



Fire damper

FKRS-EU

according to the Declaration of Performance
DoP/FKRS-EU/DE/006



TROX[®] TECHNİK

The art of handling air

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Installation and operating instructions (translation of the original)
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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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TROX Technical Support

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

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

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

Limitation of liability

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

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

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

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

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

We reserve the right to make technical changes.

Warranty claims

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

Safety notes

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

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

DANGER!

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

WARNING!

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

CAUTION!

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

NOTICE!

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

ENVIRONMENT!

Environmental pollution hazard.

Tips and recommendations



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

Safety notes as part of instructions

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

Example:

1. ▶ Loosen the screw.

2. ▶

CAUTION!


Danger of finger entrapment when closing the lid.

Be careful when closing the lid.

3. ▶ Tighten the screw.

Specific safety notes

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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 use of the fire damper in potentially explosive atmospheres is permitted with the corresponding special accessories and a CE conformity statement according to ATEX directive 2014/34/EU. Fire dampers for use in areas with potentially explosive atmospheres are marked for the zones for which they have been approved.
- The fire dampers may only be operated in compliance with these installation instructions and the technical data in these installation and operating instructions.
- Modifying the fire damper or using spare parts that have not been approved by TROX is not permitted.

Additional provision for use in Germany:

- Do not use in extract air systems in commercial kitchens.
- For use as an air transfer damper see general type approval Z-6.50-2516.
- Use with firestop blocks requires individual type-approval.
- Installation into solid ceiling slabs with FireShield® requires a project-related type approval.
- Air transfer dampers with fusible link may require a building inspectorate licence. This must be checked and applied for by the client.
- Flame-resistant, non-dripping building materials (elastomer foams) must at least comply with fire rating class C - s2, d0 according to the German MVV TB (2019/1) guideline. The applicable local building regulations must be complied with.

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 adequate 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
- Trained 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.

Trained personnel

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

2 Technical data

2.1 General data

Nominal sizes	100 – 315 mm
Casing length L	400 mm
Volume flow rate range	Up to 770 l/s or 2770 m ³ /h
Differential pressure range	Up to 1500 Pa
Temperature range ^{1, 3, 4}	-20 °C – 50 °C
Release temperature ⁴	72 °C or 95 °C (for warm air ventilation systems)
Upstream velocity ^{2, 4}	≤ 8 m/s with fusible link, ≤ 10 m/s with spring return actuator
Closed damper blade air leakage	EN 1751, Class 3
Casing air leakage	EN 1751, Class C
Normative basics	<ul style="list-style-type: none"> ■ EU Construction Products Regulation No. 305/2011 ■ EN 15650 – Ventilation for buildings - Fire dampers ■ EN 13501-3 – Classification – Part 3: Fire resisting ducts and fire dampers ■ EN 1366-2 – Fire resistance tests for installations: Fire dampers ⁵ ■ EN 1751 Ventilation for buildings – Air terminal devices ■ EN 15882 Feb. 2023 - Expanded areas of application ■ EAD 350454-00-1104-v01
Declaration of performance	DoP/FKRS-EU/DE/006

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

⁴⁾ For explosion-proof constructions of the FK-EU see the corresponding operating manual.

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

Product sticker

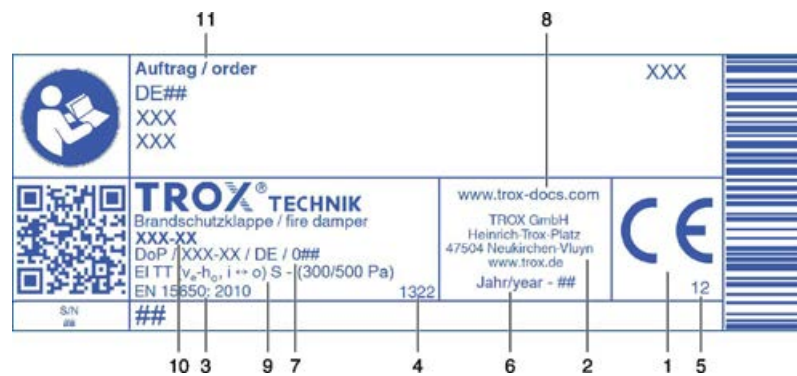


Fig. 1: Product sticker (example)

- | | | | |
|---|---|----|---|
| 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
↳ <i>Chapter 5.1 'Overview of installation situations' on page 24</i> |
| 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 weights

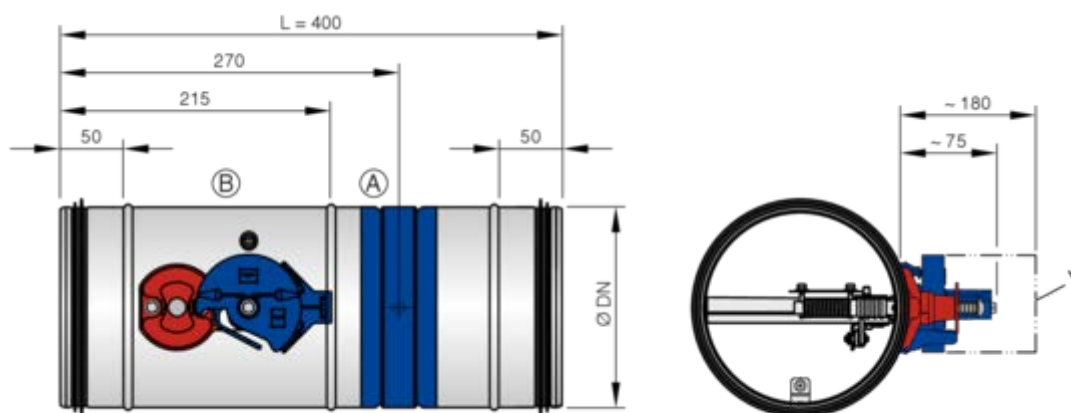


Fig. 2: FKRS-EU with fusible link

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

Limit switch	
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

Nominal size [mm]	Weight [kg]									
	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 TQ2	5.4	6.1	7.0	7.9	8.8	9.7	10.6	12.0	13.7	15.8
... and installation kit WA2	4.4	5.2	6.1	6.6	7.4	8.2	9.0	10.2	11.7	13.6
... and installation kit WE2	4.4	5.2	6.1	6.6	7.4	8.2	9.0	10.2	11.7	13.6
... and installation kit 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 weights

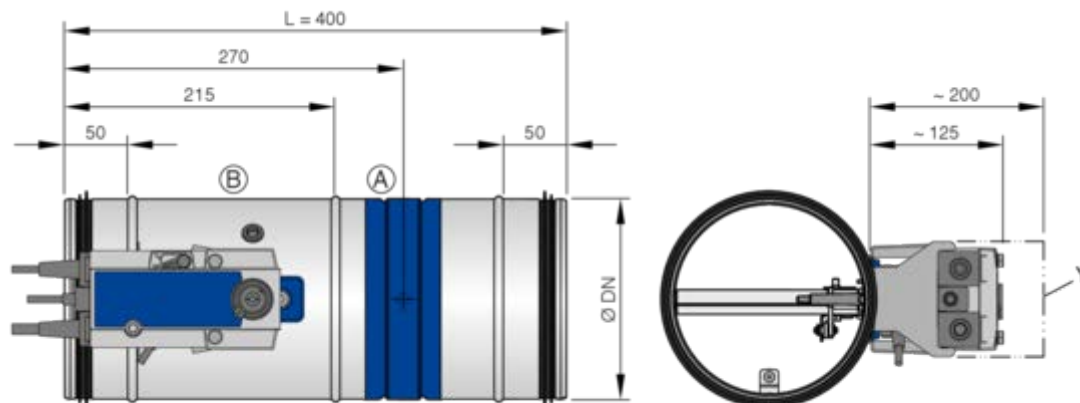


Fig. 3: FKRS-EU with spring return actuator

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

- Weight of FKRS-EU with fusible link + approx. 1.5 kg, see table 12.

Spring return actuator			
Construction		230 V	24 V
Supply voltage		230 V AC/DC, 50/60 Hz	24 V AC/DC, 50/60 Hz
Functional range		198 – 264 V AC/DC	21.6 – 28.8 V AC/DC
Power rating	Spring-winding mechanism / hold position	3.5 – 5.5 W/1.1 – 2.0 W	2.5 – 6.5 W/0.8 – 2.0 W
	Rating	9.5 VA	9 VA
Run time	Actuator / spring return	75 s / 20 s	
Limit switch	Type of contact	2 changeover contact	
	Switching voltage	5 – 250 V AC/5 – 120 V DC	
	Switching current	1 mA – 3 (0.5 inductive) A	
	Contact resistance	Unknown	
IEC protection class / IP protection		II / IP 54	
Storage temperature / ambient temperature		-30 °C – +50 °C	
Ambient humidity		5 – 95% r.h., no condensation	
Connecting cable	Actuator / limit switch	1 m, 2 × 0.75 mm ² (free of halogens)/1 m, 6 × 0.75 mm ² (free of halogens)	

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

Dimensions and weights

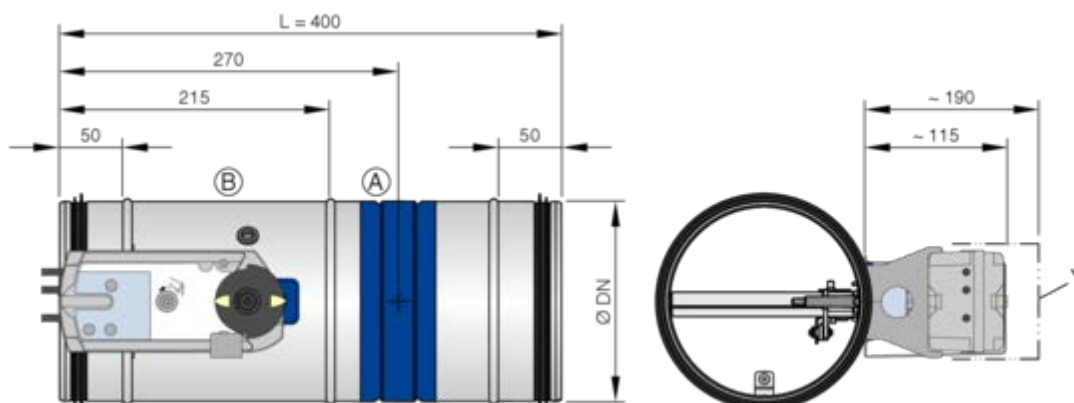


Fig. 4: FKRS-EU with Siemens spring return actuator

- Y 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 12.

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 contact	
	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, 2 × 0.75 mm ² / 0.9 m, 6 × 0.75 mm ² (free of halogens)	

*Connecting cable at the bottom

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".

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

Dimensions and weights

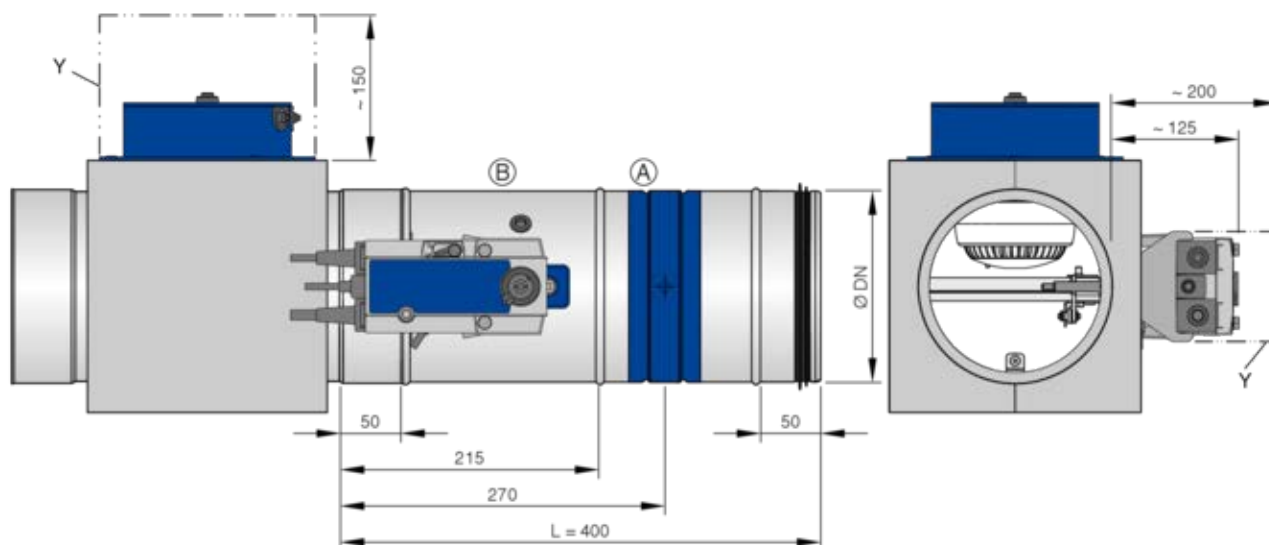


Fig. 5: FKRS-EU with Belimo spring return actuator and duct smoke detector, drawn in a square air duct (on-site)

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

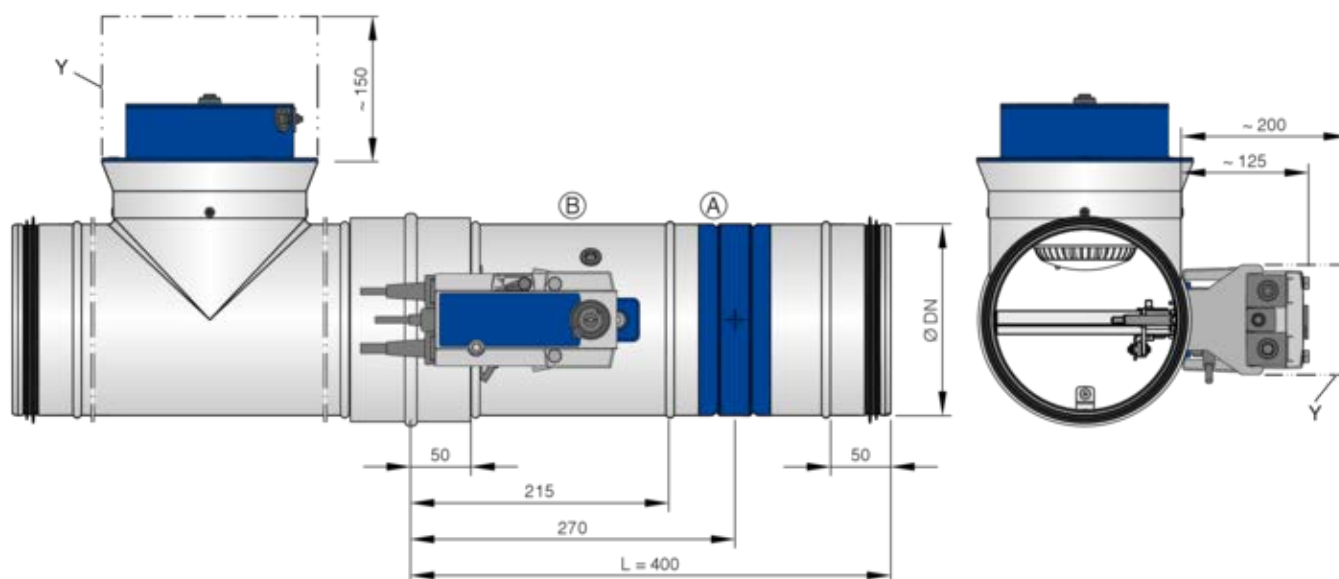


Fig. 6: FKRS-EU with Belimo spring return actuator and duct smoke detector, drawn in a round air duct (on-site)

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

- Technical data for spring return actuator, see table ↗ on page 13
- The duct smoke detector type RM-O-3-D is to be arranged in a square air duct on the top or alternatively in a round air duct in a T-piece on the top. For technical details of the duct smoke detector see the RM-O-3-D operating and installation manual.

2.5 FKRS-EU with fusible link and cover grille on both sides as an upstream shutter for the air transfer unit

Dimensions and weights

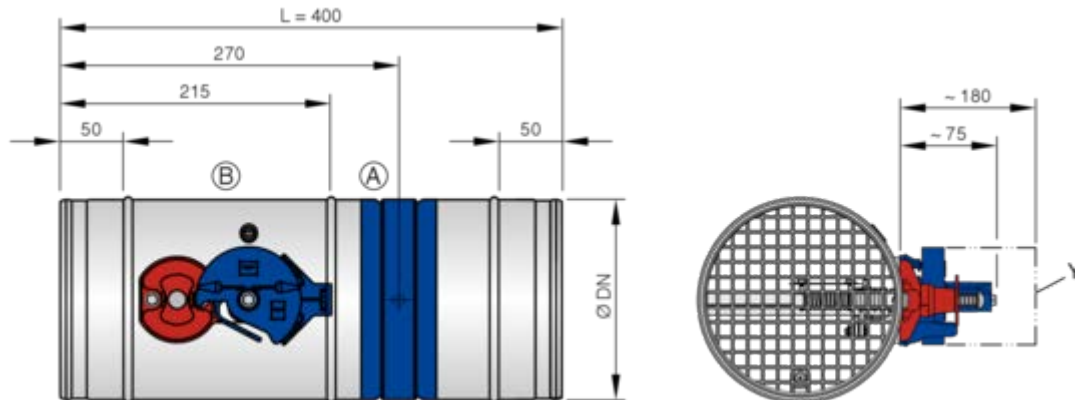


Fig. 7: FKRS-EU with fusible link and cover grille on both sides as an upstream shutter for the air transfer unit

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

Note: Air transfer dampers may require a general building inspectorate licence. This must be checked and applied for by the client.

For installation in Germany, please note:

If a fire damper with only a mechanical shut-off element (fusible link) to be used as an air transfer damper, the local building regulations apply.

Such air transfer dampers with fusible link are usually used in pressure differential systems only.

2.6 FKRS-EU with spring return actuator and duct smoke detector used as an air transfer damper

Dimensions and weights

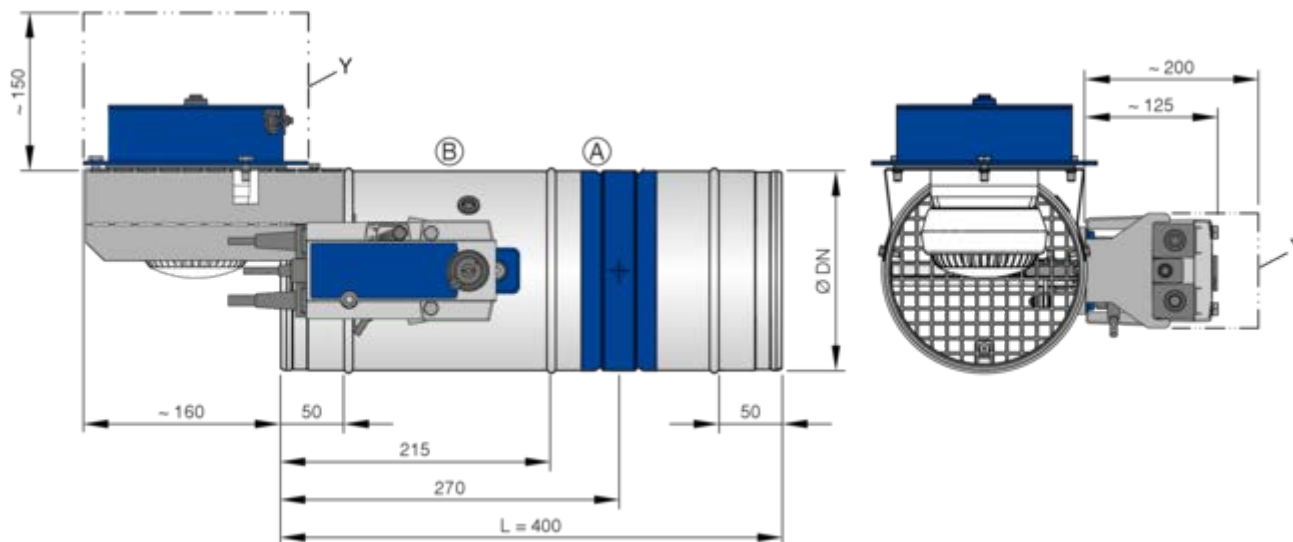


Fig. 8: FKRS-EU with spring return actuator and duct smoke detector used as an air transfer damper

Y Keep clear to provide access for operation

A Installation side

B Operating side

- Weight of FKRS-EU with fusible link + approx. 2.5 kg, see table ↗ 12 .
- Technical data for spring return actuator, see table ↗ on page 13
- The duct smoke detector type RM-O-3-D is to be placed on top of a console (scope of supply). For technical details of the duct smoke detector see the RM-O-3-D operating and installation manual.

Note: For more information on the installation and use of the fire damper as an air transfer damper in Germany see general type approval Z-6.50-2516.

3 Supply package, transport and storage

Scope of delivery

If attachments and accessories are supplied from the factory with the fire dampers, they are already taken into account in the order code.

Depending on the installation situation, supplementary materials for assembly and fixing may be needed to ensure proper installation, e.g. mortar, screws, mineral wool, etc.

Such materials are not usually included in the supply package (unless stated otherwise).

The selection of additional attachments or accessories as well as the identification and provision of materials for assembly and fixing is the responsibility of those involved in the building project and must be done taking into account the required classification.

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 (one per delivery)



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 product in its transport packaging up to the installation location.

Storage

For temporary storage please note:

- Remove any plastic wrapping.
- Protect the product from dust and contamination.
- Store the product in a dry place and remote from direct sunlight.
- Do not expose the unit to the effects of weather (not even in its packaging).
- Do not store the product below -40 °C or above 50 °C.

Packaging

Properly dispose of packaging material.

4 Parts and function

4.1 Function in a ventilation system

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. Closure 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.

4.2 FKRS-EU with fusible link

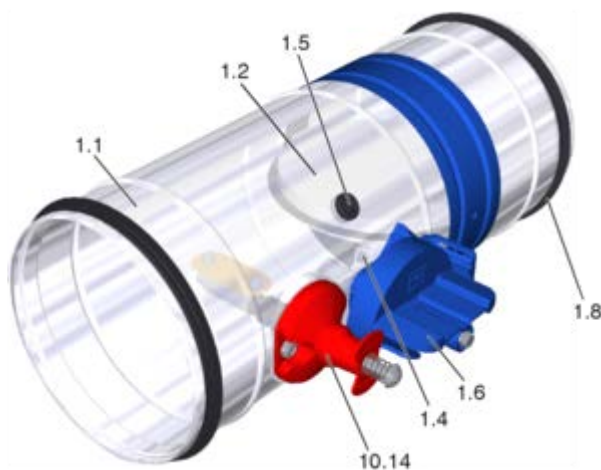


Fig. 9: FKRS-EU with fusible link

- 1.1 Casing
- 1.2 Damper blade with sealing ring
- 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 device 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.

4.3 FKRS-EU with spring return actuator

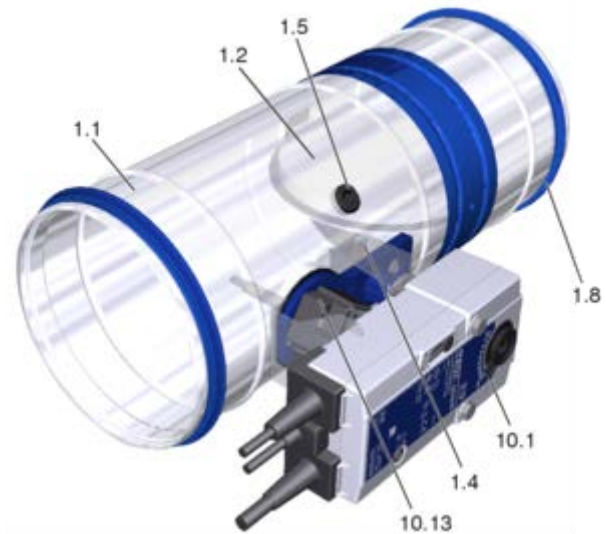


Fig. 10: FKRS-EU with spring return actuator

- 1.1 Casing
- 1.2 Damper blade with sealing ring
- 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.

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

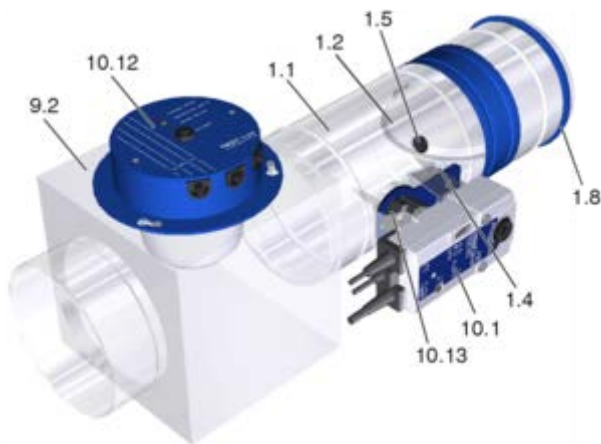


Fig. 11: FKRS-EU with spring return actuator and duct smoke detector

- 1.1 Casing
- 1.2 Damper blade with sealing ring
- 1.4 Travel stop for CLOSED position
- 1.5 Inspection access (12 mm)
- 1.8 Lip seal
- 9.2 Rectangular duct, customer supply
- 10.1 Spring return actuator
- 10.12 Duct smoke detector RM-O-3-D (Fastening in the rectangular duct, customer-supplied)
- 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 damper closes when at least one of the following is true:

- 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 by the customer in a rectangular duct. Fig. 12 .

Alternatively, the installation is carried out on-site in a round air duct with T-piece, Fig. 13 .

As a rule, the duct smoke detector is to be positioned at the top. Deviating arrangements are permissible. In Germany, the general building inspectorate licence of the duct smoke detector must be observed.



Fig. 12: FKRS-EU with spring return actuator and duct smoke detector in a rectangular duct

- 1 FKRS-EU
- 9.2 Rectangular duct, customer supply
- 10.12 Duct smoke detector



Fig. 13: FKRS-EU with spring return actuator and duct smoke detector in a circular duct

- 1 FKRS-EU
- 9.15 T-piece or saddle connector, on-site
- 10.12 Duct smoke detector

4.5 FKRS-EU with fusible link and cover grille on both sides as an upstream shutter for the air transfer unit

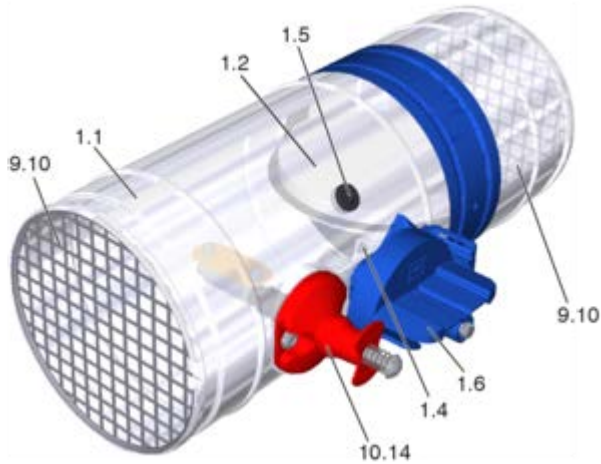


Fig. 14: FKRS-EU with fusible link and cover grille on both sides as an upstream shutter for the air transfer unit

- 1.1 Casing
- 1.2 Damper blade with sealing ring
- 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 device 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 thermal release mechanism 72 °C and cover grilles on both sides; it does not include a duct smoke detector.

Note:

Crossflow fasteners may require a building inspectorate licence. This must be checked and applied for by the client.

For installation in Germany please note:

If a fire damper with only a mechanical shut-off element is to be used as an air transfer unit, the local building regulations apply. Such air transfer units are usually only used for pressure differential systems.

4.6 FKRS-EU with spring return actuator and duct smoke detector used as an air transfer damper

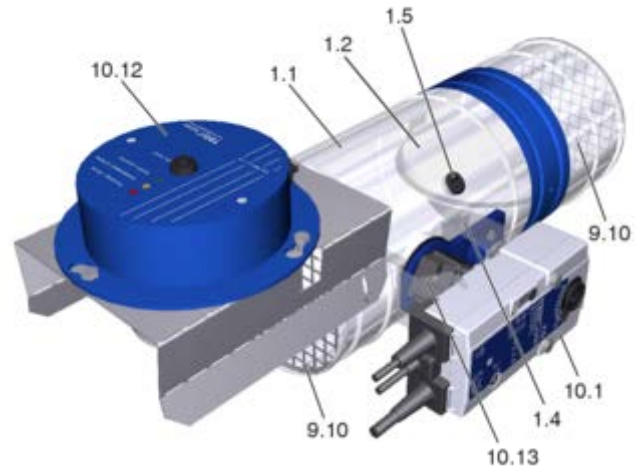


Fig. 15: FKRS-EU with spring return actuator and duct smoke detector as air transfer damper

- 1.1 Casing
- 1.2 Damper blade
- 1.4 Travel stop for CLOSED position
- 1.5 Inspection access
- 9.10 Cover grille
- 10.1 Spring return actuator
- 10.12 Duct smoke detector RM-O-3-D (fixed with bracket)
- 10.13 Thermoelectric release mechanism with temperature sensor

The variant with bracket is intended for installation just below the ceiling. In this case the duct smoke detector is to be fitted at the top right, left or centrally in front of the cover grille. It can be mounted on the drive side or on the non-drive side.

Functional description

If the duct smoke detector detects smoke, the spring return actuator closes the damper blade. This prevents smoke from being transferred to 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 damper closes when at least one of the following is true:

- 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 air transfer damper consists of the FKRS-EU fire damper with a thermal release mechanism 72 °C, cover grilles on both sides and a duct smoke detector.

For more information on the installation and use of the fire damper as an air transfer damper in Germany see general type approval Z-6.50-2516.

5 Installation

5.1 Overview of installation situations

i Note

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

Fire dampers with stainless steel casing (FKRS-EU-2/... version) have a performance class up to EI 90 S for all subsequent applications due to an update of EN 15882.

Overview of 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	Chapter
Solid walls	In	75	EI 120 S ⁴	N	↳ 54
		75	EI 90 S	N	↳ 54
	in, combined installation	100	EI 90 S	N	↳ 57
	in, multiple installation	100	EI 90 S	N	↳ 59
	in, partly with mineral wool	100	EI 90 S	N	↳ 62
	in, underneath flexible ceiling joint	100	EI 90 S	N	↳ 64
	in, installation block ER	100	EI 90 S	E	↳ 65
	in, installation kit TQ2	100	EI 120 S ⁴	E	↳ 66
	on the face of, installation kit WA2	100	EI 90 S	E	↳ 67
	remote from, wall attachment, installation kit WE2	100	EI 120 S ⁴	E	↳ 69
	remote from, wall penetration, installation kit WE2	100	EI 120 S ⁴	E	↳ 74
	Remote from, mineral wool insulation	100	EI 60 S	T	↳ 79
	Remote from, mineral wool insulation, fire batt	100	EI 60 S	T	↳ 80
	in, fire batt	100	EI 120 S ⁴	W ¹	↳ 81
		100	EI 90 S	W ¹	↳ 81
		100	EI 60 S	W ¹	↳ 81
	in, fire batt, multiple installation	100	EI 90 S	W ¹	↳ 84
	in, combined penetration seal	100	EI 90 S	W ¹	↳ 38
	in, fire protection block bulk-head	100	EI 90 S	T	↳ 38

¹⁾ The class of performance depends on the installation details

²⁾ Thickness increased near the installation opening

³⁾ Depending on local conditions

⁴⁾ Up to EI 90 S with stainless steel casing

N = Mortar-based installation

E = Installation kit

W = Fire batt

E = Dry mortarless installation

Overview of 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	Chapter
Metal stud walls	In	94	EI 120 S ⁴	N ¹	🔗 93
		94	EI 90 S	N ¹	🔗 93
		80	EI 60 S	N ¹	🔗 93
		75	EI 30 S	N ¹	🔗 94
	in, underneath flexible ceiling joint	94	EI 120 S ⁴	N	🔗 93
	in, combined installation	94	EI 90 S	N ¹	🔗 98
	in, multiple installation	94	EI 90 S	N ¹	🔗 100
	in, without installation kit	94	EI 60 S	T	🔗 103
	in, installation kit TQ2	94	EI 120 S ⁴	E ¹	🔗 104
		94	EI 90 S	E ¹	🔗 104
		80	EI 60 S	E ¹	🔗 104
		75	EI 30 S	E	🔗 104
	In, underneath flexible ceiling joint, installation kit TQ2	94	EI 120 S ⁴	E	🔗 104
	remote from, wall penetration, installation kit WE2	94	EI 90 S	E	🔗 109
	Remote from, wall penetration, mineral wool insulation	94	EI 60 S	T	🔗 115
	Remote from, mineral wool insulation, fire batt	94	EI 60 S	T	🔗 116
	in, direct installation, installation kit GL2	94	EI 90 S	T	🔗 117
	in, flexible ceiling joint, installation kit GL2	100	EI 90 S	E	🔗 118
	in, fire batt	94	EI 120 S ⁴	W ¹	🔗 127
		94	EI 90 S	W ¹	🔗 127
		80	EI 60 S	W ¹	🔗 127
		75	EI 30 S	W ¹	🔗 127
in, fire batt, multiple installation	100	EI 90 S	W ¹	🔗 133	
in, combined penetration seal	100	EI 90 S	W ¹	🔗 38	
in, fire protection block bulk-head	100 – 200	EI 90 S	T	🔗 38	
Timber stud walls	In	130	EI 120 S ⁴	N	🔗 139
		130	EI 90 S	N	🔗 139

¹⁾ The class of performance depends on the installation details
²⁾ Thickness increased near the installation opening
³⁾ Depending on local conditions
⁴⁾ Up to EI 90 S with stainless steel casing

N = Mortar-based installation
 E = Installation kit
 W = Fire batt
 E = Dry mortarless installation

Overview of 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	Chapter
		110	EI 60 S	N	↗ 139
		105	EI 30 S	N	↗ 139
	in, combined installation	130	EI 90 S	N	↗ 141
	in, multiple installation	130	EI 90 S	N	↗ 146
	in, installation kit TQ2	130	EI 120 S ⁴	E	↗ 150
		110	EI 60 S	E	↗ 150
		105	EI 30 S	E	↗ 150
	Remote from, mineral wool insulation	130	EI 60 S	T	↗ 152
	Remote from, mineral wool insulation, fire batt	130	EI 60 S	T	↗ 154
	in, fire batt	130	EI 120 S ⁴	W	↗ 156
		130	EI 90 S	W	↗ 156
		110	EI 60 S	W	↗ 156
		105	EI 30 S	W	↗ 156
	in, fire batt, multiple installation	130	EI 90 S	W ¹	↗ 165
	in, combined penetration seal	130	EI 90 S	W ¹	↗ 38
	Half-timbered constructions	In	140	EI 120 S ⁴	N
		140	EI 90 S	N	↗ 142
		110	EI 30 S	N	↗ 142
in, combined installation		140	EI 90 S	N	↗ 144
in, multiple installation		140	EI 90 S	N	↗ 146
in, installation kit TQ2		140	EI 120 S ⁴	E	↗ 151
		140	EI 90 S	E	↗ 151
		110	EI 30 S	E	↗ 151
Remote from, mineral wool insulation		140	EI 60 S	T	↗ 153
Remote from, mineral wool insulation, fire batt		140	EI 60 S	T	↗ 155
in, fire batt		140	EI 120 S ⁴	W	↗ 161
		140	EI 90 S	W	↗ 161
		110	EI 30 S	W	↗ 161
in, fire batt, multiple installation		140	EI 90 S	W ¹	↗ 165

¹⁾ The class of performance depends on the installation details

²⁾ Thickness increased near the installation opening

³⁾ Depending on local conditions

⁴⁾ Up to EI 90 S with stainless steel casing

N = Mortar-based installation

E = Installation kit

W = Fire batt

E = Dry mortarless installation

Overview of 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	Chapter
Solid wood/CLT walls	In	95	EI 90 S	N	↳ 171
	in, installation kit TQ2	95	EI 90 S	E	↳ 173
	Remote from, mineral wool insulation	100	EI 60 S	T	↳ 174
	Remote from, mineral wool insulation, fire batt	100	EI 60 S	T	↳ 175
	in, fire batt	95	EI 90 S	W	↳ 176
Shaft wall with metal support structure	In	90	EI 90 S	N	↳ 181
		90	EI 60 S	N	↳ 181
		90	EI 30 S	N	↳ 181
	in, combined installation	90	EI 90 S	N	↳ 184
	in, installation kit TQ2	90	EI 90 S	E	↳ 186
	on the face of, installation kit WA2	90	EI 90 S	E	↳ 188
	in, fire batt	90	EI 60 S	W	↳ 189
Shaft wall without metal support structure	In	90	EI 90 S	N	↳ 193
	in, installation kit TQ2	90	EI 90 S	E	↳ 194
	on the face of, installation kit WA2	90	EI 90 S	E	↳ 195
Sandwich panel walls	in, fire protection block bulk-head	100 – 200	EI 90 S	T	↳ 38
Solid ceiling slabs	In	100 (150) ²	EI 120 S ⁴	N	↳ 198
		100	EI 90 S	N	↳ 198
	in, combined installation	150	EI 90 S	N	↳ 201
	in, multiple installation	150	EI 90 S	N	↳ 203
	In, with concrete base	100	EI 120 S ⁴	N	↳ 205
	in, with concrete base, combined assembly	100	EI 90 S	N	↳ 206
	in, with concrete base, multiple mounting	100	EI 90 S	N	↳ 208
	in, hollow concrete block ceilings	150	EI 90 S	N	↳ 210
	in, hollow core slabs	150	EI 90 S	N	↳ 211
	in, ribbed ceilings	150 ²	EI 90 S	N	↳ 212
	in, composite ceilings	150	EI 90 S	N	↳ 213

¹⁾ The class of performance depends on the installation details

²⁾ Thickness increased near the installation opening

³⁾ Depending on local conditions

⁴⁾ Up to EI 90 S with stainless steel casing

N = Mortar-based installation

E = Installation kit

W = Fire batt

E = Dry mortarless installation

Overview of 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	Chapter
	In, combined with wooden beam ceilings	150	EI 90 S	N	☞ 214
	in, combined with solid wood ceiling	150	EI 90 S	N	☞ 215
	In, combined lightweight ceiling, Cadoldo system	150	EI 120 S ^{1,4}	N	☞ 216
	In, combined lightweight ceiling, system ADK modular space	125	EI 90 S	N	☞ 217
	In, combined, FireShield®	150	EI 90 S	N	☞ 228
	in, installation block ER	100 (150) ²	EI 90 S	E	☞ 219
	on the face of, installation kit WA2	150	EI 90 S	E	☞ 221
		150	EI 60 S	E	☞ 221
	underneath (horizontal duct), installation kit WE2	125	EI 90 S	E	☞ 223
	above (horizontal duct), installation kit WE2	125	EI 90 S	E	☞ 223
	in, fire batt	100 (150) ²	EI 120 S ⁴	W ¹	☞ 229
100 (150) ²		EI 90 S	W ¹	☞ 229	
Solid wood ceilings	In	140	EI 90 S	N	☞ 232
		112.5	EI 90 S	N	☞ 232
	in, installation kit TQ2	140	EI 90 S	E	☞ 233
		112.5	EI 90 S	E	☞ 233
Wooden panel elements	In	140	EI 90 S	N	☞ 234
	in, installation kit TQ2	140	EI 90 S	E	☞ 235
Wooden beam ceilings	In	167.5	EI 90 S	N	☞ 236
		155	EI 60 S	N	☞ 236
		142.5	EI 30 S	N	☞ 236
	in, installation kit TQ2	167.5	EI 90 S	E	☞ 238
		155	EI 60 S	E	☞ 238
		142.5	EI 30 S	E	☞ 238
	in, historic wooden beam ceilings	– ³	EI 30 S	N	☞ 240

¹⁾ The class of performance depends on the installation details

²⁾ Thickness increased near the installation opening

³⁾ Depending on local conditions

⁴⁾ Up to EI 90 S with stainless steel casing

N = Mortar-based installation

E = Installation kit

W = Fire batt

E = 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.

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.
 - Before installation: Perform a functional test, then close the fire damper ↪ 249.
 - Do NOT remove the product sticker or the adhesive tape from the damper.
 - 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.
 - To ensure that the fire damper can be connected to the ductwork after installation even if the wall or ceiling is fairly thick, you should extend the fire damper with a suitable extension piece (attachment or by others) on the installation side, ↪ Chapter 6 'Accessories' on page 247.
 - 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.
 - The following applies unless stated otherwise in the installation details:
 - Each fire damper is to be installed in its own installation opening. Distance between two fire dampers ≥ 200 mm.
 - The distance to uncovered steel beams is ≥ 75 mm.
 - No more than two fire dampers in the same installation opening.
 - Fire dampers may be installed in mortar-based and fire batt installations at a distance of ≥ 40 mm from wooden beams or wooden ceilings and steel beams with fire protection cladding. In dry mortarless installation with installation kit TQ2, the distance is 55 mm with a shortened orifice plate. The fire-resistant cladding must be manufactured in accordance with a national or European certificate and must have full surface contact (no cavities) with the supporting structure.
 - 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 must be ensured by other, e.g., by switching off the fan or by mutual interlocking in the case of the construction with a spring return actuator.
 - The interior of the fire damper must be accessible for maintenance and cleaning. For this purpose, Type FKRS-EU fire dampers have an inspection access that is closed with a rubber stopper ↪ 20. 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.
 - When mounting two fire dampers side by side and arranging the drives between the fire dampers, provide sufficient clearance for inspection.
 - Load-bearing structures
This includes solid ceiling slabs, concrete beams and load-bearing solid walls.
 - Distance to fire-rated partitions
The minimum distances between a partition and other openings or installations, e.g. fire dampers, are usually given in the usability certificates of each partition. A partitioning panel must not be located in the direct installation area of the fire damper (installation in separate installation opening, exception: combined penetration seal and fire protection brick bulkhead).
 - Connecting duct and extension piece
It is possible to insert screws near the spigots for fixing.

General installation information

After installation

- Clean the fire damper.
- 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.
- Connect the ductwork.
- Make electrical connections.

Flexible connectors

- 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
 - Fire batt systems
 - Fire protection bricks

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.

Potential equalisation

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

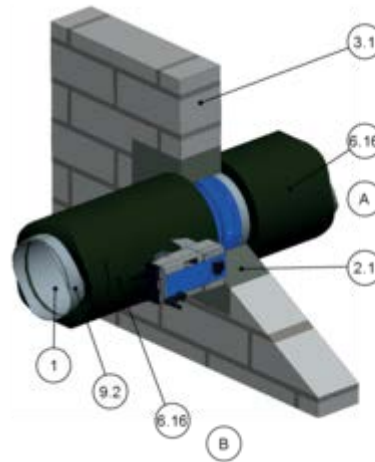
In the event of a fire, loads from the equipotential bond must not affect the fire damper.

Thermal insulation

As suitable insulating materials, especially for outdoor air or exhaust air components, you can use fully bonded panels made of elastomer foams (synthetic rubber), e.g. Armaflex Ultima from Armacell. Be sure to comply with the relevant national guidelines and regulations for combustible building materials and smoke development 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 remain accessible.
- The insulation does not penetrate walls or ceilings.



GR3893710, A

Fig. 16: Thermal insulation

- 1 FKRS-EU
- 2.1 Mortar
- 3.1 Solid wall
- 6.16 Perimeter insulation (elastomer foam, flame-resistant, non-dripping); actuator and release mechanism, inspection accesses and product sticker must be accessible
- 9.2 Air duct/extension piece

Note: The installation situation shown applies to all supporting constructions.

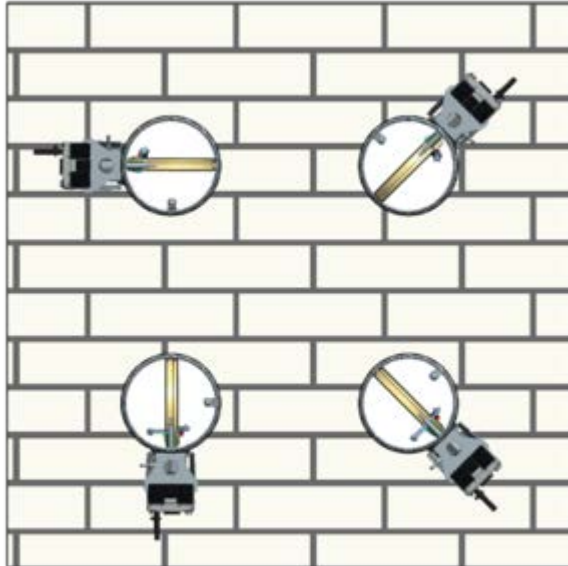
For installation in Germany please note:

In Germany, only insulation materials with a fire behaviour of at least C - s2, d0, may be used according to the specifications of the MVV TB (since 2019/1). This requirement is met by Armaflex Ultima insulation material from Armacell, for example. The applicable local building regulations have to be observed.

For information on the use of elastomer foams see *‘Additional provision for use in Germany:’ on page 8.*

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.



GR3893730, A

Fig. 17: Installation positions

If a duct smoke detector is installed in the connected duct, it must be positioned at the top. You may choose a different arrangement as long as you comply with the general building inspectorate licence/ general type certification for the duct smoke detector.



GR3925254, A

Fig. 18: FKRS-EU with spring return actuator and duct smoke detector

Y Keep clear for operation and maintenance

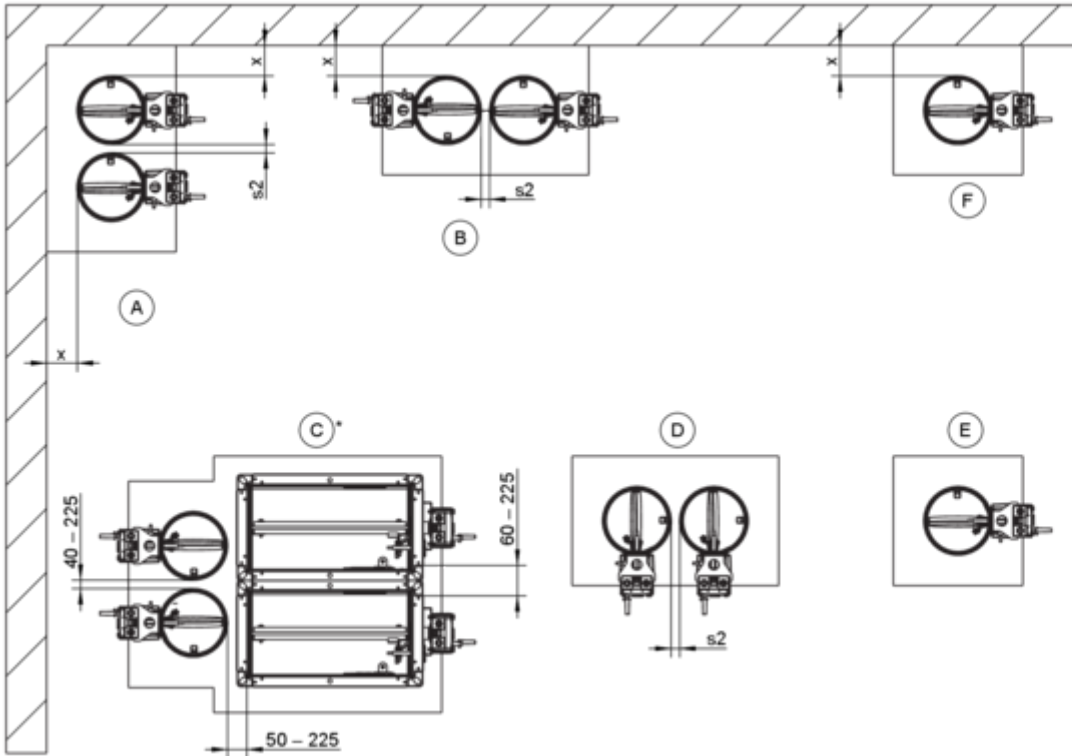


GR3905661, A

Fig. 19: FKRS-EU with spring return actuator and duct smoke detector used as an air transfer damper

Y Keep clear for operation and maintenance

Distances



GR3893796, A

Fig. 20: Overview of distances

* Combined installation with fire damper type FK2-EU

Distances (unless stated otherwise in the 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 TQ2 ^{1,2}	100 / 55 ⁵	≥ 200
Dry mortarless installation with installation kit 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, φ 'Installation orientation (see installation details for fire resistance)' on page 33

⁴ Solid wall only

⁵ With shortened cover plate

⁶ Distance between installation block(s)

Installation orientation (see installation details for fire resistance)

Supporting construction	Installation type		
	Mortar-based installation	Dry mortarless installation	Coated board system installation
Solid wall	A – F	E	A, B, D – F
Gypsum wallboard with W = 80 – < 100 mm	E, F		
Lightweight partition wall with metal support structure	A – F	E, F	A, B, D – F
Timber stud wall/half-timbered construction	A – F	E, F	A, B, D – F
Solid wood wall/CLT wall	A, B, D – F	E, F	E, F
Shaft wall with metal support structure	A – F	E, F	E, F
Asymmetrical shaft wall	E	E	
Shaft wall without metal support structure	E	E	
Sandwich panel wall		E *	
Solid ceiling slab	A – F	E	E
FireShield®	E		
Hollow chamber ceiling, hollow concrete block ceiling, composite ceiling, ribbed ceiling	A, B, D – F		
Combined with a lightweight ceiling (Cadolto system)	A, B, D – F		
In combination with lightweight ceiling (ADK Modulraum system)	A, B, D – F	E	
In/combined with a solid wood ceiling	E/A, B, D – F	E/–	
Wooden panel elements	E	E	
In/combined with a wooden beam ceiling	E/A, B, D – F	E/–	
In historical wood beam ceilings	E		

* The following applies to Germany: Installation requires a project-related type approval.

Perimeter gap »s1«

- For mortar-based installation, the perimeter gap »s1« is limited to 225 mm (wall and ceiling). The perimeter gap must be large enough so that installation and filling with mortar are possible, in even in case of thicker walls or ceilings. Larger wall openings must be sealed beforehand, matching the type of wall. In case of larger openings in solid ceilings, the dampers can be encased in concrete during construction of the ceiling section. The minimum gap can be reduced, but must be large enough so that mortar can be filled in. We recommend a mortar gap of at least 20 mm (note the minimum installation opening size). Provide reinforcement according to structural requirements.

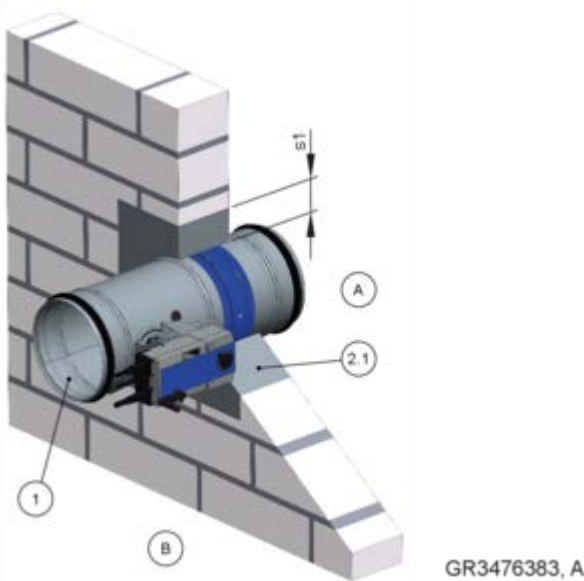


Fig. 21: Perimeter gap

- 1 FKRS-EU
- 2.1 Mortar
- s1 Perimeter gap

Limitations of maximum gap widths are based on the specifications of European standard EN 15882-2. Larger mortar gaps do not have a negative effect on fire protection and are, in our opinion, harmless.

Mortar-based installation

- Cover all openings and control elements of the fire damper, e.g. with plastic, to protect them from contamination (if necessary).
- Push the fire dampers into the installation opening in a centred manner and secure them. The distance from the spigot on the operating side to the wall/ceiling 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.
- In case of mortar-based installation, the open spaces between the fire damper casing and the wall or ceiling must be closed off with mortar. Entrapped air must be avoided. The mortar bed depth should be equal to the thickness of the wall, but must be at least 100 mm.
- The bond between the mortar and the supporting structure must be ensured on site. If necessary, create a form-fit connection, e.g., screws in the installation opening for mortar-based installation in wooden beam ceilings.
- If you install the fire damper during the construction of the solid wall or solid ceiling, perimeter gap »s1« is not required. Any cavities between the fire damper and the wall must be closed off with mortar. For installation into solid ceilings, open spaces can be filled with concrete. Provide reinforcement according to structural requirements.
- For lightweight partition walls, the mortar bed depth should be equal to the thickness of the wall. If reveals with appropriate fire resistance are used, a mortar bed depth of 100 mm is sufficient.

Mortar

- DIN 1053: Groups II, IIa, III, IIIa; or fire protection mortar of groups II, III
- EN 998-2: Classes M 2.5 to M 20 or fire protection mortar of classes M 2.5 to M 20
- Fireproof mortar to BS 476: Part 20
- Mortar or fire protection mortar that has been verified by an ETA
- Equivalent mortars that meet the requirements of the above standards, gypsum mortar, or concrete

Installation without mortar-mix

For installation without mortar-mix, installation blocks or installation kits can be used:

- in walls and ceilings: ER, TQ2
- onto walls and ceilings: WA2
- remote from walls and ceilings: WE2
- into lightweight partition walls with sliding ceiling connection: GL2

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.

Use dry wall screws that are long enough.

■ Installation block ER

- Only installation in solid walls and ceilings without hollows. If hollows are present, they must be completely sealed with mortar all around to a depth of ≥ 100 mm.
- The installation block ER is factory-mounted on the fire damper, ↗ 5.4.2 'Installation block ER' on page 45 .
- The installation of the installation block is always centred in the installation opening.
- Circular installation opening ER: $\varnothing D1$, ↗ 5.4.1 'Overview of installation block and installation kits' on page 44 .

■ Installation kit TQ2

- The installation kit TQ2 is mounted on the fire damper on site, ↗ 5.4.3 'Installation kit TQ2' on page 46 .
- Make square installation opening with nominal width + 110 mm.
- The installation of the TQ2 installation kit is always centred in the installation opening.
- If specified in the installation details, the cover plates of the installation kit TQ2 can be proficiently shortened on one side for installation near the ceiling and floor.
As a replacement for the missing fixings, fixing screws must be provided on the H-sides of the orifice plate close to the floor or ceiling.

■ Installation kit WA2

- The WA2 installation kit is mounted on the fire damper on site, ↗ 5.4.4 'Installation kit WA2' on page 47
- Installation is carried out on solid walls and ceilings in front of a core drill hole nominal width + 10 – 30 mm. If hollows are present in the wall/ceiling, they must be completely sealed with mortar all around to a depth of ≥ 100 mm.
- The installation is carried out on a mortared-in, wall-flush shortened air duct with additional reinforcing board made of calcium silicate, $d = 30 - 50$ mm or mineral wool, ≥ 1000 °C, ≥ 140 kg/m³, $d = 50$ mm.

- Installation is carried out on shaft walls with and without a metal support structure and cladding on one side with a round installation opening with nominal width + 5 mm, fastening of the installation kit by means of push-through mounting.

■ Installation kit WE2

- The installation kit WE2 is mounted on the fire damper on site, ↗ 5.4.5 'Installation kit WE 2' on page 48 .
- Installation is carried out on sheet steel ducts without any openings, with fire-resistant cladding made of:
 - Promatect® LS35 (d = 35 mm)
 - Promatect® L500 (d = 40 mm)
 - Promatect® AD40 (d = 40 mm)
- The wall/ceiling connections must be made in accordance with these instructions and the supplementary assembly instructions WE2.
- Enough clear space is required to mount the installation kit onto the fire damper.
- Fire dampers installed remote from walls and ceilings need to be suspended or fixed. Suspension systems with $L \geq 1.5$ m require fire-resistant insulation. Use cladding or mineral wool insulation according to the manufacturer's specifications.
- No installation remote from walls with flexible ceiling joint
- For more installation details and for components to be provided by others, see the supplementary installation manual WE2.

■ Installation kit GL2

- The installation kit GL2 is mounted on the fire damper on site and adapted to the existing wall thickness, ↗ 5.4.6 'Installation kit GL2' on page 49 .
- The installation is carried out in metal stud walls clad on both sides.
- The installation is carried out near the ceiling under a solid ceiling slab and must be fixed to the ceiling with the supplied brackets.
- When installing with no ceiling fastening on the rear side, the steel angles Fig. 36 and the cover Fig. 37 must be made by the customer.
- For further installation details and components to be provided by the customer, see additional assembly instructions for the sliding ceiling connection.

Mineral wool as filling material

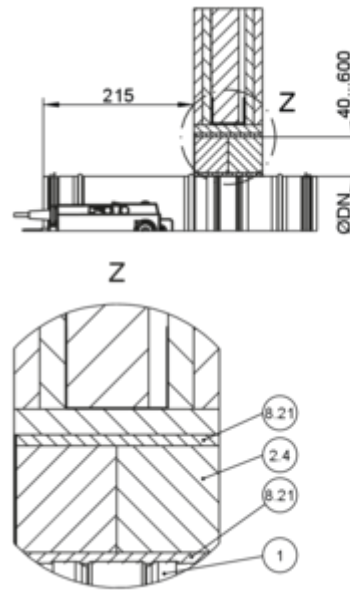
Unless otherwise stated in the installation details, mineral wool with a gross density of ≥ 80 kg/m³ and a melting point of ≥ 1000 °C must be used.

Installation remote from walls with mineral wool

- Installation is carried out on sheet steel ducts without any openings, with fire-resistant cladding.
- The following materials are acceptable for the cladding of fire dampers and ducts:
 - PAROC HVAC Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$)
- The wall connections must be made in accordance with these instructions. Fittings must be configured according to PAROC specifications.
- When installing in conjunction with fire batt, use "PAROC Pyrotech Slab 140".

Installation in coated board system

- The distance from the operating side spigot to the wall/ceiling has to be 215 mm for installation into fire batt systems.
- Fire batt systems consist of two layers of mineral wool slabs, gross density $\geq 140 \text{ kg/m}^3$ and must be provided by the customer.
- The mineral wool boards must be glued tightly into the installation opening with fire protection sealant. 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 firestop coating to the mineral wool panels, joints, transitions and to any damage on the pre-coated mineral wool panels; coating thickness $\geq 2.5 \text{ mm}$.
- Depending on the selected installation situation and fire resistance duration, the fire damper casings must be partially coated, thickness $\geq 2.5 \text{ mm}$. The drive and release unit as well as the product label must not be coated.
Permitted alternatives:
 - Mineral wool strips $> 1000 \text{ }^\circ\text{C}$, $> 80 \text{ kg/m}^3$, 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 $\S 8$.
- Fix fire dampers on both sides of the wall/ceiling; for deviations, see \S Chapter 5.15.3.1 'Duct, horizontal' on page 243.
- For installation into walls and fixing to the ceiling (see $\S 242$), combinations with sliding ceiling connections are not possible.
- If the wall/ceiling is fairly thick, you must use additional layers of mineral wool slabs on side A.
- Only installation in solid walls and ceilings without hollows. If hollows are present, they must be completely sealed with mortar all around to a depth of $\geq 100 \text{ mm}$.



GR3894955, A

Fig. 22: Fire-resistant sealant

- 1 FKRS-EU
- 2.4 Coated board system
- 8.21 Fire-resistant sealant

Fire batt systems

The fire batt systems listed below can be used. All rock wool slabs belonging to the system can be used if they are listed in the ETA (European Technical Assessment) of the system.

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

FLAMRO

- BML Fire protection coating ablative
- BMS Fire protection sealant ablative

Rockwool

- Firestop coating FIREPRO® Acoustic Intumescent Sealant
- Firestop sealant FIREPRO® Acoustic Intumescent Sealant

KBS

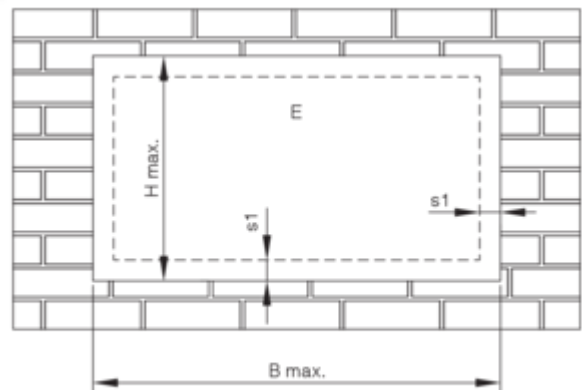
- Firestop coating KBS Coating
- Firestop sealant KBS Sealant

In addition to the listed fire batt systems, alternative fire batt systems with ablative coatings can be used if they fulfil the following requirements:

- Non-flammable slab material, melting point $\geq 1000^{\circ}\text{C}$, minimum thickness 50 mm

- Minimum density of the panel material 140 kg/m^3
- Ablative coating, fire behaviour at least class E... according to EN 13501-1
- Test certificate in accordance with EN 1366-3 (submission of a valid ETA is sufficient as proof of suitability, provided the required information is included). The suitability of the fire batt systems in terms of fire resistance is tested on site

Dimensions and distances for coated board system for wall installation



GR3420162, D

Fig. 23: Fire batt – installation in solid walls and ceilings, lightweight partition, timber stud wall, half-timbered construction and solid wood walls

E Installation area

Fire batt system	B max. [mm]	H max. [mm]
Promat®	≤ 3750	≤ 1840
Hilti	≤ 3000	≤ 2115
Hensel	≤ 1900	≤ 1400
SVT		
OBO Bettermann		
Würth		
AGI		
FLAMRO®		
Rockwool		
KBS		

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

General installation information

Installation with combined penetration seal

Combined penetrating installation of FKRS-EU and FK2-EU fire dampers, together with cables and pipes in a Hilti soft penetration seal system (CFS-CT, CP 670 and CP 673), are permitted in the TROX combined penetration seal. The positions of the fire dampers, pipes and cables in the combined penetration seal are irrelevant as long as the specified distances are kept. Bulkhead sizes up to $B1 \times H1 = 3000 \times 2000$ mm are possible.

Installation is permitted in solid walls, as well as lightweight partition walls with metal or timber support structure and solid wood walls.

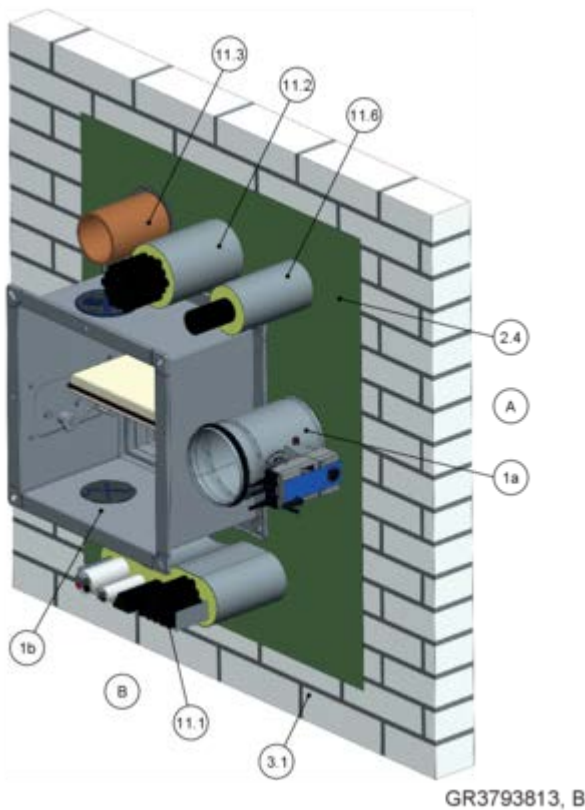


Fig. 24: Combined penetration seal (drawn solid wall)

- 1a FKRS-EU
- 1b FK2-EU
- 2.4 Coated board system with firestop coating
- 3.1 Solid wall
- 11.1 Cable tray
- 11.2 Cable bundle
- 11.3 Pipe penetration
- 11.6 Cable gland

Additional provision for use:

- Use of FK2-EU and FKRS-EU with combined penetration seal in accordance with ETA-21/0528.

Note: For more information on the combined penetration seal refer to the installation and operating manual for the combined penetration seal.

Installation in fire protection block bulkhead

- Fire damper penetrations are permitted with fire protection blocks (CFS-BL) in solid walls, lightweight partition walls with metal support structures and sandwich panel walls.

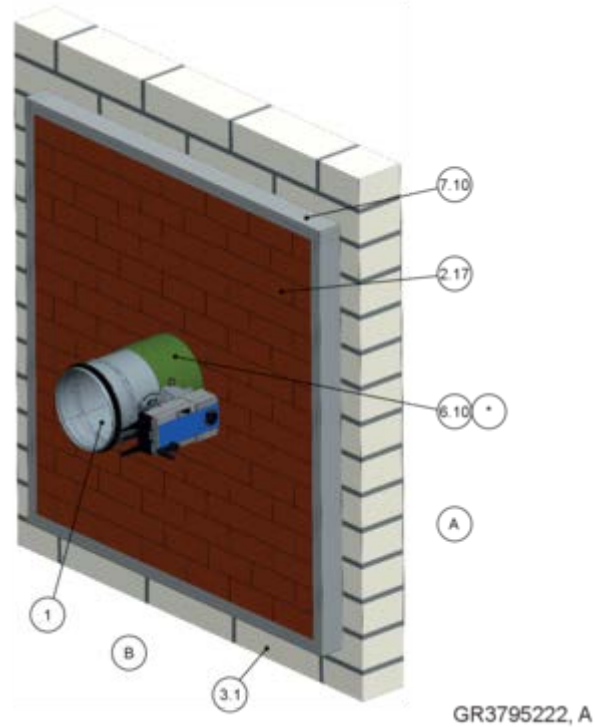


Fig. 25: Fire protection stone bulkhead (single penetration)

- 1 FKRS-EU
- 2.17 Fire protection block Hilti CFS-BL
- 3.1 Solid wall
- 6.10 Ablative coating around the perimeter, $d =$ at least 2.5 mm
- 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
- 6.20 Sleeve (to be ordered separately)
- 6.24 Elastomeric foam (flame-resistant, non-dripping)
The following applies in Germany: For notes on the use of elastomeric foams ↪ 'Additional provision for use in Germany:' on page 8 .
- 7.10 Trim panels, fire-resistant, double-layered, required for wall thicknesses < 200 mm
- 8.21 Fire-resistant sealant CFS-S ACR CW
- 9.2 Air duct/extension piece
- * 6.19, 6.20 or 6.24 as an alternative

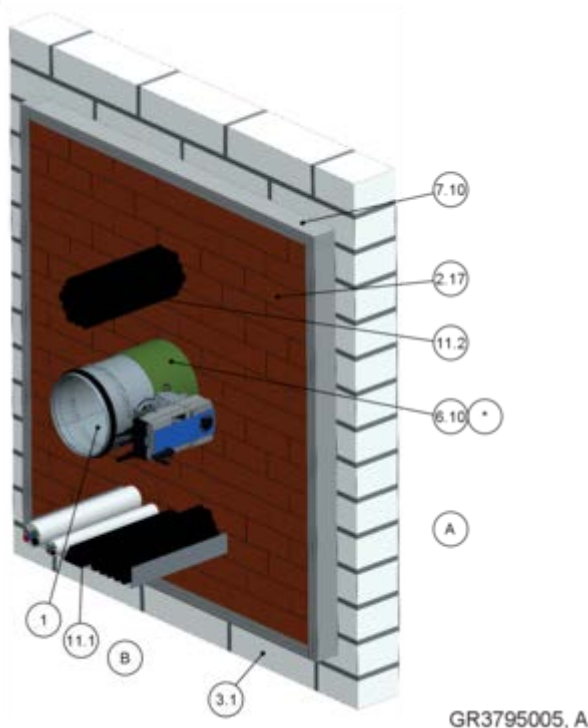


Fig. 26: Fire protection stone bulkhead (mixed execution)

- 1 FKRS-EU
 - 2.17 Fire protection block Hilti CFS-BL
 - 3.1 Solid wall
 - 6.10 Ablative coating around the perimeter, d = at least 2.5 mm
 - 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
 - 6.20 Sleeve (to be ordered separately)
 - 6.24 Elastomeric foam (flame-resistant, non-dripping)
The following applies in Germany: For notes on the use of elastomeric foams ↪ 'Additional provision for use in Germany:' on page 8 .
 - 7.10 Trim panels, fire-resistant, double-layered, required for wall thicknesses < 200 mm
 - 8.21 Fire-resistant sealant CFS-S ACR CW
 - 9.2 Air duct/extension piece
 - 11.1 Cable tray
 - 11.2 Cable set
 - * 6.19, 6.20 or 6.24 as an alternative
- Mixed penetrations of FKRS-EU fire dampers together with cable and cable trays are permitted with a Hilti fire protection brick system (CFS-BL).
 - The positions of the fire dampers, pipes and cables in the fire protection brick bulkhead are arbitrary, provided the specified minimum distances are observed.
Bulkhead sizes up to B1 × H1 = 1000 × 1000 mm are possible.
 - Distance between fire damper and penetration seal edge ≥ 50 mm

- Distance to load-bearing structural elements ≥ 75 mm
- Distance between casings ≥ 200 mm (separate installation opening)
- Distances to cables, cable bundles, cable trays and empty conduits up to 16 mm see additional assembly instructions

Additional provision for use 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 on the fire protection brick bulkhead can be found in the additional assembly instructions for the fire protection brick bulkhead.

5.3.1 Requirements for wall and ceiling systems

FKRS-EU fire dampers may be installed in wall and ceiling systems if these walls and ceilings have been erected in compliance with the relevant regulations, 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.

The structural safety of the wall/ceiling must be ensured (by the customer). Compensation measures, especially with regard to large installation openings, must be determined on a case to case basis (by the customer).

5.3.1.1 Wall systems

■ Solid walls

- Made of concrete, aerated concrete, masonry or solid gypsum wallboards to EN 12859 (without hollows) wallboard thickness $W \geq 80$ mm, raw density ≥ 350 kg/m³.
- Wall thickness $W \geq 100$ mm (≥ 75 mm in case of mortar-based installation).
- Provide each installation opening and cut hole according to the local and structural conditions and with regard to the size of the fire damper.
- Cavities in the supporting structure as a consequence of creating wall penetrations or cutting holes, must be filled before the installation of the fire damper at least 100 mm deep so that the fire resistance of the supporting structure is restored.

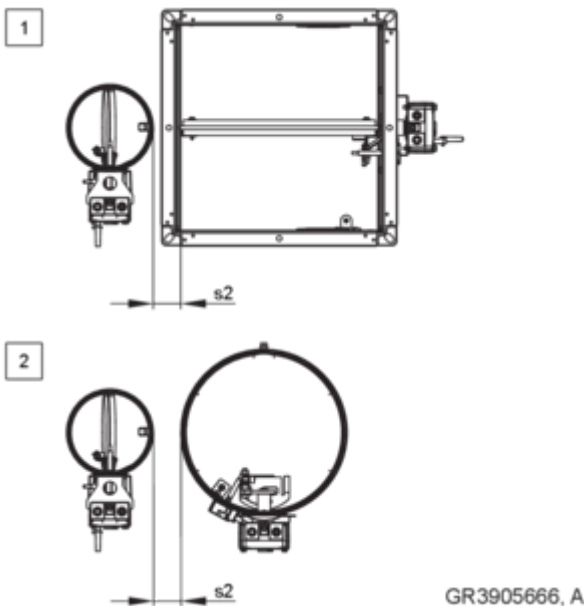


Fig. 27: Distance from the FKRS-EU to other TROX fire dampers in mortar-based installation

Distance between different TROX fire dampers – mortar-based installation into solid walls (one installation opening)

No.	Damper combination up to EI 90 S	s2 [mm]
1	FKRS-EU – FK2-EU	≥ 50
2	FKRS-EU – FKR-EU	≥ 40

■ Metal stud walls

- 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 $W \geq 94$ mm.
- Distance between metal studs ≤ 625 mm; distance between metal studs for compartment walls ≤ 312.5 mm.
- Constructions as fire or safety partition walls can contain sheet steel inserts or steel nets.
- Create an installation opening with trimmer and angle section.
- If necessary, provide trim panels and screw-fix them to the support structure at approx. 100 mm intervals.
- Additional layers of cladding and double stud constructions (if covered by the usability certificate for the wall) are approved.
- Connect the metal sections near the installation opening according to the installation details in this manual.
- If reinforcing boards are required, screw-fix them to the metal support structure at intervals of approx. 100 mm.
- Installation only in non-load-bearing walls (load-bearing wall constructions on request).
- Extension of wall structures with fire-rated plasterboard panels to plasterboard construction panels for EI 30 S to EI 60 S is permitted.
- Additional layers of cladding or reinforcing boards made of the same material as the wall or additional layers of wooden panels are permitted.
- Country-specific lightweight partition walls can be constructed with alternative support structures and wall structures. The geometry of the metal profiles can deviate from standard metal profiles. Use of the FKRS-EU in such walls is permitted if the wall construction has been tested by the wall manufacturer. This also applies to wall structures with metal inserts, metal nets or additional layers of wooden panels. European and national evidence (report or expert opinion, etc.) and also additional tests and classifications carried out by testing institutes are regarded as evidence.

- **Timber stud walls and half-timbered constructions**
 - Lightweight partition walls, either timber stud walls or half-timbered constructions, with European classification to EN 13501-2 or equivalent national classification. This also includes walls in accordance with DIN 4102-4 or EN 1995-1-2, Eurocode 5, provided that the minimum wall thicknesses corresponding to the required fire resistance duration are complied with in the installation area.
 - ≤ 625 mm distance between timber studs; half-timbered constructions ≤ 1000 mm
 - Cladding on both sides made of gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards.
 - Additional layers of cladding and double stud constructions (if covered by the usability certificate for the wall) are approved.
 - Timber support structure, wall thickness $W \geq 130$ mm ($W \geq 110$ with F60, $W \geq 105$ with F30); half-timbered construction, wall thickness $W \geq 140$ mm ($W \geq 110$ with F30).
 - Erect the timber stud wall or half-timbered construction according to the manufacturer's instructions.
 - Additional layers of cladding and double stud constructions (if covered by the usability certificate for the wall) 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 a reinforcing board in the installation area on the operating or installation side to $W \geq 100$ mm).
 - If required, additional gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum board are permitted.
- **Sandwich panel walls**
 - Self-supporting sandwich panels/sandwich panels (sheet steel ≥ 0.5 mm, both ends, mineral wool filling, $\geq 1000^\circ\text{C}$, ≥ 115 kg/m³).
 - Wall thickness ≥ 100 mm – 200 mm
- **Walls of modular systems**
 - Room systems in the steel construction version a with double-layer trim panel made of fire-rated plasterboard panels, composite panels or comparable panel building materials.
 - Modular wall constructions with proven fire resistance properties
 - Additional assembly instructions for manufacturers' room modules according to the module manufacturer's specifications.
 - Mortar-based or dry mortarless installation with installation kits.
 - In dry mortarless installation with installation kits, fire dampers can be installed without a minimum distance under modular ceiling designs with proven fire resistance duration. The orifice plate of the installation kit must be shortened on one side. As a replacement for the missing fixings, fixing screws must be provided on the H-sides of the orifice plate close to the floor or ceiling. Pre-drill the screw holes with $\varnothing 4$ mm.
- **Shaft walls with metal support structure**

Shaft walls or facing shells with metal or steel support structure and European classification according to EN 13501-2 or comparable national classification. Cladding on one side made of gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards. Shaft wall construction EI 30 and EI 60 can be constructed with cladding made of Promatect 100. The fire safety engineering proofs and manufacturer's specifications must be observed.

 - Wall thickness $W \geq 90$ mm.
 - Cladding/reinforcing boards according to installation details.
 - Thickness of the cladding, including the reinforcing board ≥ 55 mm. A reinforcing board can be dispensed with if the thickness of the wall cladding is ≥ 55 mm.
 - Distance between metal support structures ≤ 625 mm.
 - Be sure to follow the manufacturers' instructions for the height, width and thickness of walls.
 - Create an installation opening with trimmer and angle section. If necessary, provide trim panels and screw-fix them to the support structure at approx. 100 mm intervals.
 - The unit is mounted with the operating side (B) on the room end.

■ Asymmetrical shaft walls

- Shaft wall constructions for use in Great Britain with the use of purely national panel building materials and metal profiles.
- Can be used when access is only possible from one side during installation.
- The fire damper is mounted with the operating side (B) on the room end.
- Be sure to follow the manufacturers' instructions for the heights and widths of walls.
- For further information, see "Additional assembly instructions for asymmetrical shaft walls in type FKRS-EU fire dampers".

■ 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.
- Shaft wall between two solid walls, without corners
- Wall thickness $W \geq 50$ mm (in case of installation with WA2, $W \geq 40$ mm).
- If reinforcing boards are required, screw-fix them to the metal support structure at intervals of approx. 100 mm.

5.3.1.2 Ceiling systems

■ 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 where required (unless stated otherwise in the installation details).
- Partial solid ceiling slab, $d \geq 150$ mm when combined with a fire-resistant wooden beam ceiling (also glulam), solid wood ceilings and ceilings from modular systems (except for room-in-room systems).
- Provide each installation opening and cut hole according to the local and structural conditions and with regard to the size of the fire damper.
- Other ceiling types:
 - Hollow concrete block ceilings, $D \geq 150$ mm
 - Hollow core slabs, $D \geq 150$ mm
 - Ribbed ceilings, thickness increased to $D \geq 150$ mm
 - Composite ceilings, $D \geq 150$ mm
- The structural properties of the ceiling and the connection of the mortar/concrete grout to the ceiling or any necessary reinforcement must be checked and taken into account by others.

■ FireShield® ceiling separating elements

- Ceiling separating elements with FireShield® systems secure the access zones with walk-on and waterproof elements made of lightweight concrete or comparable materials.
- Fire resistance up to EI 90 (European and national certificates apply as proof).
- Use of fire dampers with surrounding concrete block according to installation detail.
- The statics and fire resistance duration of the overall construction must be assessed and documented on site.
- Additional assembly instructions for manufacturers' room modules according to the FireShield® manufacturer's specifications.
- The national requirements for the combination of FireShield® separating elements with fire dampers must be checked and observed on site.
- For installation in Germany, please note: Use in FireShield® requires individual type-approval.

■ 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 panel elements

- Panel elements or hollow box elements made of industrially manufactured wooden elements with low weights and high load-bearing strength.
- Elements with or without insulating material filling with proven fire resistance are permissible, provided that a circumferential replacement is installed in the installation area.
- Ceiling cavities must be filled with ceiling construction materials all round by at least 100 mm, with mortar in the case of mortar-based installation.
- The statics and fire resistance duration of the overall construction must be assessed and documented on site.
- Additional assembly instructions for wooden surface and wooden block elements according to the manufacturer's specifications.

■ Wooden beam ceilings

- Wooden beam or glulam construction.
- Ceiling thickness $D \geq 142.5$ mm (ceiling-dependent) with supplementary fire-resistant cladding.

- **Historic wooden beam ceilings**
 - Historic wooden beam ceilings structurally F30 or fire protection-technically F30-approved.
 - The statics and fire resistance duration of the overall construction must be assessed and documented on site.

- **Ceilings of modular systems**
 - Room modules in the steel construction version a with double-layer reveal made of fire-rated plasterboard panels, composite panels or comparable panel building materials.
 - Modular ceiling constructions with proven fire resistance properties
 - Ceiling installation in the ceiling as mortar-based installation with mortar or concrete, alternative installation in the concrete block above the ceiling systems.
 - The statics and fire resistance duration of the overall construction must be assessed and documented on site.
 - Additional assembly instructions for manufacturers' room modules according to the module manufacturer's specifications.

Installation in walls and ceilings with inclination

The use of fire dampers in walls and ceilings with an inclination is permitted if the fire damper remains completely in the inclination plane of the wall/ceiling. The position of the damper blade shaft is horizontal.

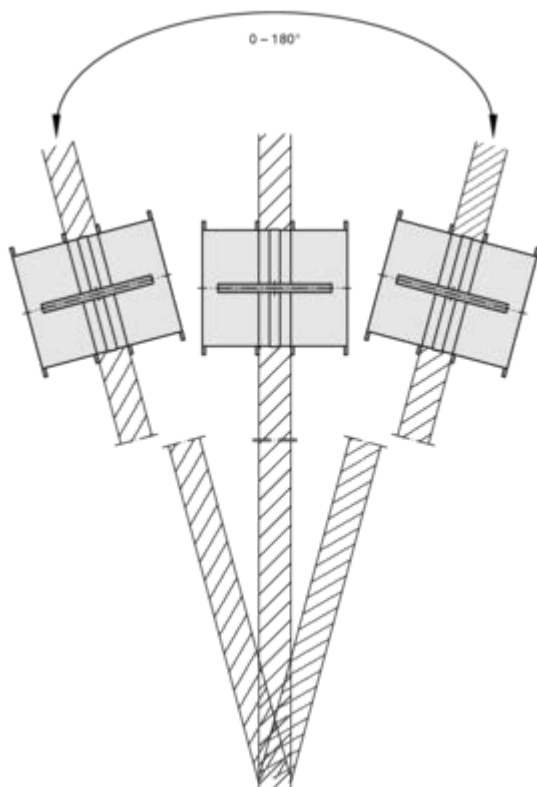
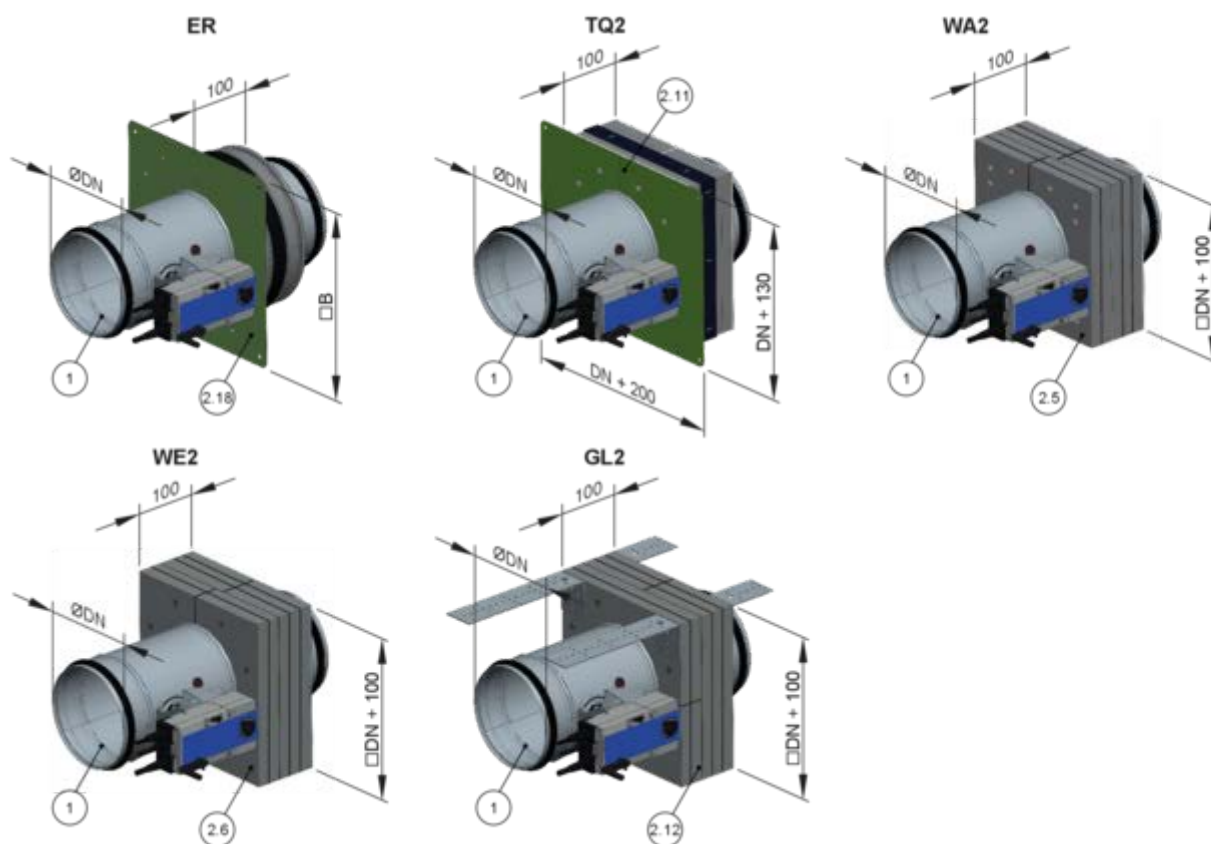


Fig. 28: Installation in walls and ceilings with inclination

5.4 Installation kits

5.4.1 Overview of installation block and installation kits



GR3925788, A

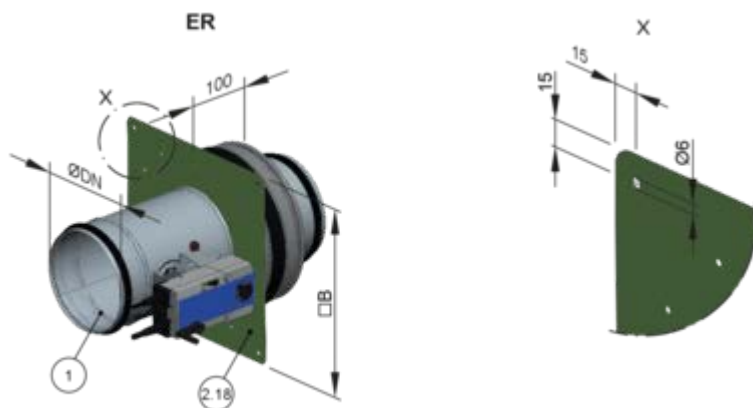
Fig. 29: Overview of installation block and installation kits

- | | | | |
|-----|-----------------------|------|--|
| 1 | FKRS-EU | 2.11 | Installation kit TQ2 |
| 2.5 | Installation kit WA2 | 2.12 | Installation kit GL2 |
| 2.6 | Installation kit WE 2 | 2.18 | Installation block ER with cover plate |

5.4.2 Installation block ER

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

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



GR3925788, A

Fig. 30: Supply package and installation of installation block ER for dry mortarless installation

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

Dimensions of installation opening/cover plate [mm]										
nominal size	100	125	150	160	180	200	224	250	280	315
ØDN	99	124	149	159	179	199	223	249	279	314
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 ceilings

5.4.3 Installation kit TQ2

Installation kit TQ2 for dry mortarless installation into walls

- Installation kit TQ2 is supplied separately and has to be installed by others.
- The installation kit can also be ordered subsequently.

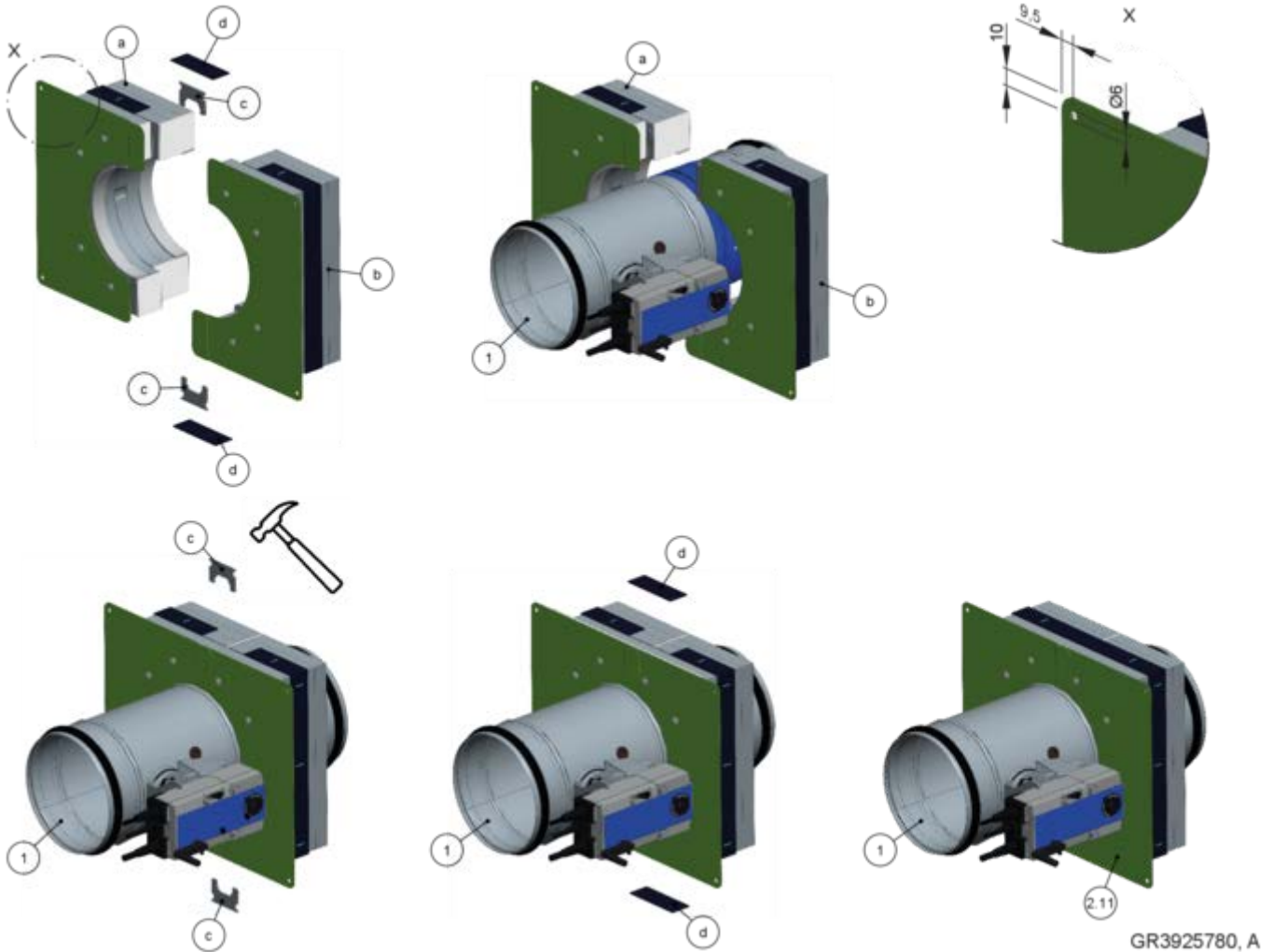


Fig. 31: Supply package and installation of installation kit TQ2 for dry mortarless installation

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

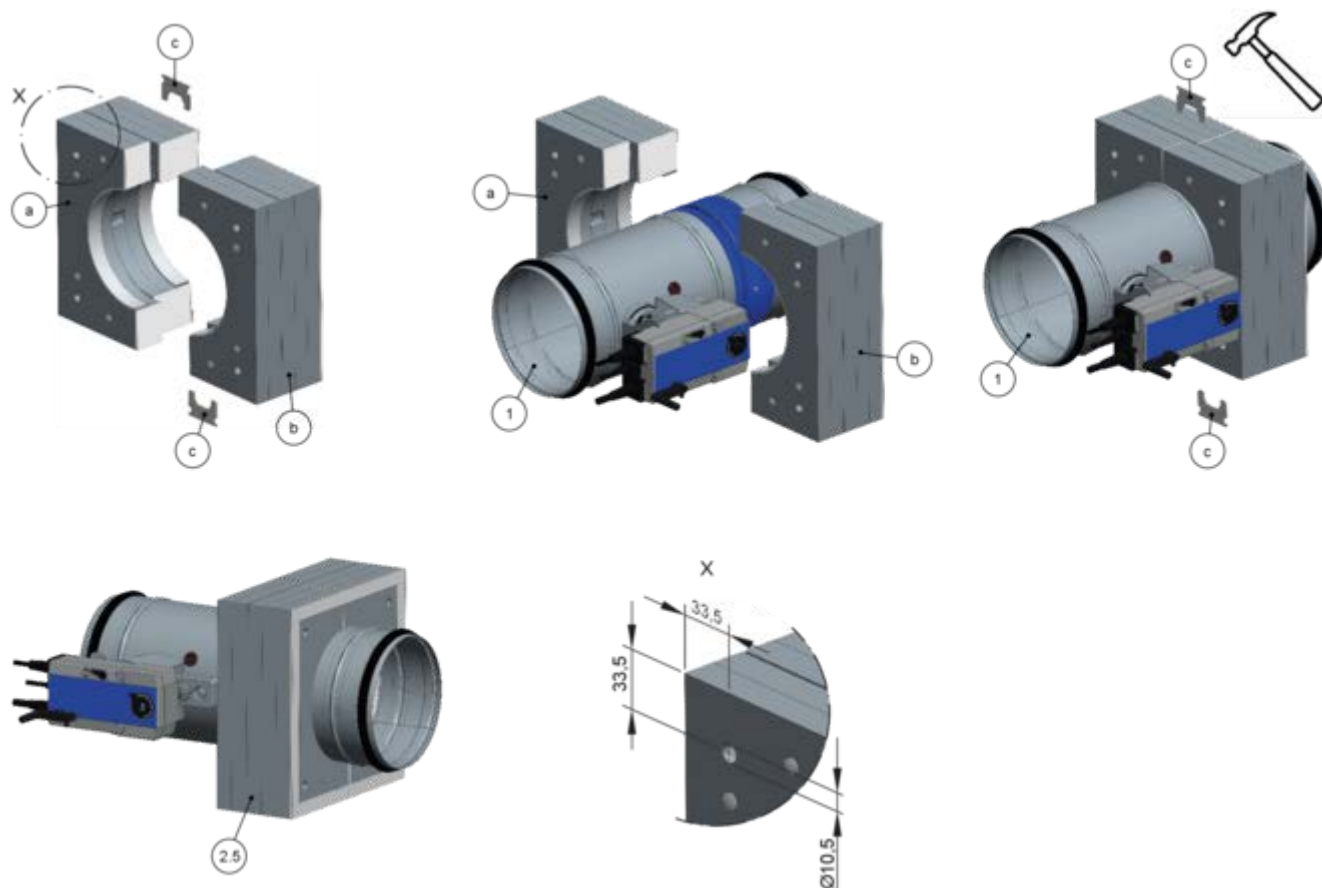
Installation of installation kit TQ2

- ▶ Place half shells (2.11a) and (2.11b) of the installation kit (2.11) around the FKRS-EU so that the cover plate is flush with the bead. Fix the installation kit with two connecting clamps (2.11c) (any installation position of the FKRS-EU). Carefully drive in the connecting clamps bit by bit using a hammer, turning the fire damper with installation kit several times if necessary.
- ▶ Affix intumescent seal (2.11d).

5.4.4 Installation kit WA2

Installation kit WA2 for dry mortarless installation on solid walls

- The installation kit WA2 is supplied separately and must be installed by the customer.
- The installation kit can also be ordered subsequently.



GR3924467, A

Fig. 32: 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 | Connecting clamp (2 ×) |
| a | Half-shell 1 with Kerafix sealing tape | | |

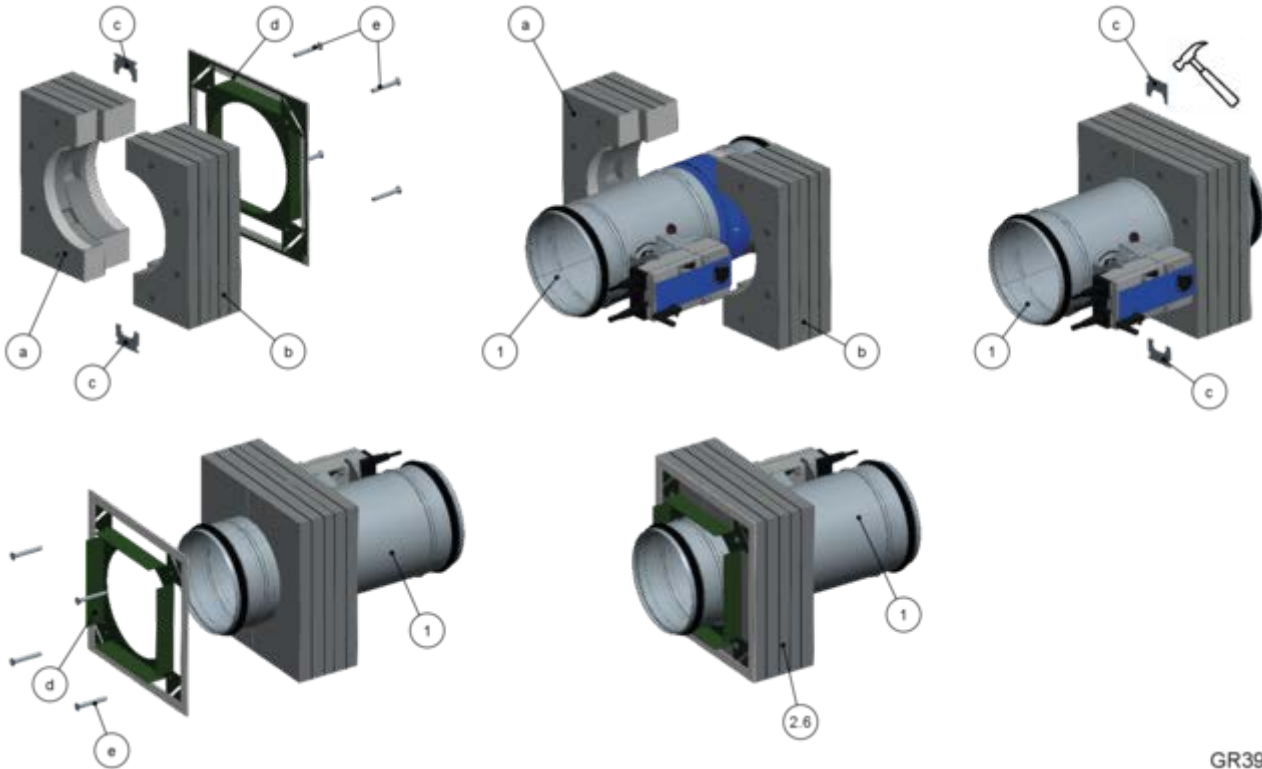
Installation of installation kit WA2

- ▶ Place half shells (2.5a) and (2.5b) of the installation kit (2.5) around the FKRS-EU so that it is flush with the bead. Fix the installation kit with two connecting clamps (2.5c) (any installation position of the FKRS-EU). Carefully drive in the connecting clamps bit by bit using a hammer, turning the fire damper with installation kit several times if necessary.

5.4.5 Installation kit WE 2

Installation kit WE2 for installation remote from solid walls and ceilings as well as remote from lightweight partition walls

- The installation kit WE2 is supplied separately and must be installed by the customer.
- The installation kit can also be ordered subsequently.



GR3926425, A

Fig. 33: Scope of supply and assembly Installation kit WE2 for dry mortarless installation

- | | | | |
|-----|--------------------------------------|---|---|
| 1 | FKRS-EU | c | Connecting clamp (2 ×) |
| 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 | | |

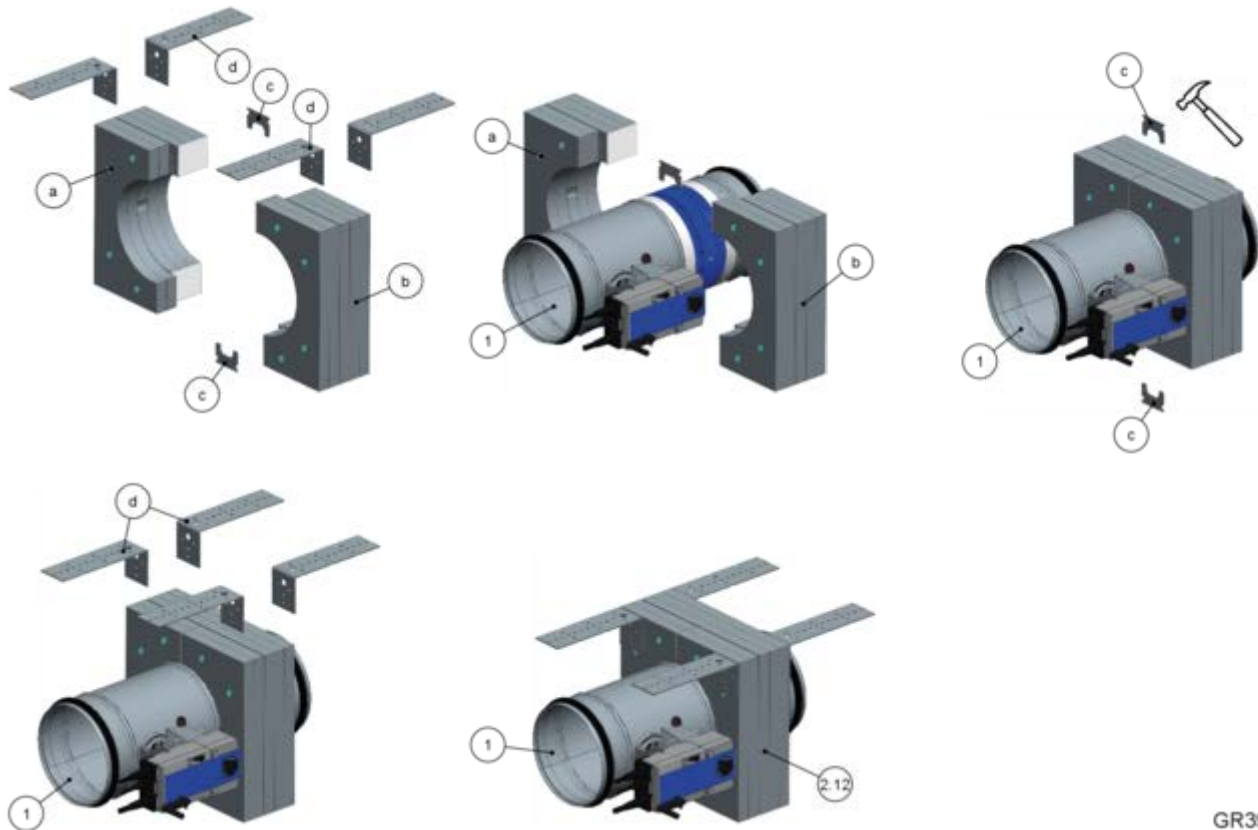
Mounting installation kit WE2

- ▶ Place half shells (2.6a) and (2.6b) of the installation kit (2.6) around the FKRS-EU so that it is flush with the bead. Fix the installation kit with two connecting clamps (2.6c) (any installation position of the FKRS-EU). Carefully drive in the connecting clamps bit by bit using a hammer, turning the fire damper with installation kit several times if necessary.
- ▶ On the rear of the installation kit (2.6), fix the sheet metal cover plate (2.6d) with 4 dry wall screws (2.6e).

5.4.6 Installation kit GL2

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

- The installation kit GL2 is supplied separately and must be installed on site.
- The installation kit can also be ordered subsequently.



GR3902361, A

Fig. 34: 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	Connecting clamp (2 ×)
a	Half shell 1	d	Bracket

Installation kit GL2 for installation in conjunction with a sliding ceiling connection in metal stud walls with cladding on both sides and no rear ceiling attachment

- The installation kit GL2 is supplied separately and must be installed on site.
- The installation kit can also be ordered subsequently.

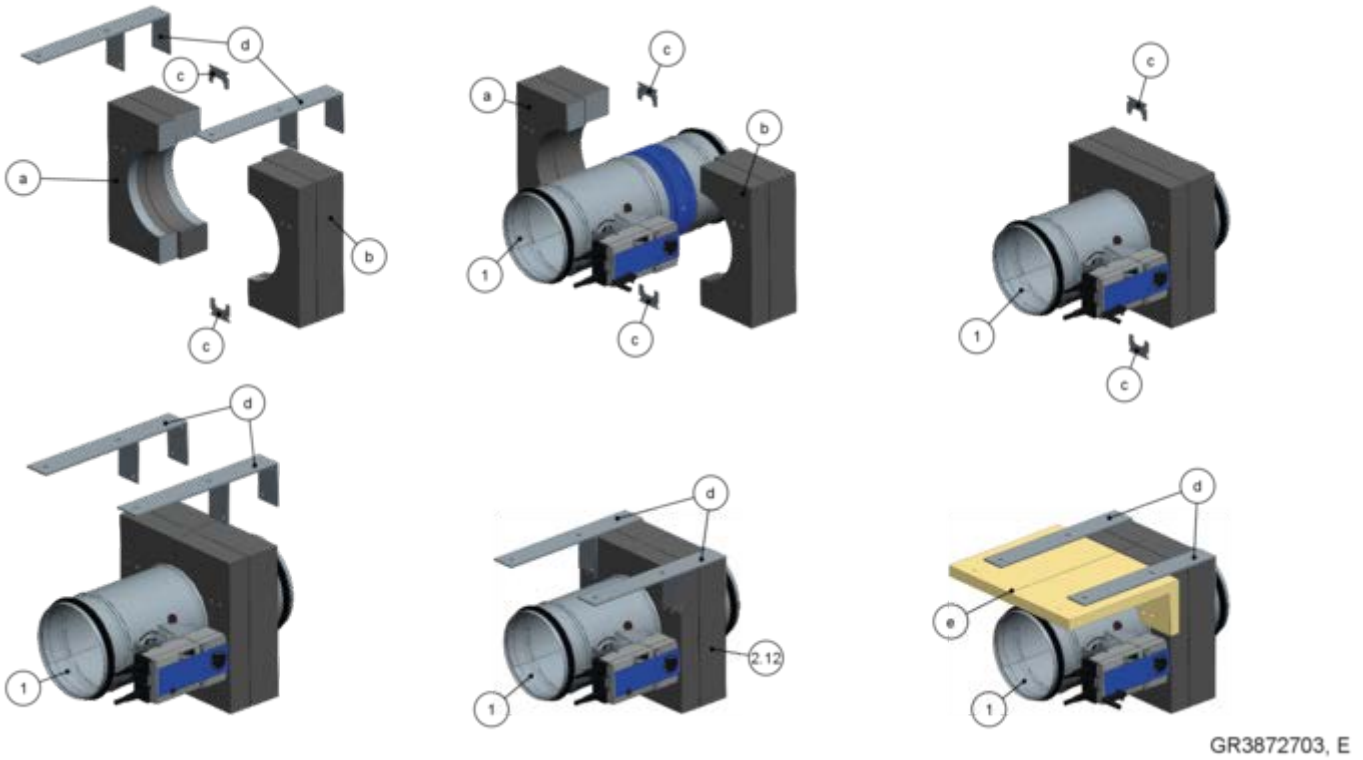


Fig. 35: Scope of supply and installation of installation kit GL2 (steel bracket and cover to be provided by customer) for dry mortarless installation if there is no ceiling fixing on the rear side

- | | | | |
|------|--------------------------------------|---|--------------------------------------|
| 1 | FKRS-EU | c | Connecting clamp (2 ×) |
| 2.12 | Installation kit GL2, consisting of: | d | Steel bracket (supplied by customer) |
| a | Half shell 1 | e | Cover (supplied by customer) |
| b | Half shell 2 | | |

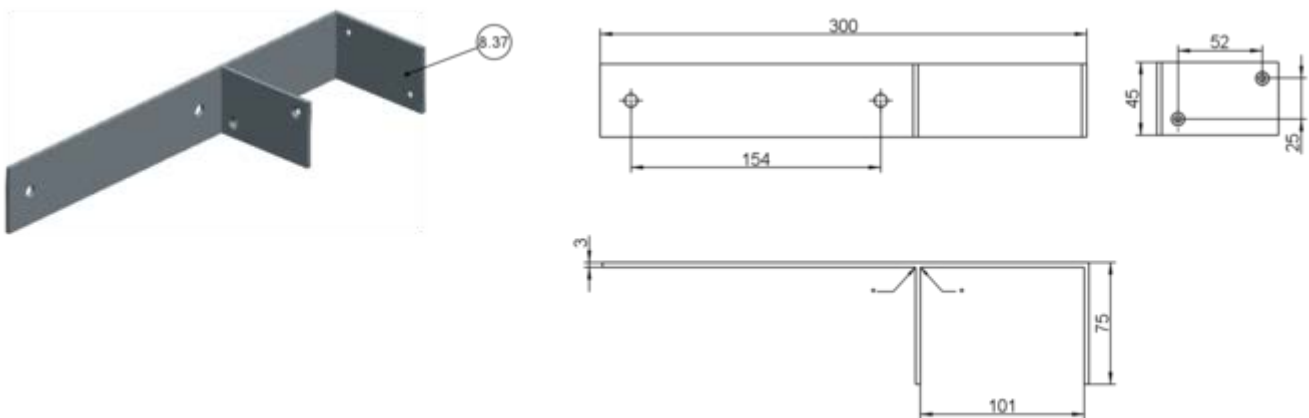
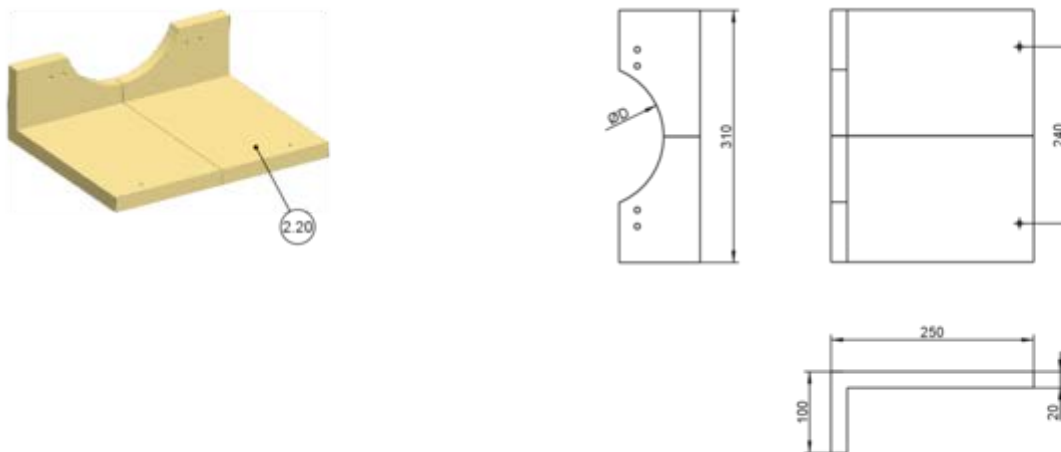


Fig. 36: Steel angle for dry mortarless installation with installation kit GL2 in lightweight partition wall if there is no rear fastening possibility

- 8.37 Steel bracket, supplied by customer
 * Welded seam



GR3872703, E

Fig. 37: Cover for dry mortarless installation with installation kit GL2 in lightweight partition wall if there is no rear fixing option

2.20 Cover (one part or two parts) Rigips Glasroc F20, supplied by customer

Cover dimensions [mm]										
Nominal size	100	125	150	160	180	200	224	250	280	315
ØD	115	140	165	175	195	215	240	265	295	330
L	250	275	300	310	330	350	375	400	430	465

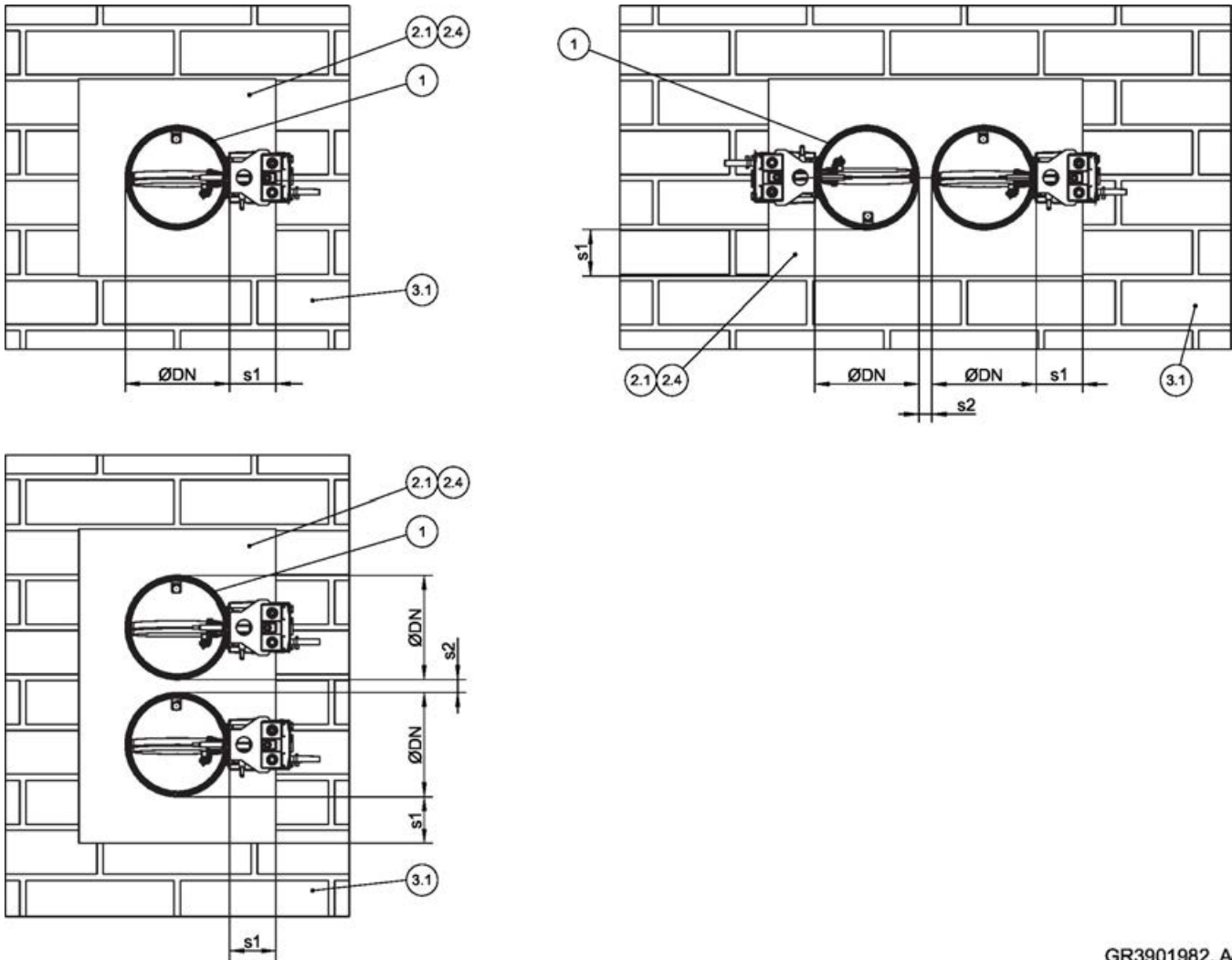
Installation of installation kit GL2

1. ▶ Place half shells (2.12a) and (2.12b) of the installation kit (2.12) around the FKRS-EU so that it is flush with the bead. Fix the installation kit with two connecting clamps (2.12c) (any installation position of the FKRS-EU). Carefully drive in the connecting clamps bit by bit using a hammer, turning the fire damper with installation kit several times if necessary.
2. ▶ Fix each bracket (2.12d) to the installation kit with at least two dry wall screws 3.9 × 35 mm.

Alternative fixing by means of on-site steel angles and cover made of Rigips Glasroc F20 see [Chapter 5.6.9 'Dry mortarless installation with flexible ceiling joint and installation kit GL2'](#) on page 118

5.5 Solid walls

5.5.1 General information



GR3901982, A

Fig. 38: Solid walls – arrangement/distances

- 1 FKRS-EU
- 2.1 Mortar
- 2.4 Coated board system

- 3.1 Solid wall
- s1 Perimeter gap,
- s2 Distance between the fire dampers, ↗ 'Distances' on page 32

Installation type	Installation opening [mm]	Distance [mm]	
		s1	s2
Mortar-based installation	\varnothing nominal width + max. 450	≤ 225	$10/40^2 - 225$
Dry mortarless installation with ER	↗ 5.4.2 'Installation block ER' on page 45	central installation	$\geq 200^3$
Dry mortarless installation with TQ2	$\square A = \varnothing$ nominal width + 110 ⁴	central installation	≥ 200
Dry mortarless installation with fire batt ¹	$\square A = \varnothing$ nominal width + max. 1200	40 – 600	$10/40^2 - 600$

¹) Note the maximum size for the fire batt

²) Depending on fire resistance duration

³) Distance between the installation blocks

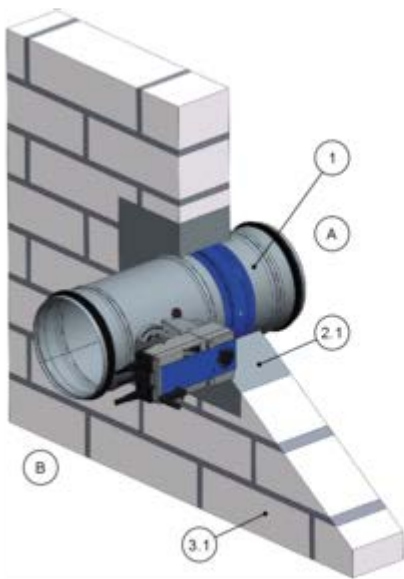
⁴) Installation opening tolerance ± 2 mm

Additional requirements: solid walls

- Solid wall, ↗ *on page 40*
- Distances and installation orientation, ↗ *'Distances' on page 32*

5.5.2 Mortar-based installation

Mortar-based installation into a solid wall



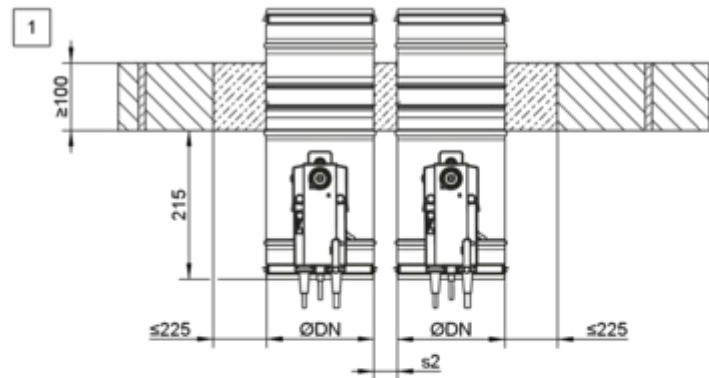
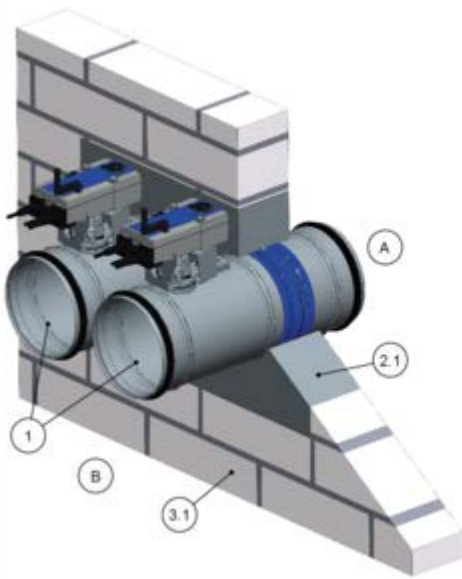
GR3791532, B

Fig. 39: 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 as in **2**
- ** Filling of the perimeter gap with mortar and a slanted smooth finish to at least 100 mm (optionally on one or two ends)
- 1 – 3** Up to EI 120 S

Mortar-based installation into a solid wall, flange to flange



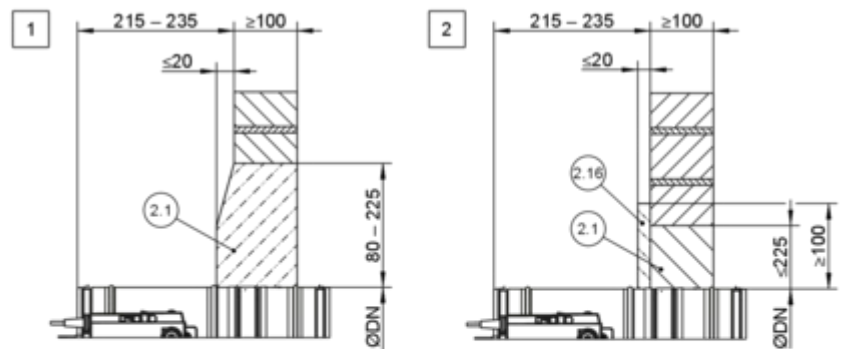
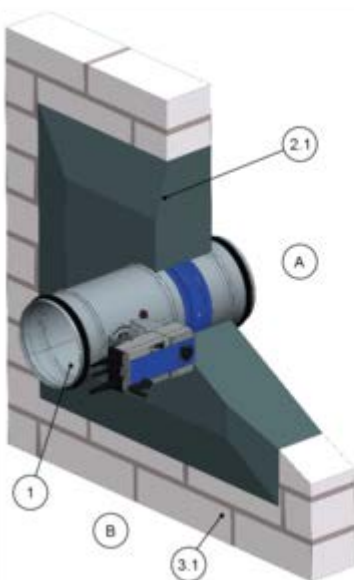
GR3791725, A

Fig. 40: 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 $s_2 = 40 - 225$ mm
- Up to EI 90 S for $s_2 = 10 - 225$ mm

Mortar-based installation in solid wall - installation not flush with wall



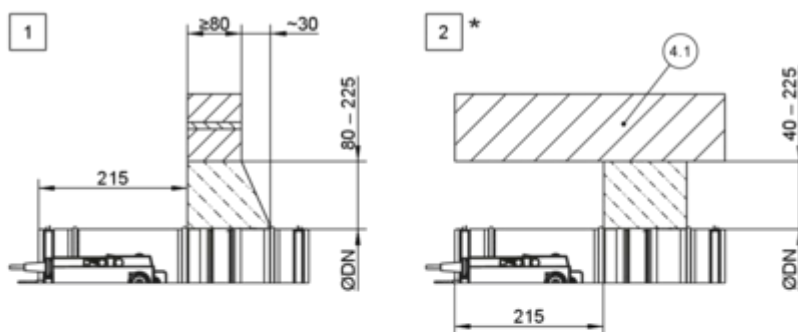
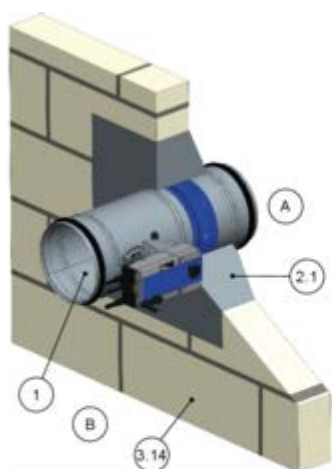
GR3882576, F

Fig. 41: Mortar-based installation in solid wall - installation not flush with wall

- 1 FKRS-EU
- 2.1 Mortar with sloping smooth screed
- 2.16 Cement plaster

- 3.1 Solid wall
- 1 2 Up to EI 120 S

Mortar-based installation into gypsum wallboard



GR3882994, C

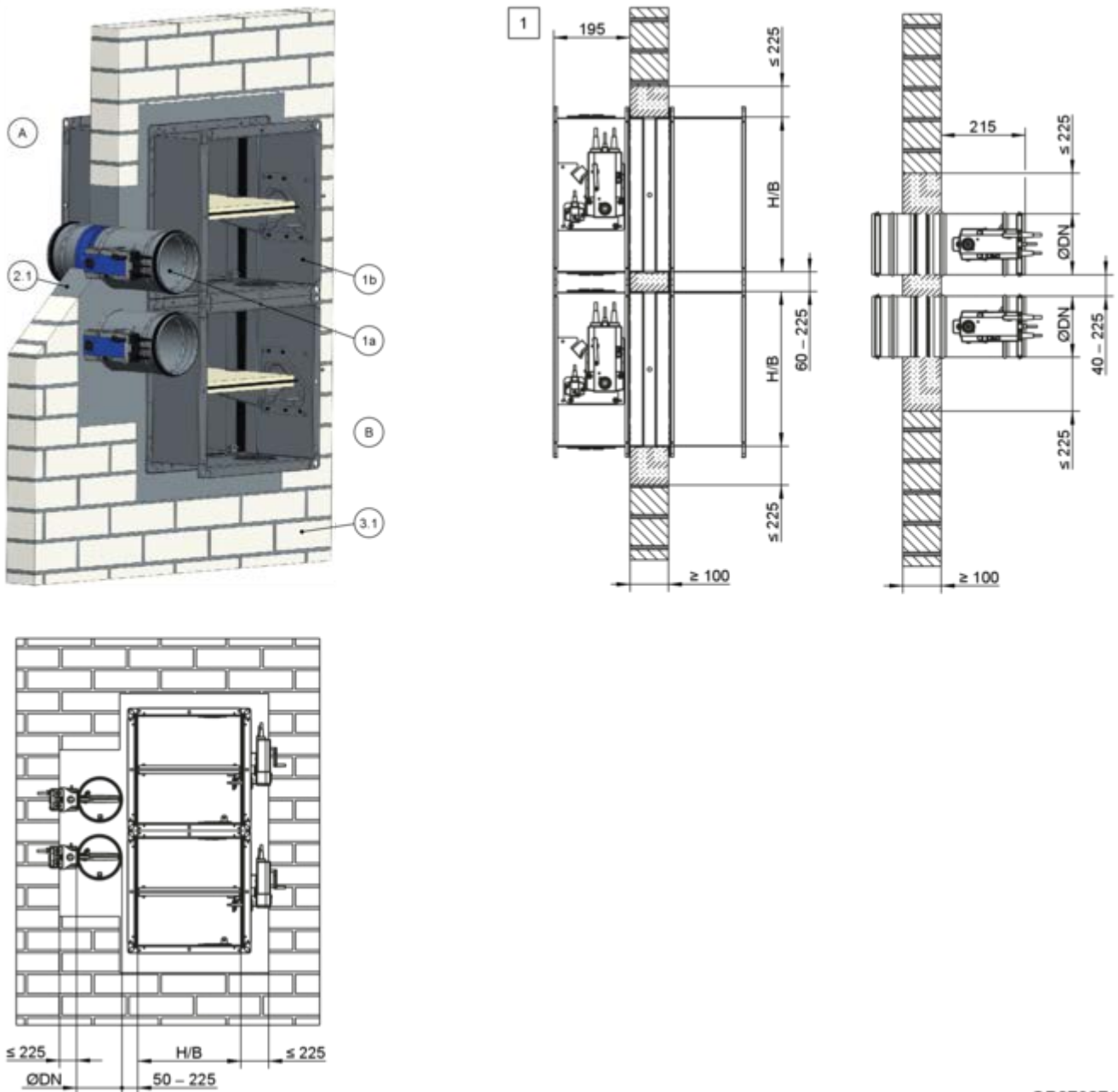
Fig. 42: Mortar-based installation into gypsum wallboard

1	FKRS-EU	4.1	Solid ceiling slab
2.1	Mortar	*	Installation near the floor as in 2
3.14	Solid wall made of gypsum wallboard EN 12859 (formerly DIN 18163)	1 2	Up to EI 120 S

Note for installation in gypsum wallboards with $W = 80$ to < 100 mm:

- Distance between two fire dampers ≥ 200 mm in separate installation openings
- at $W \geq 100$ mm, distances Fig. 39 to Fig. 41

Mortar-based installation into a solid wall, combined, FKRS-EU and FK2-EU



GR3792712, F

Fig. 43: Mortar-based installation into a solid wall, combined, FKRS-EU and FK2-EU

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

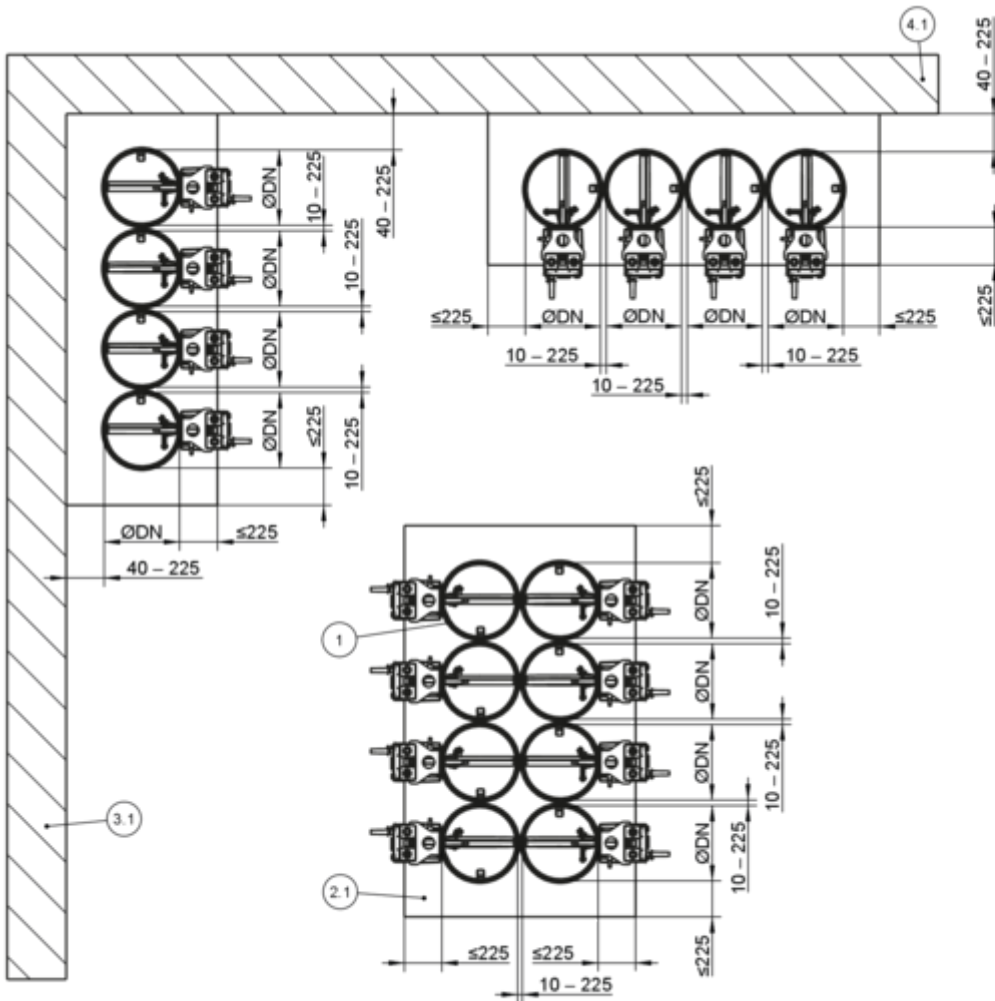
For combined installation please note:

- Overall fire damper area ≤ 1.2 m² .
- The number of fire dampers in an installation opening is limited by their size ($B \times H$ for FK2-EU and/or \varnothing nominal width for FKRS-EU) and the overall area of the fire dampers (1.2 m²).
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For installation details FK2-EU, see the installation and operating manual for this fire damper type.
- Distance to load-bearing structural elements ≥ 40 mm

Additional requirements: mortar-based installation into solid walls

- Solid wall, ↪ *on page 40*
- Mortar-based installation in opening or cut hole
- General installation information, ↪ 29 ff
- General information on mortar-based installation, ↪ **'Mortar-based installation'** *on page 34*

5.5.3 Mortar-based installation – multiple installation into one installation opening

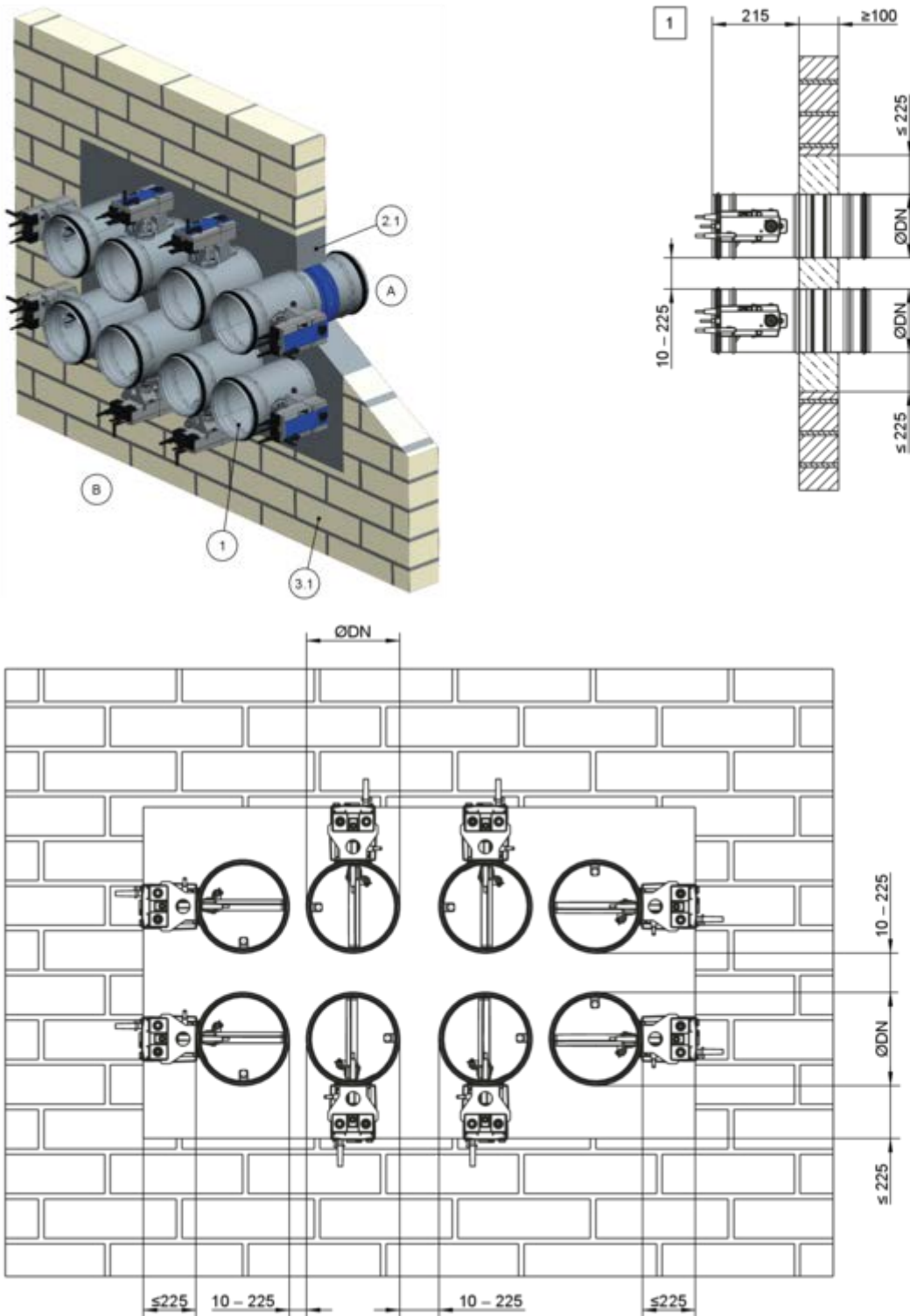


GR3791854, G

Fig. 44: Mortar-based installation – multiple installation into one installation opening

- | | | | |
|-----|---------|-----|--|
| 1 | FKRS-EU | 3.1 | Solid wall (load-bearing structural element) |
| 2.1 | Mortar | 4.1 | Solid ceiling slab (load-bearing component) |

Solid walls > Mortar-based installation – multiple installat...



GR3884799, F

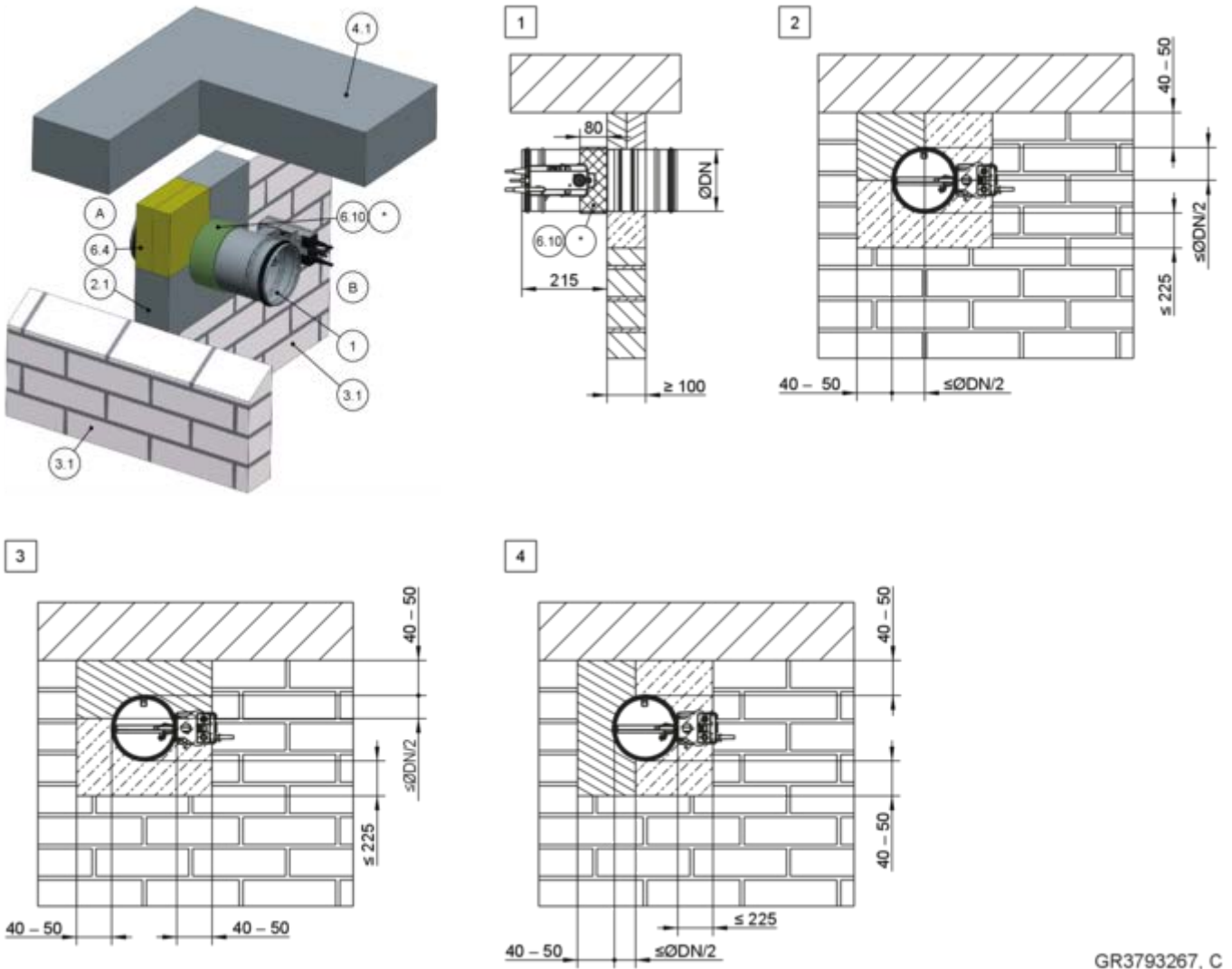
Fig. 45: Mortar-based installation – multiple installation into one installation opening

- | | | | |
|-----|---------|----------|---------------|
| 1 | FKRS-EU | 3.1 | Solid wall |
| 2.1 | Mortar | 1 | Up to EI 90 S |

Additional requirements: mortar-based installation – multiple installation into one installation opening

- Solid wall, ↪ *on page 40*
- Overall fire damper area $\leq 1.2 \text{ m}^2$
- The number of fire dampers in an installation opening is limited by their size (nominal width) and the overall area of the fire dampers (1.2 m^2) (maximum 10 FKRS-EU in single or double row arrangement)
- Distance to load-bearing structural elements $\geq 40 \text{ mm}$
- Maximum mortar bed width 225 mm; provide a lintel or brick partition if necessary

5.5.4 Mortar-based installation into a solid wall, with partial mortaring



GR3793267, C

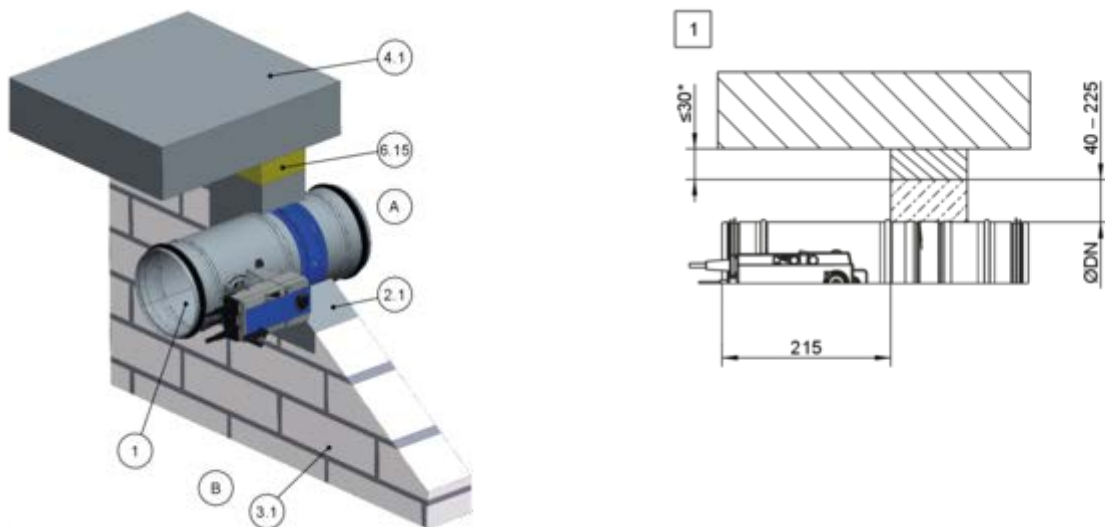
Fig. 46: Mortar-based installation into a solid wall, with partial mortaring

1	FKRS-EU	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
2.1	Mortar	6.20	Pipe collar (to be ordered separately)
3.1	Solid wall	6.24	Elastomeric foam (flame-resistant, non-dripping)
4.1	Solid ceiling slab		The following applies in Germany: For notes on the use of elastomeric foams ↪ 'Additional provision for use in Germany:' on page 8 .
6.4	Mineral wool panel, ≥ 1000°C, ≥ 140 kg/m ³	*	required for nominal diameter ≥ 224 mm, alternatively 6.19, 6.20 or 6.24
6.10	Ablative coating around the perimeter, d = at least 2.5 mm		
		1 -	Up to EI 90 S
		4	

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

- Solid wall, ↪ *on page 40*
 - Distance of 40 – 50 mm between the fire damper and load-bearing components
 - 40 – 225 mm distance between two FKRS-EU fire dampers
1. ▶ The difficult-to-access installation gap between the FKRS-EU and the wall/ceiling must be completely filled in the wall area.
 2. ▶ Completely close off the remaining gaps »s« (on 2 or 3 sides) with mortar.

5.5.5 Mortar-based installation into a solid wall underneath a flexible ceiling joint



GR3793395, B

Fig. 47: Mortar-based installation into a solid wall underneath a flexible ceiling joint

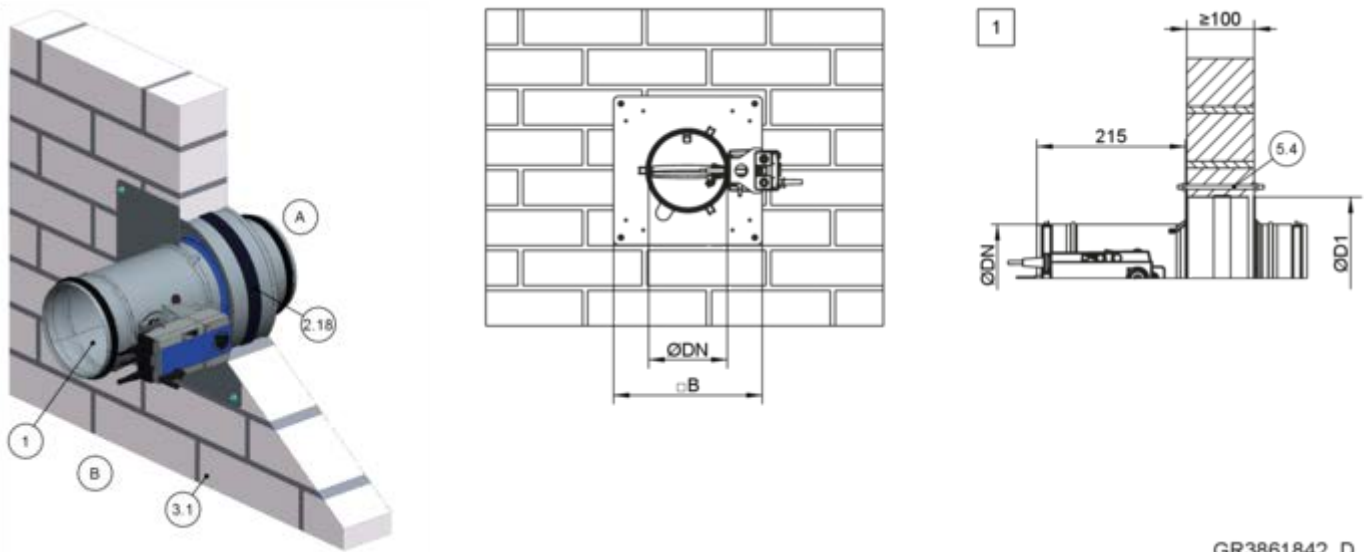
1	FKRS-EU	6.15	Mineral wool, depending on the flexible ceiling joint
2.1	Mortar	*	After subsidence of the ceiling
3.1	Solid wall	1	Up to EI 90 S
4.1	Solid ceiling slab		

Note on flexible ceiling joint: representative illustration. The distance from the ceiling depends on the construction of the flexible ceiling joint and the expected ceiling subsidence.

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

- Solid wall, ↗ on page 40
- Distance from the fire damper to the top edge of the wall 40 – 225 mm
- Distance between two fire dampers ≥ 40 mm, perimeter gap ≤ 225 mm

5.5.6 Dry mortarless installation in solid wall with installation block ER



GR3861842, D

Fig. 48: Dry mortarless installation in solid wall with installation block ER

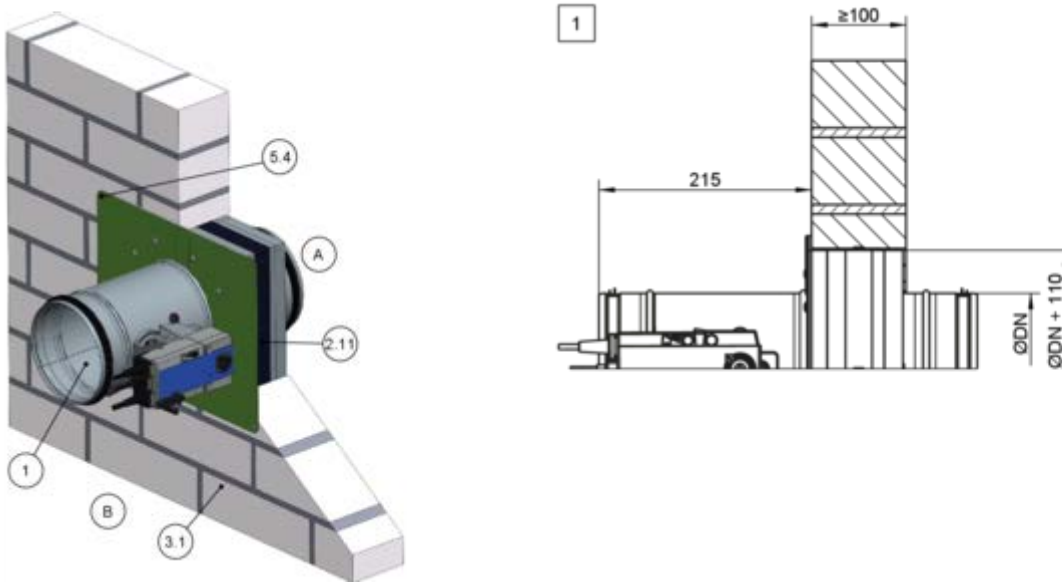
- 1 FKRS-EU
- 2.18 Installation block ER with cover plate
- 3.1 Solid wall

- 5.4 Threaded rod as push-through installation or suitable anchors approved by the building authorities, min. M6
- 1 Up to EI 90 S

Additional requirements: dry mortarless installation with installation block ER

- Solid wall, ☞ on page 40
 - Installation block ER, ☞ 5.4.2 'Installation block ER' on page 45
 - ≥ 75 mm distance between installation block and load-bearing structural elements
 - ≥ 200 mm distance between two installation blocks
 - General installation information, ☞ 5.3 'General installation information' on page 29 ff
 - General information on installation with installation block ER, ☞ on page 35
1. ▶ Create an appropriate installation opening by means of a cut hole ØD1 , ☞ 5.4.2 'Installation block ER' on page 45
 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 to the wall with four threaded rods as push-through mounting. Fixing by means of four wall plugs (M6) with fire safety suitability certificate, matched to the respective building material, is permissible, provided that all prevailing conditions of the wall plug proof are observed.

5.5.7 Dry mortarless installation into a solid wall, with installation kit TQ2



GR3795793, E

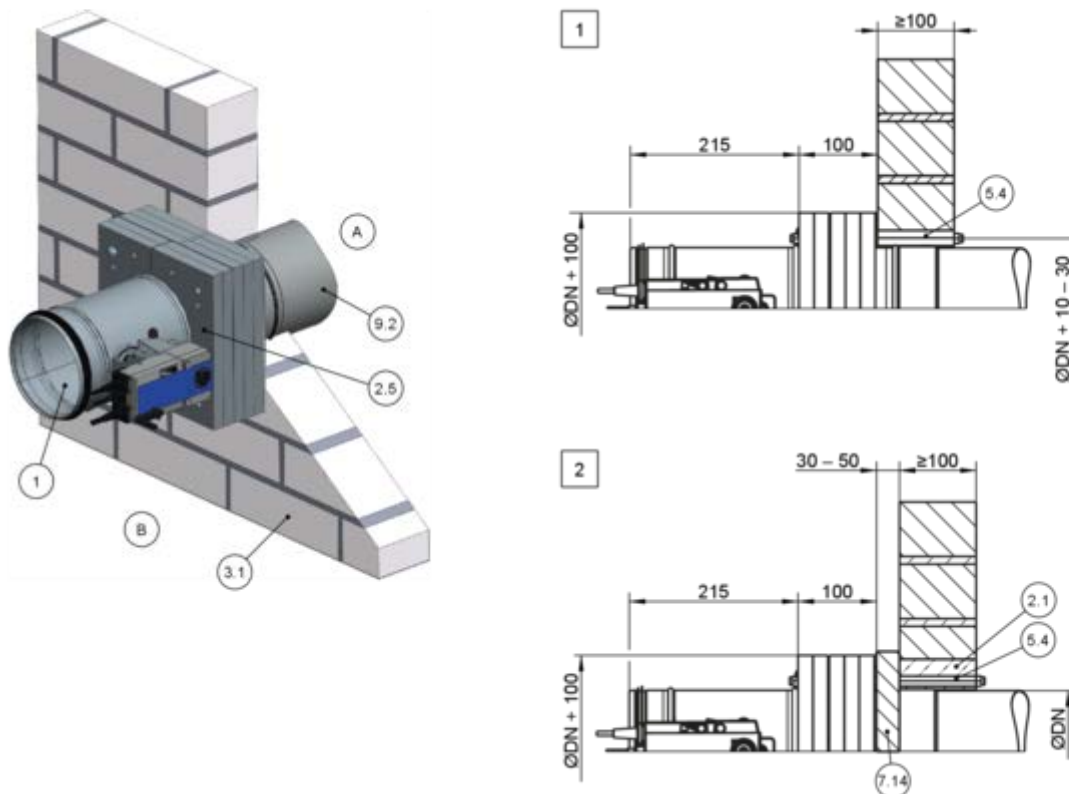
Fig. 49: Dry mortarless installation into a solid wall, with installation kit TQ2

1	FKRS-EU	5.4	Threaded rod as push-through installation or suitable anchors approved by the building authorities, min. M6
2.11	Installation kit TQ2 with cover plate	1	Up to EI 120 S
3.1	Solid wall		

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

- Solid wall, ↗ on page 40
 - Installation kit TQ2, ↗ 5.4.3 'Installation kit TQ2' on page 46
 - ≥ 55 mm distance from the fire damper to load-bearing structural elements (with shortened orifice plate)
 - ≥ 200 mm distance between two fire dampers
 - Installation only permitted in solid walls without cavities. For solid walls with cavities, these must be sealed with mortar to a depth of at least 100 mm.
 - General installation information, ↗ 5.3 'General installation information' on page 29 ff
 - General information on installation with installation kit TQ2, ↗ on page 35
1. ▶ Make a square installation opening, size $\text{ØDN} + 110$ 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 to the wall with four threaded rods as push-through mounting. Fixing by means of four wall plugs (M6) with fire safety suitability certificate, matched to the respective building material, is permissible, provided that all prevailing conditions of the wall plug proof are observed.

5.5.8 Dry mortarless installation on the face of a solid wall, with installation kit WA2



GR3795589, E

Fig. 50: Dry mortarless installation on the face of a solid wall, with installation kit WA2

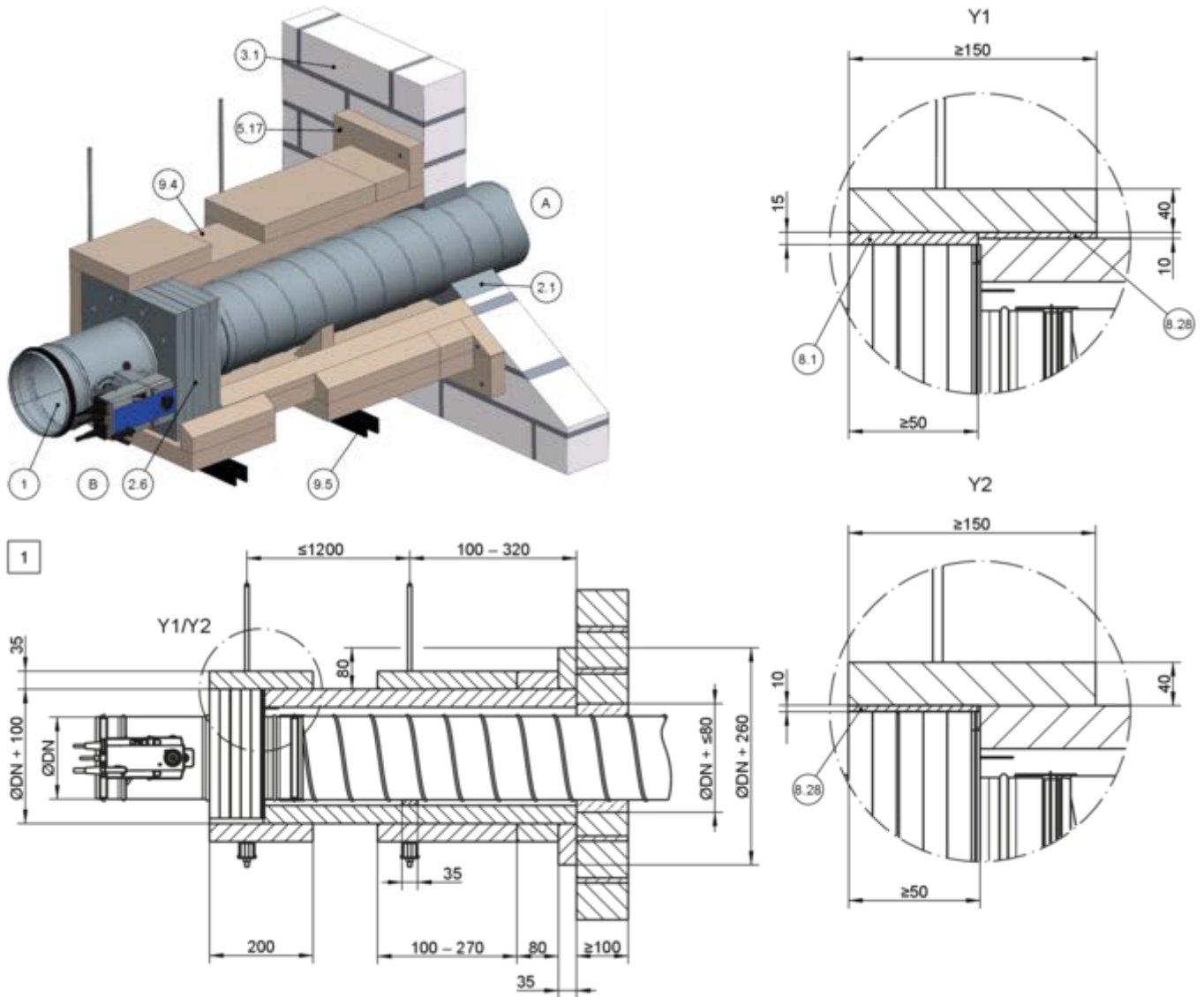
- | | |
|--|--|
| <p>1 FKRS-EU
 2.1 Mortar
 2.5 Installation kit WA2
 3.1 Solid wall</p> | <p>5.4 Threaded rod as push through installation with washers and nuts or wall plug with fire safety suitability certificate
 7.14 Reinforcing board, calcium silicate, thickness = 30 – 50 mm or mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 140\text{ kg/m}^3$, thickness = 50 mm
 9.2 Extension piece/duct with 2 shortened flush with the wall
 1 2 Up to EI 90 S</p> |
|--|--|

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

- Solid wall, ↗ on page 40
 - Installation kit WA2, ↗ 5.4.4 'Installation kit WA2' on page 47
 - ≥ 75 mm distance between the fire damper and load-bearing components
 - ≥ 200 mm distance between two fire dampers
 - General installation information, ↗ 5.3 'General installation information' on page 29 ff
 - General information on installation with installation kit WA2, ↗ on page 35
1. ▶ **1**: Make a cut hole with nominal width + 10 - 30 mm and compensate wall unevenness.
2: Shorten the mortared-in air duct flush with the wall, create a reinforcing board (7.14) and compensate for wall unevenness.
 2. ▶ The fire damper with installation kit WA2 is fixed to the wall with four threaded rods (M8 or M10) by means of push-through mounting. Fixing by means of four wall plugs (M8) with fire safety suitability certificate, matched to the respective building material, is permissible, provided that all prevailing conditions of the wall plug proof are observed.

5.5.9 Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection)

Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection), four-sided cladding



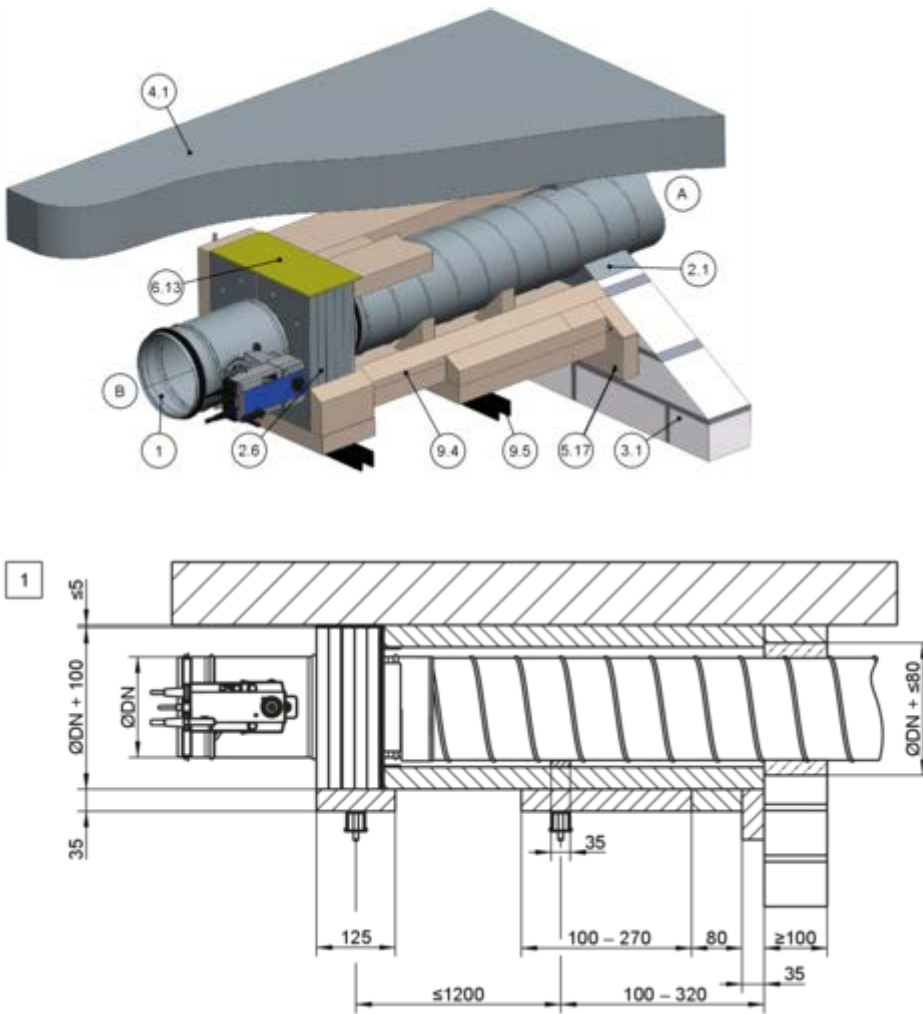
GR3795810, D

Fig. 51: Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection), four-sided cladding

- | | |
|---|---|
| <ul style="list-style-type: none"> 1 FKRS-EU 2.1 Mortar 2.6 Installation kit WE2 3.1 Solid wall 5.17 Anchor bolt Hilti® HUS-6 $\varnothing 6 \text{ mm} \times 80 \text{ mm}$
As an alternative, equivalent fire-rated anchor bolts (supplied by the customer) with suitability certificate that are suitable for the wall or ceiling can also be used; push through installation is also possible 8.1 PROMATECT®-H strip $d = 10 \text{ mm}$ 8.28 PROMATECT®-H strip $d = 15 \text{ mm}$ | <ul style="list-style-type: none"> 9.4 Sheet steel duct with fire-rated cladding
The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer 9.5 Suspension system (by others) consisting of: <ul style="list-style-type: none"> a Threaded rod M10 b Hilti® mounting rail MQ 41 $\times 3 \text{ mm}$ or equivalent c Hilti® drilled plate MQZ L13 or equivalent d Hexagon nut M10 with washer 1 Up to EI 120 S |
|---|---|

Solid walls > Dry mortarless installation remote from solid ...

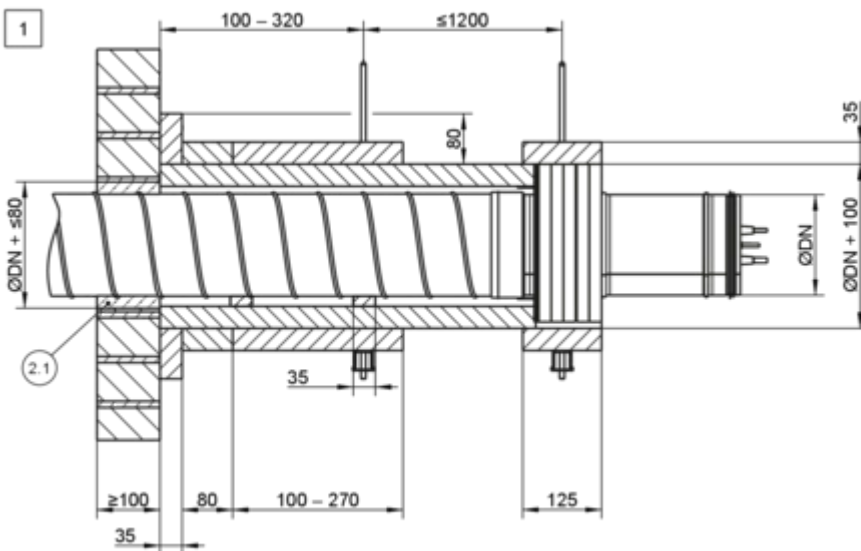
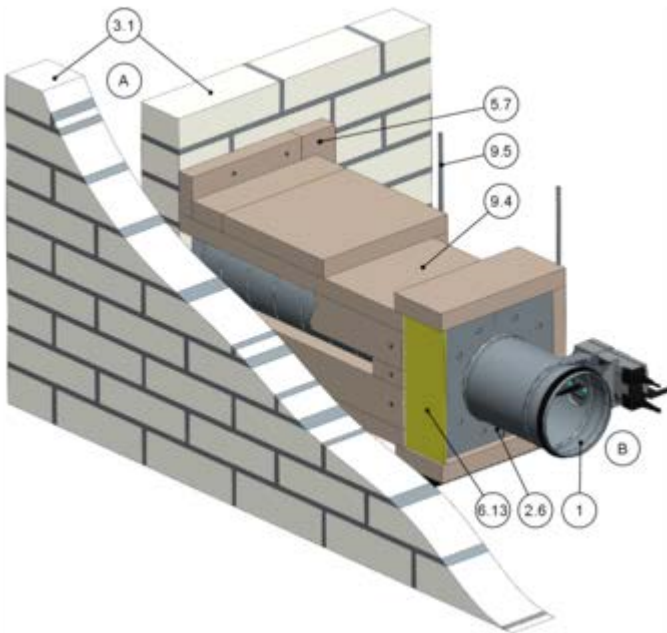
Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection), three-sided cladding



GR3795914, D

Fig. 52: Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection), three-sided cladding

- | | | | |
|------|---|-----|---|
| 1 | FKRS-EU | 9.4 | Sheet steel duct with fire-rated cladding
The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer |
| 2.1 | Mortar | 9.5 | Suspension system (by others) consisting of: |
| 2.6 | Installation kit 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 |
| 5.17 | Anchor bolt Hilti® HUS-6 Ø 6 mm × 80 mm
As an alternative, equivalent fire-rated anchor bolts (supplied by the customer) with suitability certificate that are suitable for the wall or ceiling can also be used; push through installation is also possible | d | Hexagon nut M10 with washer |
| 6.13 | Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, or gypsum mortar to even out an uneven ceiling | 1 | Up to EI 120 S |

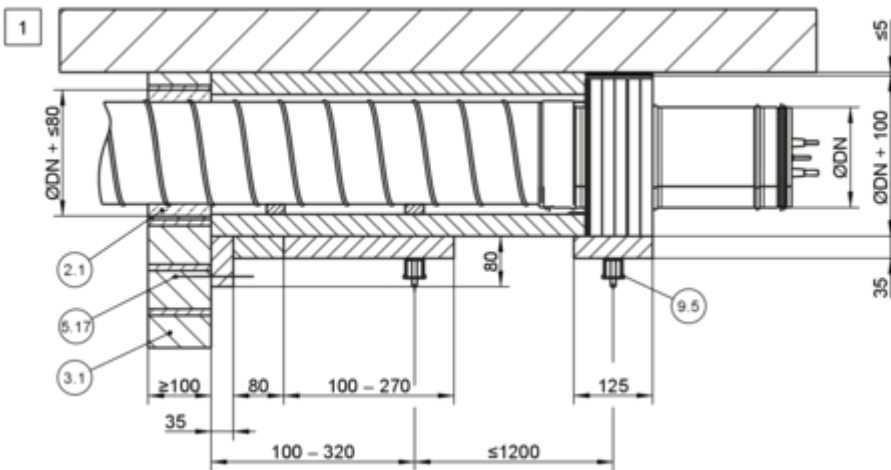
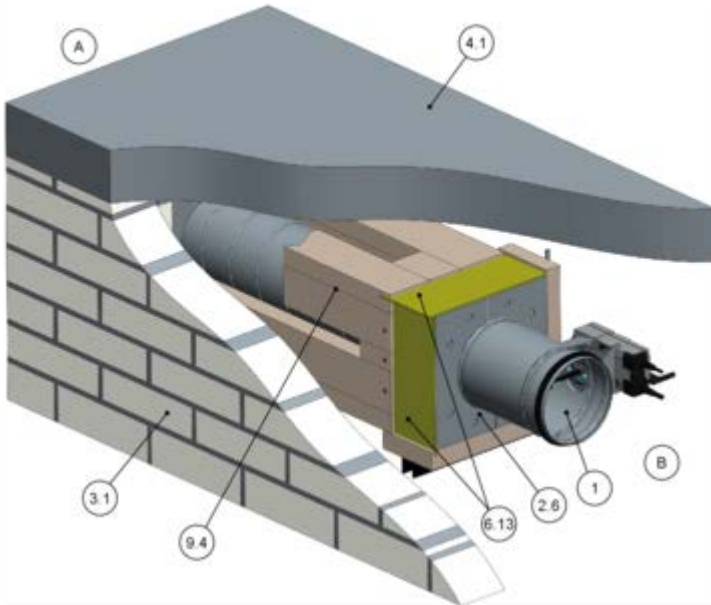


GR3796209, F

Fig. 53: Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection), three-sided cladding

- | | |
|--|--|
| <ul style="list-style-type: none"> 1 FKRS-EU 2.1 Mortar 2.6 Installation kit WE2 3.1 Solid wall 5.17 Anchor bolt Hilti® HUS-6 $\varnothing 6 \text{ mm} \times 80 \text{ mm}$
As an alternative, equivalent fire-rated anchor bolts (supplied by the customer) with suitability certificate that are suitable for the wall or ceiling can also be used; push through installation is also possible 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 9.4 Sheet steel duct with fire-rated cladding
The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer | <ul style="list-style-type: none"> 9.5 Suspension system (by others) consisting of: <ul style="list-style-type: none"> a Threaded rod M10 b Hilti® mounting rail MQ 41 \times 3 mm or equivalent c Hilti® drilled plate MQZ L13 or equivalent d Hexagon nut M10 with washer 1 Up to EI 120 S |
|--|--|

Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection), two-sided cladding



GR3796740, G

Fig. 54: Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection), two-sided cladding

- | | |
|---|--|
| <ul style="list-style-type: none"> 1 FKRS-EU 2.1 Mortar 2.6 Installation kit WE2 3.1 Solid wall 4.1 Solid ceiling slab 5.17 Anchor bolt Hilti® HUS-6 Ø 6 mm × 80 mm
As an alternative, equivalent fire-rated anchor bolts (supplied by the customer) with suitability certificate that are suitable for the wall or ceiling can also be used; push through installation is also possible 6.13 Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, or gypsum mortar to even out an uneven wall or ceiling | <ul style="list-style-type: none"> 9.4 Sheet steel duct with fire-rated cladding
The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer 9.5 Suspension system (by others) consisting of: <ul style="list-style-type: none"> a Threaded rod M10 b Hilti® mounting rail MQZ 41 × 3 mm or equivalent c Hilti® drilled plate MQZ L13 or equivalent d Hexagon nut M10 with washer 1 Up to EI 120 S |
|---|--|

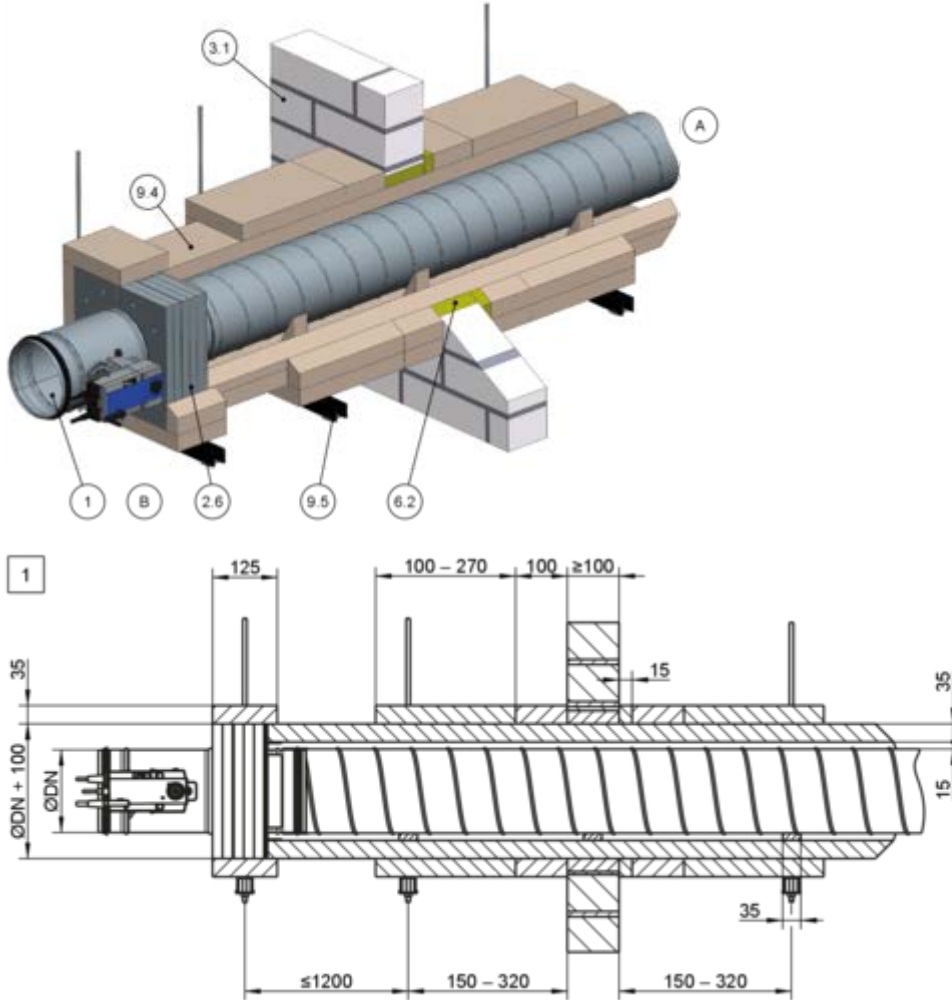
Additional requirements: dry mortarless installation remote from solid walls with installation kit WE2 (wall connection)

- Solid wall, ↪ on page 40
- Installation kit WE2, ↪ 5.4.5 'Installation kit WE 2' on page 48
- Suspension and fixing, ↪ Chapter 5.15 'Fixing the fire damper' on page 242
- ≥ 260 mm distance between two fire dampers
- General installation information, ↪ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit WE2, ↪ on page 35

Note: For more installation details and for components to be provided by the customer, see the additional WE2 installation manual.

5.5.10 Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration)

Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration), four-sided cladding

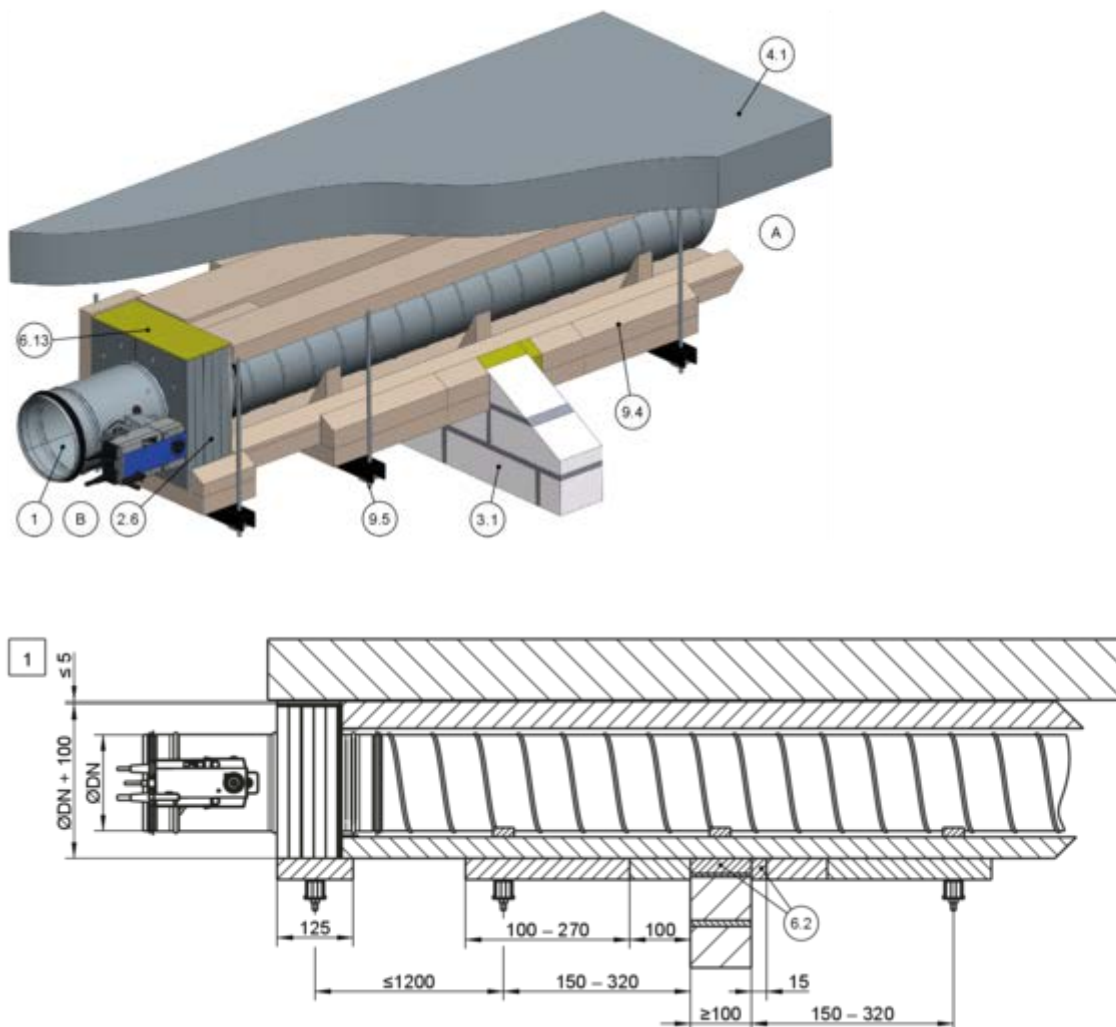


GR3797254, H

Fig. 55: Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration), four-sided cladding

- | | |
|--|---|
| <ul style="list-style-type: none"> 1 FKRS-EU 2.6 Installation kit WE2 3.1 Solid wall 6.2 Mineral wool, $\geq 1000 \text{ }^\circ\text{C}$, $\geq 80 \text{ kg/m}^3$, thickness $\leq 20 \text{ mm}$ 9.4 Sheet steel duct with fire-rated cladding
The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer 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 1 Up to EI 120 S |
|--|---|

Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration), three-sided cladding

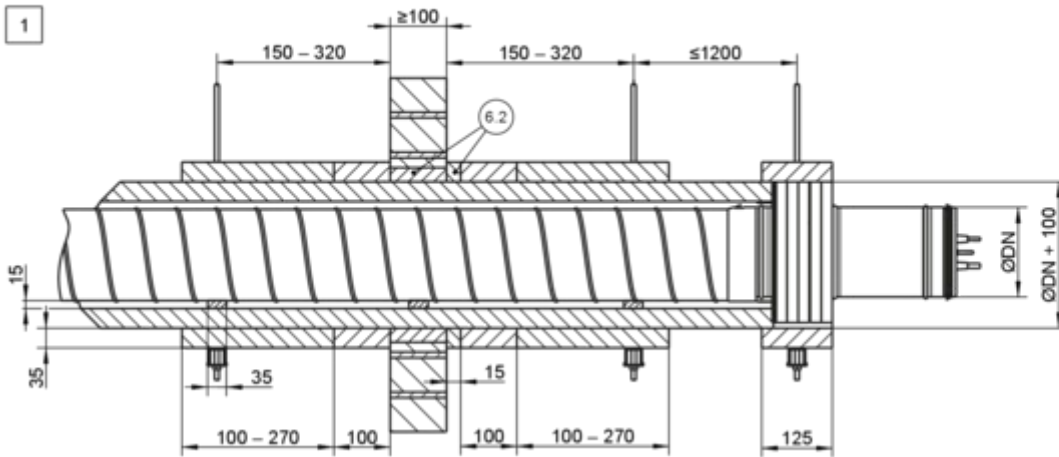
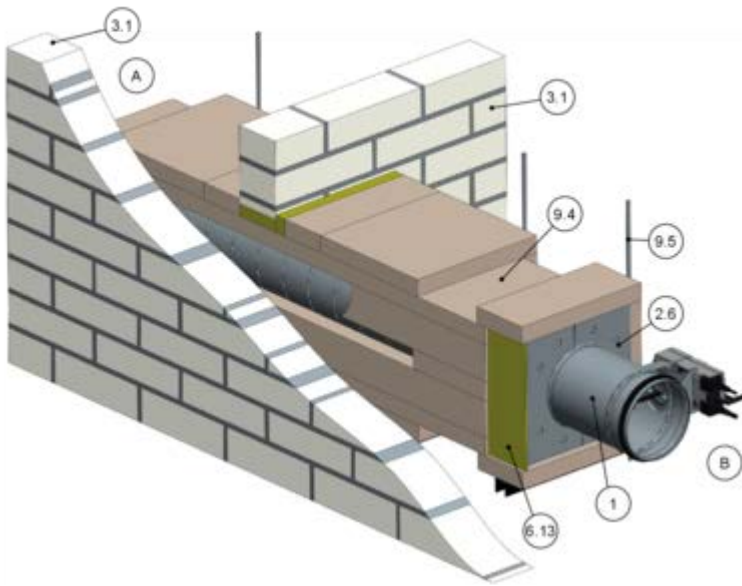


GR3797290, G

Fig. 56: Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration), three-sided cladding

- | | | | |
|------|---|----------|---|
| 1 | FKRS-EU | 9.5 | Suspension system (by others) consisting of: |
| 2.6 | Installation kit 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, $\geq 1000\text{ °C}$, $\geq 80\text{ kg/m}^3$,
thickness $\leq 20\text{ mm}$ | d | Hexagon nut M10 with washer |
| 6.13 | Mineral wool strips A1, filler as an alternative | 1 | Up to EI 120 S |
| 9.4 | Sheet steel duct with fire-rated cladding
The cladding of the air duct and the suspensions
are carried out in accordance with these instruc-
tions, the additional assembly instructions for the
installation kit WE2 and the specifications of the
panel manufacturer | | |

Solid walls > Dry mortarless installation remote from solid ...

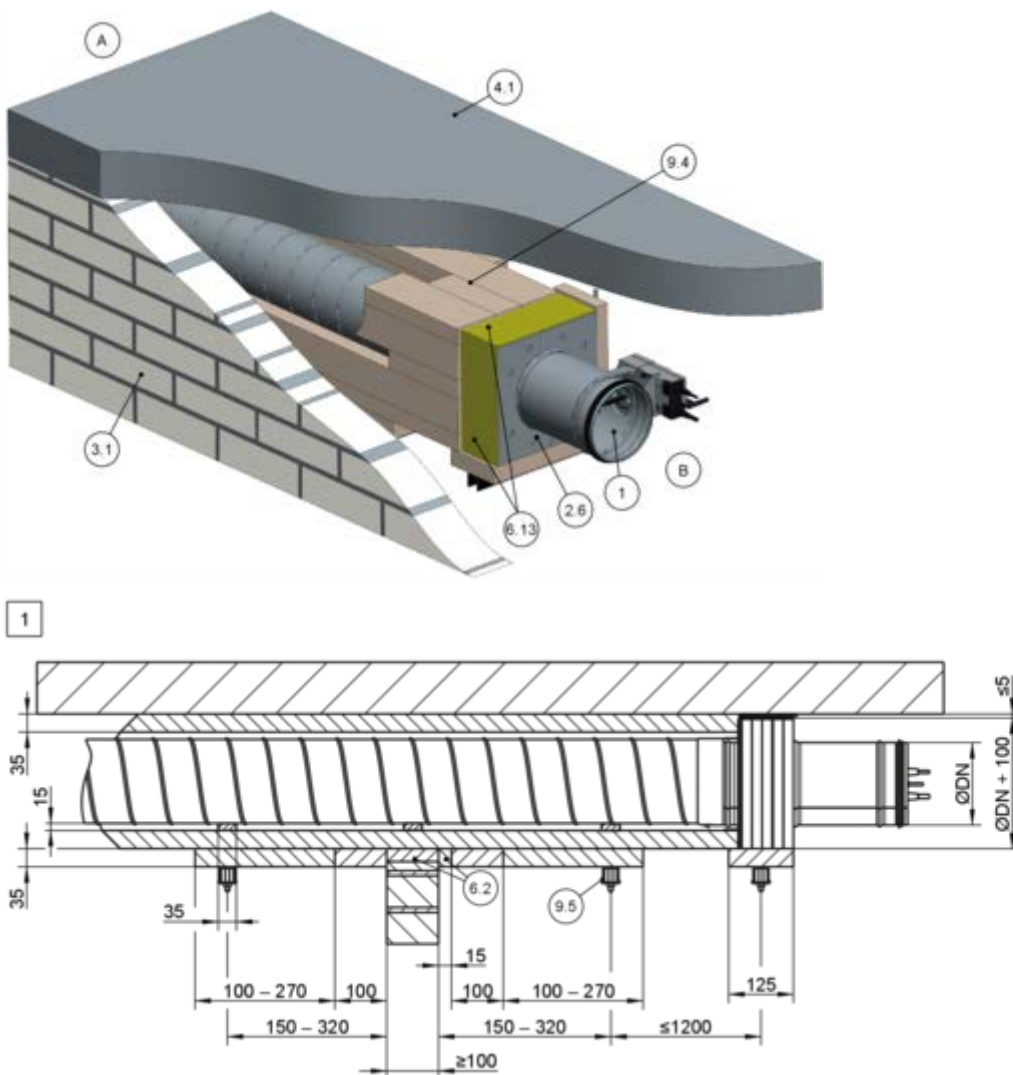


GR3797474, H

Fig. 57: Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration), three-sided cladding

- | | |
|--|--|
| <p>1 FKRS-EU</p> <p>2.6 Installation kit WE2</p> <p>3.1 Solid wall</p> <p>6.2 Mineral wool, $\geq 1000\text{ °C}$, $\geq 80\text{ kg/m}^3$, thickness $\leq 20\text{ mm}$</p> <p>6.13 Mineral wool strips A1, filler as an alternative</p> <p>9.4 Sheet steel duct with fire-rated cladding</p> <p>The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer</p> | <p>9.5 Suspension system (by others) consisting of:</p> <p>a Threaded rod M10</p> <p>b Hilti® mounting rail MQ 41 × 3 mm or equivalent</p> <p>c Hilti® drilled plate MQZ L13 or equivalent</p> <p>d Hexagon nut M10 with washer</p> <p>1 Up to EI 120 S</p> |
|--|--|

Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration), two-sided cladding



GR3797534, E

Fig. 58: Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration), two-sided cladding

- | | |
|---|---|
| <ul style="list-style-type: none"> 1 FKRS-EU 2.6 Installation kit WE2 3.1 Solid wall 4.1 Solid ceiling slab 6.2 Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 80\text{ kg/m}^3$, thickness $\leq 20\text{ mm}$ 6.13 Mineral wool strips A1, filler as an alternative 9.4 Sheet steel duct with fire-rated cladding | <ul style="list-style-type: none"> 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 1 Up to EI 120 S |
|---|---|
- The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer

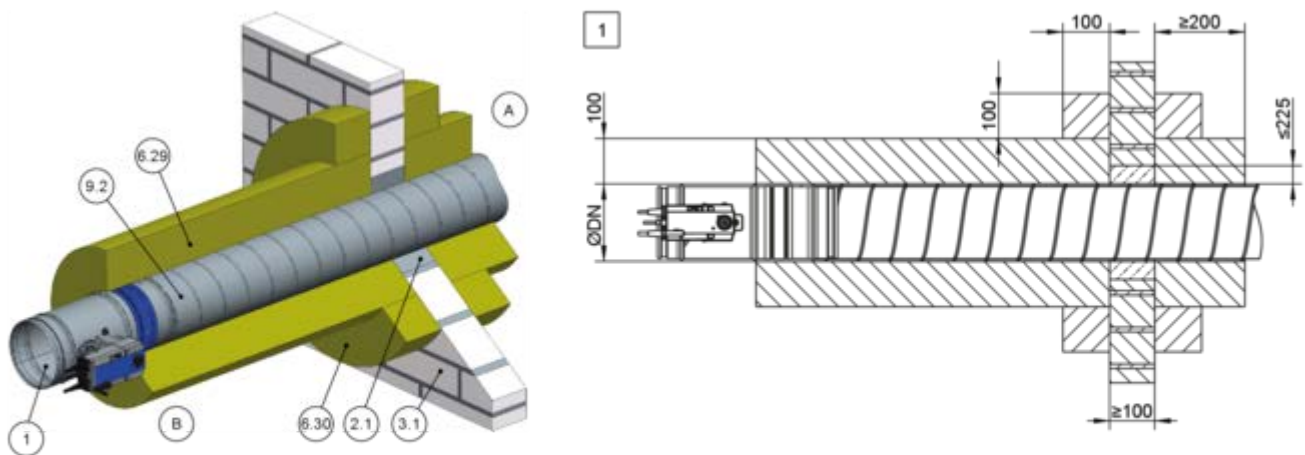
Additional requirements: dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration)

- Solid wall, ↪ *on page 40*
- Installation kit WE2, ↪ *5.4.5 'Installation kit WE 2' on page 48*
- Suspension and fixing, ↪ *Chapter 5.15 'Fixing the fire damper' on page 242*
- ≥ 200 mm distance between two fire dampers (wall penetration through separate wall openings)
- General installation information, ↪ *5.3 'General installation information' on page 29 ff*
- General information on installation with installation kit WE2, ↪ *on page 35*

Note: For more installation details and for components to be provided by the customer, see the additional WE2 installation manual.

5.5.11 Installation remote from solid walls with mineral wool

Installation remote from solid walls with mineral wool



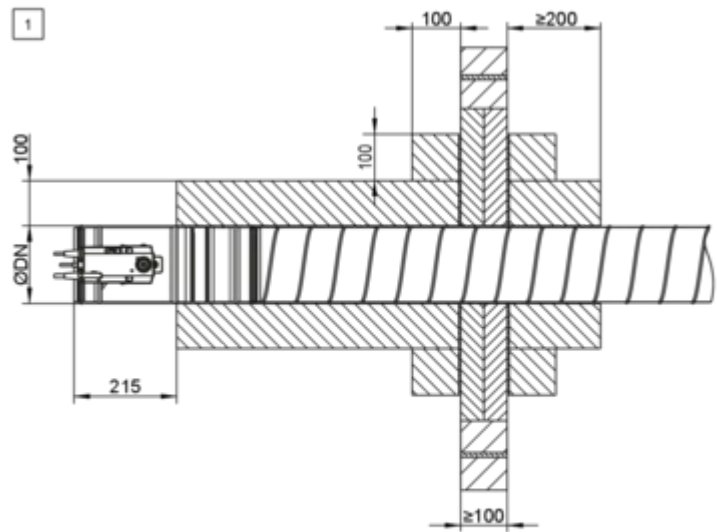
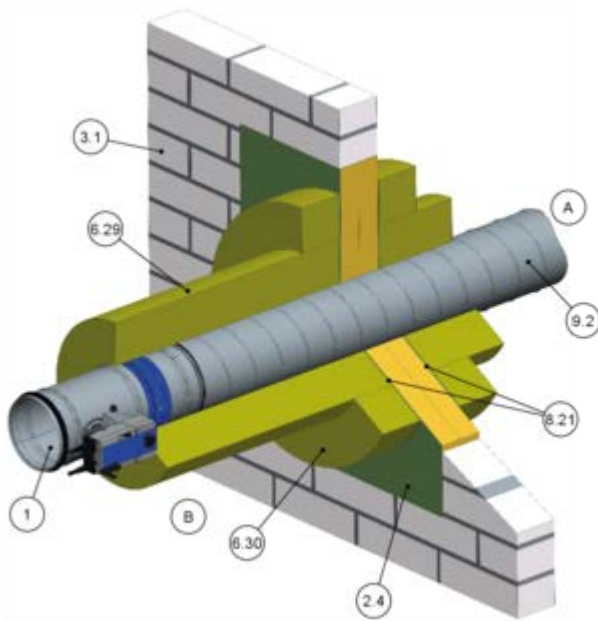
GR3793861, E

Fig. 59: Installation remote from solid walls with mineral wool

1	FKRS-EU	6.30*	Reinforcing strip made of mineral wool
2.1	Mortar		PAROC HVAC Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$),
3.1	Solid wall		glued along perimeter
6.29*	Mineral wool PAROC Hvac Fire Mat BlackCoat	9.2	Sheet steel duct
	($\geq 80 \text{ kg/m}^3$)	1	Up to EI 60 S

* Please check in advance whether the PAROC material is available in your market region.

Dry mortarless installation remote from solid walls with mineral wool and fire batt



GR3932480, A

Fig. 60: Dry mortarless installation remote from solid walls with mineral wool and fire batt

- 1 FKRS-EU
- 2.4 Fire batt, PAROC Pyrotech Slab 140
(max. W × H = 2.1 × 2.5 m)
- 3.1 Solid wall
- 6.29* Mineral wool PAROC HVAC Fire Mat 80BLC
(80 kg/m³)

- 6.30* Reinforcing strip made of mineral wool
PAROC HVAC Fire Mat BlackCoat (≥ 80 kg/m³),
glued along perimeter
- 8.21 Acrylic or sealing compound (suitable for fire batt
system)
- 9.2 Sheet steel duct
Up to EI 60 S

* Please check in advance whether the PAROC material is available in your market region.

Additional requirements: installation remote from solid walls with mineral wool

- Solid wall, ☞ on page 40
- General installation information, ☞ 5.3 'General installation information' on page 29 ff
- General information on installation with mineral wool, ☞ on page 36
- ≥ 400 mm distance between two fire dampers
- Distance to load-bearing/adjacent components ≥ 200 mm
- Suspend the fire damper and air duct according to the mineral wool manufacturer's specifications

5.5.12 Dry mortarless installation with fire batt

Dry mortarless installation with fire batt into a solid wall

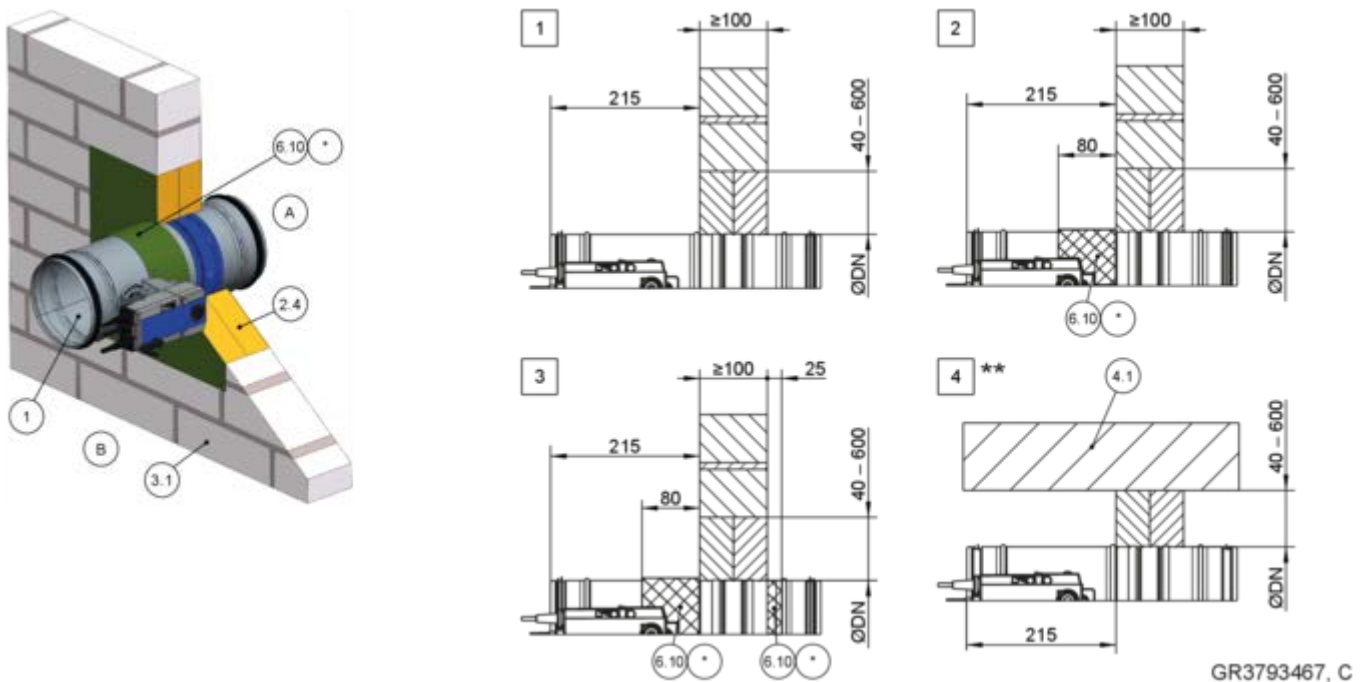


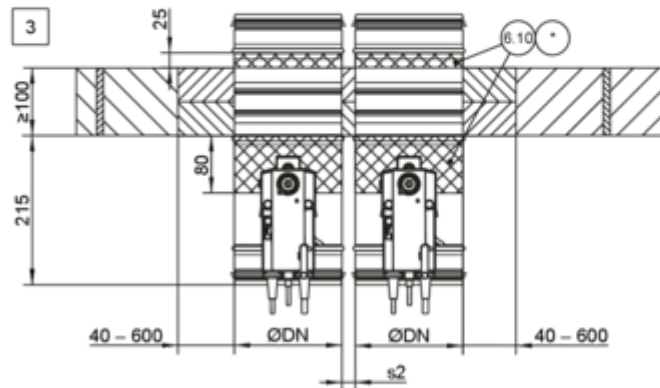
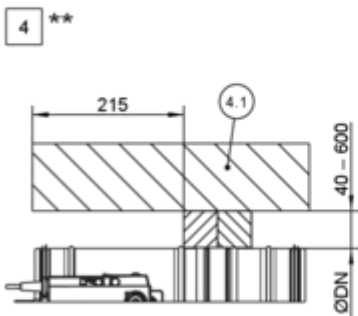
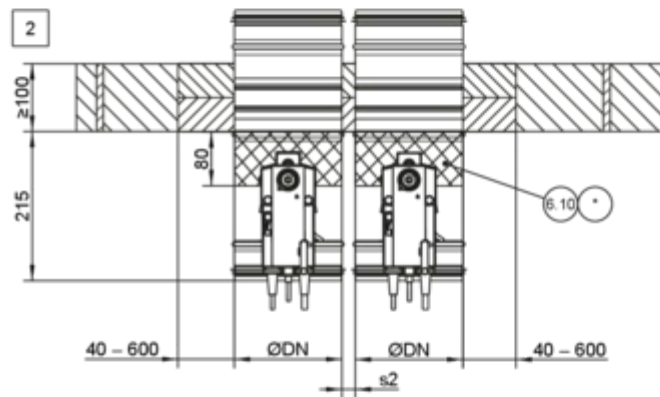
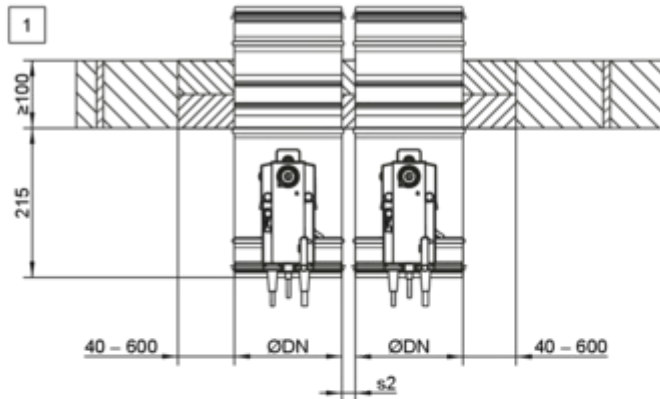
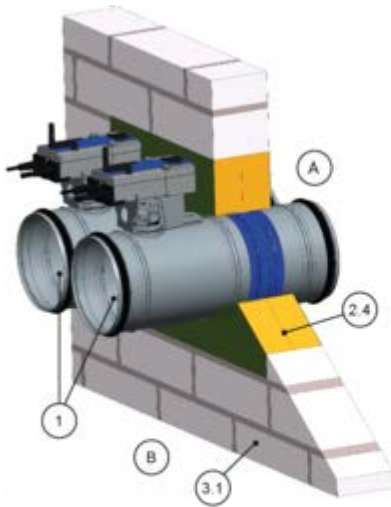
Fig. 61: Dry mortarless installation with fire batt into a solid wall

- | | | | |
|------|---|-----------|---|
| 1 | FKRS-EU | 6.20 | Pipe collar (to be ordered separately) |
| 2.4 | Coated board system | 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 |
| 6.10 | Ablative coating around the perimeter, d = at least 2.5 mm | | ☞ 'Additional provision for use in Germany:' on page 8. |
| 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 as in [4] |
| | | [1] – [4] | See table ☞ 81 |

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 – 315	EI 60 S	–	–	[1], [4]
100 – 200	EI 90 S	–	–	[1], [4]
224 – 315	EI 90 S	–	x	[2], [4]
100 – 200	EI 120 S	–	x	[2], [4]
224 – 315	EI 120 S	x	x	[3], [4]

Dry mortarless installation with fire batt in solid wall, flange to flange



GR3793494, C

Fig. 62: 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 | Pipe collar (to be ordered separately) |
| 2.4 | Coated board system | 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 |
| 4.1 | Solid ceiling slab | | ↳ 'Additional provision for use in Germany:' |
| 6.10 | Ablative coating around the perimeter, d = at least 2.5 mm | | on page 8 . |
| 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 as in [4] |
| | | [1] - [4] | See table ↳ 83 |

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

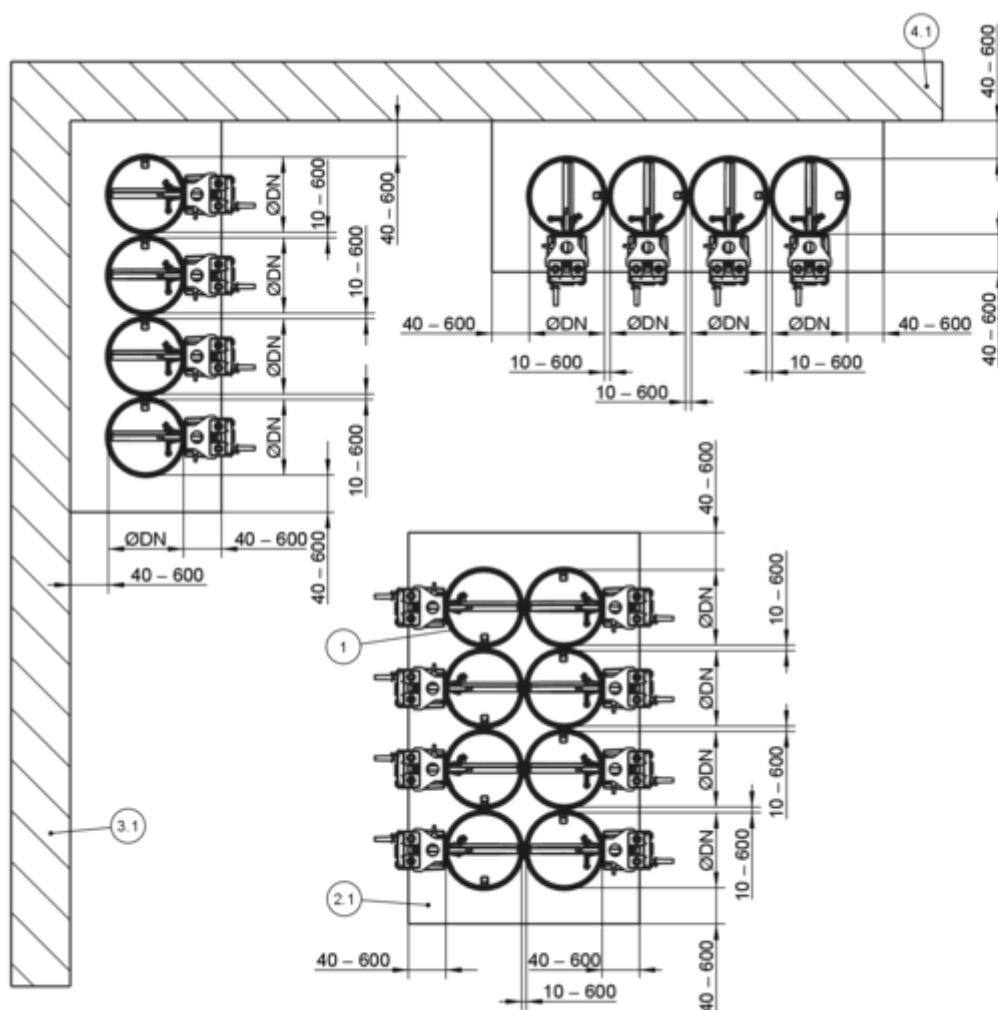
Solid wall					
NW [mm]	Fire resistance prop- erties to	Coating		s2 [mm]	Detail
		Installation side A	Operating side B		
100 – 200	EI 90 S	–	–	10* – 600	1, 4
224 – 315	EI 90 S	–	x	10* – 600	2, 4
100 – 200	EI 120 S	–	x	40 – 600	2, 4
224 – 315	EI 120 S	x	x	40 – 600	3, 4

* For a distance of 10 mm, mineral wool ≥ 1000 °C, ≥ 80 kg/m³ with d = 10 mm and width nominal width/2 shall be provided between the fire dampers.

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

- Solid wall, ↗ on page 40
- Fire batt systems, installation details, distances/dimensions, ↗ on page 36 f
- Suspension and fixing, ↗ Chapter 5.15 'Fixing the fire damper' on page 242
- General installation information, ↗ 5.3 'General installation information' on page 29 ff
- General information on installation with fire batt, ↗ on page 36

5.5.13 Dry mortarless installation with fire batt in solid wall - multiple occupancy of an installation opening

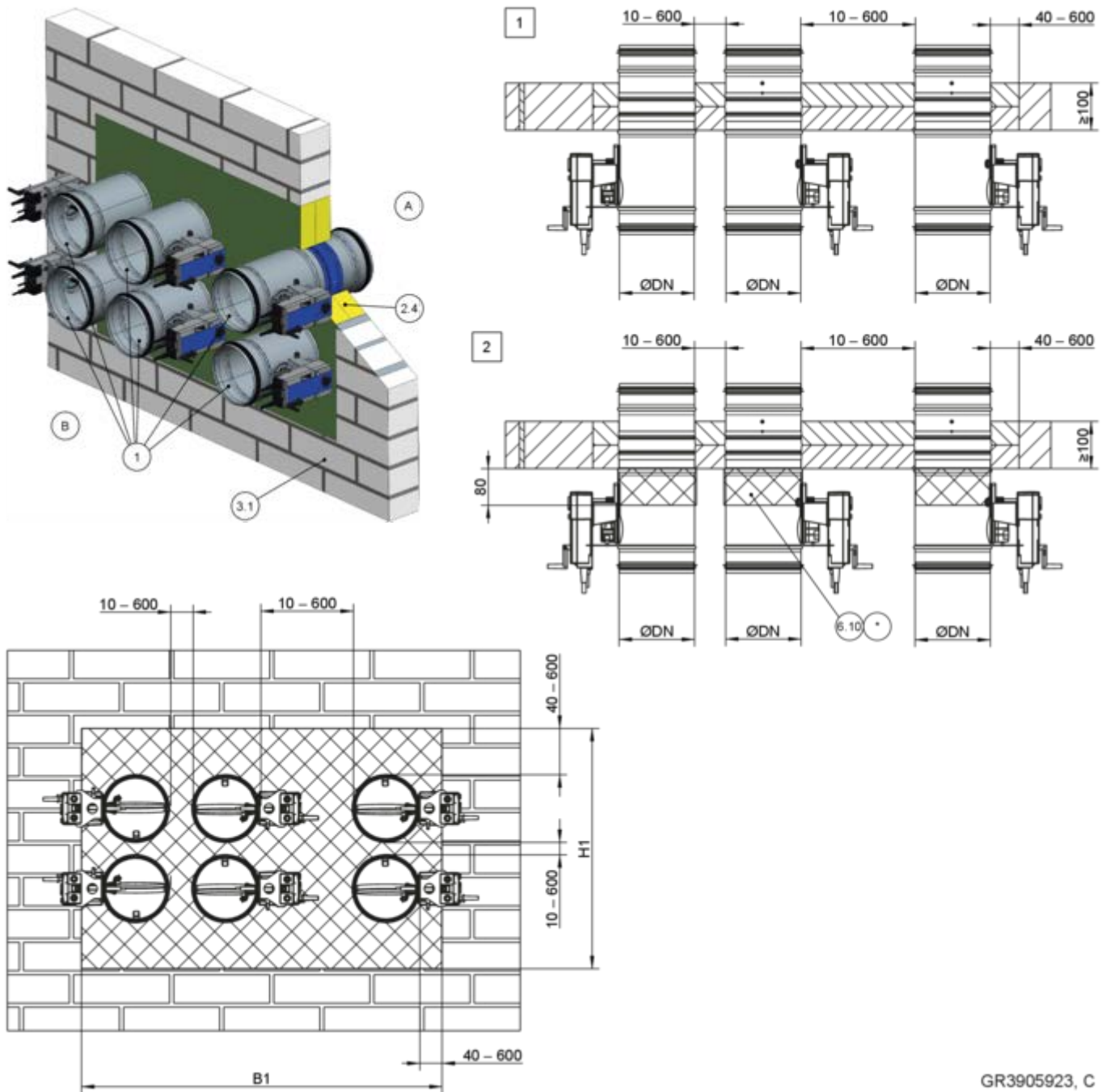


GR3791854, G

Fig. 63: Dry mortarless installation with fire batt in solid wall - multiple occupancy of an installation opening

- | | | | |
|-----|---------|-----|--|
| 1 | FKRS-EU | 3.1 | Solid wall (load-bearing structural element) |
| 2.1 | Mortar | 4.1 | Solid ceiling slab (load-bearing component) |

Solid walls > Dry mortarless installation with fire batt in ...



GR3905923, C

Fig. 64: Dry mortarless installation with fire batt in solid wall - multiple occupancy of an installation opening

- | | |
|---|---|
| <ul style="list-style-type: none"> 1 FKRS-EU 2.4 Coated board system 3.1 Solid wall 6.10 Ablative coating around the perimeter, d = at least 2.5 mm 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 | <ul style="list-style-type: none"> 6.20 Pipe collar (to be ordered separately) 6.24 Elastomeric foam (flame-resistant, non-dripping) <p>The following applies in Germany: For notes on the use of elastomeric foams ↪ 'Additional provision for use in Germany:' on page 8 .</p> <p>* 6.19, 6.20 or 6.24 as an alternative</p> <p>1 2 See table ↪ Table on page 86</p> |
|---|---|

Solid wall					
NW [mm]	Fire resistance properties to	Coating		Spacing [mm]	Detail
		Installation side A	Operating side B		
100 – 200	EI 90 S	–	–	10* – 600	1
224 – 315	EI 90 S	–	x	10* – 600	2

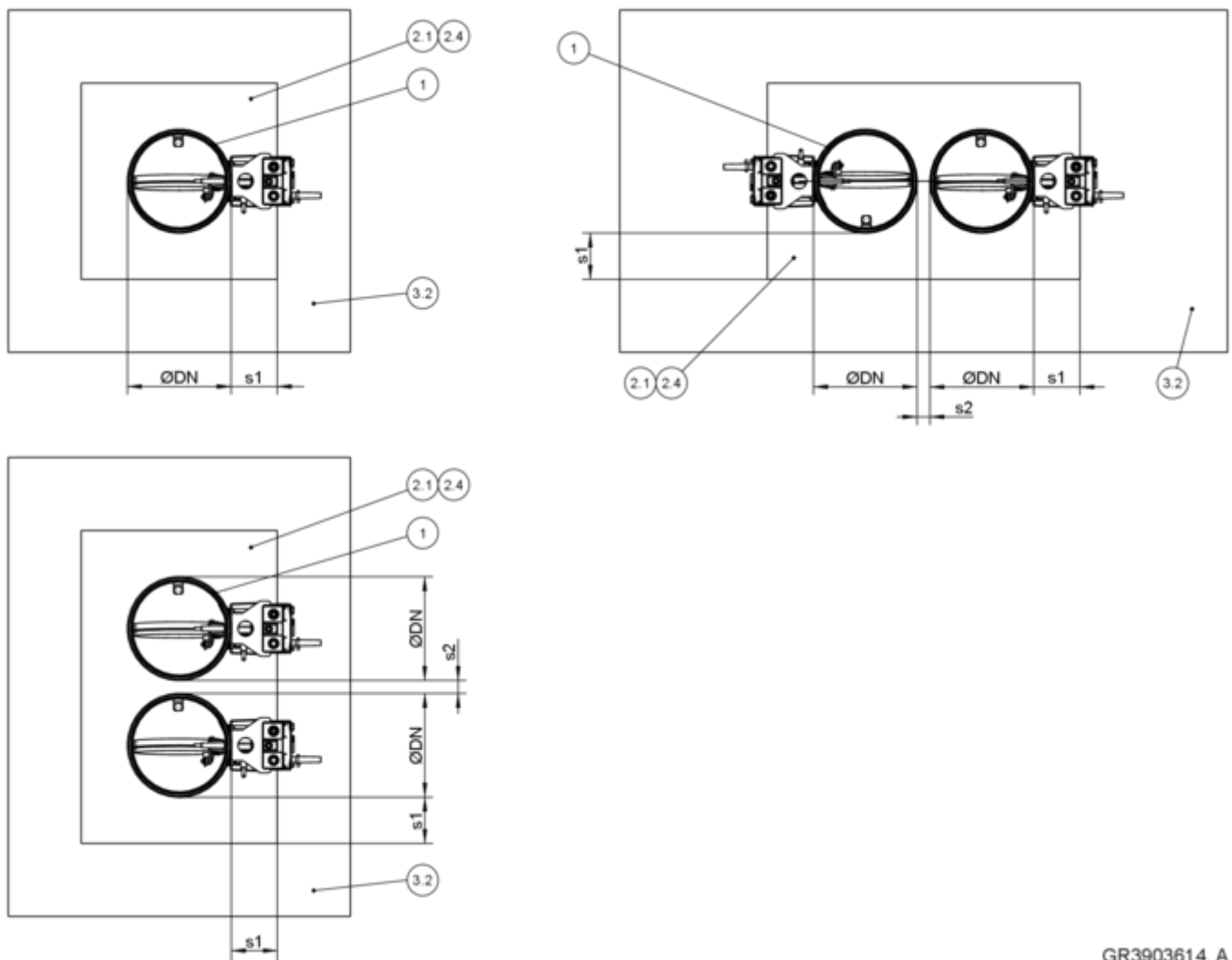
* For a distance of 10 mm, mineral wool ≥ 1000 °C, ≥ 80 kg/m³ with d = 10 mm and width nominal width/2 shall be provided between the fire dampers.

Supplementary requirements: Dry mortarless installation with fire batt in solid walls - Multiple occupancy of an installation opening

- Solid wall, ↪ on page 40
- Overall fire damper area ≤ 1.2 m²
- The number of fire dampers in an installation opening is limited by their size (nominal width) and the overall area of the fire dampers (1.2 m²) (maximum 10 FKRS-EU in single or double row arrangement)
- Distance to load-bearing structural elements ≥ 40 mm
- Fire batt systems, installation details, distances/dimensions, ↪ on page 36 f
- Suspension and fixing, ↪ Chapter 5.15 'Fixing the fire damper' on page 242
- General information on installation with fire batt, ↪ on page 36

5.6 Lightweight partition walls

5.6.1 General information



GR3903614, A

Fig. 65: Lightweight partition walls with metal support structure – arrangement/distances

- | | | | |
|-----|---------------------|-----|--|
| 1 | FKRS-EU | 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides |
| 2.1 | Mortar | s1 | Perimeter gap, |
| 2.4 | Coated board system | s2 | Distance between the fire dampers, ↪ 'Distances' on page 32 |

Installation type	Installation opening [mm]	Distance [mm]	
		s1	s2
Mortar-based installation	\varnothing nominal width + max. 450	≤ 225	$10/40^2 - 225$
Dry mortarless installation with TQ2	$\square A = \varnothing$ nominal width + 110 ³	central installation	$\geq 200^4$
Dry mortarless installation with fire batt ¹	$\square A = \varnothing$ nominal width + max. 1200	40 – 600	$10/40^2 - 600$

¹) Note the maximum size for the fire batt

²) Depending on fire resistance duration

³) Installation opening tolerance ± 2 mm

⁴) Installation into separate installation openings

Lightweight partition wall with metal support structure and cladding on both sides

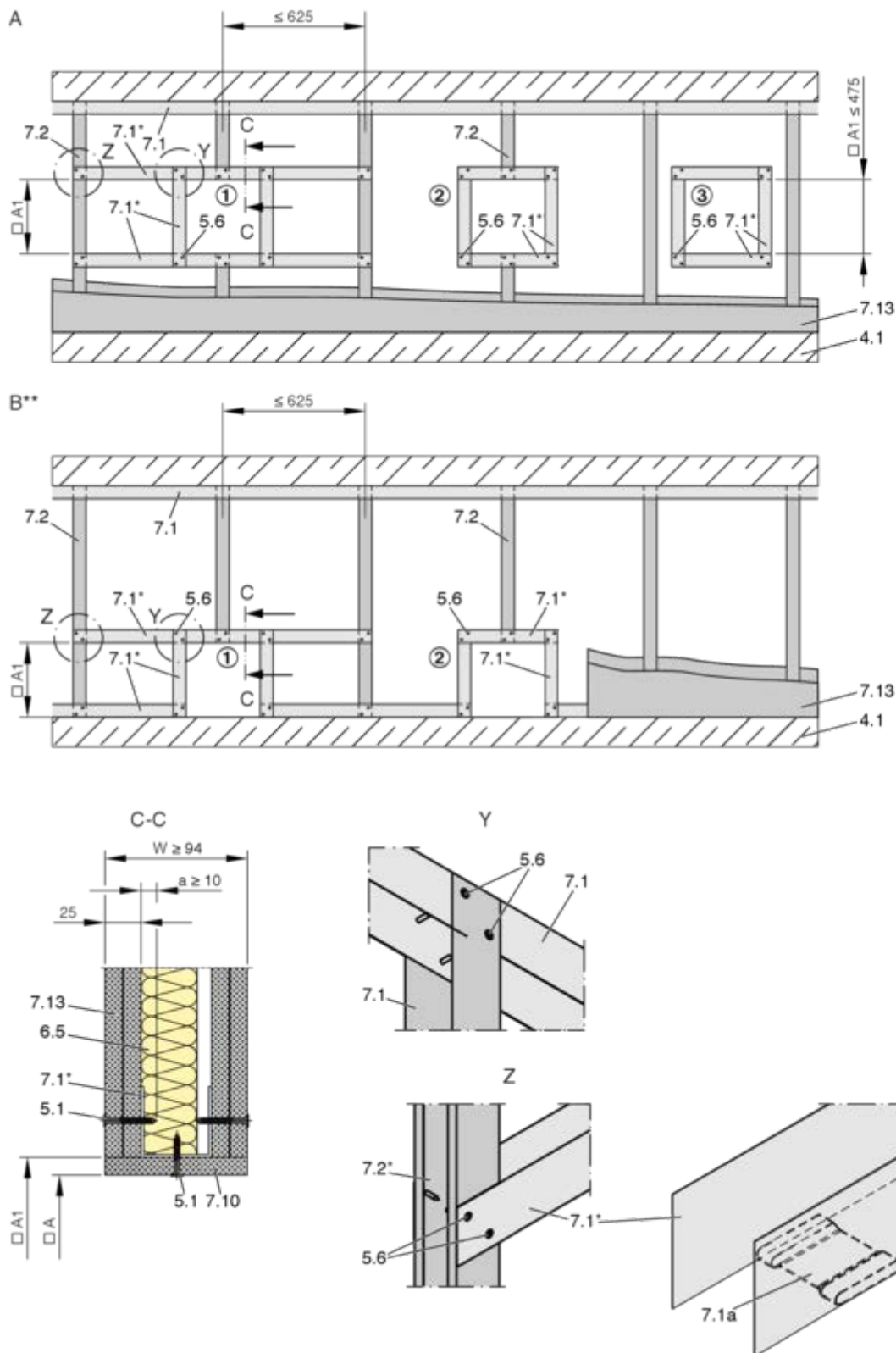


Fig. 66: Lightweight partition wall with metal support structure and cladding on both sides; for picture caption, see Fig. 67

Compartment wall with metal support structure and cladding on both sides

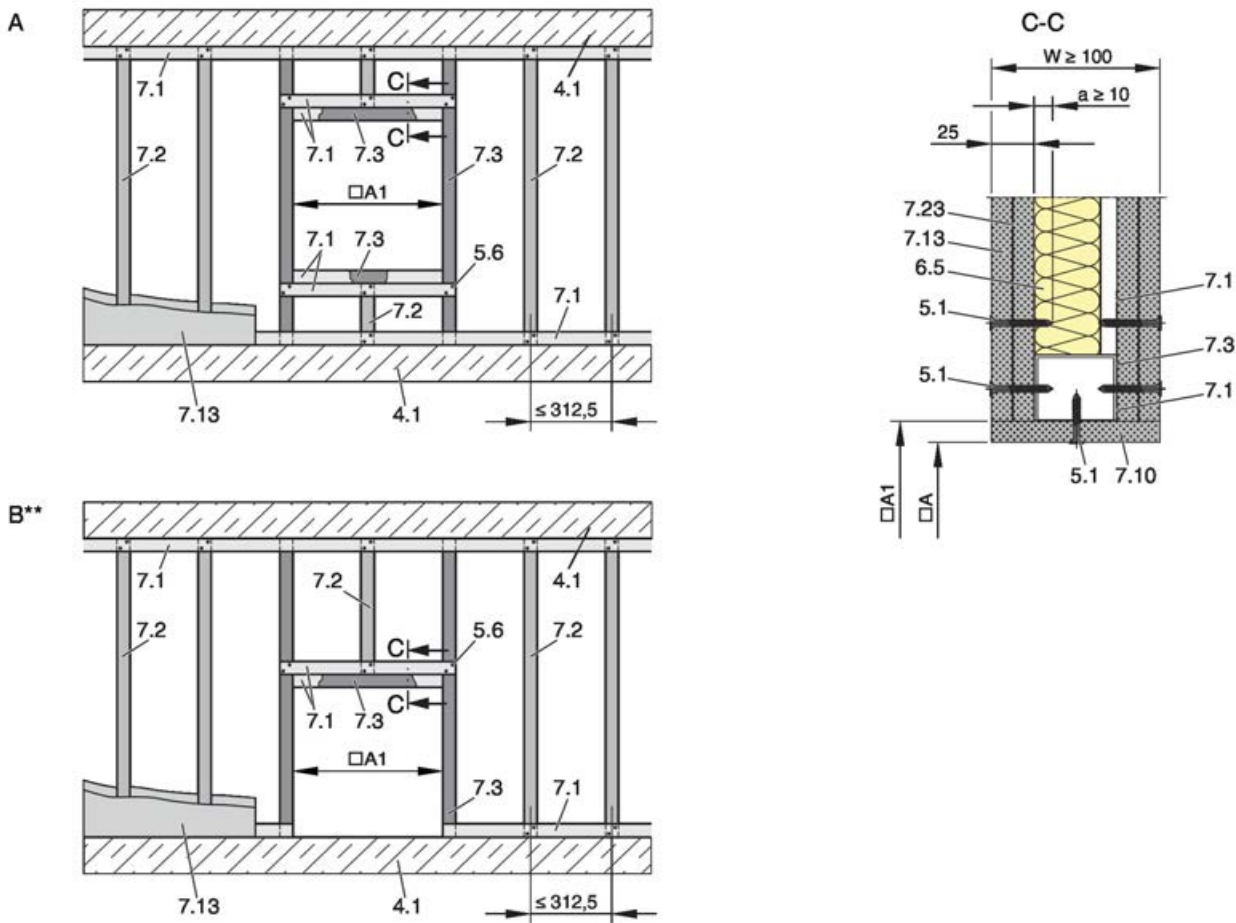


Fig. 67: Compartment wall with metal support structure and cladding on both sides

A	Lightweight partition wall/compartment wall/ safety partition wall	7.3	UA section
B	Lightweight partition wall/compartment wall/ safety partition wall, installation near the floor	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 (if any, depends on wall manufacturer)
5.6	Screw or steel rivet	*	Closed side of metal section must face the installation opening
6.5	Mineral wool, depending on wall construction	**	Installation near the ceiling analogous to B
7.1	UW section	□A	Installation opening
7.1a	UW section, either cut in and bent, or cut off	□A1	Opening in the metal support structure (without trim panels: □A = □A1)
7.2	CW section		

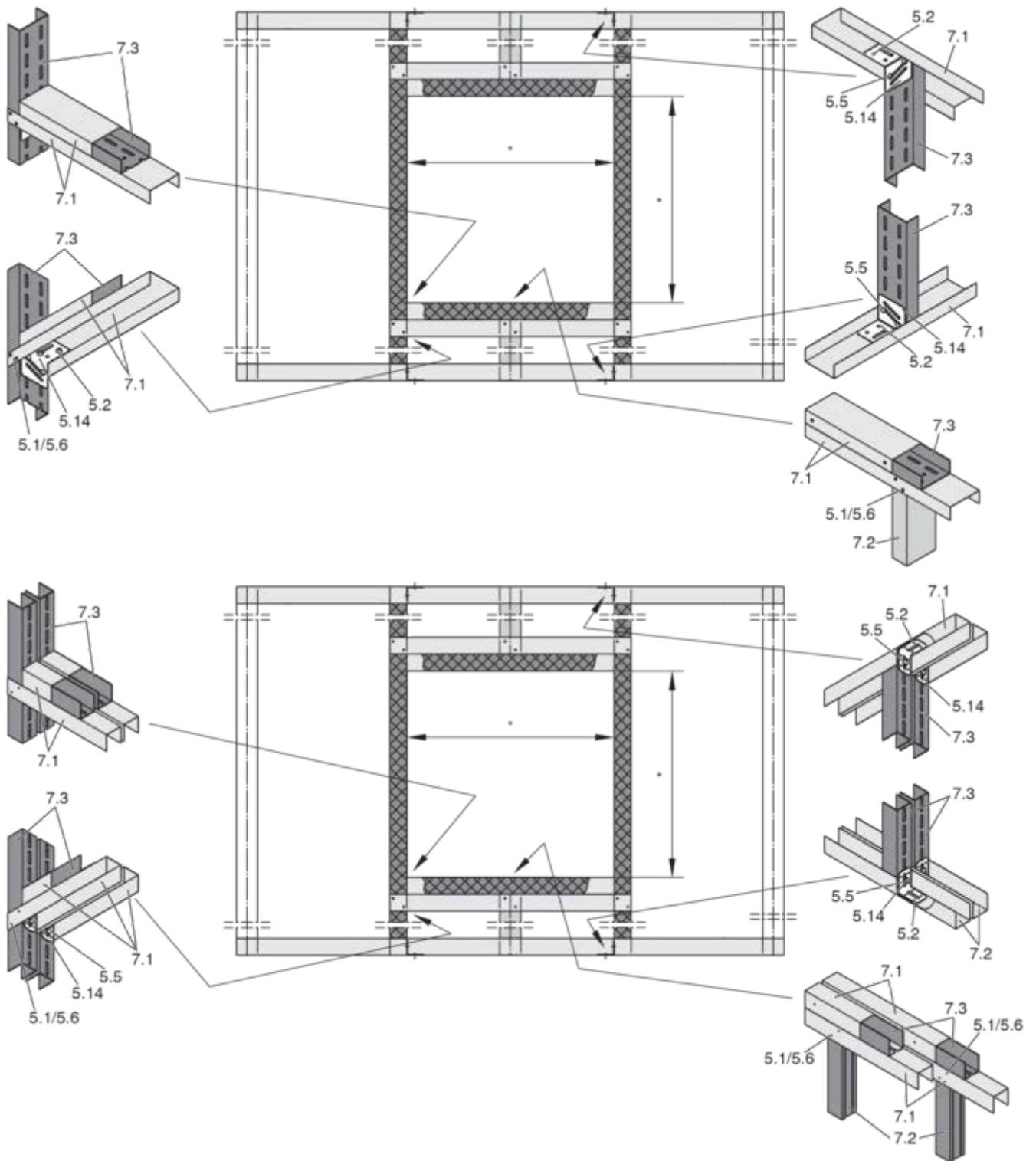


Fig. 68: Metal support structure for a compartment wall, single stud system and double stud system

- | | | | |
|------|---|-----|--|
| 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 | | |

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

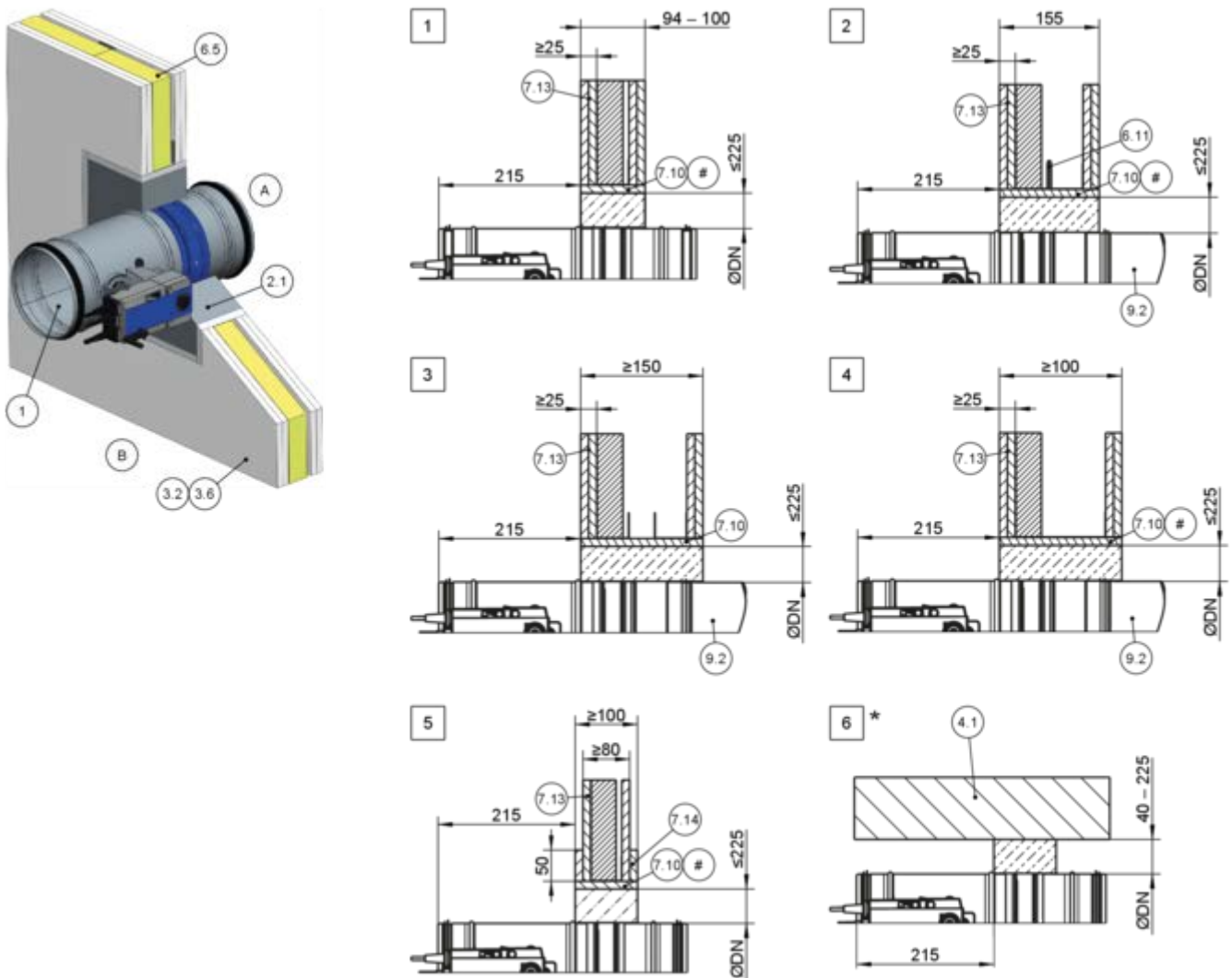
- Lightweight partition wall or compartment wall,
↳ on page 40

Erecting a wall and creating an installation opening

- Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening, ↳ 5.6.1 'General information' on page 87 ff
 - Variant 1: Provide the installation opening in the metal support structure with suitable metal sections, then clad the wall.
 - Variant 2: Create installation opening in the metal stud frame with surrounding metal sections. If a regulation stand is cut, it must be connected to the profiles of the installation opening.
 - Option 3: 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.

5.6.2 Mortar-based installation

Mortar-based installation into a lightweight partition wall, compartment wall or safety partition wall

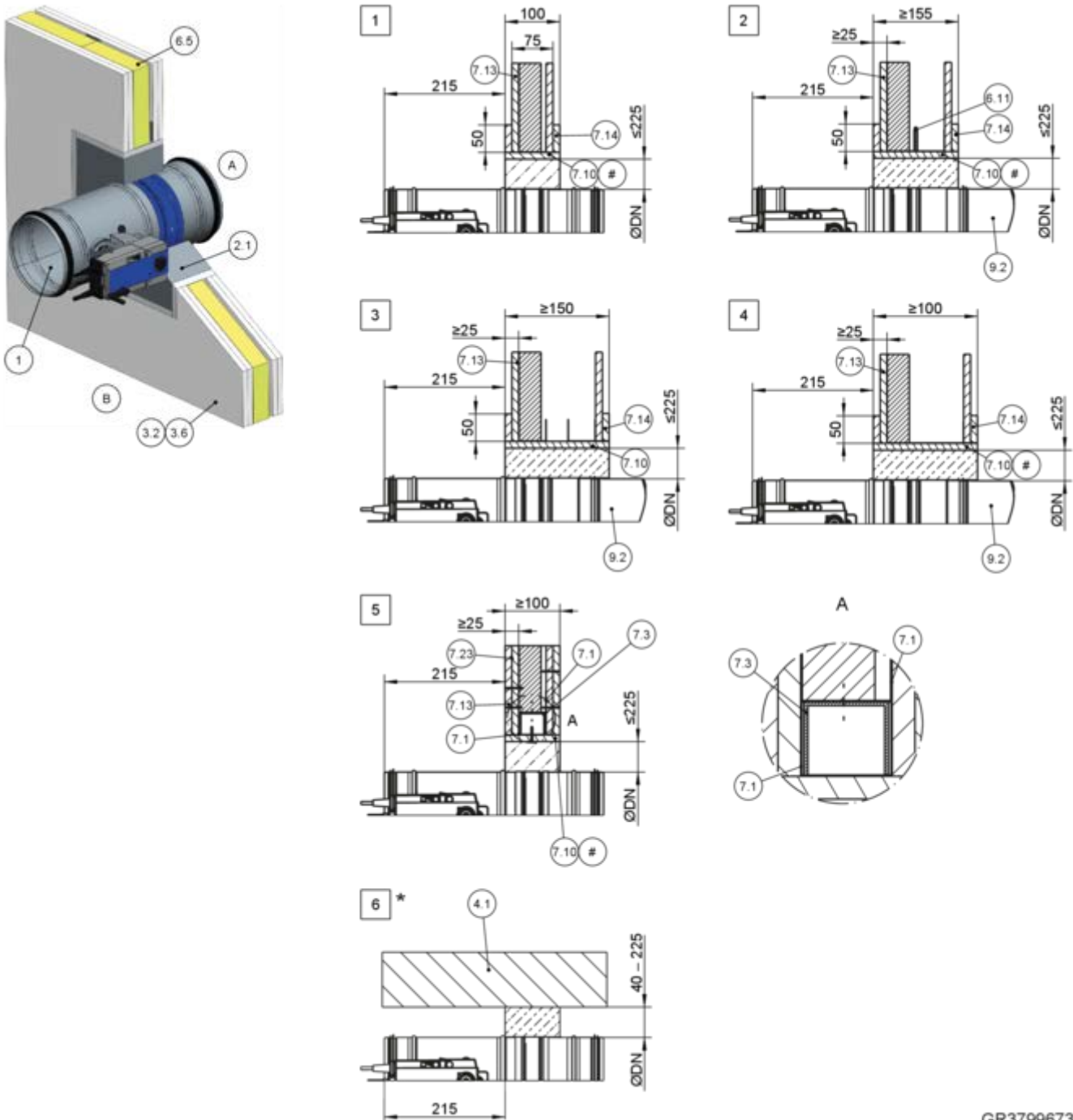


GR3799673, D

Fig. 69: Mortar-based installation into a lightweight partition wall, compartment wall or safety partition wall

1	FKRS-EU	7.13	Cladding
2.1	Mortar	7.14	Reinforcing board of the same material as the wall
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides	9.2	Air duct/extension piece
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	#	Optional
4.1	Solid ceiling slab/solid floor	*	Installation near the floor as in 6
6.5	Mineral wool, depending on wall construction	1 - 4	Up to EI 120 S
6.11	Insulating strip (depending on wall construction)	5	Up to EI 60 S
7.10	Trim panel	6	EI 30 S – EI 120 S

Mortar-based installation into a lightweight partition wall

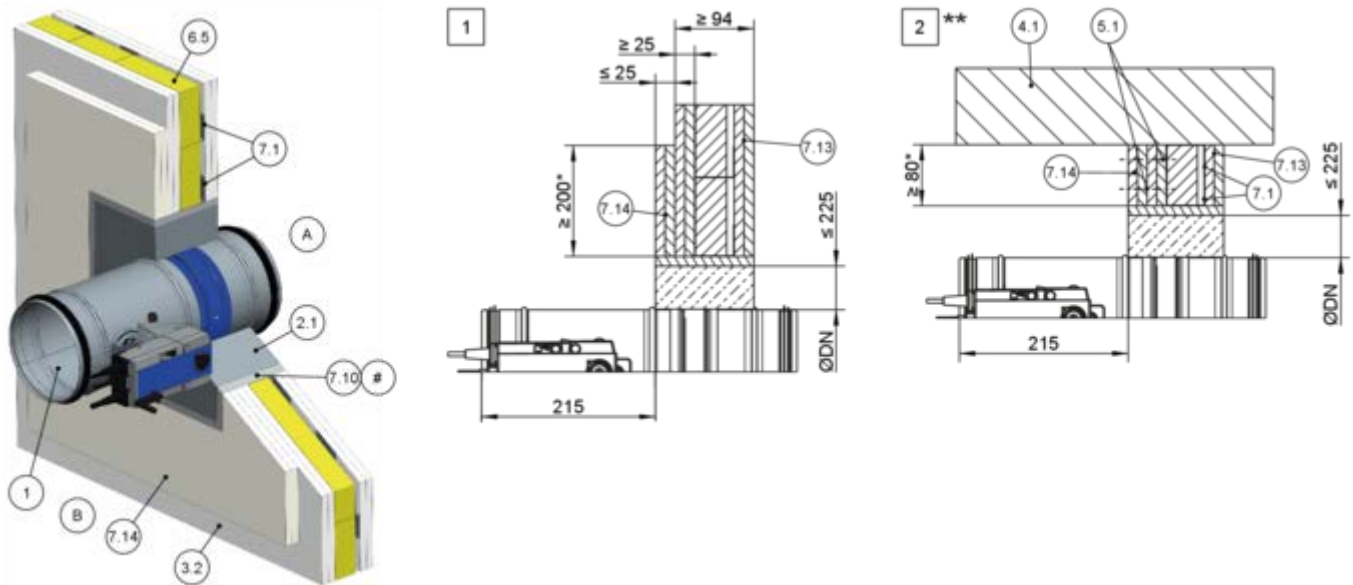


GR3799673, D

Fig. 70: Mortar-based installation into a lightweight partition wall, compartment wall or safety partition wall

1	FKRS-EU	7.13	Cladding
2.1	Mortar	7.14	Reinforcing board of the same material as the wall
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides	7.23	Sheet steel insert
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	9.2	Air duct/extension piece
4.1	Solid ceiling slab/solid floor	#	Optional
6.5	Mineral wool, depending on wall construction	*	Installation near the floor as in 6
6.11	Insulating strip (depending on wall construction)	1 - 4	EI 30 S
7.3	UA section	5	EI 120 S
7.10	Trim panel	6	EI 30 S – EI 120 S

Mortar-based installation in lightweight partition wall – Installation not flush with wall

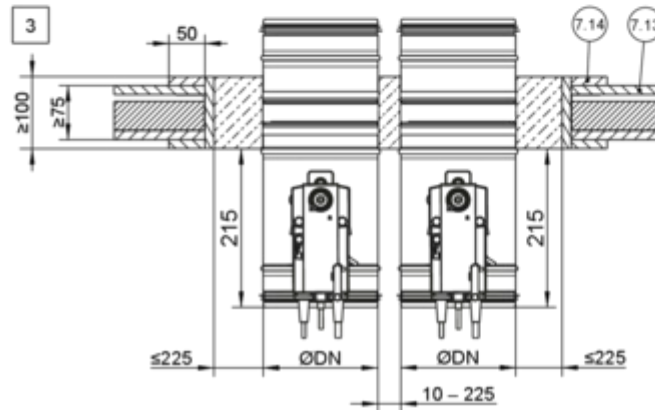
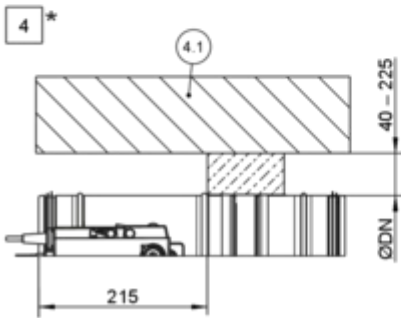
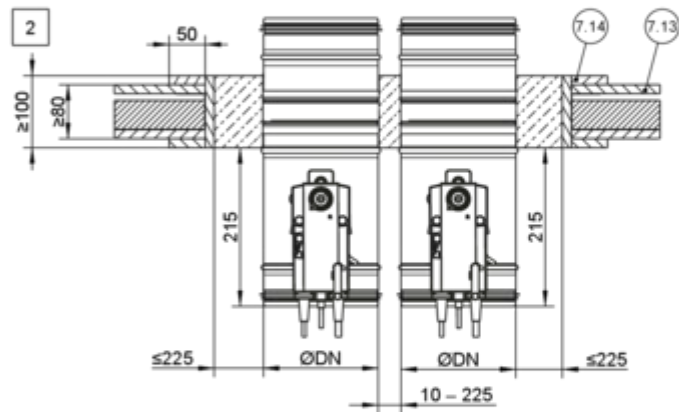
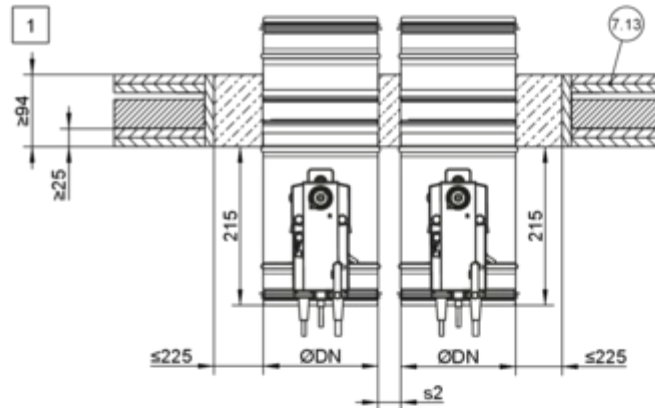
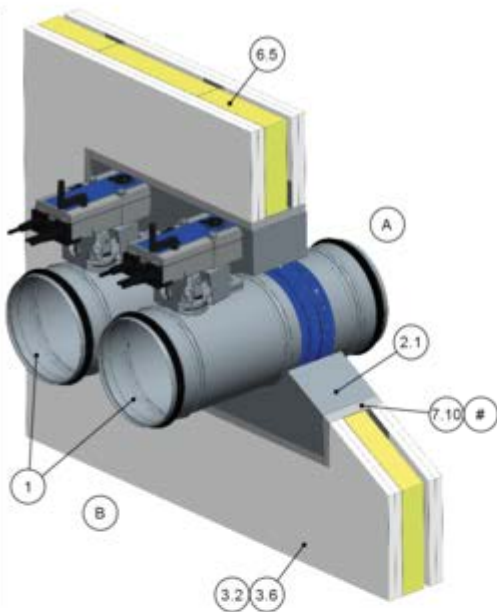


GR3801414, C

Fig. 71: Mortar-based installation in lightweight partition wall – Installation not flush with wall

1	FKRS-EU	7.13	Cladding
2.1	Mortar	7.14	Reinforcing board of the same material as the wall
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides	#	Optional/depending on wall construction
4.1	Solid ceiling slab/solid floor	*	Fixing to at least two metal post profiles
6.5	Mineral wool, depending on wall construction	**	Installation near the floor as in 2
7.1	UW section	1 2	EI 120 S
7.10	Trim panel		

Mortar-based installation into a lightweight partition wall, flange to flange

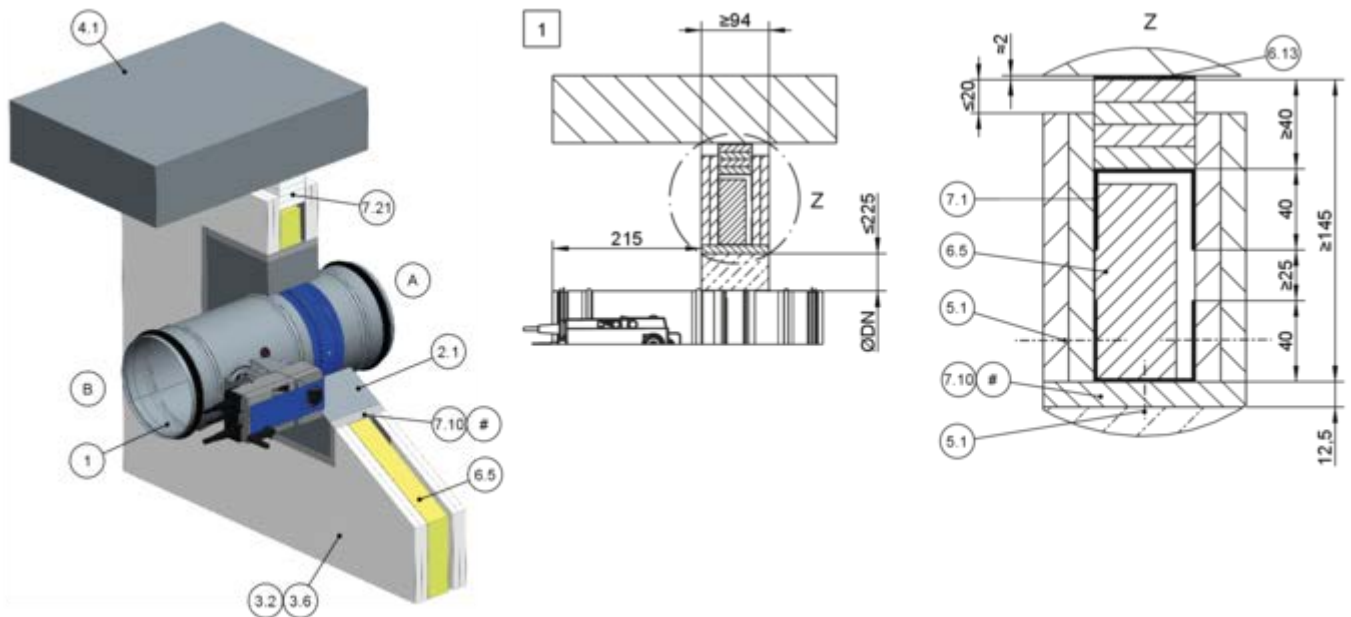


GR3800403, B

Fig. 72: 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 | # | According to installation details Fig. 69 and Fig. 70 |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | * | Installation near the floor as in [4] |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | [1] | Up to EI 120 S for s2 = 40 – 225 mm |
| 4.1 | Solid ceiling slab/solid floor | [2] | Up to EI 90 S for s2 = 10 – 225 mm |
| 6.5 | Mineral wool, depending on wall construction | [3] | Up to EI 60 S |
| 7.10 | Trim panel | [4] | EI 30 S |
| 7.13 | Cladding | | EI 30 S – EI 120 S |

Mortar-based installation into a lightweight partition wall, below a flexible ceiling joint



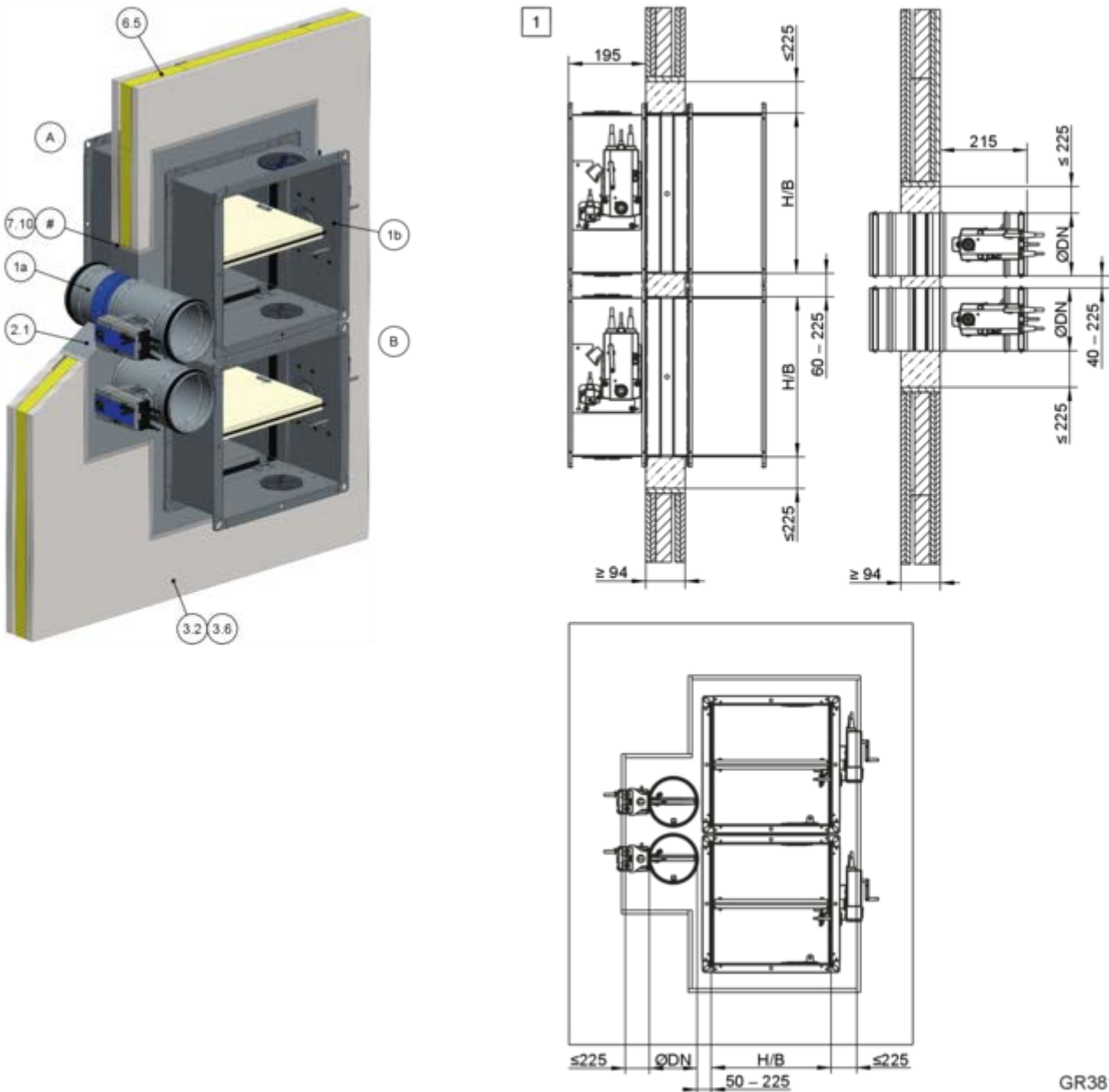
GR3800809, E

Fig. 73: 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 |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | 7.10 | Trim panel |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | 7.21 | Ceiling joint strips (e.g. 4 × ≥ 10 mm) |
| 4.1 | Solid ceiling slab | # | According to installation details Fig. 69 and Fig. 70 |
| 5.1 | Dry wall screw | 1 | Up to EI 120 S |
| 6.5 | Mineral wool, depending on wall construction | | |

Note: Illustration is an example. The distance from the ceiling depends on the flexible ceiling joint, the expected ceiling subsidence and the specifications of the wall manufacturer.

Mortar-based installation into a lightweight partition wall, FKRS-EU and FK2-EU, combined



GR3812596, D

Fig. 74: Mortar-based installation into a lightweight partition wall, FKRS-EU and FK2-EU, combined

- | | | | |
|-----|--|------|---|
| 1a | FKRS-EU | 6.5 | Mineral wool, depending on wall construction |
| 1b | FK2-EU up to $B \times H \leq 800 \times 400$ mm | 7.10 | Trim panel |
| 2.1 | Mortar | # | According to installation details Fig. 69 and Fig. 70 |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | 1 | Up to EI 90 S |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | | |

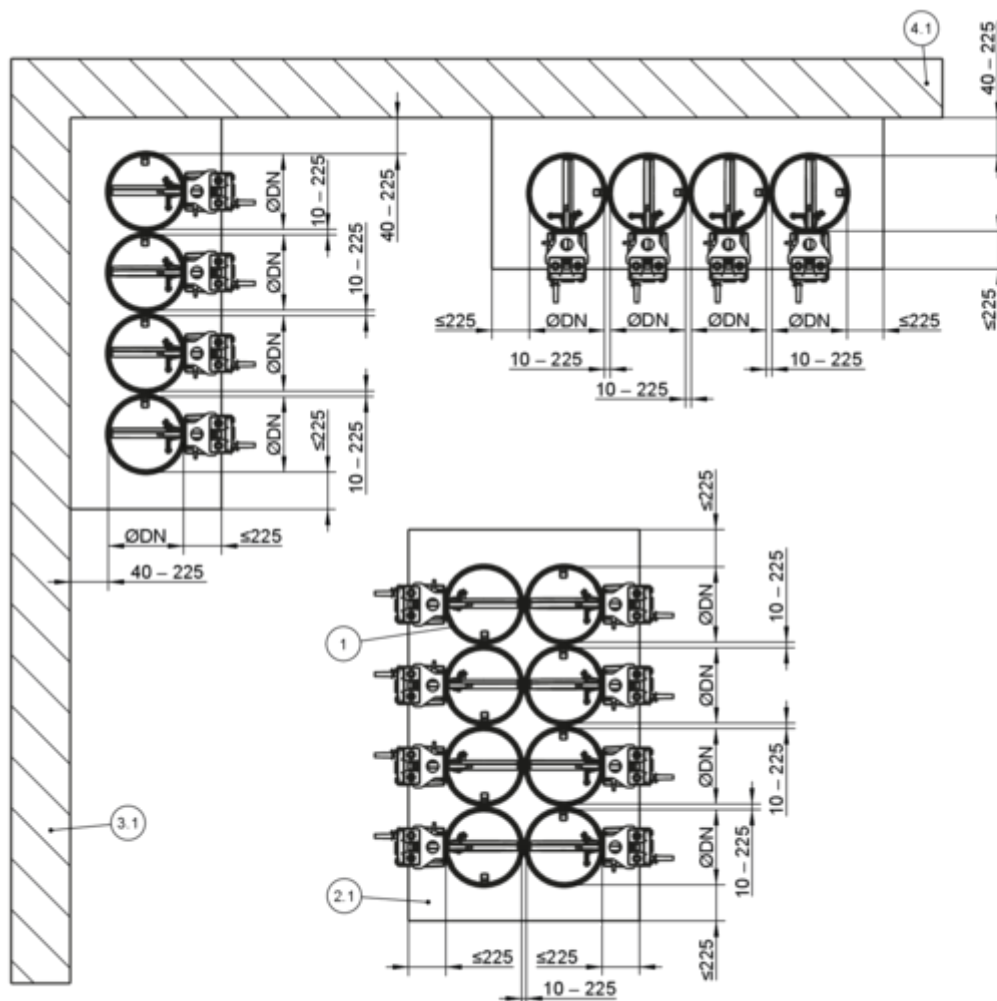
For combined installation please note:

- Overall fire damper area ≤ 1.2 m².
- The number of fire dampers in an installation opening is limited by their size ($B \times H$ for FK2-EU and/or \varnothing nominal width for FKRS-EU) and the overall area of the fire dampers (1.2 m²).
- Other arrangements (side by side or on top of each other) are possible.
For installation details FK2-EU, see the installation and operating manual for this fire damper type.
- Distance to load-bearing structural elements ≥ 40 mm

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

- Lightweight partition wall or compartment wall,
↳ on page 40
- General installation information, ↳ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation,
↳ '**Mortar-based installation**' on page 34

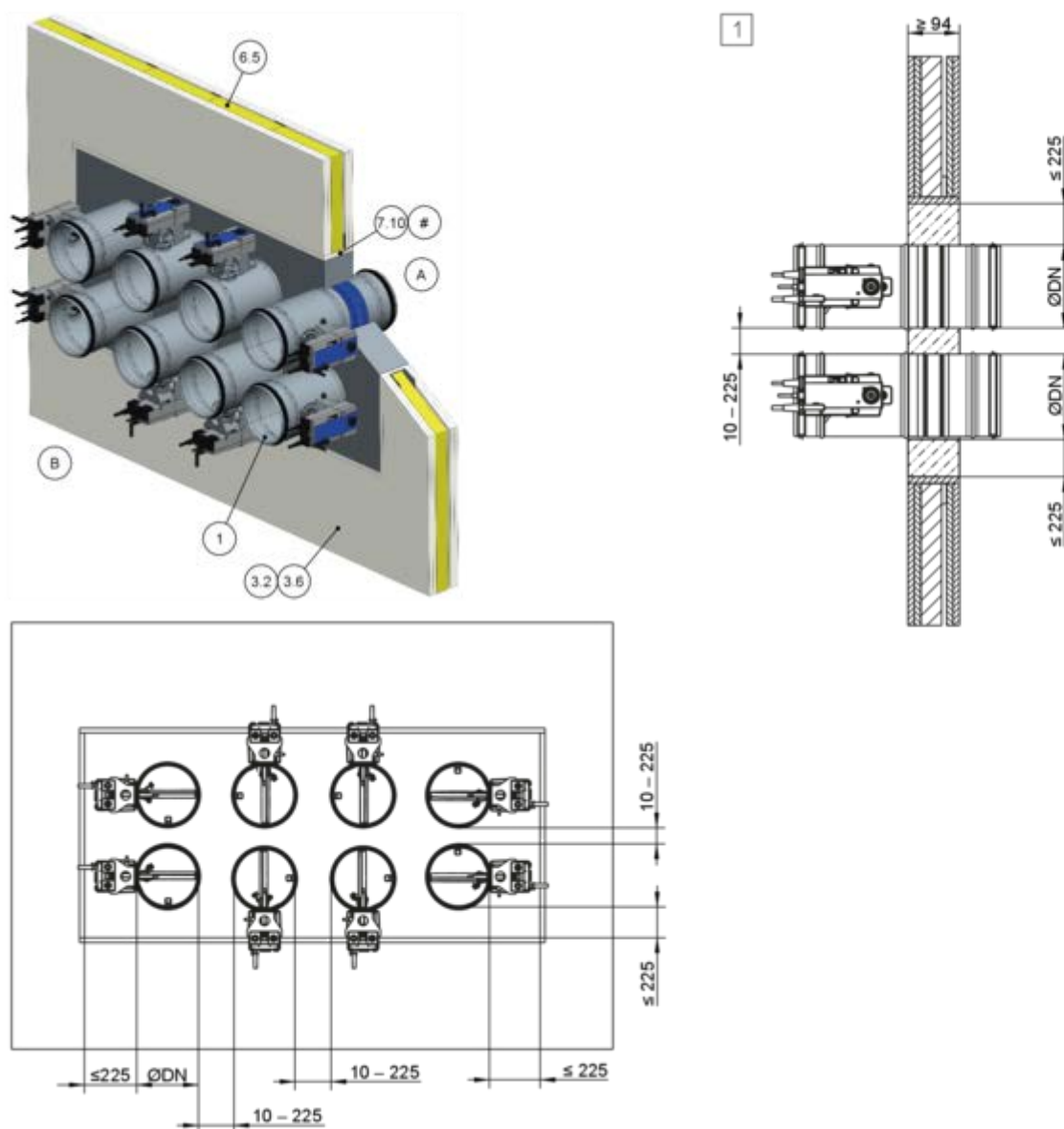
5.6.3 Mortar-based installation – multiple installation into one installation opening



GR3791854, G

Fig. 75: Mortar-based installation – multiple installation into one installation opening

- | | | | |
|-----|---------|-----|--|
| 1 | FKRS-EU | 3.1 | Solid wall (load-bearing structural element) |
| 2.1 | Mortar | 4.1 | Solid ceiling slab (load-bearing component) |



GR3935398, A

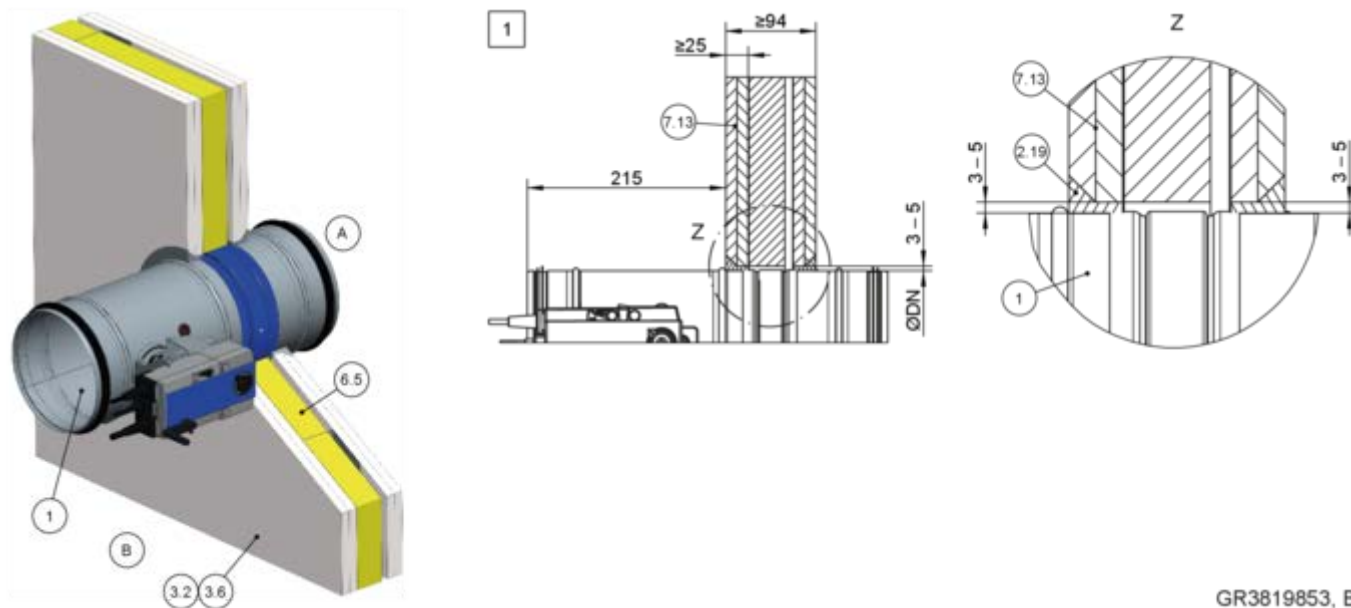
Fig. 76: Mortar-based installation – multiple installation into one installation opening

- | | | | |
|-----|--|----------|---|
| 1 | FKRS-EU | 6.5 | Mineral wool, depending on wall construction |
| 2.1 | Mortar | 7.10 | Trim panel |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | # | According to installation details Fig. 69 and Fig. 70 |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | 1 | Up to EI 90 S |

Additional requirements: mortar-based installation – multiple installation into one installation opening

- Lightweight partition wall or compartment wall,
↳ *on page 40*
- The number of fire dampers in an installation opening is limited by their size (nominal width) and the overall area of the fire dampers (1.2 m²) (maximum 10 FKRS-EU in single or double row arrangement)
- Distance to load-bearing structural elements
≥ 40 mm
- The mortar bed width must not exceed 225 mm, provide separate trimmers if necessary.

5.6.4 Dry mortarless installation into a lightweight partition wall, without installation kit



GR3819853, B

Fig. 77: Dry mortarless installation into a lightweight partition wall, without installation kit

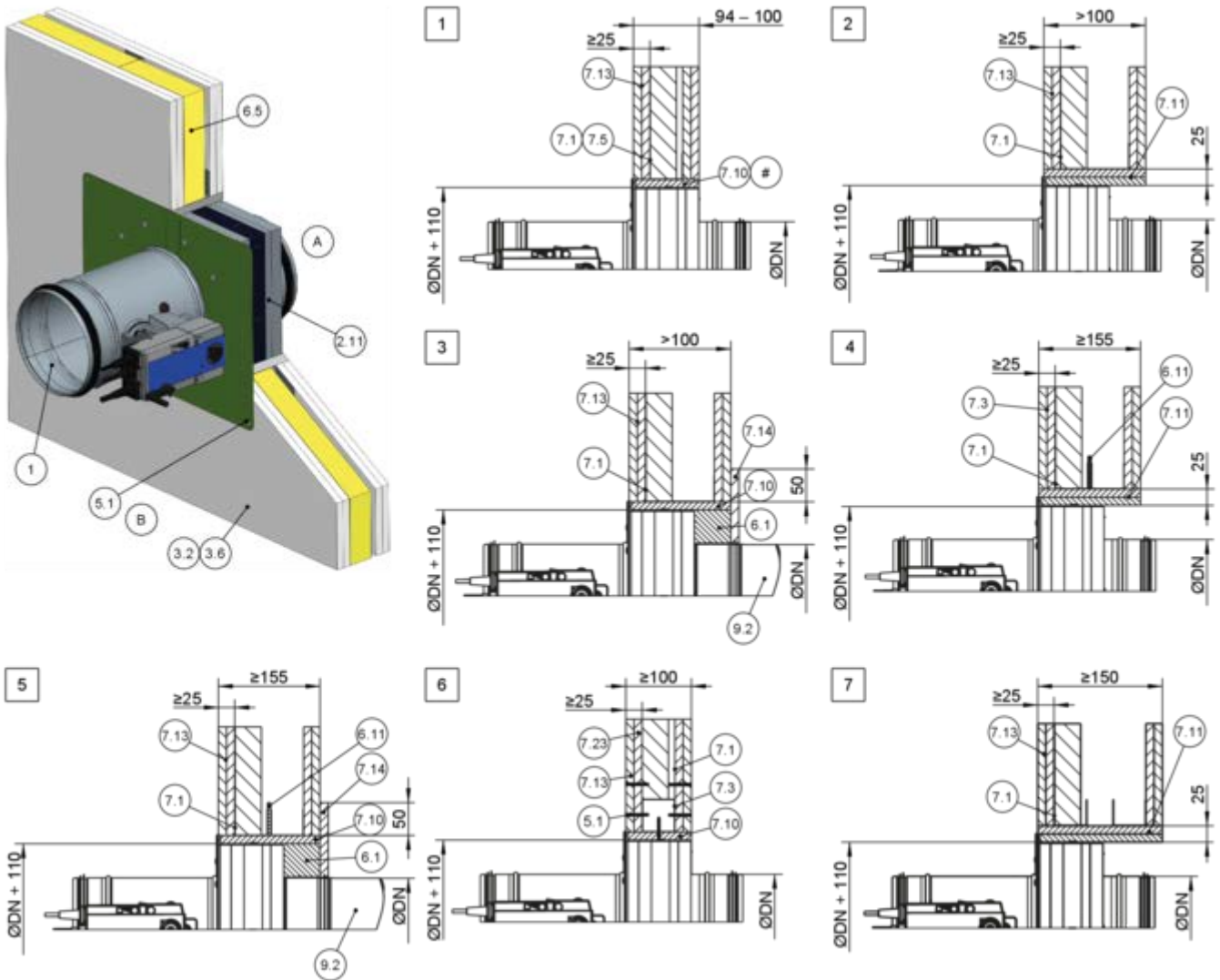
1	FKRS-EU	6.5	Mineral wool, depending on wall construction
2.19	Joint filler (filler, ready-to-use putty or equivalent)	7.13	Cladding
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides	1	Up to EI 60 S
3.6	Compartment wall or safety partition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

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

- Lightweight partition wall, ↗ on page 40
 - ≥ 200 mm distance between two fire dampers
 - ≥ 75 mm distance between the fire damper and load-bearing components
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.
 3. ▶ Connection of the air duct via flexible connectors (recommendation).

5.6.5 Dry mortarless installation into a lightweight partition wall, with installation kit TQ2

Dry mortarless installation into a lightweight partition wall, with installation kit TQ2



GR3805414, D

Fig. 78: Dry mortarless installation into a lightweight partition wall, with installation kit TQ2

1	FKRS-EU	7.5	Steel support structure (box section)
2.11	Installation kit TQ2 with cover plate	7.10	Trim panels (fire-resistant)
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides	7.11	Fire-resistant trim panels, double
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	7.13	Cladding
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame	7.14	Reinforcing board of the same material as the wall
6.1	Mineral wool, $\geq 1000\text{ °C}$, $\geq 40\text{ kg/m}^3$	7.23	Sheet steel insert
6.5	Mineral wool, depending on wall construction	9.2	Air duct/extension piece
6.11	Insulating strip (depending on wall construction)	#	Optional
7.1	UW section	1 – 7	Up to EI 120 S
7.3	UA section		

Lightweight partition walls > Dry mortarless installation into a lightweight...

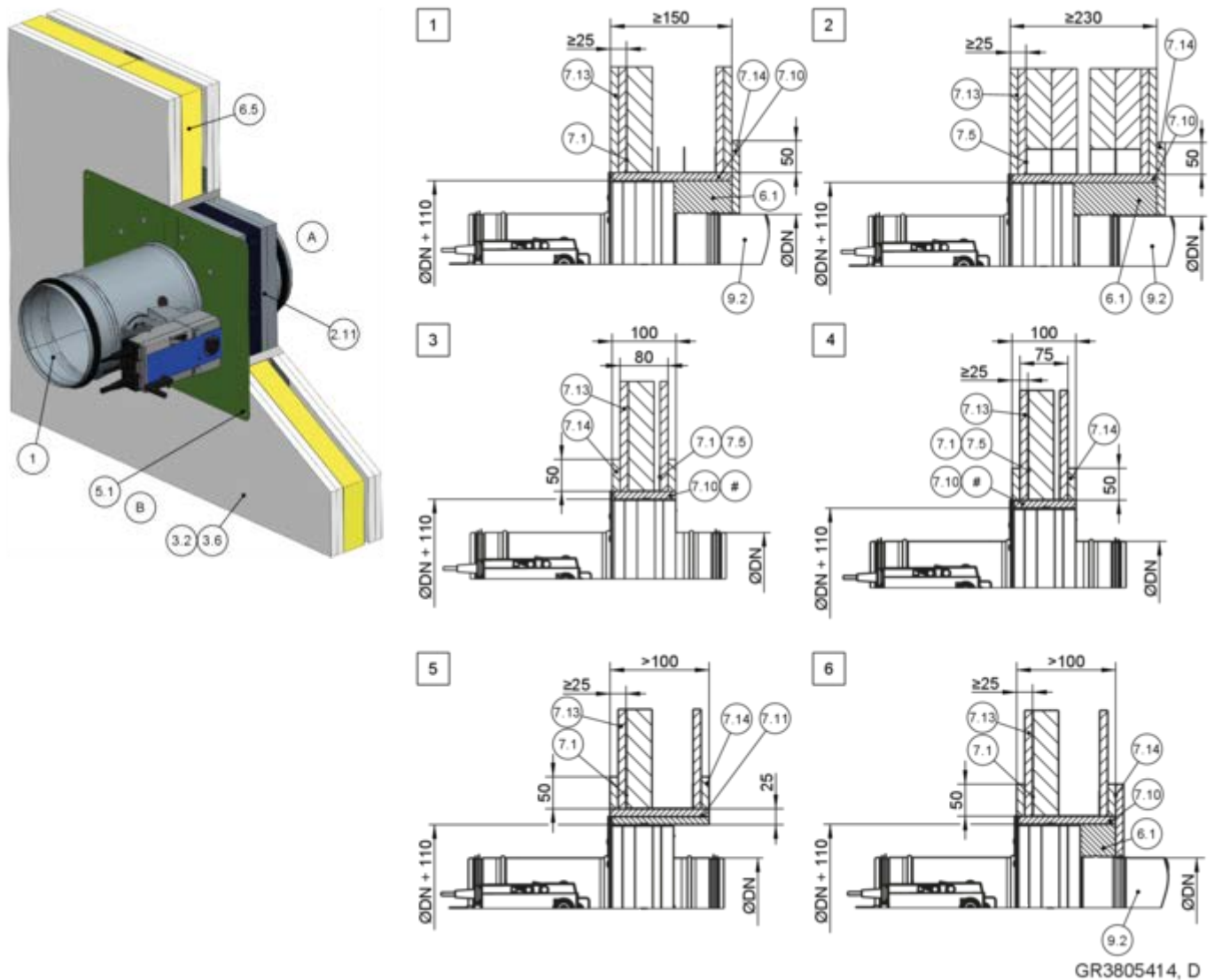
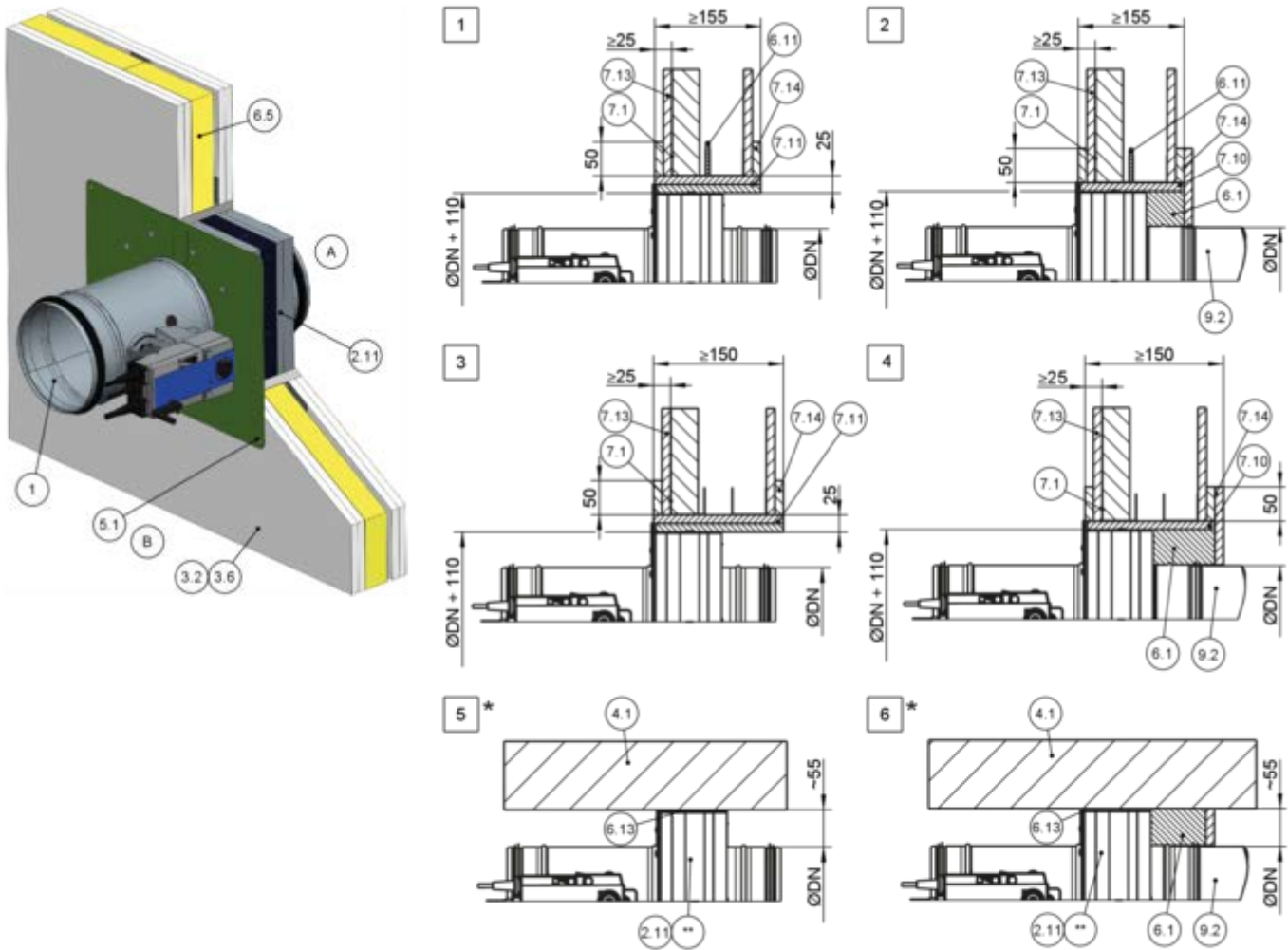


Fig. 79: Dry mortarless installation into a lightweight partition wall, with installation kit TQ2

1	FKRS-EU	7.10	Trim panels (fire-resistant)
2.11	Installation kit TQ2 with cover plate	7.11	Fire-resistant trim panels, double
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides	7.13	Cladding, fire-resistant, also with sheet steel insert
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	7.14	Reinforcing board of the same material as the wall
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame	9.2	Air duct/extension piece
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	1 2	Up to EI 120 S
7.1	UW section	3	Up to EI 60 S
7.5	Steel support structure (box section)	4 – 6	EI 30 S

Lightweight partition walls > Dry mortarless installation into a lightweight...

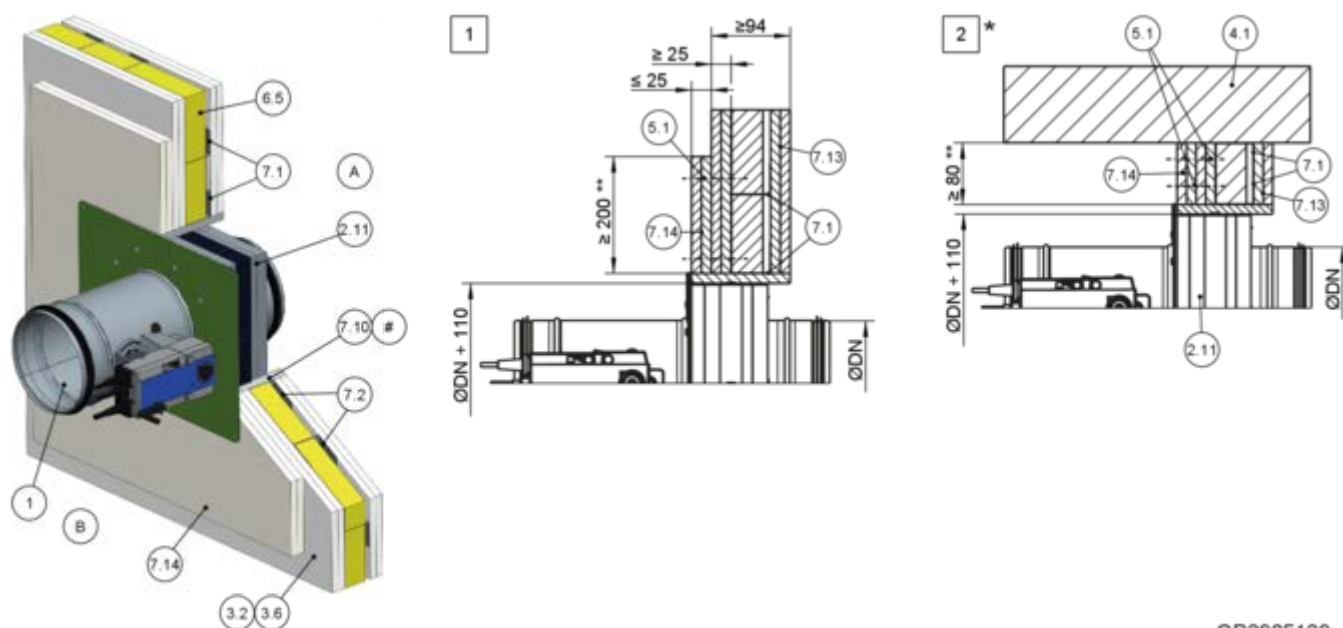


GR3805414, D

Fig. 80: Dry mortarless installation into a lightweight partition wall, with installation kit TQ2

1	FKRS-EU	7.10	Trim panels (fire-resistant)
2.11	Installation kit TQ2 with cover plate	7.11	Fire-resistant trim panels, double
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides	7.13	Cladding, fire-resistant, also with sheet steel insert
3.6	Compartment wall or safety partition wall with metal 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	Air duct/extension piece
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame	#	Optional
6.1	Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 40\text{ kg/m}^3$	*	Installation near the floor analogous to 5 and 6
6.5	Mineral wool, depending on wall construction	**	Cover plate shortened by others
6.11	Insulating strip (depending on wall construction)	1 - 4	EI 30 S
6.13	Mineral wool strips A1, alternatively gypsum mortar	5 6	EI 30 S – EI 120 S
7.1	UW section		

Dry mortarless installation in lightweight partition wall with installation kit TQ2 – Installation not flush with wall



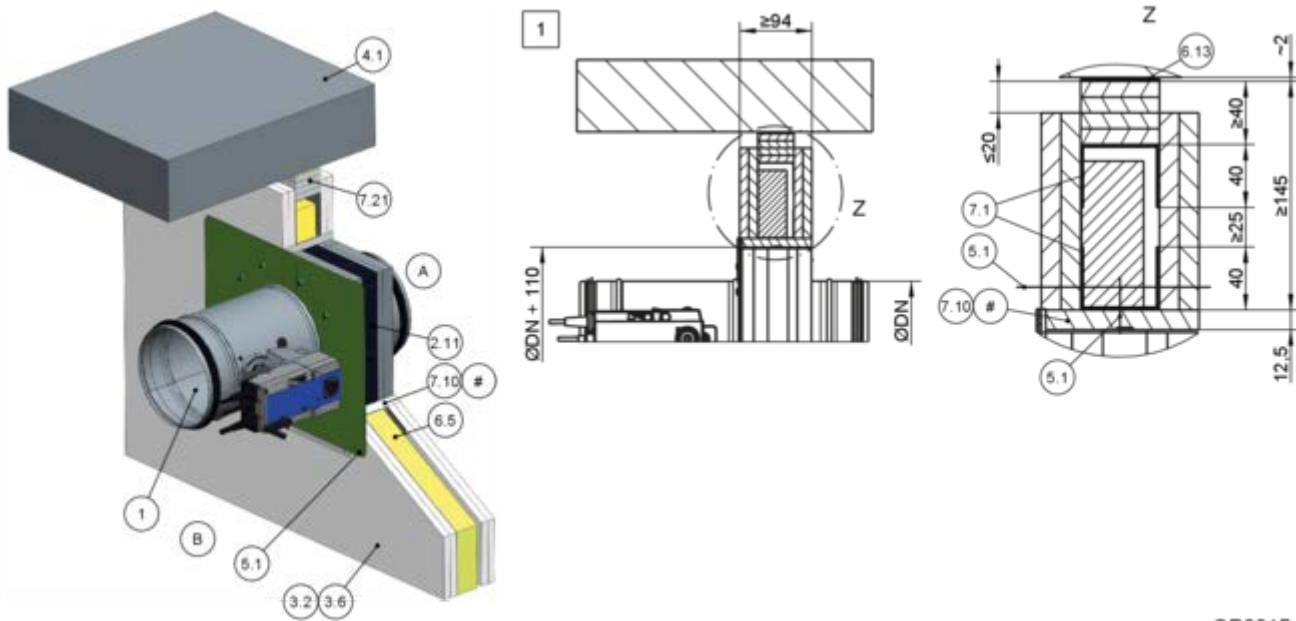
GR3905139, C

Fig. 81: Dry mortarless installation in lightweight partition wall with installation kit TQ2 – Installation not flush with wall

1	FKRS-EU	7.2	CW section
2.11	Installation kit TQ2 with cover plate	7.10	Trim panel
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides	7.13	Cladding, fire-resistant, also with sheet steel insert
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	7.14	Reinforcing board of the same material as the wall
4.1	Solid ceiling slab	#	Optional/depending on wall construction
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame	*	Installation near the floor as in 2
6.5	Mineral wool, depending on wall construction	**	Fixing to at least two metal post profiles
7.1	UW section	1 2	Up to EI 120 S

Lightweight partition walls > Dry mortarless installation into a lightweight...

Dry mortarless installation with installation kit TQ2 into a lightweight partition wall, below a flexible ceiling joint



GR3815466, D

Fig. 82: Dry mortarless installation with installation kit 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 TQ2 with cover plate	7.1	UW section
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides	7.10	Trim panel
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	7.21	Ceiling joint strips (e.g. $4 \times \geq 10$ mm) according to installation details Fig. 78 to Fig. 80
4.1	Solid ceiling slab	1	Up to EI 120 S
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame		
6.5	Mineral wool, depending on wall construction		

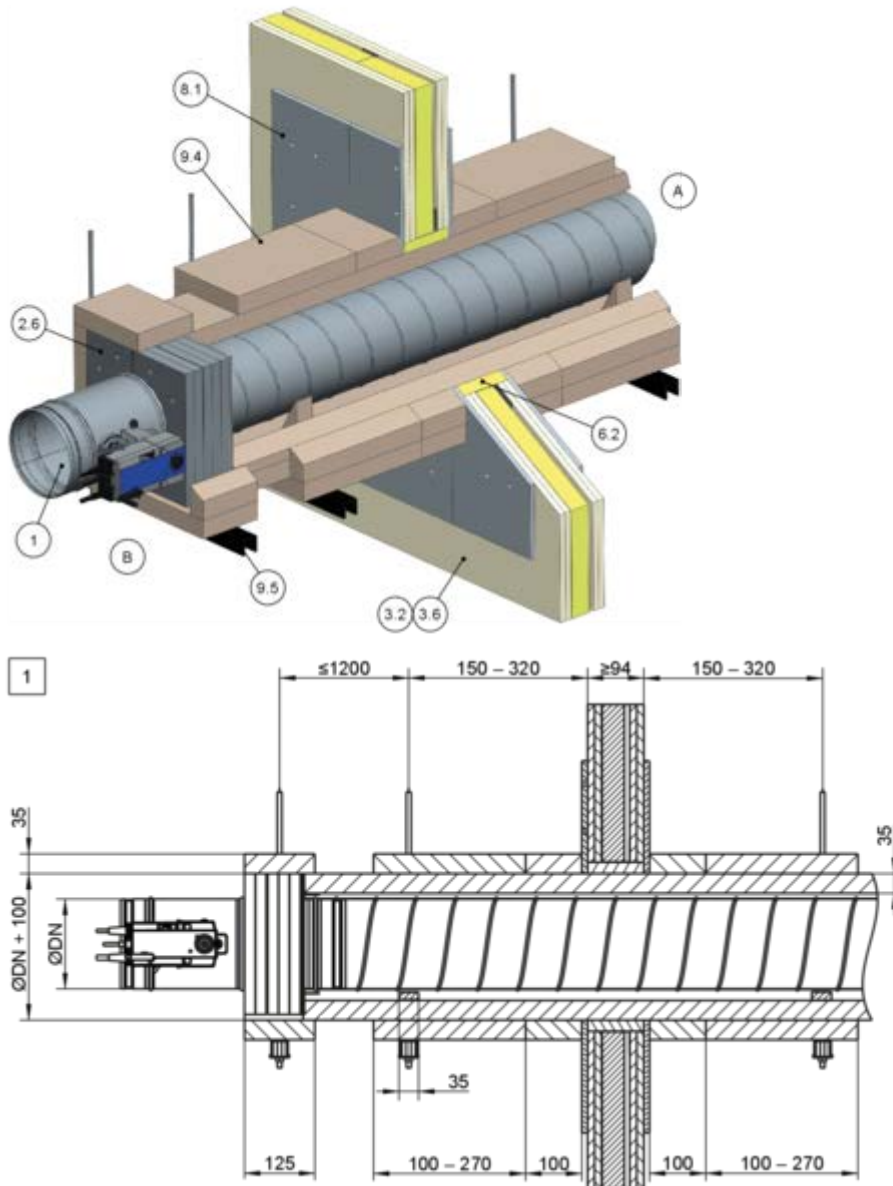
Note: Illustration is an example. The distance from the ceiling depends on the flexible ceiling joint, the expected ceiling subsidence and the specifications of the wall manufacturer.

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

- Lightweight partition wall or compartment wall, ☞ on page 40
- Installation kit TQ2, ☞ 5.4.3 'Installation kit TQ2' on page 46
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ☞ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit TQ2, ☞ on page 35

5.6.6 Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall bushing)

Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall penetration), four-sided cladding



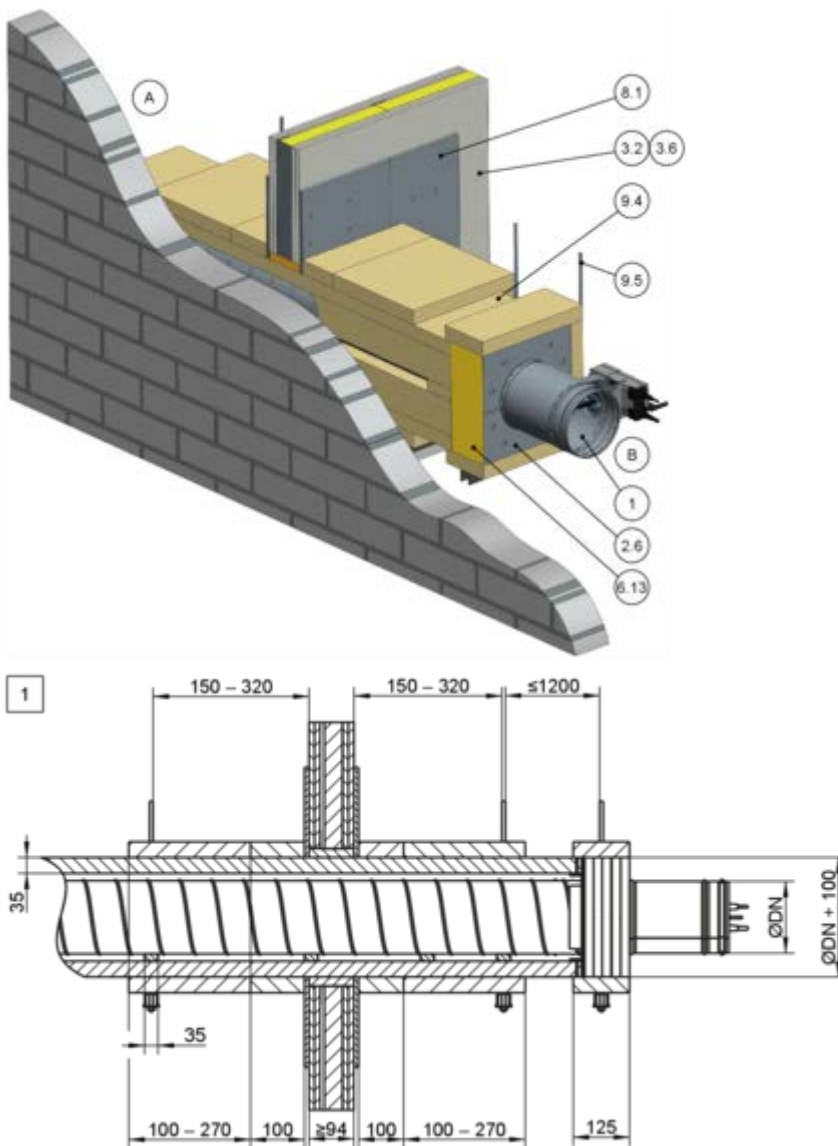
GR3815501, G

Fig. 83: Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall penetration), four-sided cladding

- | | |
|--|--|
| <ul style="list-style-type: none"> 1 FKRS-EU 2.6 Installation kit WE2 3.2 Lightweight partition wall with metal support structure or steel support structure, cladding on both sides 3.6 Compartment wall or safety partition wall with metal support structure, cladding on both sides 6.2 Mineral wool, $\geq 1000\text{ °C}$, $\geq 80\text{ kg/m}^3$ 8.1 PROMATECT® -H, d = 10 mm 9.4 Sheet steel duct with fire-rated cladding | <ul style="list-style-type: none"> 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 1 Up to EI 90 S |
|--|--|

The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer

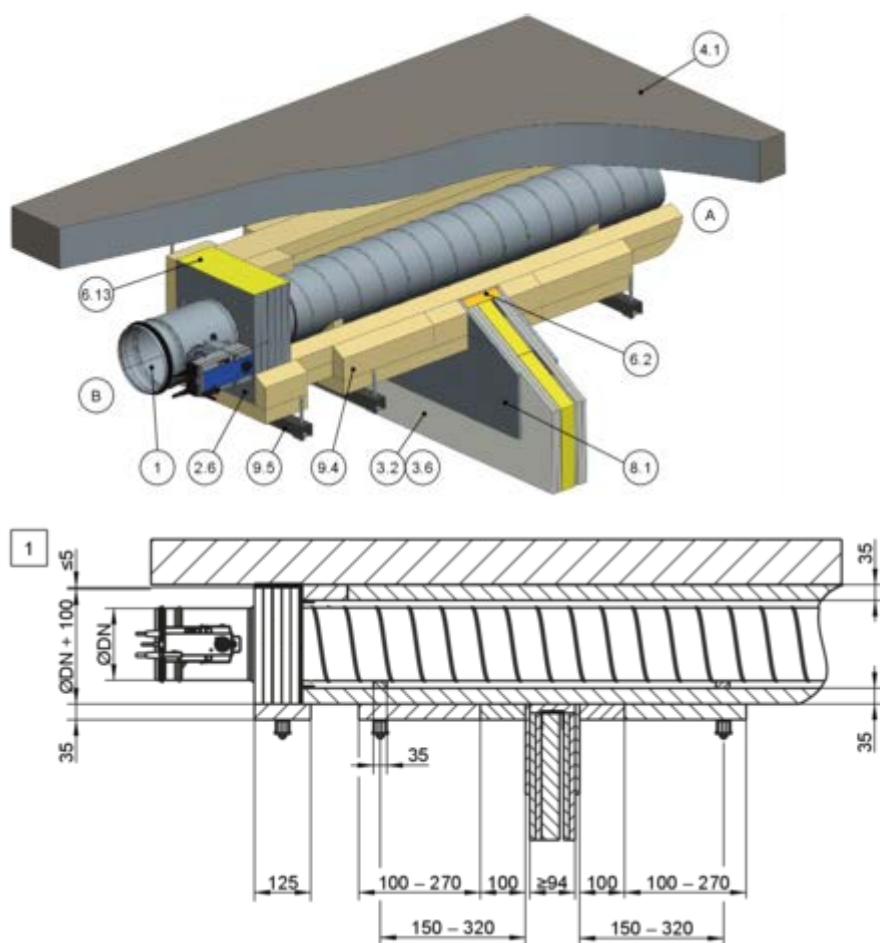
Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall penetration), three-sided cladding



GR3886329, D

Fig. 84: Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall penetration), three-sided cladding

- | | |
|---|---|
| <p>1 FKRS-EU</p> <p>2.6 Installation kit WE2</p> <p>3.2 Lightweight partition wall with metal support structure or steel support structure, cladding on both sides</p> <p>3.6 Compartment wall or safety partition wall with metal support structure, cladding on both sides</p> <p>6.13 Mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$ or gypsum mortar for compensating unevenness</p> <p>8.1 PROMATECT® -H, d = 10 mm</p> <p>9.4 Sheet steel duct with fire-rated cladding</p> | <p>9.5 Suspension system (by others) consisting of:</p> <p>a Threaded rod M10</p> <p>b Hilti® mounting rail MQ 41 × 3 mm or equivalent</p> <p>c Hilti® drilled plate MQZ L13 or equivalent</p> <p>d Hexagon nut M10 with washer</p> <p>1 Up to EI 90 S</p> |
|---|---|
- The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer

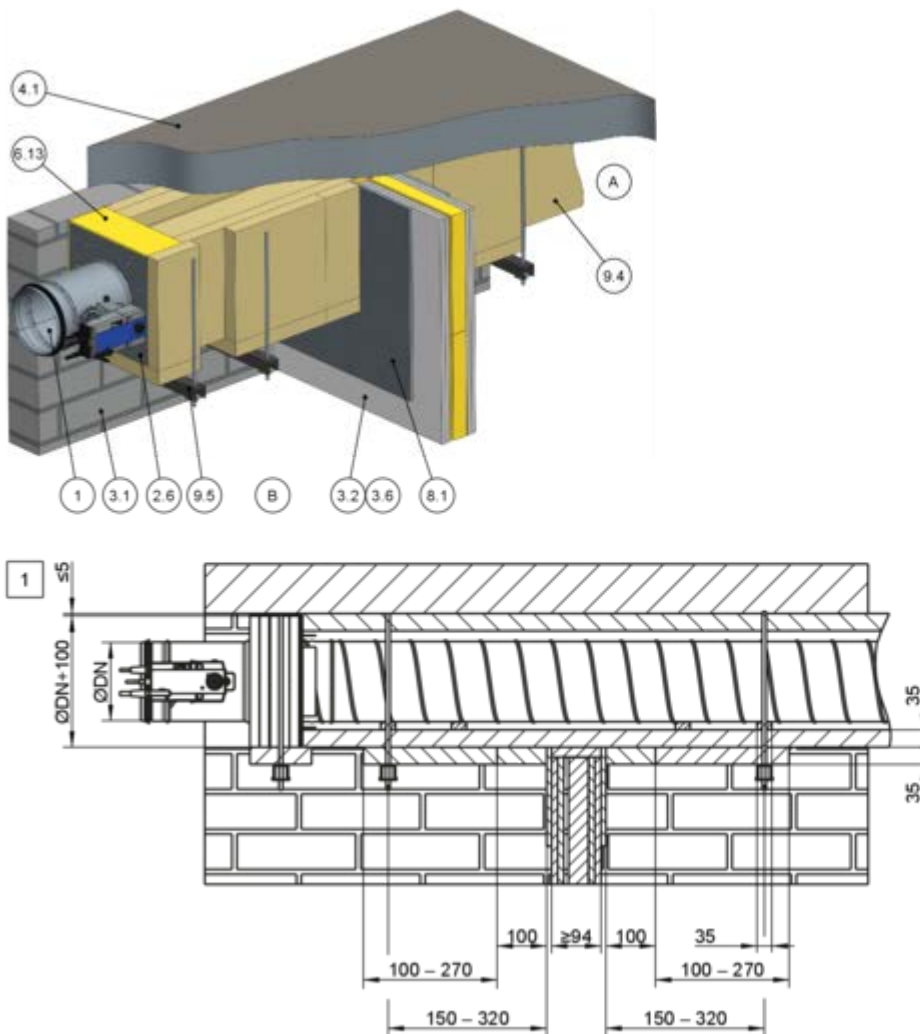


GR3889333, D

Fig. 85: Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall penetration), three-sided cladding

- | | | | |
|------|--|-----|--|
| 1 | FKRS-EU | 9.4 | Sheet steel duct with fire-rated cladding |
| 2.6 | Installation kit WE2 | | The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | 9.5 | Suspension system (by others) consisting of: |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | a | Threaded rod M10 |
| 4.1 | Solid ceiling slab | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 6.2 | Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³ | 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 |
| 8.1 | PROMATECT® -H, d = 10 mm | 1 | Up to EI 90 S |

Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall penetration), two-sided cladding



GR3887531, E

Fig. 86: Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall penetration), two-sided cladding

- | | |
|---|---|
| <ul style="list-style-type: none"> 1 FKRS-EU 2.6 Installation kit WE2 3.1 Solid wall 3.2 Lightweight partition wall with metal support structure or steel support structure, cladding on both sides 3.6 Compartment wall or safety partition wall with metal support structure, cladding on both sides 4.1 Solid ceiling slab 6.13 Mineral wool, $\geq 1000\text{ °C}$ or gypsum mortar for compensating unevenness 8.1 PROMATECT® -H, d = 10 mm | <ul style="list-style-type: none"> 9.4 Sheet steel duct with fire-rated cladding
The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer 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 1 Up to EI 90 S |
|---|---|

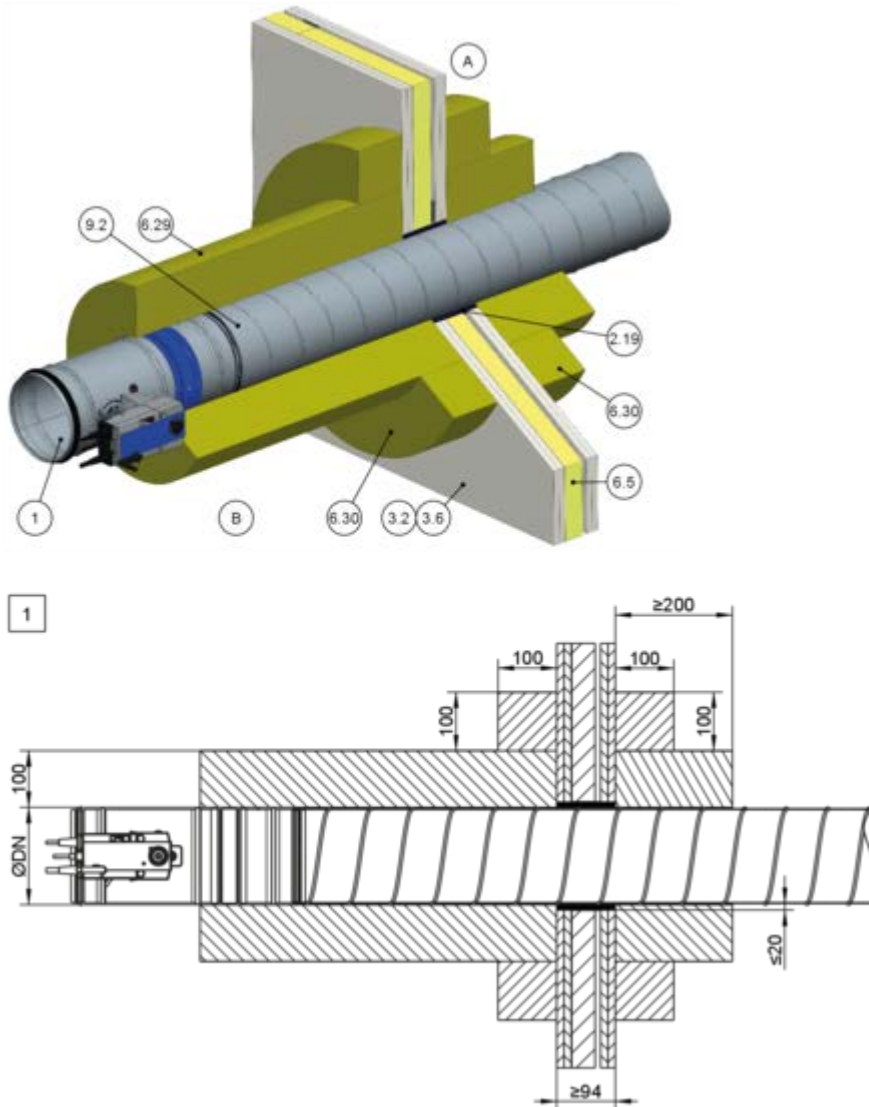
Additional requirements: dry mortarless installation with installation kit WE2 remote from lightweight partition walls (wall penetration)

- Lightweight partition wall or compartment wall,
↳ on page 40
- Installation kit WE2, ↳ 5.4.5 'Installation kit WE 2' on page 48
- Suspension and fixing, ↳ Chapter 5.15 'Fixing the fire damper' on page 242
- 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
- General installation information, ↳ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit WE2, ↳ on page 35

Note: For more installation details and for components to be provided by the customer, see the additional WE2 installation manual.

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

Installation remote from lightweight partition walls with mineral wool and joint filler



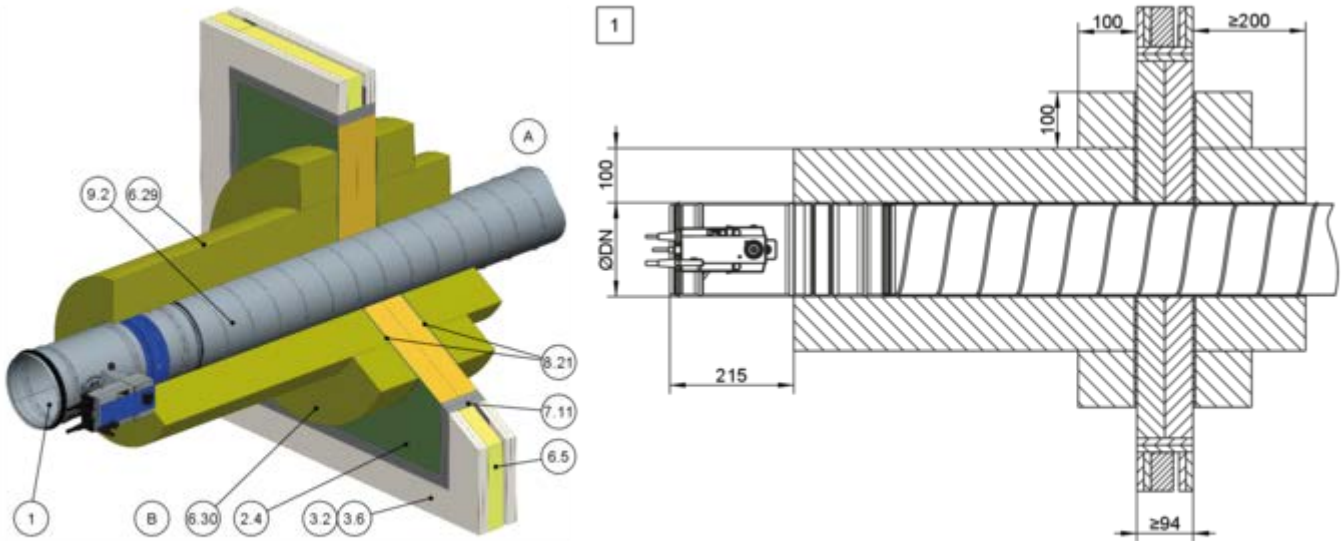
GR3816134, D

Fig. 87: Installation remote from lightweight partition walls with mineral wool and joint filler

1	FKRS-EU	6.29*	Mineral wool PAROC Hvac Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$)
2.19	Joint filler	6.30*	Reinforcing strip made of mineral wool PAROC HVAC Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$), glued along perimeter
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides	9.2	Sheet steel duct
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	1	Up to EI 60 S
6.5	Mineral wool, depending on wall construction		

* Please check in advance whether the PAROC material is available in your market region.

Dry mortarless installation remote from lightweight partition walls with mineral wool and fire batt



GR3817935, C

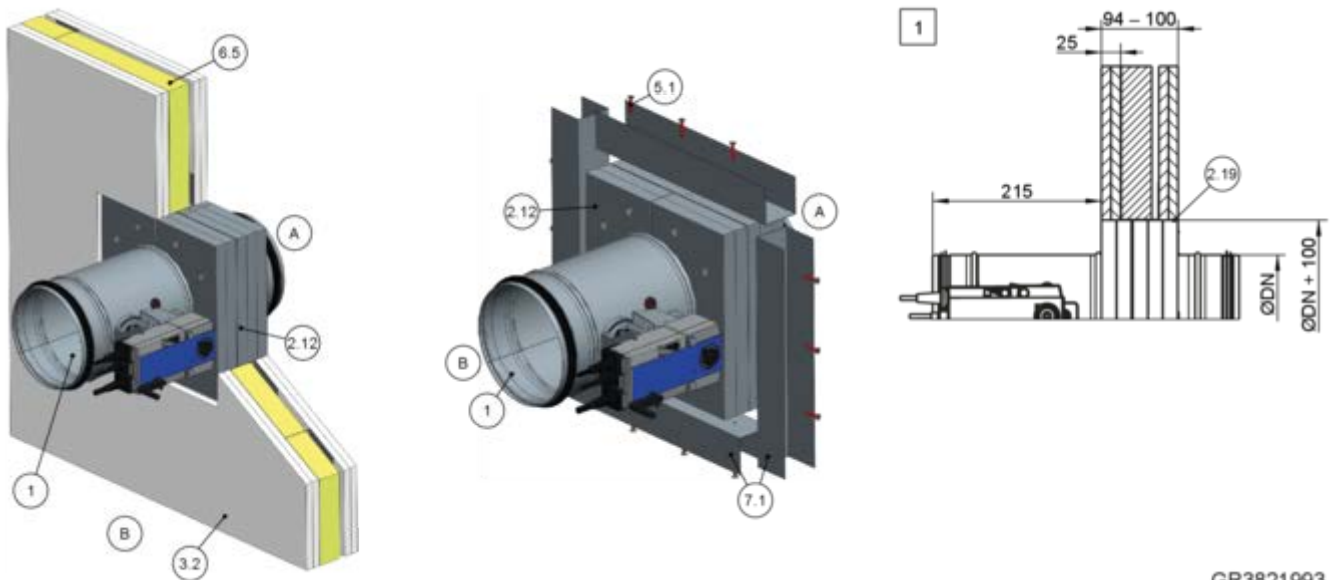
Fig. 88: Dry mortarless installation remote from lightweight partition walls with mineral wool and fire batt

1	FKRS-EU	6.30*	Reinforcing strip made of mineral wool PAROC HVAC Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$), glued along perimeter
2.4	Fire batt, PAROC Pyrotech Slab 140 (max. $W \times H = 2.1 \times 2.5 \text{ m}$)	7.11	Trim panels, single-layer, fire-resistant
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides	8.21	Acrylic or sealing compound (suitable for fire batt system)
3.6	Compartment wall or safety 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
6.29*	Mineral wool PAROC Hvac Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$)	*	Please check in advance whether the PAROC material is available in your market region.

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

- Lightweight partition wall or compartment wall, ↪ on page 40
- General installation information, ↪ 5.3 'General installation information' on page 29 ff
- General information on installation with mineral wool, ↪ on page 36
- $\geq 400 \text{ mm}$ distance between two fire dampers
- Distance to load-bearing/adjacent components $\geq 200 \text{ mm}$
- Suspend the fire damper and air duct according to the mineral wool manufacturer's specifications

5.6.8 Dry mortarless installation in lightweight partition wall with installation kit GL2 during wall construction



GR3821993, D

Fig. 89: Dry mortarless installation in lightweight partition wall with installation kit GL2 during wall construction

- | | | | |
|------|--|----------|--|
| 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 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 or steel support structure, cladding on both sides | 1 | Up to EI 90 S |

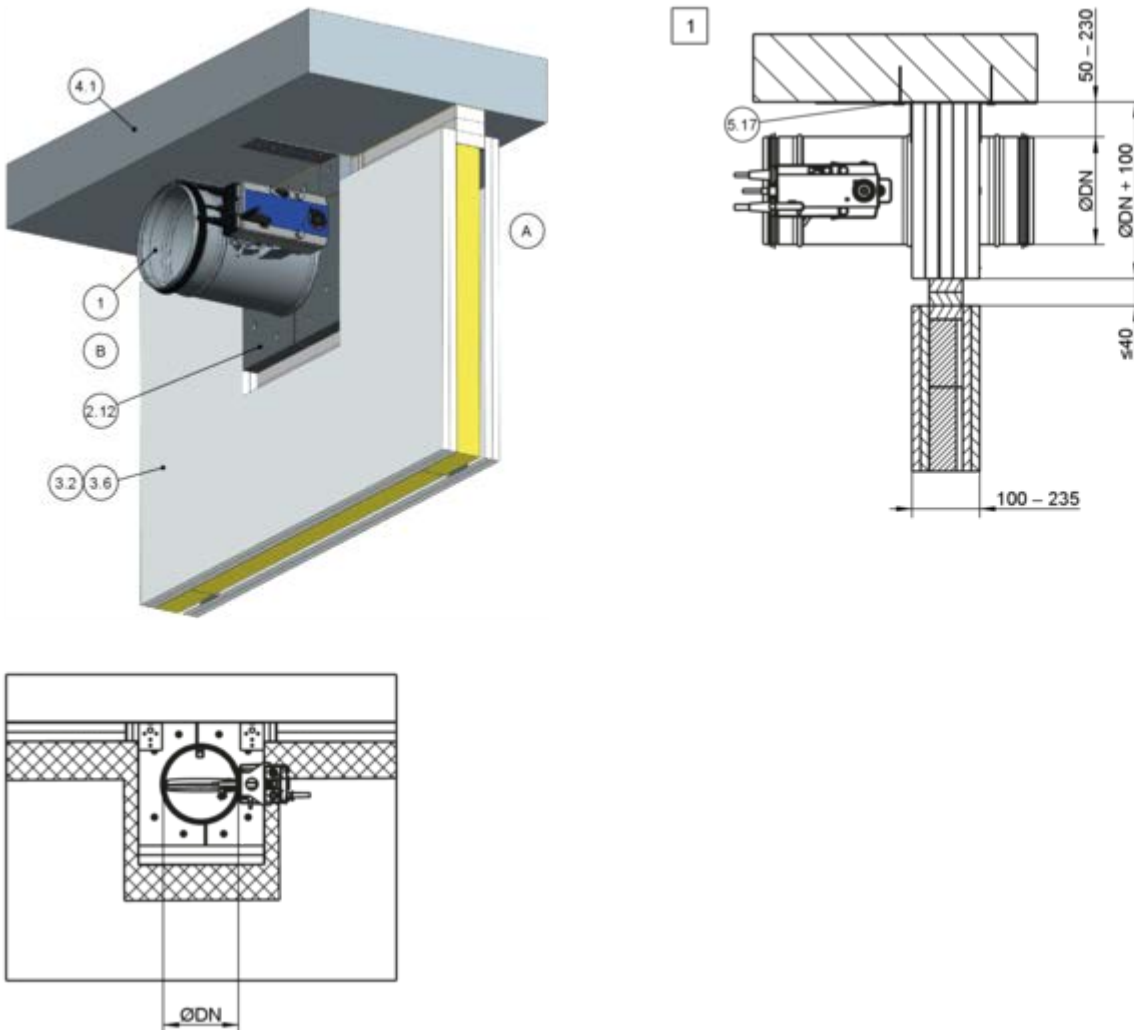
Note: Gaps between the installation kit GL2 and the wall cladding must be filled with joint filler (2.19), matching the wall cladding.

Supplementary requirements: Dry mortarless installation in lightweight partition walls with installation kit GL2 during wall construction

- Lightweight partition wall (except compartment wall), ↪ on page 40
 - Installation kit GL2, ↪ 5.4.6 'Installation kit GL2' on page 49
 - 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 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.

5.6.9 Dry mortarless installation with flexible ceiling joint and installation kit GL2

Dry mortarless installation with installation kit GL2 into lightweight partition or compartment wall

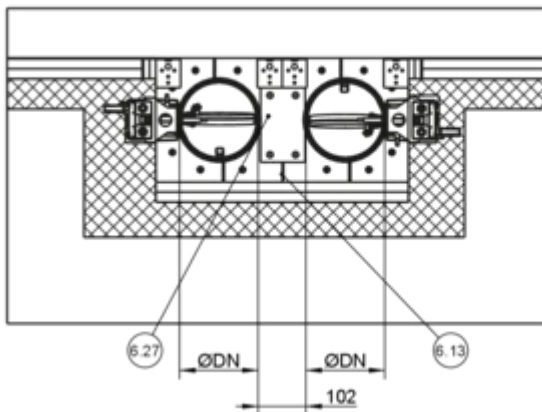
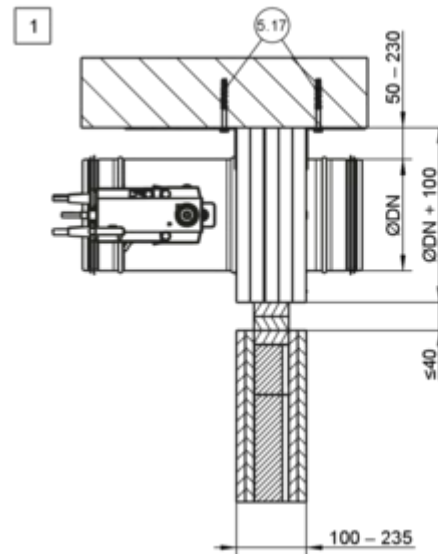
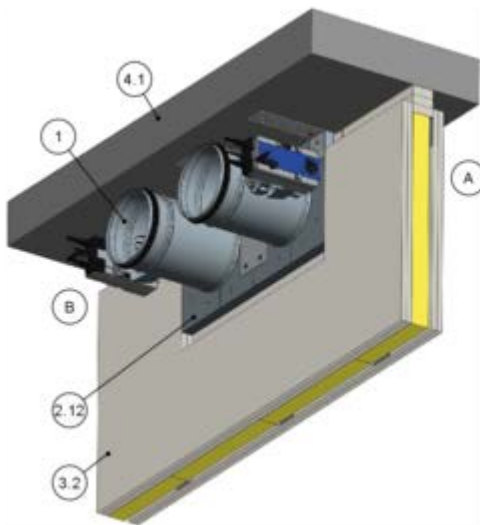


GR3812669, D

Fig. 90: Dry mortarless installation with installation kit GL2 into lightweight partition or compartment wall

- | | | | |
|------|--|----------|---|
| 1 | FKRS-EU | 4.1 | Solid ceiling slab |
| 2.12 | Installation kit GL2 | 5.17 | Anchor bolt Hilti® HUS-6 Ø 6 mm × 60 mm or equivalent wall plugs with fire protection suitability certificate, adapted to the particular building material, alternatively push through installation |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | 1 | Up to EI 90 S |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | | |

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

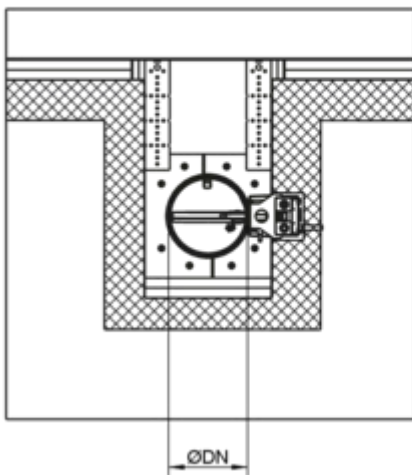
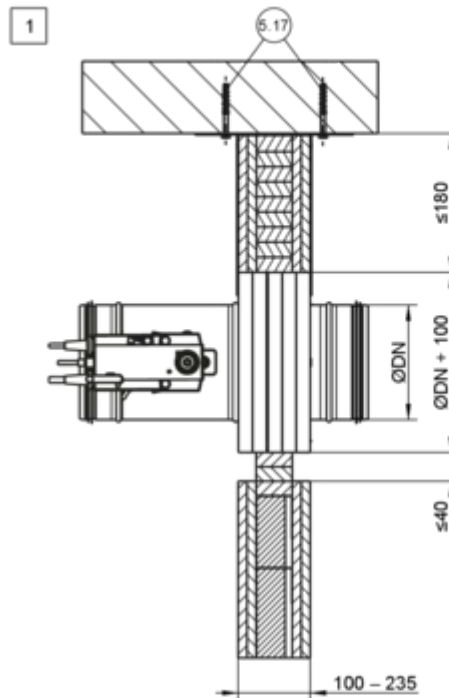
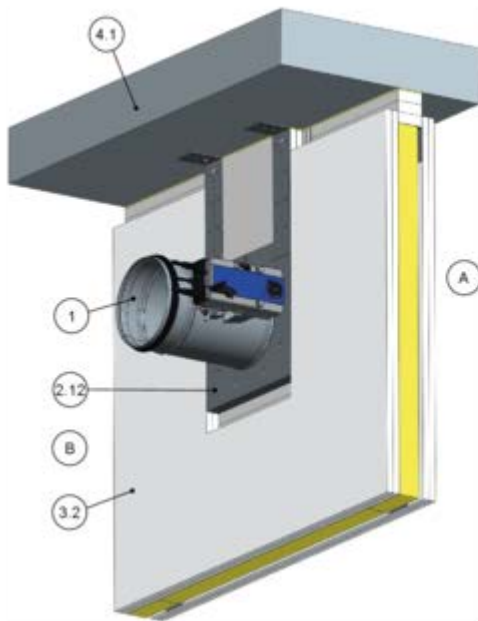


GR3814116, F

Fig. 91: Dry mortarless installation with installation kit GL2 into lightweight partition or compartment wall

- | | |
|---|--|
| <p>1 FKRS-EU
 2.12 Installation kit GL2
 3.2 Lightweight partition wall with metal support structure or steel support structure, cladding on both sides
 3.6 Compartment wall or safety partition wall with metal support structure, cladding on both sides
 4.1 Solid ceiling slab</p> | <p>5.17 Anchor bolt Hilti® HUS-6 Ø 6 mm × 60 mm or equivalent wall plugs with fire protection suitability certificate, adapted to the particular building material, alternatively push through installation
 6.13 Mineral wool strips A1, filler as an alternative
 6.27 Z brackets both sides, 90 × 140 × 1.5 mm
 1 Up to EI 90 S</p> |
|---|--|

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

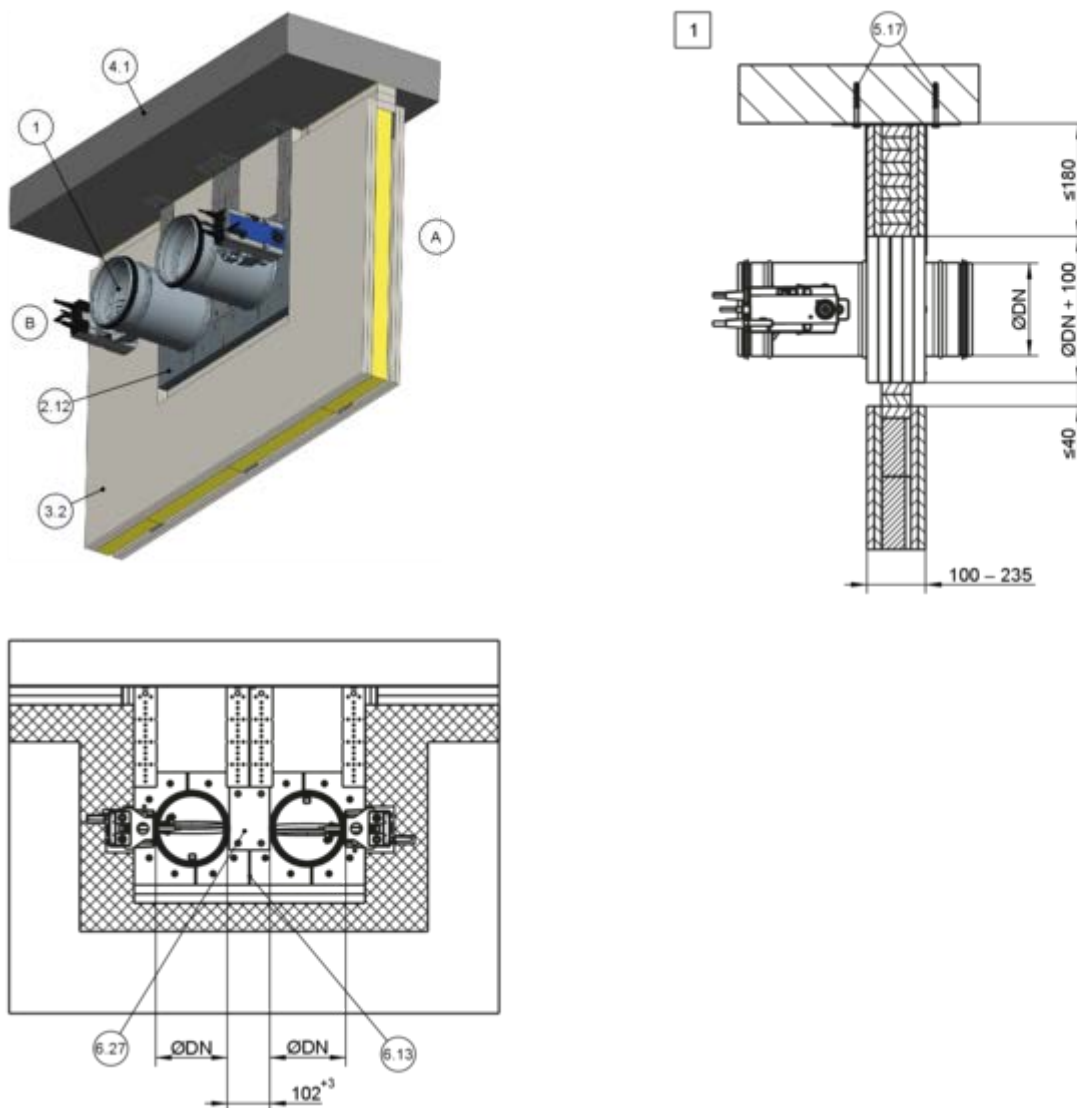


GR3812656, D

Fig. 92: Dry mortarless installation with installation kit GL2 into lightweight partition or compartment wall

- | | | | |
|------|--|------|---|
| 1 | FKRS-EU | 4.1 | Solid ceiling slab |
| 2.12 | Installation kit GL2 | 5.17 | Anchor bolt Hilti [®] HUS-6 Ø 6 mm × 60 mm or equivalent wall plugs with fire protection suitability certificate, adapted to the particular building material, alternatively push through installation |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | | |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | 1 | Up to EI 90 S |

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



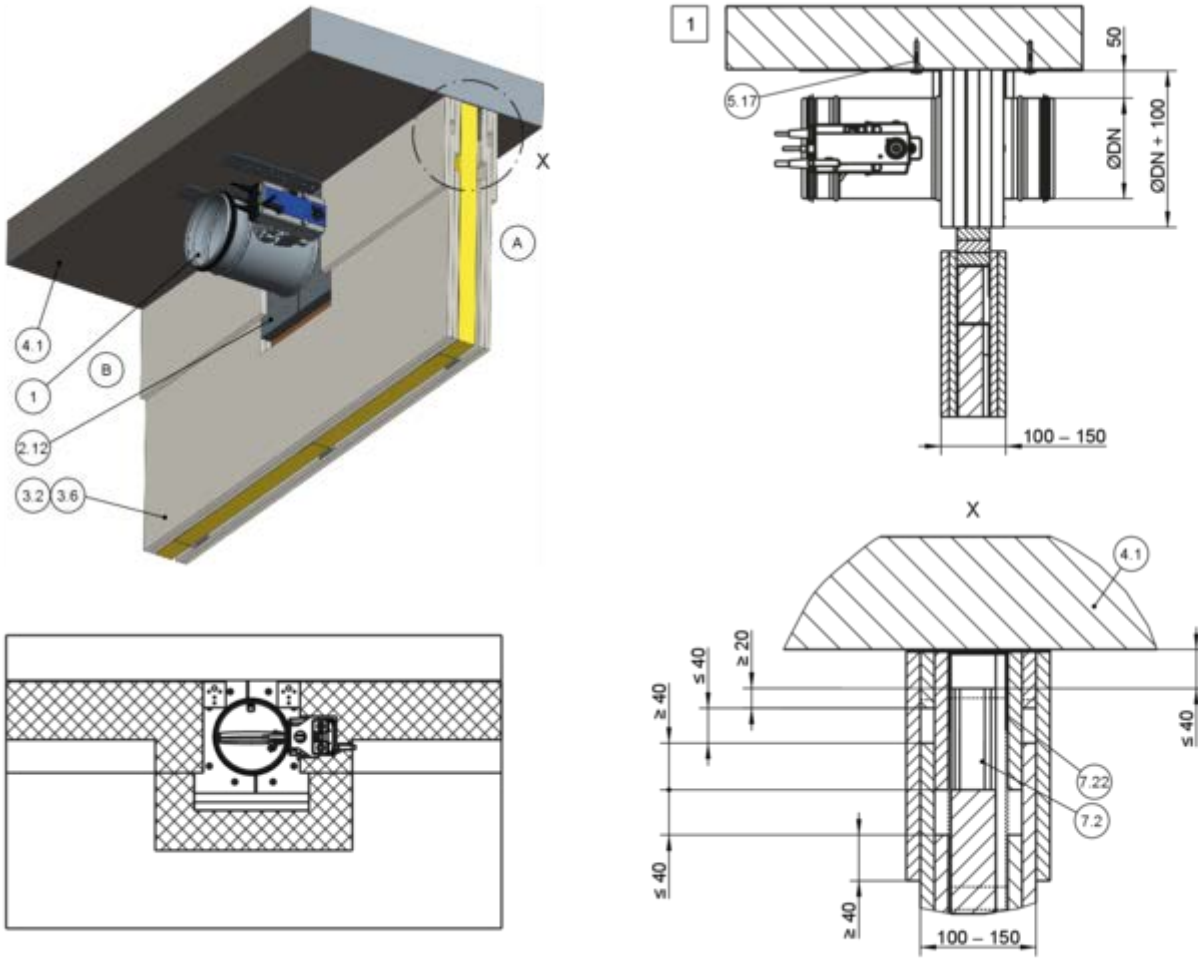
GR3813548, C

Fig. 93: Dry mortarless installation with installation kit GL2 into lightweight partition or compartment wall

- | | | | |
|------|--|----------|---|
| 1 | FKRS-EU | 5.17 | Anchor bolt Hilti [®] HUS-6 Ø 6 mm × 60 mm or equivalent wall plugs with fire protection suitability certificate, adapted to the particular building material, alternatively push through installation |
| 2.12 | Installation kit GL2 | 6.13 | Mineral wool strips A1, filler as an alternative |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | 6.27 | Z brackets both sides, 90 × 140 × 1.5 mm |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | 1 | Up to EI 90 S |
| 4.1 | Solid ceiling slab | | |

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

Lightweight partition walls > Dry mortarless installation with flexible ceil...

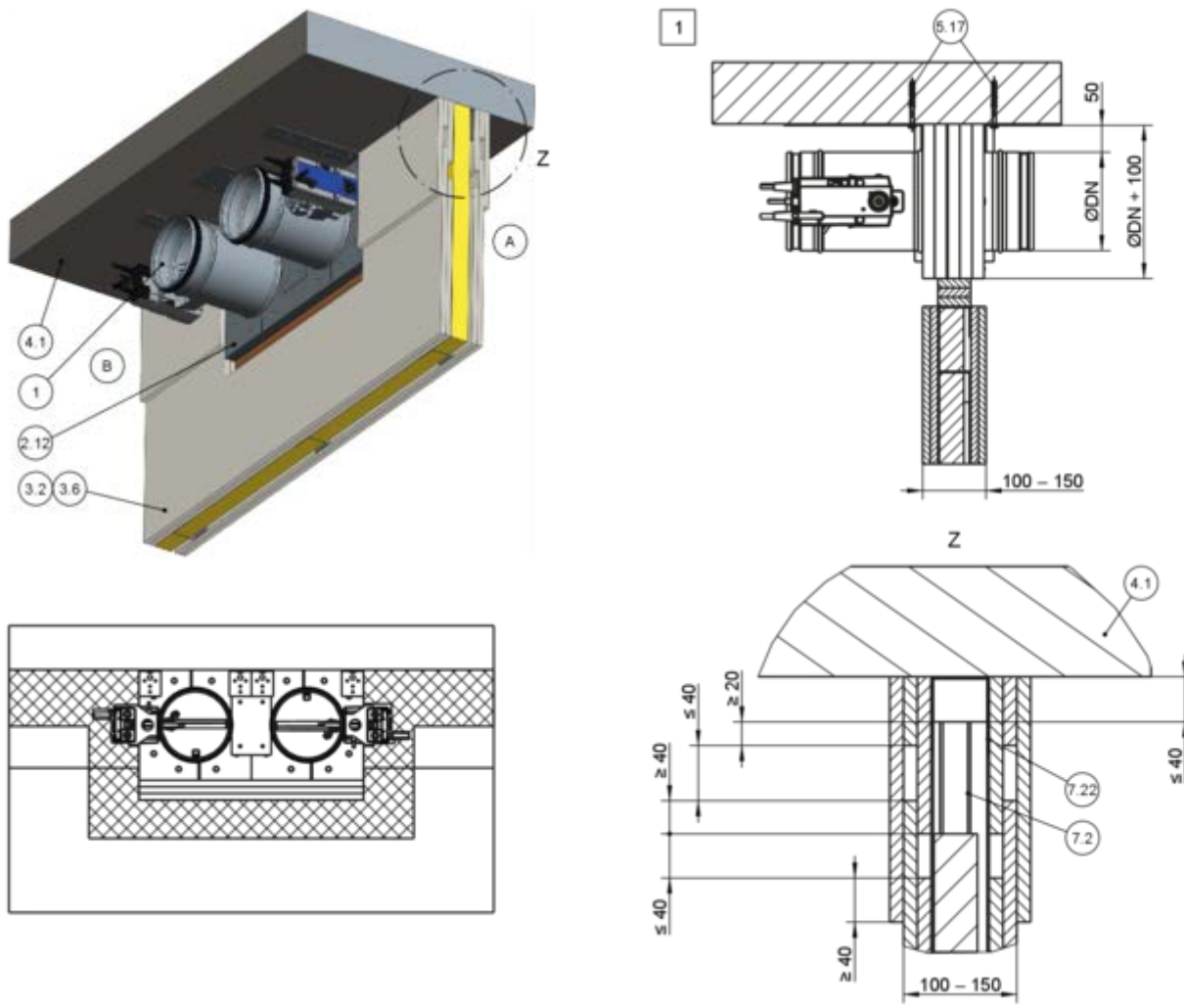


GR3892058, D

Fig. 94: Dry mortarless installation in lightweight construction or compartment wall and Knauf ceiling connection with installation kit GL2

- | | | | |
|------|--|----------|---|
| 1 | FKRS-EU | 5.17 | Anchor bolt Hilti® HUS-6 Ø 6 mm × 60 mm or equivalent wall plugs with fire protection suitability certificate, adapted to the particular building material, alternatively push through installation |
| 2.12 | Installation kit GL2 | 7.2 | CW section |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | 7.22 | Ceiling joint section |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | 1 | Up to EI 90 S |
| 4.1 | Solid ceiling slab | | |

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



GR3893121, E

Fig. 95: Dry mortarless installation in lightweight construction or compartment wall and Knauf ceiling connection with installation kit GL2

- | | | | |
|------|--|------|---|
| 1 | FKRS-EU | 5.17 | Anchor bolt Hilti® HUS-6 Ø 6 mm × 60 mm or equivalent wall plugs with fire protection suitability certificate, adapted to the particular building material, alternatively push through installation |
| 2.12 | Installation kit GL2 | 7.2 | CW section |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | 7.22 | Ceiling joint section |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | 1 | Up to EI 90 S |
| 4.1 | Solid ceiling slab | | |

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

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

- Lightweight partition wall, ↗ on page 40
- Installation kit GL2, ↗ 5.4.6 'Installation kit GL2' on page 49
- Wall thickness $W = 100 - 235$ mm
- Distance between fire damper and ceiling 50 - 230 mm, with "Knauf ceiling connection" 50 mm.
- ≥ 125 mm distance from the fire damper to adjacent walls
- Distance between two fire dampers ≥ 200 mm (separate installation opening), when installed in a common installation opening 102^{+3} mm
- Subsidence of the ceiling $a \leq 40$ mm
- General installation information, ↗ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit GL2, ↗ on page 35
- If necessary, provide mineral fibre strips A1, alternatively levelling material (≤ 5 mm) above the installation kit to even out ceiling unevenness.

Note: Installation is carried out in accordance with the additional assembly instructions for sliding ceiling connection supplied.
Installation details for installation in compartment walls on request.

Dry mortarless installation in lightweight partition wall with installation kit GL2 and steel bracket if there is no rear fixing option

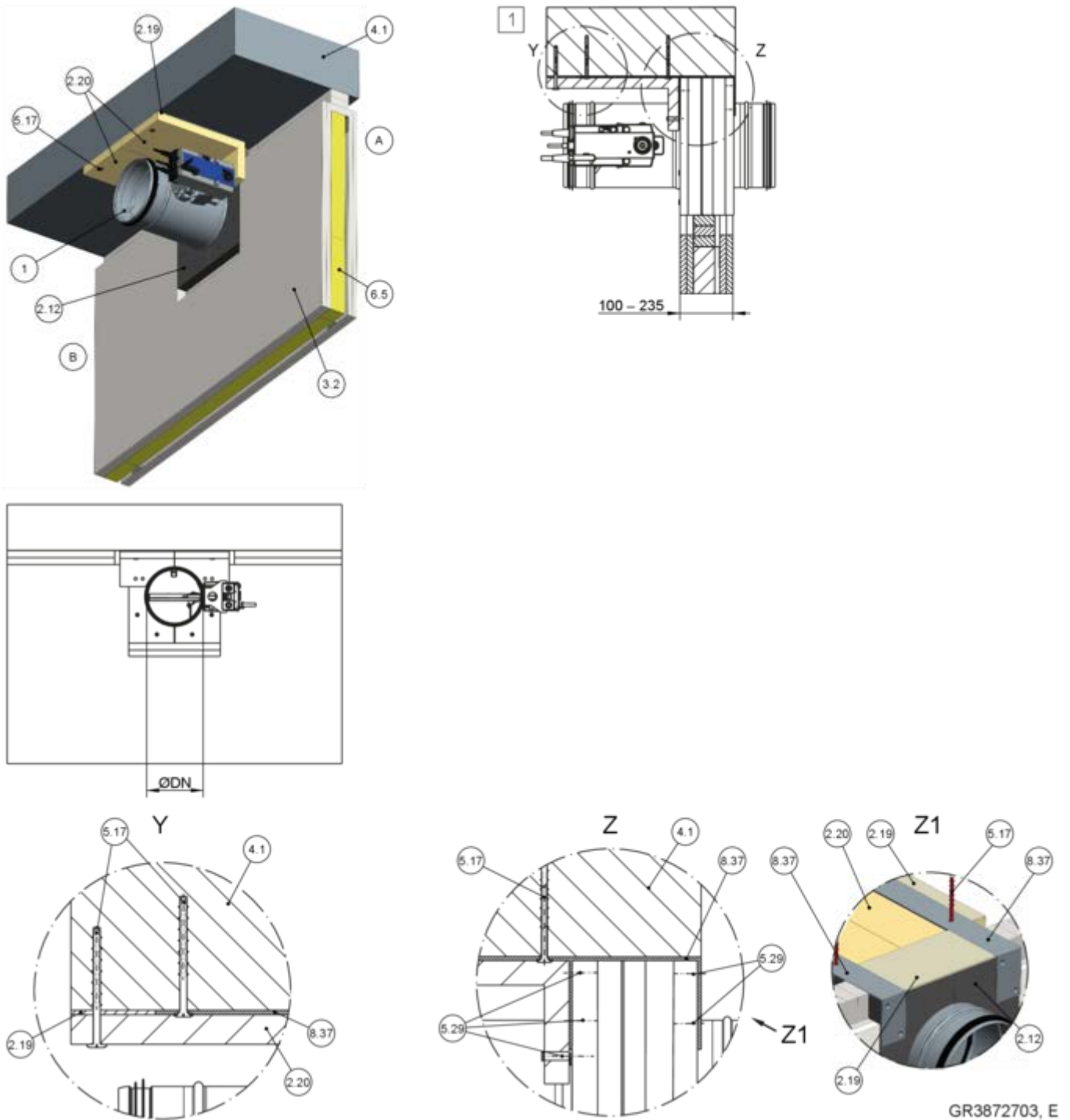


Fig. 96: Dry mortarless installation in lightweight partition wall with installation kit GL2 and steel bracket if there is no rear fixing option

- | | |
|--|---|
| <ul style="list-style-type: none"> 1 FKRS-EU 2.12 Installation kit GL2 2.19 Joint filler 2.20 Cover (one part or two parts) Rigips Glasroc F20, supplied by customer 3.2 Lightweight partition wall with metal support structure or steel support structure, cladding on both sides 4.1 Solid ceiling slab | <ul style="list-style-type: none"> 5.17 Anchor bolt Hilti® HUS-6 Ø 6 mm × 60 mm or equivalent wall plugs or fire-rated anchors with suitability certificate (push through installation is also possible) 5.29 Self-drilling screws Ø 3.5 × 40 mm 6.3 Mineral wool ≥ 1000 °C, ≥ 100 kg/m³ 8.37 Steel bracket, supplied by customer 1 Up to EI 90 S |
|--|---|

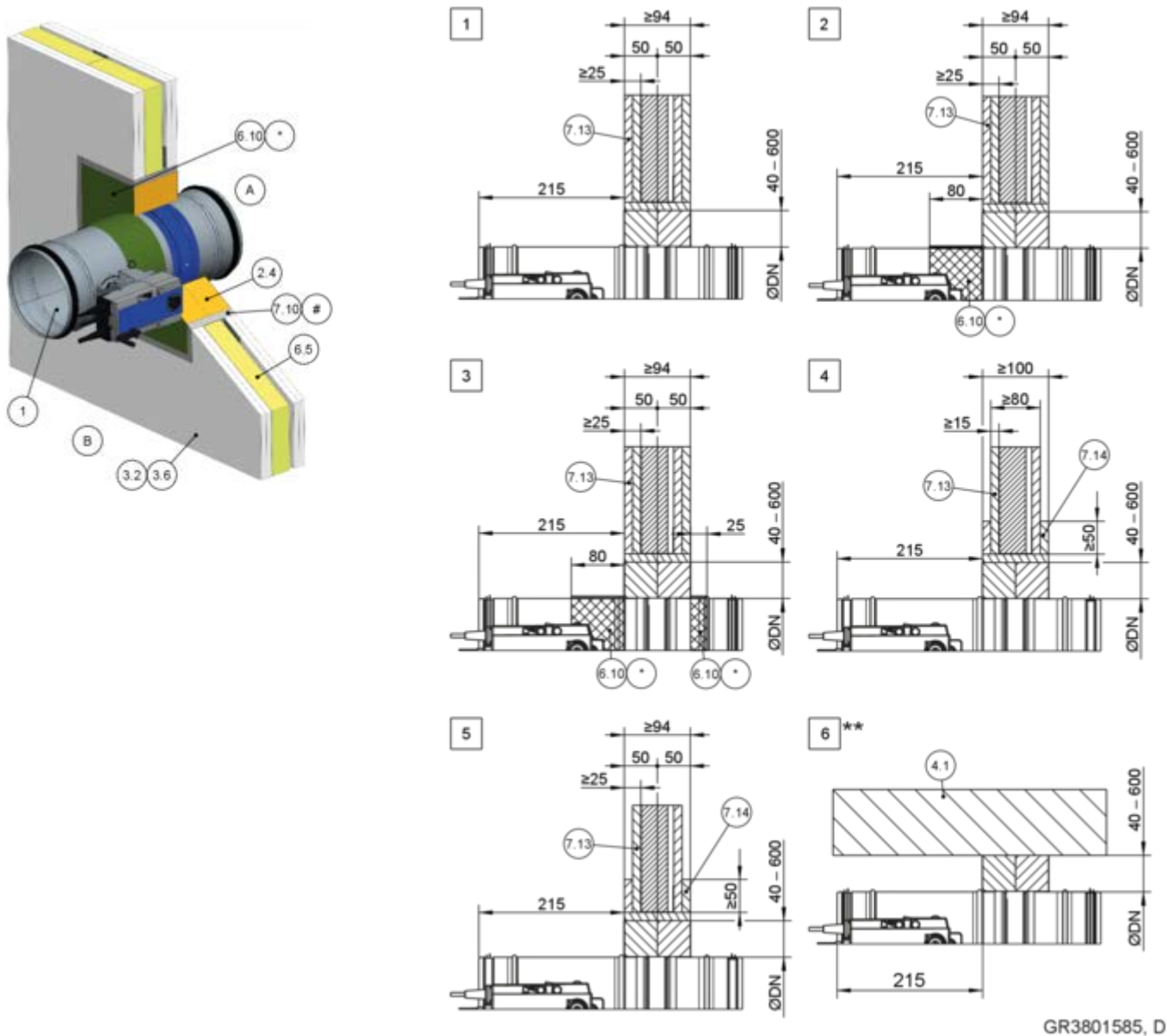
Supplementary requirements: Dry mortarless installation in lightweight partition walls with installation kit GL2 and steel angle if there is no rear fixing option

- Lightweight partition wall (except compartment wall),
↳ on page 40
- Installation kit GL2, ↳ 5.4.6 'Installation kit GL2'
on page 49
- Wall thickness $W = 100 - 235$ mm
- 50 mm distance of fire damper to the ceiling
- ≥ 125 mm distance from the fire damper to adjacent walls
- ≥ 200 mm distance between two fire dampers (separate installation opening)
- Subsidence of the ceiling $a \leq 40$ mm
- General installation information, ↳ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit GL2, ↳ on page 35
- If necessary, provide mineral fibre strips A1, alternatively levelling material (≤ 5 mm) above the installation kit to even out ceiling unevenness.

Note: Installation is carried out in accordance with the additional assembly instructions for sliding ceiling connection supplied.

5.6.10 Dry mortarless installation with fire batt

Dry mortarless installation into a lightweight partition wall, with a fire batt



GR3801585, D

Fig. 97: Dry mortarless installation into a lightweight partition wall, with a fire batt

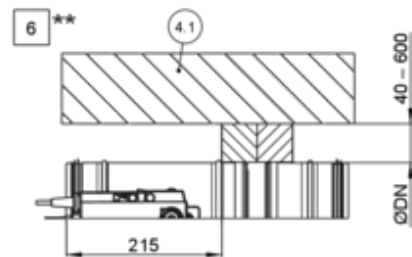
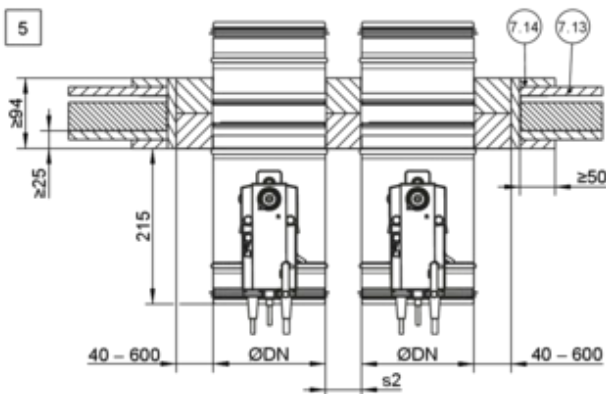
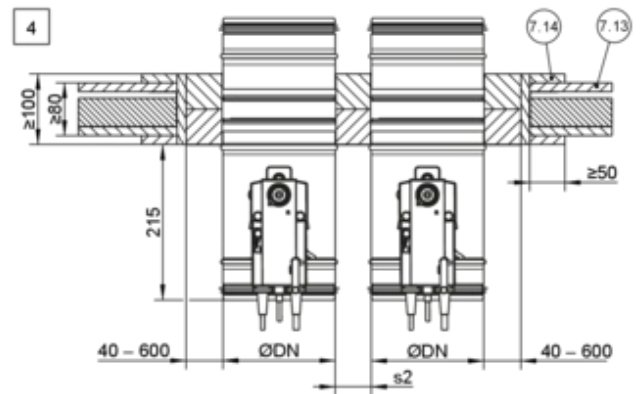
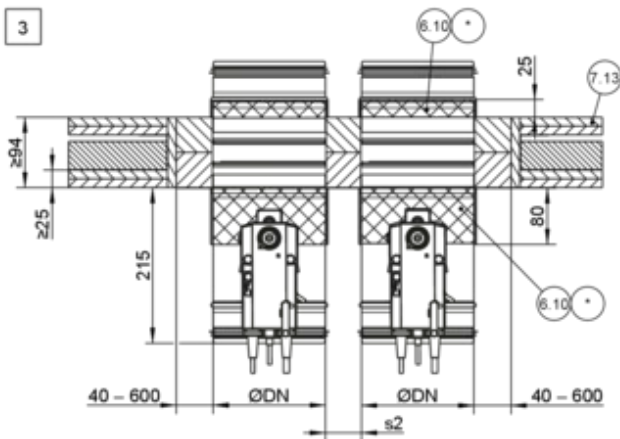
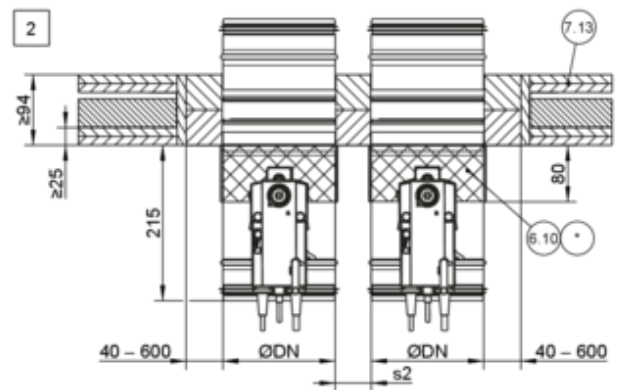
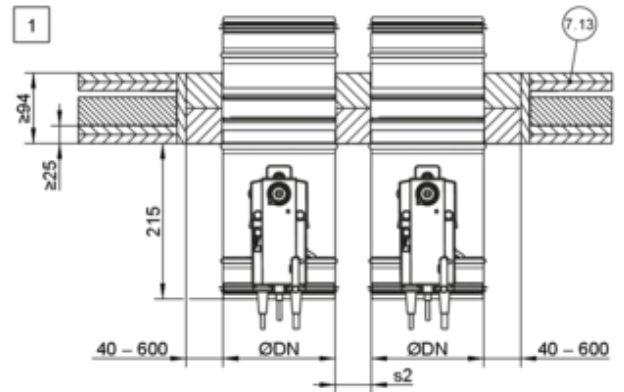
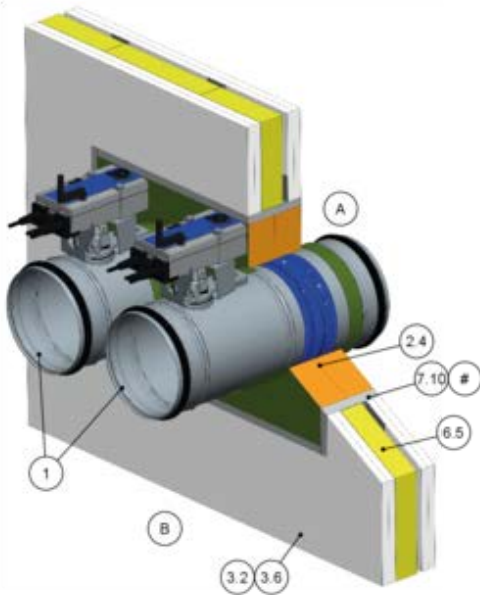
1	FKRS-EU	6.20	Pipe collar (to be ordered separately)
2.4	Coated board system	6.24	Elastomeric foam (flame-resistant, non-drip-ping)
3.2	Lightweight partition wall with metal support structure or steel support structure, cladding on both sides		The following applies in Germany: For notes on the use of elastomeric foams ↪ 'Additional provision for use in Germany:' on page 8 .
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides		
4.1	Solid ceiling slab/solid floor	7.10#	Trim panel
6.5	Mineral wool, depending on wall construction		At $W \leq 100$ mm optional,
6.10	Ablative coating around the perimeter, $d =$ at least 2.5 mm		at $W > 100$ mm double-layered (2×12.5 mm); also see Fig. 98
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	7.13	Cladding
		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 as in [6]
		[1] - [6]	See table ↪ 128

Lightweight partition walls > Dry mortarless installation with fire batt

Note: The fire resistance properties of **6** 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 , 6
224 – 315	EI 90 S	–	x	2 , 6
100 – 200	EI 120 S	–	x	2 , 6
224 – 315	EI 120 S	x	x	3 , 6
100 – 315	EI 60 S	–	–	4 , 6
100 – 315	EI 30 S	–	–	5 , 6

Dry mortarless installation with fire batt in lightweight partition wall, "flange to flange"



GR3803034, C

Fig. 98: 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

6.20 Pipe collar (to be ordered separately)

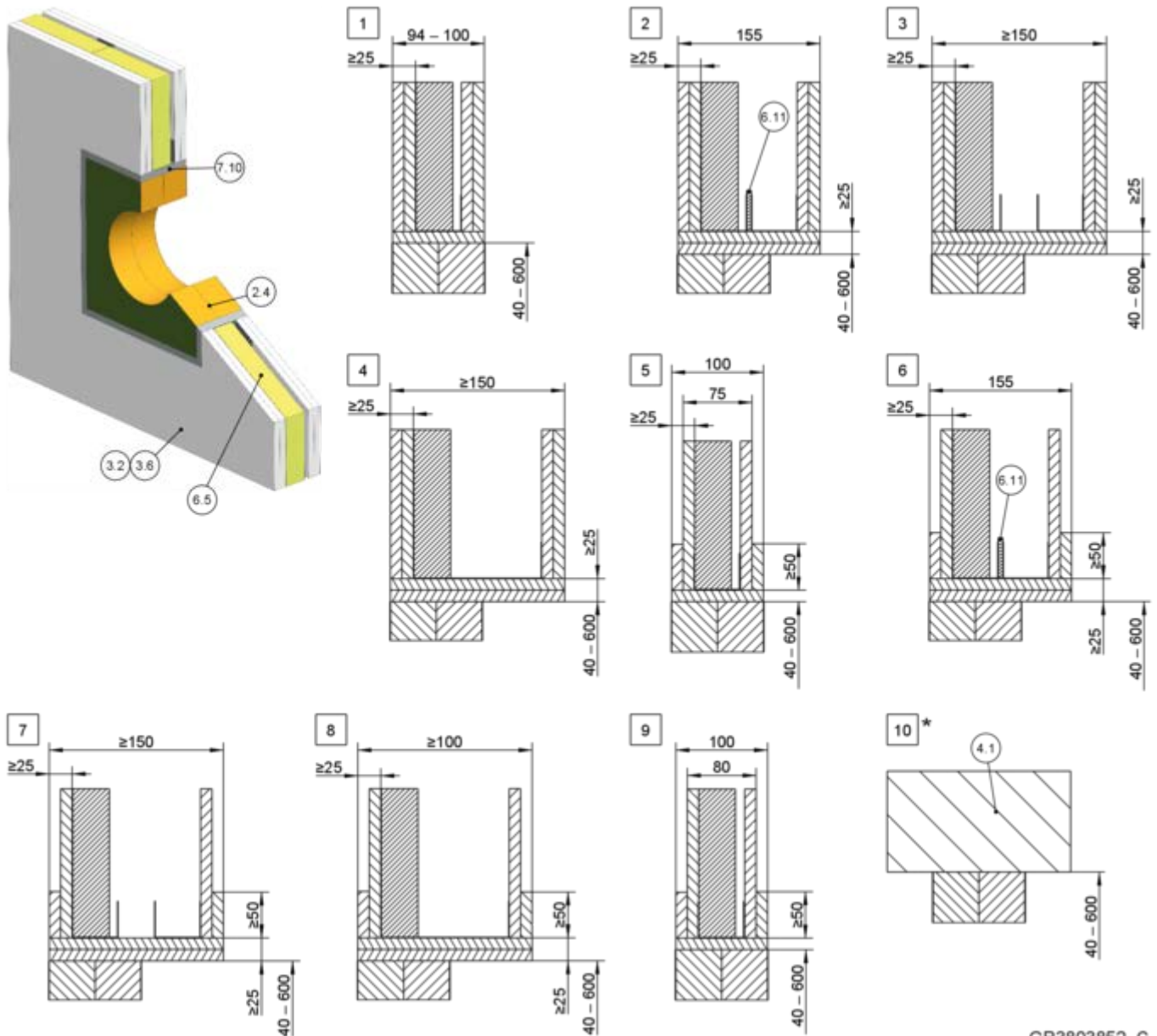
- | | |
|--|---|
| <p>2.4 Coated board system</p> <p>3.2 Lightweight partition wall with metal support structure or steel support structure, cladding on both sides</p> <p>3.6 Compartment wall or safety partition wall with metal support structure, cladding on both sides</p> <p>4.1 Solid ceiling slab/solid floor</p> <p>6.5 Mineral wool, depending on wall construction</p> <p>6.10 Ablative coating around the perimeter, d = at least 2.5 mm</p> <p>6.19 Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm, leave out the actuator and release mechanism; inspection openings must remain accessible</p> | <p>6.24 Elastomeric foam (flame-resistant, non-dripping)
The following applies in Germany: For notes on the use of elastomeric foams ↪ 'Additional provision for use in Germany:' on page 8 .</p> <p>7.10# Trim panel
At W ≤ 100 mm optional,
at W > 100 mm double-layered (2 × 12.5 mm); also see Fig. 98</p> <p>7.13 Cladding</p> <p>7.14 Reinforcing board of the same material as the wall</p> <p>* 6.19, 6.20 or 6.24 as an alternative</p> <p>** Installation near the floor as in 6</p> <p>1 – 6 See table ↪ 130</p> |
|--|---|

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
224 – 315	EI 90 S	–	x	10* – 600	2 , 6
100 – 200	EI 120 S	–	x	40 – 600	2 , 6
224 – 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

* For a distance of 10 mm, mineral wool ≥ 1000 °C, ≥ 80 kg/m³ with d = 10 mm and width nominal width/2 shall be provided between the fire dampers.

Approved combinations for thicker walls



GR3803852, C

Fig. 99: Dry mortarless installation into a lightweight partition wall, with a fire batt, approved combinations for thicker walls

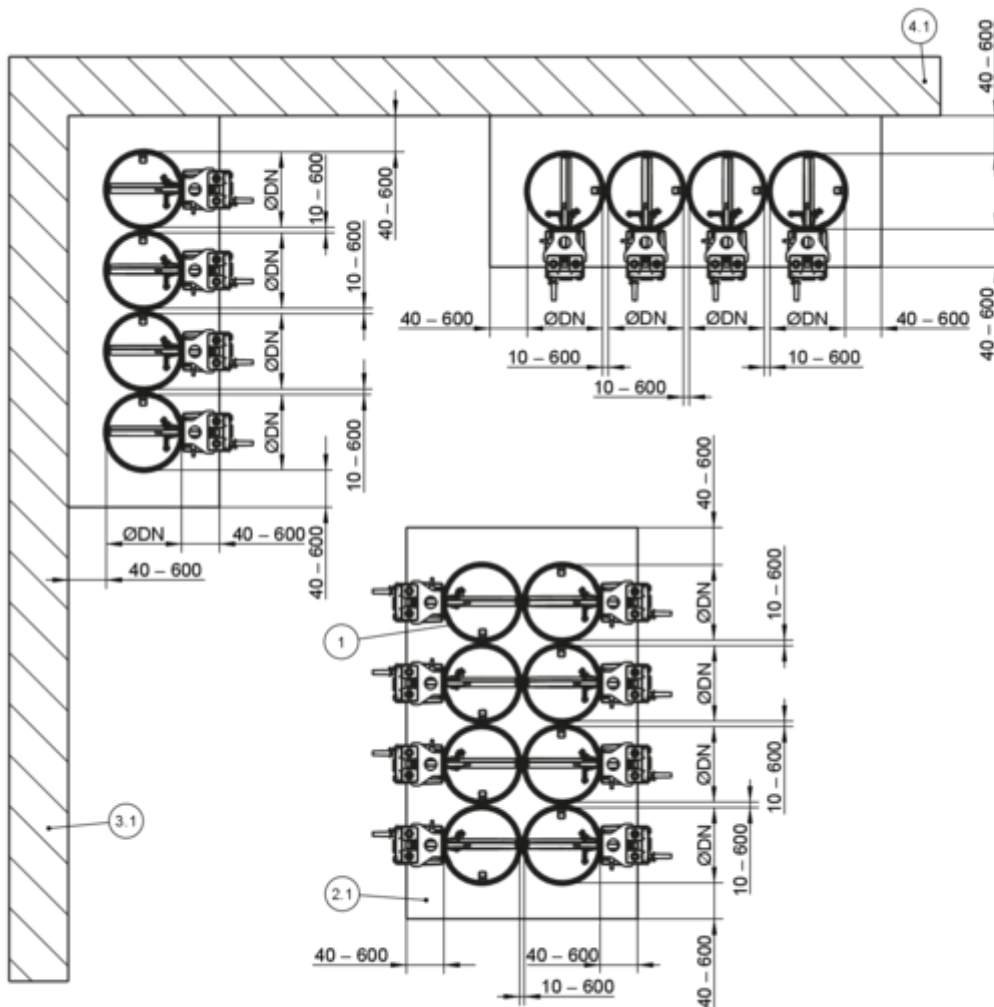
- | | | | |
|------|--|---------------------|---|
| 2.4 | Coated board system | 7.10 | Trim panel |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides | | At $W \leq 100$ mm optional,
From $W > 100$ mm double-layered and required |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | * | Installation near the floor as in 10 |
| 4.1 | Solid ceiling slab/solid floor | 1 - 4 | F120 |
| 6.5 | Mineral wool, depending on wall construction | 5 - 8 | F30 |
| 6.11 | Insulating strip | 9 | F60 |
| | | 10 | F 30 – F 120 |

Lightweight partition walls > Dry mortarless installation with fire batt

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

- Lightweight partition wall or compartment wall,
↳ *on page 40*
- Fire batt systems, installation details, distances/dimensions, ↳ *on page 36 f*
- Suspension and fixing, ↳ *Chapter 5.15 'Fixing the fire damper' on page 242*
- General installation information, ↳ *5.3 'General installation information' on page 29 ff*
- General information on installation with fire batt,
↳ *on page 36*

5.6.11 Dry mortarless installation with fire batt in lightweight partition wall – Multiple occupancy of an installation opening



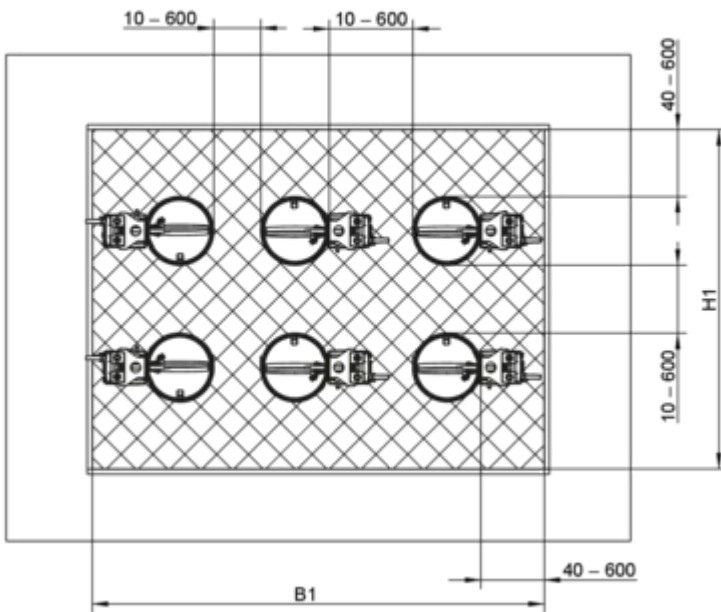
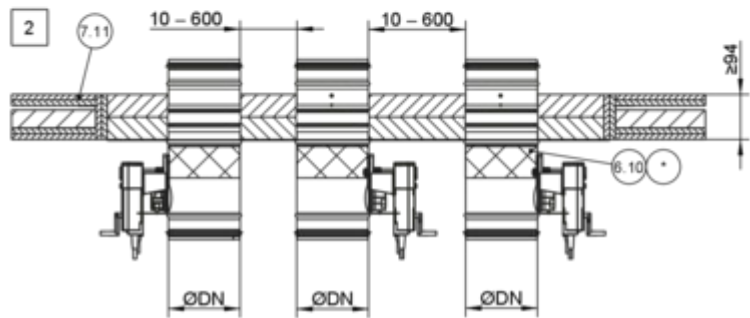
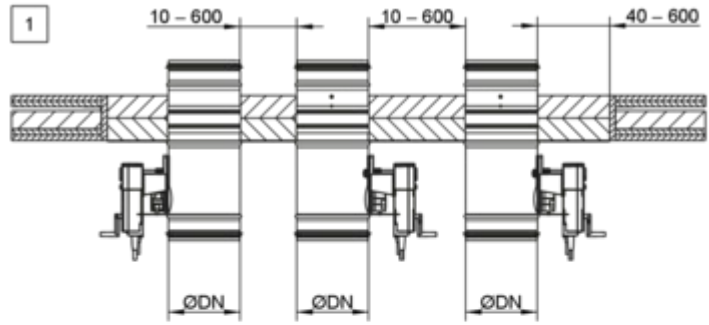
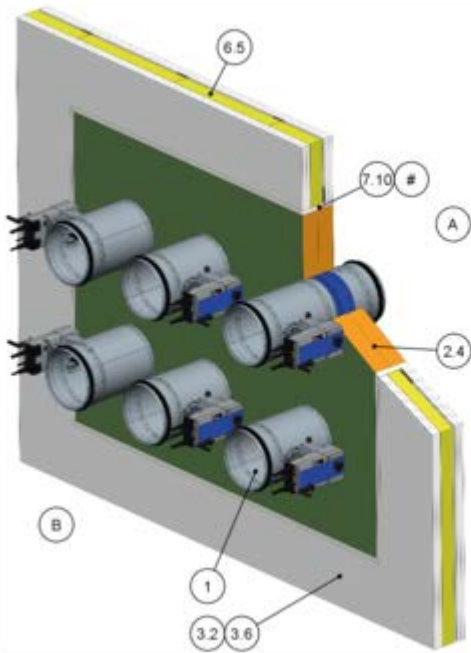
GR3791854, G

Fig. 100: Dry mortarless installation with fire batt in lightweight partition wall – Multiple occupancy of an installation opening

1 FKRS-EU
2.1 Mortar

3.1 Solid wall (load-bearing structural element)
4.1 Solid ceiling slab (load-bearing component)

Lightweight partition walls > Dry mortarless installation with fire batt in ...



GR3907490, A

Fig. 101: Dry mortarless installation with fire batt in lightweight partition wall – Multiple occupancy of an installation opening

- | | | | |
|------|--|------|--|
| 1 | FKRS-EU | 6.20 | Pipe collar (to be ordered separately) |
| 2.4 | Coated board system | 6.24 | Elastomeric foam (flame-resistant, non-dripping) |
| 3.2 | Lightweight partition 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 ↪ 'Additional provision for use in Germany:' on page 8 . |
| 3.6 | Compartment wall or safety partition wall with metal support structure, cladding on both sides | 7.10 | Trim panel |
| 6.5 | Mineral wool, depending on wall construction | # | At $W \leq 100$ mm optional,
At $W > 100$ mm double-layered (2×12.5 mm) |
| 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, leave out the actuator and release mechanism; inspection openings must remain accessible | 1 2 | See table ↪ Table on page 135 |

Lightweight partition wall					
NW [mm]	Fire resistance prop- erties to	Coating		Spacing [mm]	Detail
		Installation side A	Operating side B		
100 – 200	EI 90 S	–	–	10* – 600	1
224 – 315	EI 90 S	–	x	10* – 600	2

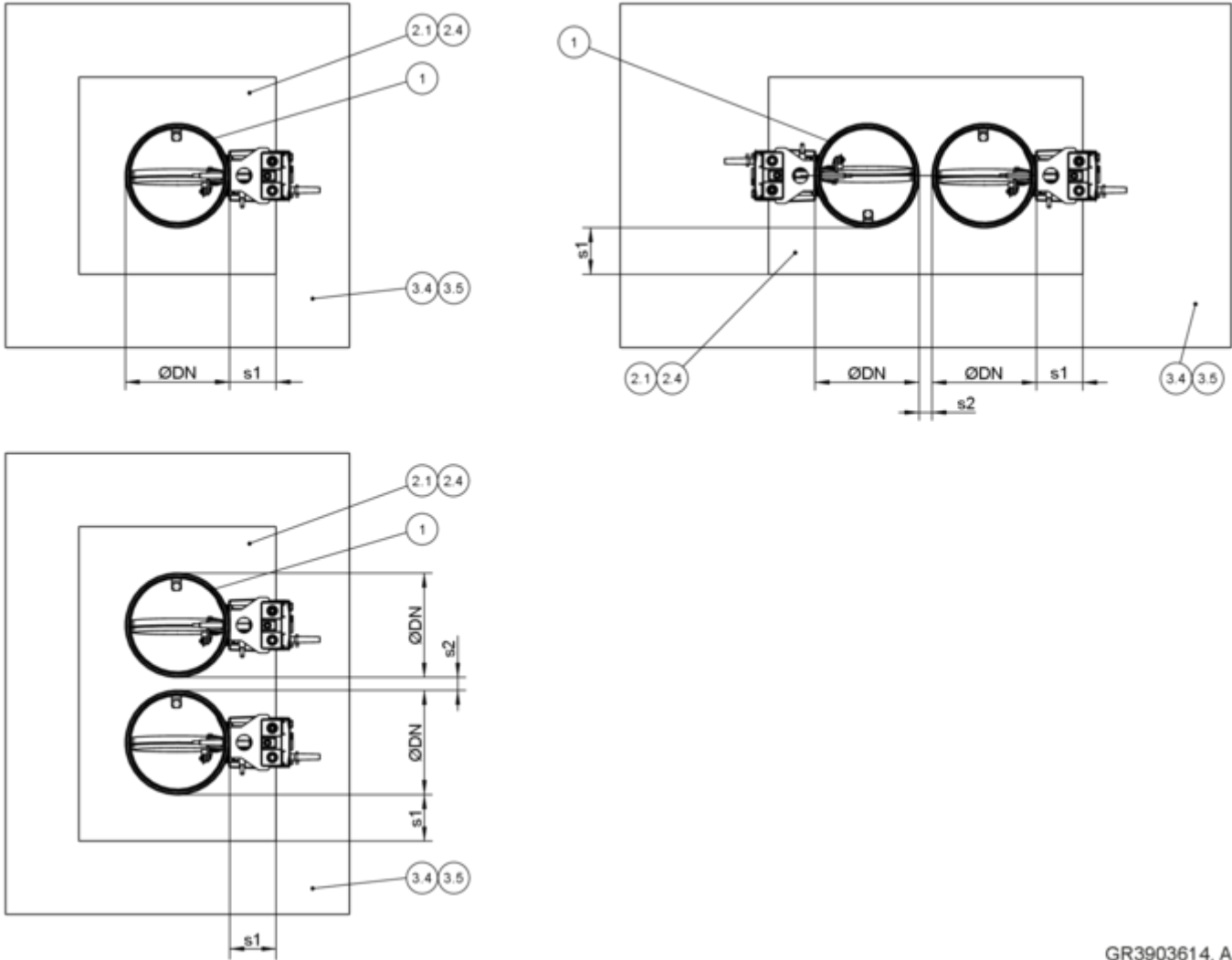
* For a distance of 10 mm, mineral wool ≥ 1000 °C, ≥ 80 kg/m³ with d = 10 mm and width nominal width/2 shall be provided between the fire dampers.

Supplementary requirements: Dry mortarless installation with fire batt in lightweight partition walls – Multiple occupancy of an installation opening

- Lightweight partition wall or compartment wall,
↳ on page 40
- Fire batt systems, installation details, distances/dimensions, ↳ on page 36 f
- ≥ 40 mm distance between the fire damper and load-bearing components
- Suspension and fixing, ↳ Chapter 5.15 'Fixing the fire damper' on page 242
- General installation information, ↳ 5.3 'General installation information' on page 29 ff
- General information on installation with fire batt,
↳ on page 36
- Overall fire damper area ≤ 1.2 m²
- The number of fire dampers in an installation opening is limited by their size (nominal width) and the overall area of the fire dampers (1.2 m²) (maximum 10 FKRS-EU in single or double row arrangement)

5.7 Lightweight partition walls with timber support structure or half-timbered constructions

5.7.1 General information



GR3903614, A

Fig. 102: Lightweight partition walls with timber frame/ half-timbered construction – arrangement/spacing

- | | | | |
|-----|--|-----|---|
| 1 | FKRS-EU | 3.5 | Half-timbered construction, cladding on both sides |
| 2.1 | Mortar | s1 | Perimeter gap, |
| 2.4 | Coated board system | s2 | Distance between the fire dampers, ↺ 'Distances' on page 32 |
| 3.4 | Timber stud wall, cladding on both sides | | |

Installation type	Installation opening [mm]	Distance [mm]	
		s1	s2
Mortar-based installation	\varnothing nominal width + max. 450	≤ 225	$10/40^2 - 225$
Dry mortarless installation with TQ2	$\square A = \varnothing$ nominal width + 110^3	central installation	≥ 200
Dry mortarless installation with fire batt ¹	$\square A = \varnothing$ nominal width + max. 1200	40 – 600	$10/40^2 - 600$

¹) Note the maximum size for the fire batt

²) Depending on fire resistance duration

³) Installation opening tolerance ± 2 mm

Lightweight partition wall with timber support structure and cladding on both sides

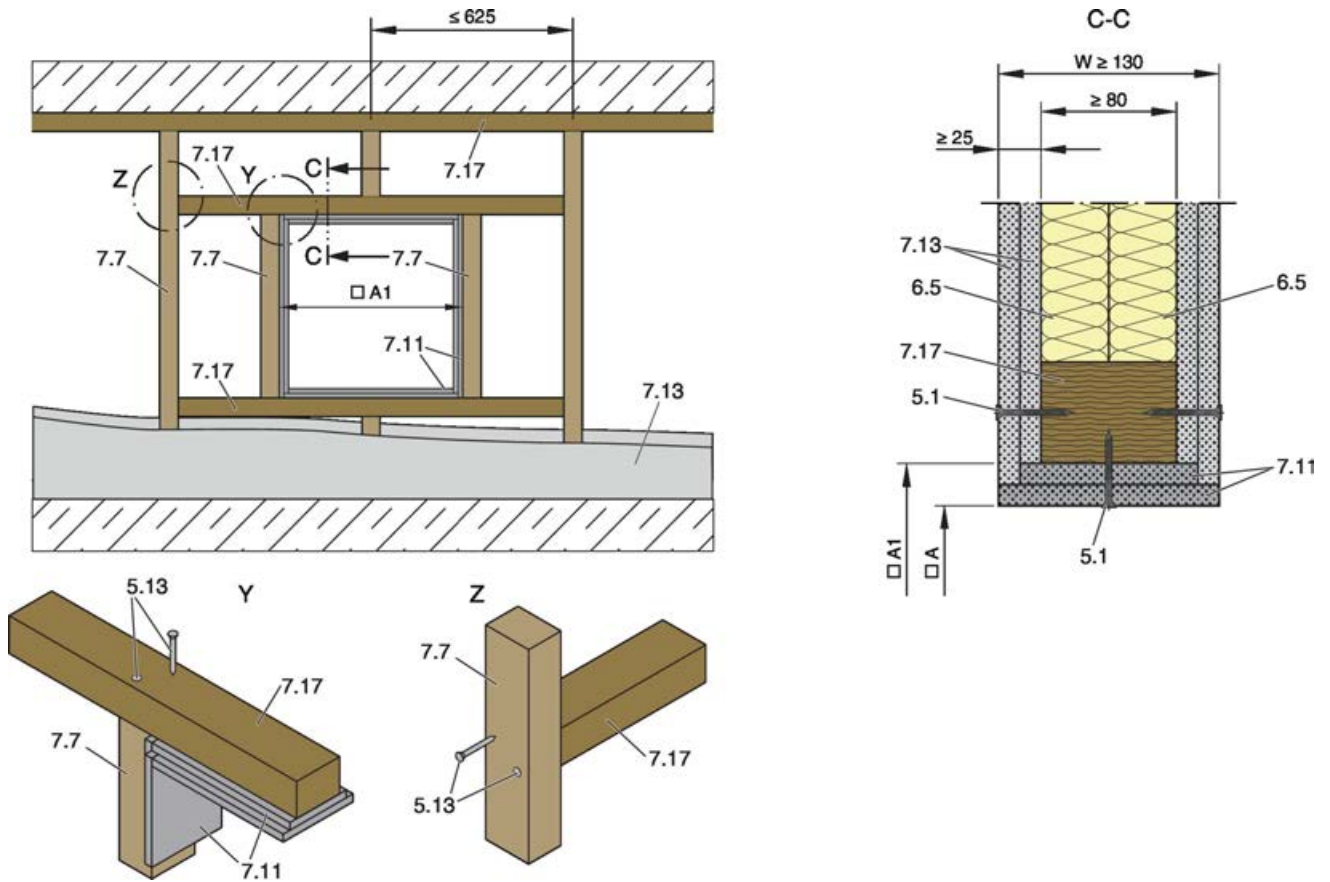


Fig. 103: Lightweight partition wall with timber support structure and cladding on both sides

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

Lightweight partition wall, half-timbered construction with cladding on both sides

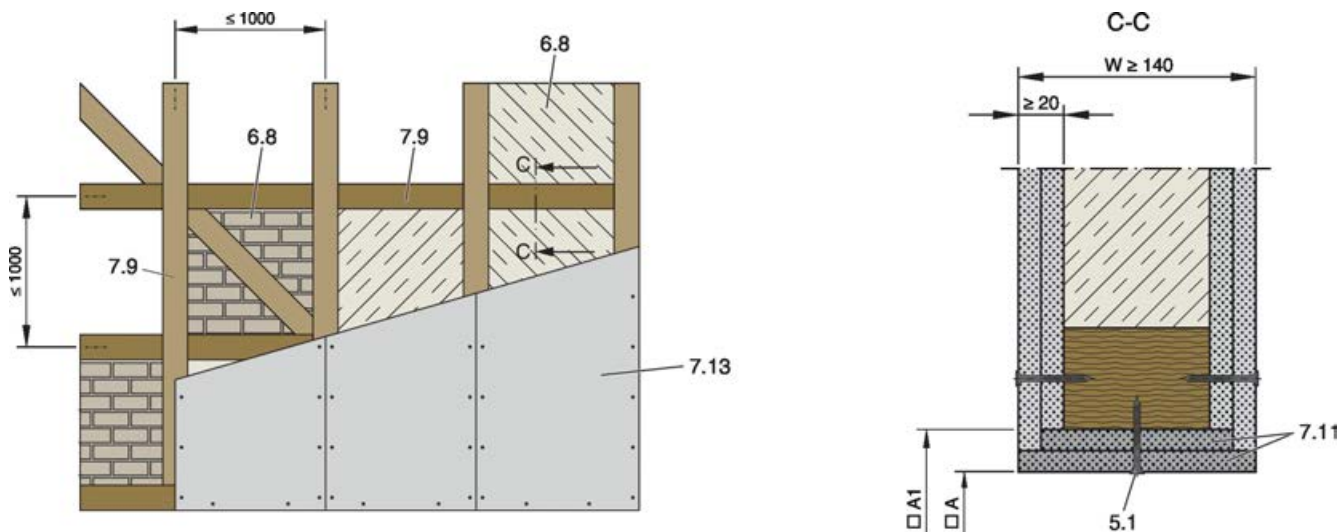


Fig. 104: Lightweight partition wall, half-timbered construction with cladding on both sides

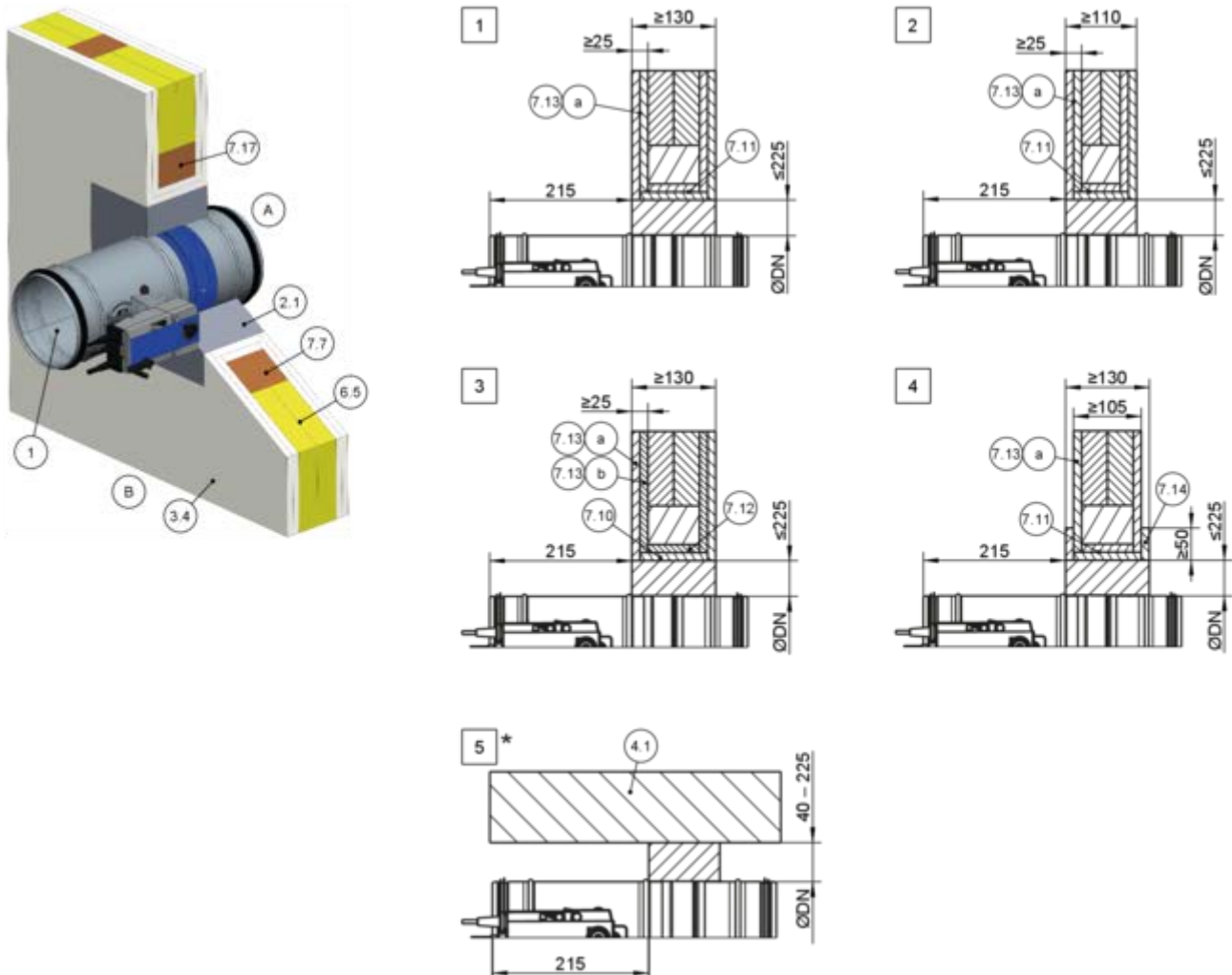
5.1	Dry wall screw	7.13	Cladding
6.8	Infill*	*	Cavities completely filled with mineral wool $\geq 50 \text{ kg/m}^3$, bricks, aerated concrete, lightweight concrete, reinforced concrete or clay
7.9	Timber structure	□A	Clear installation opening
7.11	Trim panels, double layer, staggered joints	□A1	Opening in the half-timbered construction, □A1 = □A + (4 × trim panels)

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

- Timber stud wall/half-timbered construction, [↪ on page 41](#)

5.7.2 Mortar-based installation

Mortar-based installation into a lightweight partition wall with timber support structure

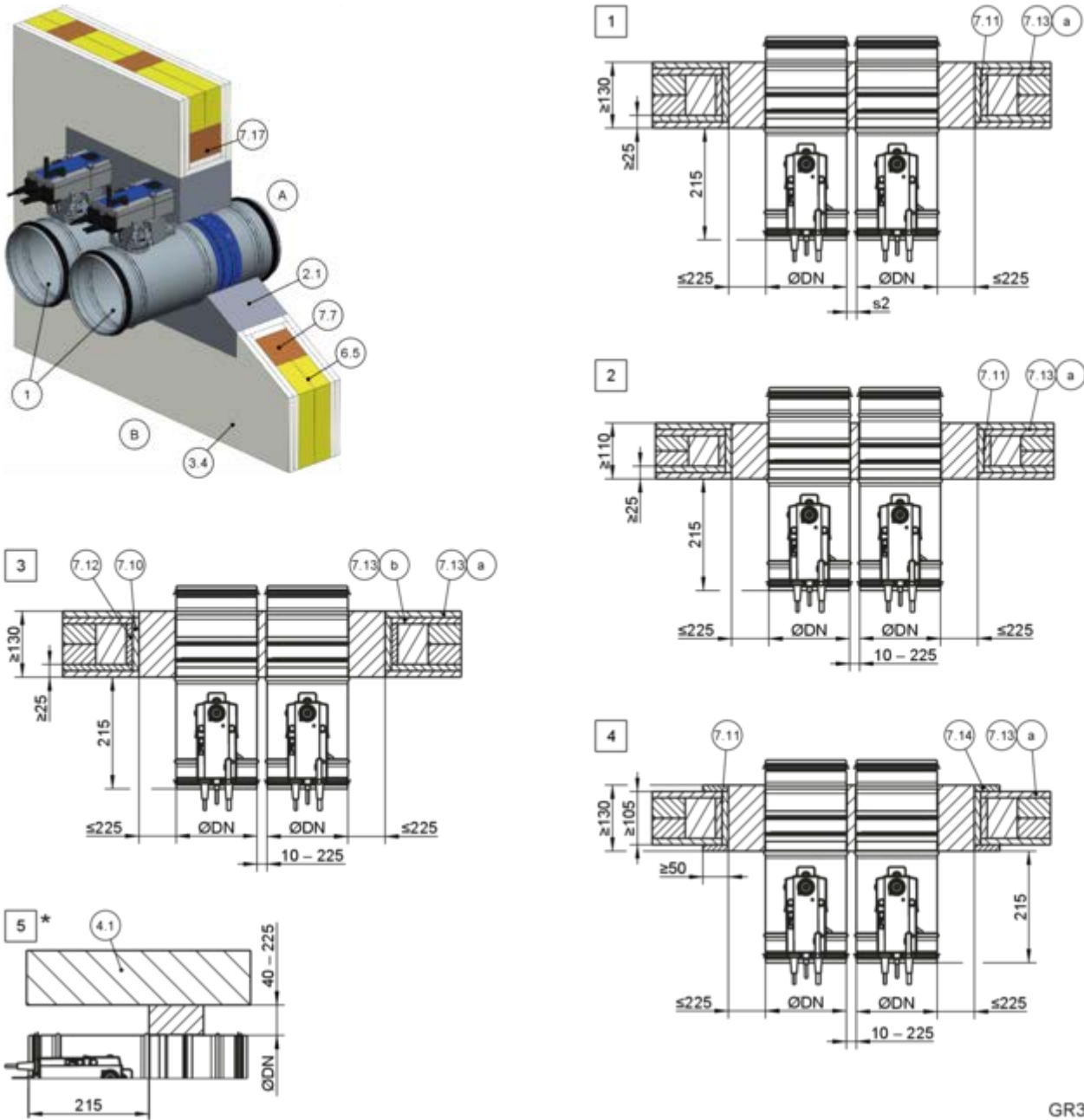


GR3840324, C

Fig. 105: 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 as in [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

Mortar-based installation in lightweight partition wall with timber support structure, "flange to flange"

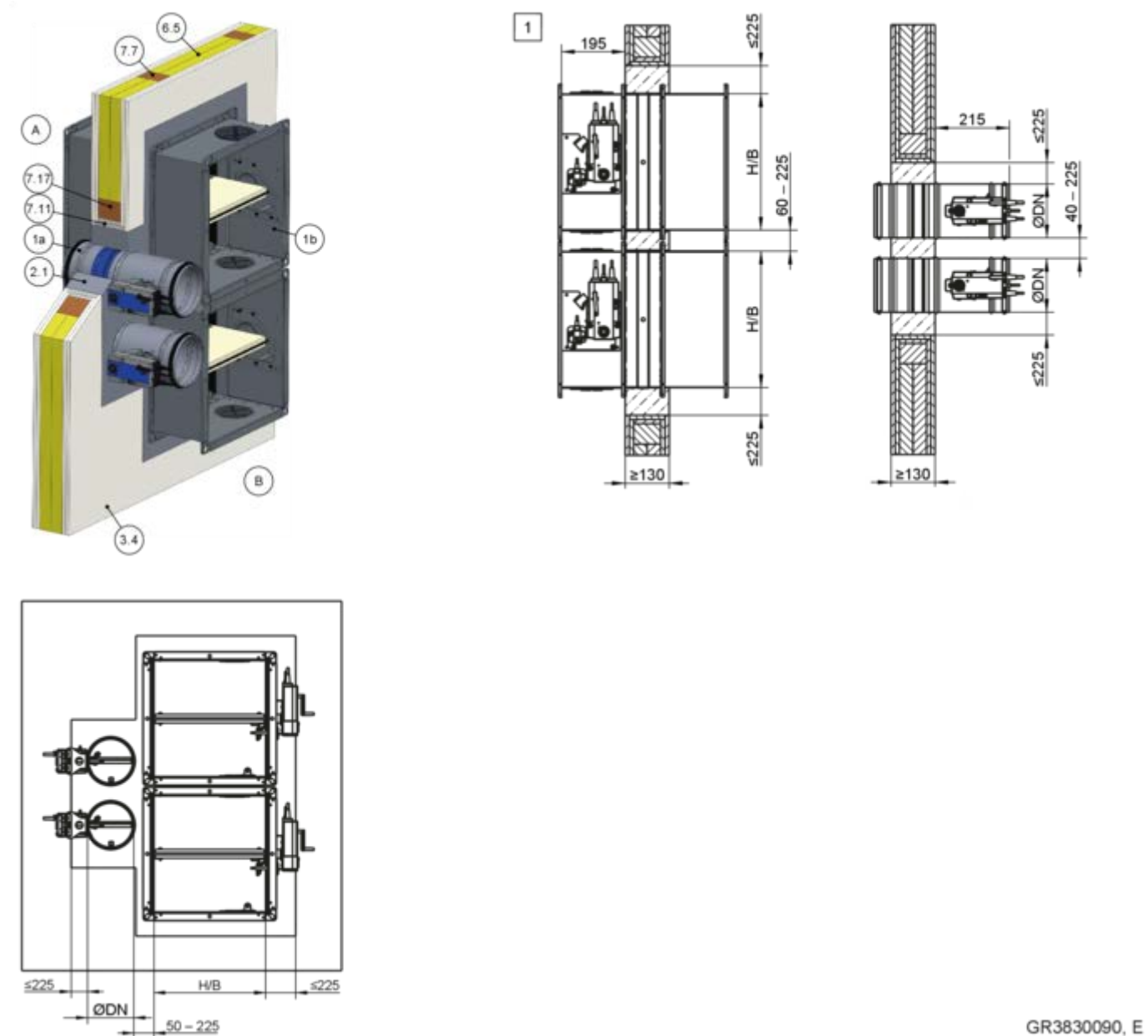


GR3840809, C

Fig. 106: 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	7.13a	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	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 as in [5]
7.7	Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60	[1]	Up to EI 120 S for s2 = 40 – 225 mm
7.11	Trim panels, double layer, staggered joints	[2]	Up to EI 60 S
7.12	Trim panels, wood sheet, at least 600 kg ³	[3] [4]	EI 30 S
7.13	Cladding	[5]	EI 30 to EI 120 S

Mortar-based installation into a lightweight partition wall with timber support structure, FKRS-EU and FK2-EU, combined



GR3830090, E

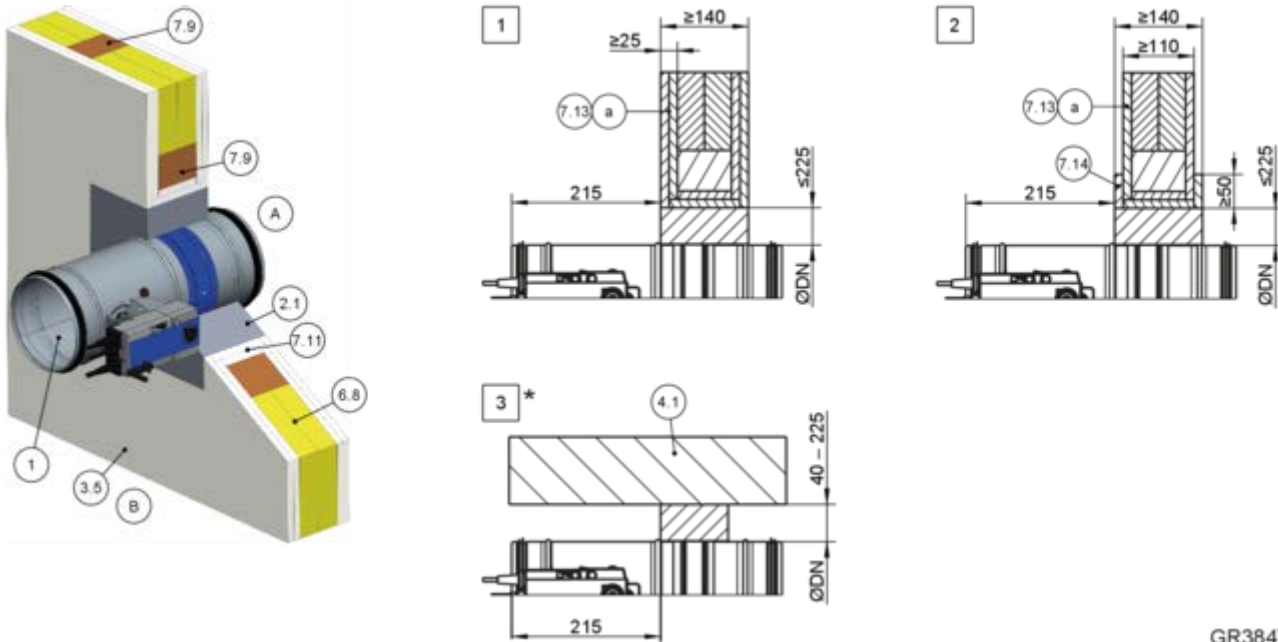
Fig. 107: Mortar-based installation into a lightweight partition wall with timber support structure, FKRS-EU and FK2-EU, combined

1a	FKRS-EU	7.7	Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60
1b	FK2-EU up to B × H ≤ 800 × 400 mm	7.11	Trim panels, double layer, staggered joints
2.1	Mortar	7.17	Trimmer, wooden beam min. 60 × 80 mm or min. 60 × 60 mm with F60
3.4	Timber stud wall (also timber panel constructions), cladding on both sides	1	Up to EI 90 S
6.5	Mineral wool, depending on wall construction		

For combined installation please note:

- Overall fire damper area ≤ 1.2 m² .
- The number of fire dampers in an installation opening is limited by their size (B × H for FK2-EU and/or Ønominal width for FKRS-EU) and the overall area of the fire dampers (1.2 m²).
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For installation details FK2-EU, see the installation and operating manual for this fire damper type.
- Distance to load-bearing structural elements ≥ 40 mm

Mortar-based installation into a lightweight partition wall, half-timbered construction

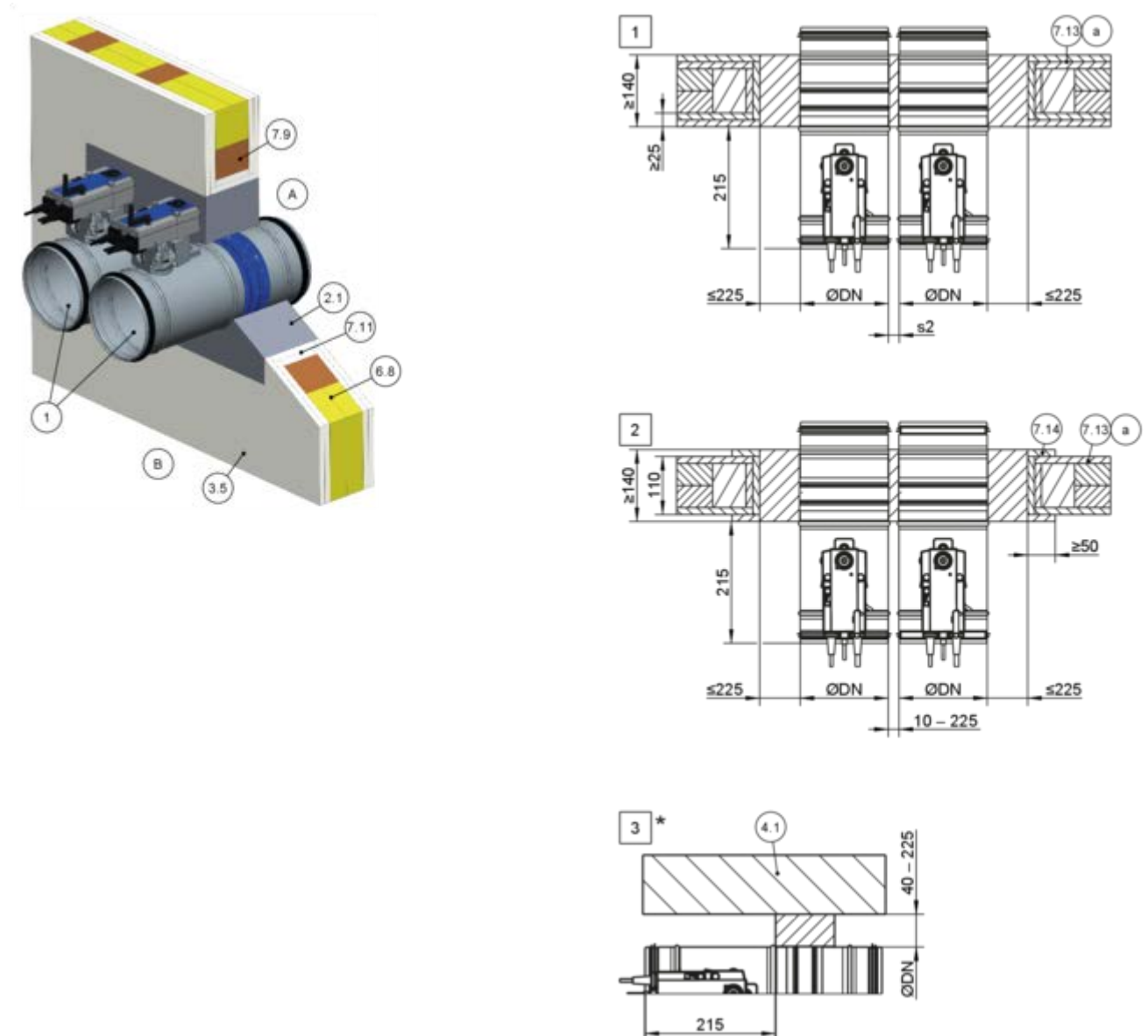


GR3847637, D

Fig. 108: Mortar-based installation into a lightweight partition wall, half-timbered construction

1	FKRS-EU	7.13a	Cladding, fire-resistant
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 as in 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	Timber structure	3	EI 30 to EI 120 S
7.11	Trim panels, fire-resistant, double layer, staggered joints		

Mortar-based installation in lightweight partition wall with half-timbered construction, "flange to flange"

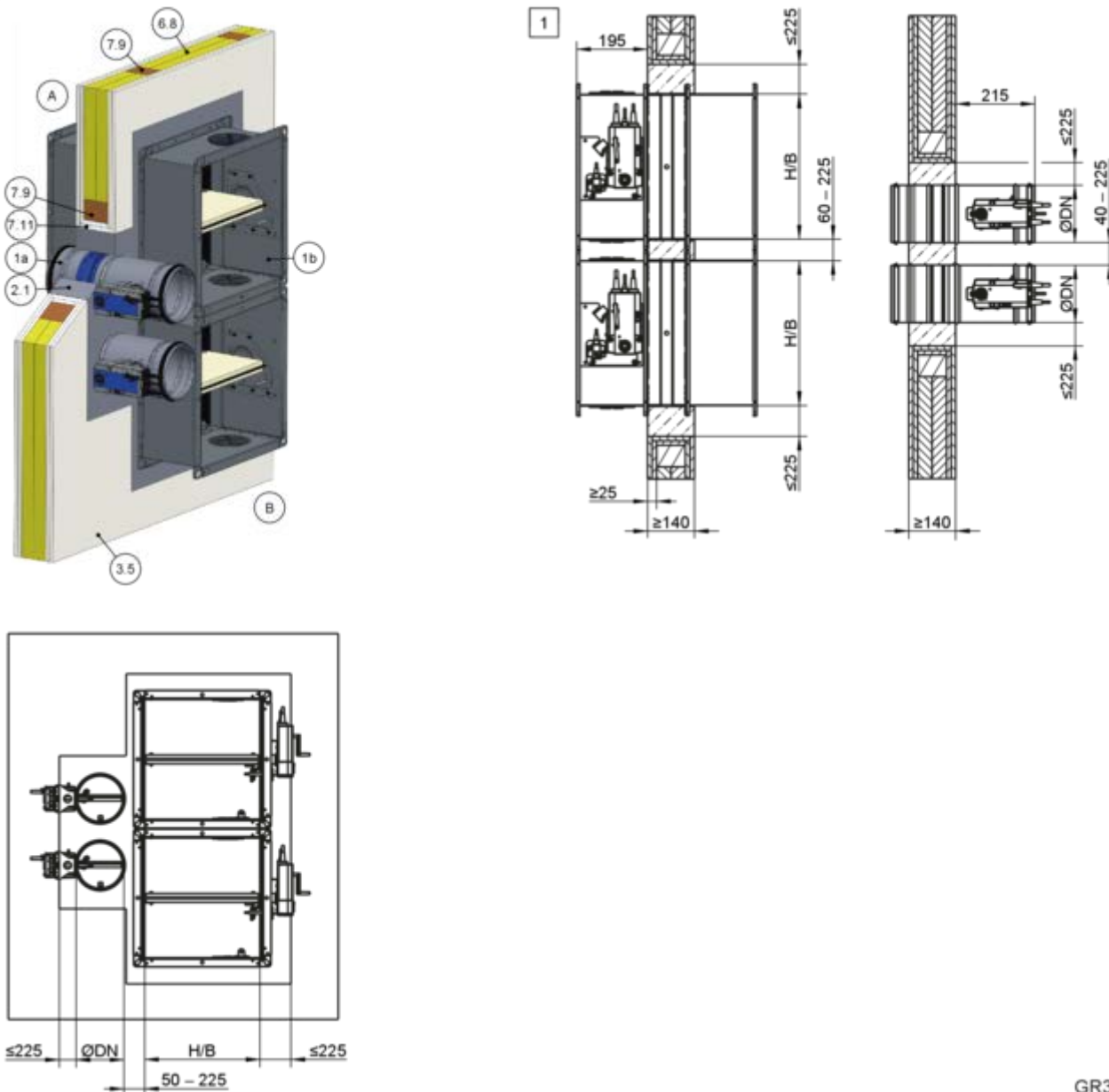


GR3847906, D

Fig. 109: Mortar-based installation into a lightweight partition wall, 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 | 7.13a | Cladding, fire-resistant |
| 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 as in 3 |
| 4.1 | Solid ceiling slab/solid floor | 1 | Up to EI 120 S for s2 = 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 | Up to EI 90 S for s2 = 10 – 225 mm |
| 7.9 | Timber structure | 3 | EI 30 S |
| 7.11 | Trim panels, fire-resistant, double layer, staggered joints | | EI 30 to EI 120 S |

Mortar-based installation into a lightweight partition wall with half-timbered construction, FKRS-EU and FK2-EU, combined



GR3831287, G

Fig. 110: Mortar-based installation into a lightweight partition wall with half-timbered construction, FKRS-EU and FK2-EU, combined

1a	FKRS-EU	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)
1b	FK2-EU up to $B \times H \leq 800 \times 400\text{ mm}$	7.9	Timber structure
2.1	Mortar	7.11	Trim panels, double layer, staggered joints
3.5	Half-timbered construction, cladding on both sides	1	Up to EI 90 S

For combined installation please note:

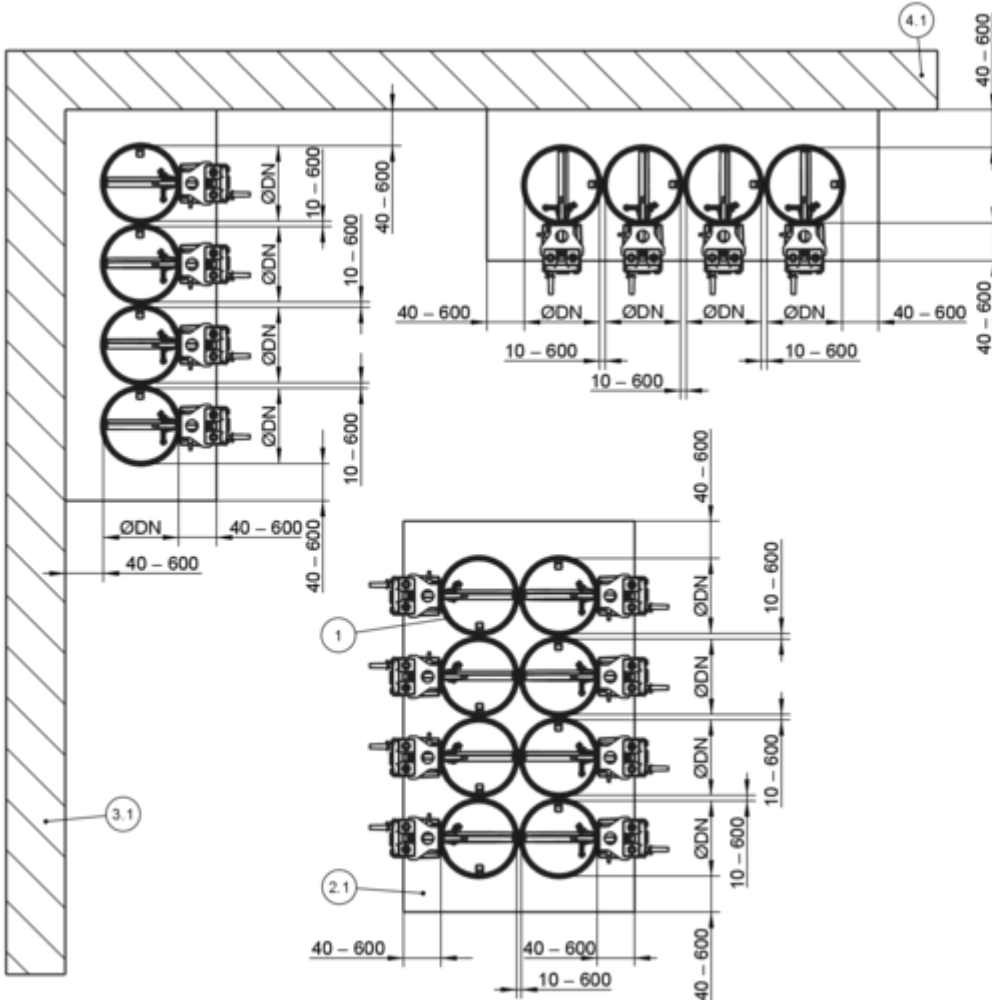
- Overall fire damper area $\leq 1.2\text{ m}^2$.
- The number of fire dampers in an installation opening is limited by their size ($B \times H$ for FK2-EU and/or \varnothing nominal width for FKRS-EU) and the overall area of the fire dampers (1.2 m^2).
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For installation details FK2-EU, see the installation and operating manual for this fire damper type.
- Distance to load-bearing structural elements $\geq 40\text{ mm}$

Additional requirements: mortar-based installation in lightweight partition wall with timber support structure/half-timbered construction

- Timber stud wall/half-timbered construction,
↳ on page 41
- General installation information, ↳ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation,
↳ '**Mortar-based installation**' on page 34

5.7.3 Mortar-based installation – multiple installation into one installation opening

Mortar-based installation into a lightweight partition wall with timber support structure

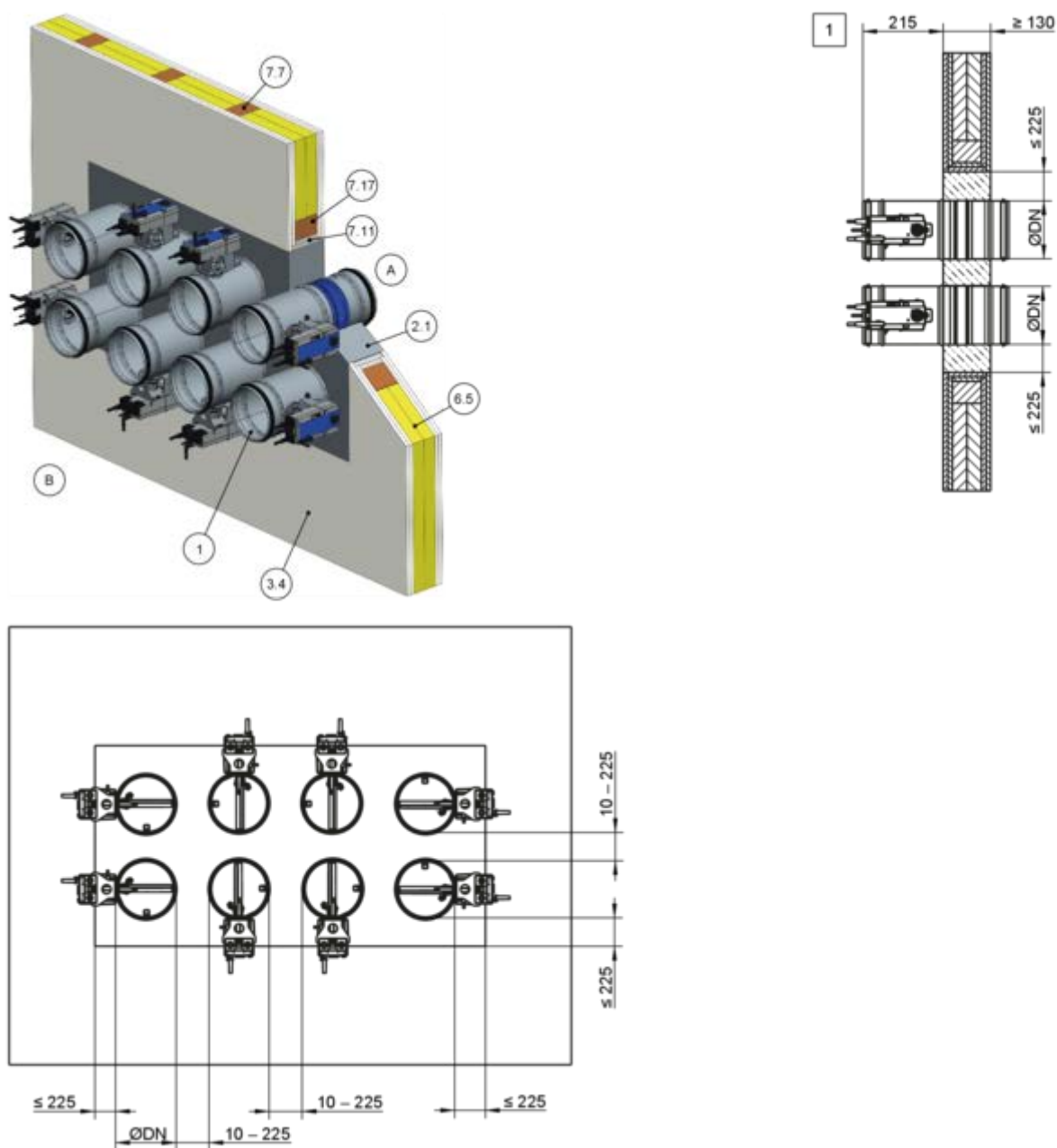


GR3791854, G

Fig. 111: Mortar-based installation in lightweight partition wall with timber stud – Multiple occupancy of an installation opening

- | | | | |
|-----|---------|-----|--|
| 1 | FKRS-EU | 3.1 | Solid wall (load-bearing structural element) |
| 2.1 | Mortar | 4.1 | Solid ceiling slab (load-bearing component) |

Lightweight partition walls with timber support ... > Mortar-based installation – multiple installat...

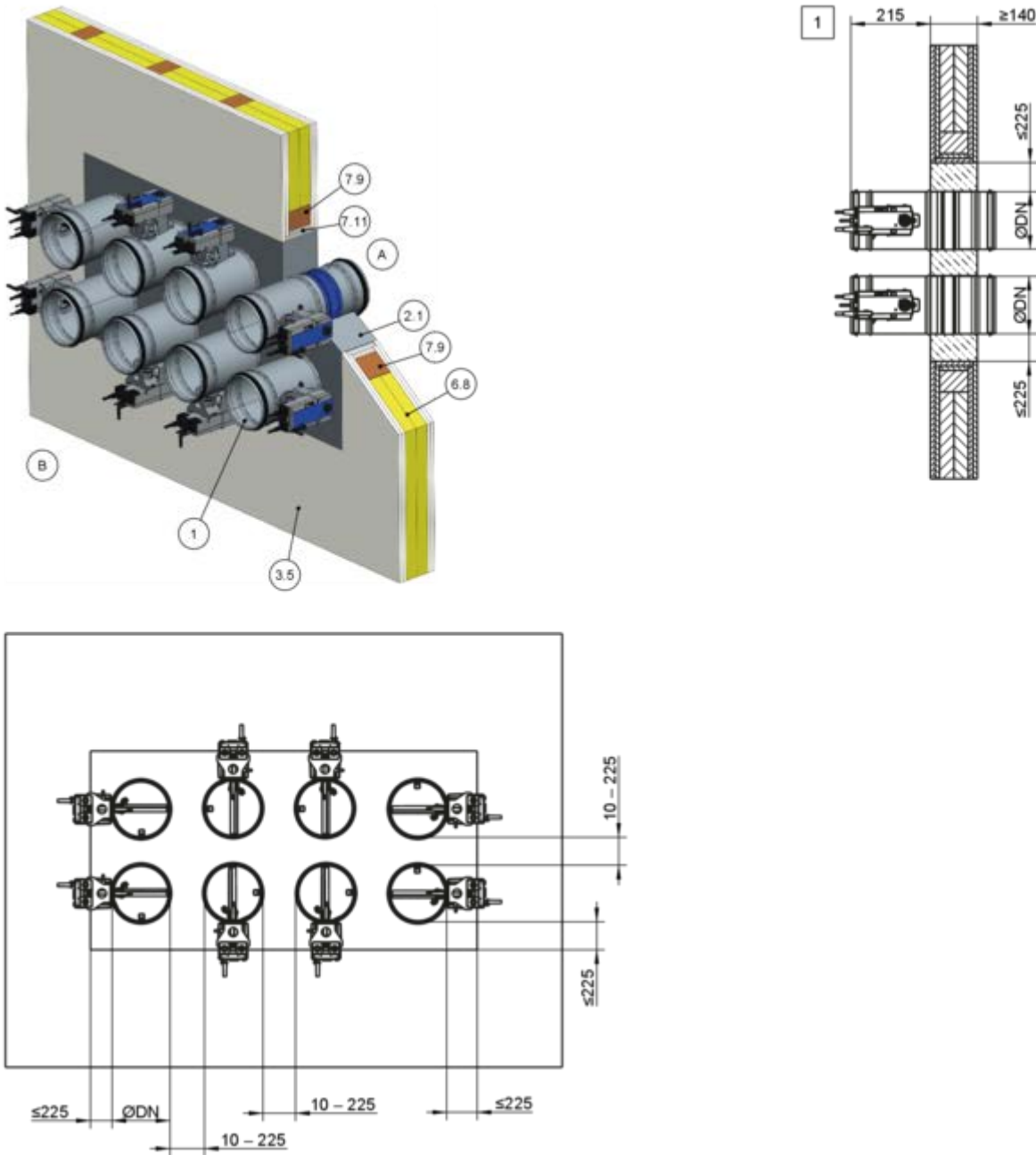


GR3941945, A

Fig. 112: Mortar-based installation in lightweight partition wall with timber stud – Multiple occupancy of an installation opening

1	FKRS-EU	7.7	Timber stud, at least 60 × 80 mm
2.1	Mortar	7.11	Trim panels, fire-resistant, double layer, staggered joints
3.4	Timber stud wall (also timber panel constructions), cladding on both sides	7.17	Trimmers, timber stud/nogging min. 60 × 80 mm
6.5	Mineral wool, depending on wall construction	1	Up to EI 90 S

Mortar-based installation into a lightweight partition wall, half-timbered construction



GR3942065, A

Fig. 113: Mortar-based installation in lightweight partition wall with half-timbered construction – Multiple occupancy of an installation opening

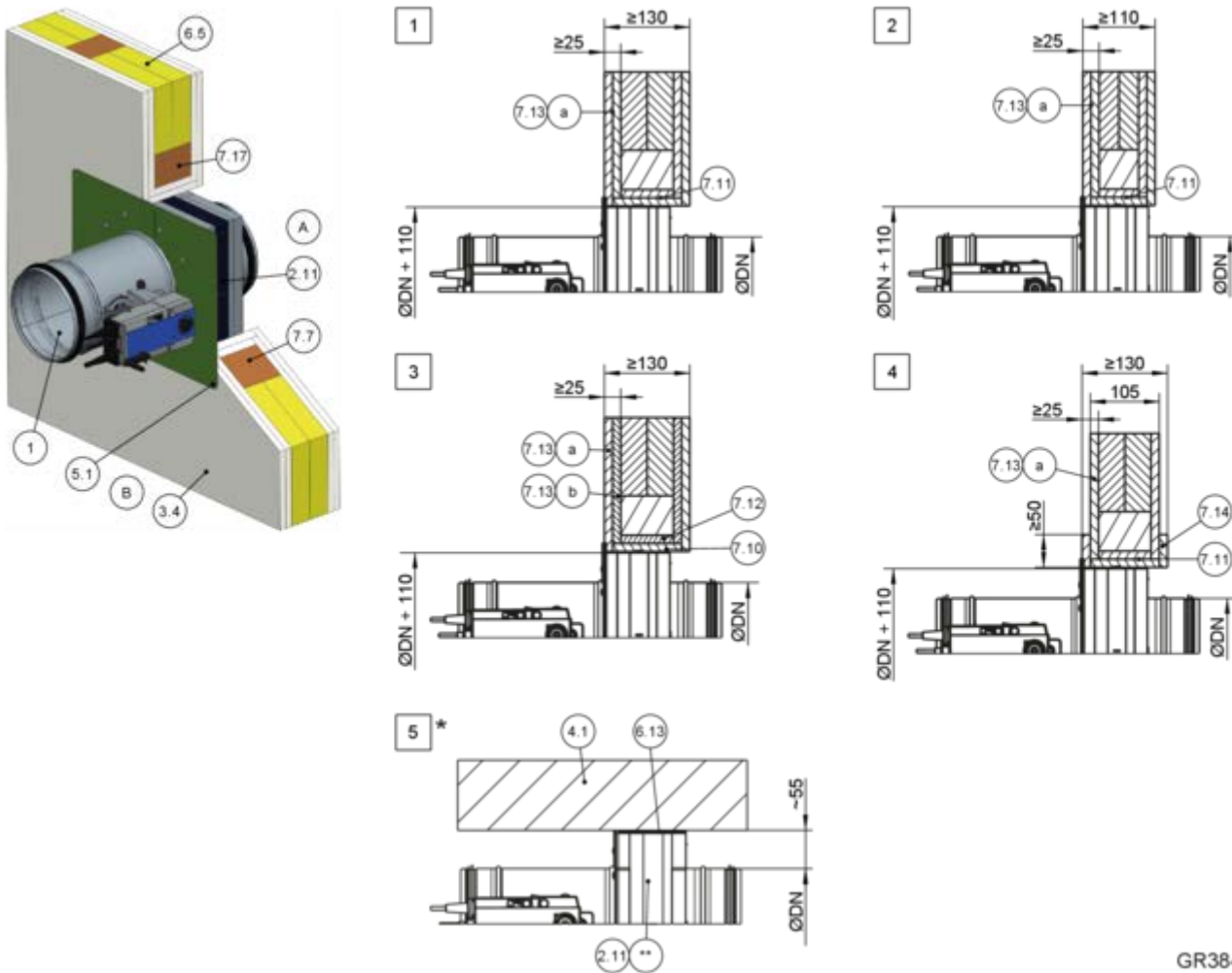
- | | | | |
|-----|--|------|---|
| 1 | FKRS-EU | 7.9 | Timber structure |
| 2.1 | Mortar | 7.11 | Trim panels, fire-resistant, double layer, staggered joints |
| 3.5 | Half-timbered construction, cladding on both sides | | |
| 6.8 | Infill (cavities completely filled with mineral wool $\geq 1000 \text{ }^\circ\text{C}$, $\geq 50 \text{ kg/m}^3$, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay) | 1 | Up to EI 90 S |

Supplementary requirements: Mortar-based installation with fire batt in lightweight partition walls with timber studs/half-timbered construction – Multiple occupancy of an installation opening

- Timber stud wall/half-timbered construction,
☞ *on page 41*
- General installation information, ☞ 5.3 'General installation information' *on page 29 ff*
- Overall fire damper area $\leq 1.2 \text{ m}^2$
- The number of fire dampers in an installation opening is limited by their size (nominal width) and the overall area of the fire dampers (1.2 m²) (maximum 10 FKRS-EU in single or double row arrangement)
- Distance to load-bearing structural elements
 $\geq 40 \text{ mm}$

5.7.4 Dry mortarless installation with installation kit TQ2

Lightweight partition wall with timber support structure

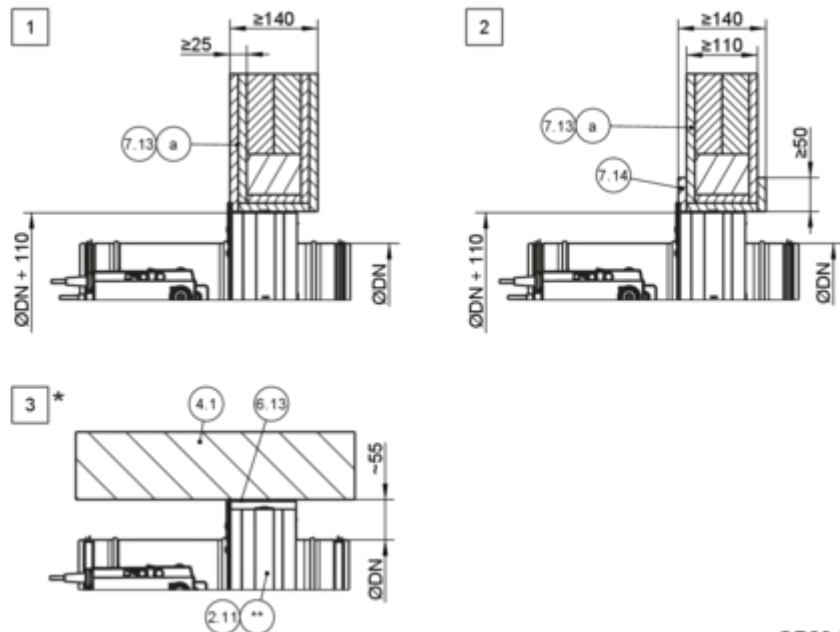
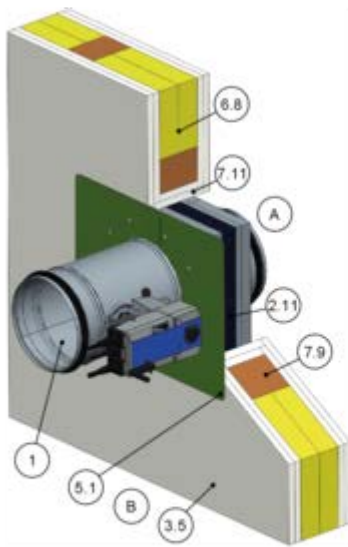


GR3841106, D

Fig. 114: Dry mortarless installation into a lightweight partition wall with timber support structure, with installation kit TQ2

1	FKRS-EU	7.13a	Cladding, fire-resistant
2.11	Installation kit TQ2 with cover plate	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	Trimmer, wooden beam min. 60 × 80 mm or min. 60 × 60 mm with F60
5.1	Dry wall screw/wood screw, min. 10 mm screwed into the wooden framework	*	Installation near the floor as in 5
6.5	Mineral wool, depending on wall construction	**	Cover plate shortened by others
6.13	Mineral wool strips A1, alternatively gypsum mortar	1	Up to EI 120 S
7.7	Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60	2	Up to EI 60 S
7.10	Trim panels (fire-resistant)	3 4	EI 30 S
7.11	Trim panels, double layer, staggered joints	5	EI 30 to EI 120 S
7.12	Trim panels, wood sheet, at least 600 kg ³		

Lightweight partition wall with half-timbered construction



GR3847931, D

Fig. 115: Dry mortarless installation into a lightweight partition wall, half-timbered construction, using installation kit TQ2

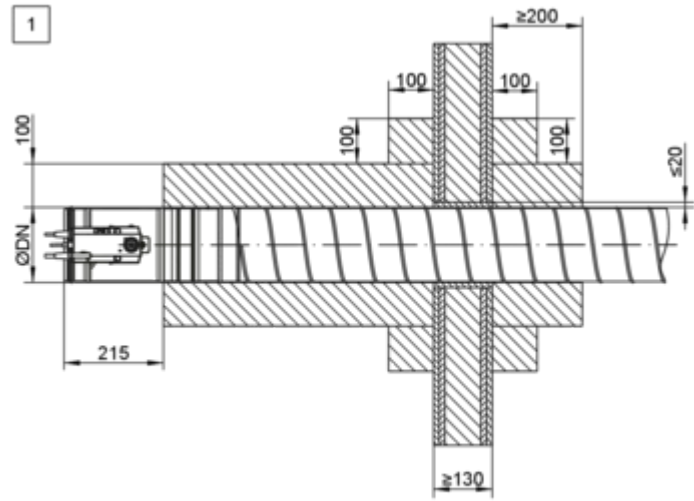
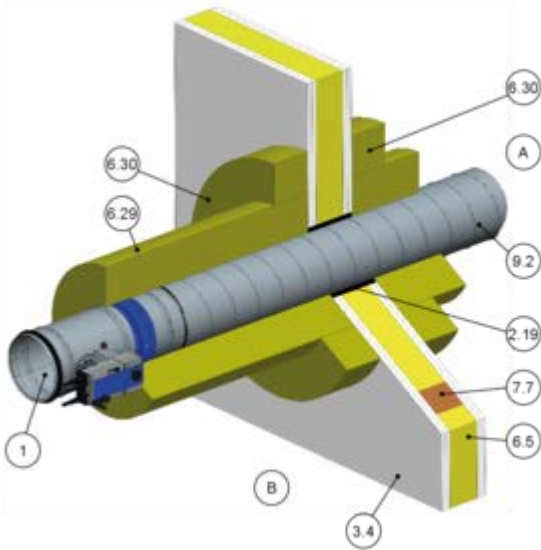
- | | | | |
|------|--|----------|---|
| 1 | FKRS-EU | 7.11 | Trim panels, fire-resistant, double layer, staggered joints |
| 2.11 | Installation kit TQ2 with cover plate | 7.13a | Cladding, fire-resistant |
| 3.5 | Half-timbered construction, cladding on both sides | 7.14 | Reinforcing board of the same material as the wall |
| 4.1 | Solid ceiling slab/solid floor | * | Installation near the floor as in 3 |
| 5.1 | Dry wall screw/wood screw, min. 10 mm screwed into the wooden framework | ** | 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 | Timber structure | 3 | EI 30 to EI 120 S |

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

- Timber stud wall/half-timbered construction, ☞ on page 41
- Installation kit TQ2, ☞ 5.4.3 'Installation kit TQ2' on page 46
- $\geq 200\text{ mm}$ distance between two fire dampers in separate installation openings
- General installation information, ☞ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit TQ2, ☞ on page 35

5.7.5 Installation remote from lightweight partition walls with mineral wool

Installation remote from timber stud walls with mineral wool and joint filler



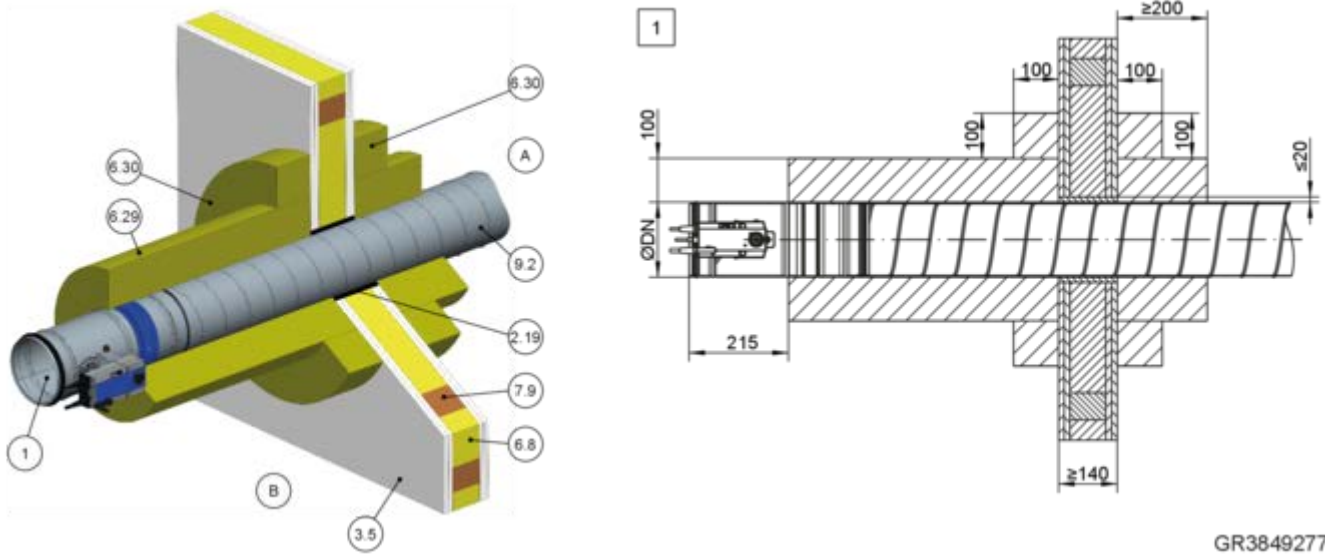
GR3843232, C

Fig. 116: Installation remote from timber stud walls with mineral wool and joint filler

1	FKRS-EU	6.30*	Reinforcing strip made of mineral wool PAROC HVAC Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$), glued along perimeter
2.19	Joint filler	7.7	Timber stud, min. $60 \times 80 \text{ mm}$
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
6.29*	Mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m^3)		

* Please check in advance whether the PAROC material is available in your market region.

Installation remote from timber frame walls with mineral wool and joint filler

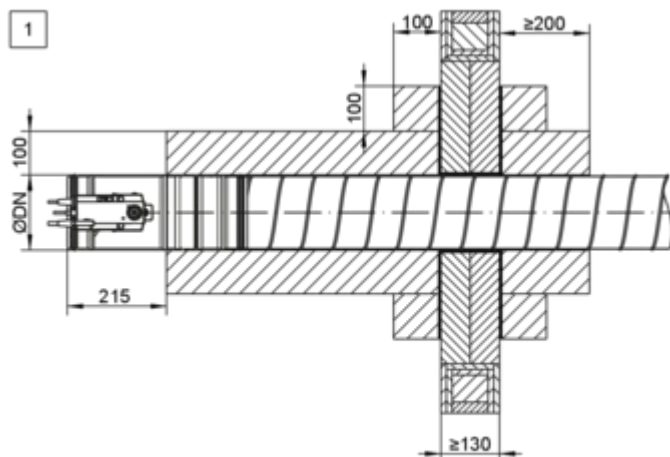
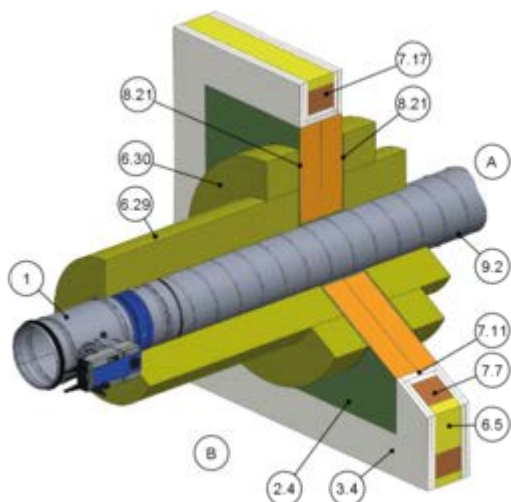


GR3849277, D

Fig. 117: Installation remote from timber frame walls with mineral wool and joint filler

- | | | | |
|-------|--|--|--|
| 1 | FKRS-EU | 6.30* | Reinforcing strip made of mineral wool PAROC HVAC Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$), glued along perimeter |
| 2.19 | Joint filler | 7.9 | Timber structure |
| 3.5 | Half-timbered construction, cladding on both sides | 9.2 | Sheet steel duct |
| 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 60 S |
| 6.29* | Mineral wool PAROC Hvac Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$) | * Please check in advance whether the PAROC material is available in your market region. | |

Dry mortarless installation remote from timber stud walls with mineral wool and fire batt

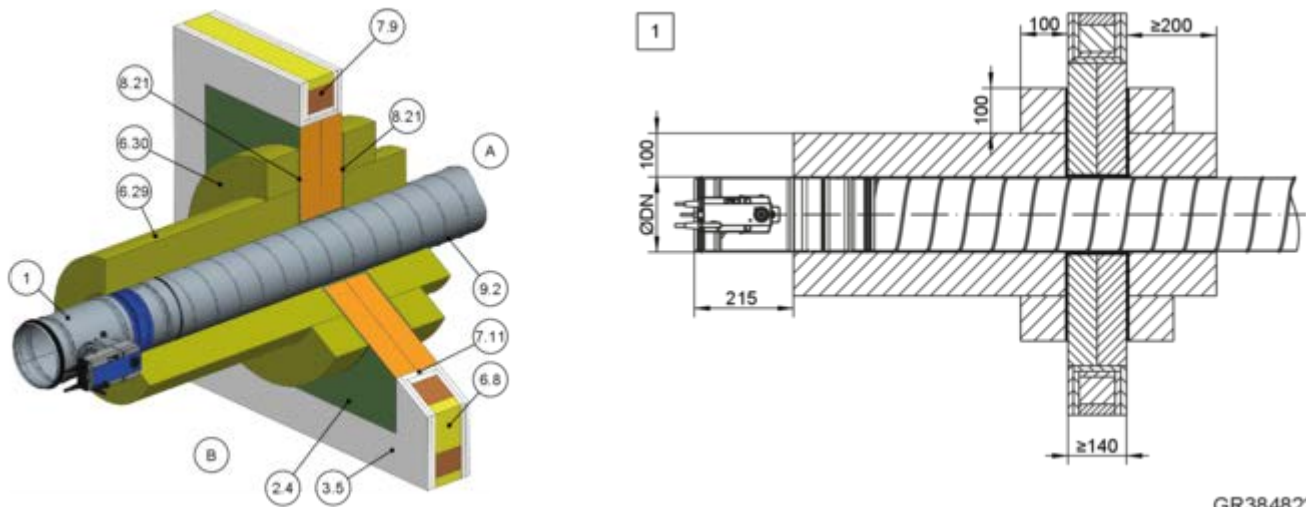


GR3843020, G

Fig. 118: Dry mortarless installation remote from timber stud walls with mineral wool and fire batt

1	FKRS-EU	7.7	Timber stud, min. 60 × 80 mm
2.4	Fire batt, PAROC Pyrotech Slab 140 (max. W × H = 2.1 × 2.5 m)	7.11	Trim panels, fire-resistant, double layer, staggered joints
3.4	Timber stud wall, cladding on both sides	7.17	Trimmer, wooden beam min. 60 × 80 mm
6.5	Mineral wool, depending on wall construction	8.21	Acrylic or sealing compound (suitable for fire batt system)
6.29*	Mineral wool PAROC Hvac Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$)	9.2	Sheet steel duct
6.30*	Reinforcing strip made of mineral wool PAROC HVAC Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$), glued along perimeter	1	Up to EI 60 S

* Please check in advance whether the PAROC material is available in your market region.

Dry mortarless installation remote from timber frame walls with mineral wool and fire batt

GR3848226, E

Fig. 119: Dry mortarless installation remote from timber frame walls with mineral wool and fire batt

1	FKRS-EU	7.9	Timber structure
2.4	Fire batt, PAROC Pyrotech Slab 140 (max. W × H = 2.1 × 2.5 m)	7.11	Trim panels, fire-resistant, double layer, staggered joints
3.5	Half-timbered construction, cladding on both sides	8.21	Acrylic or sealing compound (suitable for fire batt system)
6.8	Infill (cavities completely filled with mineral wool $\geq 1000\text{ °C}$, $\geq 50\text{ kg/m}^3$, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)	9.2	Sheet steel duct
6.29*	Mineral wool PAROC Hvac Fire Mat BlackCoat ($\geq 80\text{ kg/m}^3$)	1	Up to EI 60 S
6.30*	Reinforcing strip made of mineral wool PAROC HVAC Fire Mat BlackCoat ($\geq 80\text{ kg/m}^3$), glued along perimeter		

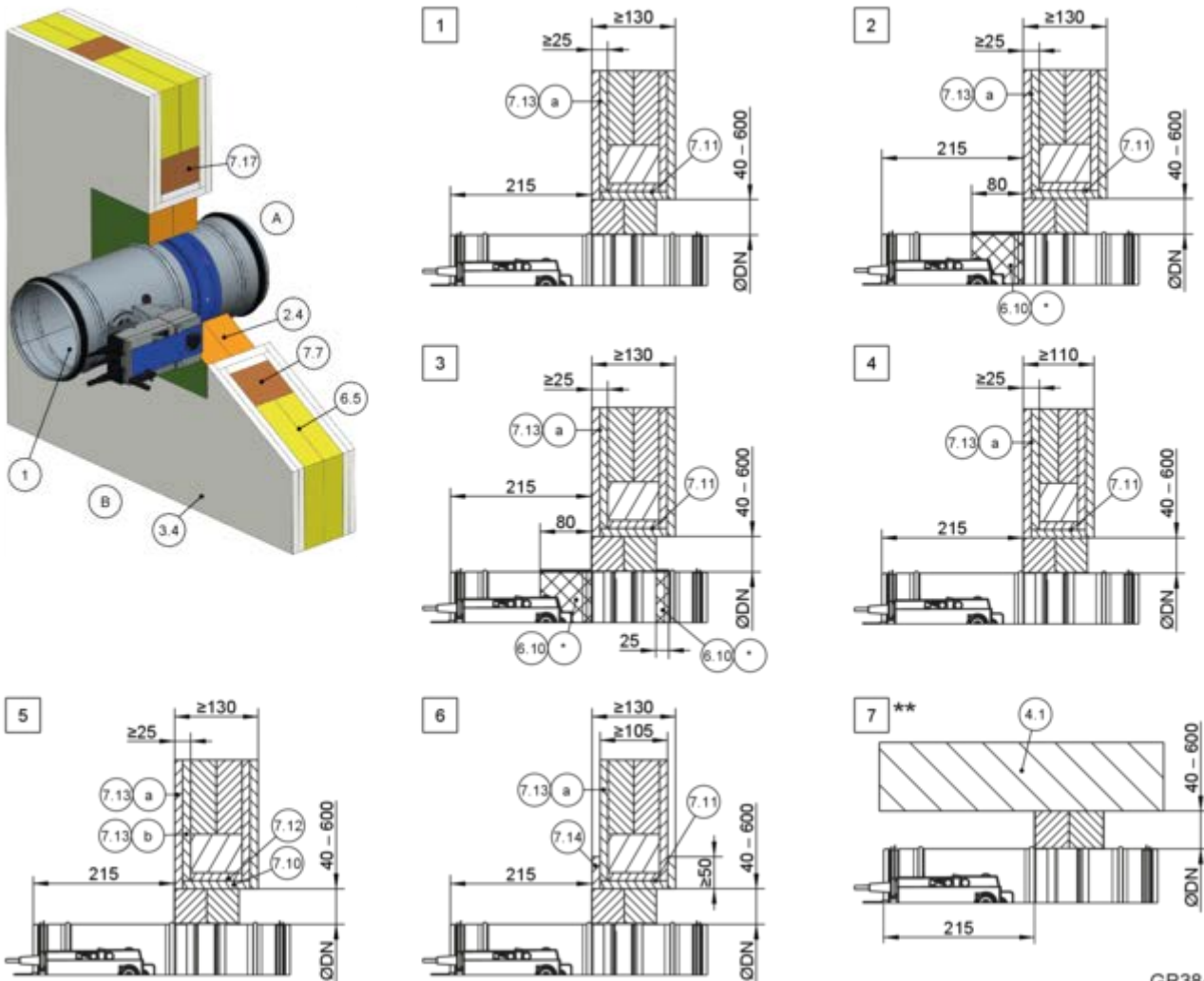
* Please check in advance whether the PAROC material is available in your market region.

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

- Timber stud wall/half-timbered construction, ↪ on page 41
- General installation information, ↪ 5.3 'General installation information' on page 29 ff
- General information on installation with mineral wool, ↪ on page 36
- $\geq 400\text{ mm}$ distance between two fire dampers
- Distance to load-bearing/adjacent components $\geq 200\text{ mm}$
- Suspend the fire damper and air duct according to the mineral wool manufacturer's specifications

5.7.6 Dry mortarless installation with fire batt

Dry mortarless installation into a lightweight partition wall with timber support structure, with a fire batt



GR3841537, E

Fig. 120: Dry mortarless installation into a lightweight partition wall with timber support structure, with a fire batt

1	FKRS-EU	7.10	Trim panels (fire-resistant)
2.4	Coated board system	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	Pipe collar (to 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 ☞ 'Additional provision for use in Germany:' on page 8.	**	Installation near the floor as in 7
7.7	Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60	1 - 7	See table ☞ 157

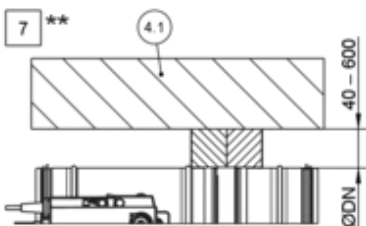
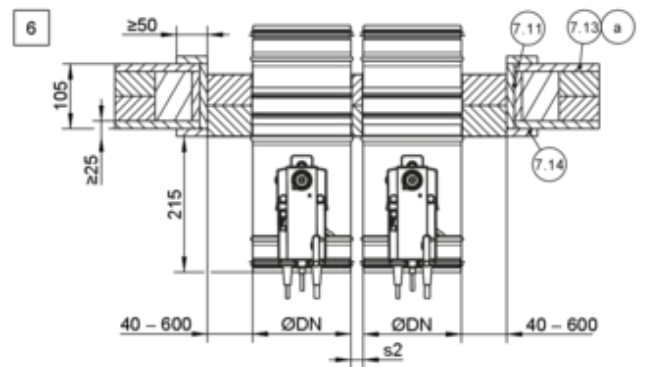
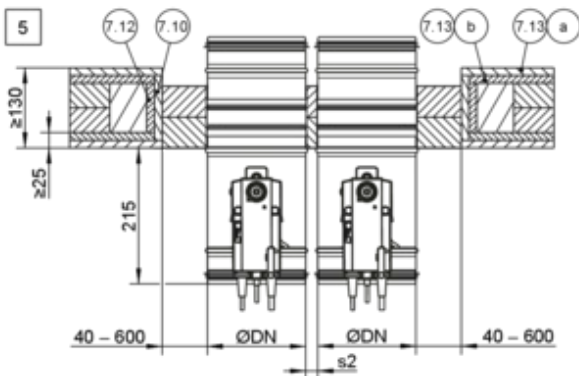
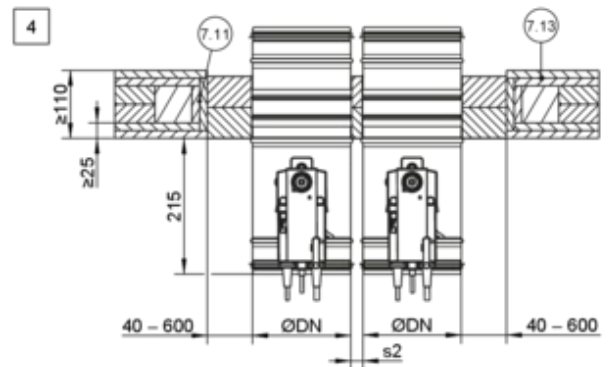
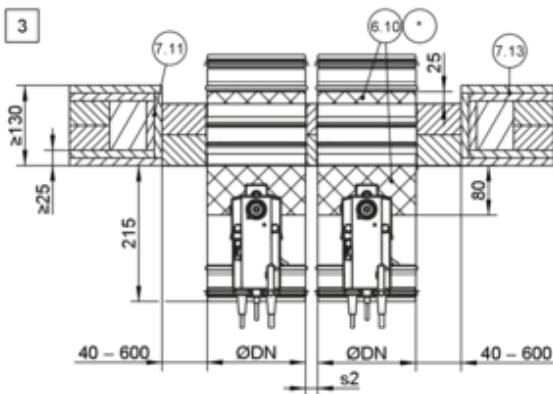
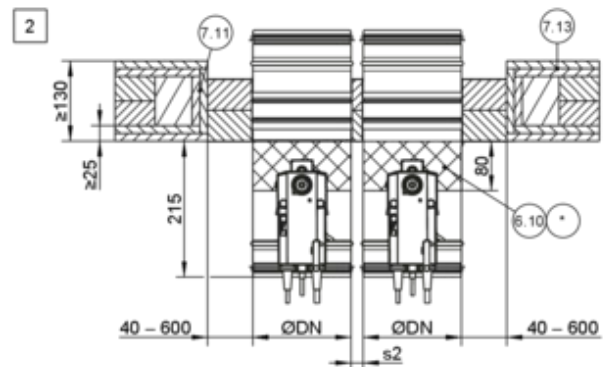
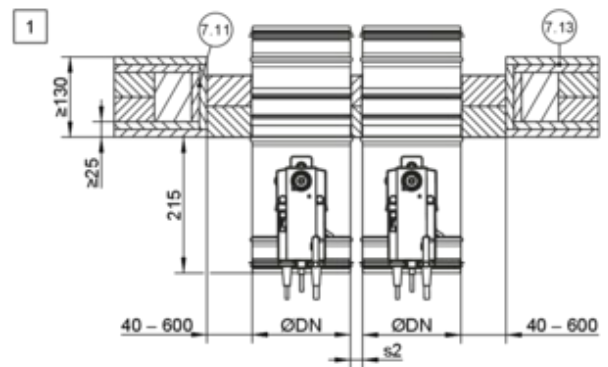
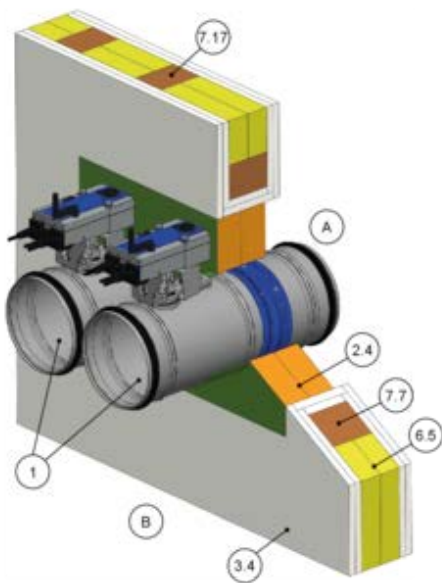
Lightweight partition walls with timber support ... > Dry mortarless installation with fire batt

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
224 – 315	EI 90 S	–	x	2 , 7
100 – 200	EI 120 S	–	x	2 , 7
224 – 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

Dry mortarless installation into a lightweight partition wall, with a fire batt, with timber support structure, "flange to flange"



GR3841934, E

Fig. 121: 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)

1	FKRS-EU	7.10	Trim panels (fire-resistant)
2.4	Coated board system	7.11	Trim panels, double layer, staggered joints

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

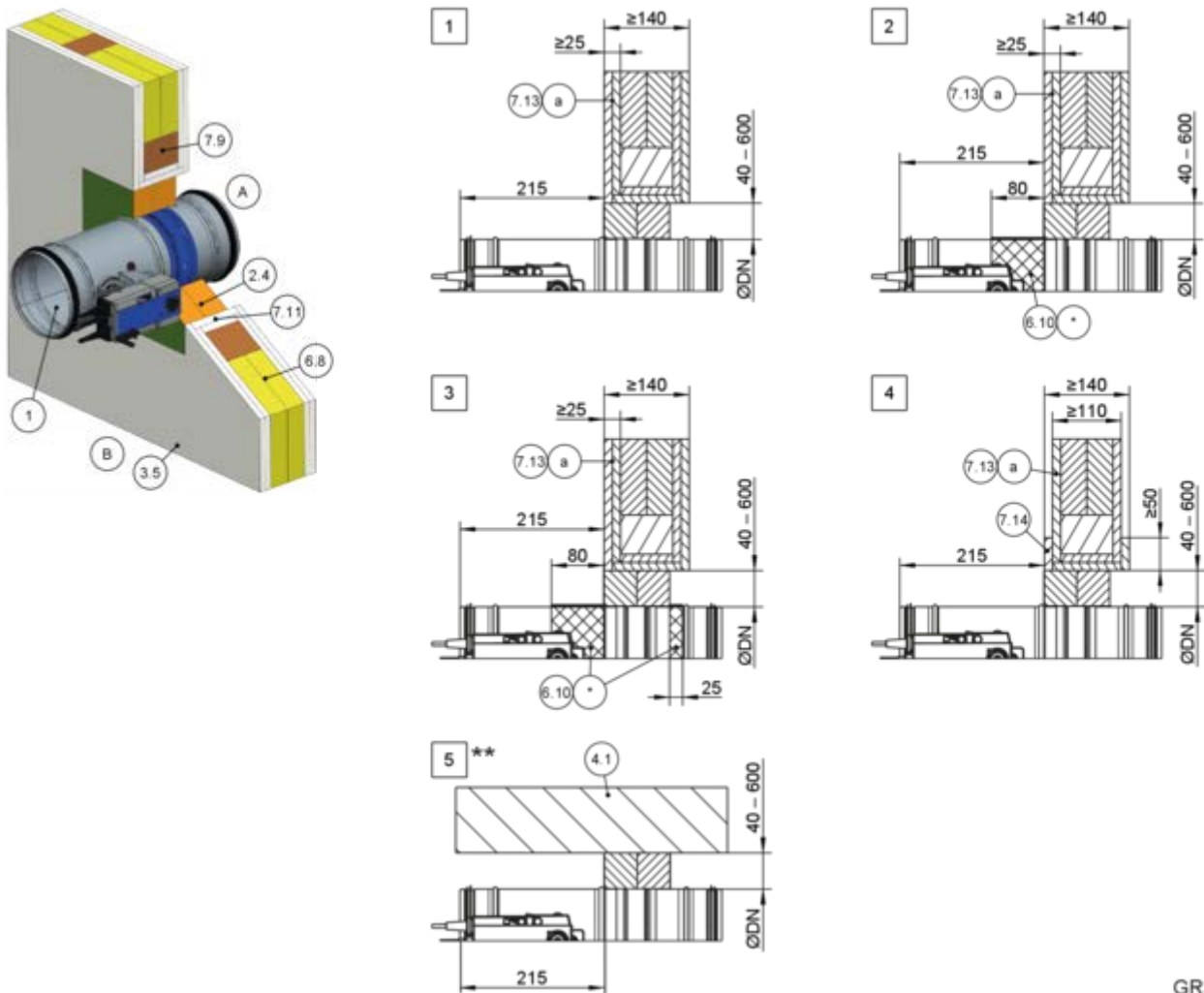
- | | |
|--|---|
| <p>3.4 Timber stud wall (also timber panel constructions), cladding on both sides</p> <p>4.1 Solid ceiling slab/solid floor</p> <p>6.5 Mineral wool, depending on wall construction</p> <p>6.10 Ablative coating around the perimeter, d = at least 2.5 mm</p> <p>6.19 Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm, leave out the actuator and release mechanism; inspection openings must remain accessible</p> <p>6.20 Pipe collar (to be ordered separately)</p> <p>6.24 Elastomeric foam (flame-resistant, non-dripping) The following applies in Germany: For notes on the use of elastomeric foams ↪ 'Additional provision for use in Germany:' on page 8 .</p> <p>7.7 Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60</p> | <p>7.12 Trim panels, wood sheet, at least 600 kg/³</p> <p>7.13a Cladding, fire-resistant</p> <p>7.13b Cladding, wood sheet, at least 600 kg/³</p> <p>7.14 Reinforcing board of the same material as the wall</p> <p>7.17 Trimmer, wooden beam min. 60 × 80 mm or min. 60 × 60 mm with F60</p> <p>* 6.19, 6.20 or 6.24 as an alternative</p> <p>** Installation near the floor as in 7</p> <p>1 – 7 See table ↪ 160</p> |
|--|---|

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
224 – 315	EI 90 S	–	x	10* – 600	2 , 7
100 – 200	EI 120 S	–	x	40 – 600	2 , 7
224 – 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

* For a distance of 10 mm, mineral wool ≥ 1000 °C, ≥ 80 kg/m³ with d = 10 mm and width nominal width/2 shall be provided between the fire dampers.

Dry mortarless installation into a lightweight partition wall, with fire batt, with half-timbered construction



GR3848060, D

Fig. 122: Dry mortarless installation into a lightweight partition wall, with fire batt, with half-timbered construction

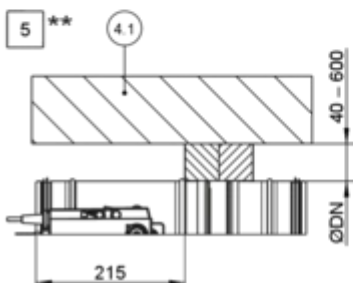
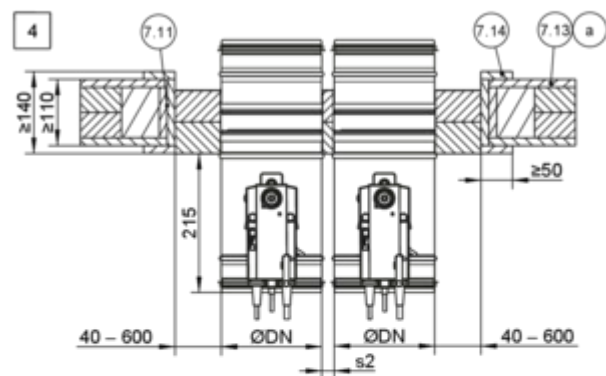
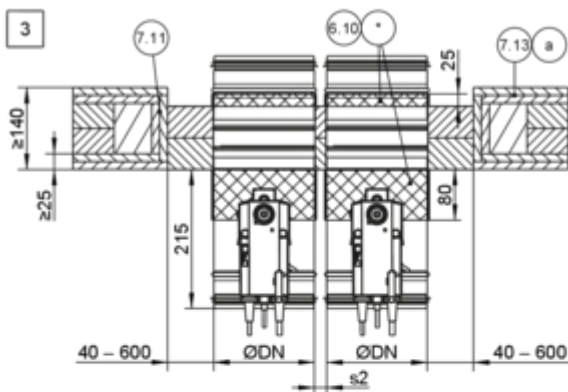
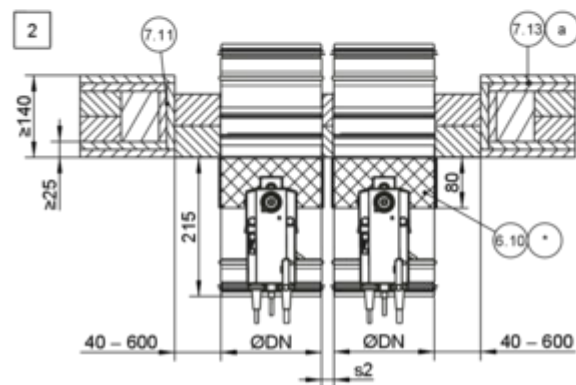
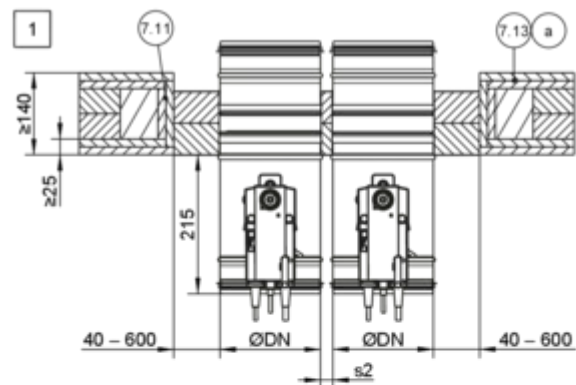
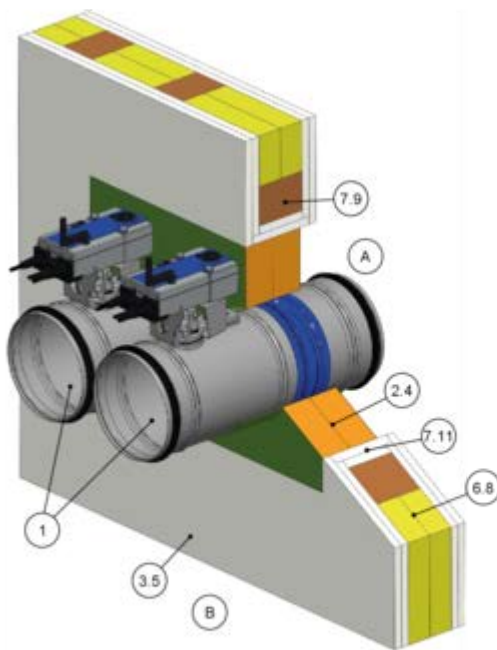
1	FKRS-EU	7.9	Timber structure
2.4	Coated board system	7.11	Trim panels, fire-resistant, double layer, staggered joints
3.5	Half-timbered construction, cladding on both sides	7.13	Cladding
4.1	Solid ceiling slab/solid floor	7.13a	Cladding, fire-resistant
6.8	Infill (cavities completely filled with mineral wool $\geq 1000\text{ }^\circ\text{C}$, $\geq 50\text{ kg/m}^3$, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)	7.14	Reinforcing board of the same material as the wall
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 $> 1000\text{ }^\circ\text{C}$, $> 80\text{ kg/m}^3$, thickness = 20 mm, panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible	**	Installation near the floor as in [5]
6.20	Pipe collar (to be ordered separately)	[1] – [5]	See table ↪ 162
6.24	Elastomeric foam (flame-resistant, non-dripping)		

The following applies in Germany: For notes on the use of elastomeric foams ↪ 'Additional provision for use in Germany:' on page 8 .

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

Half-timbered wall				
NW [mm]	Fire resistance properties to	Coating		Detail
		Installation side A	Operating side B	
100 – 200	EI 90 S	–	–	1 , 5
224 – 315	EI 90 S	–	x	2 , 5
100 – 200	EI 120 S	–	x	2 , 5
224 – 315	EI 120 S	x	x	3 , 5
100 – 315	EI 30 S	–	–	4 , 5

Dry mortarless installation with fire batt in lightweight partition wall with half-timbered construction, "flange to flange"



GR3848153, D

Fig. 123: Dry mortarless installation into a lightweight partition wall with 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 | Coated board system | | |
| 3.5 | Half-timbered construction, cladding on both sides | | |

- | | |
|--|---|
| <p>4.1 Solid ceiling slab/solid floor</p> <p>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)</p> <p>6.10 Ablative coating around the perimeter, $d =$ at least 2.5 mm</p> <p>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</p> <p>6.20 Pipe collar (to be ordered separately)</p> | <p>7.9 Timber structure</p> <p>7.11 Trim panels, fire-resistant, double layer, staggered joints</p> <p>7.13a Cladding, fire-resistant</p> <p>7.14 Reinforcing board of the same material as the wall</p> <p>* 6.19, 6.20 or 6.24 as an alternative</p> <p>** Installation near the floor as in 5</p> <p>1 – 5 See table ↪ <i>Table on page 164</i></p> |
|--|---|

The following applies in Germany: For notes on the use of elastomeric foams ↪ *'Additional provision for use in Germany:' on page 8*.

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
224 – 315	EI 90 S	–	x	10* – 600	2 , 5
100 – 200	EI 120 S	–	x	40 – 600	2 , 5
224 – 315	EI 120 S	x	x	40 – 600	3 , 5
100 – 315	EI 30 S	–	–	10 – 600	4 , 5

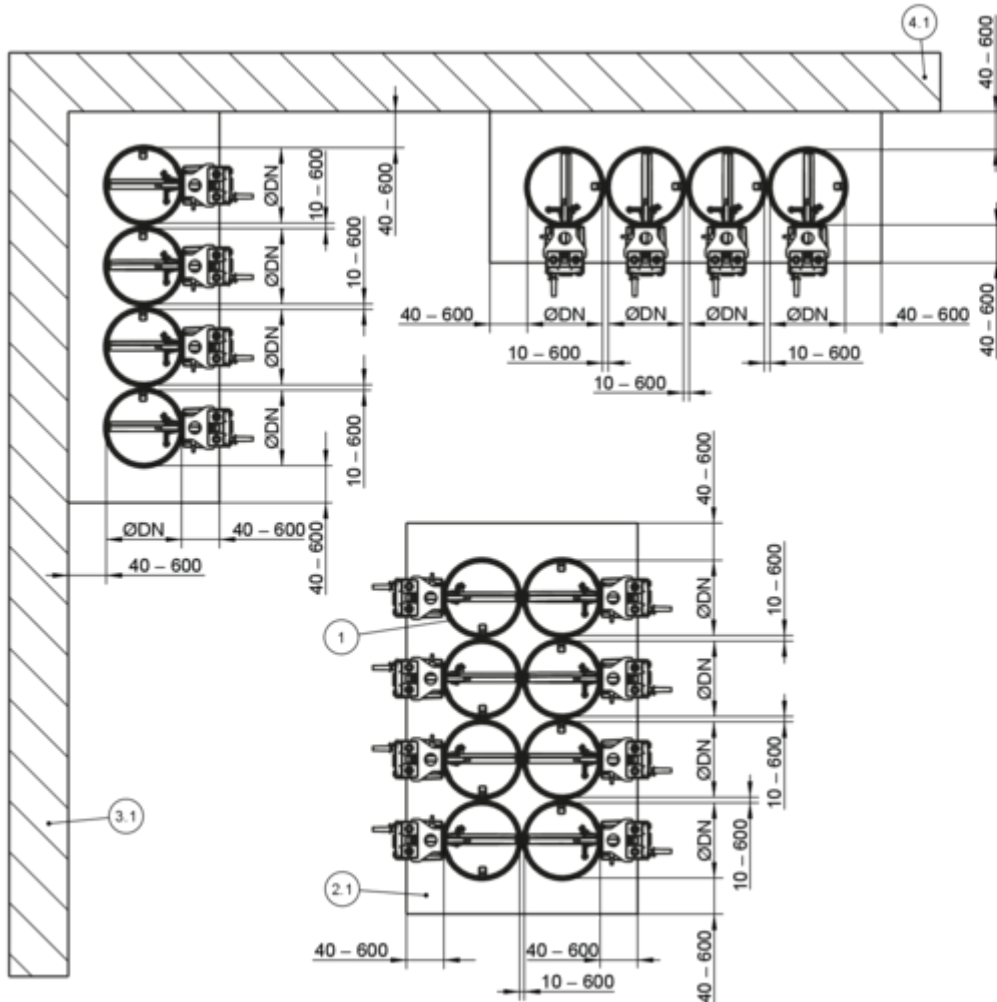
* For a distance of 10 mm, mineral wool $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 80\text{ kg/m}^3$ with $d = 10\text{ mm}$ and width nominal width/2 shall be provided between the fire dampers.

Additional requirements: dry mortarless installation with fire batt into lightweight partition walls with timber support structure/half-timbered construction

- Timber stud wall/half-timbered construction, ↪ *on page 41*
- Fire batt systems, installation details, distances/dimensions, ↪ *on page 36 f*
- Suspension and fixing, ↪ *Chapter 5.15 'Fixing the fire damper' on page 242*
- General installation information, ↪ *5.3 'General installation information' on page 29 ff*
- General information on installation with fire batt, ↪ *on page 36*

5.7.7 Dry mortarless installation with fire batt – Multiple occupancy of an installation opening

Dry mortarless installation into a lightweight partition wall with timber support structure, with a fire batt

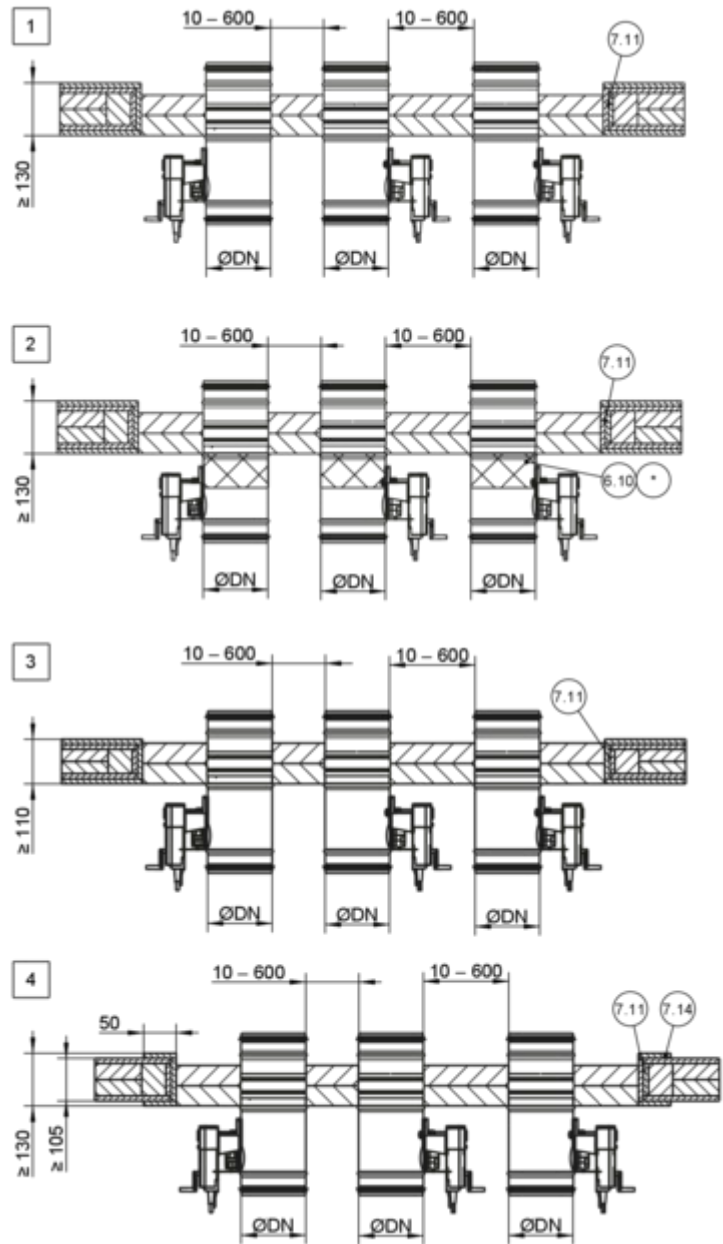
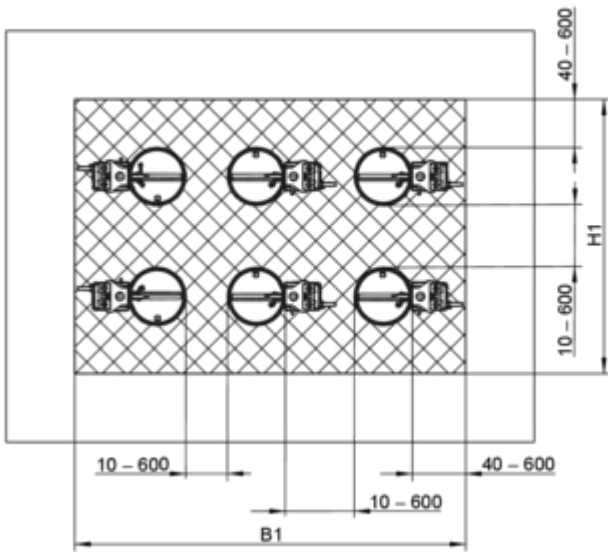
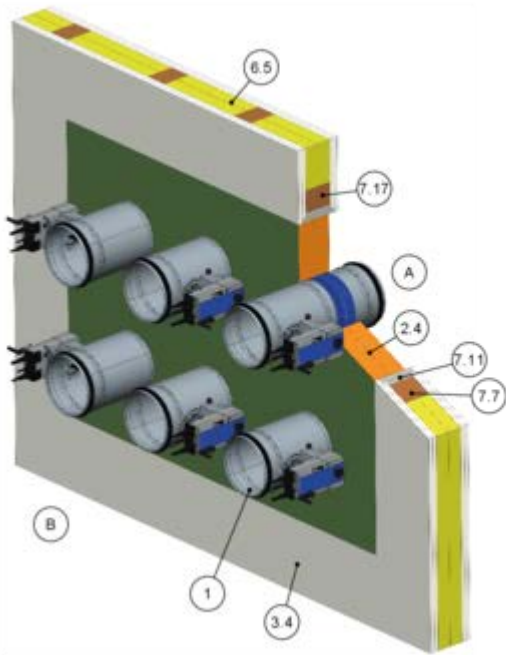


GR3791854, G

Fig. 124: Dry mortarless installation with fire batt in lightweight partition wall with timber studs – Multiple occupancy of an installation opening

1	FKRS-EU	3.1	Solid wall (load-bearing structural element)
2.1	Mortar	4.1	Solid ceiling slab (load-bearing component)

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



GR3915123, A

Fig. 125: Dry mortarless installation with fire batt in lightweight partition wall with timber studs – Multiple occupancy of an installation opening

- | | | | |
|------|--|-------|---|
| 1 | FKRS-EU | 6.24 | Elastomeric foam (flame-resistant, non-dripping) |
| 2.4 | Coated board system | | The following applies in Germany: For notes on the use of elastomeric foams |
| 3.4 | Timber stud wall (also timber panel constructions), cladding on both sides | | ☞ 'Additional provision for use in Germany:' on page 8 . |
| 6.5 | Mineral wool, depending on wall construction | 7.7 | Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60 |
| 6.10 | Ablative coating around the perimeter, d = at least 2.5 mm | 7.11 | Trim panels, fire-resistant, double layer, staggered joints |
| 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 | 7.17 | Trimmer, wooden beam min. 60 × 80 mm or min. 60 × 60 mm with F60 |
| 6.20 | Pipe collar (to be ordered separately) | * | 6.19, 6.20 or 6.24 as an alternative |
| | | 1 - 4 | See table ☞ Table on page 167 |

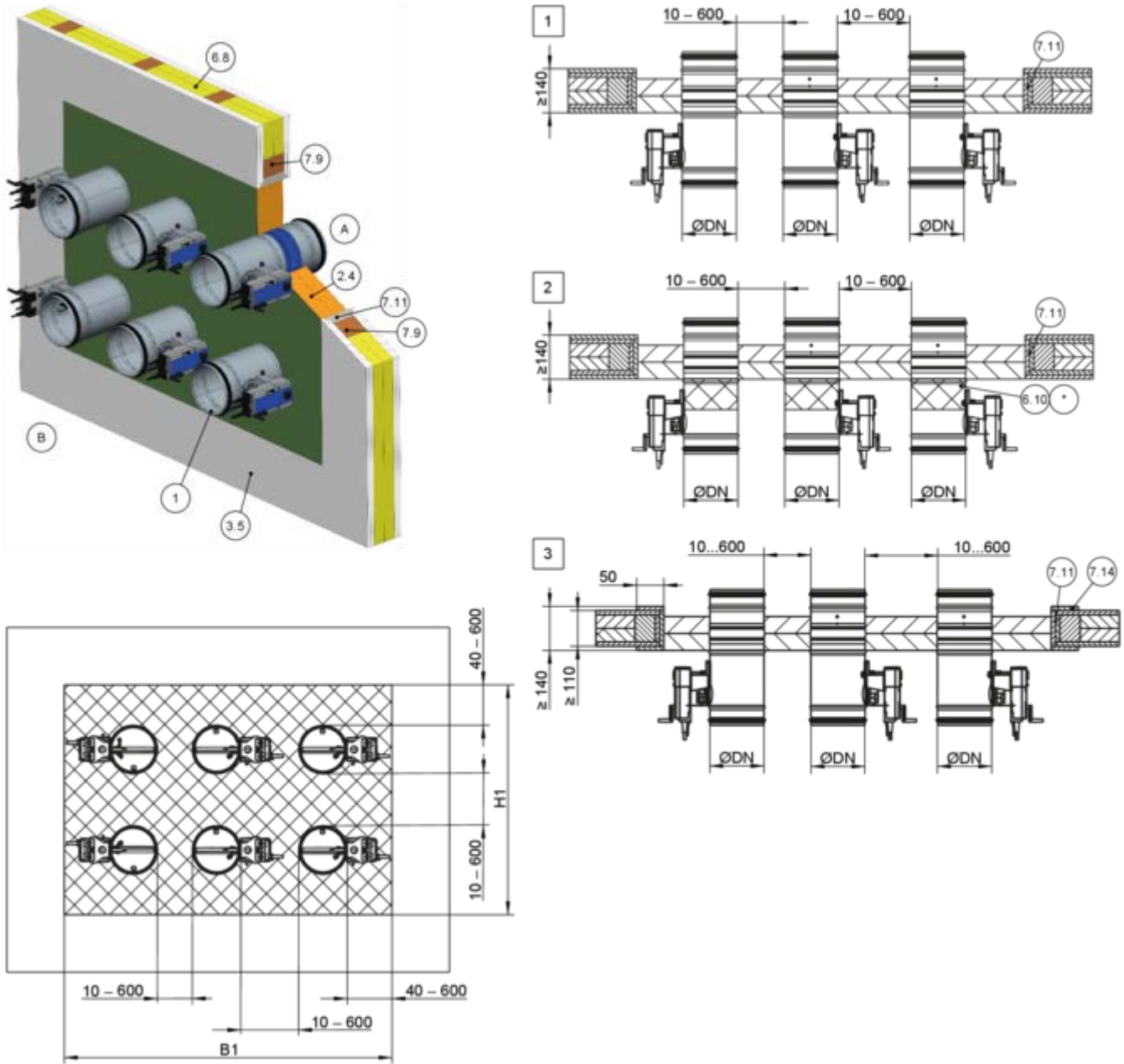
Lightweight partition walls with timber support ... > Dry mortarless installation with fire batt – M...

Lightweight partition wall with timber support structure

NW [mm]	Fire resistance prop- erties to	Coating		Spacing [mm]	Detail
		Installation side A	Operating side B		
100 – 200	EI 90 S	–	–	10* – 600	1
224 – 315	EI 90 S	–	x	10* – 600	2
100 – 315	EI 60 S	–	–	10 – 600	3
100 – 315	EI 30 S	–	–	10 – 600	4

* For a distance of 10 mm, mineral wool ≥ 1000 °C, ≥ 80 kg/m³ with d = 10 mm and width nominal width/2 shall be provided between the fire dampers.

Dry mortarless installation into a lightweight partition wall, with fire batt, with half-timbered construction



GR3916763, A

Fig. 126: Dry mortarless installation with fire batt in lightweight partition wall with half-timbered construction – Multiple occupancy of an installation opening

- | | | | |
|------|--|--------------|---|
| 1 | FKRS-EU | 6.24 | Elastomeric foam (flame-resistant, non-dripping) |
| 2.4 | Coated board system | | The following applies in Germany: For notes on the use of elastomeric foams |
| 3.5 | Half-timbered construction, cladding on both sides | | ↳ 'Additional provision for use in Germany:' on page 8. |
| 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) | 7.9 | Timber structure |
| 6.10 | Ablative coating around the perimeter, $d = \text{at least } 2.5\text{ mm}$ | 7.11 | Trim panels, fire-resistant, double layer, staggered joints |
| 6.19 | Mineral wool $> 1000\text{ }^{\circ}\text{C}$, $> 80\text{ kg/m}^3$, thickness = 20 mm, leave out the actuator and release mechanism; inspection openings must remain accessible | 7.14 | Reinforcing board of the same material as the wall |
| | | * | 6.19, 6.20 or 6.24 as an alternative |
| | | 1 - 3 | See table ↳ Table on page 169 |

6.20 Pipe collar (to be ordered separately)

Half-timbered wall					
NW [mm]	Fire resistance prop- erties to	Coating		Spacing [mm]	Detail
		Installation side A	Operating side B		
100 – 200	EI 90 S	–	–	10* – 600	1
224 – 315	EI 90 S	–	x	10* – 600	2
100 – 315	EI 30 S	–	–	10 – 600	3

* For a distance of 10 mm, mineral wool ≥ 1000 °C, ≥ 80 kg/m³ with d = 10 mm and width nominal width/2 shall be provided between the fire dampers.

Supplementary requirements: Dry mortarless installation with fire batt in lightweight partition walls with timber studs/ half-timbered construction – Multiple occupancy of an installation opening

- Timber stud wall/half-timbered construction, *☞ on page 41*
- Fire batt systems, installation details, distances/dimensions, *☞ on page 36 f*
- Suspension and fixing, *☞ Chapter 5.15 'Fixing the fire damper' on page 242*
- General installation information, *☞ 5.3 'General installation information' on page 29 ff*
- General information on installation with fire batt, *☞ on page 36*
- Overall fire damper area ≤ 1.2 m²
- The number of fire dampers in an installation opening is limited by their size (nominal width) and the overall area of the fire dampers (1.2 m²) (maximum 10 FKRS-EU in single or double row arrangement)
- Distance to load-bearing structural elements ≥ 40 mm

5.8 Solid wood walls

5.8.1 General information

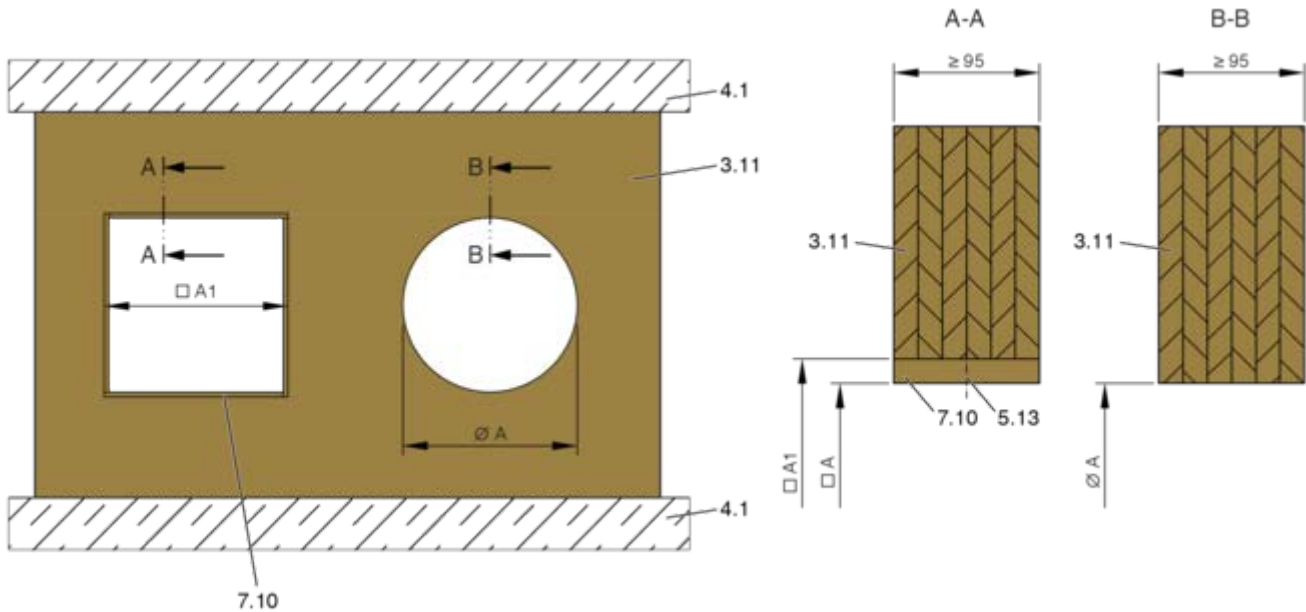


Fig. 127: Solid wood wall

- 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)

Installation type	Installation opening [mm]	Distance [mm]	
		s1	s2
Mortar-based installation	\varnothing nominal width + max. 450	≤ 225	10 – 225
Dry mortarless installation with TQ2	$\square A = \varnothing$ nominal width + 110 ²	central installation	≥ 200
Dry mortarless installation with fire batt ¹	$\square A = \varnothing$ nominal width + max. 1200	40 – 600	≥ 200

¹⁾ Note the maximum size for the fire batt

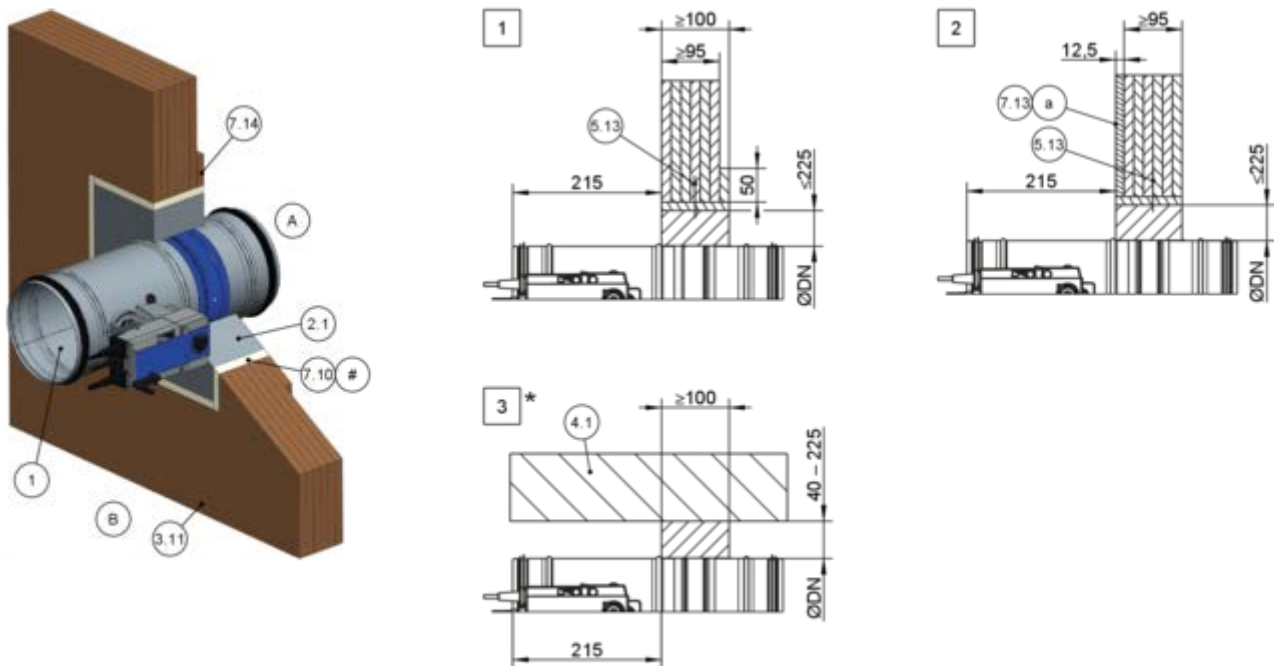
²⁾ Installation opening tolerance ± 2 mm

Additional requirements: solid wood walls

- Solid wood wall or CLT wall, on page 41

5.8.2 Mortar-based installation

Mortar-based installation into a solid wood wall or CLT wall

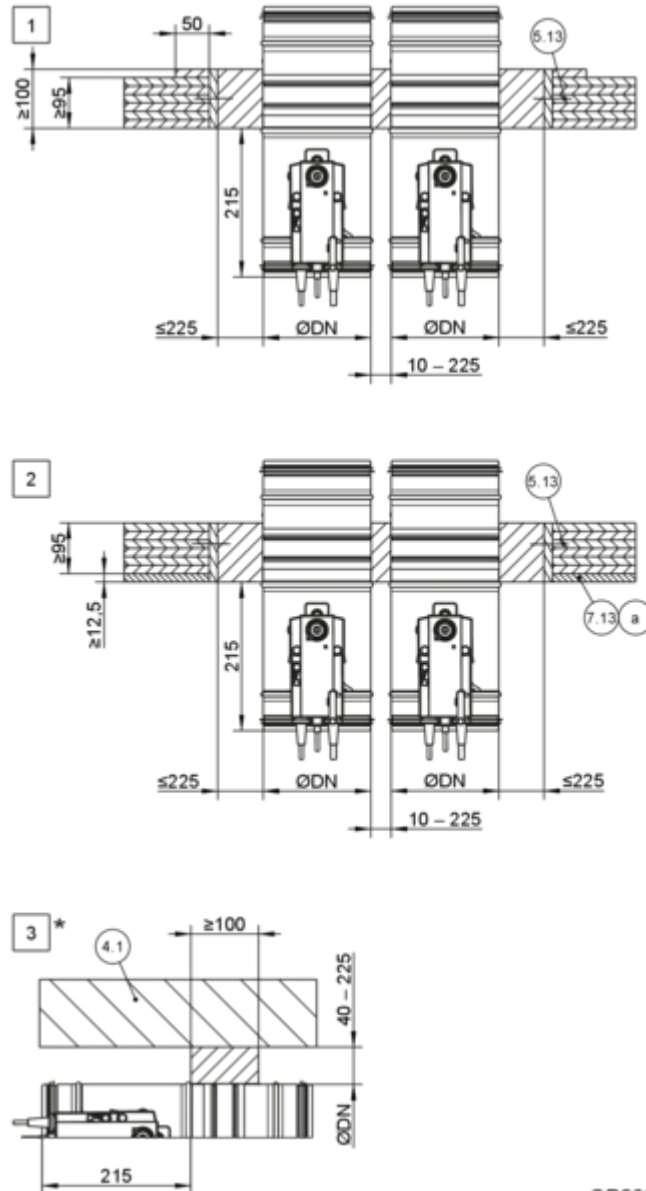
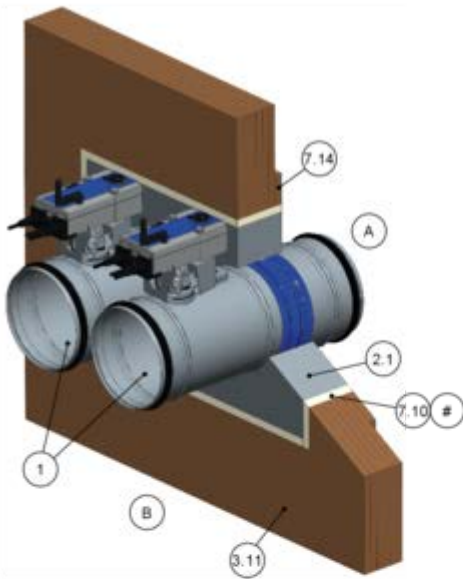


GR3850623, C

Fig. 128: Mortar-based installation into a solid wood wall or CLT wall

1	FKRS-EU	7.13a	Cladding, 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 as in 3
5.13	Wood screw or pin	1 - 3	Up to EI 90 S
7.10	Trim panel		

Mortar-based installation in solid wood wall/CLT wall, "flange to flange"



GR3852662, E

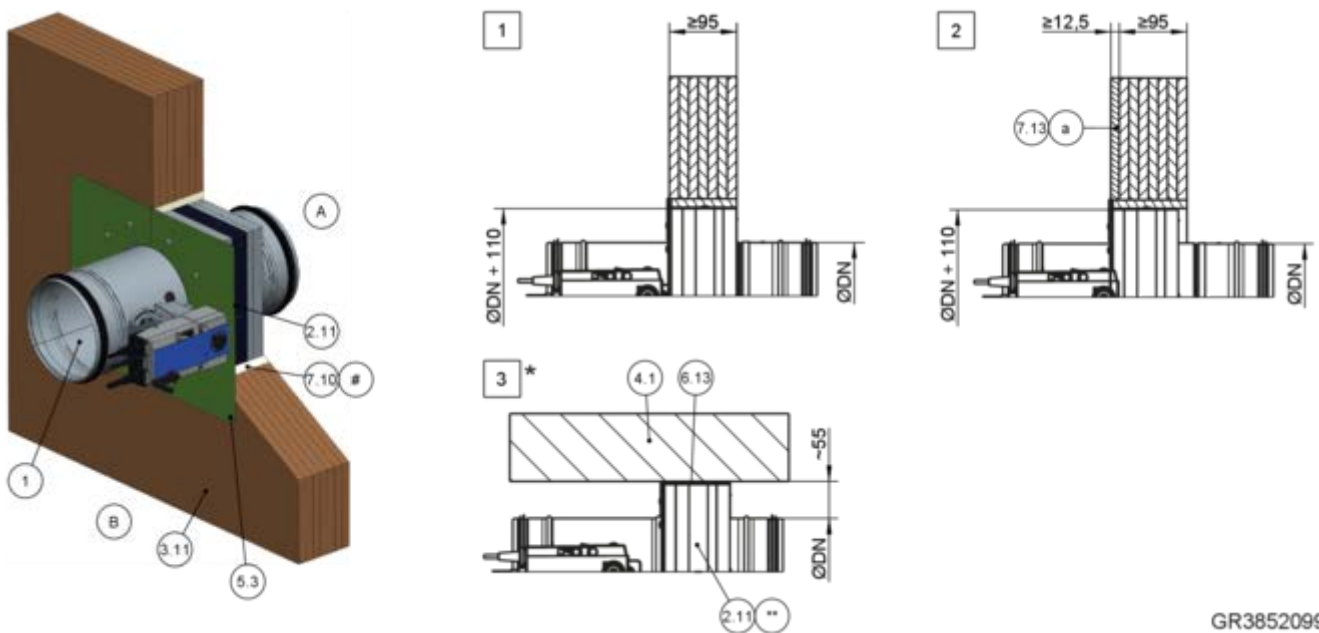
Fig. 129: Mortar-based installation into a solid wood wall or CLT wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FKRS-EU	7.13a	Cladding, 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 as in 3
5.13	Wood screw or pin	1 - 3	Up to EI 90 S
7.10	Trim panel		

Additional requirements: mortar-based installation into solid wood walls

- Solid wood wall or CLT wall, ↗ on page 41
- General installation information, ↗ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation, ↗ '**Mortar-based installation**' on page 34

5.8.3 Dry mortarless installation into a solid wood wall or CLT wall, with installation kit TQ2



GR3852099, D

Fig. 130: Dry mortarless installation into a solid wood wall or CLT wall, with installation kit TQ2

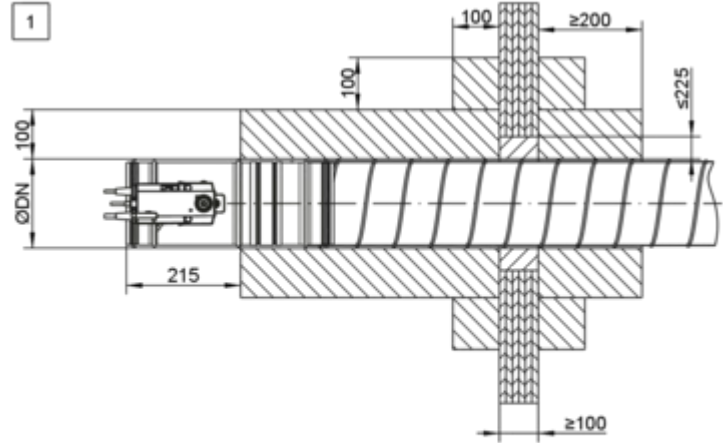
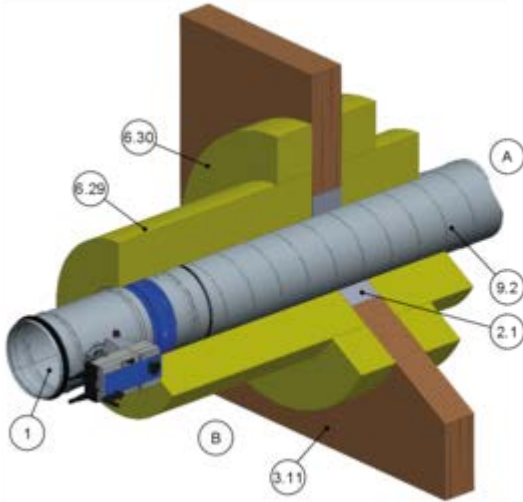
1	FKRS-EU	7.10	Trim panel
2.11	Installation kit TQ2 with cover plate	7.13a	Cladding, fire-resistant
3.11	Solid wood wall/CLT wall	#	Optional
4.1	Solid ceiling slab/solid floor	*	Installation near the floor as in 3
5.3	Chipboard screw/wood screw	**	Cover plate shortened by others
6.13	Mineral wool strip A1, ≤ 5 mm thick, ≤ 1000 °C, filler as an alternative	1 – 3	Up to EI 90 S

Supplementary requirements: Dry mortarless installation in solid wood or cross laminated timber walls with installation kit TQ2

- Solid wood wall or CLT wall, ↗ on page 41
- Installation kit TQ2, ↗ 5.4.3 'Installation kit TQ2' on page 46
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↗ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit TQ2, ↗ on page 35

5.8.4 Installation remote from solid wood or cross laminated timber walls with mineral wool

Installation remote from solid wood or cross laminated timber walls with mineral wool



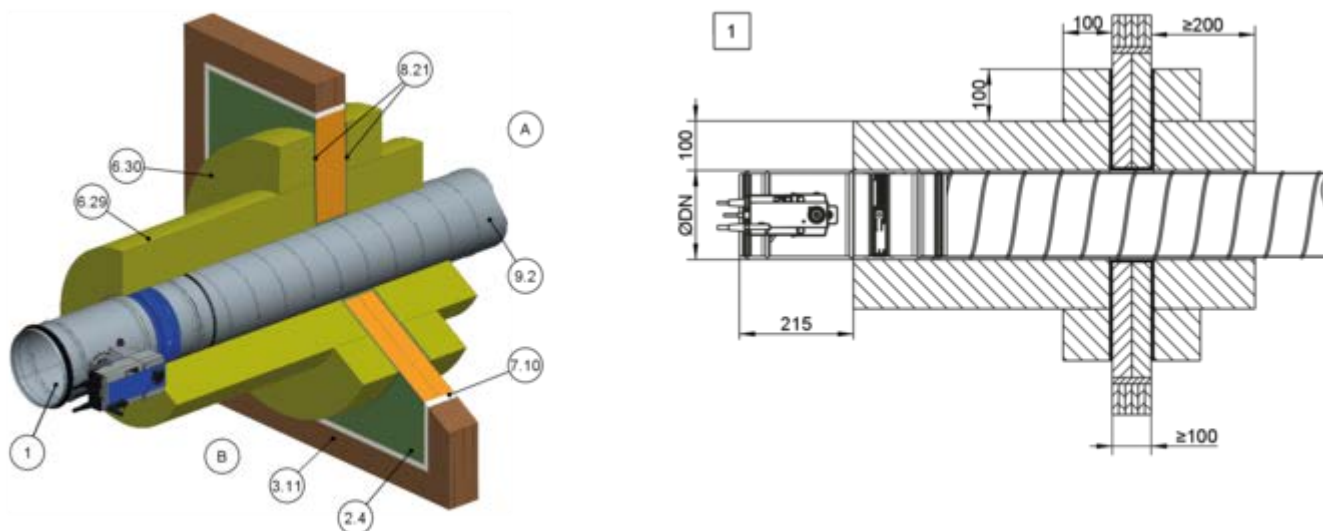
GR3852770, C

Fig. 131: Installation remote from solid wood or cross laminated timber walls with mineral wool

1	FKRS-EU	6.30*	Reinforcing strip made of mineral wool PAROC HVAC Fire Mat BlackCoat ($\geq 80 \text{ kg/m}^3$), glued along perimeter
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 BlackCoat ($\geq 80 \text{ kg/m}^3$)		

* Please check in advance whether the PAROC material is available in your market region.

Dry mortarless installation remote from solid wood or cross-laminated timber walls with mineral wool and fire batts



GR3880251, E

Fig. 132: Dry mortarless installation remote from solid wood or cross-laminated timber walls with mineral wool and fire batts

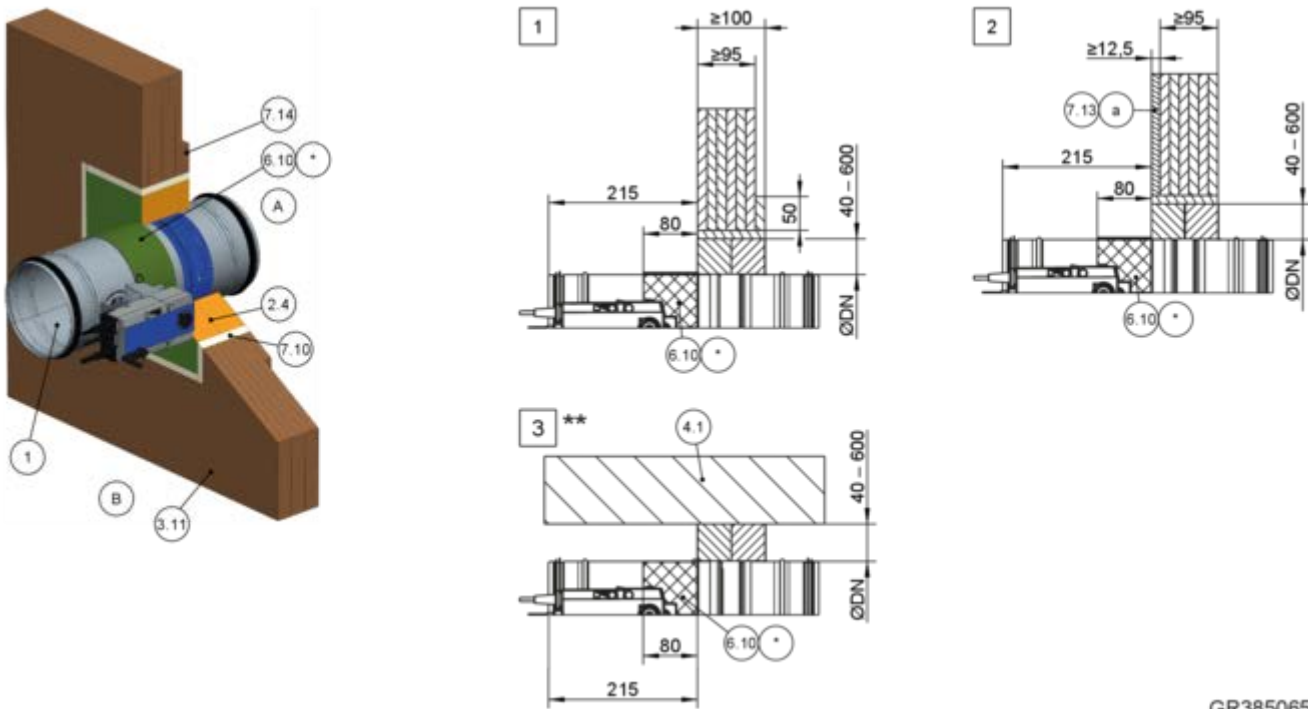
1	FKRS-EU	7.10	Trim panels, single-layer, fire-resistant
2.4	Fire batt, PAROC Pyrotech Slab 140 (max. W × H = 2.1 × 2.5 m)	8.21	Acrylic or sealing compound (suitable for fire batt system)
3.11	Solid wood wall/CLT wall	9.2	Sheet steel duct
6.29*	Mineral wool PAROC Hvac Fire Mat BlackCoat (≥ 80 kg/m ³)	1	Up to EI 60 S
6.30*	Reinforcing strip made of mineral wool PAROC HVAC Fire Mat BlackCoat (≥ 80 kg/m ³), glued along perimeter		
		*	Please check in advance whether the PAROC material is available in your market region.

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

- Solid wood wall or CLT wall, ☞ on page 41
- General installation information, ☞ 5.3 'General installation information' on page 29 ff
- General information on installation with mineral wool, ☞ on page 36
- ≥ 400 mm distance between two fire dampers
- Distance to load-bearing/adjacent components ≥ 200 mm
- Suspend the fire damper and air duct according to the mineral wool manufacturer's specifications

5.8.5 Dry mortarless installation with fire batt

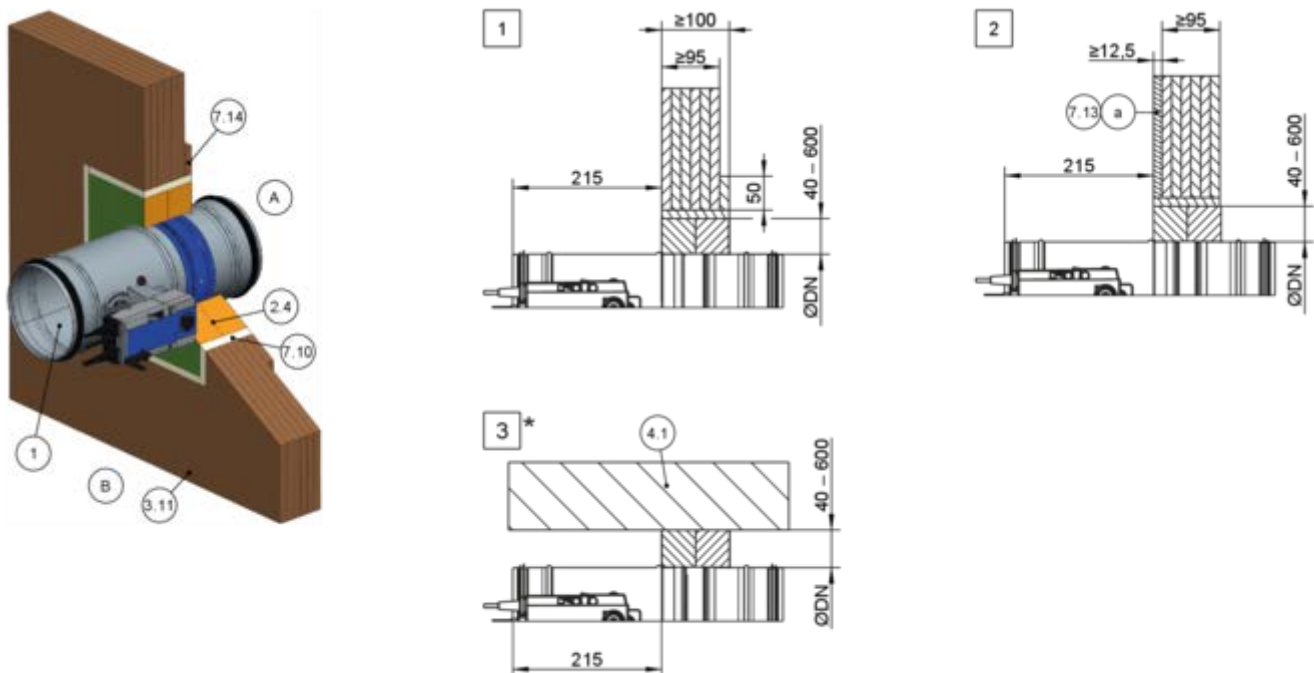
Dry mortarless installation into a timber wall or CLT wall, with a fire batt



GR3850650, D

Fig. 133: Dry mortarless installation into a timber wall or CLT wall, with a fire batt

1	FKRS-EU	6.24	Elastomeric foam (flame-resistant, non-dripping)
2.4	Coated board system		
3.11	Solid wood wall/CLT wall		
4.1	Solid ceiling slab/solid floor		
6.10	Ablative coating around the perimeter, d = at least 2.5 mm		
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	7.10	Trim panels (fire-resistant)
6.20	Pipe collar (to be ordered separately)	7.13a	Cladding, fire-resistant
		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 as in 3
		1 – 3	Up to EI 90 S



GR3851569, D

Fig. 134: Dry mortarless installation into a timber wall or CLT wall, with a fire batt

1	FKRS-EU	7.13a	Cladding, fire-resistant
2.4	Coated board system	7.14	Reinforcing board of the same material as the wall
3.11	Solid wood wall/CLT wall	*	Installation near the floor as in 3
4.1	Solid ceiling slab/solid floor	1 – 3	Up to EI 60 S
7.10	Trim panels (fire-resistant)		

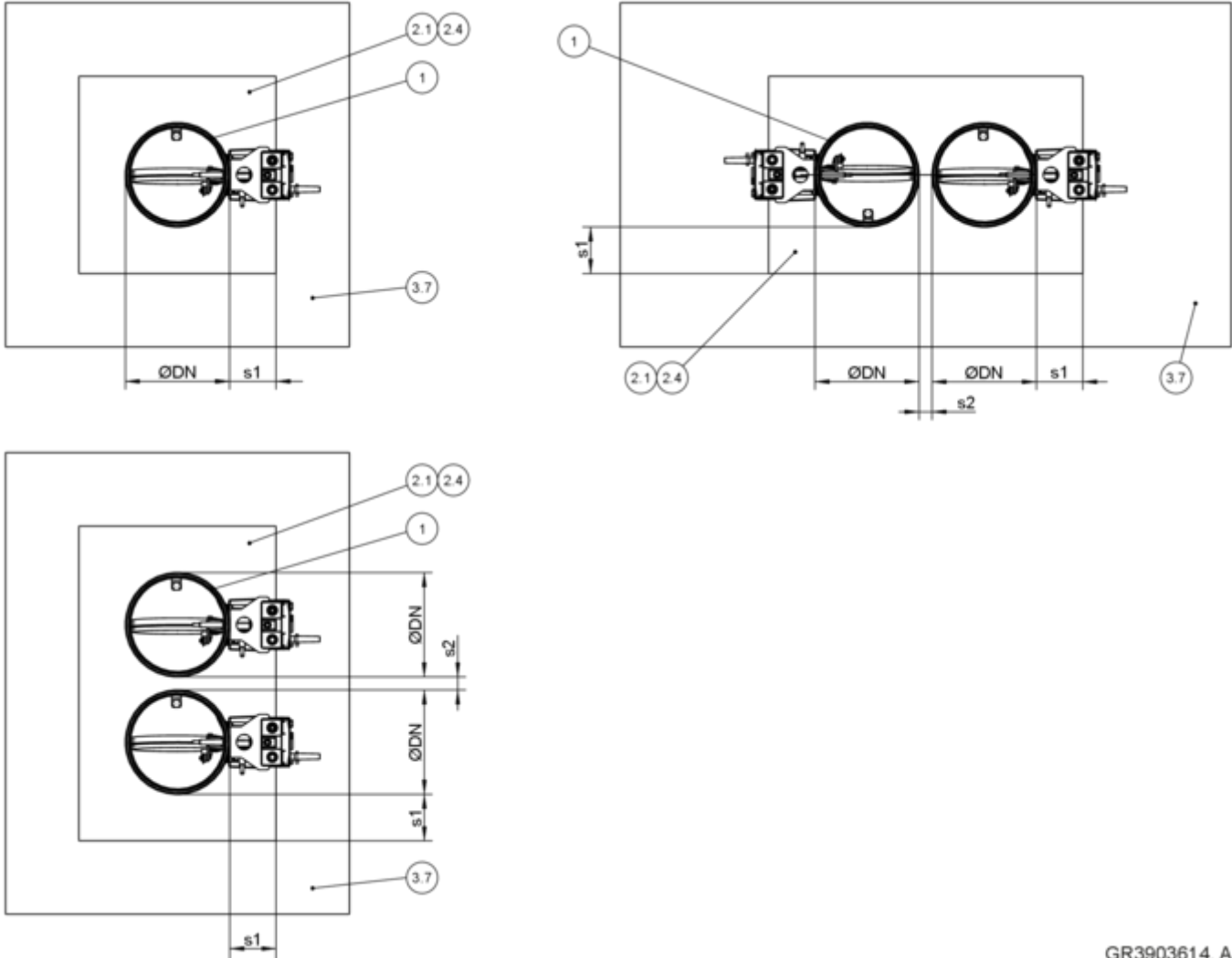
Supplementary requirements: Dry mortarless installation with fire batt in solid wood or cross laminated timber walls

- Solid wood wall or CLT wall, ↗ on page 41
- Fire batt systems, installation details, distances/dimensions, ↗ on page 36 f
- Suspension and fixing, ↗ Chapter 5.15 'Fixing the fire damper' on page 242
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↗ 5.3 'General installation information' on page 29 ff
- General information on installation with fire batt, ↗ on page 36

5.9 Shaft walls with metal support structure

5.9.1 General information

Shaft walls with metal support structure and cladding on one side



GR3903614, A

Fig. 135: Shaft walls with metal support structure – arrangement/distances

- | | | | |
|-----|---------------------|-----|---|
| 1 | FKRS-EU | 3.7 | Shaft wall with metal support structure, cladding on one side |
| 2.1 | Mortar | s1 | Perimeter gap, |
| 2.4 | Coated board system | s2 | Distance between the fire dampers, ↗ 'Distances' on page 32 |

Installation type	Installation opening [mm]	Distance [mm]	
		s1	s2
Mortar-based installation	\varnothing nominal width + max. 450	≤ 225	10 – 225
Dry mortarless installation with TQ2	$\square A = \varnothing$ nominal width + 110 ²	central installation	≥ 200
Dry mortarless installation with fire batt ¹	$\square A = \varnothing$ nominal width + max. 1200	40 – 600	≥ 200

¹) Note the maximum size for the fire batt

²) Installation opening tolerance ± 2 mm

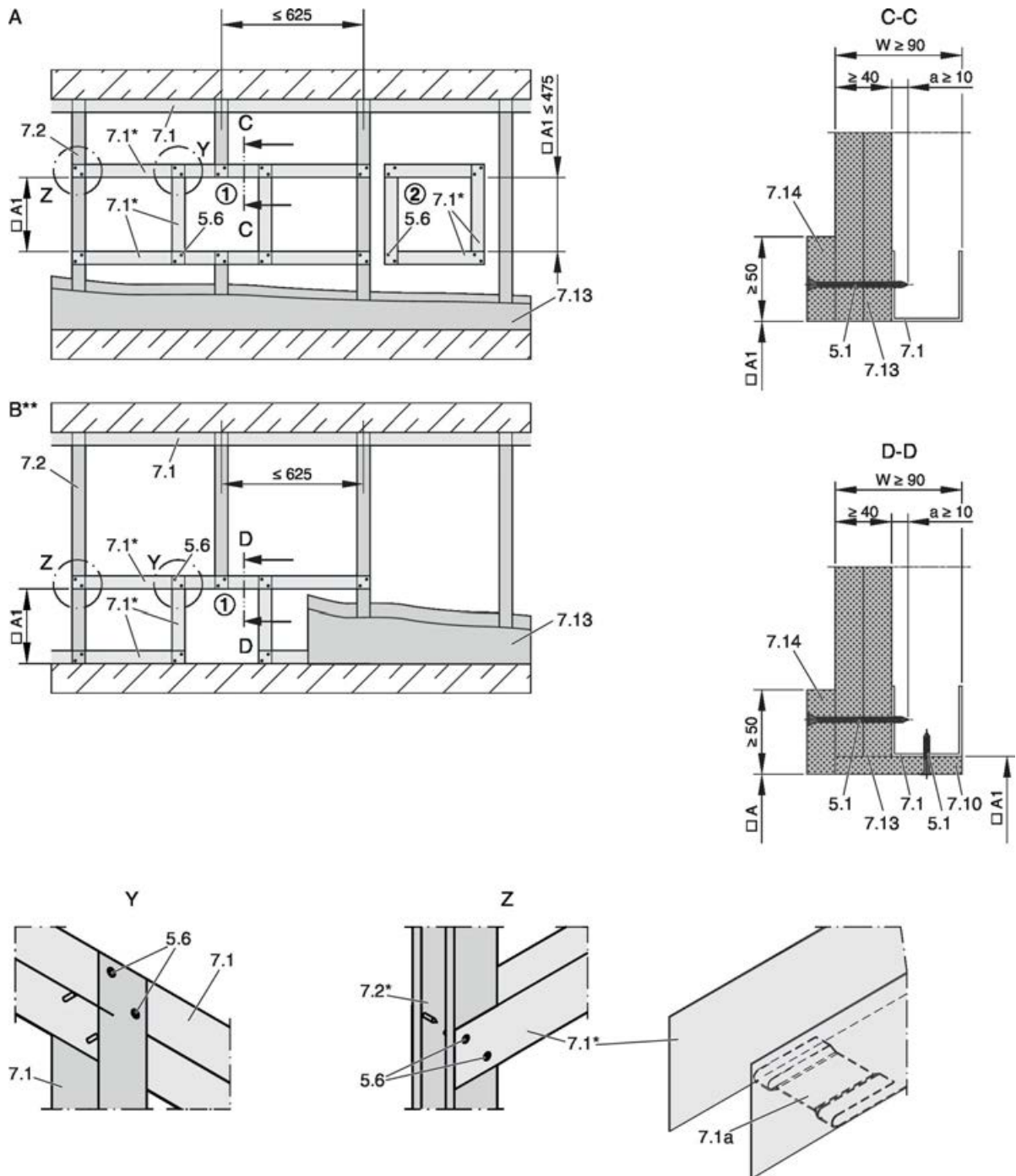


Fig. 136: Shaft walls with metal support structure and cladding on one side

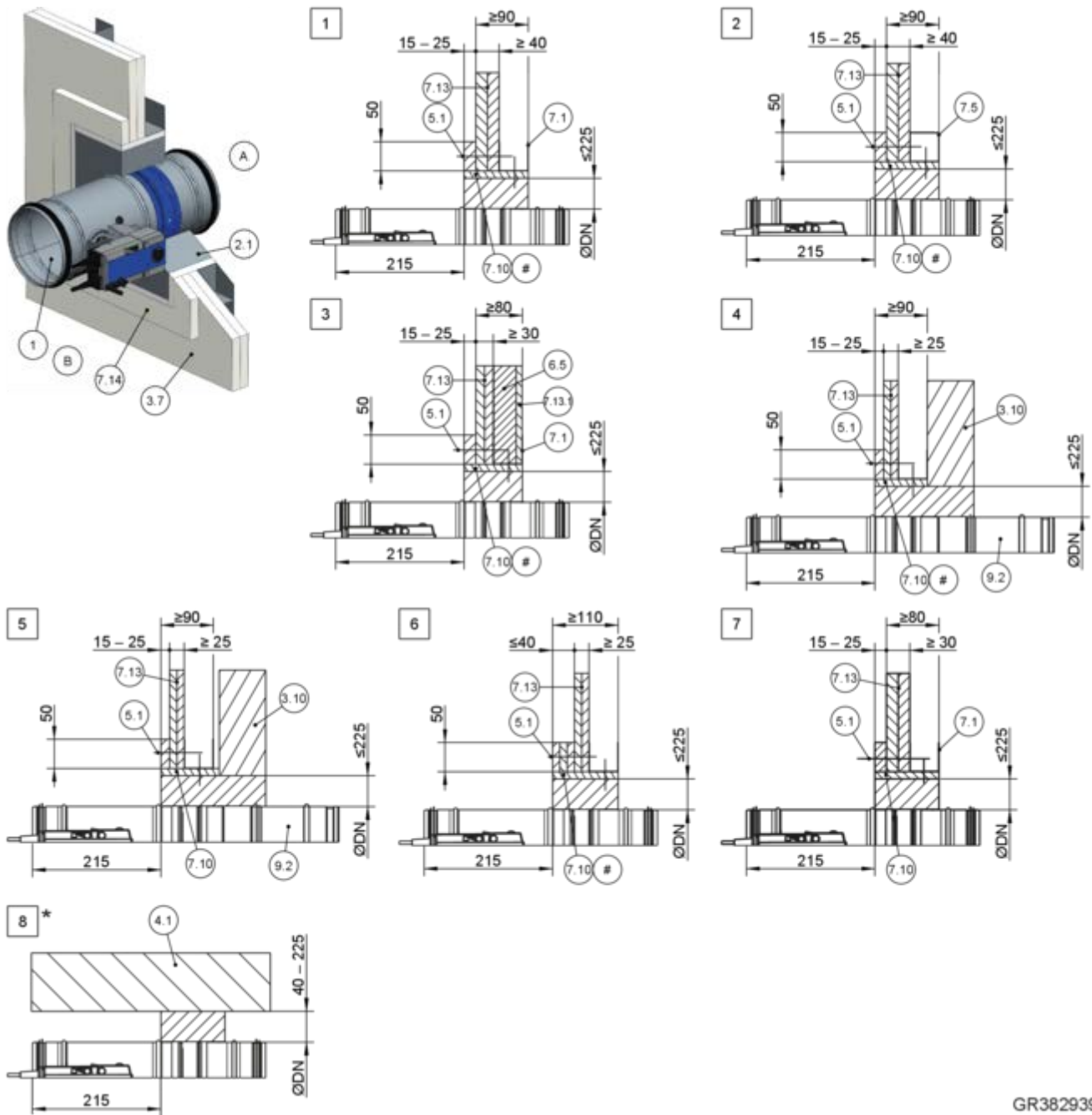
A	Shaft wall	7.13	Cladding
B	Shaft wall, installation near the floor***	7.14	Reinforcing board of the same material as the wall according to installation details
5.1	Dry wall screw	*	Closed side of metal section must face the installation opening
5.6	Screw or steel rivet	**	Installation near the ceiling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

Additional requirements: shaft walls with metal support structure

- Shaft wall with metal support structure,
↳ *on page 41*
- Erect the shaft wall according to the manufacturer's instructions and create an installation opening, Fig. 136
 - Variant 1: Provide the installation opening in the metal support structure with suitable metal sections, then clad the wall.
 - Variant 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.

5.9.2 Mortar-based installation

Mortar-based installation into shaft wall with metal support structure

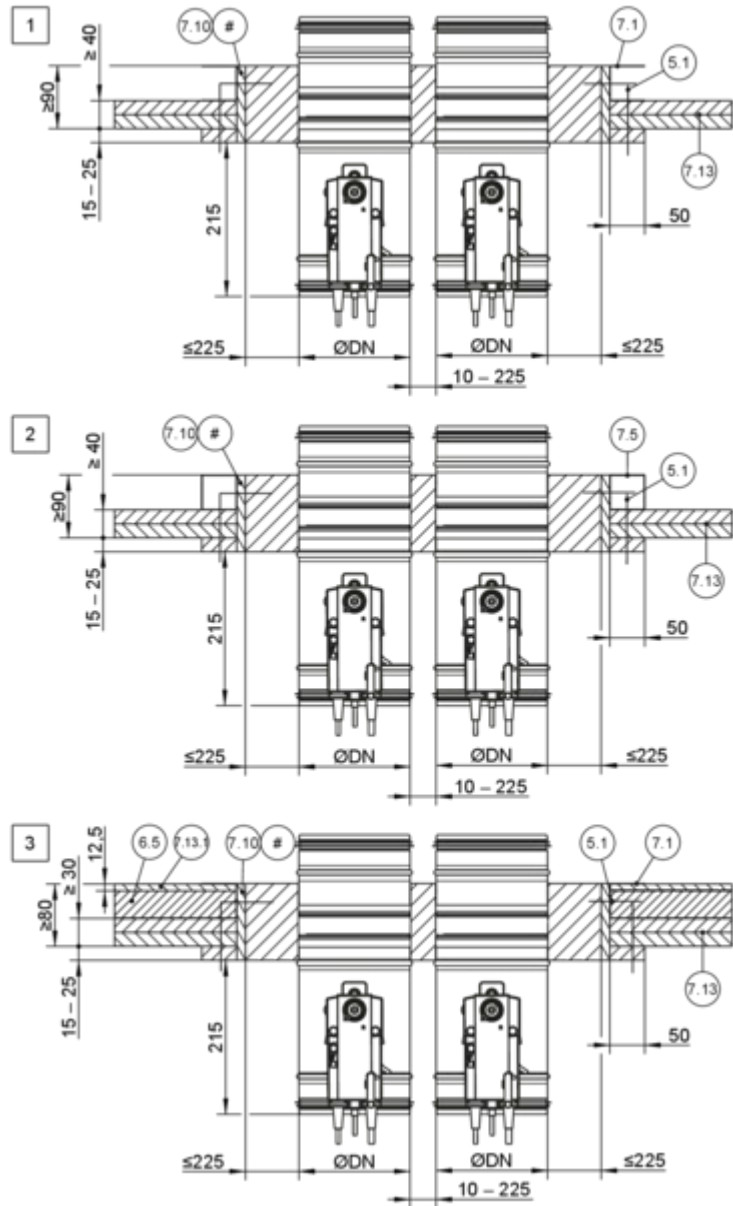
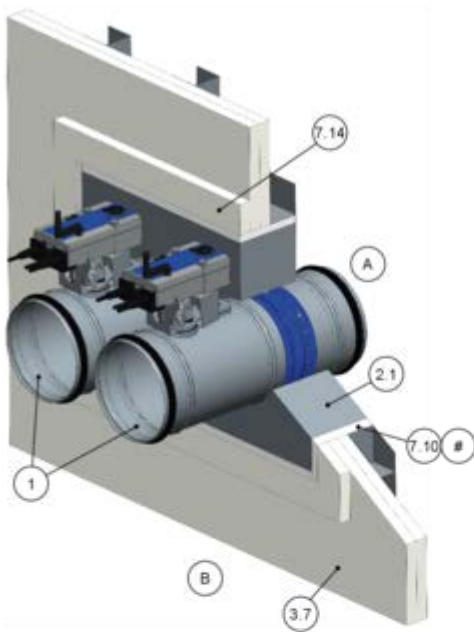


GR3829392, D

Fig. 137: Mortar-based installation into shaft wall with metal support structure

1	FKRS-EU	7.13	Cladding
2.1	Mortar	7.13.1	Cladding, single-layer
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	Air duct/extension piece
4.1	Solid ceiling slab/solid floor	#	Optional
5.1	Dry wall screw	*	Installation near the floor as in 8
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	Up to EI 60 S
7.10	Trim panel	8	EI 30 S – EI 90 S

Mortar-based installation into a shaft wall, flange to flange



GR3832738, C

Fig. 138: 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 panel
2.1	Mortar	7.13	Cladding
3.7	Shaft wall with metal support structure, cladding on one side	7.13.1	Cladding, single-layer
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)		

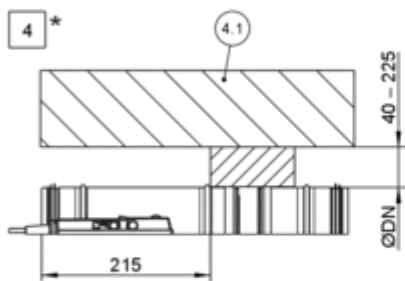
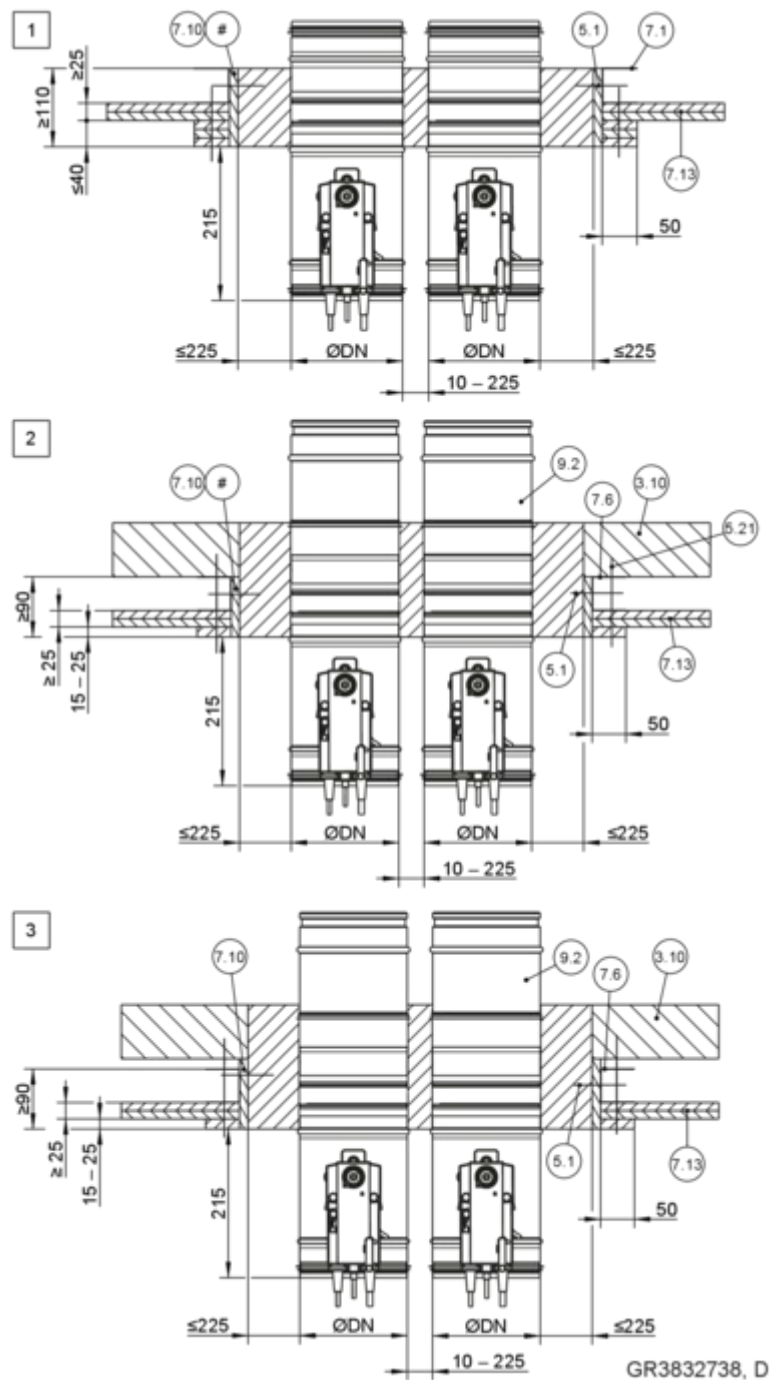
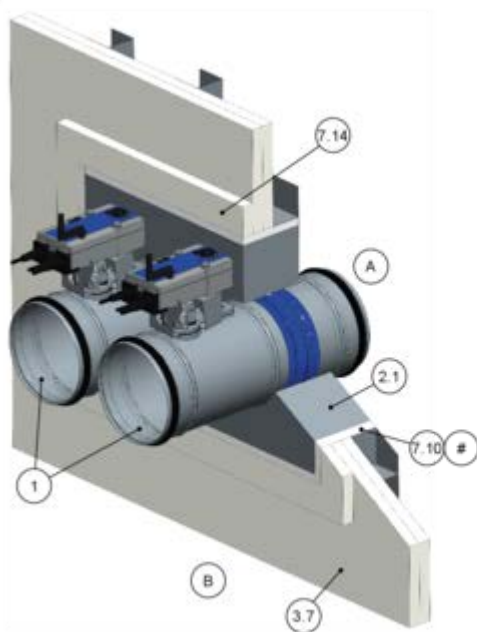
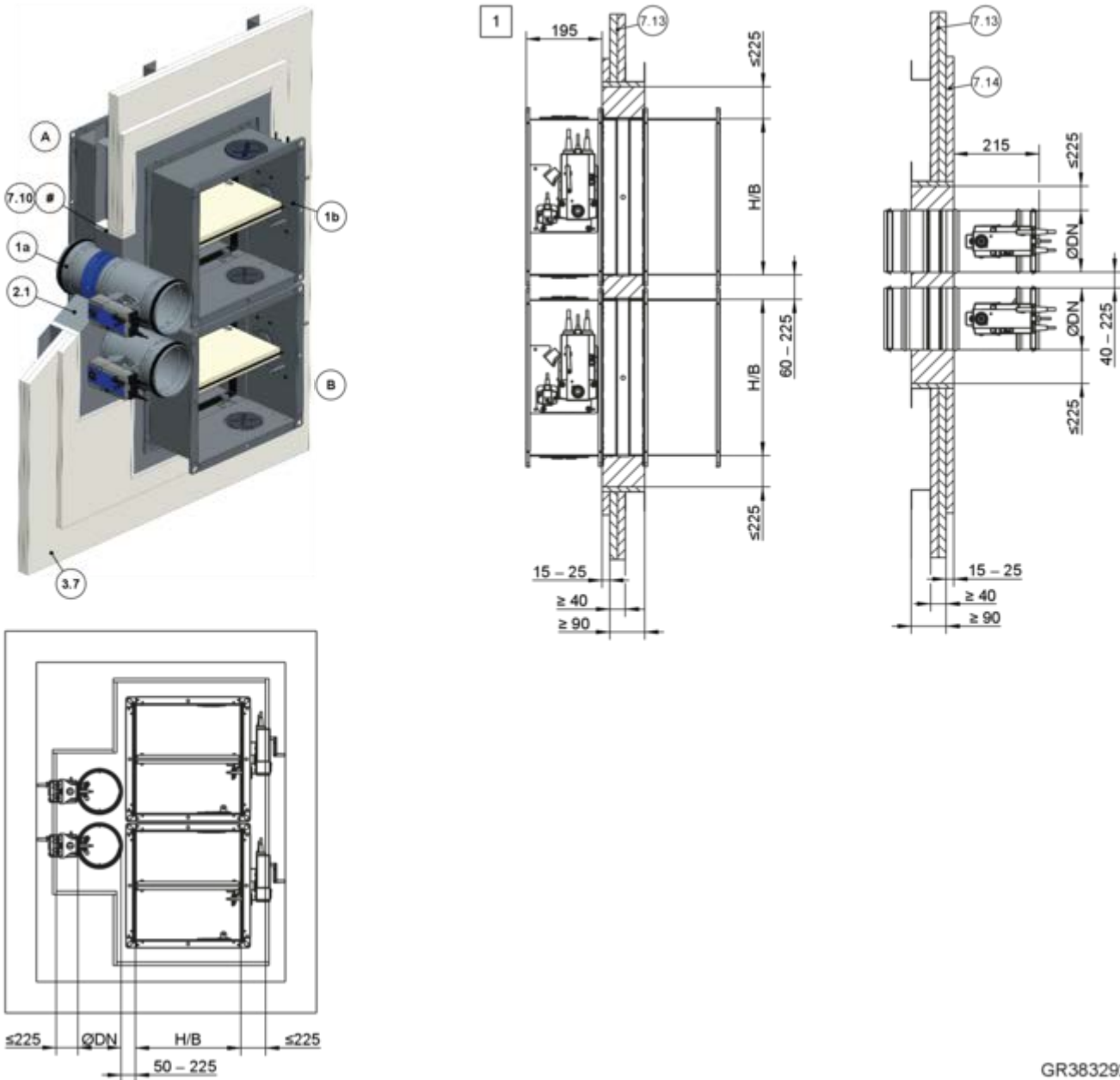


Fig. 139: Mortar-based installation into a shaft wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

- | | | | |
|------|---|---------------------|--|
| 1 | FKRS-EU | 7.10 | Trim panel |
| 2.1 | Mortar | 7.13 | Cladding |
| 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 | Air duct/extension piece |
| 4.1 | Solid ceiling slab/solid floor | # | Optional |
| 5.1 | Dry wall screw | * | Installation near the floor as in 4 |
| 5.21 | Screw/wall plug | 1 - 3 | EI 30 S |
| 7.1 | UW section | 4 | EI 30 S – EI 90 S |
| 7.6 | Metal section according to wall manufacturer | | |

Mortar-based installation into a shaft wall, FKR-EU and FK2-EU combined



GR3832928, E

Fig. 140: Mortar-based installation into a shaft wall, FKR-EU and FK2-EU combined

1a	FKRS-EU	7.13	Cladding
1b	FK2-EU up to $B \times H \leq 800 \times 400$ 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	1	Up to EI 90 S
7.10	Trim panel		

For combined installation please note:

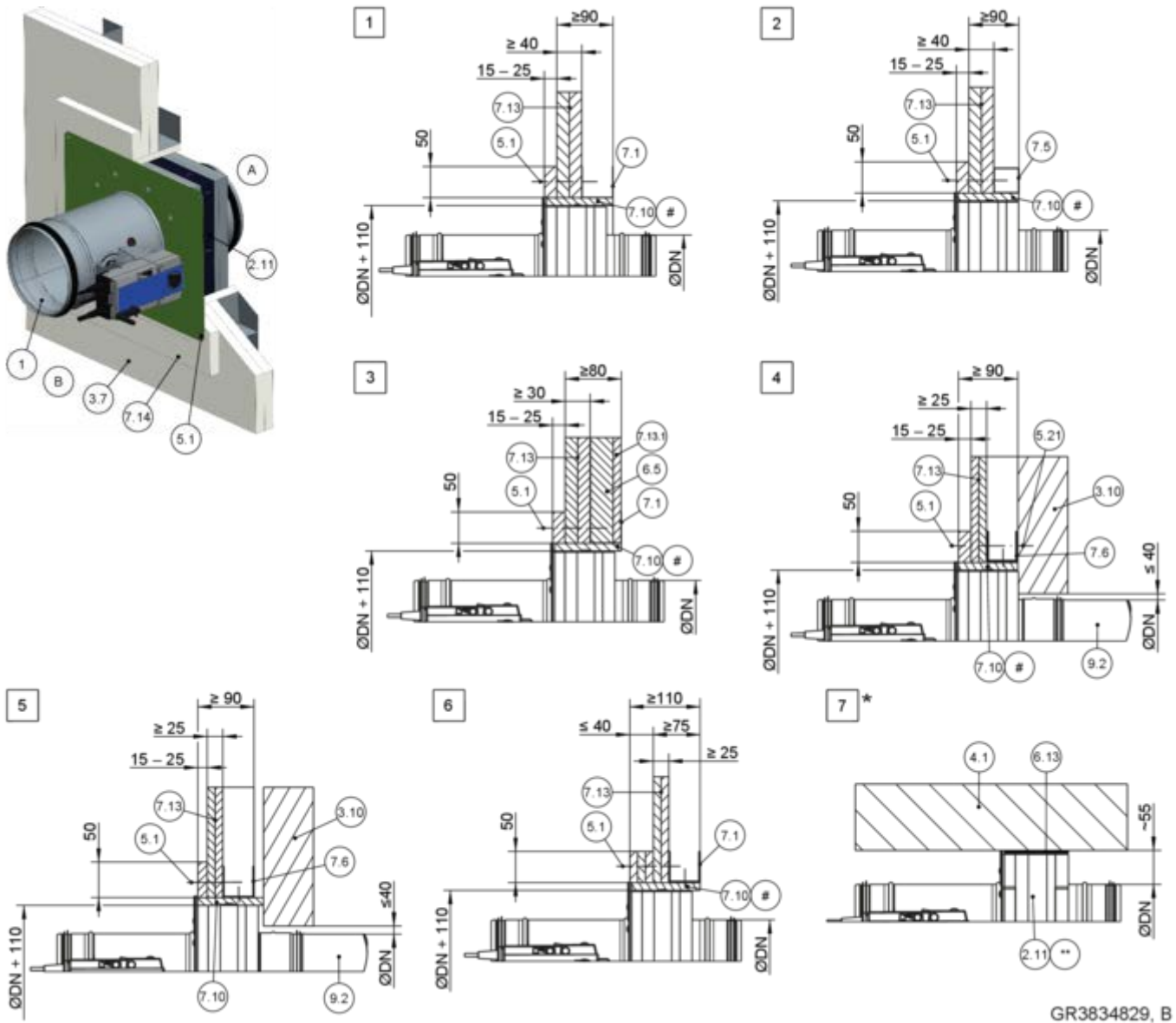
- Overall fire damper area ≤ 1.2 m².
- The number of fire dampers in an installation opening is limited by their size ($B \times H$ for FK2-EU and/or \varnothing nominal width for FKRS-EU) and the overall area of the fire dampers (1.2 m²).
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For installation details FK2-EU, see the installation and operating manual for this fire damper type.
- Distance to load-bearing structural elements ≥ 40 mm

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

- Shaft wall, ↪ on page 41
- General installation information, ↪ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation, ↪ '**Mortar-based installation**' on page 34

Shaft walls with metal support structure > Dry mortarless installation into a shaft wall ...

5.9.3 Dry mortarless installation into a shaft wall with metal support structure, with installation kit TQ2



GR3834829, B

Fig. 141: Dry mortarless installation into a shaft wall with metal support structure, with installation kit TQ2

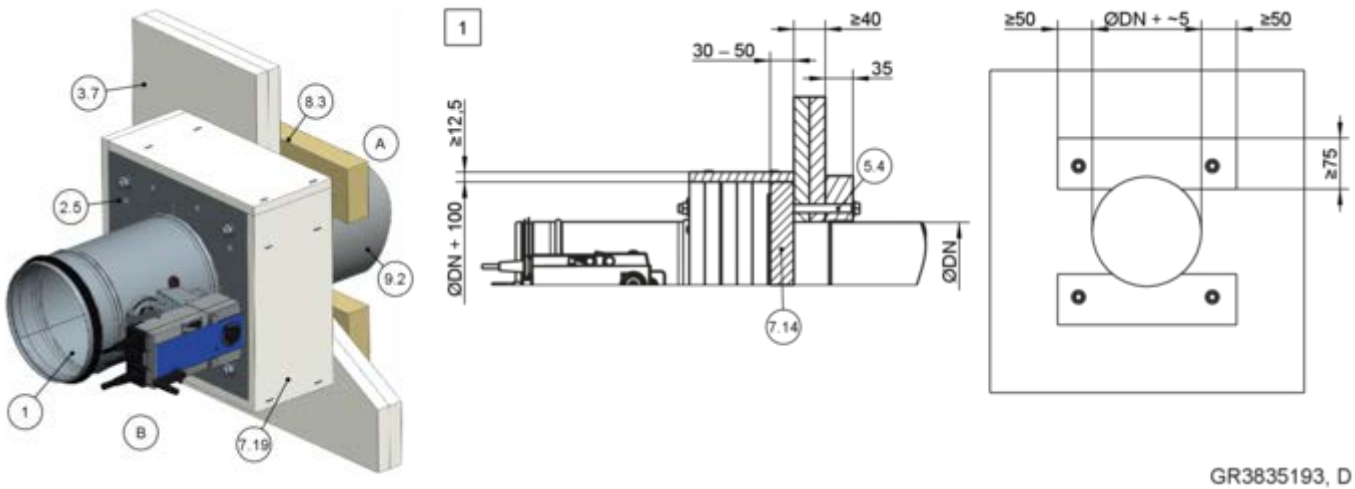
1	FKRS-EU	7.10	Trim panel
2.11	Installation kit TQ2 with cover plate	7.13	Cladding
3.7	Shaft wall with metal support structure, cladding on one side	7.13.1	Cladding, single-layer
3.10	Wall without adequate fire resistance rating	7.14	Reinforcing board of the same material as the wall
4.1	Solid ceiling slab/solid floor	9.2	Air duct/extension piece
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame	#	Optional
5.21	Screw/wall plug	*	Installation near the floor as in 7
6.5	Mineral wool, depending on wall construction	**	Cover plate shortened by others
6.13	Mineral fibre strips A1, alternatively gypsum mortar (for levelling ceiling unevenness)	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
7.6	Metal section according to wall manufacturer		

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

- Shaft wall, ↪ *on page 41*
- Installation kit TQ2, ↪ 5.4.3 '*Installation kit TQ2*' *on page 46*
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↪ 5.3 '*General installation information*' *on page 29 ff*
- General information on installation with installation kit TQ2, ↪ *on page 35*

Shaft walls with metal support structure > Dry mortarless installation into a shaft wall ...

5.9.4 Dry mortarless installation into a shaft wall with metal support structure, with installation kit WA2



GR3835193, D

Fig. 142: Dry mortarless installation into a shaft wall with metal support structure, with installation kit WA2

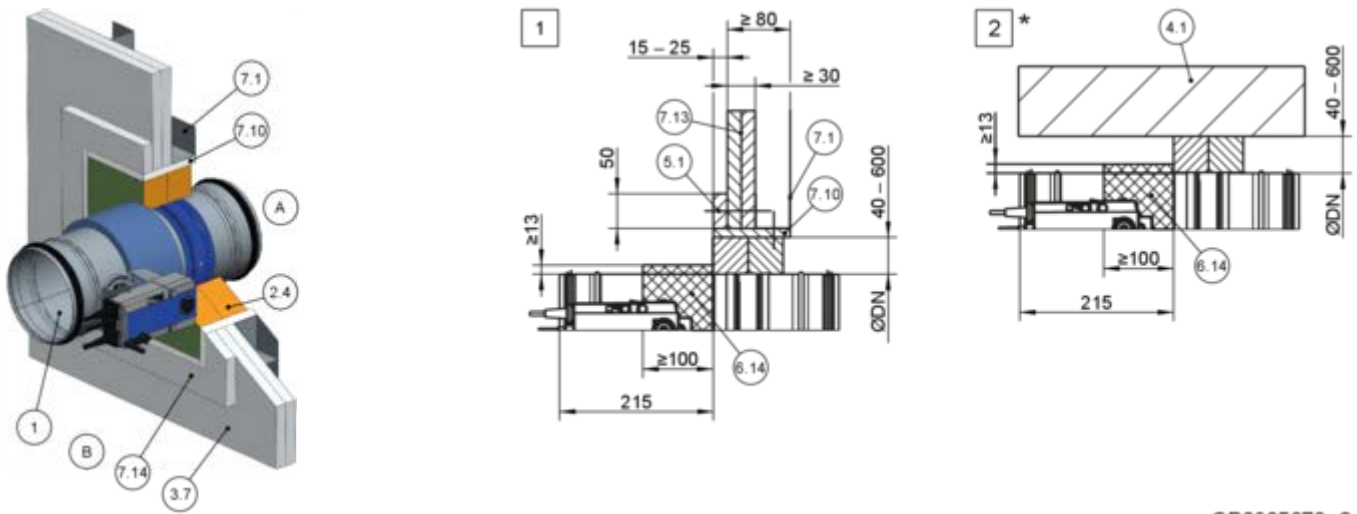
1	FKRS-EU	7.19	Fire-resistant cladding (fire-rated plasterboard panel, thickness ≥ 12.5 mm)
2.5	Installation kit WA2	8.3	PROMATECT®-LS board, d = 35 mm
3.7	Shaft wall with metal support structure, cladding on one side	9.2	Air duct/extension piece
5.4	Threaded rod (M8 or M10) as push through installation 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 WA2 into shaft walls with metal support structure

- Shaft wall, ↗ on page 41
 - Installation kit WA2, ↗ 5.4.4 'Installation kit WA2' on page 47
 - ≥ 75 mm distance between the fire damper and load-bearing components
 - ≥ 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).

5.9.5 Dry mortarless installation with fire batt

Dry mortarless installation with fire batt in shaft wall with metal support structure



GR3905678, C

Fig. 143: Dry mortarless installation with fire batt in shaft wall with metal support structure

1	FKRS-EU	7.1	UW section
2.4	Coated board system	7.10	Trim panel
3.7	Shaft wall with metal support structure, cladding on one side	7.13	Cladding
4.1	Solid ceiling slab/solid floor	7.14	Reinforcing board of the same material as the wall
5.1	Dry wall screw	*	Installation near the floor as in [2]
6.14	Armaflex	[1] [2]	Up to EI 60 S

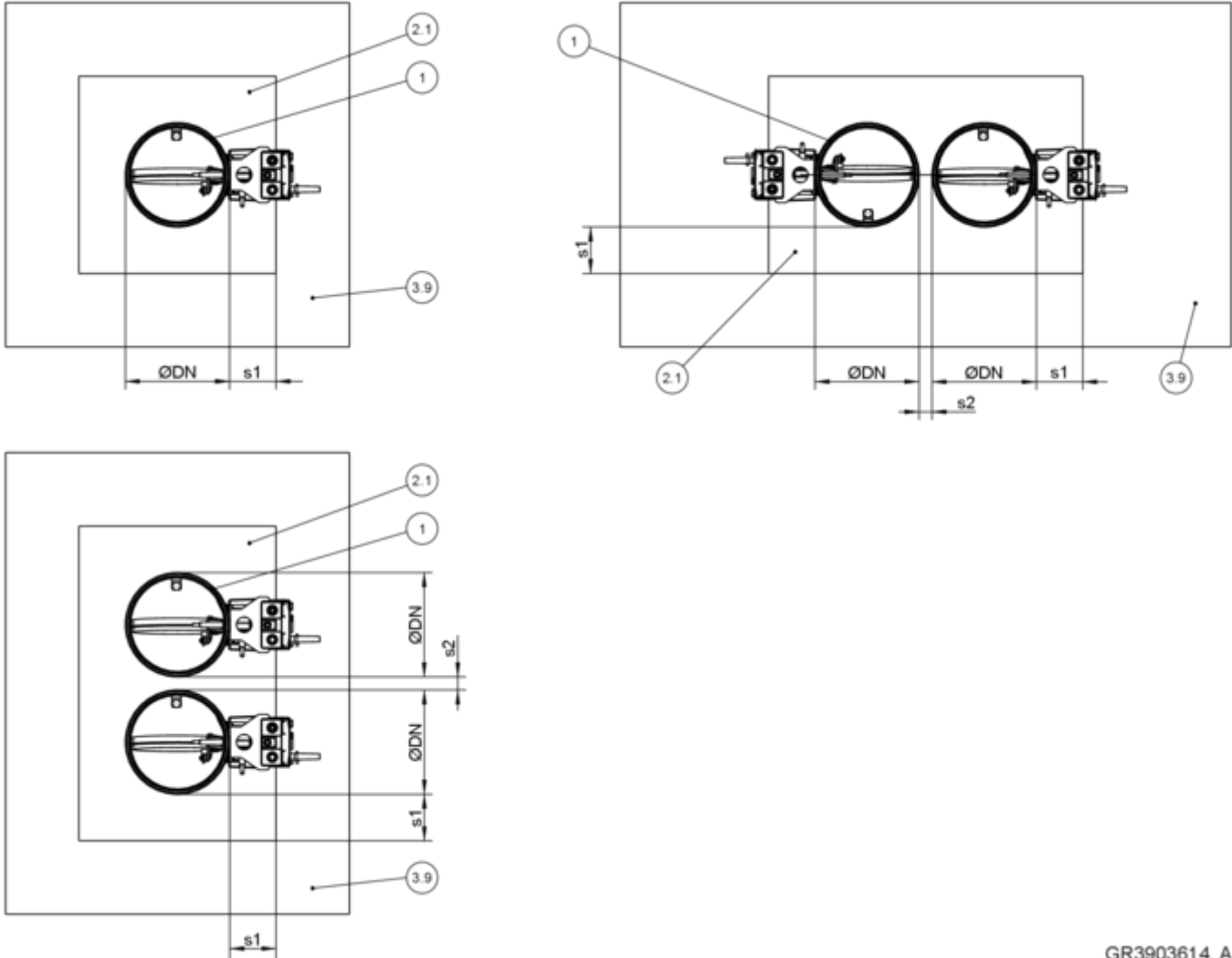
Supplementary requirements: Dry mortarless installation with fire batt in shaft walls with metal support structure

- Shaft wall, ↪ on page 41
- Fire batt systems, installation details, distances/dimensions, ↪ on page 36 f
- Suspension and fixing, ↪ Chapter 5.15 'Fixing the fire damper' on page 242
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↪ 5.3 'General installation information' on page 29 ff
- General information on installation with fire batt, ↪ on page 36

5.10 Shaft walls without metal support structure

5.10.1 General information

Shaft wall without metal support structure and cladding on one side



GR3903614, A

Fig. 144: Shaft walls without metal support structure – Arrangement/distances

- | | | | |
|-----|--|----|---|
| 1 | FKRS-EU | s1 | Perimeter gap, |
| 2.1 | Mortar | s2 | Distance between the fire dampers, ↺ 'Distances' on page 32 |
| 3.9 | Shaft wall without metal support structure, cladding on one side | | |

Installation type	Installation opening [mm]	Distance [mm]	
		s1	s2
Mortar-based installation	$\varnothing_{\text{nominal width}} + \text{max. } 450$	≤ 225	≥ 200
Dry mortarless installation with TQ2	$\square A = \varnothing_{\text{nominal width}} + 110^1$	central installation	≥ 200

¹ Installation opening tolerance ± 2 mm

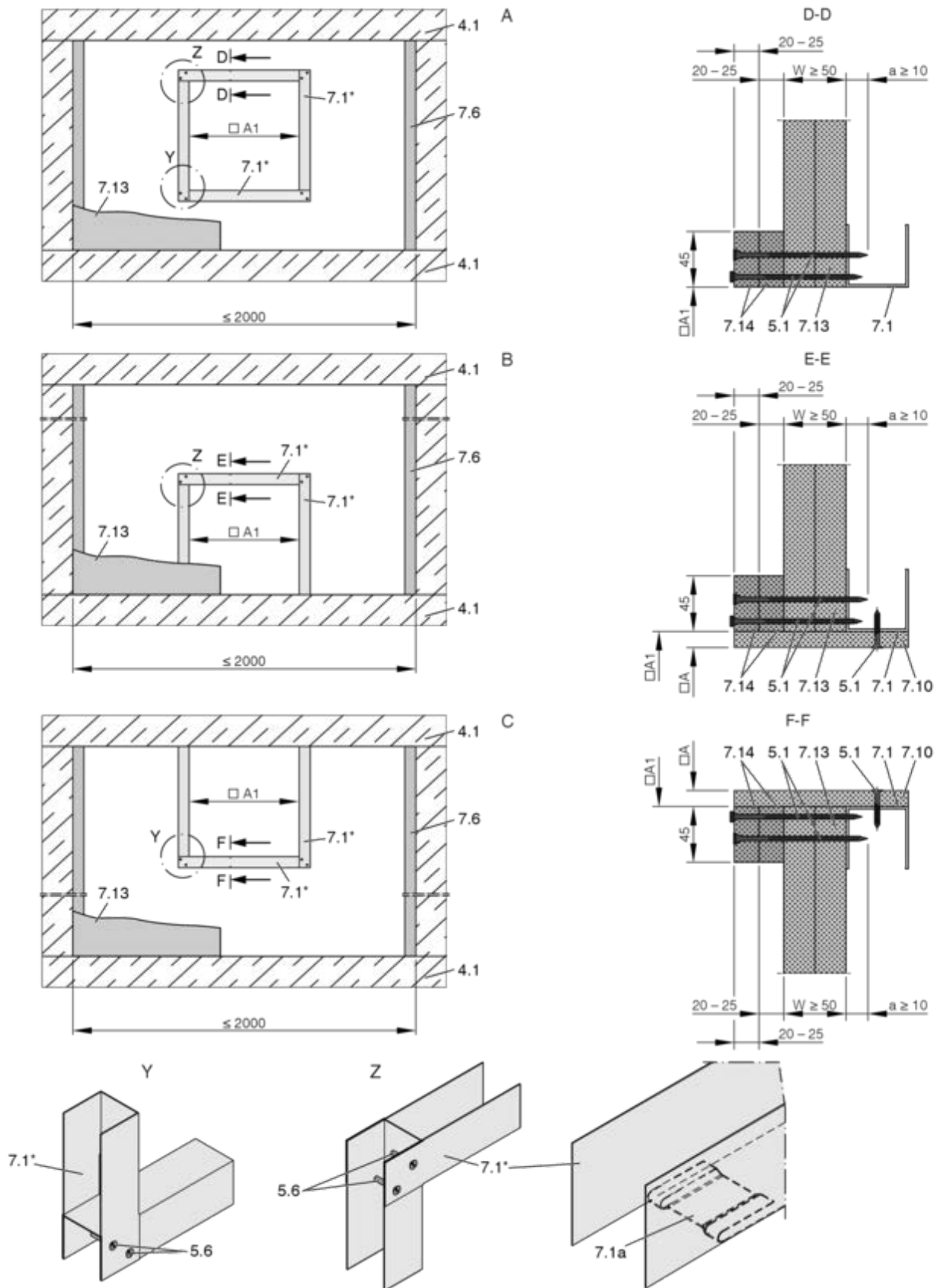


Fig. 145: Shaft wall without metal support structure and cladding on one side

A	Shaft wall	7.6	Metal section/steel bracket according to wall manufacturer
B	Shaft wall, installation near the floor	7.10	Trim panels, according to installation details
C	Shaft wall, installation near the ceiling	7.13	Cladding
4.1	Solid ceiling slab / solid floor		

Shaft walls without metal support structure > General information

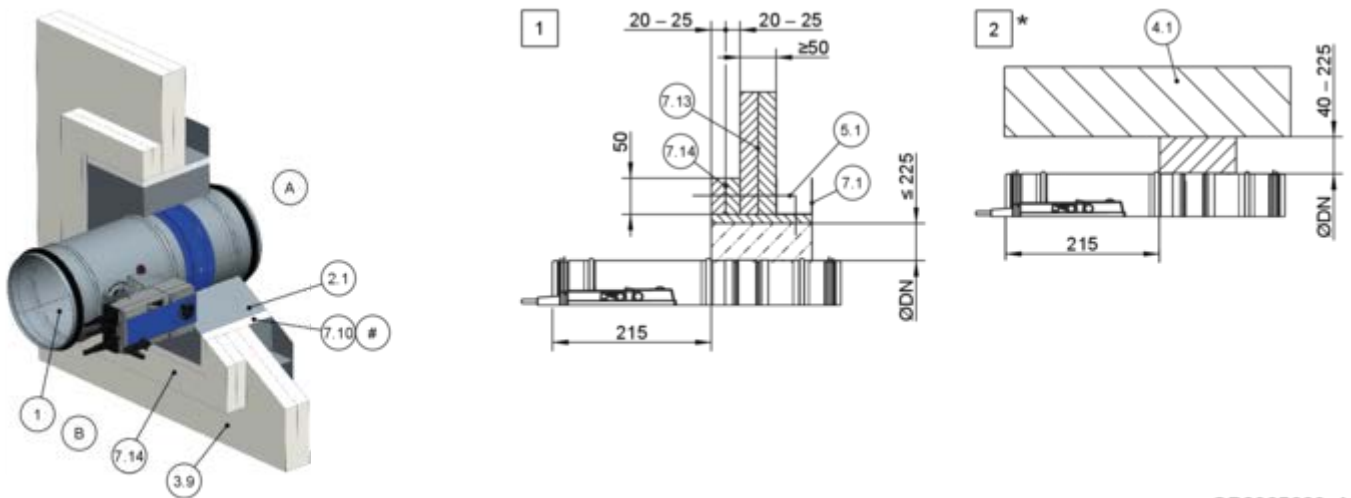
- | | | | |
|------|--|------|---|
| 5.1 | Dry wall screw | 7.14 | Reinforcing |
| 5.6 | Screw or steel rivet | □A | Installation opening |
| 7.1 | UW section | □A1 | Opening in shaft wall |
| 7.1a | UW section, either cut in and bent, or cut off | | (without trim panels: □A = □A1) |
| | | * | Closed side of metal section must face the installation opening |

Additional requirements

- Shaft wall without metal support structure,
↳ on page 42

5.10.2 Mortar-based installation

Mortar-based installation into shaft wall without metal support structure



GR3905669, A

Fig. 146: Mortar-based installation into shaft wall without metal support structure

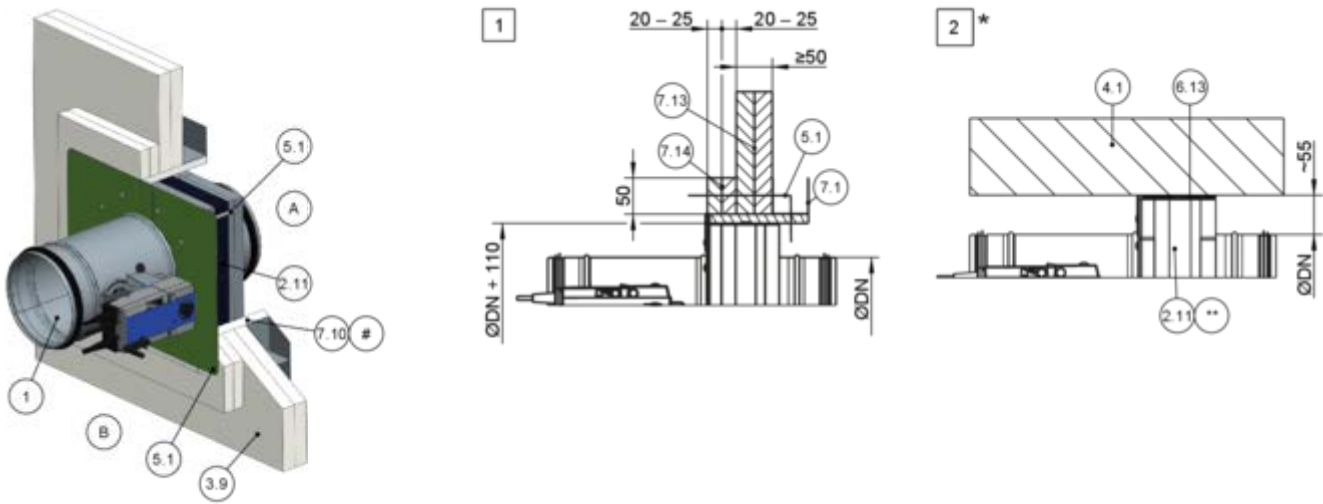
1	FKRS-EU	7.13	Cladding
2.1	Mortar	7.14	Reinforcing board of the same material as the wall
3.9	Shaft wall without metal support structure, cladding on one side	#	Optional
4.1	Solid ceiling slab/solid floor	*	Installation near the floor as in 2
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame	1	Up to EI 90 S
7.1	UW section	2	EI 30 S – EI 90 S
7.10	Trim panel		

Additional requirements: mortar-based installation into shaft walls without metal support structure

- Shaft wall, ↪ on page 42
- Distance to load-bearing components ≥ 40 mm
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↪ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation, ↪ '**Mortar-based installation**' on page 34

Shaft walls without metal support structure > Dry mortarless installation into a shaft wall ...

5.10.3 Dry mortarless installation into a shaft wall without metal support structure, with installation kit TQ2



GR3836049, C

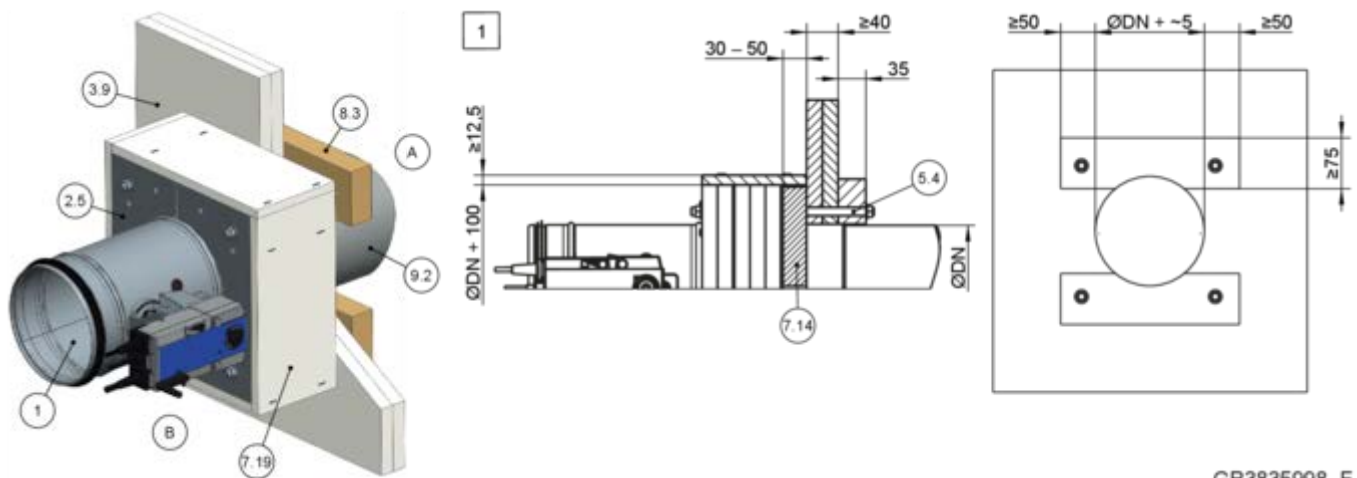
Fig. 147: Dry mortarless installation into a shaft wall without metal support structure, with installation kit TQ2

1	FKRS-EU	7.13	Cladding
2.11	Installation kit TQ2 with cover plate	7.14	Reinforcing board of the same material as the wall
3.9	Shaft wall without metal support structure, cladding on one side	#	Optional
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame	*	Installation near the floor as in 2
6.13	Mineral fibre strips A1, alternatively gypsum mortar (for levelling ceiling unevenness)	**	Cover plate shortened by others
7.1	UW section	1	Up to EI 90 S
7.10	Trim panel	2	EI 30 to EI 90 S

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

- Shaft wall, ↗ on page 42
- Installation kit TQ2, ↗ 5.4.3 'Installation kit TQ2' on page 46
- ≥ 200 mm distance between two fire dampers in separate installation openings
- ≥ 55 mm distance between the fire damper and load-bearing components
- General installation information, ↗ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit TQ2, ↗ on page 35

5.10.4 Dry mortarless installation into a shaft wall without metal support structure, with installation kit WA2



GR3835998, E

Fig. 148: Dry mortarless installation into a shaft wall without metal support structure, with installation kit WA2

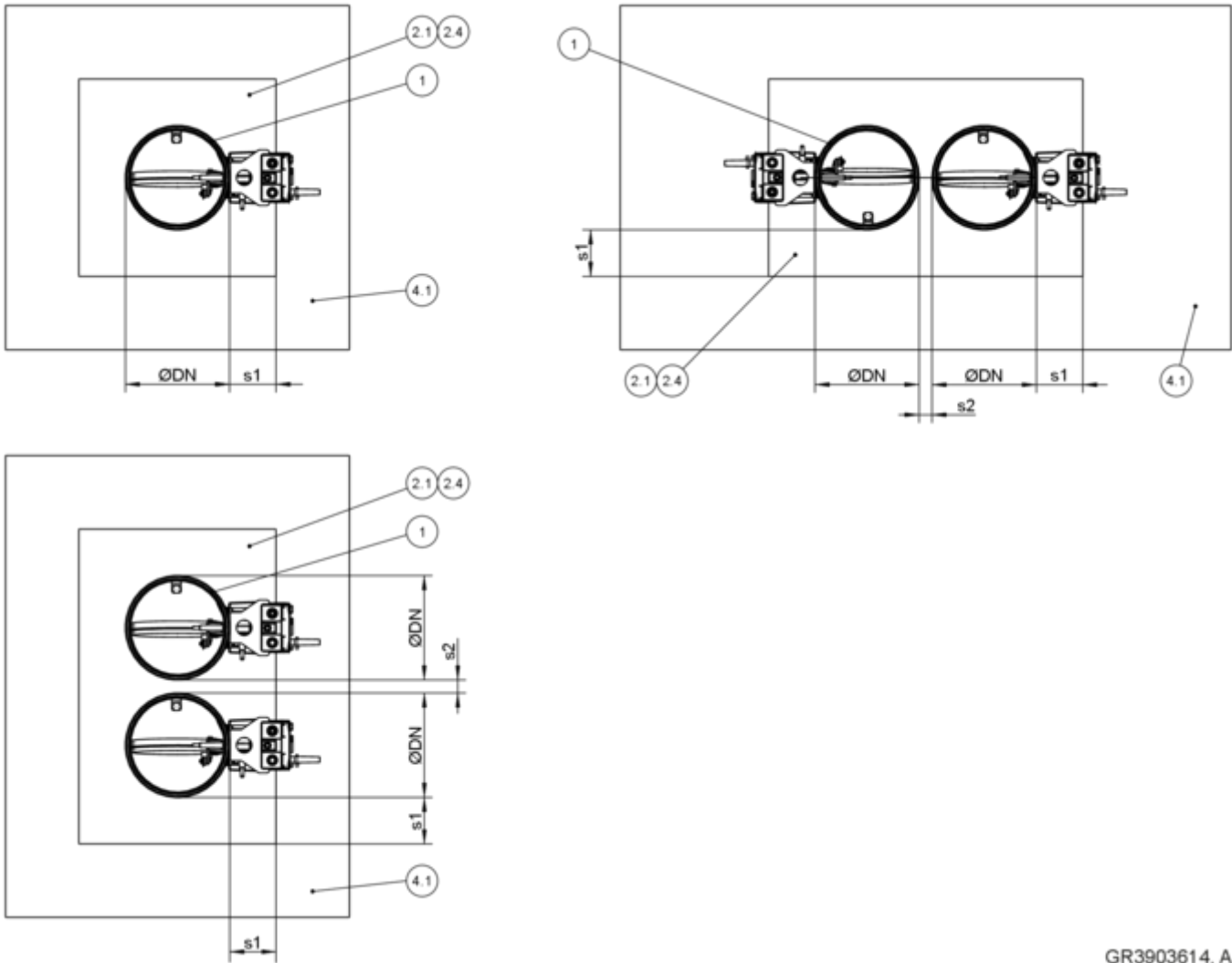
1	FKRS-EU	7.19	Fire-resistant cladding (fire-rated plasterboard panel, thickness ≥ 12.5 mm)
2.5	Installation kit WA2	8.3	PROMATECT®-LS board, d = 35 mm
3.9	Shaft wall without metal support structure, cladding on one side	9.2	Duct
5.4	Threaded rod (M8 or M10) as push through installation with washers 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 WA2 on shaft walls without metal support structure

- Shaft wall, ↗ on page 42
 - Installation kit WA2, ↗ 5.4.4 'Installation kit WA2' on page 47
 - ≥ 75 mm distance between the fire damper and load-bearing components
 - ≥ 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).

5.11 Solid ceiling slabs

5.11.1 General information



GR3903614, A

Fig. 149: Solid ceiling slabs – arrangement/distances, side-by-side arrangement by way of example

- | | | | |
|-----|---------------------|-----|---|
| 1 | FKRS-EU | 4.1 | Solid ceiling slab |
| 2.1 | Mortar | s1 | Perimeter gap, |
| 2.4 | Coated board system | s2 | Distance between the fire dampers, ↗ 'Distances' on page 32 |

Installation type	Installation opening [mm]	Distance [mm]	
		s1	s2
Mortar-based installation	\varnothing nominal width + max. 450	≤ 225	45 – 225
Dry mortarless installation with ER	↗ 5.4.2 'Installation block ER' on page 45	central installation	$\geq 200^2$
Dry mortarless installation with fire batt ¹	$\square A = \varnothing$ nominal width + max. 1200	40 – 600	$\geq 200^3$

¹) Note the maximum size for the fire batt

²) Distance between the installation blocks

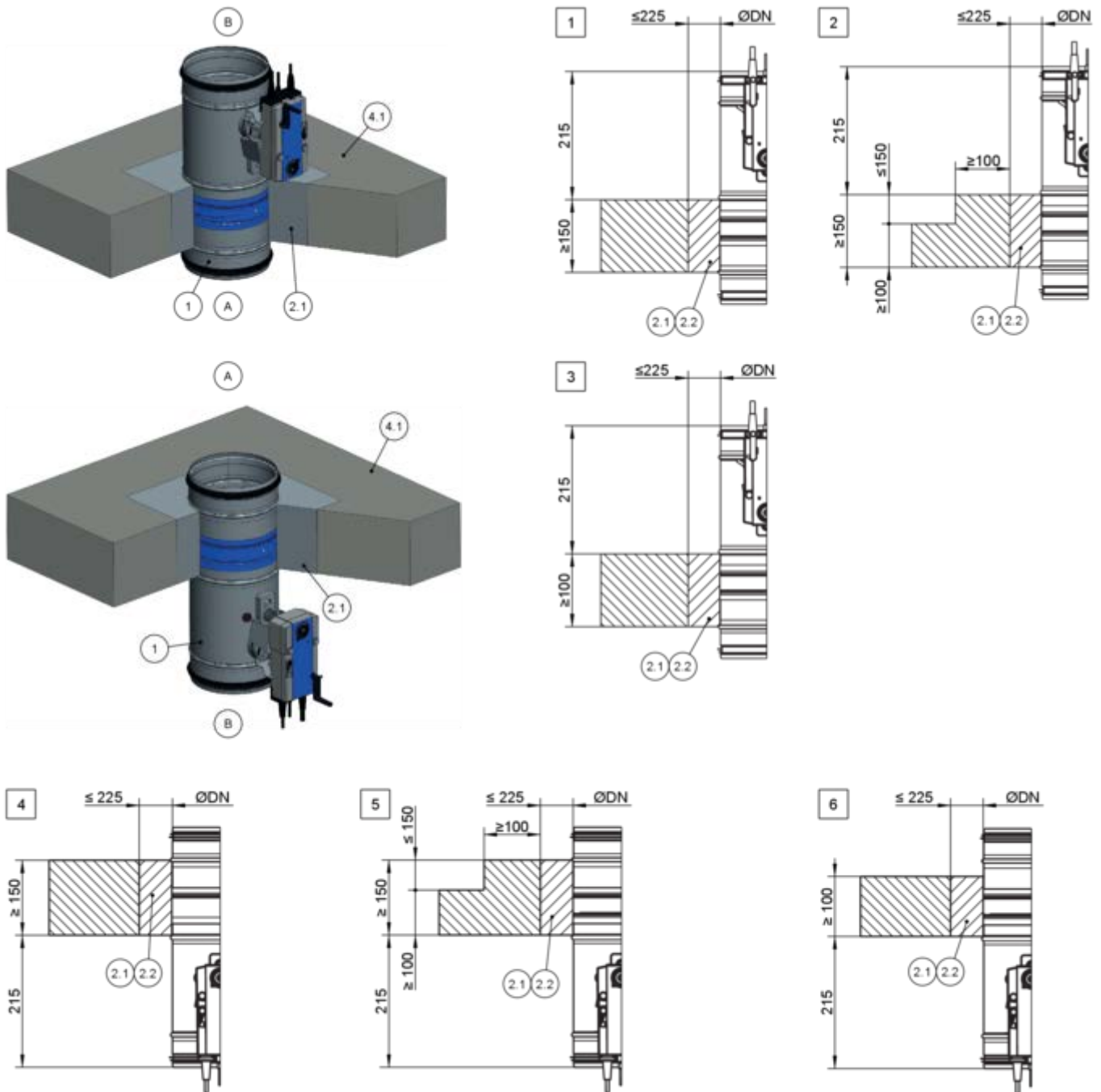
³) Installation into separate installation openings

Additional requirements: solid ceiling slabs

- Solid ceiling slab, ↗ *on page 42*
- Distances and installation orientation, ↗ *'Distances' on page 32*
- The structural safety of the ceiling as well as the attachment of the mortar or concrete to the ceiling must be ensured (by customer). Compensation measures, especially with regard to large installation openings (such as for multiple installation), must be determined on a case-to-case basis (by customer).

5.11.2 Mortar-based installation

Mortar-based installation into a solid ceiling slab, suspended or upright

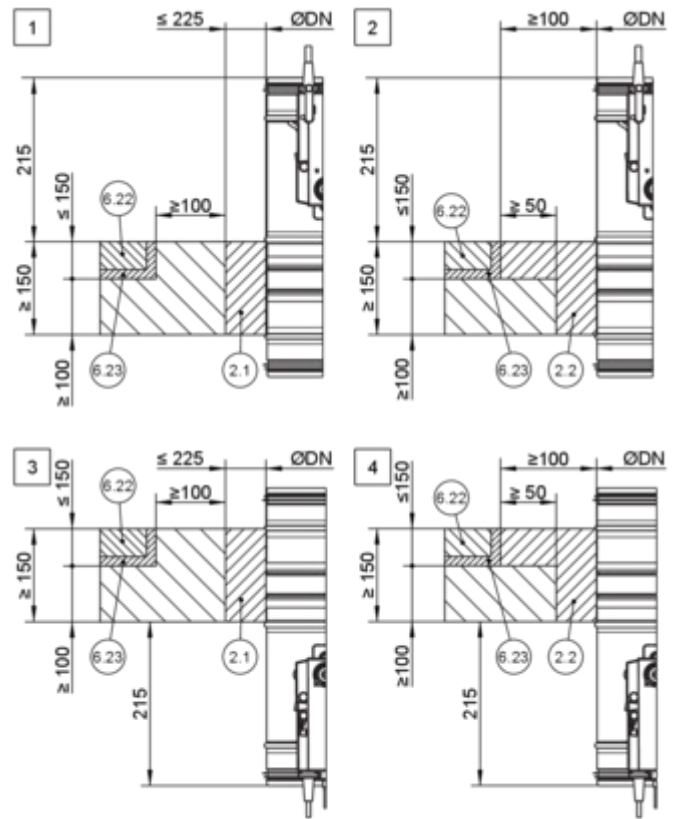
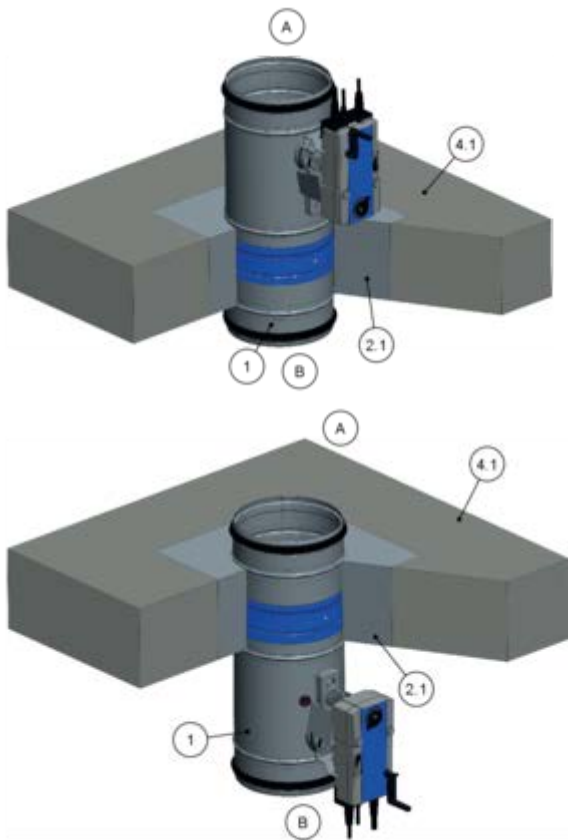


GR3836273, F
GR3837636, E

Fig. 150: Mortar-based installation into a solid ceiling slab, suspended or upright

1	FKRS-EU	1 2	Up to EI 120 S
2.1	Mortar	3	Up to EI 90 S
2.2	Reinforced concrete	4 5	Up to EI 120 S
4.1	Solid ceiling slab (thickness increased at 2 and 5)	6	Up to EI 90 S

Mortar-based installation into a solid ceiling slab with screed and footfall sound insulation, suspended or upright

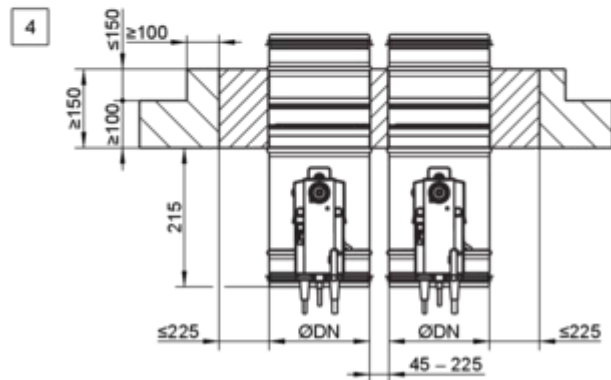
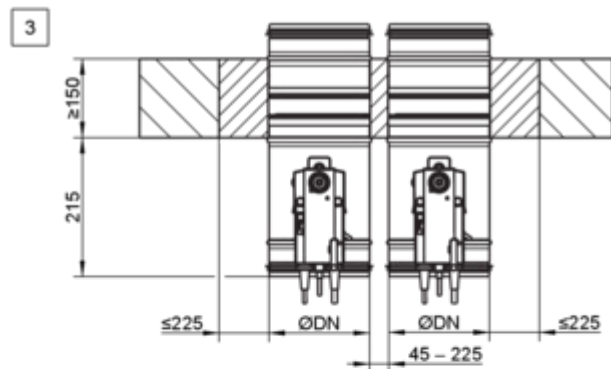
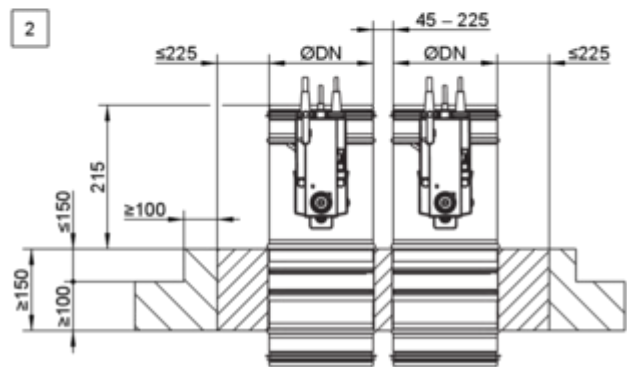
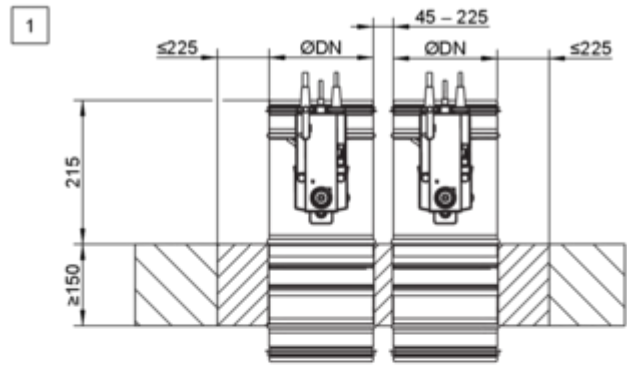
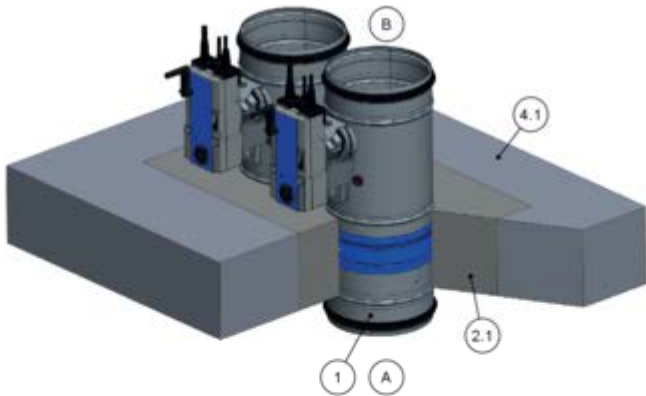


GR3836273, E
GR3837636, D

Fig. 151: Mortar-based installation into a solid ceiling slab with screed and footfall sound insulation, suspended or upright

- | | | | |
|-----|---------------------|---------------------|---------------------------|
| 1 | FKRS-EU | 6.22 | Screed |
| 2.1 | Mortar | 6.23 | Footfall sound insulation |
| 2.2 | Reinforced concrete | 1 – 4 | Up to EI 120 S |
| 4.1 | Solid ceiling slab | | |

Mortar-based installation into solid ceiling slab, suspended, "flange to flange", upright and suspended



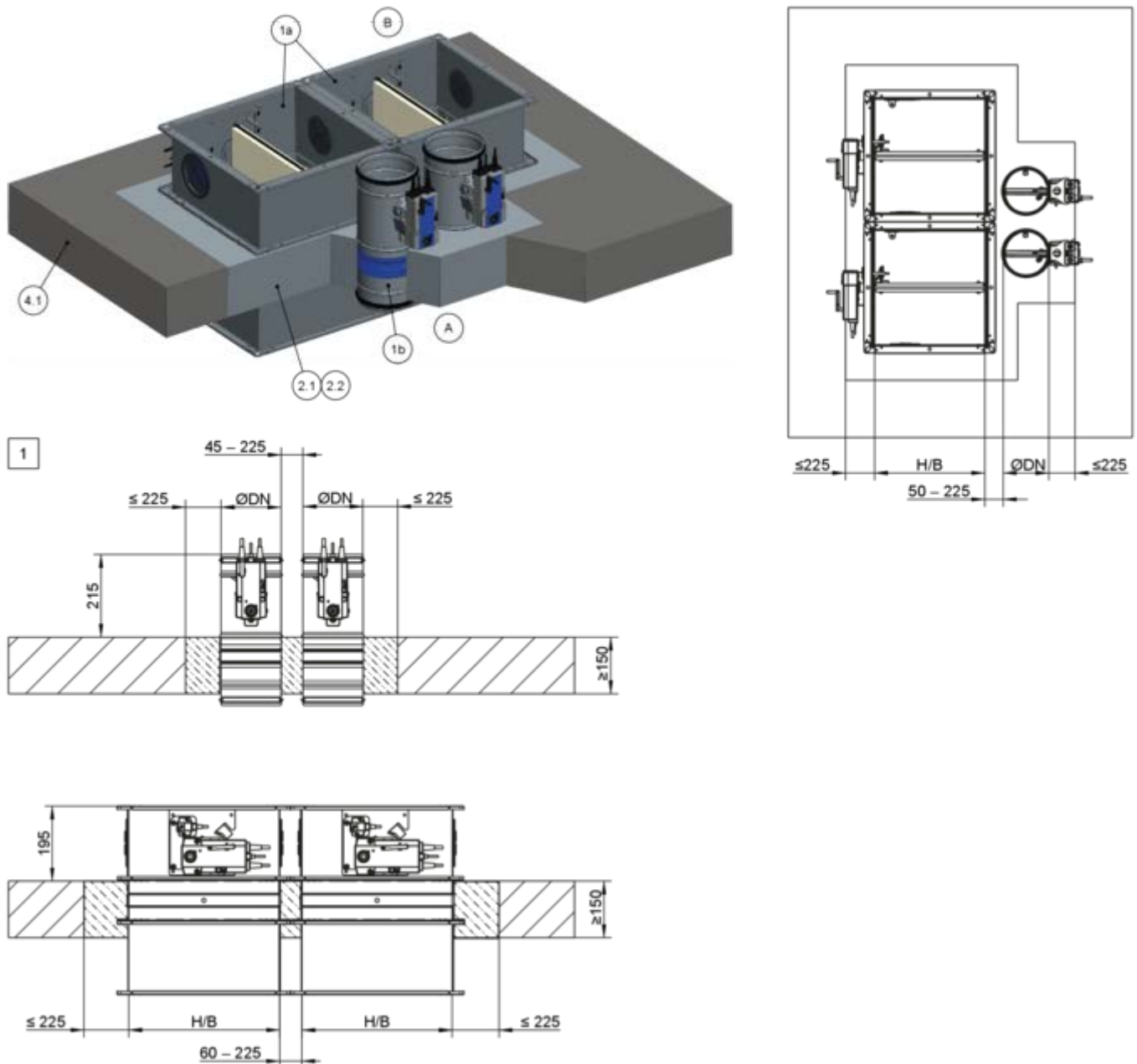
GR3837713, B
GR3838233, B

Fig. 152: Mortar-based installation into solid ceiling slab, "flange to flange", upright and suspended (also applicable for blending into the screed according to Fig. 150)

1 FKRS-EU
2.1 Mortar

4.1 Solid ceiling slab (thickness increased at 2 and 4)
1 - 4 Up to EI 120 S

Mortar-based installation into a solid ceiling slab, FKRS-EU and FK2-EU, combined



GR3848063, A

Fig. 153: Mortar-based installation into a solid ceiling slab, FKRS-EU and FK2-EU, combined

1a	FKRS-EU	2.2	Concrete
1b	FK2-EU up to $B \times H \leq 800 \times 400$ mm	4.1	Solid ceiling slab
2.1	Mortar	1	Up to EI 90 S

For combined installation please note:

- Overall fire damper area $\leq 1.2 \text{ m}^2$.
- The number of fire dampers in an installation opening is limited by their size ($B \times H$ for FK2-EU and/or \varnothing nominal width for FKRS-EU) and the overall area of the fire dampers (1.2 m^2).
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For installation details FK2-EU, see the installation and operating manual for this fire damper type.
- Distance to load-bearing structural elements ≥ 40 mm

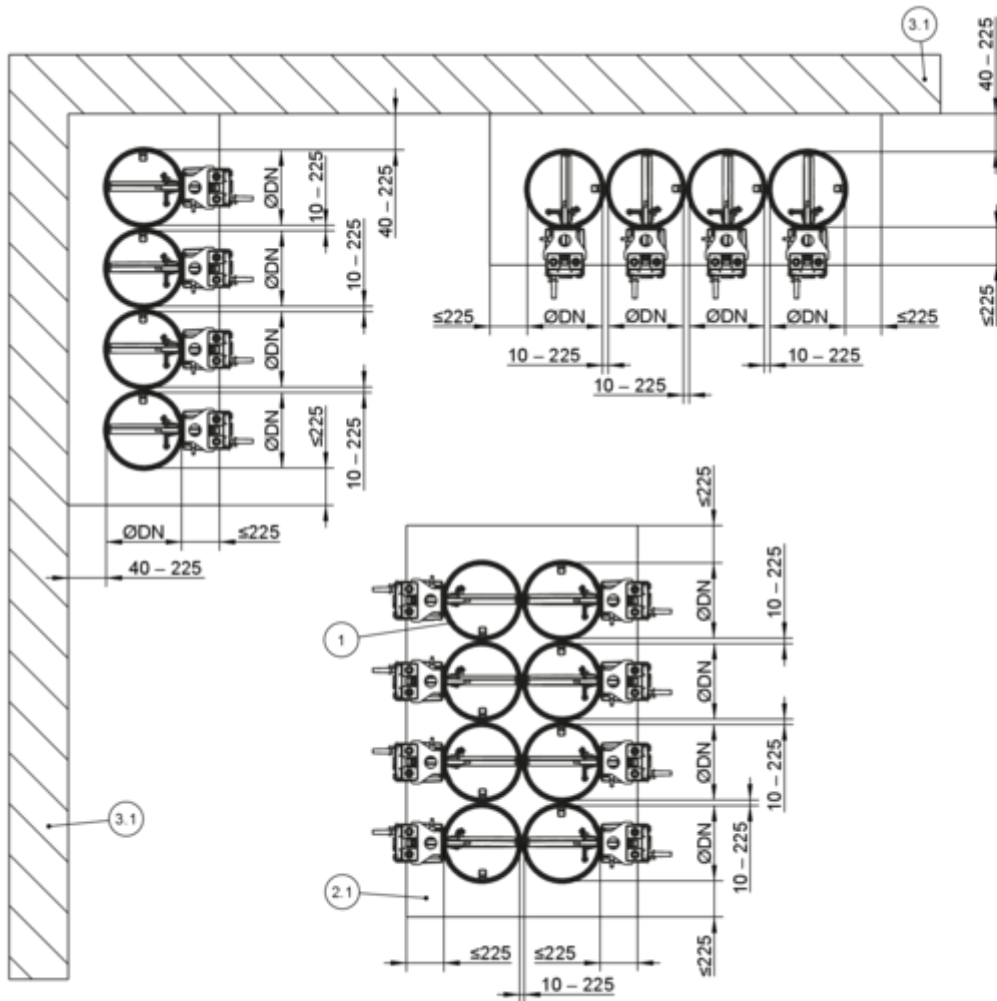
Additional requirements: mortar-based installation into solid ceiling slabs

- Solid ceiling slab, ↪ on page 42
- ≥ 40 mm distance between the fire damper and load-bearing components
- General installation information, ↪ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation, ↪ '**Mortar-based installation**' on page 34

Note:

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 – multiple installation into one installation opening



GR4044836, A

Fig. 154: Mortar-based installation – multiple installation into one installation opening

- 1 FKRS-EU
- 2.1 Mortar
- 3.1 Solid wall (load-bearing structural element)

Solid ceiling slabs > Mortar-based installation – multiple installat...

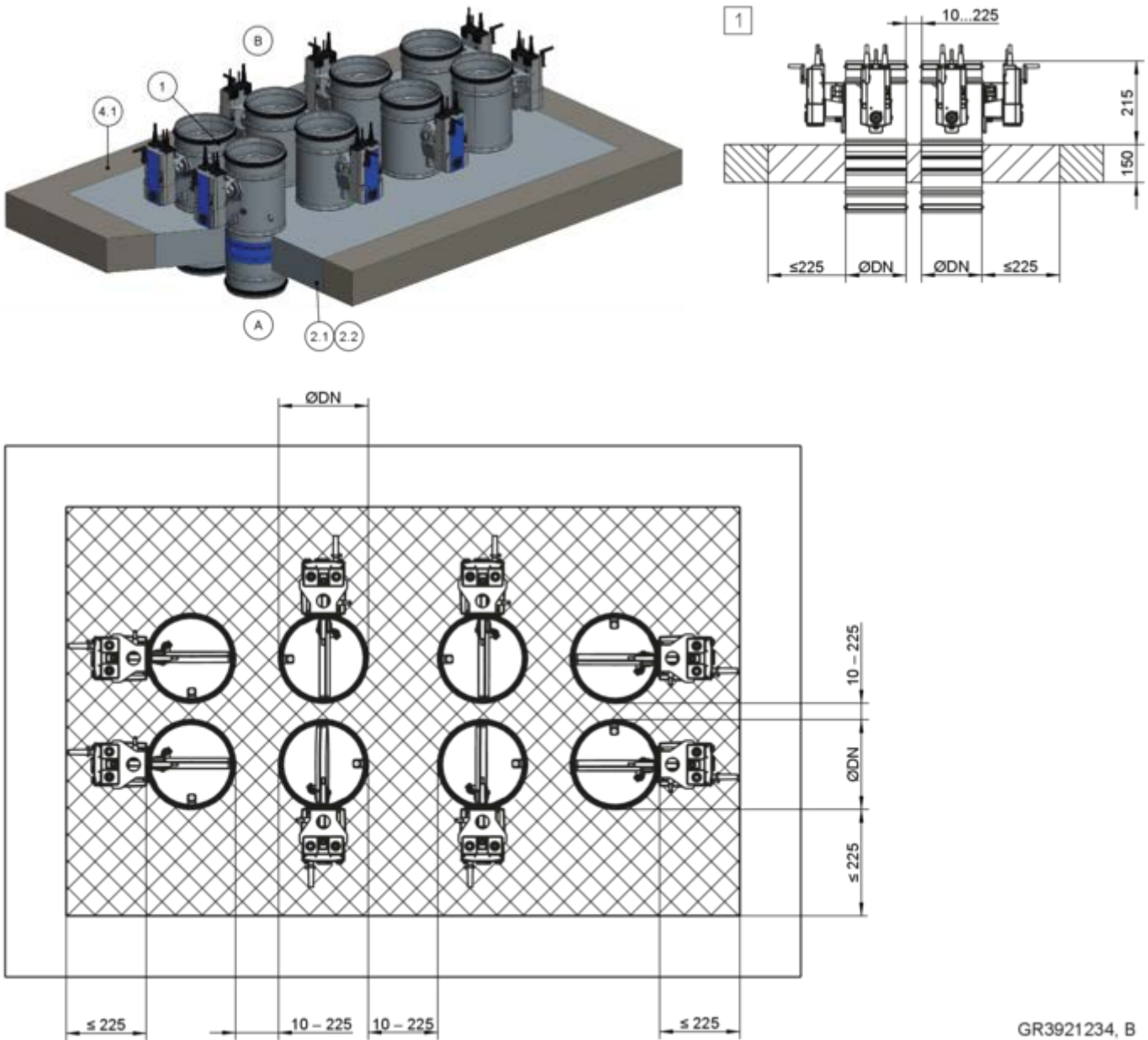


Fig. 155: Mortar-based installation – multiple installation into one installation opening, illustration shows upright installation (applies also to suspended installation)

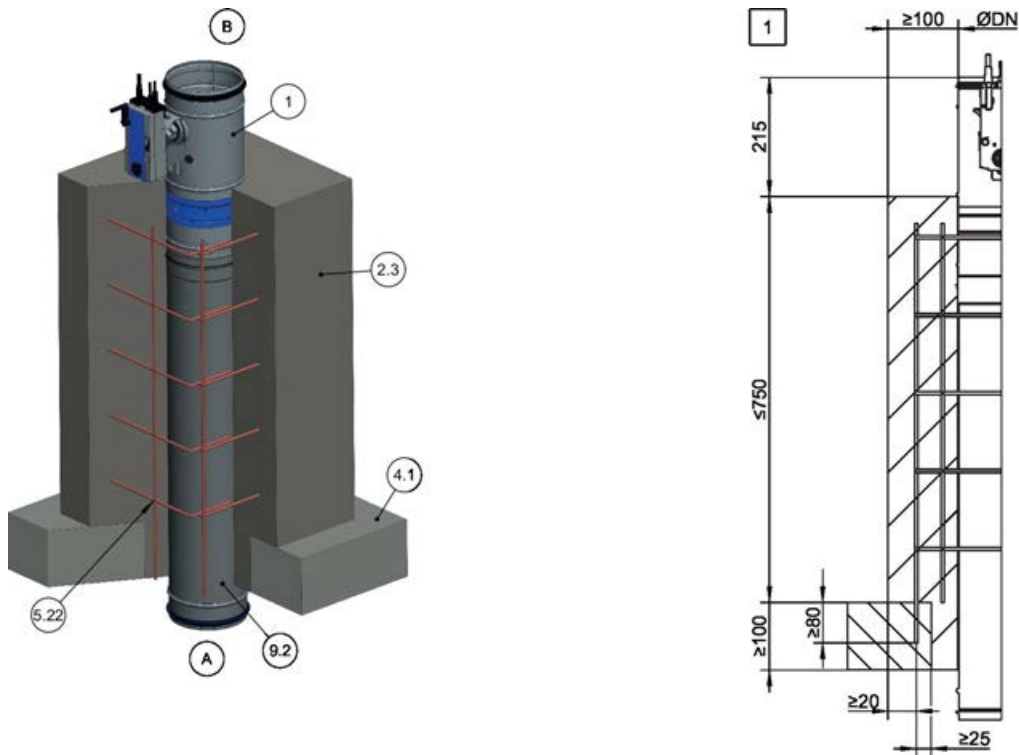
- | | | | |
|-----|----------|-----|--------------------|
| 1 | FKRS-EU | 3.1 | Solid ceiling slab |
| 2.1 | Mortar | 1 | Up to EI 90 S |
| 2.2 | Concrete | | |

Additional requirements: mortar-based installation – multiple installation into one installation opening

- Solid ceiling slab, ↗ on page 42
- Overall fire damper area ≤ 1.2 m²
- The number of fire dampers in an installation opening is limited by their size (nominal width) and the overall area of the fire dampers (1.2 m²) (maximum 10 FKRS-EU in single or double row arrangement)
- Distance to load-bearing structural elements ≥ 40 mm

5.11.4 Mortar-based installation into a concrete base

Mortar-based installation with concrete base into a solid ceiling slab, upright



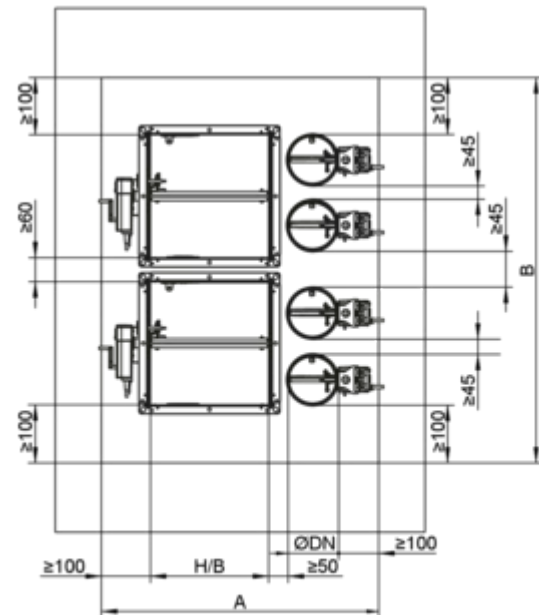
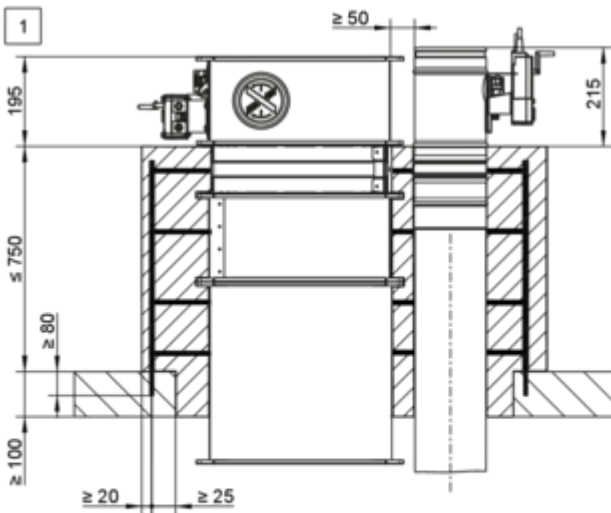
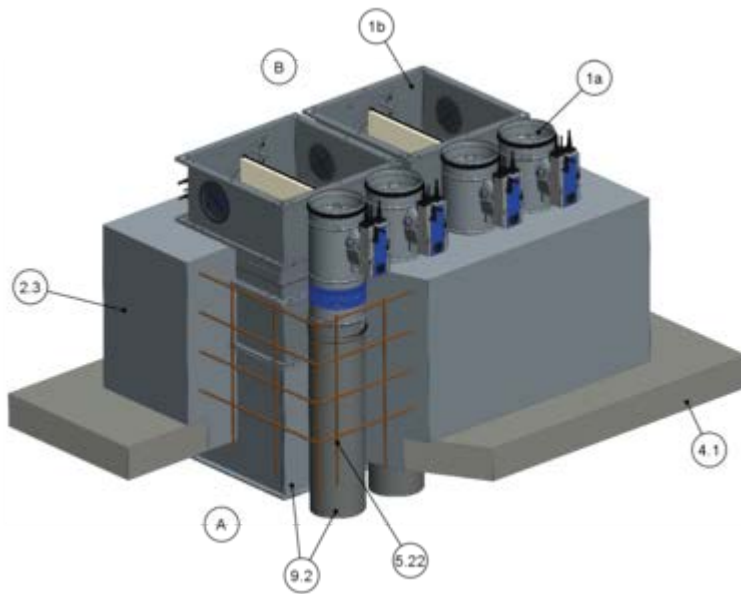
GR3872606, A

Fig. 156: 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	Air duct/extension piece
4.1	Solid ceiling slab	1	Up to EI 120 S

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

Mortar-based installation with concrete base into a solid ceiling slab, upright, combined, FKRS-EU and FK2-EU



GR3860064, D

Fig. 157: Mortar-based installation with concrete base into a solid ceiling slab, upright, combined, FKRS-EU and FK2-EU

- 1a FKRS-EU
- 1b FK2-EU up to $B \times H \leq 800 \times 400$ mm
- 2.3 Concrete base
- 4.1 Solid ceiling slab

- 5.22 Steel fabric, $\varnothing \geq 8$ mm, mesh aperture 150 mm, or equivalent, for number of fixing points see table \varnothing 207
- 9.2 Air duct/extension piece
- 1 Up to EI 90 S

For combined installation please note:

- Overall fire damper area ≤ 1.2 m².
- The number of fire dampers in an installation opening is limited by their size ($B \times H$ for FK2-EU and/or \varnothing nominal width for FKRS-EU) and the overall area of the fire dampers (1.2 m²).
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For installation details FK2-EU, see the installation and operating manual for this fire damper type.

- Distance to load-bearing structural elements ≥ 40 mm
- Minimum number of fixing points in the ceiling slab ↪ *on page 207*

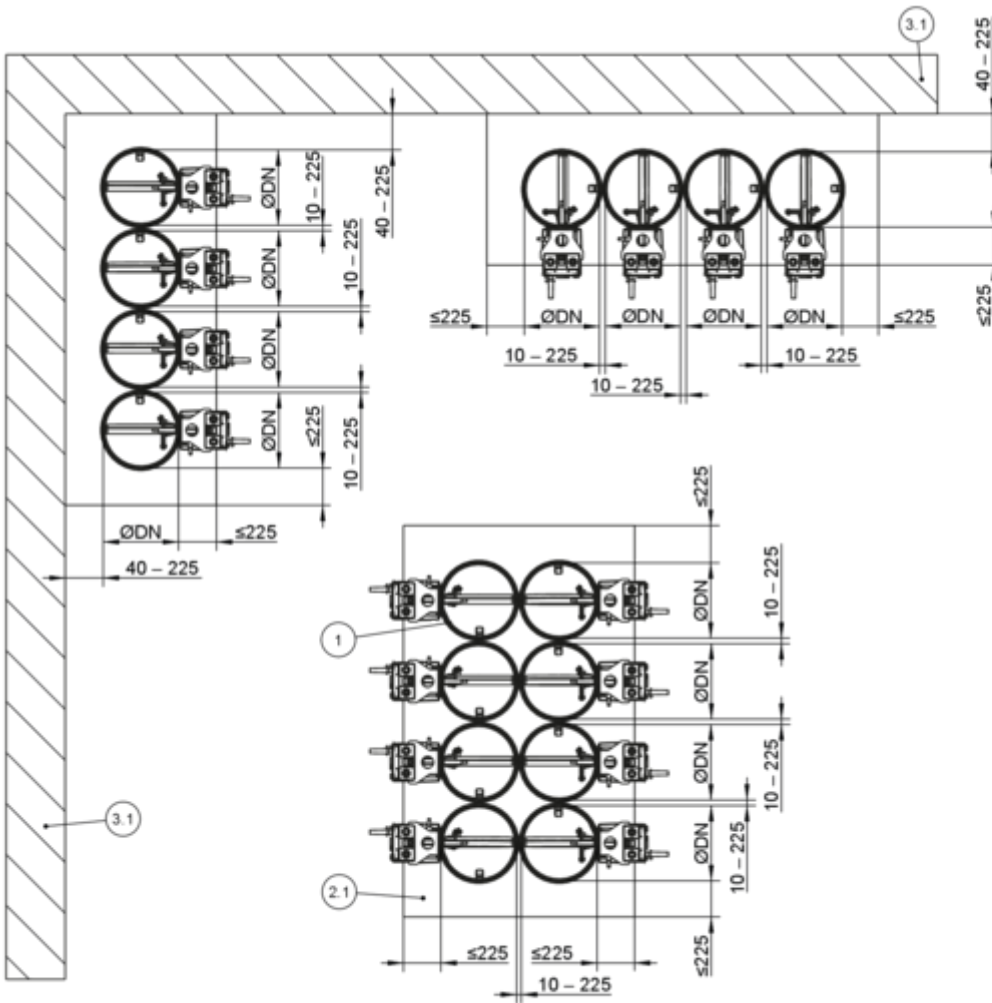
Minimum number of fixing points in the ceiling slab

B ≥ [mm]	A ≥ [mm]													
	200	500	800	1100	1400	1700	2000	2300	2600	2900	3200	3500	3800	4100
100	4	6	8	10	12	14	16	18	20	22	24	26	28	30
400	6	8	10	12	14	16	18	20	22	24	26	28	30	32
700	8	10	12	14	16	18	20	22	24	26	28	30	32	34
1000	10	12	14	16	18	20	22	24	26	28	30	–	–	–
1300	12	14	16	18	20	22	24	26	28	30	32	–	–	–
1600	14	16	18	20	22	24	26	28	30	32	34	–	–	–
1900	16	18	20	22	24	26	28	30	32	34	36	–	–	–
2000	18	20	22	24	26	28	30	32	34	36	38	–	–	–

Supplementary requirements: mortar-based installation in solid ceiling slabs with concrete base

- Solid ceiling slab, ↪ *on page 42*
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 45 mm distance between two fire dampers
- If the distance to adjacent solid walls is < 100 mm and if the concrete base has been correctly attached, no reinforcement is required on the wall side.
- Concrete bases with $H \leq 150$ mm do not require reinforcement
- General installation information, ↪ 5.3 'General installation information' on page 29 ff

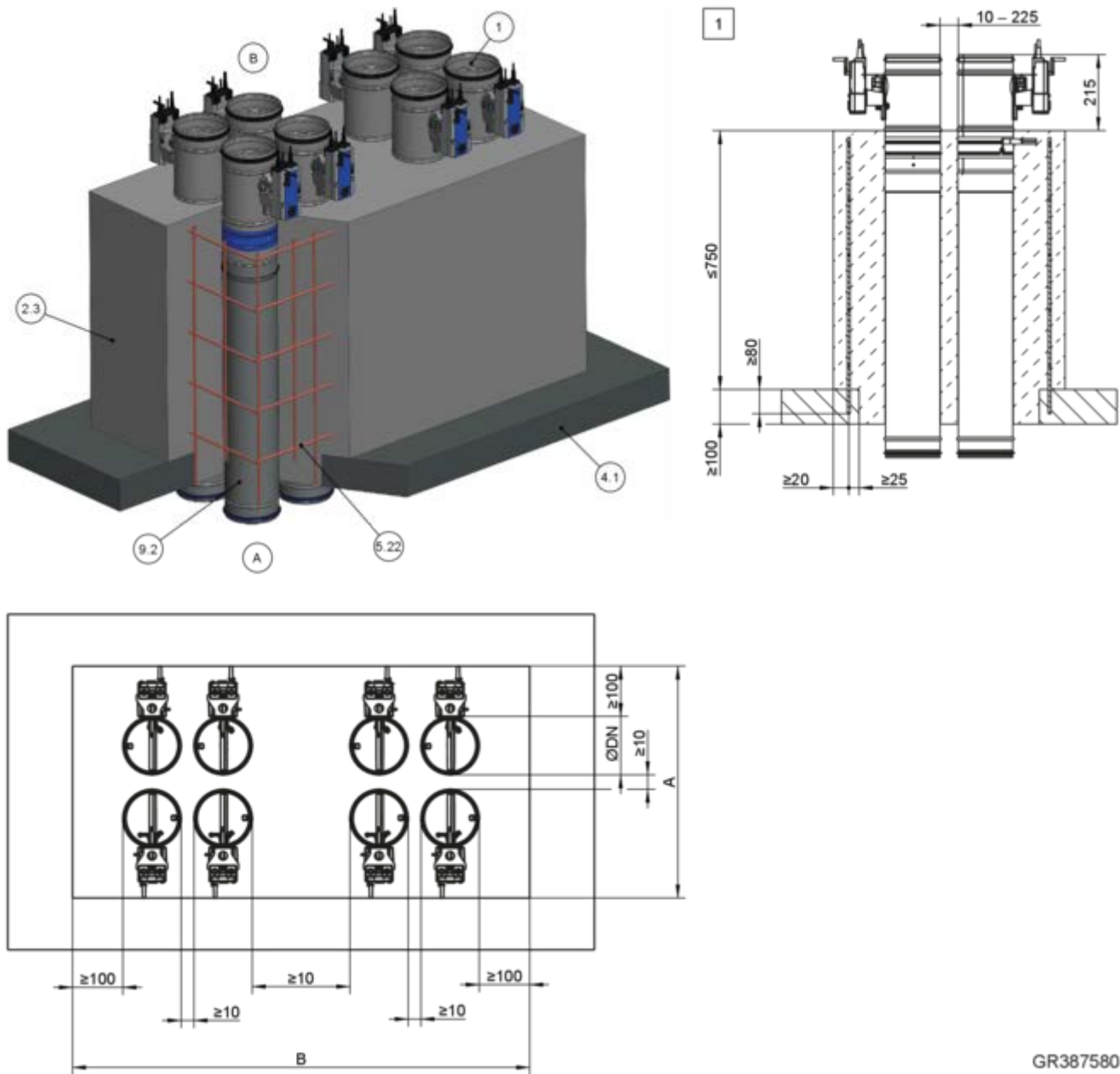
5.11.5 Mortar-based installation into a concrete base – multiple installation opening into one installation opening



GR4044836, A

Fig. 158: Mortar-based installation – multiple installation into one installation opening

- 1 FKRS-EU
- 2.1 Mortar
- 3.1 Solid wall (load-bearing structural element)



GR3875803, E

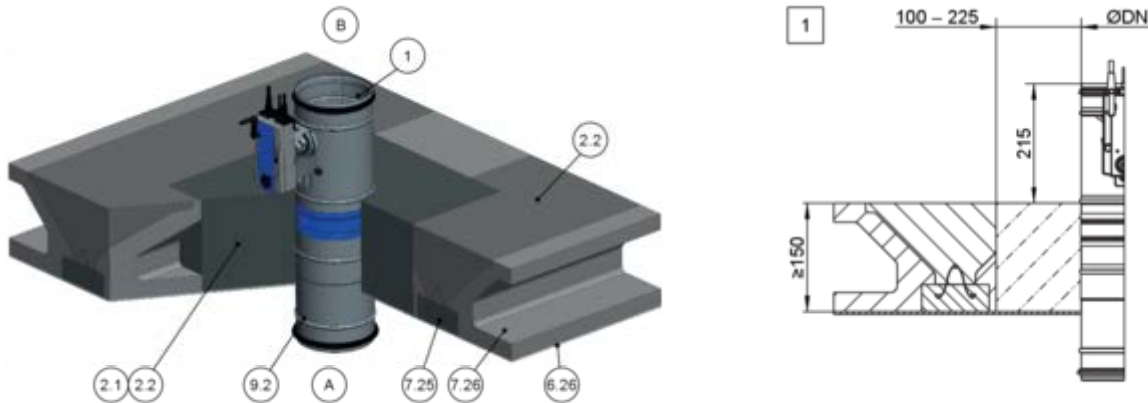
Fig. 159: Mortar-based installation with concrete base into a solid ceiling slab, upright, multiple installation

- | | |
|---|---|
| <p>1 FKRS-EU
 2.3 Concrete base
 4.1 Solid ceiling slab</p> | <p>5.22 Steel fabric, $\varnothing \geq 8$ mm, mesh aperture 150 mm, or equivalent, for number of fixing points see table ☞ 207
 9.2 Air duct/extension piece
 1 Up to EI 90 S</p> |
|---|---|

Additional requirements: mortar-based installation into a solid ceiling slab with concrete base – multiple installation into one installation opening

- Solid ceiling slab, ☞ on page 42
- Overall fire damper area ≤ 1.2 m²
- The number of fire dampers in an installation opening is limited by their size (nominal width) and the overall area of the fire dampers (1.2 m²) (maximum 10 FKRS-EU in single or double row arrangement)
- Distance to load-bearing structural elements ≥ 40 mm
- Minimum number of fixing points in the ceiling slab ☞ on page 207

5.11.6 Mortar-based installation in hollow concrete block ceiling



GR3874598, F

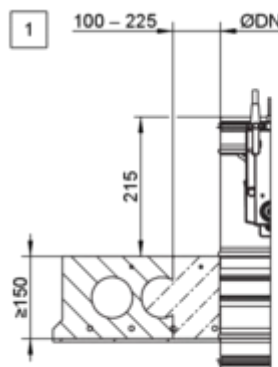
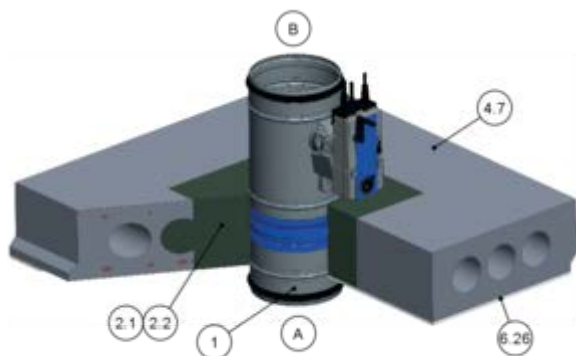
Fig. 160: Mortar-based installation in hollow block ceiling, drawn standing (also applies to suspended arrangement)

1	FKRS-EU	7.26	Hollow concrete block*
2.1	Mortar	9.2	Air duct/extension piece
2.2	Concrete	*	The illustration is an example; other ceiling constructions may be possible depending on make and local conditions
6.26	Cement plaster*		
7.25	Reinforced concrete beam*		
		1	Up to EI 90 S

Additional requirements: mortar-based installation into hollow concrete block ceilings

- Hollow concrete block ceiling, ↗ on page 42
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 45 mm distance between two fire dampers
- General installation information, ↗ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation, ↗ '**Mortar-based installation**' on page 34

5.11.7 Mortar-based installation in hollow core ceiling



GR3873370, C

Fig. 161: Mortar-based installation in hollow chamber ceiling, drawn standing (also applies to suspended arrangement)

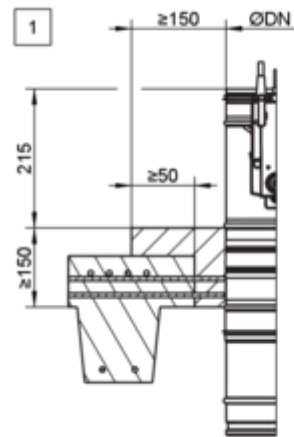
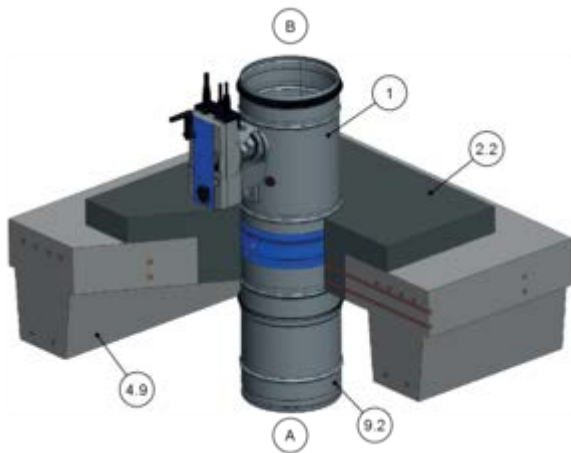
- 1 FKRS-EU
- 2.1 Mortar
- 2.2 Concrete
- 4.7 Reinforced hollow core slab*

- 6.26 Cement plaster*
- * The illustration is an example; other ceiling constructions may be possible depending on make and local conditions
- 1 Up to EI 90 S

Additional requirements: mortar-based installation into hollow core slabs

- Hollow core slab, ☞ on page 42
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 45 mm distance between two fire dampers
- General installation information, ☞ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation, ☞ '**Mortar-based installation**' on page 34
 - ▶ After the installation opening has been created, the adjacent cavities have to be partially (in relation to the depth) closed off around the perimeter by at least 100 mm.

5.11.8 Mortar-based installation in ribbed ceiling



GR3875133, C

Fig. 162: Mortar-based installation in ribbed ceiling

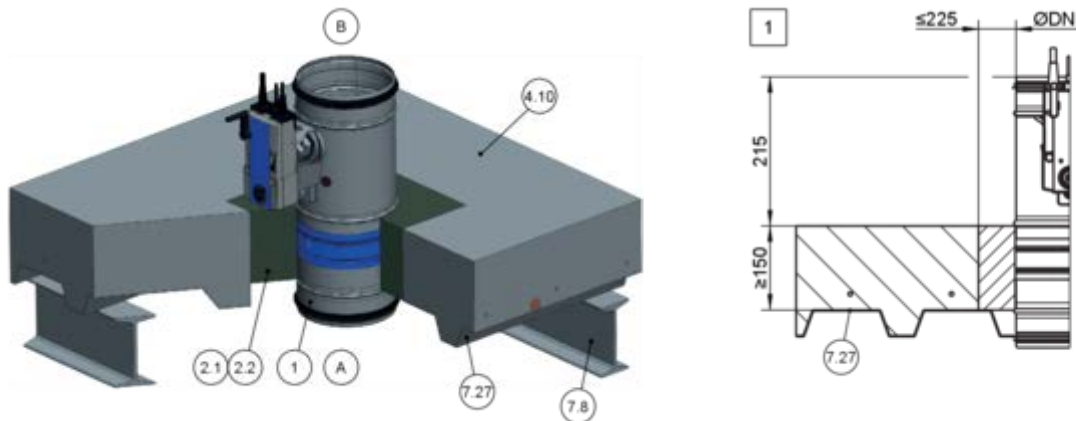
- 1 FKRS-EU
- 2.2 Concrete
- 4.9 Reinforced ribbed ceiling*

- 9.2 Air duct/extension piece
- * The illustration is an example; other ceiling constructions may be possible depending on make and local conditions
- 1 Up to EI 90 S

Additional requirements: mortar-based installation into ribbed ceilings

- Ribbed ceiling, ↗ on page 42
- Concrete bases with $H \leq 150$ mm do not require reinforcement
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 45 mm distance between two fire dampers
- General installation information, ↗ 5.3 'General installation information' on page 29 ff

5.11.9 Mortar-based installation in composite ceiling



GR3872387, C

Fig. 163: Mortar-based installation in composite ceiling

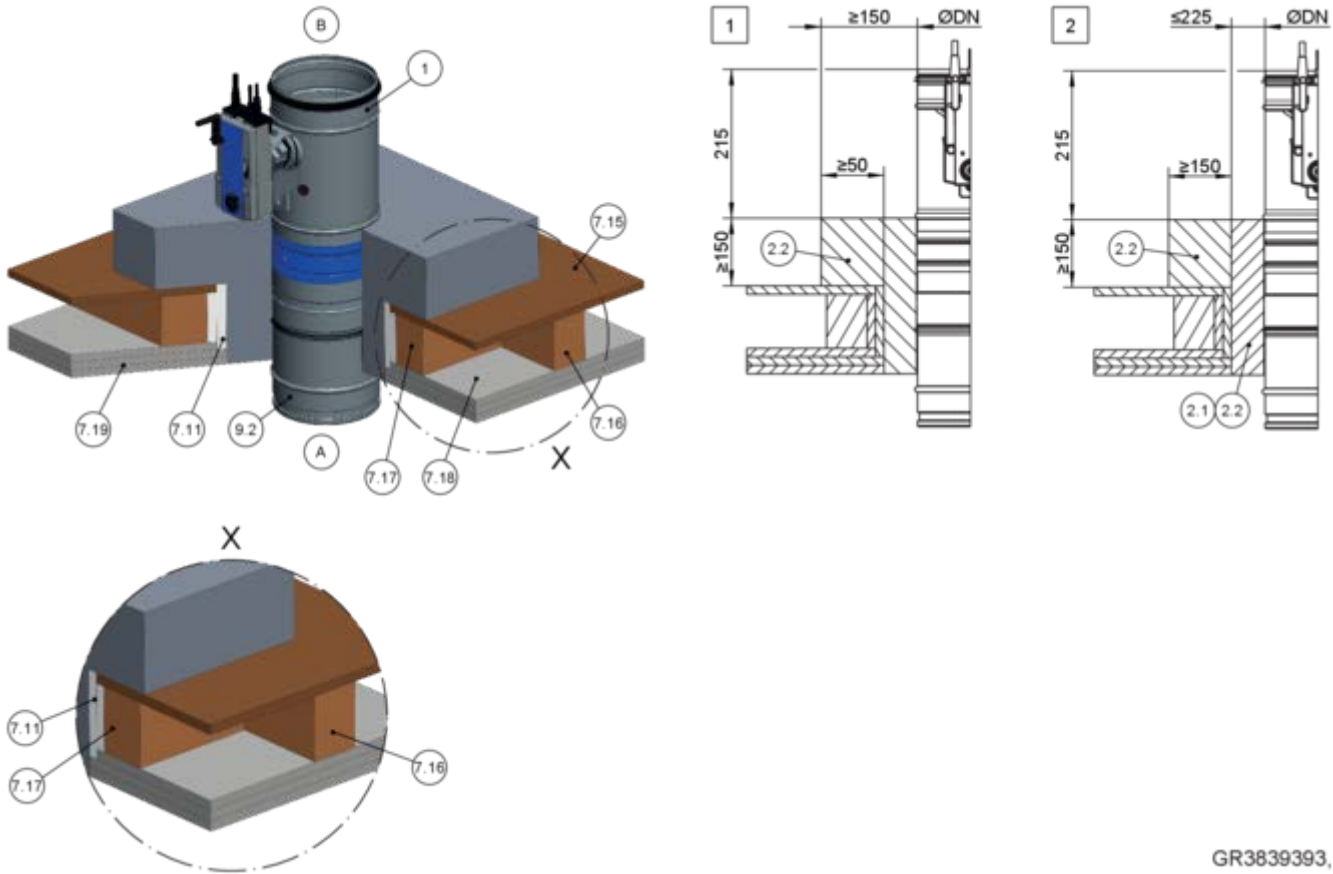
- 1 FKRS-EU
- 2.1 Mortar
- 2.2 Concrete
- 4.10 Reinforced composite ceiling*

- 7.8 Steel girder
- 7.27 Troughed sheet
- * The illustration is an example; other ceiling constructions may be possible depending on make and local conditions
- 1** Up to EI 90 S

Additional requirements: mortar-based installation into composite ceilings

- Composite ceiling, ↪ on page 42
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 45 mm distance between two fire dampers
- General installation information, ↪ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation, ↪ '**Mortar-based installation**' on page 34

5.11.10 Mortar-based installation in combination with wooden beam ceiling



GR3839393, A

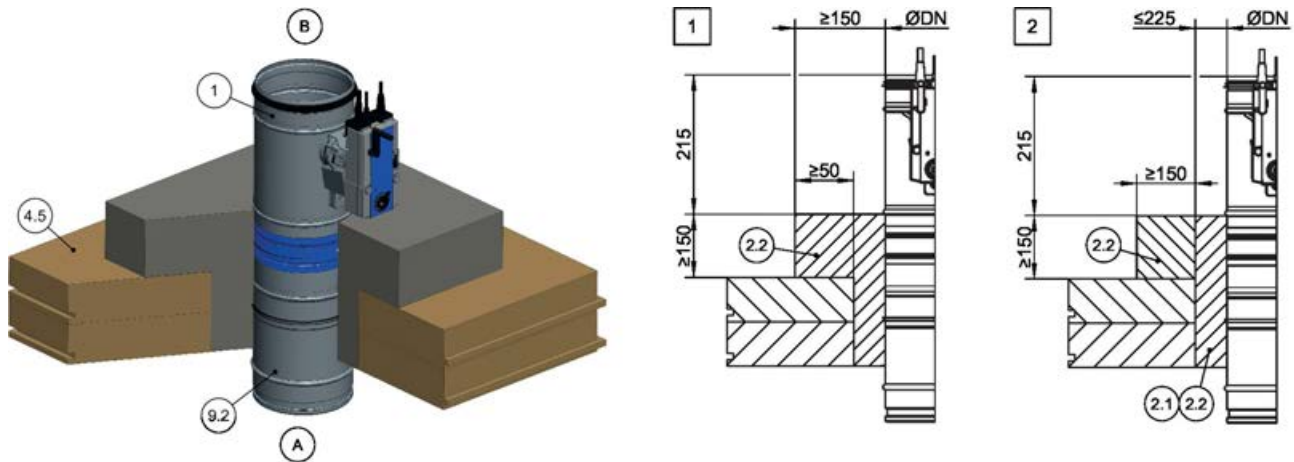
Fig. 164: Mortar-based installation in solid ceiling slab in combination with wooden beam/gluelam ceiling

1	FKRS-EU	7.17	Trimmers, wooden beam/gluelam
2.1	Mortar	7.18	Formwork
2.2	Reinforced concrete	7.19	Fire-resistant cladding (depending on ceiling)
7.11	Trim panel, same construction as 7.19	9.2	Air duct/extension piece
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 or gluelam ceilings

- Wooden beam ceiling, ↪ on page 42
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 45 mm distance between two fire dampers

5.11.11 Mortar-based installation in combination with solid wood ceiling




GR3872049, A

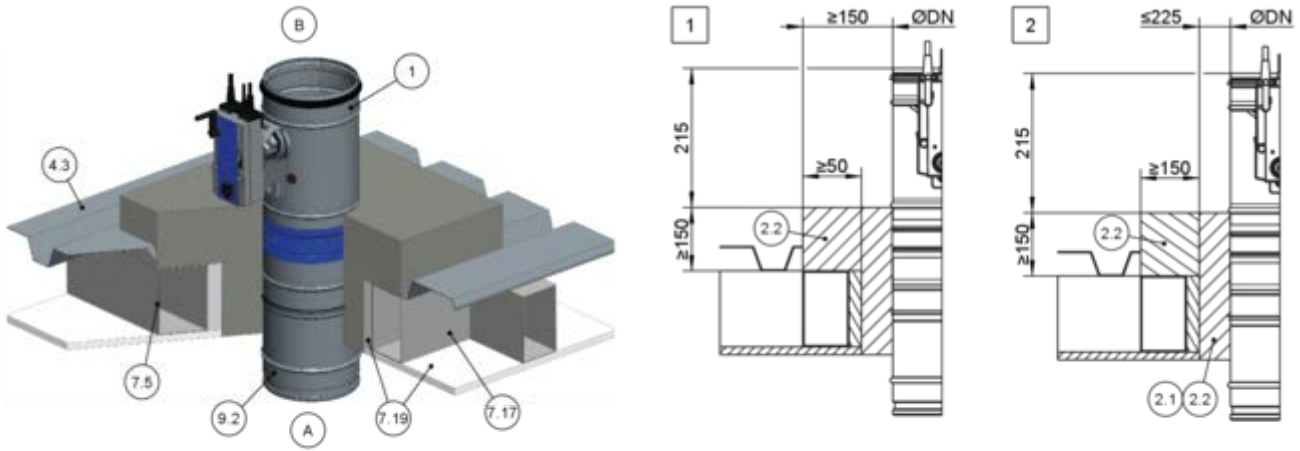
Fig. 165: Mortar-based installation in solid ceiling slab in combination with solid wood ceiling

1	FKRS-EU	4.5	Solid wood ceiling
2.1	Mortar	9.2	Extension piece/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,  on page 42
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 45 mm distance between two fire dampers

5.11.12 Mortar-based installation in combination with a lightweight ceiling (Cadolto system)



GR3872190, A

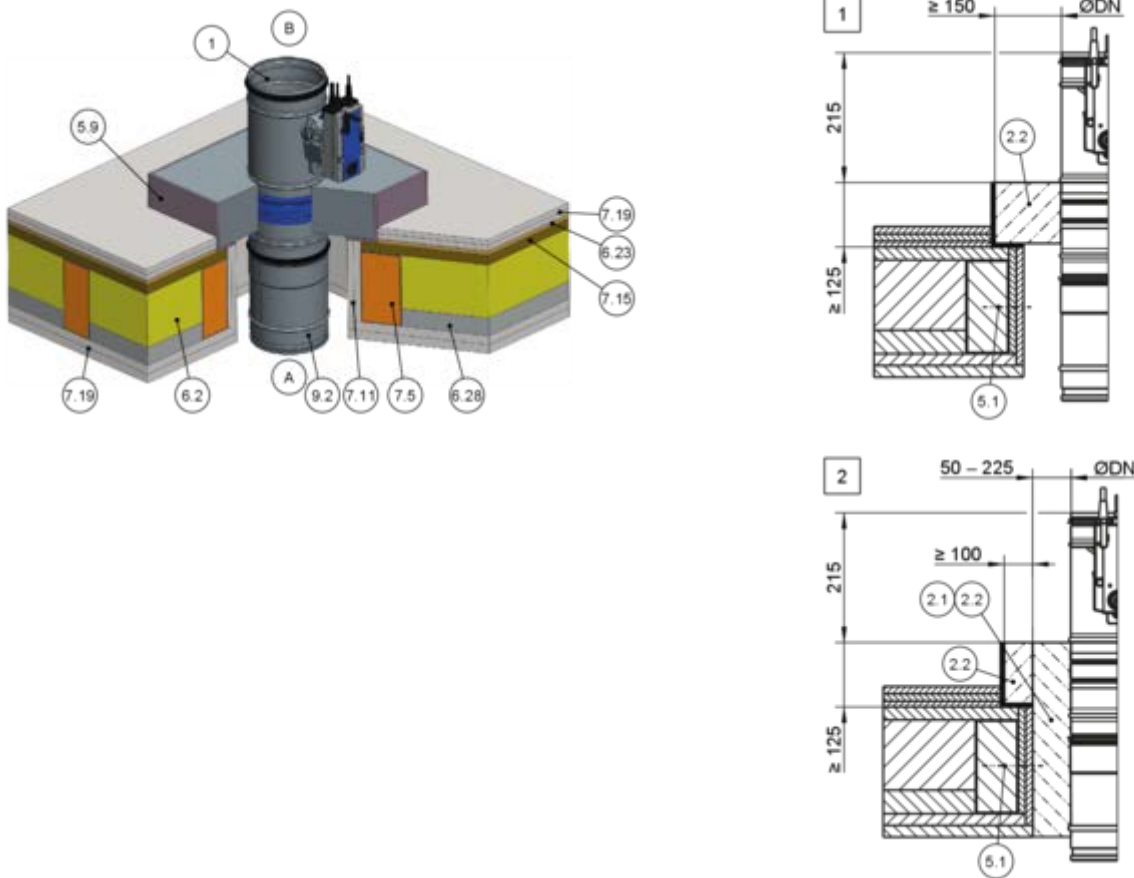
Fig. 166: Mortar-based installation into a solid ceiling slab in conjunction with a lightweight ceiling (Cadolto system)

1	FKRS-EU	7.17	Trimmers, steel support structure
2.1	Mortar	7.19	Fire-resistant cladding
2.2	Reinforced concrete	9.2	Air duct/extension piece
4.3	Modular ceiling (Cadolto system), installation according to manufacturer's instructions and general appraisal certificate	1 2	Up to EI 120 S
7.5	Steel support structure		

Supplementary requirements: mortar-based installation in solid ceiling slabs in combination with lightweight ceiling (Cadolto system)

- Modular ceiling, (Cadolto system), ↗ on page 43
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 45 mm distance between two fire dampers

5.11.13 Mortar-based installation in combination with lightweight ceiling (ADK Modulraum system)



GR3883977, D

Fig. 167: Mortar-based installation in solid ceiling slab in combination with lightweight ceiling (ADK Modulraum system)

1	FKRS-EU	6.28	Counter position
2.1	Mortar	7.5	Steel section with mineral wool filling
2.2	Concrete (reinforcement according to structural requirements)	7.11	Trim panel, double layer, fire-resistant
5.1	Dry wall screw, min. 10 mm into steel section	7.15	Wood-based panel/wood plank
5.9	Aluminium bracket $\geq 130 \times 80 \times 6$ mm	7.19	Fire-resistant cladding
6.2	Mineral wool, A1, ≥ 1000 °C, 140 mm thick	9.2	Air duct/extension piece
6.23	Footfall sound insulation	1 2	Up to EI 90 S

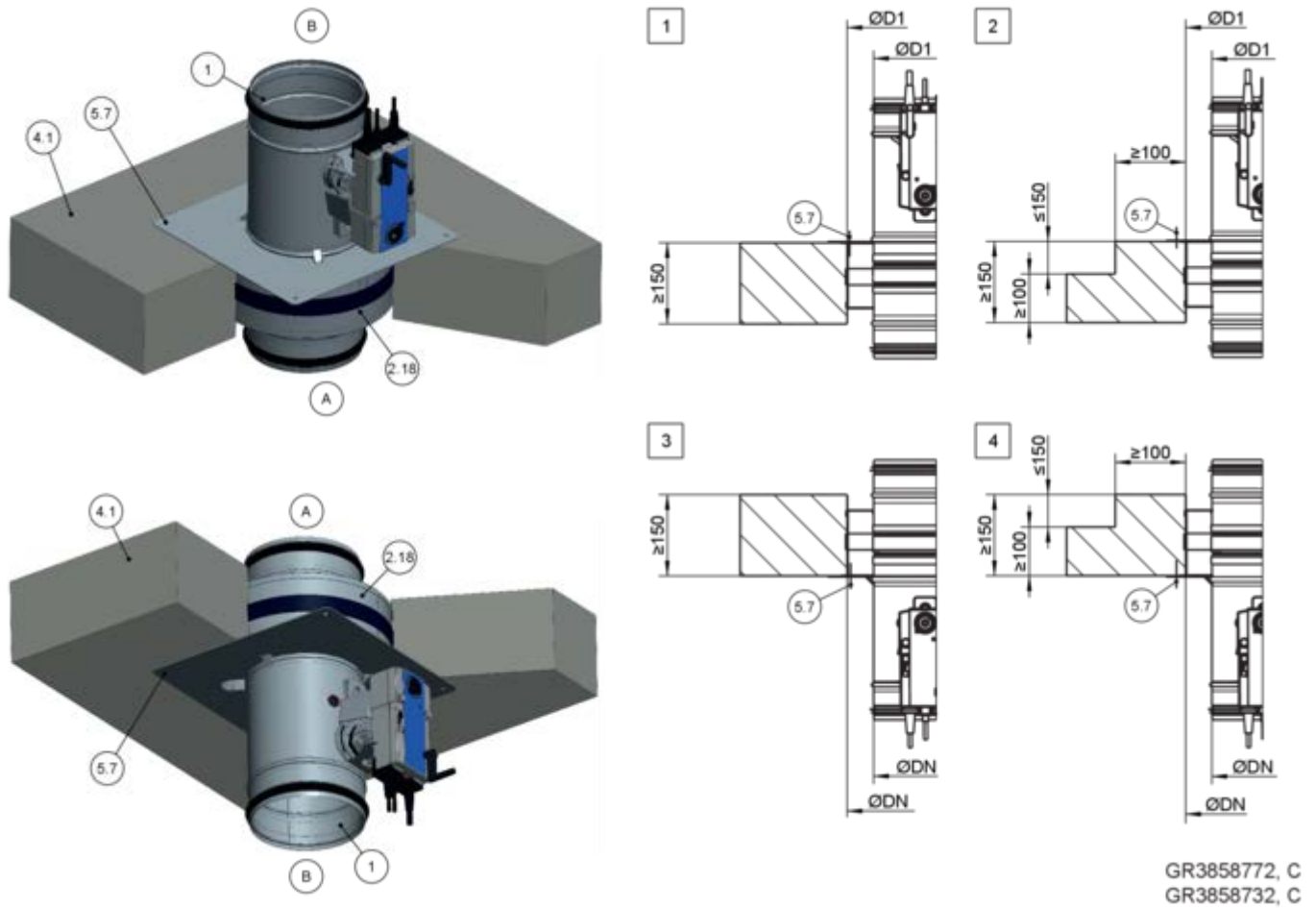
Note on lightweight ceiling: Ceiling construction according to ADK module room specifications.

Solid ceiling slabs > Mortar-based installation in combination with ...

Additional requirements: mortar-based installation into solid ceiling slabs in conjunction with light-weight ceilings (ADK Modulraum system)

- Modular ceiling (ADK Modulraum system),
↳ on page 43
 - ≥ 40 mm distance between the fire damper and load-bearing components
 - ≥ 45 mm distance between two fire dampers
1. ▶ Make a square installation opening (connection of the steel sections in the ceiling's own type of construction) with trim panels (executed as 7.19).
 2. ▶ Leave out impact sound insulation (6.23) and fire protection cladding (7.19) and screw angle bracket to the steel section.
 3. ▶ Set fire damper in concrete [1] or pour concrete base [2] and then mortar the gap between fire damper and concrete base. Provide reinforcement according to structural requirements.

5.11.14 Dry mortarless installation in solid ceiling slab with installation block ER



GR3858772, C
GR3858732, C

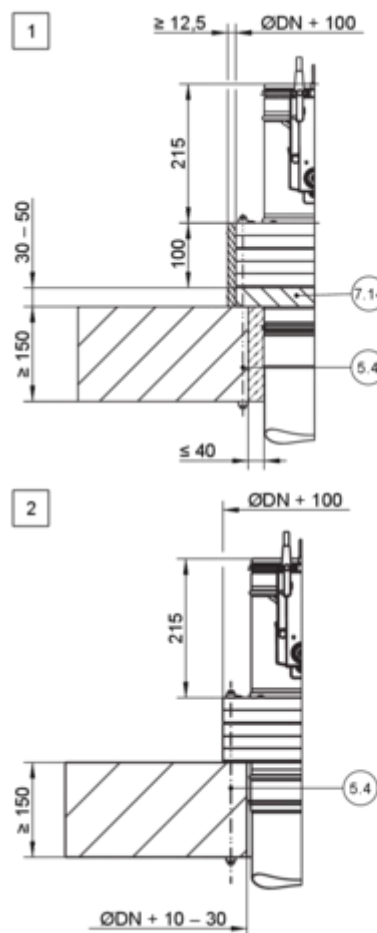
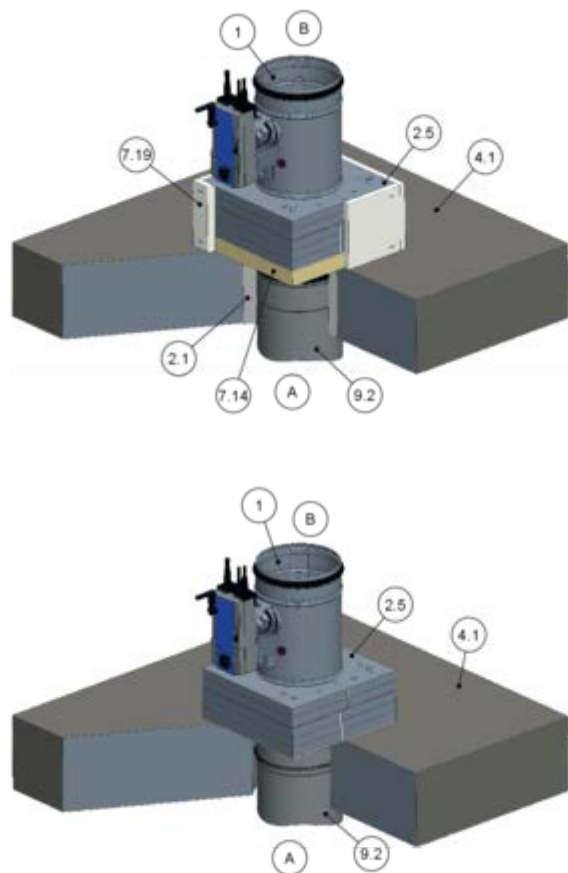
Fig. 168: Dry mortarless installation with installation block ER in solid ceiling slab, upright and suspended

- | | | | |
|------|--|---------------------|--|
| 1 | FKRS-EU | 5.7 | 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 ceiling slab, ↪ on page 42
 - Installation block ER, ↪ 5.4.2 'Installation block ER' on page 45
 - ≥ 75 mm distance between installation block and load-bearing structural elements
 - ≥ 200 mm distance between two installation blocks
 - General installation information, ↪ 5.3 'General installation information' on page 29 ff
 - General information on installation with installation block ER, ↪ on page 35
1. ▶ Create an appropriate installation opening by means of a cut hole $\varnothing D1$, ↪ 5.4.2 'Installation block ER' on page 45
 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 wall plugs with building inspectorate approval that have been adapted to the respective building material must be used.

5.11.15 Dry mortarless installation onto a solid ceiling slab with installation kit WA2



GR3954216, A

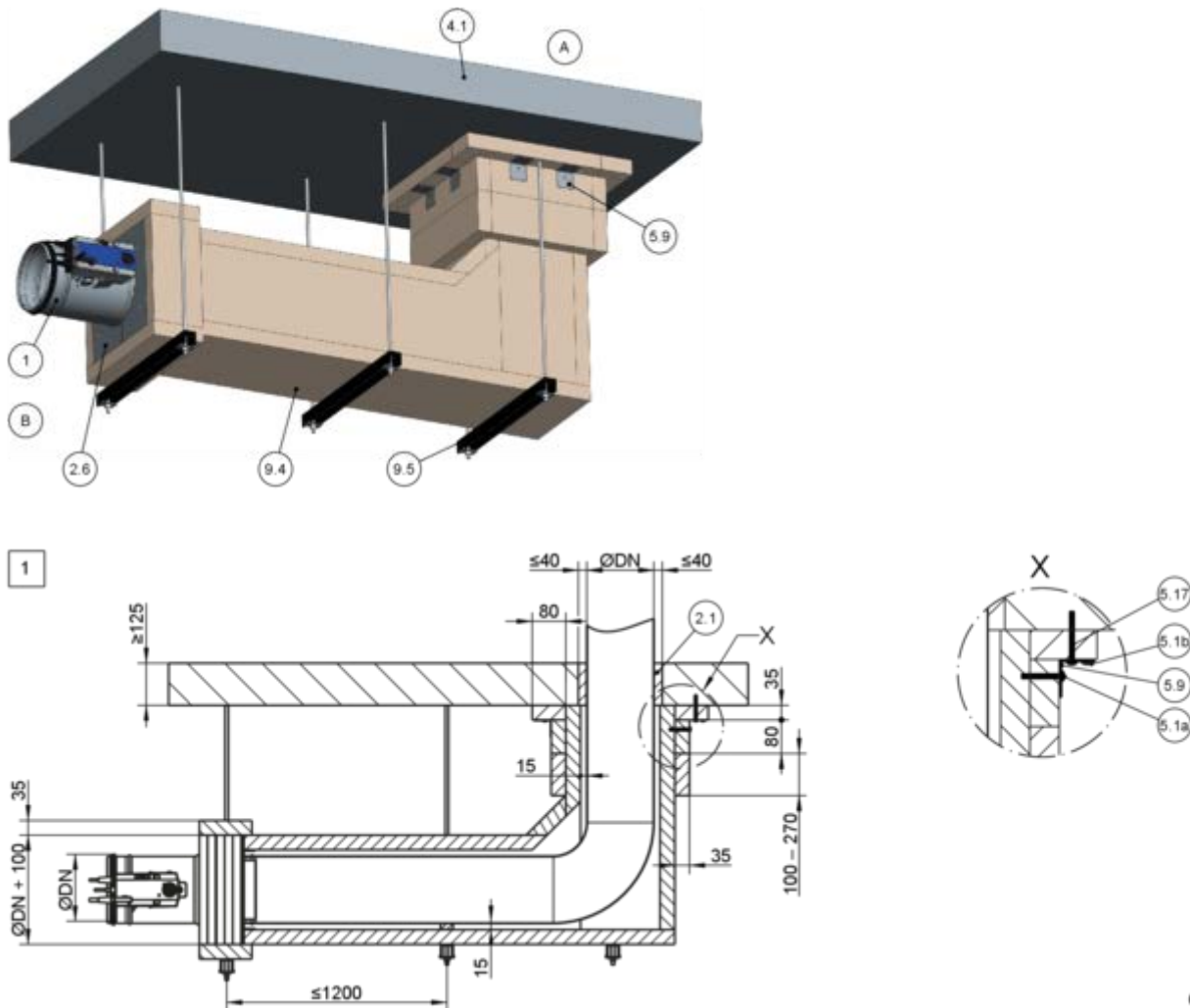
Fig. 169: Dry mortarless installation into a solid ceiling slab with installation kit WA2, illustration shows upright installation (applies also to suspended installation)

1	FKRS-EU	7.14	Reinforcing board, calcium silicate, thickness = 30 – 50 mm or mineral wool, $\geq 1000\text{ }^{\circ}\text{C}$, $\geq 140\text{ kg/m}^3$, thickness = 50 mm
2.1	Mortar	7.19	Fire-resistant cladding (fire-rated plasterboard panel, thickness $\geq 12.5\text{ mm}$)
2.5	Installation kit WA2	9.2	Extension piece/duct with 1 , shortened, flush with the ceiling
4.1	Solid ceiling slab	1	Up to EI 90 S
5.4	Threaded rod as push through installation with washers and nuts or wall plug with fire safety suitability certificate	2	Up to EI 60 S

Additional requirements: Dry mortarless installation with installation kit WA2 on solid walls

- Solid ceiling slab, ↪ on page 42
 - Installation kit WA2, ↪ 5.4.4 'Installation kit WA2' on page 47
 - ≥ 75 mm distance between the fire damper and load-bearing components
 - ≥ 200 mm distance between two fire dampers
 - General installation information, ↪ 5.3 'General installation information' on page 29 ff
 - General information on installation with installation kit WA2, ↪ on page 35
1. ▶ **1**: Shorten the mortared-in air duct flush with the ceiling, create a reinforcing board (7.14) and compensate for wall unevenness.
2: Make a cut hole with nominal width + 10 – 30 mm and compensate wall unevenness.
 2. ▶ The fire damper with installation kit WA2 is fixed to the ceiling with four threaded rods (M8 or M10) by means of push-through mounting. Fixing by means of four wall plugs (M8) with fire safety suitability certificate, matched to the respective building material, is permissible, provided that all prevailing conditions of the wall plug proof are observed.
1: Fire protection cladding (7.19) with the installation kit WA2 at a distance of ≤ 100 mm.

5.11.16 Dry mortarless installation remote from solid ceiling slabs, with installation kit WE2

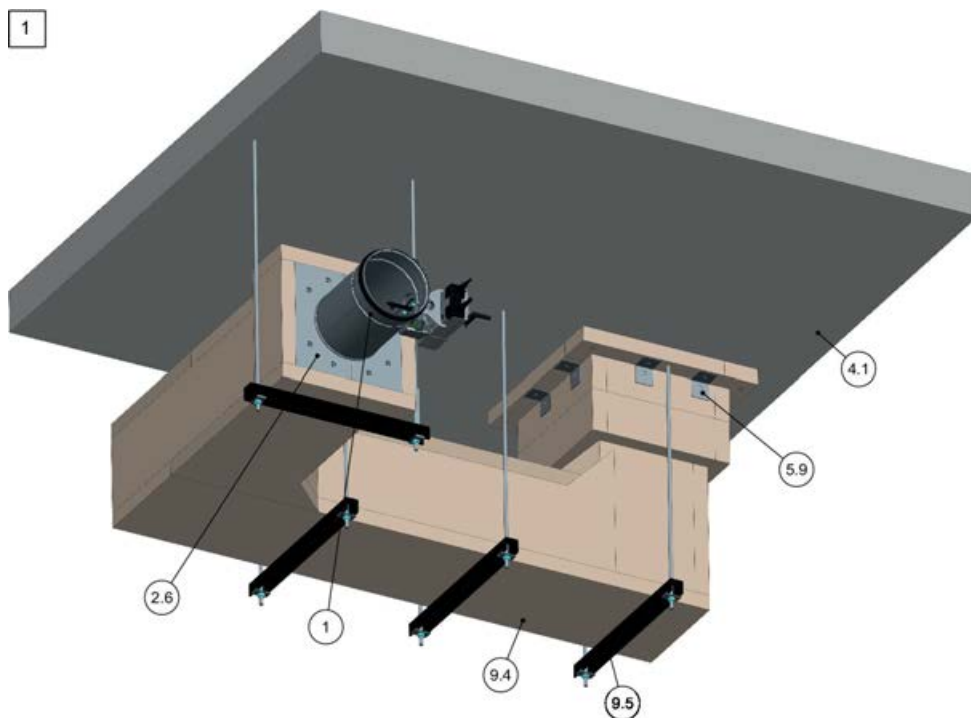


GR3860241, D

Fig. 170: Dry mortarless installation remote from solid ceiling slabs, with installation kit WE2

- | | |
|--|---|
| <p>1 FKRS-EU
 2.1 Mortar
 2.6 Installation kit WE2
 4.1 Solid ceiling slab
 5.1a Dry wall screw, 4 × 50 mm
 5.1b Dry wall screw, 4 × 30 mm
 5.9 Angle steel circumferential or steel angle
 40 × 40 × 1.5 mm (distance ≤ 150 mm)
 5.17 Anchor bolt Hilti® HUS-6 Ø 6 mm × 80 mm
 As an alternative, equivalent fire-rated anchor bolts (supplied by the customer) with suitability certificate that are suitable for the wall or ceiling can also be used; push through installation is also possible</p> | <p>9.4 Sheet steel duct with fire-rated cladding
 The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer
 9.5 Suspension system (by others) consisting of:
 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> |
|--|---|

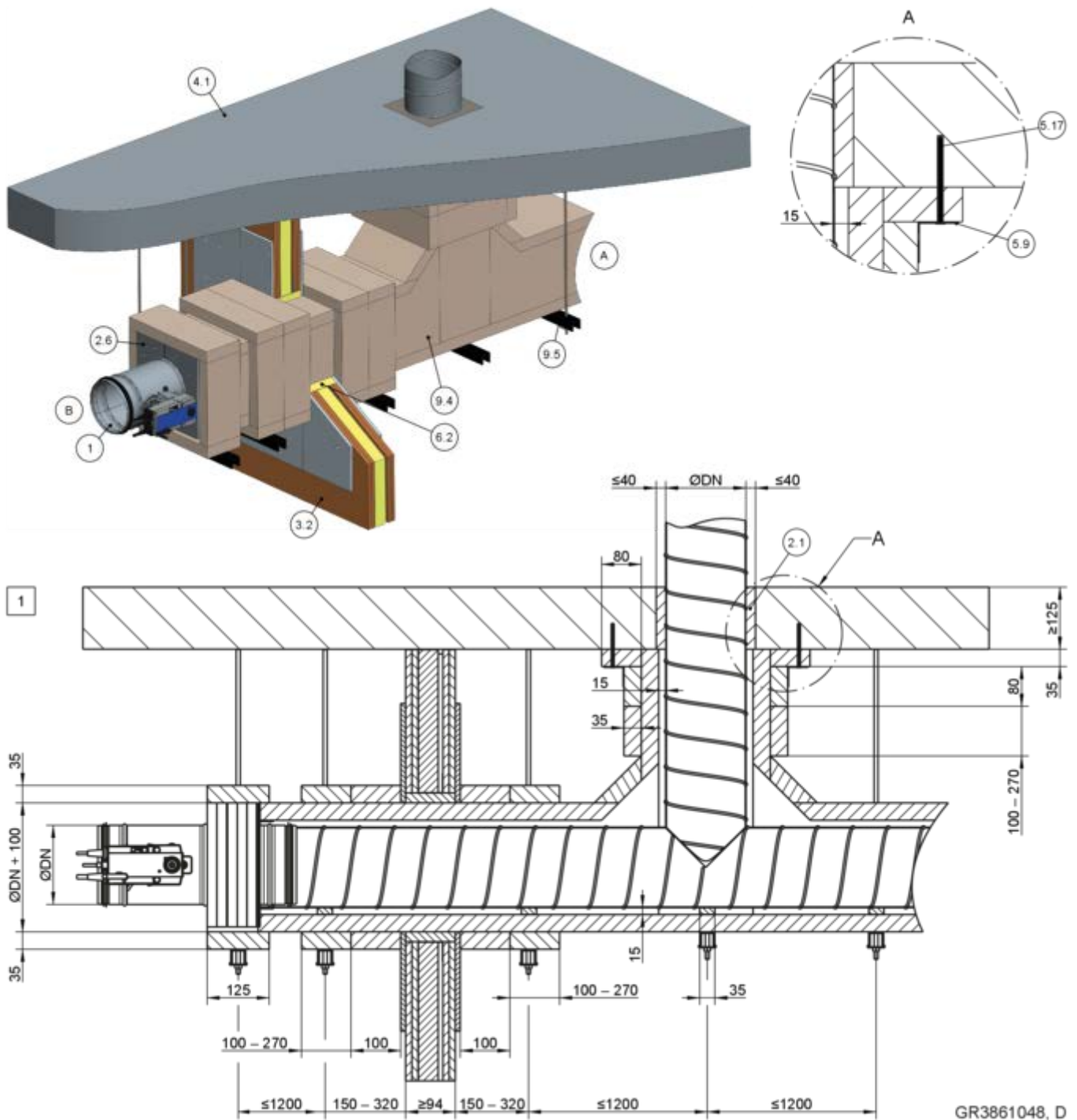
Solid ceiling slabs > Dry mortarless installation remote from solid ...



GR3860984 B

Fig. 171: Dry mortarless installation remote from solid ceiling slabs, with installation kit WE2

- | | |
|---|---|
| <p>1 FKRS-EU</p> <p>2.6 Installation kit WE2</p> <p>4.1 Solid ceiling slab</p> <p>5.9 Angle steel circumferential or steel angle
40 × 40 × 1.5 mm (distance ≤ 150 mm)</p> <p>9.4 Sheet steel duct with fire-rated cladding
The cladding of the air duct and the suspensions
are carried out in accordance with these instruc-
tions, the additional assembly instructions for the
installation kit WE2 and the specifications of the
panel manufacturer</p> <p>9.5 Suspension system (by others) consisting of:</p> | <p>a Threaded rod M10</p> <p>b Hilti® mounting rail MQ 41 × 3 mm or equivalent</p> <p>c Hilti® drilled plate MQZ L13 or equivalent</p> <p>d Hexagon nut M10 with washer</p> <p>1 Up to EI 90 S</p> |
|---|---|

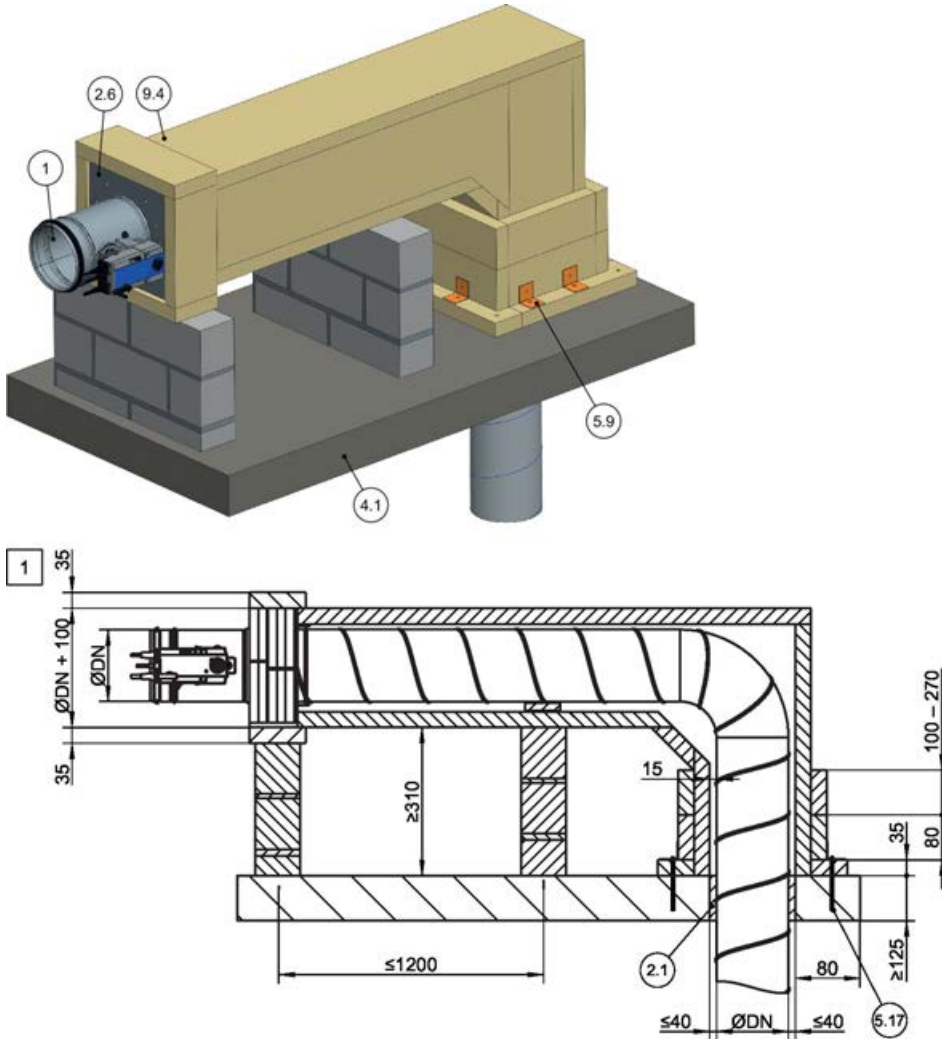


GR3861048, D

Fig. 172: Dry mortarless installation remote from solid ceiling slabs, with installation kit WE2

- | | | | |
|------|---|-----|---|
| 1 | FKRS-EU | 9.4 | Sheet steel duct with fire-rated cladding
The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer |
| 2.1 | Mortar | 9.5 | Suspension system (by others) consisting of: |
| 2.6 | Installation kit WE2 | a | Threaded rod M10 |
| 3.2 | Lightweight partition wall with metal support structure or steel support structure, cladding on both sides or solid wall (if present) | b | Hilti® mounting rail MQ 41 × 3 mm or equivalent |
| 4.1 | Solid ceiling slab | c | Hilti® drilled plate MQZ L13 or equivalent |
| 5.9 | Angle steel circumferential or steel angle
40 × 40 × 1.5 mm (distance ≤ 150 mm) | d | Hexagon nut M10 with washer |
| 5.17 | Anchor bolt Hilti® HUS-6 Ø 6 mm × 80 mm | 1 | Up to EI 90 S |

As an alternative, equivalent fire-rated anchor bolts (supplied by the customer) with suitability certificate that are suitable for the wall or ceiling can also be used; push through installation is also possible



GR3889465, E

Fig. 173: Dry mortarless installation remote from solid ceiling slabs, with installation kit WE2

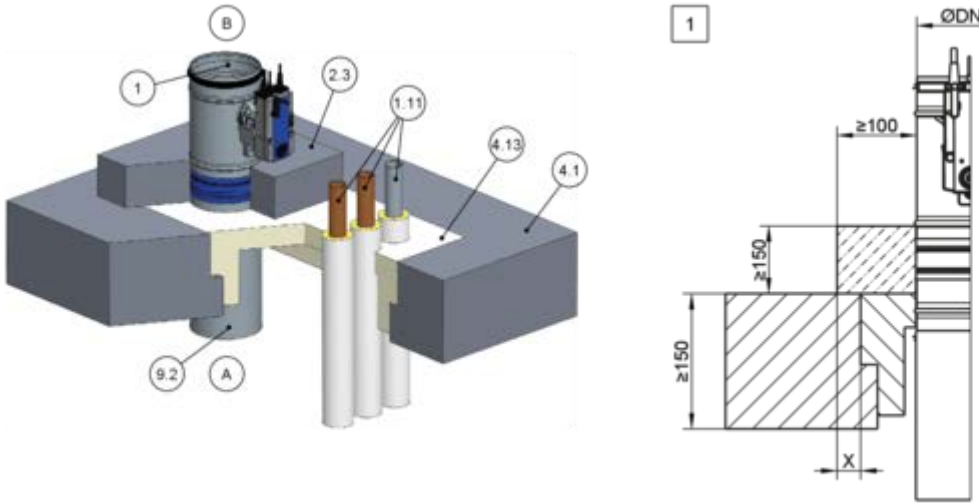
- | | |
|--|---|
| <p>1 FKRS-EU</p> <p>2.1 Mortar</p> <p>2.6 Installation kit WE2</p> <p>4.1 Solid ceiling slab</p> | <p>5.9 Angle steel circumferential or steel angle
40 × 40 × 1.5 mm (distance ≤ 150 mm)</p> <p>5.17 Anchor bolt Hilti® HUS-6 Ø 6 mm × 80 mm
As an alternative, equivalent fire-rated anchor bolts (supplied by the customer) with suitability certificate that are suitable for the wall or ceiling can also be used; push through installation is also possible</p> <p>9.4 Sheet steel duct with fire-rated cladding
The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer</p> <p>1 Up to EI 90 S</p> |
|--|---|

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

- Solid ceiling slabs without open spaces, made of concrete or aerated concrete, gross density ≥ 450 kg/m³
- Installation kit WE2, ↗ 5.4.5 'Installation kit WE 2' on page 48
- ≥ 130 mm distance between the fire damper and adjacent structural elements
- ≥ 260 mm distance between two fire dampers
- General installation information, ↗ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit WE2, ↗ on page 35

Note: For more installation details and for components to be provided by the customer, see the additional WE2 installation manual.

5.11.17 Dry mortarless installation in solid ceiling slab with a FireShield®



GR3944251, A

Fig. 174: Dry mortarless installation in solid ceiling slab with a FireShield®

1	FKRS-EU	9.2	Air duct/extension piece
2.3	Reinforced concrete base	11.1	Pipe collar or other penetrations according to local conditions
4.1	Solid ceiling slab	X	Overhang X at least on two sides
4.13	FireShield®	1	Up to EI 90 S

Additional requirements: dry mortarless installation in solid ceiling slabs with a FireShield®

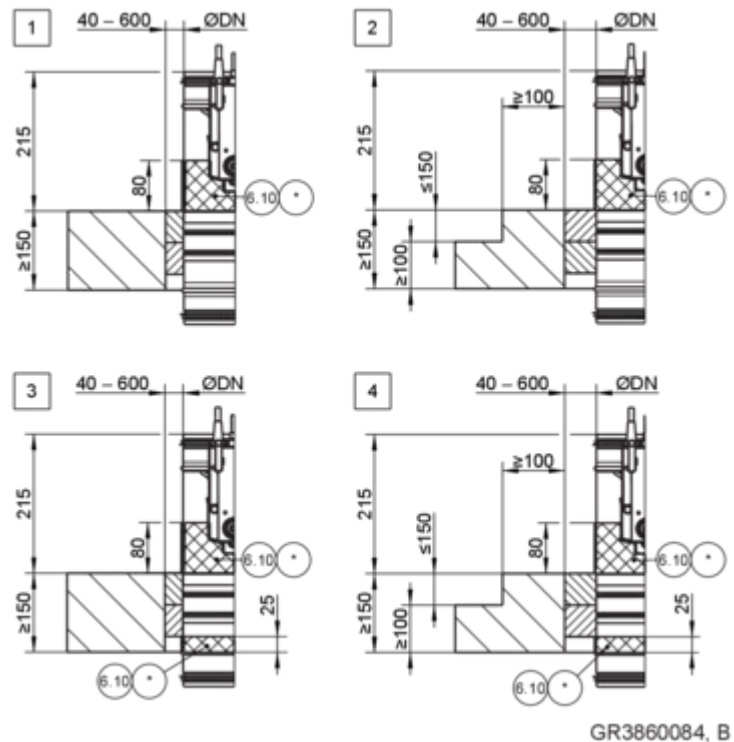
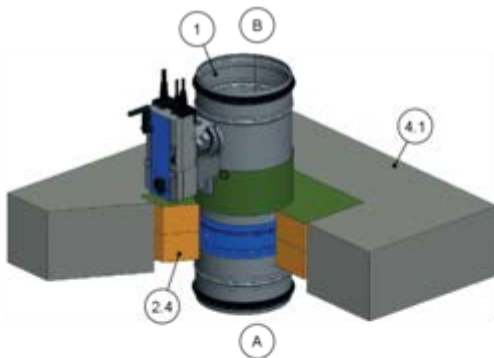
- FireShield®, ↗ on page 42
 - Solid ceiling slab, ↗ on page 42
 - ≥ 100 mm distance between the fire damper and adjacent structural elements
 - ≥ 200 mm distance between two fire dampers in separate installation openings
 - Other penetrations outside the concrete base
 - General installation information, ↗ 5.3 'General installation information' on page 29 ff
1. ▶ Create an installation opening with nominal width + 10 – 40 mm.
 2. ▶ Centred installation of the fire damper in the concrete base with reinforcement.

For installation in Germany, please note:

Use in FireShield with a combined penetration seal requires individual type-approval.

5.11.18 Dry mortarless installation with fire batt

Dry mortarless installation into a solid ceiling slab, with a fire batt, upright



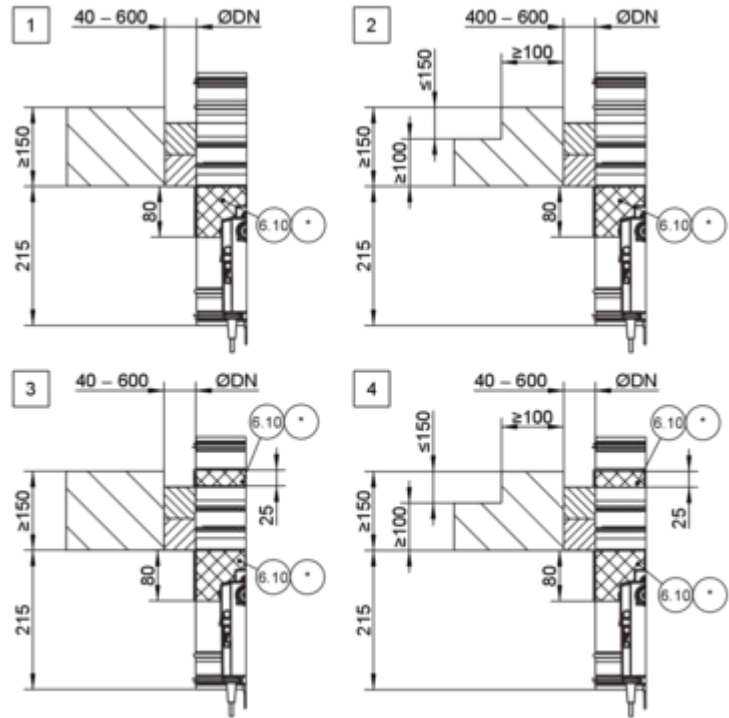
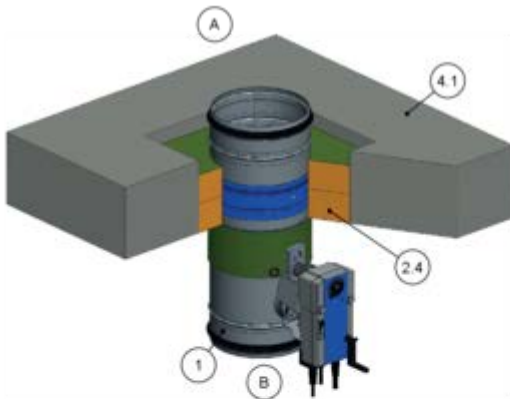
GR3860084, B

Fig. 175: Dry mortarless installation into a solid ceiling slab, with a fire batt, upright

- | | | | |
|------|--|---------------------|---|
| 1 | FKRS-EU | 6.20 | Pipe collar (to be ordered separately) |
| 2.4 | Coated board system | 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
↳ 'Additional provision for use in Germany:' on page 8 . |
| 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/m³, thickness = 20 mm, panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible | 1 – 4 | See table ↳ 229 |

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
100 – 315	EI 120 S	x	x	3 , 4

Dry mortarless installation into a solid ceiling slab, with a fire batt, suspended



GR3858963, C

Fig. 176: Dry mortarless installation into a solid ceiling slab, with a fire batt, suspended

- | | | | |
|------|---|---------------------|--|
| 1 | FKRS-EU | 6.20 | Pipe collar (to be ordered separately) |
| 2.4 | Coated board system | 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
☞ 'Additional provision for use in Germany:'
on page 8 . |
| 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 | 1 – 4 | See table ☞ 229 |

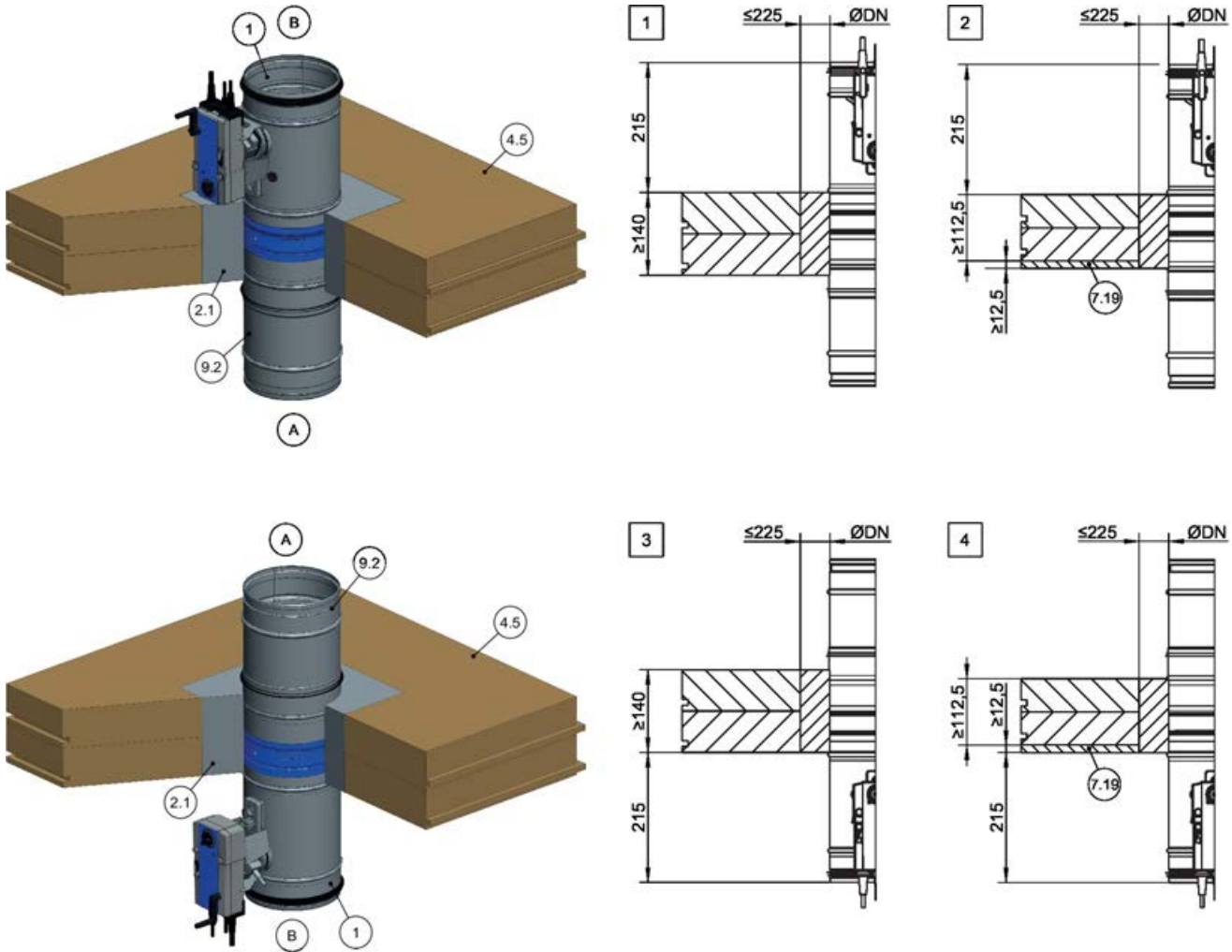
Solid ceiling slab				
NW [mm]	Fire resistance properties to	Coating		Detail
		Installation side A	Operating side B	
100 – 315	EI 90 S	–	x	1 , 2
100 – 315	EI 120 S	x	x	3 , 4

Additional requirements: dry mortarless installation into solid ceiling slabs, with a fire batt

- Solid ceiling slab,
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Fire batt systems, installation details, distances/dimensions, ↪ *on page 36*
- Suspension and fixing, ↪ *Chapter 5.15 'Fixing the fire damper' on page 242*
- General installation information, ↪ *5.3 'General installation information' on page 29 ff*
- General information on installation with fire batt, ↪ *on page 36*

5.12 Solid wood ceilings

5.12.1 Mortar-based installation into a solid wood ceiling, suspended or upright



GR3856726, A
GR3856732, A

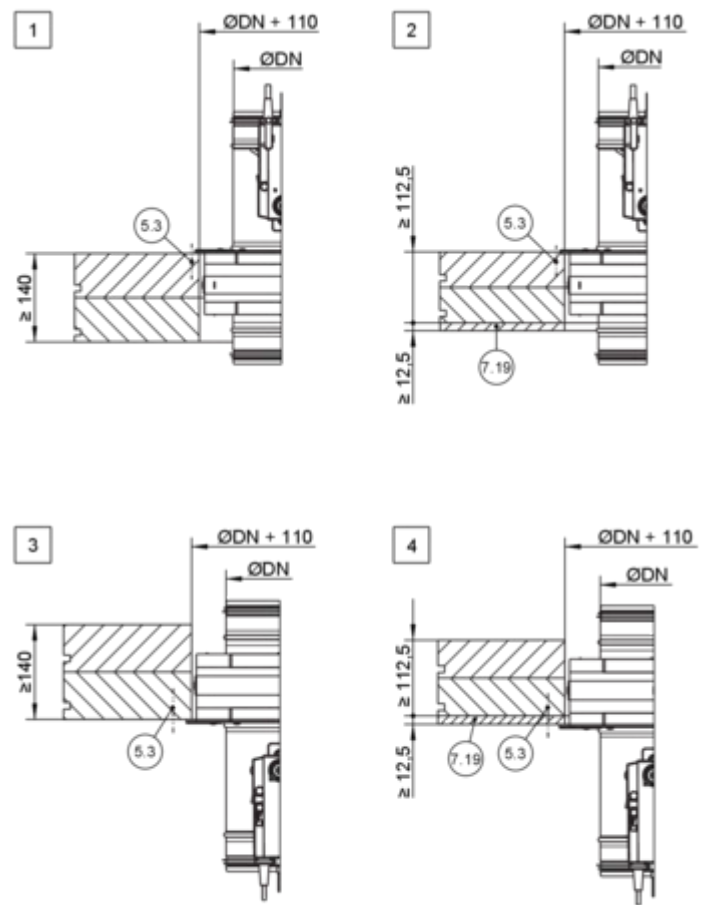
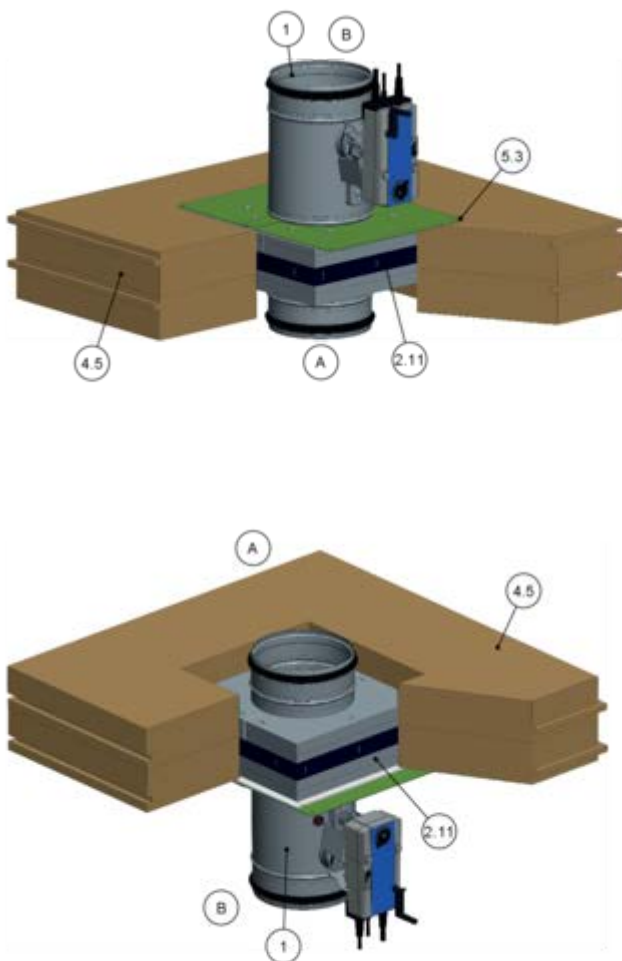
Fig. 177: Mortar-based installation into a solid wood ceiling, suspended or upright

1	FKRS-EU	7.19	Fire-resistant cladding
2.1	Mortar	9.2	Extension piece/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, ↪ on page 42
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↪ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation, ↪ 'Mortar-based installation' on page 34

5.12.2 Dry mortarless installation with installation kit TQ2 into solid wood ceiling, upright and suspended



GR3856995, C
GR3857139, C

Fig. 178: Dry mortarless installation with installation kit TQ2 into solid wood ceiling, upright and suspended

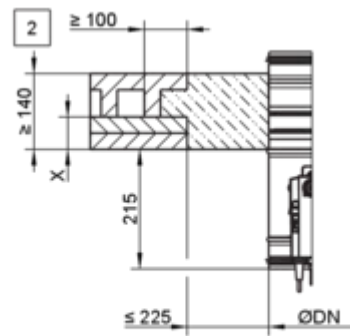
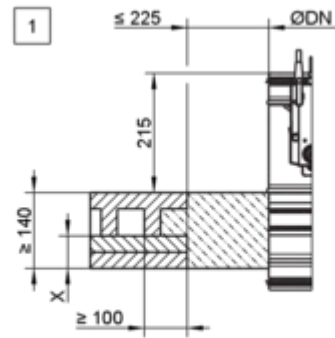
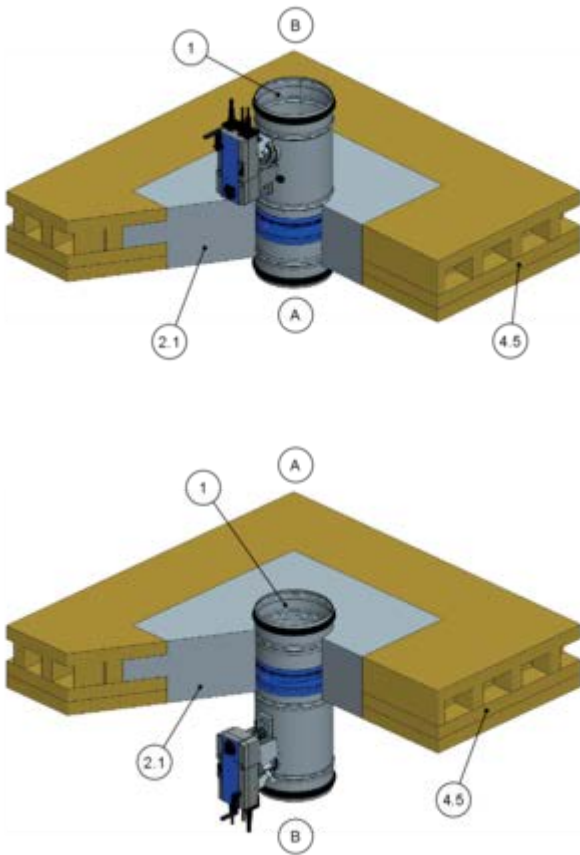
- | | | | |
|------|---------------------------------------|-------|---------------------------|
| 1 | FKRS-EU | 5.3 | Wood screw min. 5 × 70 mm |
| 2.11 | Installation kit TQ2 with cover plate | 7.19 | Fire-resistant cladding |
| 4.5 | Solid wood ceiling | 1 – 4 | Up to EI 90 S |

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

- Solid wood ceiling, ☞ on page 42
- Installation kit TQ2, ☞ 5.4.3 'Installation kit TQ2' on page 46
- ≥ 55 mm distance from the fire damper to load-bearing structural elements (with shortened orifice plate)
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ☞ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit TQ2, ☞ on page 35

5.13 Wooden panel elements

5.13.1 Mortar-based installation into wooden panel element, upright or suspended



GR4051092, A
GR4051098, A

Fig. 179: Mortar-based installation into wooden panel element, upright or suspended

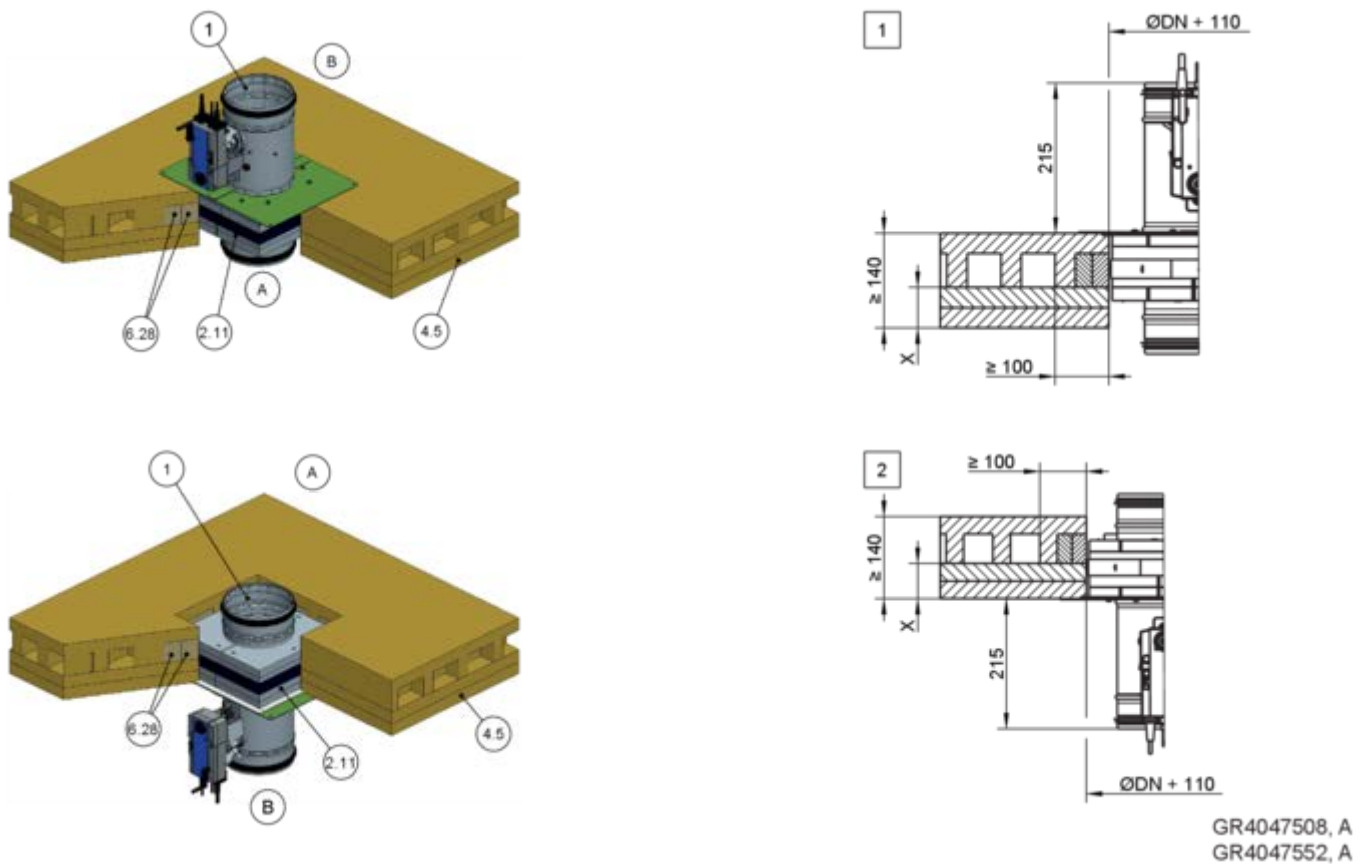
- 1 FKRS-EU
- 2.1 Mortar
- 4.5 Wooden panel element

- X Ceiling thickness according to the desired fire resistance duration, as well as the selected ceiling system and the specifications of the ceiling manufacturer
- 1 Up to EI 90 S

Additional requirements: mortar-based installation into wooden panel element

- Wooden panel element ↪ on page 42
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↪ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation, ↪ 'Mortar-based installation' on page 34

5.13.2 Dry mortarless installation into wooden panel element with installation kit TQ2, upright and suspended



GR4047508, A
GR4047552, A

Fig. 180: Dry mortarless installation into wooden panel element with installation kit TQ2, upright and suspended

- | | | | |
|------|---------------------------------------|------|--|
| 1 | FKRS-EU | 6.28 | Ceiling filling (layers of boards or beams) |
| 2.11 | Installation kit TQ2 with cover plate | X | Ceiling thickness according to the desired fire resistance duration, as well as the selected ceiling system and the specifications of the ceiling manufacturer |
| 4.5 | Wooden panel element | 1 | Up to EI 90 S |

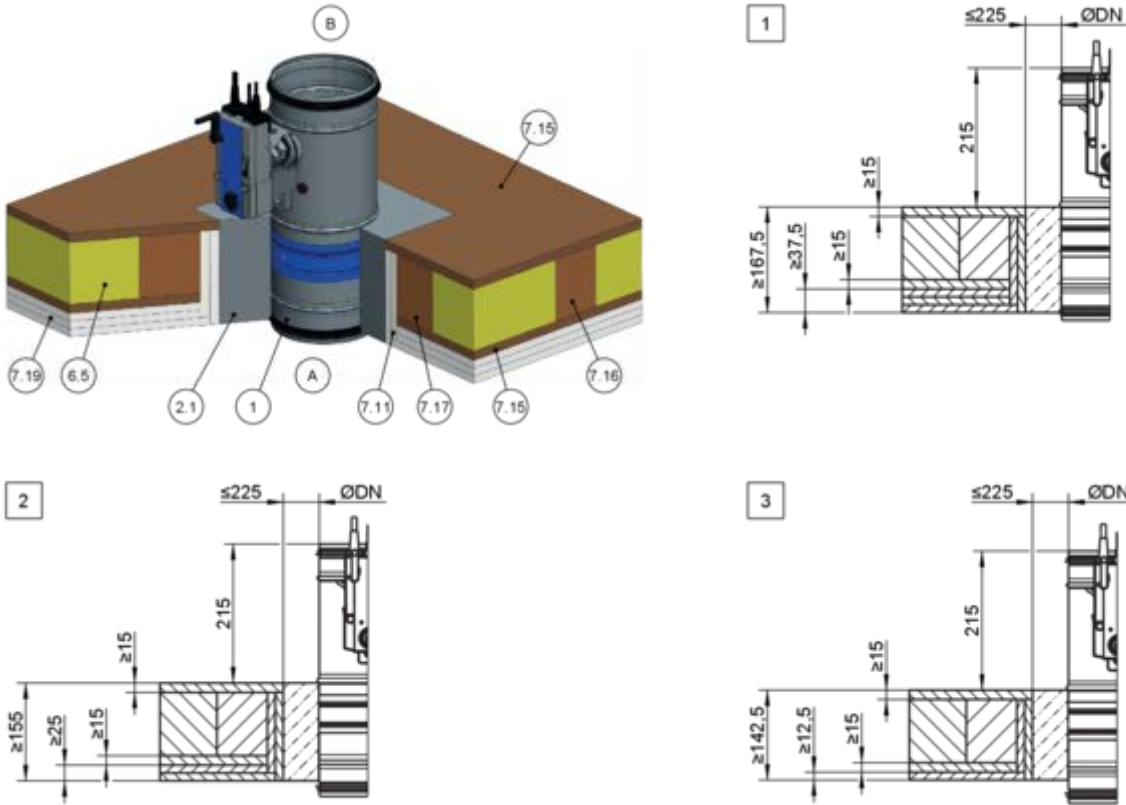
Additional requirements: Dry mortarless installation into wooden panel element with installation kit TQ2

- Wooden panel element ☞ on page 42
- Installation kit TQ2, ☞ 5.4.3 'Installation kit TQ2' on page 46
- ≥ 55 mm distance from the fire damper to load-bearing structural elements (with shortened orifice plate)
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ☞ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit TQ2, ☞ on page 35

5.14 Wooden beam ceilings

5.14.1 Mortar-based installation into wooden beam ceilings

Mortar-based installation into wooden beam or gluelam ceilings, upright

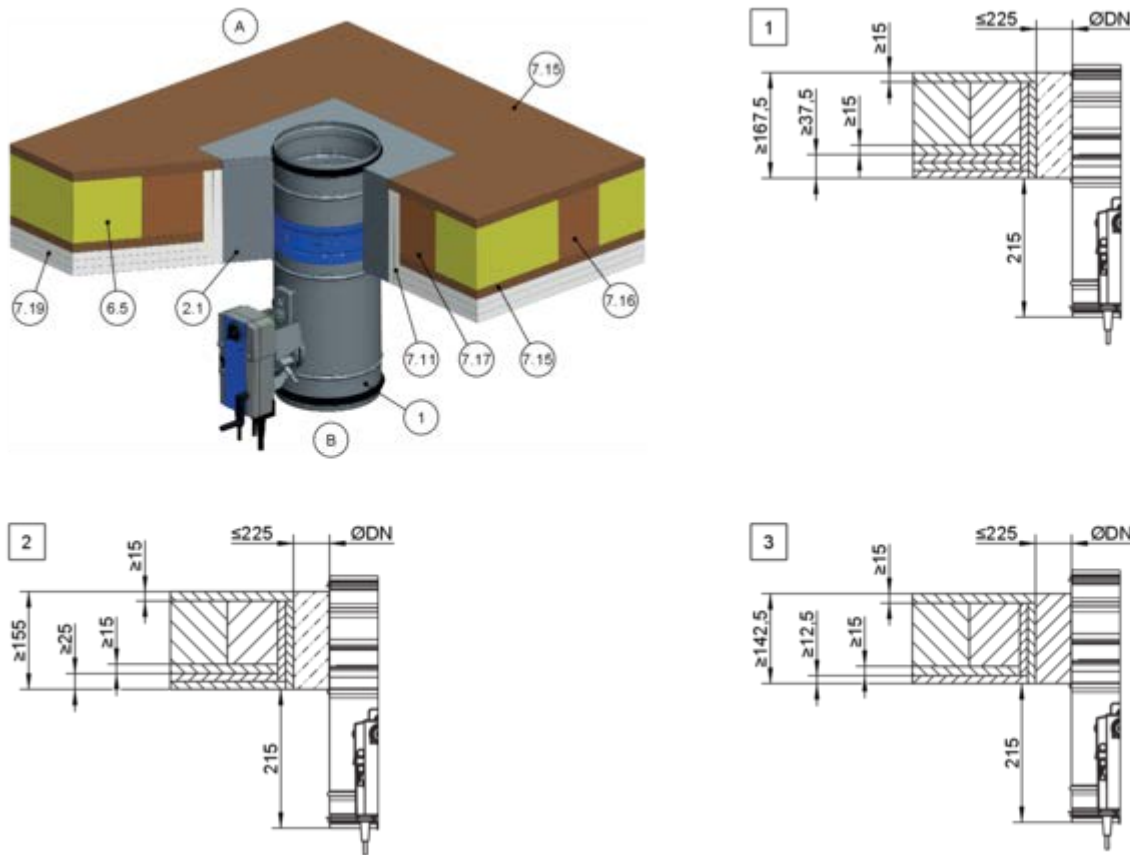


GR3853093, D

Fig. 181: Mortar-based installation into wooden beam or gluelam ceiling, upright (illustration is an example; other ceiling constructions upon request)

1	FKRS-EU	7.17	Trimmers, wooden beam ceiling/gluelam ceiling at least 100 × 80 mm
2.1	Mortar	7.19	Fire-resistant cladding (depending on ceiling)
6.5	Mineral wool filling (depending on ceiling)	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 at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)		

Mortar-based installation into a wooden beam ceiling/gluelam ceiling, suspended



GR3853124, C

Fig. 182: Mortar-based installation into a wooden beam ceiling/gluelam ceiling, suspended (the illustration is an example; other ceiling constructions may be possible upon request)

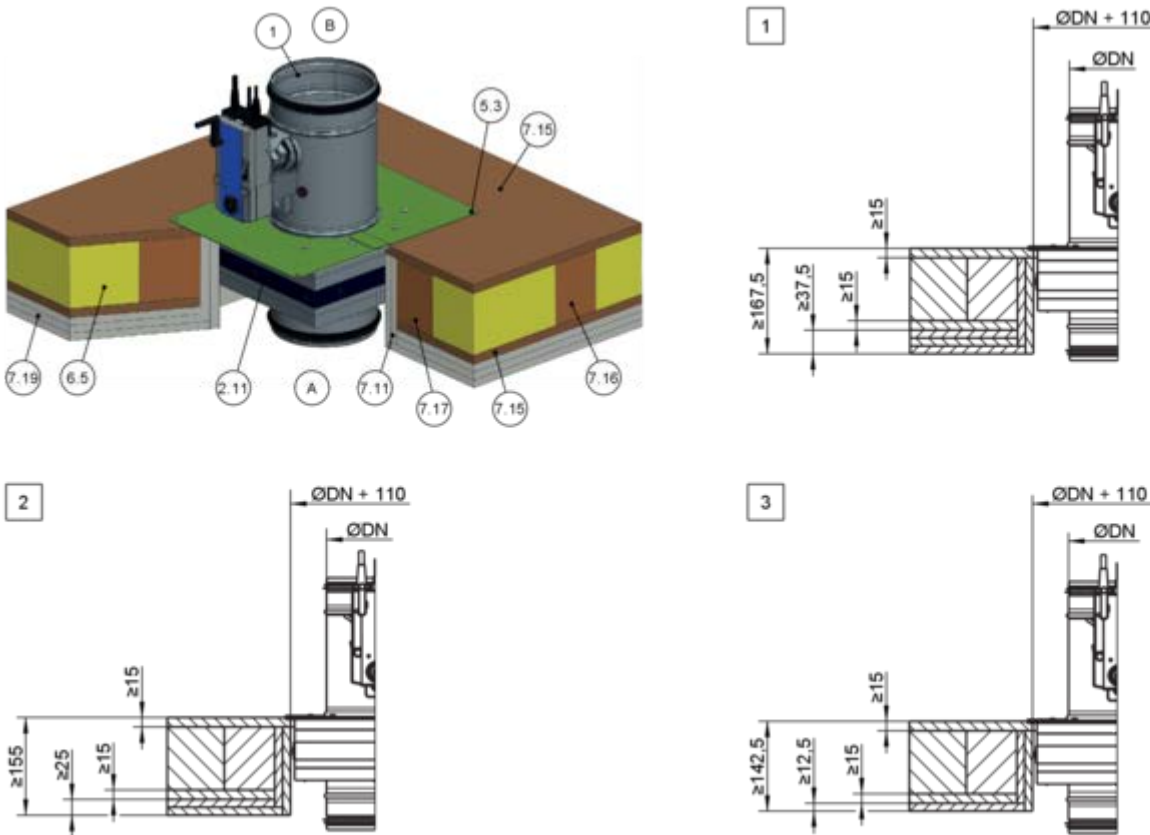
- | | | | |
|------|--|------|--|
| 1 | FKRS-EU | 7.17 | Trimmers, wooden beam ceiling/gluelam ceiling at least 100 × 80 mm |
| 2.1 | Mortar | 7.19 | Fire-resistant cladding (depending on ceiling) |
| 6.5 | Mineral wool filling (depending on ceiling) | 1 | Up to EI 90 S |
| 7.11 | Trim panel, same construction 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 at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening) | | |

Additional requirements: mortar-based installation into wooden beam or gluelam ceilings

- Wooden beam ceiling, ↗ on page 42
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↗ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation, ↗ '**Mortar-based installation**' on page 34

5.14.2 Dry mortarless installation in wooden beam ceiling with installation kit TQ2

Dry mortarless installation into wooden beam ceilings or gluelam ceilings, upright, with installation kit TQ2

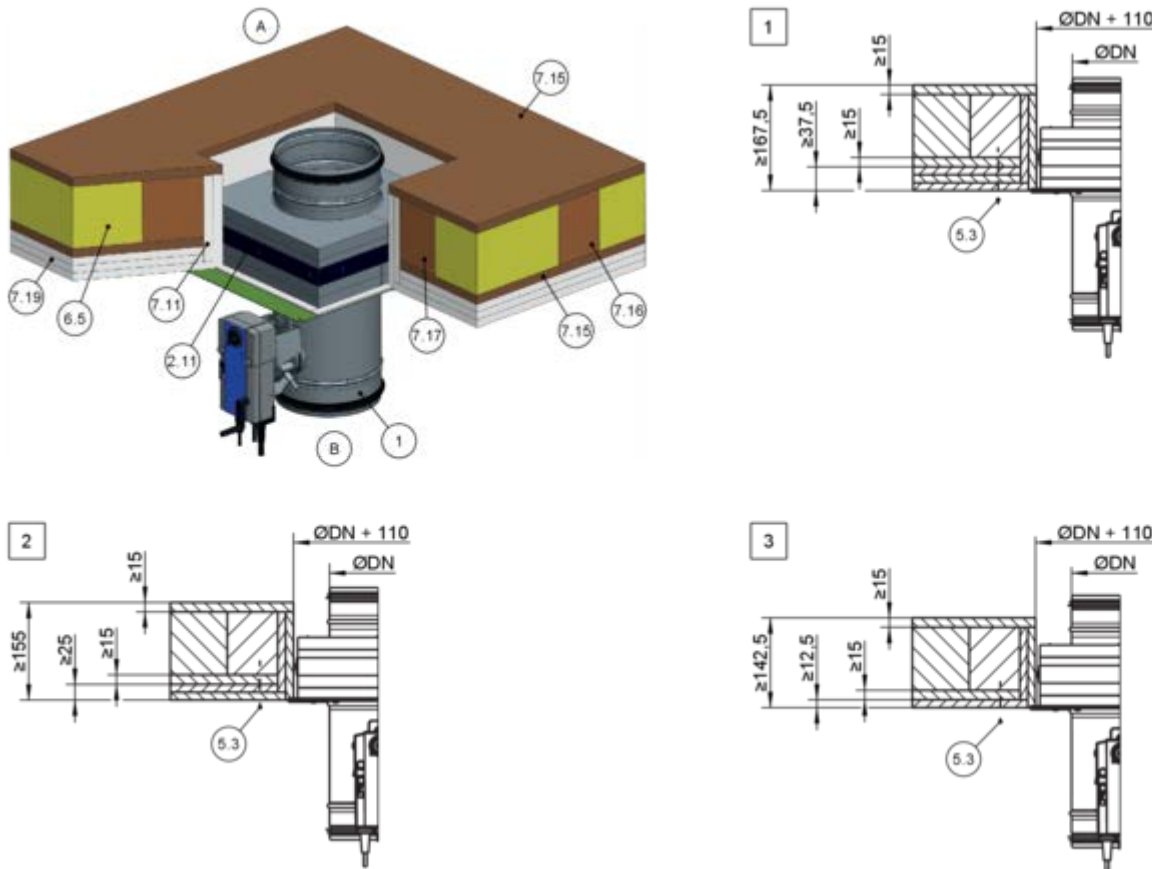


GR3853391, C

Fig. 183: Dry mortarless installation with installation kit TQ2 into wooden beam/gluelam ceiling, upright (illustration representative, alternative ceiling construction possible on request)

1	FKRS-EU	7.16	Wooden beam/gluelam at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)
2.11	Installation kit TQ2 with cover plate	7.17	Trimmers, wooden beam ceiling/gluelam ceiling at least 100 × 80 mm
5.3	Wood screw min. 5 × 70 mm	7.19	Fire-resistant cladding (depending on ceiling)
6.5	Mineral wool filling (depending on ceiling)	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

Dry mortarless installation into a wooden beam or gluelam ceiling, suspended, with installation kit TQ2



GR3853687, C

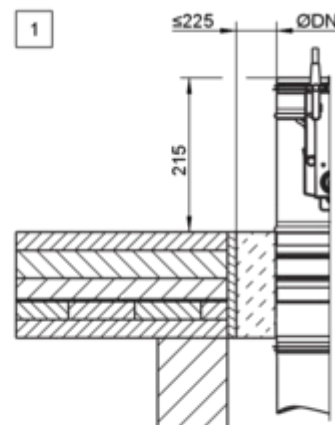
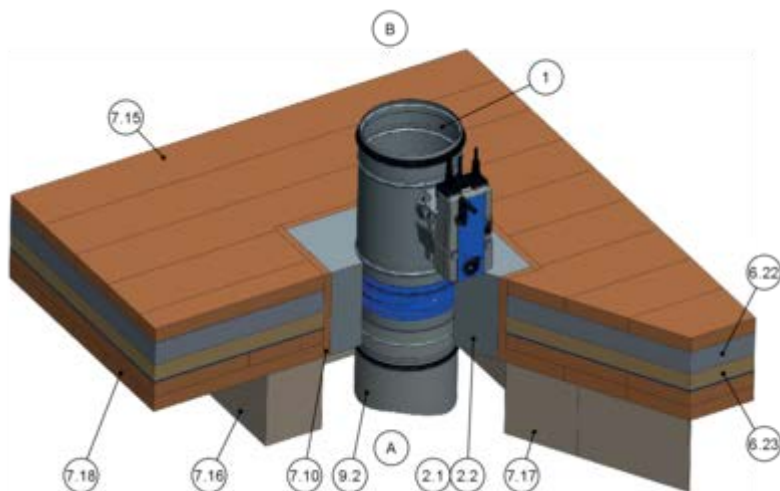
Fig. 184: Dry mortarless installation with installation kit TQ2 into wooden beam/gluelam ceiling, suspended (illustration representative, alternative ceiling construction possible on request)

- | | | | |
|------|---|------|--|
| 1 | FKRS-EU | 7.16 | Wooden beam/gluelam at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening) |
| 2.11 | Installation kit TQ2 with cover plate | 7.17 | Trimmers, wooden beam ceiling/gluelam ceiling at least 100 × 80 mm |
| 5.3 | Wood screw min. 5 × 70 mm | 7.19 | Fire-resistant cladding (depending on ceiling) |
| 6.5 | Mineral wool filling (depending on ceiling) | 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 TQ2 into wooden beam/gluelam ceilings

- Wooden beam ceiling, ☞ on page 42
- Installation kit TQ2, ☞ 5.4.3 'Installation kit TQ2' on page 46
- ≥ 55 mm distance from the fire damper to load-bearing structural elements (with shortened orifice plate)
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ☞ 5.3 'General installation information' on page 29 ff
- General information on installation with installation kit TQ2, ☞ on page 35

5.14.3 Mortar-based installation into historical wooden beam ceilings

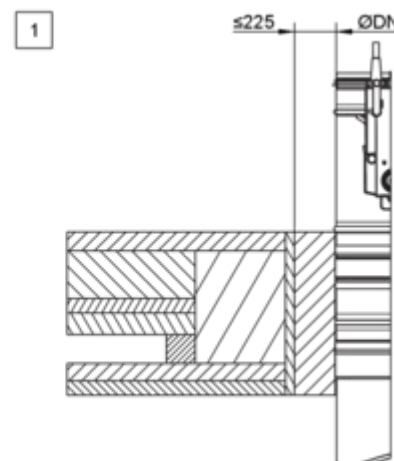
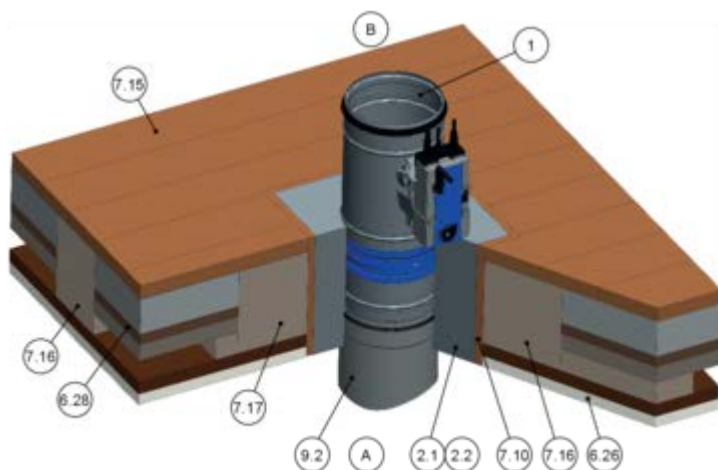


GR3837379, C

Fig. 185: Mortar-based installation into historical wooden beam ceilings

- | | |
|------|---|
| 1 | FKRS-EU |
| 2.1 | Mortar |
| 2.2 | Concrete |
| 6.22 | Screed* |
| 6.23 | Footfall sound insulation* |
| 7.10 | Trim panels (fire-rated plasterboard or wood sheet) |
| 7.15 | Wooden floorboard/flooring* |

- | | |
|------|--|
| 7.16 | Timber beams |
| 7.17 | Substitution |
| 7.18 | Formwork* |
| 9.2 | Air duct/extension piece |
| * | The illustration is an example; other ceiling constructions may be possible depending on make and local conditions |
| 1 | EI 30 S |

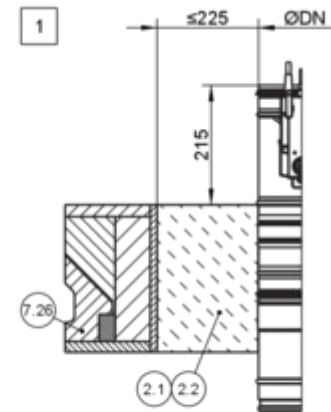
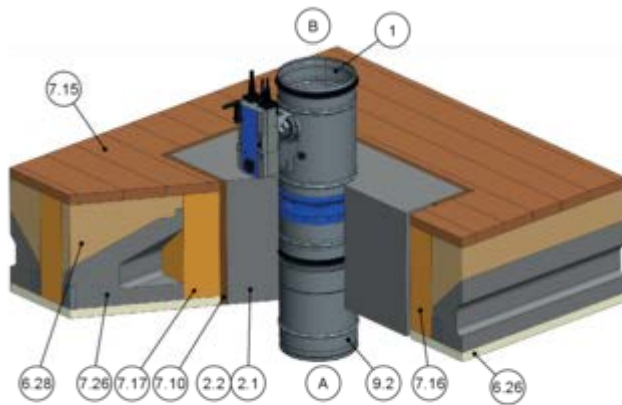


GR3836929, B

Fig. 186: Mortar-based installation into historic wooden beam ceilings, illustration shows upright installation (applies also to suspended installation)

- | | |
|------|---|
| 1 | FKRS-EU |
| 2.1 | Mortar |
| 2.2 | Concrete |
| 6.26 | Cement plaster* |
| 6.28 | Ceiling filling* |
| 7.10 | Trim panels (fire-rated plasterboard or wood sheet) |

- | | |
|------|--|
| 7.15 | Wooden floorboard/flooring* |
| 7.16 | Timber beams |
| 7.17 | Trimmers, wooden beam |
| 9.2 | Air duct/extension piece |
| * | The illustration is an example; other ceiling constructions may be possible depending on make and local conditions |
| 1 | EI 30 S |



GR3878885, E

Fig. 187: Mortar-based installation into historic wooden beam ceilings, illustration shows upright installation (applies also to suspended installation)

1	FKRS-EU	7.16	Timber beams
2.1	Mortar	7.17	Trimmers, wooden beam
2.2	Concrete	7.26	Hollow concrete block
6.26	Cement plaster*	9.2	Air duct/extension piece
6.28	Ceiling filling*	*	The illustration is an example; other ceiling constructions may be possible depending on make and local conditions
7.10	Trim panels (fire-rated plasterboard or wood sheet)	1	EI 30 S
7.15	Wooden floorboard/flooring*		

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

- Historic wooden beam ceiling, ↪ on page 43
- ≥ 40 mm distance between the fire damper and load-bearing components
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↪ 5.3 'General installation information' on page 29 ff
- General information on mortar-based installation, ↪ '**Mortar-based installation**' on page 34

5.15 Fixing the fire damper

5.15.1 General information

Fire dampers are suspended with threaded steel rods:

- remote from walls and ceiling slabs
- Installation in fire batt
- Installation with fire protection block bulkhead

The threaded rods must be fixed to solid ceiling slabs in accordance with the required fire resistance duration. Use only fire-rated wall plugs with suitability certificate depending on the ceiling construction.

Instead of wall plugs, 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; ducts must be suspended separately.

Weight [kg]: ↪ Chapter 2.2 'FKRS-EU with fusible link' on page 12 ↪ Chapter 2.3 'FKRS-EU with spring return actuator' on page 13 ↪ Chapter 2.4 'FKRS-EU with spring return actuator and duct smoke detector' on page 16 ↪ Chapter 2.5 'FKRS-EU with fusible link and cover grille on both sides as an upstream shutter for the air transfer unit' on page 17 ↪ Chapter 2.6 'FKRS-EU with spring return actuator and duct smoke detector used as an air transfer damper' on page 18.

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).

5.15.2 Alternative fixing systems

Alternative fixings may be used, provided that their performance is supported by fire test, stress, linear expansion or load data. Other information may be taken into consideration. In addition to these fixings, fixing variants approved by a testing body may also be used.

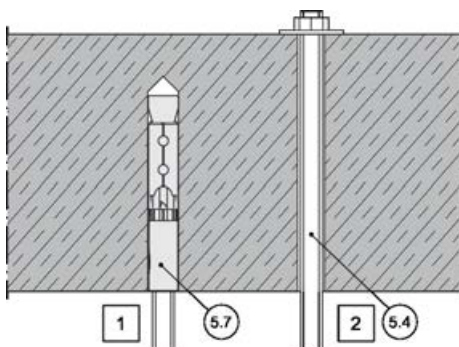


Fig. 188: Fixing to the ceiling

- 5.4 Threaded rod
- 5.7 Fire-rated wall plug (with suitability certificate)
- 1 Fixing with fire-rated wall plug with suitability certificate
- 2 Fixing with threaded rod (push through)

5.15.3 Fixing in conjunction with fire batt/ fire protection block bulkhead

5.15.3.1 Duct, horizontal

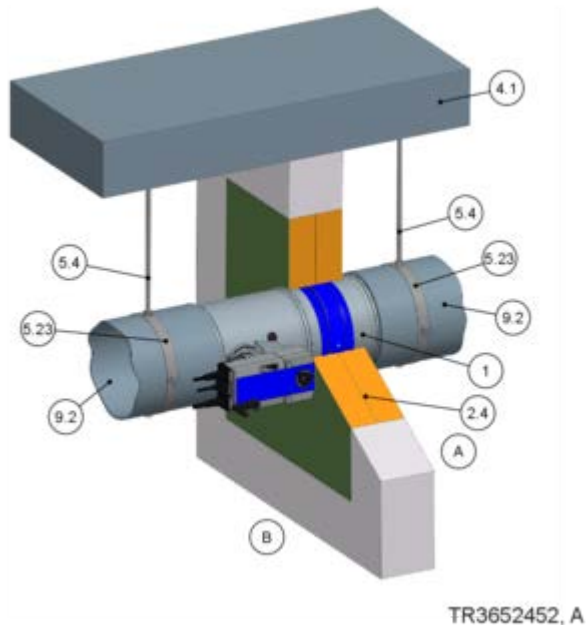


Fig. 189: Suspension system, horizontal duct

- 1 FKRS-EU
- 2.4 Coated board system
- 4.1 Solid ceiling slab
- 5.4 Threaded rod, at least M8, galvanised steel. Fixing to the ceiling. Suspension systems longer than > 1.5 m require fire-resistant insulation.
- 5.23 Pipe clamp
- 9.2 Air duct/extension piece

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

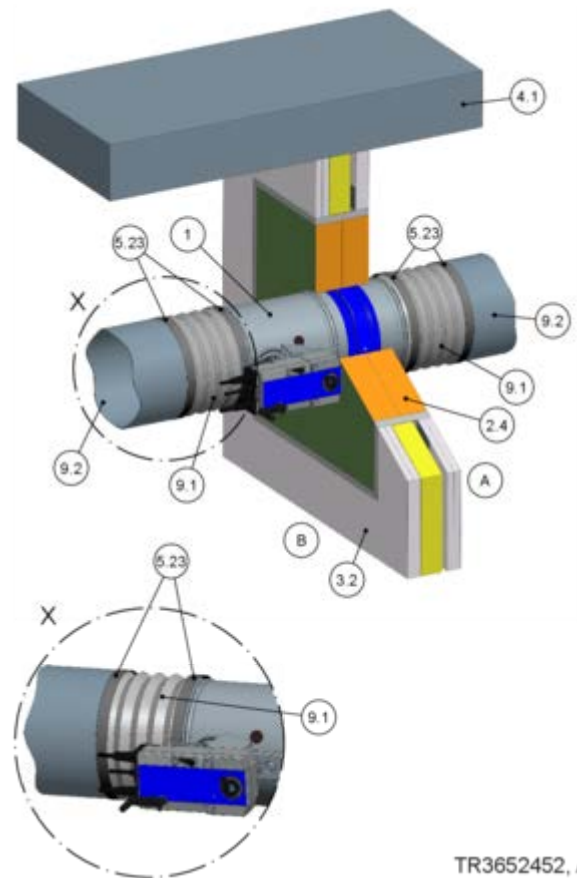


Fig. 190: Horizontal air duct

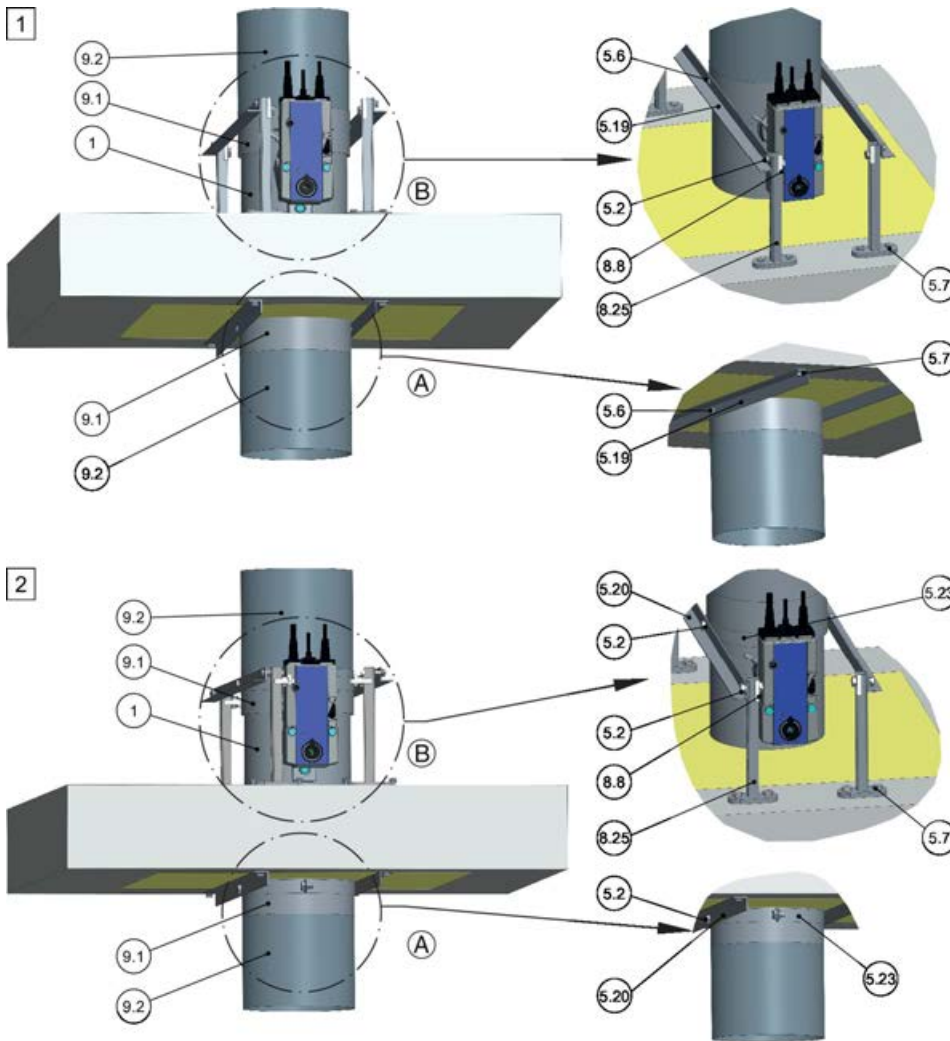
- 1 FKRS-EU
- 2.4 Coated board system
- 3.2 Lightweight partition wall with metal support structure or steel support structure, cladding on both sides
- 4.1 Solid ceiling slab
- 5.23 Pipe clamp
- 9.1 Flexible connector
- 9.2 Air duct/extension piece

For wall installation in fire batts, suspensions/fixings can be dispensed with if the distance from the ceiling to the lower edge of the fire damper does not exceed 1.5 m. The fire dampers must then be connected on both sides with flexible connectors (length of elastic area \geq 100 mm when installed), which are installed in such a way that shear and tensile forces can be absorbed.

If the FKRS-EU is attached to the ceiling, fire batt systems are not suitable for use below flexible ceiling joints.

5.15.3.2 Duct, vertical

Upright installation of the fire damper



TR3653265, A

Fig. 191: Upright installation variants for fire dampers

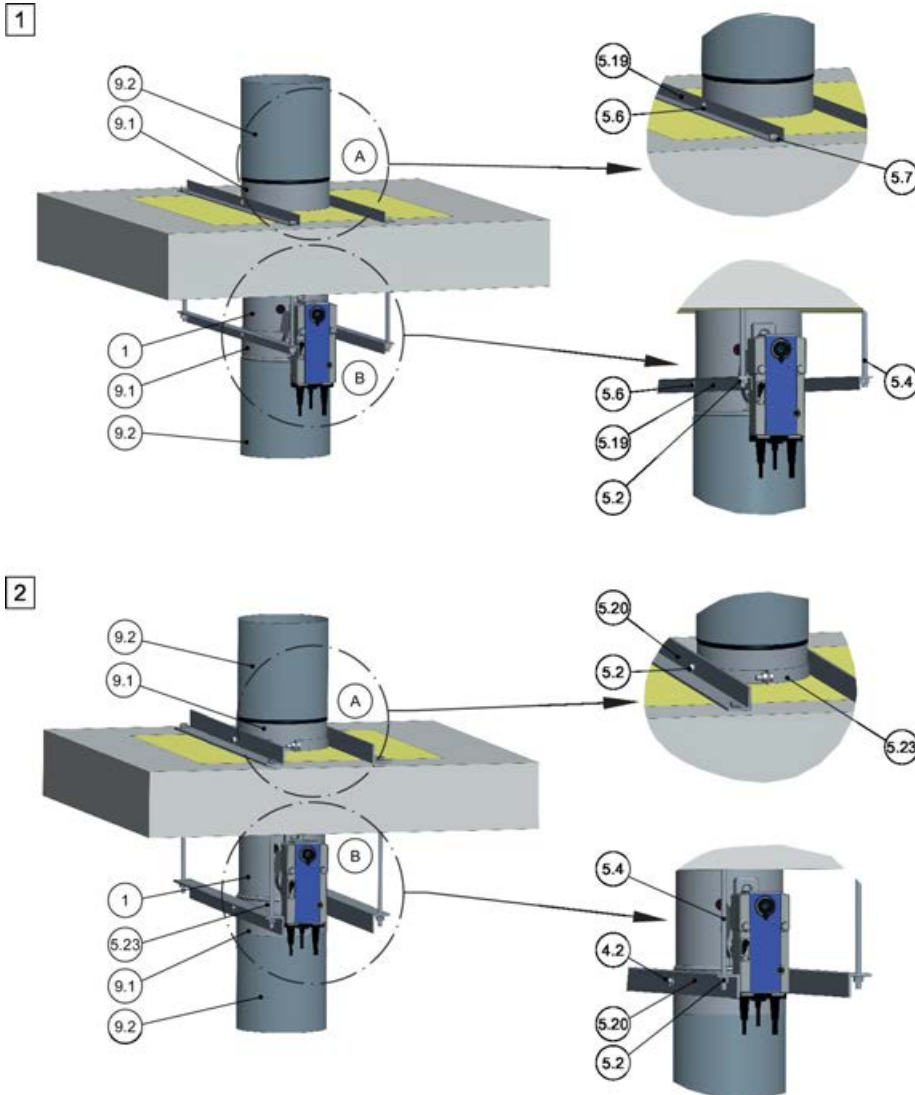
- | | | | |
|------|---|------|--|
| 1 | FKRS-EU | 8.8 | Fixing bracket, Varifix or Müpro MPC or equivalent |
| 5.2 | 4 screw fixings (M8 screw with 2 washers and nut), suitable for the bracket or screw fixing matching the clamp | 8.25 | Bracket, e.g. Hilti MM-B-30 or equivalent |
| 5.6 | 4 steel rivets \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 | Air duct/extension piece |
| 5.19 | L-bracket according to EN 10056-1, 20 × 20 × 3 mm galvanised, painted or similar. | 1 | Fixing above and below the ceiling 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 with heavy duty clamp |
| 5.23 | Pipe 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. 192: Suspended installation variants for fire dampers

- | | | | |
|------|--|----------|--|
| 1 | FKRS-EU | 5.23 | Pipe 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 | Air duct/extension piece |
| 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 with rivets |
| 5.7 | Anchor bolt Hilti® HUS-6 or equivalent | 2 | Fixing above and below the ceiling 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. | | |

5.15.4 Fire damper remote from walls and ceilings

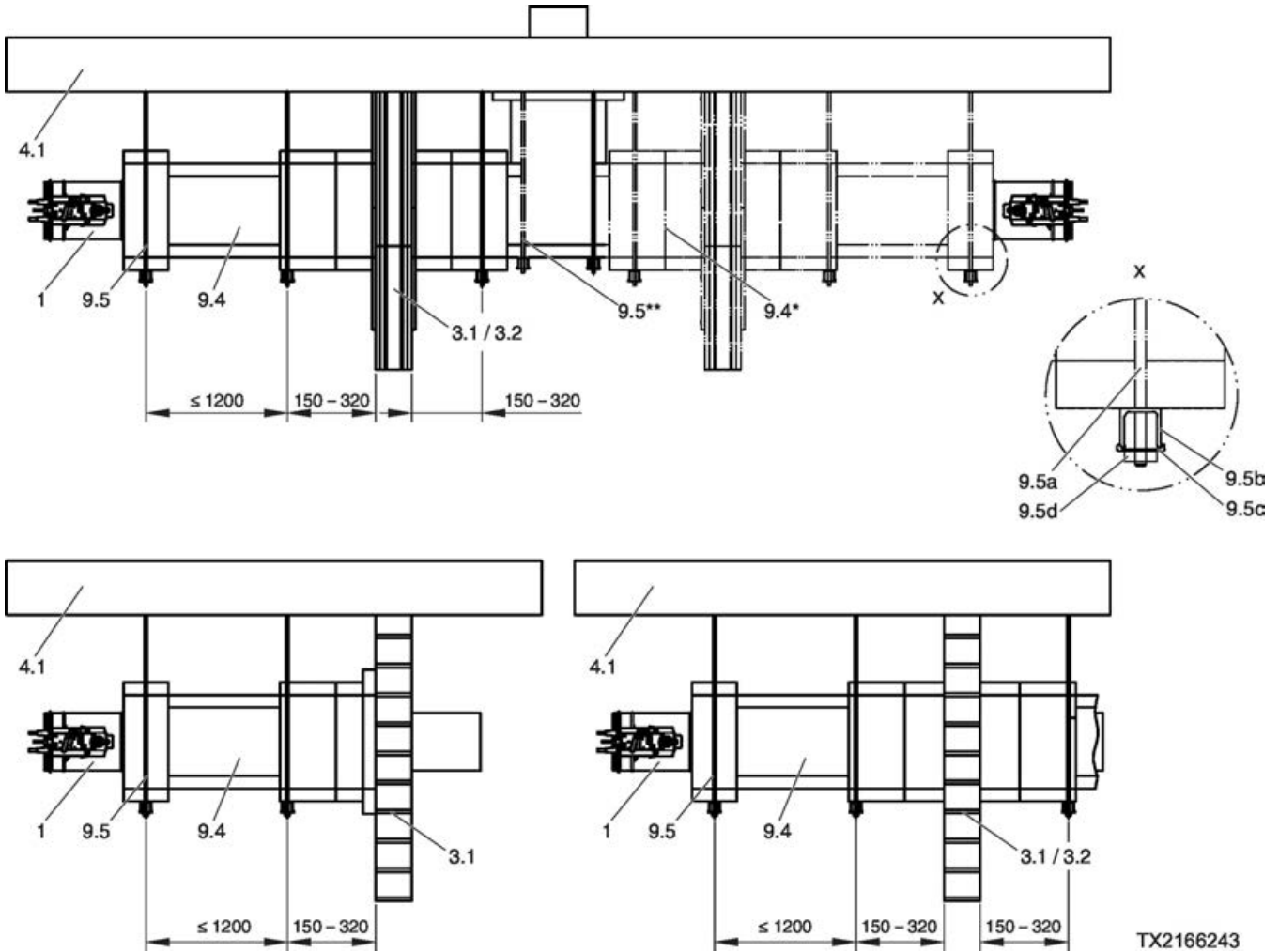


Fig. 193: FKRS-EU in a cladded duct

- 1 FKRS-EU
- 3.1 Solid wall
- 3.2 Lightweight partition wall with metal support structure or steel support structure, cladding on both sides
- 4.1 Solid ceiling slab
- 9.4 Sheet steel duct with fire-rated cladding
The cladding of the air duct and the suspensions are carried out in accordance with these instructions, the additional assembly instructions for the installation kit WE2 and the specifications of the panel manufacturer
- 9.5 Suspension system (by others) consisting of:

- 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 247. 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

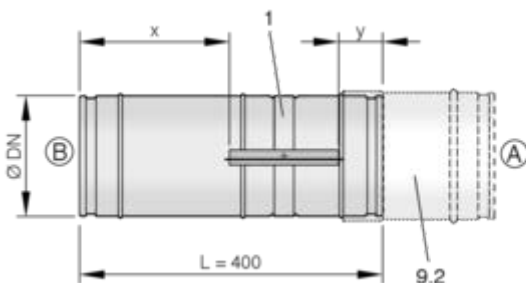


Fig. 194: Open blade protrusion

- 1 FKRS-EU
- 9.2 Air duct/extension piece

Note

The movement of the damper blade must not be obstructed by any accessory. The minimum 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.

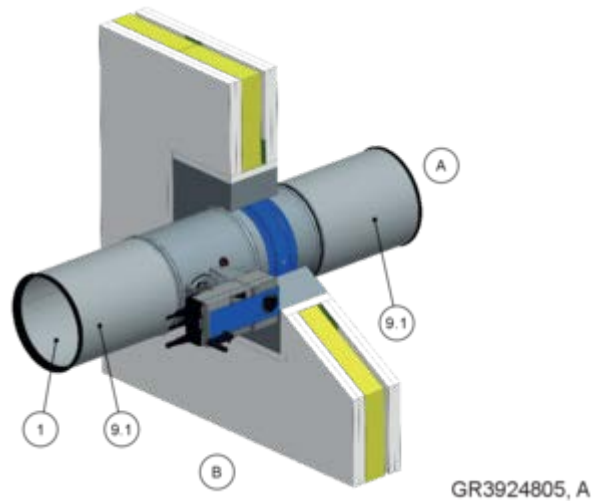


Fig. 195: FKRS-EU with flexible connectors

- 1 FKRS-EU
- 9.1 Flexible connector

Cover grille

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

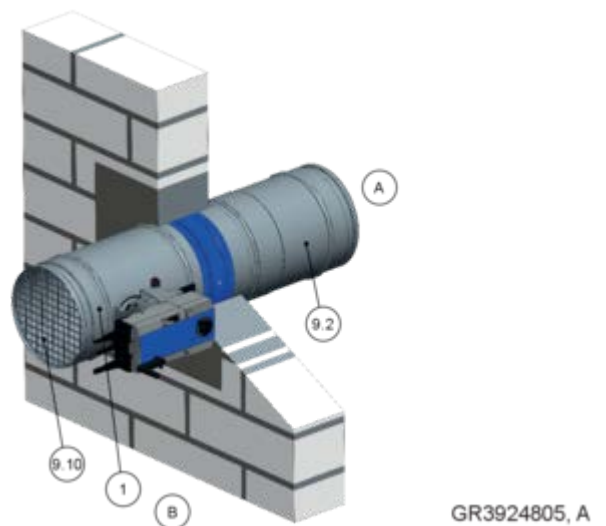


Fig. 196: Fire damper with cover grille

- 1 FKRS-EU
- 9.2 Air duct/extension piece
- 9.10 Cover grille

7 Electrical connection

7.1 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.

The dimensioning of the connection cables is done on site depending on the supply voltage (230 V or 24 V), the cable length as well as the power consumption and number of actuators.

7.2 Limit switches (fire dampers with fusible link)

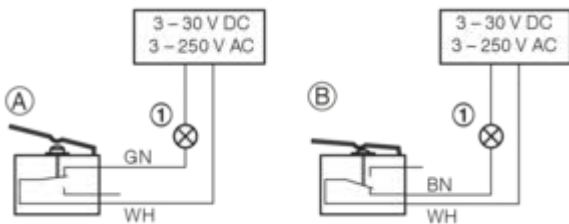


Fig. 197: Wiring of limit switches, example

- 1 Indicator light or relay, to be provided by customer
- A Type of connection: NC contact
B Type of connection: NO contact
- The limit switches must be connected according to the wiring example Fig. 197
 - Indicator lamps 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.

Connection type	Limit switch	Damper blade	Electric circuit
A	Not actuated	CLOSED or OPEN position <u>not</u> reached	closed
B	actuated	CLOSED or OPEN position reached	closed

Note: For wiring explosion-proof limit switch, see "Supplementary operating manual for explosion-proof fire dampers type FKRS-EU".

7.3 Spring return actuator

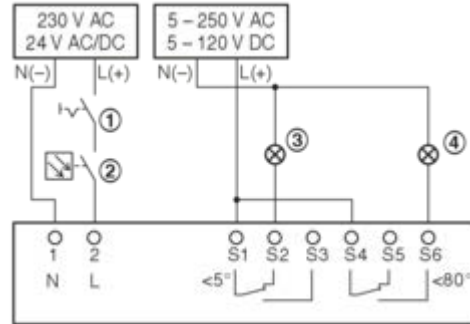


Fig. 198: Actuator connection, example

- 1 Switch for opening and closing, to be provided by customer
- 2 Optional release mechanism, e.g. TROX duct smoke detector Type RM-O-3-D
- 3 Indicator light for CLOSED position, to be provided by customer
- 4 Indicator light for OPEN position, to be provided by customer

- 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 type 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".

Drives with 24 V AC/DC

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

7.4 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

8.1 General Information

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

 **CAUTION!**

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

8.2 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 information 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).

8.3 Fire damper with fusible link

Close the fire damper

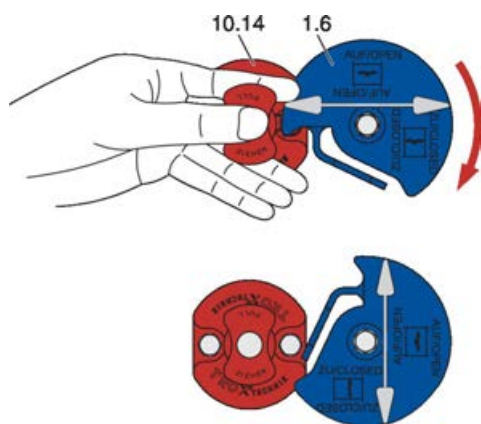


Fig. 199: Close the fire damper

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

CAUTION!

Danger of injury when reaching into the fire damper. 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

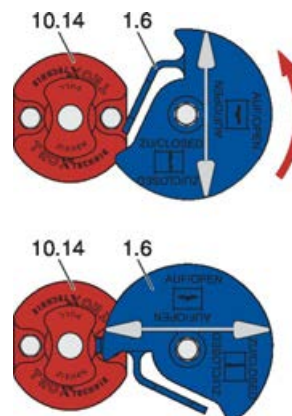


Fig. 200: Opening the damper blade

- 1.6 Handle/damper blade position indicator

Requirement

- The damper blade is CLOSED
1. ▶ Turn the handle (1.6) anti-clockwise (see arrow) until
 2. ▶ the handle (1.6) locks into place (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.

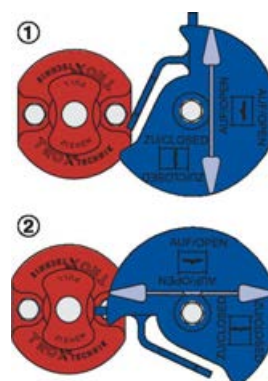


Fig. 201: Damper blade position indicator

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

8.4 Fire damper with spring return actuator

Status indicator



Fig. 202: 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.

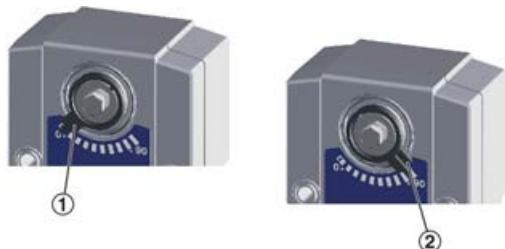


Fig. 203: Damper blade position indicator

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

Closing/opening the damper blade with spring return actuator



Fig. 204: Functional test

- 1 Push button for functional test

CAUTION!

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

Requirement

- Power is being supplied
1. ▶ Push the 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 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. 205: 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. 206: 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.

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 *Chapter 10.3 'Inspection, maintenance and repair measures' on page 256*.

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 system is running must be inspected before they are opened again in order to ensure their correct function
↳ 'Inspection' on page 254.

10 Maintenance

10.1 General information

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:

- DIN EN 13306
- DIN 31051
- DIN EN 15423

The function of fire dampers with a spring return actuator can also be tested with an automatic control unit  on page 249.

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 SWK1. 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  on page 256. 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 is required after any repair work  8.1 'General Information' on page 249.

10.2 Replacing the fusible link

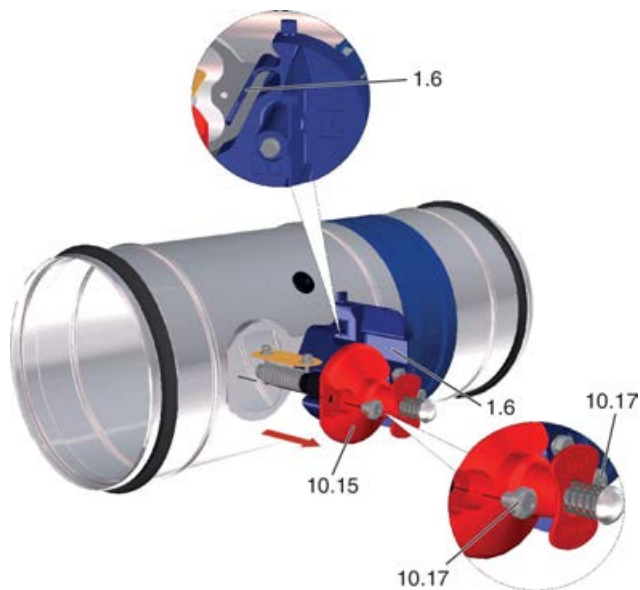


Fig. 207: Removing the fusible link holder

1.6 Handle
10.15 Fusible link holder
10.17 Screw

1. ▶ Close the fire damper.
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.

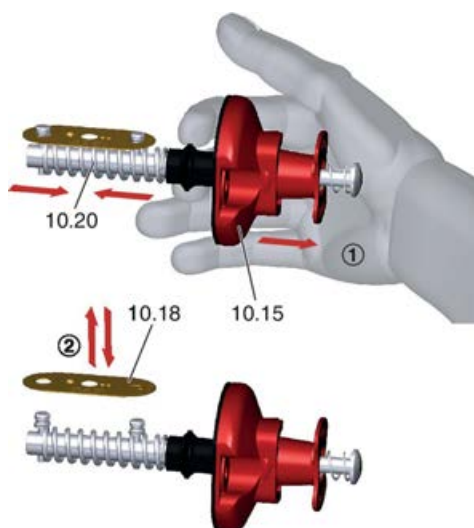


Fig. 208: Replacing the fusible link

10.15 Fusible link holder
10.18 Fusible link
10.20 Spring

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).

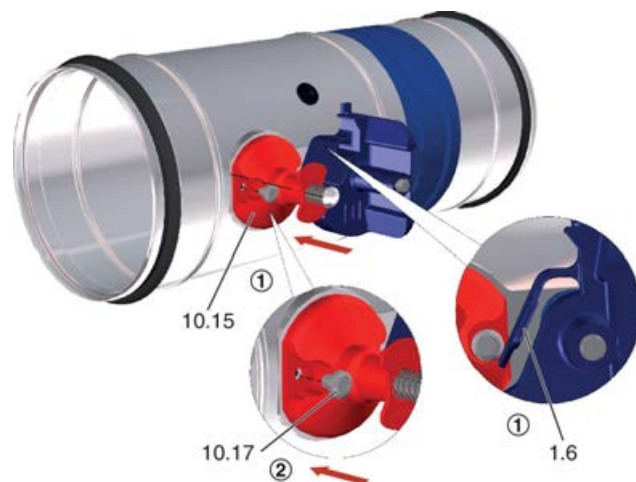


Fig. 209: Install the fusible link holder

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.

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 the operating manual ↗ 29 <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 air ducts/Cover grilles/Flexible connectors <ul style="list-style-type: none"> ■ Connection according to the operating manual ↗ Chapter 6 'Accessories' on page 247 <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"> – Supply 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 ↗ 250 <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 ↗ 251 <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

11.1 Final decommissioning

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

11.2 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 fire damper
4. ▶ Remove the fire damper.

11.3 Scrap

ENVIRONMENT!

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

Incorrect disposal can harm the environment.

- Be sure to comply with the relevant national guidelines and regulations.
- Have electronic waste, electronic components and operating fluids (refrigerant, compressor oil, lubricants etc.) disposed of by an approved specialist disposal company.
- If you are not sure how to dispose of anything in an environmentally friendly manner, contact your local authorities or a specialist disposal company.

Note: The fire damper has to be disassembled for disposal.

If no take back (disposal) agreement with TROX GmbH is in place, we recommend disposing of the various materials as described below:

Disposal information

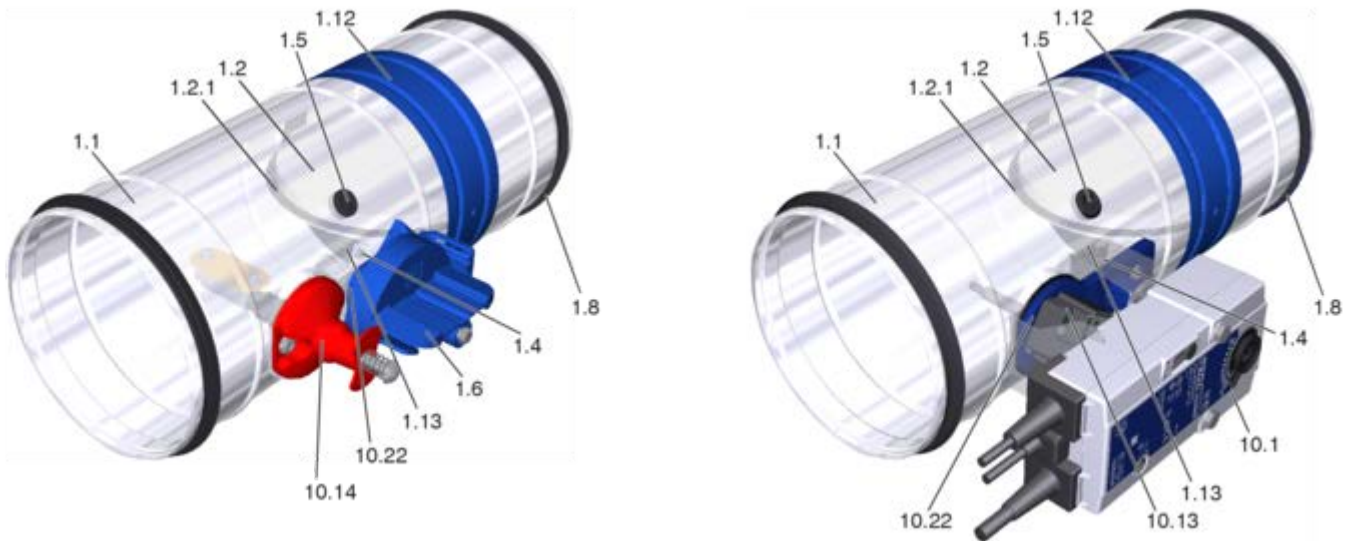



Fig. 210: FKRS-EU with fusible link or spring return actuator

Item	Component	Material/waste disposal code	Type of disposal
1.1	Casing	Metal	Scrap and metal recycling
1.2	Damper blade	EAK 17 09 04 – mixed construction and demolition wastes	Take such materials to an inert waste landfill (class 1 landfill).
1.2.1	Sealing ring	EWC 07 02 13 – waste plastic	Disposal according to EWC.
1.4	Parabolic buffer	Rubber	Can be fully recycled.
1.5	Stopper	EWC 07 02 99 – waste not otherwise specified	Disposal according to EWC.
1.6	Release element	Plastic	Thermoplastic waste can be recycled. Recycling is preferable to disposal or burning.
1.8	Lip seal	EAK 17 09 04 – mixed construction and demolition wastes	Disposal according to EWC.
1.12	Adhesive tape	EWC 15 01 02 – waste plastic	Disposal according to EWC.
1.13	Intumescent seal	EWC 07 02 13 – waste plastic	Disposal according to EWC.
10.1	Actuator	Electronic part	Have electronic waste disposed of by an authorised specialist company.
10.13	Release element	Electronic part	Have electronic waste disposed of by an authorised specialist company.
10.14	Release element	Metal	Scrap and metal recycling
10.22	Bearing/motor base	Plastic	Thermoplastic waste can be recycled. Recycling is preferable to disposal or burning.

EWC: European Waste Catalogue

12 Nomenclature

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

Conse c. item no.	Designation
1	Fire damper
1.1	Casing
1.2	Damper blade (with or without lip seal)
1.2.1	Lip seal/travel stop seal/sealing ring
1.3	Travel stop for OPEN position
1.4	Travel stop for CLOSED position/parabolic buffer
1.5	Inspection access/inspection access panel/plug
1.6	Handle/damper blade position indicator
1.7	Interlock
1.8	Lip seal
1.9	Cover
1.10	Release tab
1.11	Flange
1.12	Adhesive tape
1.13	Intumescent seal

Conse c. item no.	Designation
2	Materials for fire damper installation
2.1	Mortar/gypsum mortar
2.2	Reinforced concrete/non-reinforced concrete
2.3	Reinforced concrete base
2.4	Coated board system
2.5	Installation kit WA/WA2
2.6	Installation kit WE/WE2
2.7	Installation kit WV
2.8	Installation kit E1/E2/E3/EW
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

Conse c. item no.	Designation
2	Materials for fire damper installation
2.14	Lintel
2.15	
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® filling compound, Promat® finishing filler or equivalent)

Conse c. item no.	Designation
3	Walls
3.1	Solid wall
3.2	Lightweight partition wall with metal support structure or steel 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 or safety partition 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	Metal support structure with additional leaf
3.14	Solid wall made from gypsum wallboard

Conse c. item no.	Designation
4	Ceilings
4.1	Solid ceiling slab/solid floor
4.2	Wooden beam ceiling

Conse c. item no.	Designation
4	Ceilings
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 core slab
4.8	Hollow concrete block ceiling
4.9	Ribbed ceiling
4.10	Composite ceiling
4.11	Historic wooden beam ceiling, fire resistance \geq F 30
4.12	Panelled ceiling
4.13	FireShield®

Conse c. item no.	Designation
5	Fixing material
5.1	Dry wall screw
5.2	Hexagon head screws, washers, nuts (see installation details)
5.3	Chipboard screw
5.3a	Chipboard screw 5 × 80 mm
5.3b	Chipboard screw 5 × 100 mm
5.3c	Chipboard screw 5 × 60 mm
5.3d	Chipboard screw 5 × 50 mm (4 – 8 screws, depending on damper size)
5.3e	Chipboard screw 5 × 70 mm (16 – 28 screws, depending on damper size)
5.4	Threaded rod, galvanised steel (see installation details)
5.5	Carriage bolt $L \leq 50$ mm with washer and nut
5.6	Screw or rivet, galvanised steel (see respective installation detail)
5.7	Wall plug with suitability certificate for fire resistance
5.8	Anchor M8 – M12
5.9	Steel bracket
5.10	Fixing tab
5.11	Mounting plate
5.12	Cover plate

Conse c. item no.	Designation
5	Fixing material
5.13	Wood screw or pin
5.14	Angle bracket
5.15	Flange bracket/clamp
5.16	Wall face frame
5.17	Anchor bolt
5.18	L-bracket to EN 10056-1, galvanised, painted or similar, according to installation detail
5.19	Connecting clamp
5.20	Fischer® screw, FFS 7.5 × 82 mm or equivalent
5.21	Screw/wall plug
5.22	Steel fabric, $\varnothing \geq 8$ mm, mesh aperture 150 mm or equivalent
5.23	Pipe clamp, e.g., Hilti MP-MX, Valraven BIS HD 500 or equivalent
5.24	Sheet-metal strip
5.25	Dry wall screw
5.26	Steel wire clip
5.27	Fixing element

Conse c. item no.	Designation
6	Filling and coating material
6.1	Mineral wool ≥ 1000 °C, ≥ 40 kg/m ³
6.2	Mineral wool ≥ 1000 °C, ≥ 80 kg/m ³
6.3	Mineral wool ≥ 1000 °C, ≥ 100 kg/m ³
6.4	Mineral wool panel, ≥ 1000 °C, ≥ 140 kg/m ³
6.5	Mineral wool depending on wall or ceiling construction, mineral wool filling if required
6.6	
6.7	Coated board system
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)
6.9	Fire-resistant sealant suitable for the fire batt system used
6.10	Ablative coating around the perimeter, 2.5 mm thick
6.11	Insulating strip (depending on wall construction)

Conse c. item no.	Designation
6	Filling and coating material
6.12	Intumescent seal
6.13	Mineral wool strip A1, ≤ 5 mm thick, ≤ 1000 °C, filler as an alternative
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	
6.19	Mineral wool >1000 °C, >80 kg/m ³ , panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible
6.20	Pipe collar (to be ordered separately)
6.21	Kerafix 2000 sealing tape
6.22	Screed
6.23	Footfall sound insulation
6.24	Elastomer foam (synthetic rubber) of fire rating class B-S3, D0
6.25	Mineral wool or glass wool infill
6.26	Cement plaster
6.27	Z brackets both sides, 90 × 140 × 1.5 mm
6.28	Ceiling filling (layers of boards or beams)
6.29	Mineral wool PAROC Hvac Fire Mat BlackCoat (≥ 80 kg/m ³)
6.30	Reinforcing strip made of mineral wool PAROC HVAC Fire Mat BlackCoat (≥ 80 kg/m ³)
6.31	Fire-rated plasterboard strip d = 12.5 mm
6.32	Fire-rated plasterboard strip d = 20 mm
6.33	Fire-rated plasterboard strip d = 15 mm

Conse c. item no.	Designation
7	Supporting construction
7.1	UW section
7.1a	UW section, cut and bent
7.2	CW section (metal support structure)
7.3	UA section

Conse c. item no.	Designation
7	Supporting construction
7.4	U50 channel
7.5	Steel support structure
7.6	Perimeter metal section
7.7	Timber stud, at least 60 × 80 mm
7.8	Steel girder
7.9	Timber structure
7.10	Trim panels (also optional)
7.11	Trim panels, double layer, staggered joints
7.12	Trim panels, wood sheet, at least 600 kg/m ³
7.13	Cladding/wall cladding
7.13a	Cladding, fire-resistant
7.13b	Cladding, wood sheet, at least 600 kg/m ³
7.13.1	Cladding, single-layer
7.14	Reinforcing
7.15	Wooden floorboard/floor tile/wood sheet min. 600 kg/m ³
7.16	Wooden beam/gluelam
7.17	Trimmers
7.18	Formwork
7.19	Fire-resistant cladding
7.20	U-channel
7.21	Ceiling joint strips
7.22	Ceiling joint section
7.23	Sheet steel insert depending on wall manufacturer
7.24	Ceiling construction
7.25	Reinforced concrete beam
7.26	Hollow concrete block
7.27	Troughed sheet

Conse c. item no.	Designation
8	Material for extended applications
8.1	PROMATECT®-H strips d = 10 mm
8.2	PROMATECT®-H strips d = 20 mm
8.3	PROMATECT®-LS board d = 35 mm
8.4	Hilti mounting rail MQ 41 × 3 or equivalent

Conse c. item no.	Designation
8	Material for extended applications
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	Varifix ANSHWNKL-PRFL36-90GRAD or Müpro mounting bracket 90°, galvanised, or equivalent
8.10	Large gears
8.11	Actuator with strap
8.12	Strap of 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	Firestop board, made of 8.3
8.20	Promaseal®-Mastic intumescent sealant
8.21	Fire-resistant sealant CFS-S ACR CW
8.22	Calcium silicate board, alternatively mineral wool ≥ 1000 °C, ≥ 140 kg/m ³
8.23	Foam rubber seal
8.24	Z brackets both sides, sheet steel ≥ 1 mm thick
8.25	Bracket, e.g. Hilti MM-B-30 or equivalent
8.26	Sheet metal cover, t = 1mm
8.27	Seal
8.28	PROMATECT®-H strips d = 15 mm
8.29	PROMATECT®-H strips d = 25 mm
8.30	PROMATECT® AD, d = 40 mm
8.31	PROMATECT® L500, d = 50 mm
8.32	Firestop board, made of 8.30
8.33	Firestop board, made of 8.31
8.34	Sealing tape, Flexan
8.35	Intumescent material
8.36	Promaxon® panel, type A, d = 20 mm
8.37	Steel bracket

Conse c. item no.	Designation
8	Material for extended applications
8.38	OWA adhesive
8.39	Spiral duct for stiffening, 2 × raised edges

Conse c. item no.	Designation
9	Accessories
9.1	Flexible connector
9.2	Air duct/extension piece
9.3	Prop
9.4	Sheet steel duct with fire-rated cladding The cladding of the air duct, as well as the suspensions, are carried out according to these instructions, the additional assembly instructions of the installation kit WE2 as well as the specifications of the panel manufacturer (Promat).
9.5	Suspension system
9.6	Repair damper blade
9.7	Damper blade
9.8	Rivet axis
9.9	Plate
9.10	Cover grilles
9.11	Circular spigot
9.12	Clamping ring
9.13	Reinforcement bracket
9.14	Connecting subframe
9.15	T-piece

Conse c. item no.	Designation
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)

Conse c. item no.	Designation
10	Release mechanisms
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 lever
10.17	Screw
10.18	Fusible link
10.19	Cover
10.20	Spring
10.21	Z-plate
10.22	Bearing/motor base
10.23	Monitoring system
10.24	Limit switch sub-assembly with position indicator
10.25	Pneumatic actuator, 6 bar (single acting)

Conse c. item no.	Designation
11	Additions
11.1	Cable tray
11.2	Cable bundle
11.3	Pipe
11.4	Underlay material, non-combustible, to be provided by others
11.5	Underlay (by others)
11.6	Cable penetration
11.7	Potential equalisation

13 Revision history

The table shows all changes made to this document.

Version no.	Date	Author	Remark/Amendment
2	2023-12-01	PB	<ul style="list-style-type: none"> ■ General information: <ul style="list-style-type: none"> – Declaration of Performance increased from DoP / FKRS-EU / DE / 005 to DoP / FKRS-EU / DE / 006 – Addition EN 15882 to the standardisation principles, as a result: <ul style="list-style-type: none"> - Specification of the performance class for FKRS-EU with stainless steel casing, for all applications up to EI 90 S - Dry mortarless installation with TQ2 in lightweight ceilings (ADK system) not applicable - Dry mortarless installation with TQ2 in combination with lightweight ceiling (ADK system) not applicable – Belimo spring return actuators have been replaced by "general" spring return actuators. – Use of flexible connector as separate point – Adaptation/extension table for installation positions and distances – Editorial text and drawing adjustments ■ Extensions: <ul style="list-style-type: none"> – Use in combined penetration seal according to ETA-21/0528 – Solid wall with $W \geq 75$ mm, mortar-based installation, up to EI 120 S – Timber stud wall, mortar-based installation, multiple installation, EI 90 S – Half-timbered construction, mortar-based installation, multiple installation, EI 90 S – Asymmetrical shaft wall, mortar-based installation, EI 60 S to EI 120 S – Asymmetrical shaft wall, dry mortarless installation, EI 60 S to EI 120 S – Solid ceiling slab, dry mortarless installation with installation kit WA2, EI 90 S – Solid ceiling slab in conjunction with FireShield®, EI 90 S (currently not available for Germany) – Wooden ceiling slab, wooden panel element, mortar-based installation, EI 30 S to EI 90 S – Wooden ceiling slab, wooden panel element, dry mortarless installation, EI 30 S to EI 90 S – Timber stud walls, extension of non-load-bearing timber wall constructions to include walls in accordance with DIN 4102-4, or EN 1995-1-2, Eurocode 5, provided that the minimum wall thicknesses corresponding to the required fire resistance duration are complied with in the installation area. – Solid ceiling slab in conjunction with wooden beam ceiling, extension of the existing ADK and Cadolto modules also for modules from other manufacturers whose constructions (e.g. steel construction with double-layer reveal made of fire-rated plasterboard panels) are comparable with the above-mentioned systems. – Alternative coated board systems, the list of approved soft insulation systems is extended to include Rockwool and KBS. Other coated board systems are also permitted if they fulfil the following requirements: <ul style="list-style-type: none"> - Non-flammable slab material, melting point $\geq 1000^\circ$ C - Minimum thickness 50 mm - Minimum density of the panel material 140 kg/m^3 - Ablative coating, minimum fire behaviour class E... according to EN 13501-1

Version no.	Date	Author	Remark/Amendment
			<ul style="list-style-type: none"> - Test certificate in accordance with EN 1366-3 (a valid ETA is sufficient as proof of suitability, provided the required information is included). The suitability of the coated board systems in terms of fire resistance is tested on site. - Installation in walls and ceilings with slope - Alternative shaft wall systems are permitted, provided they are covered by the direct scope of EN 1366-2 (more layers, greater thickness, etc.). - Simplification of the distance rules below supporting structures: <ul style="list-style-type: none"> - Distance from 40 mm using the mortar-based installation method - Distance from 40 mm with soft bulkhead - Distance from 55 mm in dry mortarless installation with installation block/installation frame <p>These distances can now also be applied to ceilings (also in slab form) in horizontal alignment that have a valid European or national fire resistance certificate (report or expert report, etc.).</p> <p>The verifications of these reports and the suitability of the supporting structure with regard to fire resistance and statics are carried out on site.</p> - Lightweight partition walls with alternative stud frame and wall construction, extension to include lightweight partition walls that are constructed with country-specific metal profiles that differ in their geometry from the profiles used in the fire tests. The use of FKRS-EU in walls with such profiles is permitted if the wall construction has been tested by the wall manufacturer. This also applies to wall structures with metal inserts, metal nets or additional layers of wooden composite boards. European and national evidence (report or expert opinion, etc.) and also additional tests and classifications carried out by testing institutes are regarded as evidence. - Shaft walls, extension to include shaft walls up to EI 60 S, which were constructed with Promatect 100. - Lightweight partition walls, extension of wall structures with fire-rated plasterboard panels (GKF) to plasterboard construction panels (GKB) for EI 30 S to EI 60 S. Additional reinforcing boards made of wall construction materials or additional wood-based panels are permitted. - Alternative fixing systems, alternative fixings may be used provided that their performance is proven by fire test, stresses, linear expansion or load data. Other information may be taken into account. In addition to these fastenings, fastening variants approved by a testing facility may also be used. ■ New document ID <ul style="list-style-type: none"> - A00000092709 Version 1 -> A00000092709 Version 2
1	2023-03-06	PB	<ul style="list-style-type: none"> ■ Technical data - New attachments: <ul style="list-style-type: none"> - FKRS-EU with spring return actuator and duct smoke detector - FKRS-EU with fusible link and cover grilles as an air transfer damper (FD) - FKRS-EU with spring return actuator and duct smoke detector as an air transfer damper (MFD) ■ Structure and function - New attachments: <ul style="list-style-type: none"> - FKRS-EU with fusible link and cover grilles as an air transfer damper (FD) - FKRS-EU with spring return actuator and duct smoke detector as an air transfer damper (MFD) ■ Installation - installation kits: <ul style="list-style-type: none"> - Old installation kits TQ, WA, WE and GL no longer applicable ■ Installation - New uses: <ul style="list-style-type: none"> - Solid walls - Mortar-based installation in solid wall - installation not flush with wall

Version no.	Date	Author	Remark/Amendment
			<ul style="list-style-type: none"> - Mortar-based installation in gypsum wallboard - Dry mortarless installation remote from solid walls with mineral wool and coated board system - Dry mortarless installation with coated board system in solid wall - multiple occupancy of an installation opening - Lightweight partition walls <ul style="list-style-type: none"> - Mortar-based installation in lightweight partition wall – Installation not flush with wall - Mortar-based installation – multiple occupancy of one installation opening - Dry mortarless installation in lightweight partition wall with installation kit TQ2 – Installation not flush with wall - Dry mortarless installation with installation kit GL2 in lightweight construction or compartment wall and Knauf ceiling connection - Dry mortarless installation with installation kit GL2 and steel bracket in lightweight partition wall, if there is no rear fixing option - Dry mortarless installation with coated board system in lightweight partition wall – Multiple occupancy of an installation opening - Timber stud walls and half-timbered construction walls <ul style="list-style-type: none"> - Mortar-based installation into a lightweight partition wall with timber support structure, combined, FKRS-EU and FK2-EU - Mortar-based installation into a lightweight partition wall with half-timbered construction, combined, FKRS-EU and FK2-EU - Dry mortarless installation with coated board system - multiple occupancy of an installation opening - Shaft walls with metal support structure <ul style="list-style-type: none"> - Dry mortarless installation with installation kit WA2 - Dry mortarless installation with coated board system - Shaft walls without metal support structure <ul style="list-style-type: none"> - Mortar-based installation - Solid ceiling slabs <ul style="list-style-type: none"> - Mortar-based installation in solid ceiling, combined, FKRS-EU and FK2-EU - Mortar-based installation – multiple occupancy of one installation opening - Mortar-based installation in combination with lightweight ceilings (ADK modular room system) - Dry mortarless installation in combination with lightweight ceilings (ADK modular room system), with concrete base and installation kit TQ2 ■ New document ID <ul style="list-style-type: none"> - M375DE7 Version 5 -> A00000092709 Version 1

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