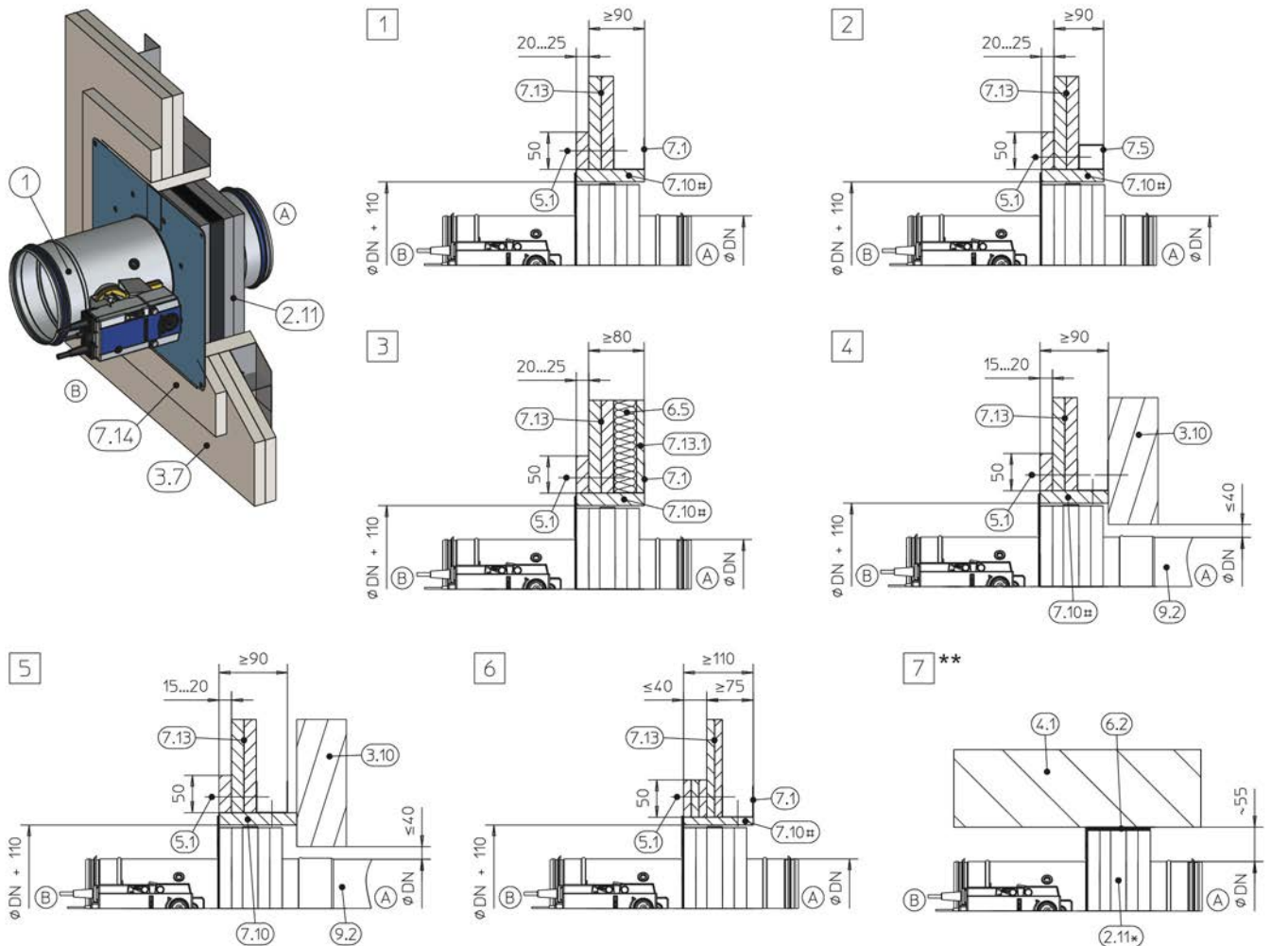
Note: Alternative installation orientations of side-by-side, under or on top of one another possible. Details are available upon request.

For installation details FK-EU and FK2-EU, see the installation and operating manual for these fire damper types.

Additional requirements: mortar-based installation into shaft walls with metal support structure

- Shaft wall ↻ 33

5.8.2 Dry mortarless installation with installation kit TQ / TQ2



GR3612552, A

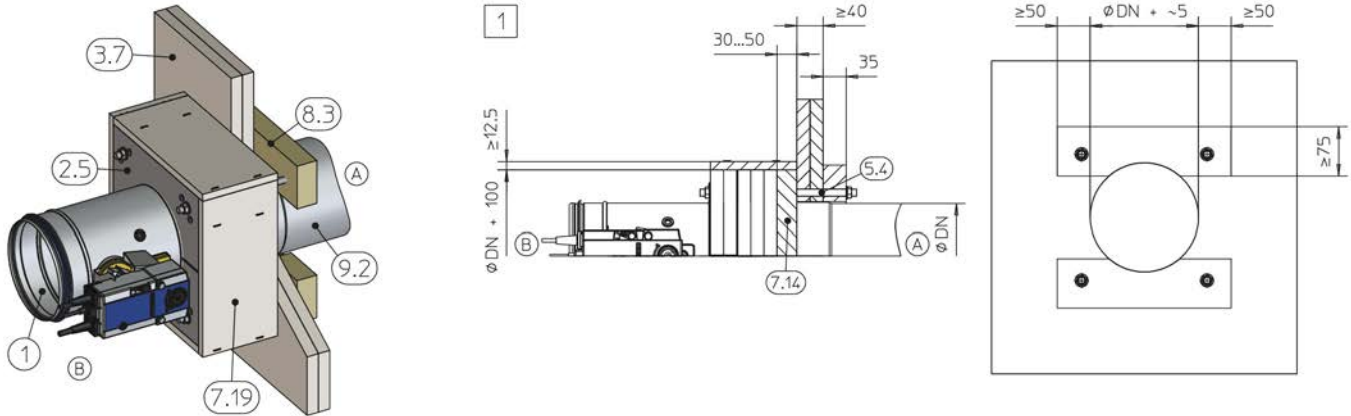
Fig. 101: Dry mortarless installation with installation kit TQ / TQ2 into a shaft wall with metal support structure

1	FKRS-EU	7.13	Cladding, two layers
2.11	Installation kit TQ / TQ2 with cover plate (two-part with TQ2)	7.13.1	Cladding, single-layer, adjusted
3.7	Shaft wall with metal support structure, cladding on one side	7.14	Reinforcing board of the same material as the wall
3.10	Wall without adequate fire resistance rating	9.2	Extension piece or duct
4.1	Solid ceiling slab / solid floor	#	optional
5.1	Dry wall screw	*	Installation near the floor analogous to 7
6.2	Mineral wool, $\geq 1000\text{ }^\circ\text{C}$, $\geq 80\text{ kg/m}^3$, alternatively gypsum mortar (to even out an uneven ceiling or floor)	**	Cover plate shortened by others
6.5	Mineral wool (depending on wall construction)	1 - 3	Up to EI 90 S
7.1	UW section	4 - 6	EI 30 S
7.5	Steel support structure (box section)	7	EI 30 to EI 90 S
7.10	Trim panels		

Additional requirements: dry mortarless installation with installation kit TQ / TQ2 into shaft walls with metal support structure

- Shaft wall ↪ 33
- Installation kit TQ / TQ2, see ↪ 36
- $\geq 200\text{ mm}$ distance between two fire dampers in separate installation openings

5.8.3 Dry mortarless installation with installation kit WA / WA2



GR3636238, A

Fig. 102: Dry mortarless installation with installation kit WA / WA2 into a shaft wall with metal support structure

1	FKRS-EU	7.19	Fire-resistant cladding (fire-rated plasterboard panel, thickness ≥ 12.5 mm)
2.5	Installation kit WA / WA2	8.3	PROMATECT®-LS board, d = 35 mm
3.7	Shaft wall with metal support structure, cladding on one side	9.2	Extension piece or duct
5.4	Threaded rod (M8 or M10) as push through installation with washers and nuts	1	Up to EI 90 S
7.14	Reinforcing board (square, DN + 100 mm), calcium silicate, thickness = 30 – 50 mm or mineral wool, ≥ 1000 °C, ≥ 140 kg/m ³ , thickness = 50 mm		

Additional requirements: dry mortarless installation with installation kit WA / WA2 into shaft walls with metal support structure

- Shaft wall ↗ 33
 - Installation kit WA / WA2, see ↗ 37
 - ≥ 75 mm distance from fire damper to load-bearing structural elements
 - ≥ 200 mm distance between two fire dampers
1. ▶ Make a circular installation opening DN + approx. 5 mm between two regular studs.
 2. ▶ Create a reinforcing board (7.14) and fix it to the installation kit.
 3. ▶ Create Promatect strips (8.3).
 4. ▶ Push the fire damper into the wall opening and fix it with threaded rods (5.4) and Promatect strips (8.3).
 5. ▶ Apply fire-resistant cladding (7.19).

5.9 Shaft walls without metal support structure

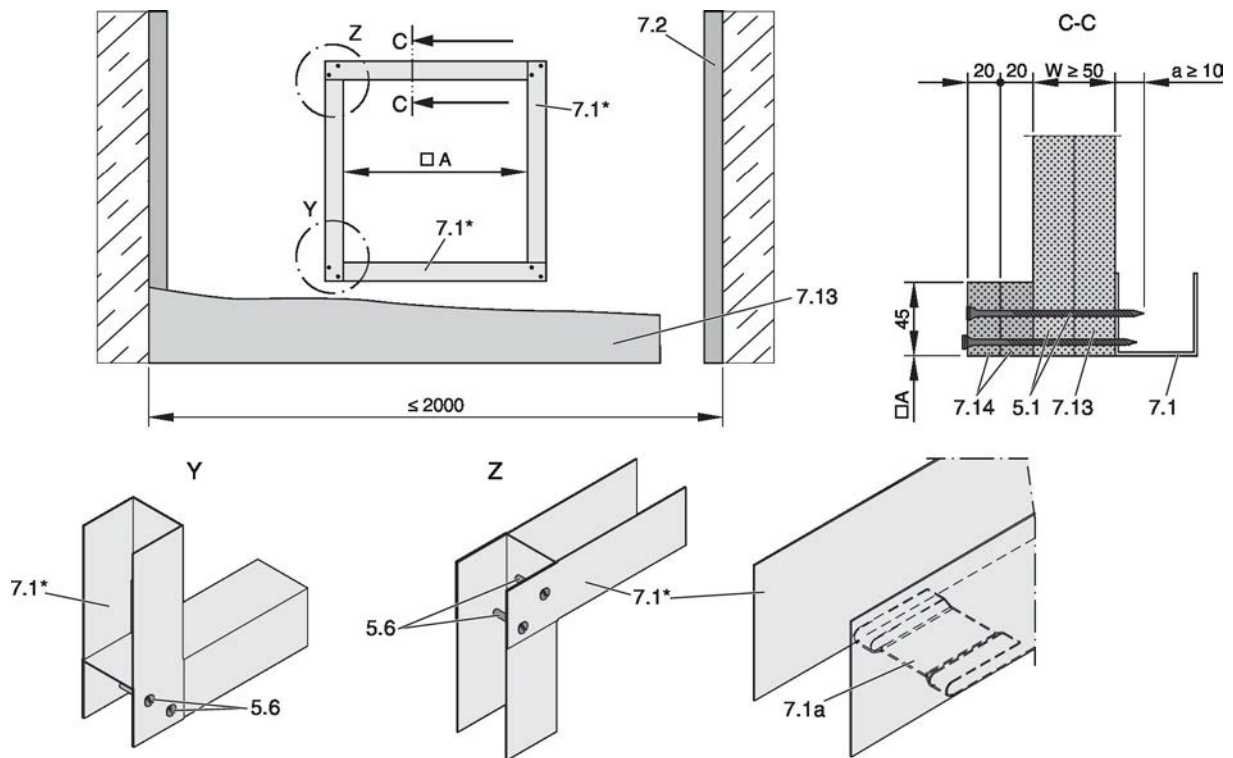


Fig. 103: Shaft wall without metal support structure and with cladding on one side

- 5.1 Dry wall screw
- 5.6 Screw or steel rivet
- 7.1 UW section
- 7.1a UW section, cut in and bent or cut off
- 7.2 CW section
- 7.13 Double layer cladding, on one side of the metal stud system
- 7.14 Reinforcing board
- * Closed side of metal section must face the installation opening
- A Clear installation opening

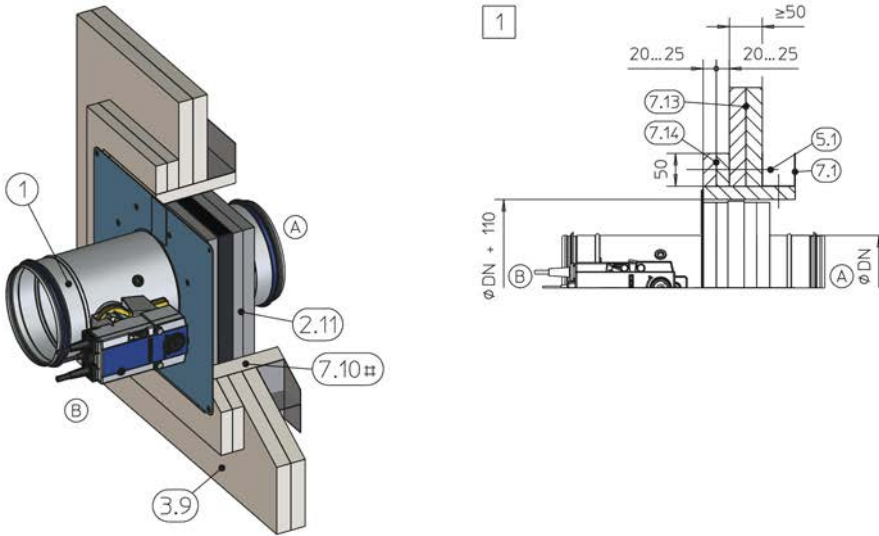
Additional requirements: shaft walls without metal support structure

- Shaft wall without metal support structure, see ↻ 33

Installation type	Installation opening A [mm]									
	Nominal size									
	100	125	150	160	180	200	224	250	280	315
Dry mortarless installation with installation kit TQ / TQ2 ¹⁾	□A = ØDN + 110 mm									
Dry mortarless installation with installation kit WA / WA2	ØDN + approx. 5 mm									

¹⁾ Installation opening tolerance ± 2 mm

5.9.1 Dry mortarless installation with installation kit TQ / TQ2



GR3612961, A

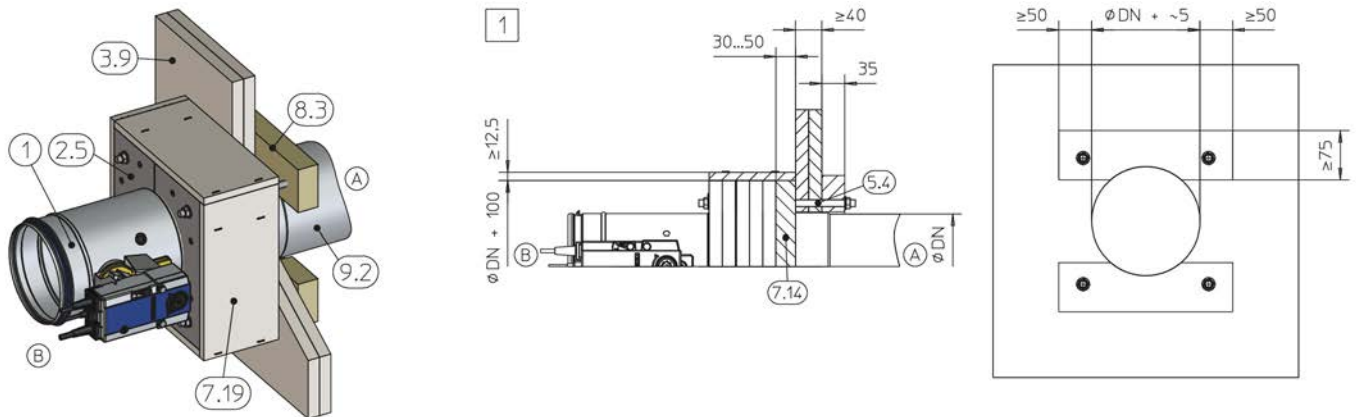
Fig. 104: Dry mortarless installation with installation kit TQ / TQ2 into a shaft wall without metal support structure

1	FKRS-EU	7.10	Trim panels
2.11	Installation kit TQ / TQ2 with cover plate (two-part with TQ2)	7.13	Cladding, two layers
3.9	Shaft wall without metal support structure, cladding on one side	7.14	Reinforcing board of the same material as the wall
5.1	Dry wall screw	#	optional
7.1	UW section	1	Up to EI 90 S

Additional requirements: dry mortarless installation with installation kit TQ / TQ2 into shaft walls without metal support structure

- Shaft wall ↪ 33
- Installation kit TQ / TQ2, see ↪ 36
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Approx. 100 mm distance from the fire damper to load-bearing / adjacent structural elements

5.9.2 Dry mortarless installation with installation kit WA / WA2



GR3629547, A

Fig. 105: Dry mortarless installation with installation kit WA / WA2 into a shaft wall without metal support structure

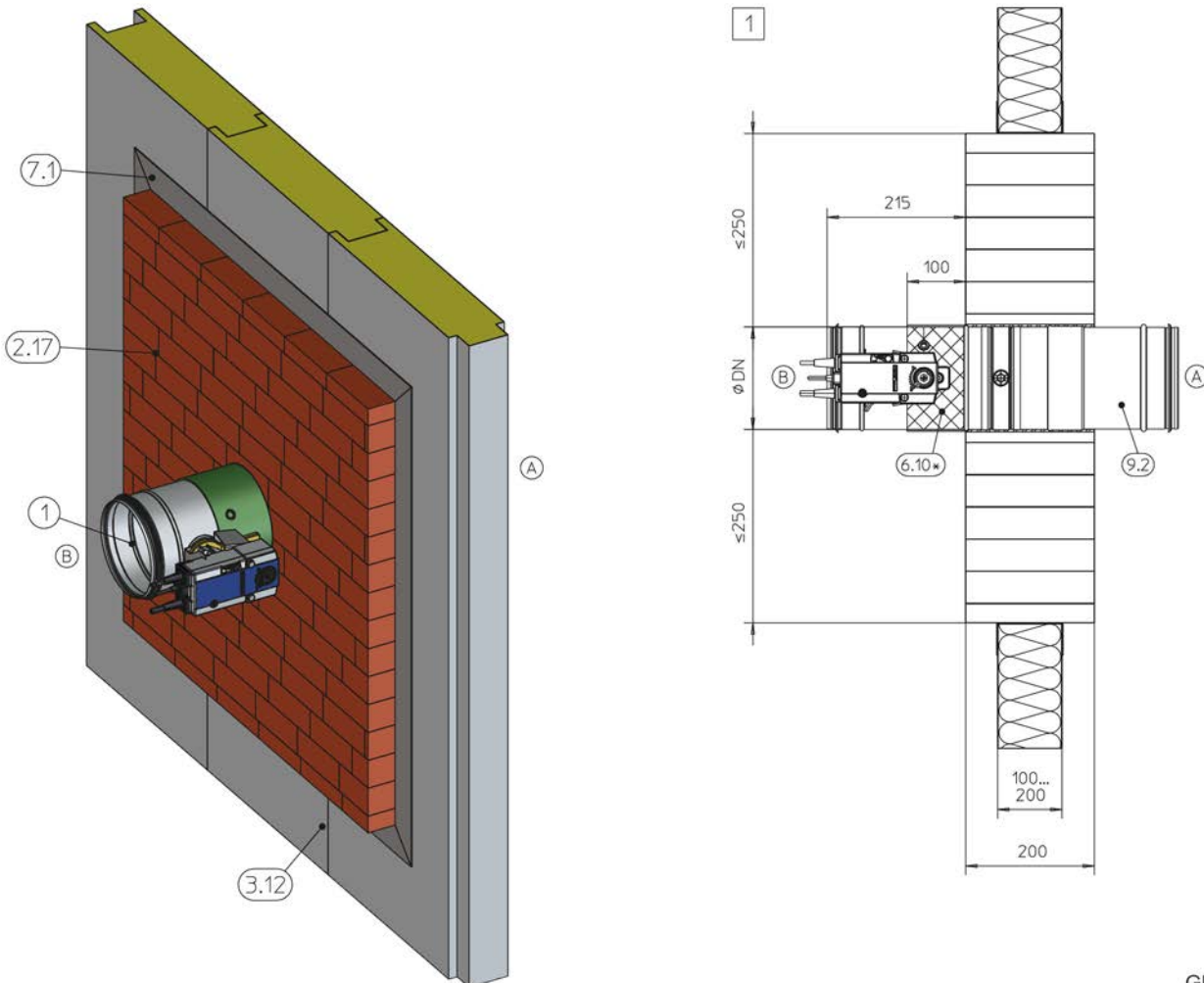
1	FKRS-EU	7.19	Fire-resistant cladding (fire-rated plasterboard panel, thickness ≥ 12.5 mm)
2.5	Installation kit WA / WA2	8.3	PROMATECT®-LS board, d = 35 mm
3.9	Shaft wall without metal support structure, cladding on one side	9.2	Duct
5.4	Threaded rod (M8 or M10) as push through installation with washers and nuts	1	Up to EI 90 S
7.14	Reinforcing board (square, DN + 100 mm), calcium silicate, thickness = 30 – 50 mm or mineral wool, ≥ 1000 °C, ≥ 140 kg/m ³ , thickness = 50 mm		

Additional requirements: dry mortarless installation with installation kit WA / WA2 on shaft walls without metal support structure

- Shaft wall ↪ 33
 - Installation kit WA / WA2, see ↪ 37
 - ≥ 75 mm distance from fire damper to load-bearing structural elements
 - ≥ 200 mm distance between two fire dampers
1. ▶ Make a circular installation opening DN + approx. 5 mm.
 2. ▶ Create a reinforcing board (7.14) and fix it to the installation kit.
 3. ▶ Create Promatect strips (8.3).
 4. ▶ Push the fire damper into the wall opening and fix it with threaded rods (5.4) and Promatect strips (8.3).
 5. ▶ Apply fire-resistant cladding (7.19).

5.10 Sandwich panel walls

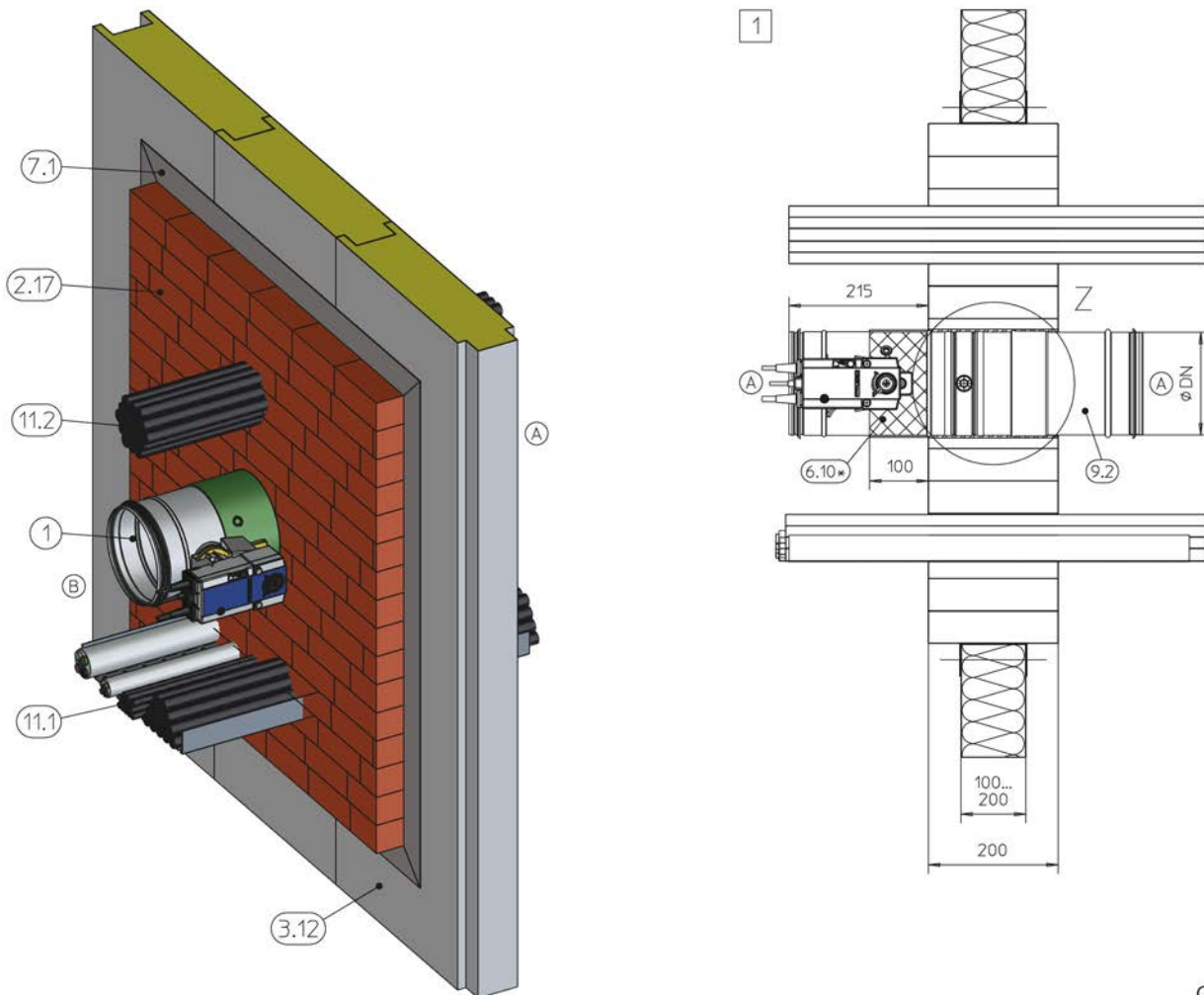
5.10.1 Dry mortarless installation



GR3621784, A

Fig. 106: Dry mortarless installation into sandwich panel wall

- | | |
|--|--|
| <p>1 FKRS-EU</p> <p>2.17 Fire protection block Hilti CFS-BL</p> <p>3.12 Sandwich panel wall 100 – 200 mm, with mineral wool filling $\geq 1000\text{ }^\circ\text{C}$, $\geq 150\text{ kg/m}^3$, sheet metal thickness $\geq 0.5\text{ mm}$ on both sides</p> <p>6.10 Ablative coating thickness = min. 2.5 mm, around the perimeter</p> <p>6.19 Mineral wool, $\geq 1000\text{ }^\circ\text{C}$, $\geq 80\text{ kg/m}^3$, around the perimeter, Leave out the actuator and release mechanisms; inspection openings must be accessible</p> <p>6.20 Sleeve (can be ordered separately)</p> | <p>6.24 Panel insulating material $\geq 6\text{ mm}$, Armaflex AF / Armaflex Ultima, alternatively panel insulation made of elastomeric foam (flame-resistant, non-dripping)</p> <p>The following applies in Germany: For notes on the use of elastomeric foams, see 7.</p> <p>7.1 Trim panels 100 – 200 mm, alternatively UW section</p> <p>9.2 Extension piece or duct</p> <p>* 6.19, 6.20 or 6.24 as an alternative</p> <p>1 Up to EI 90 S</p> |
|--|--|



GR3621723, A

Fig. 107: Dry mortarless installation into sandwich panel wall

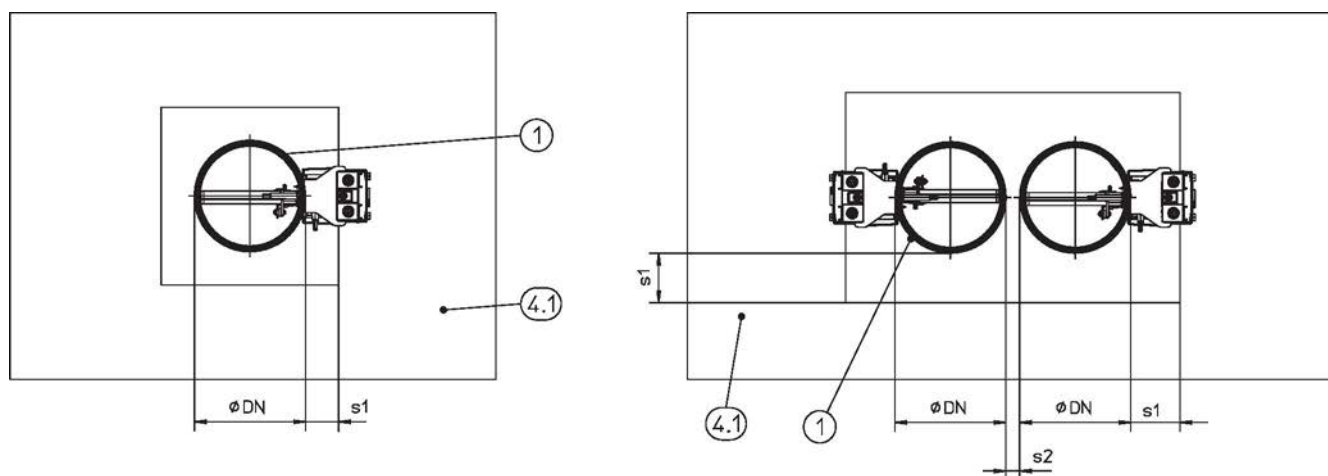
- | | | | |
|------|---|------|--|
| 1 | FKRS-EU | 7.1 | Trim panels 100 – 200 mm, alternatively UW section |
| 2.17 | Fire protection block Hilti CFS-BL | 9.2 | Extension piece or duct |
| 3.12 | Sandwich panel wall 100 – 200 mm, with mineral wool filling $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 150\text{ kg/m}^3$, sheet metal thickness $\geq 0.5\text{ mm}$ on both sides | 11.1 | Cable tray |
| 6.10 | Ablative coating thickness = min. 2.5 mm, around the perimeter | 11.2 | Cable set |
| 6.19 | Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 80\text{ kg/m}^3$, around the perimeter, Leave out the actuator and release mechanisms; inspection openings must be accessible | * | 6.19, 6.20 or 6.24 as an alternative |
| 6.20 | Sleeve (can be ordered separately) | 1 | Up to EI 90 S |
| 6.24 | Panel insulating material $\geq 6\text{ mm}$, Armaflex AF / Armaflex Ultima, alternatively panel insulation made of elastomeric foam (flame-resistant, non-dripping) | | |
- The following applies in Germany: For notes on the use of elastomeric foams, see ☞ 7.

Additional requirements: dry mortarless installation into sandwich panel walls

- Sandwich panel wall, see ☞ 33
- Installation into fire protection block bulkhead, see ☞ 31
- Suspension and fixing, see ☞ 154

Note: For installation, follow the supplied installation manual.

5.11 Solid ceiling slabs



GR3610093, A

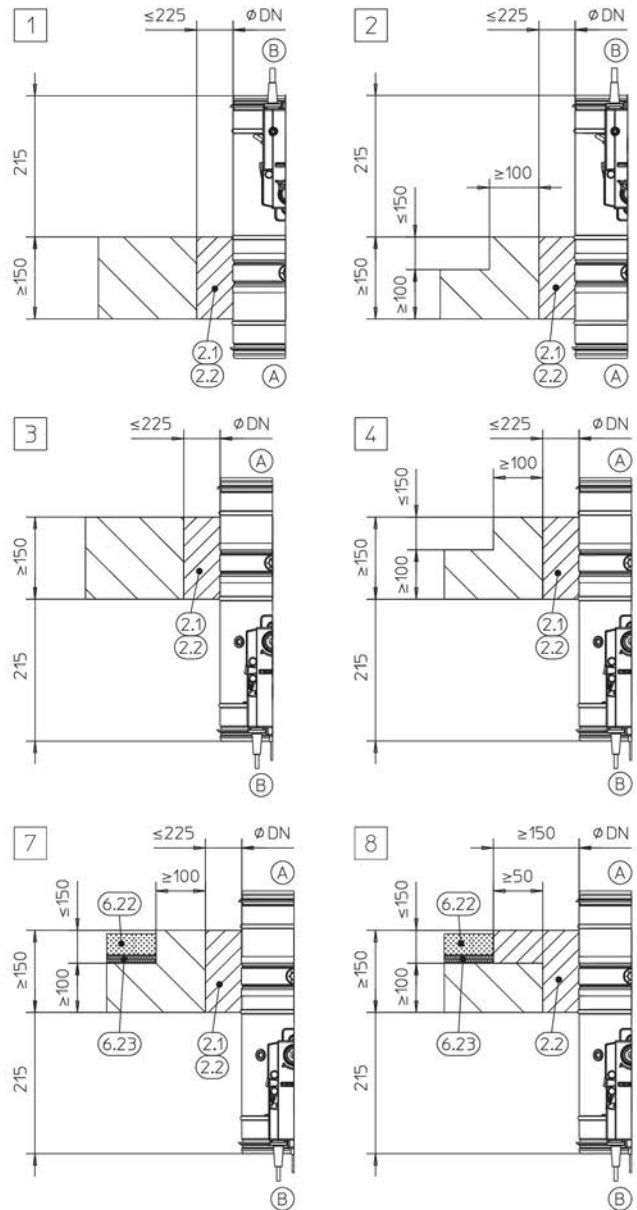
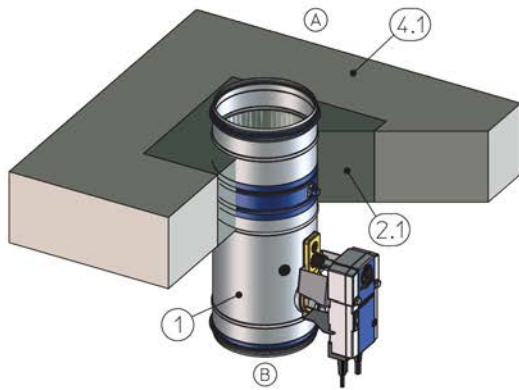
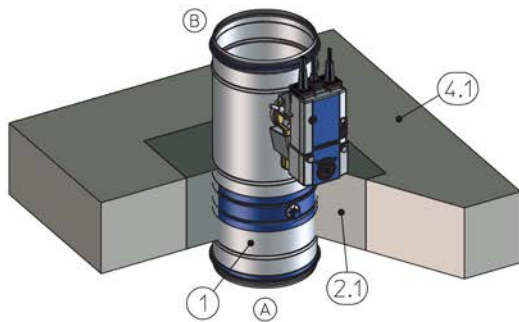
Fig. 108: Solid ceilings – arrangement / distances, side-by-side arrangement by way of example

1	FKRS-EU	s1	Perimeter gap, see ☞ 27
4.1	Solid ceiling slab	s2	Distance between the fire dampers, see ☞ 25

Additional requirements: solid ceiling slabs

- Solid wall ☞ 33
- Distances and installation orientations, see ☞ 25

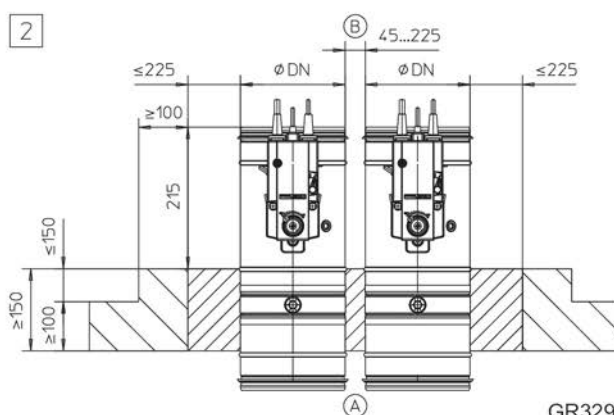
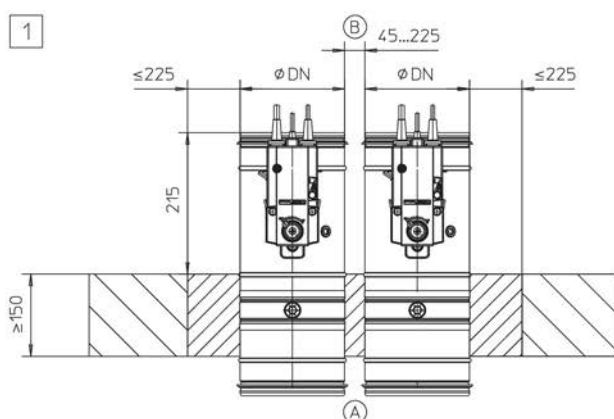
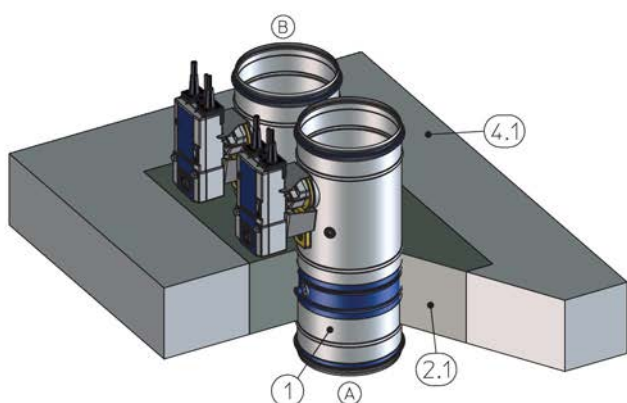
5.11.1 Mortar-based installation



GR3296486, B
GR3487276, B

Fig. 109: Mortar-based installation into a solid ceiling slab with blending into the screed, suspended or upright

- | | | | |
|-----|---------------------|-------|---------------------------|
| 1 | FKRS-EU | 6.22 | Screed |
| 2.1 | Mortar | 6.23 | Footfall sound insulation |
| 2.2 | Reinforced concrete | 1 - 8 | Up to EI 120 S |
| 4.1 | Solid ceiling slab | | |



GR3294658, B

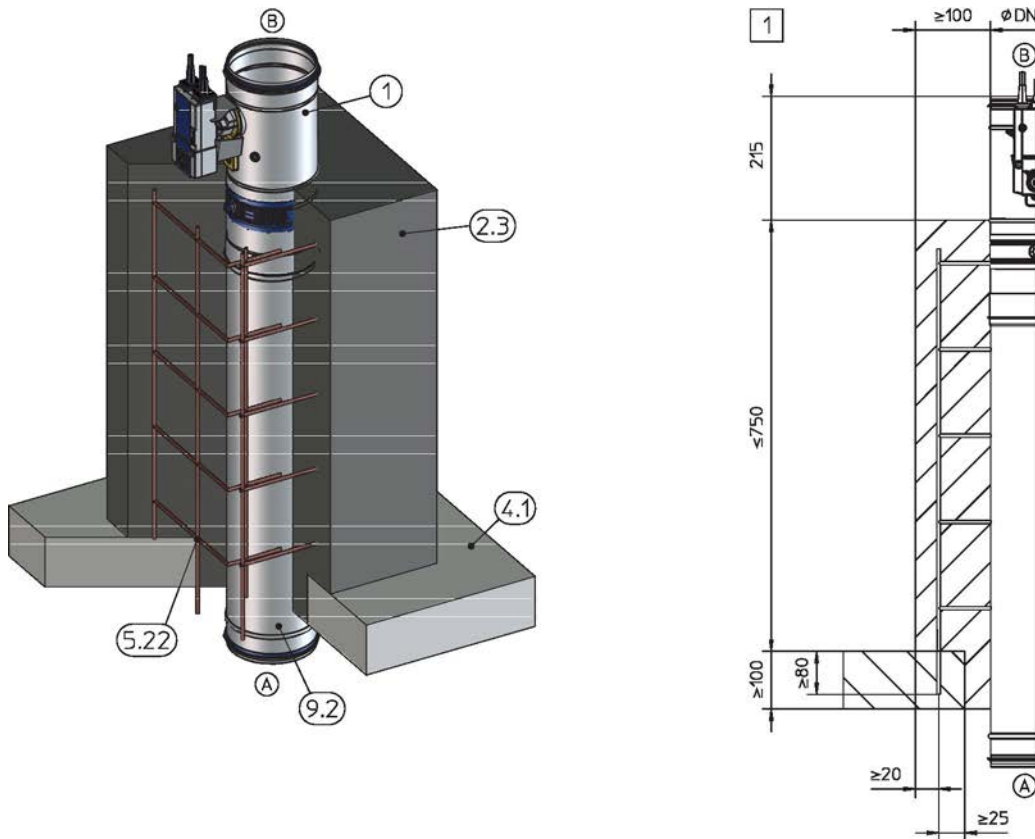
Fig. 110: Mortar-based installation into solid ceiling slab, "flange to flange", shown upright (also applicable for suspended arrangement and with blending into the screed according to Fig. 109)

1	FKRS-EU	4.1	Solid ceiling slab (thickness increased at 2)
2.1	Mortar	1 2	Up to EI 120 S

Additional requirements: mortar-based installation into solid ceiling slabs

- ≥ 40 mm distance from fire damper to load-bearing structural elements
- ≥ 45 mm distance between two fire dampers
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.11.2 Mortar-based installation into a concrete base

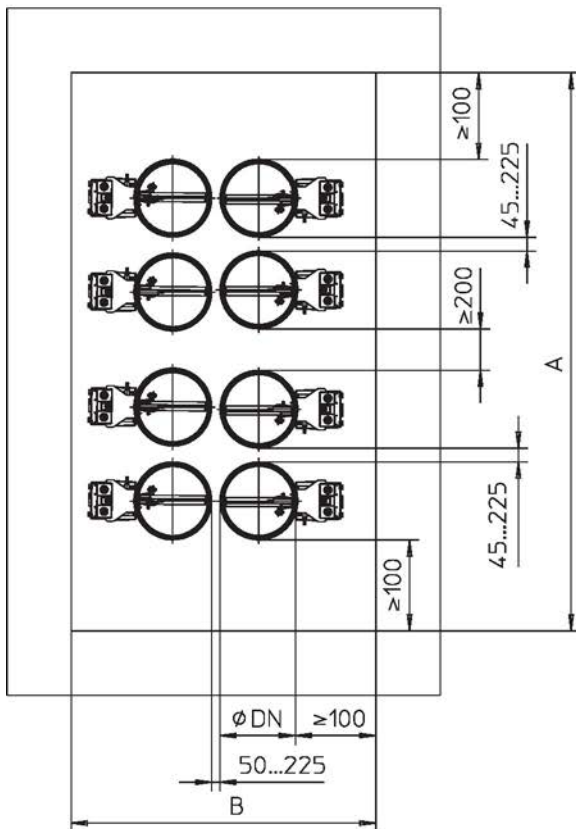
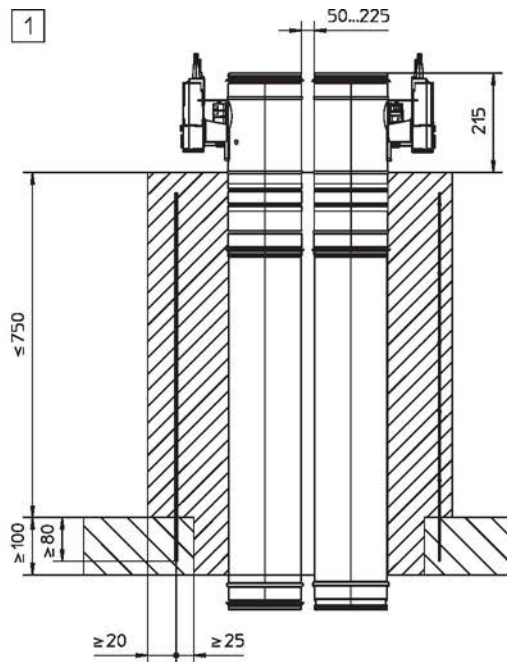
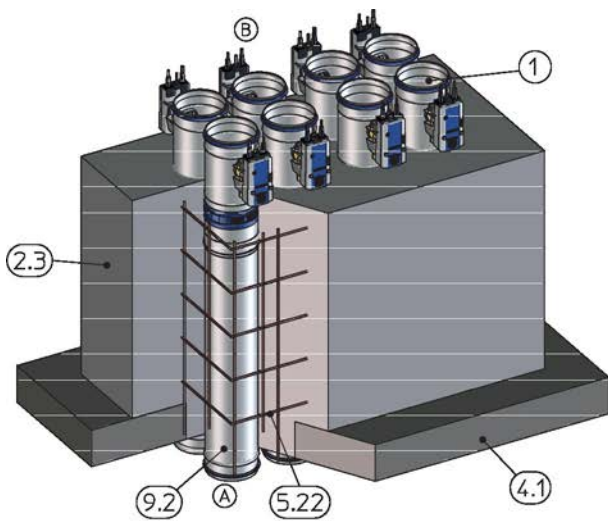


GR2091165, D

Fig. 111: Mortar-based installation with concrete base into a solid ceiling slab, upright

- | | | | |
|-----|--------------------|----------|--|
| 1 | FKRS-EU | 5.22 | Steel fabric, $\varnothing \geq 8$ mm, mesh aperture 150 mm, or equivalent, for number of fixing points: 4 |
| 2.3 | Concrete base | 9.2 | Extension piece or duct |
| 4.1 | Solid ceiling slab | 1 | Up to EI 120 S |

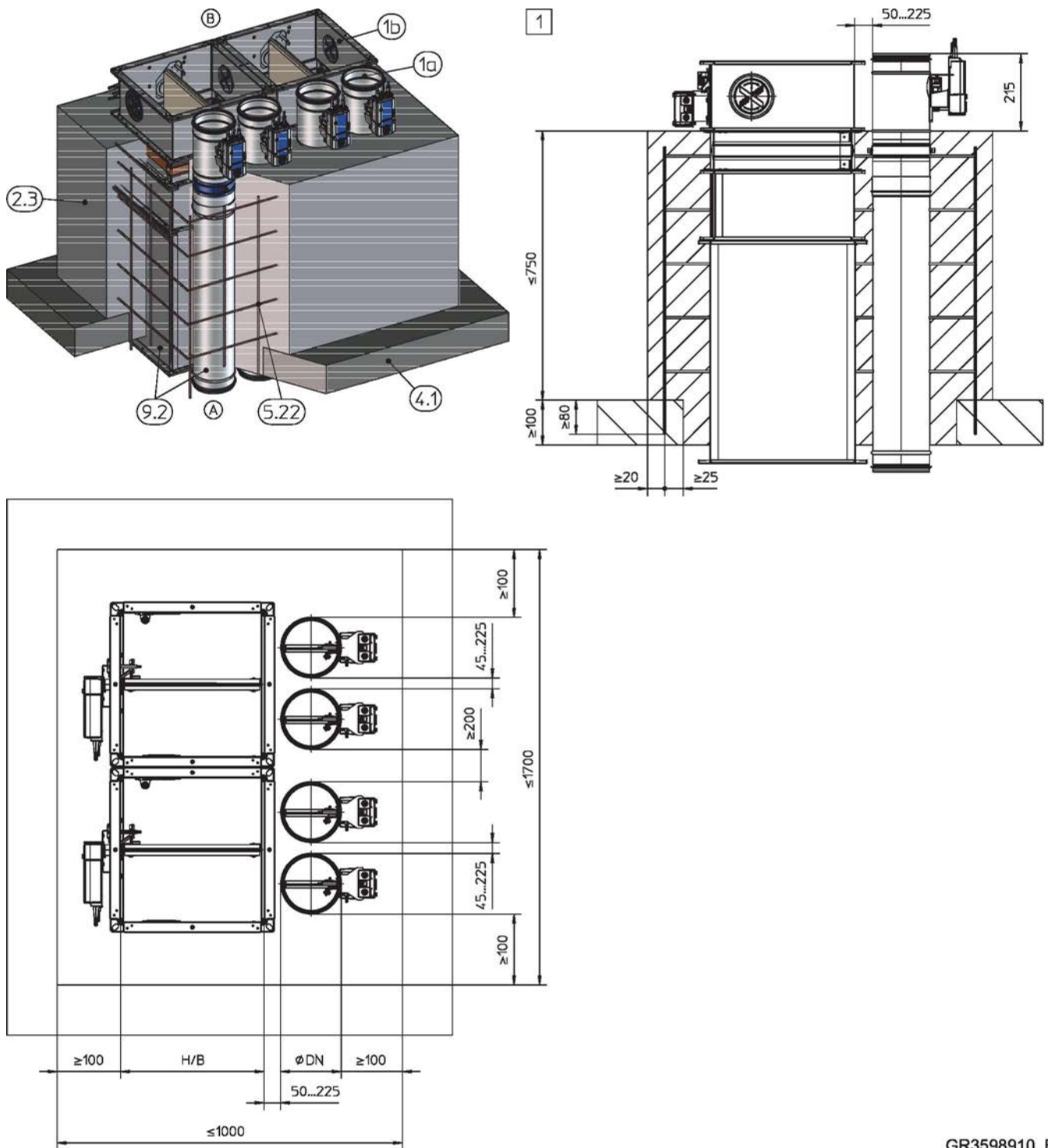
Solid ceiling slabs > Mortar-based installation into a concrete base



GR3657798, A

Fig. 112: Mortar-based installation with concrete base into a solid ceiling slab, upright, multiple occupancy

- | | | | |
|-----|---|------|---|
| 1 | FKRS-EU | 5.22 | Steel fabric, $\varnothing \geq 8$ mm, mesh aperture 150 mm, or equivalent, for number of fixing points see table 132 |
| 2.3 | Concrete base, $A \times B \leq 1.2$ m ² | 9.2 | Extension piece or duct |
| 4.1 | Solid ceiling slab | 1 | Up to EI 90 S |



GR3598910, B

Fig. 113: Mortar-based installation with concrete base into a solid ceiling slab, upright, combined, FKRS-EU and FK-EU / FK2-EU

- | | | | |
|-----|--|------|---|
| 1a | FKRS-EU | 5.22 | Steel fabric, $\varnothing \geq 8$ mm, mesh aperture 150 mm, or equivalent, for number of fixing points see table 132 |
| 1b | FK-EU / FK2-EU up to $W \times H \leq 800 \times 400$ mm | 9.2 | Extension piece or duct |
| 2.3 | Concrete base | 1 | Up to EI 90 S |
| 4.1 | Solid ceiling slab | | |

Note: For installation details FK-EU and FK2-EU, see the installation and operating manual for these fire damper types.

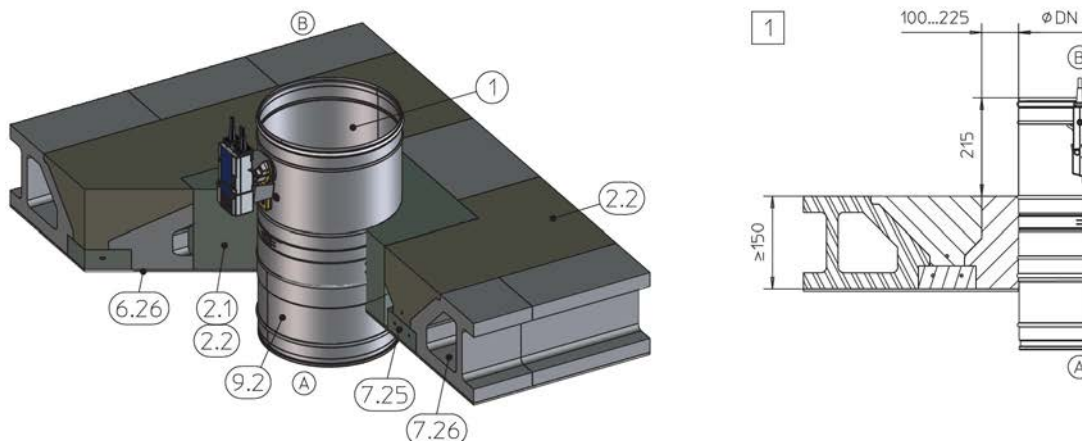
Minimum number of fixing points in the bare ceiling

H [mm]	B [mm]				
	≥ 200	≥ 500	≥ 800	≥ 1100	≥ 1400
≥ 100	4	6	8	10	12
≥ 400	6	8	10	12	14
≥ 700	8	10	12	14	16

Additional requirements: mortar-based installation into solid ceiling slab with concrete base

- Solid wall ↻ 33
- ≥ 40 mm distance from fire damper to load-bearing structural elements
- If the distance to adjacent solid walls is < 150 mm and if the concrete base has been correctly attached, no reinforcement is required on the wall side.
- Concrete bases $H \leq 150$ mm do not require reinforcement
- ≥ 45 – 225 mm distance between two fire dampers. ≥ 200 mm distance between two pairs of FKRS-EU.
- ≥ 50 – 225 mm distance to fire dampers FK-EU / FK2-EU
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.11.3 Mortar-based installation into hollow stone ceilings



GR3608864, B

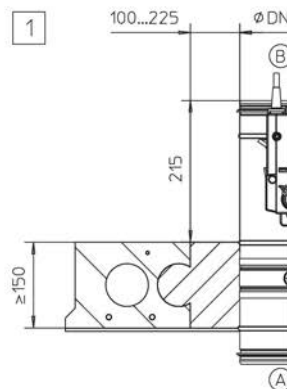
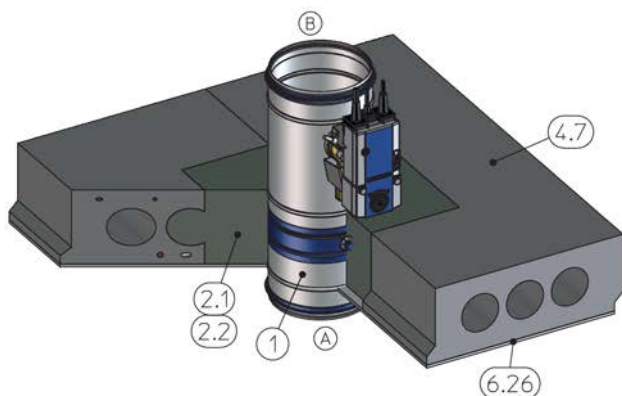
Fig. 114: Mortar-based installation into hollow stone ceilings, shown upright (also applicable for suspended arrangement)

1	FKRS-EU	7.6	Hollow stone*
2.1	Mortar	9.2	Extension piece or duct
2.2	Concrete	1	Up to EI 90 S
6.26	Plaster*	*	Illustration representative, other ceiling constructions possible according to local conditions and ceiling manufacturers
7.5	Reinforced concrete support*		

Additional requirements: mortar-based installation into hollow stone ceilings

- Hollow stone ceiling, see ↪ 33
- ≥ 40 mm distance from fire damper to load-bearing structural elements
- ≥ 45 mm distance between two fire dampers
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.11.4 Mortar-based installation into hollow chamber ceilings



GR3598810, B

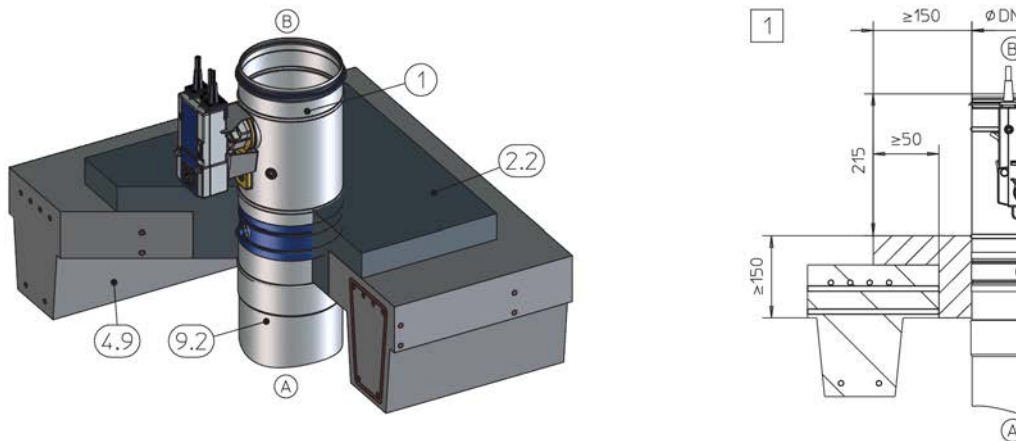
Fig. 115: Mortar-based installation into hollow chamber ceilings, shown upright (also applicable for suspended arrangement)

1	FKRS-EU	6.26	Plaster*
2.1	Mortar	1	Up to EI 90 S
2.2	Concrete	*	Illustration representative, other ceiling constructions possible according to local conditions and ceiling manufacturers
4.7	Reinforced hollow chamber ceiling*		

Additional requirements: mortar-based installation into hollow chamber ceilings

- Hollow chamber ceiling, see ↗ 33
 - ≥ 40 mm distance from fire damper to load-bearing structural elements
 - ≥ 45 mm distance between two fire dampers
1. ▶ After the installation opening has been created, the adjacent open spaces must be partially closed all the way round (in relation to the depth) by at least 100 mm.
 2. ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.11.5 Mortar-based installation into ribbed ceilings



GR3609417, B

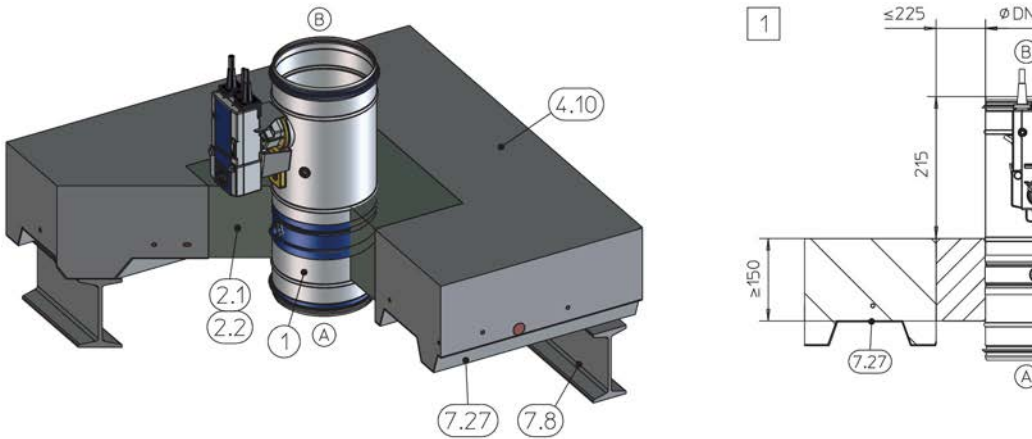
Fig. 116: Mortar-based installation into ribbed ceilings, shown upright (also applicable for suspended arrangement)

1	FKRS-EU	9.2	Extension piece or duct
2.2	Concrete	1	Up to EI 90 S
4.9	Reinforced ribbed ceiling*	*	Illustration representative, other ceiling constructions possible according to local conditions and ceiling manufacturers

Additional requirements: mortar-based installation into ribbed ceilings

- Ribbed ceiling, see ↪ 33
- Concrete bases $H < 150$ mm do not require reinforcement
- ≥ 40 mm distance from fire damper to load-bearing structural elements
- ≥ 45 mm distance between two fire dampers
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.11.6 Mortar-based installation into composite ceilings



GR3608819, B

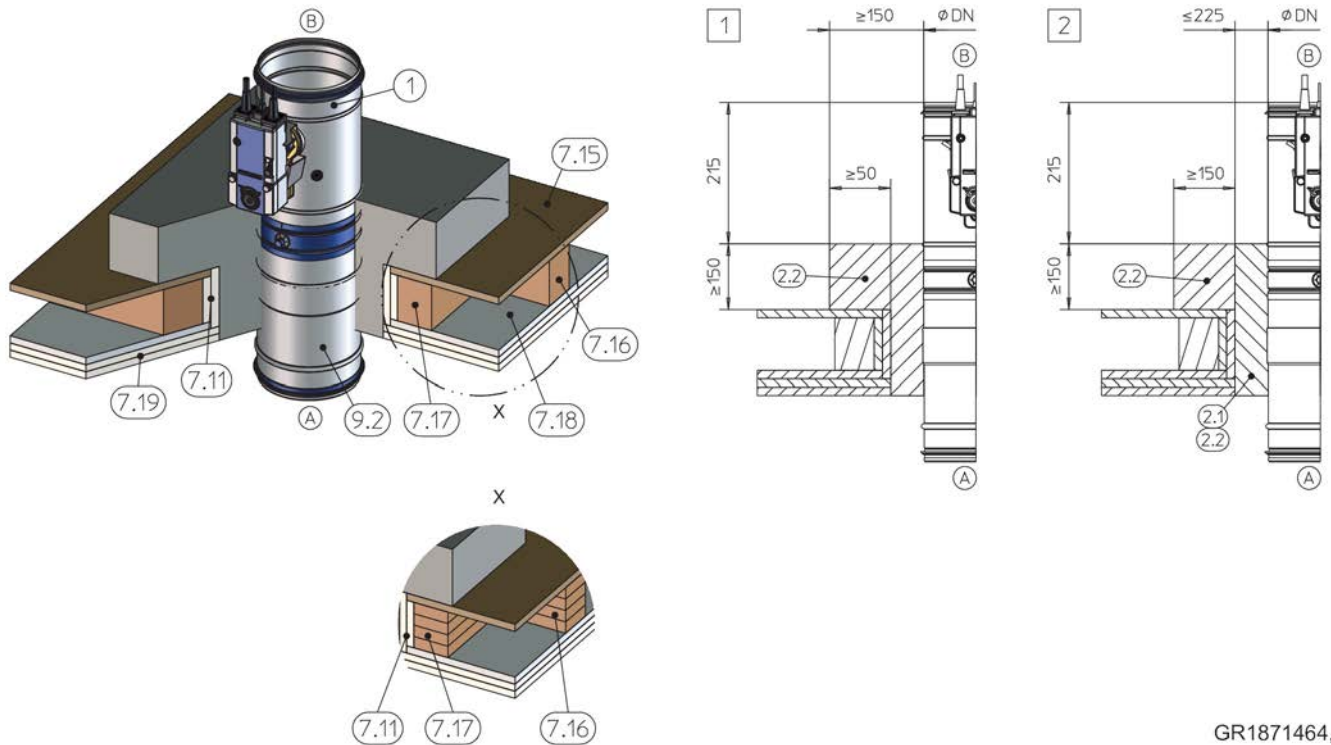
Fig. 117: Mortar-based installation into composite ceilings, shown upright (also applicable for suspended arrangement)

1	FKRS-EU	7.8	Steel girder
2.1	Mortar	7.27	Profile sheet metal
2.2	Concrete	1	Up to EI 90 S
4.10	Reinforced composite ceiling*	*	Illustration representative, other ceiling constructions possible according to local conditions and ceiling manufacturers

Additional requirements: mortar-based installation into composite ceilings

- Composite ceiling, see ☞ 33
- ≥ 40 mm distance from fire damper to load-bearing structural elements
- ≥ 45 mm distance between two fire dampers
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.11.7 Mortar-based installation in conjunction with wooden beam ceilings



GR1871464, D

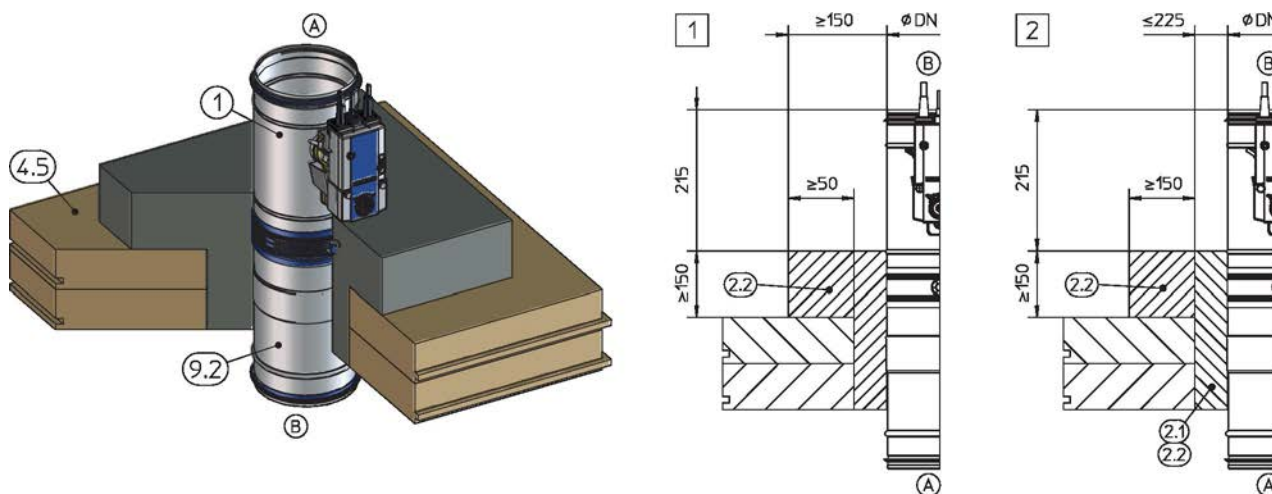
Fig. 118: Mortar-based installation into solid ceiling slab in conjunction with wooden beam / laminated beam ceilings, shown upright (also applicable for suspended arrangement)

1	FKRS-EU	7.17	Trimmers, wooden beam / gluelam
2.1	Mortar	7.18	Formwork
2.2	Reinforced concrete	7.19	Fire-resistant cladding (ceiling-dependent)
7.11	Trim panel, same construction as 7.19	9.2	Extension piece or duct
7.15	Wooden floorboard / floor tiles (different ceiling construction may be possible)	1 2	Up to EI 90 S
7.16	Wooden beam / gluelam (reduce distances between wooden beams to the size of the installation opening)		

Additional requirements: mortar-based installation into solid ceiling slabs in conjunction with wooden beam / laminated beam ceilings

- Wooden beam ceiling, see ↪ 33
- ≥ 40 mm distance from fire damper to load-bearing structural elements
- ≥ 45 mm distance between two fire dampers
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.11.8 Mortar-based installation in conjunction with solid wood ceilings



GR3284982, A

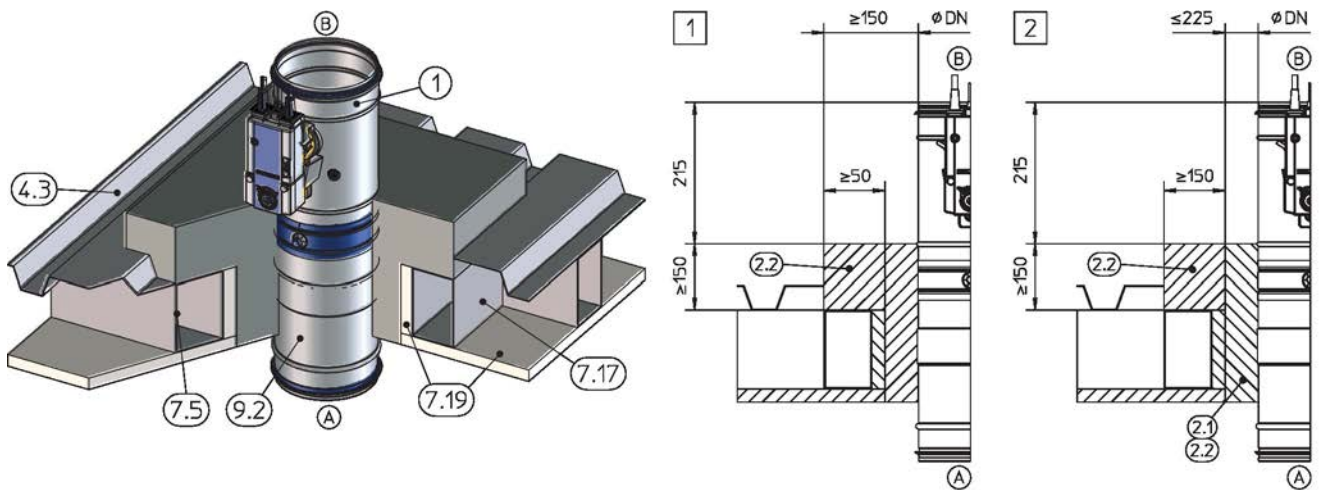
Fig. 119: Mortar-based installation into solid ceiling slab in conjunction with solid wood ceiling, shown upright (also applicable for suspended arrangement)

1	FKRS-EU	4.5	Solid wood ceiling
2.1	Mortar	9.2	Extension piece or duct
2.2	Reinforced concrete	1 2	Up to EI 90 S

Additional requirements: mortar-based installation into solid ceiling slabs in conjunction with solid wood ceilings

- Solid wood ceiling ↻ 33
- ≥ 40 mm distance from fire damper to load-bearing structural elements
- ≥ 45 mm distance between two fire dampers
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.11.9 Mortar-based installation in conjunction with lightweight ceilings



GR1795371, D

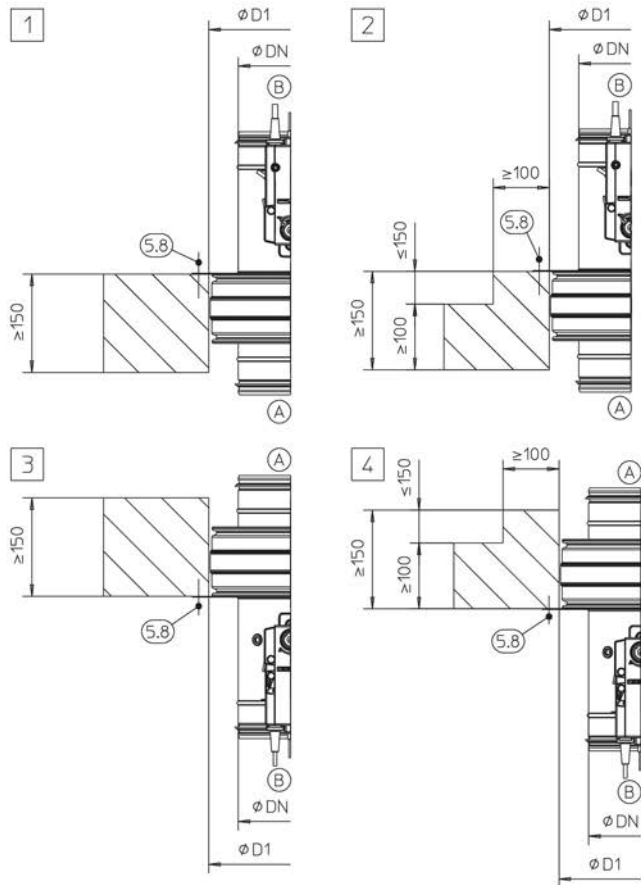
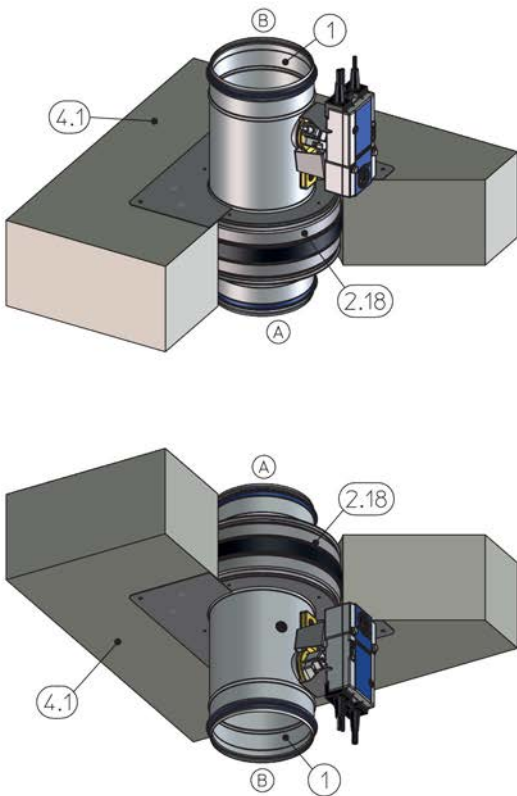
Fig. 120: Mortar-based installation into solid ceiling slab in conjunction with lightweight ceiling (Cadolto system), shown upright (also applicable for suspended arrangement)

1	FKRS-EU	7.5	Steel support structure
2.1	Mortar	7.17	Trimmers, steel support structure
2.2	Reinforced concrete	7.19	Fire-resistant cladding
4.3	Modular ceiling (Cadolto system), installation according to manufacturer's instructions and general appraisal certificate	9.2	Extension piece or duct
4.4	Partial concrete ceiling with reinforcement	12	Up to EI 120 S

Additional requirements: mortar-based installation into solid ceiling slabs in conjunction with lightweight ceilings

- Modular ceiling (Cadolto) ↗ 33
- ≥ 40 mm distance from fire damper to load-bearing structural elements
- ≥ 45 mm distance between two fire dampers
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.11.10 Dry mortarless installation with installation block ER



GR3487543, B
GR3316833, B

Fig. 121: Dry mortarless installation with installation block ER in solid ceiling slab, upright and suspended

1	FKRS-EU	5.8	Wallplug with fire protection suitability certificate, alternatively push through installation
2.18	Installation block ER with cover plate	[1] – [4]	Up to EI 90 S
4.1	Solid ceiling slab		

Additional requirements: dry mortarless installation with installation block ER in solid ceiling slabs

- Solid wall ↪ 33
 - Installation block ER, see ↪ 35
 - ≥ 75 mm distance between installation block and load-bearing structural elements
 - ≥ 200 mm distance between two installation blocks
1. ▶ Create an appropriate opening with $\phi D1$, see ↪ 35
 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. ▶ Fix the cover plate with four threaded rods (push through installation) or with at least four M6 screws. For solid walls and solid ceiling slabs, suitable steel anchors with building inspectorate approval must be used.

5.11.11 Installation with installation kit WE / WE2 remote from solid ceiling slabs

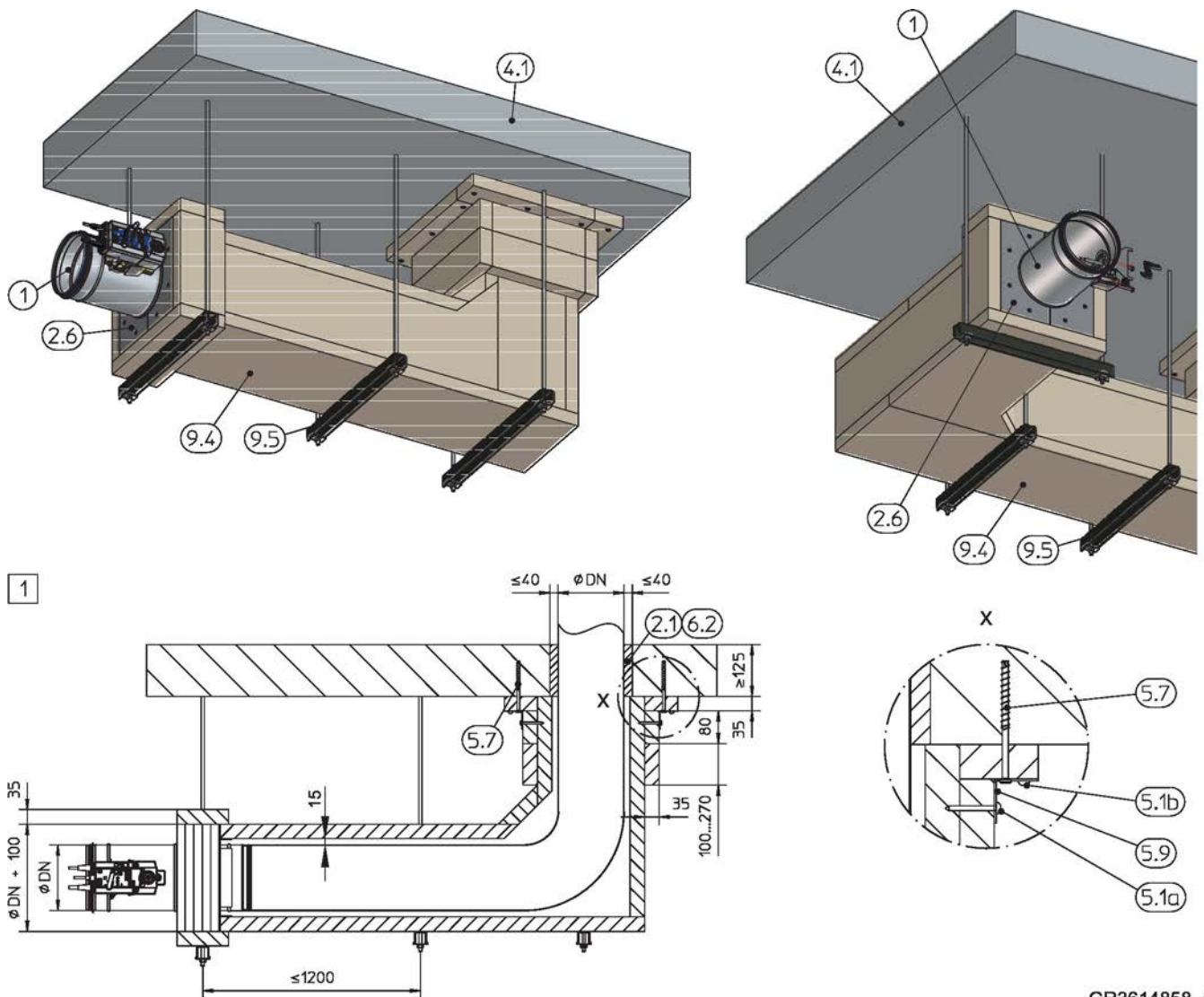
GR3614858, A
GR3617007, A

Fig. 122: Dry mortarless installation with installation kit WE / WE2, remote from a solid ceiling slab

1	FKRS-EU	6.2	Mineral wool, ≥ 1000 °C, ≥ 80 kg/m ³
2.1	Mortar	9.4	Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition
2.6	Installation kit WE / WE2	9.5	Suspension system (by others) consisting of:
4.1	Solid ceiling slab	a	Threaded rod M10
5.1a	Dry wall screw, 4 × 50 mm	b	Hilti® mounting rail MQ 41 × 3 mm or equivalent
5.1b	Dry wall screw, 4 × 30 mm	c	Hilti® drilled plate, MQZ L13 or equivalent
5.7	Anchor bolt Hilti® HUS-6 or equivalent	d	Hexagon nut M10 with washer
5.9	Steel angle section 40 × 40 × 1.5 mm	1	Up to EI 90 S

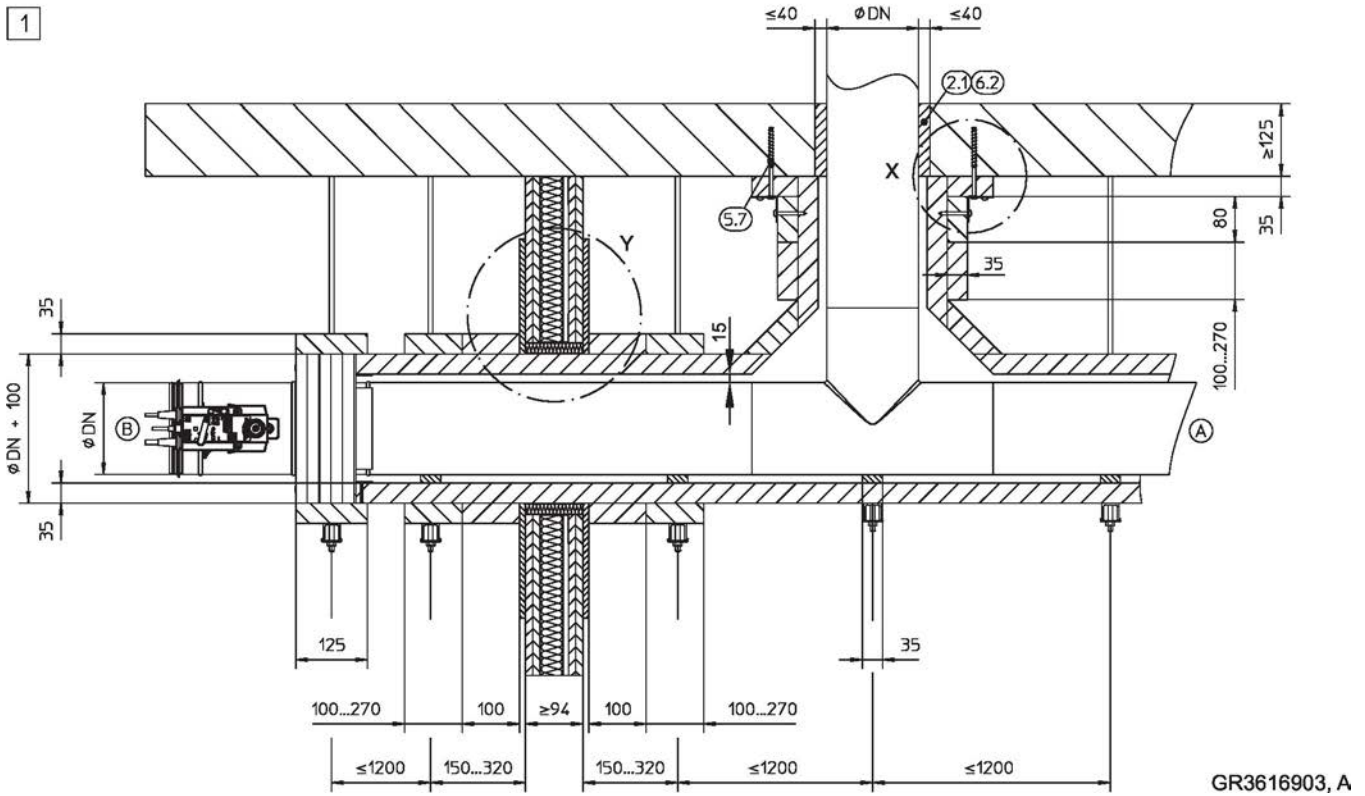
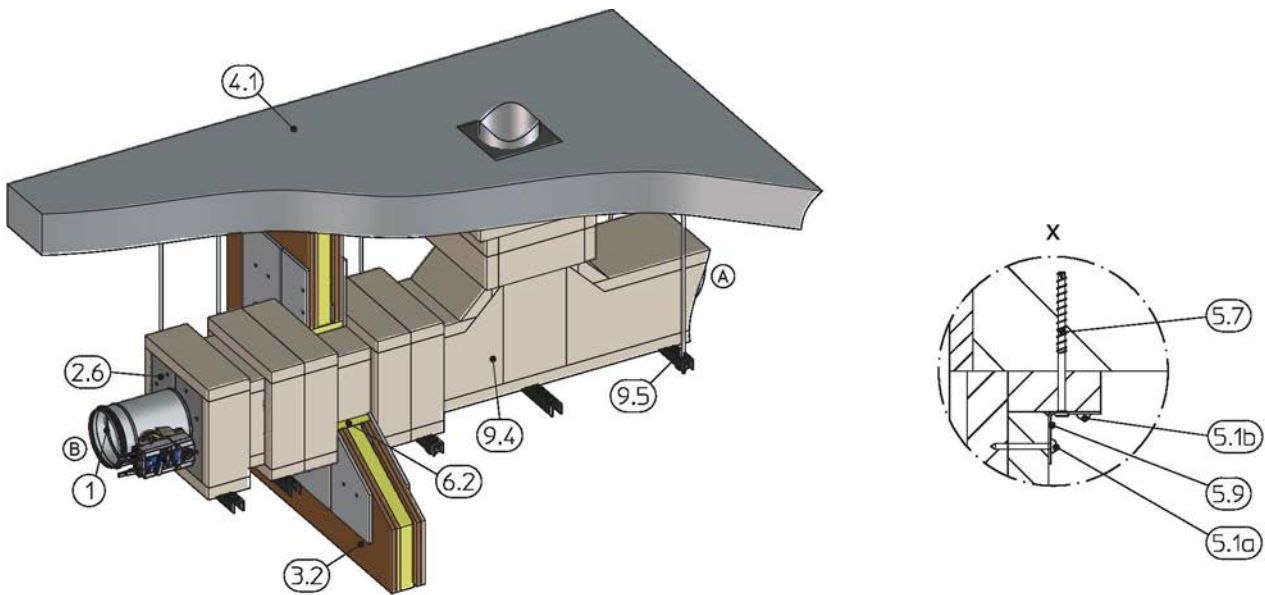
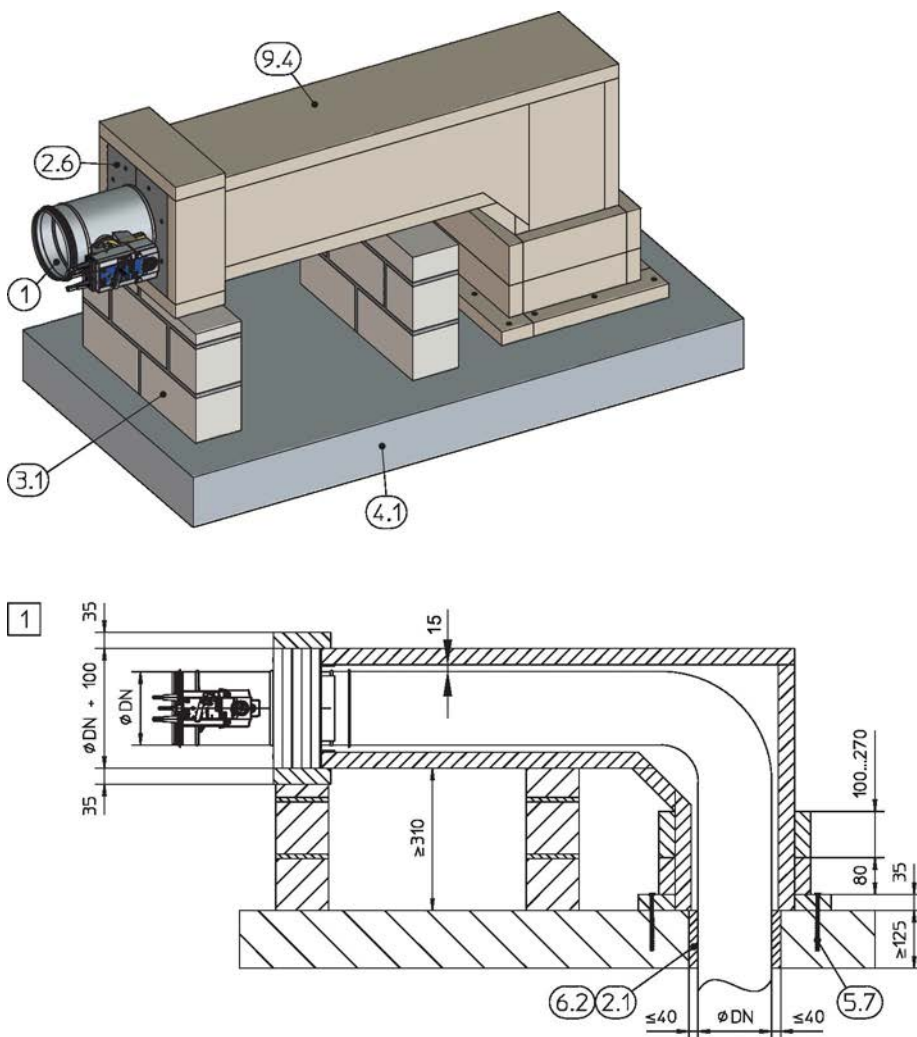


Fig. 123: Dry mortarless installation with installation kit WE / WE2, remote from a solid ceiling slab

- | | | | |
|-----|---|----------|--|
| 1 | FKRS-EU | 9.5 | Suspension system (by others) consisting of: |
| 2.1 | Mortar | a | Threaded rod M10 |
| 2.6 | Installation kit WE / WE2 | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 3.2 | Lightweight partition wall or solid wall (if any) | c | Hilti® drilled plate, MQZ L13 or equivalent |
| 4.1 | Solid ceiling slab | d | Hexagon nut M10 with washer |
| 6.2 | Mineral wool, ≥ 1000 °C, ≥ 80 kg/m ³ | Y | Wall penetration according to Promat® manual, construction 478, latest edition |
| 9.4 | Sheet steel duct with fire-rated cladding | 1 | Up to EI 90 S |



GR3636253, A

Fig. 124: Dry mortarless installation with installation kit WE / WE2, remote from a solid ceiling slab

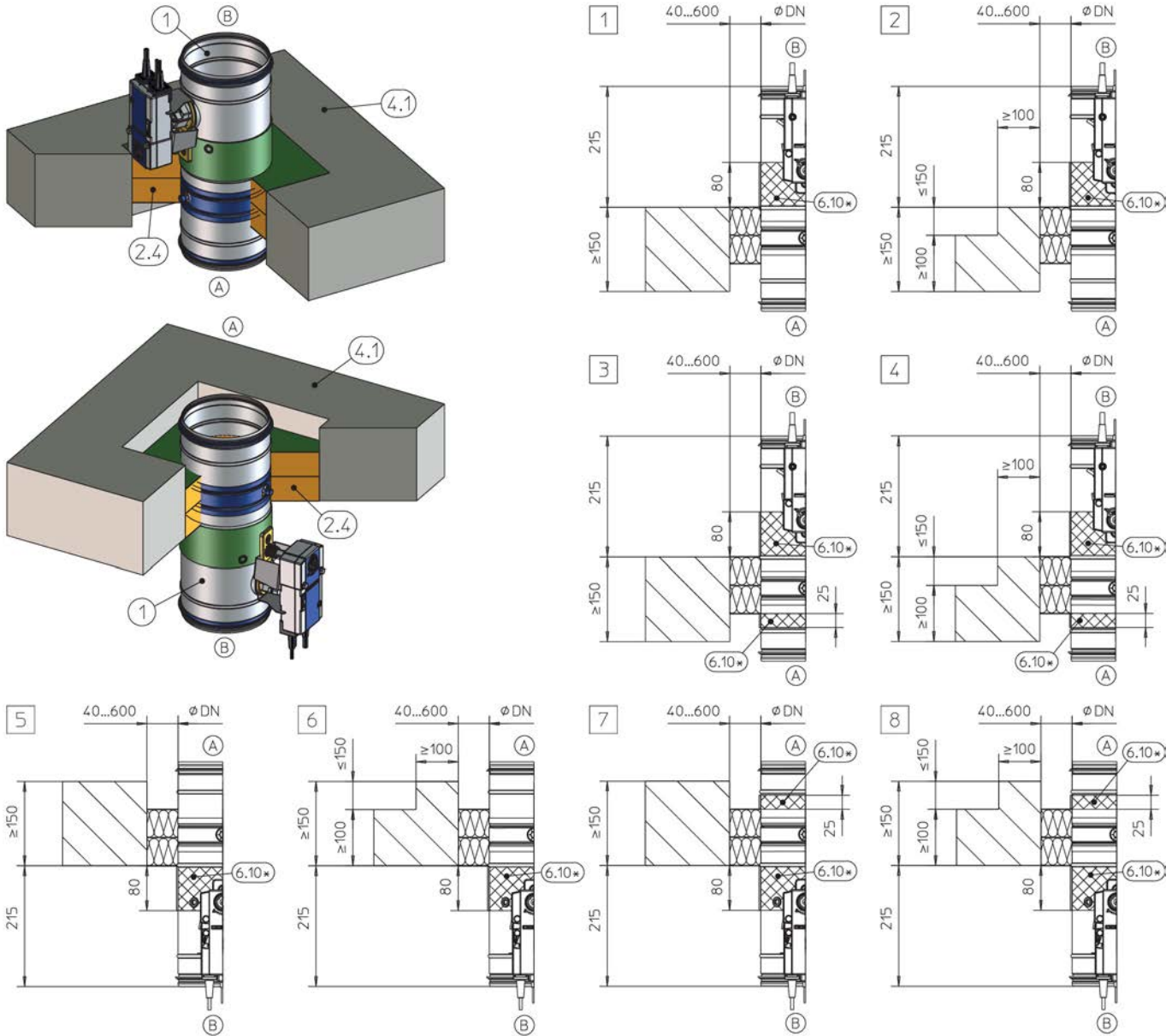
1	FKRS-EU	5.7	Anchor bolt Hilti® HUS-6 or equivalent
2.1	Mortar	6.2	Mineral wool, $\geq 1000\text{ °C}$, $\geq 80\text{ kg/m}^3$
3.1	Solid wall	9.4	Sheet steel duct with fire-rated cladding according to Promat® manual, construction 478, latest edition
2.6	Installation kit WE / WE2		
4.1	Solid ceiling slab		
		1	Up to EI 90 S

Additional requirements: dry mortarless installation with installation kit WE / WE2 remote from solid ceiling slabs

- Solid ceiling slabs without open spaces, made of concrete or aerated concrete, gross density $\geq 450\text{ kg/m}^3$
- Installation kit WE / WE2, see ↗ 38
- $\geq 130\text{ mm}$ distance from the fire damper to the wall or ceiling slab
- $\geq 260\text{ mm}$ distance between two fire dampers

Note: For more installation details and for components to be provided by others, see the WE / WE2 installation manual.

5.11.12 Dry mortarless installation with fire batt



GR3318630, B
GR3320054, B

Fig. 125: Dry mortarless installation into a solid ceiling slab, with a fire batt, upright and suspended

- | | | | |
|------|---|------|---|
| 1 | FKRS-EU | 6.20 | Sleeve (can be ordered separately) |
| 2.4 | Fire batt with ablative coating | 6.24 | Elastomeric foam (flame-resistant, non-dripping) |
| 4.1 | Solid ceiling slab (thickness increased at 2 and 4) | | The following applies in Germany: For notes on the use of elastomeric foams, see ↗ 7. |
| 6.10 | Ablative coating around the perimeter, d = at least 2.5 mm | | 6.19, 6.20 or 6.24 as an alternative |
| 6.19 | Mineral wool > 1000 °C, > 80 kg/m ³ , thickness = 20 mm, panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible | * | See table ↗ 145 |
- 1** – **8**

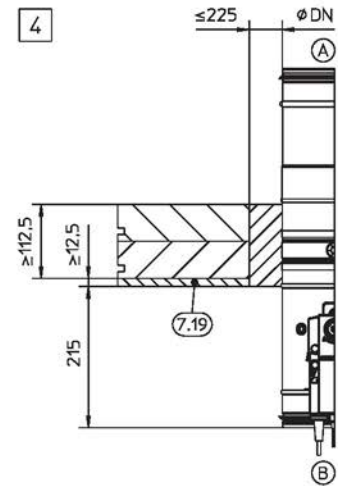
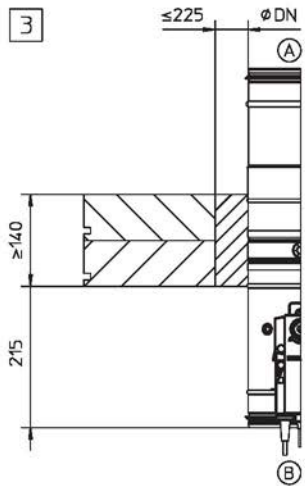
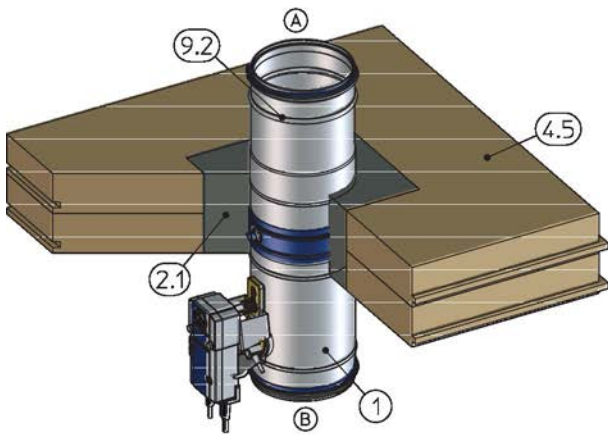
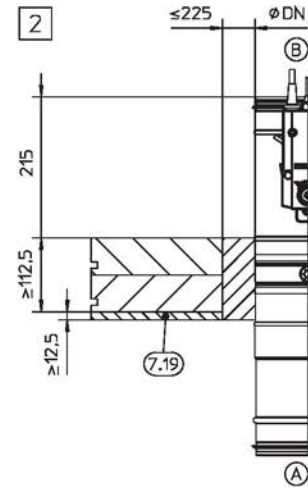
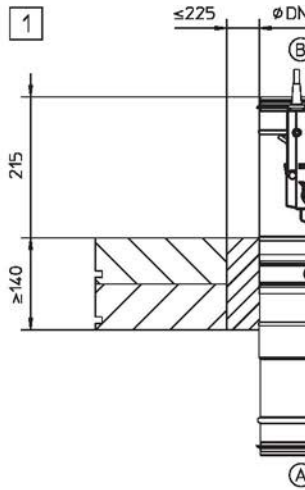
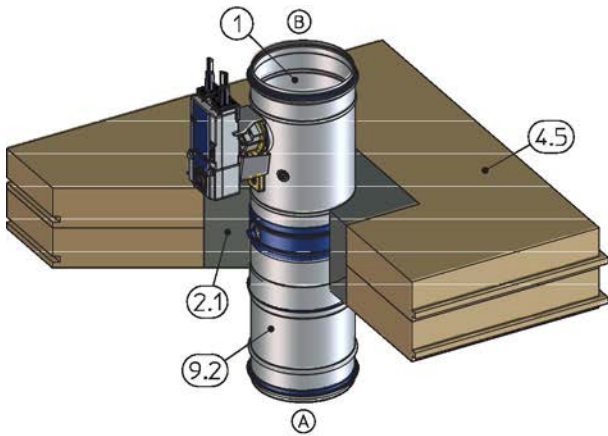
Solid ceiling slab				
NW [mm]	Fire resistance properties to	Coating		Detail
		Installation side A	Operating side B	
100 – 315	EI 90 S	–	x	1 , 2 , 5 , 6
100 – 315	EI 120 S	x	x	3 , 4 , 7 , 8

Additional requirements: dry mortarless installation with fire batt in solid ceiling slabs

- Solid wall ☞ 33
- ≥ 75 mm distance from fire damper to load-bearing structural elements
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Fire batt systems, installation details, distances / dimensions, see ☞ 28
- Suspension and fixing, see ☞ 154

5.12 Solid wood ceilings

5.12.1 Mortar-based installation into solid wood ceilings



GR3563702, A
GR3563718, A

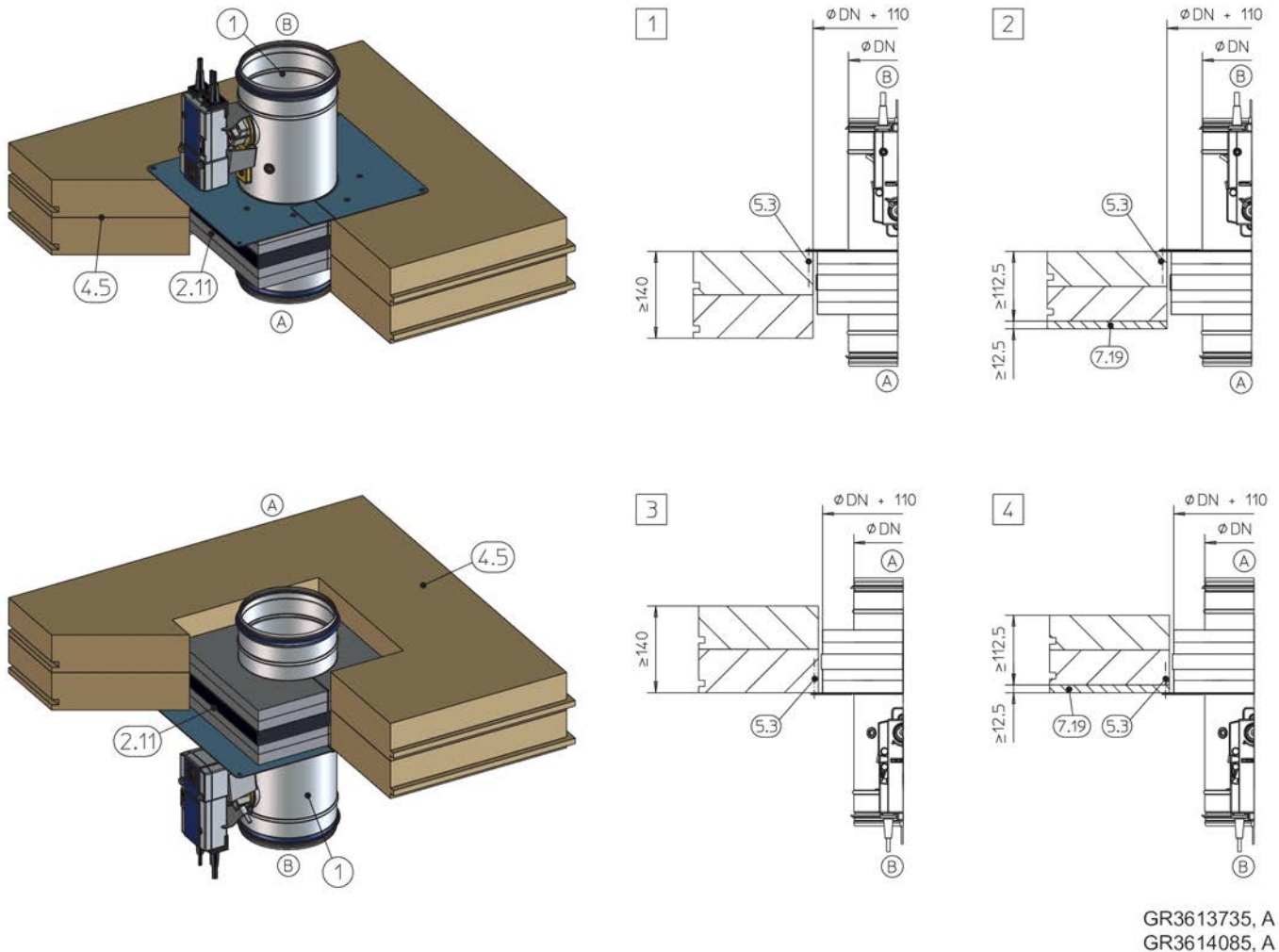
Fig. 126: Mortar-based installation into a solid wood ceiling, suspended or upright

1	FKRS-EU	7.19	Fire-resistant cladding
2.1	Mortar	9.2	Extension piece or duct
4.5	Solid wood ceiling	[1] – [4]	Up to EI 90 S

Additional requirements: mortar-based installation into solid wood ceilings

- Solid wood ceiling ↻ 33
- ≥ 75 mm distance from fire damper to load-bearing structural elements
- ≥ 200 mm distance between two fire dampers in separate installation openings
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.12.2 Dry mortarless installation with installation kit TQ / TQ2 into solid wood ceilings



GR3613735, A
GR3614085, A

Fig. 127: Dry mortarless installation with installation kit TQ / TQ2 into solid wood ceiling, upright and suspended

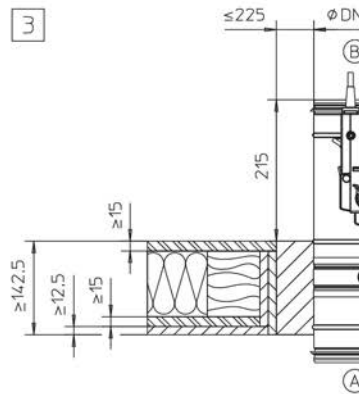
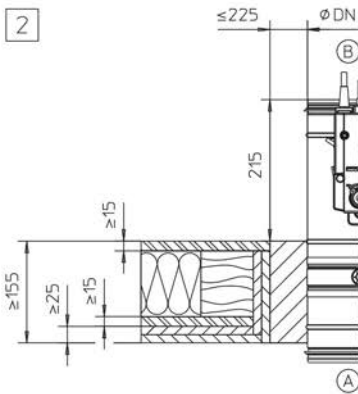
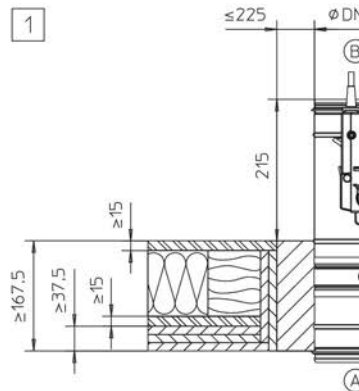
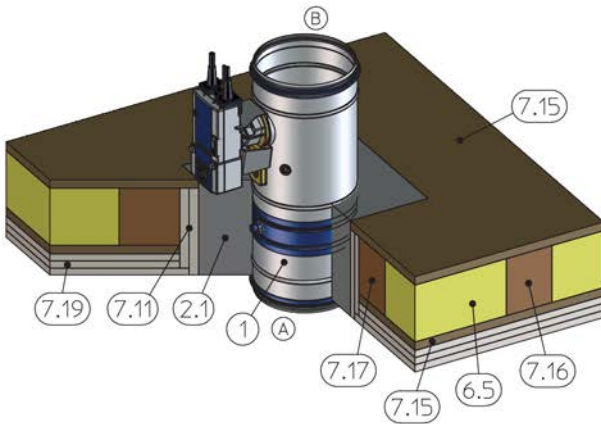
- | | | | |
|------|--|-------|---------------------------|
| 1 | FKRS-EU | 5.3 | Wood screw min. 5 × 70 mm |
| 2.11 | Installation kit TQ / TQ2 with cover plate (two-part with TQ2) | 7.19 | Fire-resistant cladding |
| 4.5 | Solid wood ceiling | 1 – 4 | Up to EI 90 S |

Additional requirements: dry mortarless installation with installation kit TQ / TQ2 into solid wood ceilings

- Solid wood ceiling ↪ 33
- Installation kit TQ / TQ2, see ↪ 36
- ≥ 75 mm distance from the fire damper to load-bearing structural elements (structure 100 mm)
- ≥ 200 mm distance between two fire dampers in separate installation openings
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.13 Wooden beam ceilings

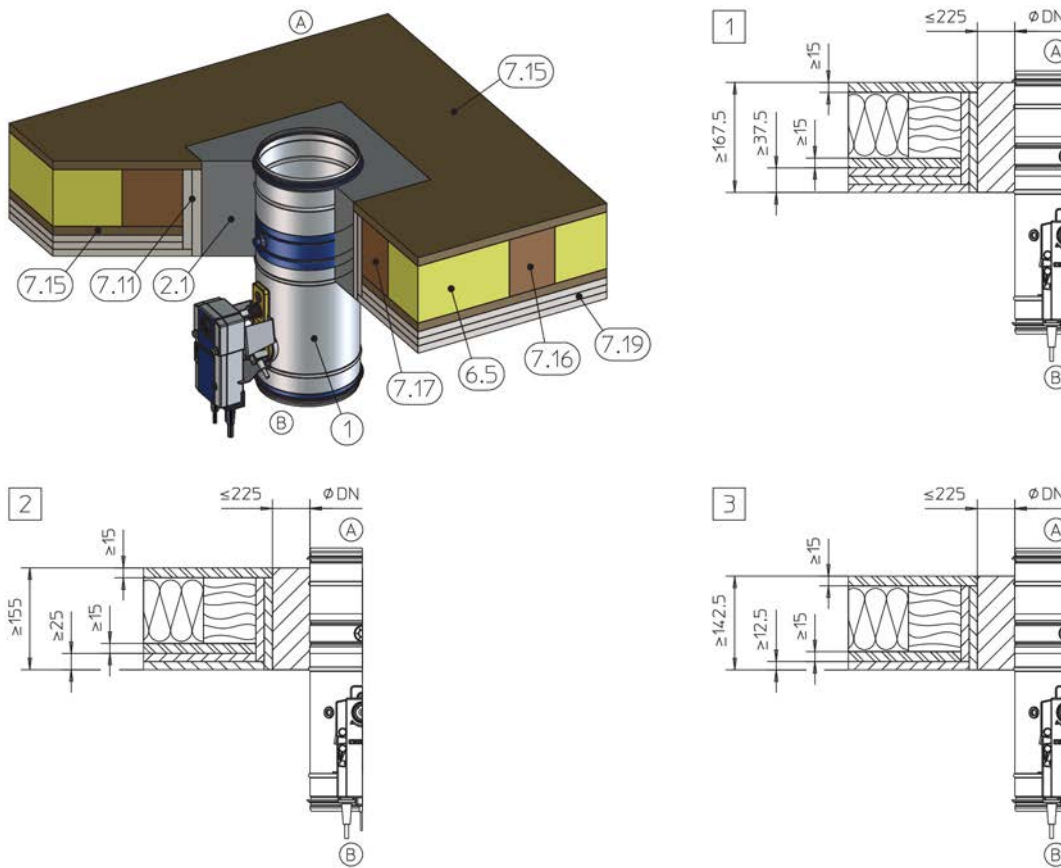
5.13.1 Mortar-based installation into wooden beam ceilings



GR3596890, A

Fig. 128: Mortar-based installation into wooden beam / laminated beam ceiling, upright (illustration representative, alternative ceiling construction possible on request)

- | | | | |
|------|--|----------|---|
| 1 | FKRS-EU | 7.17 | Trimmers, wooden beam / gluelam
min. 100 × 80 mm |
| 2.1 | Mortar | 7.19 | Fire-resistant cladding (ceiling-dependent) |
| 6.5 | Mineral wool fill if required | 1 | Up to EI 90 S |
| 7.11 | Trim panel, same construction as 7.19 | 2 | Up to EI 60 S |
| 7.15 | Wood sheet, at least 600 kg/m ³ | 3 | EI 30 S |
| 7.16 | Wooden beam / gluelam min. 100 × 80 mm
(reduce distances between wooden beams to the
size of the installation opening) | | |



GR3596639, A

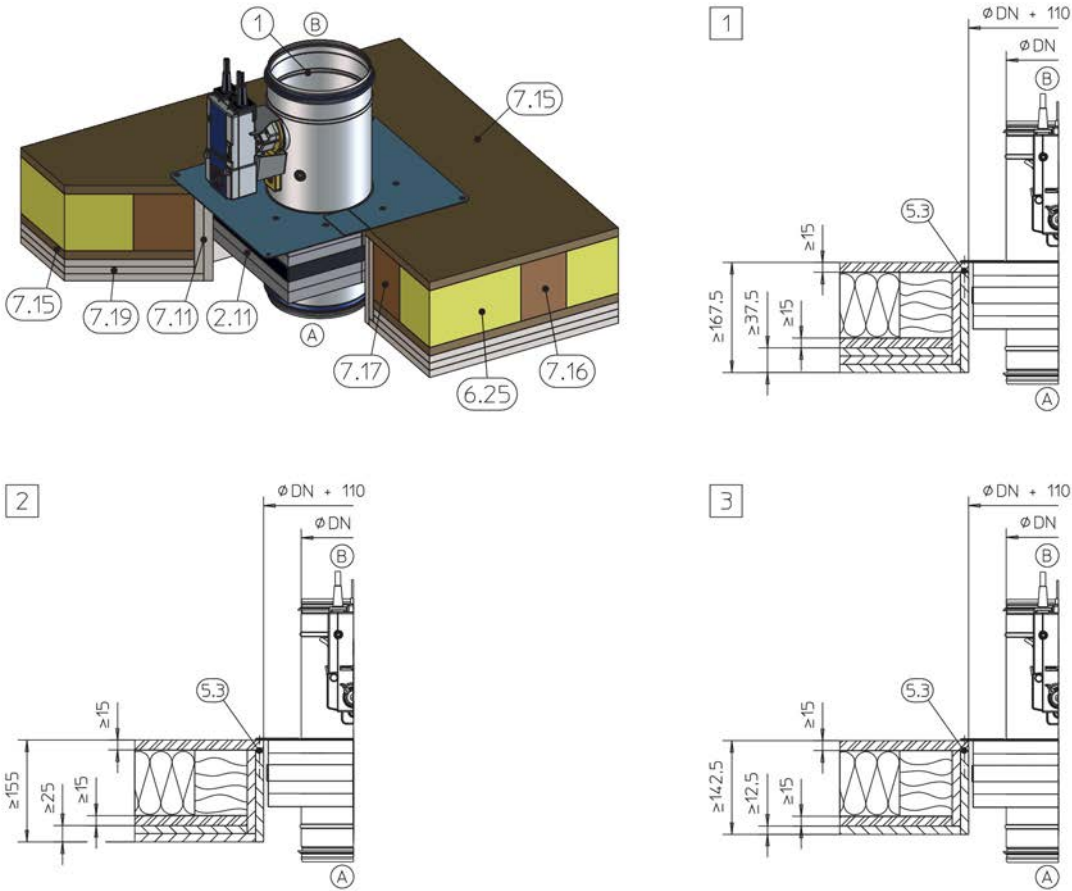
Fig. 129: Mortar-based installation into wooden beam / laminated beam ceiling, suspended (illustration representative, alternative ceiling construction possible on request)

1	FKRS-EU	7.17	Trimmers, wooden beam / gluelam min. 100 × 80 mm
2.1	Mortar	7.19	Fire-resistant cladding (ceiling-dependent)
6.5	Mineral wool fill if required	1	Up to EI 90 S
7.11	Trim panel, same construction as 7.19	2	Up to EI 60 S
7.15	Wood sheet, at least 600 kg/m ³	3	EI 30 S
7.16	Wooden beam / gluelam min. 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)		

Additional requirements: mortar-based installation into wooden beam / laminated beam ceilings

- Wooden beam ceiling, see ☞ 33
- ≥ 75 mm distance from fire damper to load-bearing structural elements
- ≥ 200 mm distance between two fire dampers in separate installation openings
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

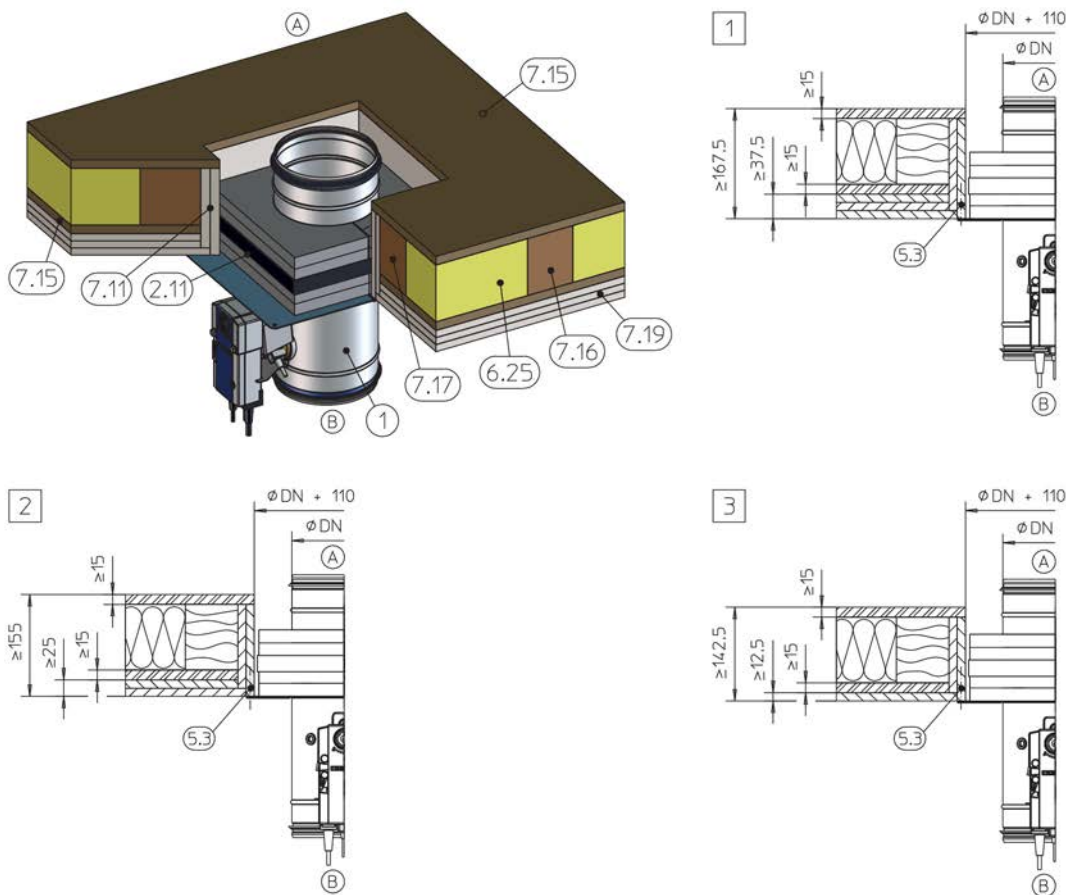
5.13.2 Dry mortarless installation with installation kit TQ / TQ2 into wooden beam ceilings



GR3613654, A

Fig. 130: Dry mortarless installation with installation kit TQ / TQ2 into wooden beam / laminated beam ceiling, upright (illustration representative, alternative ceiling construction possible on request)

1	FKRS-EU	7.16	Wooden beam / gluelam min. 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)
2.11	Installation kit TQ / TQ2 with cover plate (two-part with TQ2)	7.17	Trimmers, wooden beam / gluelam min. 100 × 80 mm
5.3	Wood screw min. 5 × 70 mm	7.19	Fire-resistant cladding (ceiling-dependent)
6.25	Mineral wool fill if required	1	Up to EI 90 S
7.11	Trim panel, same construction as 7.19	2	Up to EI 60 S
7.15	Wood sheet, at least 600 kg/m ³	3	EI 30 S



GR3614114, A

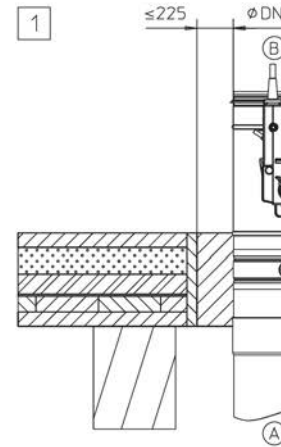
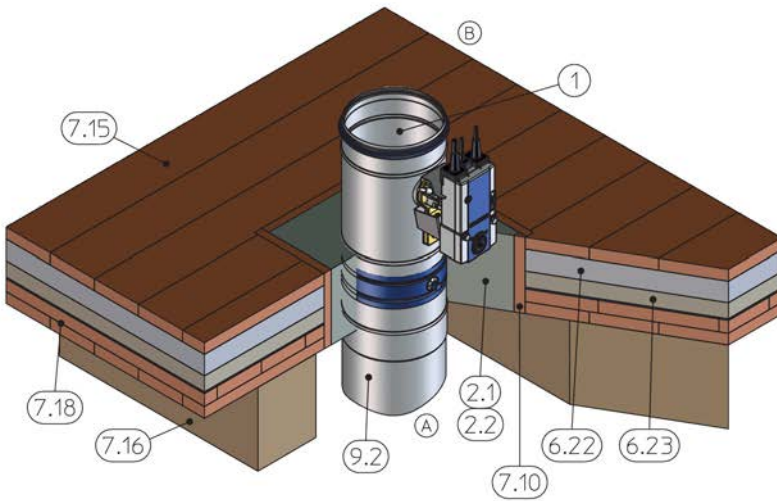
Fig. 131: Dry mortarless installation with installation kit TQ / TQ2 into wooden beam / laminated beam ceiling, suspended (illustration representative, alternative ceiling construction possible on request)

1	FKRS-EU	7.16	Wooden beam / gluelam min. 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)
2.11	Installation kit TQ / TQ2 with cover plate (two-part with TQ2)	7.17	Trimmers, wooden beam / gluelam min. 100 × 80 mm
5.3	Wood screw min. 5 × 70 mm	7.19	Fire-resistant cladding (ceiling-dependent)
6.25	Mineral wool fill if required	1	Up to EI 90 S
7.11	Trim panel, same construction as 7.19	2	Up to EI 60 S
7.15	Wood sheet, at least 600 kg/m ³	3	EI 30 S

Additional requirements: dry mortarless installation with installation kit TQ / TQ2 into wooden beam / laminated beam ceilings

- Wooden beam ceiling, see ↗ 33
- Installation kit TQ / TQ2, see ↗ 36
- ≥ 75 mm distance from the fire damper to load-bearing structural elements (structure 100 mm)
- ≥ 200 mm distance between two fire dampers in separate installation openings
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete or any required reinforcement, have to be evaluated and ensured by others.

5.13.3 Mortar-based installation into historical wooden beam ceilings

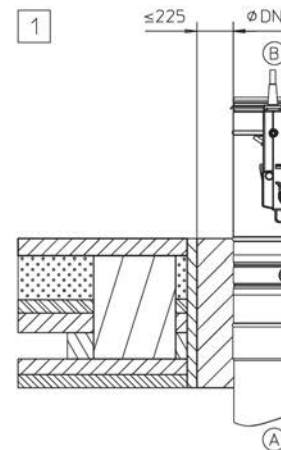
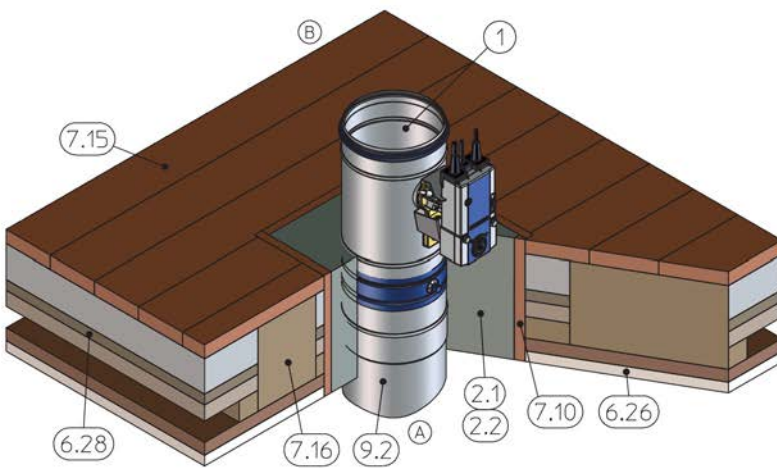


GR3633257, A

Fig. 132: Mortar-based installation into historical wooden beam ceilings, shown upright (also applicable for suspended arrangement)

1	FKRS-EU	7.15	Wooden floorboard / floor covering*
2.1	Mortar	7.16	Wooden beam
2.2	Concrete	7.18	Formwork*
6.22	Screed*	9.2	Extension piece or duct
6.23	Footfall sound insulation*	*	Illustration representative, other ceiling constructions possible according to local conditions and ceiling manufacturers
7.10	Trim panels		

1 EI 30 S

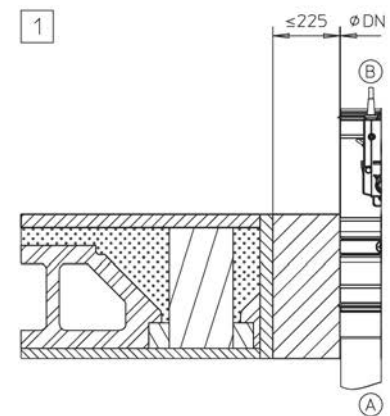
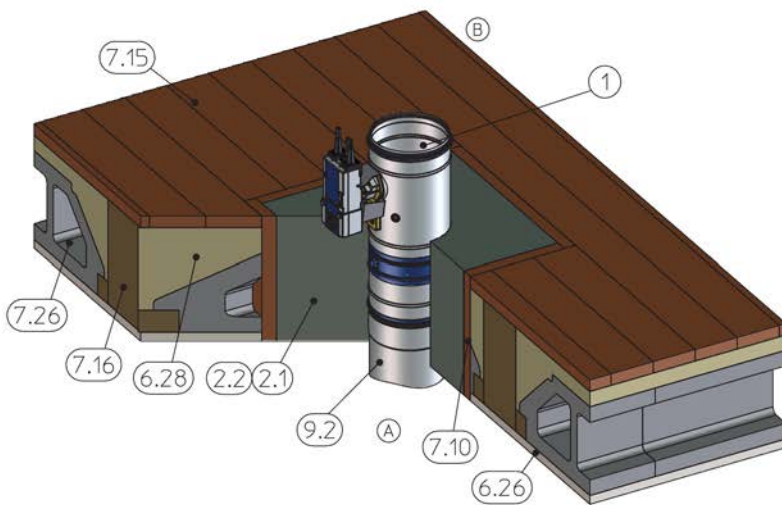


GR3633250, A

Fig. 133: Mortar-based installation into historical wooden beam ceilings, shown upright (also applicable for suspended arrangement)

1	FKRS-EU	7.15	Wooden floorboard / floor covering*
2.1	Mortar	7.16	Wooden beam
2.2	Concrete	9.2	Extension piece or duct
6.26	Plaster*	*	Illustration representative, other ceiling constructions possible according to local conditions and ceiling manufacturers
6.28	Ceiling fill*		
7.10	Trim panels		

1 EI 30 S



GR3633159, A

Fig. 134: Mortar-based installation into historical wooden beam ceilings, shown upright (also applicable for suspended arrangement)

1	FKRS-EU	7.15	Wooden floorboard / floor covering*
2.1	Mortar	7.16	Wooden beam
2.2	Concrete	7.26	Hollow stone*
6.26	Plaster*	9.2	Extension piece or duct
6.28	Ceiling fill*	*	Illustration representative, other ceiling constructions possible according to local conditions and ceiling manufacturers
7.10	Trim panels	1	EI 30 S

Additional requirements: mortar-based installation into historical wooden beam ceilings

- Historical wooden beam ceiling, see ↗ 33
- ≥ 75 mm distance from fire damper to load-bearing structural elements
- ≥ 200 mm distance between two fire dampers in separate installation openings
- ▶ Structural and fire resistance properties of the ceiling construction, including the attachment to the mortar/ concrete or any required reinforcement, have to be evaluated and ensured by others.

5.14 Fixing the fire damper

5.14.1 General

For installation remote from walls and ceilings and installation with fire batt and fire protection block bulk-head, the fire dampers must be suspended with steel threaded rods. The rods have to be fixed to the ceiling slab; the required fire resistance must not be compromised. Use only fire-rated steel anchors with suitability certificate. Instead of anchors, you can use threaded rods and secure them using nuts and washers. Secure the threaded rods above the ceiling using steel nuts and washers. Threaded rods up to 1.50 m long do not require any insulation; longer rods do require insulation (according to Promat® work sheet 478, for example). Load the suspension system only with the weight of the fire damper, ducting must be suspended separately. For weights [kg] of FKRS-EU fire dampers see ↗ 11.

In addition to the fixing systems described in this manual, you may also use fixing systems that have been approved by accredited testing institutes. This applies in particular to the fire damper installation near a wall or in a corner (when angle sections or mounting plates are used).

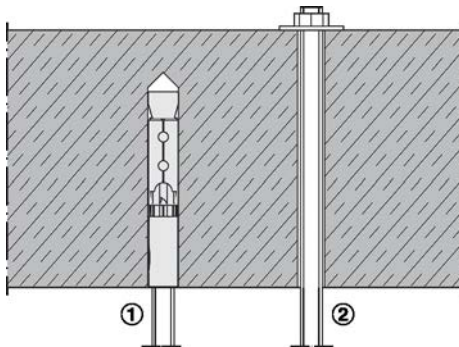
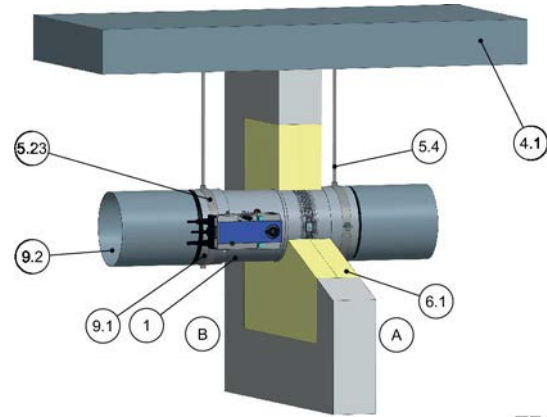


Fig. 135: Fixing to the ceiling slab

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

5.14.2 Fixing in conjunction with fire batt / fire protection block bulk-head

5.14.2.1 Horizontal duct



TR3652452, A

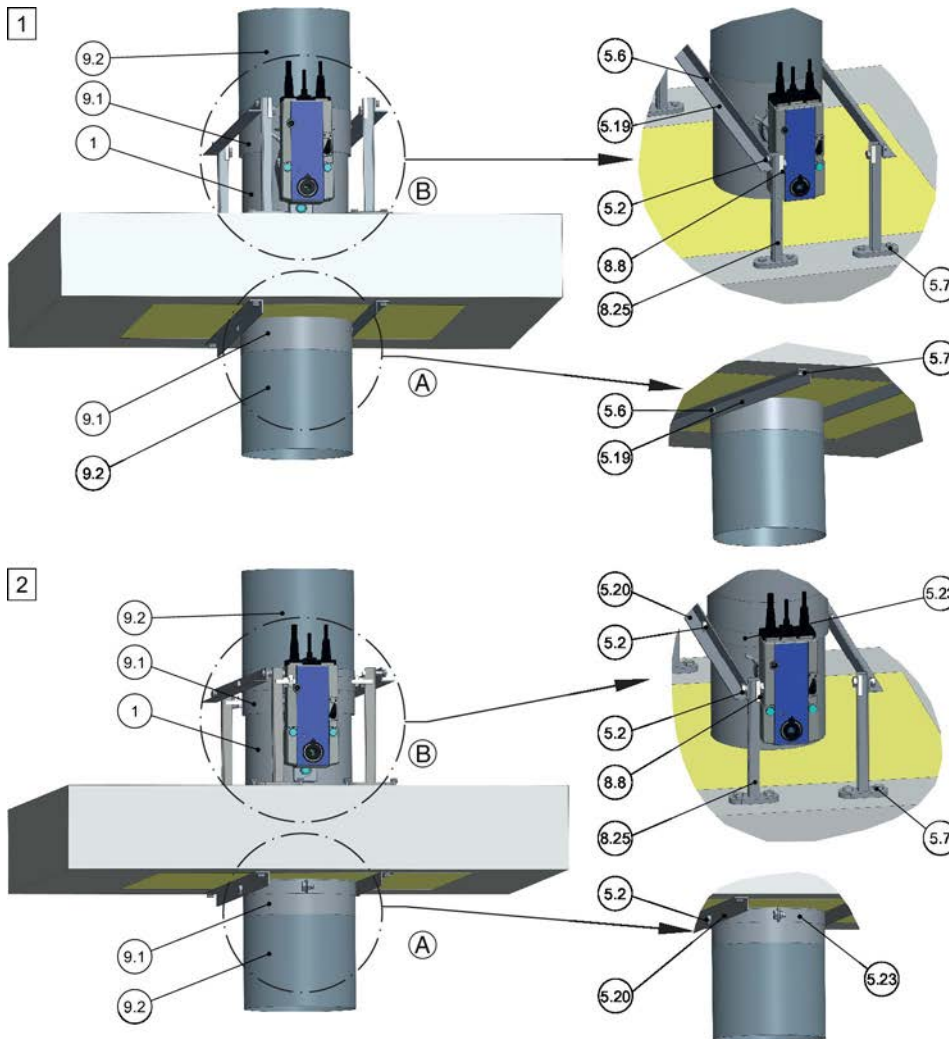
Fig. 136: Suspension system, horizontal duct

- 1 FKRS-EU
- 4.1 Solid ceiling slab
- 5.4 Threaded rod, at least M8, galvanised steel. Fixing to the ceiling slab ↗ 154. Suspension systems longer than 1.5 m require fire-resistant insulation.
- 5.23 Clamp
- 6.1 Mineral wool
- 9.1 Flexible connector
- 9.2 Extension piece or duct

Note: Each fire damper has to be suspended both on the operating side and on the installation side.

5.14.2.2 Vertical duct

Upright installation of the fire damper



TR3653265, A

Fig. 137: Upright installation variants for fire dampers

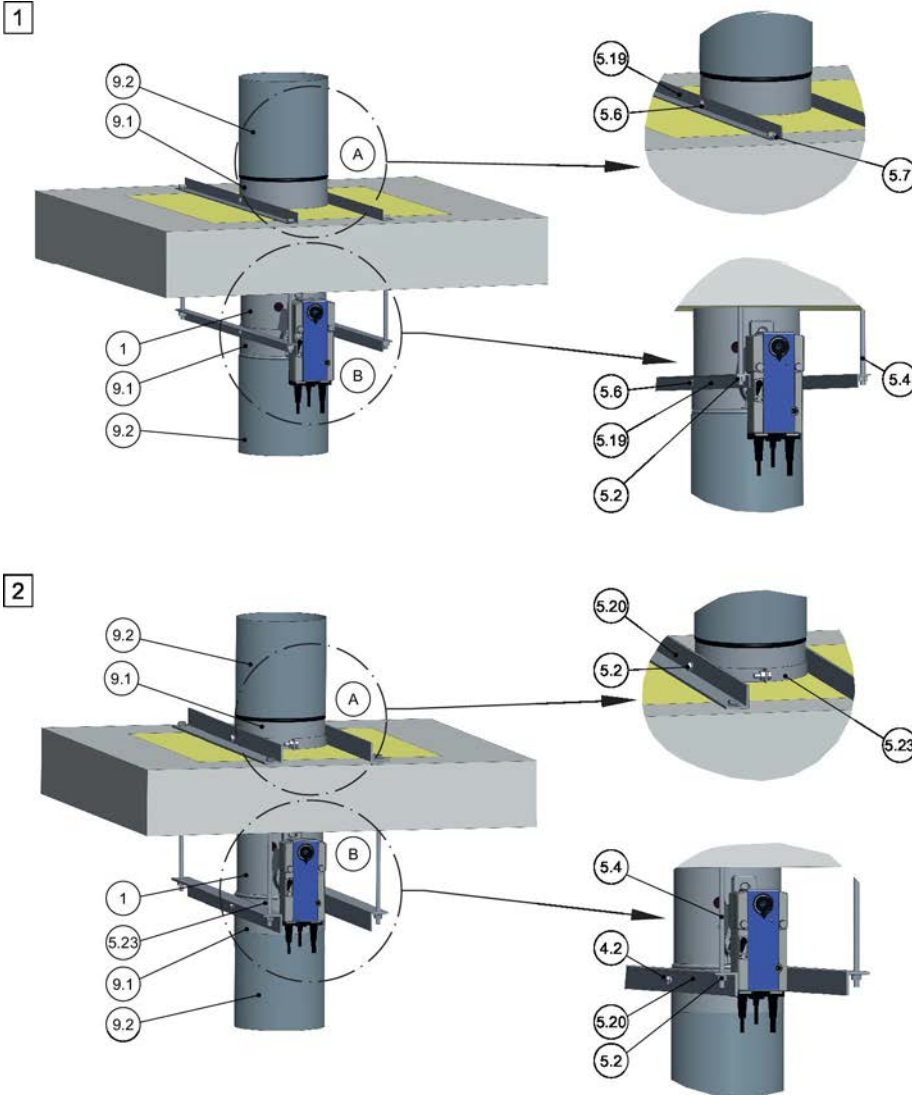
- | | | | |
|------|---|------|---|
| 1 | FKRS-EU | 8.8 | Fixing bracket, Varifix or Müpro MPC or equivalent |
| 5.2 | 4 screw fixings (M8 screw with 2 washers and nut), suitable for the bracket or screw fixing matching the clamp | 8.25 | Bracket, e.g. Hilti MM-B-30 or equivalent |
| 5.6 | 4 steel rivets \varnothing 6.4 mm, clamping range 2 – 20 mm, e.g. cap blind rivets or high strength rivets; the riveted connection must be air-tight. | 9.1 | Flexible connector (if required) |
| 5.7 | Anchor bolt Hilti® HUS-6 or equivalent | 9.2 | Extension piece or duct |
| 5.19 | L-bracket according to EN 10056-1, 20 × 20 × 3 mm galvanised, painted or similar. | 1 | Fixing above and below the ceiling slab with rivets |
| 5.20 | L-bracket according to EN 10056-1, 35 × 35 × 4 mm galvanised, painted or similar. | 2 | Fixing above and below the ceiling slab with heavy duty clamp |
| 5.23 | Clamp, e.g. Hilti MP-MX, Valraven BIS HD 500 or equivalent | | |

⚠ DANGER!

Danger of falling off! Do not step onto the fire batt!

The fire batt cannot carry any loads. Adequate means, e.g. a permanent barrier, must be installed to prevent people from stepping onto the fire batt.

Suspended installation of the fire damper

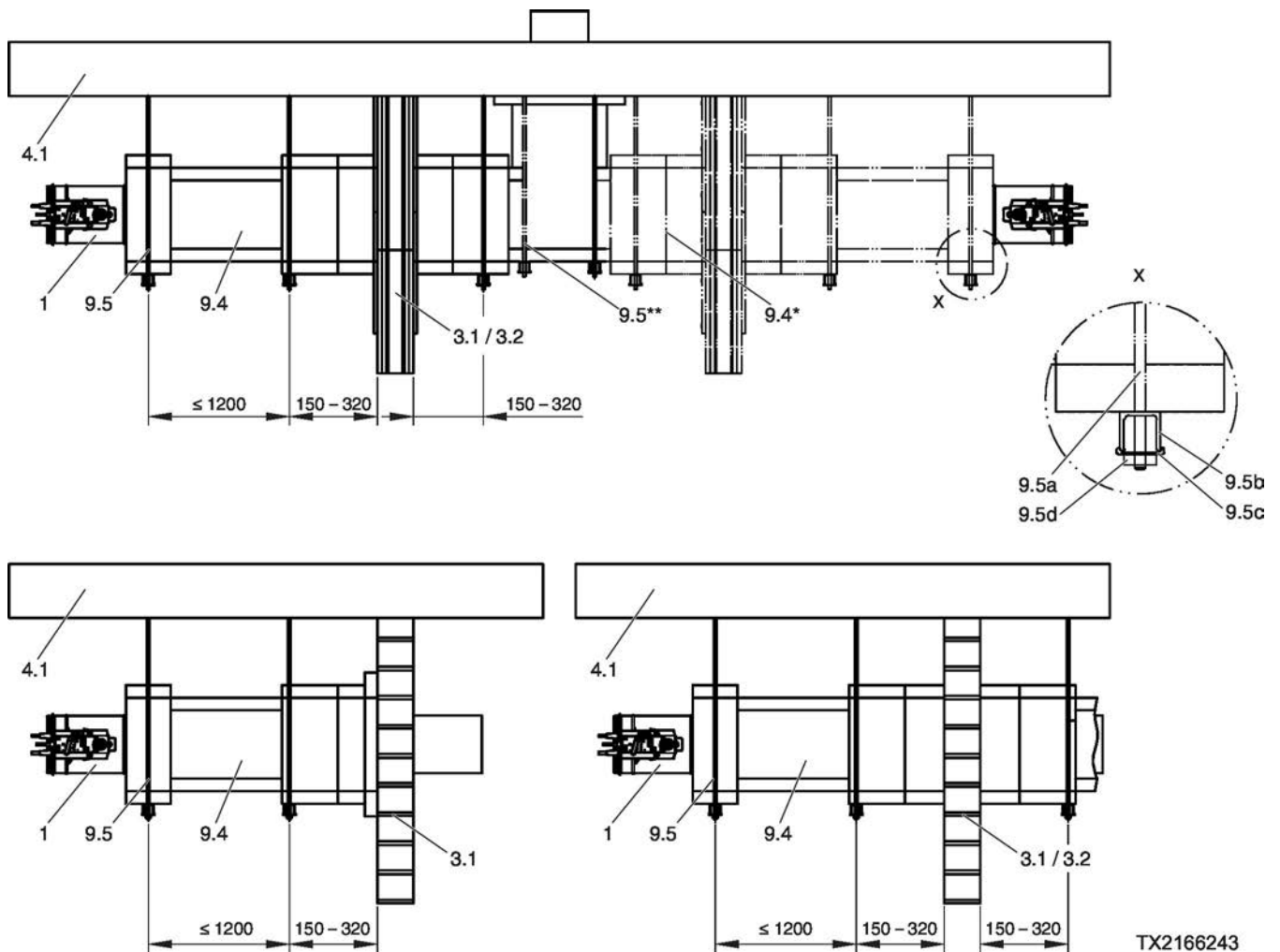


TR3654447, A

Fig. 138: Suspended installation variants for fire dampers

- | | | | |
|------|--|------|---|
| 1 | FKRS-EU | 5.23 | Clamp, e.g. Hilti MP-MX, Valraven BIS HD 500 or equivalent |
| 5.2 | Washer, nut appropriate for the threaded rod or screw fixing suitable for the clamp | 9.1 | Flexible connector |
| 5.4 | Threaded rod, at least M8, galvanised steel | 9.2 | Extension piece or duct |
| 5.6 | 4 steel rivets \varnothing 6.4 mm clamping range 2 – 20 mm, e.g. cap blind rivets or high strength rivets; the riveted connection must be air-tight. | 1 | Fixing above and below the ceiling slab with rivets |
| 5.7 | Anchor bolt Hilti® HUS-6 or equivalent | 2 | Fixing above and below the ceiling slab with heavy duty clamp |
| 5.19 | L-bracket according to EN 10056-1, 20 × 20 × 3 mm galvanised, painted or similar. | | |
| 5.20 | L-bracket according to EN 10056-1, 35 × 35 × 4 mm galvanised, painted or similar. | | |

5.14.3 Fire damper remote from walls and ceilings



TX2166243

Fig. 139: FKRS-EU in a cladded duct

- | | |
|--|--|
| <ul style="list-style-type: none"> 1 FKRS-EU 3.1 Solid wall 3.2 Lightweight partition wall with metal support structure, cladding on both sides 4.1 Solid ceiling slab 9.4 Sheet steel duct with L90 cladding and suspension system according to Promat® manual, construction 478, latest edition 9.5 Suspension system (by others) consisting of: | <ul style="list-style-type: none"> a Threaded rod M10 b Hilti® mounting rail MQ 41 × 3 mm or equivalent c Hilti® drilled plate, MQZ L13 or equivalent d Hexagon nut M10 with washer * Additional ducting can be used ** Suspension is required in connection with 9.4* |
|--|--|

6 Accessories

Extension pieces

Depending on the design, the damper protrusion must be taken into account when using flexible connectors, cover grilles, pipe bends etc., see table 158. Sufficient clearance must be provided, we recommend 50 mm distance to the opened damper blade.

Open blade protrusion [mm]		
Nominal size [mm]	x [mm]	y [mm]
100	-220	-80
125	-208	-67.5
150	-195	-55
160	-190	-50
180	-180	-40
200	-170	-30
224	-158	-18
250	-145	-5
280	-130	10
315	-113	27.5

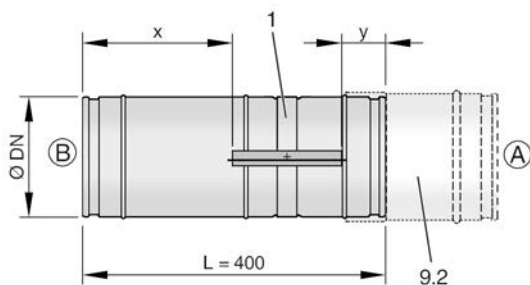


Fig. 140: Open blade protrusion

- 1 FKRS-EU
- 9.2 Extension piece or duct

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

Flexible connectors are used to avoid both tension and compression.

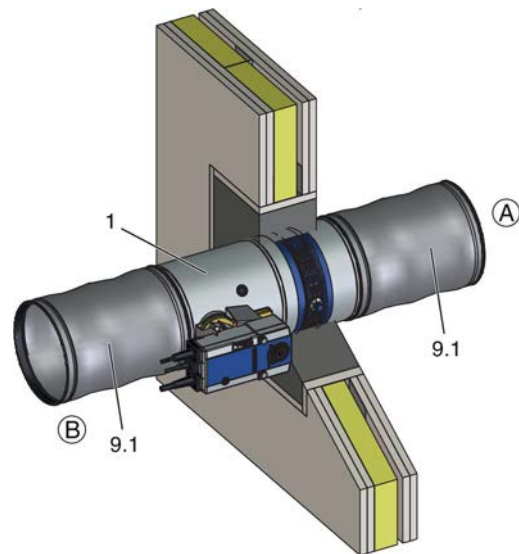


Fig. 141: FKRS-EU with flexible connectors

- 1 FKRS-EU
- 9.1 Flexible connector

Cover grille

Cover grilles are used on non-ducted ends of fire dampers.

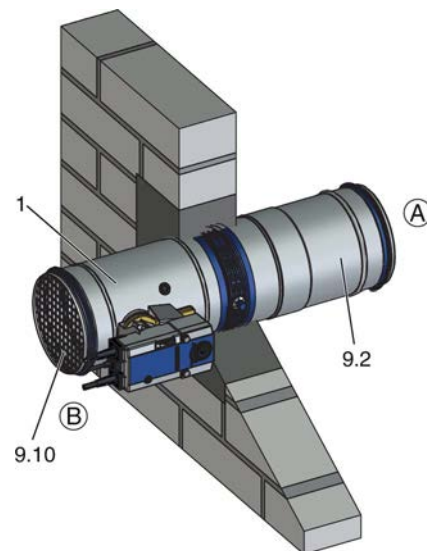


Fig. 142: Fire damper with cover grille

- 1 FKRS-EU
- 9.2 Extension piece or duct
- 9.10 Cover grille

7 Electrical connection

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 Limit switches (fire dampers with fusible link)

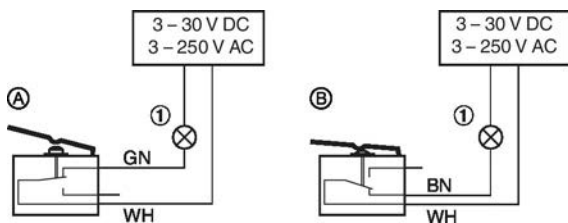


Fig. 143: Wiring of limit switches, example

- 1 Indicator light or relay, to be provided by others
- A Type of connection normally closed
B Type of connection normally open
- The limit switches must be connected according to the wiring example Fig. 143
 - 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
A	Not actuated	CLOSED or OPEN position is <u>not</u> reached	Closed
B	actuated	CLOSED or OPEN position is reached	Closed

7.2 Spring return actuator

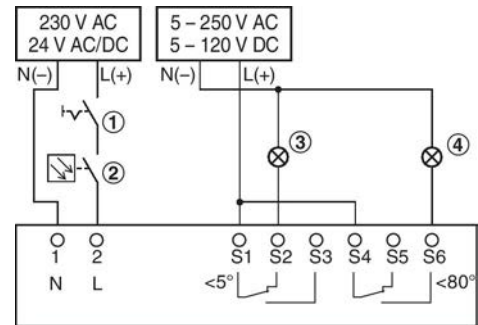


Fig. 144: Actuator connection, example

- 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 actuator 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.

Note: For wiring explosion-proof spring return actuator see "Supplementary operating manual for explosion-proof fire dampers Type FKRS-EU".

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 Spring return actuator and duct smoke detector RM-O-3-D

Note: For connection examples and further details see the RM-O-3-D operating and installation manual

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

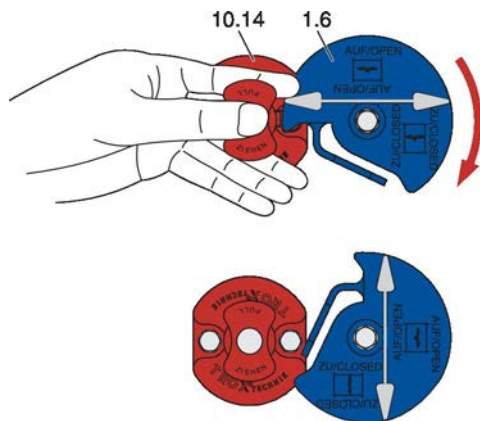


Fig. 145: Close the damper blade

- 1.6 Handle/damper blade position indicator
- 10.14 Thermal release mechanism with fusible link

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. ▶ Pull the knob of the thermal release mechanism (10.14) forwards in the direction of the arrow to release
 2. ▶ the handle (1.6).
 3. ▶ The handle (1.6) swivels automatically in the direction of the arrow.
 4. ▶ The damper blade is closed and
 5. ▶ the handle (1.6) shows that the damper blade is closed.

Opening the damper blade

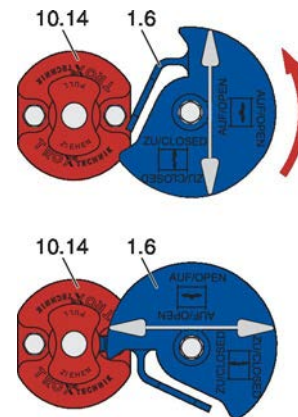


Fig. 146: Opening the damper blade

- 1.6 Handle/damper blade position indicator

Requirement

- The damper blade is CLOSED
1. ▶ Turn the handle (1.6) in the direction of the arrow (counter-clockwise) until
 2. ▶ the handle (1.6) engages behind the knob of the thermal release mechanism (10.14).
 3. ▶ The damper blade is open and
 4. ▶ the handle (1.6) indicates that the damper blade is open.

Damper blade position indicator

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

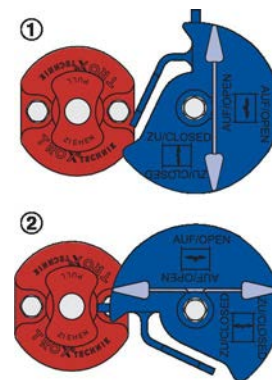


Fig. 147: Damper blade position indicator

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

8.2 Fire damper with spring return actuator

Status indicator



Fig. 148: Thermoelectric release mechanism BAT

- 1 Push button for functional test
- 2 Indicator light

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

- Power is being supplied.
- The thermal fuses are intact.
- The push button is not being pushed.

Damper blade position indicator

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

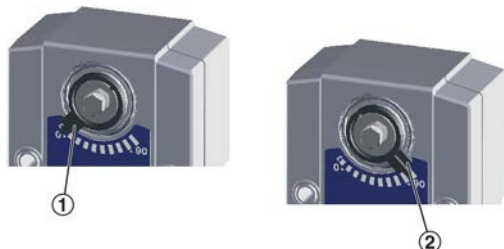


Fig. 149: Damper blade position indicator

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

Closing/opening the damper blade with spring return actuator



Fig. 150: Functional test

- 1 Push button for 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 the push button (1) and keep it pushed.
 - ⇒ This interrupts the power supply, and the damper blade closes.
 2. ▶ Check if the damper blade is CLOSED, check run time.
 3. ▶ Release the push button (1).
 - ⇒ Power is supplied again, and the damper blade opens.
 4. ▶ Check if the damper blade is OPEN, check run time.

Opening the damper blade using the crank handle



Fig. 151: Functional test (without power supply)

- 1 Crank handle
- 2 Direction of arrow
- 3 Locking lever

⚠ 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 in the direction of the arrow (2) to just short of the travel stop and hold it.
- 3. ▶ Set the interlock (3) to "Lock "
- ⇒ The damper blade remains in the OPEN position.
- 4. ▶ Remove the crank handle.

Close the damper blade



Fig. 152: Functional test (without power supply)

- 3 Locking lever

⚠ 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 "Lock opened "
- ⇒ The damper blade is released and closes. Check if the CLOSED position is reached on the damper blade position indicator.

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 system owner)
- 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 more informationen see www.troxtechnik.com.

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 run time of actuators. They may also indicate the need for additional measures which help to maintain the system's function, e.g. removing 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 page 167.*


Operation

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

If the temperature in the duct ($\geq 72\text{ °C}$ / $\geq 95\text{ °C}$ in warm air ventilation systems) or the ambient temperature ($\geq 72\text{ °C}$) rises in the event of a fire, the thermal release mechanism is triggered. This action 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 165.

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 system owner is responsible for the maintenance of the fire damper.

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

Functional test

The functional reliability of the fire damper must be tested at least every six months; this has to be arranged by the system owner. 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 163.*

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). For disinfection you may use commercially available disinfectants or disinfecting procedures.

Hygiene

Hygienic requirements are fulfilled in accordance with VDI 6022-1, VDI 3803-1, DIN 1946-4, DIN EN 13779 as well as the Önorm H 6020 and H 6021 and SWKI. The fire damper building materials were tested for resistance to fungi and bacteria in a test of their microbial metabolic potential in accordance with DIN EN ISO 846. The building materials do not promote the growth of microorganisms (fungi, bacteria), thus reducing the risks of infection for people. The fire dampers are resistant to disinfectants¹ and are thus suitable for hospitals and comparable institutions. Disinfection and cleaning is very straightforward. Verification of corrosion resistance was provided in accordance with EN 15650.

¹ Resistance to disinfectants was tested with the disinfectant groups of active substances alcohol and quaternary compounds. These disinfectants correspond with the list from the Robert Koch Institute and were used in accordance with the specifications of the Disinfectant List of the Disinfectant Commission in the Association for Applied Hygiene (VAH).

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 in ↪ *Table on page 167.* 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 ↪ 160 is required after any repair work.

Replacing the fusible link

10.2 Replacing the fusible link

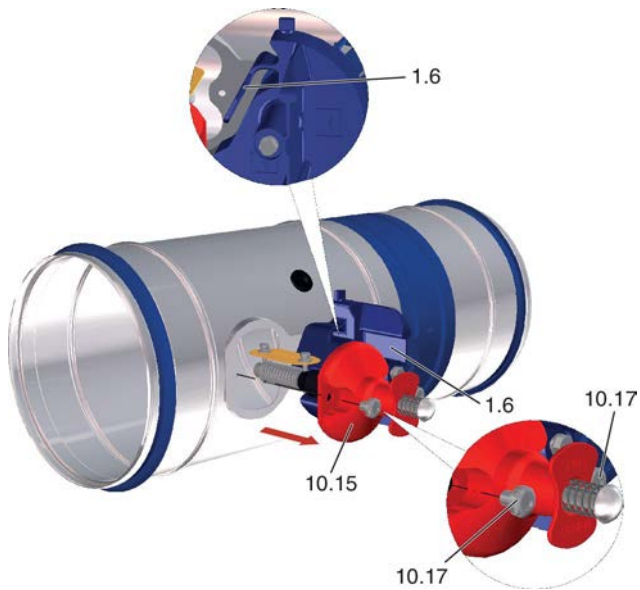


Fig. 153: Removing the fusible link holder

- 1.6 Handle
- 10.15 Fusible link holder
- 10.17 Screw

1. ▶ Close the damper blade.
2. ▶ Release screws (10.17) on the fusible link holder (10.15).
3. ▶ Remove fusible link holder (10.15) from the fire damper. While doing so, slightly press down the tab (1.6) of the handle.

1. ▶ Cover fusible link holder (10.15) as shown and press together in the direction of the arrow to tension the spring (10.20).
2. ▶ Remove old fusible link (10.18), hook in new fusible link (10.18).

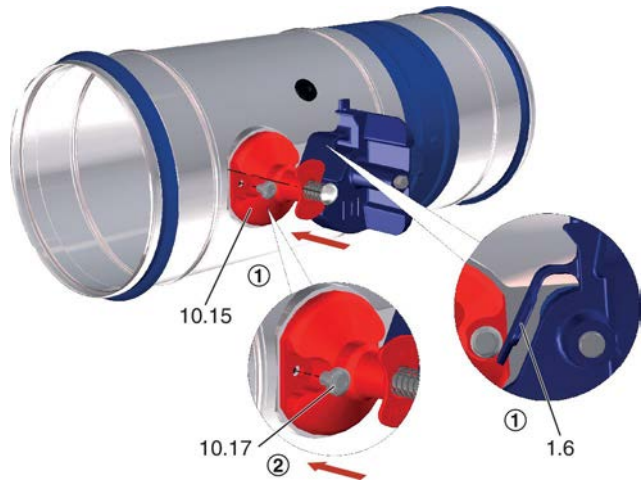


Fig. 155: Install the fusible link holder

- 1.6 Handle
- 10.15 Fusible link holder
- 10.17 Screw

1. ▶ Press the tab of the handle (1.6) slightly against the handle and push the fusible link holder (10.15) into the fire damper and
 2. ▶ fasten with screws (10.17).
- ⇒ Carry out functional test.

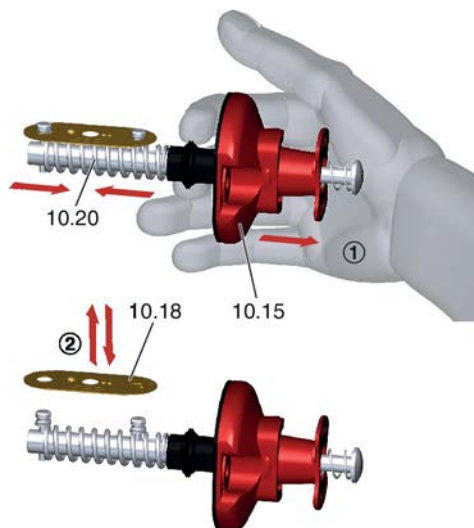


Fig. 154: Replacing the fusible link

- 10.15 Fusible link holder
- 10.18 Fusible link
- 10.20 Spring

10.3 Inspection, maintenance and repair measures

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 operating manual <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 has been removed <ul style="list-style-type: none"> – Remove transport/installation protection 	Specialist personnel
	Connection of ductwork/cover grille/flexible connector <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) ↪ 160 <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) ↪ 161 <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 duct 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 duct 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

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 Explanation

For various installation situations described in this manual you have some choice, e.g. , either (6.2) or (6.16).

Item no.	Description
1	Fire damper
1.1	Casing
1.2	Damper blade (with or without lip seal)
1.3	Travel stop for OPEN position
1.4	Travel stop for CLOSED position
1.5	Inspection access
1.6	Handle/damper blade position indicator
1.7	Interlock
1.8	Lip seal

Item no.	Description
2	Materials for fire damper installation
2.1	Mortar or gypsum mortar
2.2	Reinforced concrete / Non-reinforced concrete
2.3	Reinforced concrete base
2.4	Fire batt with ablative coating
2.5	Installation kit / wall mounting kit WA, WA2
2.6	Installation kit WE, WE2
2.7	Installation kit WV
2.8	Installation kit E1, E2
2.9	Installation kit ES
2.10	Installation kit GM
2.11	Installation kit TQ, TQ2
2.12	Installation kit GL, GL2
2.13	Installation kit GL100
2.14	Lintel
2.15	Steel bracket, galvanised
2.16	Installation subframe
2.17	Hilti CFS-BL fire stop block
2.18	Installation block ER with cover plate
2.19	Joint filler (Promat® filler, Promat® ready-to-use putty; mineral wool > 80 kg / m ³ , > 1000 °C or mortar)

Item no.	Description
3	Walls
3.1	Solid wall
3.2	Lightweight partition wall with metal support structure, cladding on both sides
3.3	Lightweight partition wall with steel support structure, cladding on both sides
3.4	Timber stud wall (also timber panel constructions), cladding on both sides
3.5	Half-timbered construction, cladding on both sides
3.6	Compartment wall with metal support structure, cladding on both sides
3.7	Shaft wall with metal support structure, cladding on one side
3.8	Shaft wall with steel support structure, cladding on one side
3.9	Shaft wall without metal support structure, cladding on one side
3.10	Wall without adequate fire resistance rating
3.11	Solid wood wall / CLT wall
3.12	Sandwich panel wall
3.13	Additional leaf with metal support structure

Item no.	Description
4	Ceilings
4.1	Solid ceiling slab / solid floor
4.2	Wooden beam ceiling
4.3	Modular ceiling, Cadolto system
4.4	Partial concrete ceiling with reinforcement
4.5	Solid wood ceiling
4.6	False ceiling
4.7	Reinforced hollow chamber ceiling
4.8	Hollow stone ceiling
4.9	Ribbed ceiling
4.10	Composite ceiling
4.11	Historical wooden beam ceiling, fire resistance properties > REI 30

Item no.	Description
5	Fixing material
5.1	Dry wall screw
5.2	Hexagon head screws, washers, nuts (see installation details)
5.3	Chipboard screw
5.4	Threaded rod, galvanised steel (see installation details)
5.5	Carriage bolt L ≤ 50 mm with washer and nut
5.6	Screw or rivet, galvanised steel (see installation details)
5.7	Fire-rated anchor (with suitability certificate)
5.8	Anchor M8 – M12
5.9	Steel angle section
5.10	Fixing tab
5.11	Floor mounting plate
5.12	Cover plate
5.13	Wood screw or pin
5.14	Angle bracket
5.15	Bracket
5.16	Wall connection frame
5.17	Anchor bolt
5.18	Steel angle section to EN 10056-1, 40 × 40 × 5 mm, galvanised, painted, or equivalent
5.19	Connecting clip
5.20	Fire safety dowel Fischer® FFS 7.5 × 82 mm
5.21	Screw / wallplug
5.22	Steel fabric, Ø ≥ 6 mm, mesh aperture 150 mm or equivalent
5.23	Clamp, e.g. Hilti MP-MX, Valraven BIS HD 500, or equivalent

Item no.	Description
6	Filling and coating material
6.1	Mineral wool ≥ 1000 °C, ≥ 40 kg/m³
6.2	Mineral wool ≥ 1000 °C, ≥ 80 kg/m³
6.3	Mineral wool ≥ 1000 °C, ≥ 100 kg/m³
6.4	Mineral wool ≥ 1000 °C, ≥ 140 kg/m³
6.5	Mineral wool (depending on wall construction) / ceiling construction, mineral wool filling on request

Item no.	Description
6	Filling and coating material
6.6	Fire batt with ablative coating
6.7	Fire batt
6.8	Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
6.9	Fire-resistant sealant suitable for the fire batt system used
6.10	Ablative coating around the perimeter, thickness 2.5 mm
6.11	Insulating strip (depending on wall construction)
6.12	Intumescent seal
6.13	Mineral wool strips A1, if required
6.14	Armaflex
6.15	Mineral wool (depending on the flexible ceiling joint)
6.16	Armaflex AF / Armaflex Ultima
6.17	Fire batt (Hensel)
6.18	Filler
6.19	Mineral wool > 1000 °C, > 80 kg/m³, panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible
6.20	Sleeve (can be ordered separately)
6.21	Kerafix 2000 sealing tape
6.22	Screed
6.23	Footfall sound insulation
6.24	Elastomeric foam (flame-resistant, non-dripping)
6.25	Glass wool > 1000 °C, > 80 kg/m³
6.26	Plaster
6.27	Holding plate on both sides, 90 × 140 × 1.5 mm
6.28	Ceiling fill

Item no.	Description
7	Supporting construction
7.1	UW section
7.1a	UW section, cut and bent
7.2	CW section (metal support structure)

Item no.	Description
7	Supporting construction
7.3	UA section
7.4	U50 channel
7.5	Steel support structure
7.6	Perimeter metal section
7.7	Timber stud, at least 60 × 80 mm
7.9	Half-timbered construction
7.10	Trim panels (optional)
7.11	Trim panels, double layer, staggered joints
7.12	Trim panels, wood sheet
7.13	Cladding made from material x, one, two or three layers
7.13a	Cladding, fire-resistant
7.13b	Cladding, wood sheet, at least 600 kg/m ³
7.14	Reinforcing board made from material x, one, two or three layers
7.15	Wooden floorboard / floor tile / wood sheet min. 600 kg/m ³
7.16	Wooden beam / gluelam (reduce distances between wooden beams to the size of the installation opening)
7.17	Trimmers, wooden beam / gluelam, metal support structure or steel support structure (see installation details)
7.18	Formwork
7.19	Fire-resistant cladding
7.20	Fixing kit GL for FK-EU
7.21	Ceiling joint strips
7.22	Ceiling joint section
7.23	Sheet steel insert depending on wall manufacturer
7.24	Ceiling design
7.25	Reinforced concrete support
7.26	Hollow stone
7.27	Profile sheet metal

Item no.	Description
8	Material for extended applications
8.1	PROMATECT®-H strip b ≥ 100 mm, d = 10 mm

Item no.	Description
8	Material for extended applications
8.2	PROMATECT®-H strip b ≥ 200 mm, d = 10 mm
8.3	PROMATECT®-LS board d = 35 mm
8.4	Hilti mounting rail MQ 41 × 3 or equivalent
8.5	Hilti drilled plate MQZ L13 or equivalent
8.6	Hilti fixing band LB26 or equivalent
8.7	Mounting rail, Würth Varifix 36 × 36 × 2,5, or Müpro MPC 38/40 or equivalent
8.8	Fixing bracket, Varifix or Müpro MPC or equivalent
8.9	Bracket, Varifix ANSHWNKL-PRFL36-90GRAD or Müpro mounting bracket 90°, galvanised, or equivalent
8.10	Large gears
8.11	Actuator
8.12	Actuator mounting plate
8.13	Small gears
8.14	Connecting cable
8.15	Adjustment screws
8.16	Actuator mounting plate
8.17	Cover
8.18	Junction box
8.19	Support, made from 8.3
8.20	Promaseal®-Mastic intumescent sealant
8.21	Fire-resistant sealant CFS-S ACR CW
8.22	Calcium silicate board
8.23	Foam rubber seal
8.24	Retaining plate on both sides, sheet steel ≥ 1 mm thick
8.25	Bracket, e.g. Hilti MM-B-30 or equivalent

Item no.	Description
9	Accessories
9.1	Flexible connector
9.2	Extension piece or duct
9.3	Prop
9.4	Sheet steel duct with L90 cladding and suspension system according to Promat® manual, construction 478, latest edition
9.5	Suspension

Item no.	Description
9	Accessories
9.6	Damper blade used for repair
9.7	Blade
9.8	Rivet axis
9.9	Plate
9.10	Cover grille
9.11	Circular spigot
9.12	Clamping ring
9.13	Bracing
9.14	Profile connecting frame
9.15	T-piece

Item no.	Description
10	Release mechanisms
10.1	Spring return actuator
10.2	Spring return actuator Belimo BLF
10.3	Spring return actuator Belimo BF
10.4	Spring return actuator Belimo BFN
10.5	Spring return actuator Belimo BFL
10.6	Spring return actuator Schischek ExMax (yellow)
10.7	Spring return actuator Schischek RedMax (magenta)
10.8	Spring return actuator Siemens GGA
10.9	Spring return actuator Siemens GRA
10.10	Spring return actuator Siemens GNA
10.11	Spring return actuator Joventa SFR
10.12	Duct smoke detector RM-O-3-D (fixed with adapter metal sheet)
10.13	Thermoelectric release mechanism with temperature sensor
10.14	Thermal release mechanism with fusible link, 72 °C / 95 °C
10.15	Fusible link holder
10.16	Fusible link holder rocker
10.17	Screw
10.18	Fusible link
10.19	Cover
10.20	Spring

Item no.	Description
11	Additions
11.1	Cable tray
11.2	Cable set
11.3	Pipe collar
11.4	Underlay material, non-combustible, to be provided by others
11.5	Base, to be provided by others
11.6	Cable penetration

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