Fire damper

FKRS-EU

according to Declaration of Performance
DoP/FKRS-EU/DE/005

TROX® TECHNIK
The art of handling air

Read the instructions prior to performing any task!

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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.

Copyright

TROX Technical Support

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

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

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

Limitation of liability

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

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

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

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

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

We reserve the right to make technical changes.

Warranty claims

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

Safety notes

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

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

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

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

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

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

ENVIRONMENT!
Environmental pollution hazard.

Tips and recommendations

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

Safety notes as part of instructions

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

Example:

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

Specific safety notes

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

Warning signs	Type of danger
⚠	Warning – danger zone.

1 Safety

1.1 General safety notes

Sharp edges, sharp corners and thin sheet metal parts

CAUTION!

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

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

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

Electrical voltage

DANGER!

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

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

1.2 Correct use

- 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 it in extract air systems in commercial kitchens.
- For use as an air transfer damper see general type approval Z-6.50-2516.
- Use with a combined penetration seal requires individual type-approval.
- Use with firestop blocks requires individual type-approval.
- Crossflow fasteners 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 have to be observed.

Incorrect use

WARNING!

Danger due to incorrect use!

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

Never use the fire damper:

– without specially approved attachments in areas with potentially explosive atmospheres
– as a smoke control damper
– outdoors without 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 m³/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
EC conformity	■ 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
Declaration of Performance	DoP/FKRS-EU/DE/005

[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] Non-condensing operation or without moisture entry via the fresh air intake.

[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

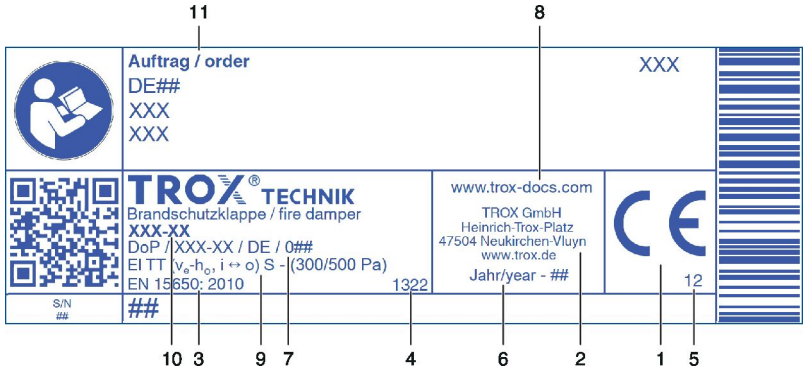


Fig. 1: Product sticker (example)

1 CE mark
2 Manufacturer's address
3 Number of the European standard and year of its publication
4 Notified body
5 The last two digits of the year in which the CE marking was affixed
6 Year of manufacture
7 No. of the declaration of performance
8 Website from which the DoP can be downloaded
9 Regulated characteristics; the fire resistance class depends on the application and may vary
↳ *Chapter 5.1 'Overview of installation situations' on page 24*
10 Type
11 Order number

2.2 FKRS-EU with fusible link

Dimensions and weight

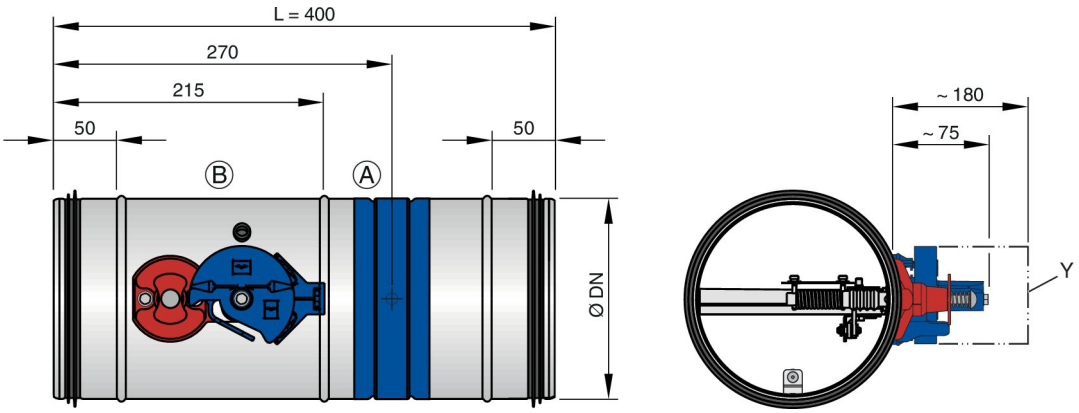


Fig. 2: FKRS-EU with fusible link

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 mm²
Protection level	IP 66
Type of contact	1 changeover contact, gold-plated
Maximum switching current	0.5 A
Maximum switching voltage	30 V DC, 250 V AC
Contact resistance	approx. 30 mΩ

Weight [kg]										
Nominal size [mm]	**100**	**125**	**150**	**160**	**180**	**200**	**224**	**250**	**280**	**315**
ØDN [mm]	**99**	**124**	**149**	**159**	**179**	**199**	**223**	**249**	**279**	**314**
FKRS-EU with fusible link	1.3	1.6	1.8	2.0	2.3	2.5	2.7	3.3	3.8	4.4
... and installation block ER	5.7	8.6	7.6	7.3	11.0	9.8	13.5	12.1	16.0	15.0
... and installation kit 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 weight

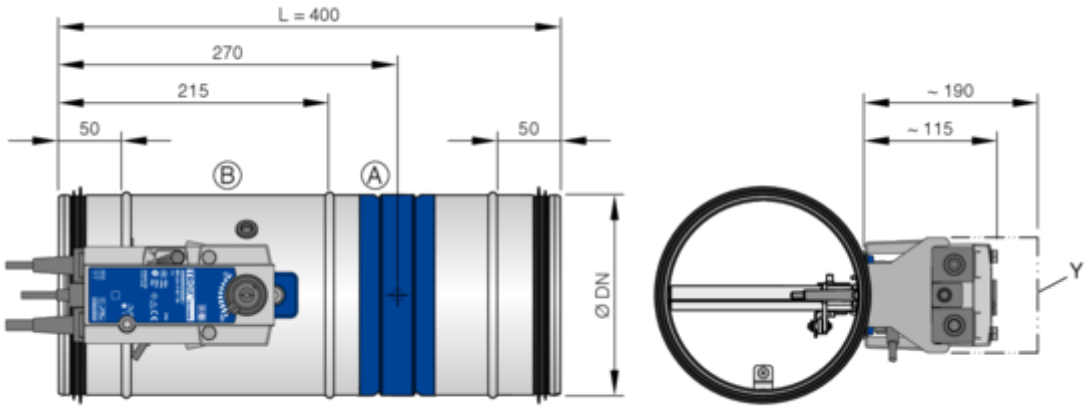


Fig. 3: FKRS-EU with Belimo spring return actuator

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 BFL...			
Construction		**230-T TR**	**24-T-ST TR**
Supply voltage		230 V AC, 50/60 Hz	24 V AC/DC, 50/60 Hz
Functional range		198 – 264 V AC	19.2 – 28.8 V AC 21.6 – 28.8 V DC
Power rating	Spring winding mechanism / hold position	3.5 W / 1.1 W	2.5 W / 0.8 W
	Rating	6.5 VA	4 VA
Run time	Actuator / spring return	< 60 s / < 20 s	
Limit switch	Type of contact	2 changeover contacts	
	Switching voltage	5 – 120 V DC / 5 – 250 V AC	
	Switching current	1 mA – 3 (0.5 inductive) A	
	Contact resistance	< 1 Ω (when new)	
IEC protection class / IP protection		II / IP 54	
Storage temperature / ambient temperature		-40 to 55 °C / -30 to 55 °C [1]	
Ambient humidity		≤ 95% rh, no condensation	
Connecting cable	Actuator / limit switch	1 m, 2 × 0.75 mm² / 1 m, 6 × 0.75 mm² (free of halogens)	

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

Dimensions and weight

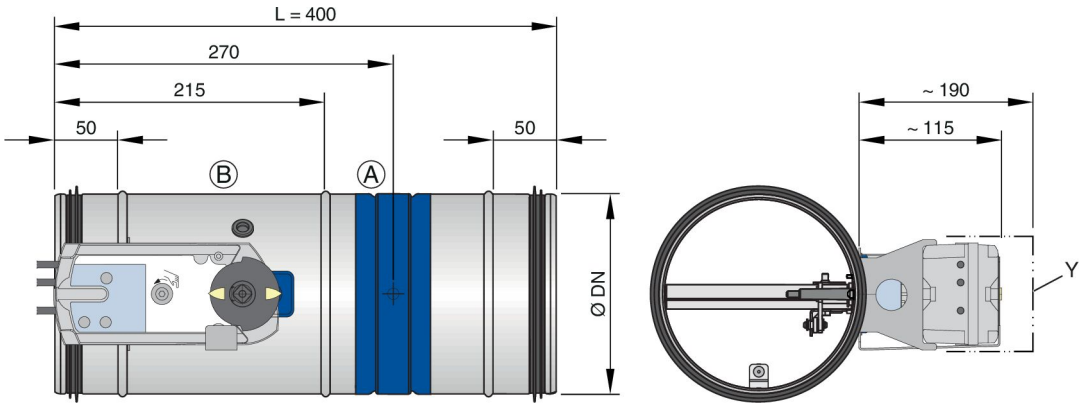


Fig. 4: FKRS-EU with Siemens spring return actuator

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 mm² / 0.9 m, 6 × 0.75 mm² (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 weight

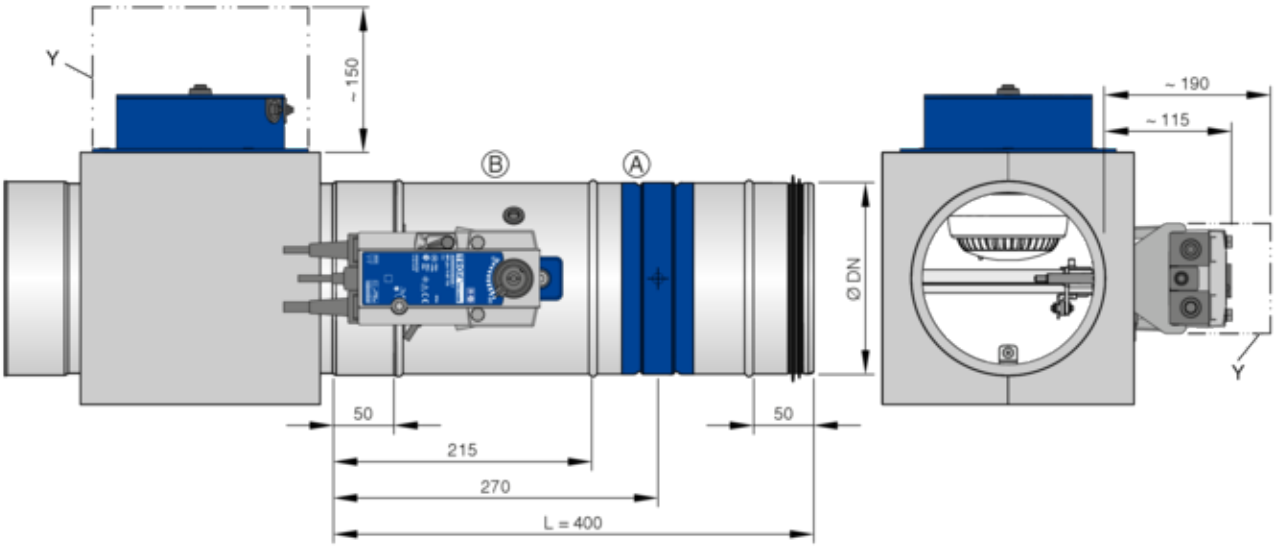


Fig. 5: FKRS-EU with Belimo spring return actuator and duct smoke detector, drawn in a square air duct (on-site)

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

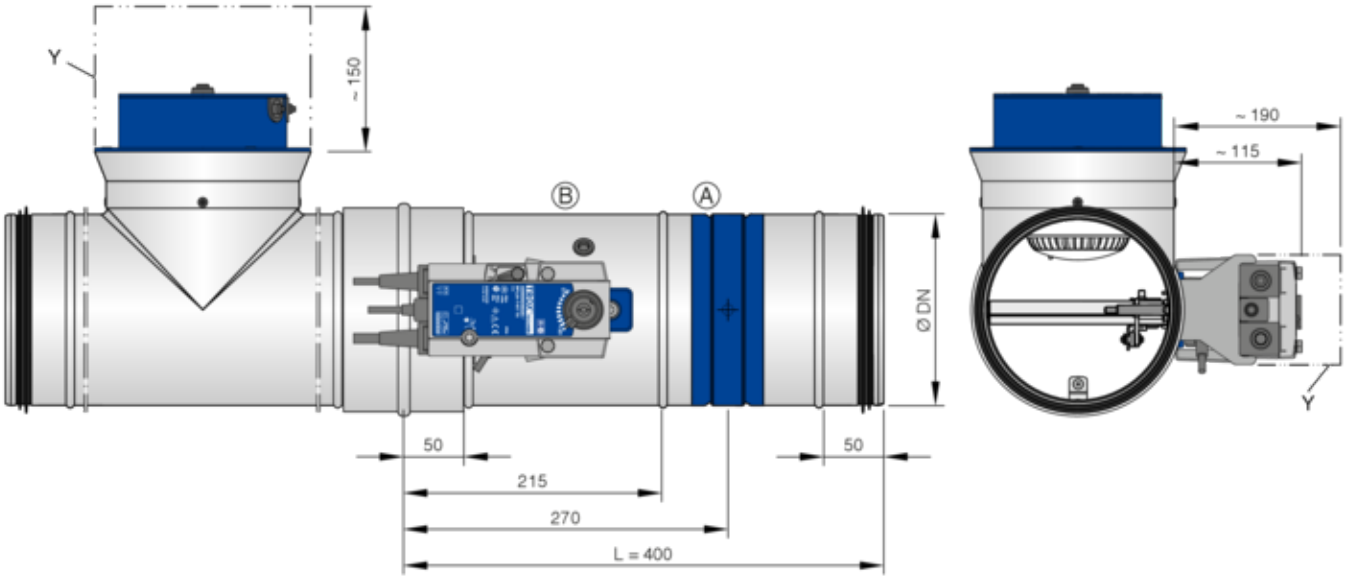


Fig. 6: FKRS-EU with Belimo spring return actuator and duct smoke detector, drawn in a round air duct (on-site)

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 weight

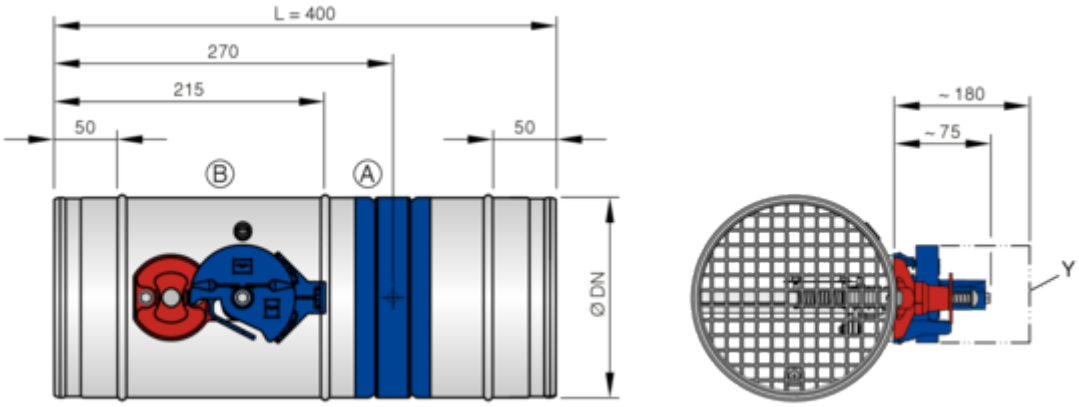


Fig. 7: FKRS-EU with fusible link and cover grille on both sides as an upstream shutter for the air transfer unit

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

Note: Air transfer units 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.

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

Dimensions and weight

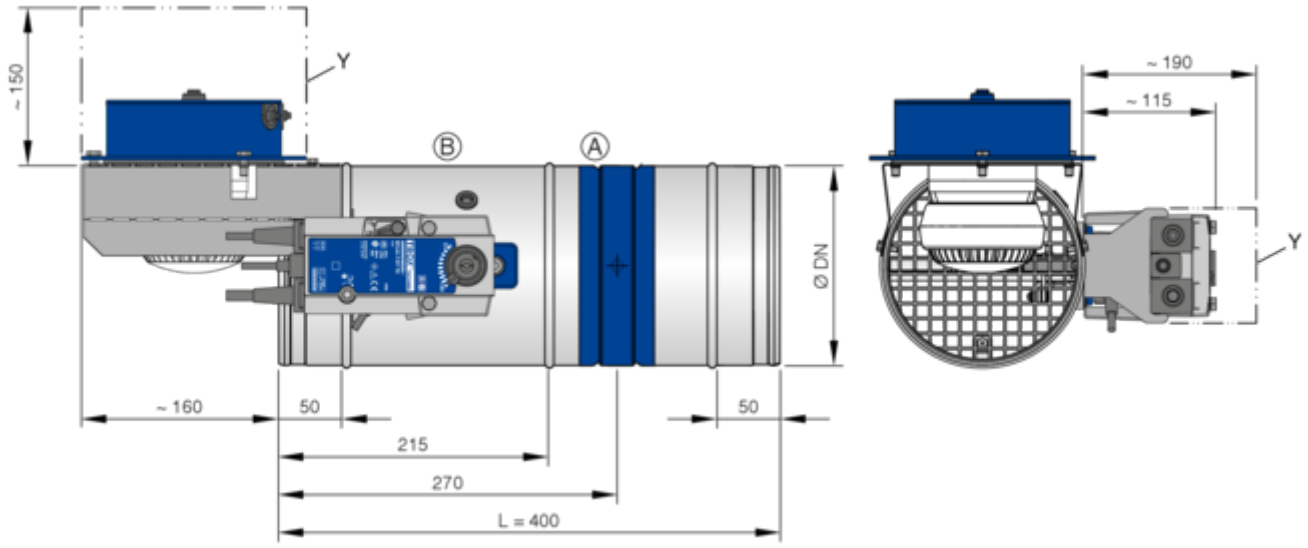


Fig. 8: FKRS-EU with spring return actuator and duct smoke detector used as an air transfer damper

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

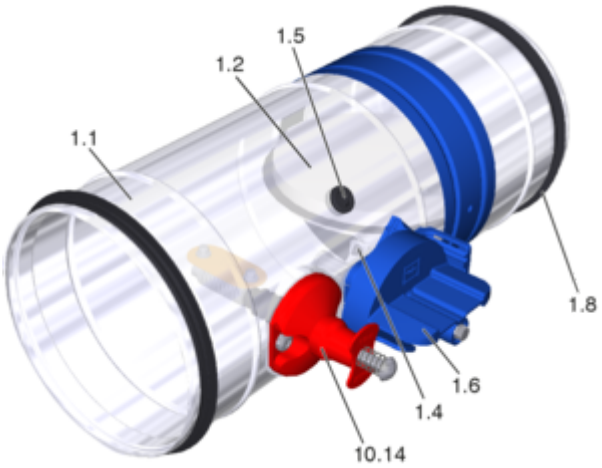


Fig. 9: FKRS-EU with fusible link

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

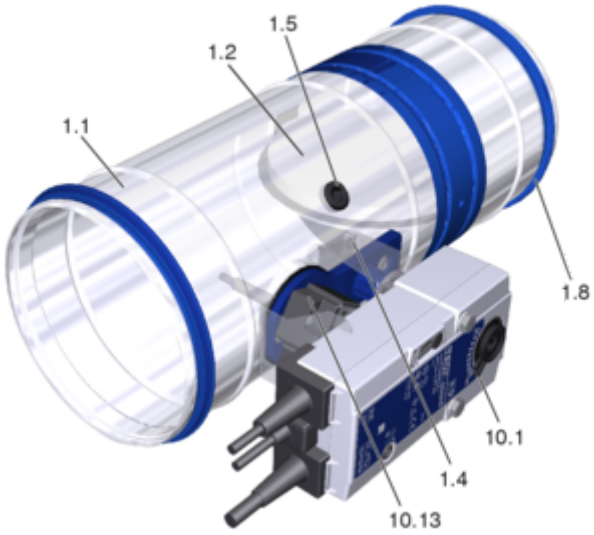


Fig. 10: FKRS-EU with spring return actuator

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

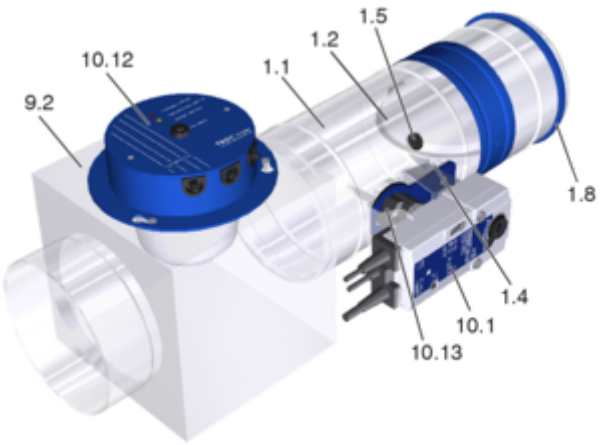


Fig. 11: FKRS-EU with spring return actuator and duct smoke detector

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.

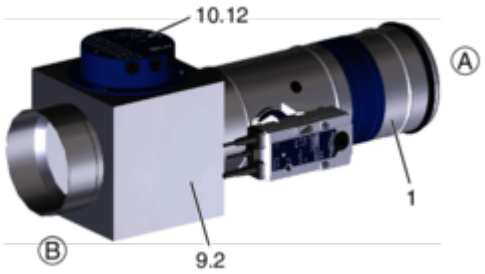


Fig. 12: FKRS-EU with spring return actuator and duct smoke detector in a rectangular duct

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

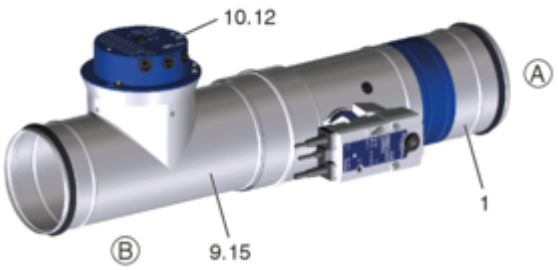


Fig. 13: FKRS-EU with spring return actuator and duct smoke detector in a circular duct

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

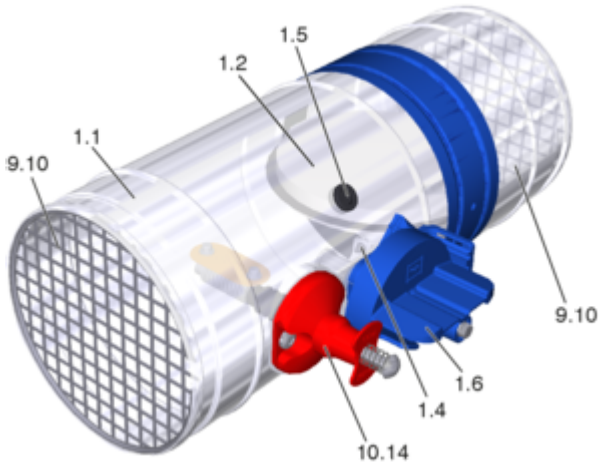


Fig. 14: FKRS-EU with fusible link and cover grille on both sides as an upstream shutter for the air transfer unit

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

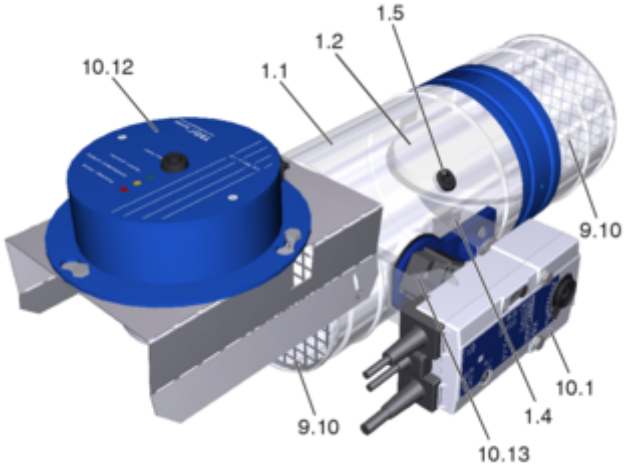


Fig. 15: FKRS-EU with spring return actuator and duct smoke detector as air transfer damper

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

Note

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

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	100	EI 120 S	N	*53*
		100	EI 90 S	N	*53*
	in, combined installation	100	EI 90 S	N	*55*
	in, multiple installation	100	EI 90 S	N	*57*
	in, partly with mineral wool	100	EI 120 S	N	*60*
	in, underneath flexible ceiling joint	100	EI 90 S	N	*62*
	in, installation block ER	100	EI 90 S	E	*63*
	in, installation kit TQ2	100	EI 120 S	E	*64*
	on the face of, installation kit WA2	100	EI 90 S	E	*66*
	remote from, wall attachment, installation kit WE2	100	EI 120 S	E	*68*
	remote from, wall penetration, installation kit WE2	100	EI 120 S	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	W [1]	*81*
		100	EI 90 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 bulkhead	100	EI 90 S	T	*39*
Metal stud walls	in	94	EI 120 S	N [1]	*93*
		94	EI 90 S	N [1]	*93*
		80	EI 60 S	N [1]	*93*

[1] The class of performance depends on the installation details
[2] Thickness increased near the installation opening
[3] Depending on local conditions

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**
		75	EI 30 S	N [1]	*94*
	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	E [1]	*104*
		94	EI 90 S	E [1]	*104*
		80	EI 60 S	E [1]	*104*
		75	EI 30 S	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	*114*
	remote from, mineral wool insulation, fire batt	94	EI 60 S	T	*115*
	in, direct installation, installation kit GL2	94	EI 90 S	T	*116*
	in, flexible ceiling joint, installation kit GL2	100	EI 90 S	E	*117*
	in, fire batt	94	EI 120 S	W [1]	*126*
		94	EI 90 S	W [1]	*126*
		80	EI 60 S	W [1]	*126*
		75	EI 30 S	W [1]	*126*
	in, fire batt, multiple installation	100	EI 90 S	W [1]	*132*
	in, combined penetration seal	100	EI 90 S	W [1]	*38*
	in, fire protection block bulkhead	100 – 200	EI 90 S	T	*39*
Timber stud walls	in	130	EI 120 S	N	*138*
		130	EI 90 S	N	*138*
		110	EI 60 S	N	*138*
		105	EI 30 S	N	*138*
	in, combined installation	130	EI 90 S	N	*140*
	in, installation kit TQ2	130	EI 120 S	E	*145*
		110	EI 60 S	E	*145*
		105	EI 30 S	E	*145*

[1] The class of performance depends on the installation details
[2] Thickness increased near the installation opening
[3] Depending on local conditions

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**
	remote from, mineral wool insulation	130	EI 60 S	T	*147*
	remote from, mineral wool insulation, fire batt	130	EI 60 S	T	*149*
	in, fire batt	130	EI 120 S	W	*151*
		130	EI 90 S	W	*151*
		110	EI 60 S	W	*151*
		105	EI 30 S	W	*151*
	in, fire batt, multiple installation	130	EI 90 S	W [1]	*159*
	in, combined penetration seal	130	EI 90 S	W [1]	*38*
Half-timbered constructions	in	140	EI 120 S	N	*141*
		140	EI 90 S	N	*141*
		110	EI 30 S	N	*141*
	in, combined installation	140	EI 90 S	N	*143*
	in, installation kit TQ2	140	EI 120 S	E	*146*
		140	EI 90 S	E	*146*
		110	EI 30 S	E	*146*
	remote from, mineral wool insulation	140	EI 60 S	T	*148*
	remote from, mineral wool insulation, fire batt	140	EI 60 S	T	*150*
	in, fire batt	140	EI 120 S	W	*155*
		140	EI 90 S	W	*155*
		110	EI 30 S	W	*155*
	in, fire batt, multiple installation	140	EI 90 S	W [1]	*159*
Solid wood/CLT walls	in	95	EI 90 S	N	*165*
	in, installation kit TQ2	95	EI 90 S	E	*167*
	remote from, mineral wool insulation	100	EI 60 S	T	*168*
	remote from, mineral wool insulation, fire batt	100	EI 60 S	T	*169*
	in, fire batt	95	EI 90 S	W	*170*
Shaft wall with metal support structure	in	90	EI 90 S	N	*176*
		90	EI 30 S	N	*176*
	in, combined installation	90	EI 90 S	N	*179*

[1] The class of performance depends on the installation details

[2] Thickness increased near the installation opening

[3] Depending on local conditions

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, installation kit TQ2	90	EI 90 S	E	*181*
	on the face of, installation kit WA2	90	EI 90 S	E	*183*
	in, fire batt	90	EI 60 S	W	*184*
Shaft wall without metal support structure	in	90	EI 90 S	N	*186*
	in, installation kit TQ2	90	EI 90 S	E	*187*
	on the face of, installation kit WA2	90	EI 90 S	E	*188*
Sandwich panel walls	in, fire protection block bulkhead	100 – 200	EI 90 S	T	
Solid ceiling slabs	in	100 (150) [2]	EI 120 S	N	*191*
		100	EI 90 S	N	*191*
	in, combined installation	150	EI 90 S	N	*194*
	in, multiple installation	150	EI 90 S	N	*196*
	in, with concrete base	100	EI 120 S	N	*199*
	in, with concrete base, combined assembly	100	EI 90 S	N	*200*
	in, with concrete base, multiple mounting	100	EI 90 S	N	*202*
	in, hollow concrete block ceilings	150	EI 90 S	N	*205*
	in, hollow core slabs	150	EI 90 S	N	*206*
	in, ribbed ceilings	150 [2]	EI 90 S	N	*207*
	in, composite ceilings	150	EI 90 S	N	*208*
	in, combined with wooden beam ceilings	150	EI 90 S	N	*209*
	in, combined with solid wood ceiling	150	EI 90 S	N	*210*
	in, combined lightweight ceiling, Cadoldo system	150	EI 120 S [1]	N	*211*
	in, combined lightweight ceiling, system ADK modular space	125	EI 90 S	N	*212*
		125	EI 90 S	E	*214*
	in, installation block ER	100 (150) [2]	EI 90 S	E	*217*
	underneath (horizontal duct), installation kit WE2	125	EI 90 S	E	*219*
	above (horizontal duct), installation kit WE2	125	EI 90 S	E	*219*

[1] The class of performance depends on the installation details
[2] Thickness increased near the installation opening
[3] Depending on local conditions

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, fire batt	100 (150) [2]	EI 120 S	W [1]	↳ *225*
		100 (150) [2]	EI 90 S	W [1]	↳ *225*
Solid wood ceilings	in	140	EI 90 S	N	↳ *227*
		112.5	EI 90 S	N	↳ *227*
	in, installation kit TQ2	140	EI 90 S	E	↳ *228*
		112.5	EI 90 S	E	↳ *228*
Wooden beam ceilings	in	167.5	EI 90 S	N	↳ *229*
		155	EI 60 S	N	↳ *229*
		142.5	EI 30 S	N	↳ *229*
	in, installation kit TQ2	167.5	EI 90 S	E	↳ *231*
		155	EI 60 S	E	↳ *231*
		142.5	EI 30 S	E	↳ *231*
	in, historic wooden beam ceilings	– [3]	EI 30 S	N	↳ *233*

[1] The class of performance depends on the installation details
[2] Thickness increased near the installation opening
[3] Depending on local conditions

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 ↳ *242* .
- Do NOT remove the product sticker or the adhesive tape in the installation opening.

- 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.
- If the wall or ceiling is very thick, use an extension piece.
- 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 load-bearing components, uncovered steel girders as well as wooden walls and ceilings is ≥ 75 mm.
  - No more than two fire dampers in the same installation opening.
  - With mortar-based installation, fire dampers can be installed at ≥ 40 mm from steel girders, wooden beams or wooden ceilings with fire-rated cladding. 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.
- 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.
- 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 actuators 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 from 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).

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.

Connecting duct and extension piece

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

Equipotential bonding

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

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

Thermal insulation

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.

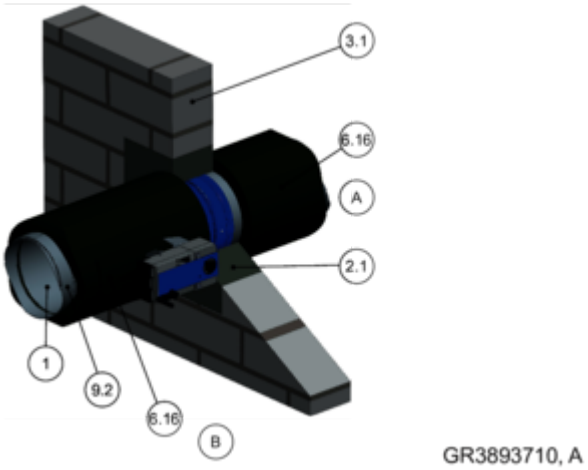


Fig. 16: Thermal insulation

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.

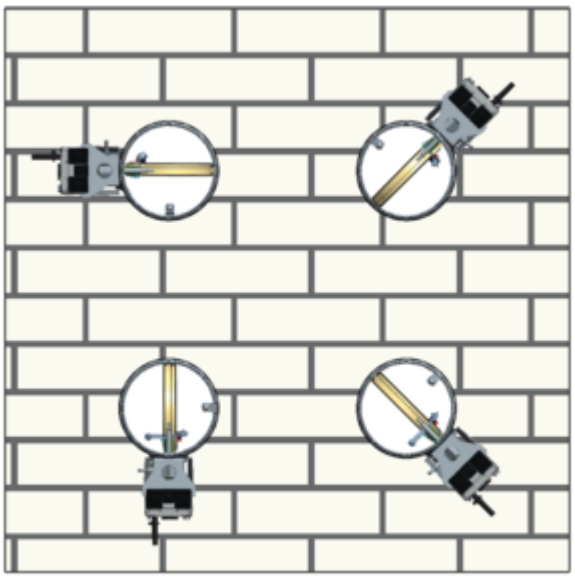
For installation in Germany please note:
In Germany, only insulation materials with a fire behaviour of at least C - s2, d0, may be used according to the specifications of the MVV TB (since 2019/1). This requirement is met by Armaflex Ultima insulation material from Armacell, for example. The applicable 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* .

Extension pieces

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 240* .

Installation positions

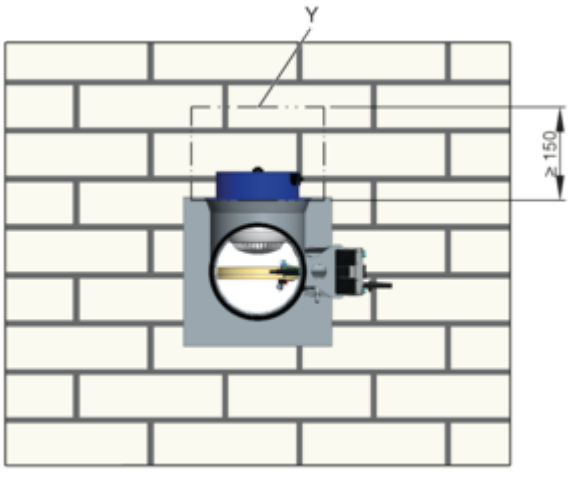
The fire damper can be installed with the damper blade shaft in any position (0 to 360°). The position of the release mechanism is not critical but the mechanism must remain accessible for maintenance.



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

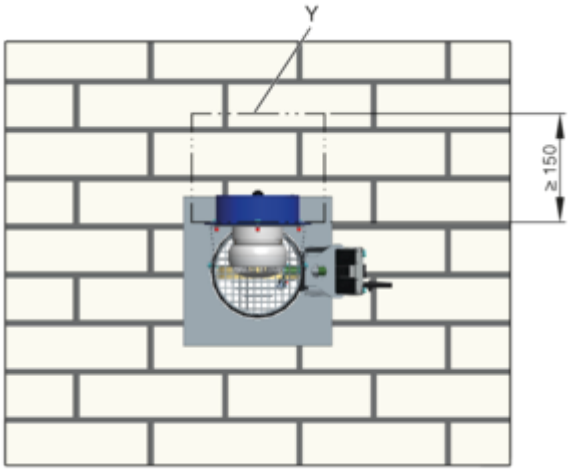


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Fig. 19: FKRS-EU with spring return actuator and duct smoke detector used as an air transfer damper

Y Keep clear for operation and maintenance

Distances

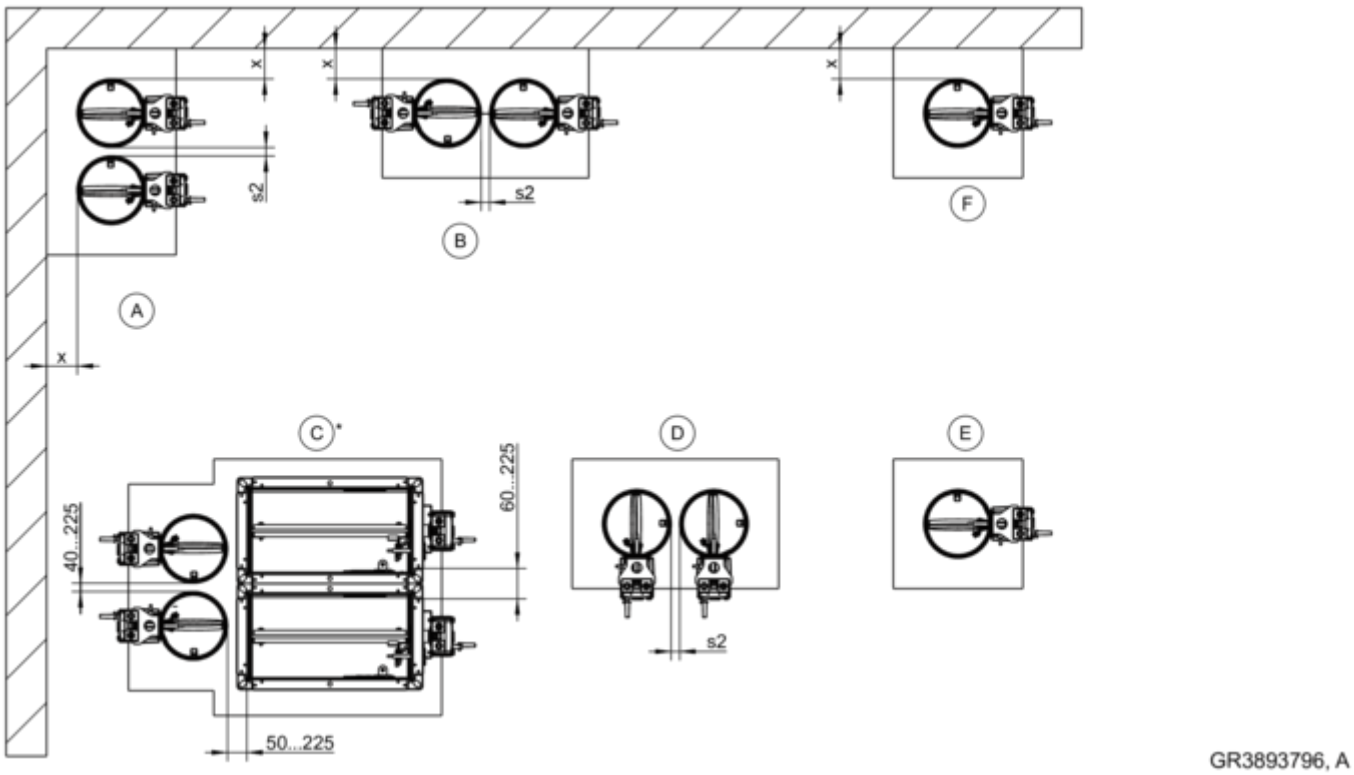


Fig. 20: Overview of distances

* 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, *'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	Fire batt 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
Shaft wall without metal support structure	E	E	
Sandwich panel wall		E *	
Solid ceiling slab	A – F	E	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/–	
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.

Mortar-based installation

- Cover all openings and control elements of the fire damper (e.g. with plastic) to protect them from contamination.
- 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 is to be avoided. The mortar bed depth should be equal to the thickness of the wall but must be at least 100 mm.
- The bond between the mortar and the supporting structure must be ensured on site. If necessary, create a positive connection, e.g., screws in the installation opening for mortar-based installation in wooden beam ceilings.
- If you install the fire damper as the solid wall or ceiling slab is being completed, perimeter gap s1 is not required. The open spaces between the fire damper and the wall must be closed off with mortar; for installation into solid ceiling slabs, use concrete. Reinforcement should meet structural requirements.
- The mortar bed depth should be equal to the thickness of the wall. If trim panels with appropriate fire resistance are used, a mortar bed depth of 100 mm suffices.

Mortar

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

Perimeter gap »s1«

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

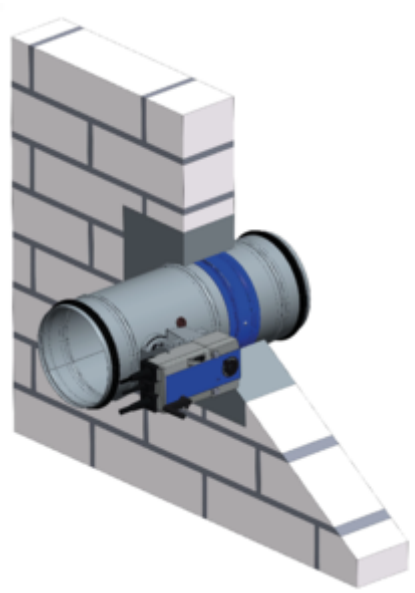


Fig. 21: Perimeter gap

1 FKRS-EU
2.1 Mortar
s1 Perimeter gap

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

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 with installation block/installation kit

- For installation without mortar-mix, installation blocks or installation kits can be used:
  - in walls and ceilings: ER, TQ2
  - on walls: WA2
  - remote from walls and ceilings: WE2
  - in 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 cavities. If cavities 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 44* .
  - The installation of the installation block is always centred in the installation opening.
  - Circular installation opening ER: ∅D1, ↬ *5.4.1 'Overview of installation block and installation kits' on page 43* .
- **Installation kit TQ2**
  - The installation kit TQ2 is mounted on the fire damper on site, ↬ *5.4.3 'Installation kit TQ2' on page 45* .
  - 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 upper fixings, fixing screws are to be provided at the top of the H-sides of the cover plate.
- **Installation kit WA2**
  - The WA2 installation kit is mounted on the fire damper on site, ↬ *5.4.4 'Installation kit WA2' on page 46*
  - Installation is carried out on solid walls in front of a core drill hole nominal width + 10 - 30 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 47* .
  - 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:
    – 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 ≥ 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 48* .
  - 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. 35 and the cover Fig. 36 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.

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 80BLC (80 kg/m³)
- 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 fire batt

- 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 ≥ 140 kg/m³.
- Apply fire-resistant sealant to the cut faces of the mineral wool slabs and fit them tightly into the installation opening. Seal any gaps between the mineral wool slabs and the installation opening, gaps between the cut faces of cut-to-size pieces, and gaps between slabs and the fire damper by applying fire-resistant sealant or coating. Use only sealant or coating that is suitable for the fire batt system.
- Apply ablative coating to the mineral wool slabs, joints, transitions and any imperfections on the coated mineral wool slabs; coating thickness ≥ 2.5 mm.
- Depending on the selected installation situation and fire resistance duration, the fire damper casings must be partially coated, thickness ≥ 2.5 mm. The drive and release unit as well as the product label must not be coated.
  Permitted alternatives:
  – Mineral wool strips > 1000 °C, > 80 kg/m³, thickness = 20 mm
  – Sleeves (can be ordered separately)
  – Elastomer foam strips (flame-resistant, non-dripping)
    The following applies in Germany: For notes on the use of elastomeric foams, see *8* .
- Fix fire dampers on both sides of the wall/ceiling, see *235* .
- 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 cavities. If cavities are present, they must be completely sealed with mortar all around to a depth of ≥ 100 mm.
- Fire batt systems are not suitable for use below flexible ceiling joints.

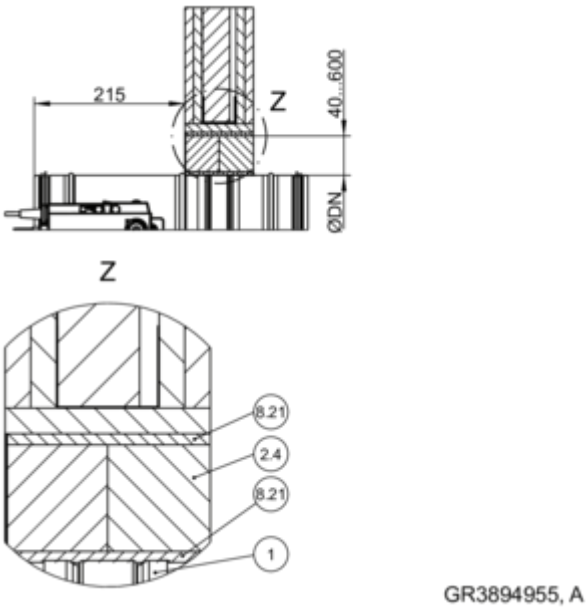


Fig. 22: Fire-resistant sealant

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

Fire batt systems

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

Promat®

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

Hilti

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

HENSEL

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

SVT

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

OBO Bettermann

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

Würth

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

AGI

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

FLAMRO

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

Dimensions and distances for fire batt systems for wall installation

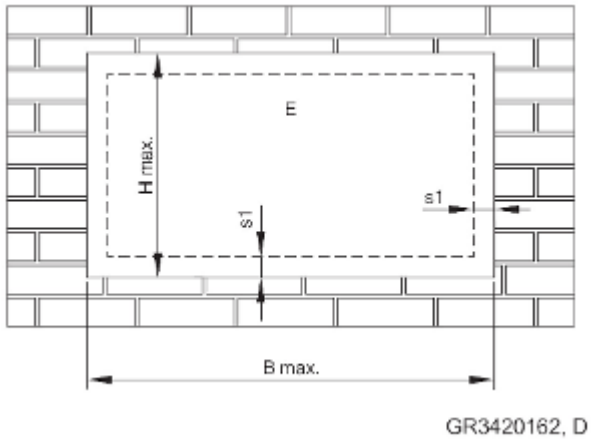


Fig. 23: Fire batt – installation in solid walls and ceilings, lightweight partition, timber stud wall, half-timbered construction and solid wood walls

E Installation area

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

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

Installation with combined penetration seal

Mixed ducts of fire dampers FKRS-EU and FK2-EU, together with cables and pipes in a Hilti fire batt 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 × H1 = 3000 × 2000 mm are possible.

Installation is permitted in solid walls as well as lightweight partition walls with metal or wooden framework.

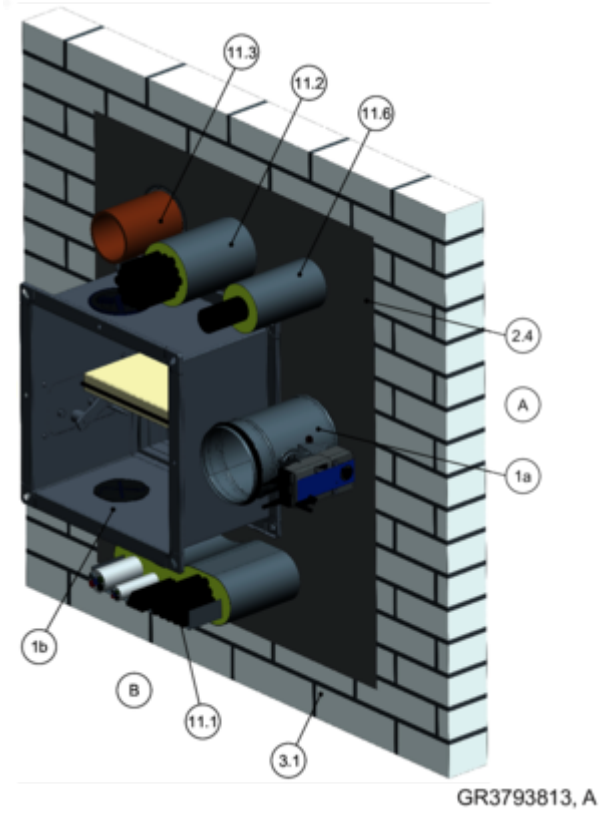


Fig. 24: Combined penetration seal (drawn solid wall)

1a FKRS-EU
1b FK2-EU
2.4 Fire batt with ablative coating
3.1 Solid wall
11.1 Cable tray
11.2 Cable set
11.3 Pipe collar
11.6 Cable penetration

Additional provision for use in Germany:

- Use with a combined penetration seal in Germany requires official approval.

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.

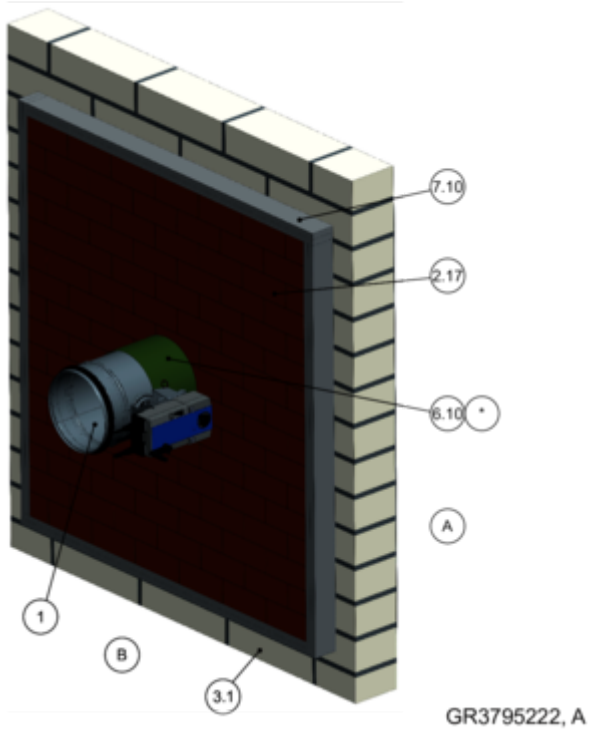


Fig. 25: Fire protection stone bulkhead (single penetration)

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

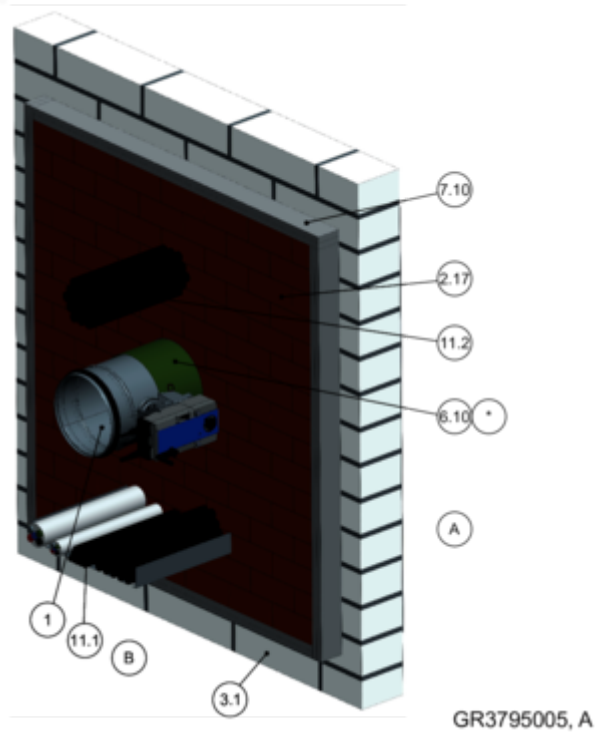


Fig. 26: Fire protection stone bulkhead (mixed execution)

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.

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).

Solid walls

- Solid walls or compartment walls made of, for example, concrete, aerated concrete, masonry or solid gypsum wallboard to EN 12859, (without cavities), gross density ≥ 350 kg/m³.
- Wall thickness W ≥ 100 mm.
- 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.

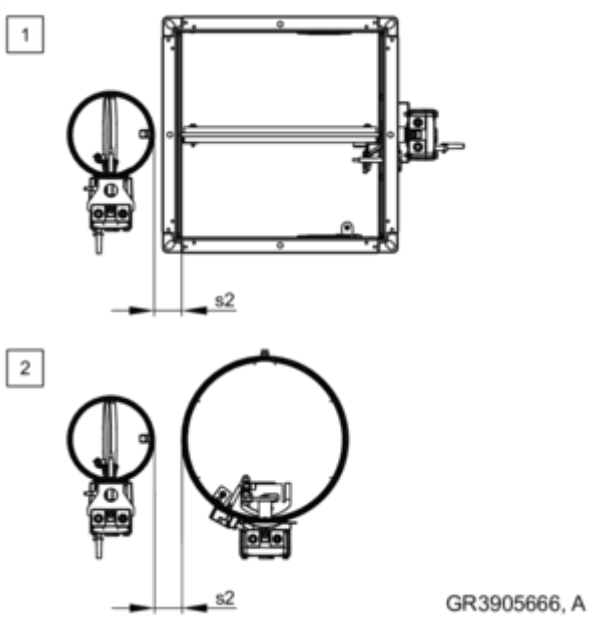


Fig. 27: Distance from the FKRS-EU to other TROX fire dampers in mortar-based installation

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

Gypsum wallboard

- Gypsum wallboard according to EN 12859 (without cavities).
- Wall slab thickness W ≥ 80 mm.
- Provide each installation opening according to the local and structural conditions and with regard to the size of the fire damper.

Module systems

- Additional assembly instructions for manufacturers' room modules:
  ADK module room and Cadolto
- In dry mortarless installation, fire dampers can be installed without a minimum distance under modular ceiling designs with proven fire resistance duration.
- In mortar-based installation, when using installation kits for ceiling installation, the cover plate of the installation kit must be professionally shortened on one side. As a replacement for the upper fixings, fixing screws are to be provided at the top of the H-sides of the cover plate. Pre-drill the screw holes with ∅ 4 mm.

Lightweight partition walls with metal support structure

- Lightweight partition walls, safety partition walls or walls to provide radiation protection, with metal support structure or steel support structure, with European classification to EN 13501-2 or equivalent national classification.
- Cladding on both sides made of gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards.
- Wall thickness W ≥ 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.
- Create an installation opening with trimmers (studs and noggings).
- If necessary, provide trim panels and screw-fix them to the support structure
- Additional layers of cladding (if stated in the usability certificate for the wall) and double stud constructions are approved.
- Connect the metal sections near the installation opening according to the installation details in this manual.
- If reinforcing boards are required, 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).

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

- Lightweight partition walls, either timber stud walls or half-timbered constructions, with European classification to EN 13501-2 or equivalent national classification.
- ≤ 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.
- Timber support structure, wall thickness W ≥ 130 mm (W ≥ 110 with F60, W ≥ 105 with F30); half-timbered construction, wall thickness W ≥ 140 mm (W ≥ 110 with F30).
- Erect the timber stud wall or half-timbered construction according to the manufacturer's instructions.
- Additional layers of cladding (if stated in the usability certificate for the wall) and double stud constructions are approved.
- Create an opening in the timber support structure with studs and trimmers.
- Trim panels and reinforcing boards have to be made of cladding material and have to be fixed to the frame.

Solid wood walls

- Fire-resistant solid wood walls or cross laminated timber walls with European or national certificate.
- Wall thickness W ≥ 95 mm (with a reinforcing board in the installation area on the operating or installation side to W ≥ 100 mm).
- If required, additional gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum board are permitted.

Shaft walls with metal support structure

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

Shaft walls without metal support structure

- Shaft walls without metal support structure, with European classification according to EN 13501-2 or equivalent national classification.
- Cladding on one side made of gypsum bonded or cement bonded panel materials, fibre-reinforced gypsum or fire-rated calcium silicate boards.
- Shaft wall between two solid walls, without corners
- Wall thickness W ≥ 40 mm.
- If reinforcing boards are required, screw-fix them to the metal support structure at intervals of approx. 100 mm.

Sandwich panel walls

- Sandwich panel wall consisting of self-supporting sandwich panels/sandwich boards
- Sheet steel ≥ 0.5 mm, both sides, mineral wool fill, ≥ 1000 °C, ≥ 115 kg/m³
- Wall thickness ≥ 100 mm – 200 mm

Solid ceiling slabs

- Solid ceiling slabs without open spaces, made of concrete or aerated concrete, gross density ≥ 450 kg/m³.
- Ceiling thickness D ≥ 100 mm, thickness increased to D ≥ 150 mm where required (unless stated otherwise in the installation details).
- Partial solid ceiling slab d ≥ 150 mm as a combination with fire-resistant wooden beam ceilings (also gluelam), solid wood ceilings and lightweight ceilings (only ceiling systems Cadolto and ADK Modulraum).
- 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 ≥ 150 mm
  - Hollow core slabs, D ≥ 150 mm
  - Ribbed ceilings, thickness increased to D ≥ 150 mm
  - Composite ceilings, D ≥ 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.

Solid wood ceilings

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

Wooden beam ceilings

- Wooden beam or gluelam construction.
- Ceiling thickness D ≥ 142.5 mm (ceiling-dependent) with supplementary fire-resistant cladding.
- Historic wooden beam ceilings structurally F30 or fire protection-technically F30-approved.

5.4 Installation kits

5.4.1 Overview of installation block and installation kits

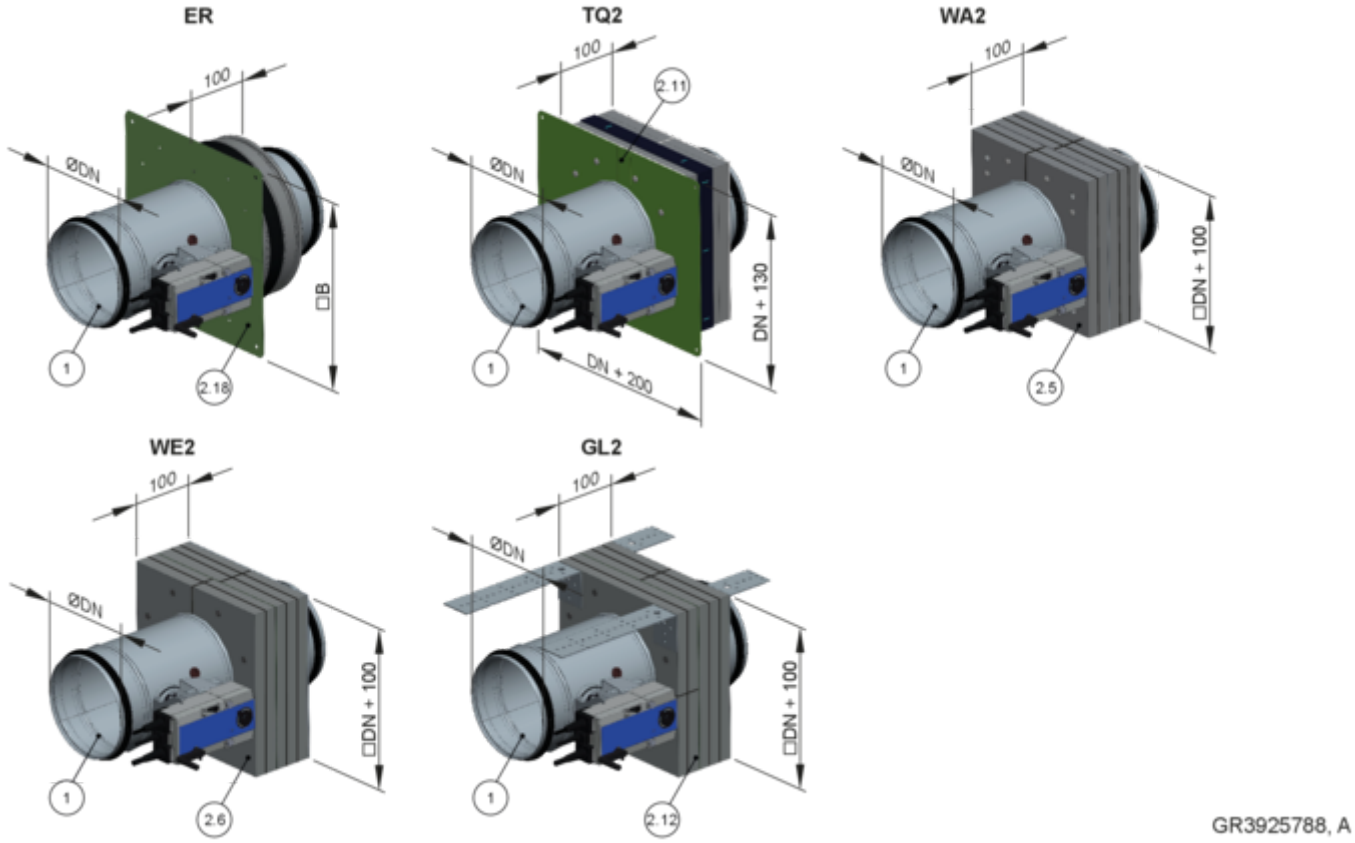


Fig. 28: Overview of installation block and installation kits

1 FKRS-EU
2.5 Installation kit WA2
2.6 Installation kit WE 2
2.11 Installation kit TQ2
2.12 Installation kit GL2
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.

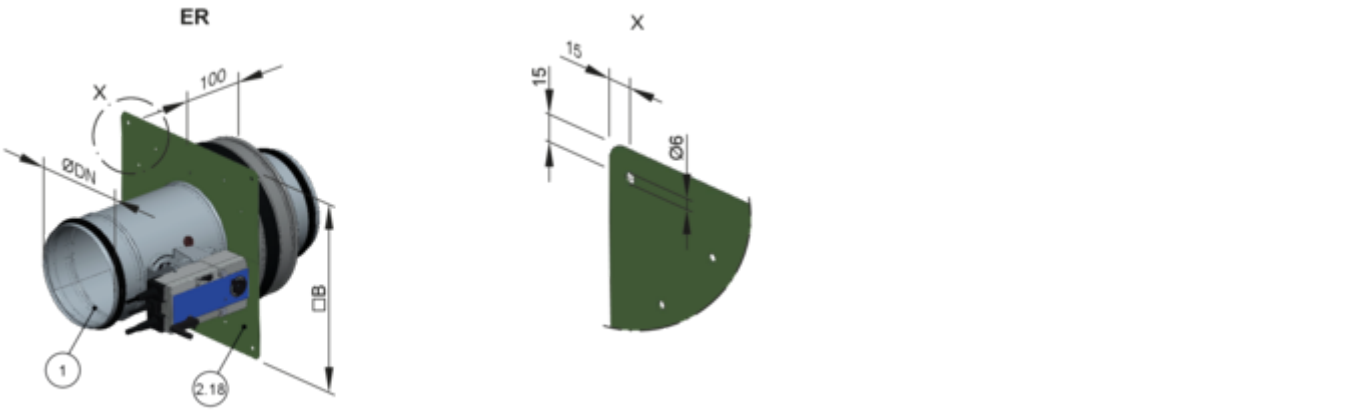


Fig. 29: Supply package and installation of installation block ER for dry mortarless installation

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**
∅D1*	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.

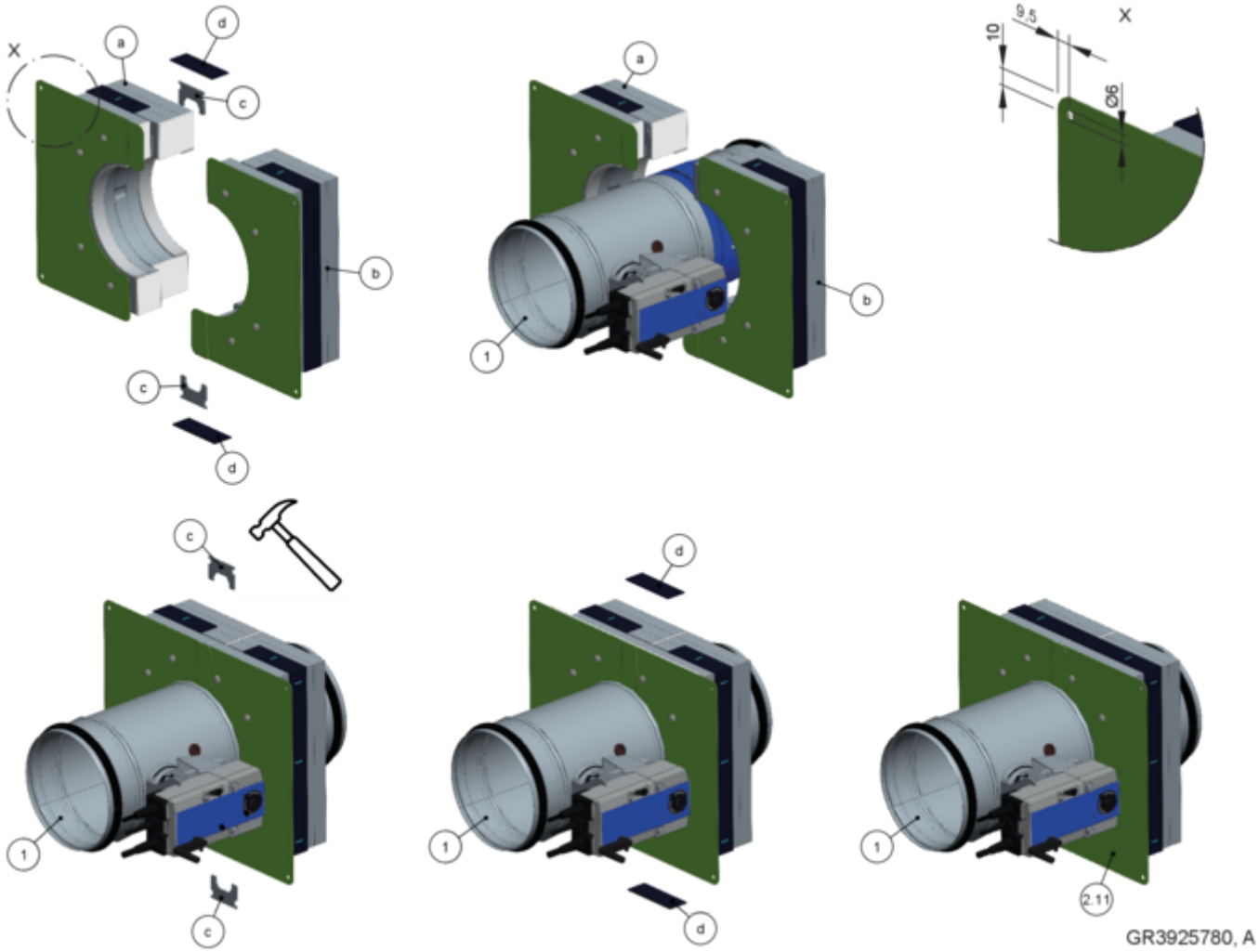


Fig. 30: Supply package and installation of installation kit TQ2 for dry mortarless installation

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

Installation of installation kit TQ2

1. ▸ 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.
2. ▸ 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.

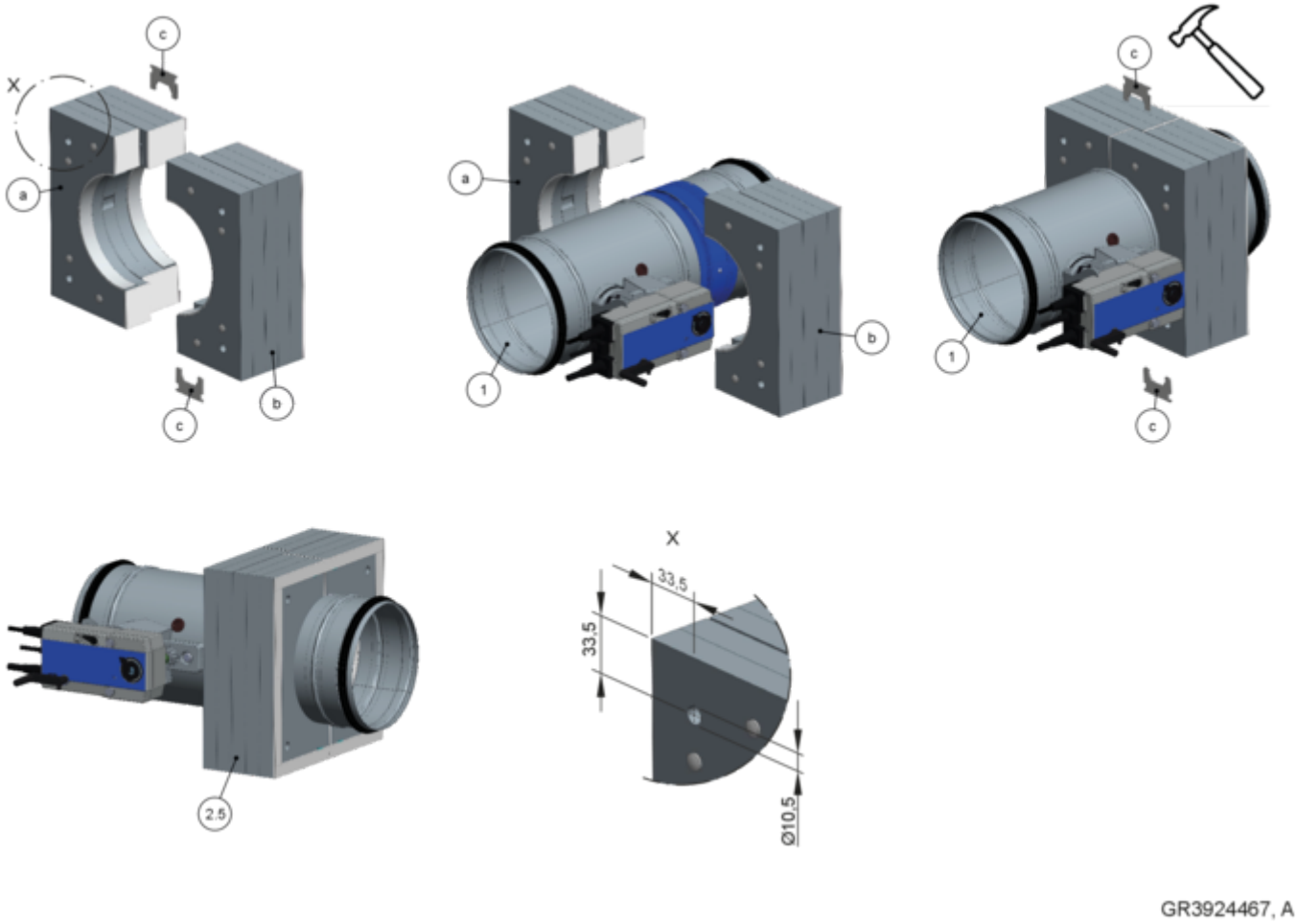


Fig. 31: Supply package and installation of installation kit WA2 for dry mortarless installation

1 FKRS-EU
2.5 Installation kit WA2, consisting of:
a Half-shell 1 with Kerafix sealing tape
b Half-shell 2 with Kerafix sealing tape
c Connecting clamp (2 ×)

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.

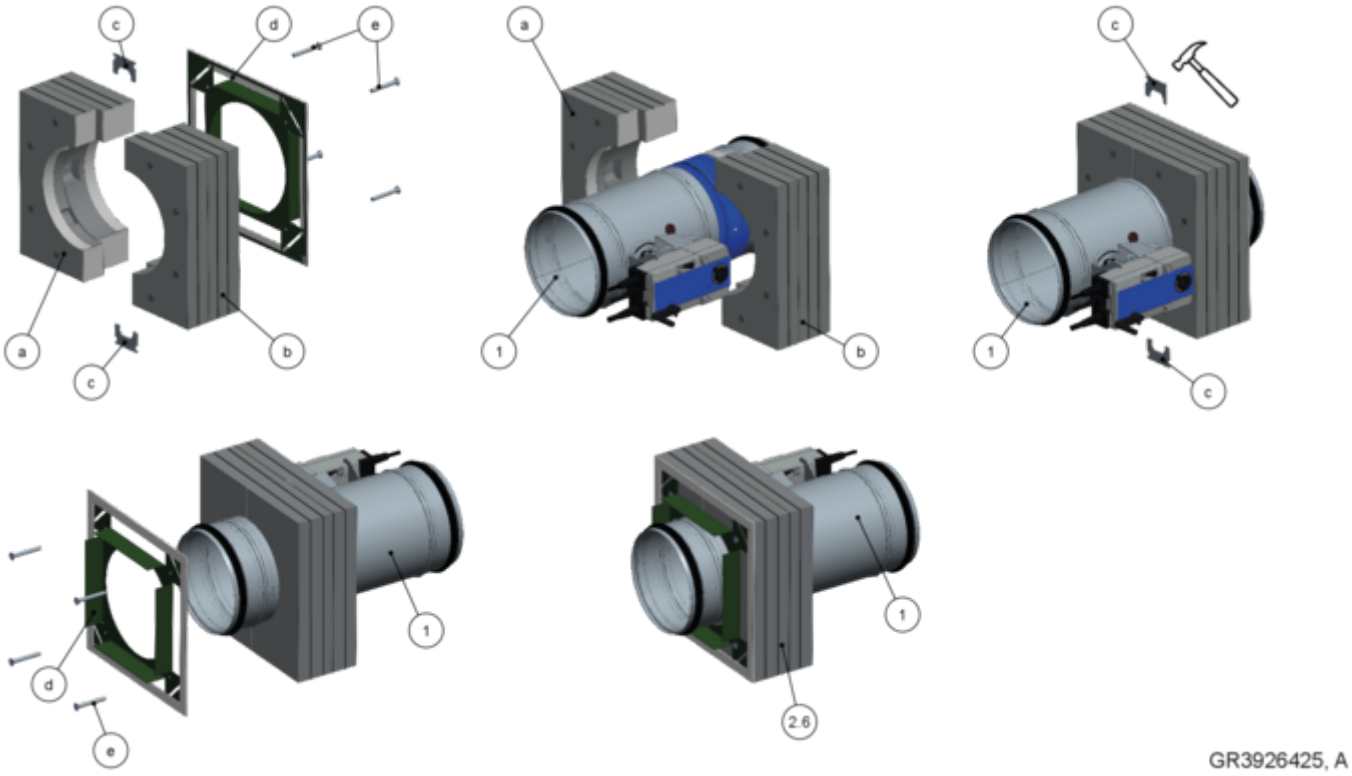


Fig. 32: Scope of supply and assembly Installation kit WE2 for dry mortarless installation

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

Mounting installation kit WE2

1. 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.
2. On the rear of the installation kit (2.6), fix the sheet metal cover plate (2.6d) with 4 dry wall screws (2.6e).

5.4.6 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.

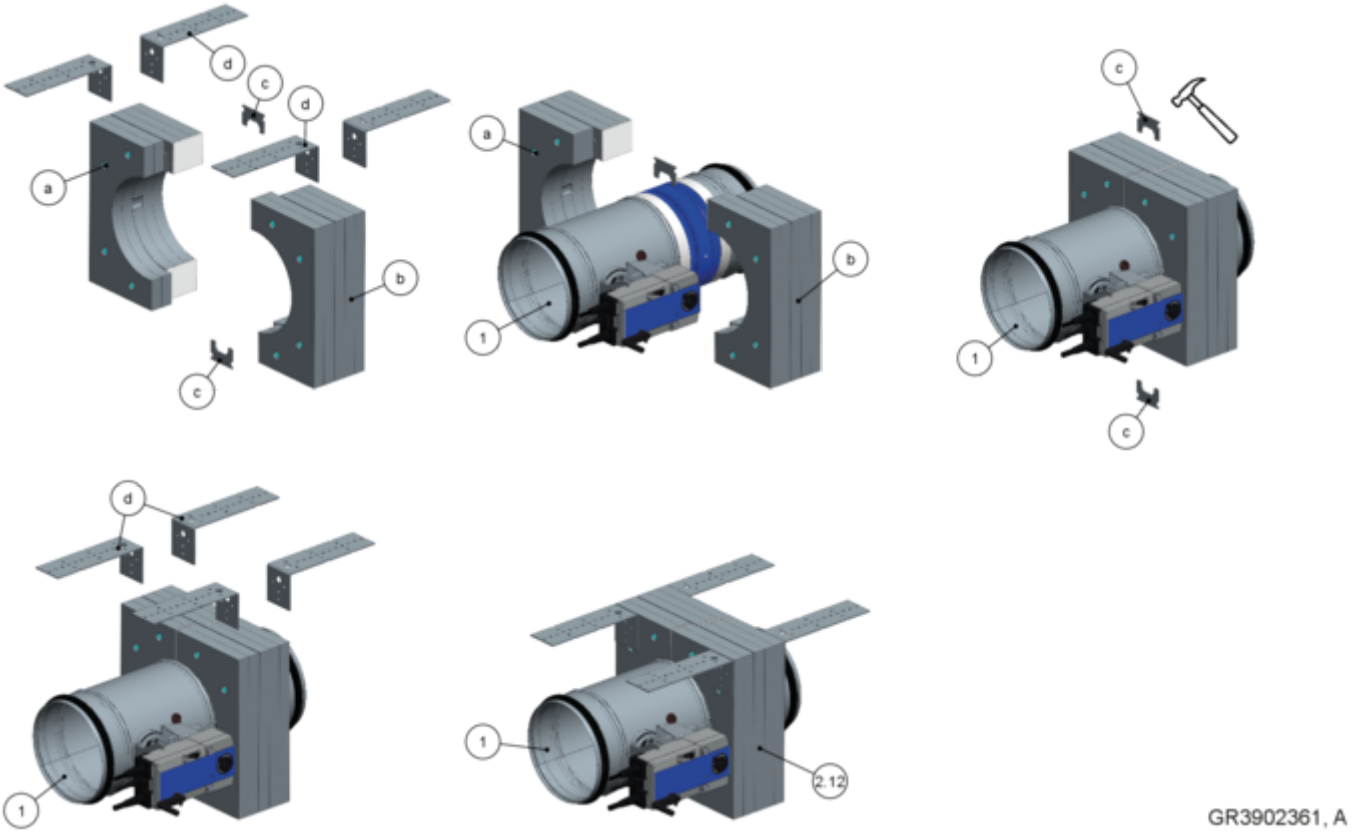


Fig. 33: Supply package and installation of installation kit GL2 for dry mortarless installation

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.

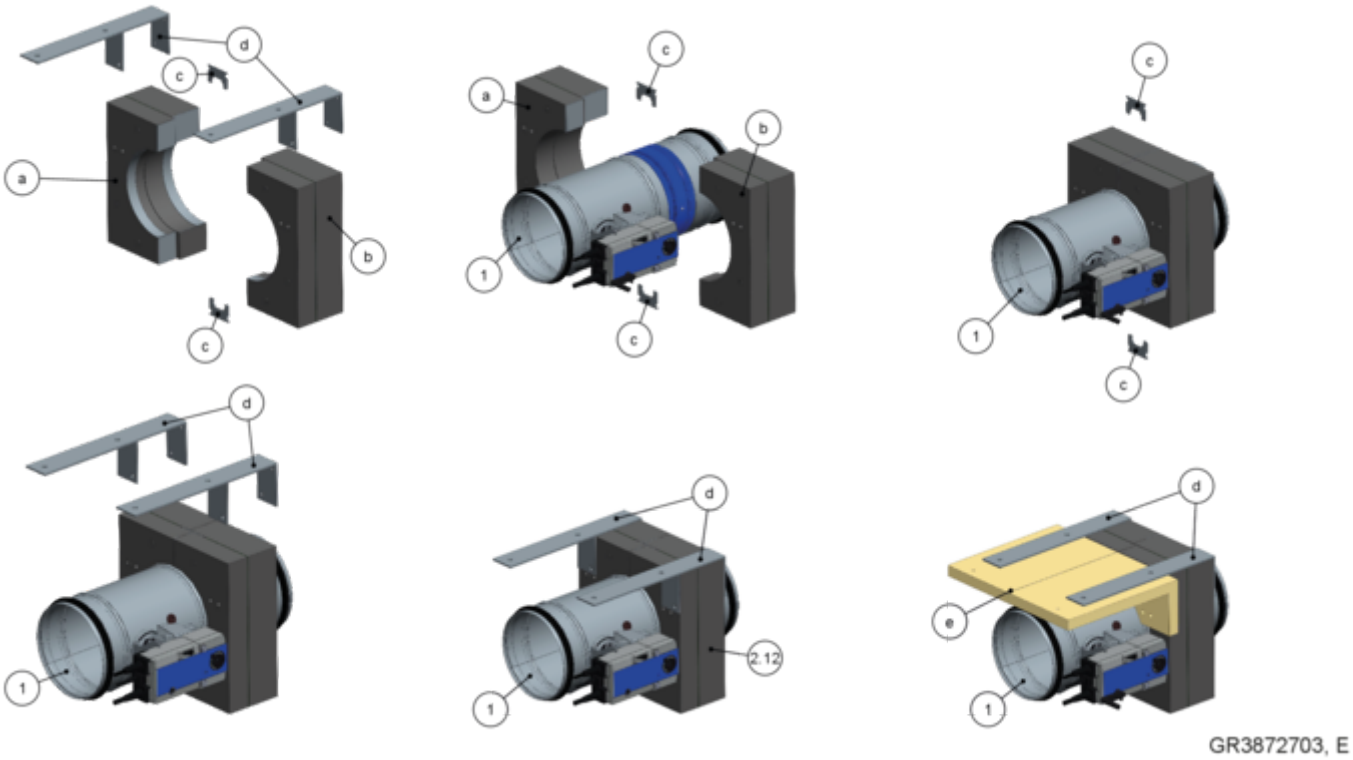


Fig. 34: Scope of supply and installation of installation kit GL2 (steel bracket and cover to be provided by customer) for dry mortarless installation if there is no ceiling fixing on the rear side

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

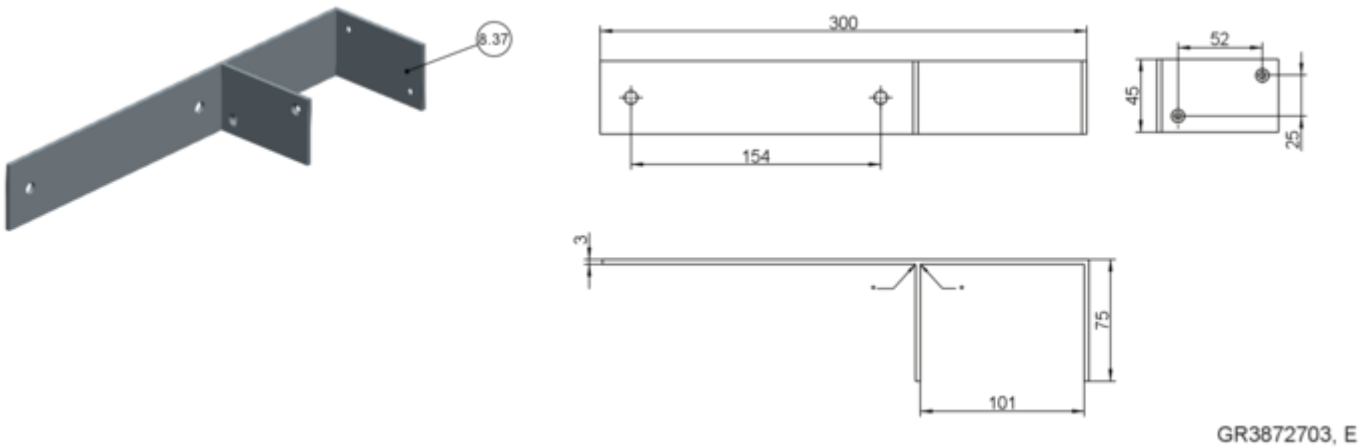


Fig. 35: Steel angle for dry mortarless installation with installation kit GL2 in lightweight partition wall if there is no rear fastening possibility

8.37 Steel bracket, supplied by customer
* Welded seam

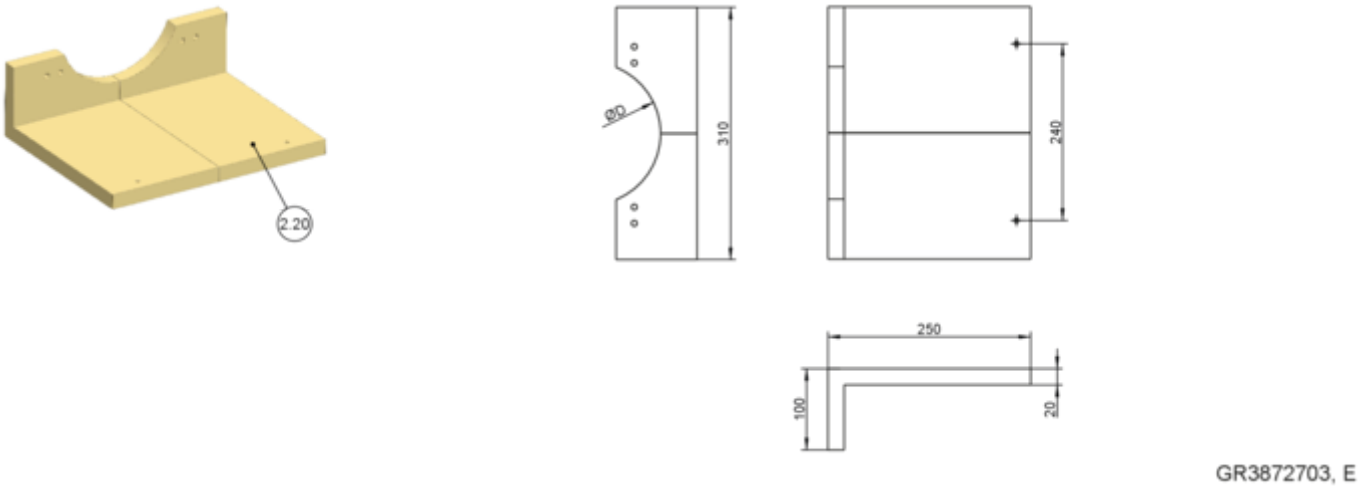


Fig. 36: Cover for dry mortarless installation with installation kit GL2 in lightweight partition wall if there is no rear fixing option

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**
∅D	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 117*

5.5 Solid walls

5.5.1 General information

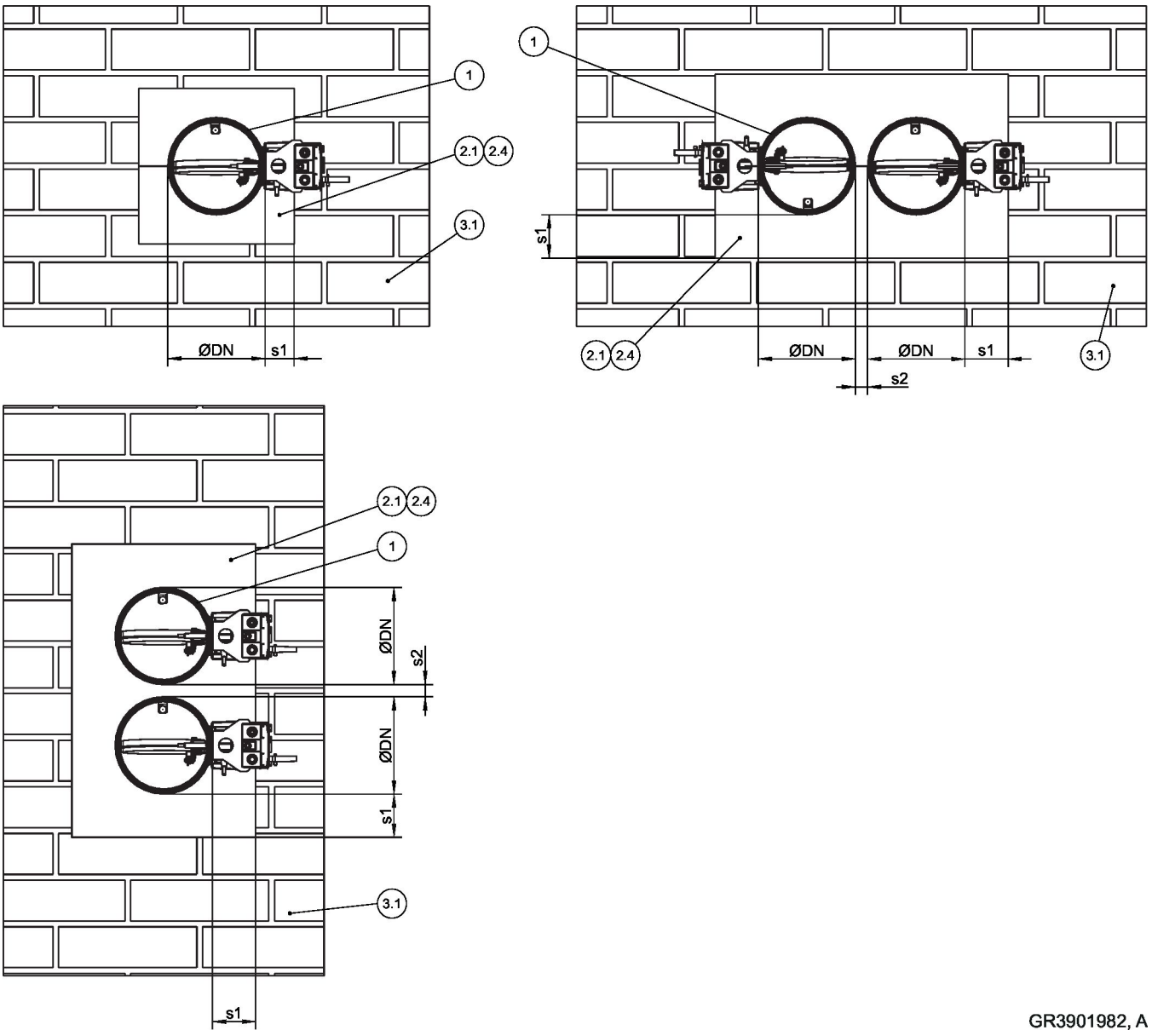


Fig. 37: Solid walls – arrangement/distances

1 FKRS-EU
2.1 Mortar
2.4 Fire batt with ablative coating
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	∅nominal width + max. 450	≤ 225	10/40 [2] – 225
Dry mortarless installation with ER	↳ *5.4.2 'Installation block ER' on page 44*	central installation	≥ 200 [3]
Dry mortarless installation with TQ2	□A = ∅nominal width + 110 [4]	central installation	≥ 200
Dry mortarless installation with fire batt [1]	□A = ∅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

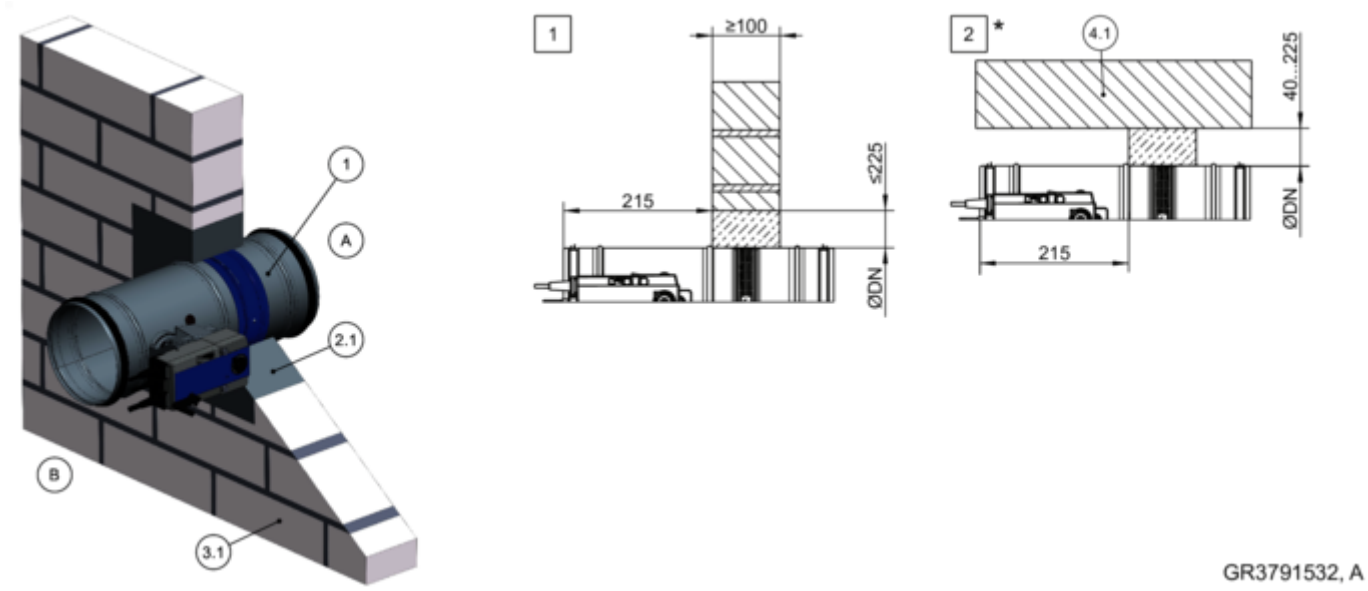


Fig. 38: Mortar-based installation into a solid wall

1	FKRS-EU	4.1	Solid ceiling slab/solid floor
2.1	Mortar	*	Installation near the floor as in 2
3.1	Solid wall	1 2	Up to EI 120 S

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

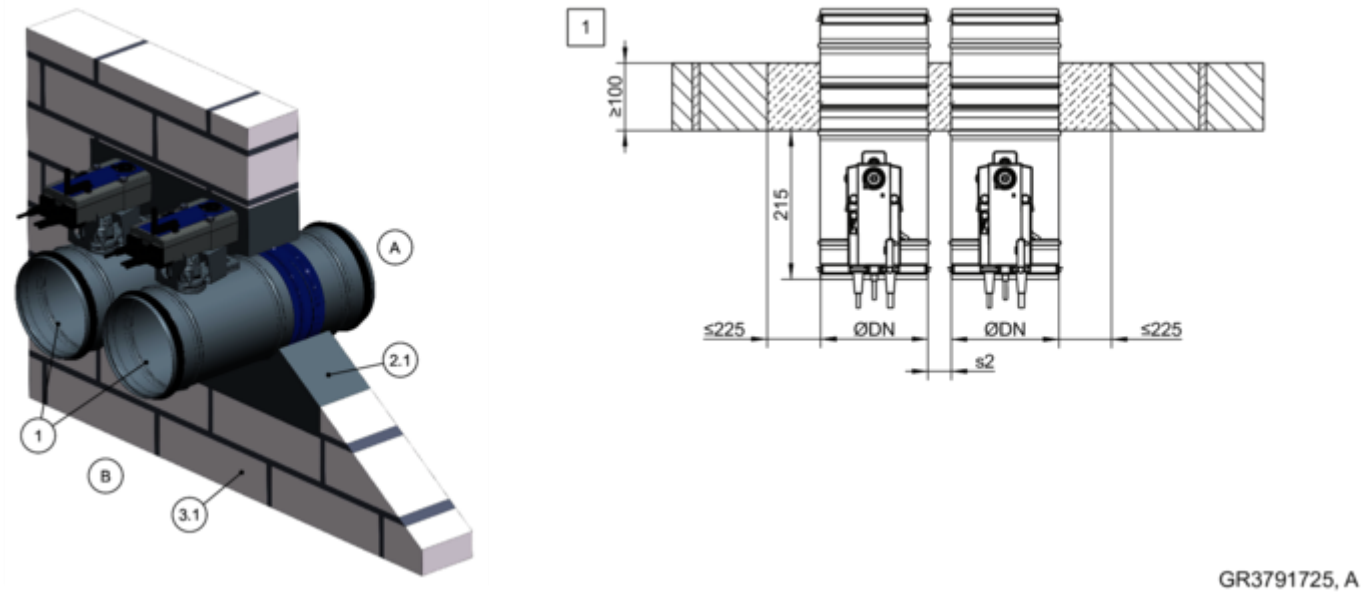


Fig. 39: Mortar-based installation into a solid wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FKRS-EU	1	Up to EI 120 S for s2 = 40 – 225 mm Up to EI 90 S for s2 = 10 – 225 mm
2.1	Mortar		
3.1	Solid wall		

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

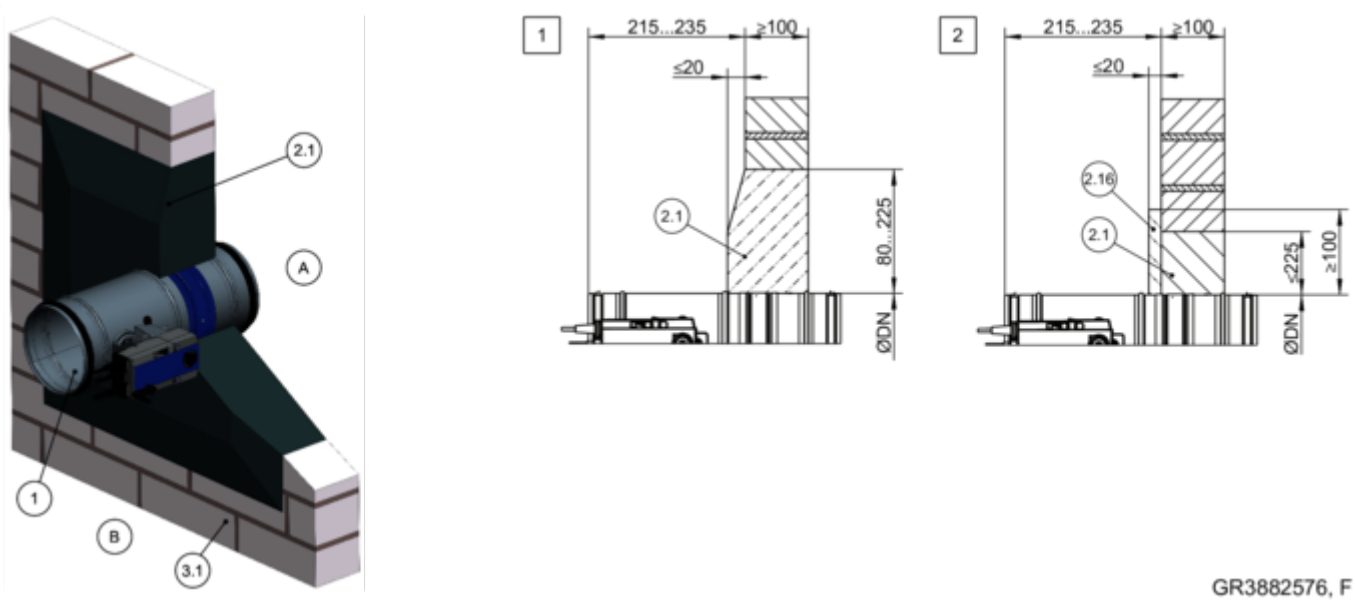


Fig. 40: Mortar-based installation in solid wall - installation not flush with wall

1	FKRS-EU	3.1	Solid wall
2.1	Mortar with sloping smooth screed	1 2	Up to EI 120 S
2.16	Cement plaster		

Mortar-based installation into gypsum wallboard

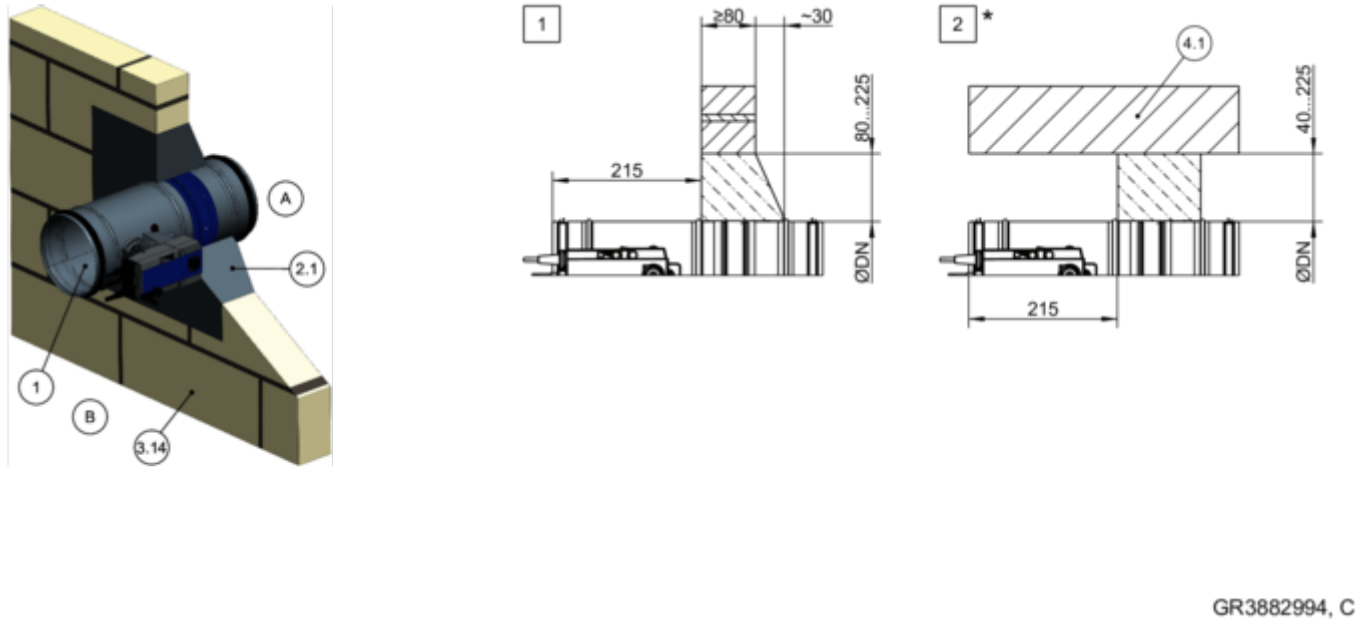


Fig. 41: Mortar-based installation into gypsum wallboard

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 ≥ 100 mm, distances Fig. 38 to Fig. 40

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

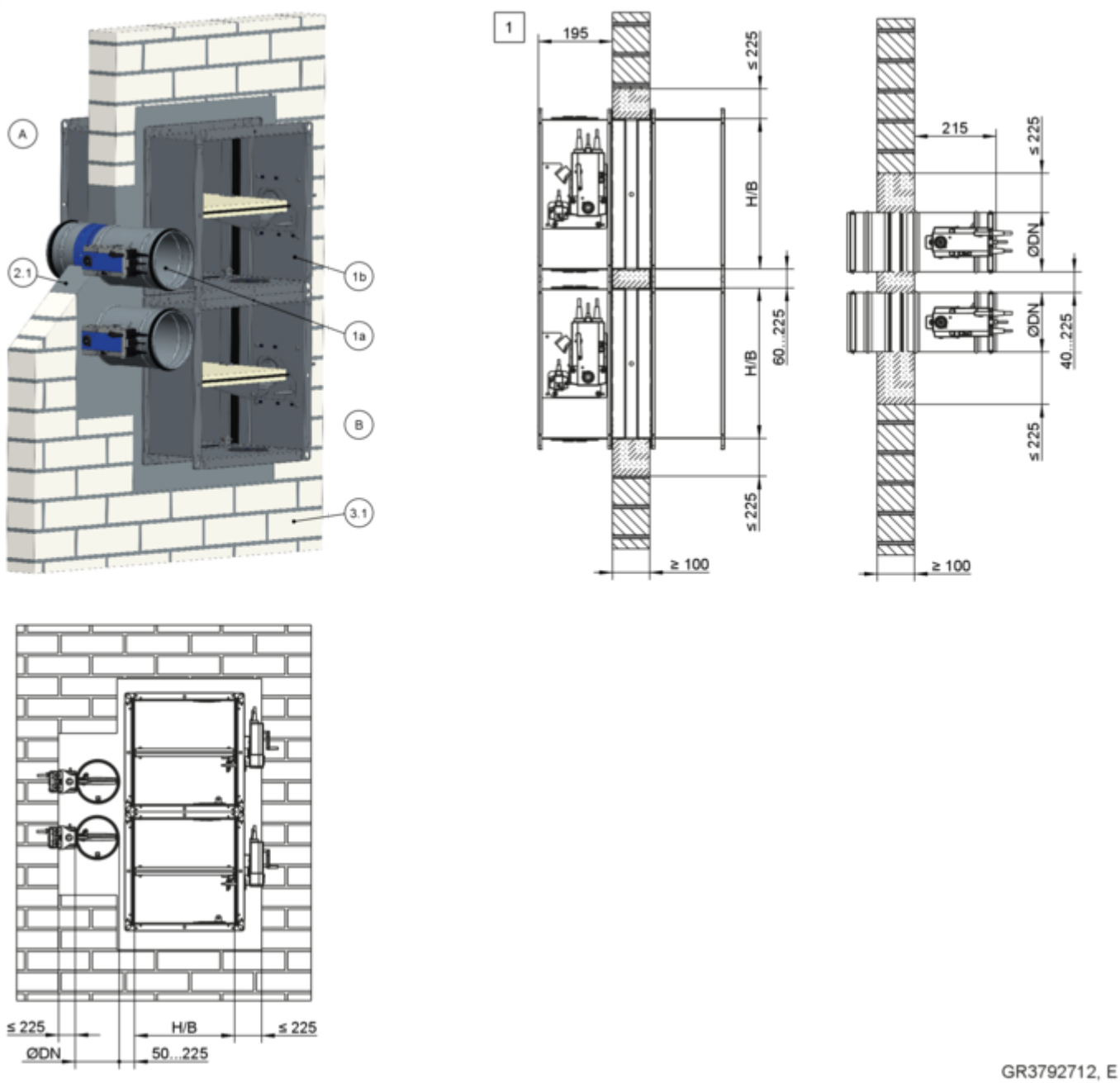


Fig. 42: Mortar-based installation into a solid wall, combined, FKRS-EU and FK2-EU

1a	FKRS-EU	3.1	Solid wall
1b	FK2-EU up to B × H ≤ 800 × 400 mm	1	Up to EI 90 S
2.1	Mortar		

For combined installation please note:

- Overall fire damper area ≤ 1.2 m^2 .
- The number of fire dampers in an installation opening is limited by their size (B × H for FK2-EU and/or ∅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 walls

- Solid wall, ↳ *on page 40*
- Mortar-based installation in opening or cut hole
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

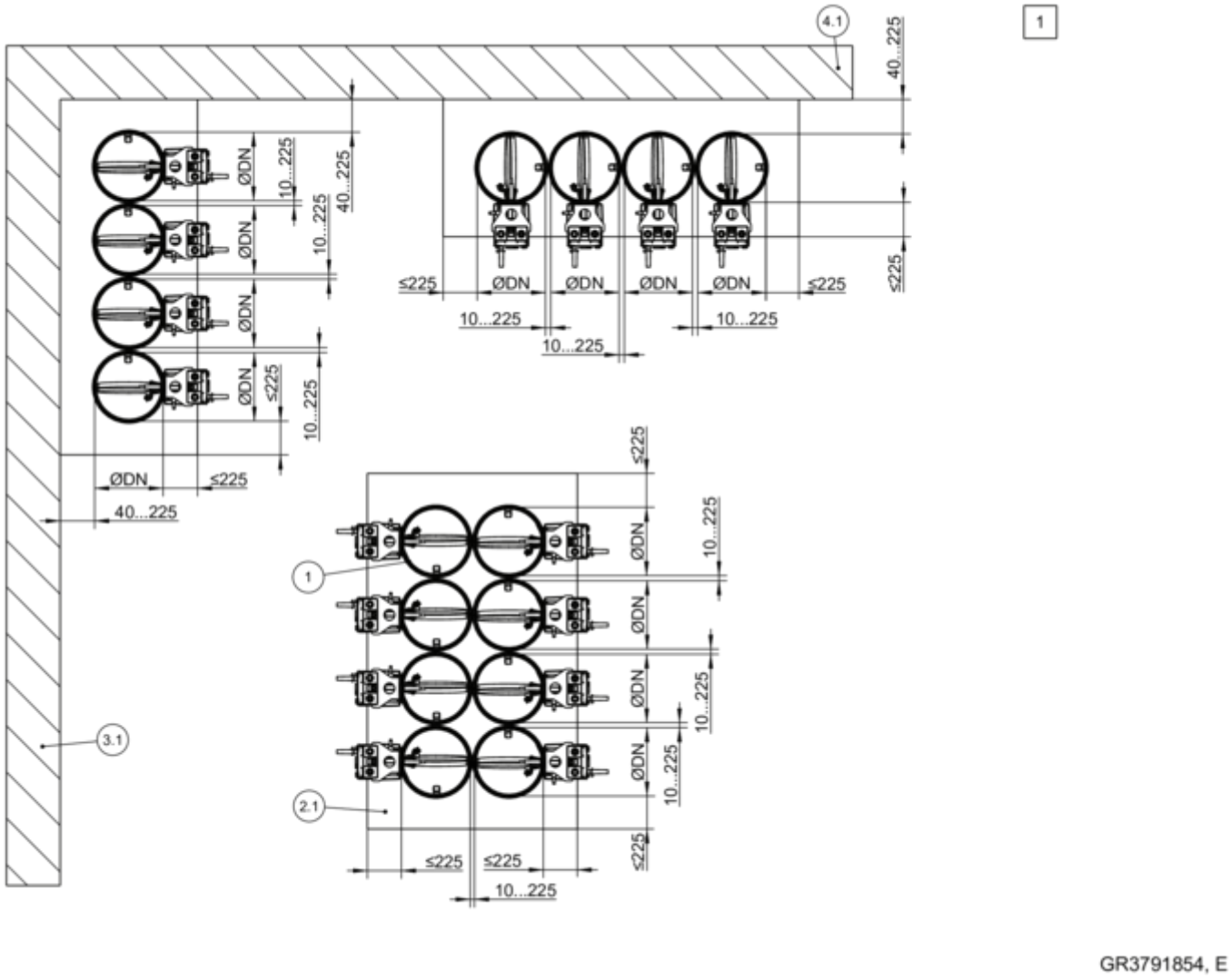


Fig. 43: Mortar-based installation – multiple installation into one installation opening

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

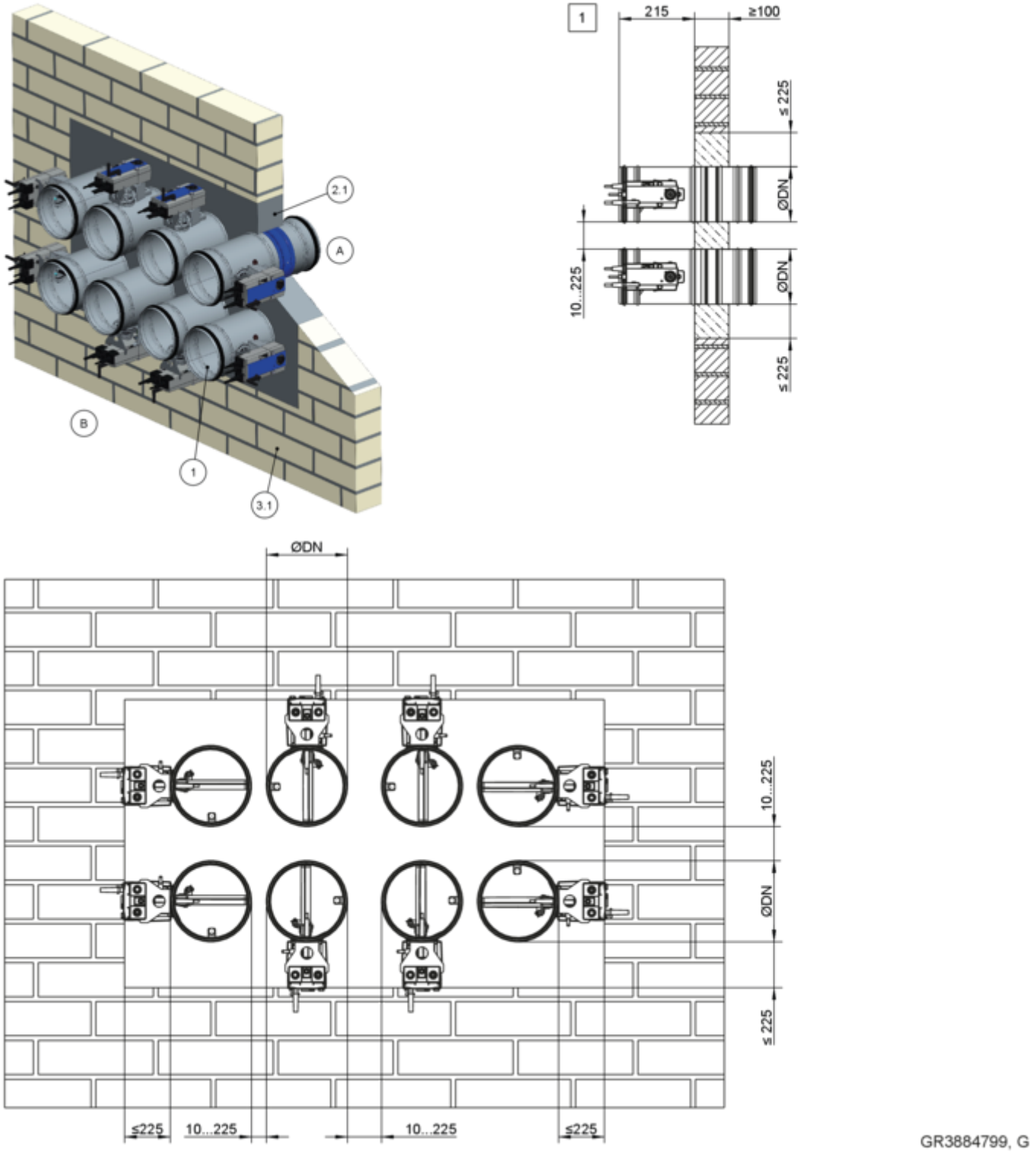


Fig. 44: Mortar-based installation – multiple installation into one installation opening

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 ≤ 1.2 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 ≥ 40 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

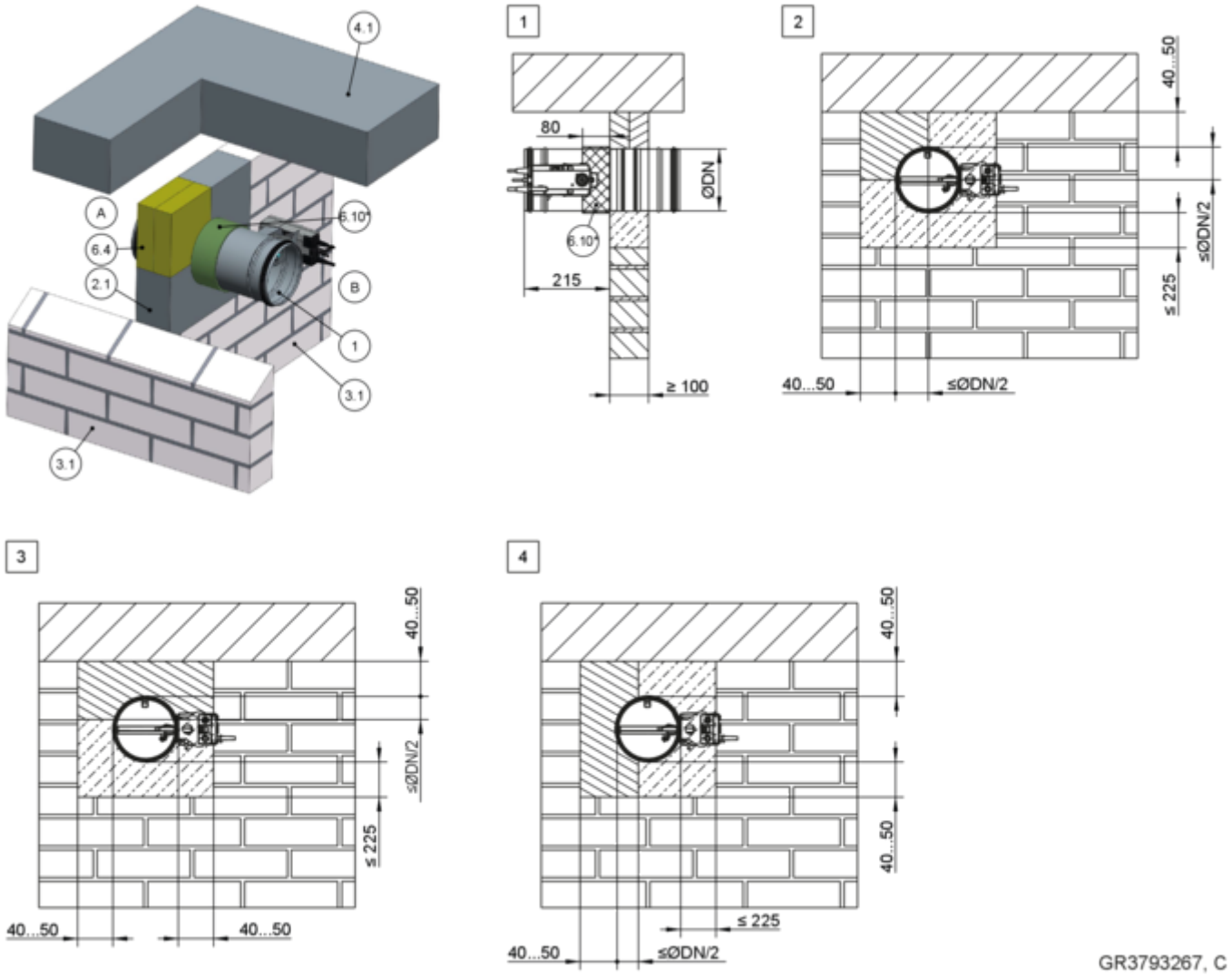


Fig. 45: Mortar-based installation into a solid wall, with partial mortaring

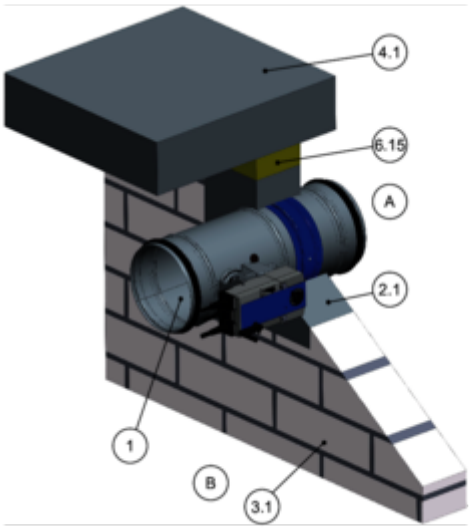
1	FKRS-EU
2.1	Mortar
3.1	Solid wall
4.1	Solid ceiling slab
6.4	Mineral wool, ≥ 1000 °C, ≥ 140 kg/m³
6.10	Ablative coating around the perimeter, d = at least 2.5 mm
6.19	Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm, panel material around the perimeter, leave out the actuator and release mechanism; 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*.
*	required for nominal diameter ≥ 224 mm, alternatively 6.19, 6.20 or 6.24
1 – 4	Up to EI 90 S

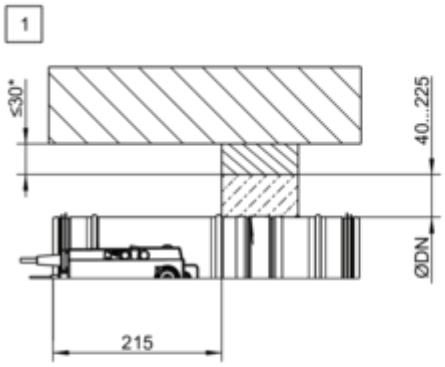
Additional requirements: mortar-based installation into solid walls with partial mortaring

- Solid wall, *on page 40*
- 40 – 50 mm distance 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. 46: 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		
3.1	Solid wall	1	Up to EI 90 S
4.1	Solid ceiling slab	*	After subsidence of the ceiling

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

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

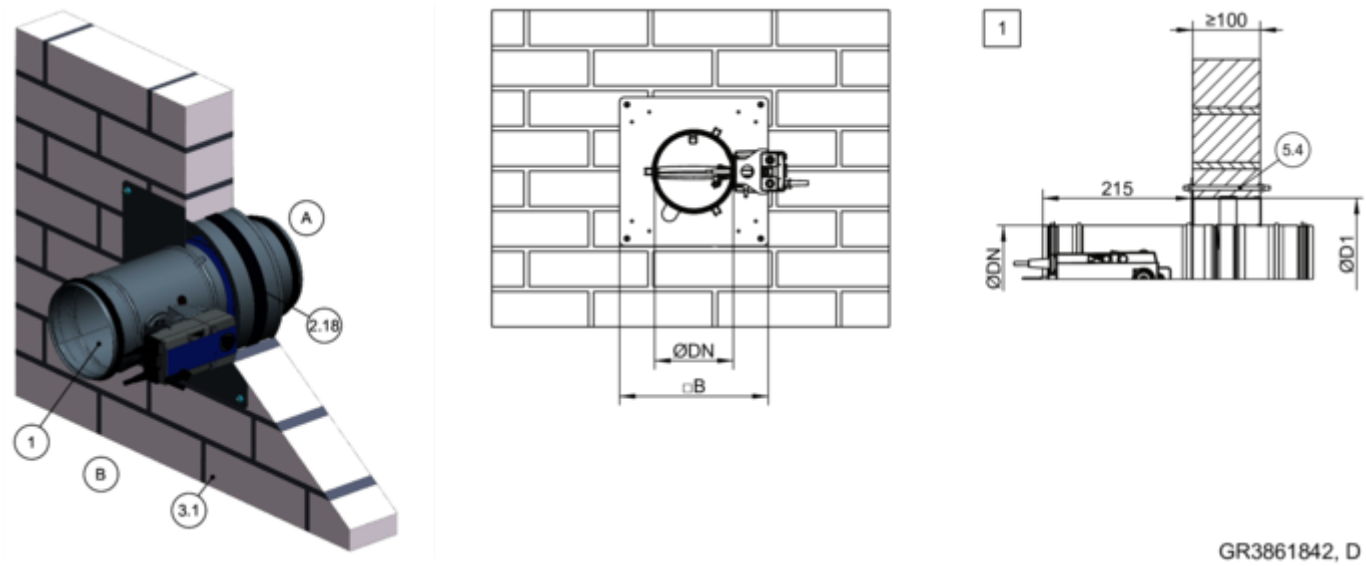


Fig. 47: Dry mortarless installation in solid wall with installation block ER

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 44*
- ≥ 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 28* ff
- General information on installation with installation block ER, ↳ *on page 35*

1. Create an appropriate installation opening by means of a cut hole ∅D1, ↳ *5.4.2 'Installation block ER' on page 44*
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

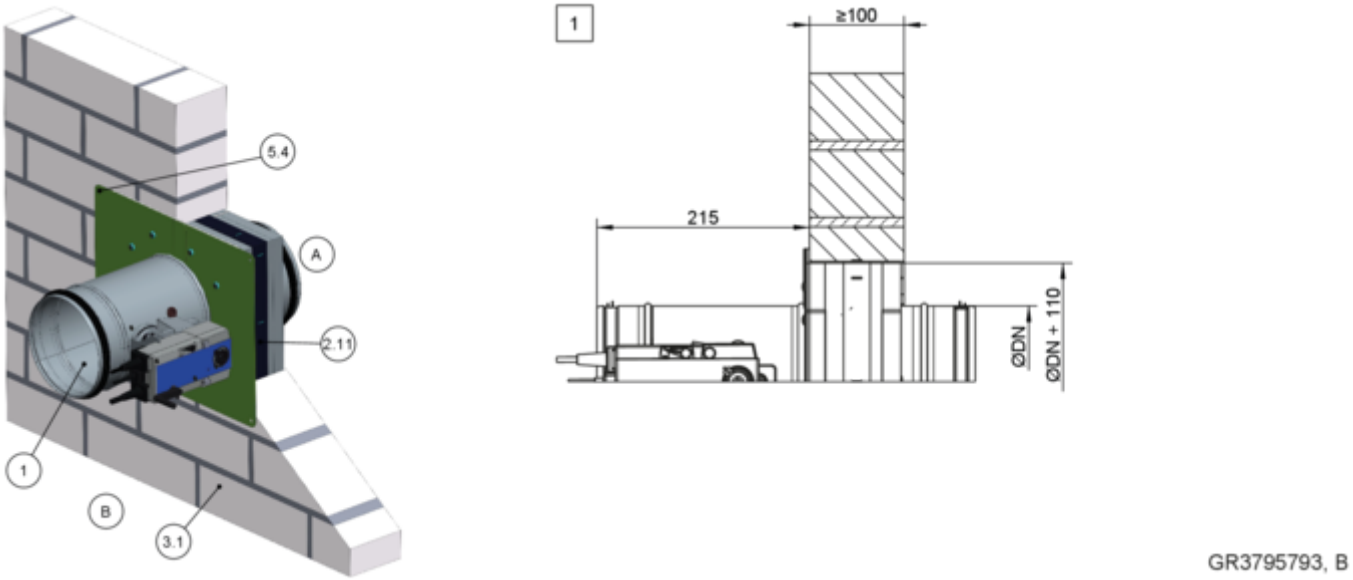


Fig. 48: Dry mortarless installation into a solid wall, with installation kit TQ2

1 FKRS-EU
2.11 Installation kit TQ2 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 120 S

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 45*
- Distance of the fire damper to load-bearing components ≥ 75 mm (depending on the arrangement, due to the cover plate ≥ 100 mm)
- ≥ 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 28* ff
- General information on installation with installation kit TQ2, *on page 35*

1. Make a square installation opening, size ∅DN + 110 mm
2. Position the fire damper with the installation kit in the centre of the installation opening and push it in up to the cover plate.

   If the wall thickness is >115 mm , extend the fire damper on the installation side with an extension piece or a spiral duct.
3. Fix the cover plate 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

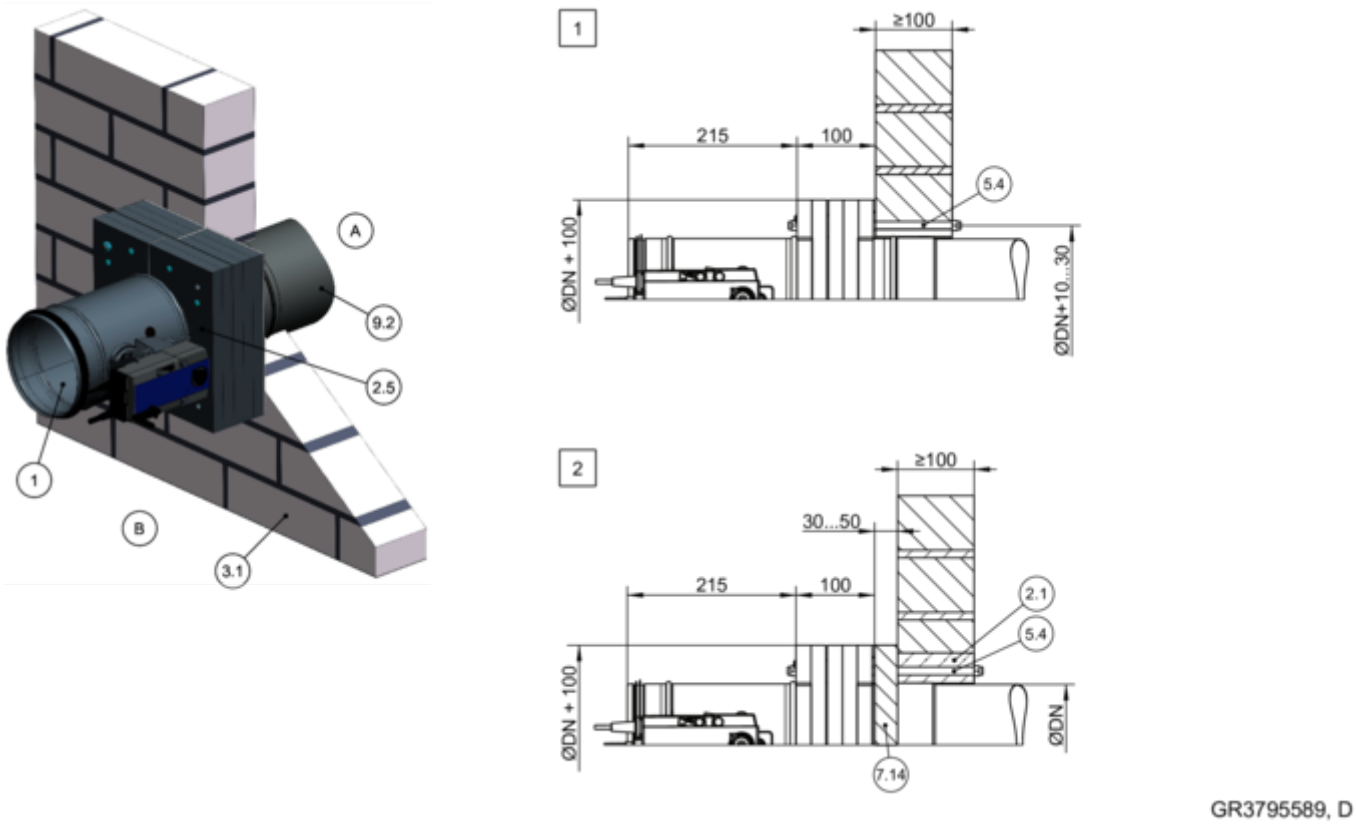


Fig. 49: Dry mortarless installation on the face of a solid wall, with installation kit WA2

1 FKRS-EU
2.1 Mortar
2.5 Installation kit WA2
3.1 Solid wall
5.4 Threaded rod as push through installation with washers and nuts
7.14 Reinforcing board, calcium silicate, thickness = 30 – 50 mm or mineral wool, ≥ 1000 °C, ≥ 140 kg/m³, thickness = 50 mm
9.2 Extension piece/duct with 2 shortened flush with the wall
1 2 Up to EI 90 S

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 46*
- ≥ 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 28* 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

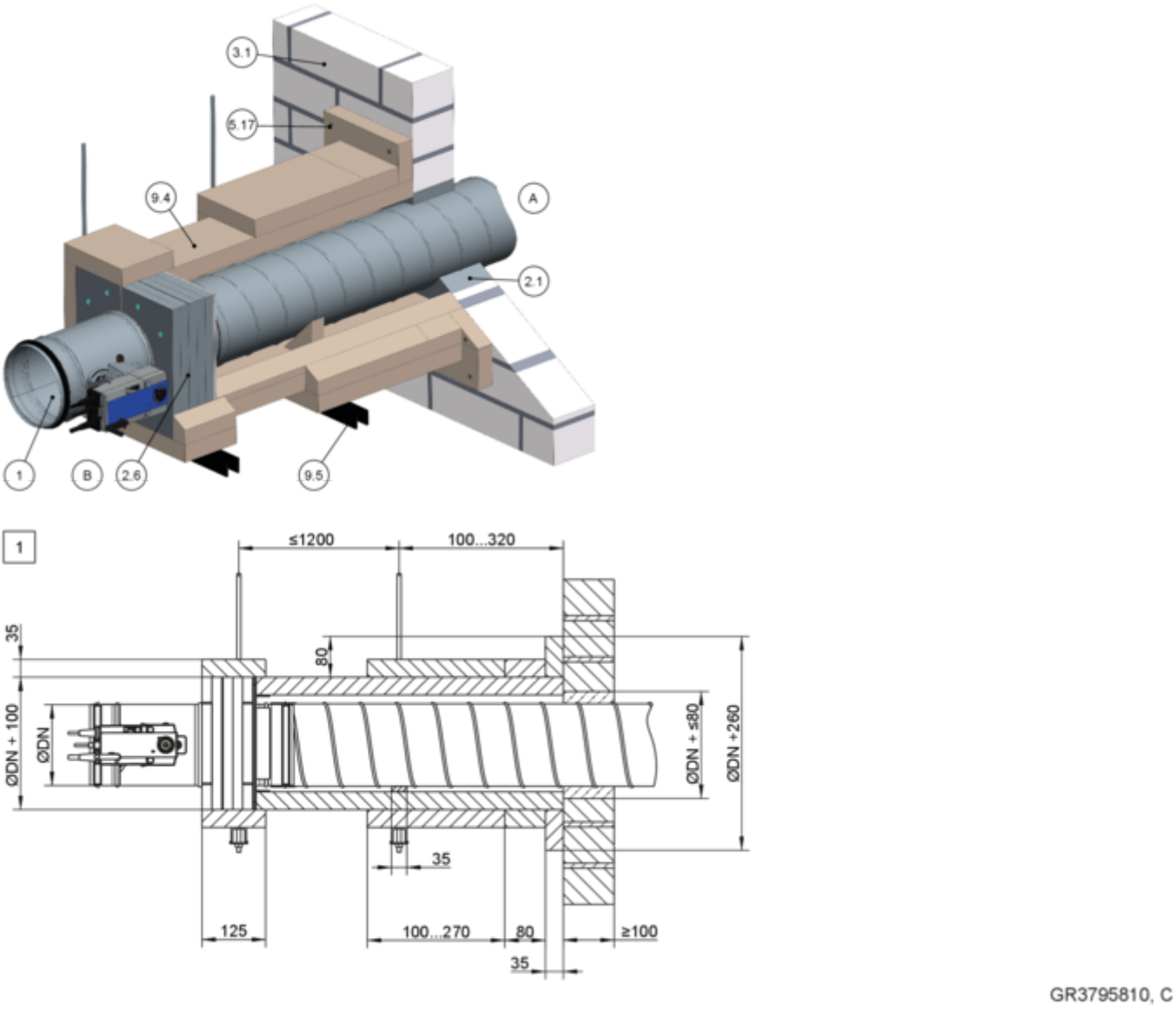


Fig. 50: Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection), four-sided cladding

1 FKRS-EU
2.1 Mortar
2.6 Installation kit WE 2
3.1 Solid wall
5.17 Anchor bolt Hilti ® HUS-6 ∅ 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
9.4 Sheet steel duct with fire-rated cladding
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 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

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

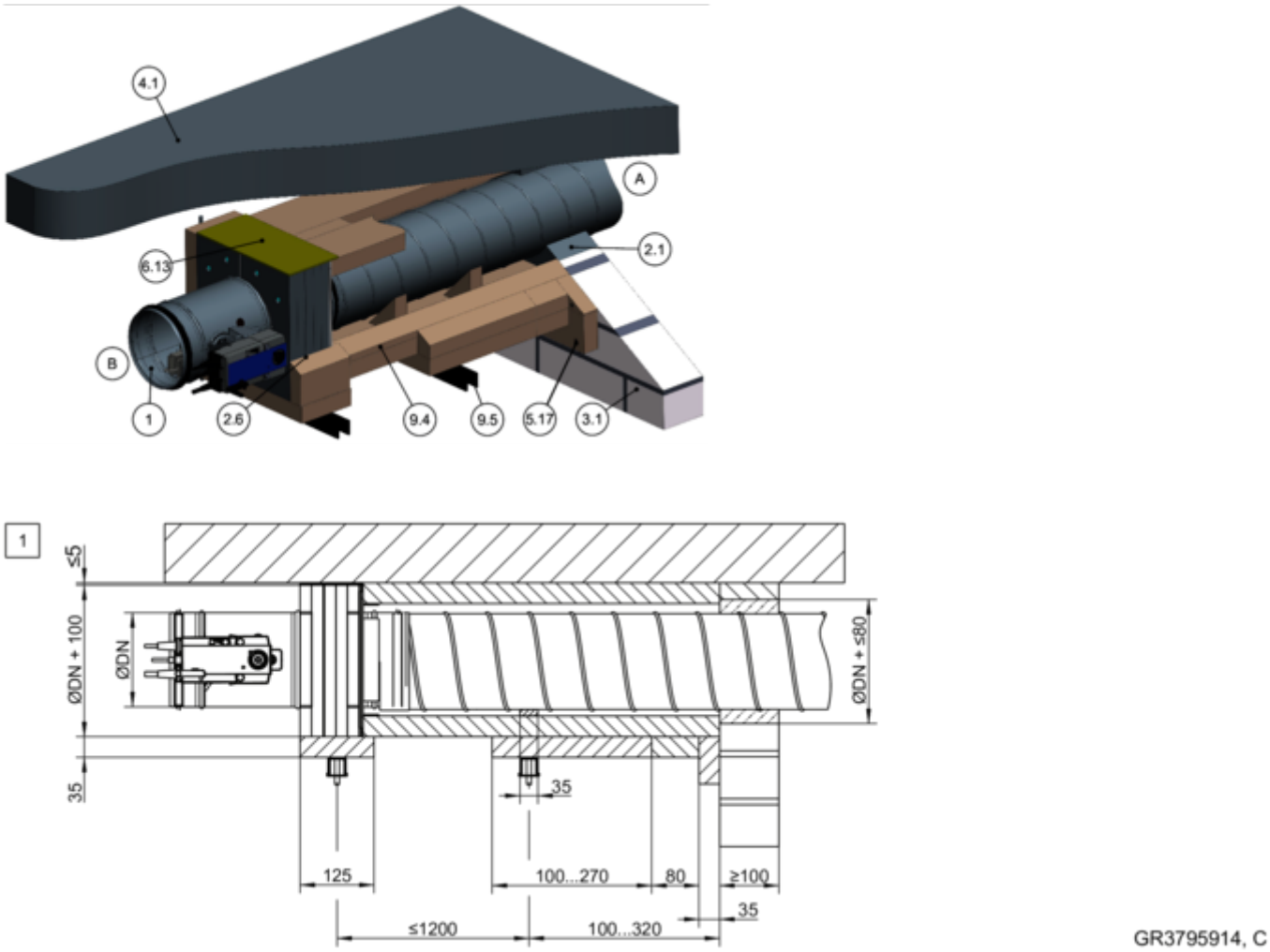


Fig. 51: Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection), three-sided cladding

1 FKRS-EU
2.1 Mortar
2.6 Installation kit WE 2
3.1 Solid wall
4.1 Solid ceiling slab
5.17 Anchor bolt Hilti ® HUS-6 ∅ 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 ceiling
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 120 S

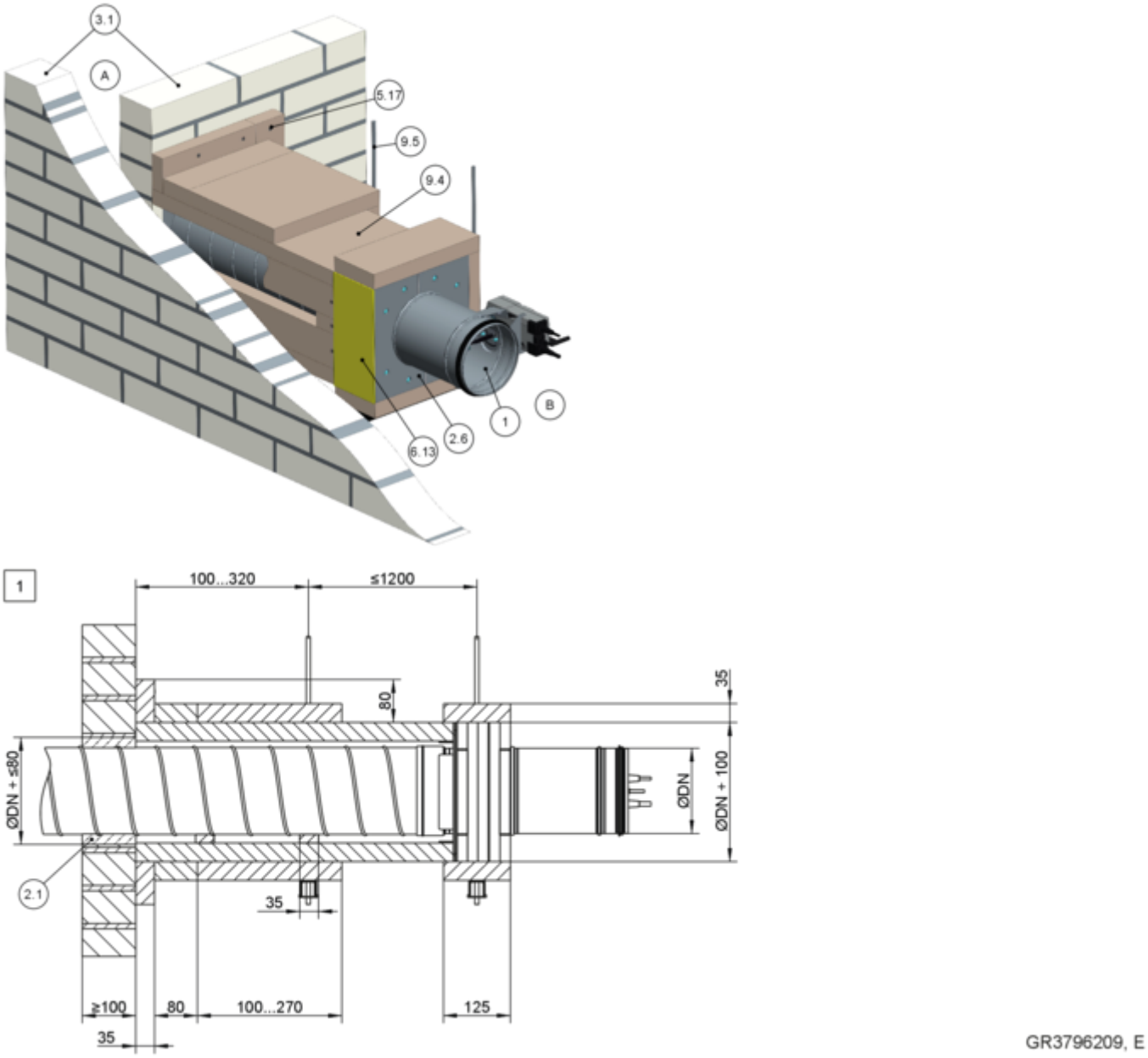


Fig. 52: Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection), three-sided cladding

1 FKRS-EU
2.1 Mortar
2.6 Installation kit WE 2
3.1 Solid wall
5.17 Anchor bolt Hilti ® HUS-6 ∅ 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
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 120 S

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

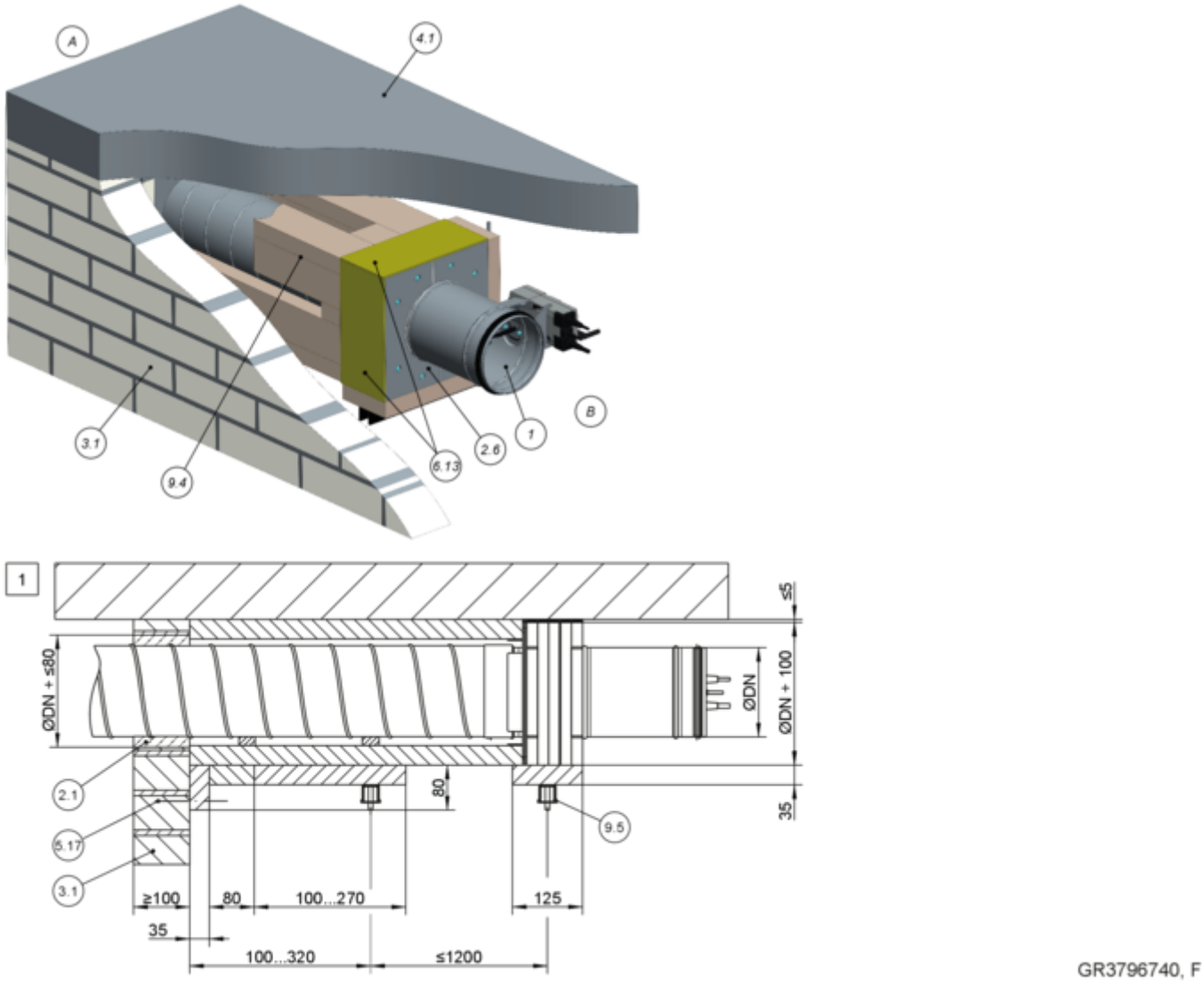


Fig. 53: Dry mortarless installation remote from solid walls with installation kit WE2 (wall connection), two-sided cladding

1 FKRS-EU
2.1 Mortar
2.6 Installation kit WE 2
3.1 Solid wall
4.1 Solid ceiling slab
5.17 Anchor bolt Hilti ® HUS-6 ∅ 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
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 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 47*
- Suspension and fixing, ↳ *Chapter 5.14 'Fixing the fire damper' on page 235*
- ≥ 260 mm distance between two fire dampers
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

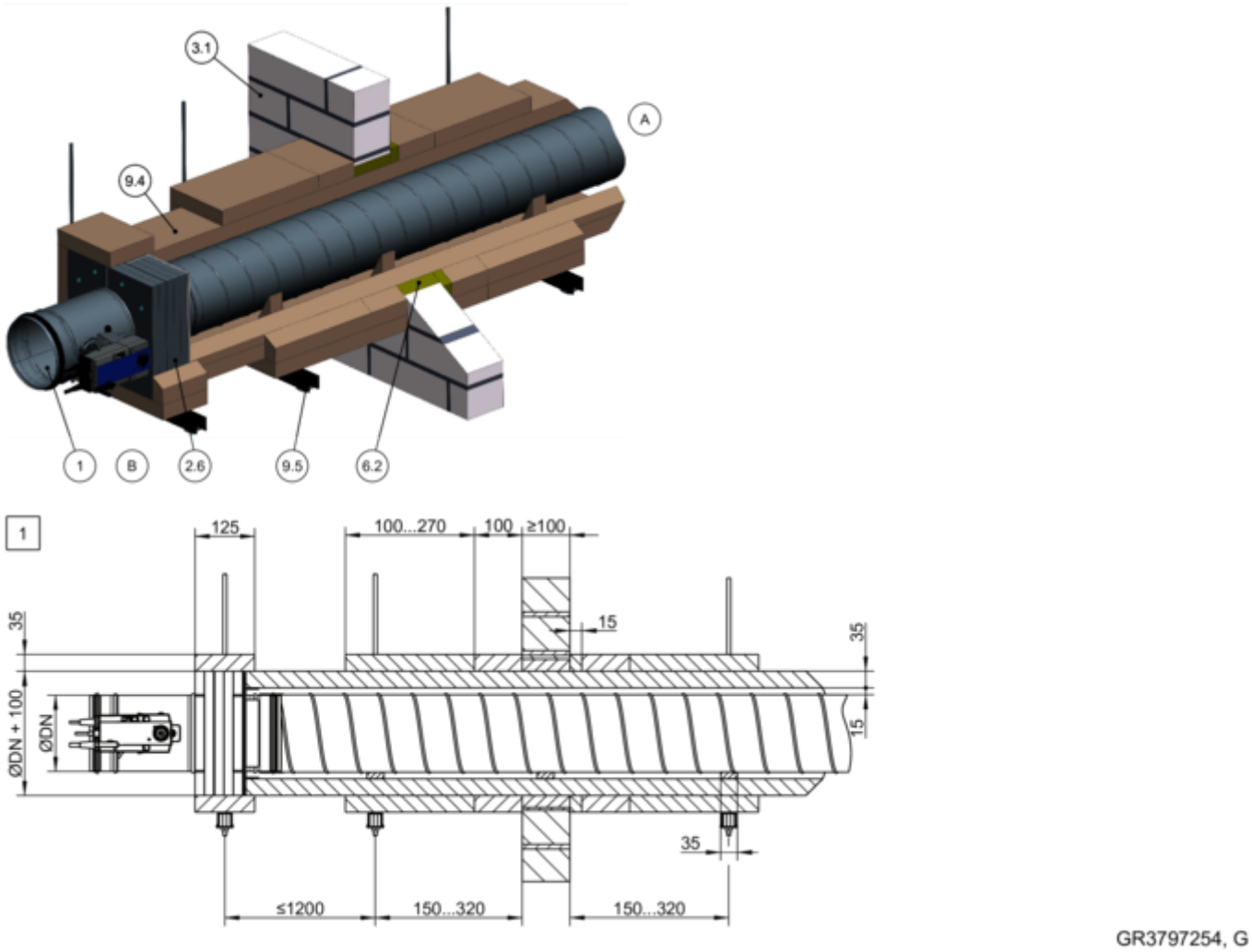


Fig. 54: Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration), four-sided cladding

1 FKRS-EU
2.6 Installation kit WE 2
3.1 Solid wall
6.2 Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, thickness ≤ 20 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:

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

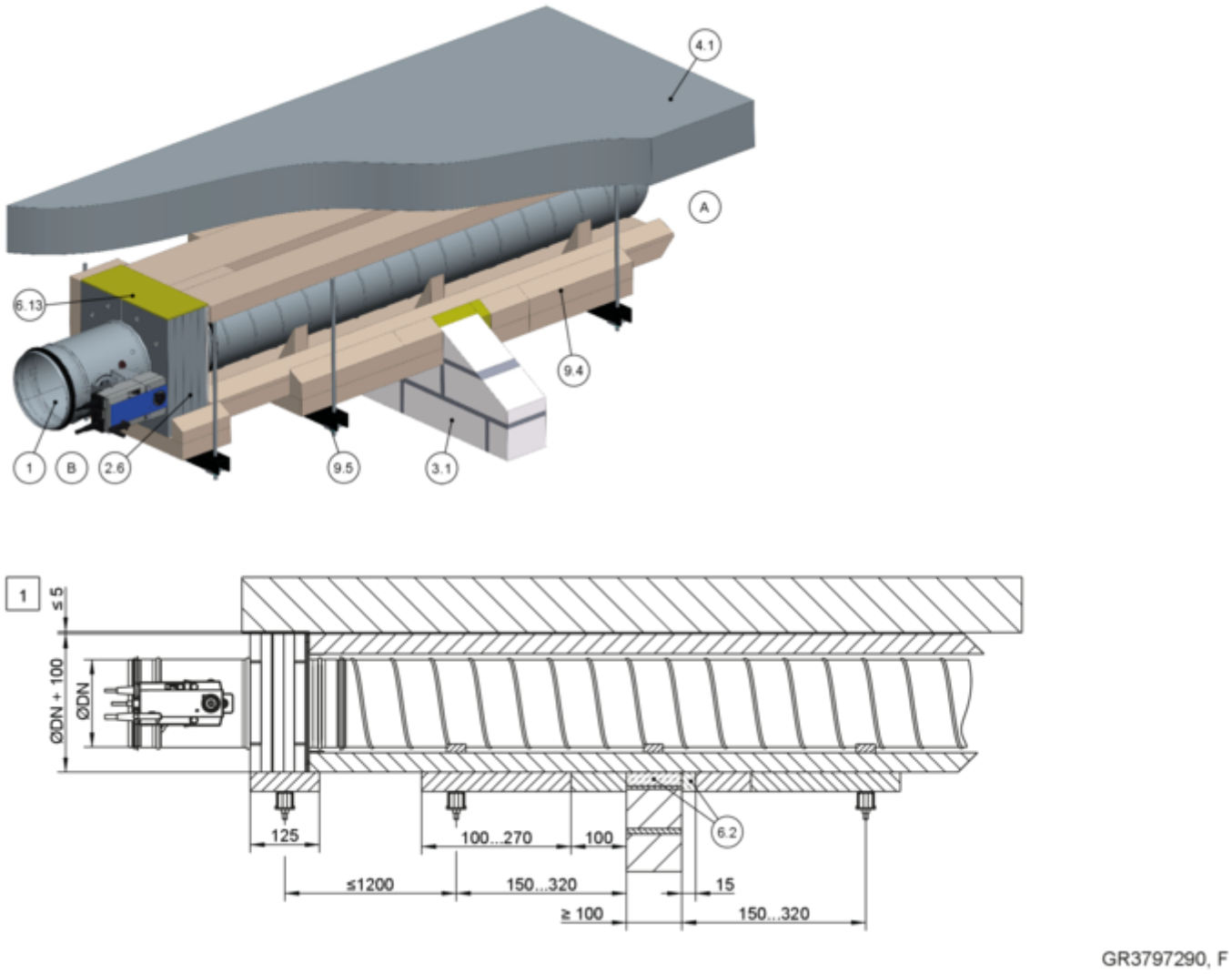


Fig. 55: Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration), three-sided cladding

1 FKRS-EU
2.6 Installation kit WE 2
3.1 Solid wall
4.1 Solid ceiling slab
6.2 Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, thickness ≤ 20 mm
6.13 Mineral wool strips A1, filler as an alternative
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 120 S

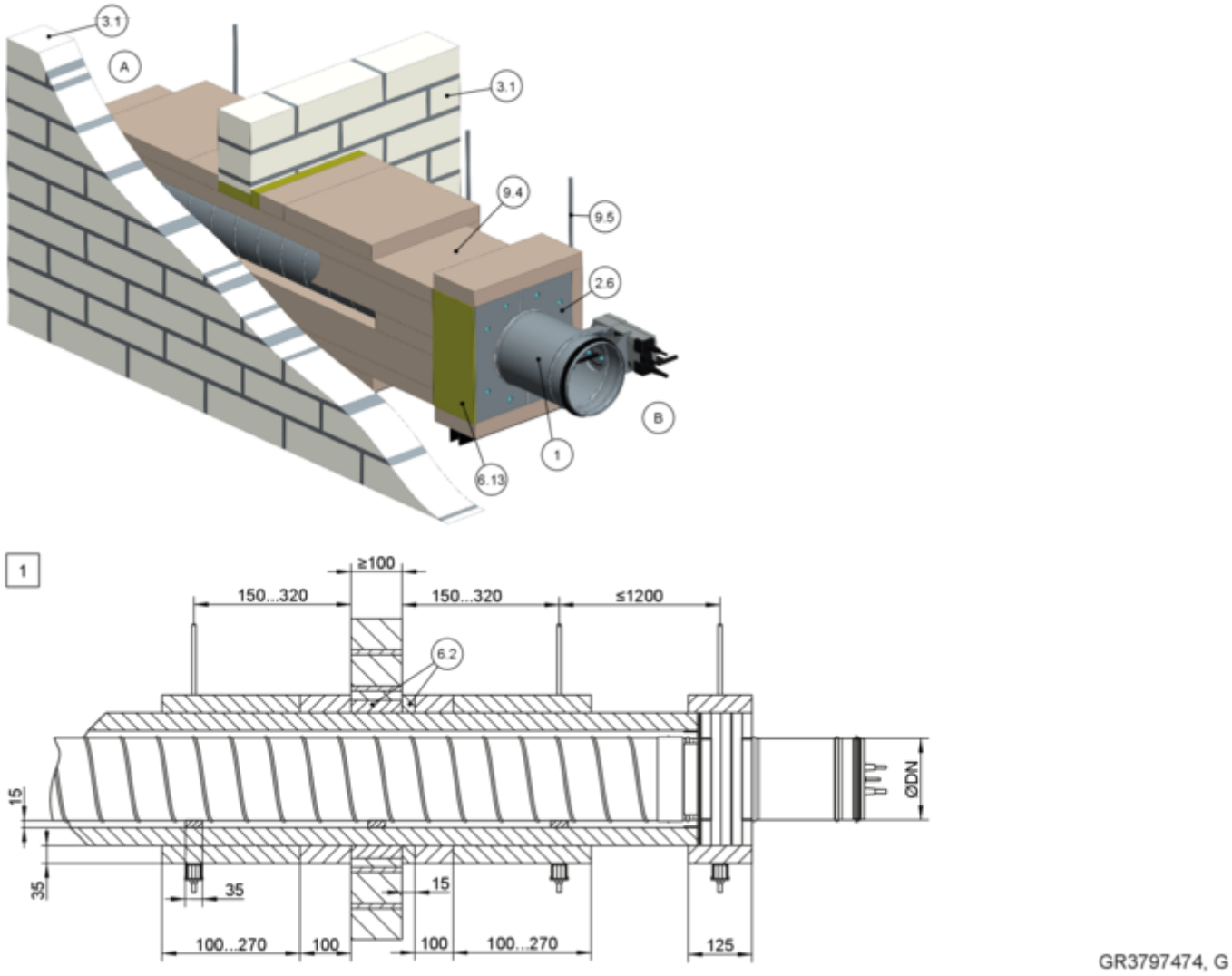


Fig. 56: Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration), three-sided cladding

1 FKRS-EU
2.6 Installation kit WE 2
3.1 Solid wall
6.2 Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, thickness ≤ 20 mm
6.13 Mineral wool strips A1, filler as an alternative
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 120 S

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

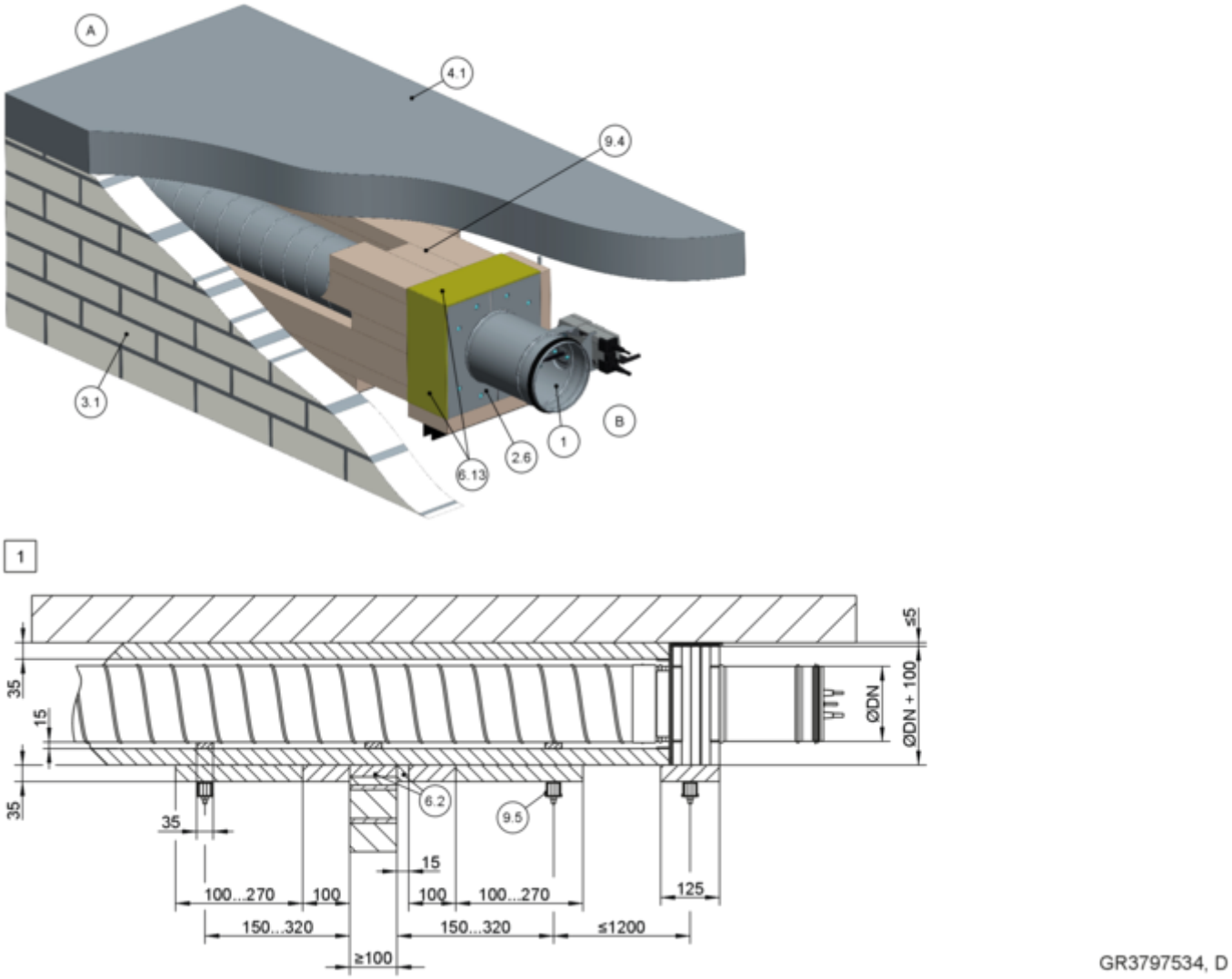


Fig. 57: Dry mortarless installation remote from solid walls with installation kit WE2 (wall penetration), two-sided cladding

1 FKRS-EU
2.6 Installation kit WE 2
3.1 Solid wall
4.1 Solid ceiling slab
6.2 Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, thickness ≤ 20 mm
6.13 Mineral wool strips A1, filler as an alternative
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 120 S

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 47*
- Suspension and fixing, ↳ *Chapter 5.14 'Fixing the fire damper' on page 235*
- ≥ 200 mm distance between two fire dampers (wall penetration through separate wall openings)
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

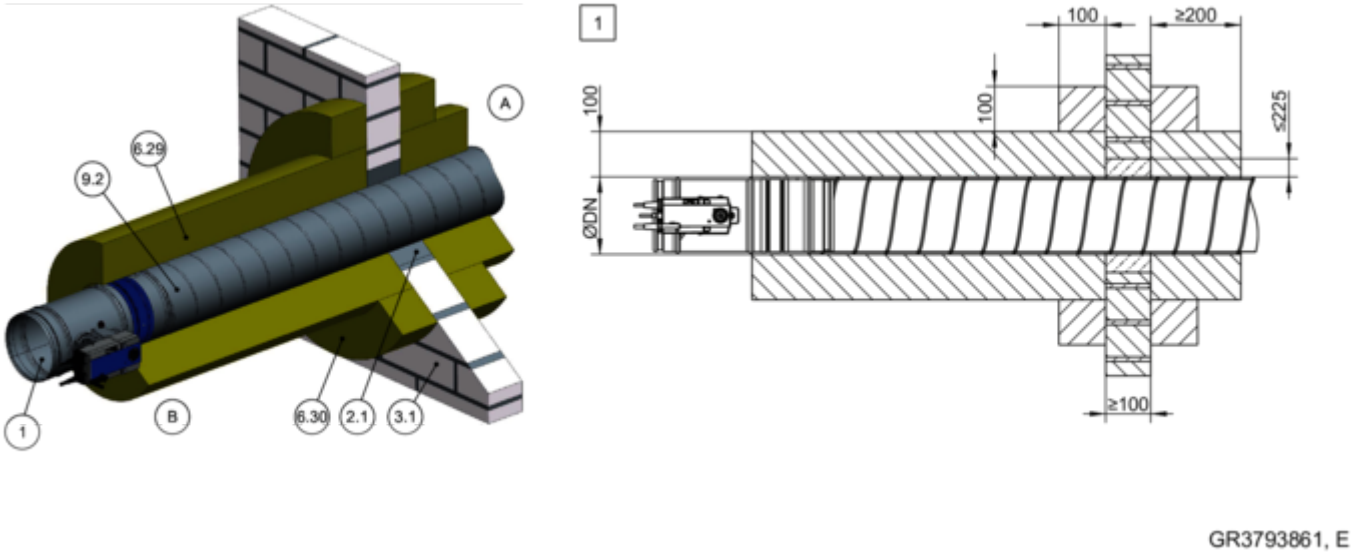


Fig. 58: Installation remote from solid walls with mineral wool

1	FKRS-EU	6.30	Reinforcing board mineral wool
2.1	Mortar		PAROC HVAC Fire Mat 80BLC (80 kg/m³), glued all round
3.1	Solid wall		
6.29	Mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³)	9.2	Sheet steel duct
		[1]	Up to EI 60 S

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

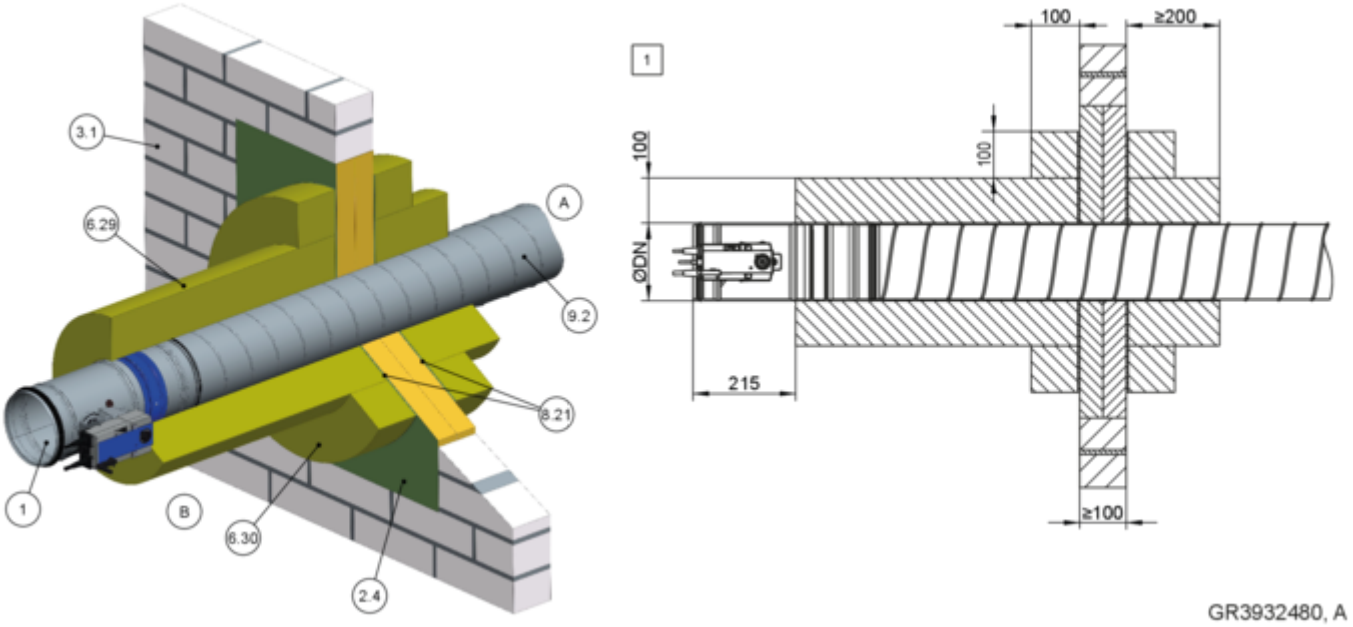


Fig. 59: Dry mortarless installation remote from solid walls with mineral wool and fire batt

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 board mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³), glued all round
8.21 Acrylic or sealing compound (suitable for fire batt system)
9.2 Sheet steel duct
1 Up to EI 60 S

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 28* 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

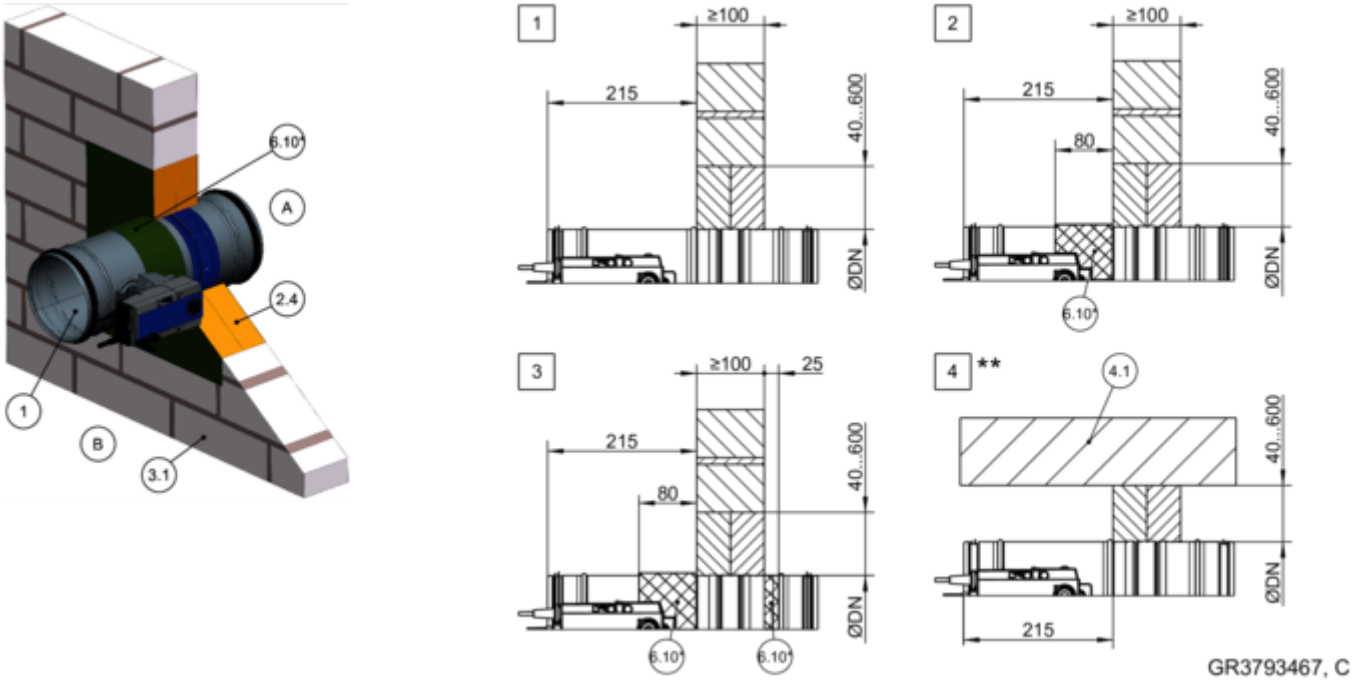


Fig. 60: Dry mortarless installation with fire batt into a solid wall

1	FKRS-EU	6.20	Sleeve (to be ordered separately)
2.4	Fire batt with ablative coating	6.24	Elastomeric foam (flame-resistant, non-dripping)
3.1	Solid wall		The following applies in Germany: For notes on the use of elastomeric foams ↳ *'Additional provision for use in Germany:' on page 8* .
4.1	Solid ceiling slab		
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	*	6.19, 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

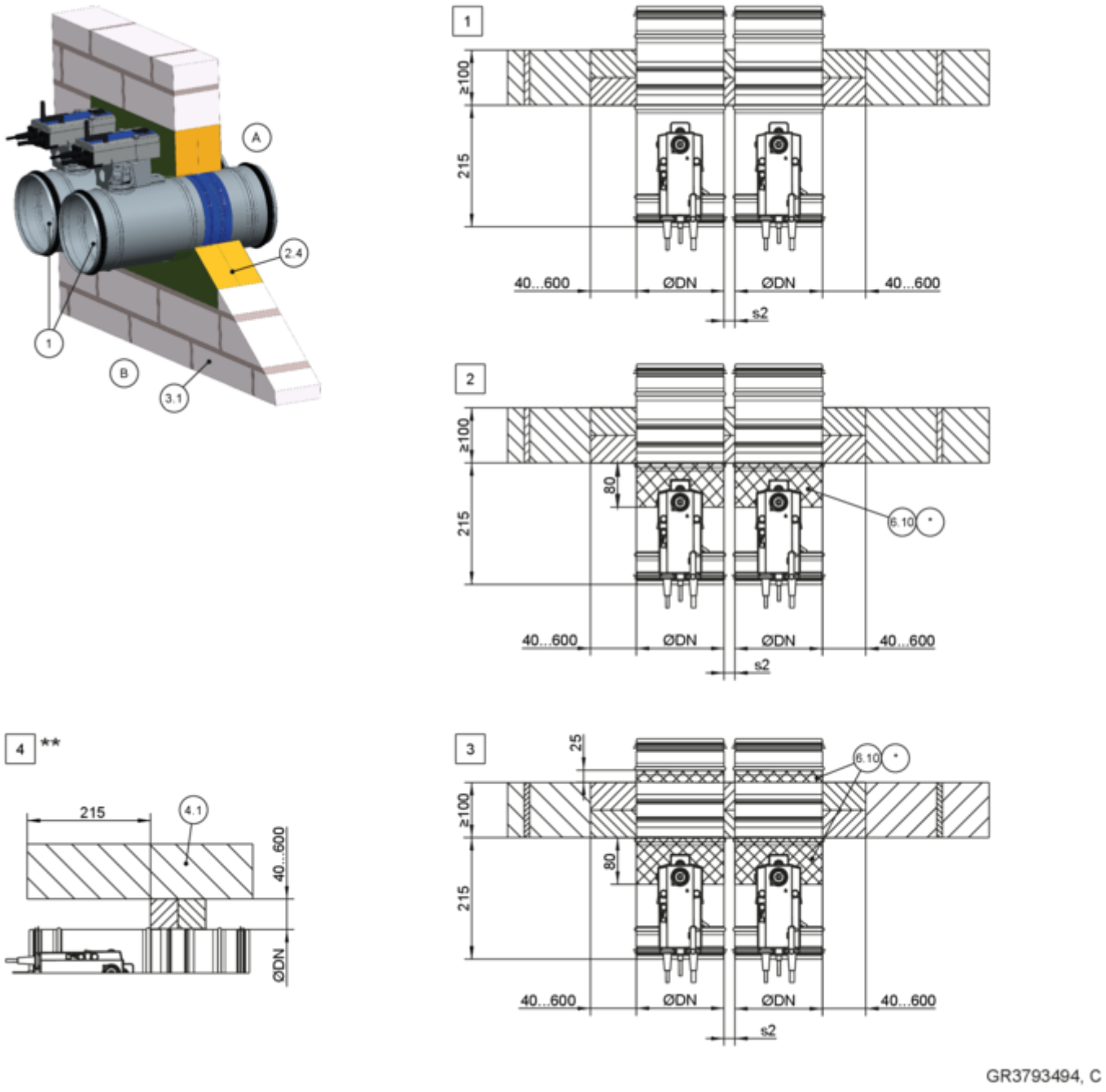


Fig. 61: Dry mortarless installation into a solid wall, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FKRS-EU
2.4	Fire batt with ablative coating
3.1	Solid wall
4.1	Solid ceiling slab
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* .
*	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 properties 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 5.14 'Fixing the fire damper' on page 235*
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

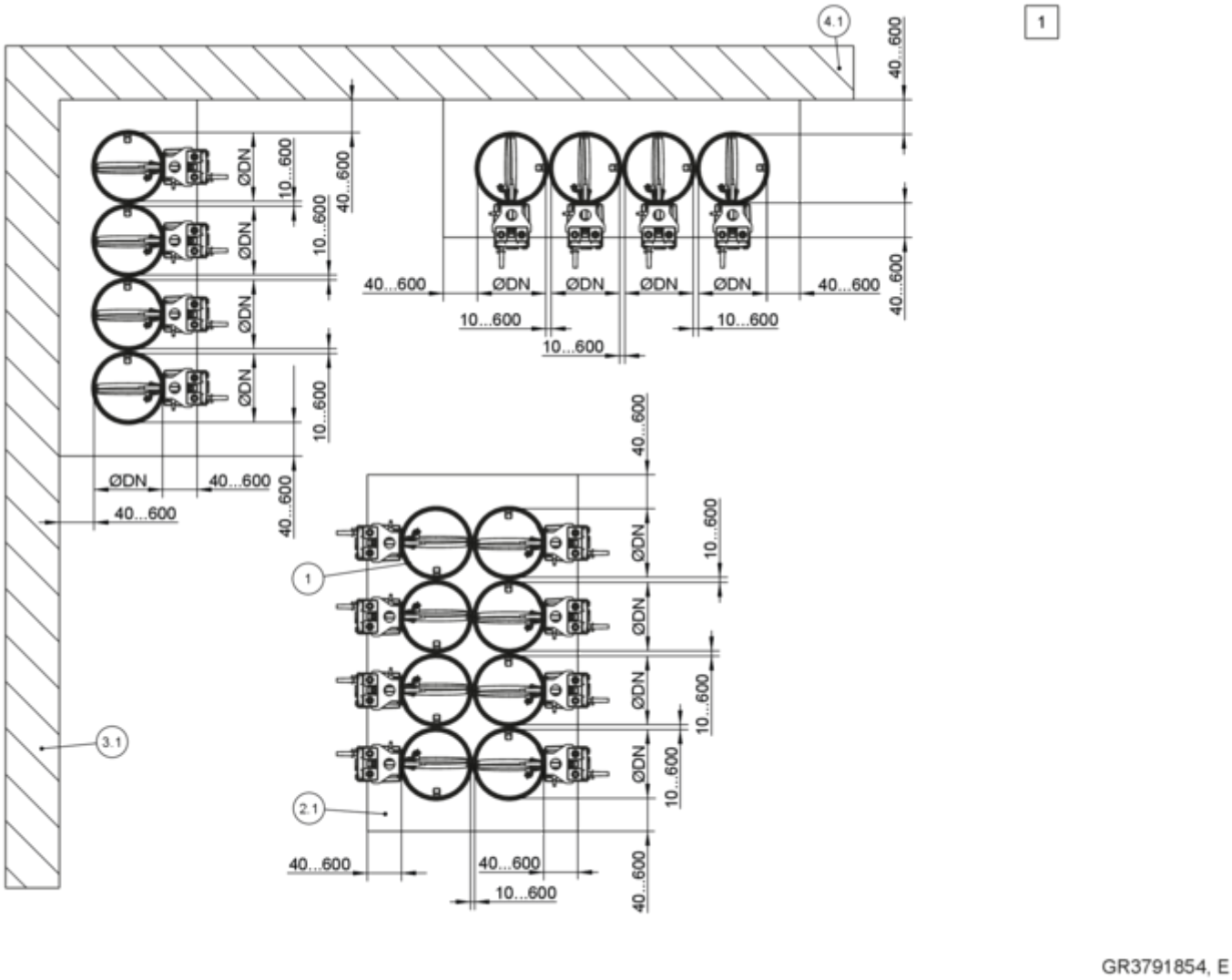


Fig. 62: Dry mortarless installation with fire batt in solid wall - multiple occupancy of an installation opening

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

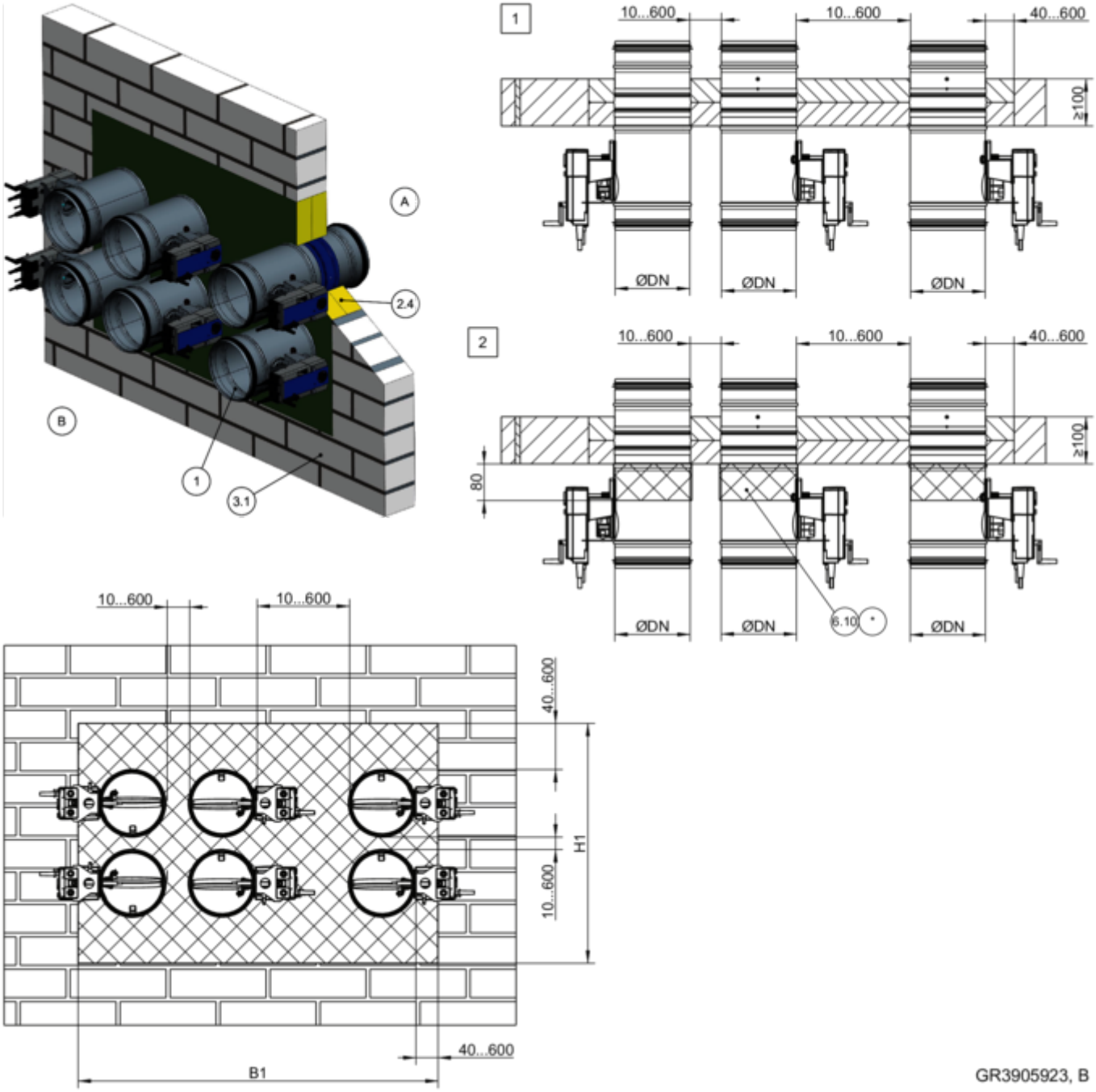


Fig. 63: Dry mortarless installation with fire batt in solid wall - multiple occupancy of an installation opening

1	FKRS-EU
2.4	Fire batt with ablative coating
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*.
*	6.19, 6.20 or 6.24 as an alternative
1 2	See table *Table on page 86*

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 5.14 'Fixing the fire damper' on page 235*
- General information on installation with fire batt, ↳ *on page 36*

5.6 Lightweight partition walls

5.6.1 General information

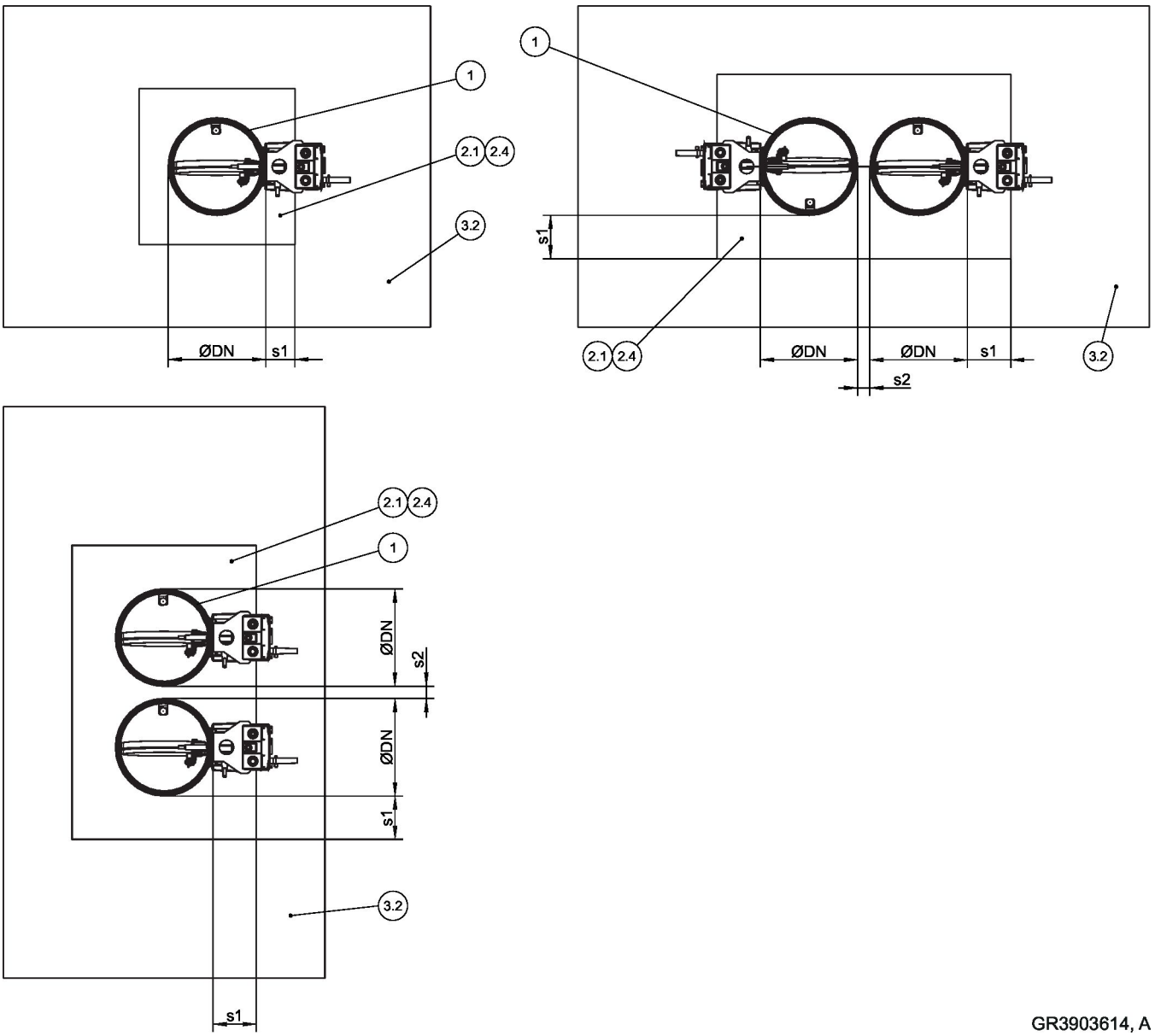


Fig. 64: Lightweight partition walls with metal support structure – arrangement/distances

1 FKRS-EU
2.1 Mortar
2.4 Fire batt with ablative coating
3.2 Lightweight partition wall, cladding on both sides
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	∅nominal width + max. 450	≤ 225	10/40 [2] – 225
Dry mortarless installation with TQ2	□A = ∅nominal width + 110 [3]	central installation	≥ 200 [4]
Dry mortarless installation with fire batt [1]	□A = ∅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

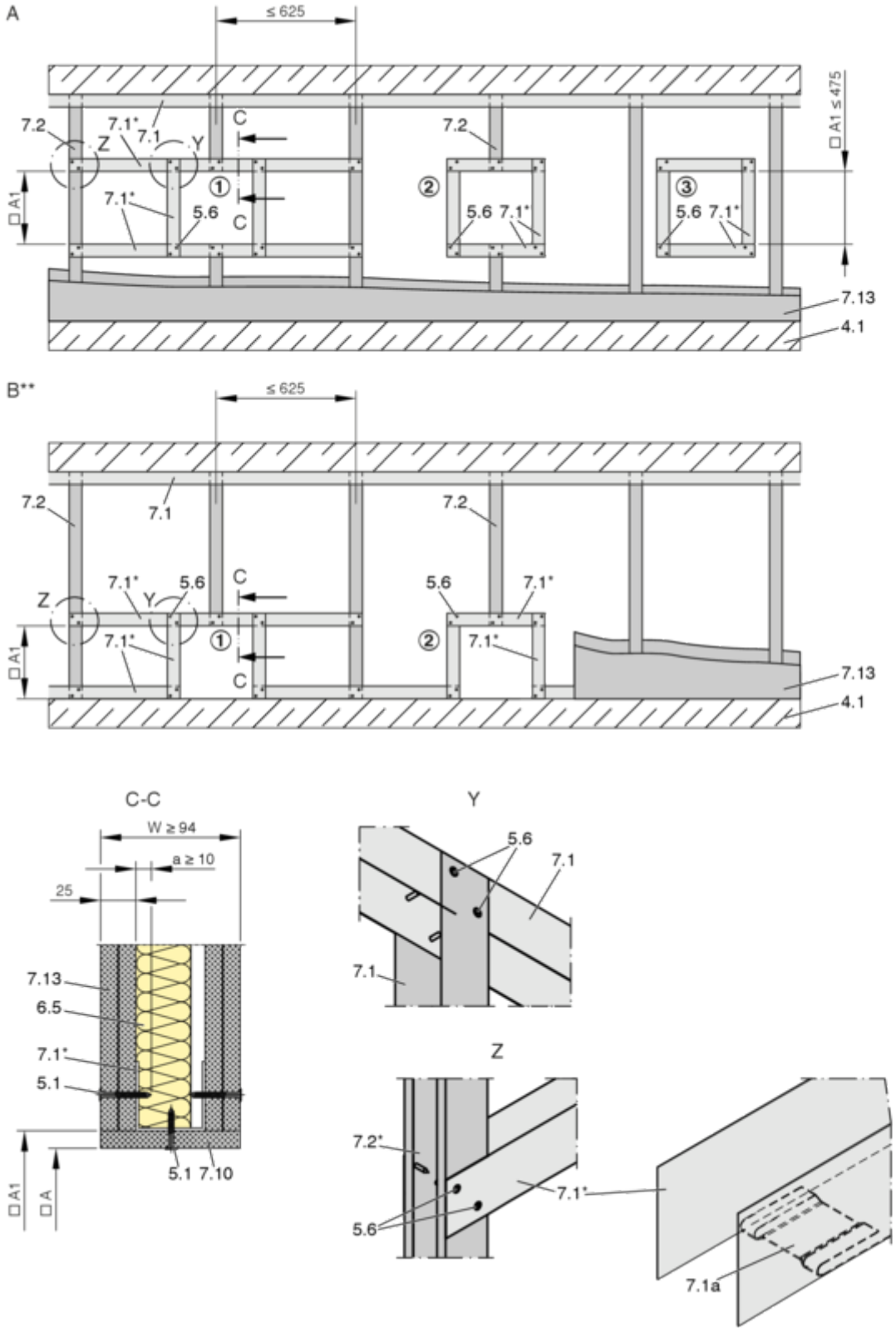


Fig. 65: Lightweight partition wall with metal support structure and cladding on both sides, explanation see Fig. 66

Compartment wall with metal support structure and cladding on both sides

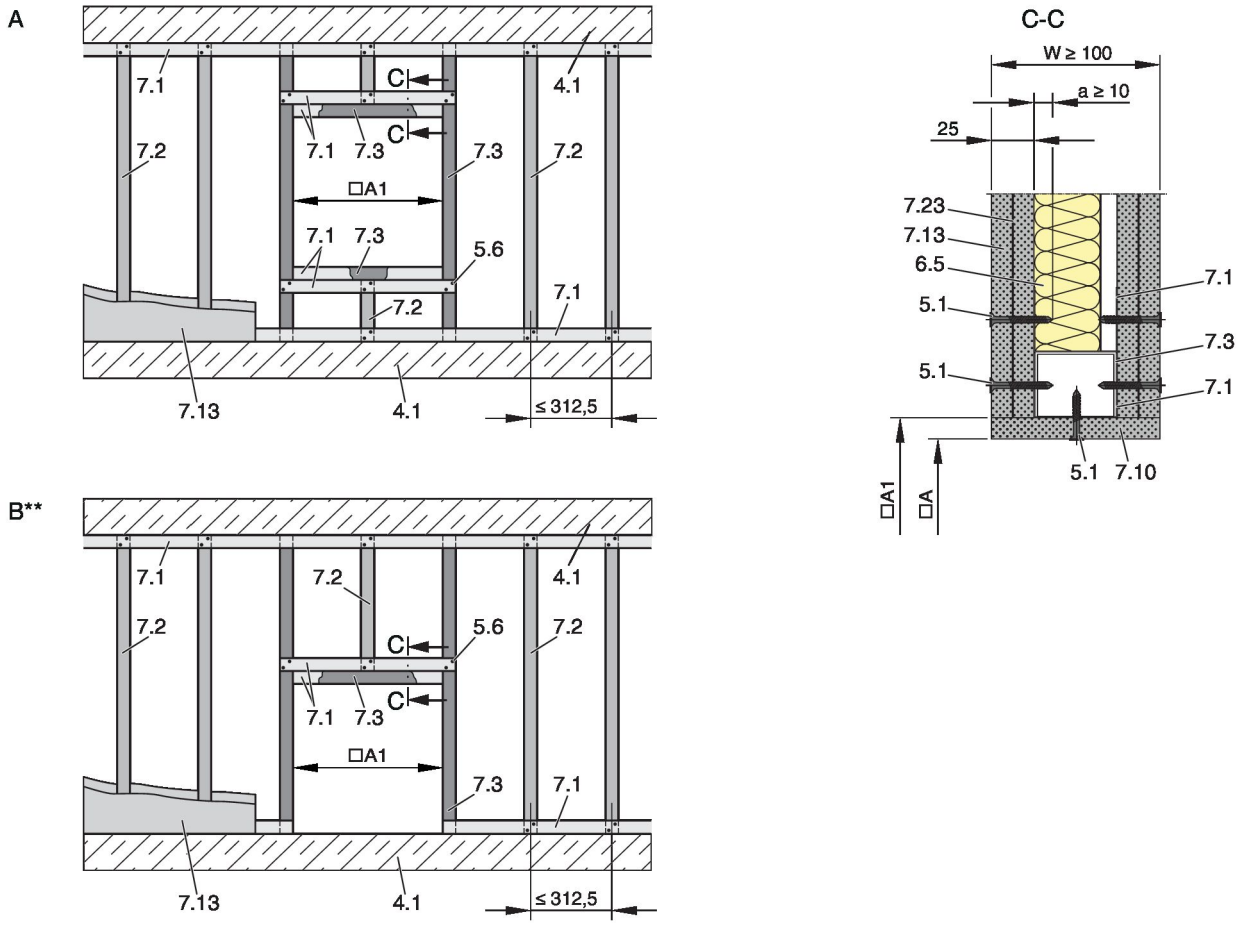


Fig. 66: Compartment wall with metal support structure and cladding on both sides

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

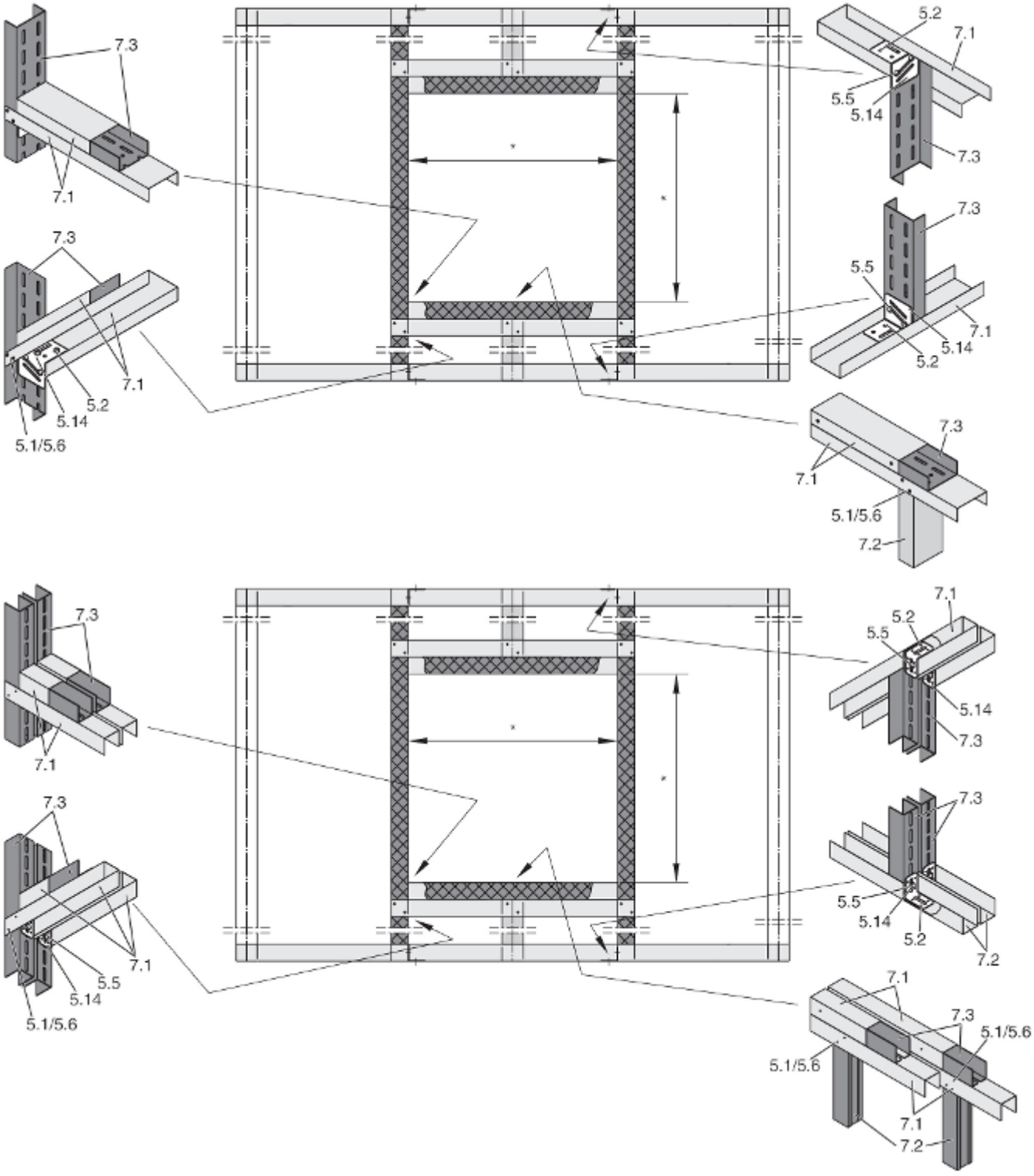


Fig. 67: Metal support structure for a compartment wall, single stud system and double stud system

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 41*

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

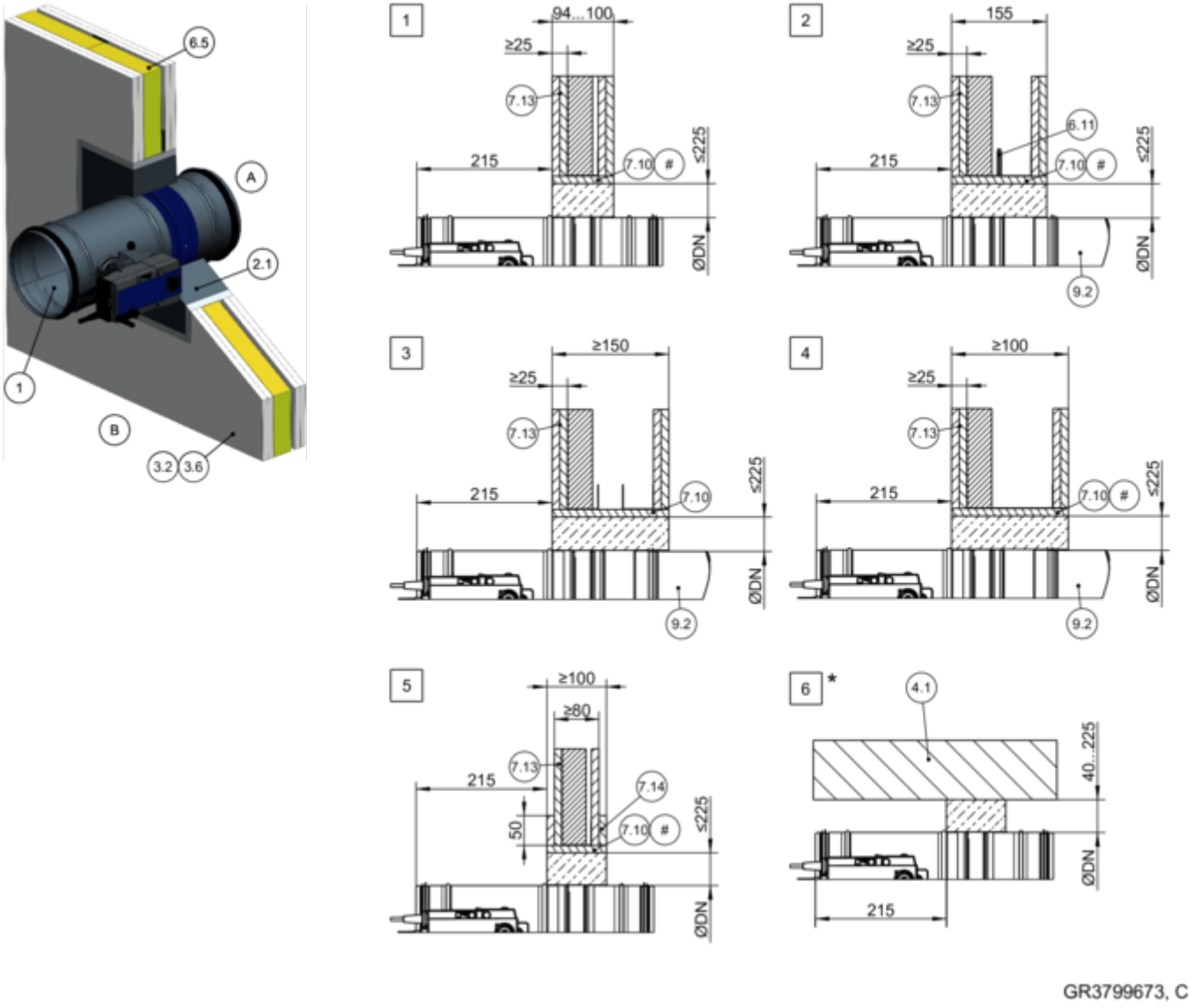


Fig. 68: Mortar-based installation into a lightweight partition wall, compartment wall or safety partition wall

1	FKRS-EU
2.1	Mortar
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/solid floor
6.5	Mineral wool (depending on wall construction)
6.11	Insulating strip (depending on wall construction)
7.10	Trim panels
7.13	Cladding
7.14	Reinforcing board of the same material as the wall
9.2	Air duct/extension piece
#	optional
*	Installation near the floor as in 6
1 – 4	Up to EI 120 S
5	Up to EI 60 S
6	EI 30 S – EI 120 S

Mortar-based installation into a lightweight partition wall

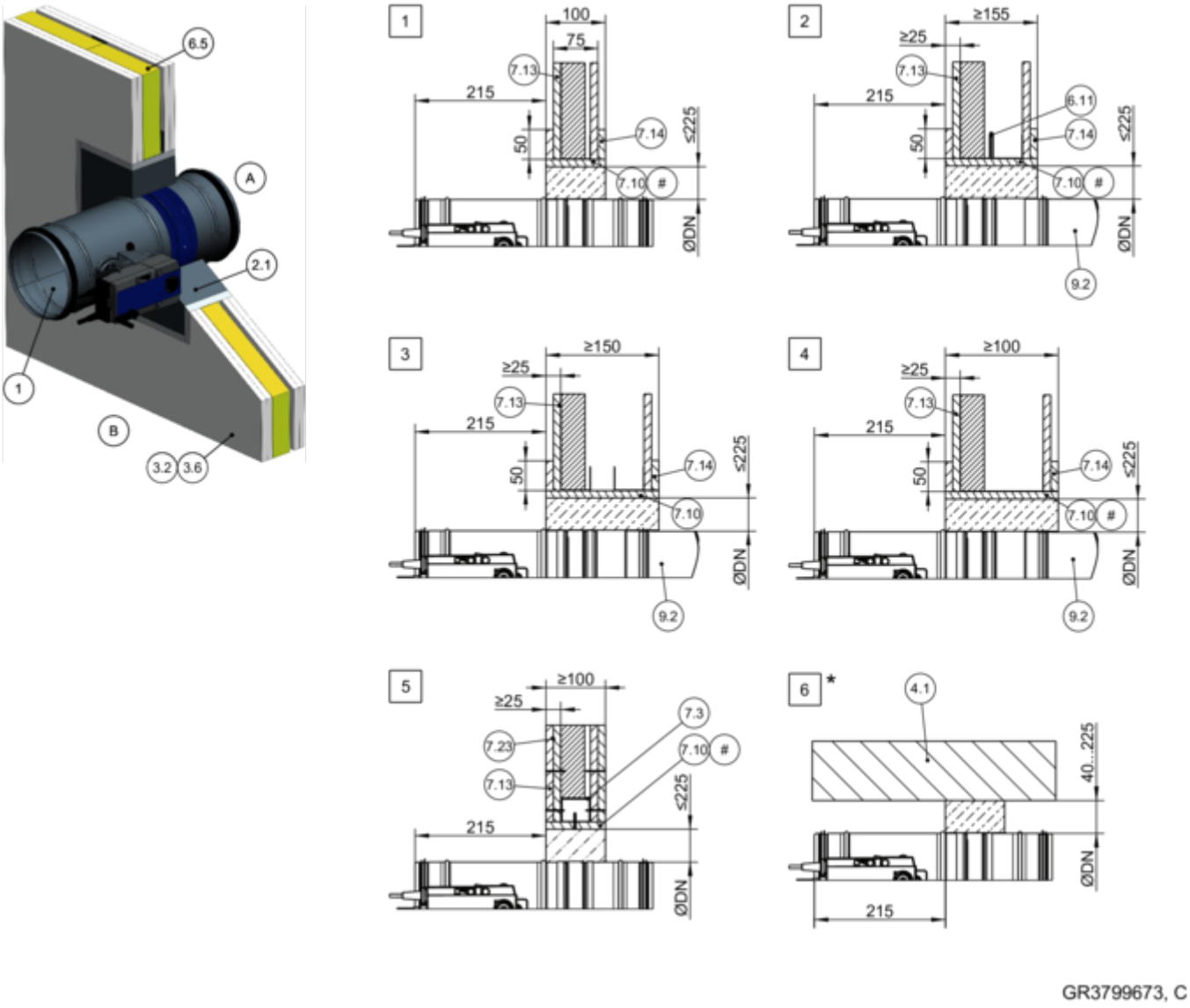


Fig. 69: Mortar-based installation into a lightweight partition wall, compartment wall or safety partition wall

1	FKRS-EU
2.1	Mortar
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/solid floor
6.5	Mineral wool (depending on wall construction)
6.11	Insulating strip (depending on wall construction)
7.3	UA section
7.10	Trim panels
7.13	Cladding
7.14	Reinforcing board of the same material as the wall
7.23	Sheet steel insert
9.2	Air duct/extension piece
#	optional
*	Installation near the floor as in 6
1 – 4	EI 30 S
5	EI 120 S
6	EI 30 S – EI 120 S

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

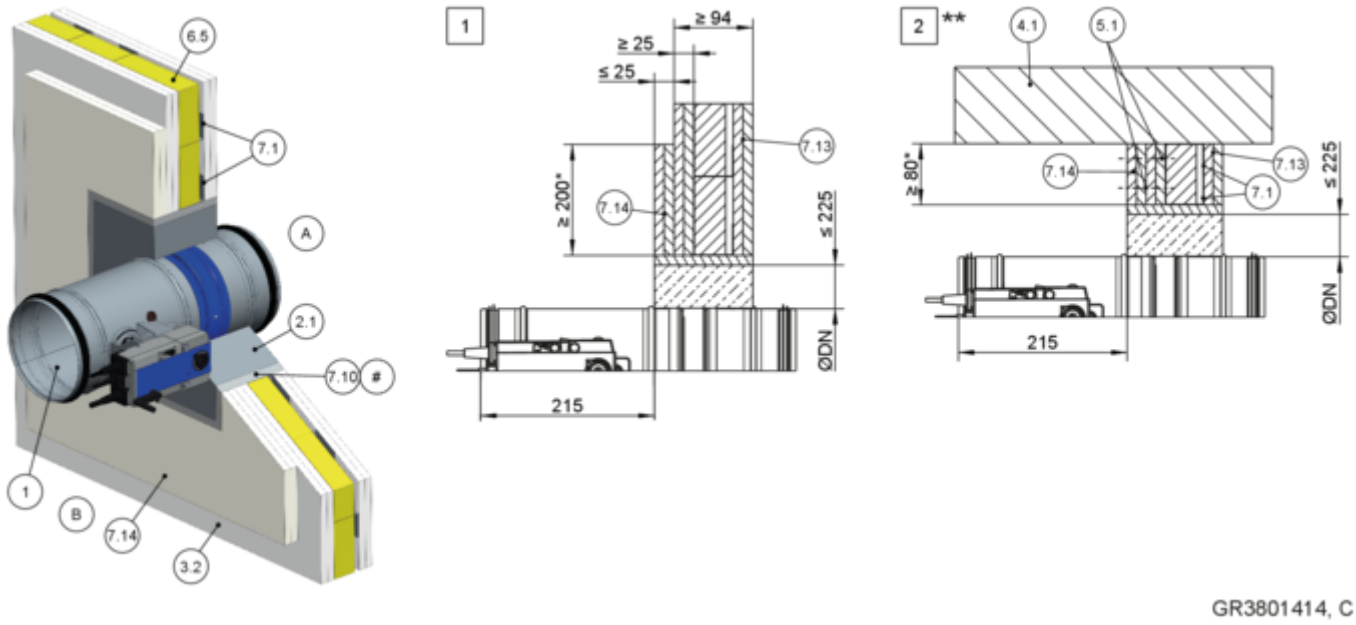


Fig. 70: Mortar-based installation in lightweight partition wall – installation not flush with wall

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

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

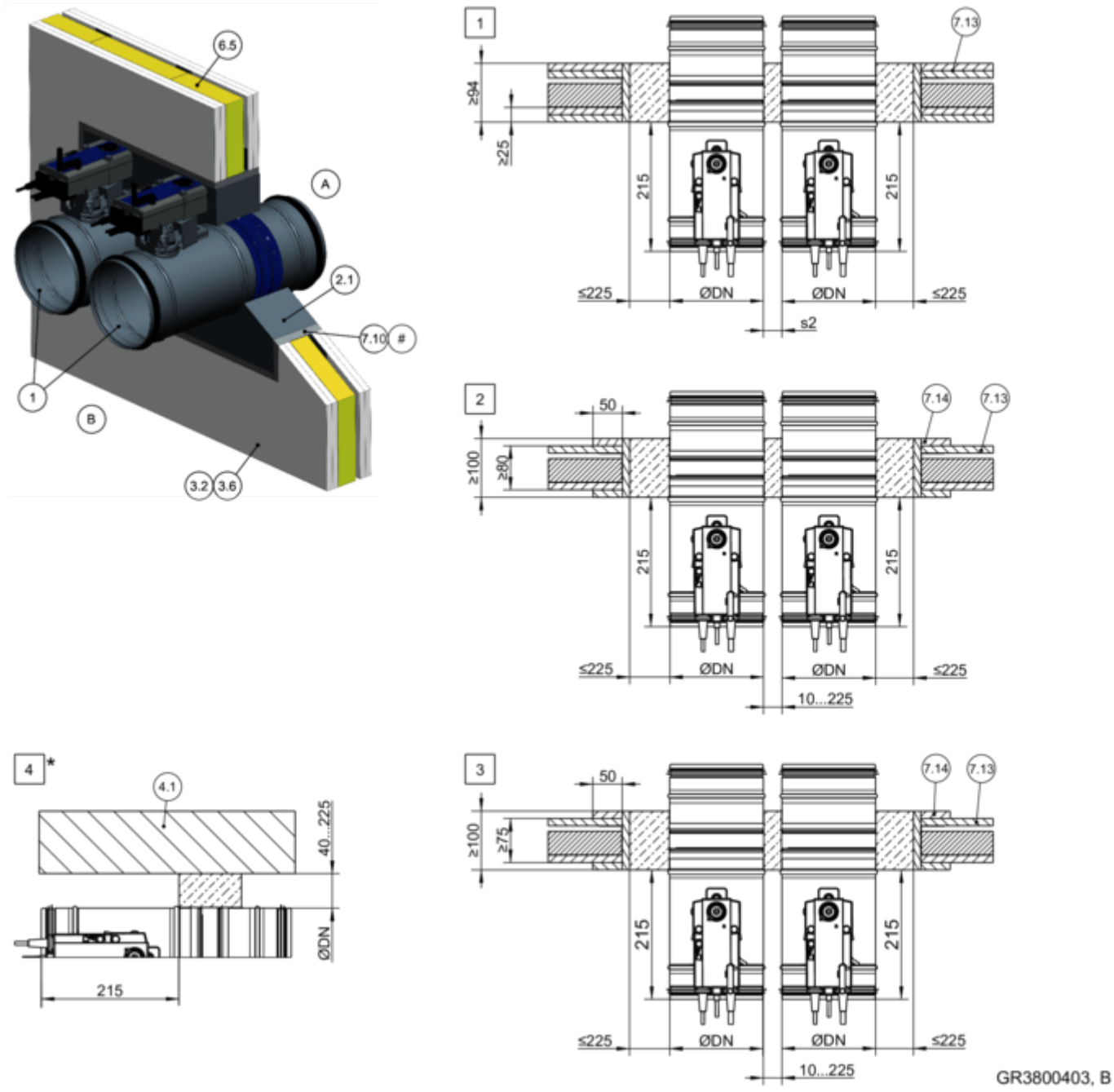


Fig. 71: Mortar-based installation into a lightweight partition wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FKRS-EU
2.1	Mortar
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/solid floor
6.5	Mineral wool (depending on wall construction)
7.10	Trim panels
7.13	Cladding
7.14	Reinforcing board of the same material as the wall
#	according to installation details Fig. 68 and Fig. 69
*	Installation near the floor as in 4
1	Up to EI 120 S for s2 = 40 – 225 mm Up to EI 90 S for s2 = 10 – 225 mm
2	Up to EI 60 S
3	EI 30 S
4	EI 30 S – EI 120 S

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

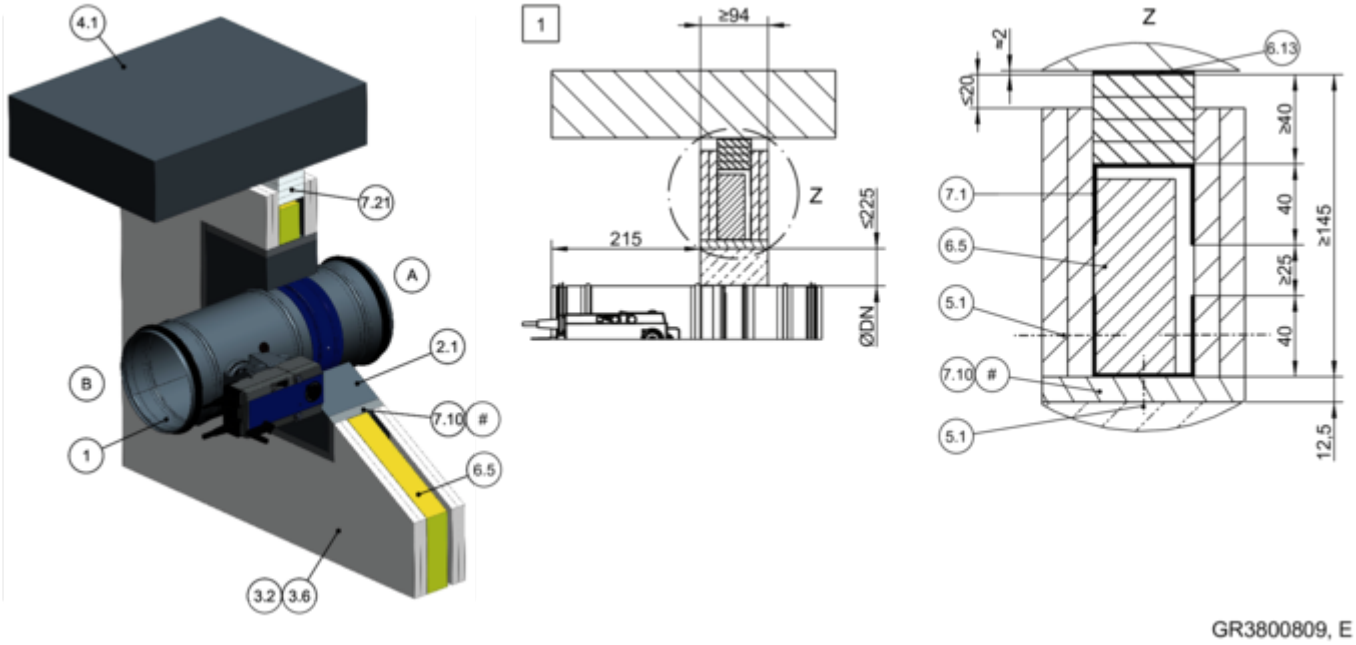


Fig. 72: Mortar-based installation into a lightweight partition wall, below a flexible ceiling joint

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, cladding on both sides	7.10	Trim panels
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. 68 and Fig. 69
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

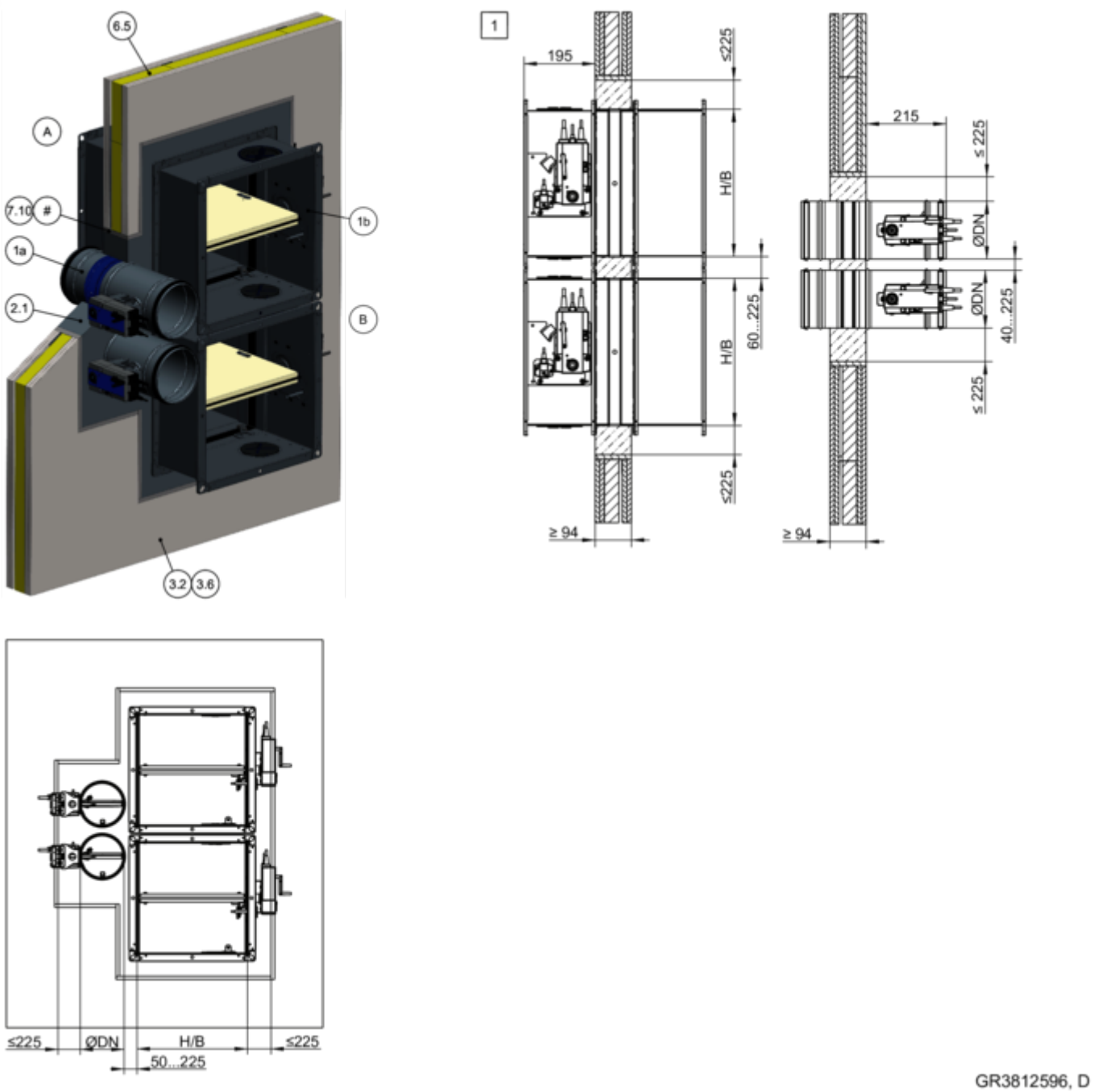


Fig. 73: Mortar-based installation into a lightweight partition wall, FKRS-EU and FK2-EU, combined

1a	FKRS-EU
1b	FK2-EU up to B × H ≤ 800 × 400 mm
2.1	Mortar
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
6.5	Mineral wool (depending on wall construction)
7.10	Trim panels
#	according to installation details Fig. 68 and Fig. 69
1	Up to EI 90 S

For combined installation please note:

- Overall fire damper area ≤ 1.2 m^2 .
- The number of fire dampers in an installation opening is limited by their size (B × H for FK2-EU and/or ∅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.
  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 41*
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

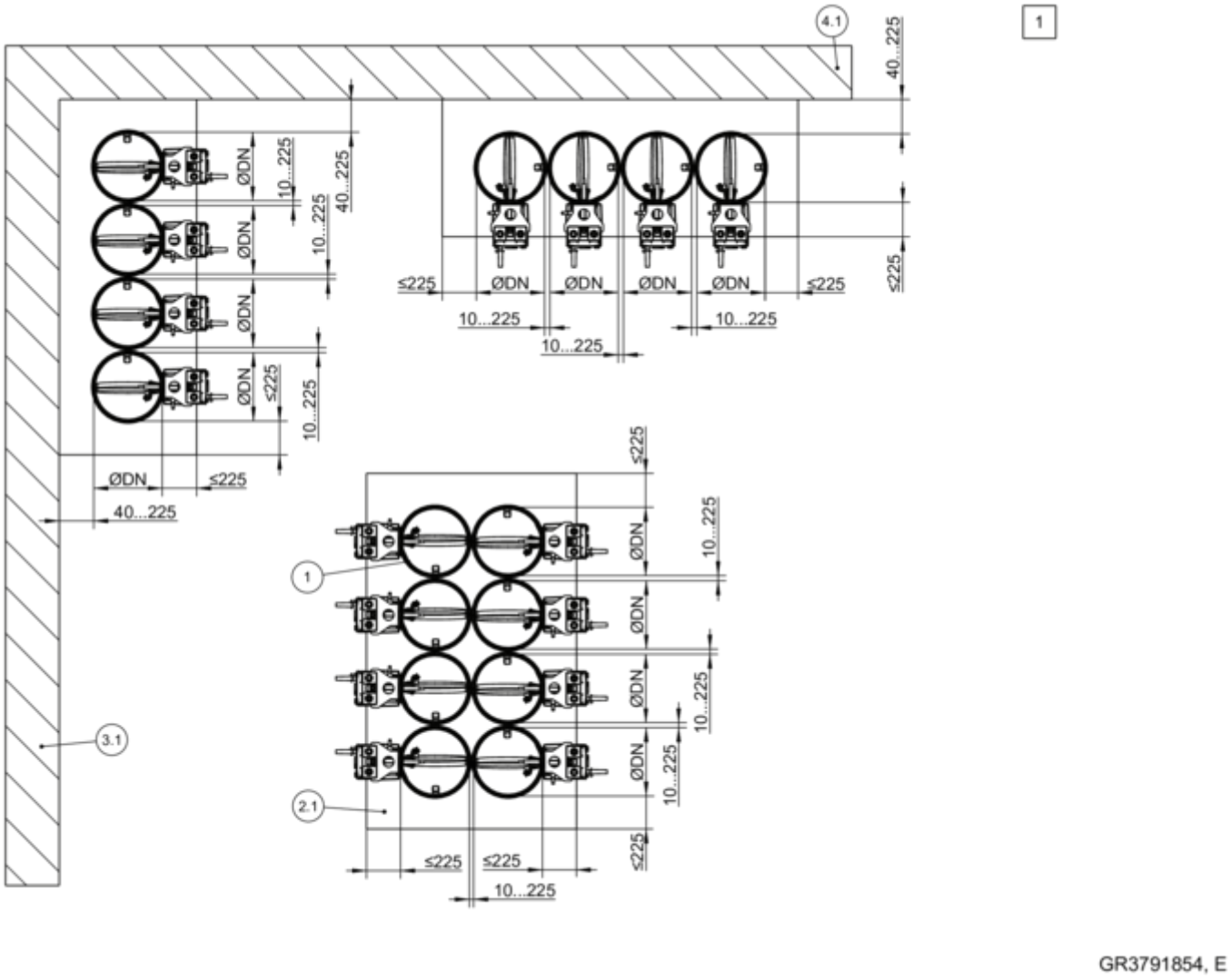


Fig. 74: Mortar-based installation – multiple installation into one installation opening

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

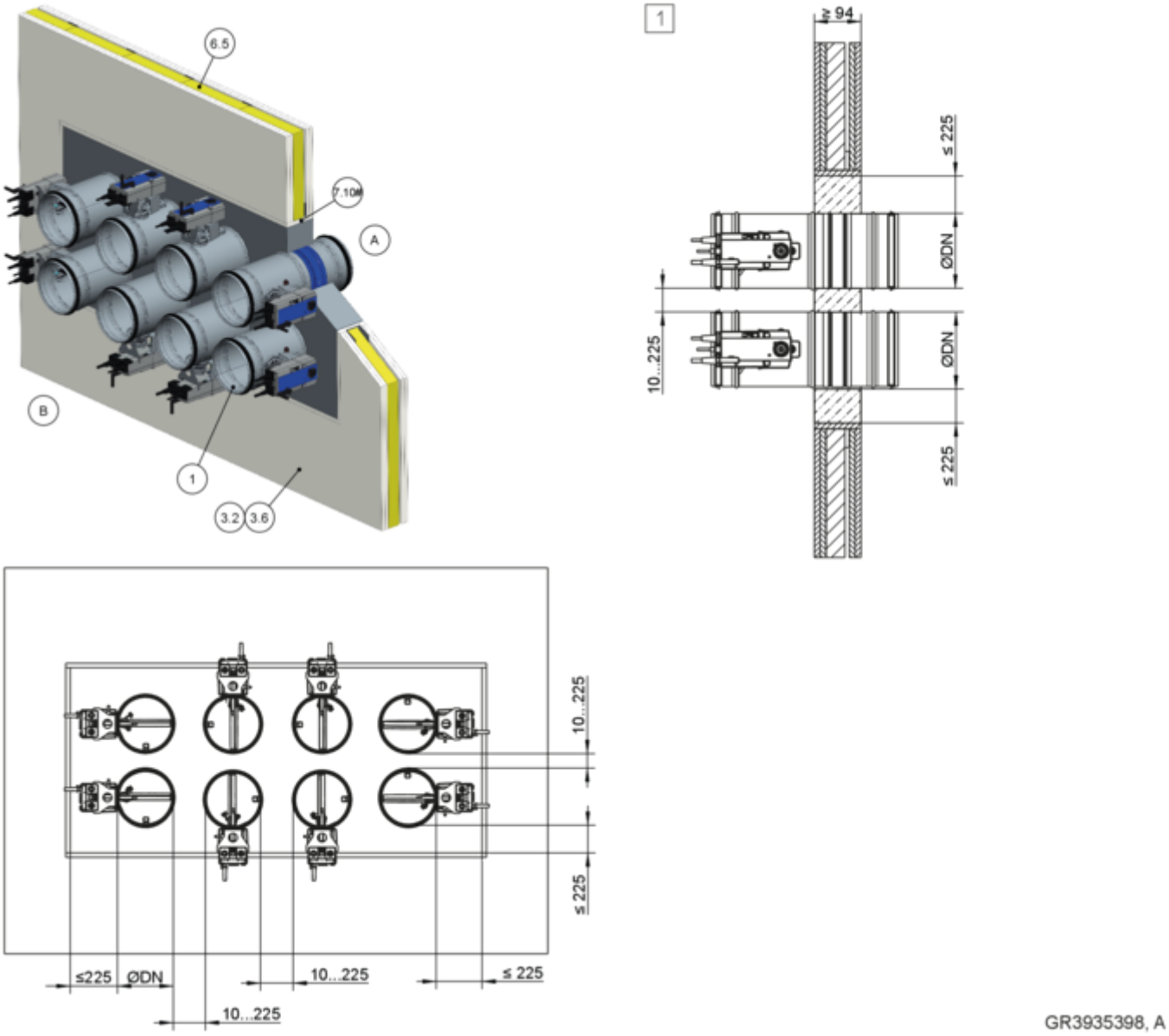


Fig. 75: Mortar-based installation – multiple installation into one installation opening

1	FKRS-EU	6.5	Mineral wool (depending on wall construction)
2.1	Mortar	7.10	Trim panels
3.2	Lightweight partition wall with metal 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		

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

- Lightweight partition wall or compartment wall, *on page 41*
- 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 ≥ 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

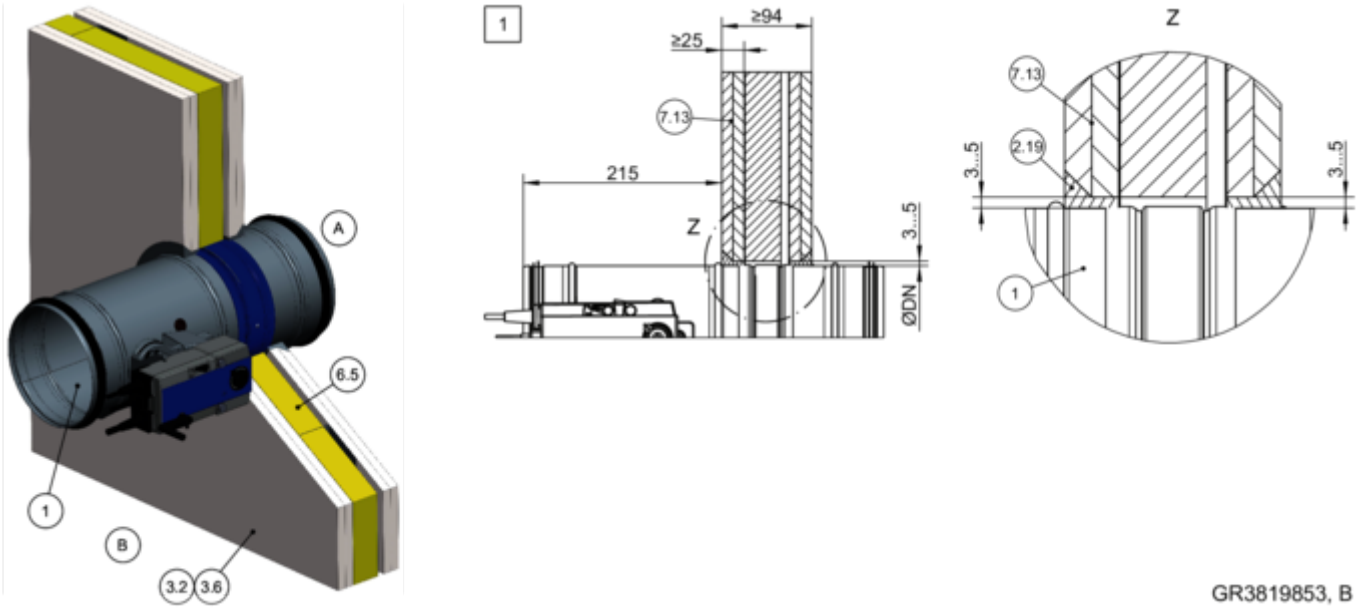


Fig. 76: Dry mortarless installation into a lightweight partition wall, without installation kit

1	FKRS-EU
2.19	Joint filler (filler, ready-to-use putty or equivalent)
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
6.5	Mineral wool (depending on wall construction)
7.13	Cladding, fire-resistant, also with sheet steel insert
1	Up to EI 60 S

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

- Lightweight partition wall, *on page 41*
- ≥ 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

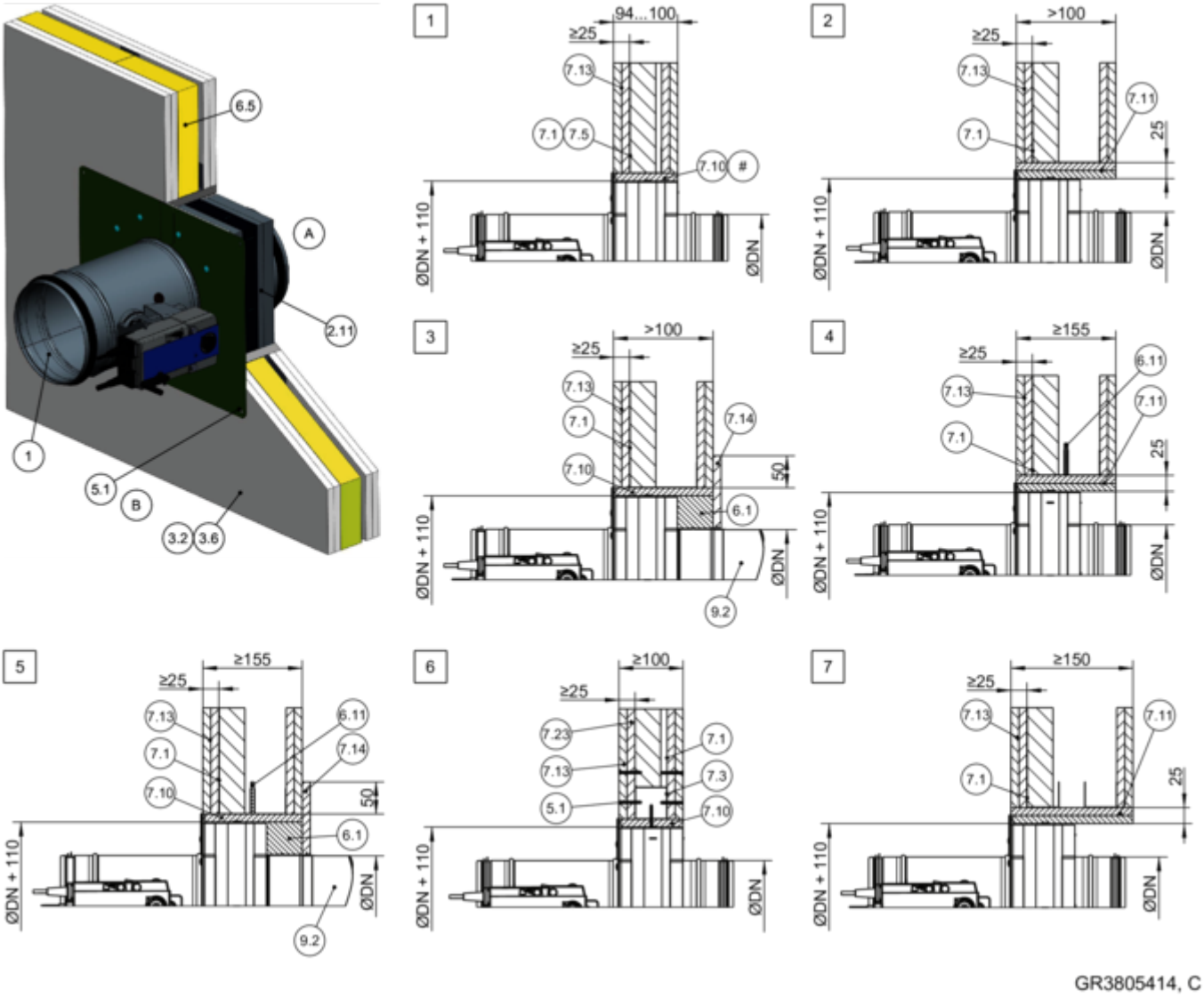


Fig. 77: Dry mortarless installation into a lightweight partition wall, with installation kit TQ2

1	FKRS-EU
2.11	Installation kit TQ2 with cover plate
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
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame
6.1	Mineral wool, ≥ 1000 °C, ≥ 40 kg/m³
6.5	Mineral wool (depending on wall construction)
6.11	Insulating strip (depending on wall construction)
7.1	UW section
7.3	UA section
7.5	Steel support structure (box section)
7.10	Trim panels (fire-resistant)
7.11	Fire-resistant trim panels, double
7.13	Cladding
7.14	Reinforcing board of the same material as the wall
7.23	Sheet steel insert
9.2	Air duct/extension piece
#	optional
1 – 7	Up to EI 120 S

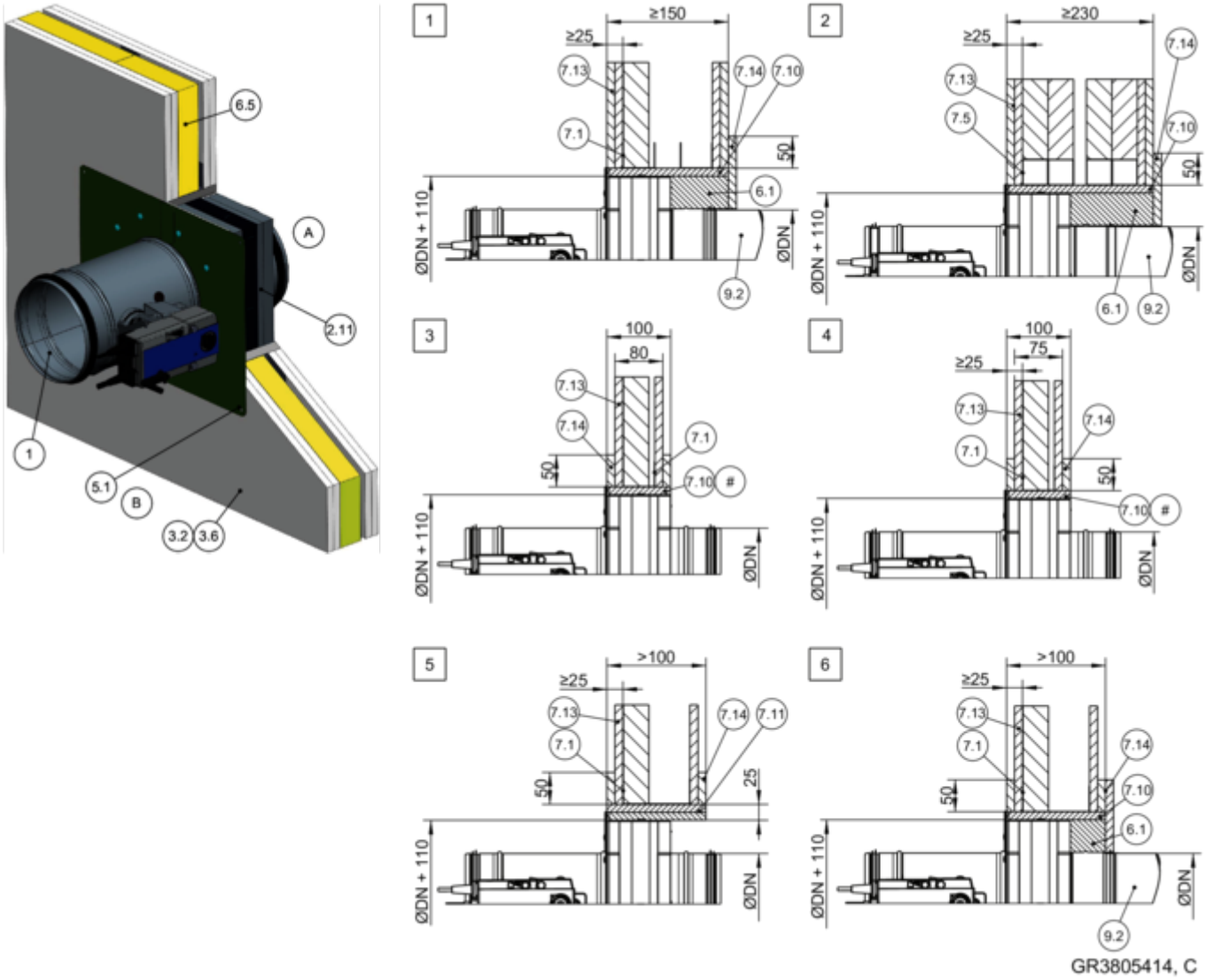


Fig. 78: Dry mortarless installation into a lightweight partition wall, with installation kit TQ2

1	FKRS-EU
2.11	Installation kit TQ2 with cover plate
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
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame
6.1	Mineral wool, ≥ 1000 °C, ≥ 40 kg/m³
6.5	Mineral wool (depending on wall construction)
7.1	UW section
7.5	Steel support structure (box section)
7.10	Trim panels (fire-resistant)
7.11	Fire-resistant trim panels, double
7.13	Cladding, fire-resistant, also with sheet steel insert
7.14	Reinforcing board of the same material as the wall
9.2	Air duct/extension piece
#	optional
1 2	Up to EI 120 S
3	Up to EI 60 S
4 – 6	EI 30 S

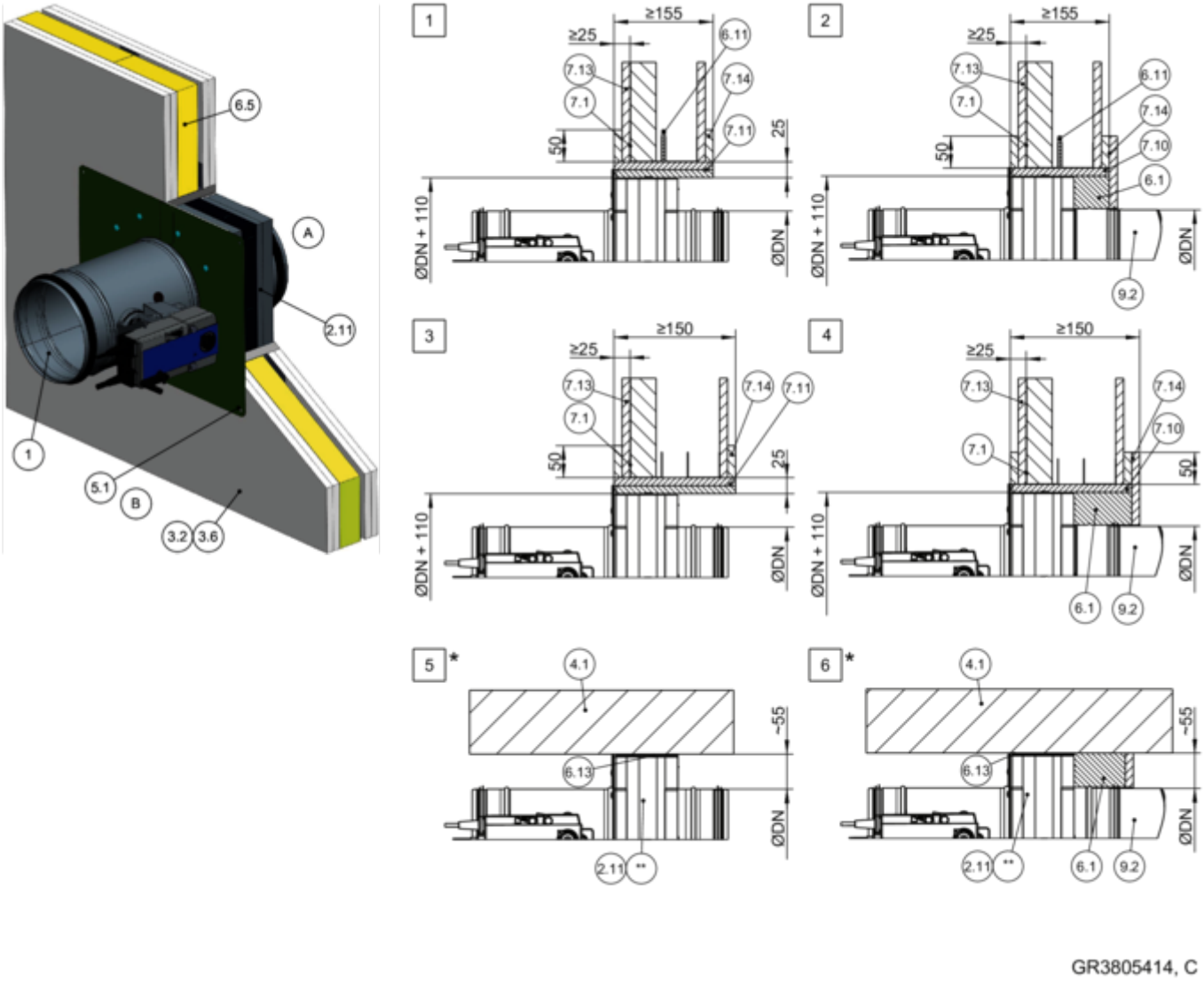


Fig. 79: Dry mortarless installation into a lightweight partition wall, with installation kit TQ2

1	FKRS-EU
2.11	Installation kit TQ2 with cover plate
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/solid floor
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame
6.1	Mineral wool, ≥ 1000 °C, ≥ 40 kg/m³
6.5	Mineral wool (depending on wall construction)
6.11	Insulating strip (depending on wall construction)
6.13	Mineral wool strips A1, alternatively gypsum mortar
7.1	UW section
7.10	Trim panels (fire-resistant)
7.11	Fire-resistant trim panels, double
7.13	Cladding, fire-resistant, also with sheet steel insert
7.14	Reinforcing board of the same material as the wall
9.2	Air duct/extension piece
#	optional
*	Installation near the floor analogous to 5 and 6
**	Cover plate shortened by others
1 – 4	EI 30 S
5 6	EI 30 S – EI 120 S

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

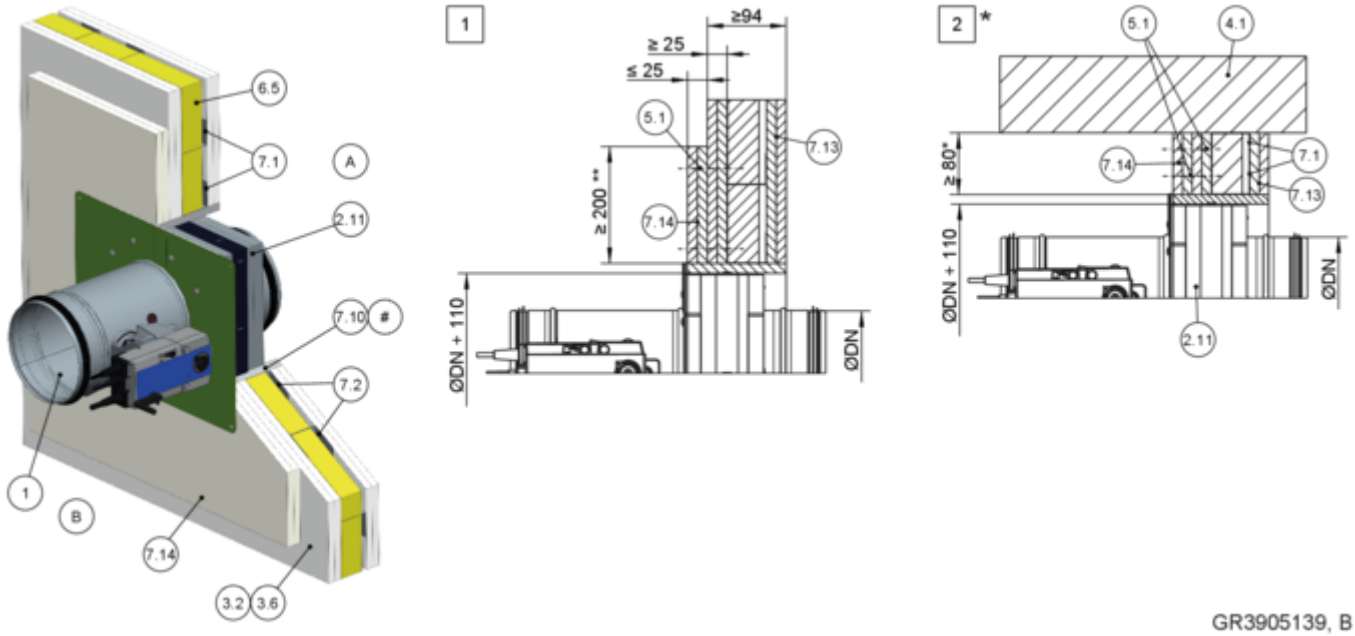


Fig. 80: Dry mortarless installation in lightweight partition wall with installation kit TQ2 - installation not flush with wall

1	FKRS-EU
2.11	Installation kit TQ2 with cover plate
3.2	Lightweight partition wall with metal 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
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame
6.5	Mineral wool (depending on wall construction)
7.1	UW section
7.2	CW section
7.10	Trim panels
7.13	Cladding, fire-resistant, also with sheet steel insert
7.14	Reinforcing board of the same material as the wall
#	optional/depending on wall construction
*	Installation near the floor as in 2
**	Fastening to at least two metal post profiles
1 2	Up to EI 120 S

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

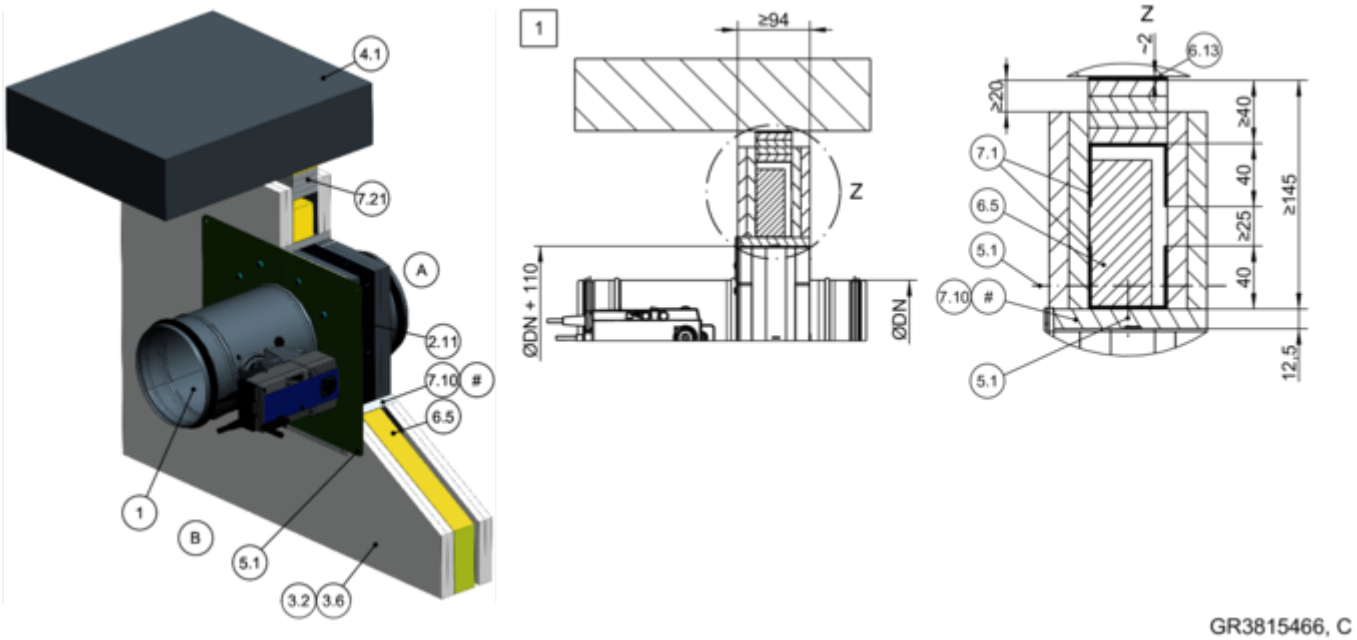


Fig. 81: Dry mortarless installation with installation kit TQ2 into a lightweight partition wall, below a flexible ceiling joint

1 FKRS-EU
2.11 Installation kit TQ2 with cover plate
3.2 Lightweight partition wall with metal 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
5.1 Dry wall screw, min. 10 mm screwed into the metal stud frame
6.5 Mineral wool (depending on wall construction)
6.13 Mineral wool strips A1, if required, alternatively gypsum mortar
7.1 UW section
7.10 Trim panels
7.21 Ceiling joint strips (e.g. 4 × ≥ 10 mm)
according to installation details Fig. 77 to Fig. 79
[1] Up to EI 120 S

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 41*
- Installation kit TQ2, ↳ *5.4.3 'Installation kit TQ2' on page 45*
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

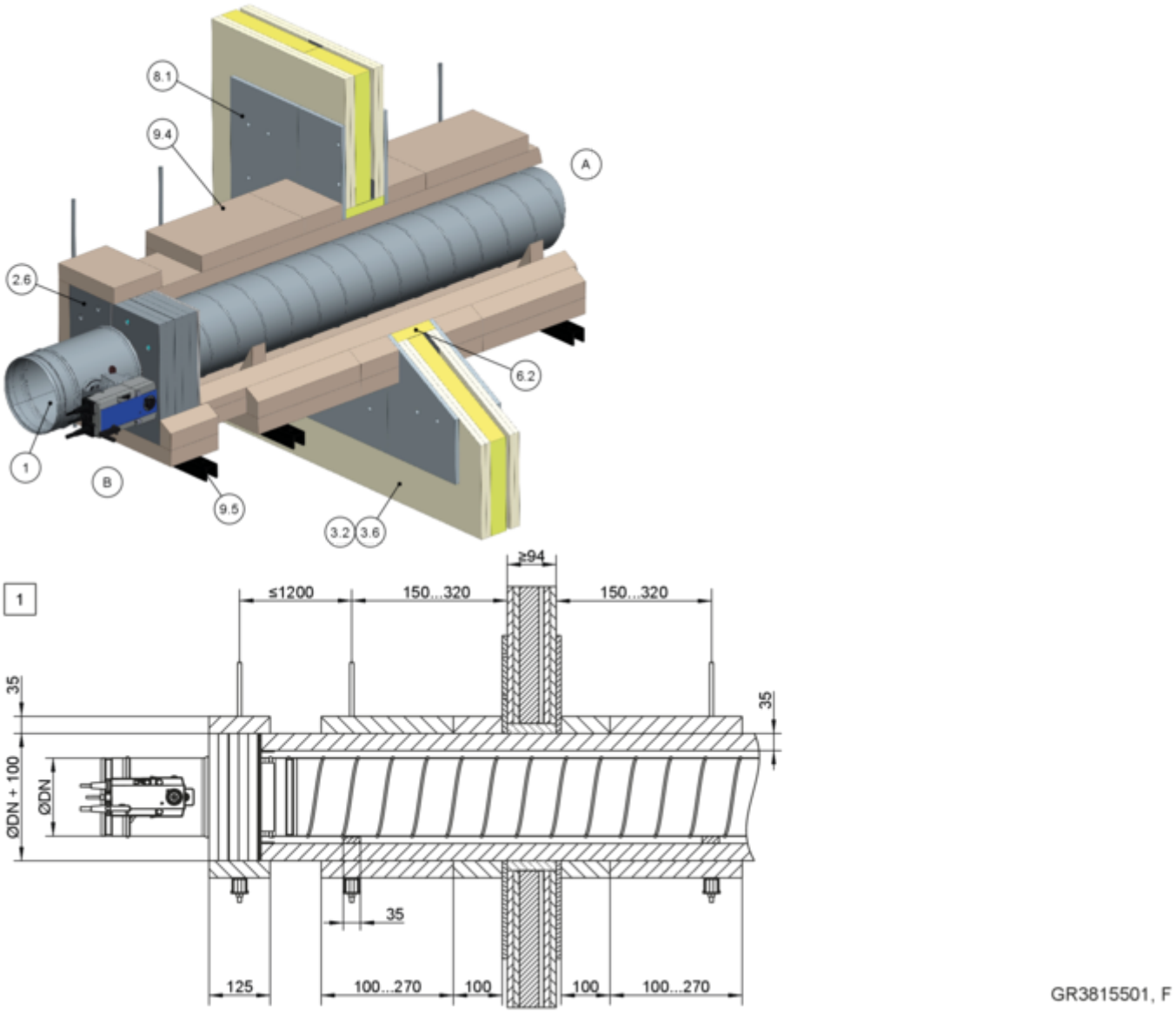


Fig. 82: Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall penetration), four-sided cladding

1 FKRS-EU
2.6 Installation kit WE 2
3.2 Lightweight partition wall with metal 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, ≥ 1000 °C, ≥ 80 kg/m³
8.1 PROMATECT® -H, d = 10 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:
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

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

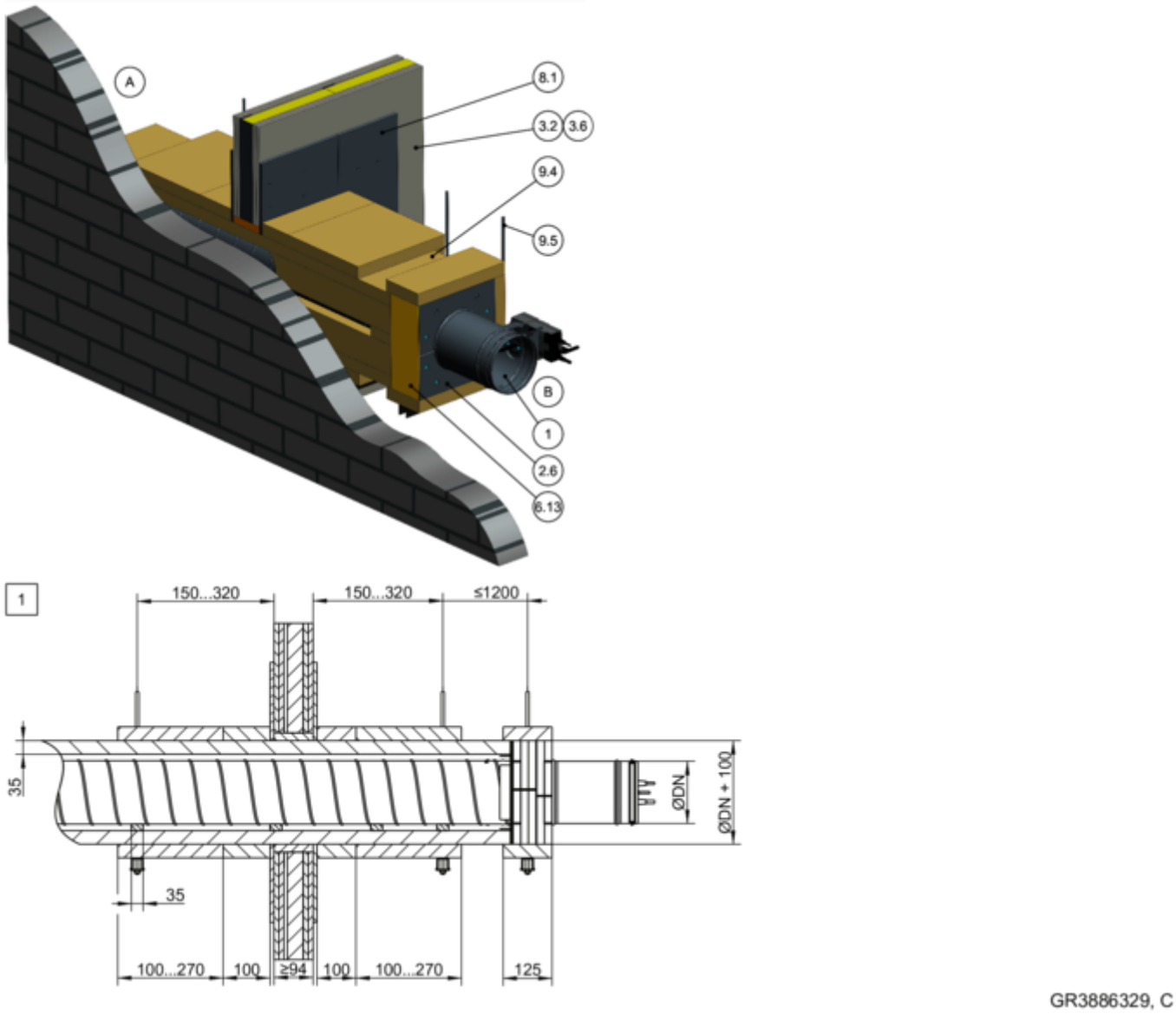


Fig. 83: Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall penetration), three-sided cladding

1 FKRS-EU
2.6 Installation kit WE 2
3.2 Lightweight partition wall with metal support structure, cladding on both sides
3.6 Compartment wall or safety partition wall with metal support structure, cladding on both sides
6.13 Mineral wool, ≥ 1000 °C or gypsum mortar for compensating unevenness
8.1 PROMATECT ® -H, d = 10 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:
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

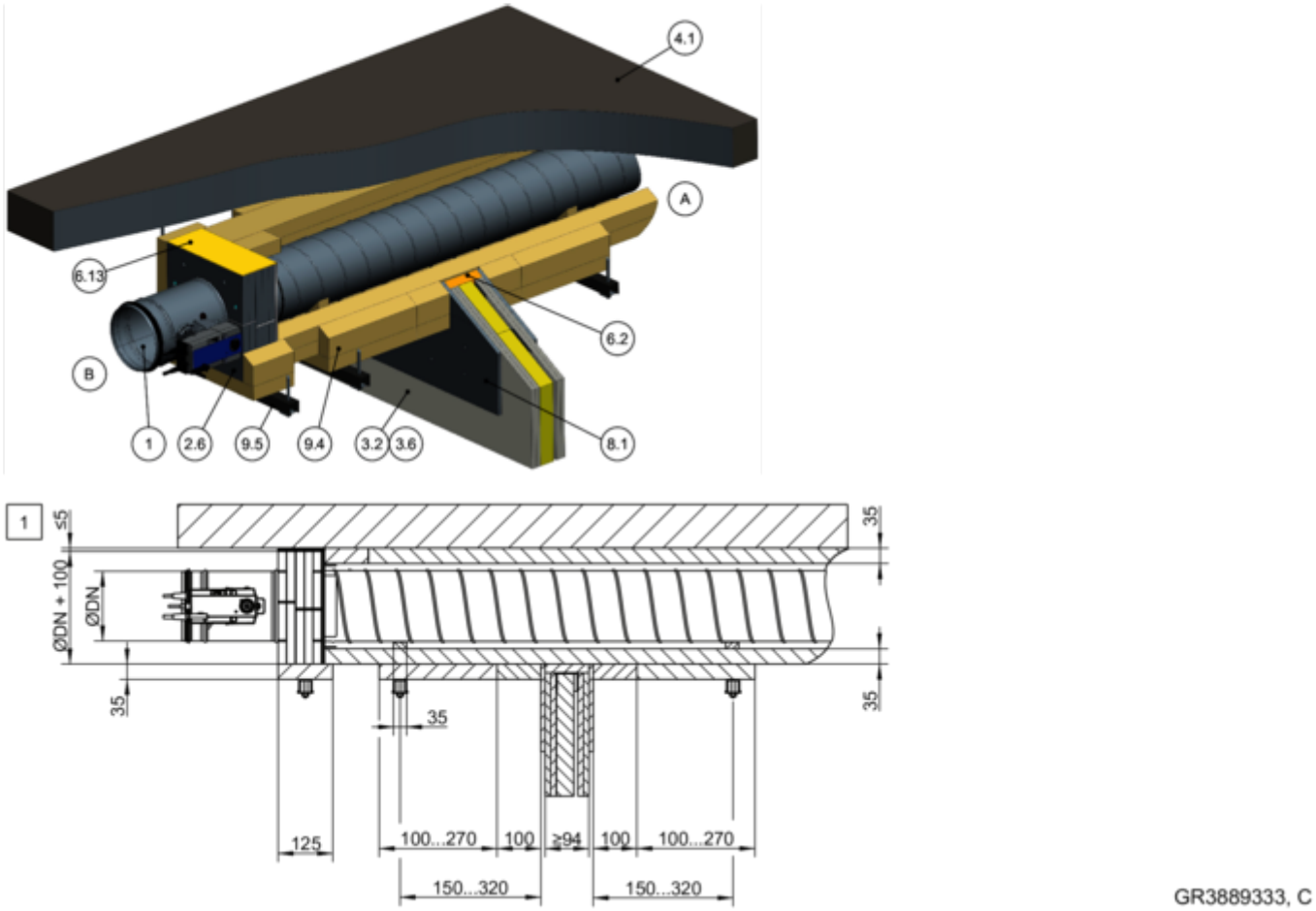


Fig. 84: Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall penetration), three-sided cladding

1 FKRS-EU
2.6 Installation kit WE 2
3.2 Lightweight partition wall with metal 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
6.2 Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³
6.13 Mineral wool, ≥ 1000 °C or gypsum mortar for compensating unevenness
8.1 PROMATECT® -H, d = 10 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:
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

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

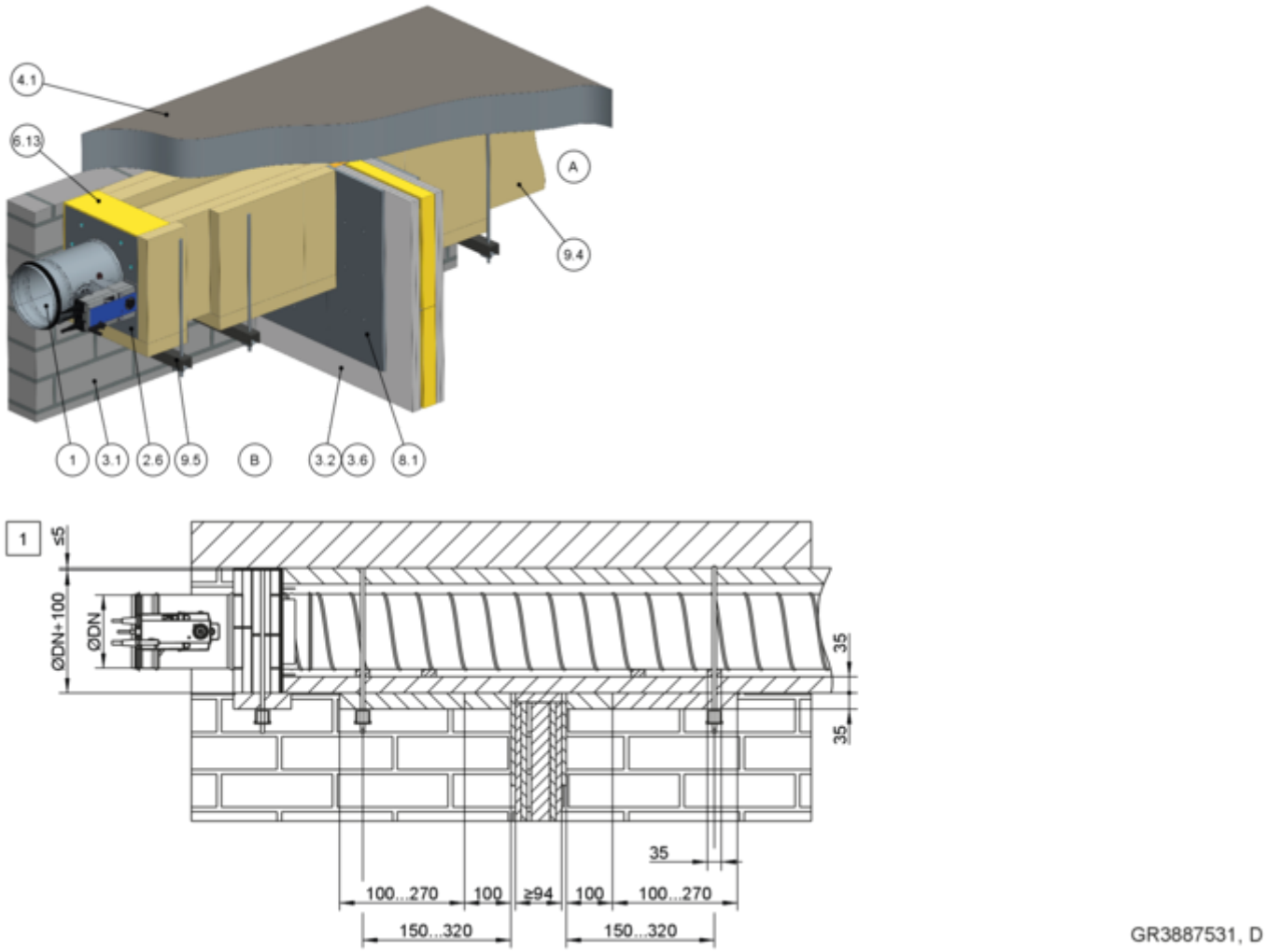


Fig. 85: Dry mortarless installation remote from lightweight partition walls with installation kit WE2 (wall penetration), two-sided cladding

1 FKRS-EU
2.6 Installation kit WE 2
3.1 Solid wall
3.2 Lightweight partition wall with metal 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, ≥ 1000 °C or gypsum mortar for compensating unevenness
8.1 PROMATECT ® -H, d = 10 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:
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

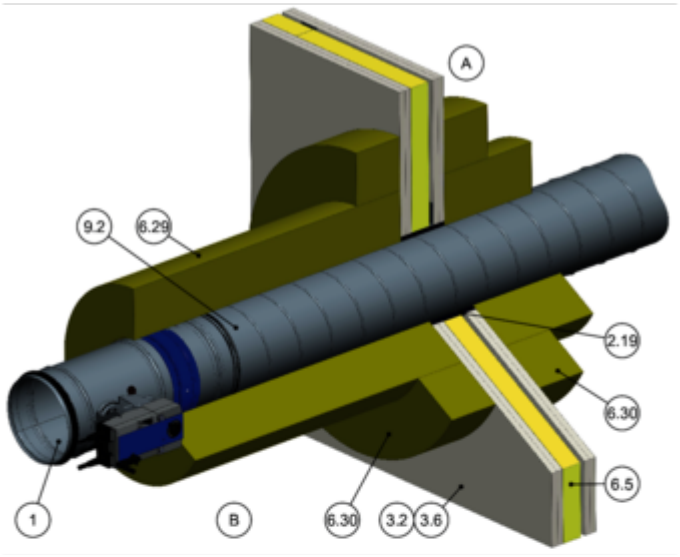
Additional requirements: dry mortarless installation with installation kit WE2 remote from lightweight partition walls (wall penetration)

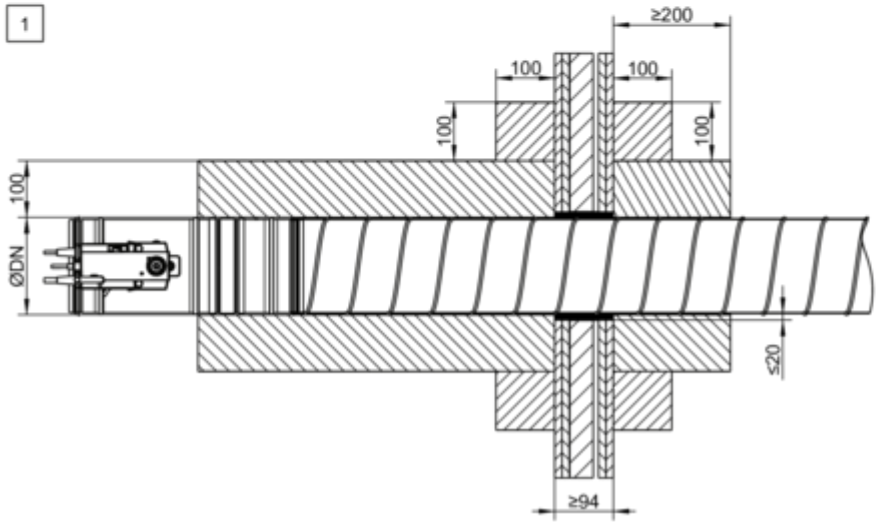
- Lightweight partition wall or compartment wall, ↳ *on page 41*
- Installation kit WE2, ↳ *5.4.5 'Installation kit WE 2' on page 47*
- Suspension and fixing, ↳ *Chapter 5.14 'Fixing the fire damper' on page 235*
- Sheet steel ducts without any openings, with fire-resistant cladding (fittings with cladding according to instructions from Promat®)
- ≥ 300 mm distance between two fire dampers
- General installation information, ↳ *5.3 'General installation information' on page 28* 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. 86: Installation remote from lightweight partition walls with mineral wool and joint filler

1	FKRS-EU	6.29	Mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³)
2.19	Joint filler	6.30	Reinforcing board mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³), glued all round
3.2	Lightweight partition wall with metal 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)		

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

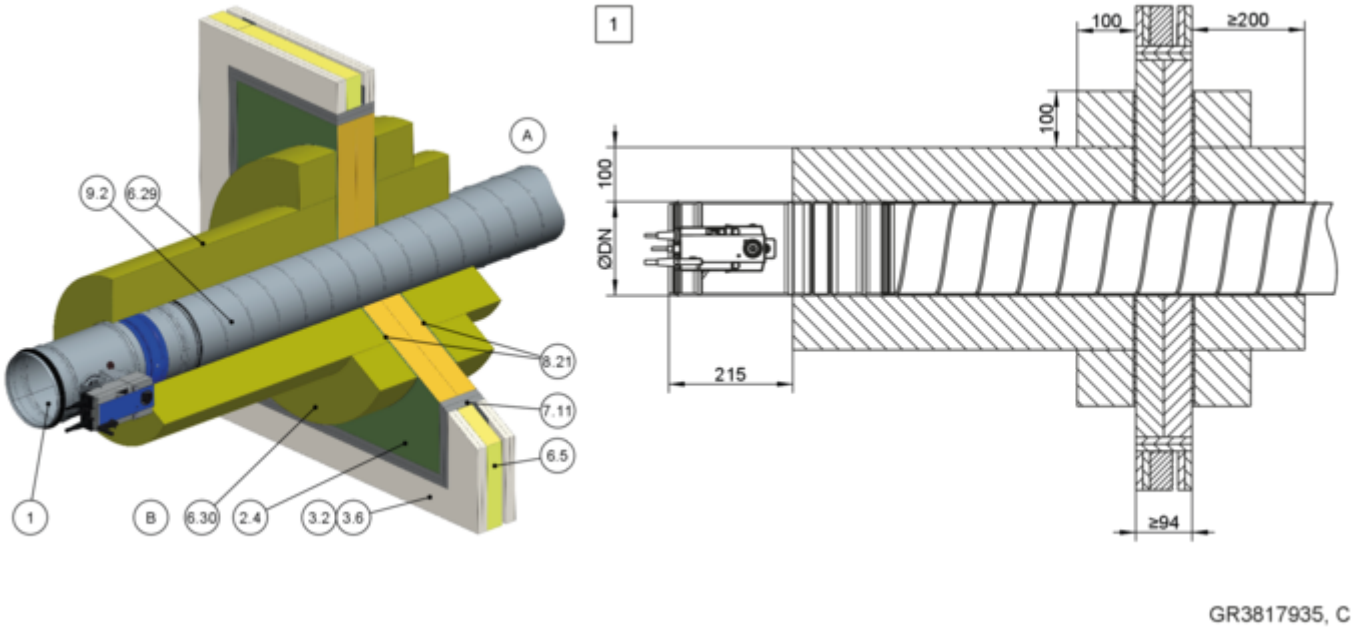


Fig. 87: Dry mortarless installation remote from lightweight partition walls with mineral wool and fire batt

1 FKRS-EU
2.4 Fire batt, PAROC Pyrotech Slab 140 (max. W × H = 2.1 × 2.5 m)
3.2 Lightweight partition wall with metal support structure, cladding on both sides
3.6 Compartment wall or safety partition wall with metal support structure, cladding on both sides
6.5 Mineral wool (depending on wall construction)
6.29 Mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³)
6.30 Reinforcing board mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³), glued all round
7.11 Trim panels, single-layer, fire-resistant
8.21 Acrylic or sealing compound (suitable for fire batt system)
9.2 Sheet steel duct
[1] Up to EI 60 S

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

- Lightweight partition wall or compartment wall, ↯ *on page 41*
- General installation information, ↯ *5.3 'General installation information' on page 28* 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

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

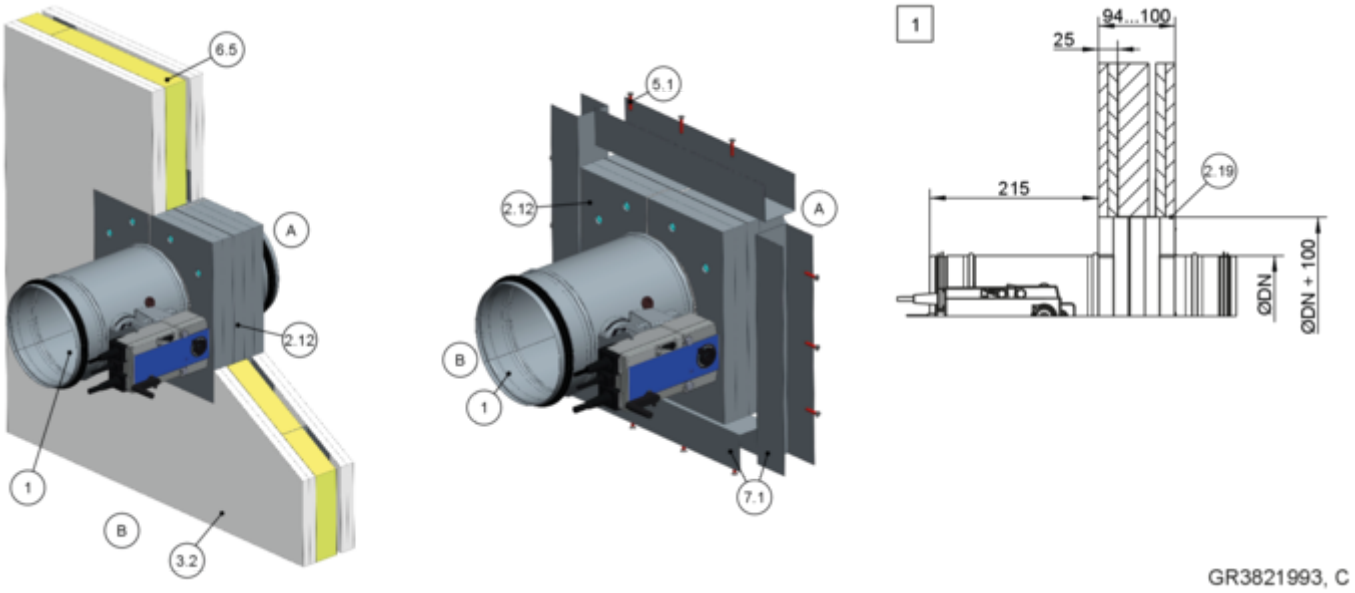


Fig. 88: Dry mortarless installation in lightweight partition wall with installation kit GL2 during wall construction

1	FKRS-EU
2.12	Installation kit GL2
2.19	Joint filler (filler, ready-to-use putty or equivalent)
3.2	Lightweight partition wall with metal support structure, cladding on both sides
5.1	Pre-drill dry wall screw 4 × 35 mm at a distance of approx. 100 mm with 3 mm
6.5	Mineral wool (depending on wall construction)
7.1	U-channel section according to wall construction, W = 44 – 50 mm, H ≥ 40 mm, e.g. UW section
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 41*
- Installation kit GL2, ↳ *5.4.6 'Installation kit GL2' on page 48*
- ≥ 75 mm distance from the fire damper to load-bearing structural elements (structure ≥ 90 mm)
- ≥ 200 mm distance between two fire dampers

1. ▸ Screw metal sections onto installation kit 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

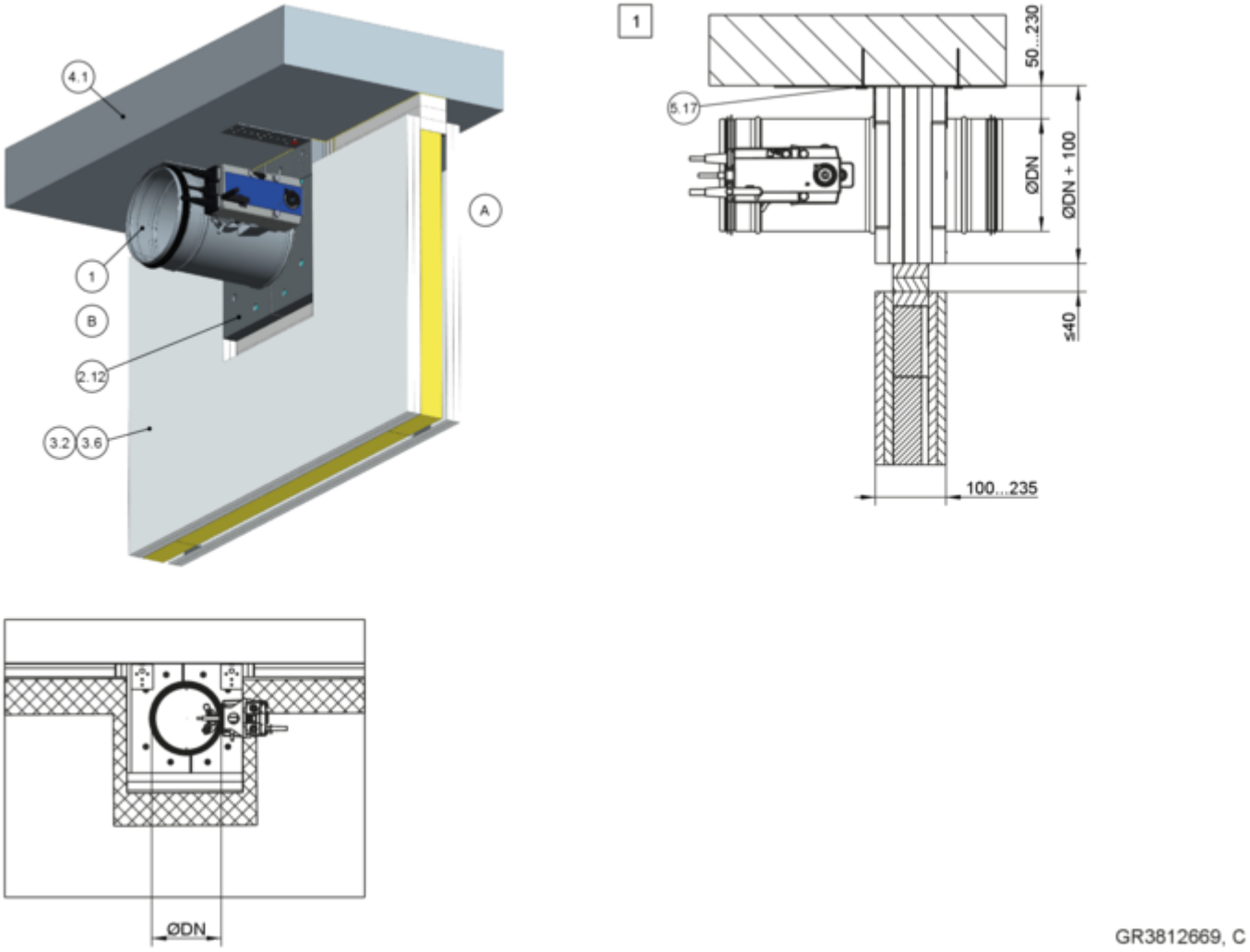


Fig. 89: Dry mortarless installation with installation kit GL2 into lightweight partition or compartment wall

1	FKRS-EU	4.1	Solid ceiling slab
2.12	Installation kit GL2	5.17	Anchor bolt Hilti ® HUS-6 ∅ 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, 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.

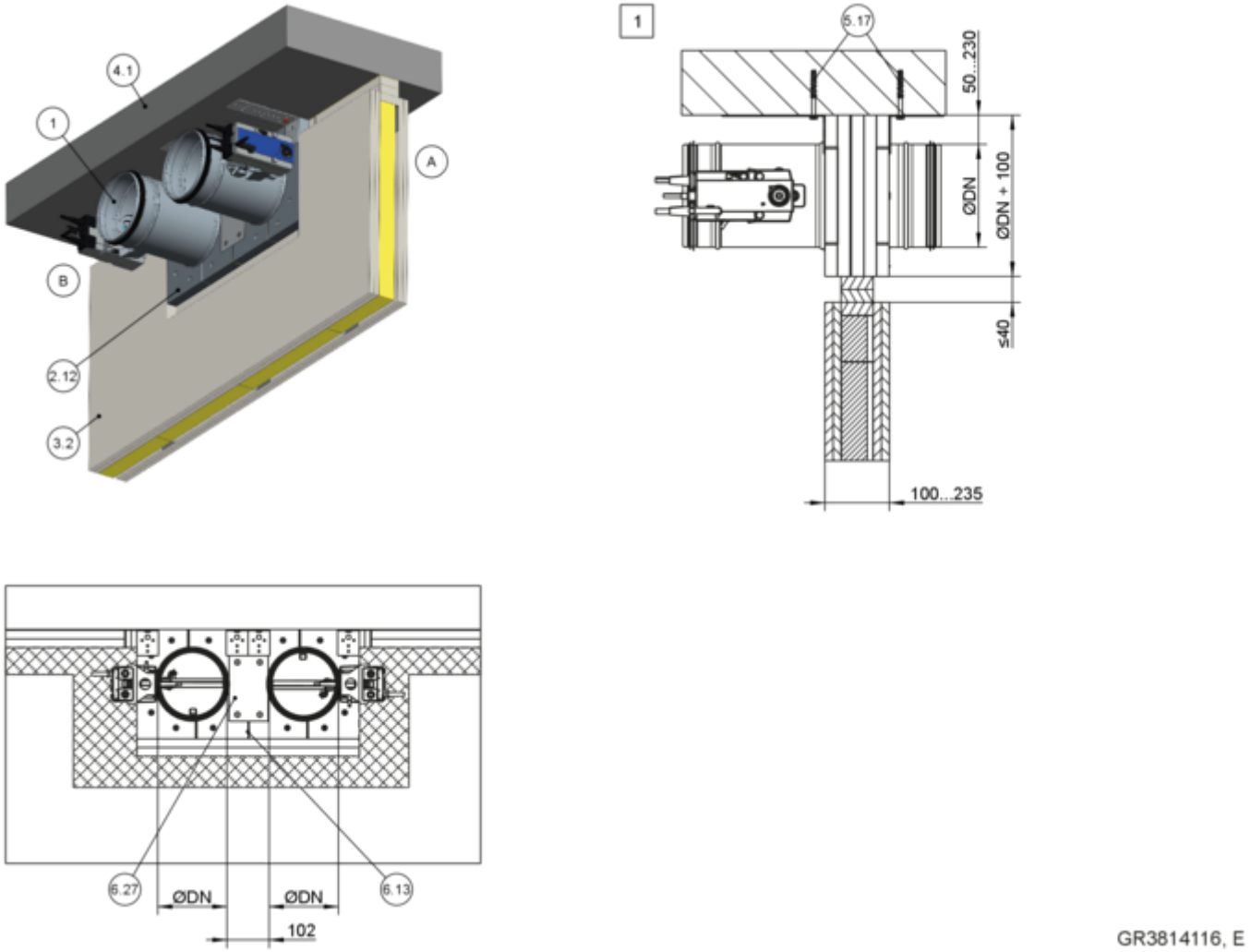


Fig. 90: Dry mortarless installation with installation kit GL2 into lightweight partition or compartment wall

1	FKRS-EU	5.17	Anchor bolt Hilti ® HUS-6 ∅ 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		
3.2	Lightweight partition wall with metal support structure, cladding on both sides	6.13	Mineral wool strips A1, filler as an alternative
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	6.27	Z brackets both sides, 90 × 140 × 1.5 mm
4.1	Solid ceiling slab	1	Up to EI 90 S

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

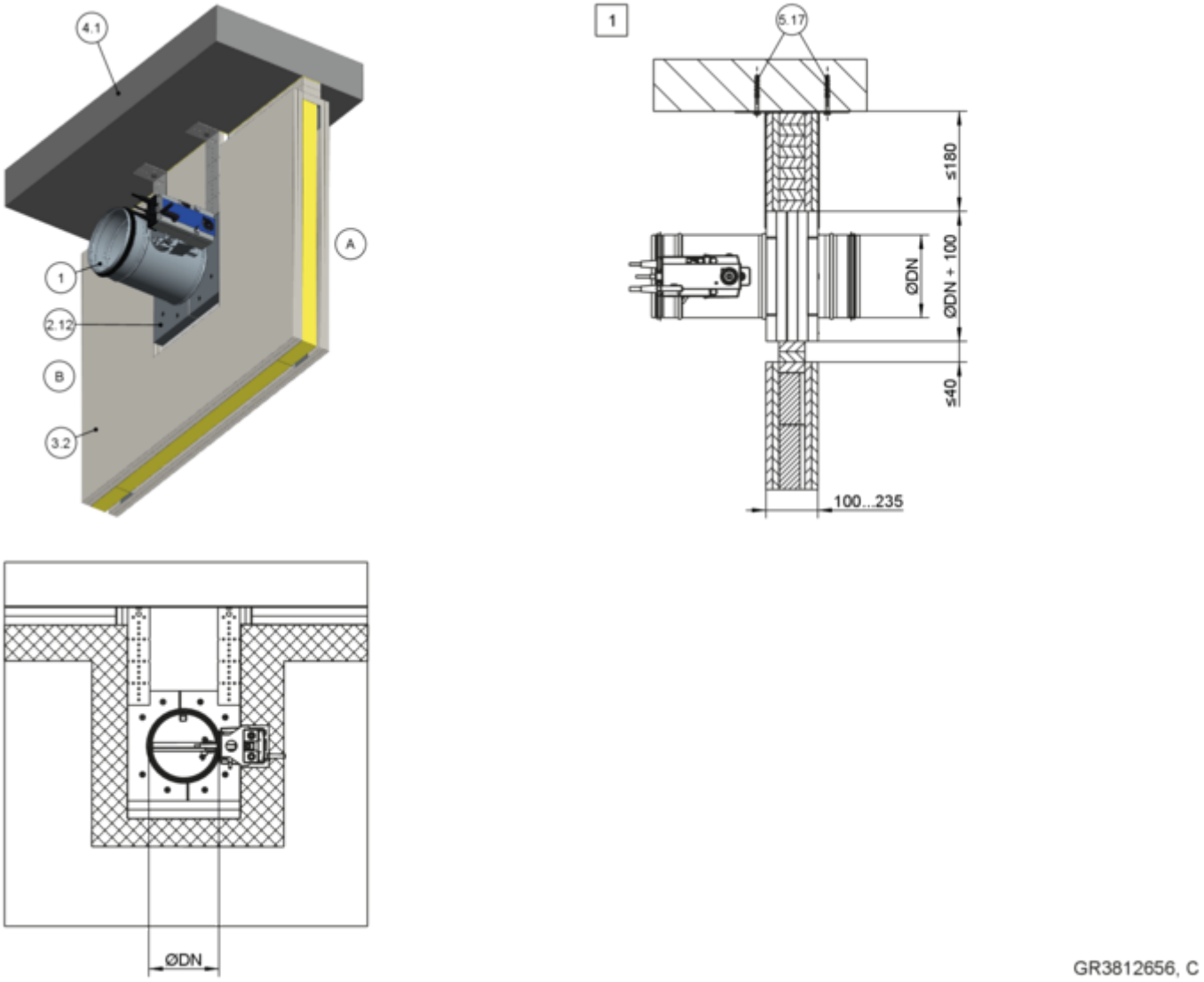


Fig. 91: Dry mortarless installation with installation kit GL2 into lightweight partition or compartment wall

1	FKRS-EU
2.12	Installation kit GL2
3.2	Lightweight partition wall with metal 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
5.17	Anchor bolt Hilti ® HUS-6 ∅ 6 mm × 60 mm or equivalent wall plugs with fire protection suitability certificate, adapted to the particular building material, alternatively push through installation
1	Up to EI 90 S

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

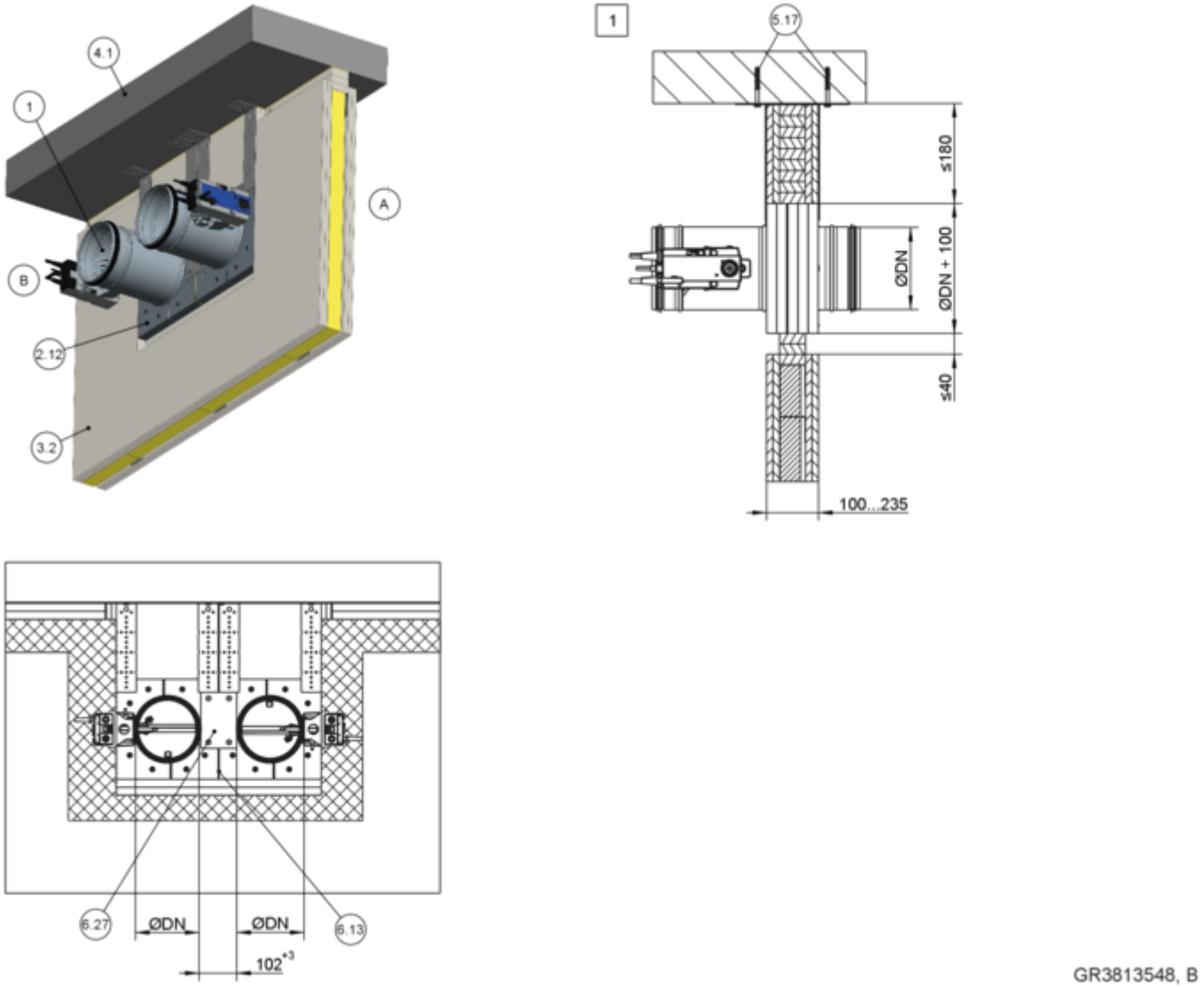
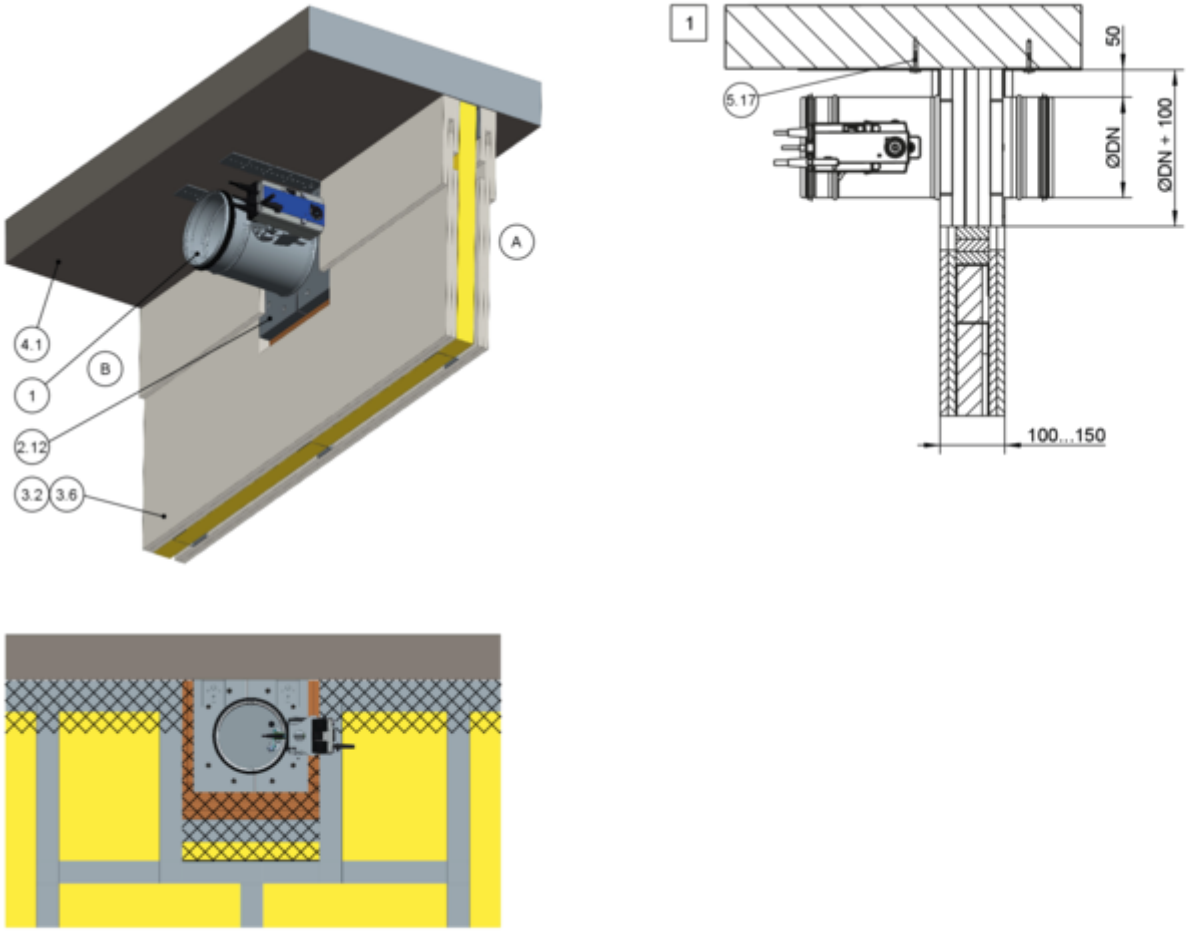


Fig. 92: Dry mortarless installation with installation kit GL2 into lightweight partition or compartment wall

1	FKRS-EU	5.17	Anchor bolt Hilti ® HUS-6 ∅ 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		
3.2	Lightweight partition wall with metal support structure, cladding on both sides		
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	6.13	Mineral wool strips A1, filler as an alternative
		6.27	Z brackets both sides, 90 × 140 × 1.5 mm
4.1	Solid ceiling slab	[1]	Up to EI 90 S

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



GR3892058, C

Fig. 93: 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 ∅ 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		
3.2	Lightweight partition wall with metal support structure, cladding on both sides	7.2	CW section
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	7.22	Ceiling joint section
4.1	Solid ceiling slab	[1]	Up to EI 90 S

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

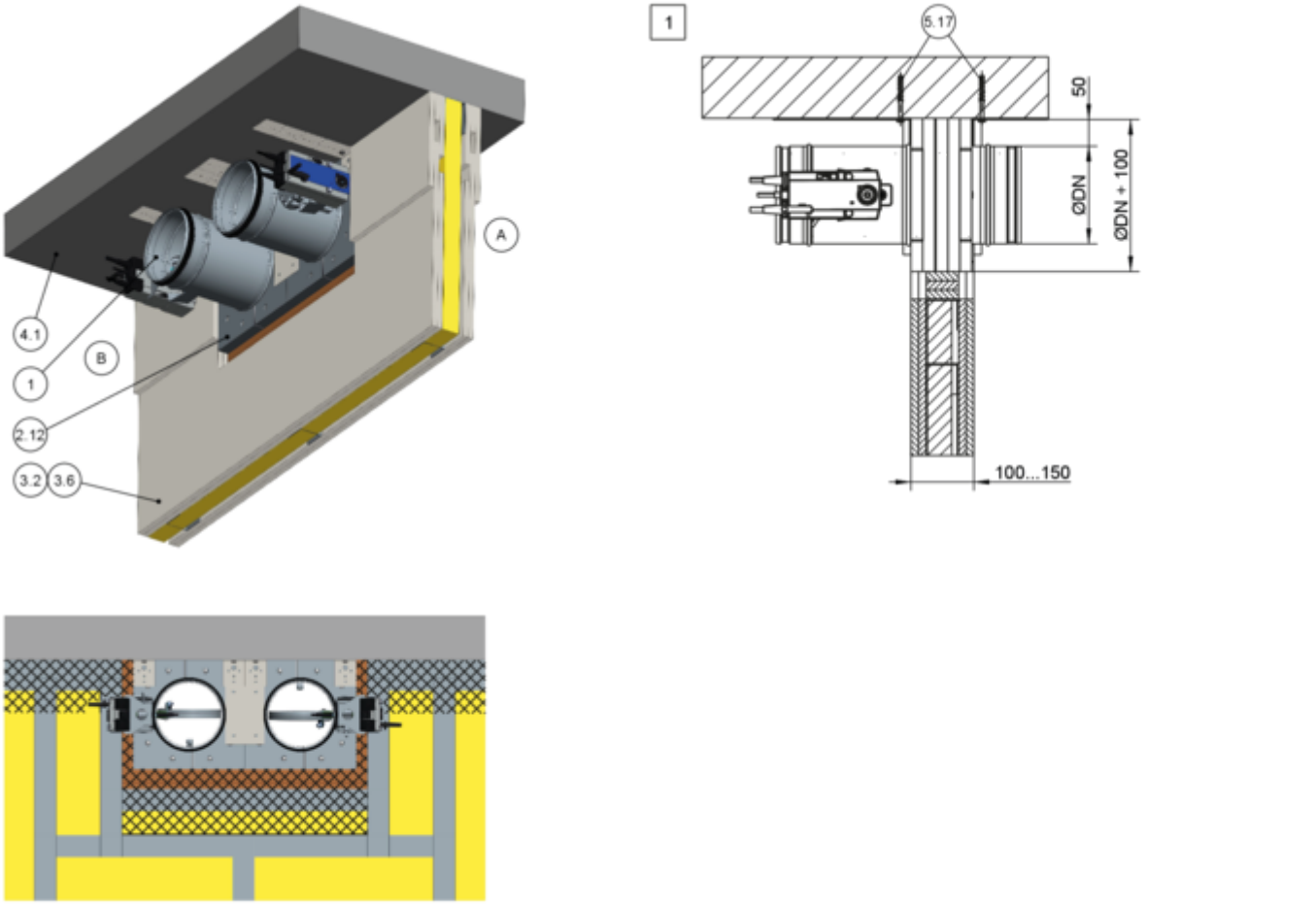


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Fig. 94: Dry mortarless installation in lightweight construction or compartment wall and Knauf ceiling connection with installation kit GL2

1	FKRS-EU	5.17	Anchor bolt Hilti ® HUS-6 ∅ 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		
3.2	Lightweight partition wall with metal support structure, cladding on both sides	7.2	CW section
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	7.22	Ceiling joint section
4.1	Solid ceiling slab	1	Up to EI 90 S

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 41*
- Installation kit GL2, ↳ *5.4.6 'Installation kit GL2' on page 48*
- 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 ≤ 40 mm
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

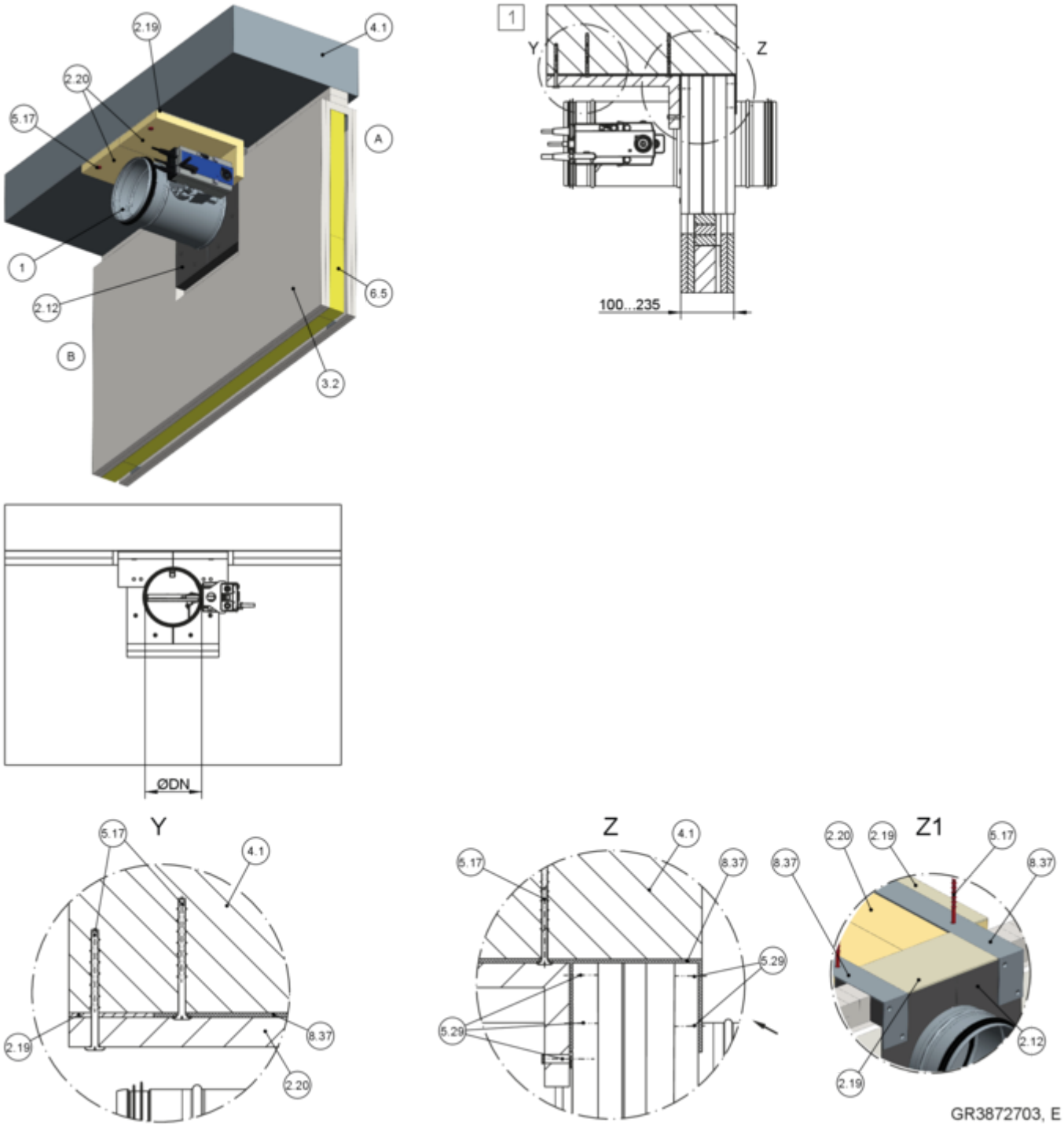

Fig. 95: Dry mortarless installation in lightweight partition wall with installation kit GL2 and steel bracket if there is no rear fixing option

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, cladding on both sides
4.1 Solid ceiling slab
5.17 Anchor bolt Hilti ® HUS-6 ∅ 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 ∅ 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 41*
- Installation kit GL2, ↳ *5.4.6 'Installation kit GL2' on page 48*
- 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 ≤ 40 mm
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

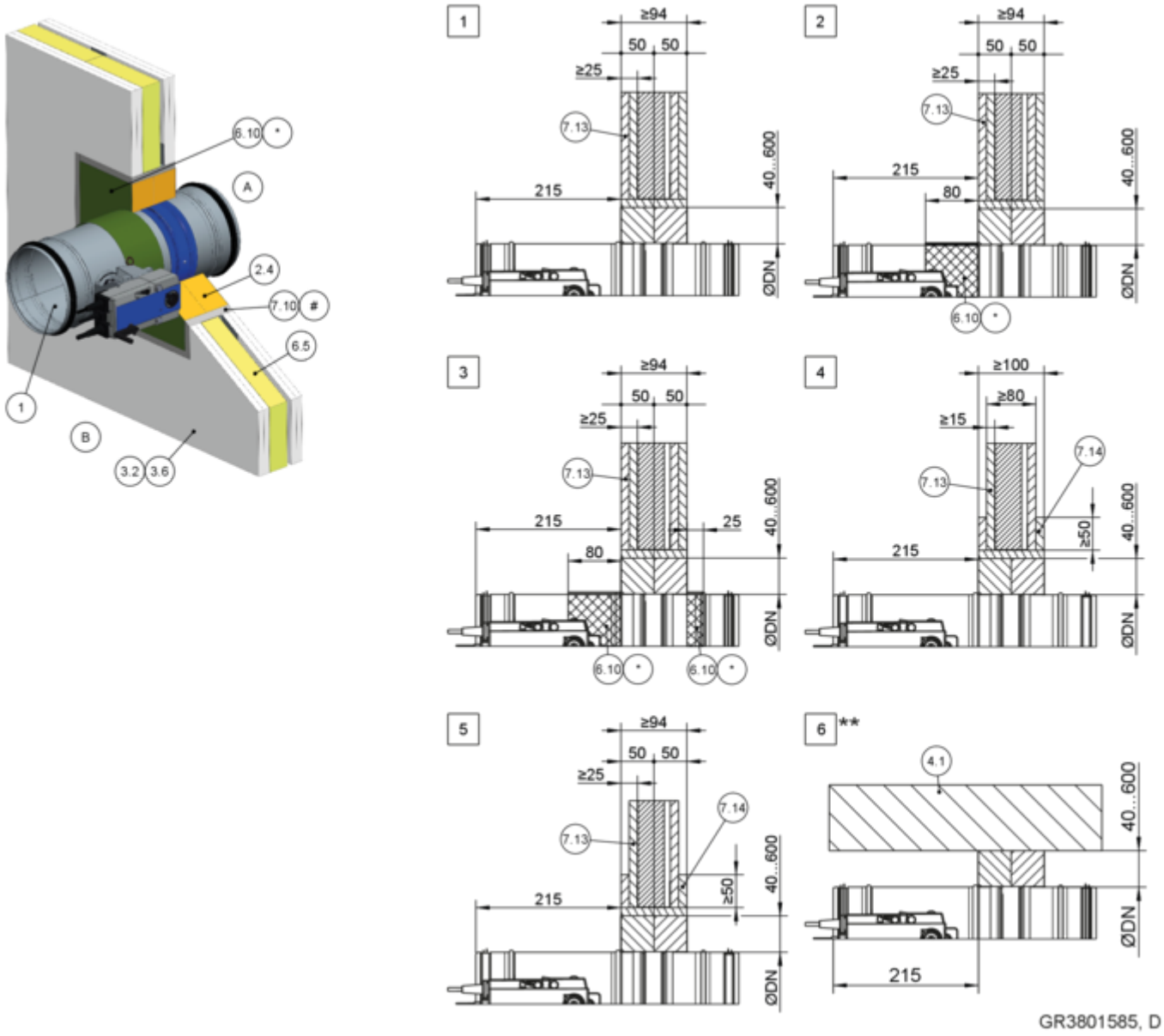

Fig. 96: Dry mortarless installation into a lightweight partition wall, with a fire batt

1	FKRS-EU
2.4	Fire batt with ablative coating
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/solid floor
6.5	Mineral wool (depending on wall construction)
6.10	Ablative coating around the perimeter, d = at least 2.5 mm
6.19	Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm, 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
7.13	Cladding, fire-resistant, also with sheet steel insert
7.14	Reinforcing board of the same material as the wall
#	at W ≤ 100 mm optional, at W > 100 mm double-layered (2 × 12.5 mm)
*	6.19, 6.20 or 6.24 as an alternative
**	Installation near the floor as in 6
1 – 6	See table ↳ *127*

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

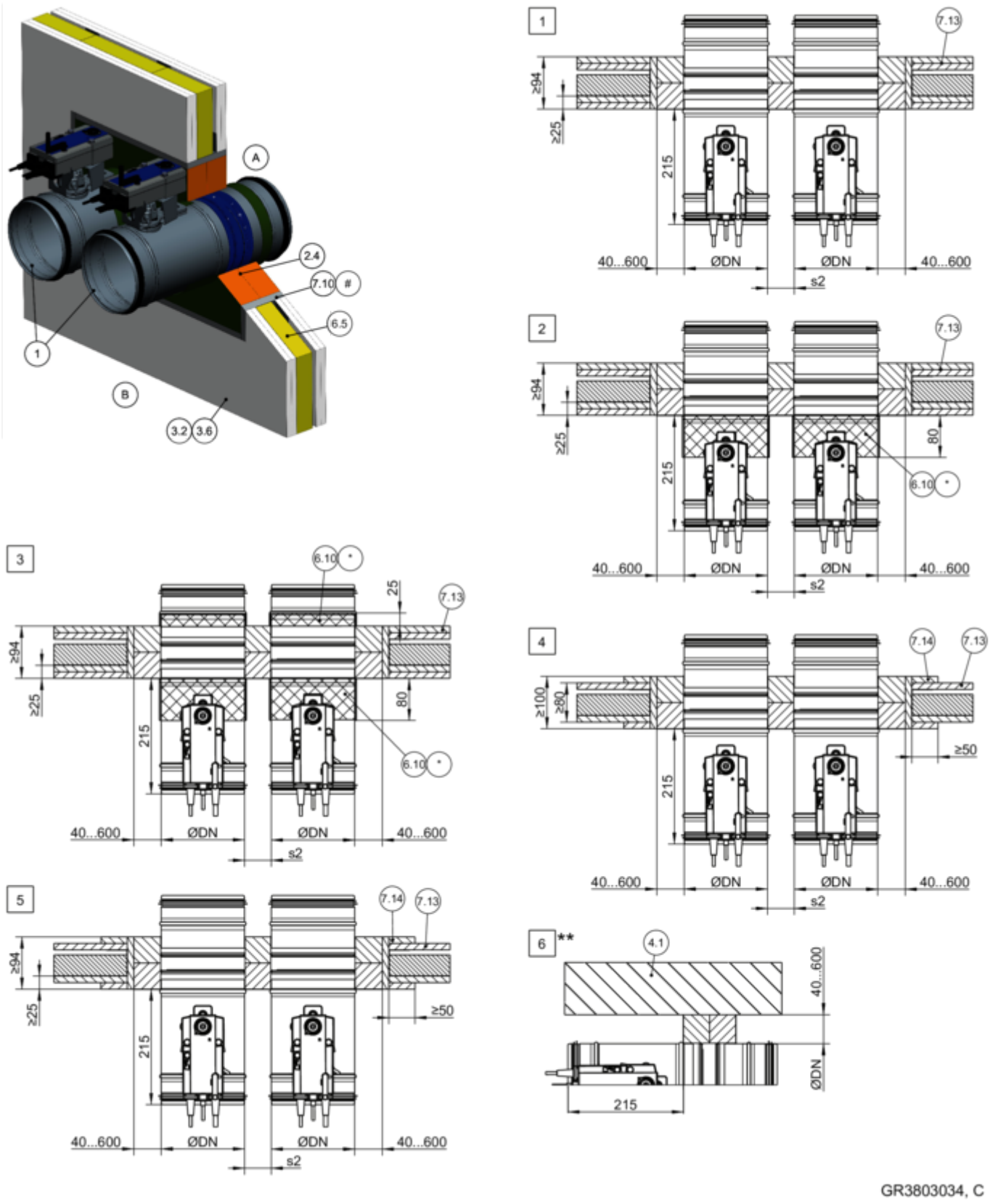

Fig. 97: Dry mortarless installation into a lightweight partition wall, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FKRS-EU	6.24	Elastomeric foam (flame-resistant, non-dripping)
2.4	Fire batt with ablative coating		

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/solid floor
6.5 Mineral wool (depending on wall construction)
6.10 Ablative coating around the perimeter, d = at least 2.5 mm
6.19 Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm, leave out the actuator and release mechanism; inspection openings must remain accessible
6.20 Sleeve (to be ordered separately)

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
7.13 Cladding, fire-resistant, also with sheet steel insert
7.14 Reinforcing board of the same material as the wall
\# at W ≤ 100 mm optional, at W > 100 mm double-layered (2 × 12.5 mm)
* 6.19, 6.20 or 6.24 as an alternative
** Installation near the floor as in 6
1 – 6 See table ↳ *129*

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

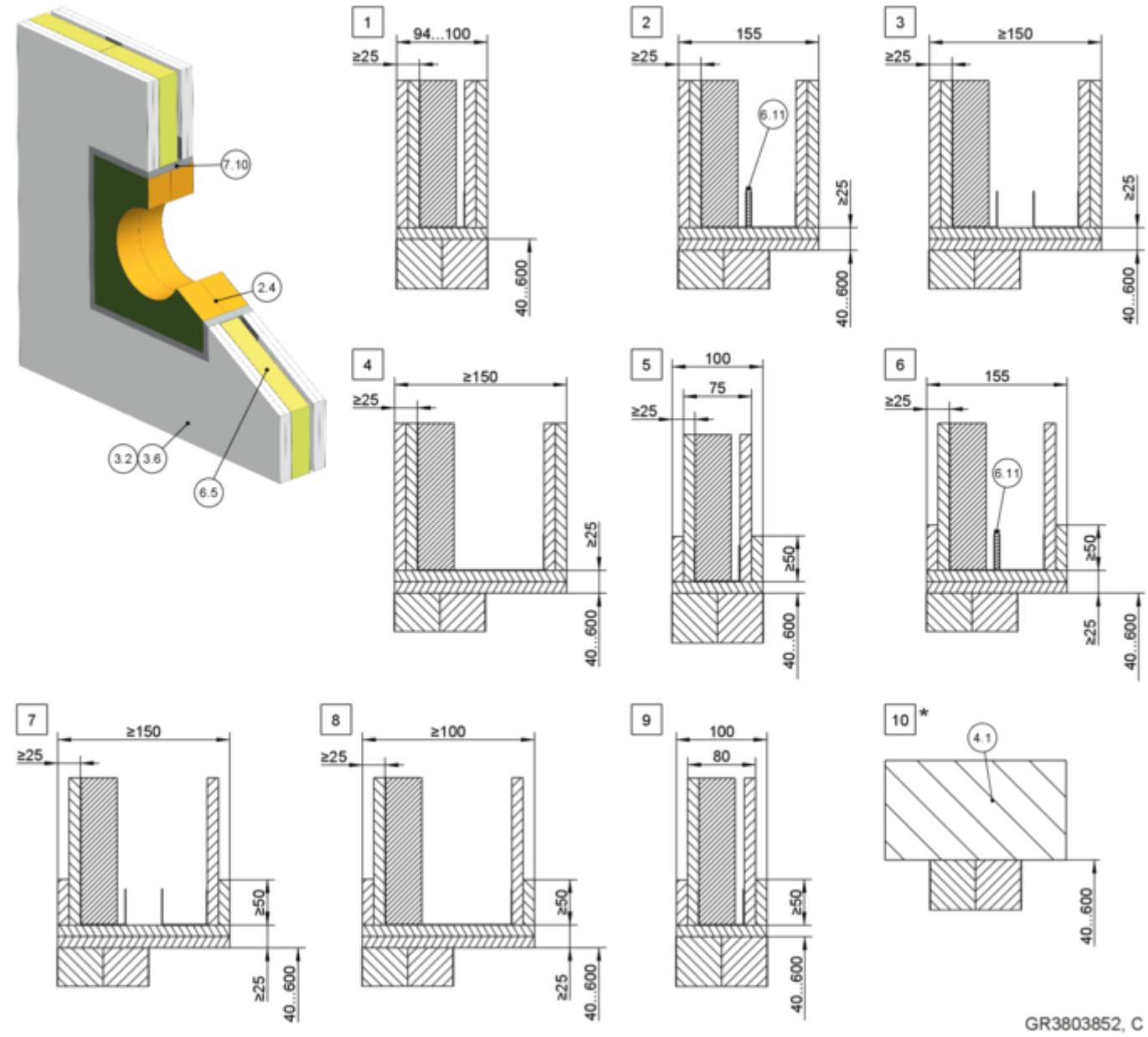

Fig. 98: Dry mortarless installation into a lightweight partition wall, with a fire batt, approved combinations for thicker walls

2.4	Fire batt with ablative coating
3.2	Lightweight partition wall 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/solid floor
6.5	Mineral wool (depending on wall construction)
6.11	Insulating strip
7.10	Trim panels (optional with W ≤ 100 mm, from W > 100 mm double-layered and required)
*	Installation near the floor as in 10
1 – 4	F 120
5 – 8	F 30
9	F 60
10	F 30 – F 120

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

- Lightweight partition wall or compartment wall, ↳ *on page 41*
- Fire batt systems, installation details, distances/dimensions, ↳ *on page 36* f
- Suspension and fixing, ↳ *Chapter 5.14 'Fixing the fire damper' on page 235*
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

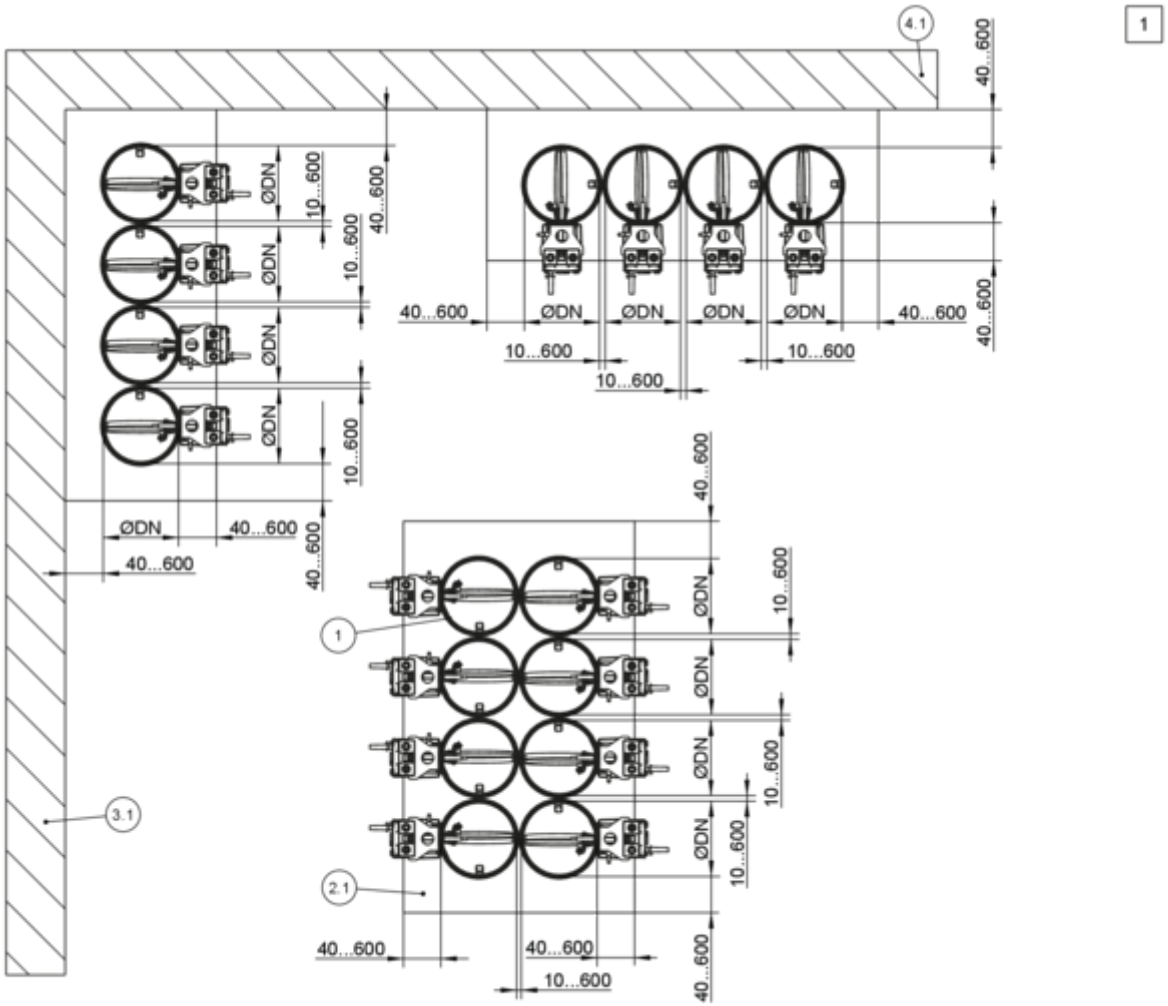

Fig. 99: Dry mortarless installation with fire batt in lightweight partition wall - Multiple occupancy of an installation opening

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

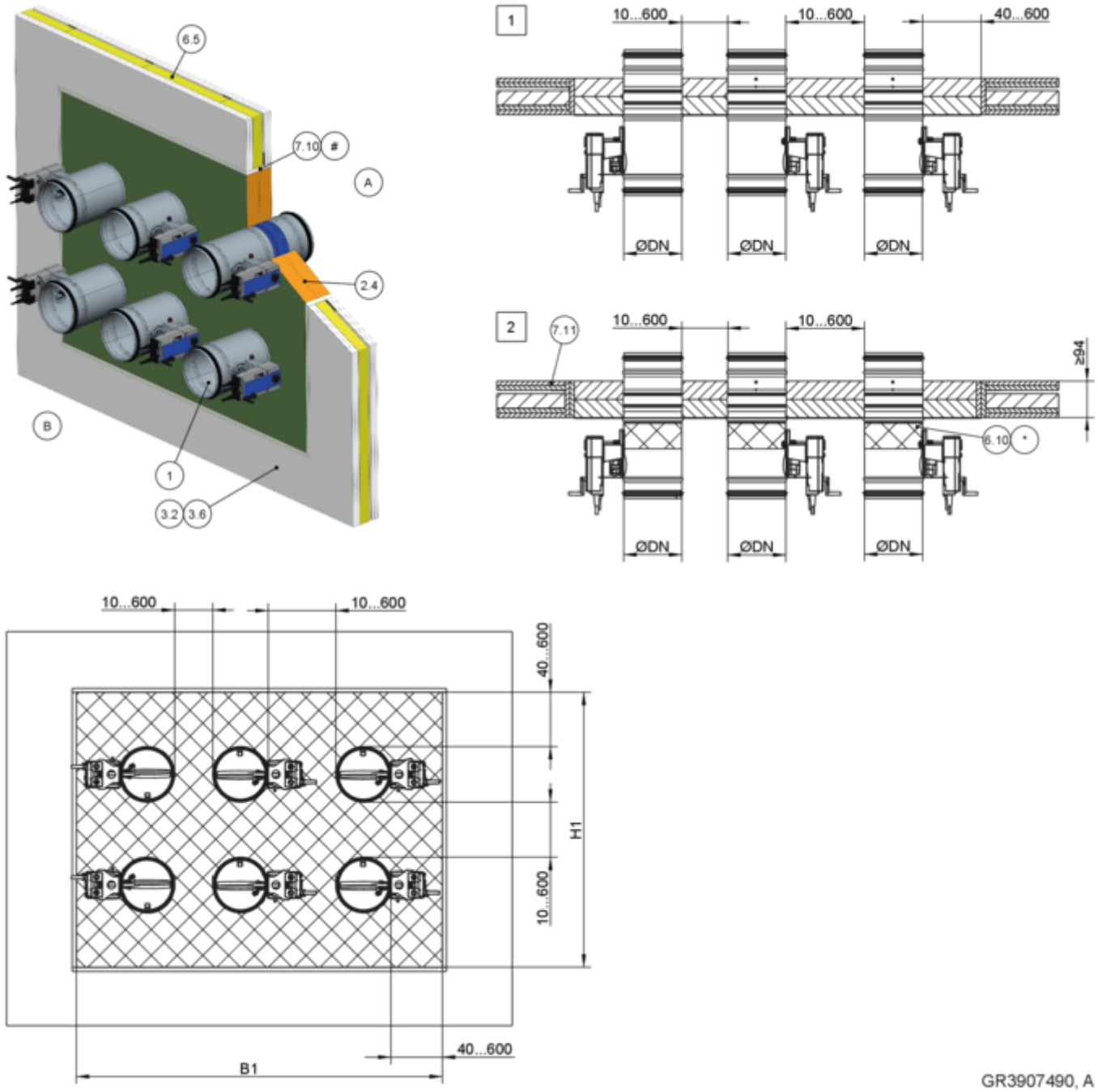

Fig. 100: Dry mortarless installation with fire batt in lightweight partition wall - Multiple occupancy of an installation opening

1	FKRS-EU
2.4	Fire batt with ablative coating
3.2	Lightweight partition wall with metal support structure, cladding on both sides
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides
6.5	Mineral wool (depending on wall construction)
6.10	Ablative coating around the perimeter, d = at least 2.5 mm
6.19	Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm, 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
#	at W ≤ 100 mm optional, at W > 100 mm double-layered (2 × 12.5 mm)
*	6.19, 6.20 or 6.24 as an alternative
1 2	See table ↳ *Table on page 134*

Lightweight partition 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 lightweight partition walls - Multiple occupancy of an installation opening

- Lightweight partition wall or compartment wall, ↬ *on page 41*
- Fire batt systems, installation details, distances/dimensions, ↬ *on page 36* f
- Suspension and fixing, ↬ *Chapter 5.14 'Fixing the fire damper' on page 235*
- General installation information, ↬ *5.3 'General installation information' on page 28* 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

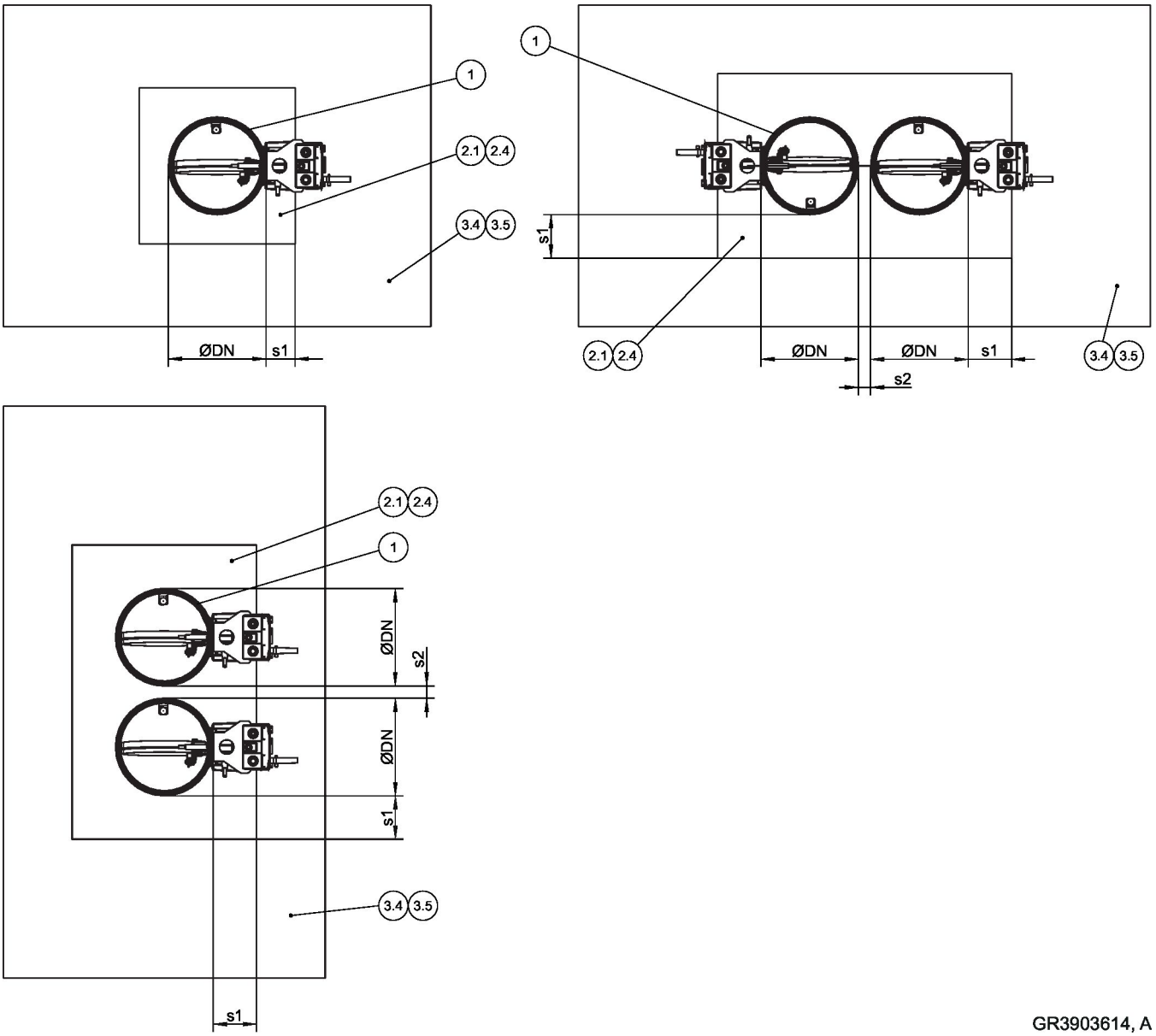

Fig. 101: Lightweight partition walls with timber frame/ half-timbered construction - arrangement/spacing

1 FKRS-EU
2.1 Mortar
2.4 Fire batt with ablative coating
3.4 Timber stud wall, cladding on both sides
3.5 Half-timbered construction, cladding on both sides
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	∅nominal width + max. 450	≤ 225	10/40 [2] – 225
Dry mortarless installation with TQ2	□A = ∅nominal width + 110 [3]	central installation	≥ 200
Dry mortarless installation with fire batt [1]	□A = ∅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

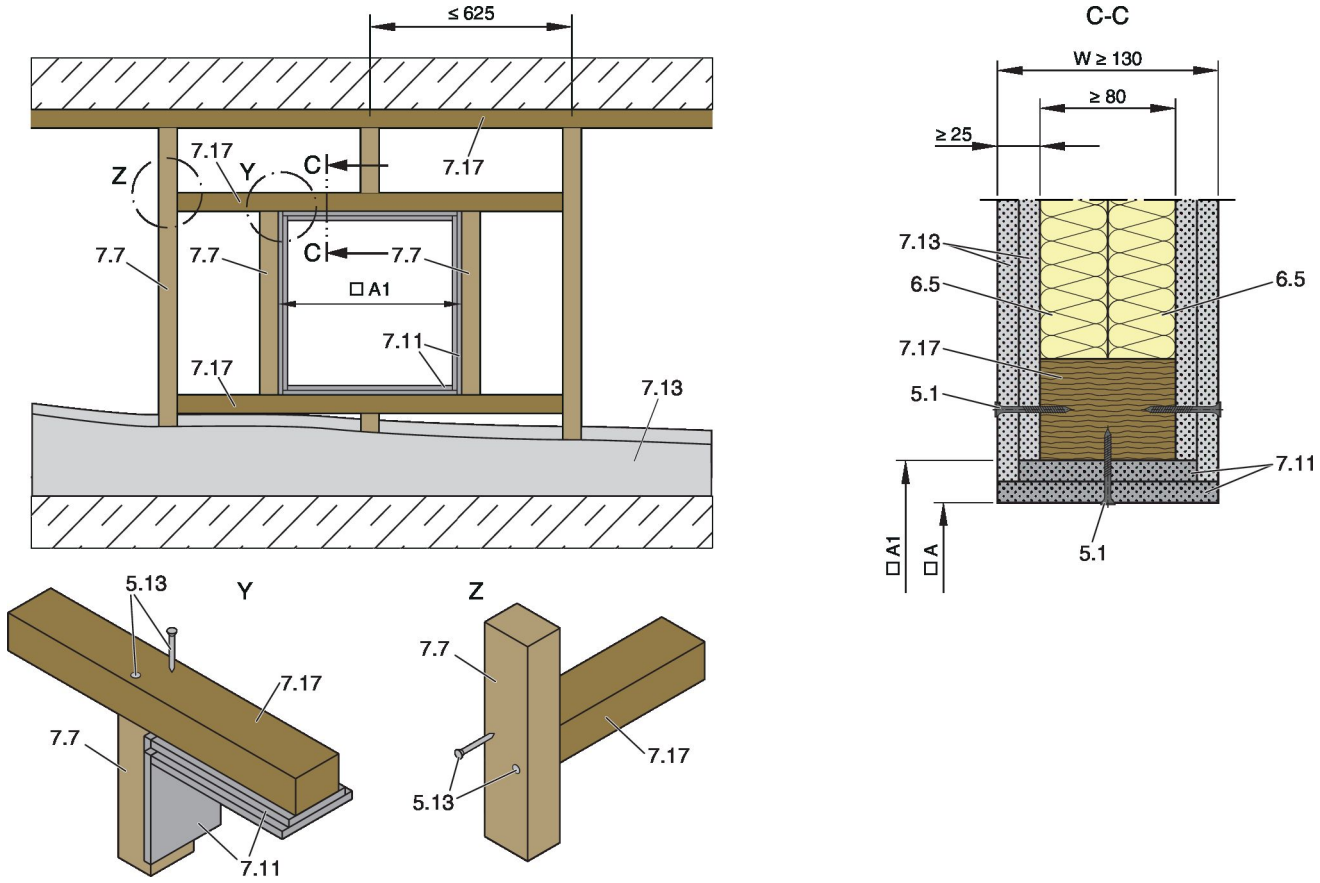

Fig. 102: Lightweight partition wall with timber support structure and cladding on both sides

5.1	Dry wall screw	7.13	Cladding
5.13	Wood screw or pin	7.17	Trimmers, timber stud/nogging 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, □A1 = □A + (4 × trim panels)
7.11	Trim panels, double layer, staggered joints		

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

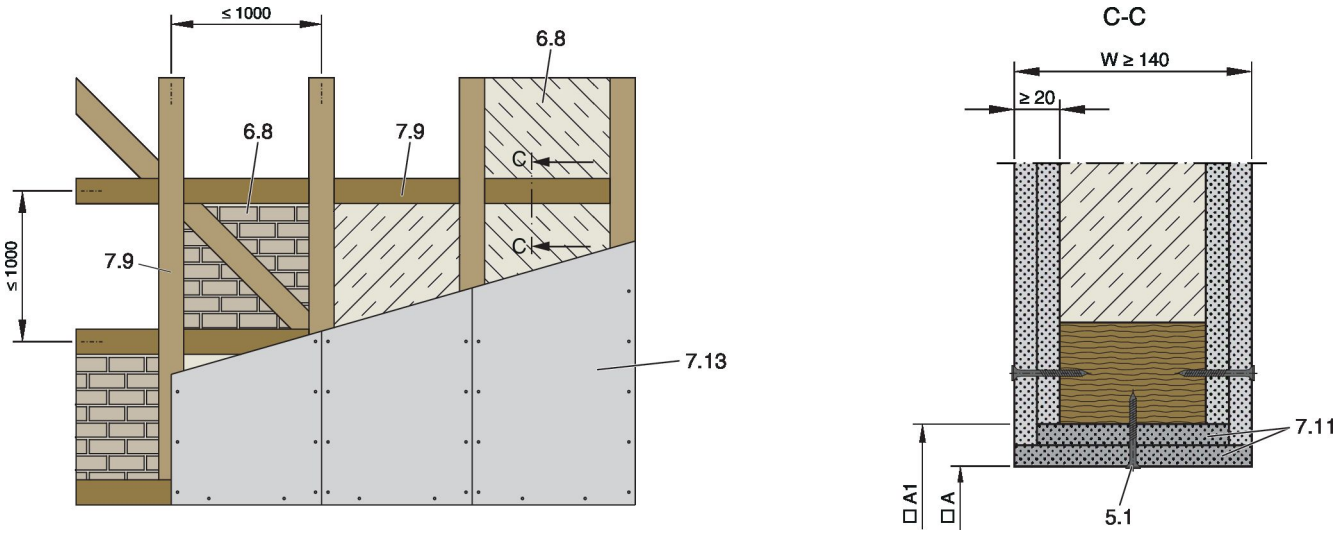

Fig. 103: Lightweight partition wall, half-timbered construction with cladding on both sides

5.1 Dry wall screw
6.8 Infill*
7.9 Half-timbered construction
7.11 Trim panels, double layer, staggered joints
7.13 Cladding
* Cavities completely filled with mineral wool ≥ 50 kg/m³, bricks, aerated concrete, lightweight concrete, reinforced concrete or clay
□A Clear installation opening
□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

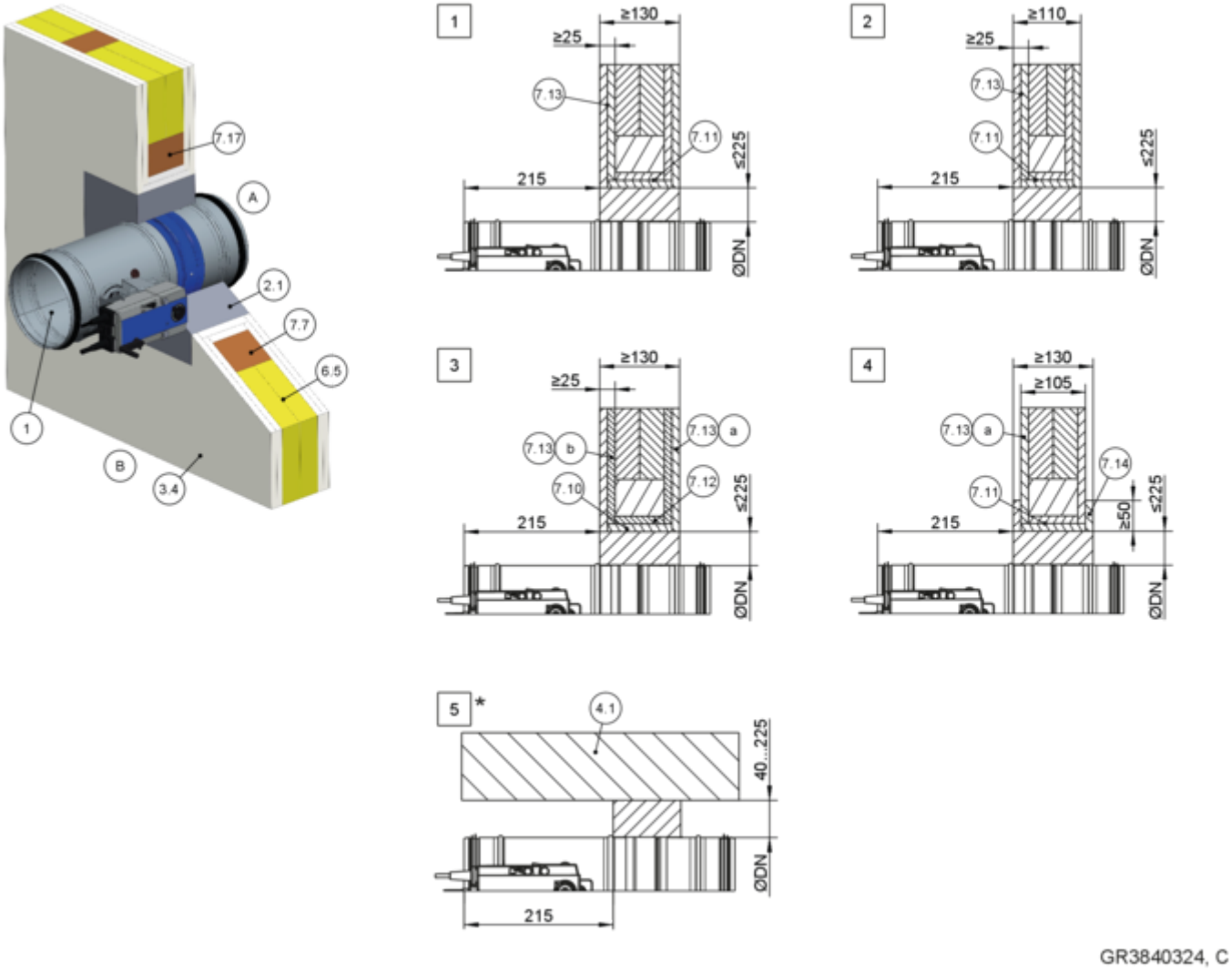

Fig. 104: Mortar-based installation into a lightweight partition wall with timber support structure

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

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

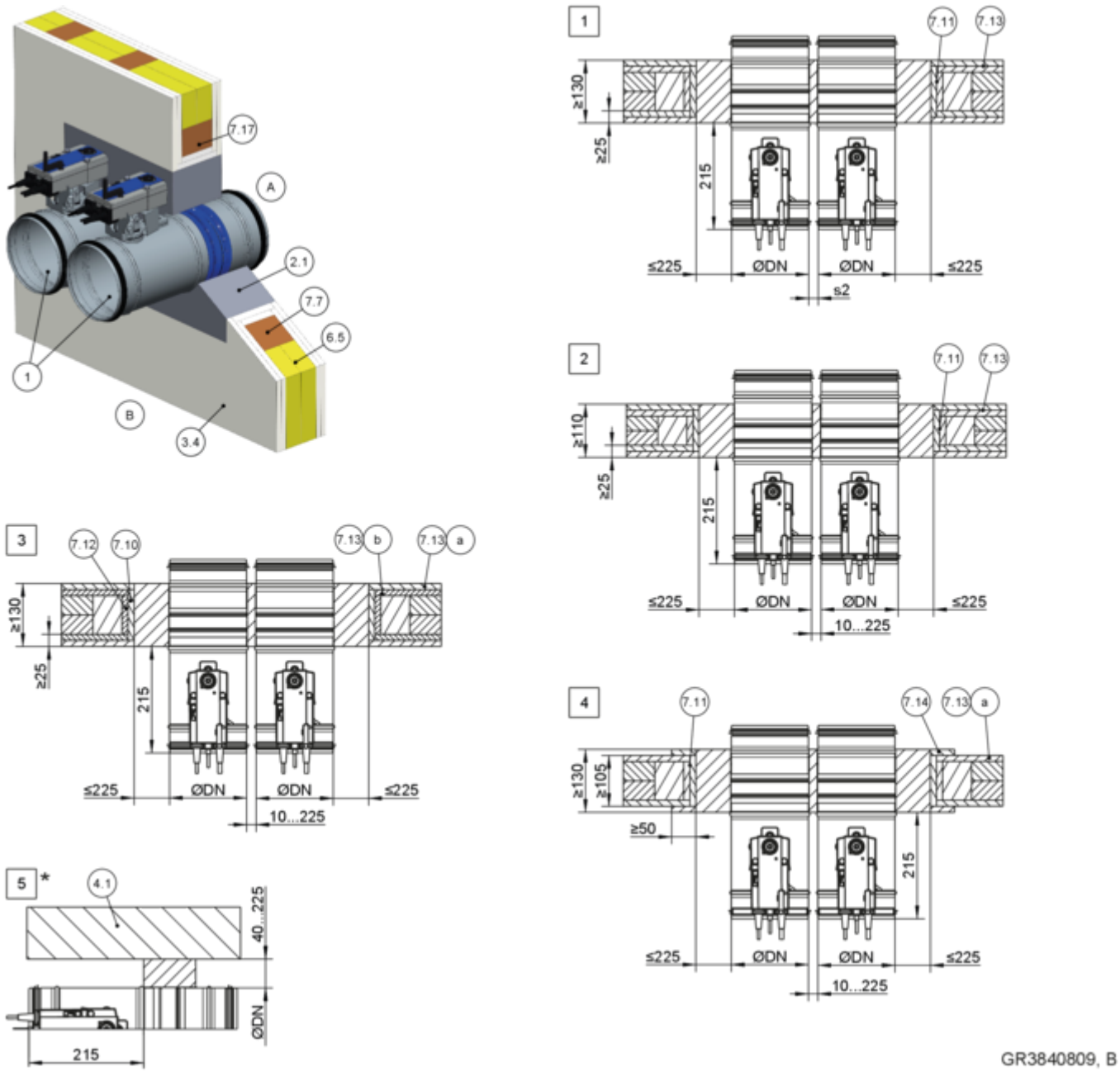

Fig. 105: Mortar-based installation into a lightweight partition wall with timber support structure, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

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

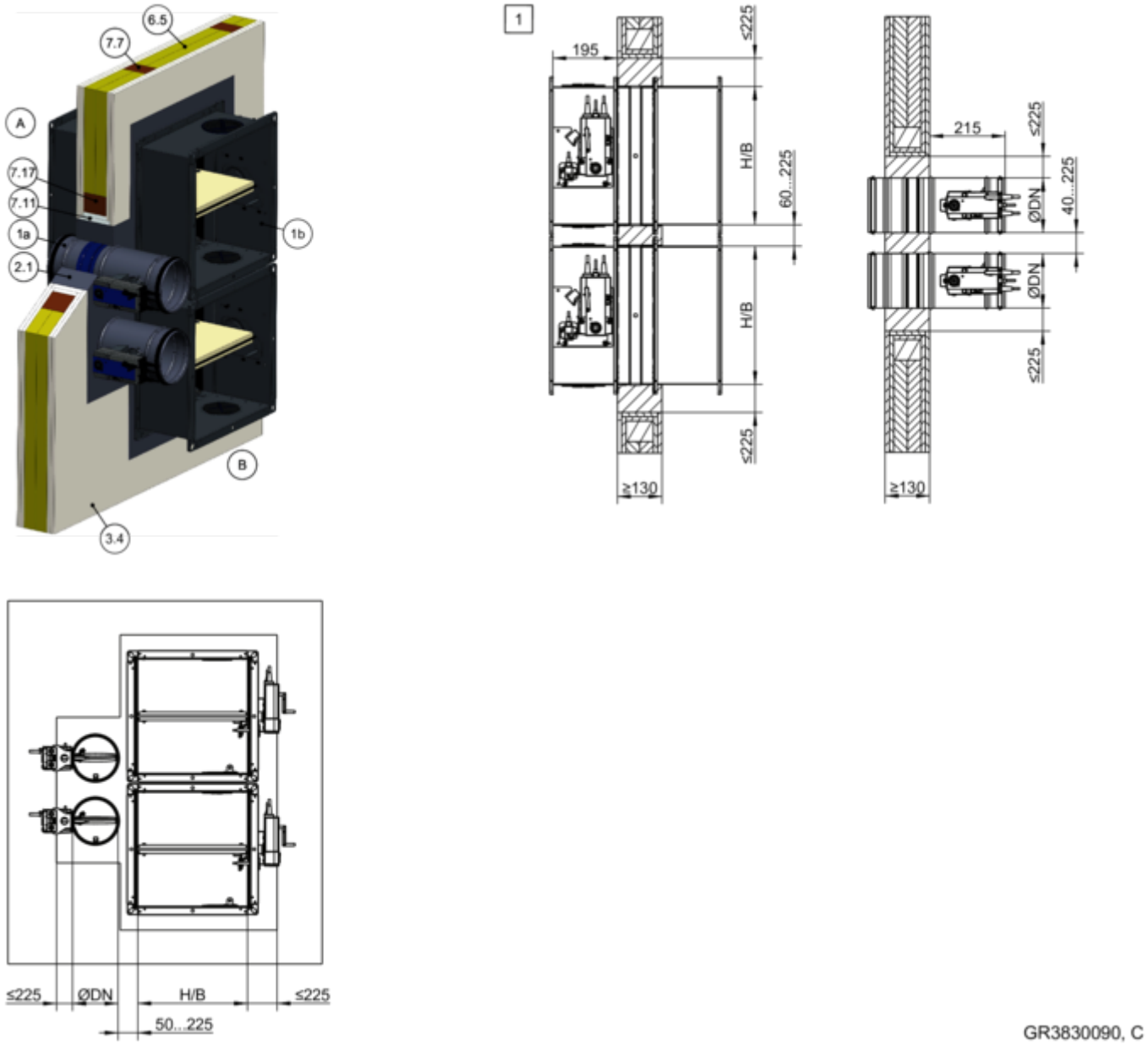

Fig. 106: Mortar-based installation into a lightweight partition wall with timber support structure, FKRS-EU and FK2-EU, combined

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 m^2 .
- The number of fire dampers in an installation opening is limited by their size (B × H for FK2-EU and/or ∅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

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

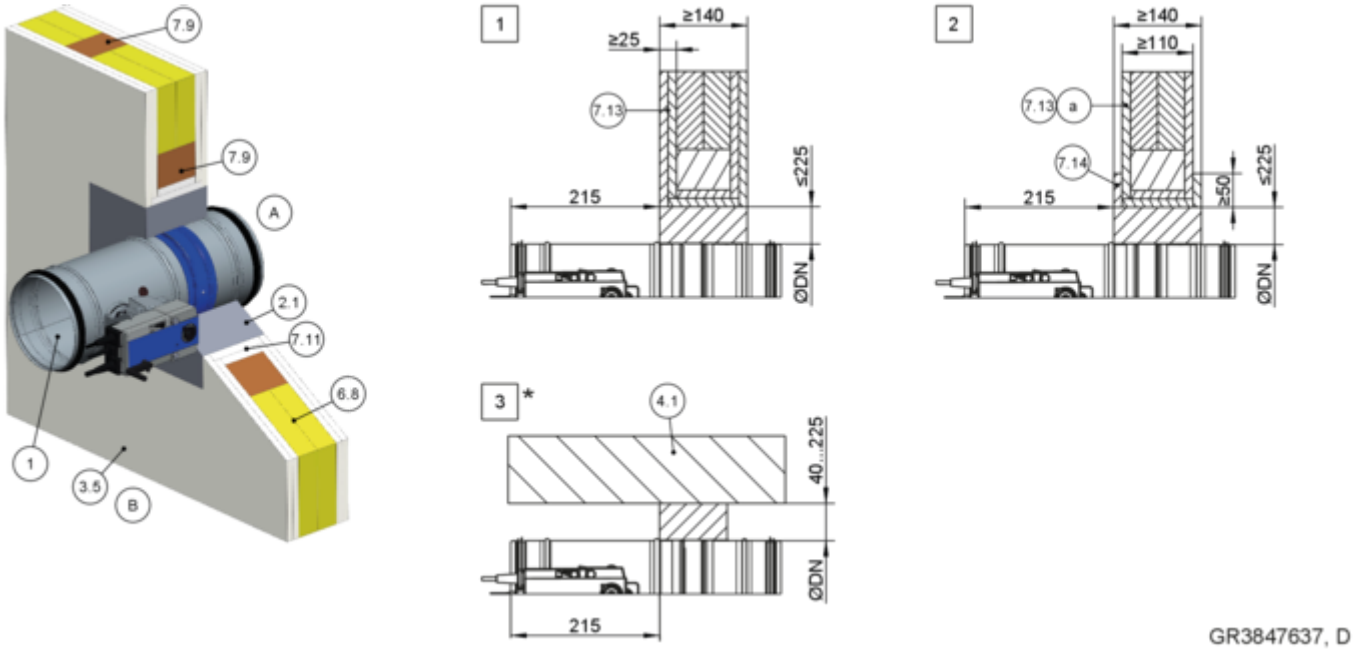

Fig. 107: Mortar-based installation into a lightweight partition wall, half-timbered construction

1	FKRS-EU
2.1	Mortar
3.5	Half-timbered construction, cladding on both sides
4.1	Solid ceiling slab/solid floor
6.8	Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
7.9	Half-timbered construction
7.11	Trim panels, fire-resistant, double layer, staggered joints
7.13	Cladding
7.13a	Cladding, fire-resistant
7.14	Reinforcing board of the same material as the wall
*	Installation near the floor as in 3
1	Up to EI 120 S
2	EI 30 S
3	EI 30 to EI 120 S

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

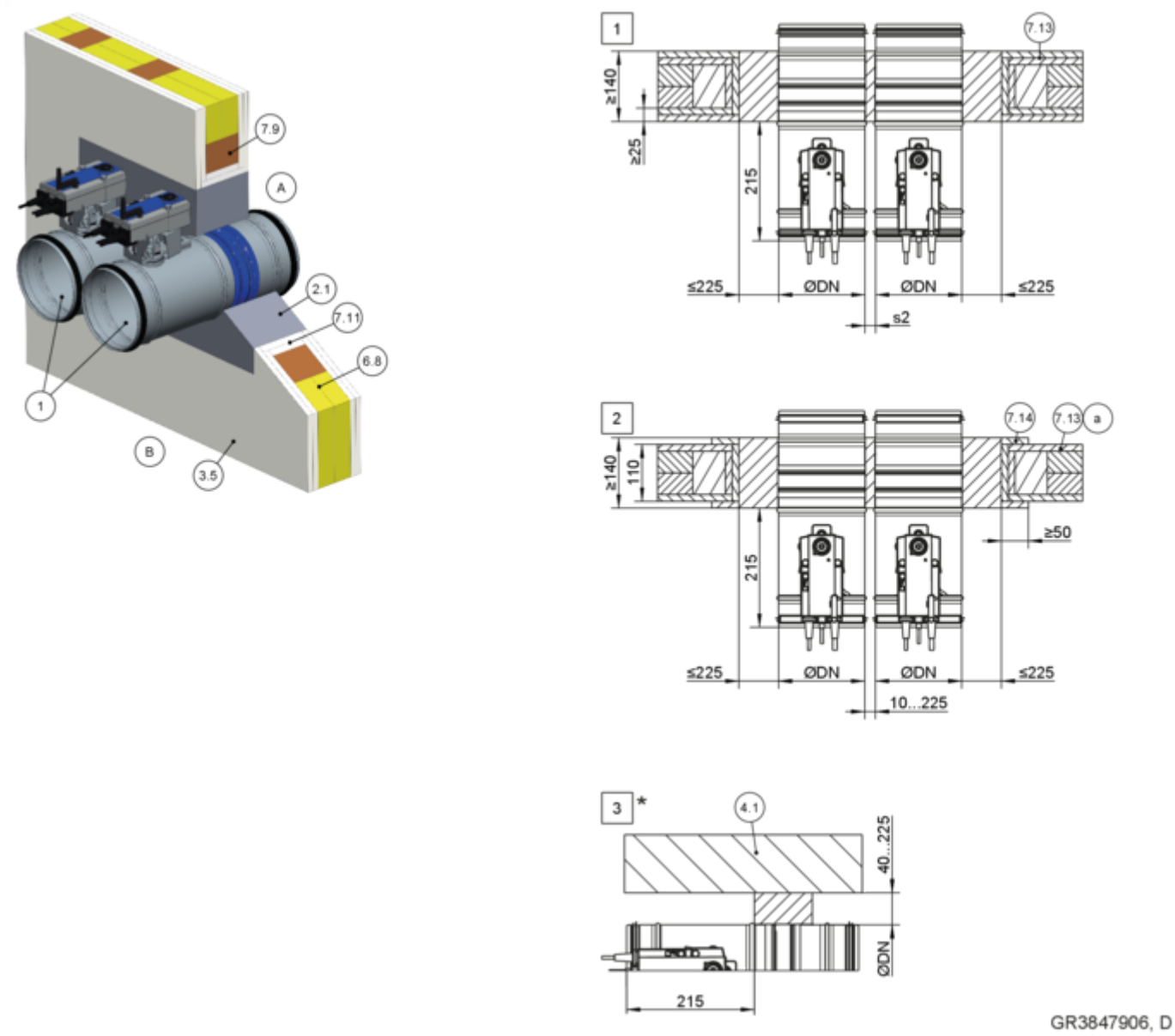

Fig. 108: Mortar-based installation into a lightweight partition wall, half-timbered construction, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FKRS-EU
2.1	Mortar
3.5	Half-timbered construction, cladding on both sides
4.1	Solid ceiling slab/solid floor
6.8	Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
7.9	Half-timbered construction
7.11	Trim panels, fire-resistant, double layer, staggered joints
7.13	Cladding
7.13a	Cladding, fire-resistant
7.14	Reinforcing board of the same material as the wall
*	Installation near the floor as in 3
1	Up to EI 120 S for s2 = 40 – 225 mm Up to EI 90 S for s2 = 10 – 225 mm
2	EI 30 S
3	EI 30 to EI 120 S

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

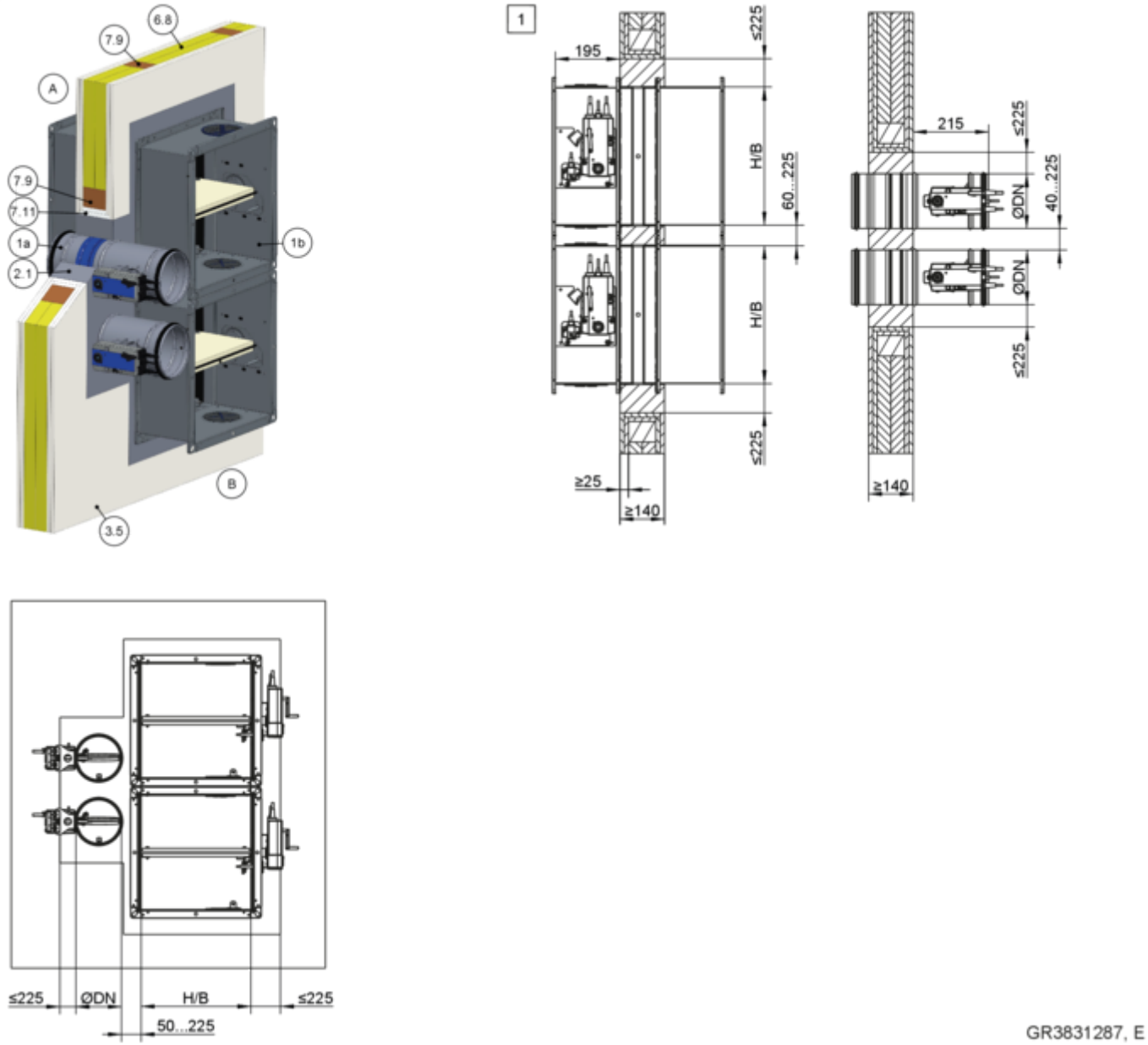

Fig. 109: Mortar-based installation into a lightweight partition wall with half-timbered construction, FKRS-EU and FK2-EU, combined

1a FKRS-EU
1b FK2-EU up to B × H ≤ 800 × 400 mm
2.1 Mortar
3.5 Half-timbered construction, cladding on both sides
6.8 Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
7.9 Half-timbered construction
7.11 Trim panels, double layer, staggered joints
1 Up to EI 90 S

For combined installation please note:

- Overall fire damper area ≤ 1.2 m^2 .
- The number of fire dampers in an installation opening is limited by their size (B × H for FK2-EU and/or ∅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 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 28* ff
- General information on mortar-based installation, ↬ *'**Mortar-based installation**' on page 34*

5.7.3 Dry mortarless installation with installation kit TQ2

Lightweight partition wall with timber support structure

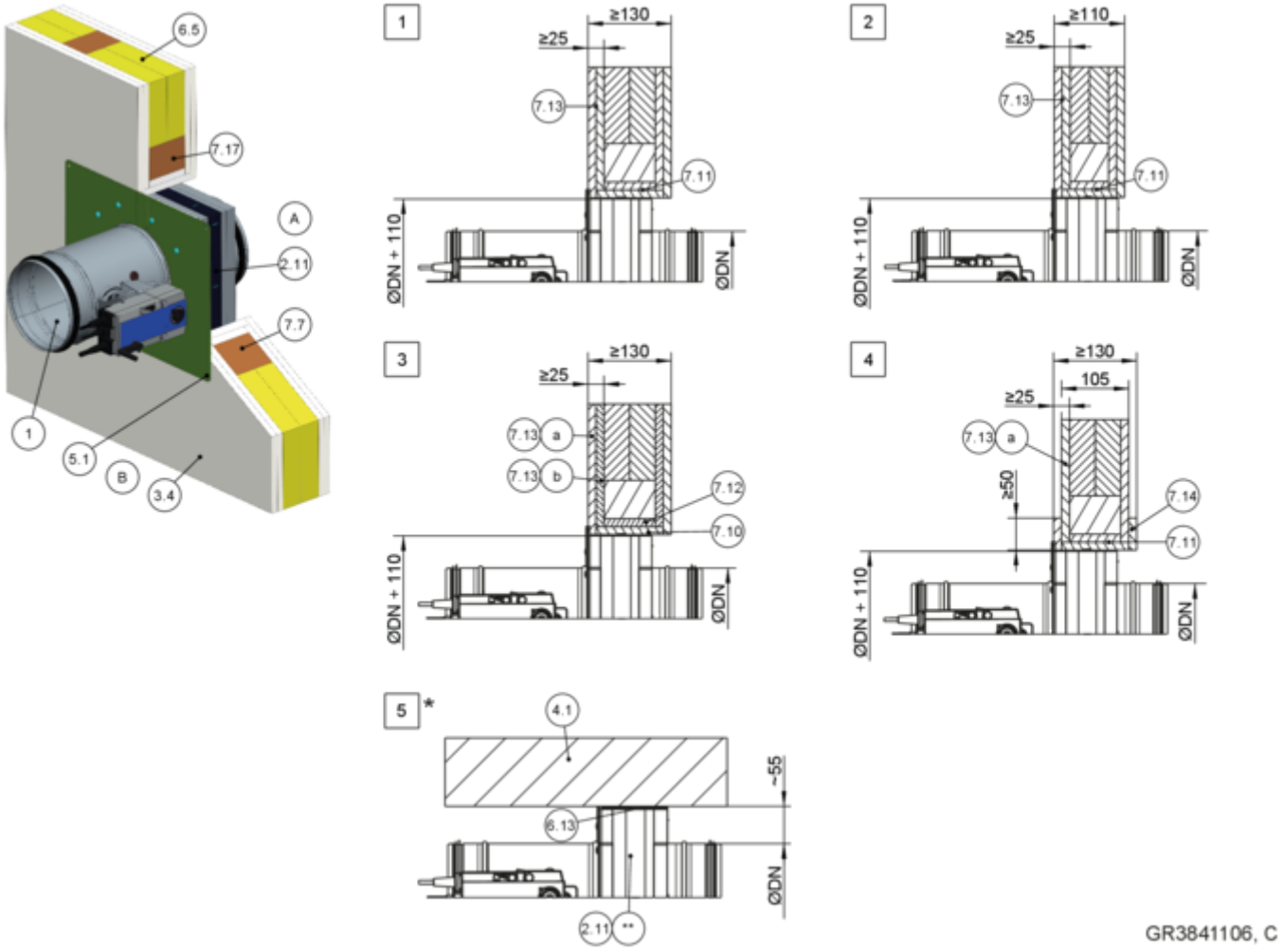

Fig. 110: Dry mortarless installation into a lightweight partition wall with timber support structure, with installation kit TQ2

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

Lightweight partition wall with half-timbered construction

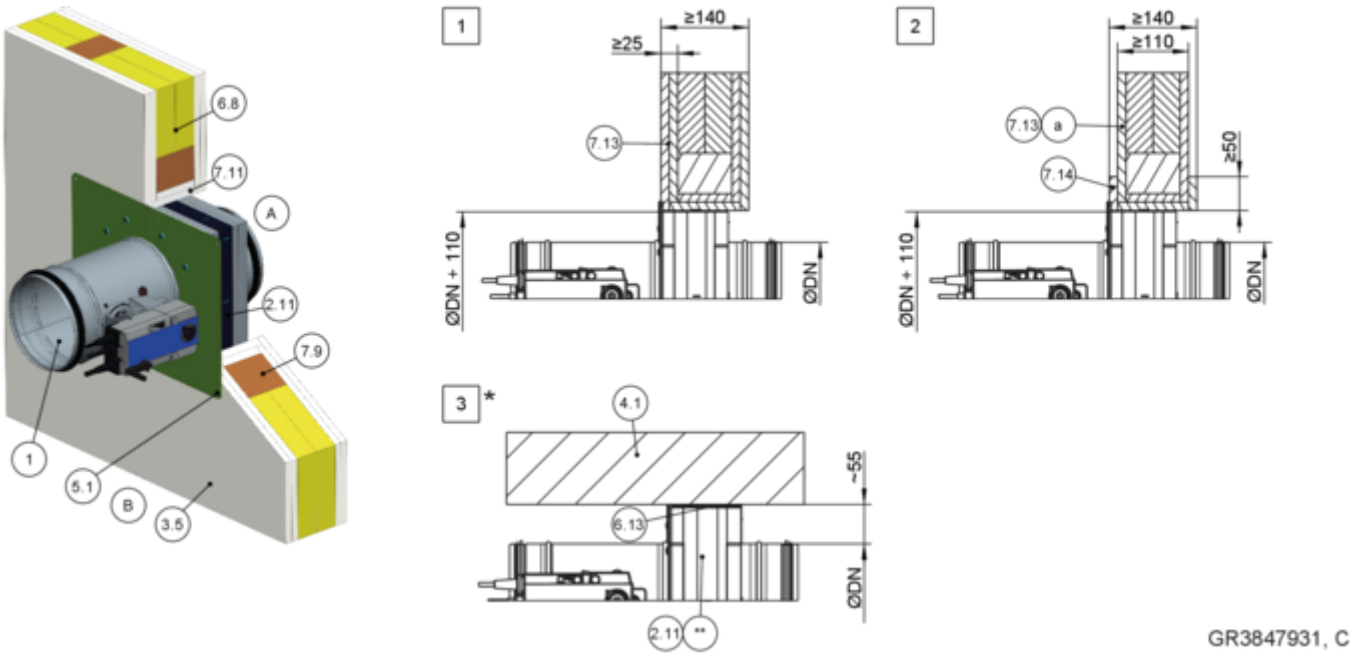

Fig. 111: Dry mortarless installation into a lightweight partition wall, half-timbered construction, using installation kit TQ2

1	FKRS-EU
2.11	Installation kit TQ2 with cover plate
3.5	Half-timbered construction, cladding on both sides
4.1	Solid ceiling slab/solid floor
5.1	Dry wall screw/wood screw, min. 10 mm screwed into the wooden framework
6.8	Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
6.13	Mineral wool strips A1, alternatively gypsum mortar
7.9	Half-timbered construction
7.11	Trim panels, fire-resistant, double layer, staggered joints
7.13	Cladding
7.13a	Cladding, fire-resistant
7.14	Reinforcing board of the same material as the wall
*	Installation near the floor as in 3
**	Cover plate shortened by others
1	Up to EI 120 S
2	EI 30 S
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 45*
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↯ *5.3 'General installation information' on page 28* ff
- General information on installation with installation kit TQ2, ↯ *on page 35*

5.7.4 Installation remote from lightweight partition walls with mineral wool

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

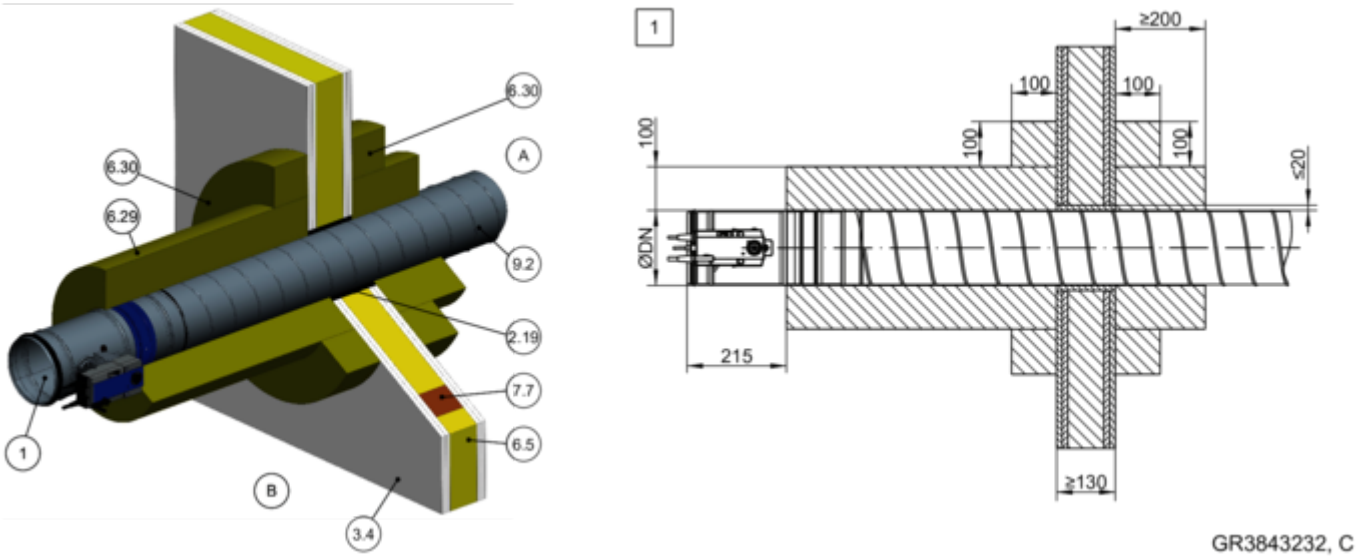

Fig. 112: Installation remote from timber stud walls with mineral wool and joint filler

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

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

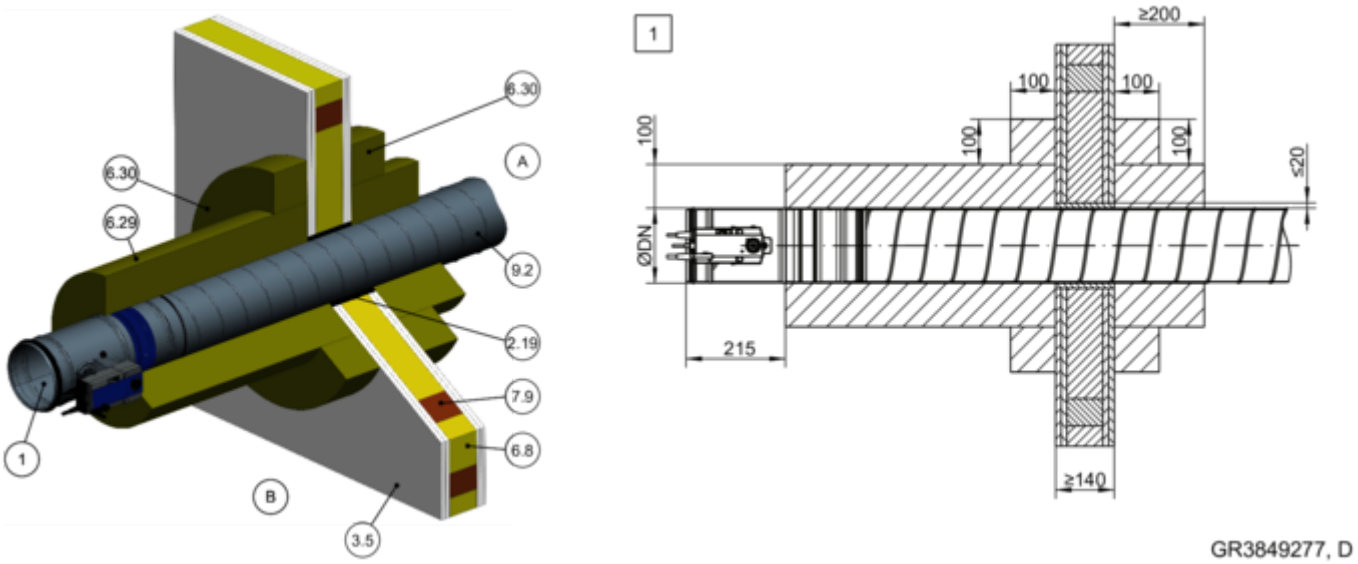

Fig. 113: Installation remote from timber frame walls with mineral wool and joint filler

1	FKRS-EU
2.19	Joint filler
3.5	Half-timbered construction, cladding on both sides
6.8	Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
6.29	Mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³)
6.30	Reinforcing board mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³), glued all round
7.9	Half-timbered construction
9.2	Sheet steel duct
1	Up to EI 60 S

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

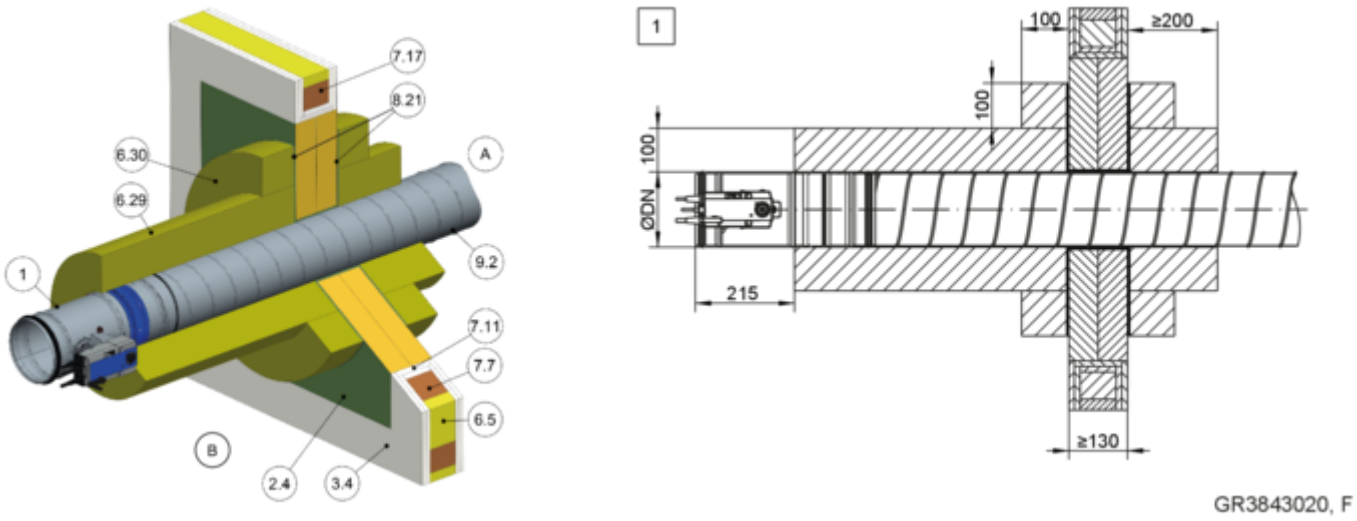

Fig. 114: Dry mortarless installation remote from timber stud walls with mineral wool and fire batt

1	FKRS-EU
2.4	Fire batt, PAROC Pyrotech Slab 140 (max. W × H = 2.1 × 2.5 m)
3.4	Timber stud wall, cladding on both sides
6.5	Mineral wool (depending on wall construction)
6.29	Mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³)
6.30	Reinforcing board mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³), glued all round
7.7	Timber stud, min. 60 × 80 mm
7.11	Trim panels, fire-resistant, double layer, staggered joints
7.17	Trimmer, wooden beam min. 60 x 80 mm
8.21	Acrylic or sealing compound (suitable for fire batt system)
9.2	Sheet steel duct
1	Up to EI 60 S

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

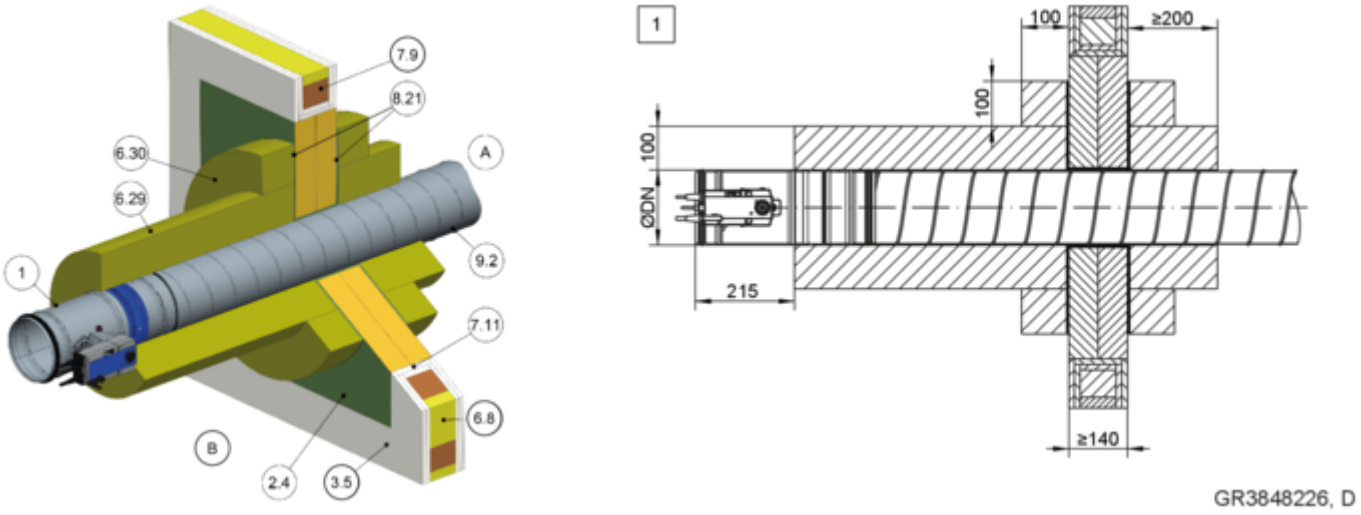

Fig. 115: Dry mortarless installation remote from timber frame walls with mineral wool and fire batt

1 FKRS-EU
2.4 Fire batt, PAROC Pyrotech Slab 140 (max. W × H = 2.1 × 2.5 m)
3.5 Half-timbered construction, cladding on both sides
6.8 Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
6.29 Mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³)
6.30 Reinforcing board mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³), glued all round
7.11 Trim panels, fire-resistant, double layer, staggered joints
8.21 Acrylic or sealing compound (suitable for fire batt system)
9.2 Sheet steel duct
[1] Up to EI 60 S

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 28* 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

5.7.5 Dry mortarless installation with fire batt

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

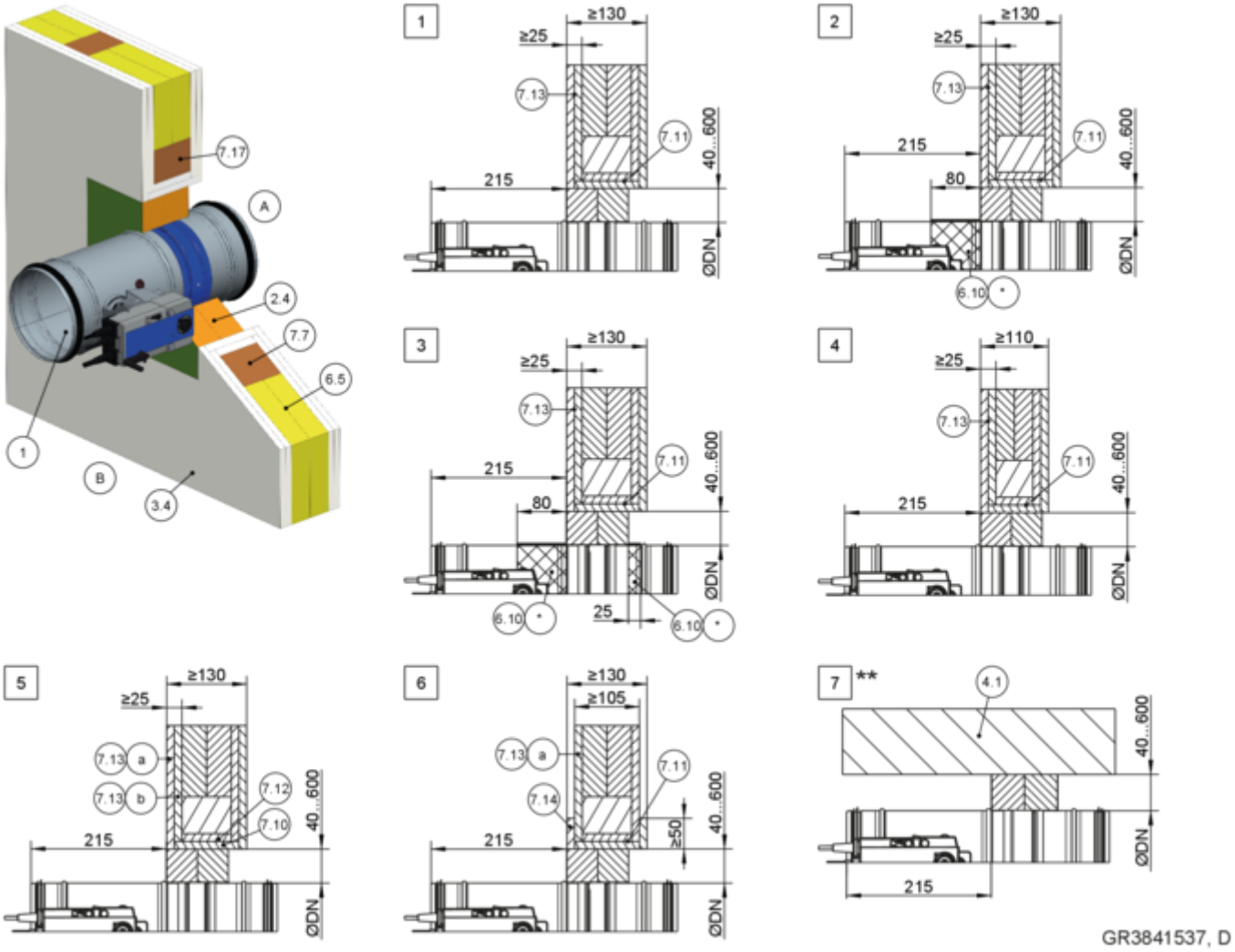

Fig. 116: Dry mortarless installation into a lightweight partition wall with timber support structure, with a fire batt

1	FKRS-EU
2.4	Fire batt with ablative coating
3.4	Timber stud wall (also timber panel constructions), cladding on both sides
4.1	Solid ceiling slab/solid floor
6.5	Mineral wool (depending on wall construction)
6.10	Ablative coating around the perimeter, d = at least 2.5 mm
6.19	Mineral wool > 1000 °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* .
7.7	Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60
7.10	Trim panels (fire-resistant)
7.11	Trim panels, fire-resistant, double layer, staggered joints
7.12	Trim panels, wood sheet, at least 600 kg/³
7.13	Cladding
7.13a	Cladding, fire-resistant
7.13b	Cladding, wood sheet, at least 600 kg/³
7.14	Reinforcing board of the same material as the wall
7.17	Trimmer, wooden beam min. 60 × 80 mm or min. 60 × 60 mm with F60
*	6.19, 6.20 or 6.24 as an alternative
**	Installation near the floor as in 7
1 – 7	See table *152*

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

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

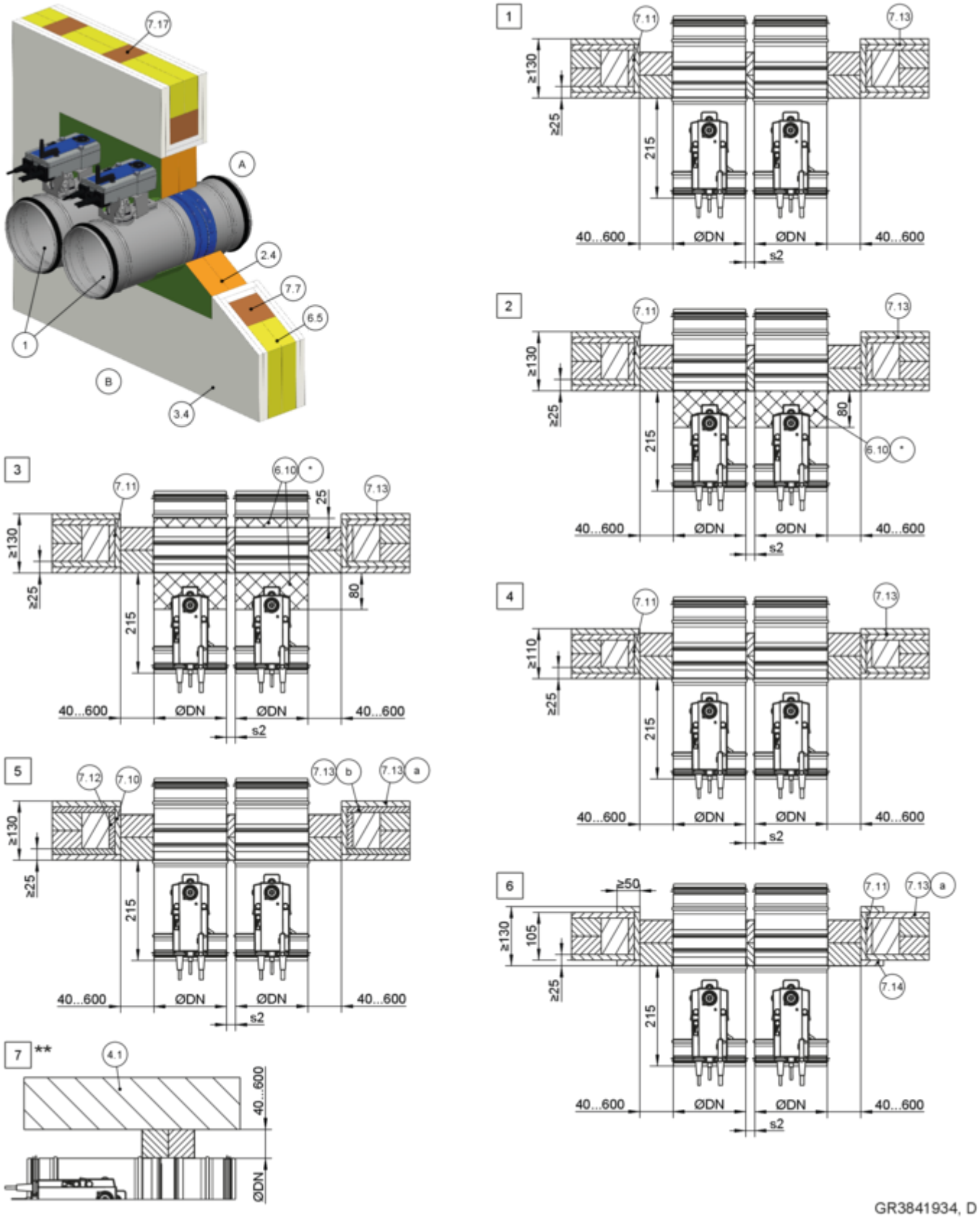

Fig. 117: Dry mortarless installation into a lightweight partition wall with timber support structure, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1 FKRS-EU
2.4 Fire batt with ablative coating
3.4 Timber stud wall (also timber panel constructions), cladding on both sides
4.1 Solid ceiling slab/solid floor
6.5 Mineral wool (depending on wall construction)
6.10 Ablative coating around the perimeter, d = at least 2.5 mm
6.19 Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm, 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*.
7.7 Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60
7.10 Trim panels (fire-resistant)
7.11 Trim panels, double layer, staggered joints
7.12 Trim panels, wood sheet, at least 600 kg/³
7.13 Cladding
7.13a Cladding, fire-resistant
7.13b Cladding, wood sheet, at least 600 kg/³
7.14 Reinforcing board of the same material as the wall
7.17 Trimmer, wooden beam min. 60 × 80 mm or min. 60 × 60 mm with F60
* 6.19, 6.20 or 6.24 as an alternative
** Installation near the floor as in 7
1 – 7 See table *154*

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

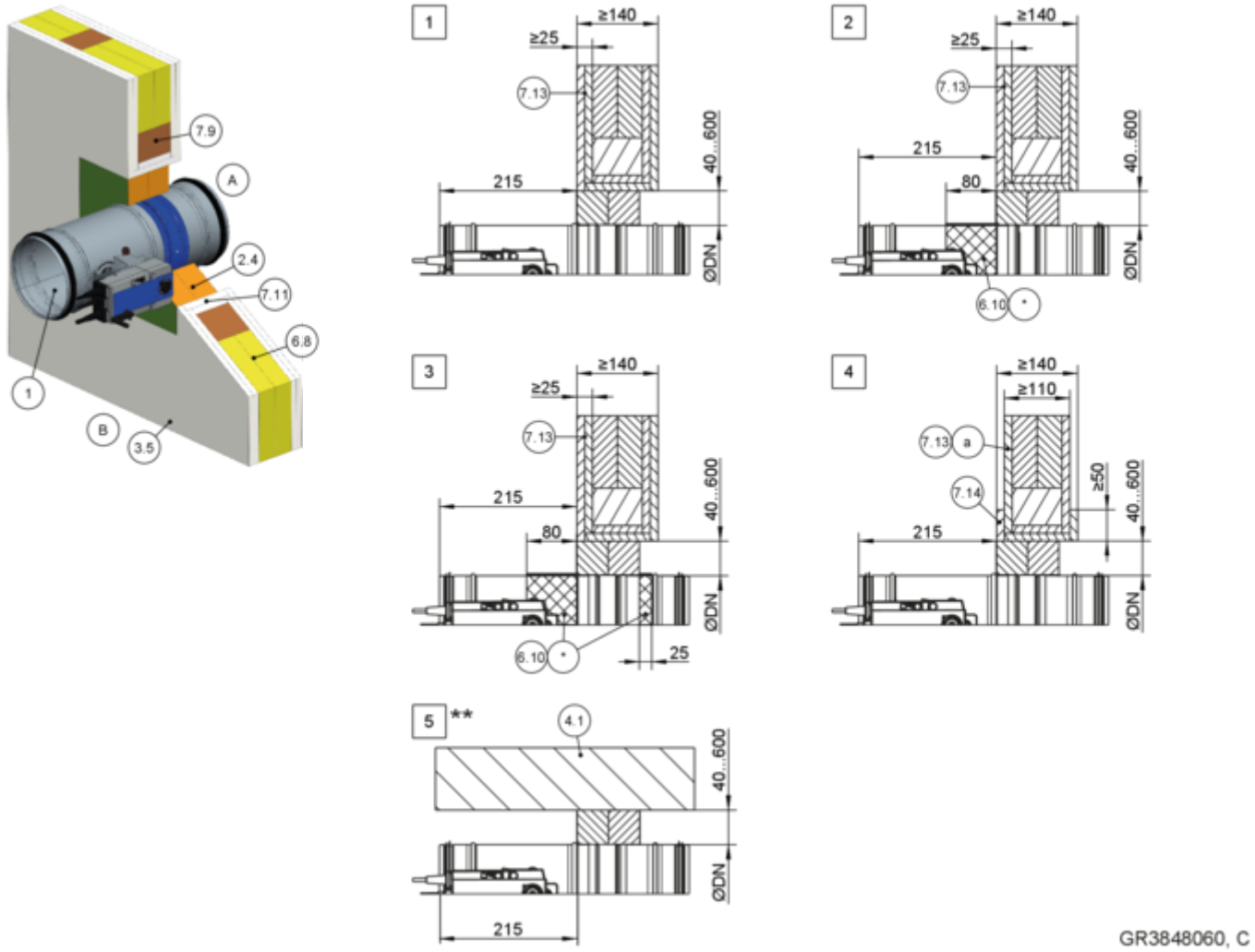

Fig. 118: Dry mortarless installation into a lightweight partition wall, with fire batt, with half-timbered construction

1	FKRS-EU
2.4	Fire batt with ablative coating
3.5	Half-timbered construction, cladding on both sides
4.1	Solid ceiling slab/solid floor
6.8	Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
6.10	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* .
7.9	Half-timbered construction
7.11	Trim panels, fire-resistant, double layer, staggered joints
7.13	Cladding
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 5
1 – 5	See table ↳ *156*

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"

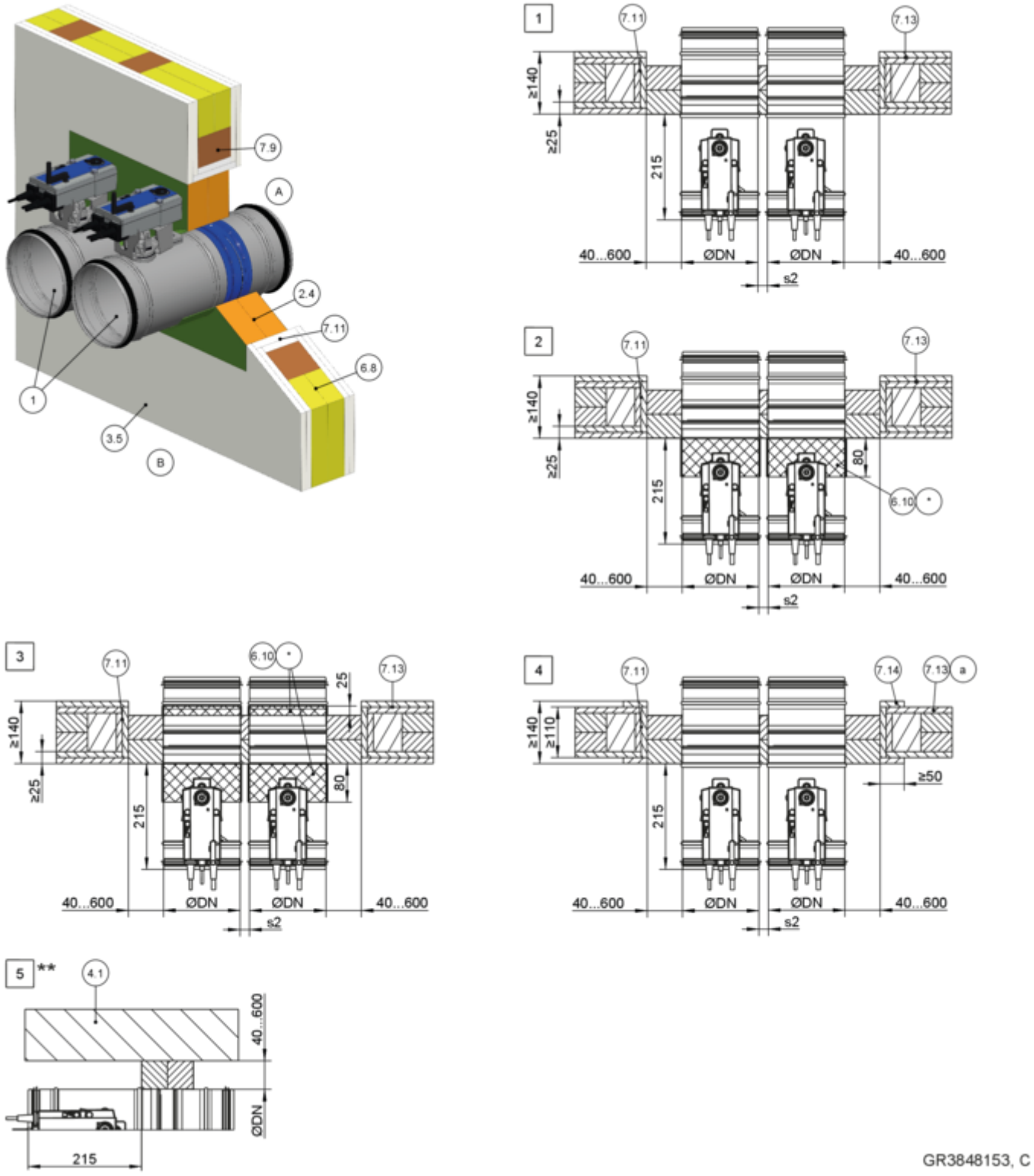

Fig. 119: Dry mortarless installation into a lightweight partition wall with half-timbered construction, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FKRS-EU
2.4	Fire batt with ablative coating
3.5	Half-timbered construction, cladding on both sides
7.9	Half-timbered construction
7.11	Trim panels, fire-resistant, double layer, staggered joints
7.13	Cladding

4.1 Solid ceiling slab/solid floor
6.8 Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
6.10 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*.

7.13a 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 5
1 – 5 See table *Table on page 158*

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 ≥ 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 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 5.14 'Fixing the fire damper' on page 235*
- General installation information, *5.3 'General installation information' on page 28* ff
- General information on installation with fire batt, *on page 36*

5.7.6 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

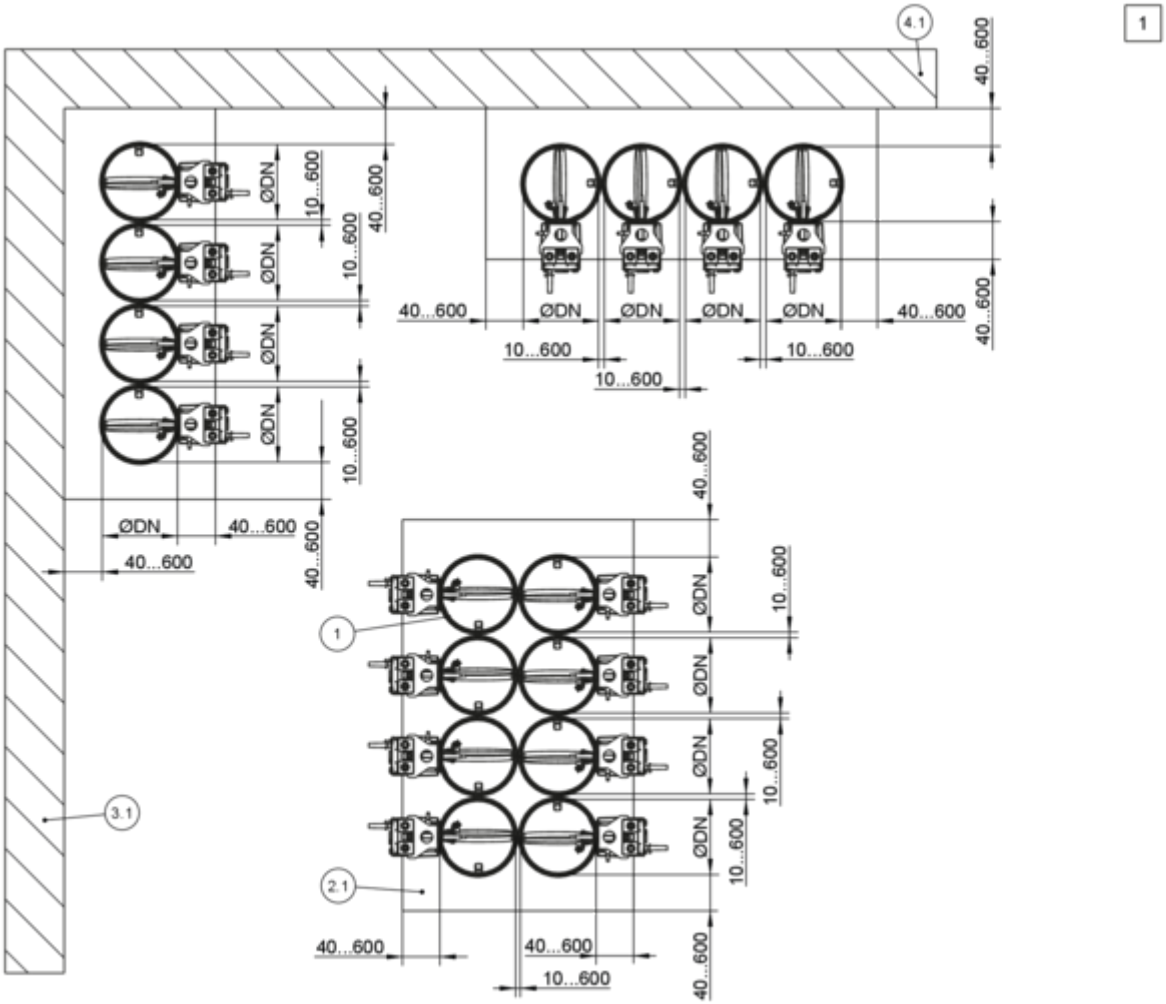

Fig. 120: Dry mortarless installation with fire batt in lightweight partition wall with wooden studs - Multiple occupancy of an installation opening

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

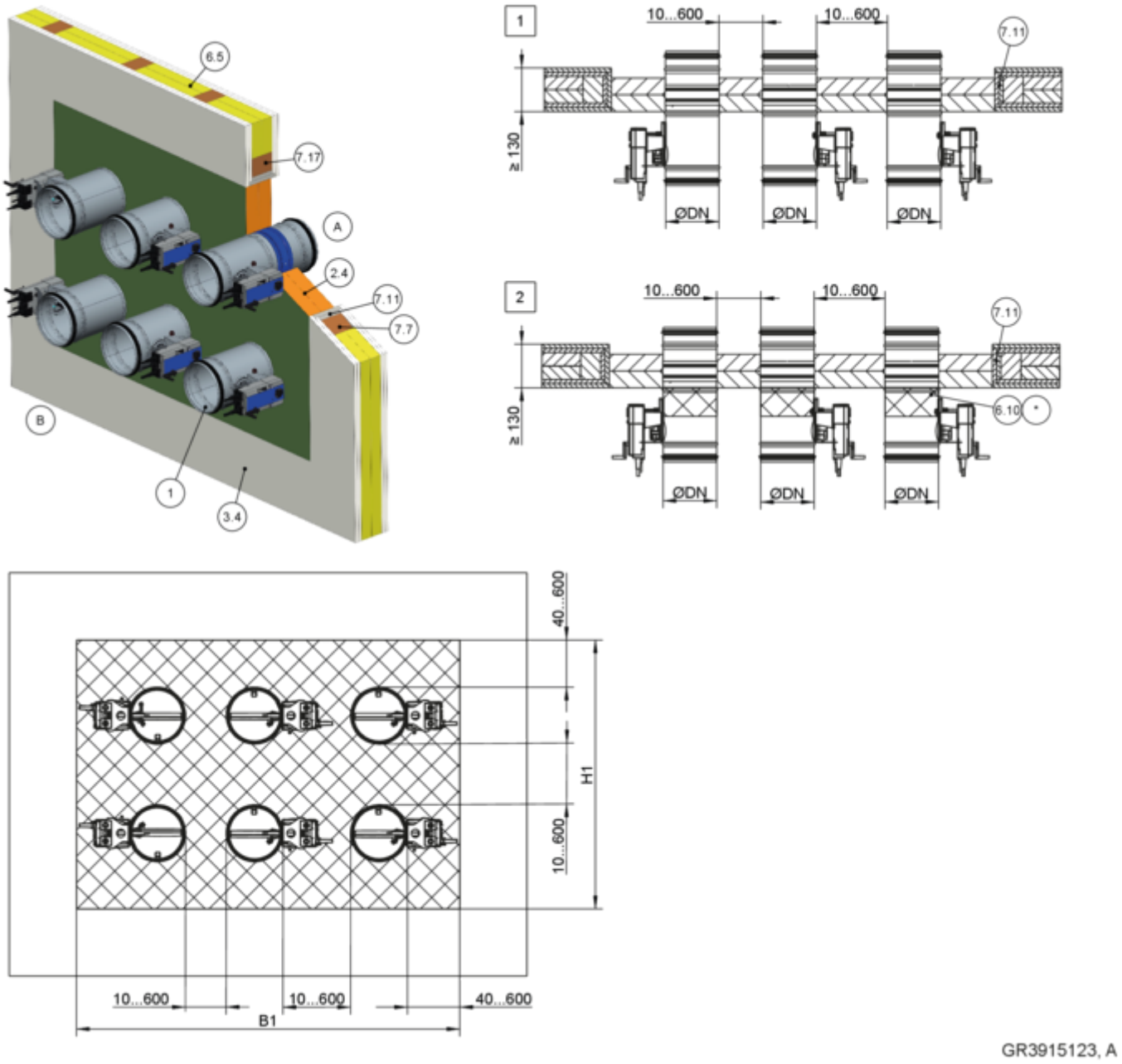

Fig. 121: Dry mortarless installation with fire batt in lightweight partition wall with wooden studs - Multiple occupancy of an installation opening

1	FKRS-EU
2.4	Fire batt with ablative coating
3.4	Timber stud wall (also timber panel constructions), cladding on both sides
6.5	Mineral wool (depending on wall construction)
6.10	Ablative coating around the perimeter, d = at least 2.5 mm
6.19	Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm, 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* .
7.7	Timber stud, min. 60 × 80 mm or min. 60 × 60 mm with F60
7.11	Trim panels, fire-resistant, double layer, staggered joints
7.17	Trimmer, wooden beam min. 60 × 80 mm or min. 60 × 60 mm with F60
*	6.19, 6.20 or 6.24 as an alternative
1 2	See table ↬ *Table on page 161*

Lightweight partition wall with timber support structure					
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/m^3 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

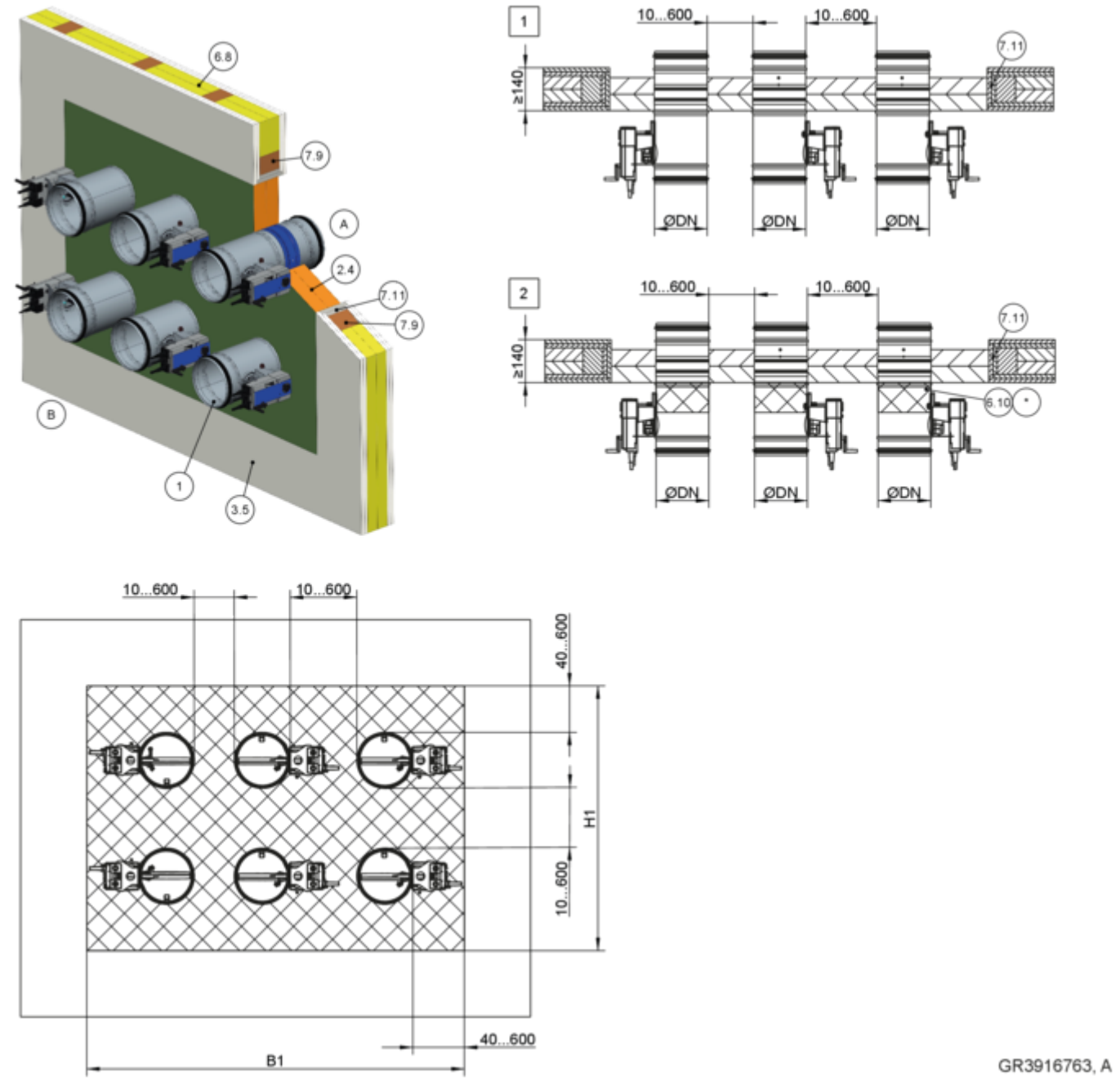

Fig. 122: Dry mortarless installation with fire batt in lightweight partition wall with half-timbered construction - multiple occupancy of an installation opening

1 FKRS-EU
2.4 Fire batt with ablative coating
3.5 Half-timbered construction, cladding on both sides
6.8 Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
6.10 Ablative coating around the perimeter, d = at least 2.5 mm
6.19 Mineral wool > 1000 °C, > 80 kg/m³, thickness = 20 mm, leave out the actuator and release mechanism; inspection openings must remain accessible
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* .
7.9 Half-timbered construction
7.11 Trim panels, fire-resistant, double layer, staggered joints
7.14 Reinforcing board of the same material as the wall
* 6.19, 6.20 or 6.24 as an alternative
1 2 See table ↯ *Table on page 163*

6.20 Sleeve (to be ordered separately)

Half-timbered 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 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 5.14 'Fixing the fire damper' on page 235*
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

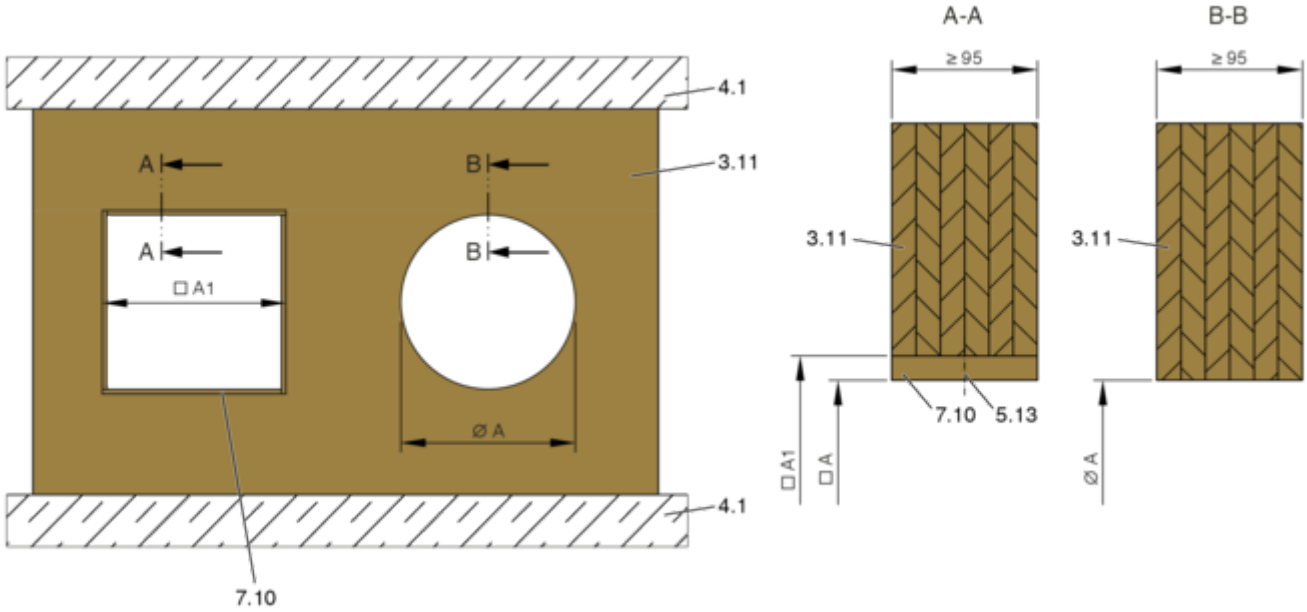

Fig. 123: Solid wood wall

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	∅nominal width + max. 450	≤ 225	10 – 225
Dry mortarless installation with TQ2	□A = ∅nominal width + 110 [2]	central installation	≥ 200
Dry mortarless installation with fire batt [1]	□A = ∅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

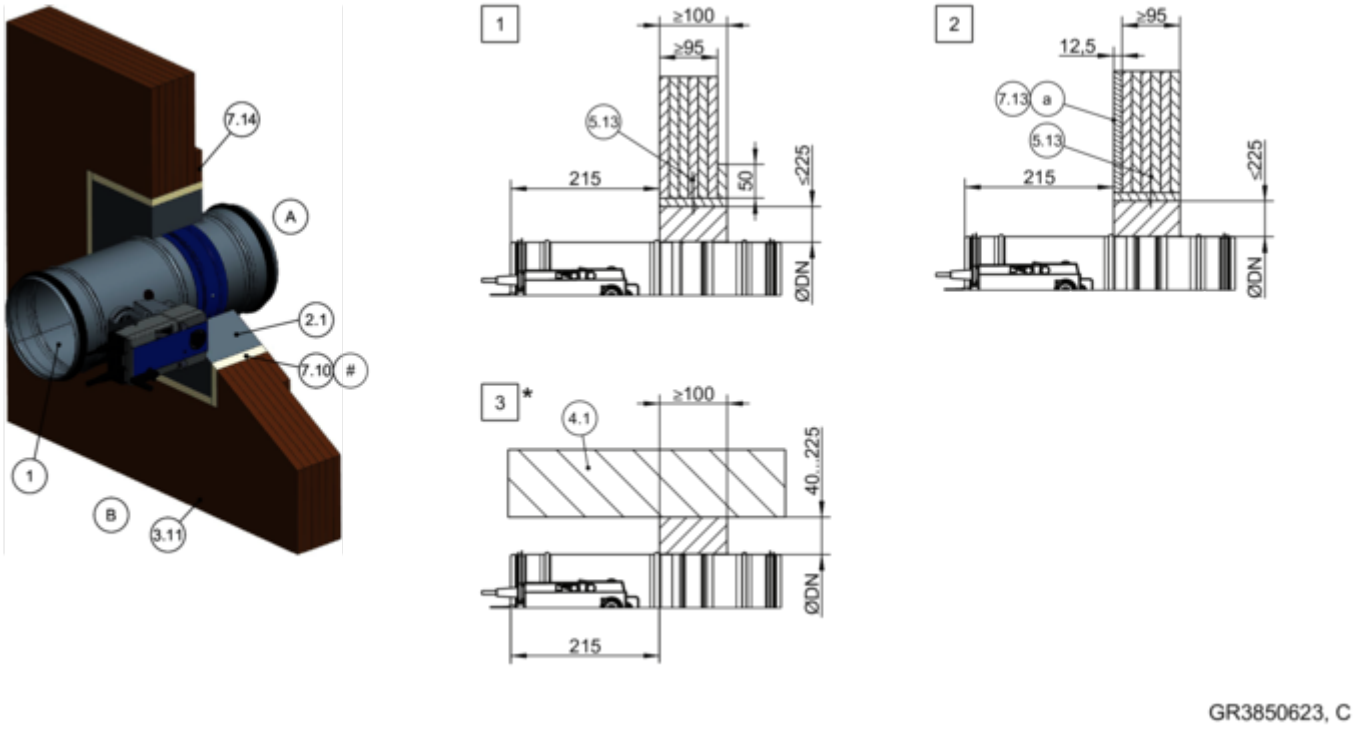

Fig. 124: Mortar-based installation into a solid wood wall or CLT wall

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		
4.1	Solid ceiling slab/solid floor	#	optional
5.13	Wood screw or pin	*	Installation near the floor as in 3
7.10	Trim panels	1 – 3	Up to EI 90 S

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

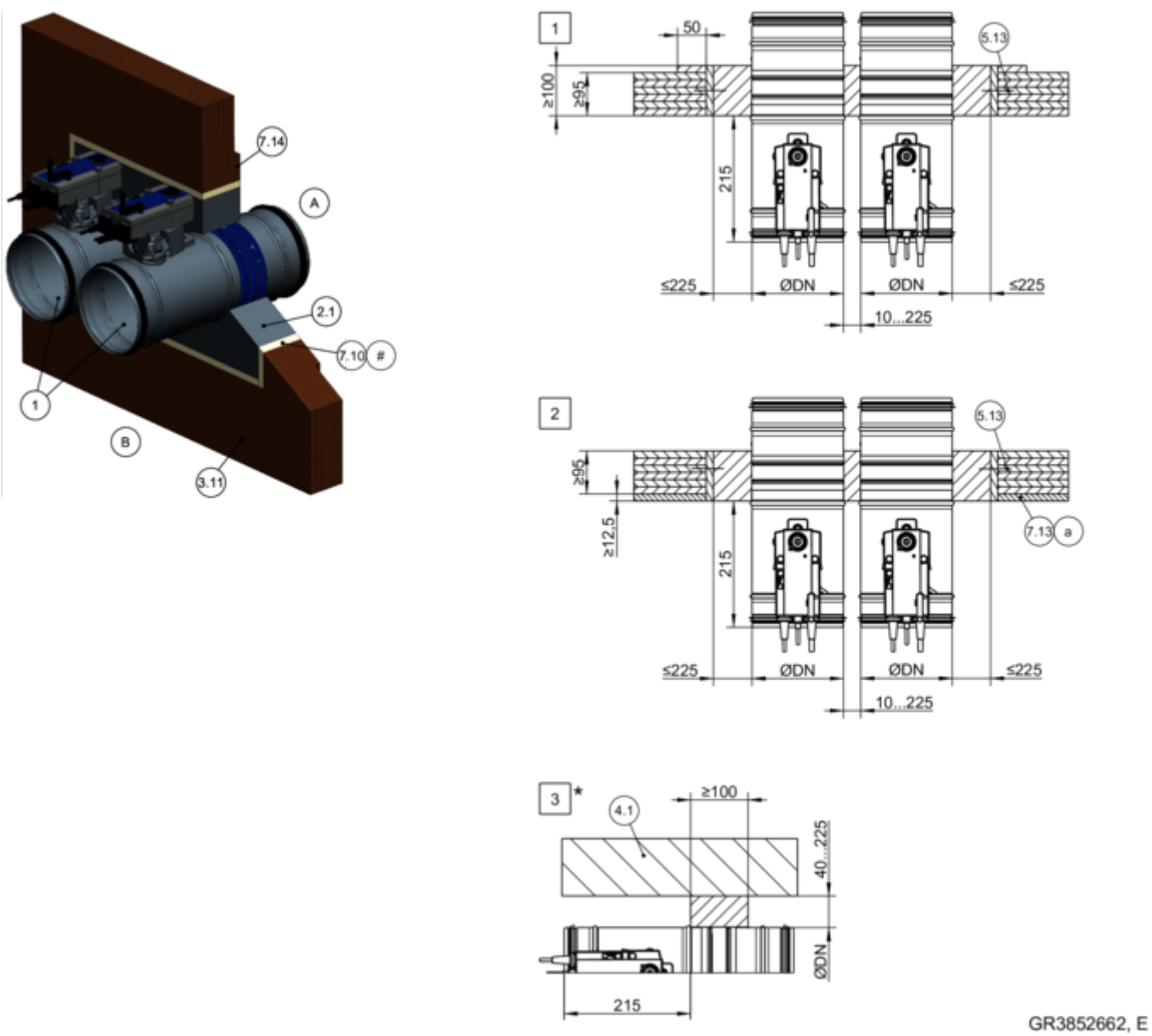

Fig. 125: Mortar-based installation into a solid wood wall or CLT wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

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

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 28* 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

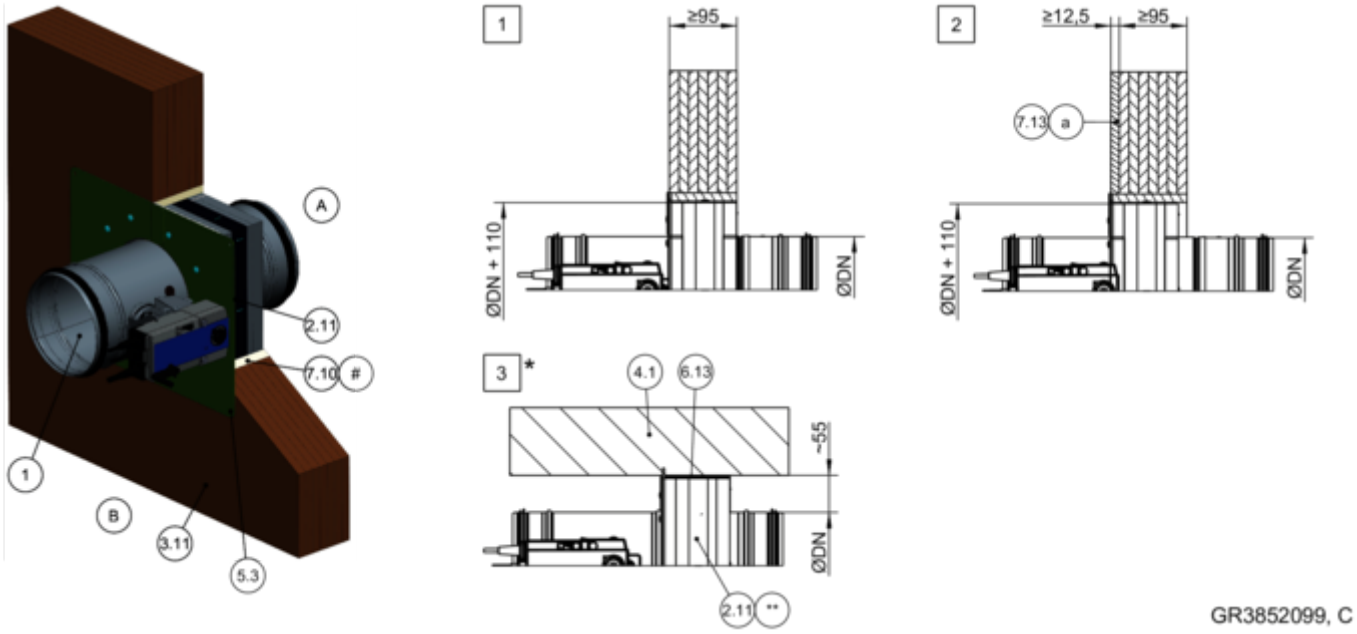

Fig. 126: Dry mortarless installation into a solid wood wall or CLT wall, with installation kit TQ2

1	FKRS-EU	7.10	Trim panels
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 45*
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

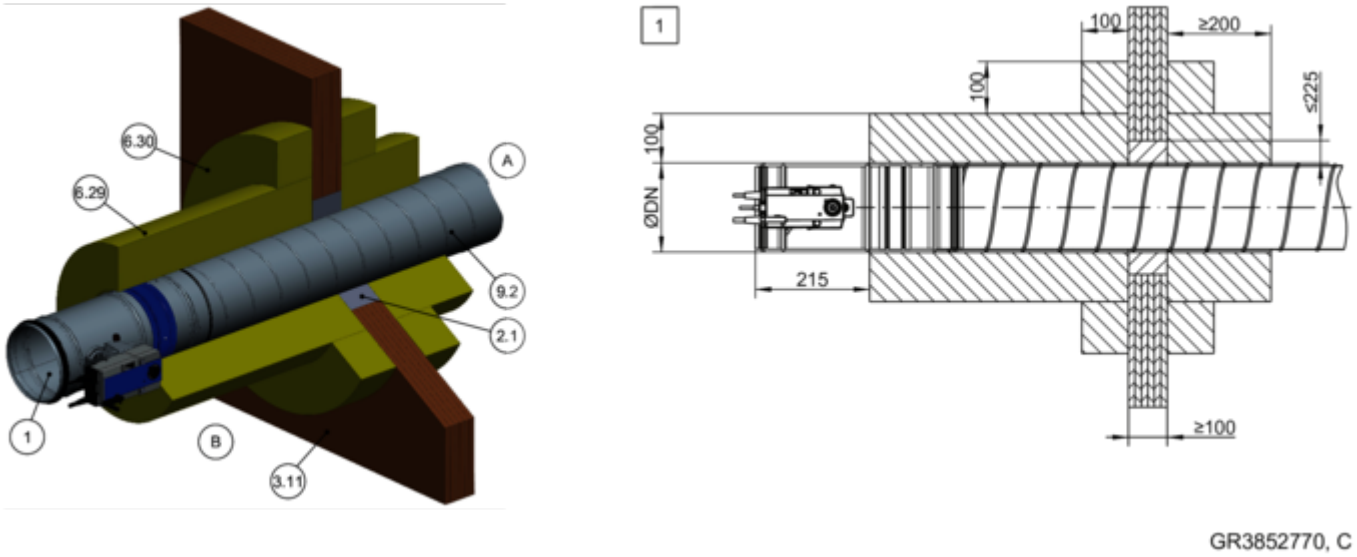

Fig. 127: Installation remote from solid wood or cross laminated timber walls with mineral wool

1	FKRS-EU	6.30	Reinforcing board mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³), glued all round
2.1	Mortar		
3.11	Solid wood wall/CLT wall		
6.29	Mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³)	9.2	Sheet steel duct
		[1]	Up to EI 60 S

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

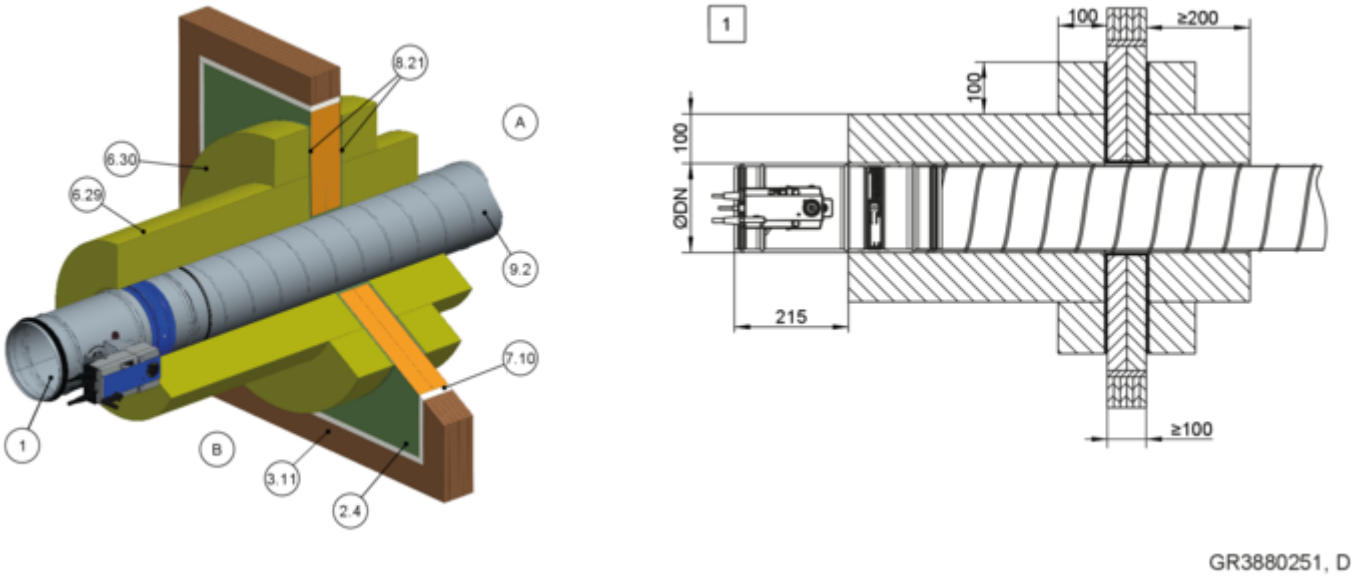

Fig. 128: Dry mortarless installation remote from solid wood or cross-laminated timber walls with mineral wool and fire batts

1 FKRS-EU
2.4 Fire batt, PAROC Pyrotech Slab 140 (max. W × H = 2.1 × 2.5 m)
3.11 Solid wood wall/CLT wall
6.29 Mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³)
6.30 Reinforcing board mineral wool PAROC HVAC Fire Mat 80BLC (80 kg/m³), glued all round
7.10 Trim panels, single-layer, fire-resistant
8.21 Acrylic or sealing compound (suitable for fire batt system)
9.2 Sheet steel duct
1 Up to EI 60 S

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 28* 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

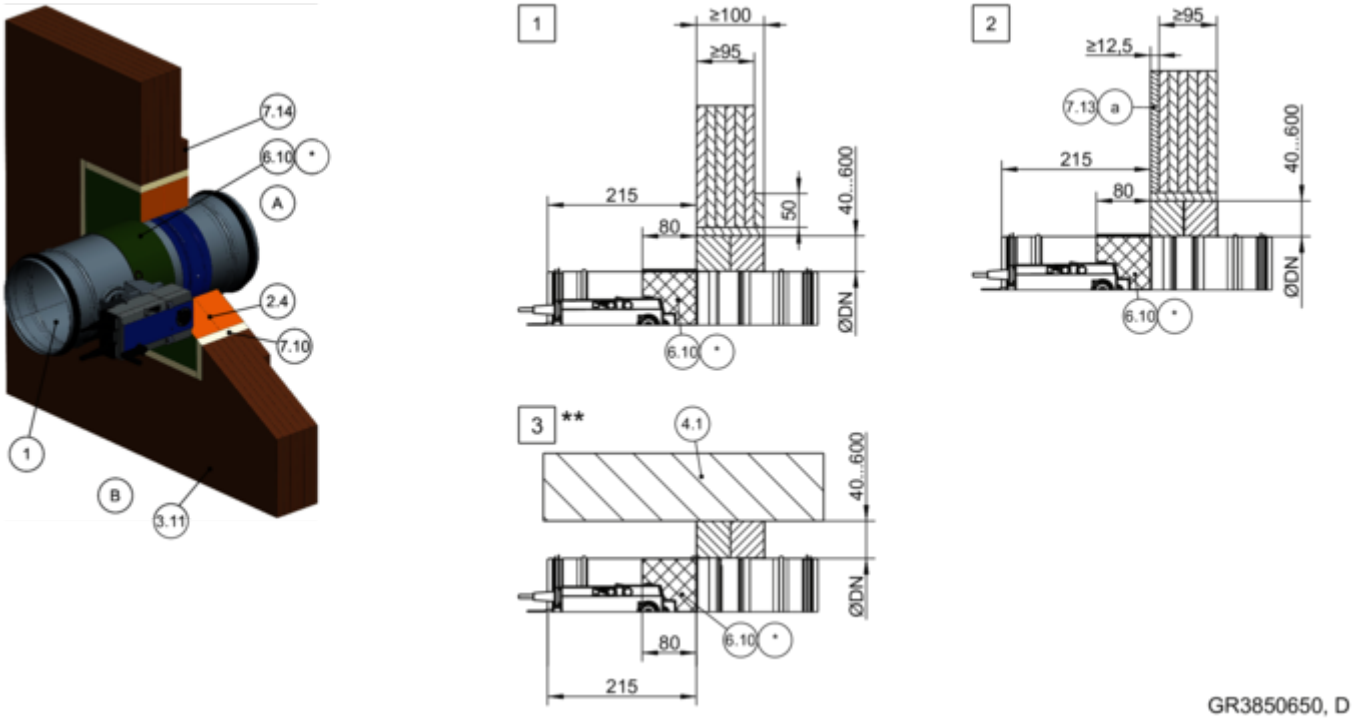

Fig. 129: Dry mortarless installation into a timber wall or CLT wall, with a fire batt

1	FKRS-EU
2.4	Fire batt with ablative coating
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/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)
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

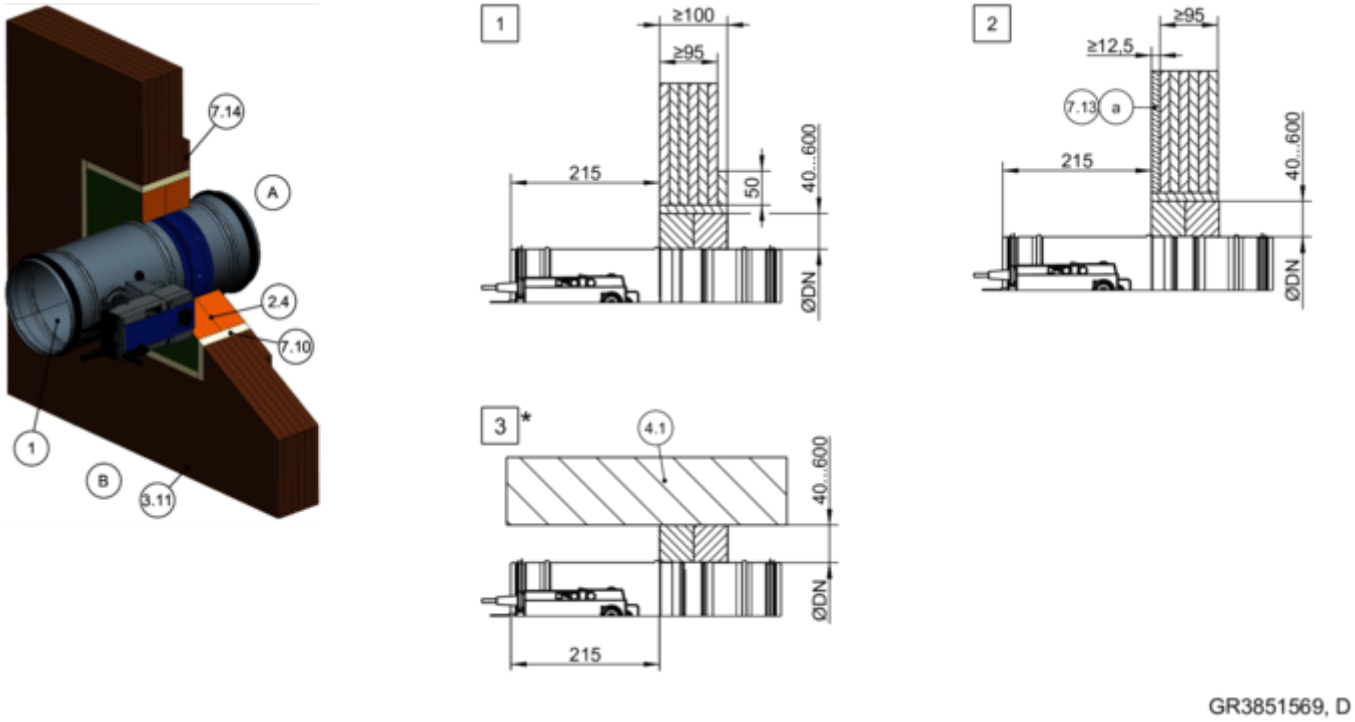

Fig. 130: Dry mortarless installation into a timber wall or CLT wall, with a fire batt

1	FKRS-EU	7.13a	Cladding, single-layer, fire-resistant
2.4	Fire batt with ablative coating	7.14	Reinforcing board of the same material as the wall
3.11	Solid wood wall/CLT wall	*	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 5.14 'Fixing the fire damper' on page 235*
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

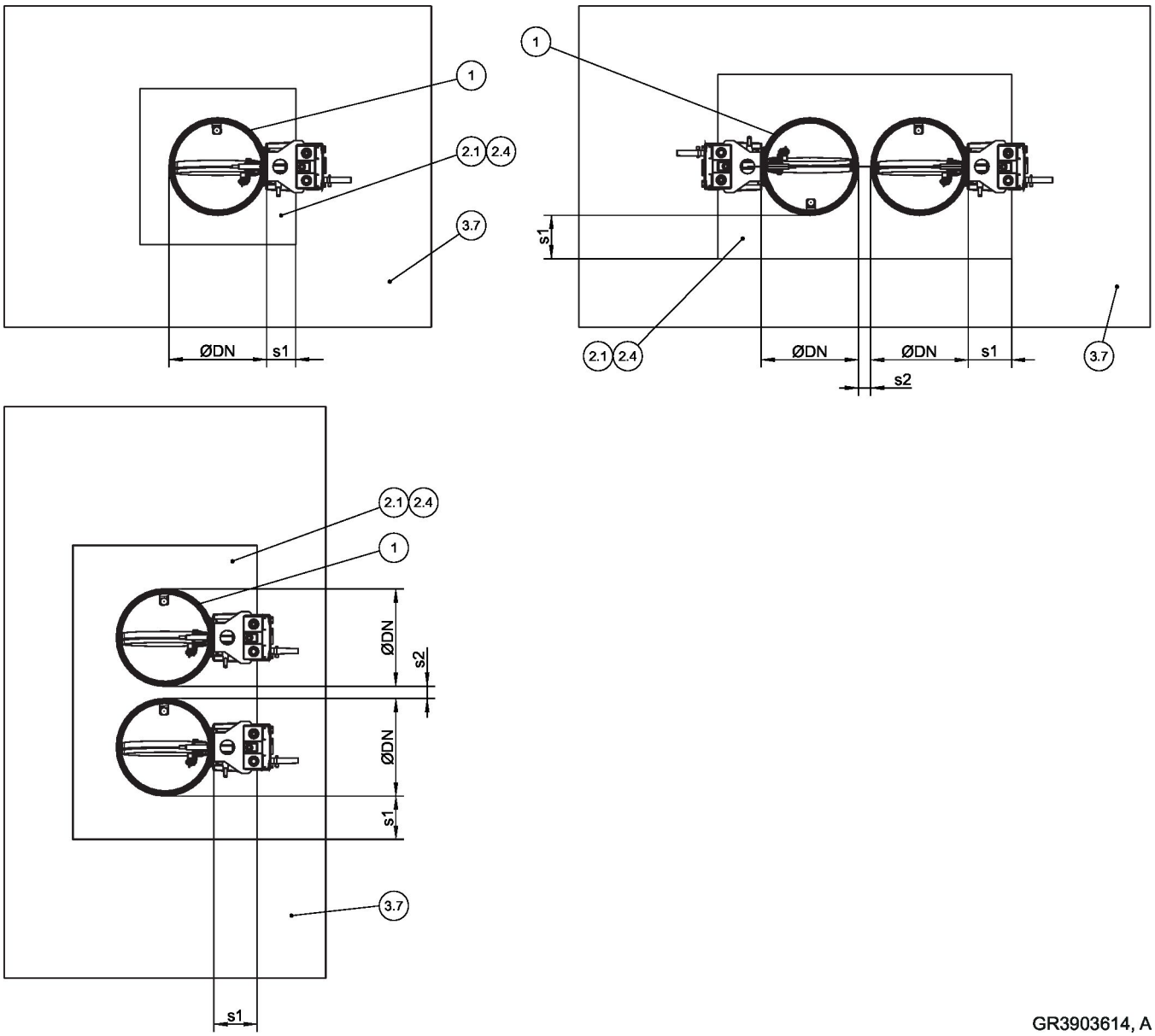

Fig. 131: Shaft walls with metal support structure – arrangement/distances

1 FKRS-EU
2.1 Mortar
2.4 Fire batt with ablative coating
3.7 Shaft wall with metal support structure, cladding on one side
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	∅nominal width + max. 450	≤ 225	10 – 225
Dry mortarless installation with TQ2	□A = ∅nominal width + 110 [2]	central installation	≥ 200
Dry mortarless installation with fire batt [1]	□A = ∅nominal width + max. 1200	40 – 600	≥ 200

[1)] Note the maximum size for the fire batt

[2] Installation opening tolerance ± 2 mm

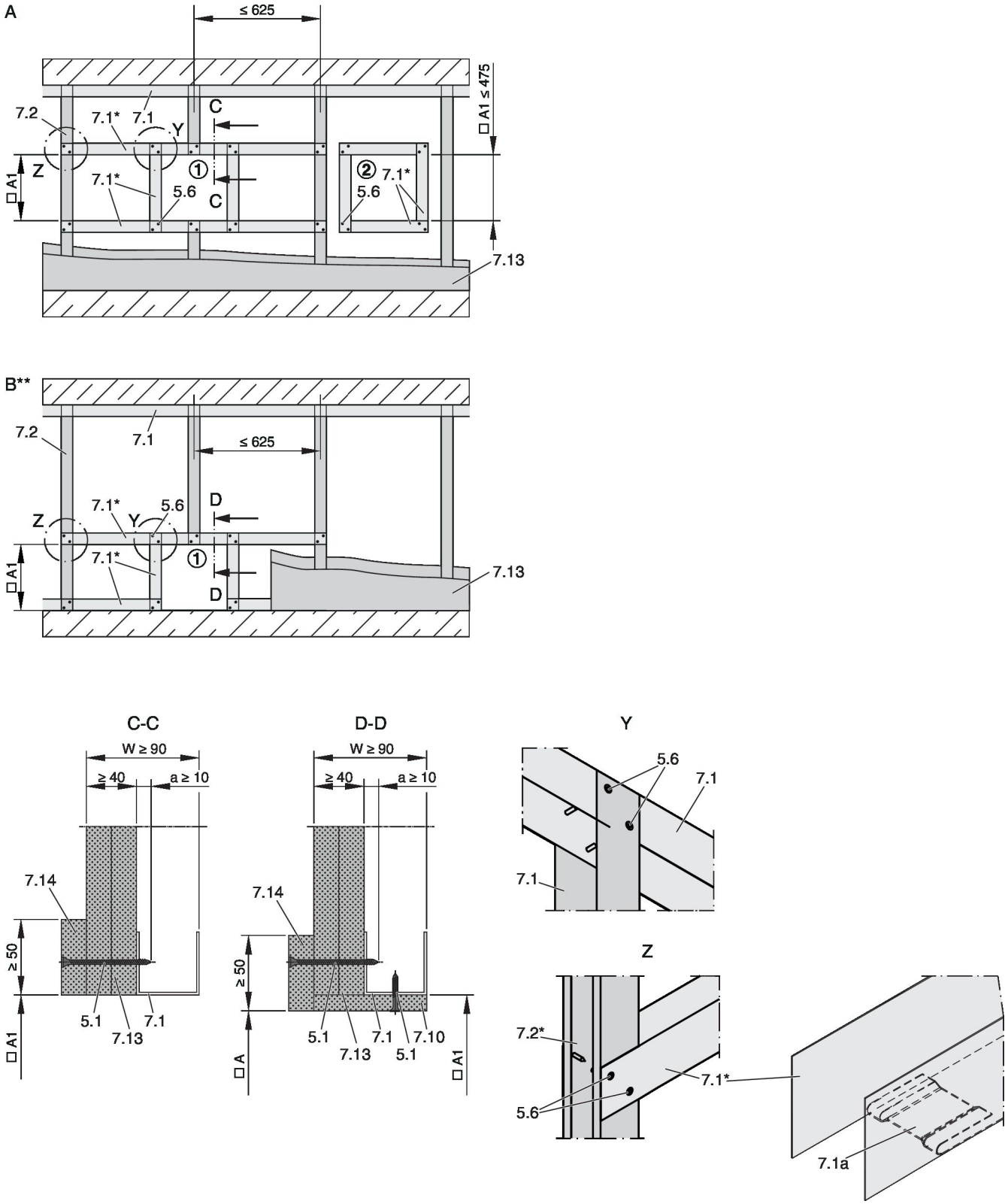

Fig. 132: Shaft walls with metal support structure and cladding on one side

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. 132
- – 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

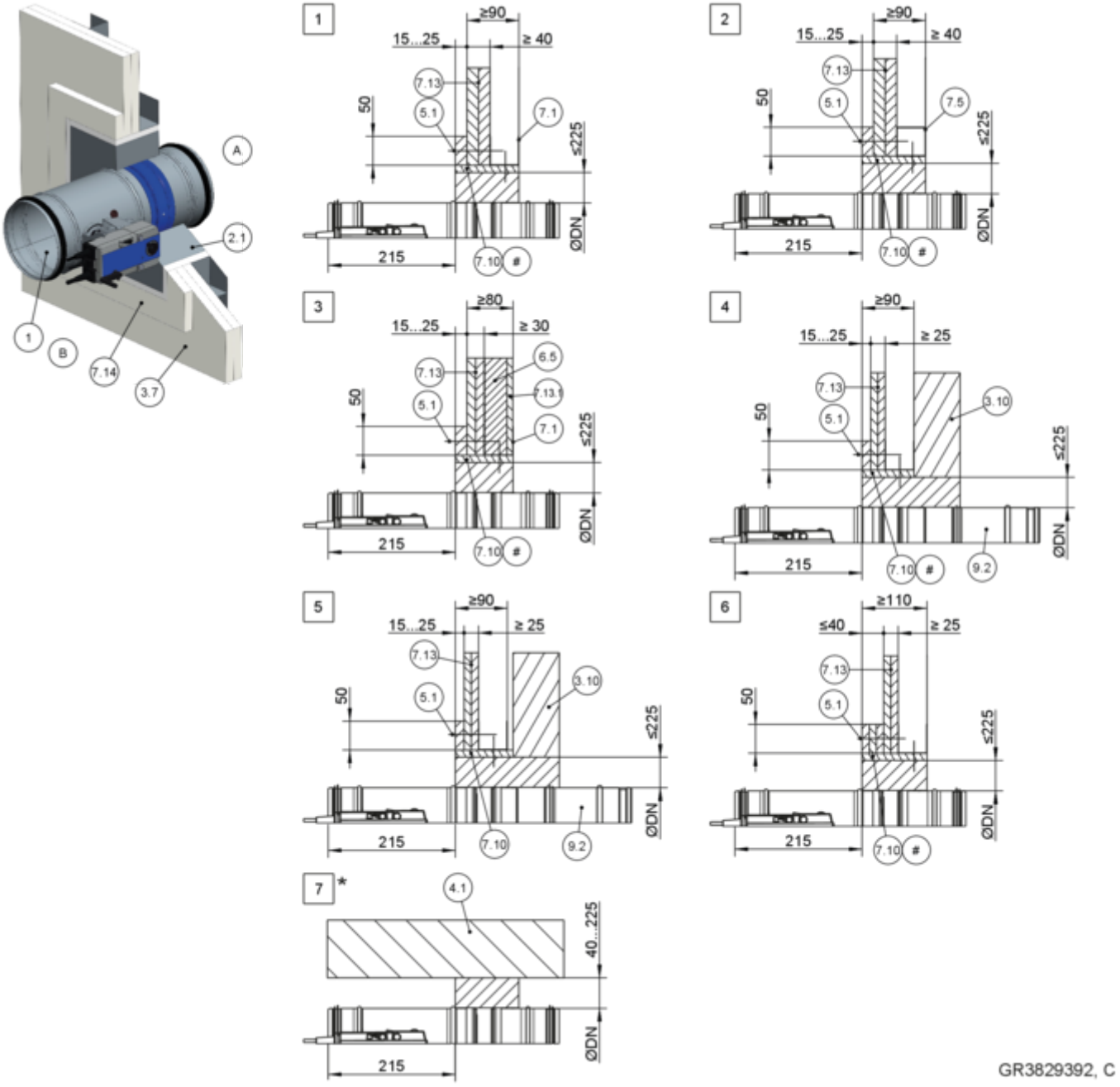

Fig. 133: Mortar-based installation into shaft wall with metal support structure

1	FKRS-EU	7.13	Cladding, two layers
2.1	Mortar	7.13.1	Cladding, single-layer
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 7
6.5	Mineral wool (depending on wall construction)	1 – 3	Up to EI 90 S
7.1	UW section	4 – 6	EI 30 S
7.5	Steel support structure (box section)	7	EI 30 S – EI 90 S
7.10	Trim panels		

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

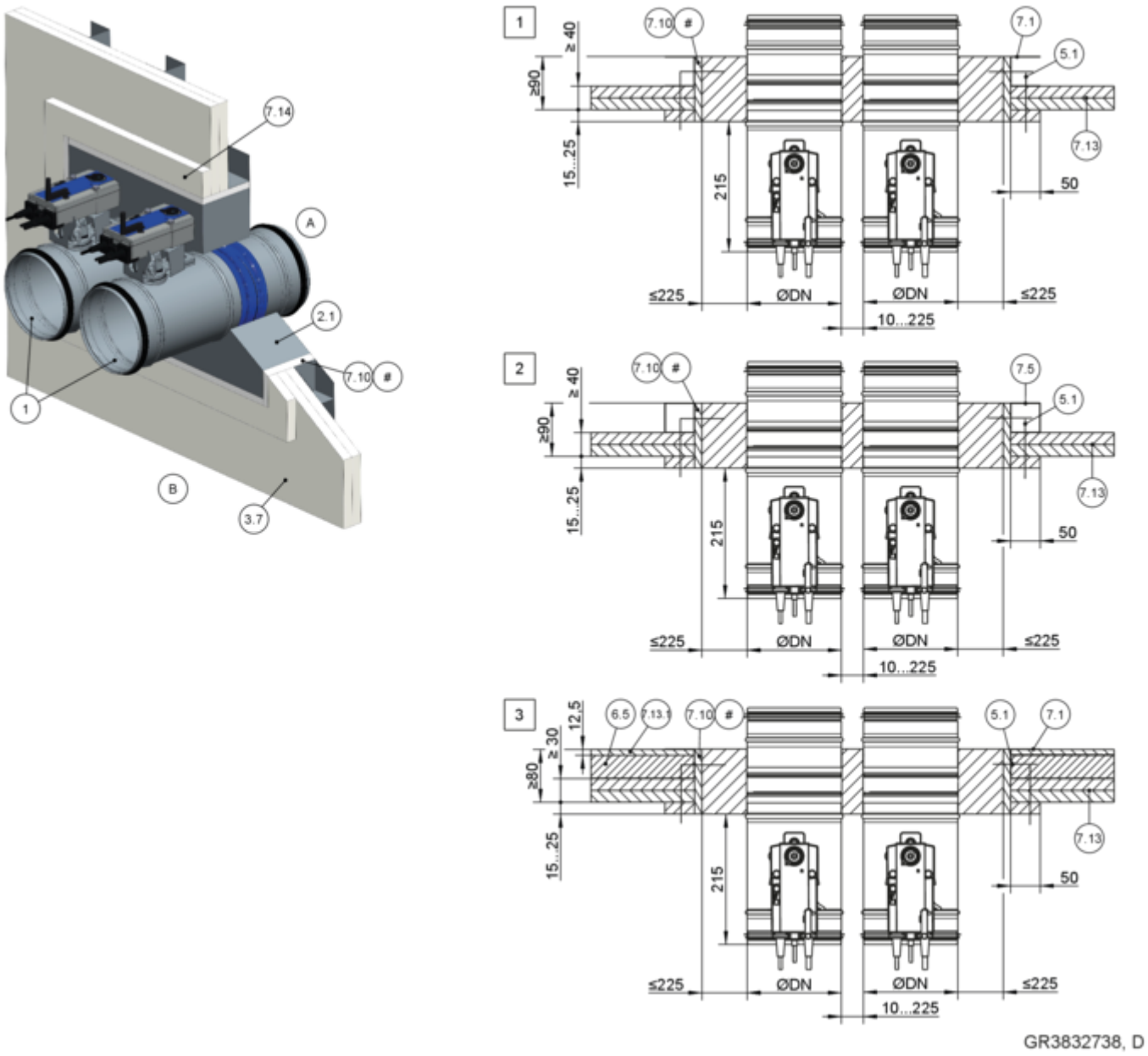

Fig. 134: Mortar-based installation into a shaft wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FKRS-EU	7.10	Trim panels
2.1	Mortar	7.13	Cladding, two layers
3.7	Shaft wall with metal support structure, cladding on one side	7.13.1	Cladding, single-layer
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)		

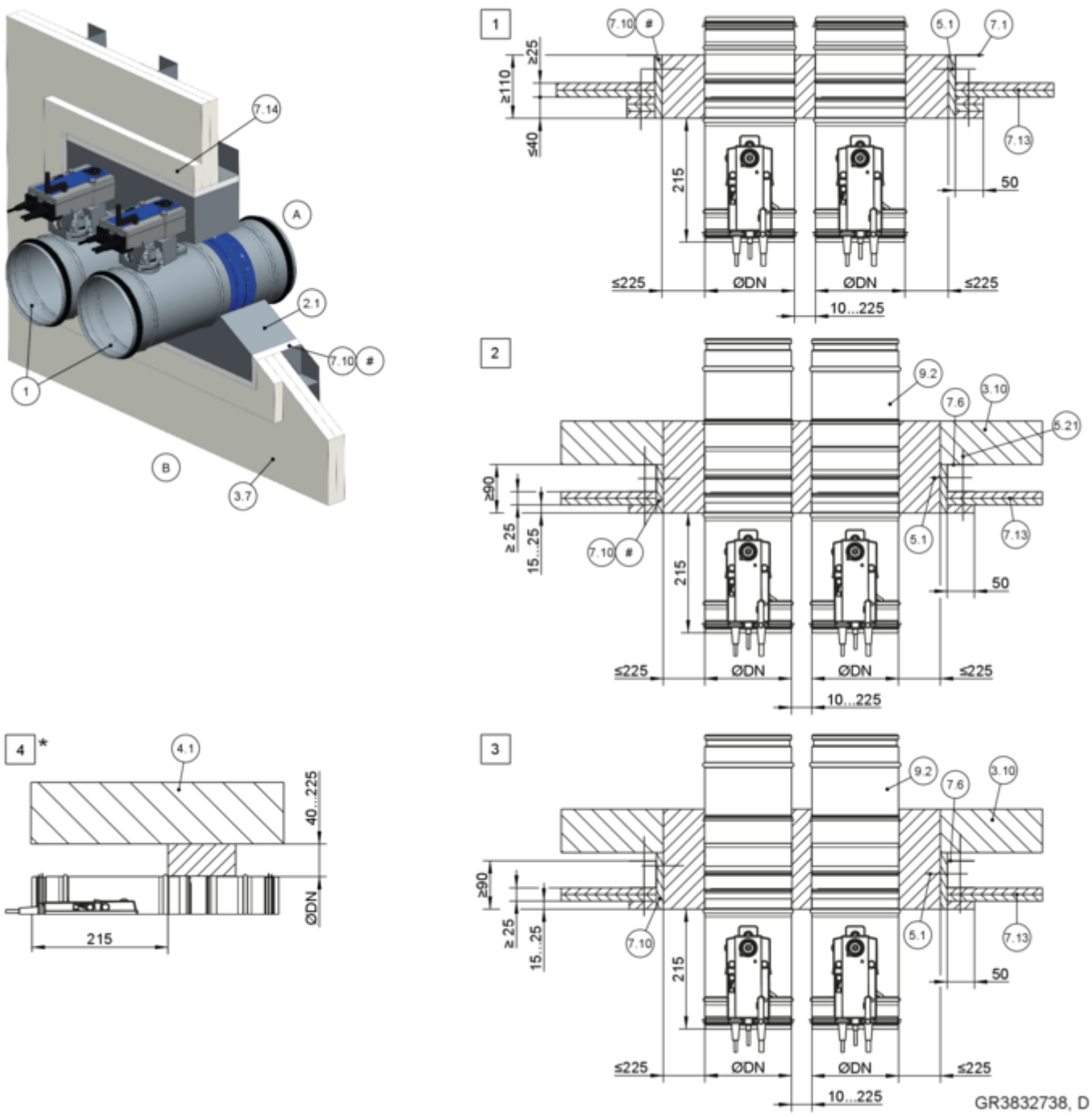

Fig. 135: Mortar-based installation into a shaft wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FKRS-EU	7.10	Trim panels
2.1	Mortar	7.13	Cladding, two layers
3.7	Shaft wall with metal support structure, cladding on one side	7.14	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

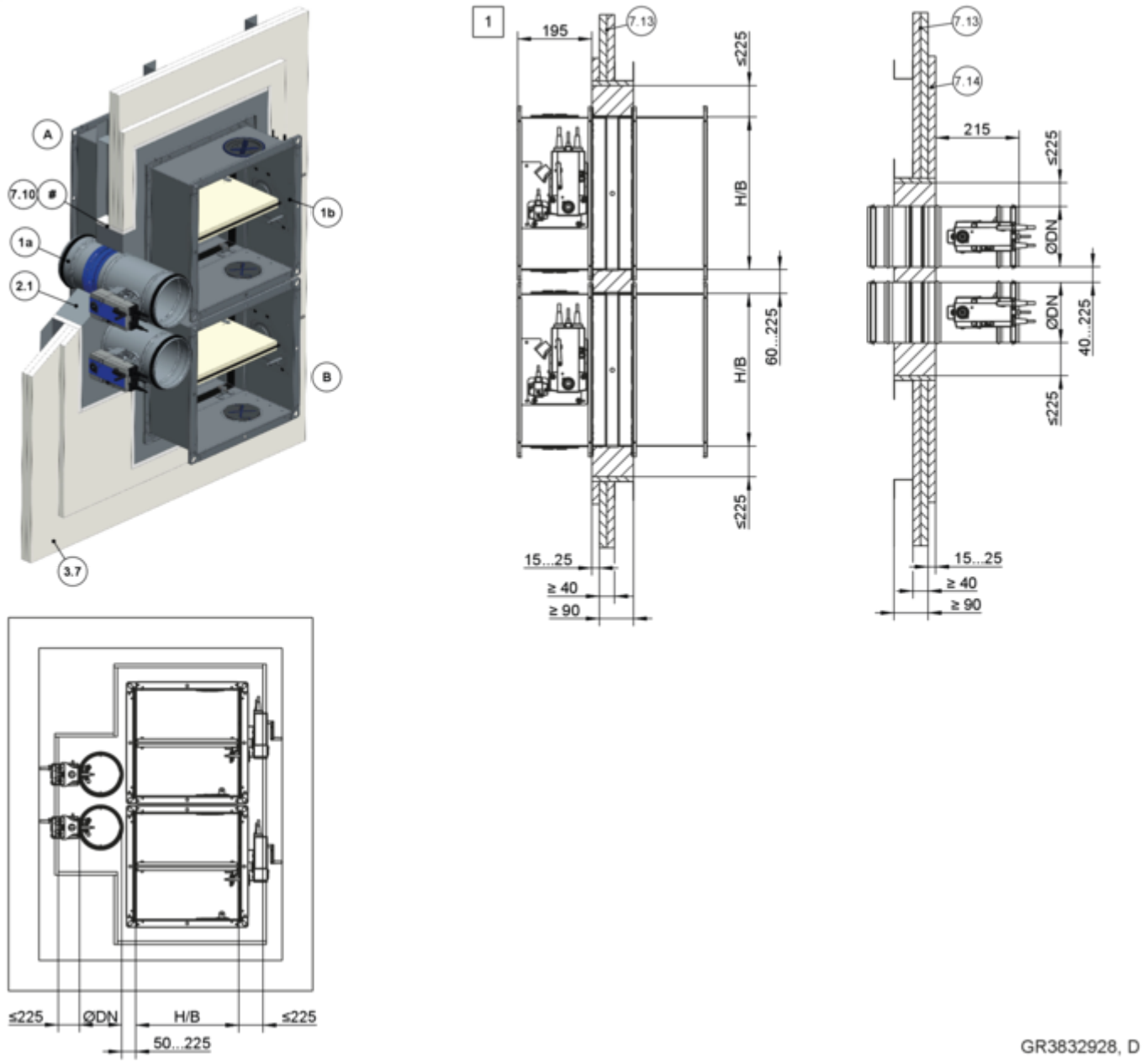

Fig. 136: Mortar-based installation into a shaft wall, FKR-EU and FK2-EU combined

1a	FKRS-EU	7.13	Cladding, two layers
1b	FK2-EU up to B × H ≤ 800 × 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 panels		

For combined installation please note:

- Overall fire damper area ≤ 1.2 m^2 .
- The number of fire dampers in an installation opening is limited by their size (B × H for FK2-EU and/or ∅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 shaft walls with metal support structure

- Shaft wall, ↳ *on page 41*
- General installation information, ↳ *5.3 'General installation information' on page 28* ff
- General information on mortar-based installation, ↳ *'**Mortar-based installation**' on page 34*

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

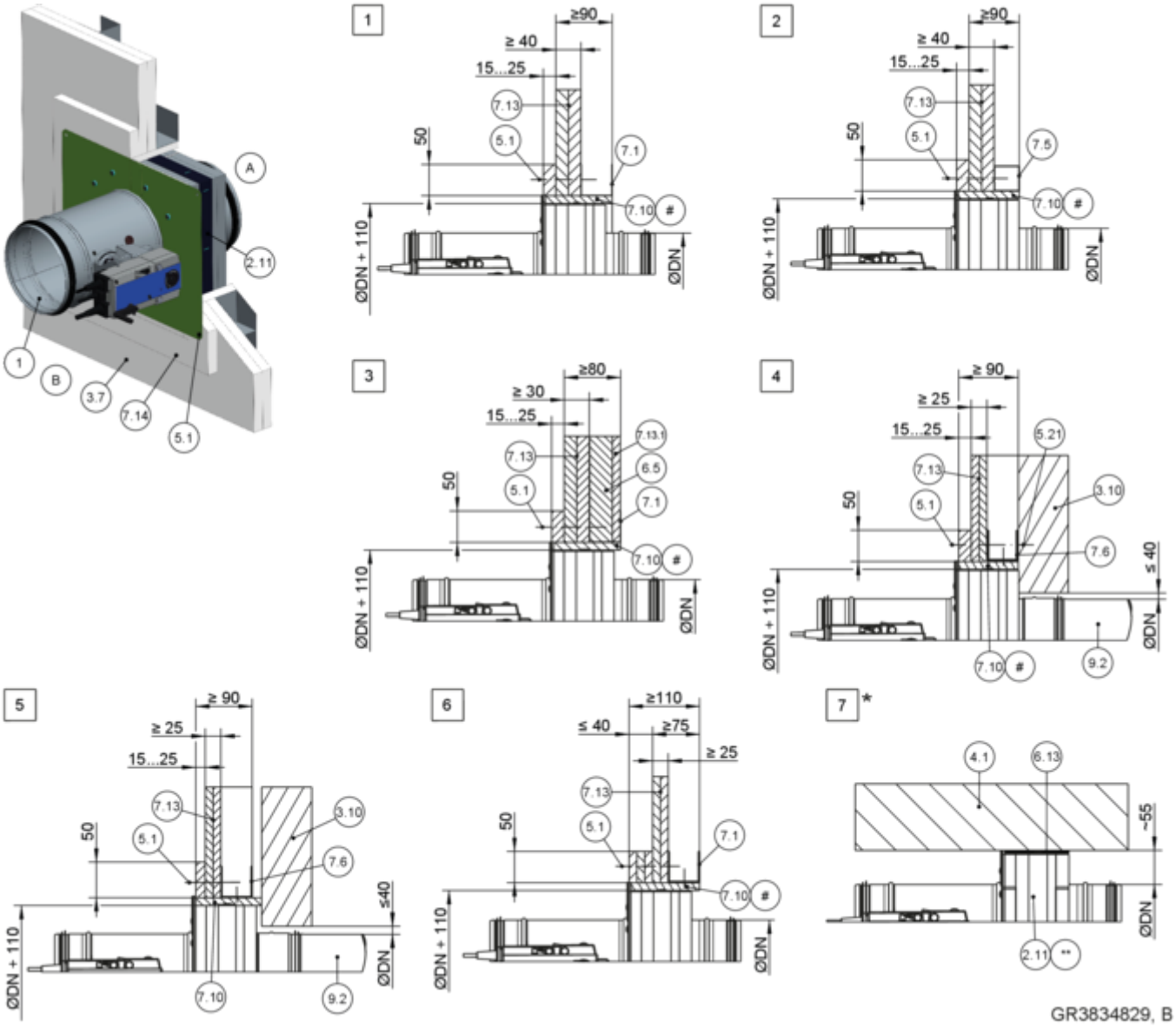

Fig. 137: Dry mortarless installation into a shaft wall with metal support structure, with installation kit TQ2

1	FKRS-EU
2.11	Installation kit TQ2 with cover plate
3.7	Shaft wall with metal support structure, cladding on one side
3.10	Wall without adequate fire resistance rating
4.1	Solid ceiling slab/solid floor
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame
5.21	Screw/wall plug
6.5	Mineral wool (depending on wall construction)
6.13	Mineral fibre strips A1, alternatively gypsum mortar (for levelling ceiling unevenness)
7.1	UW section
7.5	Steel support structure (box section)
7.6	Metal section according to wall manufacturer
7.10	Trim panels
7.13	Cladding, two layers
7.13.1	Cladding, single-layer
7.14	Reinforcing board of the same material as the wall
9.2	Air duct/extension piece
#	optional
*	Installation near the floor as in 7
**	Cover plate shortened by others
1 – 3	Up to EI 90 S
4 – 6	EI 30 S
7	EI 30 to EI 90 S

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 45*
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, *5.3 'General installation information' on page 28* ff
- General information on installation with installation kit TQ2, *on page 35*

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

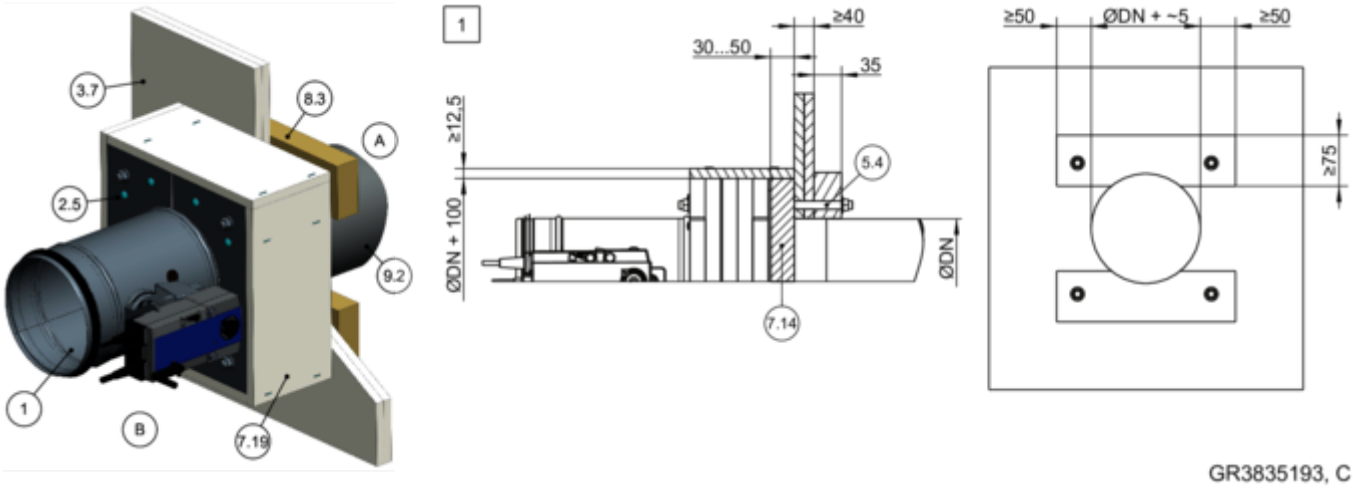

Fig. 138: Dry mortarless installation into a shaft wall with metal support structure, with installation kit WA2

1 FKRS-EU
2.5 Installation kit WA2
3.7 Shaft wall with metal support structure, cladding on one side
5.4 Threaded rod (M8 or M10) as push through installation with washers and nuts
7.14 Reinforcing board (square, DN + 100 mm), calcium silicate, thickness = 30 – 50 mm or mineral wool, ≥ 1000 °C, ≥ 140 kg/m³, thickness = 50 mm
7.19 Fire-resistant cladding (fire-rated plasterboard panel, thickness ≥ 12.5 mm)
8.3 PROMATECT®-LS board, d = 35 mm
9.2 Air duct/extension piece
[1] Up to EI 90 S

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 46*
- ≥ 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

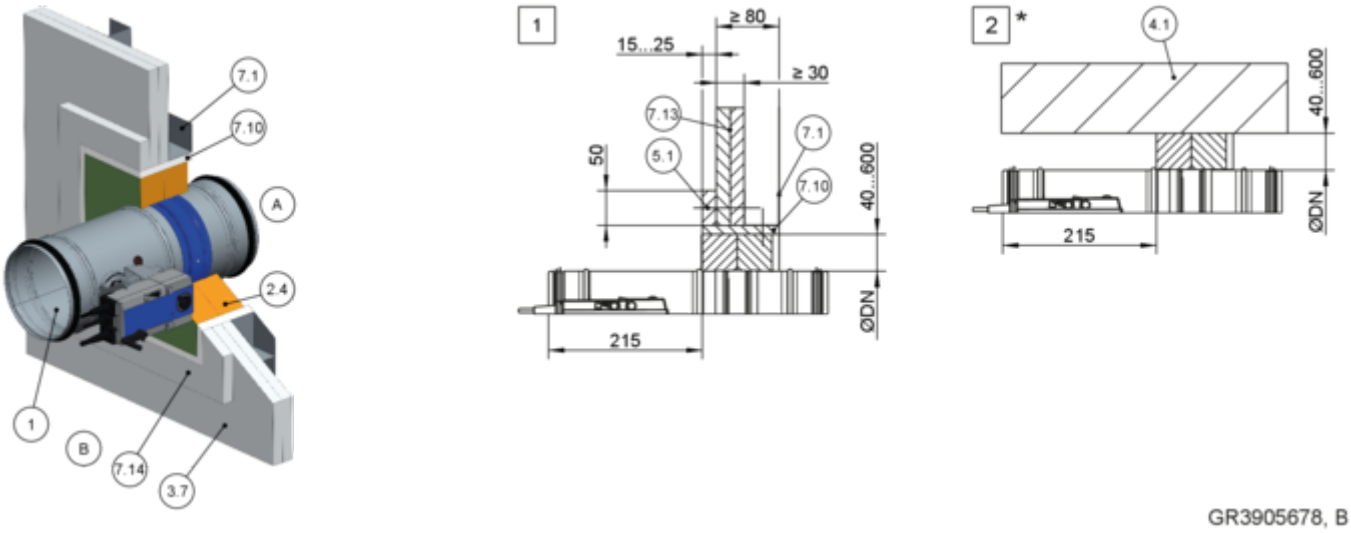

Fig. 139: Dry mortarless installation with fire batt in shaft wall with metal support structure

1	FKRS-EU
2.4	Fire batt with ablative coating
3.7	Shaft wall with metal support structure, cladding on one side
4.1	Solid ceiling slab/solid floor
5.1	Dry wall screw
7.1	UW section
7.10	Trim panels
7.13	Cladding, two layers
7.14	Reinforcing board of the same material as the wall
*	Installation near the floor as in 2
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 5.14 'Fixing the fire damper' on page 235*
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↳ *5.3 'General installation information' on page 28* ff
- General information on installation with fire batt, ↳ *on page 36*

5.10 Shaft walls without metal support structure

5.10.1 General information

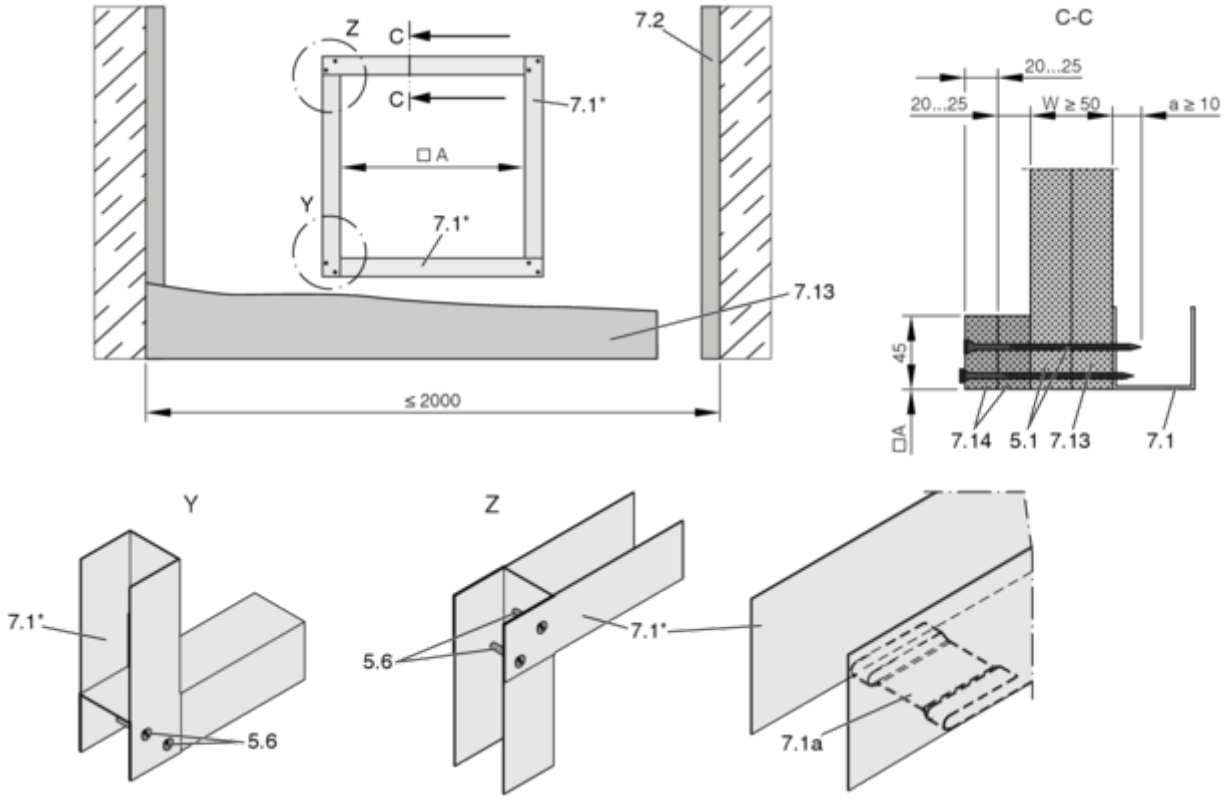

Fig. 140: Shaft wall without metal support structure and with cladding on one side

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

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

[1)] Note the maximum size for the fire batt
[2] Installation opening tolerance ± 2 mm

Additional requirements

- Shaft wall without metal support structure,
  ↳ *on page 41*

5.10.2 Mortar-based installation

Mortar-based installation into shaft wall without metal support structure

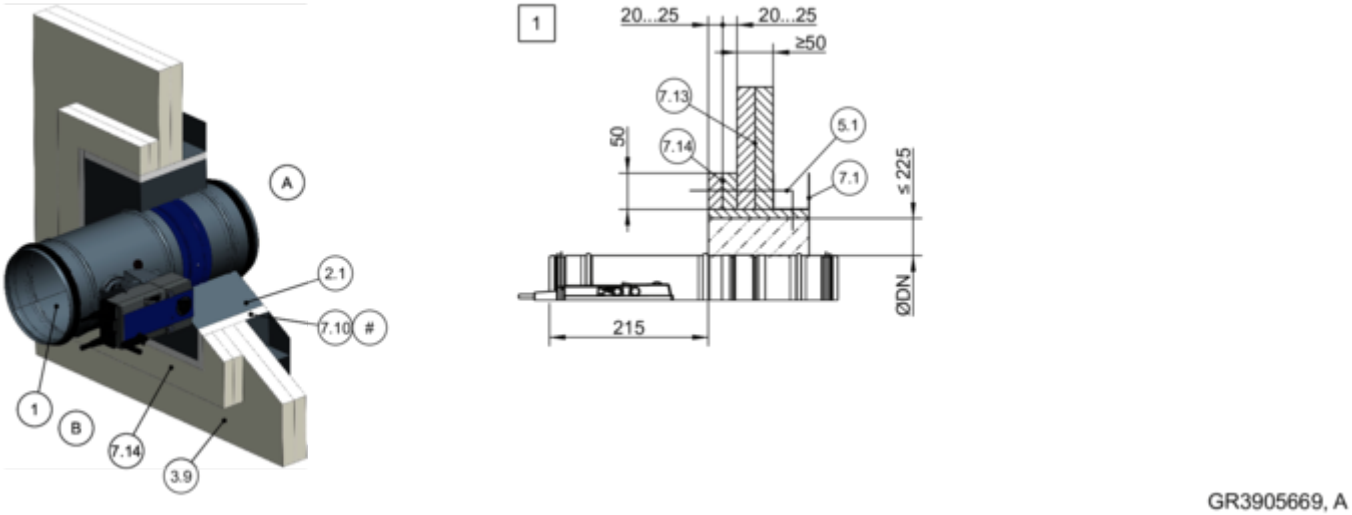

Fig. 141: Mortar-based installation into shaft wall without metal support structure

1	FKRS-EU	7.10	Trim panels
2.1	Mortar	7.13	Cladding, two layers
3.9	Shaft wall without metal support structure, cladding on one side	7.14	Reinforcing board of the same material as the wall
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame	#	optional
7.1	UW section	1	Up to EI 90 S

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

- Shaft wall, ↬ *on page 41*
- Distance to load-bearing components ≥ 75 mm
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↬ *5.3 'General installation information' on page 28* ff
- General information on mortar-based installation, ↬ *'**Mortar-based installation**' on page 34*

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

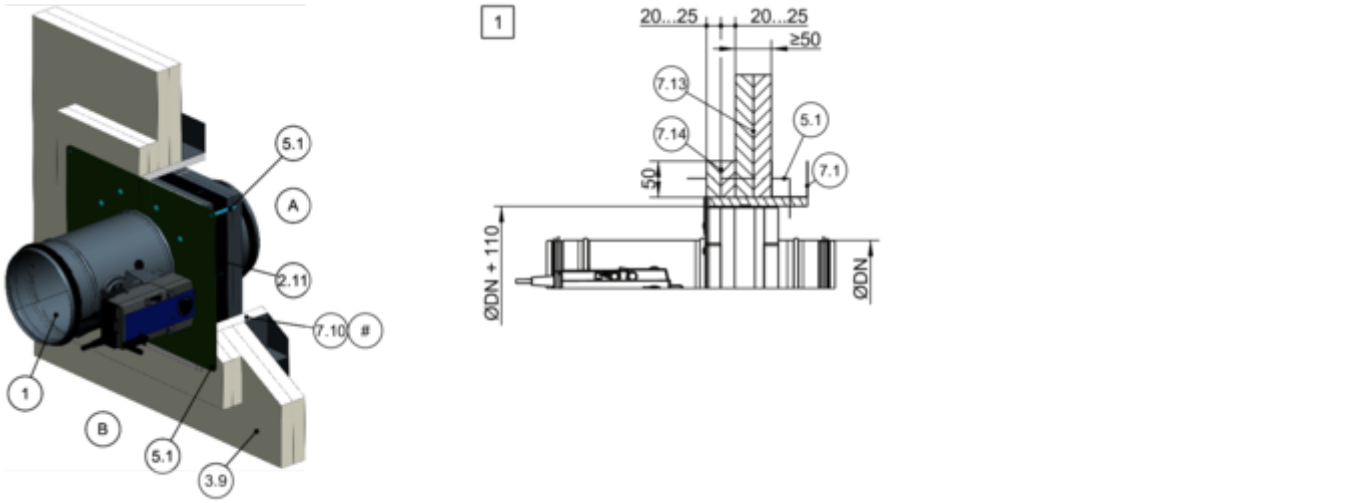

Fig. 142: Dry mortarless installation into a shaft wall without metal support structure, with installation kit TQ2

1	FKRS-EU
2.11	Installation kit TQ2 with cover plate
3.9	Shaft wall without metal support structure, cladding on one side
5.1	Dry wall screw, min. 10 mm screwed into the metal stud frame
7.1	UW section
7.10	Trim panels
7.13	Cladding, two layers
7.14	Reinforcing board of the same material as the wall
#	optional
1	Up to EI 90 S

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

- Shaft wall, ↳ *on page 41*
- Installation kit TQ2, ↳ *5.4.3 'Installation kit TQ2' on page 45*
- ≥ 200 mm distance between two fire dampers in separate installation openings
- > 100 mm distance from the fire damper to load-bearing/adjacent structural elements
- General installation information, ↳ *5.3 'General installation information' on page 28* 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

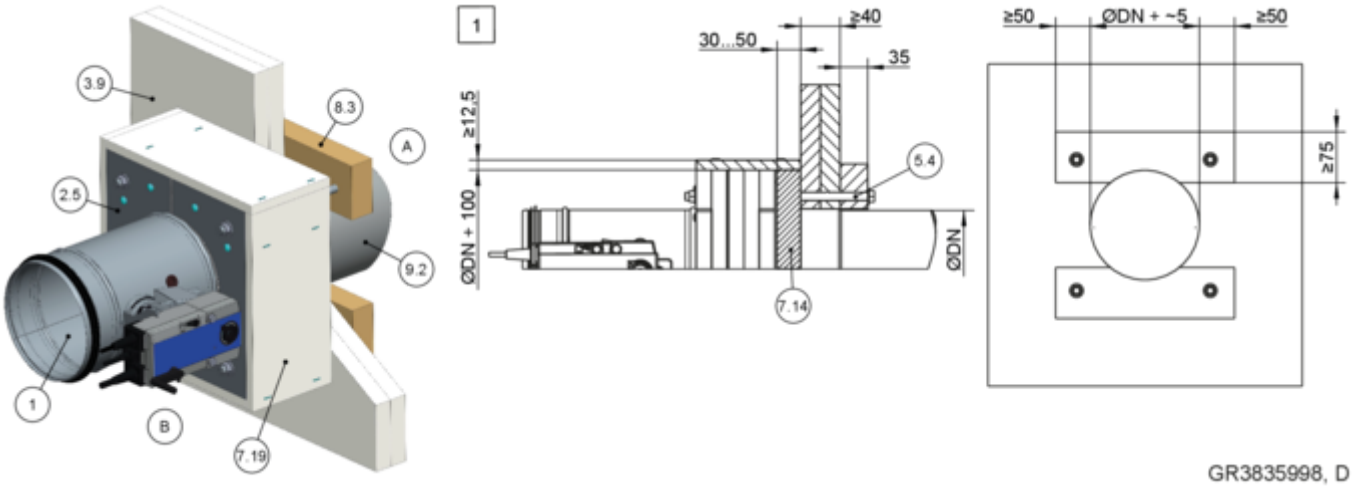

Fig. 143: Dry mortarless installation into a shaft wall without metal support structure, with installation kit WA2

1 FKRS-EU
2.5 Installation kit WA2
3.9 Shaft wall without metal support structure, cladding on one side
5.4 Threaded rod (M8 or M10) as push through installation with washers and nuts
7.14 Reinforcing board (square, DN + 100 mm), calcium silicate, thickness = 30 – 50 mm or mineral wool, ≥ 1000 °C, ≥ 140 kg/m³, thickness = 50 mm
7.19 Fire-resistant cladding (fire-rated plasterboard panel, thickness ≥ 12.5 mm)
8.3 PROMATECT®-LS board, d = 35 mm
9.2 Duct
[1] Up to EI 90 S

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

- Shaft wall, *on page 41*
- Installation kit WA2, *5.4.4 'Installation kit WA2' on page 46*
- ≥ 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

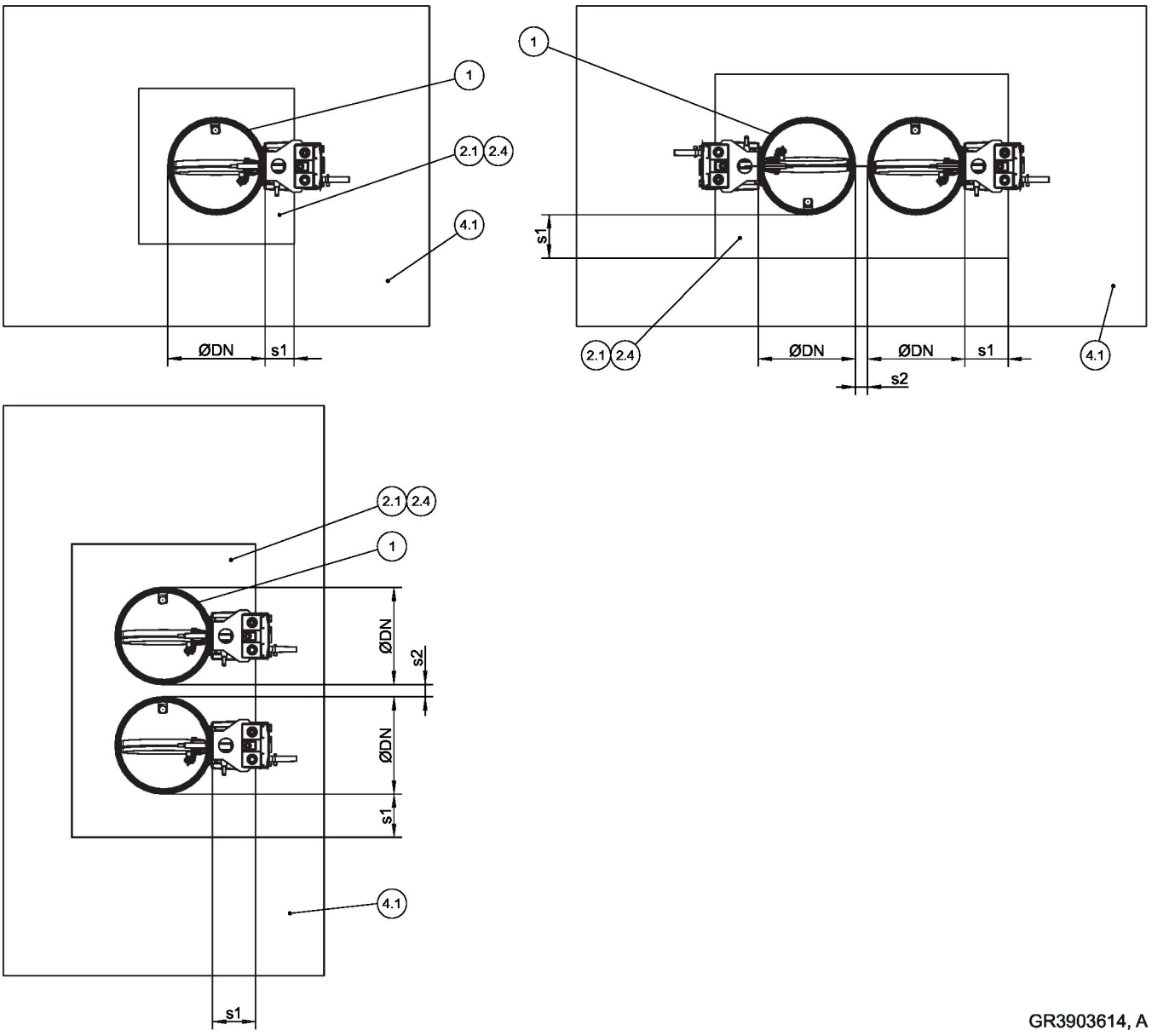

Fig. 144: Solid ceiling slabs – arrangement/distances, side-by-side arrangement by way of example

1 FKRS-EU
2.1 Mortar
2.4 Fire batt with ablative coating
4.1 Solid ceiling slab
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	∅nominal width + max. 450	≤ 225	45 – 225
Dry mortarless installation with ER	*5.4.2 'Installation block ER' on page 44*	central installation	≥ 200 [2]
Dry mortarless installation with fire batt [1]	☐A = ∅nominal width + max. 1200	40 – 600	≥ 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

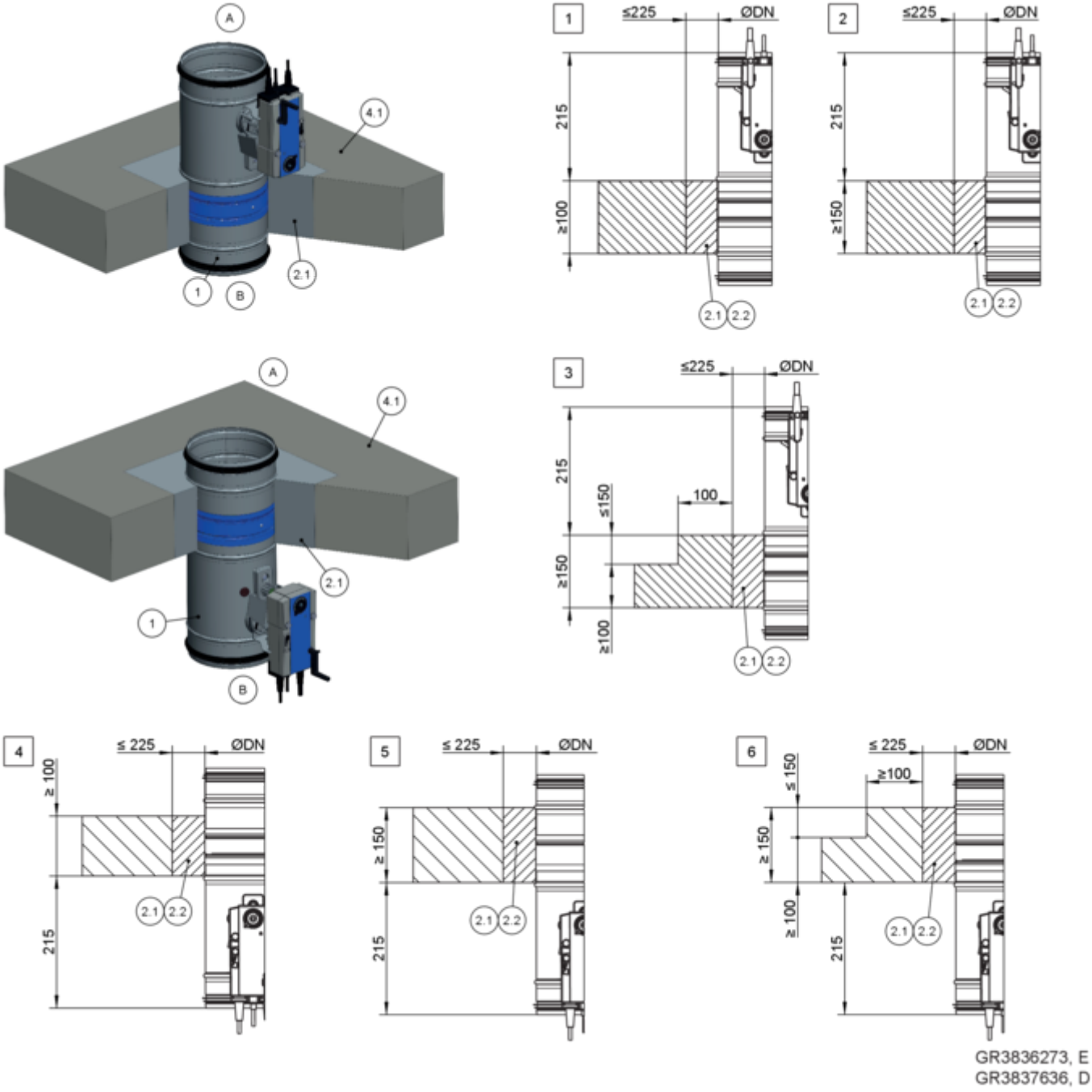

Fig. 145: Mortar-based installation into a solid ceiling slab, suspended or upright

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

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

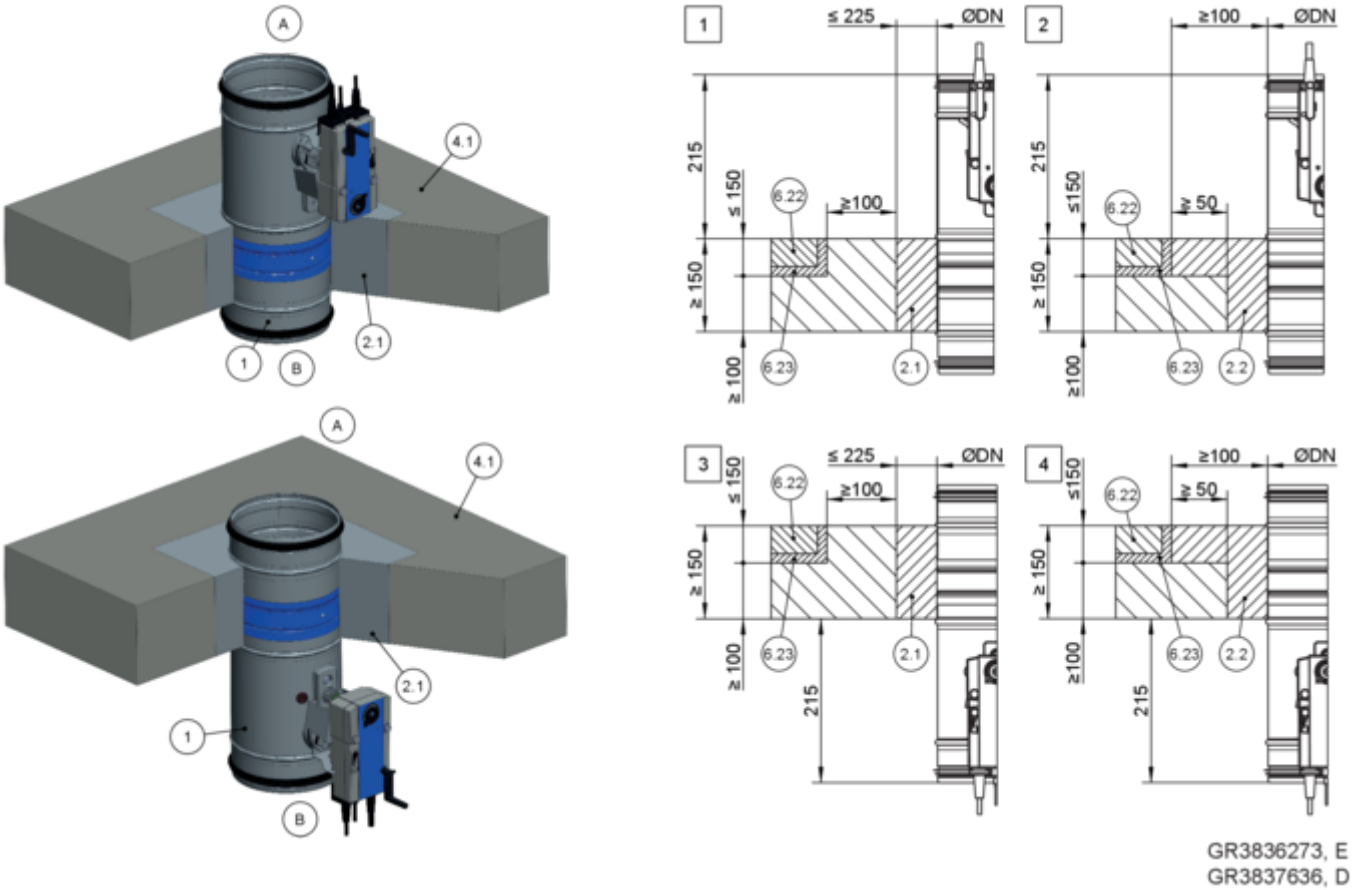

Fig. 146: Mortar-based installation into a solid ceiling slab with screed and footfall sound insulation, suspended or upright

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

Mortar-based installation into a solid ceiling slab, flange to flange

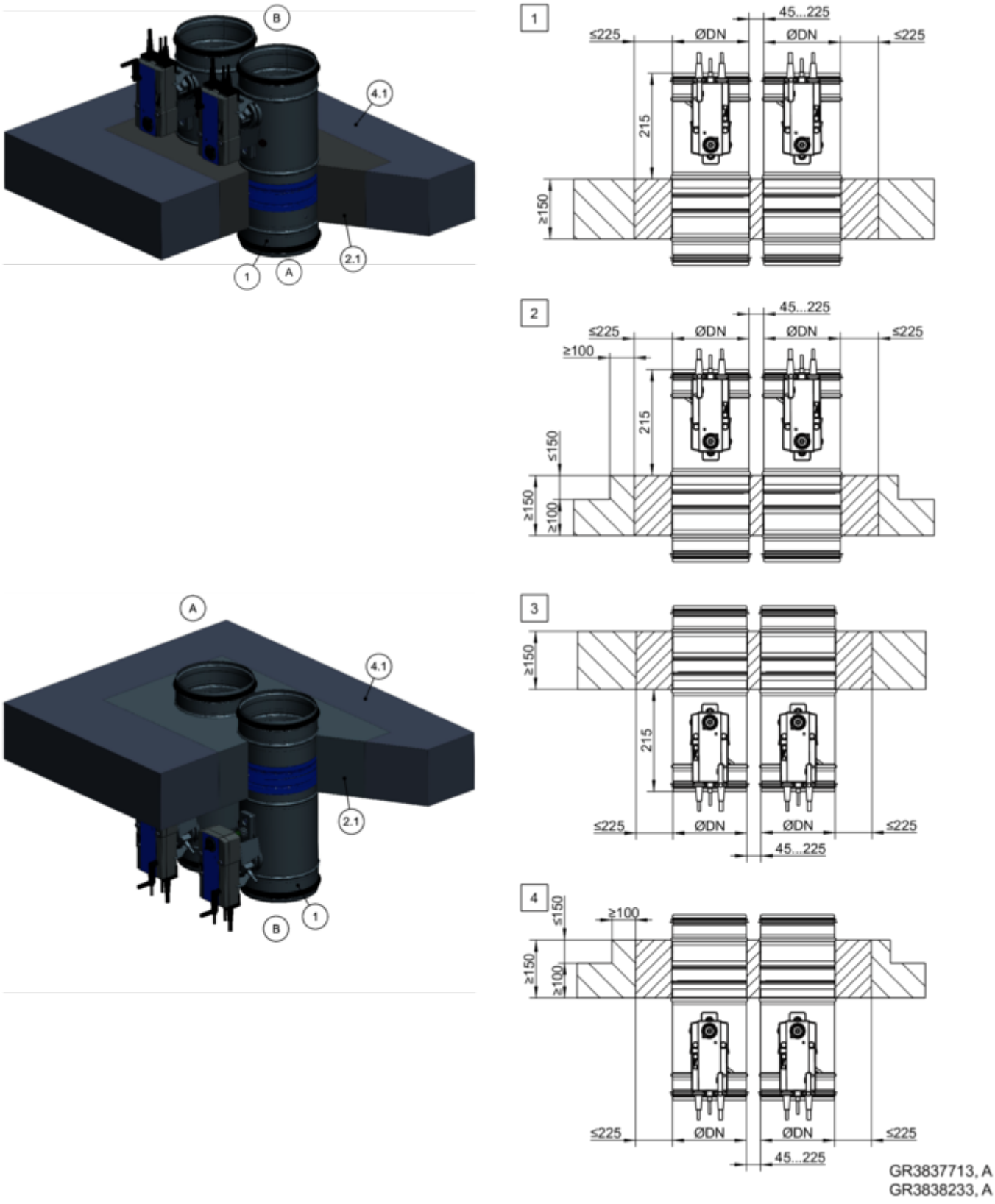

Fig. 147: Mortar-based installation into solid ceiling slab, "flange to flange", upright and suspended (also applicable for blending into the screed according to Fig. 145 *)*

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

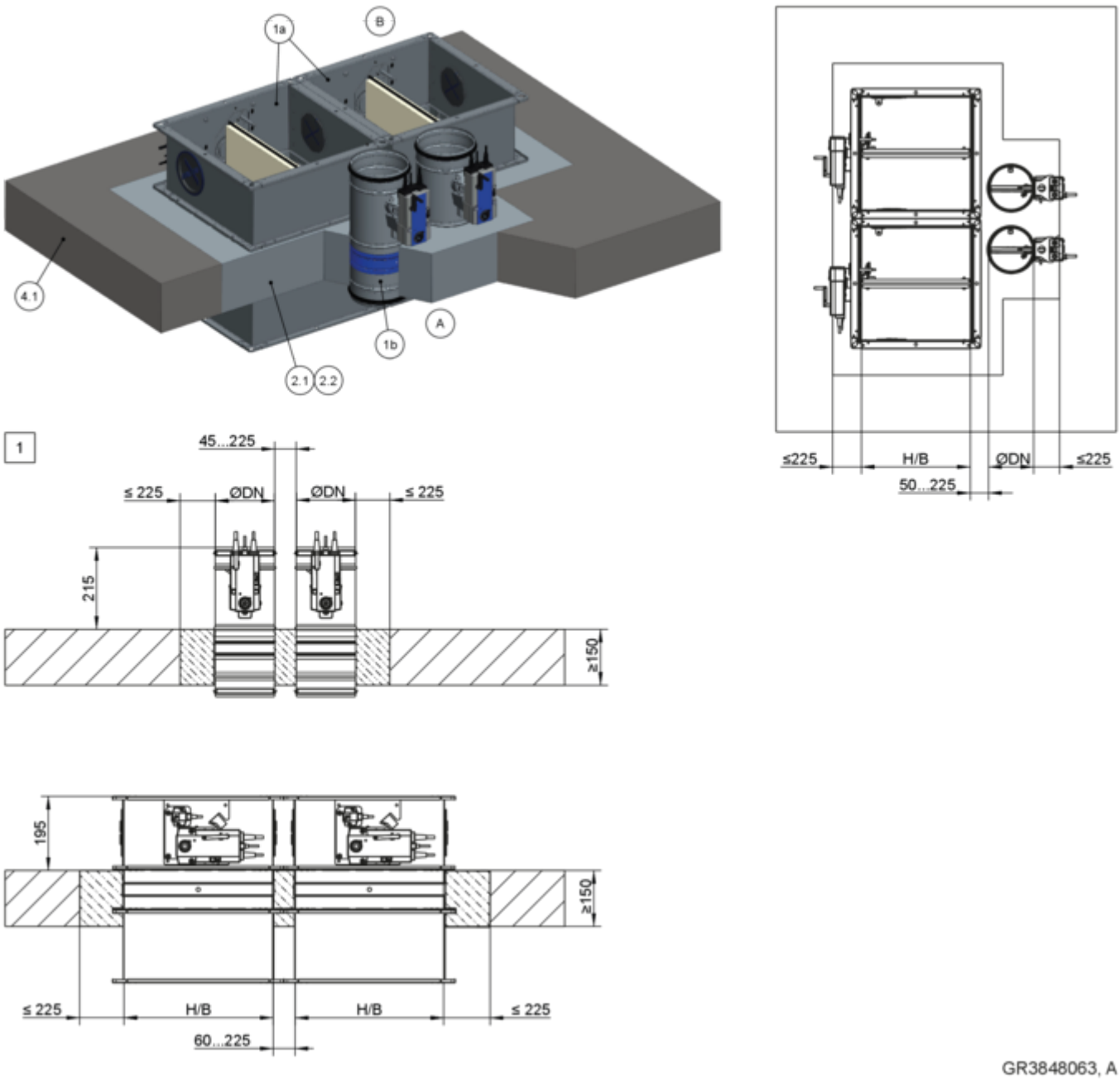

Fig. 148: Mortar-based installation into a solid ceiling slab, FKRS-EU and FK2-EU, combined

1a	FKRS-EU	4.1	Solid ceiling slab
1b	FK2-EU up to B × H ≤ 800 × 400 mm	1	Up to EI 90 S
2.1	Mortar		

For combined installation please note:

- Overall fire damper area ≤ 1.2 m^2 .
- The number of fire dampers in an installation opening is limited by their size (B × H for FK2-EU and/or ∅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 28* 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

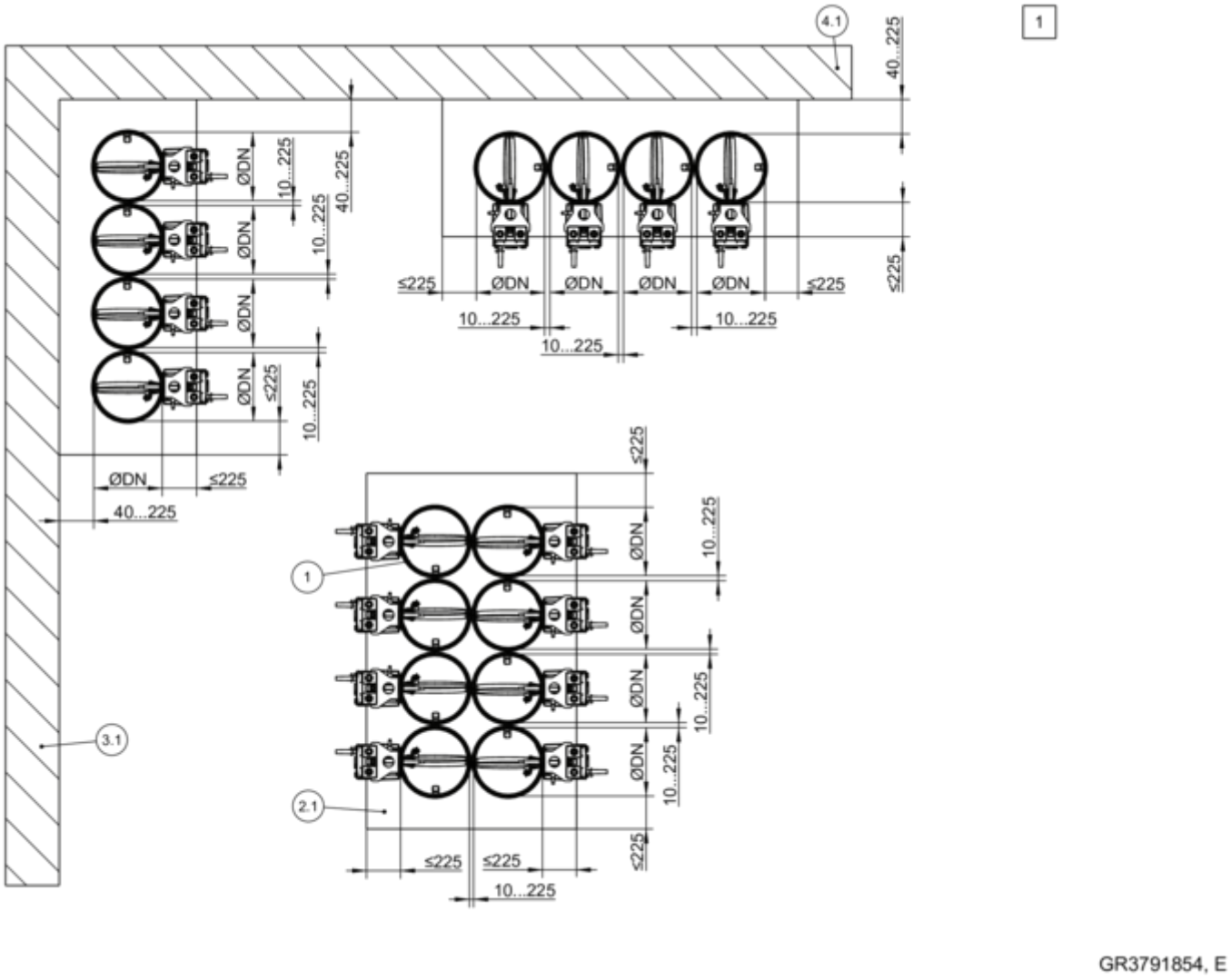

Fig. 149: Mortar-based installation – multiple installation into one installation opening

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

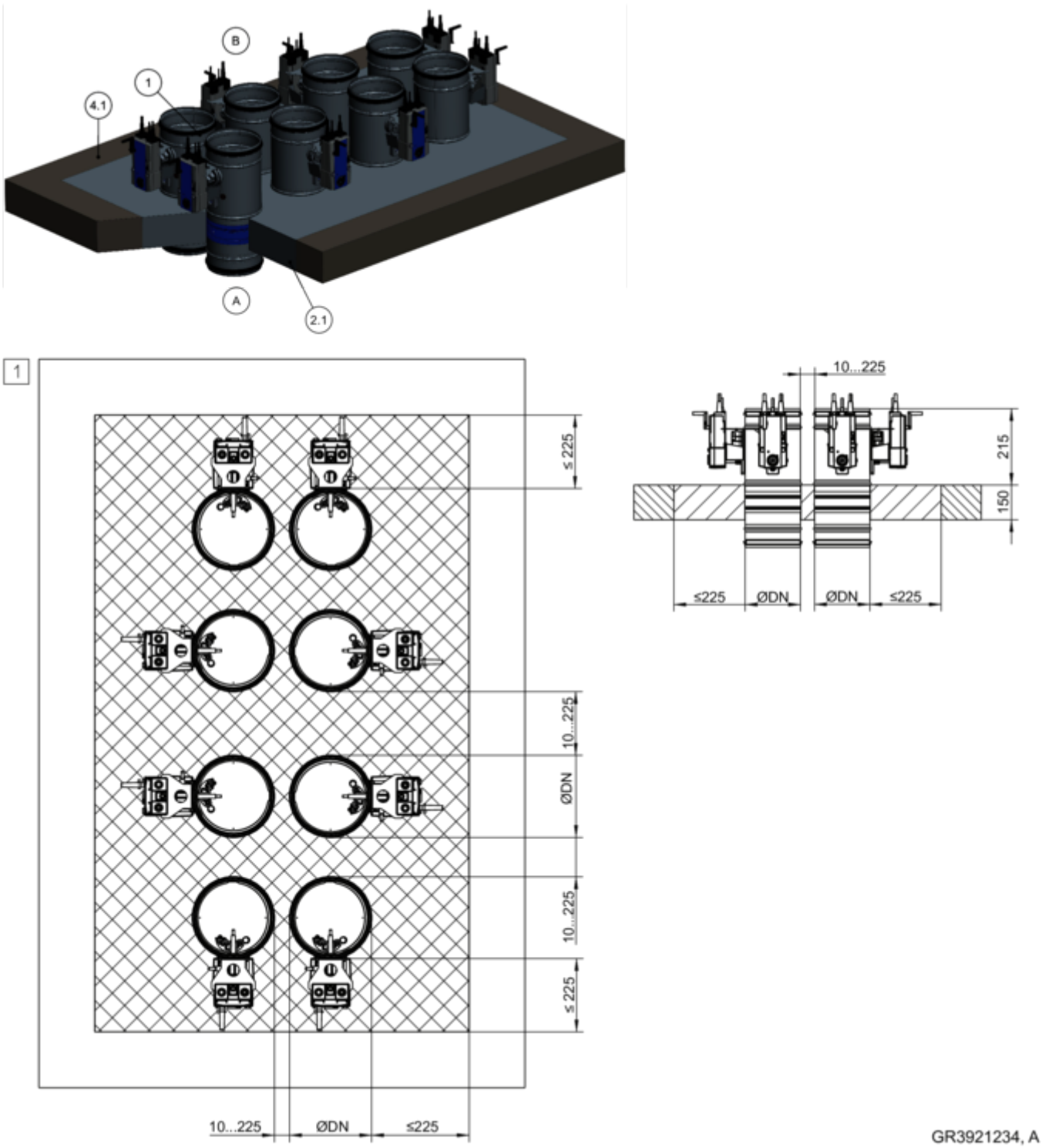

Fig. 150: Mortar-based installation – multiple installation into one installation opening, illustration shows upright installation (applies also to suspended installation)

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

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

- Solid ceiling slab, *on page 42*
- Overall fire damper area ≤ 1.2 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 ≥ 40 mm

5.11.4 Mortar-based installation into a concrete base

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

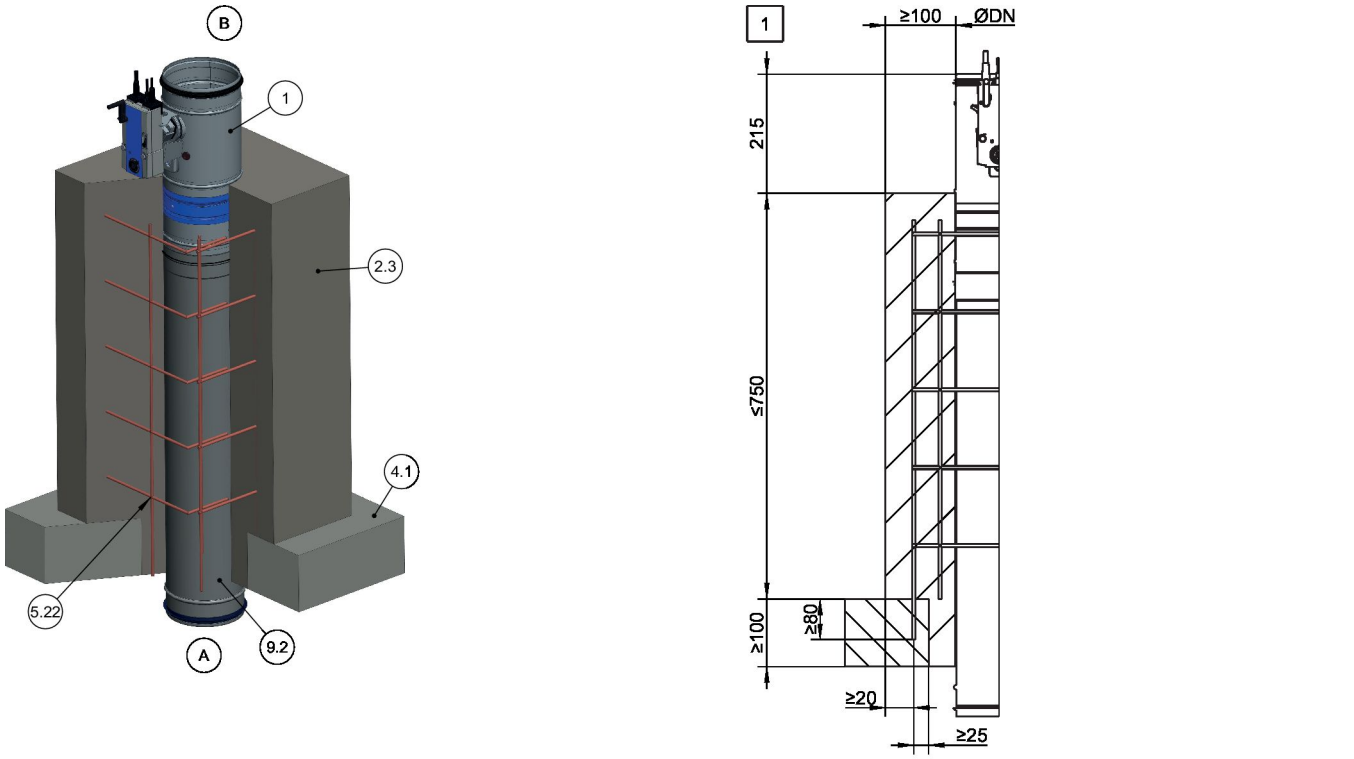

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Fig. 151: Mortar-based installation with concrete base into a solid ceiling slab, upright

1 FKRS-EU
2.3 Concrete base
4.1 Solid ceiling slab
5.22 Steel fabric, ∅ ≥ 8 mm, mesh aperture 150 mm, or equivalent, for number of fixing points: 4
9.2 Air duct/extension piece
1 Up to EI 120 S

Minimum number of fixing points in the ceiling slab

B ≥	A ≥													
	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	2	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	–	–	–

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

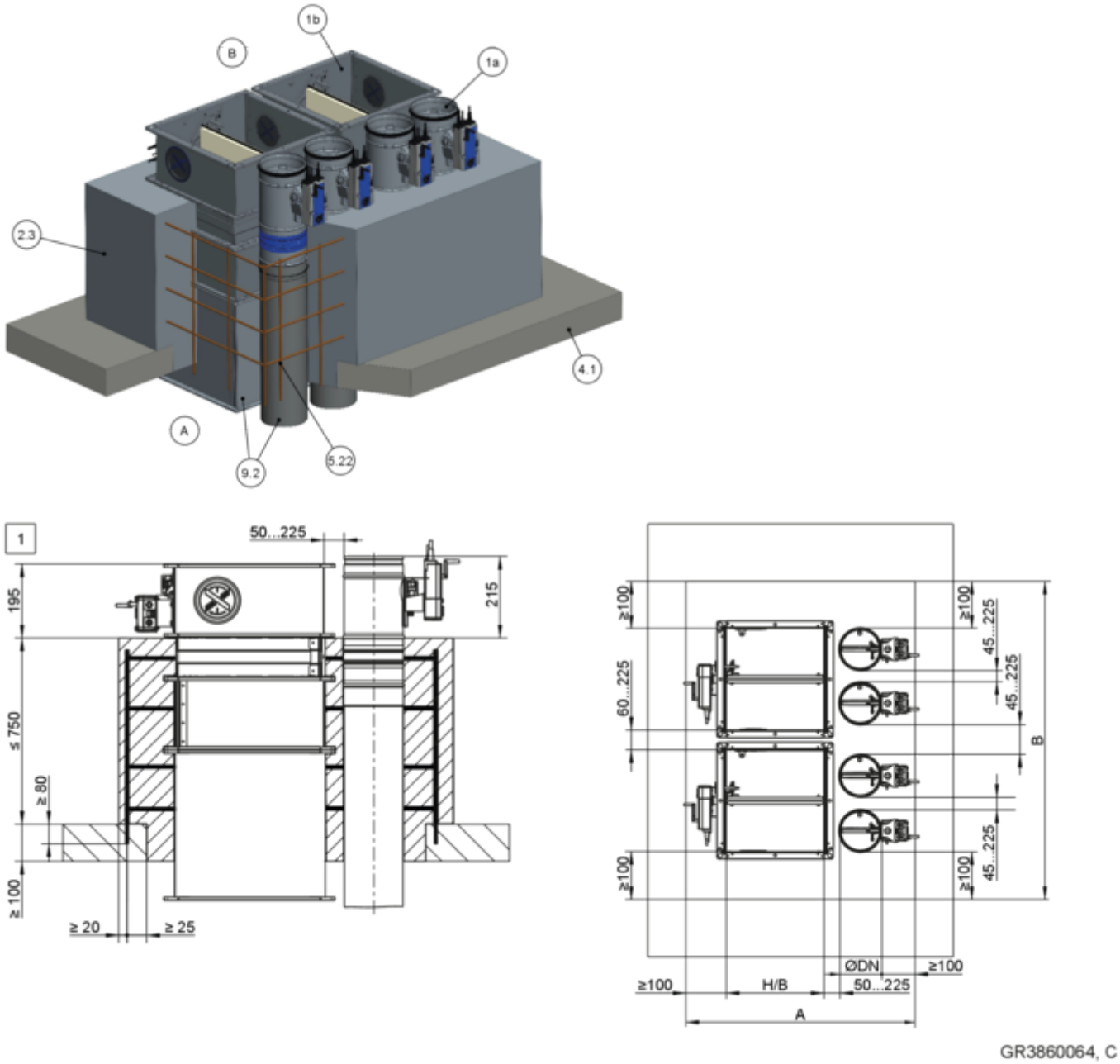

Fig. 152: Mortar-based installation with concrete base into a solid ceiling slab, upright, combined, FKRS-EU and FK2-EU

1a FKRS-EU
1b FK2-EU up to B × H ≤ 800 × 400 mm
2.3 Concrete base
4.1 Solid ceiling slab
5.22 Steel fabric, ∅ ≥ 8 mm, mesh aperture 150 mm, or equivalent, for number of fixing points see table ↳ *199*
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 × H for FK2-EU and/or ∅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 ‘ *Minimum number of fixing points in the ceiling slab’ on page 199*

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 ≤ 150 mm do not require reinforcement
- General installation information, *5.3 ‘General installation information’ on page 28* ff

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

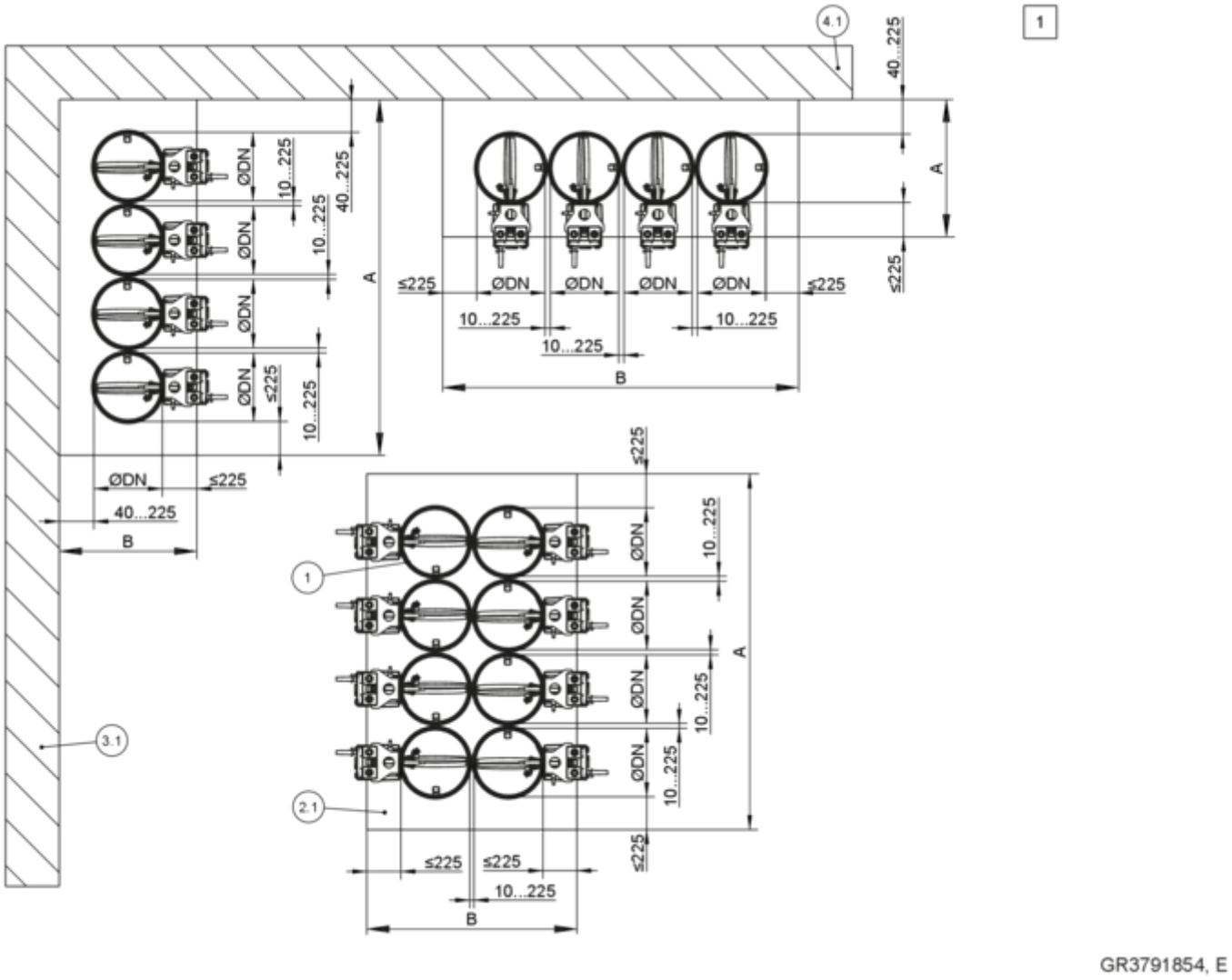

Fig. 153: Mortar-based installation – multiple installation into one installation opening

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

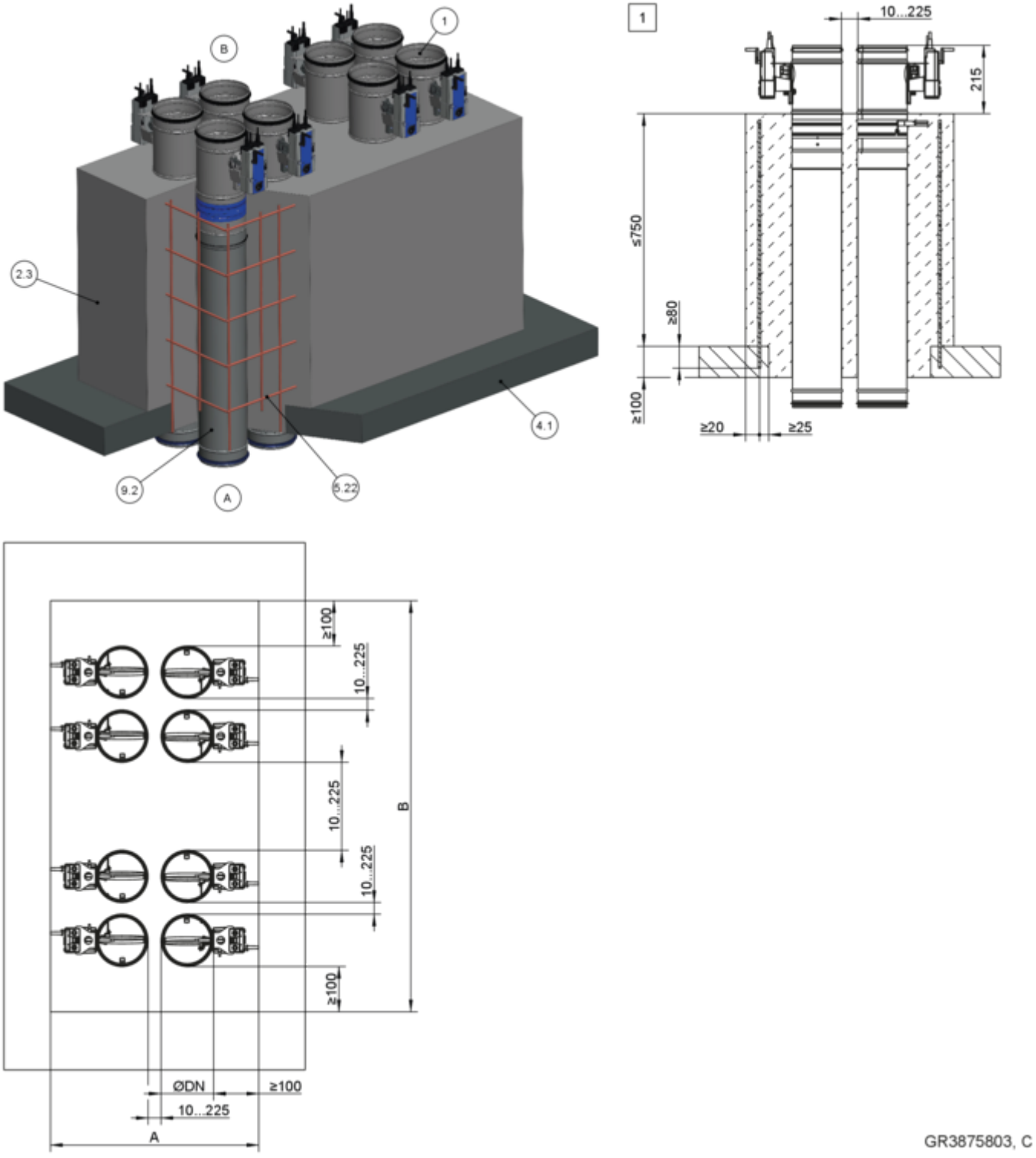

Fig. 154: Mortar-based installation with concrete base into a solid ceiling slab, upright, multiple installation

1 FKRS-EU
2.3 Concrete base
4.1 Solid ceiling slab
5.22 Steel fabric, ∅ ≥ 8 mm, mesh aperture 150 mm, or equivalent, for number of fixing points see table *199*
9.2 Air duct/extension piece
1 Up to EI 90 S

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 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 ≥ 40 mm
- Minimum number of fixing points in the ceiling slab ↳ *'Minimum number of fixing points in the ceiling slab' on page 199*

5.11.6 Mortar-based installation in hollow concrete block ceiling

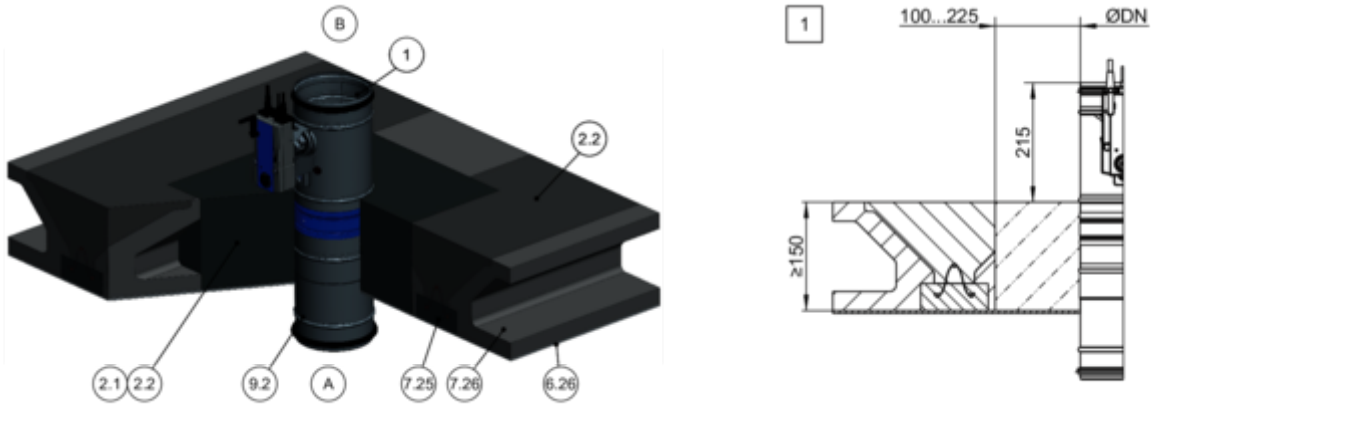

Fig. 155: Mortar-based installation in hollow block ceiling, drawn standing (also applies to suspended arrangement)

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

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 28* ff
- General information on mortar-based installation, *'**Mortar-based installation**' on page 34*

5.11.7 Mortar-based installation in hollow core ceiling

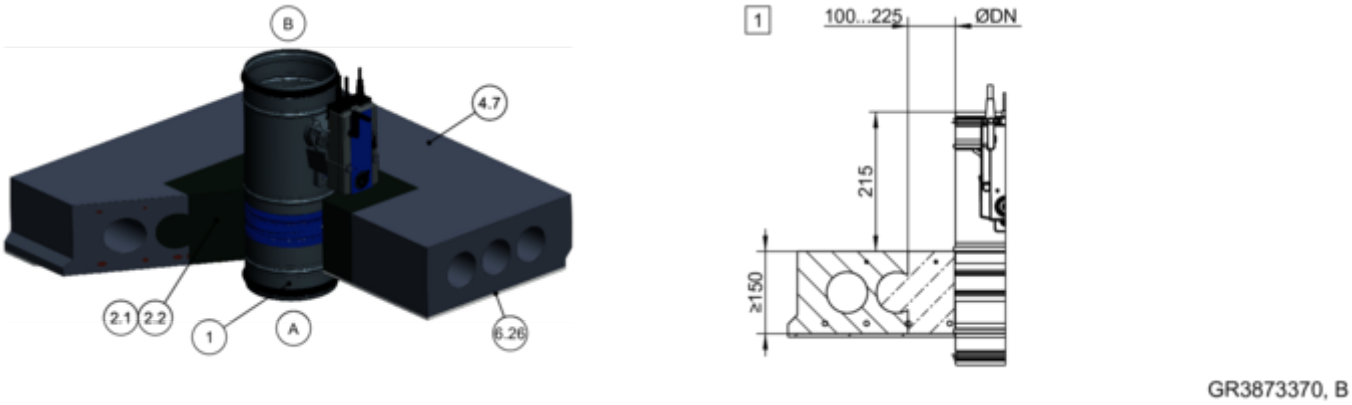

Fig. 156: Mortar-based installation in hollow chamber ceiling, drawn standing (also applies to suspended arrangement)

1 FKRS-EU
2.1 Mortar
2.2 Concrete
4.7 Reinforced hollow core slab*
6.26 Cement plaster*
1 Up to EI 90 S
* The illustration is an example; other ceiling constructions may be possible depending on make and local conditions

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 28* 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

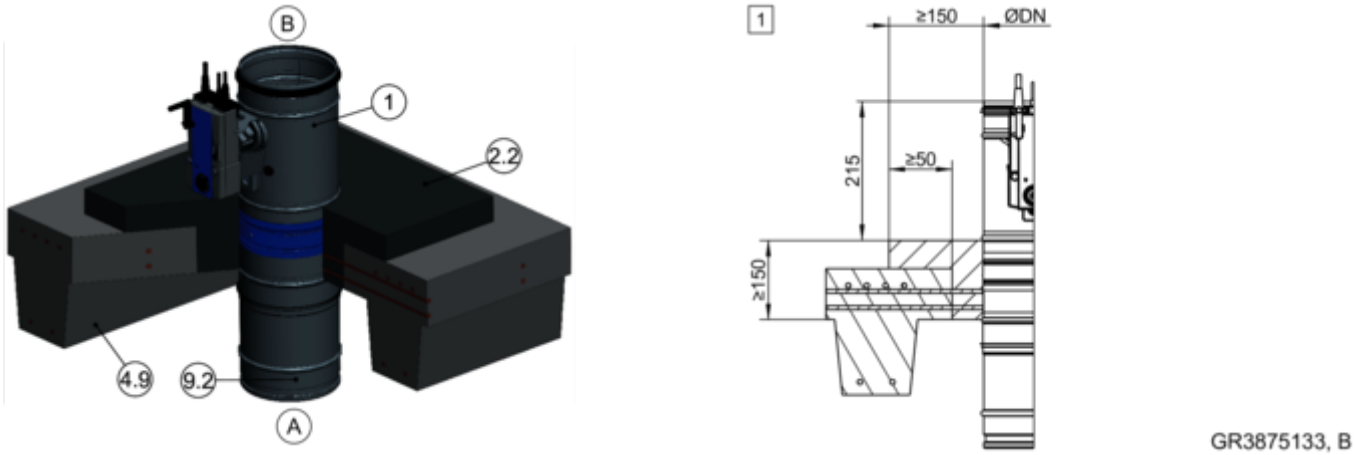

Fig. 157: Mortar-based installation in ribbed ceiling

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

Additional requirements: mortar-based installation into ribbed ceilings

- Ribbed ceiling, *on page 42*
- Concrete bases with H ≤ 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 28* ff

5.11.9 Mortar-based installation in composite ceiling

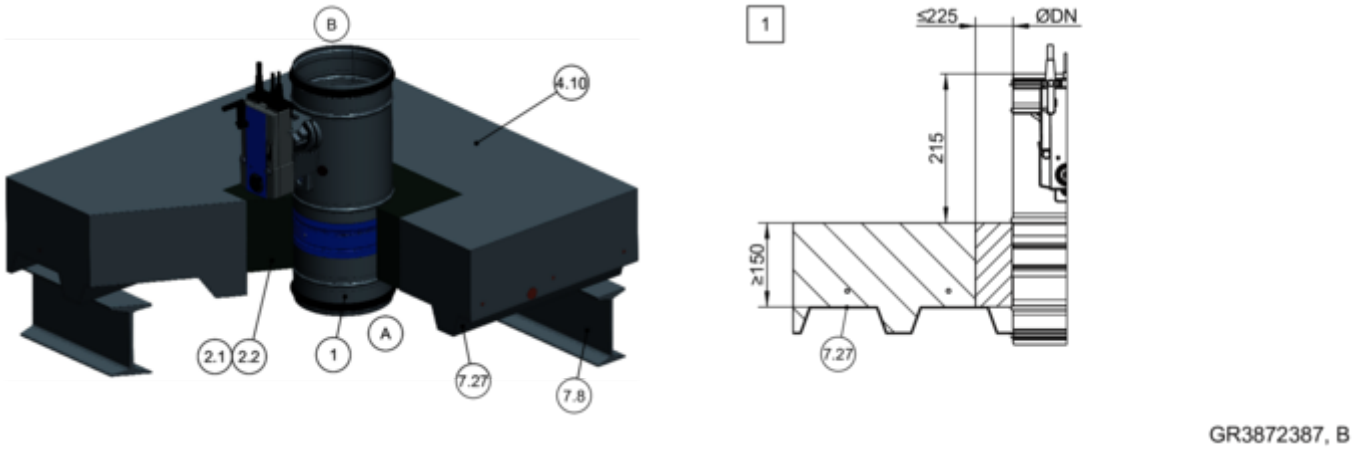

Fig. 158: Mortar-based installation in composite ceiling

1	FKRS-EU
2.1	Mortar
2.2	Concrete
4.10	Reinforced composite ceiling*
7.8	Steel girder
7.27	Troughed sheet
1	Up to EI 90 S
*	The illustration is an example; other ceiling constructions may be possible depending on make and local conditions

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 28* 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

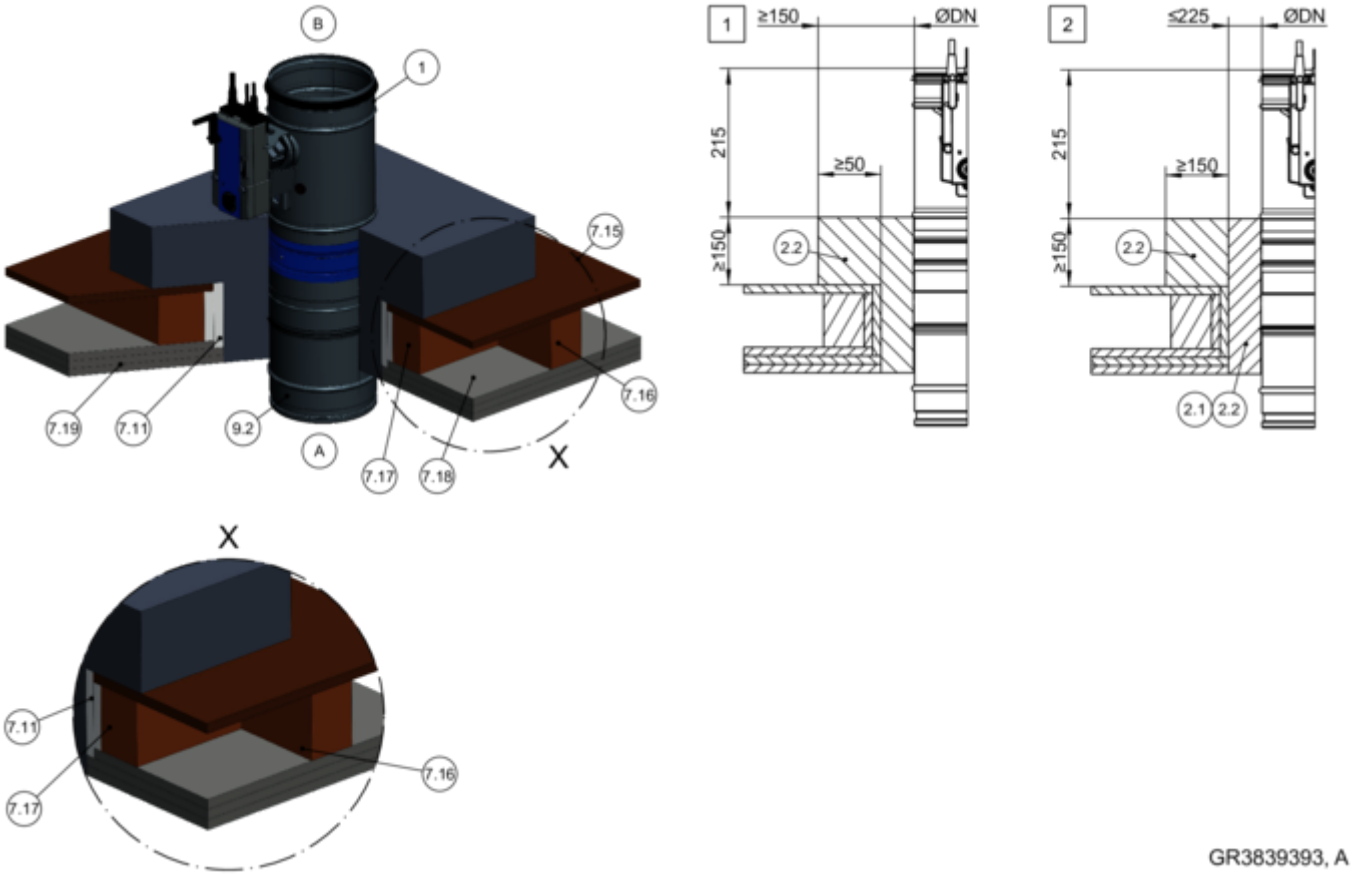

Fig. 159: Mortar-based installation in solid ceiling slab in combination with wooden beam/gluelam ceiling

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

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

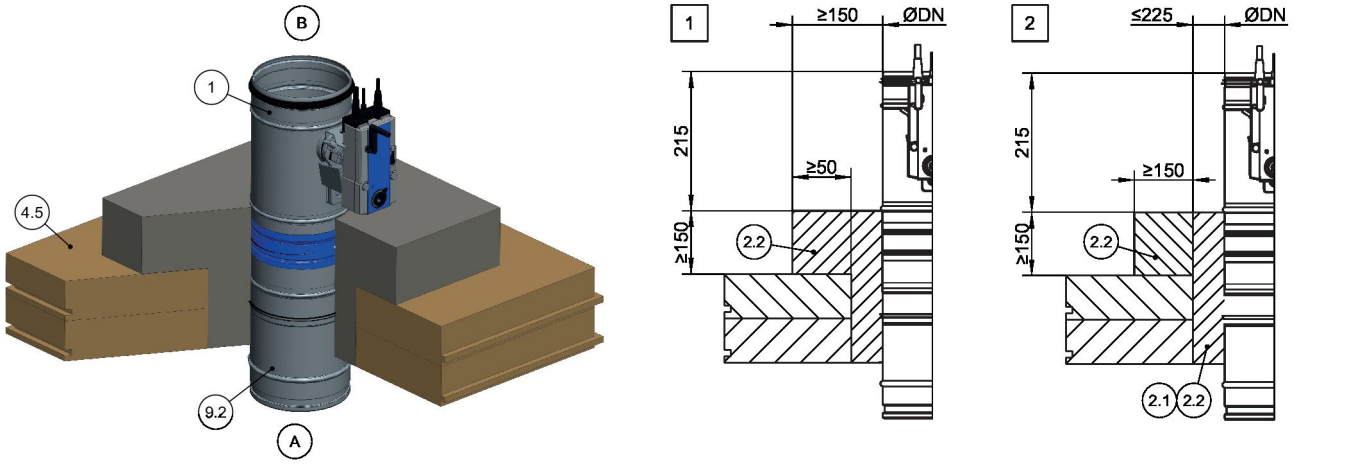

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Fig. 160: Mortar-based installation in solid ceiling slab in combination with solid wood ceiling

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)

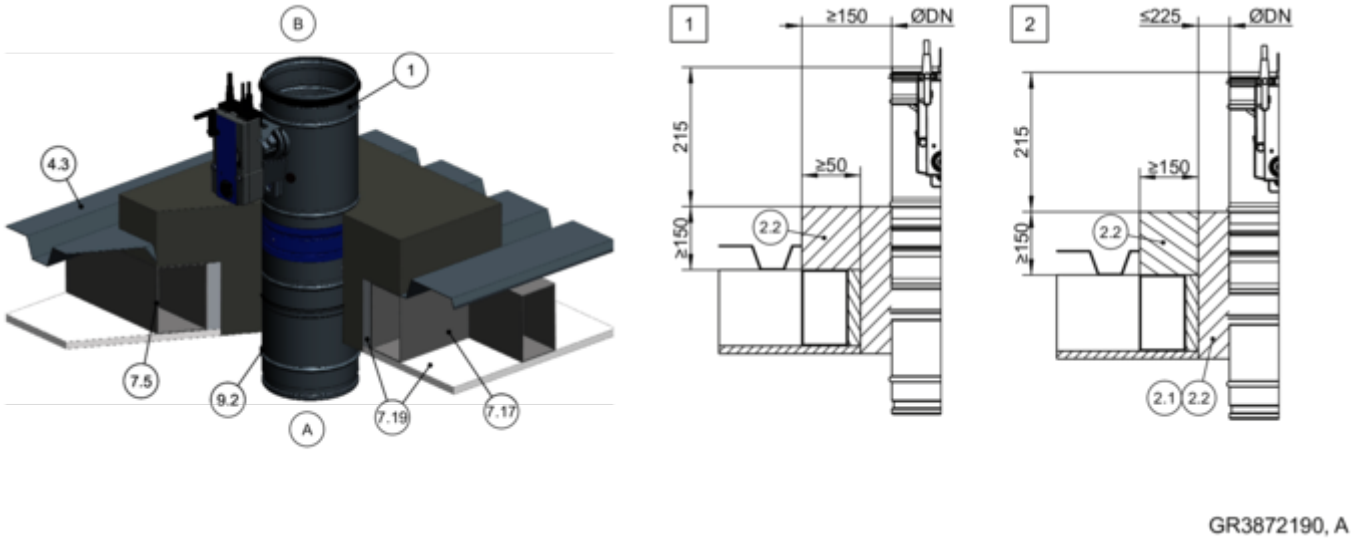


Fig. 161: Mortar-based installation into a solid ceiling slab in conjunction with a lightweight ceiling (Cadolto system)

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

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

- Modular ceiling, (Cadolto system), *on page 42*
- ≥ 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)

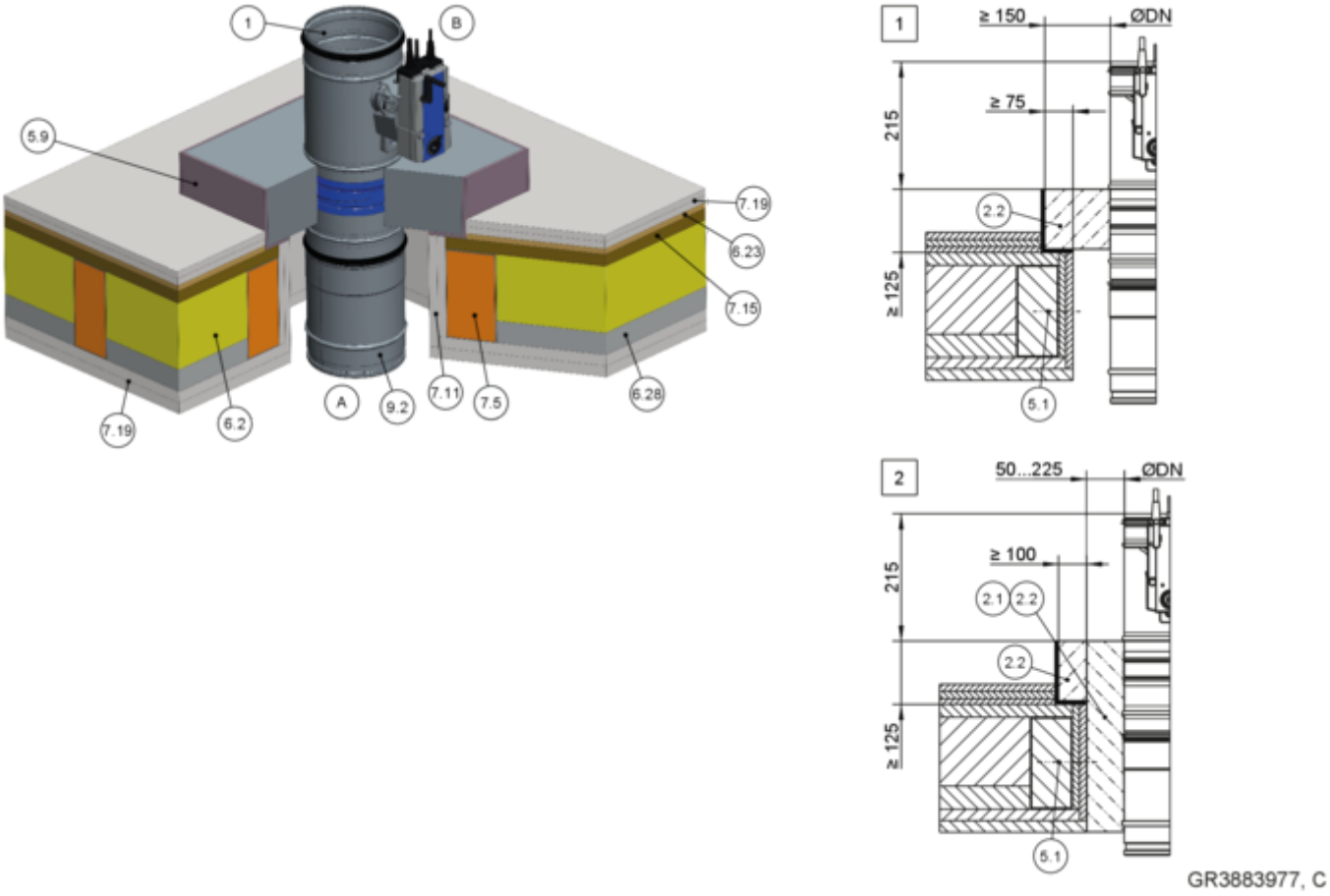


Fig. 162: Mortar-based installation in solid ceiling slab in combination with lightweight ceiling (ADK Modulraum system)

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 panels, 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 angle ≥ 130 × 80 × 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 lightweight ceiling: Ceiling construction according to ADK module room specifications.

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 42*
- ≥ 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. Reinforcement should meet structural requirements.

5.11.14 Dry mortarless installation in lightweight ceilings (ADK Modulraum system) with installation kit TQ2

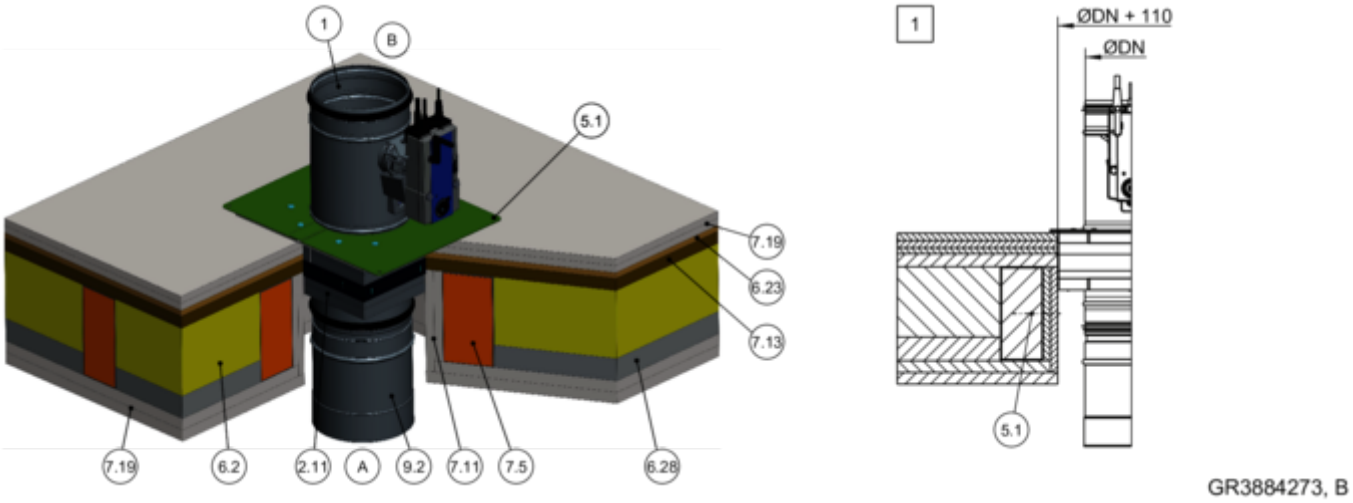


Fig. 163: Dry mortarless installation in lightweight ceiling (ADK modular room system) with installation kit TQ2, drawn standing (also applies to suspended arrangement)

1	FKRS-EU	7.5	Steel section with mineral wool filling
2.11	Installation kit TQ2 with cover plate	7.11	Trim panels, double layer, fire-resistant
5.1	Dry wall screw, min. 10 mm into steel section	7.15	Wood-based panel/wood plank
6.2	Mineral wool, A1, ≥ 1000 °C, 140 mm thick	7.19	Fire-resistant cladding
6.23	Footfall sound insulation	9.2	Air duct/extension piece
6.28	Counter position	1	Up to EI 90 S

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

Supplementary requirements: Dry mortarless installation in lightweight ceilings (ADK Modulraum system) with installation kit TQ2

- Modular ceiling (ADK system), *on page 42*
- Installation kit TQ2, *5.4.3 'Installation kit TQ2' on page 45*
- ≥ 155 mm distance between the fire damper and load-bearing components
- ≥ 310 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.

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. Insert the fire damper with installation kit centred up to the cover plate into the installation opening and fix it to the steel section using four screws.

   If the wall thickness is >115 mm , extend the fire damper on the installation side with an extension piece or a spiral duct.

5.11.15 Dry mortarless installation in combination with lightweight ceiling (ADK Modulraum system), with concrete base and installation kit TQ2

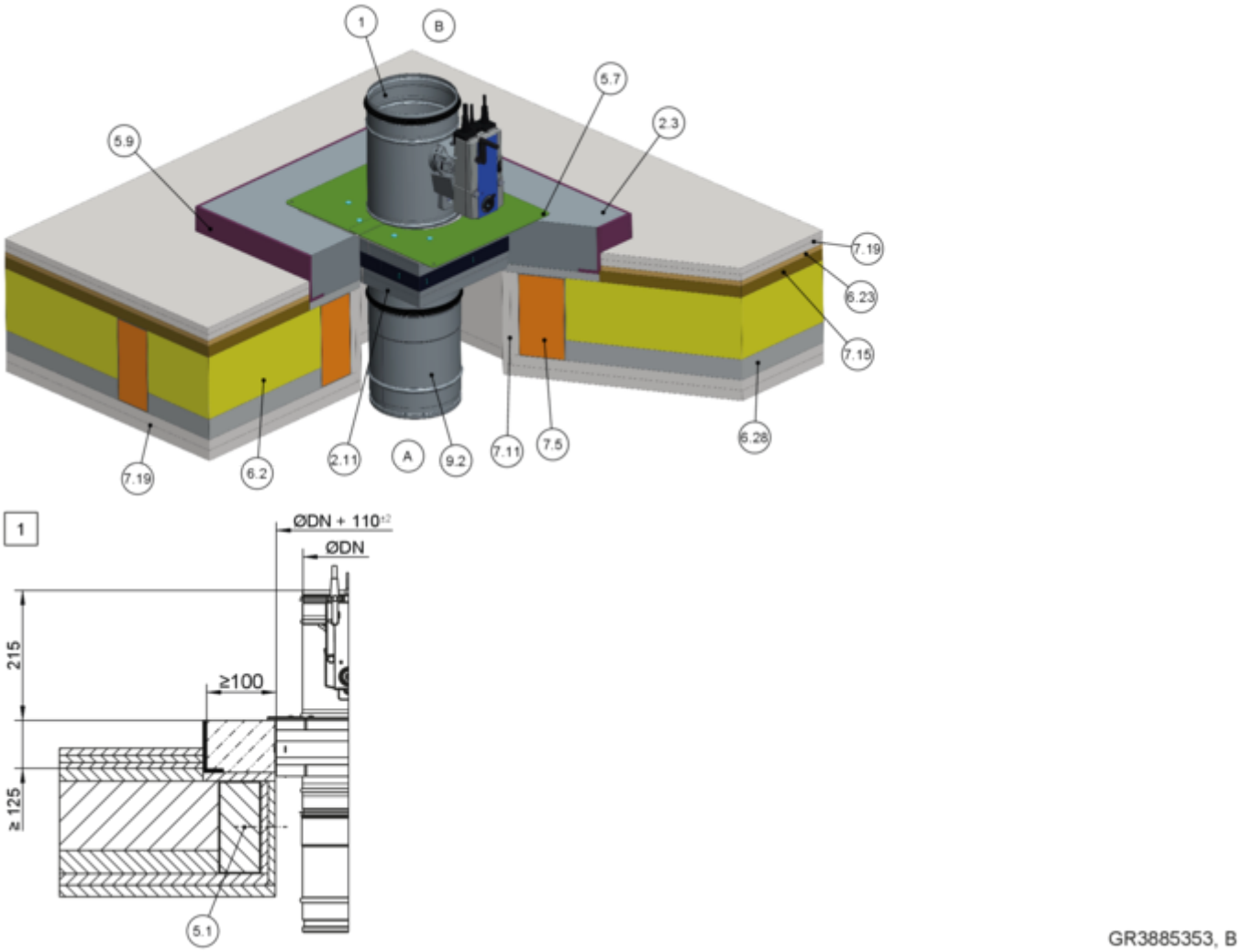


Fig. 164: Dry mortarless installation in combination with lightweight ceiling (ADK Modulraum system), with concrete base and installation kit TQ2

1	FKRS-EU	6.28	Counter position
2.3	Concrete base	7.5	Steel section with mineral wool filling
2.11	Installation kit TQ2 with cover plate	7.11	Trim panels, double layer, fire-resistant
5.7	Wall plug with suitability certificate for fire resistance	7.15	Wood-based panel/wood plank
5.9	Aluminium angle ≥ 130 × 80 × 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]	Up to EI 90 S

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

Supplementary requirements: Dry mortarless installation in combination with lightweight ceilings (ADK Modulraum system), with concrete base and installation kit TQ2

- Modular ceiling (ADK Modulraum system), *on page 42*
- Installation kit TQ2, *5.4.3 'Installation kit TQ2' on page 45*
- ≥ 155 mm distance between the fire damper and load-bearing components
- ≥ 310 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. Pour partial concrete slab (provide reinforcement according to static requirements).
4. Insert the fire damper with the installation kit centred up to the cover plate into the installation opening and fix it with four wall plugs (M6) with a fire safety suitability certificate.

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

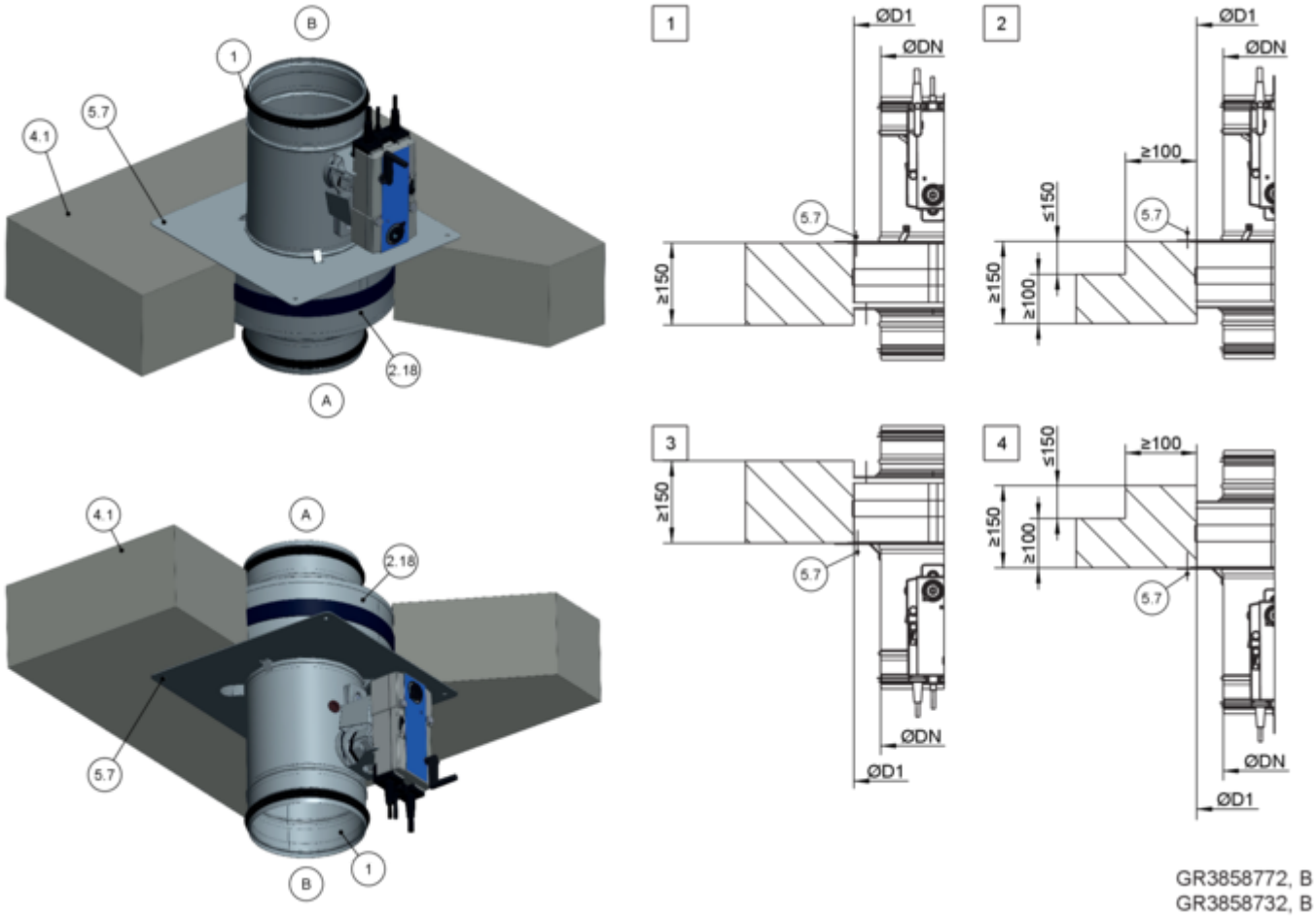


Fig. 165: Dry mortarless installation with installation block ER in solid ceiling slab, upright and suspended

1	FKRS-EU	5.7	Wallplug with fire protection suitability certificate, alternatively push through installation
2.18	Installation block ER with cover plate		
4.1	Solid ceiling slab	1 – 4	Up to EI 90 S

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 44*
- ≥ 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 28* ff
- General information on installation with installation block ER, *on page 35*

1. Create an appropriate installation opening by means of a cut hole ∅D1, *5.4.2 'Installation block ER' on page 44*
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.

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

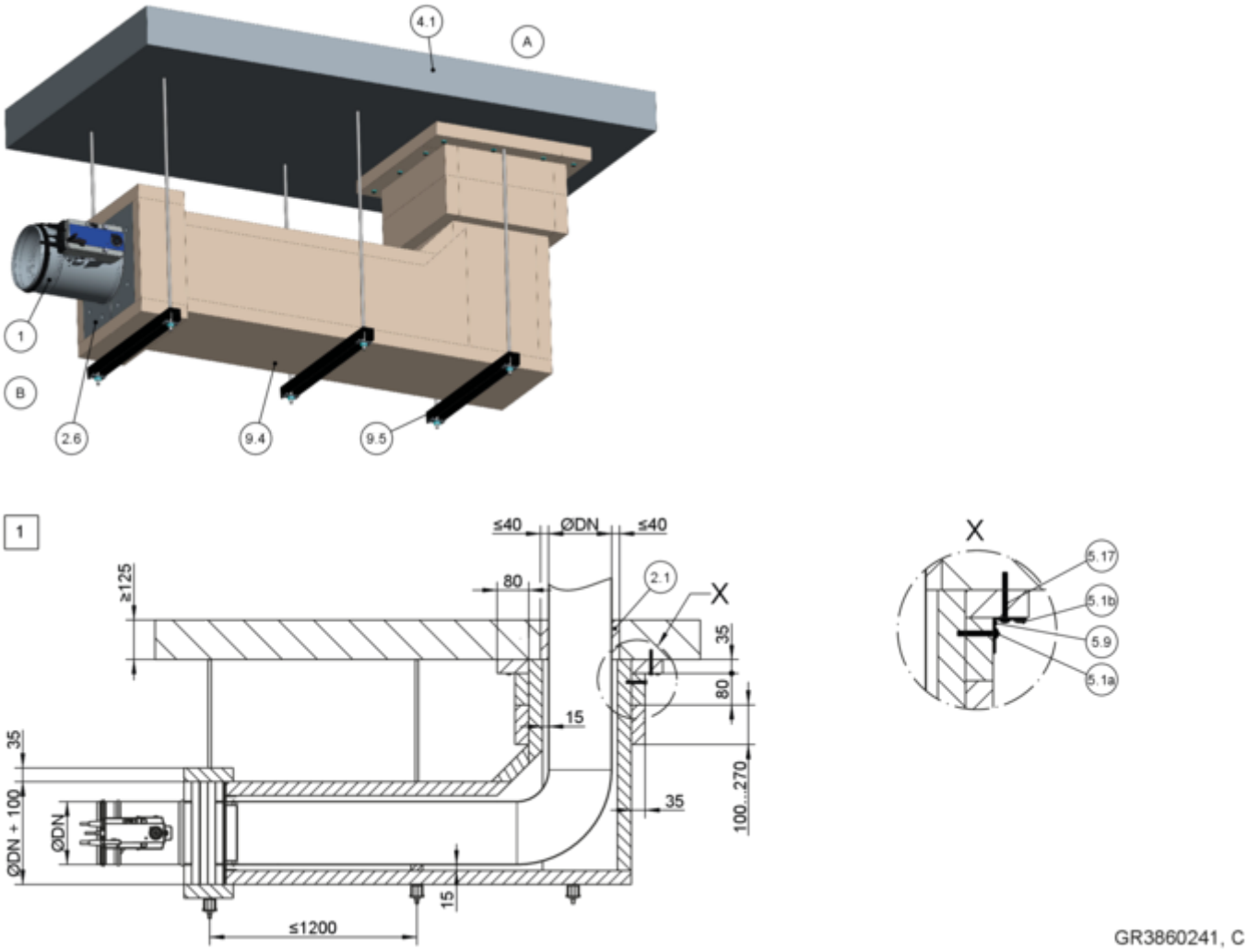


Fig. 166: Dry mortarless installation remote from solid ceiling slabs, with installation kit WE2

1 FKRS-EU
2.1 Mortar
2.6 Installation kit WE 2
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 ∅ 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
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

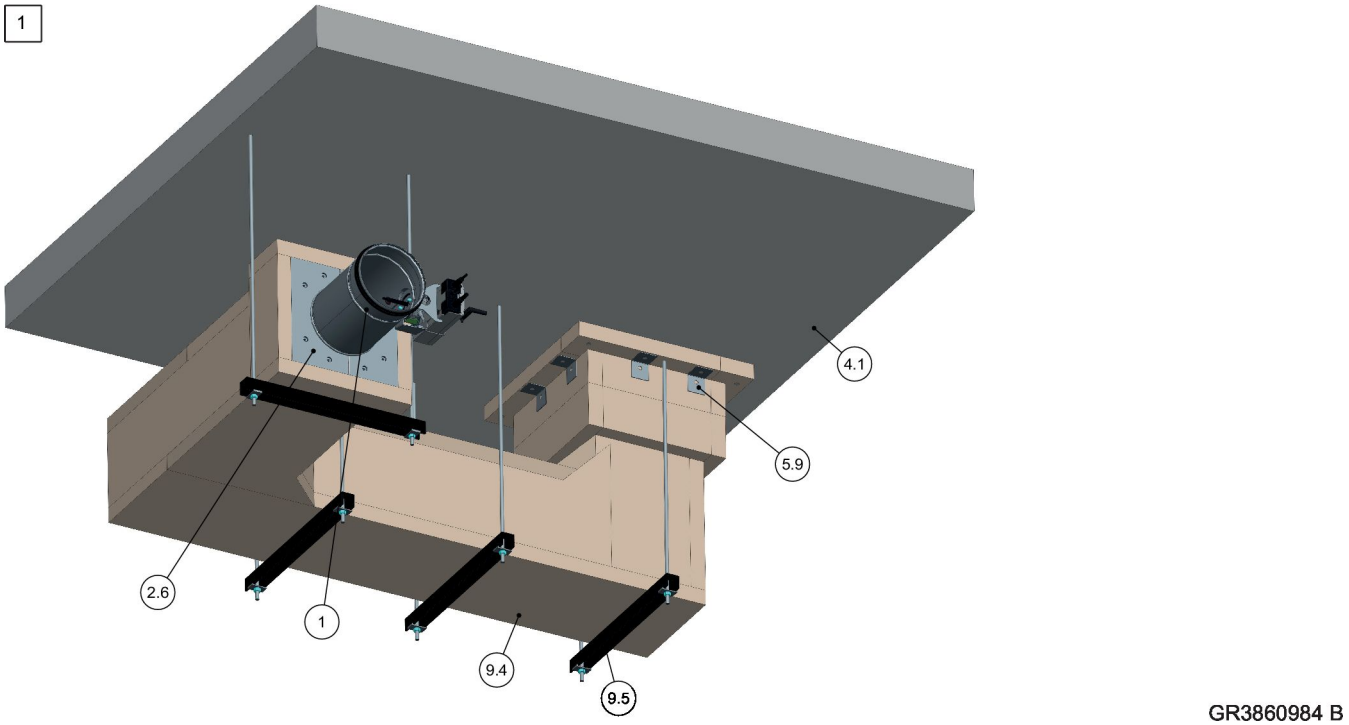


Fig. 167: Dry mortarless installation remote from solid ceiling slabs, with installation kit WE2

1 FKRS-EU
2.6 Installation kit WE 2
4.1 Solid ceiling slab
5.9 Angle steel circumferential or steel angle 40 × 40 × 1.5 mm (distance ≤ 150 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:

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

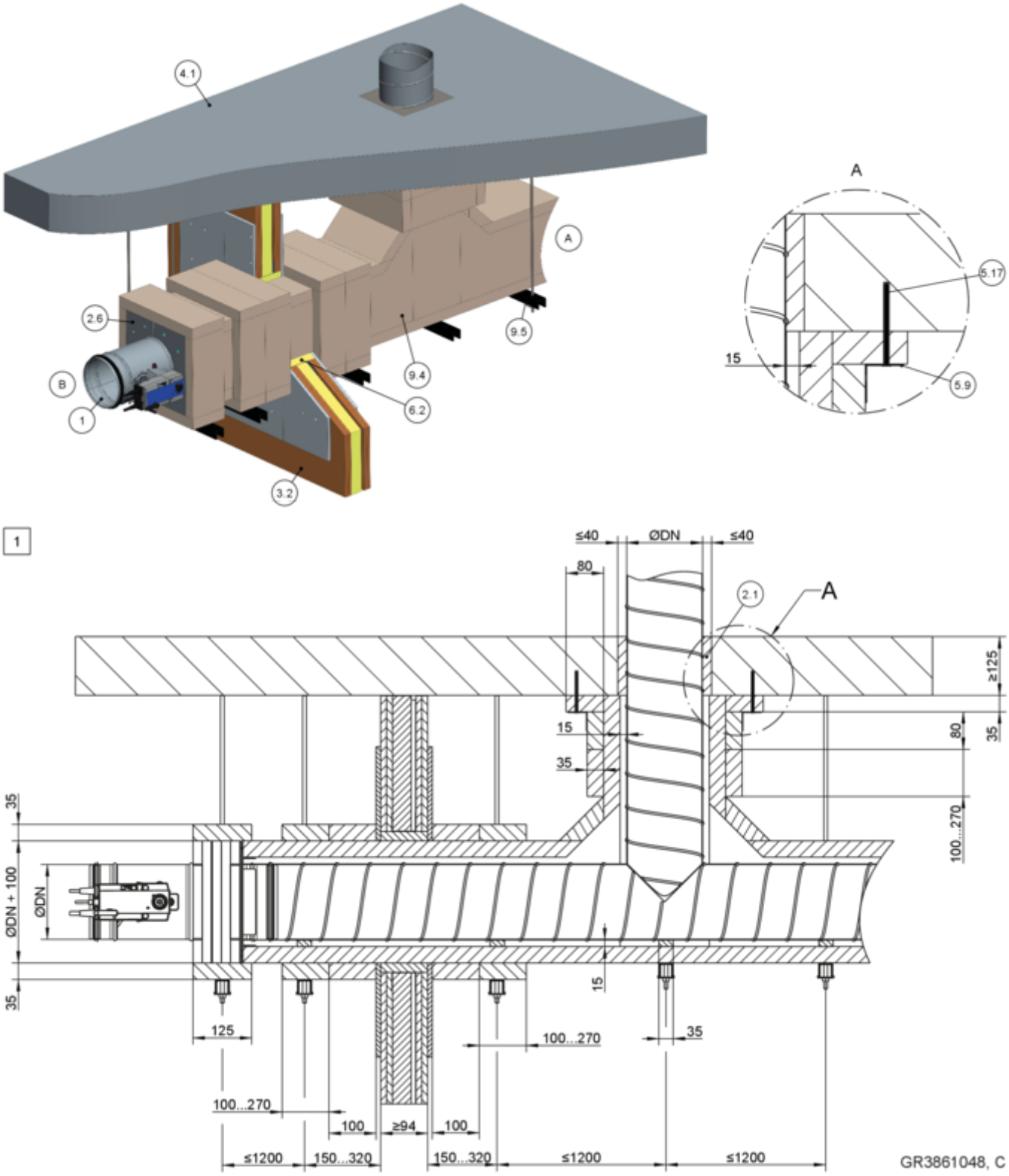


Fig. 168: Dry mortarless installation remote from solid ceiling slabs, with installation kit WE2

1	FKRS-EU
2.1	Mortar
2.6	Installation kit WE 2
3.2	Lightweight partition wall or solid wall (if any)
4.1	Solid ceiling slab
5.1a	Dry wall screw, 4 × 50 mm
5.1b	Dry wall screw, 4 × 30 mm
5.17	Anchor bolt Hilti® HUS-6 ∅ 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
9.4	Sheet steel duct with fire-rated cladding

5.9 Angle steel circumferential or steel angle 40 × 40 × 1.5 mm (distance ≤ 150 mm)

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

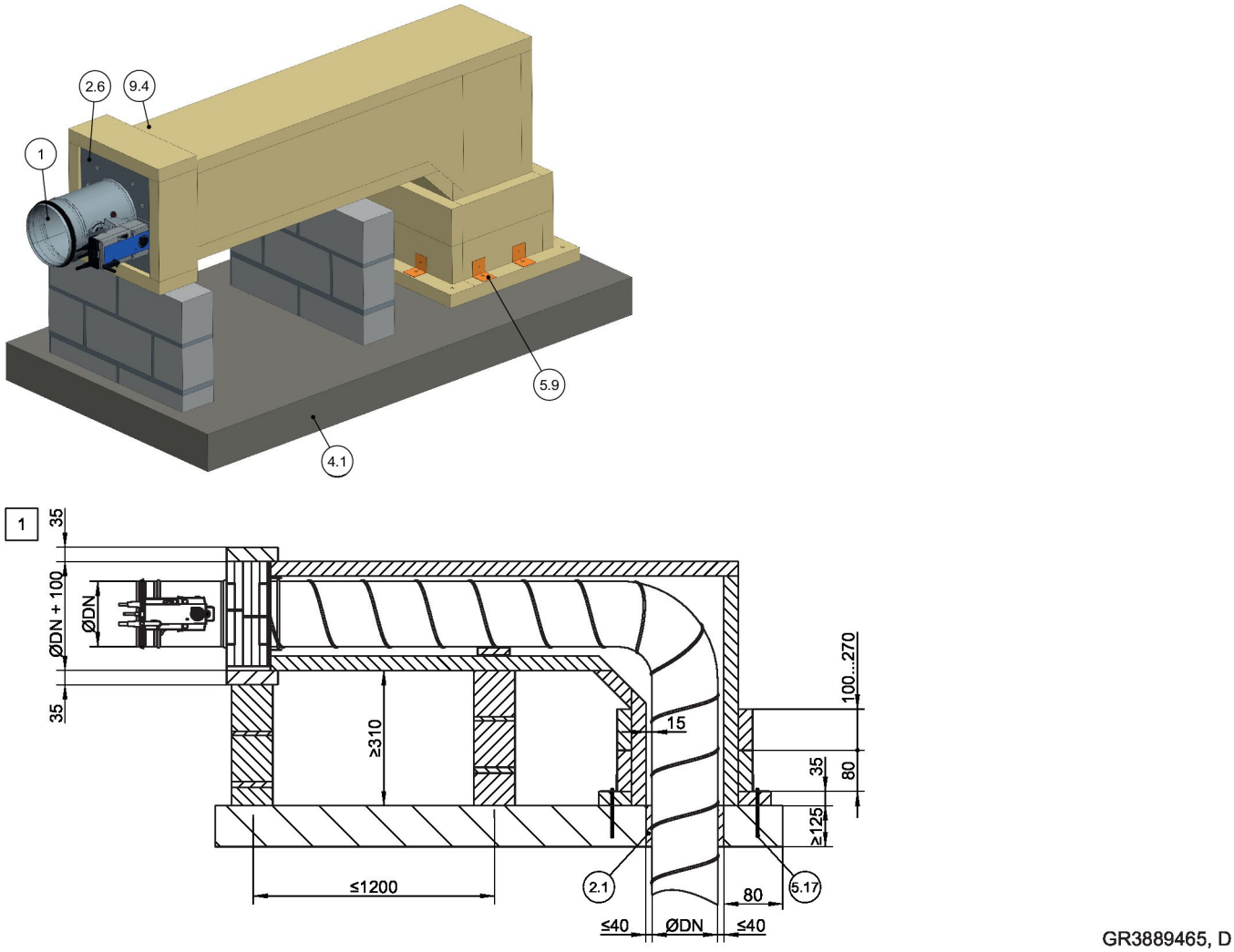


Fig. 169: Dry mortarless installation remote from solid ceiling slabs, with installation kit WE2

1 FKRS-EU
2.1 Mortar
2.6 Installation kit WE 2
4.1 Solid ceiling slab
5.9 Angle steel circumferential or steel angle 40 × 40 × 1.5 mm (distance ≤ 150 mm)
5.17 Anchor bolt Hilti ® HUS-6 ∅ 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
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
[1] Up to EI 90 S

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 47*
- ≥ 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 28* 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.

5.11.18 Dry mortarless installation with fire batt

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

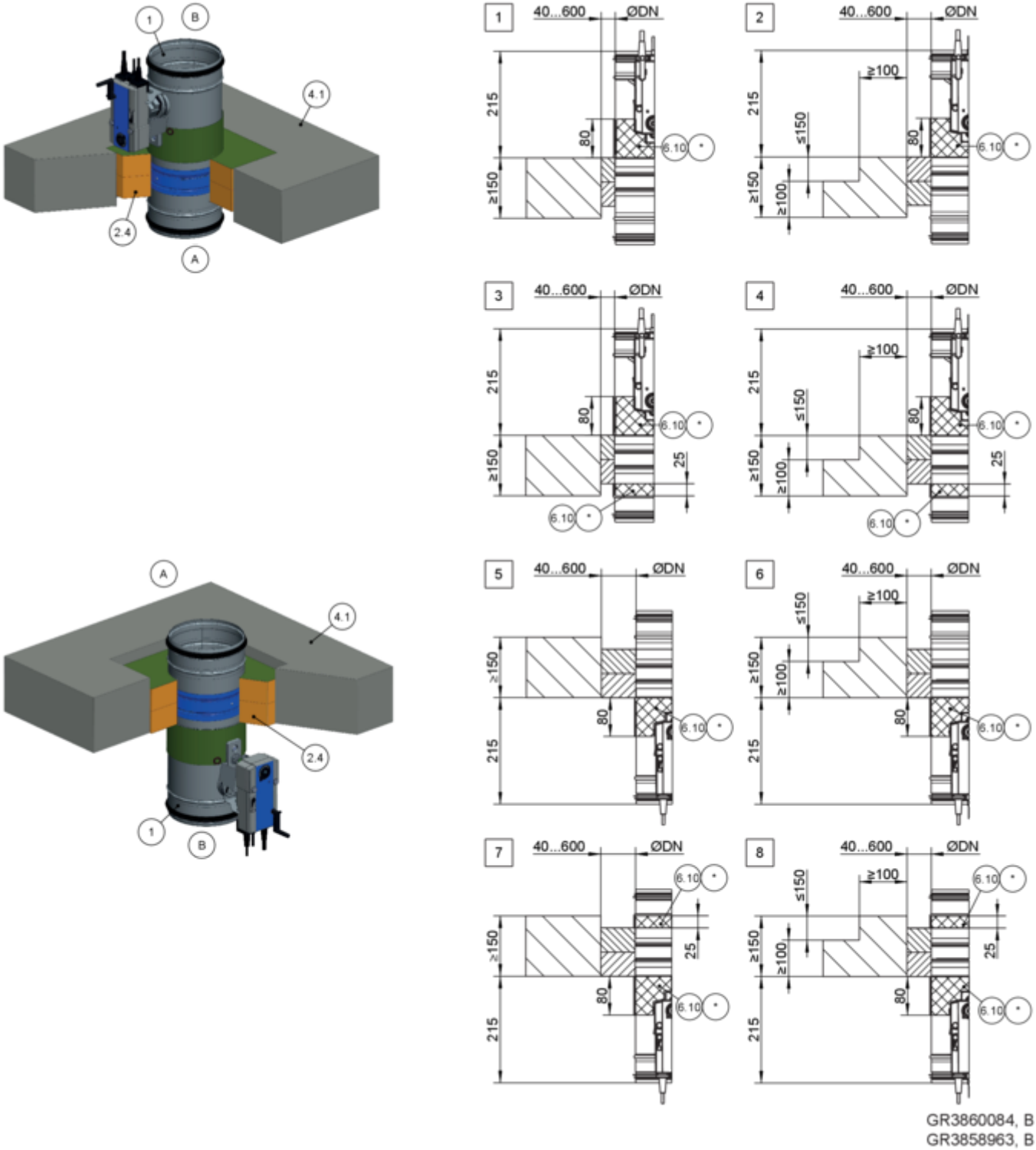


Fig. 170: Dry mortarless installation into a solid ceiling slab, with a fire batt, upright and suspended

1 FKRS-EU
2.4 Fire batt with ablative coating
4.1 Solid ceiling slab (thickness increased at 2, 4, 6 and 8)
6.10 Ablative coating around the perimeter, d = at least 2.5 mm
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 .*

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 – 8	6.19, 6.20 or 6.24 as an alternative See table *226*

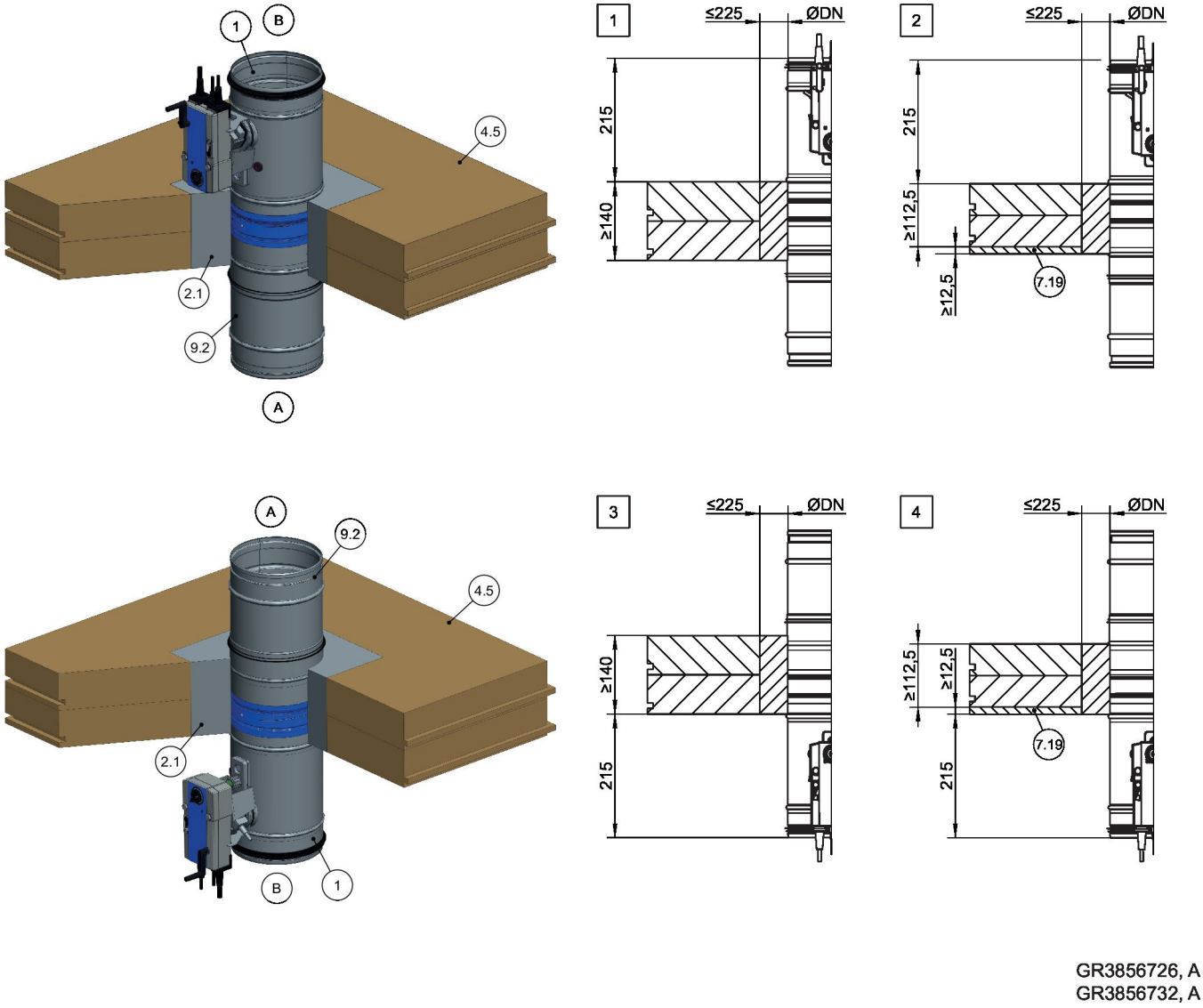
Solid ceiling slab				
NW [mm]	Fire resistance properties to	Coating		Detail
		Installation side A	Operating side B	
100 – 315	EI 90 S	–	x	1, 2, 5, 6
100 – 315	EI 120 S	x	x	3, 4, 7, 8

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

- Solid ceiling slab, *on page 42*
- ≥ 75 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 5.14 'Fixing the fire damper' on page 235*
- General installation information, *5.3 'General installation information' on page 28* 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. 171: 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*
- ≥ 75 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 28* 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

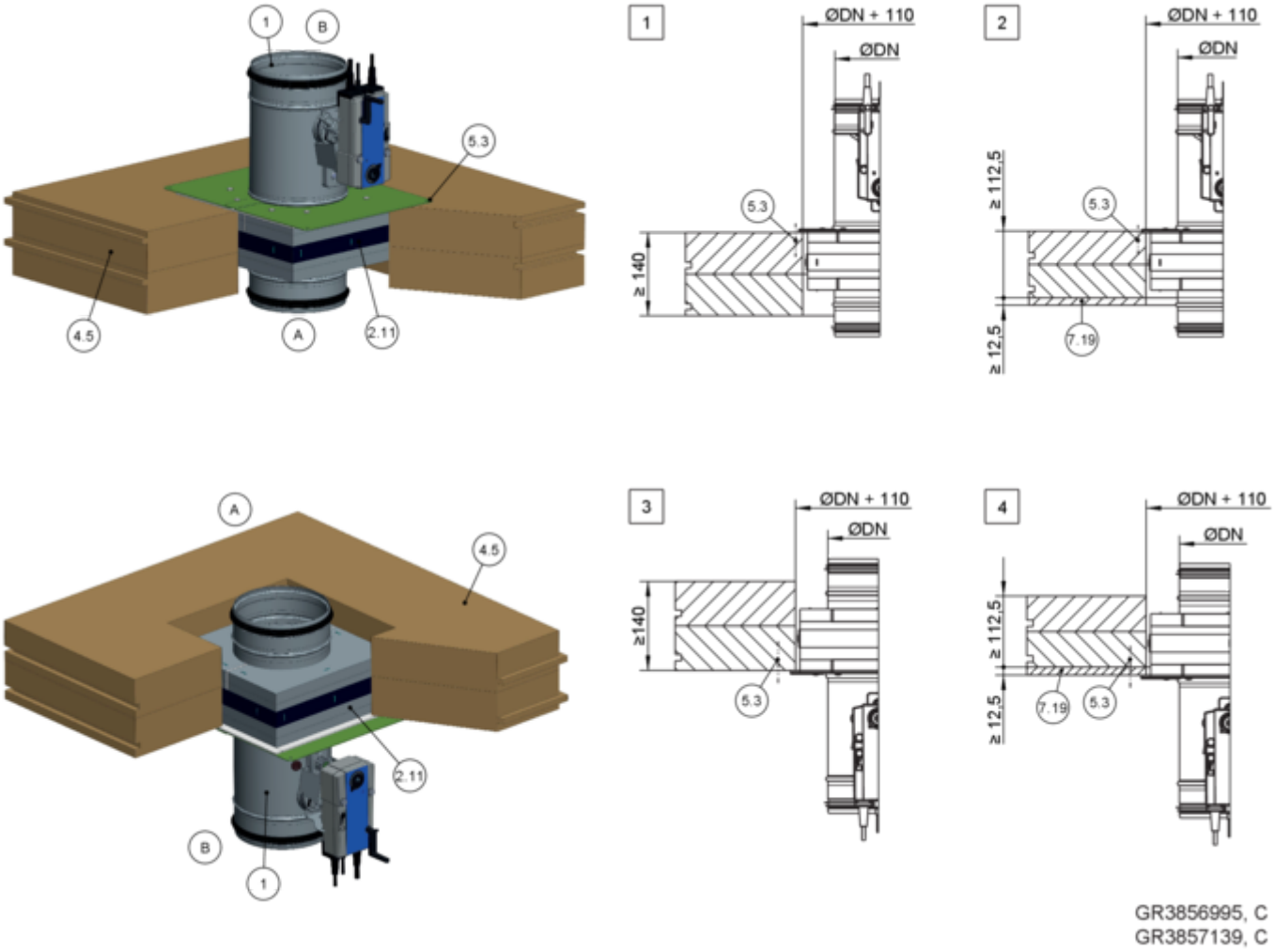


Fig. 172: Dry mortarless installation with installation kit TQ2 into solid wood ceiling, upright and suspended

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 45*
- ≥ 75 mm distance from the fire damper to load-bearing structural elements (structure 100 mm)
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↳ *5.3 'General installation information' on page 28* ff
- General information on installation with installation kit TQ2, ↳ *on page 35*

5.13 Wooden beam ceilings

5.13.1 Mortar-based installation into wooden beam ceilings

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

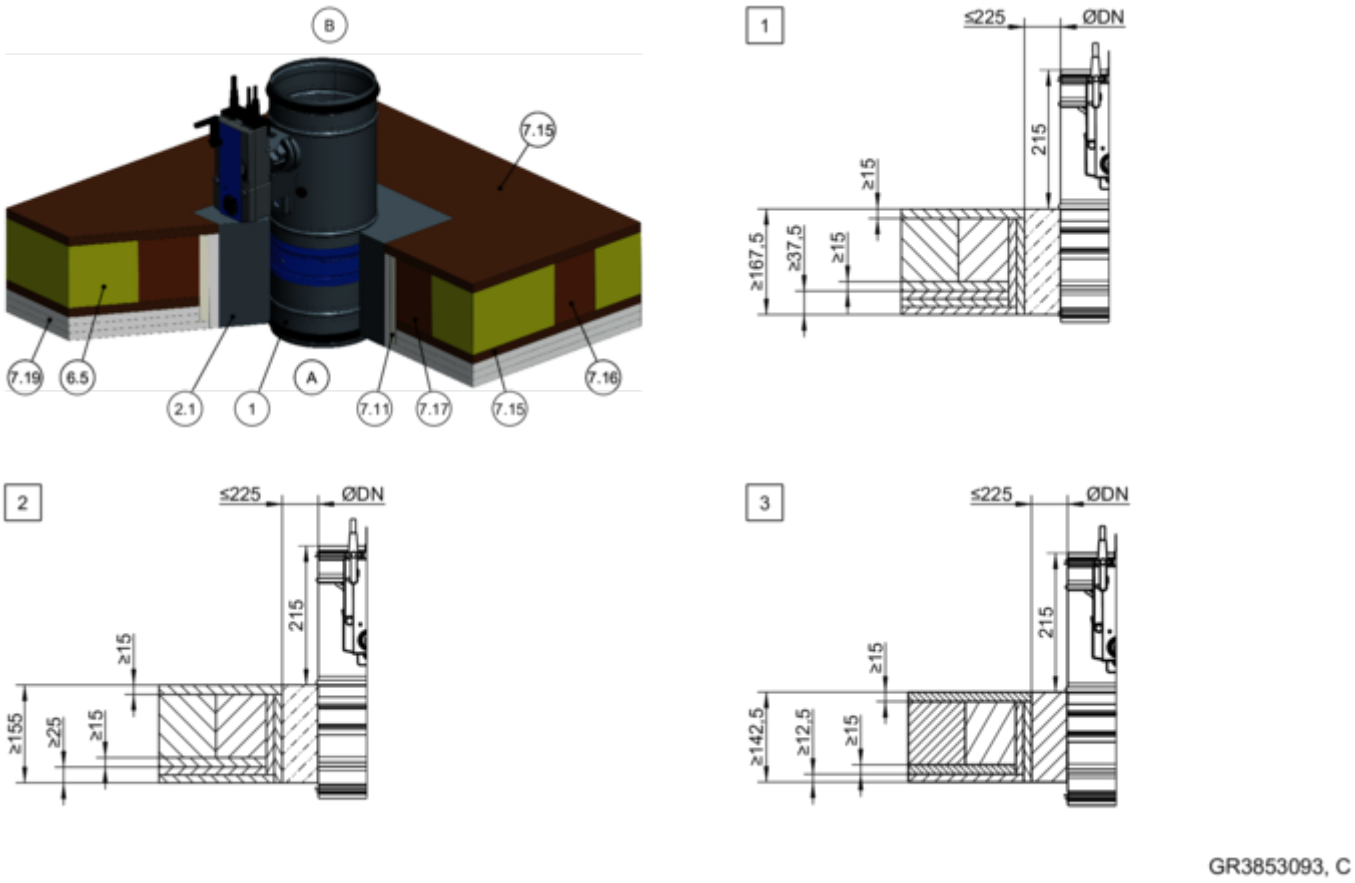


Fig. 173: Mortar-based installation into wooden beam or gluelam ceiling, upright (illustration is an example; other ceiling constructions upon request)

1 FKRS-EU
2.1 Mortar
6.5 Mineral wool filling (depending on ceiling)
7.11 Trim panel, same construction as 7.19
7.15 Wood sheet, at least 600 kg/m³
7.16 Wooden beam/gluelam at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)
7.17 Trimmers, wooden beam ceiling/gluelam ceiling at least 100 × 80 mm
7.19 Fire-resistant cladding (depending on ceiling)
1 Up to EI 90 S
2 Up to EI 60 S
3 EI 30 S

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

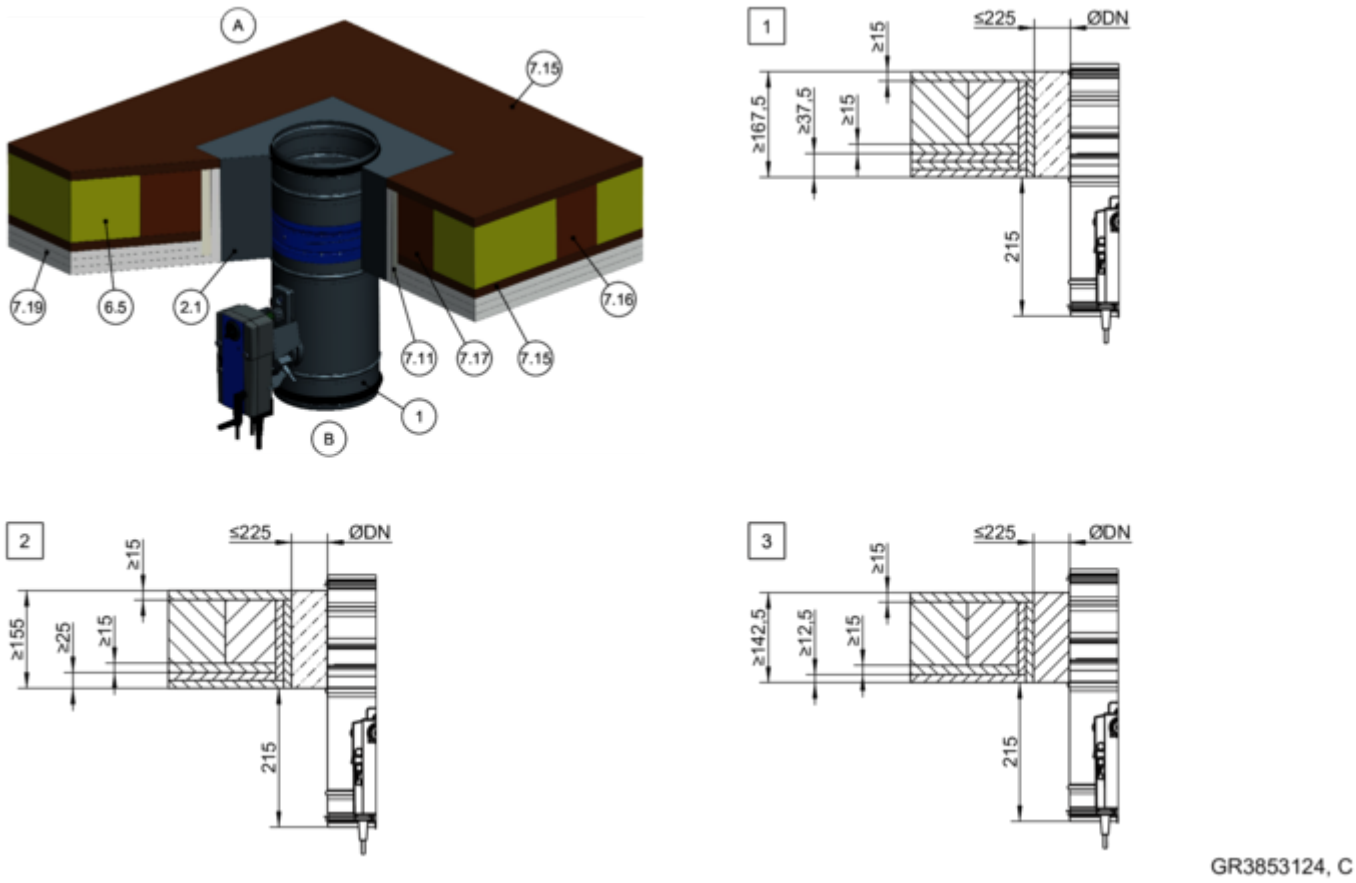


Fig. 174: Mortar-based installation into a wooden beam ceiling/gluelam ceiling, suspended (the illustration is an example; other ceiling constructions may be possible upon request)

1	FKRS-EU
2.1	Mortar
6.5	Mineral wool filling (depending on ceiling)
7.11	Trim panel, same construction as 7.19
7.15	Wood sheet, at least 600 kg/m³
7.16	Wooden beam/gluelam at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)
7.17	Trimmers, wooden beam ceiling/gluelam ceiling at least 100 × 80 mm
7.19	Fire-resistant cladding (depending on ceiling)
1	Up to EI 90 S
2	Up to EI 60 S
3	EI 30 S

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

- Wooden beam ceiling, ↳ *on page 42*
- ≥ 75 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 28* ff
- General information on mortar-based installation, ↳ *'**Mortar-based installation**' on page 34*

5.13.2 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

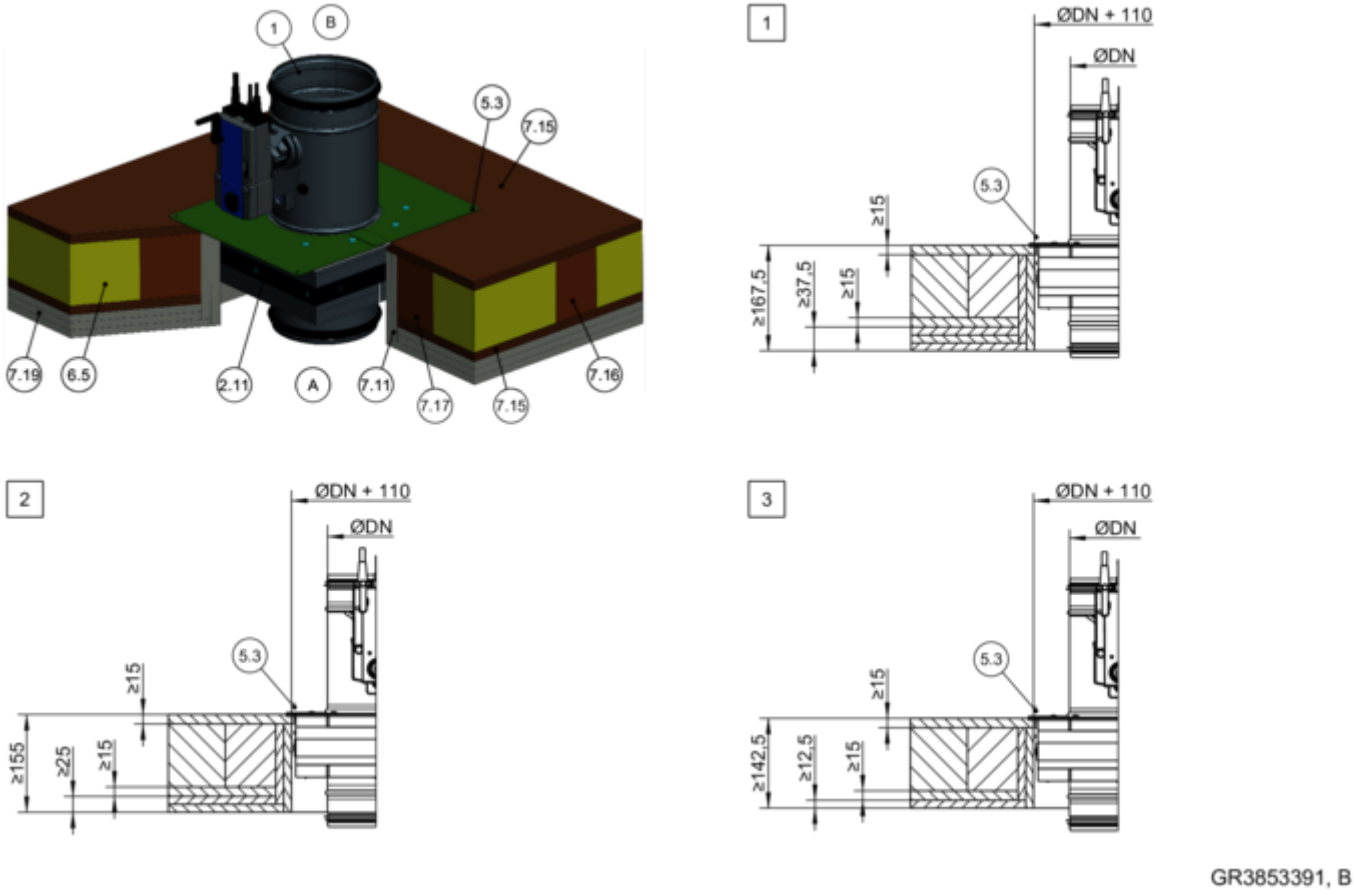


Fig. 175: Dry mortarless installation with installation kit TQ2 into wooden beam/gluelam ceiling, upright (illustration representative, alternative ceiling construction possible on request)

1 FKRS-EU
2.11 Installation kit TQ2 with cover plate
5.3 Wood screw min. 5 × 70 mm
6.5 Mineral wool filling (depending on ceiling)
7.11 Trim panel, same construction as 7.19
7.15 Wood sheet, at least 600 kg/m³
7.16 Wooden beam/gluelam at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)
7.17 Trimmers, wooden beam ceiling/gluelam ceiling at least 100 × 80 mm
7.19 Fire-resistant cladding (depending on ceiling)
1 Up to EI 90 S
2 Up to EI 60 S
3 EI 30 S

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

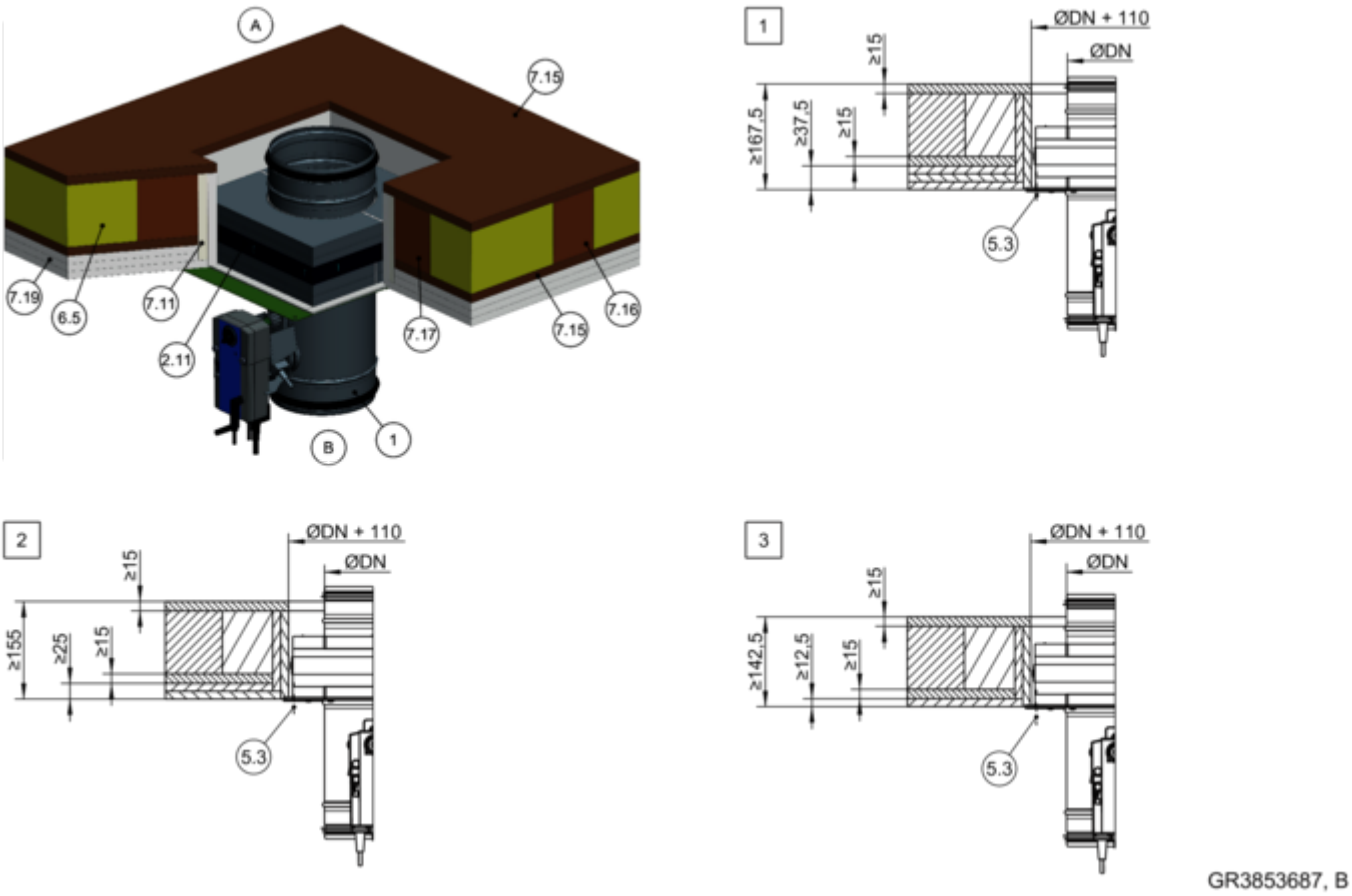


Fig. 176: Dry mortarless installation with installation kit TQ2 into wooden beam/gluelam ceiling, suspended (illustration representative, alternative ceiling construction possible on request)

1 FKRS-EU
2.11 Installation kit TQ2 with cover plate
5.3 Wood screw min. 5 × 70 mm
6.5 Mineral wool filling (depending on ceiling)
7.11 Trim panel, same construction as 7.19
7.15 Wood sheet, at least 600 kg/m³
7.16 Wooden beam/gluelam at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)
7.17 Trimmers, wooden beam ceiling/gluelam ceiling at least 100 × 80 mm
7.19 Fire-resistant cladding (depending on ceiling)
[1] Up to EI 90 S
[2] Up to EI 60 S
[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 45*
- ≥ 75 mm distance from the fire damper to load-bearing structural elements (structure 100 mm)
- ≥ 200 mm distance between two fire dampers in separate installation openings
- General installation information, ↬ *5.3 'General installation information' on page 28* ff
- General information on installation with installation kit TQ2, ↬ *on page 35*

5.13.3 Mortar-based installation into historical wooden beam ceilings

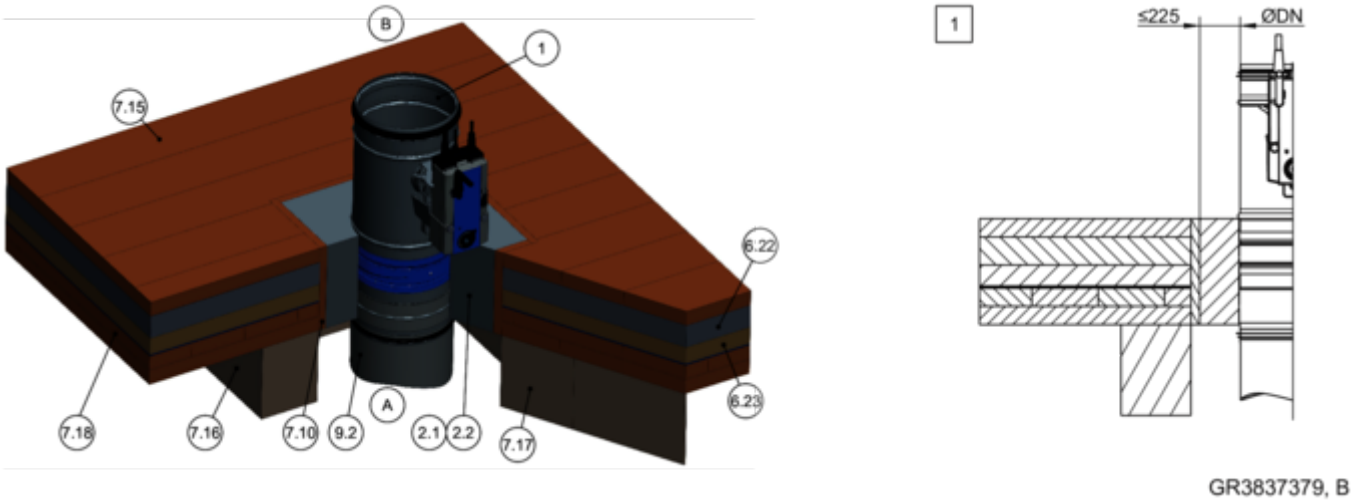


Fig. 177: Mortar-based installation into historical wooden beam ceilings

1	FKRS-EU	7.16	Wooden beam
2.1	Mortar	7.17	Substitution
2.2	Concrete	7.18	Formwork*
6.22	Screed*	9.2	Air duct/extension piece
6.23	Footfall sound insulation*	*	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*		

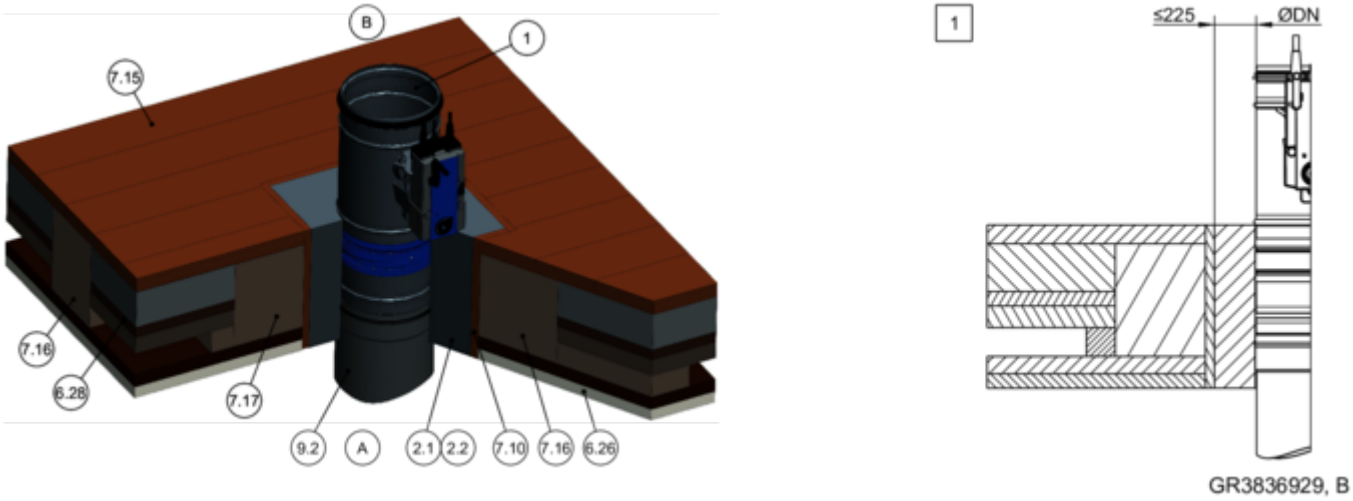


Fig. 178: Mortar-based installation into historic wooden beam ceilings, illustration shows upright installation (applies also to suspended installation)

1	FKRS-EU	7.15	Wooden floorboard/flooring*
2.1	Mortar	7.16	Wooden beam
2.2	Concrete	7.17	Trimmers, wooden beam
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

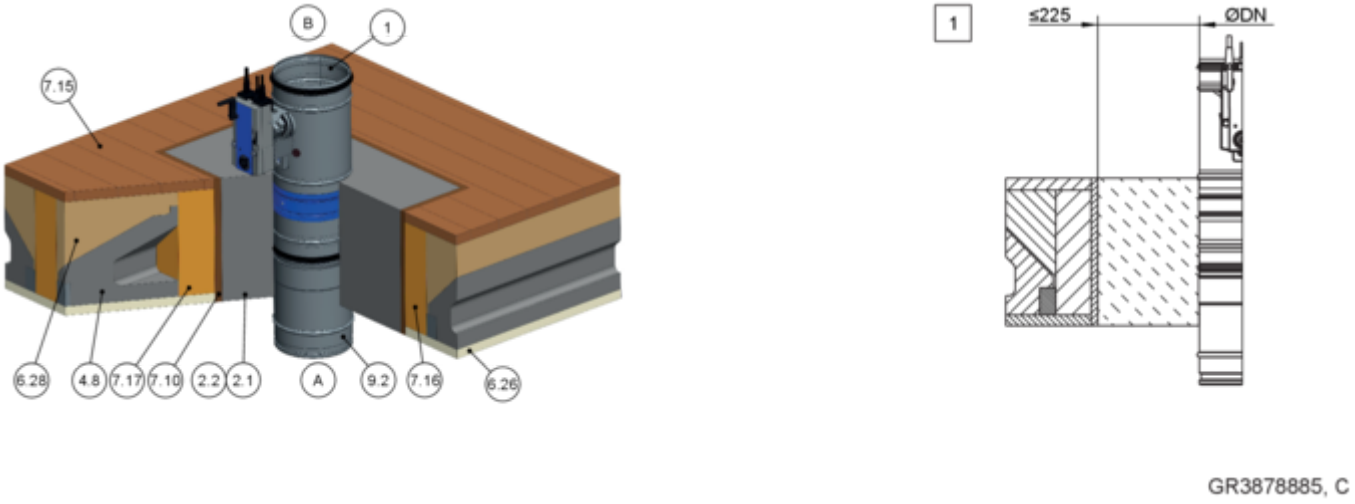


Fig. 179: Mortar-based installation into historic wooden beam ceilings, illustration shows upright installation (applies also to suspended installation)

1	FKRS-EU
2.1	Mortar
2.2	Concrete
4.8	Hollow concrete block
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	Wooden beam
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

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

- Historic wooden beam ceiling, *on page 42*
- ≥ 75 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 28* ff
- General information on mortar-based installation, '***Mortar-based installation***' *on page 34*

5.14 Fixing the fire damper

5.14.1 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).

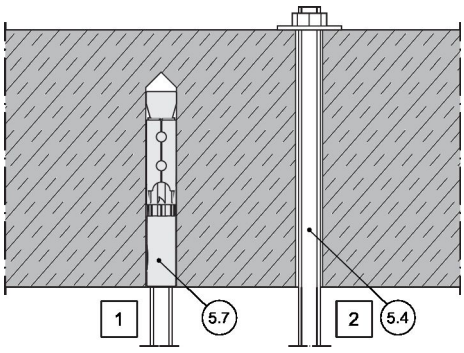


Fig. 180: Fixing to the ceiling

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)

5.14.2 Fixing in conjunction with fire batt/ fire protection block bulkhead

5.14.2.1 Horizontal duct

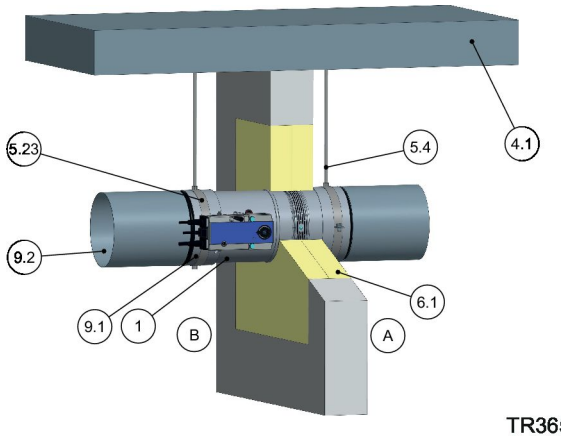


Fig. 181: Suspension system, horizontal duct

1 FKRS-EU
4.1 Solid ceiling slab
5.4 Threaded rod, at least M8, galvanised steel. Fixing to the ceiling . Suspension systems longer than > 1.5 m require fire-resistant insulation.
5.23 Pipe clamp
6.1 Mineral wool
9.1 Flexible connector
9.2 Air duct/extension piece

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

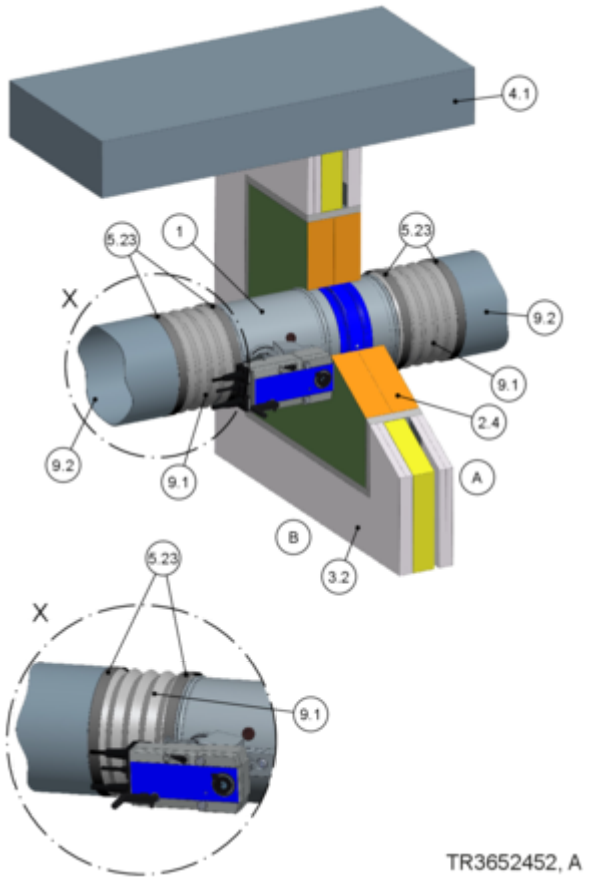


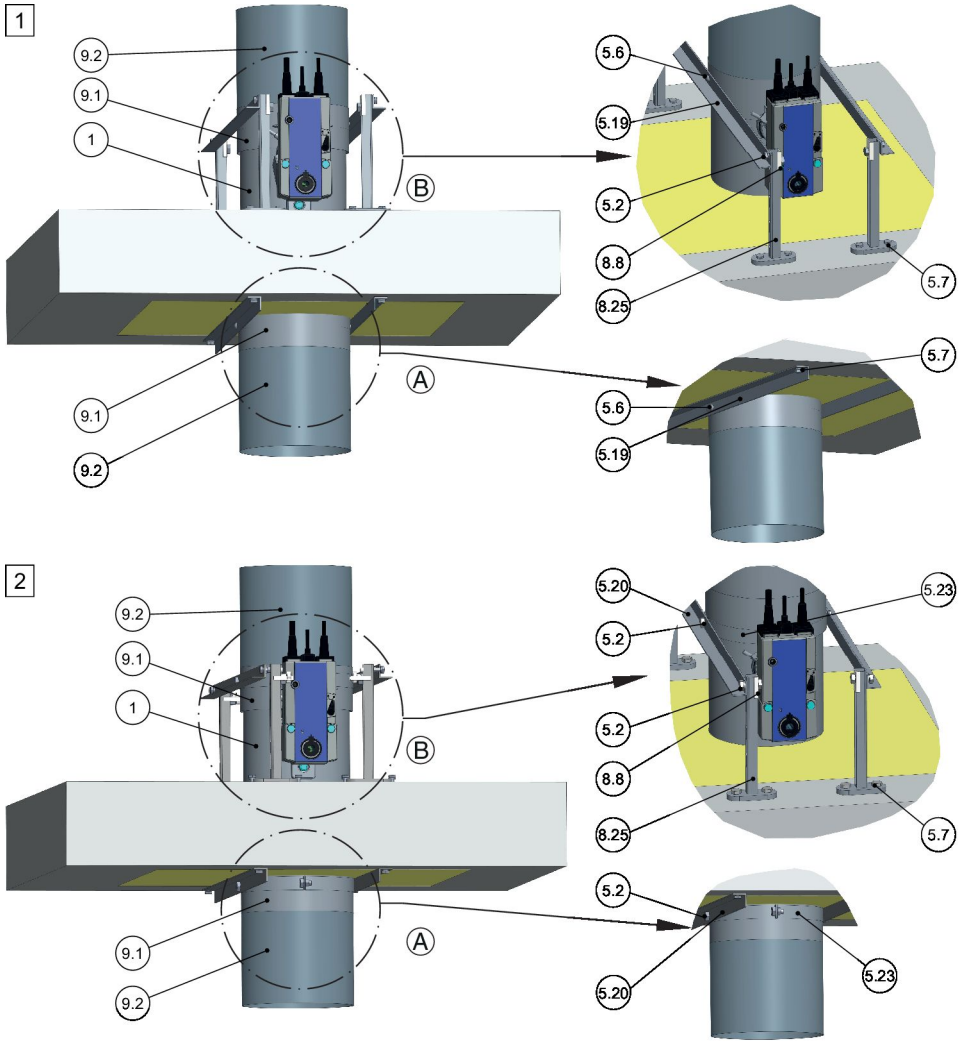
Fig. 182: Horizontal duct

1 FKRS-EU
2.4 Fire batt with ablative coating
3.2 Lightweight partition wall with metal 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/fastenings 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 elastic spigots (length of elastic area ≥ 100 mm when installed), which are installed in such a way that shear and tensile forces can be absorbed.

5.14.2.2 Vertical duct

Upright installation of the fire damper



TR3653265, A

Fig. 183: Upright installation variants for fire dampers

1 FKRS-EU
5.2 4 screw fixings (M8 screw with 2 washers and nut), suitable for the bracket or screw fixing matching the clamp
5.6 4 steel rivets ∅ 6.4 mm, clamping range 2 – 20 mm, e.g. cap blind rivets or high strength rivets; the riveted connection must be air-tight.
5.7 Anchor bolt Hilti ® HUS-6 or equivalent
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.
5.23 Pipe clamp, e.g., Hilti MP-MX, Valraven BIS HD 500 or equivalent
8.8 Fixing bracket, Varifix or Müpro MPC or equivalent
8.25 Bracket, e.g. Hilti MM-B-30 or equivalent
9.1 Flexible connector (if required)
9.2 Air duct/extension piece
1 Fixing above and below the ceiling with rivets
2 Fixing above and below the ceiling with heavy duty clamp

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

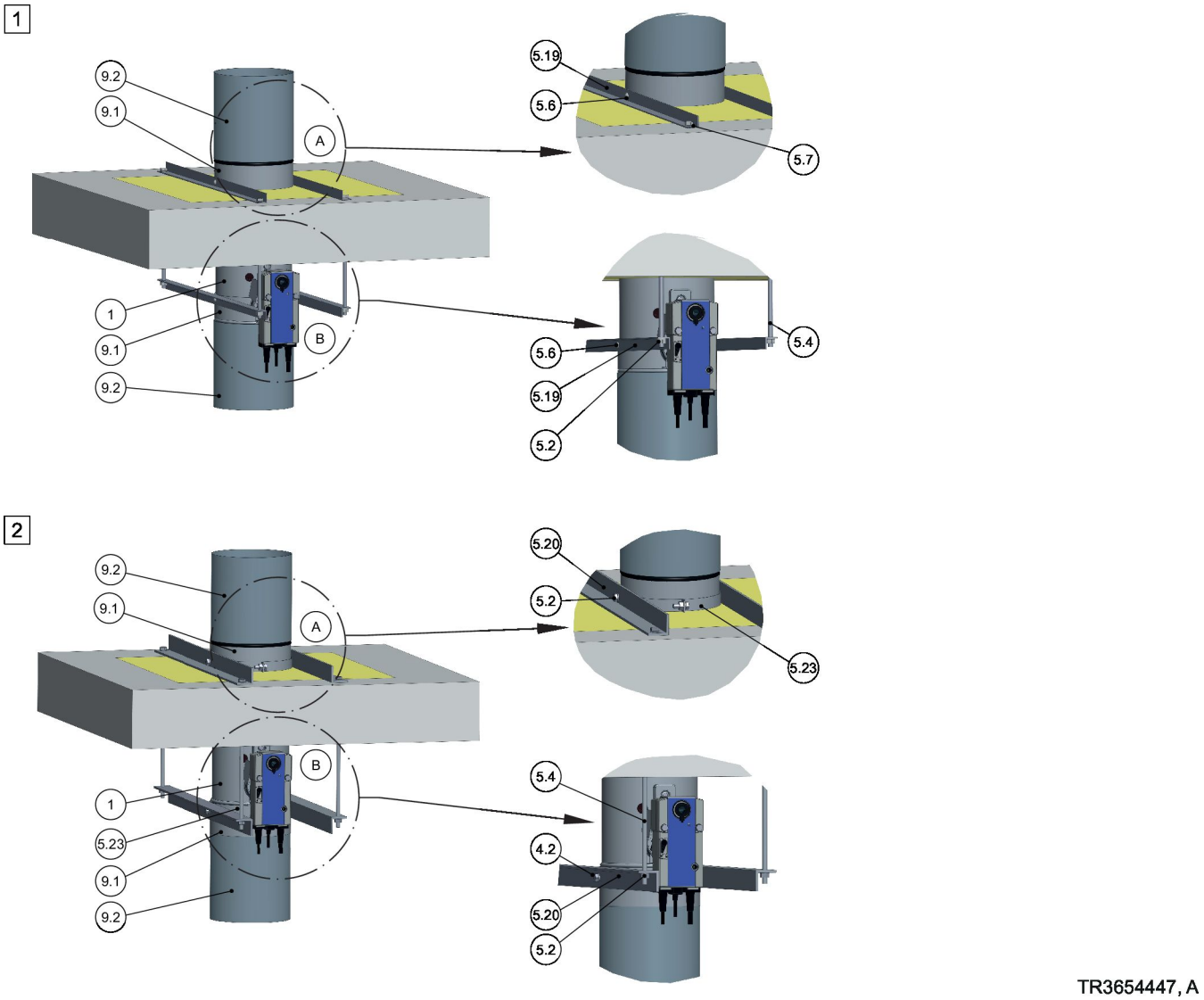


Fig. 184: Suspended installation variants for fire dampers

1 FKRS-EU
5.2 Washer, nut appropriate for the threaded rod or screw fixing suitable for the clamp
5.4 Threaded rod, at least M8, galvanised steel
5.6 4 steel rivets ∅ 6.4 mm clamping range 2 – 20 mm, e.g. cap blind rivets or high strength rivets; the riveted connection must be air-tight.
5.7 Anchor bolt Hilti ® HUS-6 or equivalent
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.
5.23 Pipe clamp, e.g., Hilti MP-MX, Valraven BIS HD 500 or equivalent
9.1 Flexible connector
9.2 Air duct/extension piece
1 Fixing above and below the ceiling with rivets
2 Fixing above and below the ceiling with heavy duty clamp

5.14.3 Fire damper remote from walls and ceilings

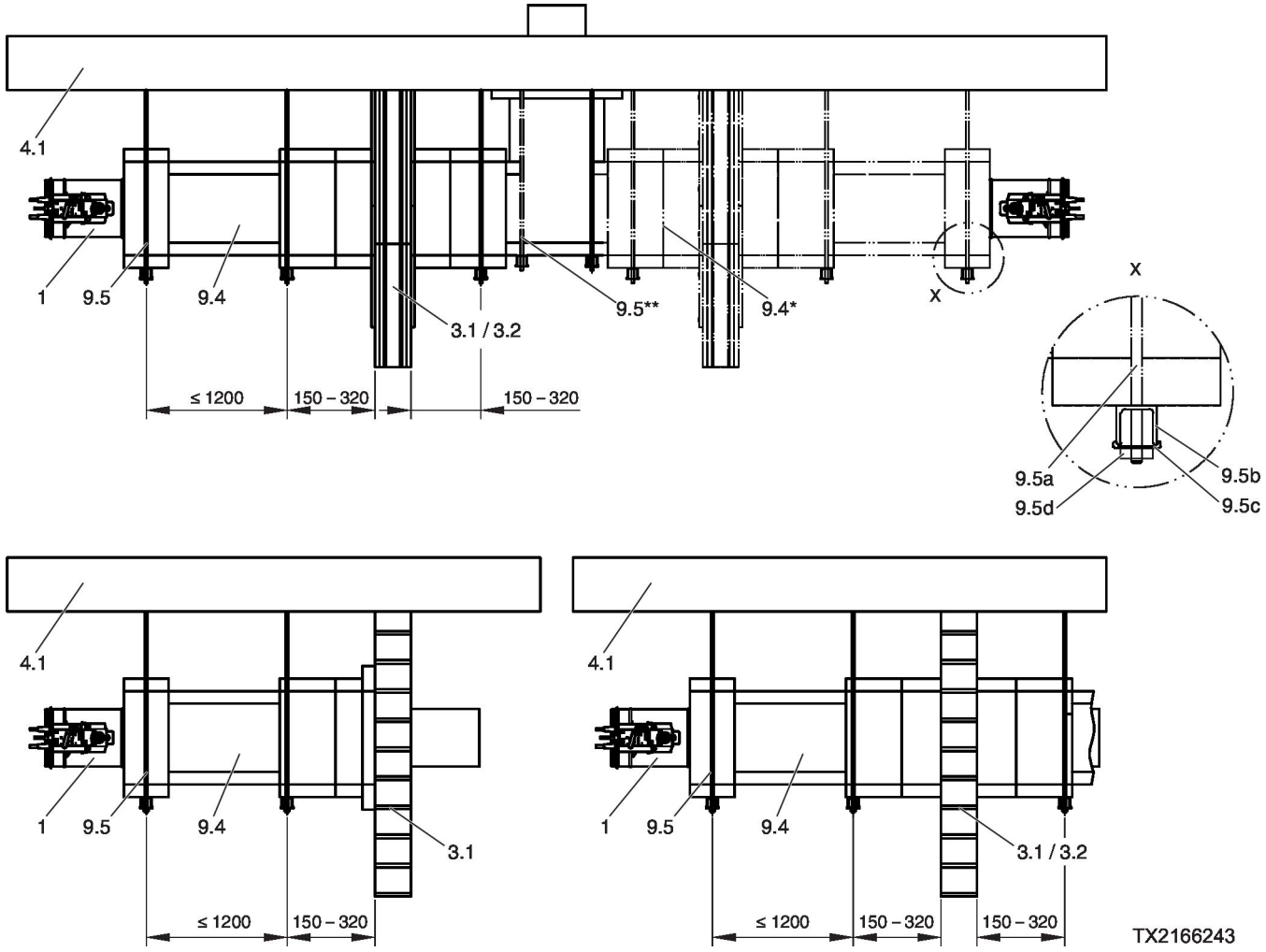


Fig. 185: FKRS-EU in a cladded duct

1 FKRS-EU
3.1 Solid wall
3.2 Lightweight partition wall with metal support structure, cladding on both sides
4.1 Solid ceiling slab
9.4 Sheet steel duct with 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 *240*. 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

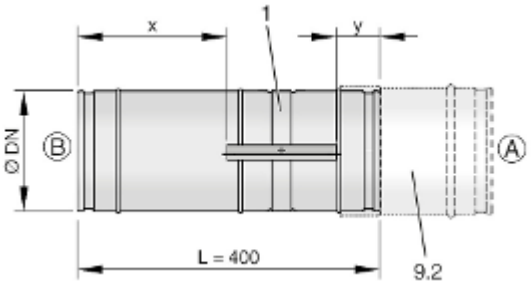


Fig. 186: Open blade protrusion

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.

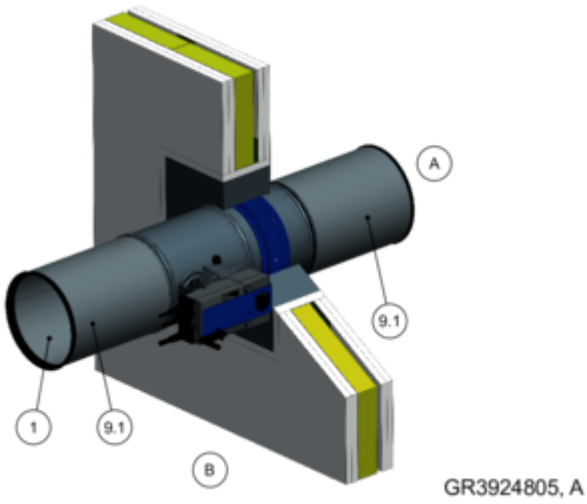


Fig. 187: FKRS-EU with flexible connectors

1 FKRS-EU
9.1 Flexible connector

Cover grille

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

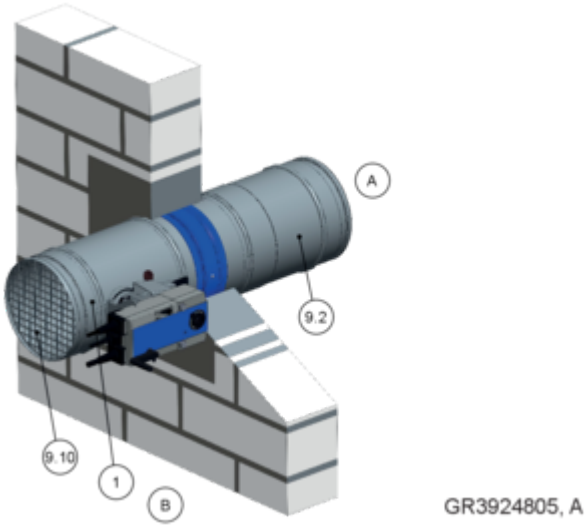


Fig. 188: Fire damper with cover grille

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)

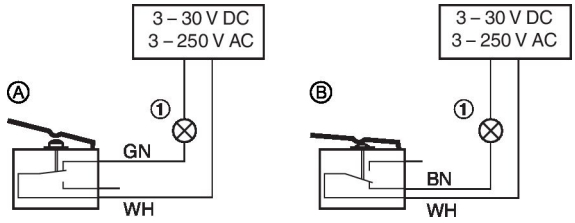


Fig. 189: Wiring of limit switches, example

1 Indicator light or relay, to be provided by others
A Type of connection normally closed
B Type of connection normally open

- The limit switches must be connected according to the wiring example Fig. 189
- Indicator lights or relays may be connected as long as the performance specifications are taken into consideration.
- Connection boxes must be fixed to the adjoining structure (wall or ceiling slab). They must not be fixed to the fire damper.

Type of connection	Limit switch	Damper blade	Electric circuit
A	Not actuated	CLOSED or OPEN position not 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

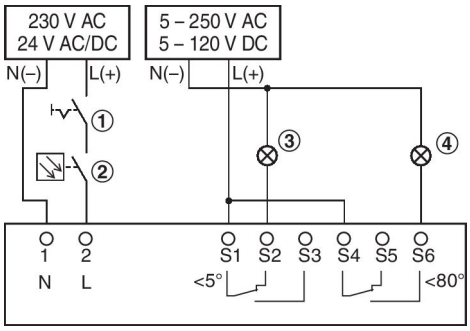


Fig. 190: Actuator connection, example

1 Switch for opening and closing, to be provided by others
2 Optional release mechanism, e.g. TROX duct smoke detector Type RM-O-3-D or RM-O-VS-D
3 Indicator light for CLOSED position, to be provided by others
4 Indicator light for OPEN position, to be provided by others

- The fire damper may be equipped with a spring return actuator for a supply voltage of 230 V AC or 24 V AC/DC. See the performance data on the actuator rating plate.
- The spring return actuator must be connected according to the wiring example shown. Several actuators can be connected in parallel as long as the performance specifications are taken into consideration.
- Connection boxes must be fixed to the adjoining structure (wall or ceiling slab). They must not be fixed to the fire damper.

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

Actuators with 24 V AC/DC

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

7.4 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 informationen see *www.troxtechnik.com* .

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

8.3 Fire damper with fusible link

Close the fire damper

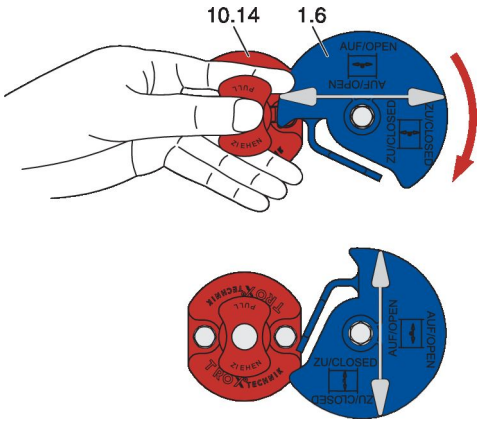


Fig. 191: Close the fire damper

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

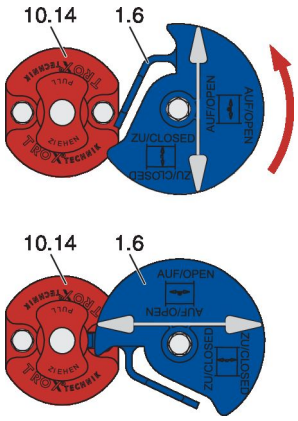


Fig. 192: Opening the damper blade

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.

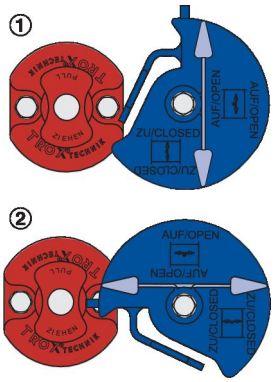


Fig. 193: Damper blade position indicator

1 Damper blade is closed
2 Damper blade is open

8.4 Fire damper with spring return actuator

Status indicator

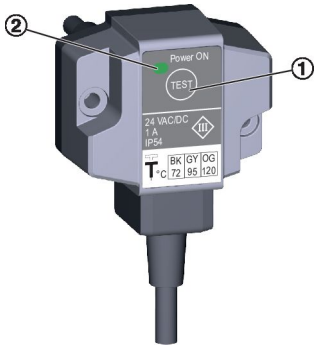


Fig. 194: Thermoelectric release mechanism BAT

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.

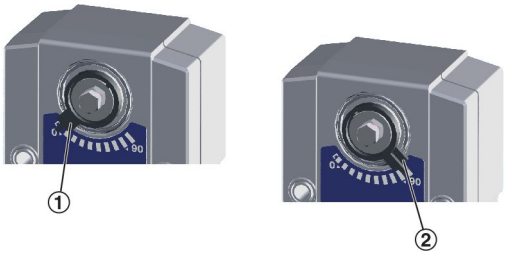


Fig. 195: Damper blade position indicator

1 Damper blade is closed
2 Damper blade is open

Closing/opening the damper blade with spring return actuator

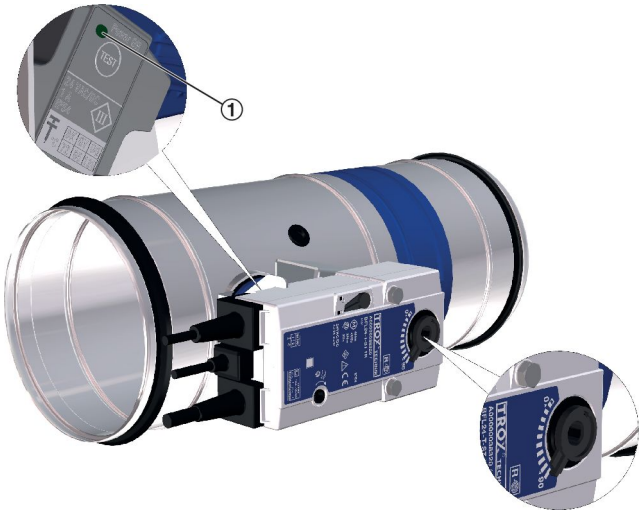


Fig. 196: Functional test

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

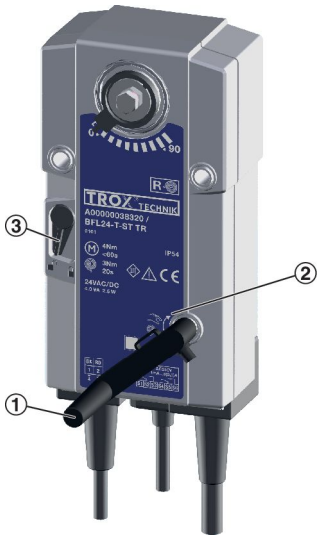


Fig. 197: Functional test (without power supply)

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. 198: 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 249* .

Operation

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

If the temperature in the duct (≥ 72 °C/≥ 95 °C in warm air ventilation systems) or the ambient temperature (≥ 72 °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 247* .

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 should 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 242* .

Maintenance

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

Cleaning

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

Hygiene

Hygienic requirements are fulfilled in accordance with VDI 6022-1, VDI 3803-1, DIN 1946-4, DIN EN 13779 as well as the Önorm H 6020 and H 6021 and SWKI. The fire damper building materials were tested for resistance to fungi and bacteria in a test of their microbial metabolic potential in accordance with DIN EN ISO 846. The building materials do not promote the growth of microorganisms (fungi, bacteria), thus reducing the risks of infection for people. The fire dampers are resistant to disinfectants[1] 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 249* . 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 242* .

10.2 Replacing the fusible link

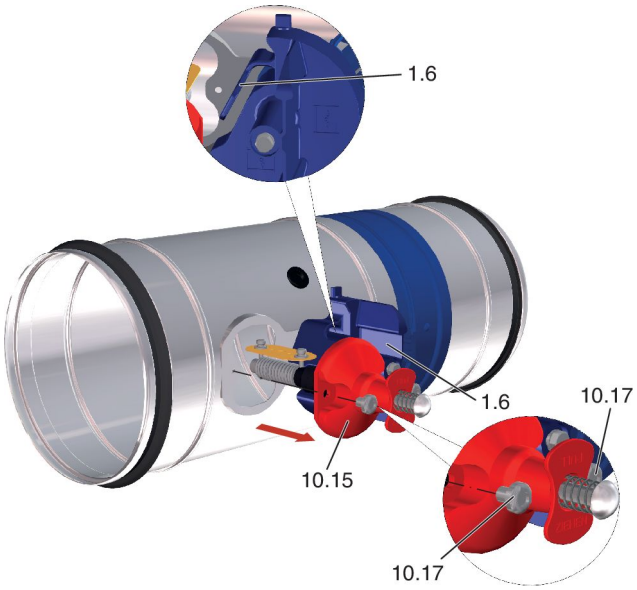


Fig. 199: Removing the fusible link holder

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.

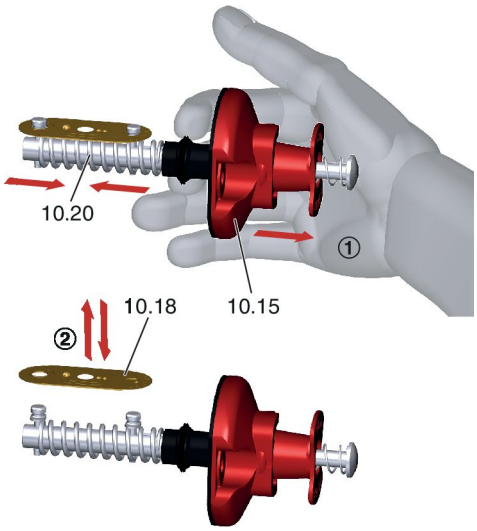


Fig. 200: Replacing the fusible link

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).

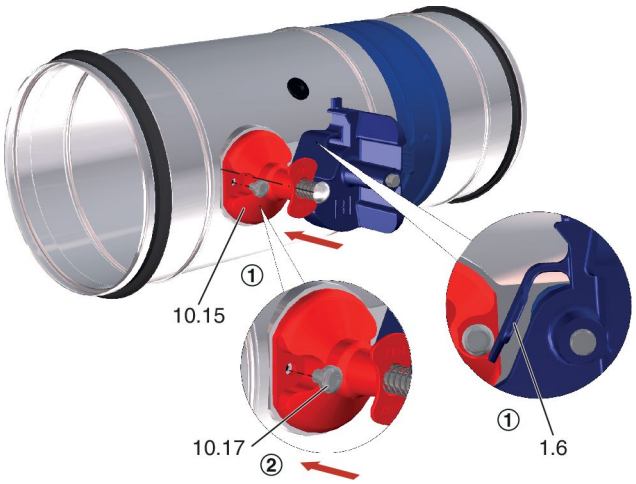


Fig. 201: Install the fusible link holder

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 ■ Internal and external accessibility – Provide access	Specialist personnel
	Installation of the fire damper ■ Installation according to the operating manual ↳ *28* – Install the fire damper correctly.	Specialist personnel
	Transport and installation protection, if any ■ Transport/installation protection has been removed – Remove transport/installation protection	Specialist personnel
	Connection of air ducts/Cover grilles/Flexible connectors ■ Connection according to the operating manual ↳ *Chapter 6 'Accessories' on page 240* – Establish correct connection	Specialist personnel
	Power supply to the spring return actuator ■ Power supply according to spring return actuator rating plate – Supply correct voltage	Skilled qualified electrician
A/B	Check fire damper for damage ■ Fire damper, damper blade and seal must be intact – Replace the damper blade – Repair or replace the fire damper.	Specialist personnel
	Function of the release mechanism ■ Function OK ■ Fusible link intact/no corrosion – Replace the fusible link – Replace the release mechanism	Specialist personnel
	Functional test of the fire damper with fusible link ↳ *243* ■ Fire damper can be opened manually ■ Handle can be locked in the OPEN position ■ Damper blade closes when triggered manually – 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 ↳ *244* ■ Actuator function OK ■ Damper blade closes ■ Damper blade opens – 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 ■ Function OK ■ Fire damper closes when triggered manually or when smoke is detected ■ Fire damper opens after reset – Determine and eliminate the cause of the fault – Repair or replace duct smoke detector	Specialist personnel

Interval	Measure	Staff
C	Cleaning the fire damper ■ No contamination in the interior or on the exterior of the fire damper ■ No corrosion – Remove contamination with a damp cloth – Remove corrosion or replace part	Specialist personnel
	Function of limit switches ■ Function OK – Replace the limit switches	Specialist personnel
	Function of the external signalling (damper blade position indicator) ■ Function OK – 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

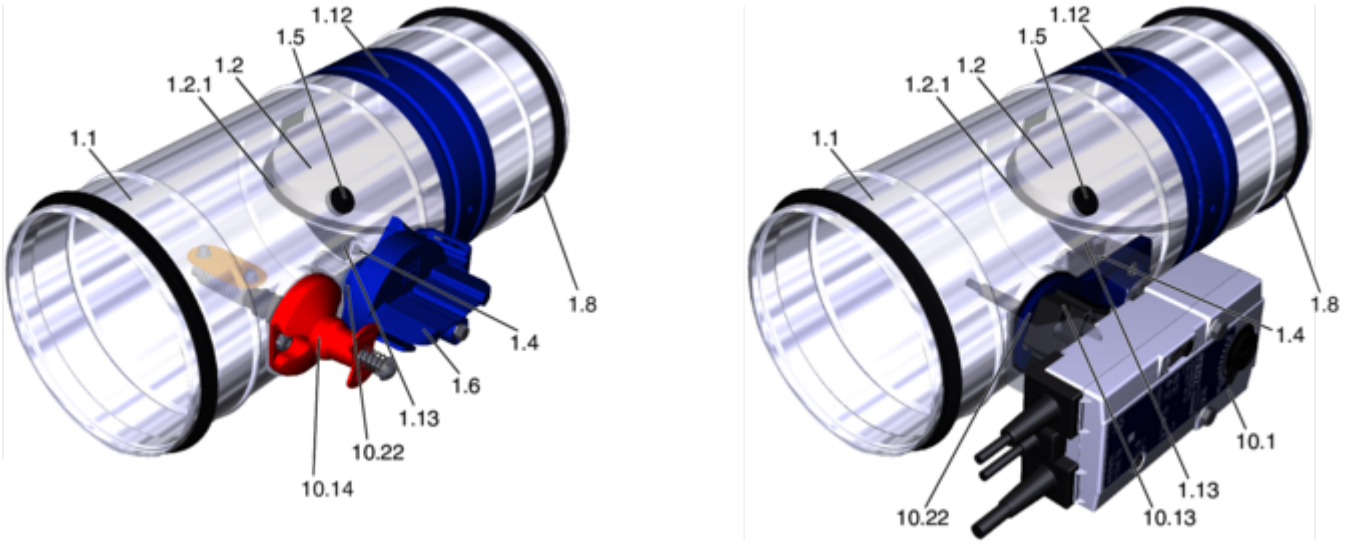


Fig. 202: FKRS-EU with fusible link or spring return actuator

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. 6.2 6.16 either (6.2) or (6.16).

Consec. item no.	Description
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

Consec. item no.	Description
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	Fire batt with ablative coating
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

Consec. item no.	Description
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)

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

Consec. item no.	Description
4	**Ceilings**
4.1	Solid ceiling slab/solid floor
4.2	Wooden beam ceiling
4.3	Modular ceiling, Cadolto system

Consec. item no.	Description
4	**Ceilings**
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 ≥ F 30
4.12	Panelled ceiling

Consec. item no.	Description
5	**Fixing material**
5.1	Dry wall screw
5.2	Hexagon head screws, washers, nuts (see installation details)
5.3	Chipboard screw
5.3a	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 ≤ 50 mm with washer and nut
5.6	Screw or rivet, galvanised steel (see installation details)
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
5.13	Wood screw or pin
5.14	Angle bracket

Consec. item no.	Description
5	**Fixing material**
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, ∅ ≥ 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

Consec. item no.	Description
6	**Filling and coating material**
6.1	Mineral wool ≥ 1000 °C, ≥ 40 kg/m³
6.2	Mineral wool ≥ 1000 °C, ≥ 80 kg/m³
6.3	Mineral wool ≥ 1000 °C, ≥ 100 kg/m³
6.4	Mineral wool ≥ 1000 °C, ≥ 140 kg/m³
6.5	Mineral wool depending on wall or ceiling construction, mineral wool infill if required
6.6	
6.7	Fire batt
6.8	Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
6.9	Fire-resistant sealant suitable for the fire batt system used
6.10	Ablative coating around the perimeter, 2.5 mm thick
6.11	Insulating strip (depending on wall construction)
6.12	Intumescent seal

Consec. item no.	Description
6	**Filling and coating material**
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/m³, panel material around the perimeter, leave out the actuator and release mechanism; inspection openings must remain accessible
6.20	Sleeve (to be ordered separately)
6.21	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
6.29	Mineral wool PAROC HVAC Fire Mat
6.30	Reinforcing strips, mineral wool, PAROC HVAC Fire Mat 80BLC (80 kg/m³)
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

Consec. item no.	Description
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
7.4	U50 channel
7.5	Steel support structure
7.6	Perimeter metal section

Consec. item no.	Description
7	**Supporting construction**
7.7	Timber stud, at least 60 × 80 mm
7.8	Steel girder
7.9	Half-timbered construction
7.10	Trim panels (also optional)
7.11	Trim panels, double layer, staggered joints
7.12	Trim panels, wood sheet, at least 600 kg/³
7.13	Cladding/wall cladding
7.13a	Cladding, fire-resistant
7.13b	Cladding, wood sheet, at least 600 kg/³
7.13.1	Cladding, single-layer
7.14	Reinforcing strip
7.15	Wooden floorboard/floor tile/wood sheet min. 600 kg/m³
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

Consec. item no.	Description
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
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

Consec. item no.	Description
8	**Material for extended applications**
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/m³
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
8.38	OWA adhesive
8.39	Spiral duct for stiffening, 2 × raised edges

Consec. item no.	Description
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
9.6	Repair damper blade
9.7	Damper blade
9.8	Rivet axis
9.9	Plate
9.10	Cover grille
9.11	Circular spigot
9.12	Clamping ring
9.13	Reinforcement bracket
9.14	Connecting subframe
9.15	T-piece

Consec. item no.	Description
10	**Release mechanisms**
10.1	Spring return actuator
10.2	Spring return actuator Belimo BLF
10.3	Spring return actuator Belimo BF
10.4	Spring return actuator Belimo BFN
10.5	Spring return actuator Belimo BFL
10.6	Spring return actuator Schischek ExMax (yellow)
10.7	Spring return actuator Schischek RedMax (magenta)
10.8	Spring return actuator Siemens GGA
10.9	Spring return actuator Siemens GRA
10.10	Spring return actuator Siemens GNA
10.11	Spring return actuator Joventa SFR
10.12	Duct smoke detector RM-O-3-D (fixed with adapter metal sheet)

Consec. item no.	Description
10	**Release mechanisms**
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

Consec. item no.	Description
11	**Additions**
11.1	Cable tray
11.2	Cable set
11.3	Pipe collar
11.4	Underlay material, non-combustible, to be provided by others
11.5	Underlay (by others)
11.6	Cable penetration
11.7	Potentional equalisation

13 Change history

The table shows all changes made to this document.

Version no.	Date	Author	Comment/change
1	2023-03-06	PB	■ Technical data - New attachments: – FKRS-EU with spring return actuator and duct smoke detector – FKRS-EU with fusible link and cover grille on both sides as an upstream shutter for the air transfer unit – FKRS-EU with spring return actuator and duct smoke detector used as an air transfer damper – ■ Design and function - New attachments: – FKRS-EU with fusible link and cover grille on both sides as an upstream shutter for the air transfer unit – FKRS-EU with spring return actuator and duct smoke detector used as an air transfer damper ■ Installation - installation kits: – Old installation kits TQ, WA, WE and GL are omitted ■ Installation - New Uses: – Solid walls - Mortar-based installation in solid wall - installation not flush with wall – Mortar-based installation into gypsum wallboard - Dry mortarless installation remote from solid walls with mineral wool and fire batt - Dry mortarless installation with fire batt in solid wall - multiple occupancy of an installation opening – Lightweight partition walls - Mortar-based installation in lightweight partition wall - installation not flush with wall – Mortar-based installation – multiple installation into 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 fire batt in lightweight partition wall - Multiple occupancy of an installation opening – Timber stud walls and half-timbered constructions – Mortar-based installation into a lightweight partition wall with timber support structure, FKRS-EU and FK2-EU, combined – Mortar-based installation into a lightweight partition wall with half-timbered construction, FKRS-EU and FK2-EU, combined - Dry mortarless installation with fire batt - multiple occupancy of an installation opening – Shaft walls with metal support structure – Dry mortarless installation with installation kit WA2 – Dry mortarless installation with fire batt – Shaft walls without metal support structure – Mortar-based installation – Solid ceiling slabs – Mortar-based installation into a solid ceiling slab, FKRS-EU and FK2-EU, combined – Mortar-based installation – multiple installation into one installation opening - Mortar-based installation in combination with lightweight ceilings (ADK Modulraum system)

Version no.	Date	Author	Comment/change
			- Dry mortarless installation in combination with lightweight ceilings (ADK Modulraum system), with concrete base and installation kit TQ2 ■ New document ID – M375DE7 Version 5 –> A00000092709 Version 1

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TROX® TECHNIK

The art of handling air

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