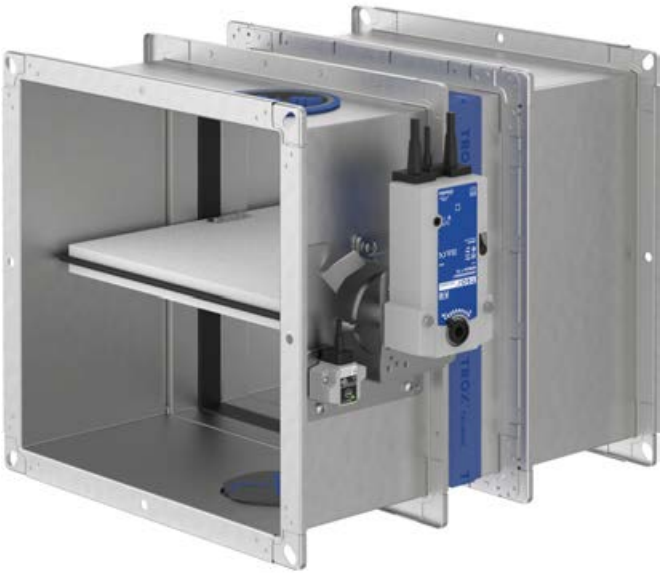
Fire damper

Type FK2-EU

according to Declaration of Performance
DoP / FK2-EU / DE / 002



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 Service

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

- Product name
- TROX order number
- Delivery date
- Brief description of the fault

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

Limitation of liability

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

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

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

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

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

We reserve the right to make technical changes.

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 fire damper may be used in potentially explosive atmospheres if appropriate special accessories are used with it and if the product bears the CE conformity marking according to Directive 94/9/EC. Fire dampers for use in potentially explosive atmospheres are marked for the zones for which they have been approved.
- Operation of the fire dampers is allowed only in compliance with installation regulations and the technical data in this installation and operating manual.
- Modifying the fire damper or using replacement parts that have not been approved by TROX is not permitted.

If this fire damper is used in Germany:

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

Incorrect use

⚠ WARNING!

Danger due to incorrect use!

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

Never use the fire damper

– without specially approved attachments in areas with potentially explosive atmospheres
– as a smoke control damper
– outdoors without sufficient protection against the effects of weather
– in atmospheres where chemical reactions, whether planned or unplanned, may cause damage to the fire damper or lead to corrosion

1.3 Qualified staff

WARNING!

Danger of injury due to insufficiently qualified individuals!

Incorrect use may cause considerable injury or damage to property.

– Only specialist personnel must carry out work.

Personnel:

- Skilled qualified electrician
- Specialist personnel

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

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

2 Technical data

2.1 General data

Nominal sizes B × H	200 × 100 – 1500 × 800 mm *
Casing lengths L	305 and 500 mm
Volume flow rate range	Up to 14400 l/s or 51840 m³/h
Differential pressure range	Up to 2000 Pa
Temperature range [1, 3, 4]	-20 °C to 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, ≤ 12 m/s with spring return actuator ≤ 10 m/s with explosion-proof spring return actuator
Closed blade air leakage	EN 1751, Class 2
Casing leakage	EN 1751, L = 305 mm, class C L = 500 mm, class C; (B + H) ≤ 700, class B
EC conformity	■ Construction Products Regulation (EU) no. 305/2011 ■ EN 15650 – Ventilation for buildings – Fire dampers ■ EN 13501-3 – Classification: Fire resistant ducts and fire dampers [5] ■ EN 1366-2 – Fire resistance tests for installations: Fire dampers ■ EN 1751 Ventilation for buildings – Air terminal devices
Declaration of performance	DoP / FK2-EU / DE / 002

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

[2] Data applies to uniform upstream and downstream conditions for the fire damper.

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

[4] For explosion-proof FK2-EU construction see the supplementary operating manual.

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

* Damper blade with lip seal for sizes 1 and 2, damper blade with travel stop seal for size 3, see table *12*.

Product sticker

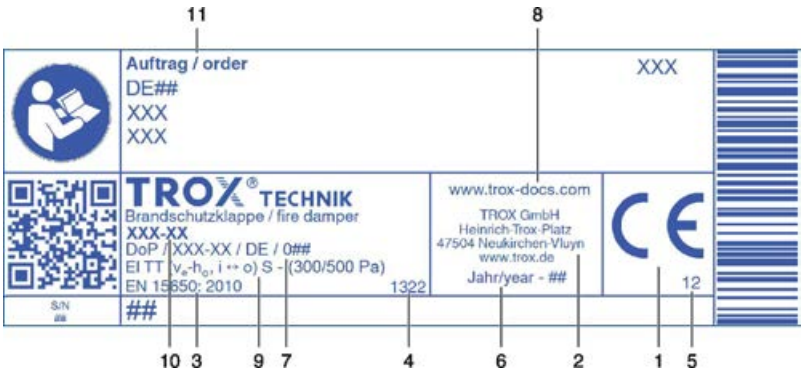


Fig. 1: Product sticker (example)

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 'Installation situations' on page 29*
10 Type
11 Order number

2.2 FK2-EU with fusible link

Dimensions and weight

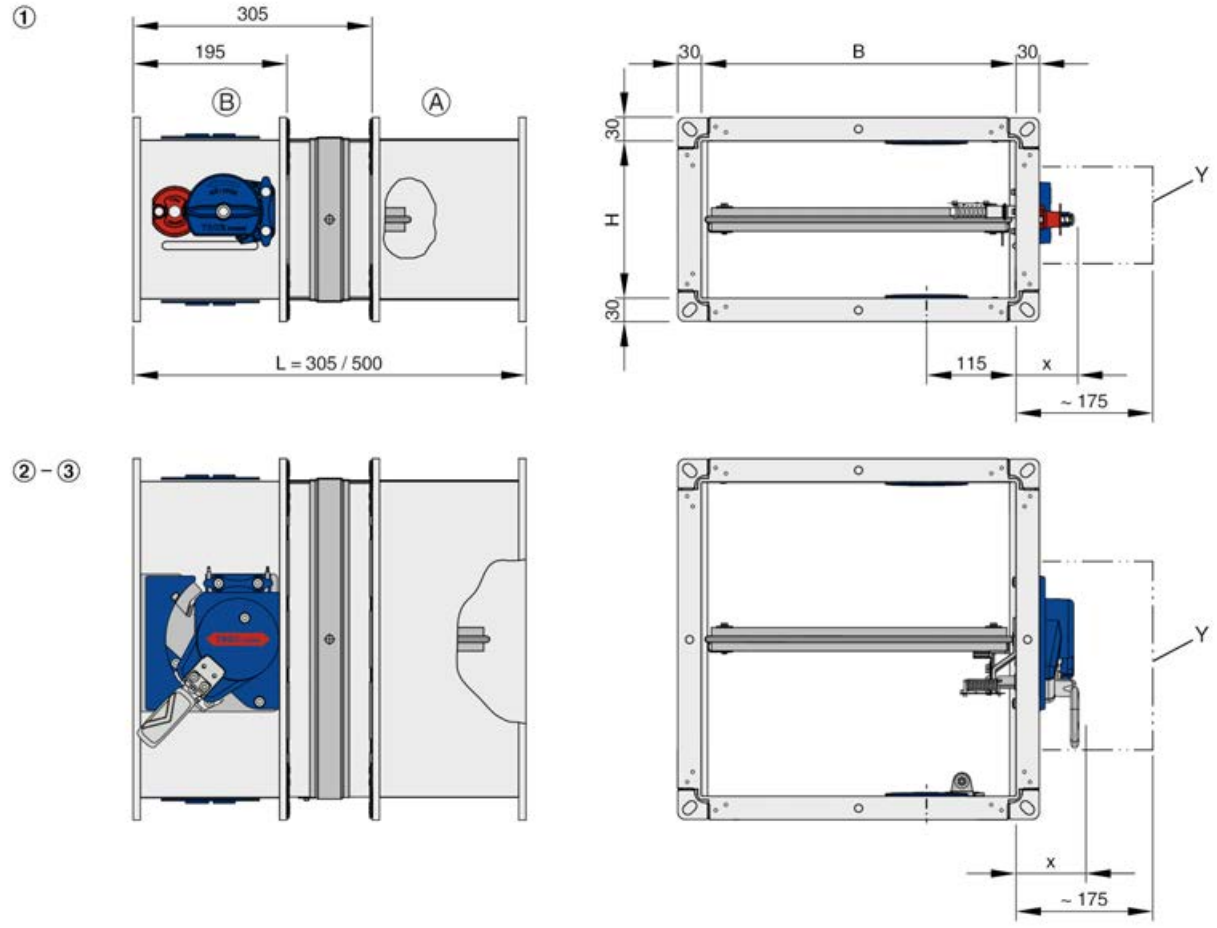


Fig. 2: FK2-EU with fusible link

B	Width of the fire damper (side B)	x	75 mm size 1 87 mm sizes 2 and 3
H	Height of the fire damper (side H)	Ⓐ	Installation side
FL	Length of the fire damper (casing length)	Ⓑ	Operating side
Y	Keep clear to provide access for operation		

- Weight of FK2-EU with fusible link, see table *12* .
- Sizes 1 to 3, see table *12* .
- Flange dimensions for L = 305 mm, see Fig. 3 .

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] for casing length L = 305 [mm] / L = 500 [mm]

H	B [mm]														1
[mm]	200	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500	
100	4/5	5/6	6/8	7/9	8/11	9/12	10/13	–	–	–	–	–	–	–	
150	4/6	5/7	7/9	8/10	9/12	10/13	11/15	–	–	–	–	–	–	–	
200	5/7	6/8	7/10	9/12	10/13	11/15	12/16	15/20	16/21	21/27	23/29	24/31	26/32	27/34	
250	7/9	8/10	10/12	11/14	12/16	14/18	15/19	16/21	18/23	24/29	25/31	27/33	29/35	30/38	[A]
300	8/10	9/12	11/14	12/15	13/17	15/19	16/21	18/23	19/25	26/32	28/34	30/36	32/39	33/41	
350	8/11	10/13	11/15	13/17	15/18	16/20	18/22	24/29	26/32	28/34	30/37	32/39	34/42	36/44	
400	9/11	11/13	12/16	14/18	16/20	17/22	19/24	26/31	28/34	31/37	33/39	35/42	37/45	39/47	
450	10/12	11/14	13/17	15/19	17/21	23/28	26/31	28/34	30/36	33/39	35/42	38/45	40/48	43/50	
500	10/13	12/15	14/18	16/20	18/22	25/30	27/33	30/36	33/39	35/42	36/45	40/48	43/51	46/54	
550	–	15/19	18/22	21/26	24/28	26/32	29/35	32/38	35/41	37/44	40/47	43/51	46/54	49/57	
600	–	16/20	19/23	22/27	25/30	28/33	31/37	34/40	37/43	40/47	43/50	46/53	49/57	52/60	[B]
650	–	17/21	20/25	23/28	27/32	30/35	33/39	36/42	39/46	42/49	45/53	48/56	51/60	55/63	
700	–	18/22	21/26	25/30	28/33	31/37	35/41	38/44	41/48	44/52	48/55	51/59	54/63	58/67	
750	–	19/23	22/27	26/31	29/35	33/39	36/43	40/47	43/50	47/54	50/58	54/62	57/66	61/70	
800	–	20/24	24/28	27/33	31/36	34/40	38/44	42/49	45/53	49/57	53/61	56/65	60/69	64/73	

[1] Construction with spring return actuator: [A] = Horizontally arranged spring return actuator, [B] = Vertically arranged spring return actuator

Sizes

1	
2	

3	

Damper blade (30 mm thick) with lip seal for sizes 1 and 2, damper blade (40 mm thick) with travel stop seal for size 3.

Flange holes

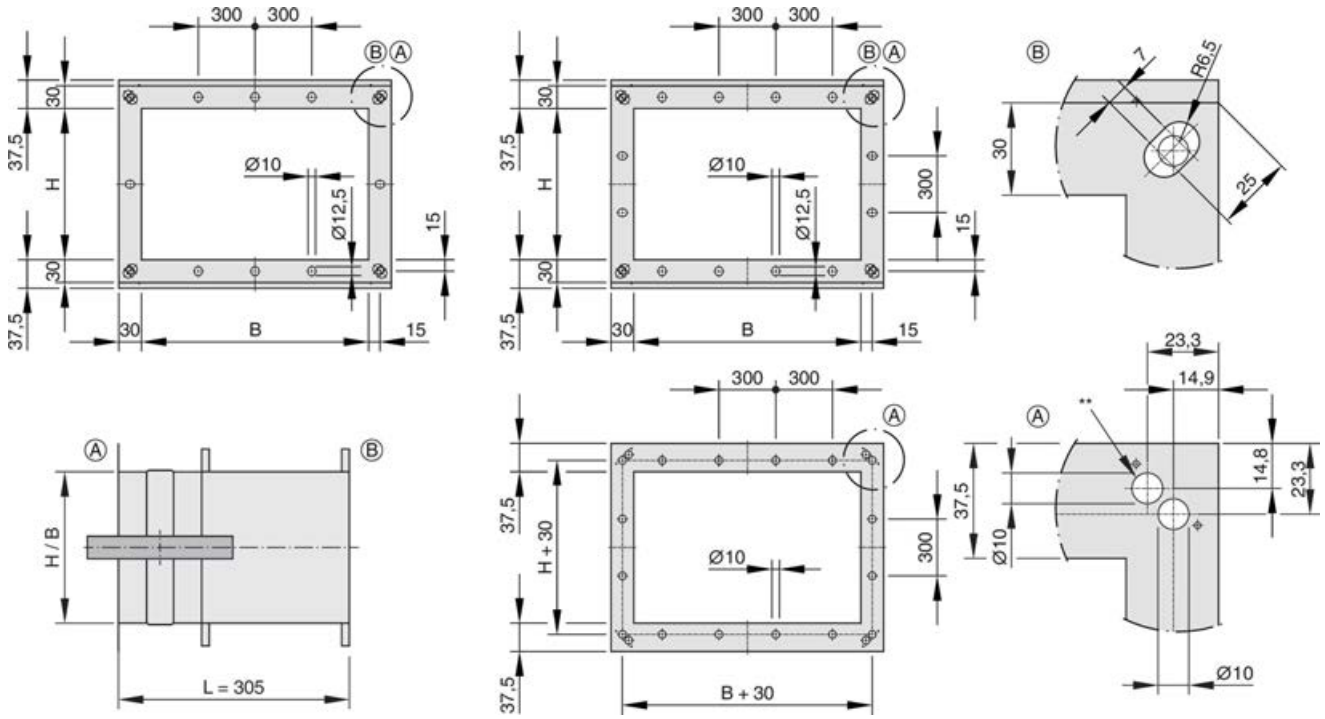


Fig. 3: Flange holes L = 305 mm – uneven and even number of holes

** Other flange holes (non-standard)

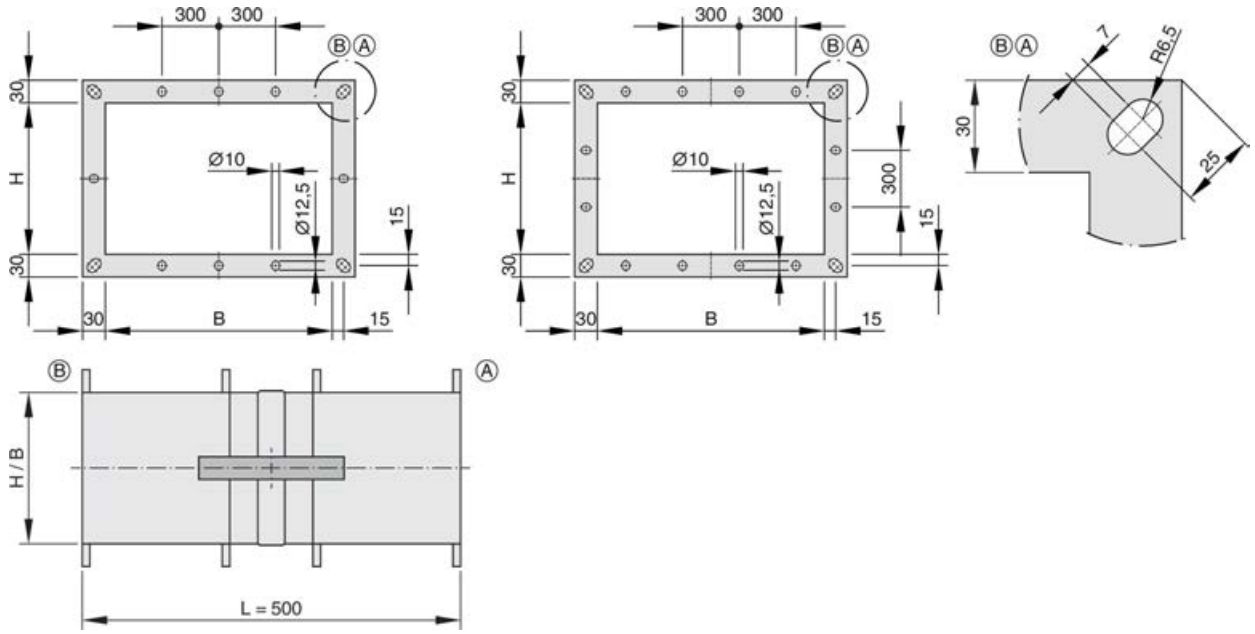


Fig. 4: Flange holes L = 500 mm – uneven and even number of holes

B or H [mm]	200/100 – 355	360 – 630	635 –800	805 – 1250	1255 – 1500
No. of holes on each side excluding corner holes	–	1	2	3	4

2.3 FK2-EU with spring return actuator

Dimensions and weight

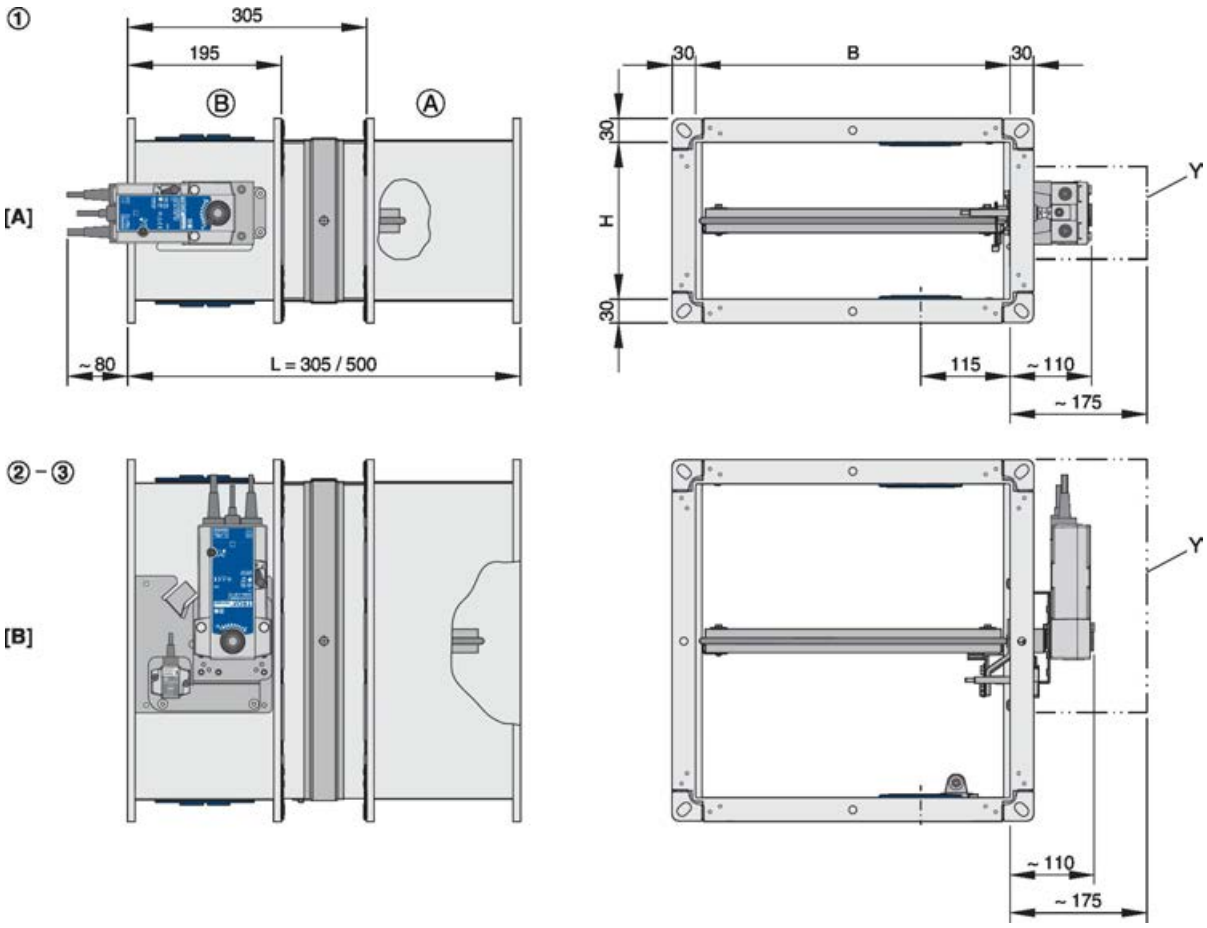


Fig. 5: FK2-EU with Belimo spring return actuator

B	Width of the fire damper (side B)	[B]	Spring return actuator vertical
H	Height of the fire damper (side H)	Y	Keep clear to provide access for operation
FL	Length of the fire damper (casing length)	Ⓐ	Installation side
[A]	Spring return actuator horizontal	Ⓑ	Operating side

- Weight of FK2-EU with fusible link + approx. 1 kg (BFL... and BFN...), see table *12* .
- For sizes 1 to 3 and orientation of the spring return actuator [A] or [B] see table *12* .
- Flange dimensions for L = 305 mm, see Fig. 3 .

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
Running time	Actuator / spring return	< 60 s / < 20 s	
Limit switch	Type of contact	2 changeover contacts	
	Switching voltage	5 – 120 V DC / 5 – 250 V AC	
	Switching current	1 mA – 3 (0.5 inductive) A	
	Contact resistance	< 1 Ω (when new)	
IEC protection class / IP protection		II / IP 54	
Storage temperature / ambient temperature		-40 – 55 °C / -30 – 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)	

Spring return actuator type BFL... for size 1.

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

Spring return actuator BFN...			
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	5 W / 2.1 W	4 W / 1.4 W
	Rating	10 VA (Imax 4 A @ 5 ms)	6 VA (Imax 8.3 A @ 5 ms)
Running time	Actuator / spring return	< 60 s / < 20 s	
Limit switch	Type of contact	2 changeover contacts	
	Switching voltage	5 – 120 V DC / 5 – 250 V AC	
	Switching current	1 mA – 3 (0.5 inductive) A	
	Contact resistance	< 1 Ω (when new)	
IEC protection class / IP protection		II / IP 54	
Storage temperature / ambient temperature		-40 – 55 °C / -30 – 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)	

Spring return actuator type BFN... for size 2 and 3.

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

Spring return actuator BF...			
Construction		**230-TN TR**	**24-TN-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	8.5 W / 3 W	7 W / 2 W
	Rating	11 VA	10 VA
Run time	Actuator / spring return	< 120 s / approx. 16 s	
Limit switch	Type of contact	2 changeover contact	
	Switching voltage	5 – 120 V DC / 5 – 250 V AC	
	Switching current	1 mA ... 6 A	
	Contact resistance	< 100 mΩ	
IEC protection class / IP protection		II / IP 54	III / IP 54
Storage temperature / ambient temperature		-40 to 50 °C / -30 to 50 °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)	

BF actuator optional / upon request, weight of FK2-EU with fusible link + approx. 2 kg

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

Dimensions and weight

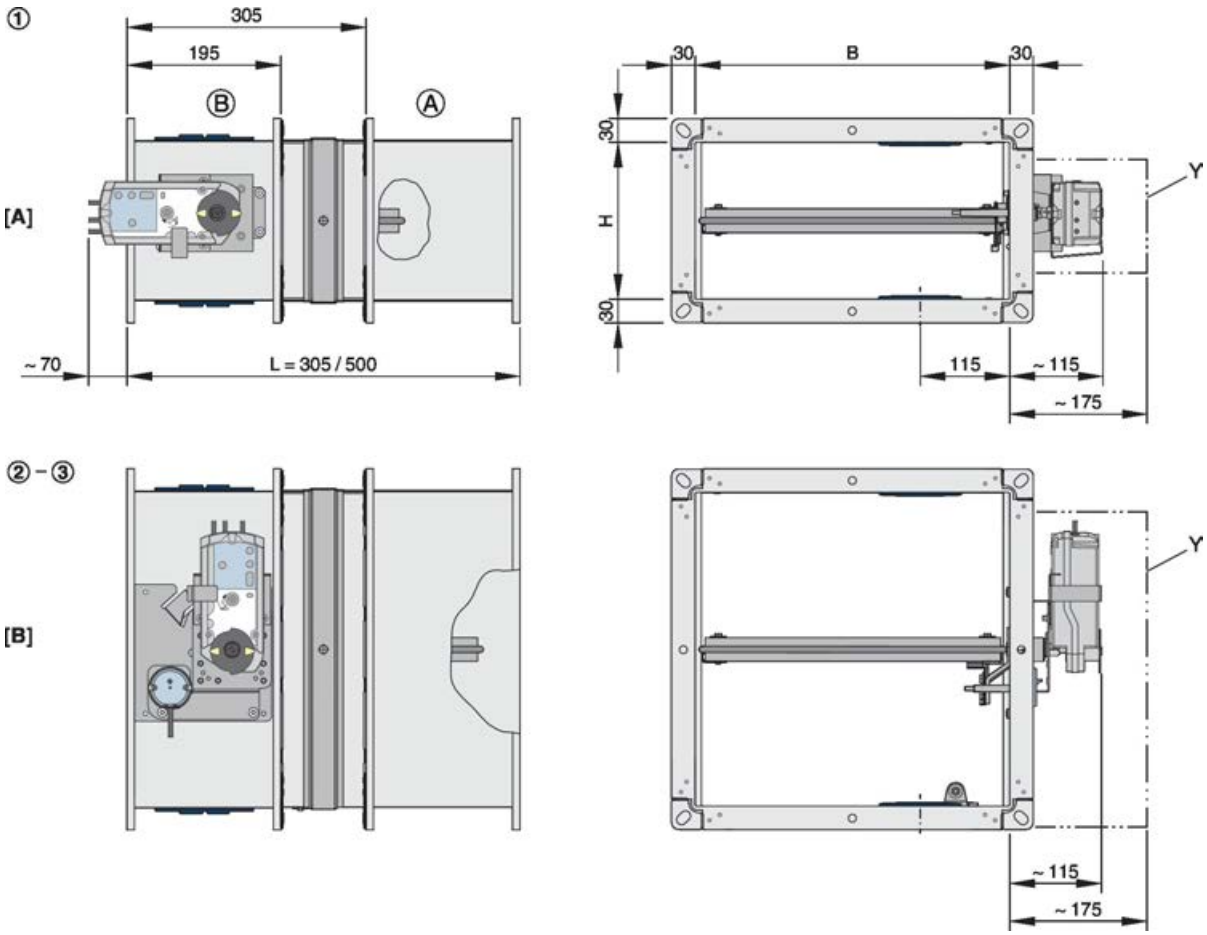


Fig. 6: FK2-EU with Siemens spring return actuator

B	Width of the fire damper (side B)	[B]	Spring return actuator vertical
H	Height of the fire damper (side H)	Y	Keep clear to provide access for operation
FL	Length of the fire damper (casing length)	Ⓐ	Installation side
[A]	Spring return actuator horizontal	Ⓑ	Operating side

- Weight of FK2-EU with fusible link + approx. 1.4 kg (GRA... and GNA...), see table ↯ *12* .
- For sizes 1 to 3 and orientation of the spring return actuator [A] or [B] see table ↯ *12* .
- Flange dimensions for L = 305 mm, see Fig. 3 .

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
Running time	Actuator / spring return	90 s / 15 s	
Limit switch	Type of contact	2 changeover contacts	
	Switching voltage	24 – 230 V AC / 12 – 30 V DC	
	Switching current	AC: 6 A (inductive 2 A) / DC: 2 A	
IEC protection class / IP protection		II / IP 42 or IP 54*	III / IP 42 or IP 54*
Storage temperature / ambient temperature		-20 to 50 °C / -20 to 50 °C	
Ambient humidity		< 95% rh, no condensation	
Connecting cable	Actuator / limit switch	0.9 m, 6 × 0.75 mm² (free of halogens)	

Spring return actuator type GRA... for size 1.

*Connecting cable at the bottom

Spring return actuator GNA...			
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
Running time	Actuator / spring return	90 s / 15 s	
Limit switch	Type of contact	2 changeover contacts	
	Switching voltage	24 – 230 V AC / 12 – 30 V DC	
	Switching current	AC: 6 A (inductive 2 A) / DC: 2 A	
IEC protection class / IP protection		II / IP 42 or IP 54*	III / IP 42 or IP 54*
Storage temperature / ambient temperature		-20 to 50 °C / -20 to 50 °C	
Ambient humidity		< 95% rh, no condensation	
Connecting cable	Actuator / limit switch	0.9 m, 6 × 0.75 mm² (free of halogens)	

Spring return actuator type GNA... for sizes 2 and 3.

*Connecting cable at the bottom

Spring return actuator GGA...			
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	8 VA / 6 W	7 VA / 5 W
	Hold position	4 W	3 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, 6 × 0.75 mm² (free of halogens)	

GGA actuator optional / upon request, weight of FK2-EU with fusible link + approx. 2.5 kg

*Connecting cable at the bottom

FK2-EU with Joventa spring return actuator

FK2-EU can also be supplied with a Joventa spring return actuator (upon request):

- SFR 2.90 T
- SFR 1.90 T
- SFR 1.90 T SLC

FK2-EU with explosion-proof Schischek spring return actuator

FK2-EU can also be supplied with an explosion-proof Schischek spring return actuator (upon request):

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

For more information see the Supplementary operating manual for explosion-proof fire dampers type FK2-EU.

2.4 FK2-EU with spring return actuator and duct smoke detector

Dimensions and weight

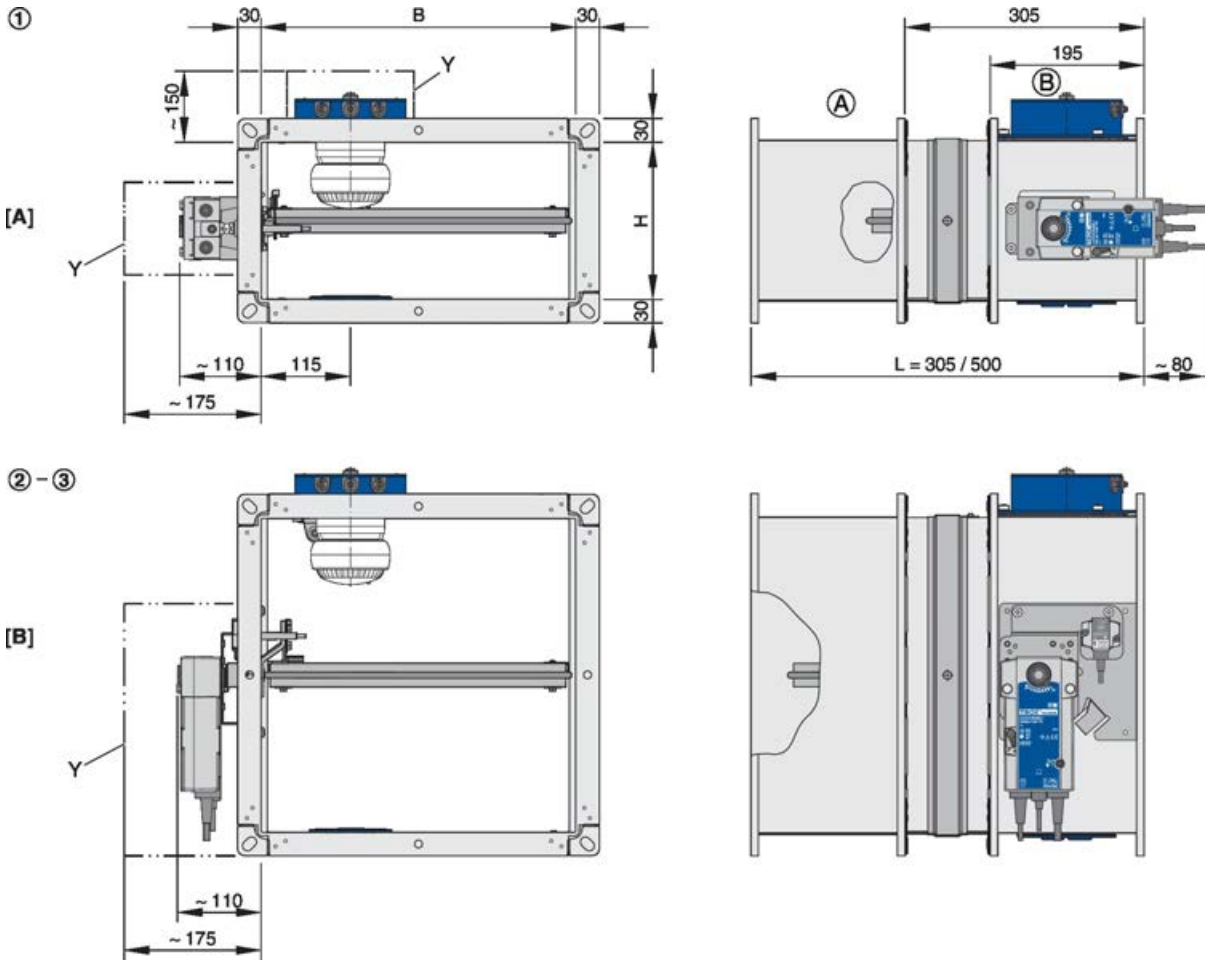


Fig. 7: FK2-EU´with Belimo spring return actuator and duct smoke detector

B	Width of the fire damper (side B)	[B]	Spring return actuator vertical
H	Height of the fire damper (side H)	Y	Keep clear to provide access for operation
FL	Length of the fire damper (casing length)	Ⓐ	Installation side
[A]	Spring return actuator horizontal	Ⓑ	Operating side

- Weight of FK2-EU with fusible link + approx. 2.5 kg (BFL... and BFN...), see table ↯ *12* .
- For technical data of the spring return actuator see table ↯ *15* and ↯ *17*
- For sizes 1 to 3 and orientation of the spring return actuator [A] or [B] see table ↯ *12* .
- Install the duct smoke detector RM-O-3-D in the lower inspection access, and at the top when you install the fire damper. For technical details of the duct smoke detector see the RM-O-3-D operating and installation manual.

2.5 FK2-EU with fusible link and cover grille as air transfer unit

Dimensions and weight

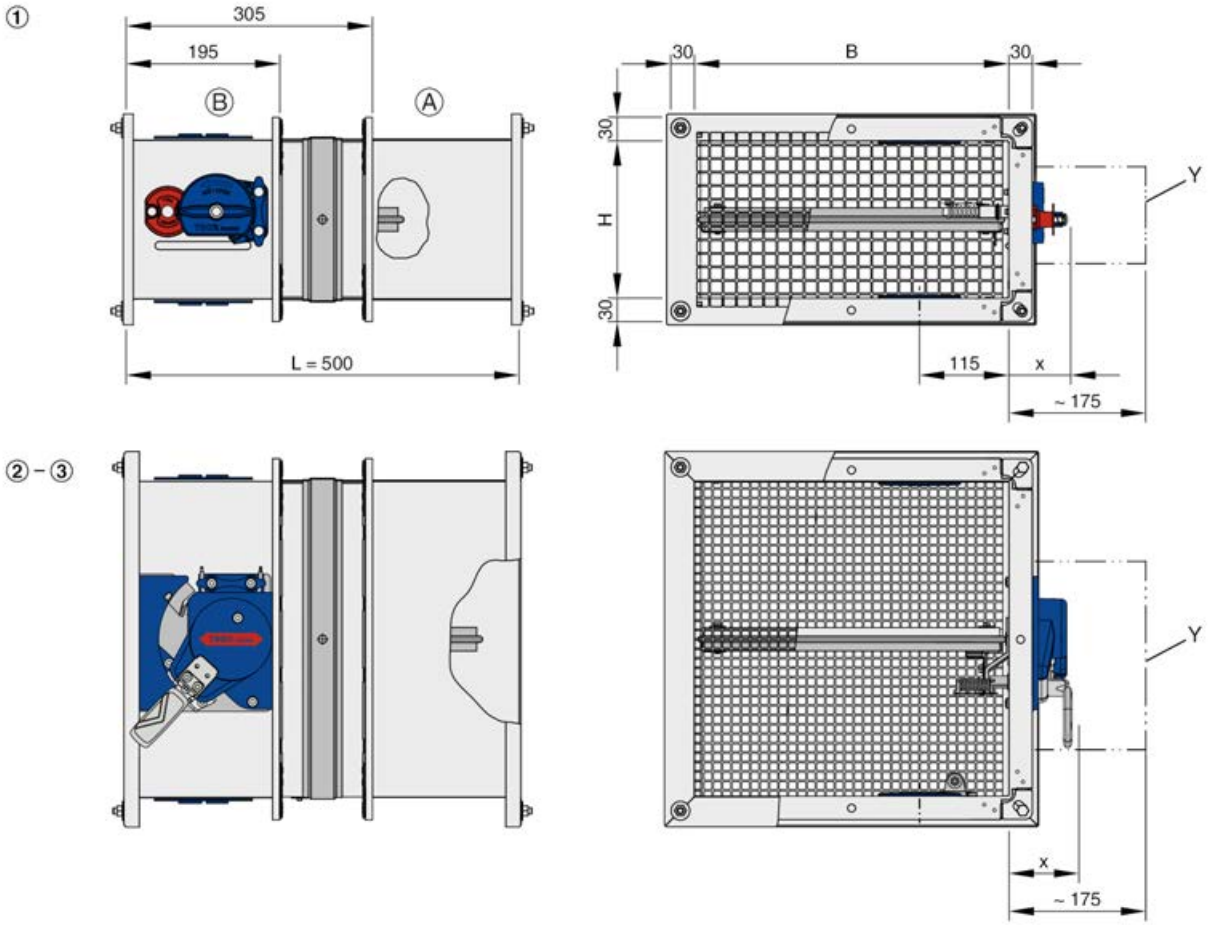


Fig. 8: FK2-EU with fusible link and cover grille as air transfer unit

B	Width of the fire damper (side B)	x	75 mm size 1 87 mm sizes 2 and 3
H	Height of the fire damper (side H)	Ⓐ	Installation side
FL	Length of the fire damper (casing length)	Ⓑ	Operating side
Y	Keep clear to provide access for operation		

- Sizes 1 to 3, see table *12* .

Note: Air transfer units may require a building inspectorate licence. This has to be determined and applied for on a case to case basis (by others).

2.6 FK2-EU with spring return actuator and duct smoke detector as air transfer damper

Dimensions and weight

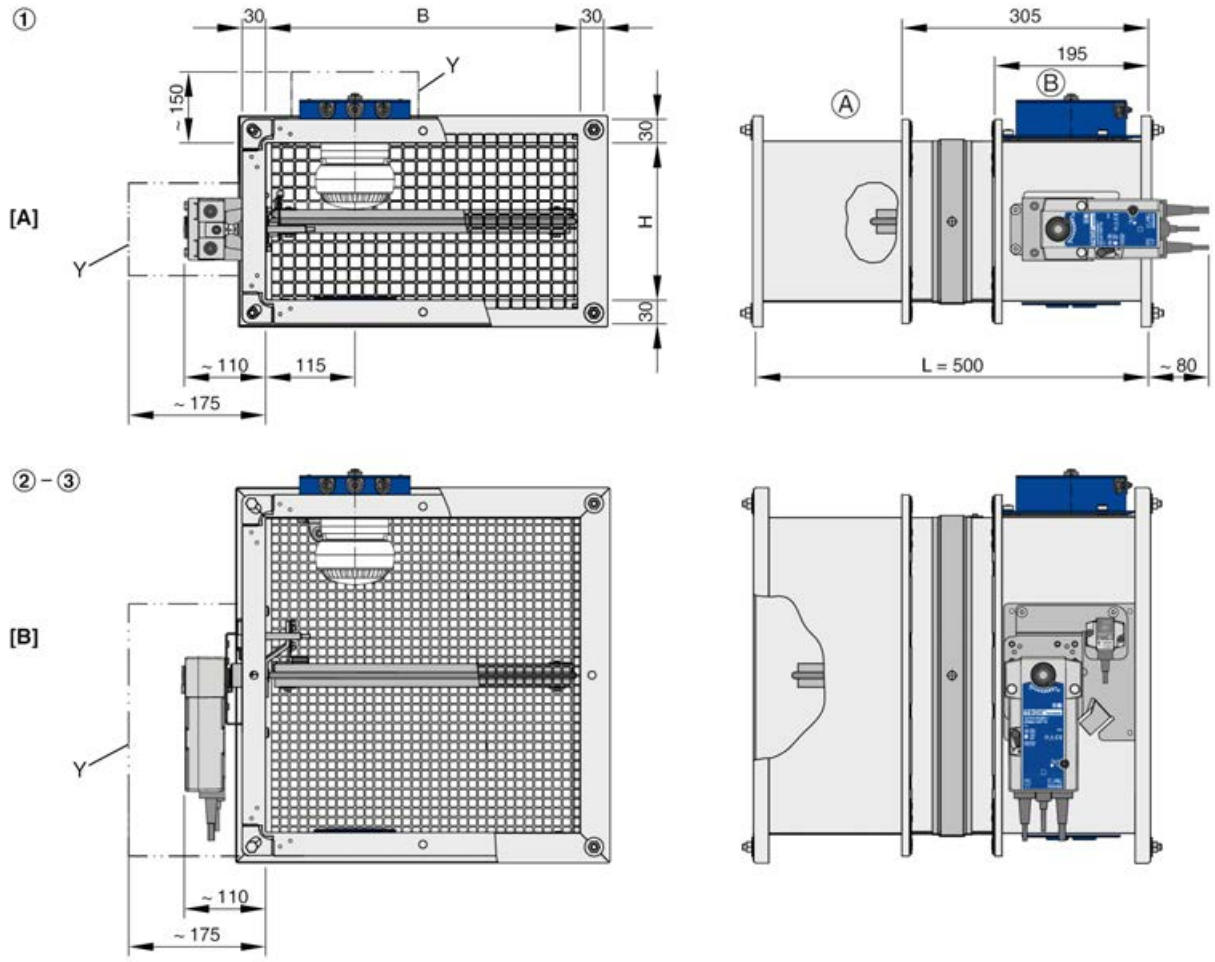


Fig. 9: FK2-EU with spring return actuator and duct smoke detector as air transfer damper

B Width of the fire damper (side B)
H Height of the fire damper (side H)
FL Length of the fire damper (casing length)
[A] Spring return actuator horizontal
[B] Spring return actuator vertical
Y Keep clear to provide access for operation
Ⓐ Installation side
Ⓑ Operating side

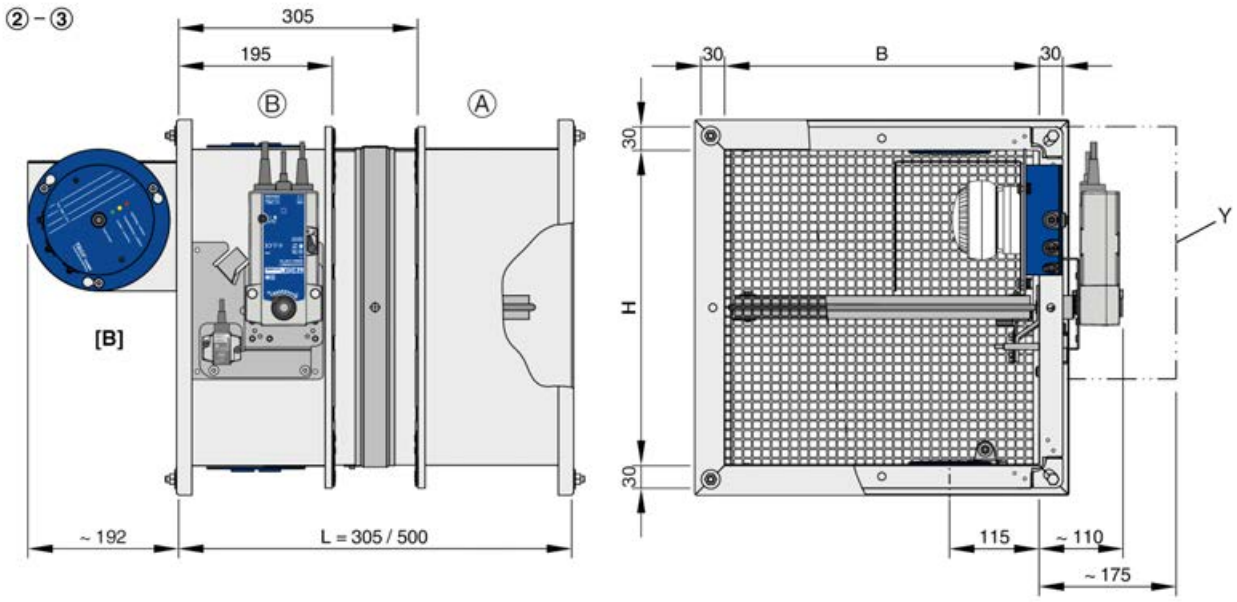


Fig. 10: FK2-EU with spring return actuator and duct smoke detector as air transfer damper – variant with bracket on the drive side, top right (shown for sizes 2 and 3)

B	Width of the fire damper (side B)	[B]	Spring return actuator vertical
H	Height of the fire damper (side H)	Y	Keep clear to provide access for operation
FL	Length of the fire damper (casing length)	Ⓐ	Installation side
[A]	Spring return actuator horizontal	Ⓑ	Operating side

- For technical data of the spring return actuator see table ↯ *15* and ↯ *17*
- For sizes 1 to 3 and orientation of the spring return actuator [A] or [B] see table ↯ *12* .
- Install duct smoke detector RM-O-3-D in the lower inspection access opening and at the top when installing the fire damper. For technical details of the duct smoke detector see the RM-O-3-D operating and installation manual.

  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, see Fig. 16 . It can be mounted on the drive side or on the non-drive side.
- If you install the air transfer damper in a ceiling, the size of FK2-EU must not exceed B × H = 500 × 500 mm.

3 Supply package, transport and storage

Supply package

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 included in the supply package, unless they are expressly described as included in the supply package.

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 (1 per shipment)

Colour hues on the damper blade

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

Transport on site

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

Bearing

For temporary storage please note:

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

Packaging

Properly dispose of packaging material.

4 Parts and function

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

4.2 FK2-EU with fusible link

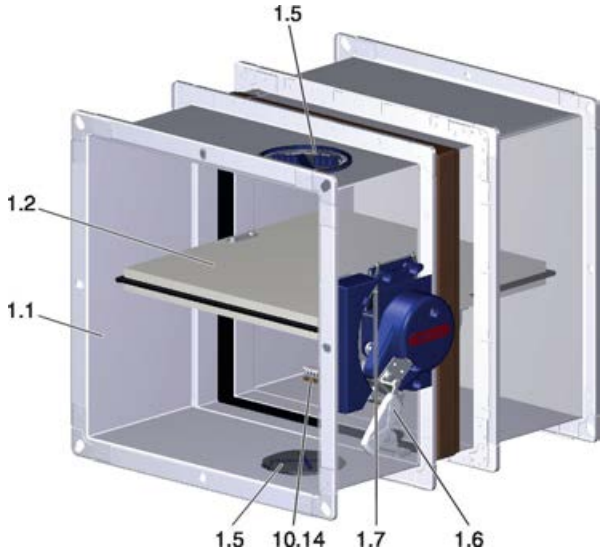


Fig. 11: FK2-EU with fusible link

1.1 Casing
1.2 Damper blade
1.5 Inspection access
1.6 Handle
1.7 Interlock
10.14 Thermal release mechanism with fusible link

Functional description

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

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

4.3 FK2-EU with spring return actuator

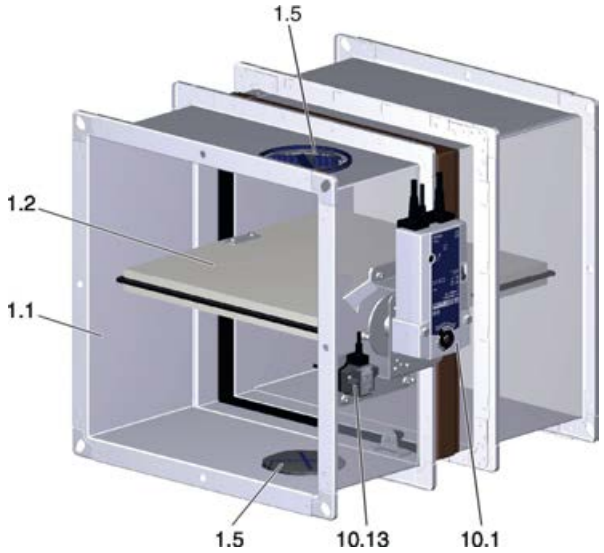


Fig. 12: FK2-EUwith spring return actuator

1.1 Casing
1.2 Damper blade
1.5 Inspection access
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 FK2-EU with spring return actuator and duct smoke detector

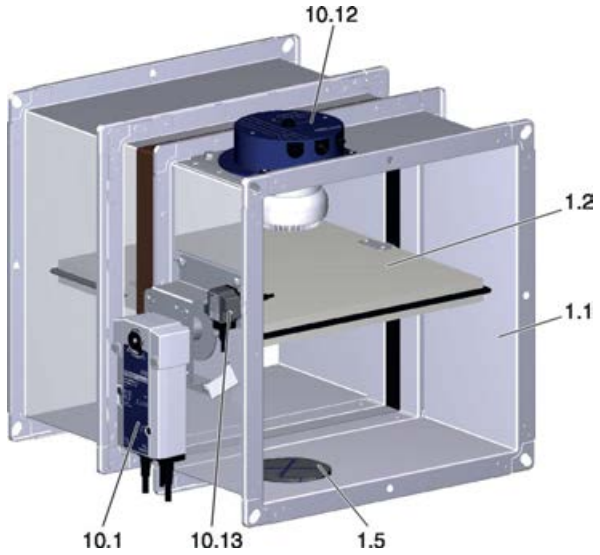


Fig. 13: FK2-EU with spring return actuator and duct smoke detector

1.1 Casing
1.2 Damper blade
1.5 Inspection access
10.1 Spring return actuator
10.12 Duct smoke detector RM-O-3-D (fixed with adapter metal sheet)
10.13 Thermoelectric release mechanism with temperature sensor

Functional description

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

As long as power is supplied to the actuator, the damper blade remains open. The spring return actuator closes the fire damper when one of the following events occur:

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

4.5 FK2-EU with fusible link and cover grille as air transfer unit

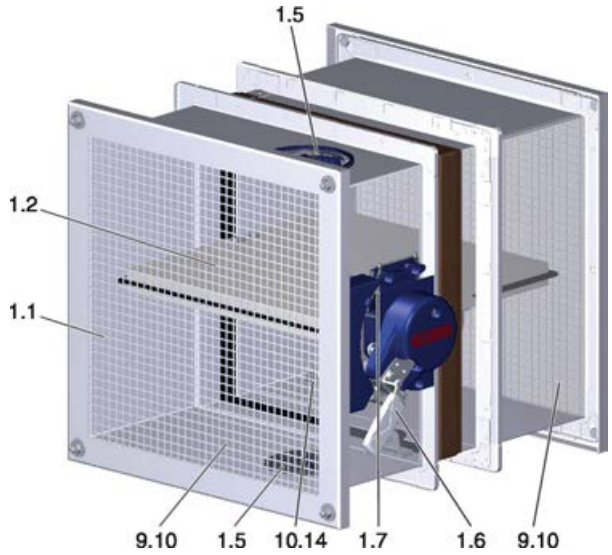


Fig. 14: FK2-EU with fusible link and cover grille as air transfer unit

1.1 Casing
1.2 Damper blade
1.5 Inspection access
1.6 Handle
1.7 Interlock
9.10 Cover grilles
10.14 Thermal release mechanism with fusible link

Functional description

Air transfer units prevent fire and smoke from spreading in buildings. The thermal release mechanism closes the air transfer unit when the release temperature (72 °C) is reached. Smoke can, however, spread below this temperature.

The air transfer unit consists of the FK2-EU fire damper with thermal release mechanism (72 °C) and cover grilles on both sides; it does not include a duct smoke detector.

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 FK2-EU with spring return actuator and duct smoke detector as air transfer damper

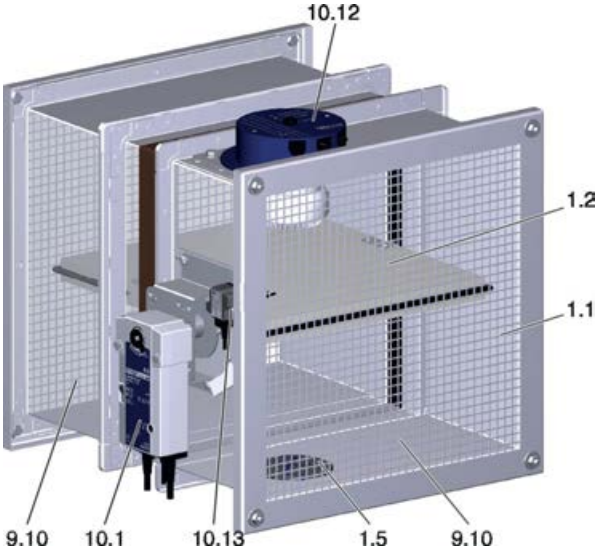
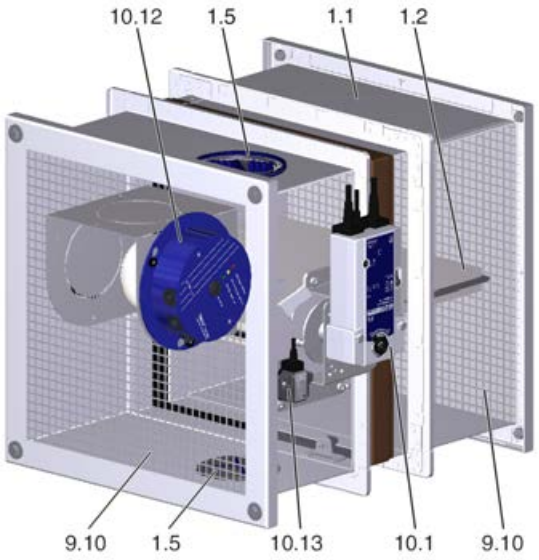


Fig. 15: FK2-EU with spring return actuator and duct smoke detector as air transfer damper

1.1 Casing
1.2 Damper blade
1.5 Inspection access
9.10 Cover grilles
10.1 Spring return actuator
10.12 Duct smoke detector RM-O-3-D (fixed with adapter metal sheet)
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.



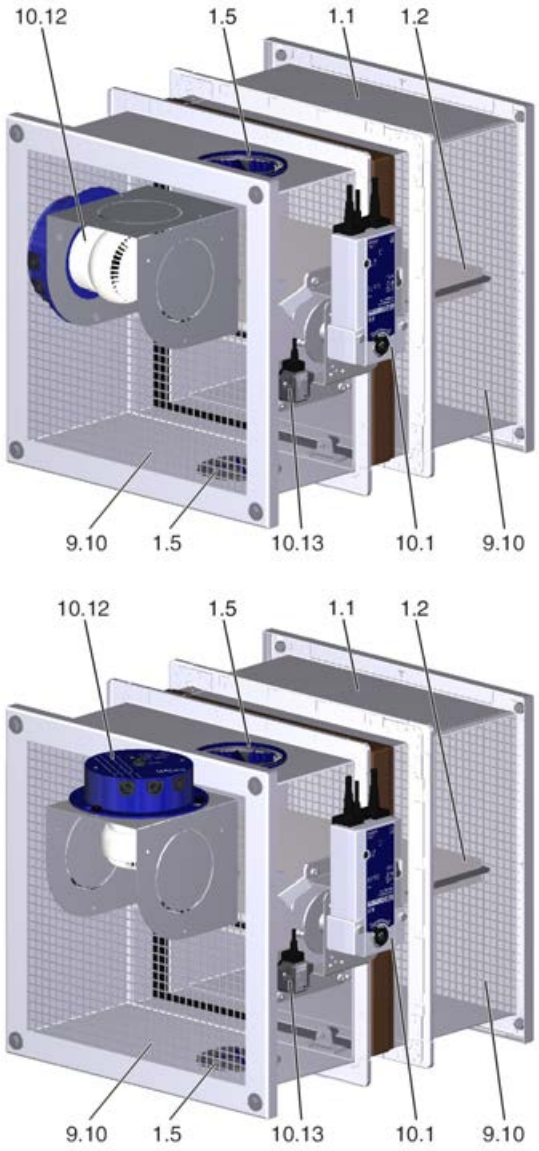


Fig. 16: FK2-EU with spring return actuator and duct smoke detector as air transfer damper

1.1 Casing
1.2 Damper blade
1.5 Inspection access
9.10 Cover grilles
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

Functional description

For more information on the installation and use of the fire damper as an air transfer damper in Germany see general type approval Z-6.50-2540.

5 Installation

5.1 Installation situations

Note

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

Installation situations						
Supporting construction	**Installation location**	**Minimum thickness [mm]**	**Class of performance EI TT (v_e–h_o, i ↔ o) S up to**	**Installation type/casing length L [mm]**		**Chapter**
				305 [1]	**500**	
Solid walls	in	150	EI 240 S	N	N	*70*
		100	EI 120 S	N	N	*70*
		100	EI 90 S	N	N	*70*
		80 [2]	EI 90 S	N	N	*70*
	in, combined installation	100	EI 90 S	N	N	*70*
	in, multiple installation	100	EI 90 S	N	N	*74*
	in, multiple installation common duct	100	EI 120 S	–	N	*76*
		100	EI 90 S	–	N	*76*
	in, partly with mineral wool	100	EI 90 S	N	N	*79*
	in, installation kit E3	100	EI 120 S	E	–	*80*
	in, installation kit EW	100	EI 120 S	–	E	*81*
	in, underneath flexible ceiling joint Installation kit GM	100	EI 90 S	–	N	*83*
	on the face of, installation kit WA	100	EI 90 S	–	E	*86*
	remote from, wall attachment, installation kit WE	100	EI 90 S	–	E	*89*
	remote from, wall penetration, installation kit WE	100	EI 90 S	–	E	*89*
	remote from, wall penetration, Installation kit WE 120	100	EI 120 S	–	E	*93*
	in, fire batt	100	EI 120 S	W	W	*95*
		100	EI 90 S	W	W	*95*
	in, fire batt, multiple installation	100	EI 90 S	W	W	*95*
	in, combined penetration seal	100	EI 90 S	W	W	*43*

[1] An extension piece may be required
[2] Gypsum wallboard to EN 12859
[3] Thickness increased near the installation opening
[4] Cadolto system
[5] Depending on local conditions

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

Installation situations						
Supporting construction	**Installation location**	**Minimum thickness [mm]**	**Class of performance EI TT (v_e–h_o, i ↔ o) S up to**	**Installation type/casing length L [mm]**		**Chapter**
				305 [1]	**500**	
Metal stud walls	in	94	EI 120 S	N	N	*103*
		94	EI 90 S	N	N	*103*
		94	EI 60 S	N	N	*103*
		94	EI 30 S	N	N	*103*
	in, combined installation	94	EI 90 S	N	N	*103*
	in, multiple installation	94	EI 90 S	N	N	*109*
	in, multiple installation, common duct	94	EI 120 S	–	N	*111*
		94	EI 90 S	–	N	*111*
	in, installation kit ES	94	EI 120 S	–	E	*114*
		94	EI 90 S	–	E	*114*
		94	EI 60 S	–	E	*114*
		94	EI 30 S	–	E	*114*
	in, with mineral wool	94	EI 60 S	–	T	*117*
	in, with fire-rated gypsum board or plasterboard strips	94	EI 90 S	–	T	*118*
	in, flexible ceiling joint, installation kit GL	100	EI 90 S	–	E	*120*
	remote from, wall penetration, Installation kit WE	94	EI 90 S	–	E	*130*
	in, fire batt	94	EI 120 S	W	W	*132*
		94	EI 90 S	W	W	*132*
		80	EI 60 S	W	W	*132*
		75	EI 30 S	W	W	*132*
	in, fire batt, multiple installation	94	EI 90 S	W	W	*132*
	in, combined penetration seal	100	EI 90 S	W	W	*43*
Timber stud walls	in	130	EI 120 S	N	N	*141*
		130	EI 90 S	N	N	*141*
		110	EI 60 S	N	N	*141*
		105	EI 30 S	N	N	*141*
	in, combined installation	130	EI 90 S	N	N	*143*
	in, multiple installation	130	EI 90 S	N	N	*150*
	in, multiple installation, common duct	130	EI 90 S	–	N	*153*

[1] An extension piece may be required
[2] Gypsum wallboard to EN 12859
[3] Thickness increased near the installation opening
[4] Cadolto system
[5] Depending on local conditions

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

Installation situations						
Supporting construction	**Installation location**	**Minimum thickness [mm]**	**Class of performance EI TT (v_e–h_o, i ↔ o) S up to**	**Installation type/casing length L [mm]**		**Chapter**
				305 [1]	**500**	
	in, installation kit ES	130	EI 120 S	E	E	*156*
		130	EI 90 S	E	E	*156*
		110	EI 60 S	E	E	*156*
		105	EI 30 S	E	E	*156*
	in, with mineral wool	130	EI 60 S	–	T	*158*
	in, fire batt	130	EI 120 S	W	W	*160*
		130	EI 90 S	W	W	*160*
		110	EI 60 S	W	W	*160*
		105	EI 30 S	W	W	*160*
	in, fire batt, multiple installation	130	EI 90 S	W	W	*160*
	in, combined penetration seal	130	EI 90 S	W	W	*43*
Half-timbered constructions	in	140	EI 120 S	N	N	*141*
		140	EI 90 S	N	N	*141*
		110	EI 30 S	N	N	*141*
	in, combined installation	140	EI 90 S	N	N	*143*
	in, multiple installation	140	EI 90 S	N	N	*150*
	in, multiple installation, common duct	140	EI 90 S	–	N	*153*
	in, installation kit ES	140	EI 120 S	–	E	*156*
		140	EI 90 S	–	E	*156*
		110	EI 30 S	–	E	*156*
	in, with mineral wool	140	EI 60 S	–	T	*158*
	in, fire batt	140	EI 120 S	W	W	*160*
		140	EI 90 S	W	W	*160*
		110	EI 30 S	W	W	*160*
	in, fire batt, multiple installation	140	EI 90 S	W	W	*160*
	in, combined penetration seal	140	EI 90 S	W	W	*43*
Solid wood / CLT walls	in	95	EI 90 S	N	N	*169*
	in, installation kit ES	95	EI 90 S	–	E	*170*
	in, with mineral wool	95	EI 60 S	–	T	*171*
	in, fire batt	95	EI 90 S	W	W	*172*

[1] An extension piece may be required
[2] Gypsum wallboard to EN 12859
[3] Thickness increased near the installation opening
[4] Cadolto system
[5] Depending on local conditions

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

Installation situations						
Supporting construction	**Installation location**	**Minimum thickness [mm]**	**Class of performance EI TT (v_e–h_o, i ↔ o) S up to**	**Installation type/casing length L [mm]**		**Chapter**
				305 [1]	**500**	
	in, combined penetration seal	100	EI 90 S	W	W	*43*
Shaft wall with metal support structure	in	90	EI 90 S	N	N	*176*
		80	EI 90 S	N	N	*176*
		75	EI 30 S	N	N	*176*
	in, combined installation	90	EI 90 S	N	N	*176*
	in, installation kit ES	90	EI 90 S	–	E	*181*
		80	EI 90 S	–	E	*181*
		75	EI 90 S	–	E	*181*
Shaft wall without metal support structure	in, installation kit ES	40	EI 90 S	–	E	*185*
Solid ceiling slabs	in	150	EI 180 S	N	N	*188*
		100 (125) [3]	EI 120 S	N	N	*188*
	in, combined installation	150	EI 90 S	N	N	*188*
	in, multiple installation	100 (125) [3]	EI 90 S	N	N	*188*
	in, concrete base	100	EI 120 S	N	N	*197*
	in, concrete base, combined installation	100	EI 90 S	N	N	*197*
	in, with concrete base, multiple installation	100	EI 90 S	N	N	*197*
	in, hollow concrete block ceilings	125	EI 90 S	N	N	*204*
	in, hollow core slabs	125	EI 90 S	N	N	*205*
	in, ribbed ceilings	125	EI 90 S	N	N	*206*
	in, composite ceilings	125	EI 90 S	N	N	*207*
	in, combined with wooden beam ceilings	125	EI 90 S	N	N	*208*
	in, combined with solid wood ceiling	125	EI 90 S	N	N	*209*
	in, combined, lightweight ceiling [4]	125	EI 120 S	N	N	*210*
	on the face of, installation kit WA	125	EI 90 S	–	E	*211*
	underneath (horizontal duct), installation kit WE	125	EI 90 S	–	E	*212*

[1] An extension piece may be required
[2] Gypsum wallboard to EN 12859
[3] Thickness increased near the installation opening
[4] Cadolto system
[5] Depending on local conditions

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

Installation situations						
Supporting construction	**Installation location**	**Minimum thickness [mm]**	**Class of performance EI TT (v_e–h_o, i ↔ o) S up to**	**Installation type/casing length L [mm]**		**Chapter**
				305 [1]	**500**	
	above (horizontal duct), installation kit WE	125	EI 90 S	–	E	212
	in, fire batt	150	EI 120 S	W	W	216
		100	EI 90 S	W	W	216
	in, fire batt, multiple installation	150	EI 90 S	W	W	216
Solid wood ceilings	in	140	EI 90 S	N	N	220
	in, with additional cladding	112.5	EI 90 S	N	N	220
	in, installation kit ES	140	EI 90 S	–	E	221
	in, installation kit ES, with additional cladding	112.5	EI 90 S	–	E	221
Wooden beam ceilings	in	167.5	EI 90 S	N	N	222
		155	EI 60 S	N	N	222
		142.5	EI 30 S	N	N	222
	in, installation kit ES	167.5	EI 90 S	–	E	224
		155	EI 60 S	–	E	224
		142.5	EI 30 S	–	E	224
	in, historic wooden beam ceilings	– [5]	EI 30 S	N	N	226

[1] An extension piece may be required
[2] Gypsum wallboard to EN 12859
[3] Thickness increased near the installation opening
[4] Cadolto system
[5] 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 ↬ *237* .
- Do NOT remove the product sticker or the adhesive tape from the damper.
- Protect the fire damper from humidity and condensation as they will damage the fire damper.
- The construction variants with stainless steel or powder-coated casing and additionally with an impregnated damper blade meet more critical requirements for corrosion protection.
- If the wall or ceiling is very thick, use an extension piece.
- Ensure that the installation of FK2-EU does not reduce the structural safety of the supporting wall or ceiling, not 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.
  - Distance to load-bearing structural elements ≥ 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 steal 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 has to be ensured by others; it can be ensured, for example, by switching off the fan or by using actuators with limit switches that ensure that not too many dampers close at the same time.
- As ducts may expand 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

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

  Ducting must be installed in such a way that it does not impose any significant loads on the fire damper in the event of a fire. This can be achieved by a non-straight duct, i.e. by bends or elbows, for example. Be sure to comply with the relevant national guidelines and regulations.
- The interior of the fire damper must be accessible for maintenance work and cleaning. Type FK2-EU fire dampers actually have two inspection accesses ↬ *26* . Depending on the installation configuration it may be necessary to provide additional inspection access points in the connecting ducts.
- 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. In addition, the DIBt has in May 2018 regulated minimum distances between fire-rated partitions and other openings, see www.DIBt.de. There must be no partition next to a fire damper installation (installation into a separate installation opening).

After installation

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

Equipotential bonding

The flange of the fire damper can be used for equipotential bonding; no holes must be drilled into the damper casing.

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.

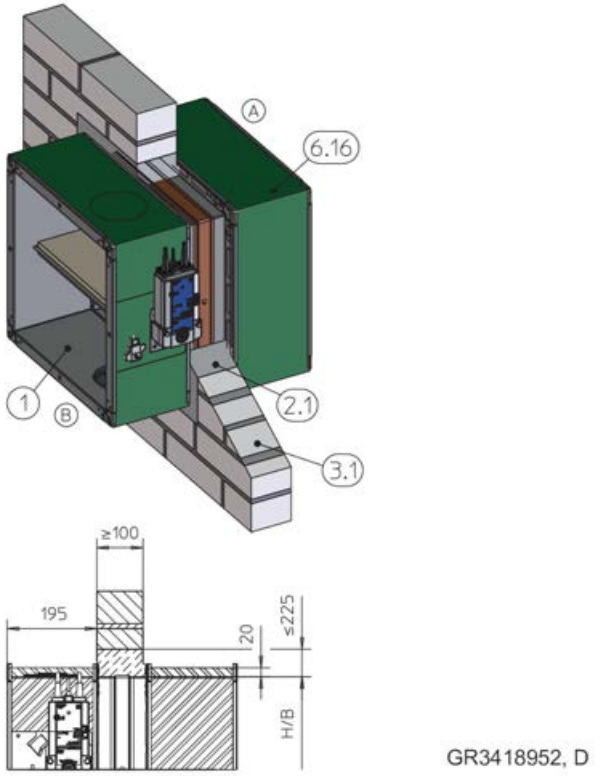


Fig. 17: Thermal insulation

1 FK2-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

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

For installation in Germany please note:
In Germany, the MVV TB (since 2019/1) allows only insulation materials with a fire behaviour of at least C - s2, d0. This requirement is met by Armaflex Ultima insulation material from Armacell, for example. The applicable local building regulations must be complied with. For information on the use of elastomer foams see *'If this fire damper is used in Germany:' on page 7*.

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 233*.

Installation positions

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

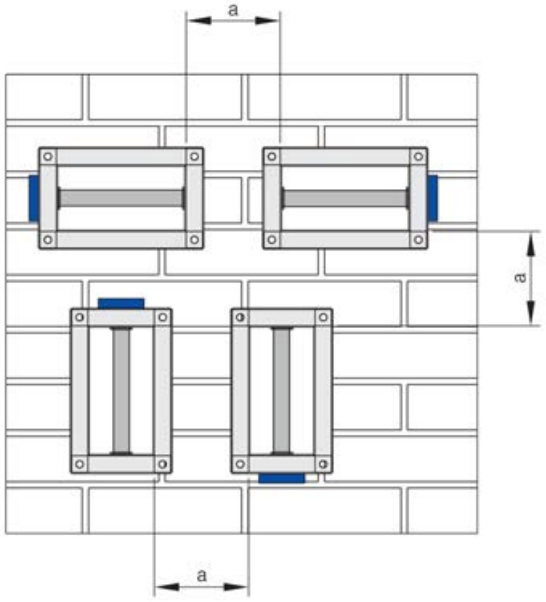


Fig. 18: Blade shaft horizontal or vertical

a Minimum distance between two fire dampers. Each fire damper is to be installed in its own installation opening unless stated otherwise in the installation details. Distance between two fire dampers ≥ 200 mm.

If the fire damper with a duct smoke detector is used in a ventilation system, it must be installed horizontally, with the duct smoke detector at the top.
You may choose a different arrangement as long as you comply with the general building inspectorate licence for the duct smoke detector.

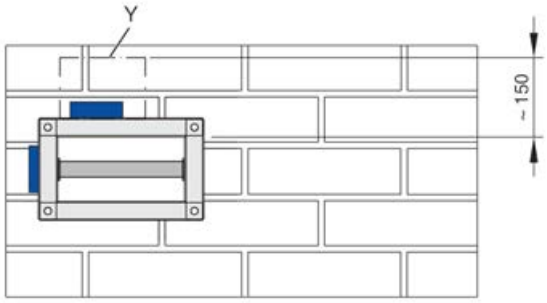


Fig. 19: Horizontal installation

Y Keep clear for operation and maintenance

Distances

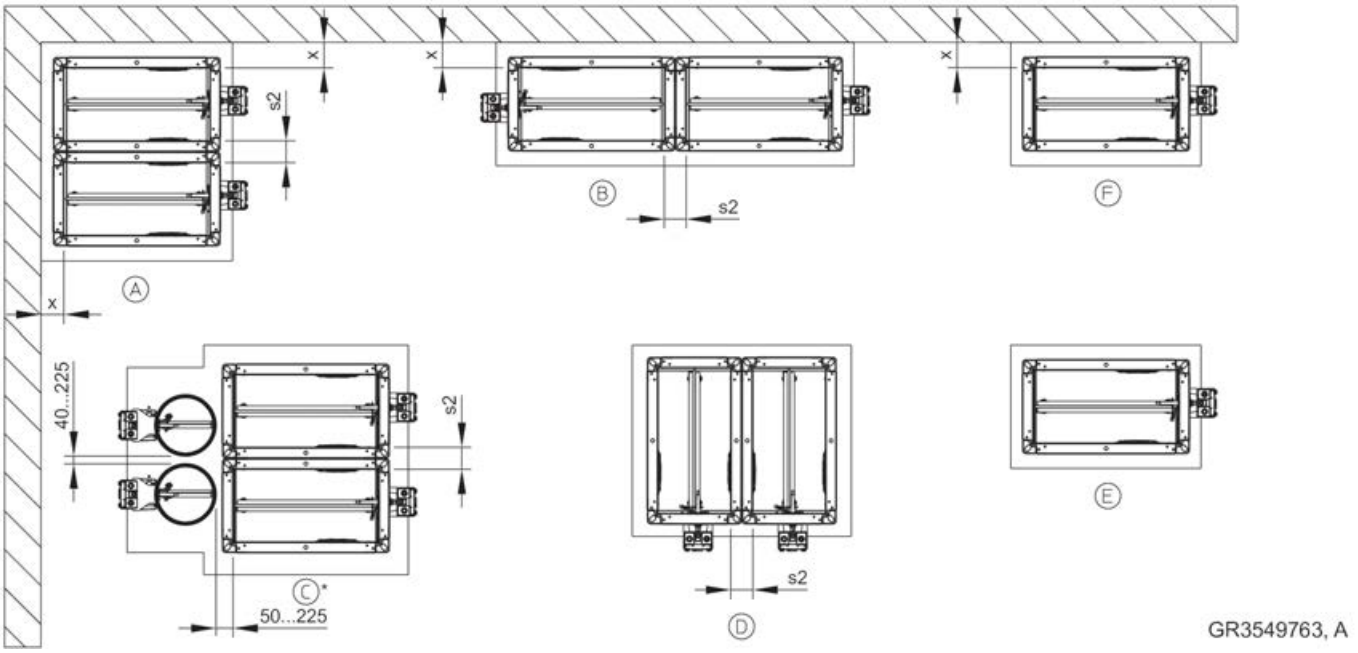


Fig. 20: Distances

* Combined installation with fire damper FKRS-EU

Distances (unless stated otherwise in the installation details)

Installation type	x [mm]	s2 [mm]
Mortar-based installation	40 – 225	60 [3] – 225
Fire batt installation	40 – 600	60 – 600 [2, 3] / ≥ 200 [2]
Partial mortaring [1]	~ 50	60 [3] – 225

[1] Solid wall only

[2] Depending on supporting structure

[3] if L = 500 mm.

If L = 305 mm and installation of dampers on top of each other, the distance has to be 75 – 225 mm (mortar-based installation) or 75 – 600 mm (fire batt installation).

Perimeter gap s1: ≤ 225 mm with mortar-based installation, 40 – 600 mmwith fire batt installation.

Installation orientation (see installation details for fire resistance)

Supporting construction	Installation type		
	Mortar-based installation	Dry and 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 / compartment wall with metal support structure	A – F	E, F	A, B, D – F
Timber stud wall or half-timbered construction	A – F	E, F	A, B, D – F
Solid wood wall / CLT wall	E, F	E, F	E, F
Shaft wall	A – F	E, F	

Supporting construction	Installation type		
	Mortar-based installation	Dry and mortarless installation	Fire batt installation
Solid ceiling slab	A, B, D – F		A, B, D – F
Combined with a lightweight ceiling (Cadolto system)	A, B, D – F		
In / combined with a solid wood ceiling	E, F / A, B, D – F		
In / combined with a wooden beam ceiling	E, F / A, B, D – F		

Perimeter gap »s1«

- With mortar-based installation the perimeter gap s1 must not exceed 225 mm (wall and ceiling). The perimeter gap »s« must be large enough so that mortar can be filled in even in case of thicker walls or ceilings. Be sure to close larger wall openings or holes beforehand and in a suitable way, i.e. depending on the type of wall. 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.

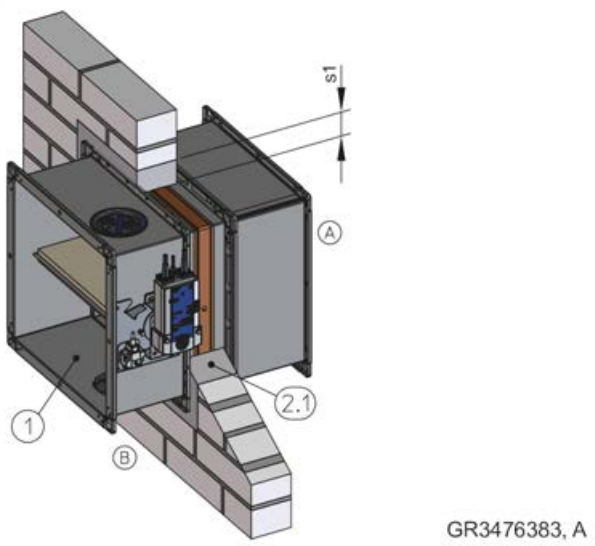


Fig. 21: Perimeter gap

1 FK2-EU
2.1 Mortar
s1 Perimeter gap

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

Mortar-based installation

- Cover all openings and control elements of the fire damper (e.g. with plastic) to protect them from contamination.
- In case of mortar-based installation it may be necessary to protect the sides of the fire damper casing against deformation, e.g. with a prop.
- Position the fire damper in the centre of the installation opening, then push it in so that the distance between the operating side flange and the wall or ceiling is 195 mm; secure the fire damper in this position. Connect extension piece, if required, or duct.
- In case of mortar-based installation, the open spaces between the fire damper casing and the wall or ceiling slab must be closed off with mortar. Entrapped air is to be avoided. The mortar bed depth should be equal to the thickness of the wall but must be at least 100 mm.
- If you install the fire damper as the solid wall or ceiling slab is being completed, perimeter gap »s1« is not required. The open spaces between the fire damper and the wall must be closed off with mortar; for installation into solid ceiling slabs, 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.

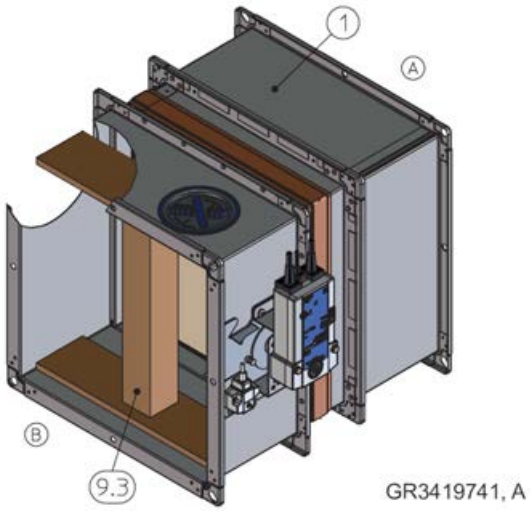


Fig. 22: FK2-EU with prop

1 FK2-EU
9.3 Prop

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
- Equivalent mortars that meet the requirements of the above standards, gypsum mortar or concrete

Mineral wool as filling material

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

Fire-resistant cladding

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

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

Installation with installation kit ES

- Casing length L = 500 mm
- The installation kit has to be attached to the fire damper (by others), see Fig. 30 to Fig. 32 .
- Enough clear space is required for mounting the installation kit onto the fire damper.
- Use dry wall screws ∅ 5.5 mm and brackets to fix the installation kit ES; be sure to fasten the dry wall screws firmly to the studs. Use dry wall screws that are long enough. The holes for the fixing screws on the B side are made in the factory.
- For installation near the floor or ceiling, professionally shorten the cover plate on the installation kit on one side. Then use the brackets that were previously on sides B and fix them in the upper parts of sides H (see installation details). Pre-drill the holes ∅ 4 mm.

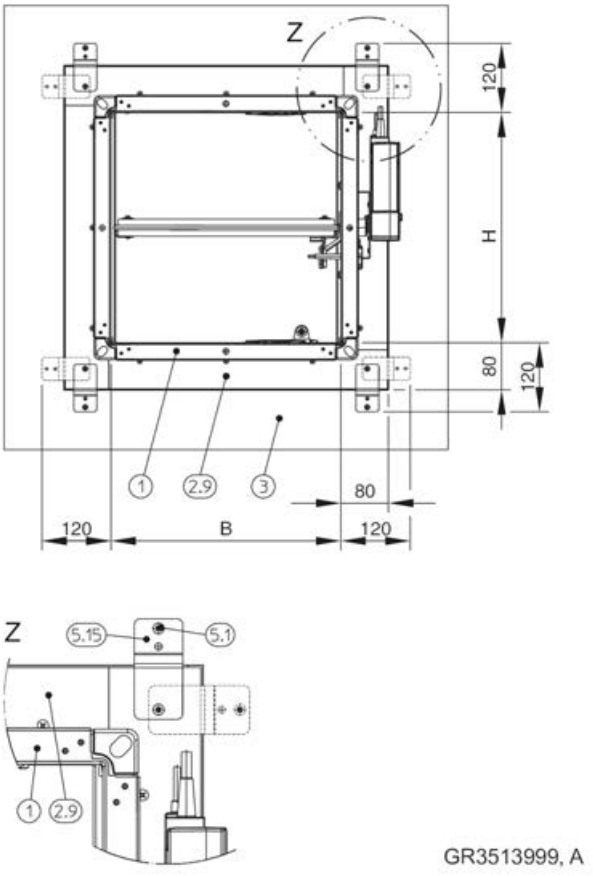


Fig. 23: Installation kit – clear space, normal installation

1 FK2-EU
2.9 Installation kit ES
3 Wall
5.1 Dry wall screw (by others)
5.15 Bracket

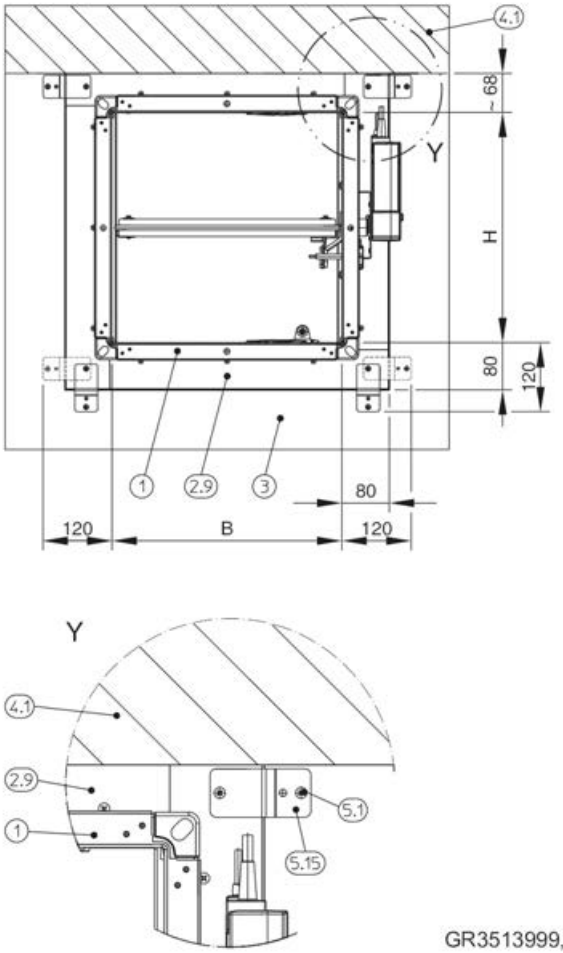


Fig. 24: Installation kit – clear space, for installation near the floor or ceiling

1 FK2-EU
2.9 Installation kit ES (cover plate shortened by others)
3 Wall
4.1 Solid ceiling slab / solid floor
5.1 Dry wall screw (by others)
5.15 Bracket

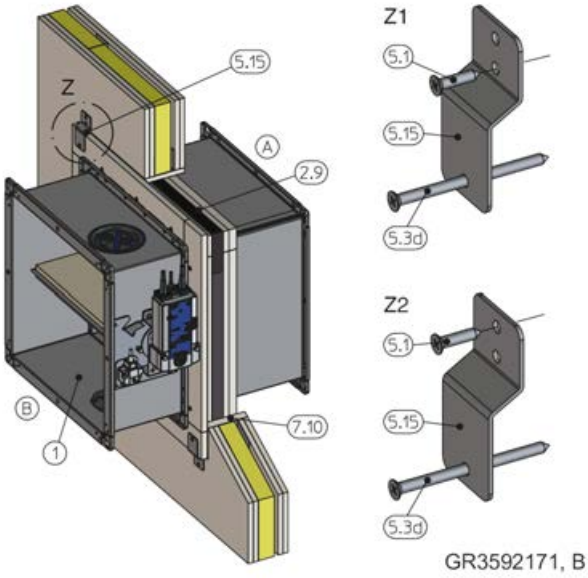


Fig. 25: Fastening the installation kit to the metal studs

1 FK2-EU
2.9 Installation kit ES
5.1 Dry wall screw (by others)
5.3d Chipboard screw 5 × 50 mm (up to B ≤ 800 mm, 4 screws; if B > 800 mm, 8 screws)
5.15 Bracket (up to B ≤ 800 mm, 4 brackets; if B > 800 mm, 8 brackets)
7.10 Trim panels
Z1 Fastening – without trim panel or with single-layer trim panel
Z2 Fastening – with double-layer trim panels
A Installation side
B Operating side

Installation with installation kit E3

- Casing length L = 305 mm (with extension pieces on both sides to achieve L = 500 mm)
- The installation kit has to be attached to the fire damper (by others), see Fig. 65 .
- For dry mortarless installation into solid walls use the existing installation subframe E1 / E2 of the FK-K90 or FK-EU.

Installation with installation kit EW

- Casing length L = 500 mm
- The installation kit has to be attached to the fire damper (by others), see Fig. 66 .
- For dry mortarless installation into solid walls use an installation subframe

Installation with installation kit GM

- Casing length L = 500 mm
- The installation kit has to be attached to the fire damper (by others), see Fig. 67 and Fig. 68 .
- The installation kit is provided for installation into solid non-load-bearing walls with a flexible ceiling joint.

Installation on the face of solid walls and ceiling slabs with installation kit WA

- Casing length L = 500 mm
- The installation kit has to be attached to the fire damper (by others), see Fig. 41 to Fig. 44
- Enough clear space is required to mount the installation kit onto the fire damper, at least 150 mm around the perimeter Cladding and wall/ceiling attachment are required on all 4 sides.
- Attach (flange) the fire damper to a sheet steel duct that has been shortened and is flush with the wall or ceiling.
- Alternatively, attach the FK2-EU with the wall face frame to a cut hole or to a circular duct that has been shortened so as to be flush with the wall. The movement of the damper blade must not be impaired.
- Use fire-rated steel anchors with suitability certificate to fix the wall face frame to the wall/ceiling (on a cut hole or circular duct) and also to fix the cladding; push through installation is also possible.
- For more installation details see the various installation situations.

Installation remote from walls and ceilings with installation kit WE

- Casing length L = 500 mm
- The installation kit has to be attached to the fire damper (by others), see Fig. 45 to Fig. 48
- Attach the fire damper to sheet steel ducts with fire-resistant cladding and without any openings.
- Wall or ceiling attachment, wall or ceiling penetration, suspension of the fire damper and attachment of the cladding to the installation kit have to be carried out as described in this manual. Suspension and cladding of the duct, including fittings, have to be carried out according to Promat® specifications.
- Cladding and wall/ceiling attachment are required on all 4 sides. Enough clear space is required, at least 155 mm around the perimeter.
- Fire dampers installed remote from walls and ceilings need to be suspended or fixed, see *Chapter 5.13.2 'Suspending fire dampers installed remote from solid walls and ceiling slabs' on page 229* .
- Suspension systems with L ≥ 1.5 m require fire-resistant insulation. Use cladding or mineral wool insulation according to the manufacturer's specifications.
- For more information on installation and components to be provided by others see the descriptions of the various installation situations and the Promat manual.

Installation remote from walls with installation kit WE 120

- Casing length L = 500 mm
- The installation kit has to be attached to the fire damper (by others), see fig. 74.
- Attach the fire damper to sheet steel ducts with PAROC® mineral wool insulation and without any openings.
- Wall attachment, wall penetration, suspension of the fire damper and attachment of the mineral wool insulation to the installation kit have to be carried out as described in this manual. Attaching the mineral wool insulation to the duct, including fittings, has to be carried out as described in this manual and also according to PAROC® specifications.
- Mineral wool insulation and wall attachment are required on all 4 sides. Enough clear space is required, at least 180 mm around the perimeter.
- Fire dampers installed remote from walls need to be suspended or fixed, see *Chapter 5.13 'Fixing the fire damper' on page 228* *5.13.3 'Fixing the damper when a fire batt is used' on page 230* .
- Suspension systems with L ≥ 1.5 m require fire-resistant insulation. Use cladding or mineral wool insulation according to the manufacturer's specifications.

Installation into lightweight partition walls with metal support and flexible ceiling joint with installation kit GL / GLK

- Casing length L = 500 mm
- The installation kit has to be attached to the fire damper (by others), see Fig. 50 to Fig. 52
- Enough clear space is required for mounting the installation kit onto the fire damper.
- Fixing installation kit GL/GLK: Use threaded rods M10, approx. 130 mm long, with nuts, and steel brackets, approx. 50 × 40 × 5 mm (supply package).
- Fixing the installation kit to the ceiling: Use fire-rated steel anchors with suitability certificate, at least M8, or alternatively threaded rods (push through).
- For more installation details see the various installation situations.

Installation with fire batt

- The distance from the operating side flange to the wall has to be 195 mm.
- 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.
- Do not use a fire batt in combination with a flexible ceiling joint.
- Fix fire dampers on both sides of the wall, ↳ *Chapter 5.13 'Fixing the fire damper' on page 228* ↳ *5.13.3 'Fixing the damper when a fire batt is used' on page 230* .
- If the ceiling is fairly thick, you may use additional layers of mineral wool slabs on side A.

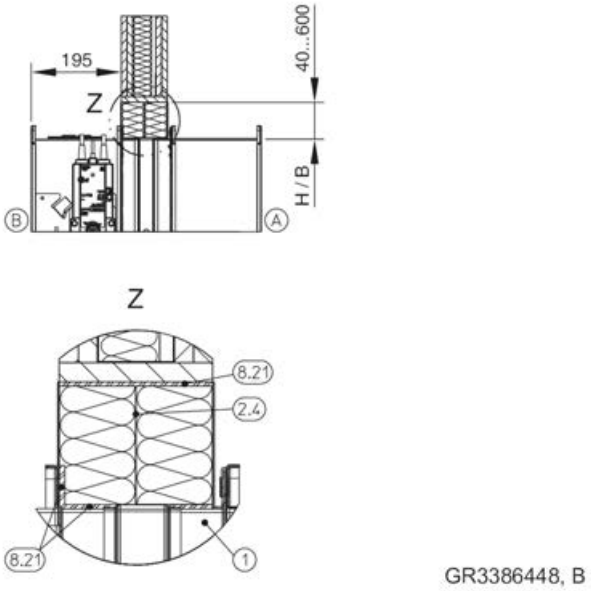


Fig. 26: Fire-resistant sealant

1 FK2-EU
2.4 Coated board system
8.21 Firestop sealant
A Installation side
B Operating side

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

Dimensions and distances for fire batt systems for wall installation

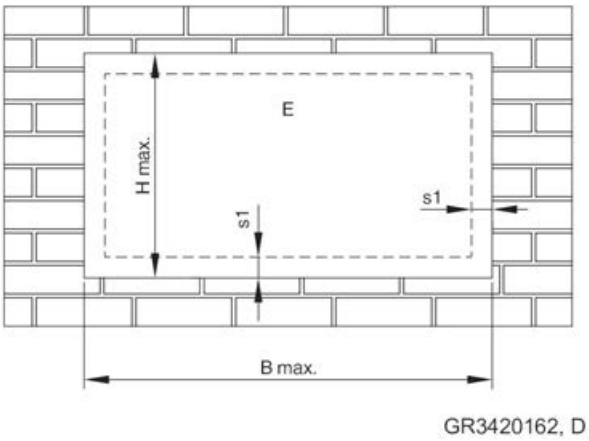


Fig. 27: Fire batt – installation in solid walls and ceiling slabs, lightweight partition, timber stud wall, half-timbered construction and solid wood walls

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		

Damper combination up to EI 90 S	s1 min. [mm]	s1 max. [mm]
FK2-EU	40	600

Installation with combined penetration seal

- Combined penetration of fire dampers FK2-EU and FKRS-EU as well as cables and pipes through a fire batt system: Hilti-CFS-CT, CP 670 and CP 673.
- Installation into solid walls, lightweight partition walls with metal or timber support structure, solid wood walls and CLT walls.
- Maximum penetration seal size: B1 × H1 = 3000 × 2000 mm. The penetration seal size depends on the size and number of dampers, cables and pipes; see the installation and operating manual for the combined penetration seal.
- Minimum distance between fire damper casing and cable penetrations: ≥ 100 mm.
- Minimum distance between fire damper casing and pipe penetrations: ≥ 50 mm.
- Distance between FK2-EU and FKRS-EU: ≥ 50 mm.
- The position of the fire dampers, pipes and cables in the combined penetration seal is irrelevant as long as the specified distances are kept.
- The combined penetration seal allows for the single or multiple installation of fire dampers, cables, cable bundles, cable trays, conduits and plastic pipes.
- Fire dampers need to be suspended on both sides, see *Chapter 5.13.1 'General' on page 228*
- Do not use a fire batt in combination with a flexible ceiling joint.
- For more information on cable and pipe penetrations and the fire batt system refer to Hilti.

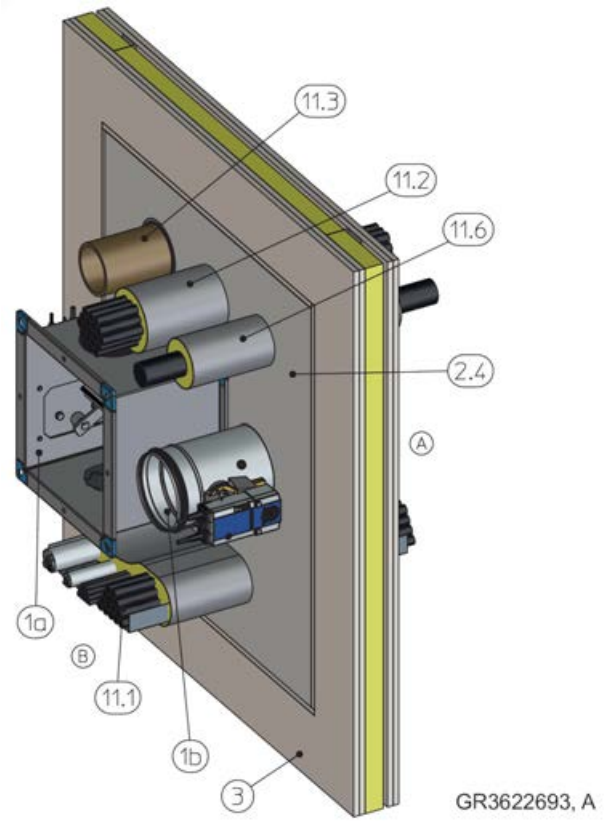


Fig. 28: Combined penetration seal

1a FK2-EU
1b FKRS-EU with ablative coating around the perimeter, d = at least 2.5 mm
Alternatively:
- Mineral wool > 1000 °C, > 80 kg/m³, d = 20 mm
- Sleeve (to be ordered separately)
- Elastomer foam (flame-resistant, non-dripping, see)

2.4 Fire batt with ablative coating
3 Solid wall, lightweight partition wall with metal or timber support structure (cladding on both sides), solid wood wall or CLT wall
11.1 Cable tray
11.2 Cable set
11.3 Pipe
11.6 Cable penetration

If this fire damper is used 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.

Requirements for wall and ceiling systems

FK2-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 others). Compensation measures, especially with regard to large installation openings, must be determined on a case to case basis (by others).

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, e.g. in hollow concrete blocks or created in the supporting structure as a consequence of wall penetrations or cutting holes, must be filled before the the installation of the fire damper so that the fire resistance of the supporting structure is restored.

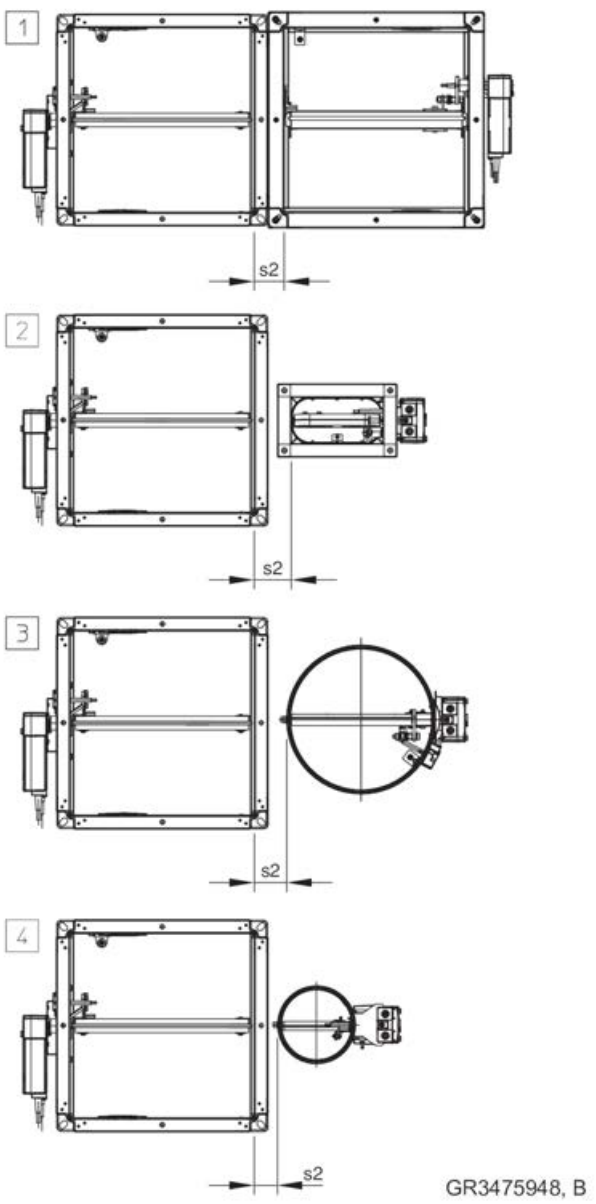


Fig. 29: Distance between FK2-EU and other TROX fire dampers in mortar-based installation

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	FK2-EU – FK-EU	65 – 225
2	FK2-EU – FKS-EU	80 – 150
3	FK2-EU – FKR-EU	70 – 225 (80 – 225, flange construction)
4	FK2-EU – FKRS-EU	50 – 225

Gypsum wallboard

- Gypsum wallboard according to EN 12859 (without cavities).
- Wallboard thickness W ≥ 80 mm, if W ≥ 100 mm see ↳ *on page 44* .
- Provide each installation opening according to the local and structural conditions and with regard to the size of the fire damper.

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 (box sections), 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, for compartment walls or safety partition walls W ≥ 100 mm.
- Distance between metal studs ≤ 625 mm; distance between metal studs for compartment walls ≤ 312.5 mm.
- Compartment walls and safety partition walls may be provided with sheet steel inserts and may require less space between the metal studs.
- Create an installation opening with trimmers (studs and noggings).
- If necessary, provide trim panels and screw-fix them to the support structure
- Additional layers of cladding (if stated in the usability certificate for the wall) and double stud constructions are approved.
- Connect the metal sections near the installation opening according to the installation details in this manual.
- If reinforcing boards are required, 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.
- Wall thickness W ≥ 130 mm (W ≥ 110 with F60, W ≥ 105 with F30); wall thickness of half-timbered constructions 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 reinforcing board W ≥ 100 mm near the installation opening).
- If required, additional gypsum bonded or cement bonded panel materials or fibre-reinforced gypsum board are permitted.

Shaft walls with metal support structure

- Shaft walls or additional leaves with metal support structure or steel support structure (box sections), 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 ≥ 2 × 20 mm (W ≥ 75 mm, cladding ≥ 2 × 12.5 mm with F30); cladding / reinforcing boards accoding to installation details.
- ≤ 625 mm distance between metal studs.
- Be sure to follow the manufacturers' instructions for the height, width and thickness of walls.
- Create an installation opening with trimmers (studs and noggings).
- If necessary, provide trim panels and screw-fix them to the support structure
- Installation with the actuator on the outside of the shaft.
- 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 ≥ 50 mm.
- If reinforcing boards are required, screw-fix them to the metal support structure at intervals of approx. 100 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 ≥ 125 mm where required (unless stated otherwise in the installation details).
- Partial solid ceiling slab, thickness ≥ 125 mm, combined with a fire-resistant wooden beam ceiling (also glulam), solid wood ceiling or lightweight ceiling (Cadolto system only).
- Provide each installation opening 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 ≥ 125 mm
  - Hollow core slabs, D ≥ 125 mm
  - Ribbed ceilings, D ≥ 125 mm (thickness increased where required)
  - Composite ceilings, D ≥ 125 mm

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.
- Historical wooden beam ceilings F30.

5.3.1 Installation kit ES – supply package and assembly

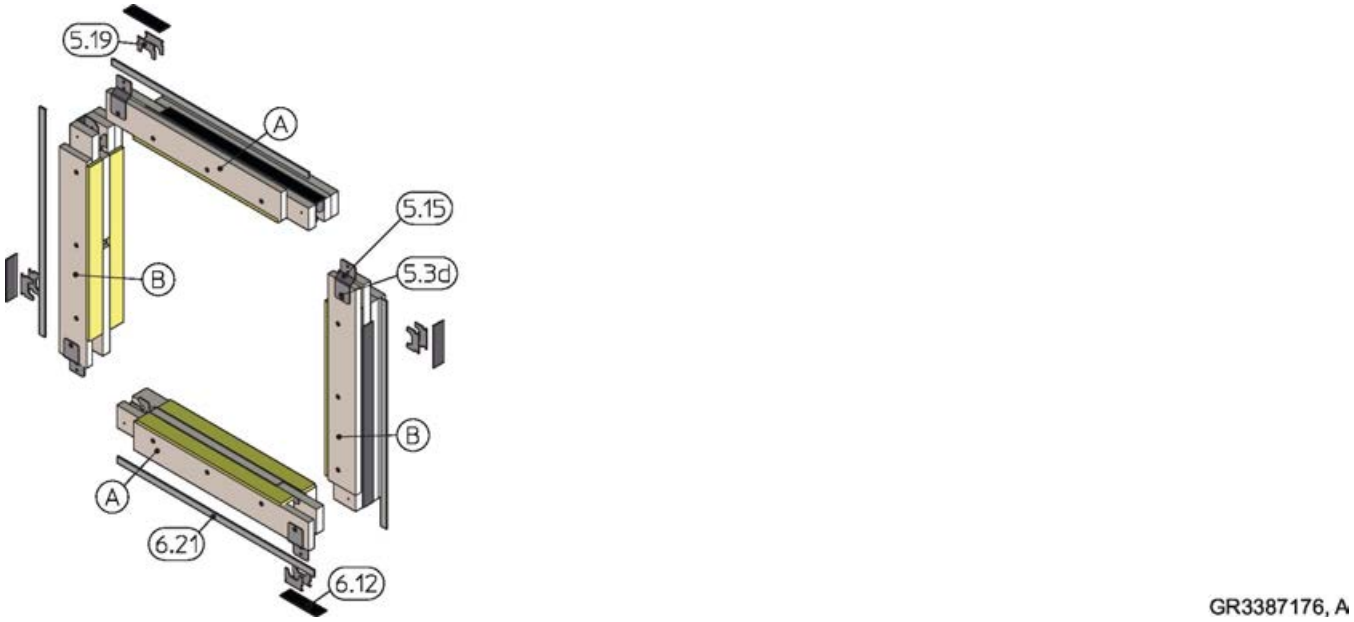


Fig. 30: Installation kit ES for dry mortarless installation – supply package

2.9 Installation kit ES consists of:
A B section with intumescent seal and mineral wool (2 ×)
B H section with intumescent seal and mineral wool (2 ×)
5.3d Chipboard screw 5 × 50 mm (4 – 8 screws, depending on damper size)
5.15 Bracket (4 – 8 brackets, depending on damper size)
5.19 Connecting clip (8 clips)
6.12 Intumescent seal (4 x)
6.21 Kerafix 2000 sealing tape

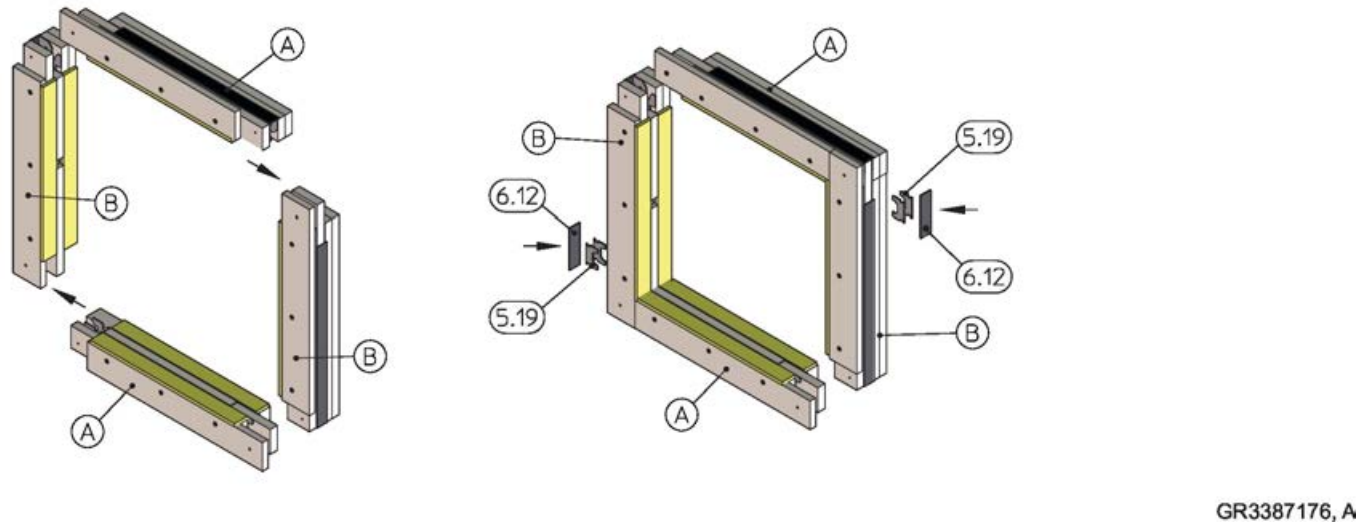


Fig. 31: Installation kit ES for dry mortarless installation – assembly

2.9 Installation kit ES consists of:
A B section with intumescent seal and mineral wool (2 ×)
B H section with intumescent seal and mineral wool (2 ×)
5.19 Connecting clip (4 clips)
6.12 Intumescent seal (2 x)

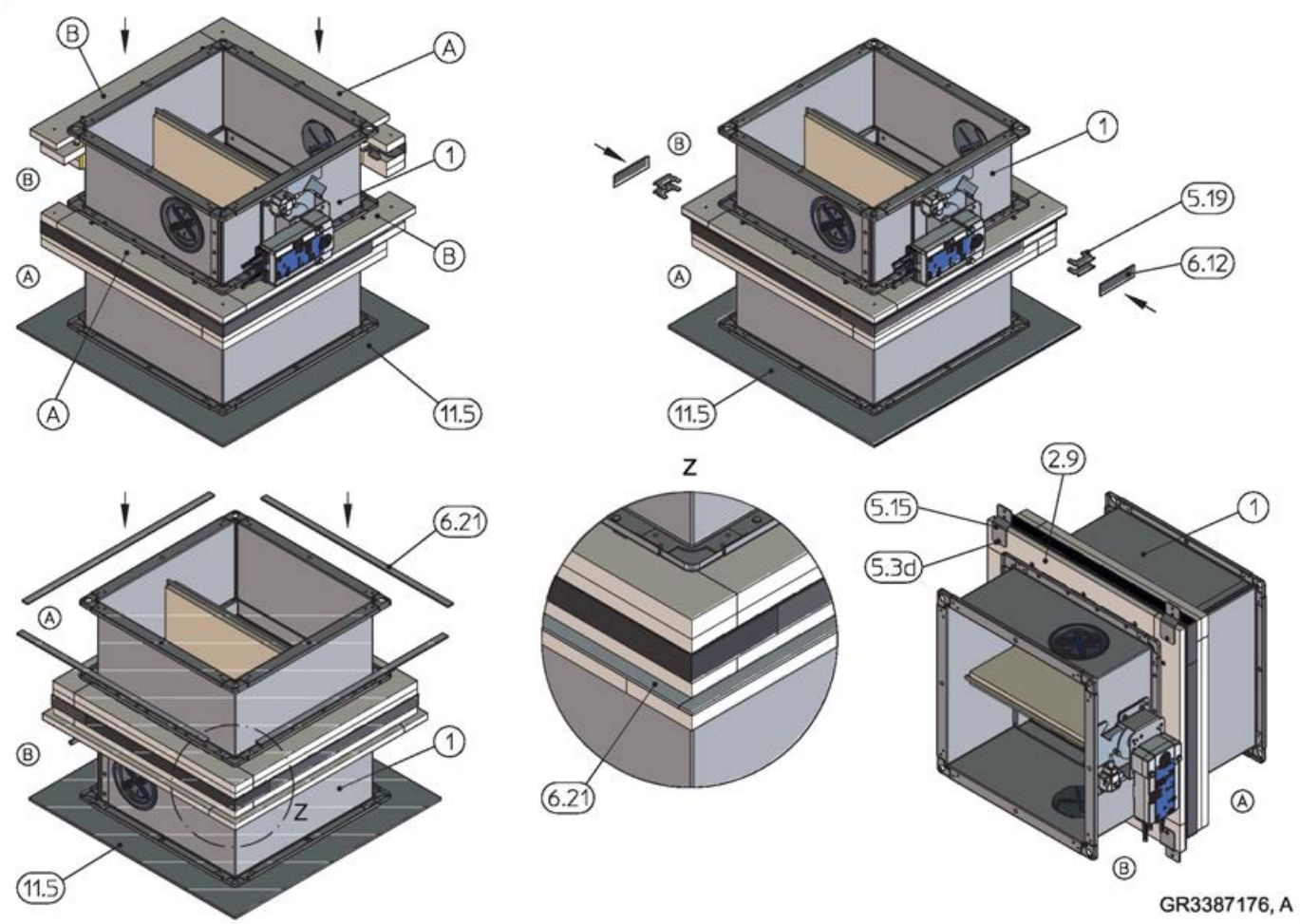


Fig. 32: Installation kit ES for dry mortarless installation – assembly

1	FK2-EU
2.9	Installation kit ES consists of:
A	B section with intumescent seal and mineral wool (2 ×)
B	H section with intumescent seal and mineral wool (2 ×)
5.3d	Chipboard screw 5 × 50 mm (4 – 8 screws, depending on damper size)
5.15	Bracket (4 – 8 brackets, depending on damper size)
5.19	Connecting clip (4 clips)
6.12	Intumescent seal (2 x)
6.21	Kerafix 2000 sealing tape
11.5	Underlay, if required (by others

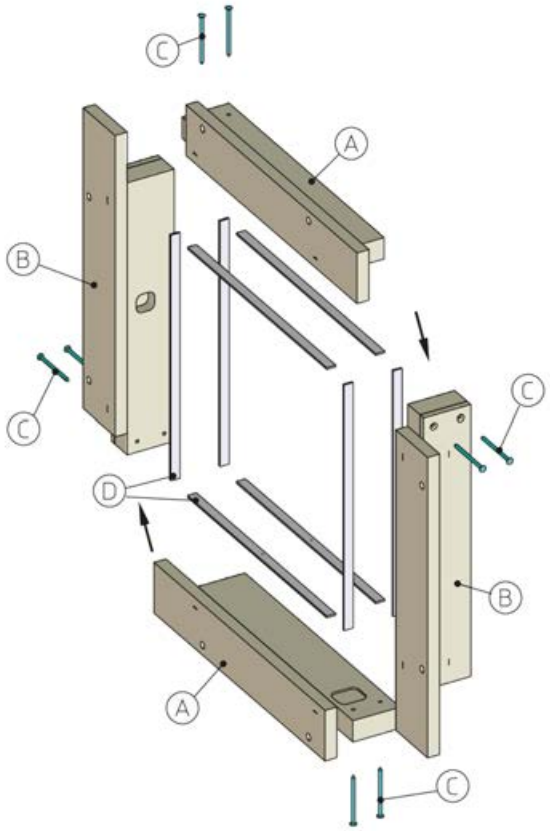
Note:

- The inner mineral wool seal is fixed to the installation kit with adhesive tape and must not be removed. Remove the adhesive tape only after the installation kit has been attached to the damper.

Installation with installation kit ES

1. Join each B section (A) with a H section (B) and fix them with two connecting clips (5.19), then apply the intumescent seal (6.12), Fig. 31 .
2. Place the fire damper (1) with the installation side (A) flange on a piece of cardboard or wood (11.5).
3. Take the two installation kit parts you joined previously, place them around the fire damper and join them with connecting clips (5.19); then apply intumescent seal (6.12).
4. Turn the fire damper (1) so that it now rests with the operating side (B) flange on the underlay, then apply the Kerafix 2000 sealing tape (6.21) around the perimeter.
5. Use chipboard screws (5.3d) to fix the wall brackets (5.15) to the installation kit. The number and position of the brackets correspond to the factory drilled holes and depend on the damper size.
6. For subsequent assembly and installation steps see the installation details.

5.3.2 Installation kit E3 – supply package and assembly



GR3748790, D

Fig. 33: Installation kit E3 for dry mortarless installation into an installation subframe E1/E2 for FK-K90/FK-EU – supply package

2.8 Installation kit E3 consists of:

A B section (2 ×)
B H section (2 ×)
C Dry wall screw 5 × 80 mm (8 screws)
D Kerafix 2000 sealing tape, see Fig. 34

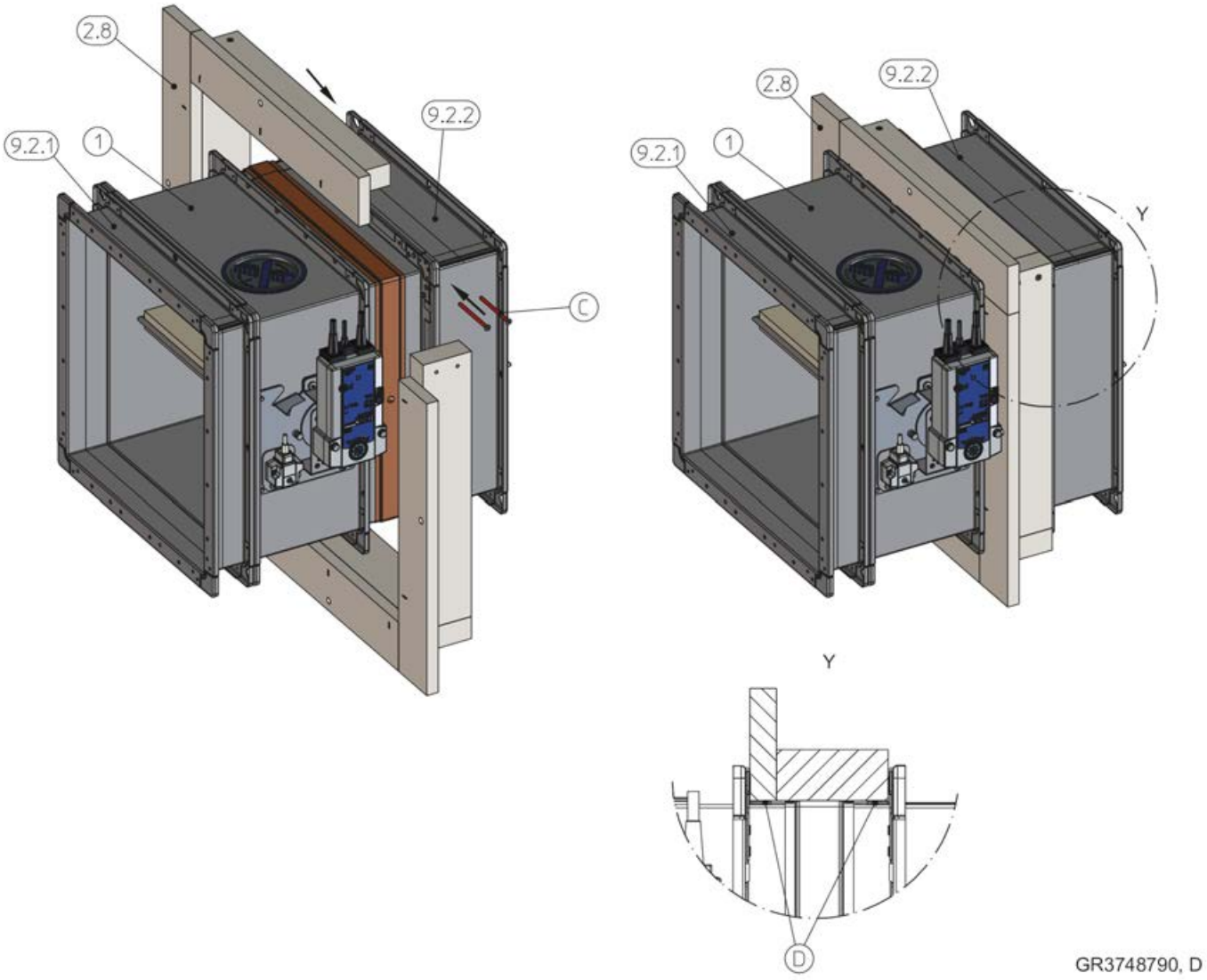


Fig. 34: Installation kit E3 for dry mortarless installation – assembly

1	FK2-EU, L = 305 mm
2.8	Installation kit E3
9.2.1	V section, L = 70 mm (factory fitted to FK2-EU)
9.2.2	V section, L = 125 mm (factory fitted to FK2-EU)
D	Kerafix 2000 sealing tape

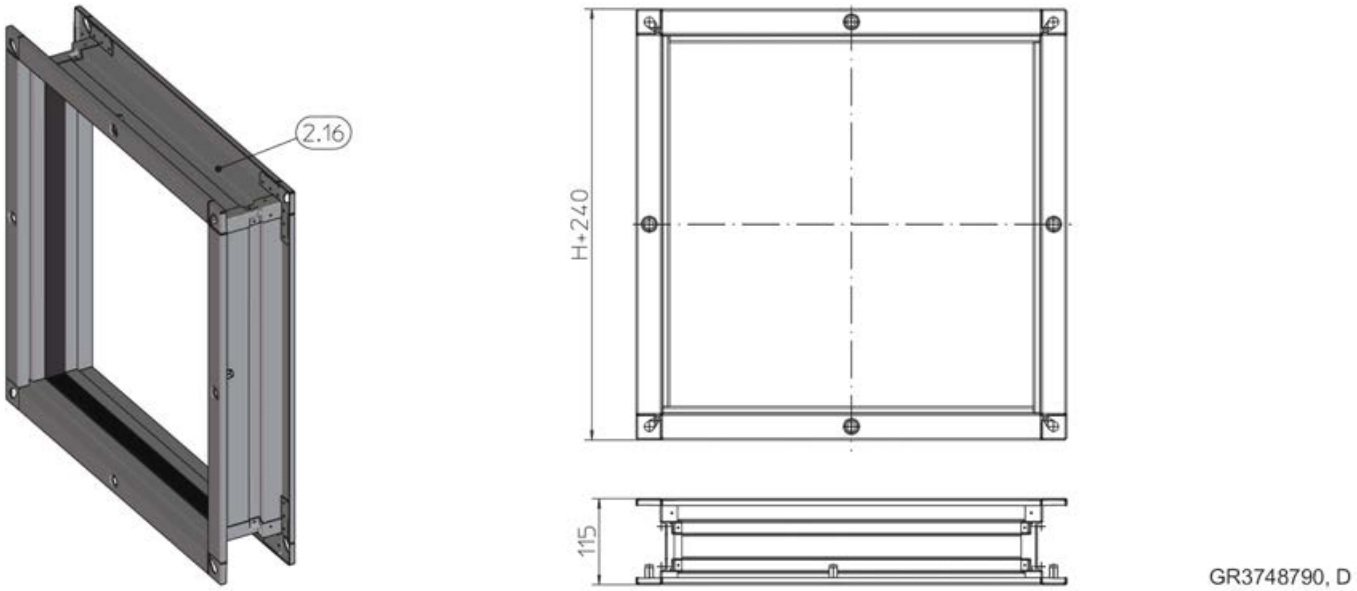


Fig. 35: Installation subframe E1/E2 for FK-K90/FK-EU

2.16 Existing and assembled installation subframe E1/E2 for FK-K90/FK-EU

Installation with installation kit E3

1. ▸ Affix Kerafix 2000 sealing tape (D) around the perimeter of the FK2-EU installation subframe, see Fig. 34 , detail Y
2. ▸ Mount installation kit E3 onto the fire damper, see Fig. 34
3. ▸ Screw the installation kit (2.8) together using chip-board screws 5 × 80 mm (C). Pre-drill installation kit with Ø 3.5 mm drill bit at least 70 mm deep.
4. ▸ For subsequent assembly and installation steps see the installation details.

5.3.3 Installation kit EW – supply package and assembly

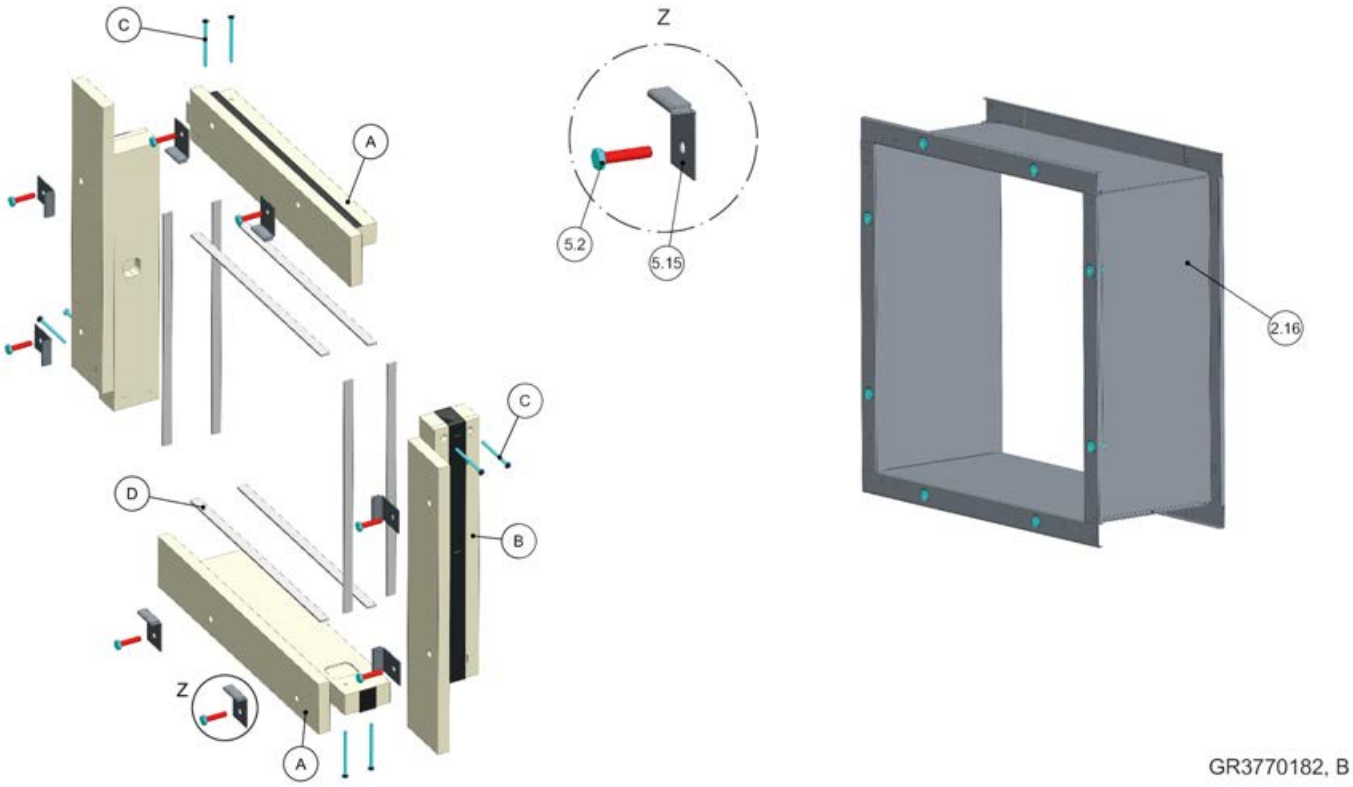


Fig. 36: Installation kit EW for dry mortarless installation with installation subframe – supply package

2.8 Installation kit EW consists of:
A B section (2 ×)
B H section (2 ×)
C Chipboard screw 5 × 80 mm (8 screws)
D Kerafix 2000 sealing tape, see Fig. 37
2.16 Installation subframe
5.2 Hexagon head screw M8 × 35 mm (4 – 16 screws)
5.15 Bracket (4 – 16 brackets, depending on damper size)

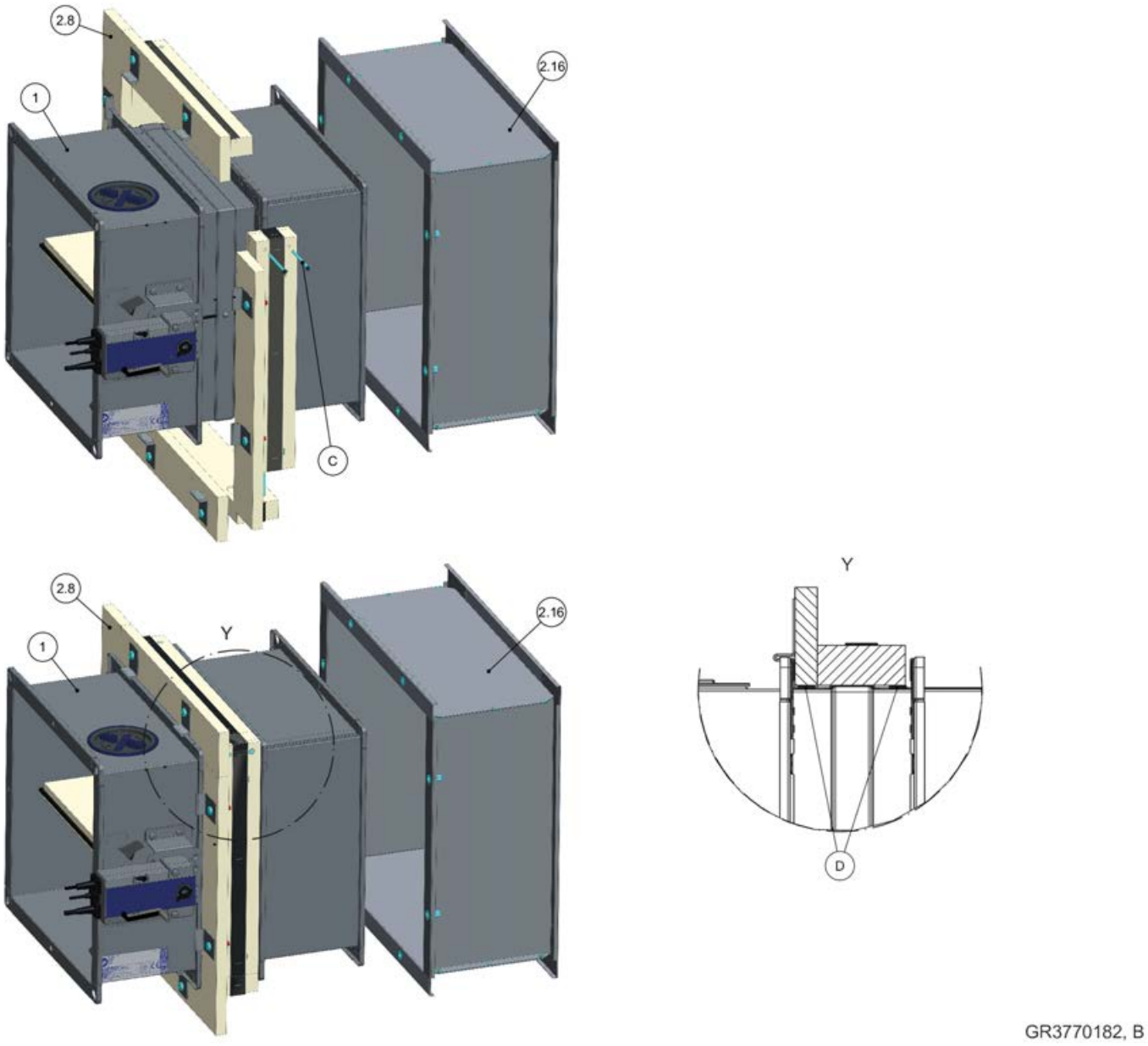


Fig. 37: Installation kit EW for dry mortarless installation with installation subframe – assembly

1	FK2-EU, L = 500 mm	2.16	Installation subframe
2.8	Installation kit EW	D	Kerafix 2000 sealing tape

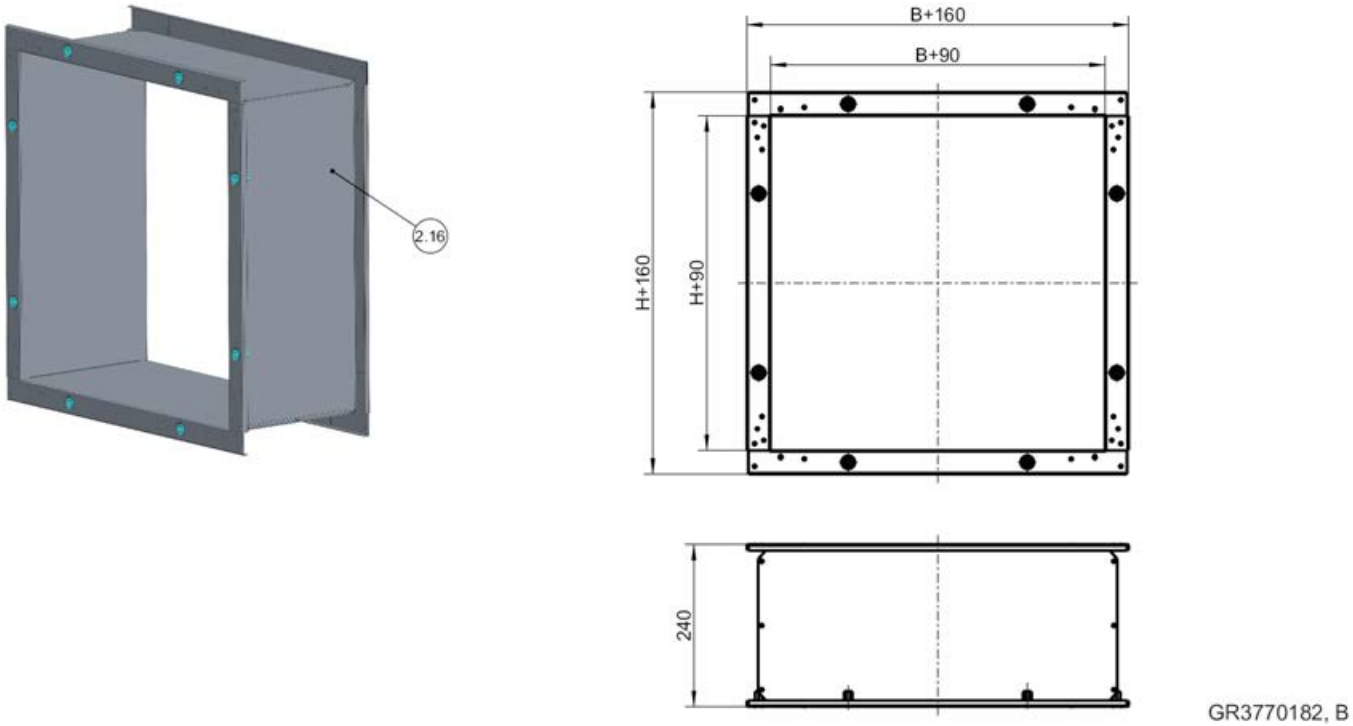


Fig. 38: Installation subframe for wall installation

2.16 Installation subframe

Installation with installation kit EW

1. Affix the sealing tape (D) around the perimeter of the flange of the installation subframe for FK2-EU, see Fig. 37 , detail Y

3. Pre-drill installation kit EW with a ∅ 3.5 mm drill bit at least 70 mm deep, mount it onto the fire damper (see Fig. 37) and screw-fix it with chip-board screws 5 × 80 mm (C).

4. For subsequent assembly and installation steps see the installation details.

5.3.4 Installation kit GM – supply package and assembly

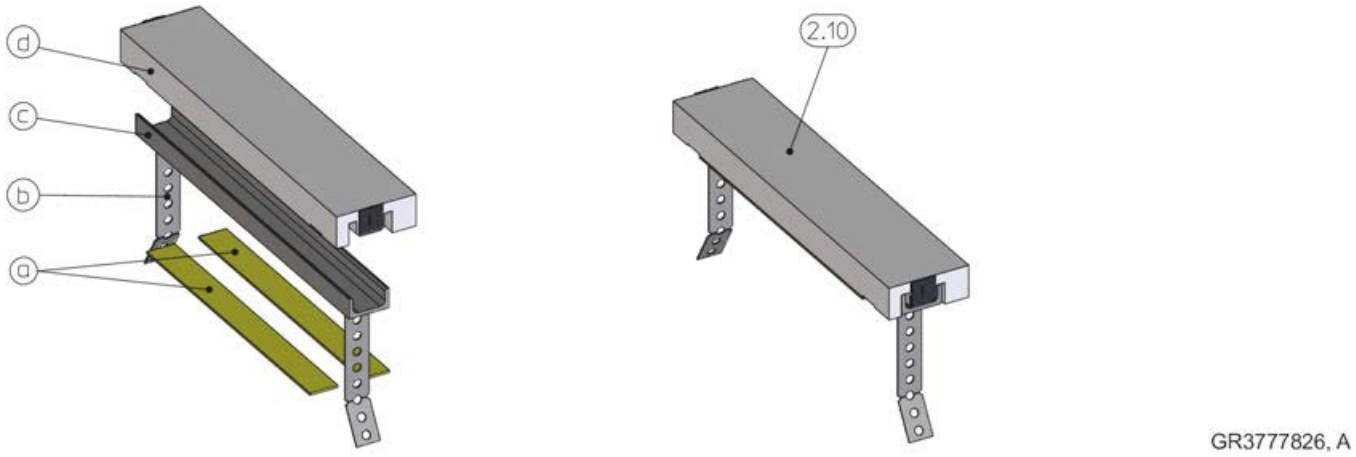


Fig. 39: Installation kit GM for dry mortarless installation – supply package

2.10	Installation kit GM consists of:	c	Steel channel
a	Mineral wool, B = 70 mm, cut into two equal parts (by others), 2 × 35 mm	days	Calcium silicate board
b	Fixing tab		

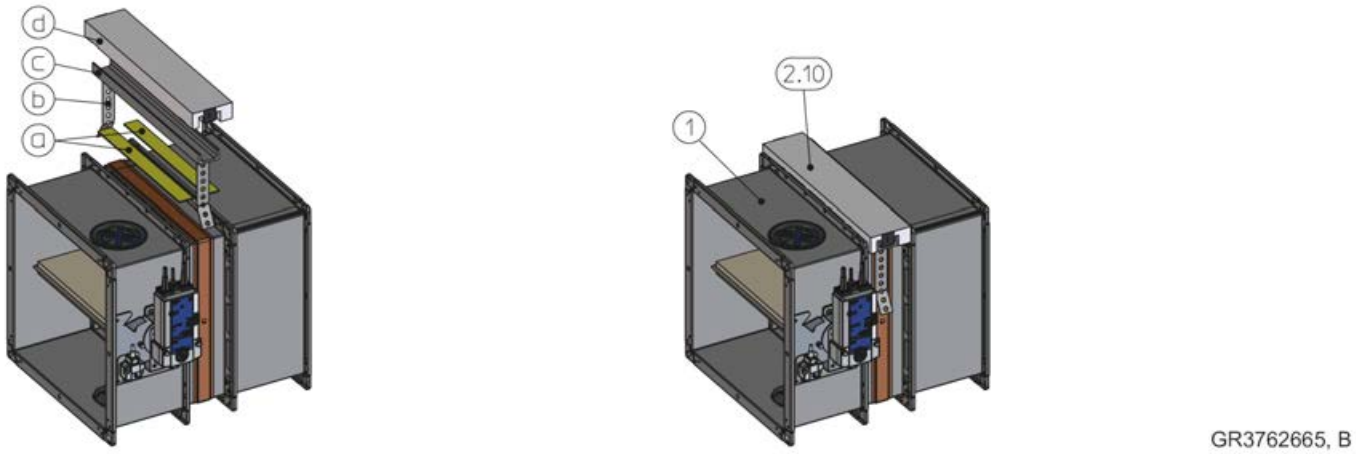


Fig. 40: Installation kit GM for dry mortarless installation – assembly

1	FK2-EU	b	Fixing tab
2.10	Installation kit GM consists of:	c	Steel channel
a	Mineral wool, B = 70 mm, cut into two equal parts (by others), 2 × 35 mm	days	Calcium silicate board

Installation with installation kit GM

1. ▸ Place the installation kit GM on the fire damper, see Fig. 40 , then install the fire damper together with the installation kit in the wall
2. ▸ For subsequent assembly and installation steps see the installation details.

5.3.5 Installation kit WA – supply package and assembly

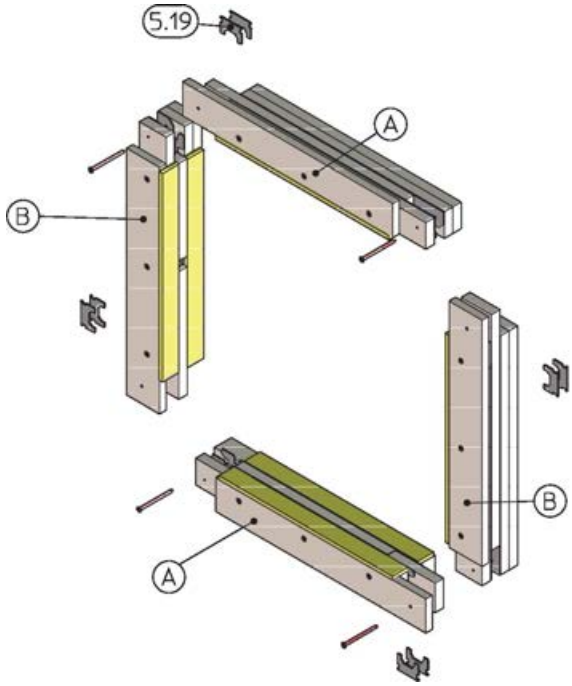


Fig. 41: Installation kit WA for dry mortarless installation – supply package

2.5	Installation kit WA consists of:	5.3	Countersunk chipboard screw 5 × 90 mm (4 screws)
A	B section (2 ×)	5.19	Connecting clip (8 clips)
B	H section (2 ×)		

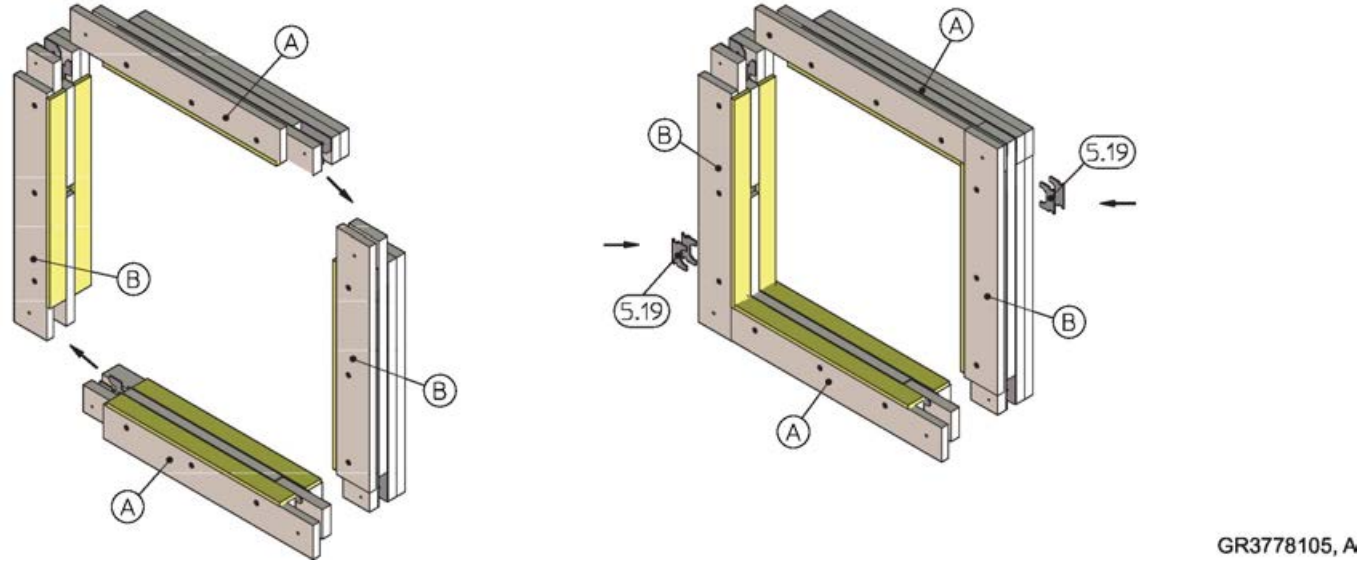


Fig. 42: Installation kit WA for dry mortarless installation – assembly

2.5 / 2.6	Installation kit WA consists of:	B	H section (2 ×)
A	B section (2 ×)	5.19	Connecting clip (4 clips)

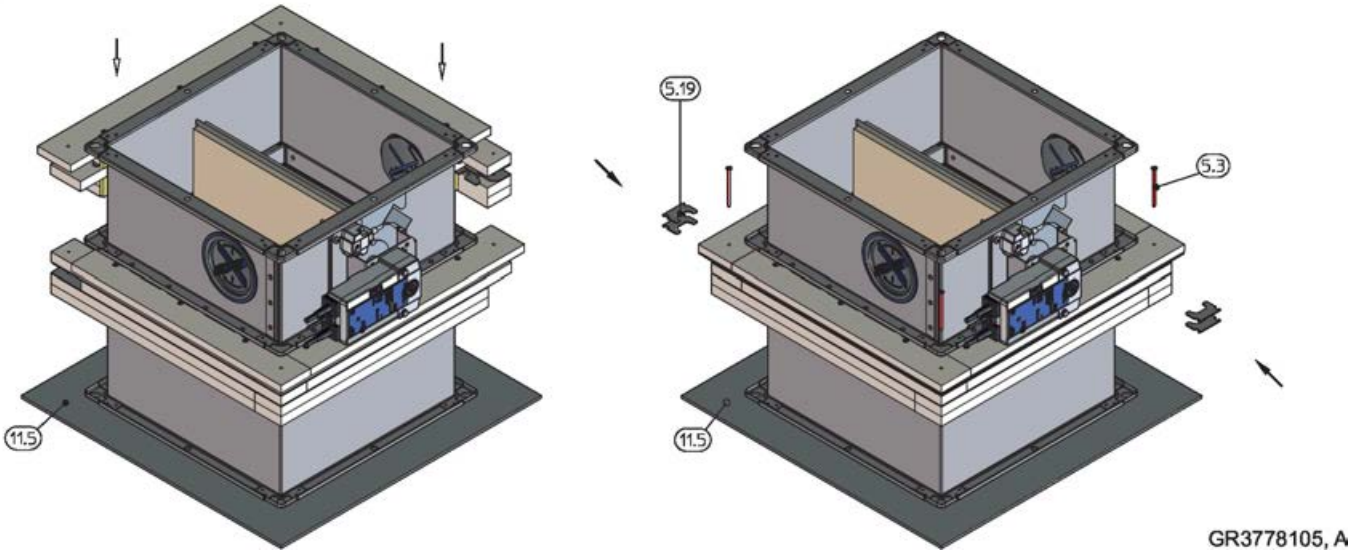


Fig. 43: Installation kit WA for dry mortarless installation – assembly

5.3 Countersunk chipboard screw 5 × 90 mm (4 screws)
5.19 Connecting clip (4 clips)
11.5 Piece of underlay

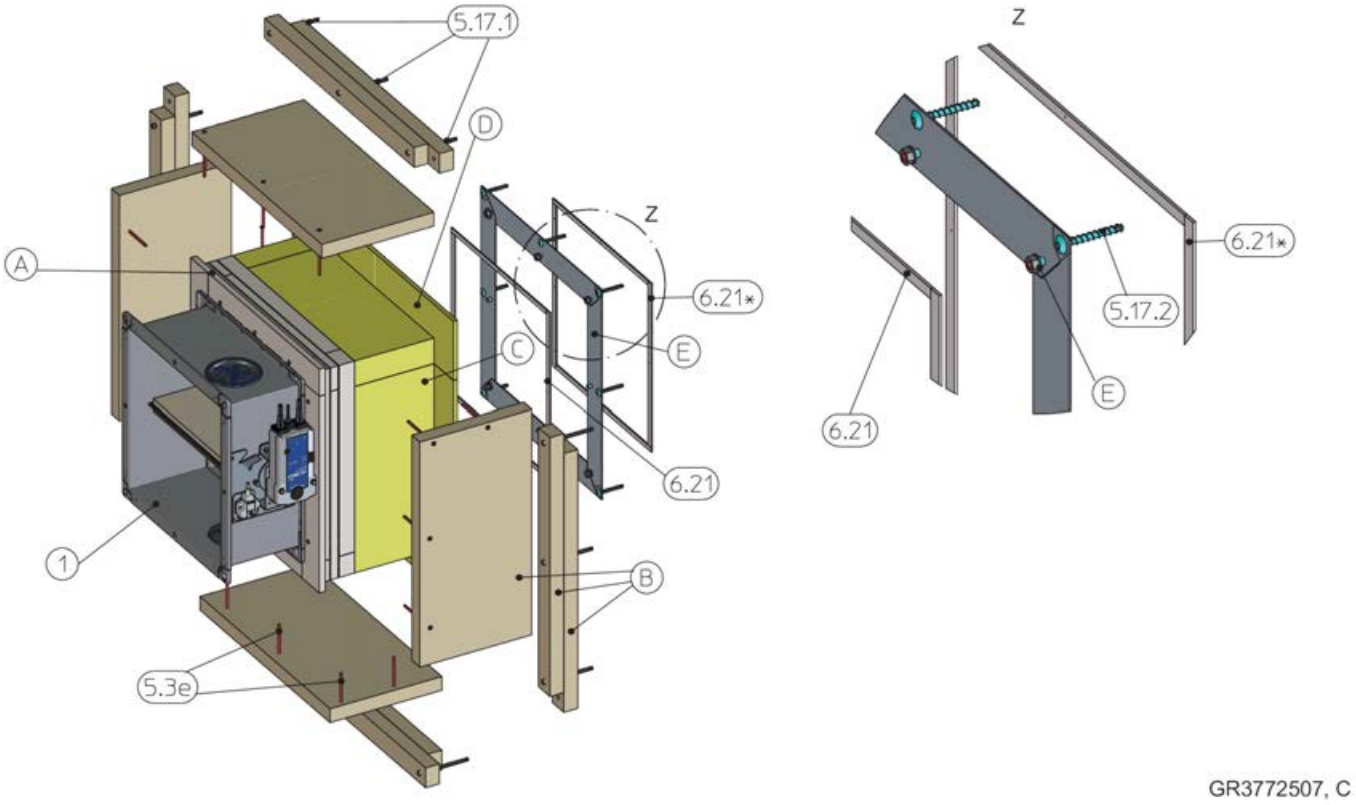


Fig. 44: Installation kit WA

1	FK2-EU
2.5	Installation kit WA consists of:
A	Installation kit (2 × B section and 2 × H section)
B	Multilayer sections (2 × B section and 2 × H section)
C	Cut mineral wool parts (2 × B section and 2 × H section), ≥ 1000°C, ≥ 80 kg/m³, d = 60 mm
D	Mineral wool strips (2 × B section and 2 × H section), ≥ 1000°C, ≥ 40 kg/m³, t = 10 mm
E	Wall face frame with Kerafix seal
5.3e	Chipboard screw 5 × 70 mm (16 – 28 screws, depending on damper size)
5.17.1	Hilti anchor ® HUS ∅ 6 mm x 120 mm (8 – 20 anchors, depending on damper size) or equivalent fire-rated anchors with suitability certificate (push through installation is also possible)
5.17.2	Anchor with pan head 6 × 60 mm
6.21	Kerafix 2000 sealing tape
*	alternatively acrylic sealant (by others)

The supplied anchors (5.17.1 and 5.17.2) are suitable for solid concrete walls and ceiling slabs. As an alternative, equivalent fire-rated anchors with suitability certificate (by others) that are suitable for the wall or ceiling slab can also be used; push through installation is also possible.

Installation with installation kit WA

1. Mount installation kit WA onto the fire damper, see Fig. 41 to Fig. 44
2. Fix the fire damper (1) to a duct (flange connection) that has been shortened to be flush with the wall or ceiling; the wall face frame (E) is not required in this case. Alternatively, use the wall face frame (E) to install the fire damper onto an opening or cut hole ($\leq$ B $\times$ H). The movement of the damper blade must not be impaired.
3. Attach mineral wool (C) and (D) tightly.
4. Fix multilayer sections (B) to the wall or ceiling slab, either with anchors bolts or push through installation (5.17.1).
5. Fasten multilayer sections (B) with chipboard screws (5.3e – supply package) to each other and to the installation kit. If you use the screws, predrill the holes with a ∅ 3.5 mm drill bit to fit the length of the screws.
6. For more information refer to the various installation details.

5.3.6 Installation kit WE – supply package and assembly

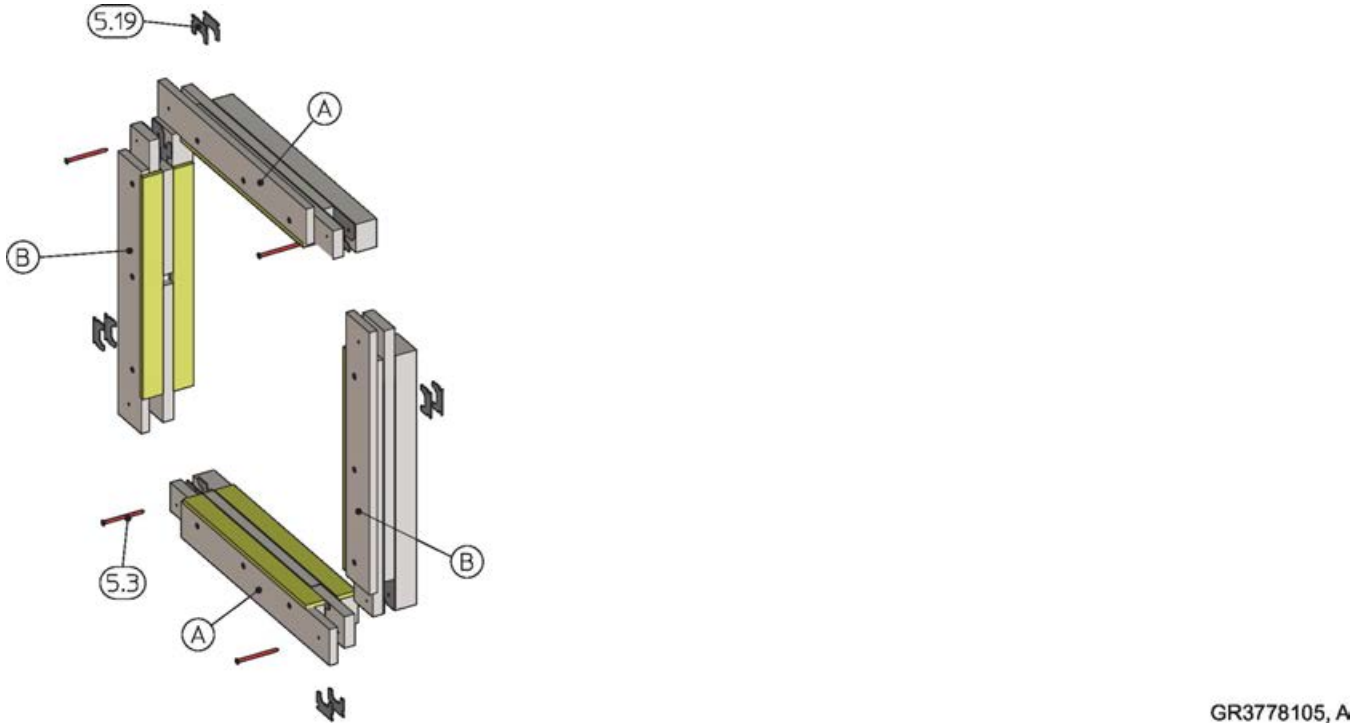


Fig. 45: Installation kit WE for dry mortarless installation – supply package

2.5 / 2.6	Installation kit WE consists of:	5.3	Countersunk chipboard screw 5 × 90 mm (4 screws)
A	B section (2 ×)		
B	H section (2 ×)	5.19	Connecting clip (8 clips)

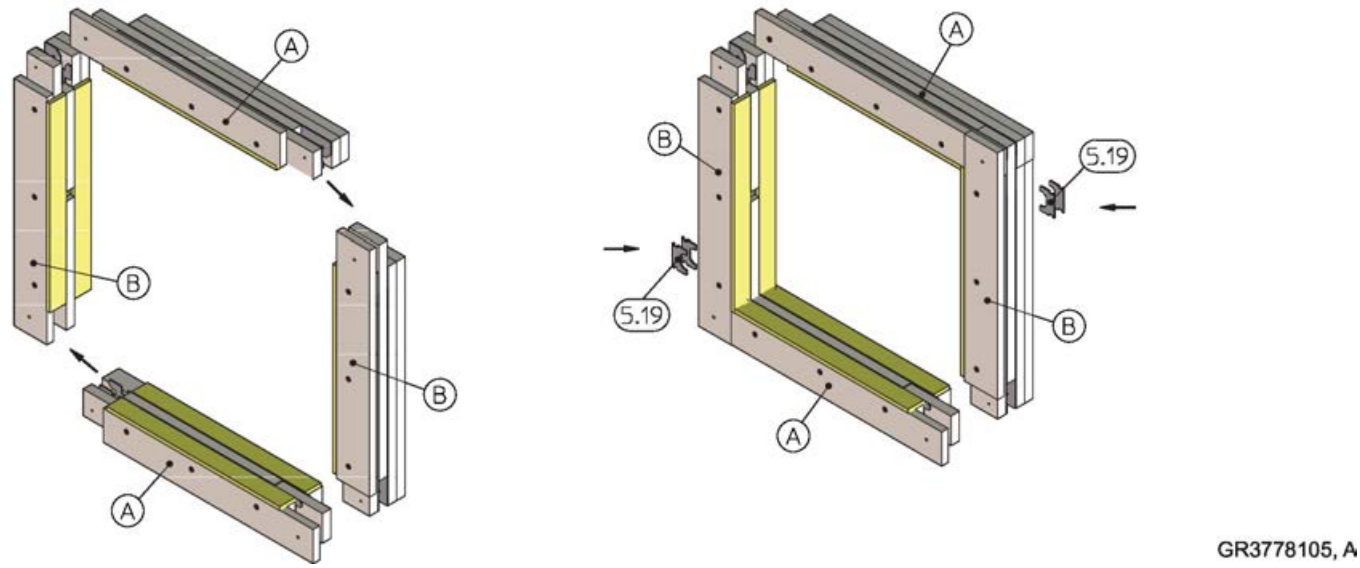


Fig. 46: Installation kit WE for dry mortarless installation – assembly

2.5 / 2.6	Installation kit WE consists of:	B	H section (2 ×)
A	B section (2 ×)	5.19	Connecting clip (4 clips)

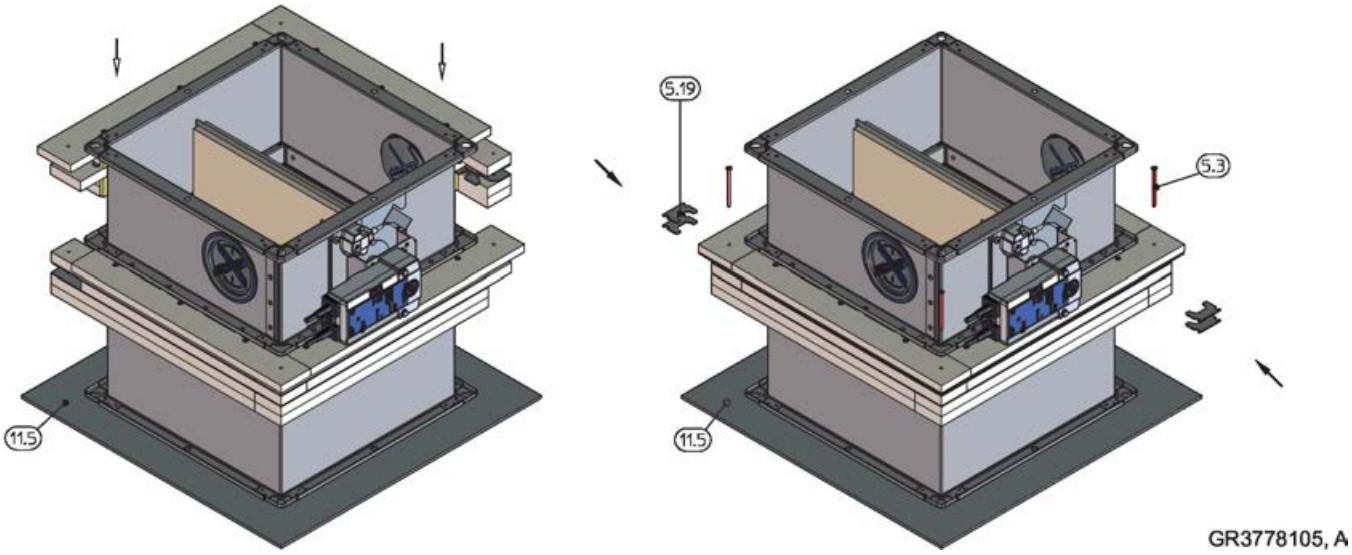


Fig. 47: Installation kit WE for dry mortarless installation – assembly

5.19 Connecting clip (4 clips)
11.5 Piece of underlay

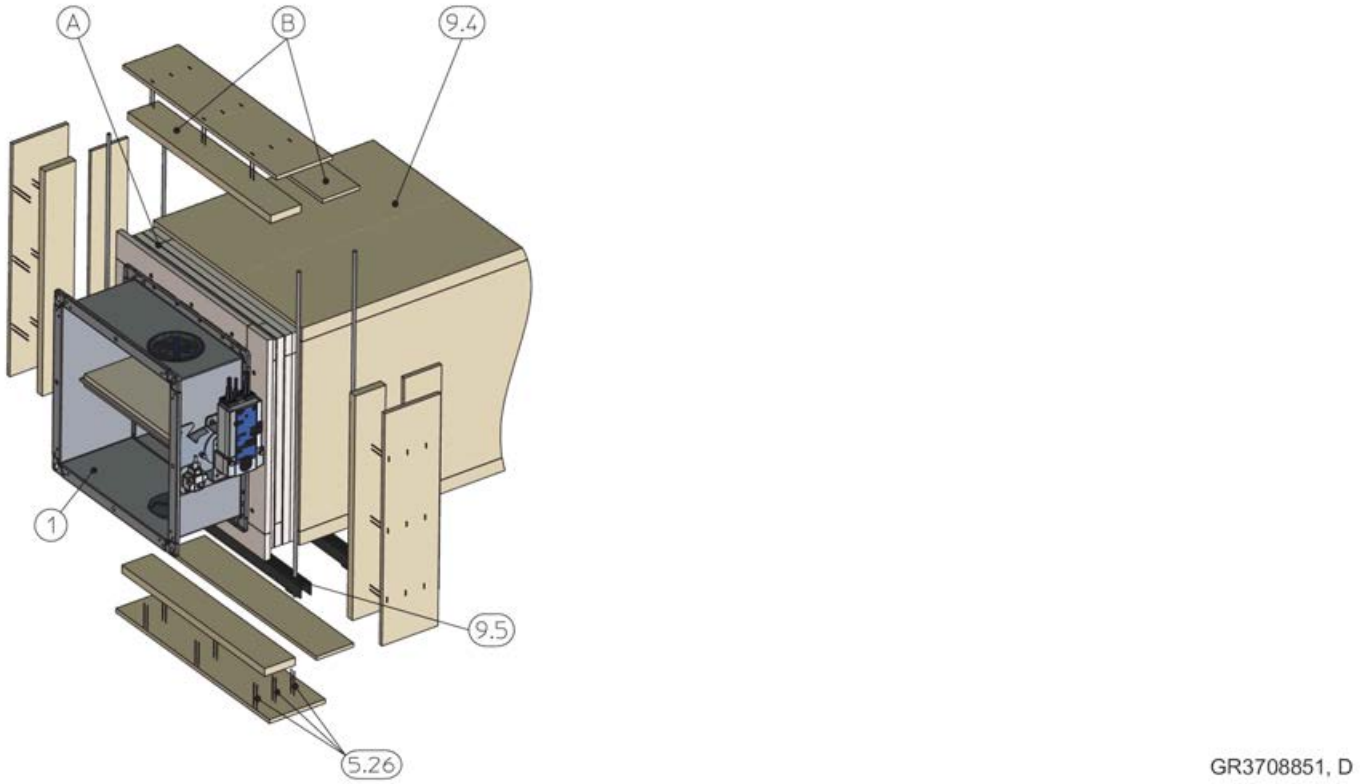


Fig. 48: Installation kit WE

1 FK2-EU
2.6 Installation kit WE consists of:
A Installation kit (2 × B section and 2 × H section)
B Plasterboard strips (6 × B section and 6 × H section)
9.4 Sheet steel duct with fire-resistant cladding and suspension system according to Promat® manual, construction 478, latest edition (see installation situation for more details)
9.5 Suspension (by others), see *229*
5.26 Steel wire clip, 63 mm (by others)

Installation with installation kit WE

1. Mount installation kit WE onto the fire damper, see Fig. 45 to Fig. 48
2. Fix fire damper (1) to the sheet steel duct and fit fire-resistant cladding as described in the installation situation details.
3. Suspend fire damper and duct from the solid ceiling slab, see *229*
4. For more information refer to the installation details.

5.3.7 Installation kit WE 120 – assembly (by others)

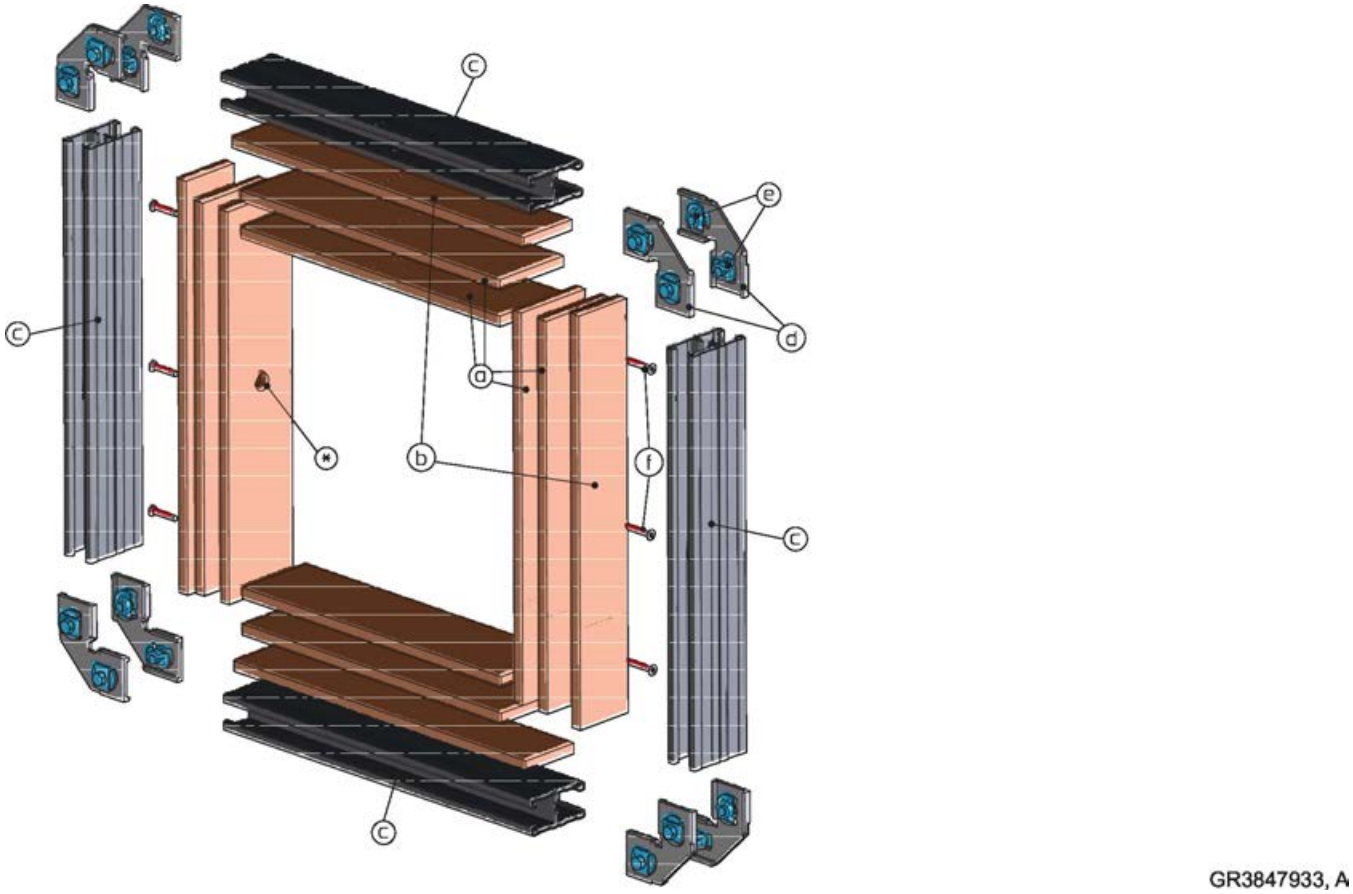


Fig. 49: Installation kit WE 120 for dry mortarless installation (assembly by others)

2.16 Installation kit WE 120 consists of:

a Fire-rated plasterboard strips 100 × 12.5 mm, 4 × B section, 4 × H section

b Fire-rated plasterboard strips 75 × 12.5 mm, 2 × B section, 2 × H section

c Hilti double channel MQ-41 DF, 2 × B section, 2 × H section

days Hilti angle bracket MQW-P2, 8 ×

e Channel connector MQN-C, 16 ×

f Board assembly, 3.9 × 35 mm, screw spacing ≤ 300 mm (at least 2 screws) for each B section and each H section

* Drilled holes for the shafts, Ø 25 mm, in the fire-rated plasterboard strips (a), in the middle of each H section, size 3

Installation with installation kit WE 120

Requirements:

Only for FK2-EU of size B × H ≤ 1000 × 600 mm, casing length L = 500 mm

1. Cut fire-rated plasterboard strips to size
2. For size 3: Drill holes for the shafts (*) into the fire-rated plasterboard strips
3. Place the fire-rated plasterboard strips (a + b) around the fire damper (be sure to leave no gaps) and connect them with screws (f)
4. Cut the double channels (c) to size, place them around the fire-rated plasterboard strips, and fix them tightly with angle brackets (d) and channel connectors (e)
5. Suspend fire damper and duct from the solid ceiling slab, see *229*
6. For more information refer to the installation details.

5.3.8 Installation kit GL – supply package and assembly

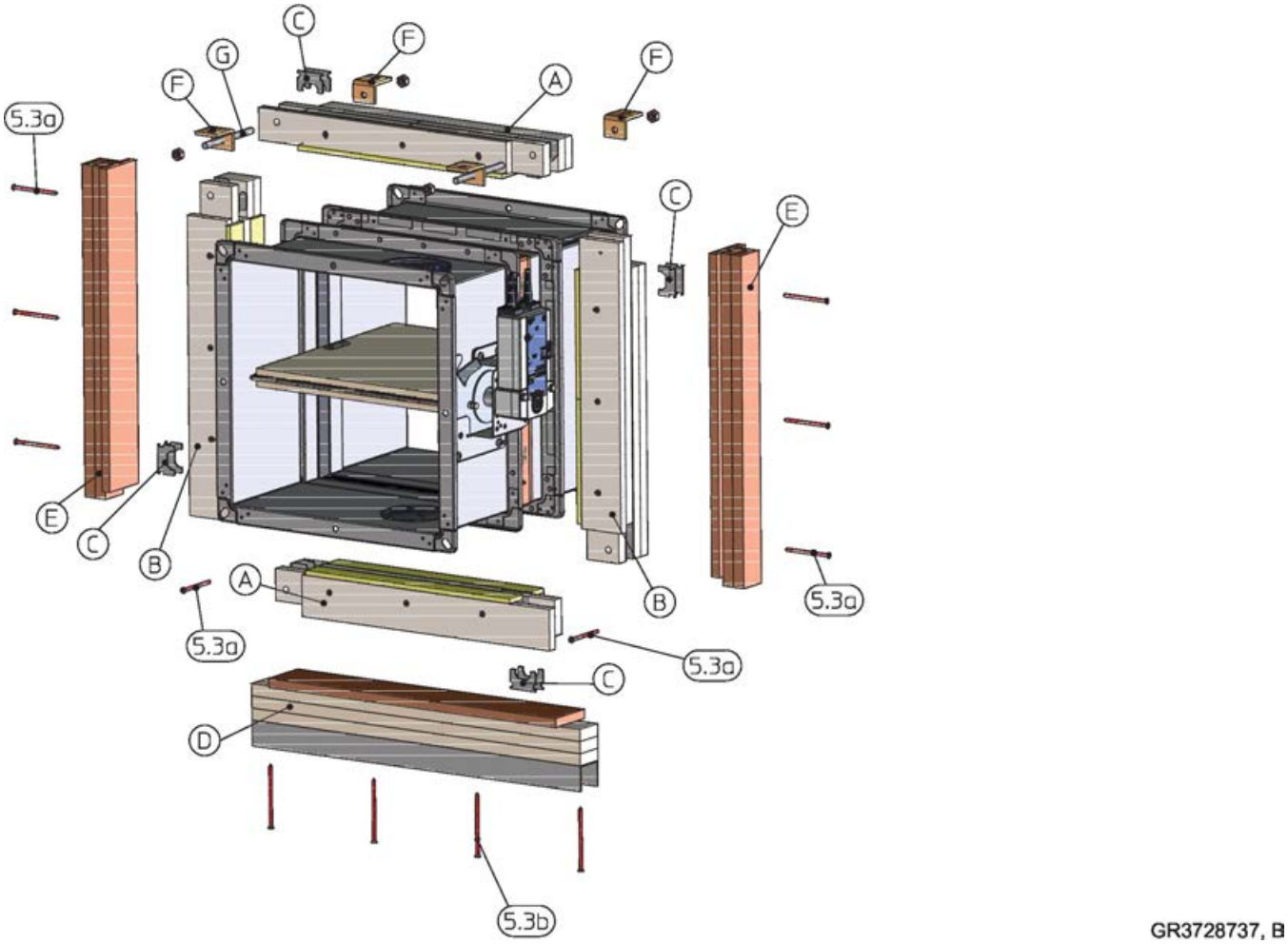


Fig. 50: Installation kit GL for dry mortarless installation – supply package (installation kit GL100 shown)

2.12 Installation kit GL consists of:

A Installation kit, B section (1 × top, 1× bottom)
B Installation kit, H section (1 × right, 1× left)
C Connecting clip (8 clips)
D Multilayer section with metal channel at the bottom (depending on wall thickness)
E Multilayer H sections (1 × right side, 1× left side, depending on wall thickness)
FL Steel bracket approx. 57 × 40 × 5 mm
G Threaded rod M10, approx. 130 mm long, with nut
5.3a Chipboard screw 5 × 80 mm
5.3b Chipboard screw 5 × 100 mm

Available installation kits:

- GL100 for wall thickness 100 mm when 50 mm sections are used
- GL125 for wall thickness 125 mm when 75 mm sections are used
- GL150 for wall thickness 150 mm when 100 mm sections are used
- GL175 for wall thickness 175 mm when 125 mm sections are used

Other wall thicknesses upon request.

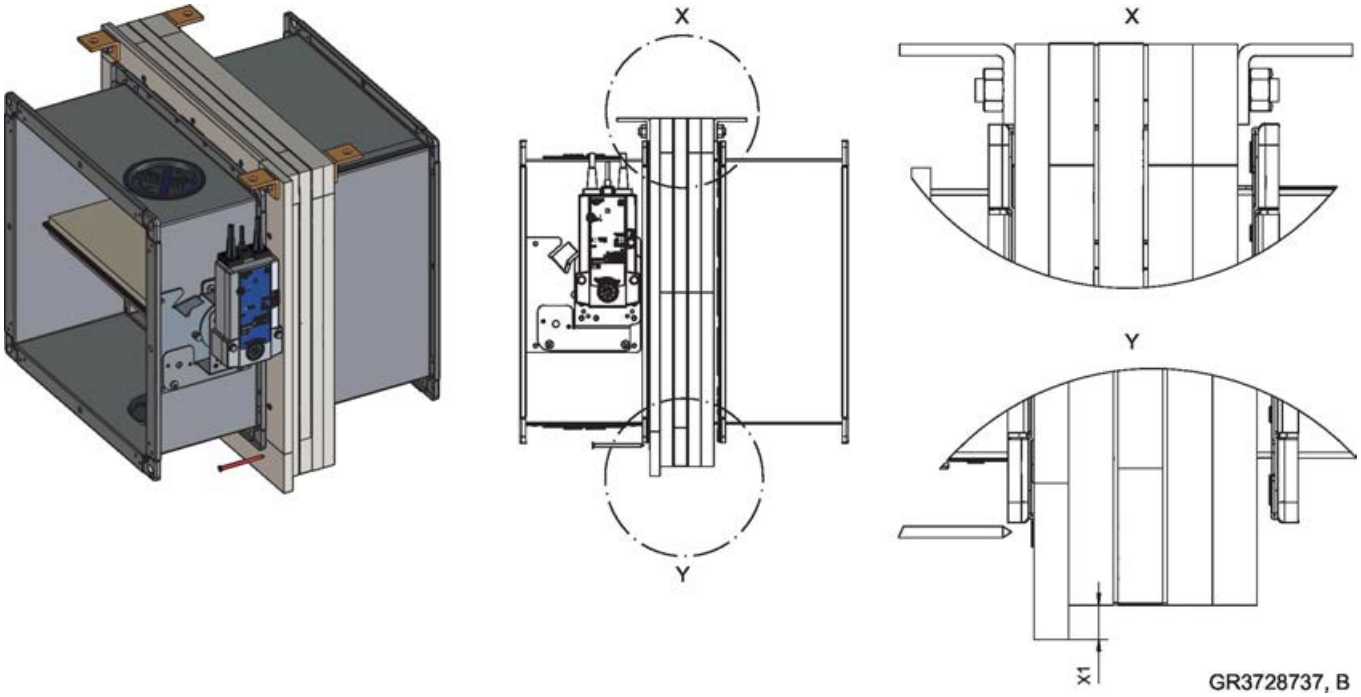


Fig. 51: Installation kit GL for dry mortarless installation – mounting after assembly

X flush at the top
Y Protruding on the left, right and at the bottom
x1 15 mm

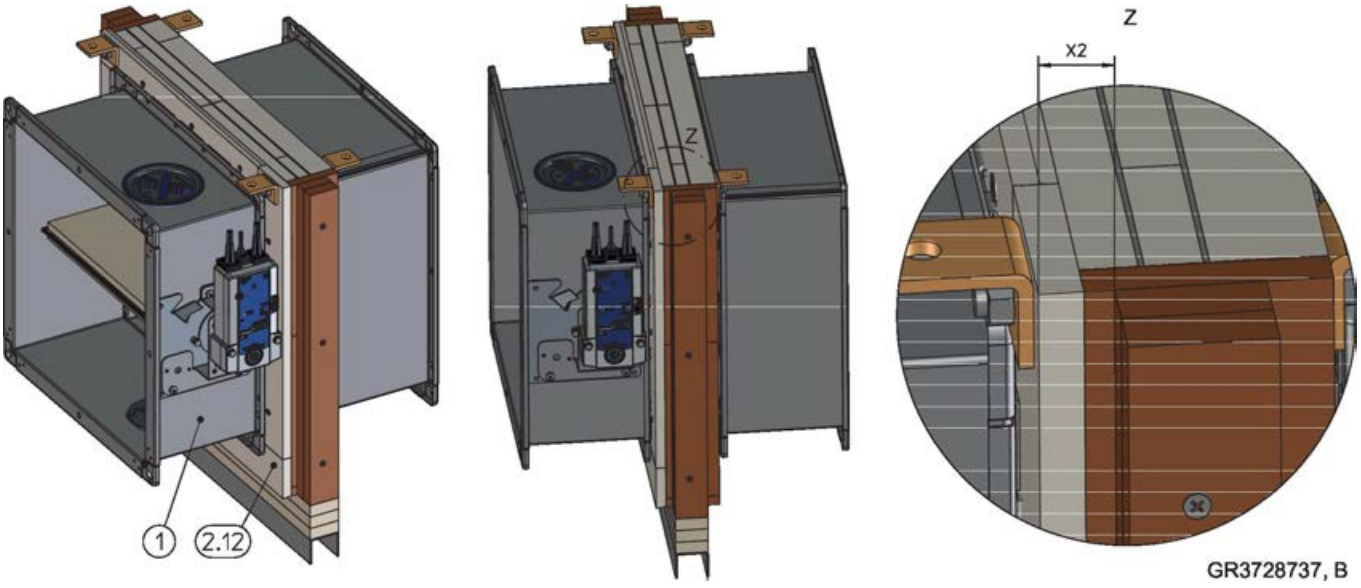


Fig. 52: Installation kit GL for dry mortarless installation – mounting after assembly (installation kit GL100 shown)

Z flush at the top
x2 Approx. 25 mm

Installation with installation kit GL

1. Mount installation kit GL onto the fire damper, see Fig. 50 to Fig. 52
2. Take the assembled multilayer sections (D and E), place them and connect them (with screws) in such a way that x2 on the right, on the left and at the bottom of the drive side is approx. 25 mm. This applies to GL100 to GL175.
3. For subsequent assembly and installation steps see the installation details.

5.4 Solid walls

5.4.1 General

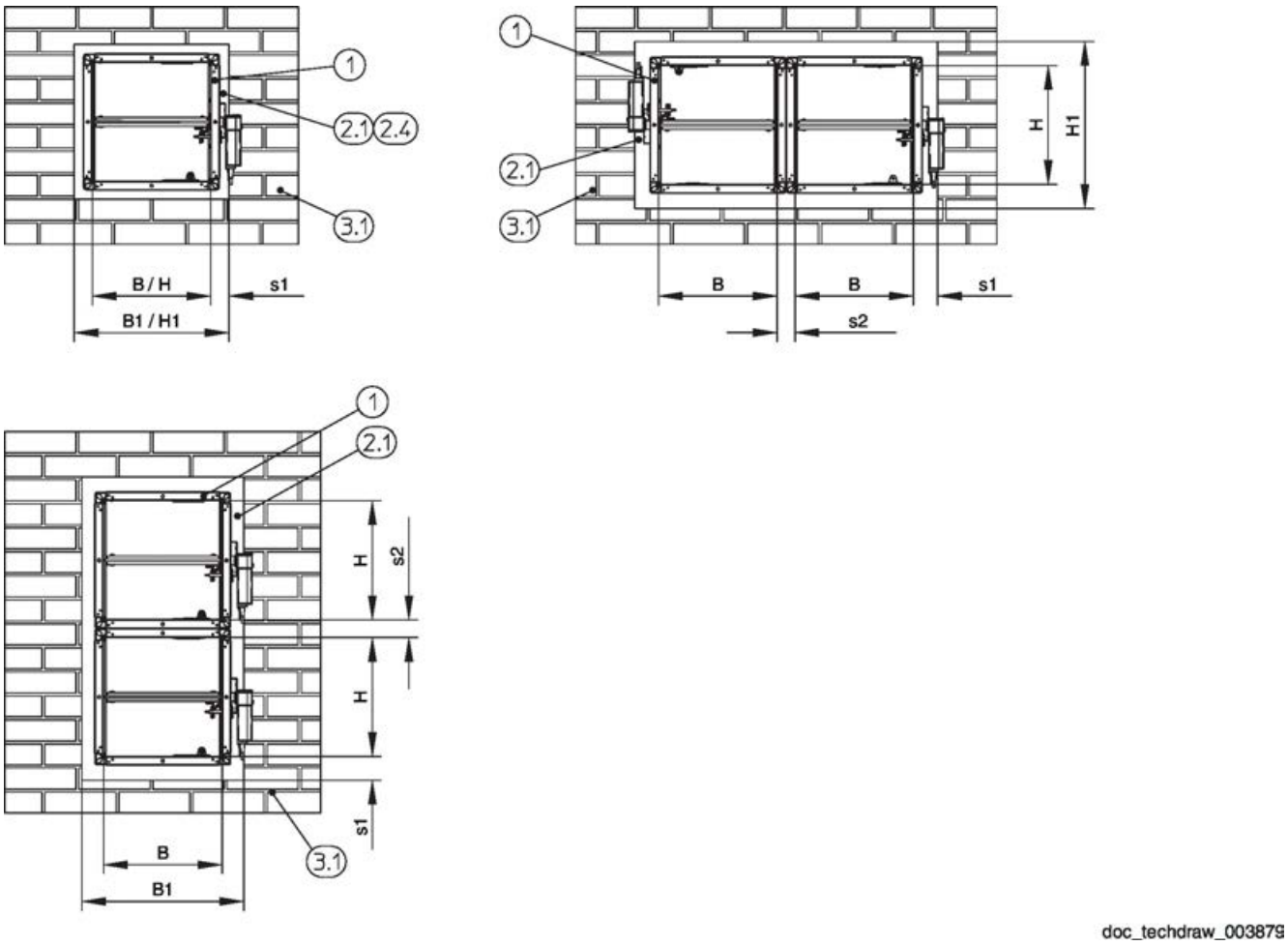


Fig. 53: Solid walls – arrangement / distances

1 FK2-EU
2.1 Mortar
2.4 Coated board system
3.1 Solid wall
s1 Perimeter gap, *on page 37*
s2 Distance between the fire dampers, *'Distances' on page 36*

Installation type	Installation opening [mm]		Distance [mm]	
	B1	H1	s1	s2
Mortar-based installation	B + 450 max.	H + 450 max.	≤ 225	60 [2] – 225
Dry mortarless installation with fire batt [1]	H + 1200 max.	H + 1200 max.	40 – 600	60 [2] – 600

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

[2] With length 305 mm and installation of fire dampers on top of each other, gap s2 has to be at least 75 mm.

Additional requirements: solid walls

- Solid wall, *on page 44*
- Distances and installation orientation, *'Distances' on page 36*

5.4.2 Mortar-based installation

Mortar-based installation into a solid wall

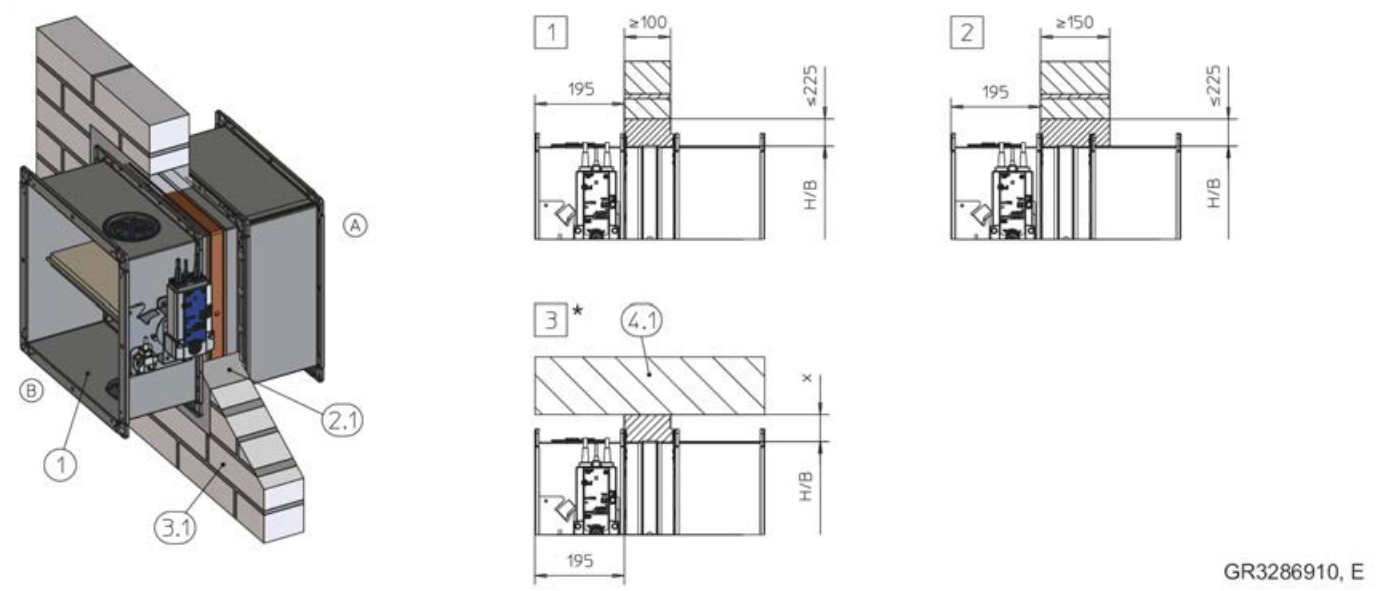


Fig. 54: Mortar-based installation into a solid wall

1 FK2-EU
2.1 Mortar
3.1 Solid wall
4.1 Solid ceiling slab / solid floor
* Installation near the floor as in 3

1 Up to EI 120 S
2 Up to EI 240 S
3 Up to EI 120 S with x ≥ 40 mm
Up to EI 240 S with x ≥ 75 mm

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

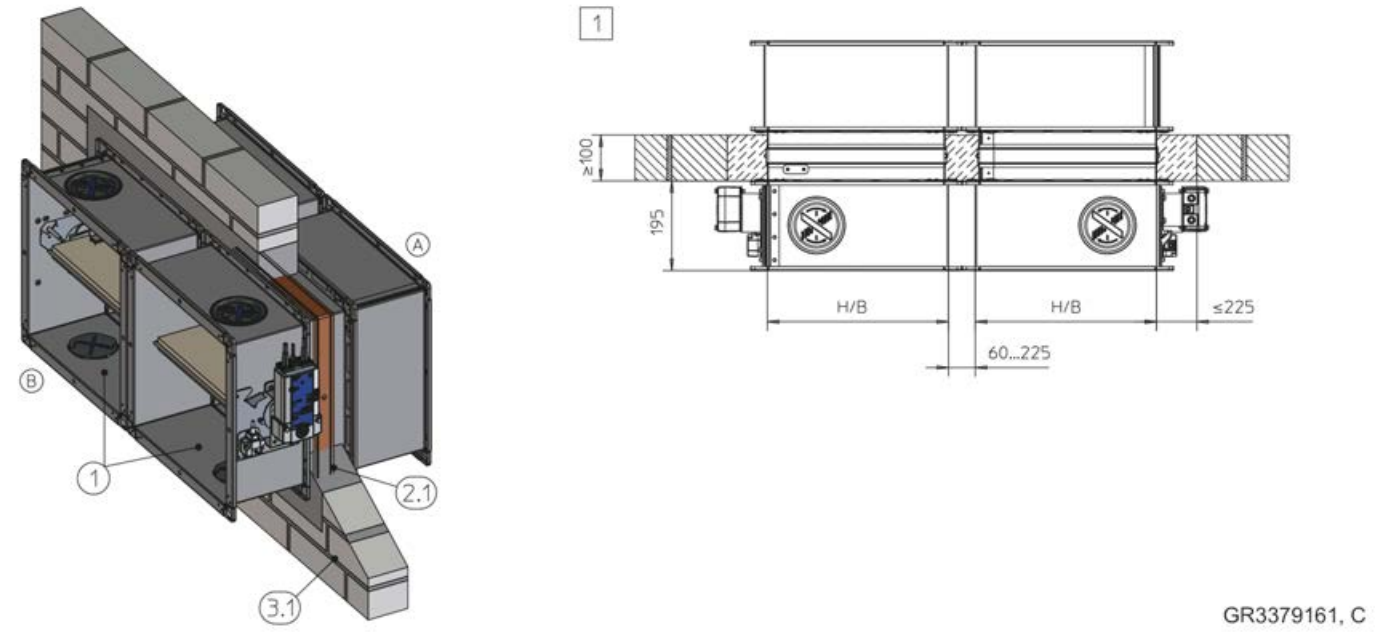


Fig. 55: Mortar-based installation into a solid wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1 FK2-EU
2.1 Mortar
3.1 Solid wall
1 Up to EI 120 S

Mortar-based installation into a solid wall

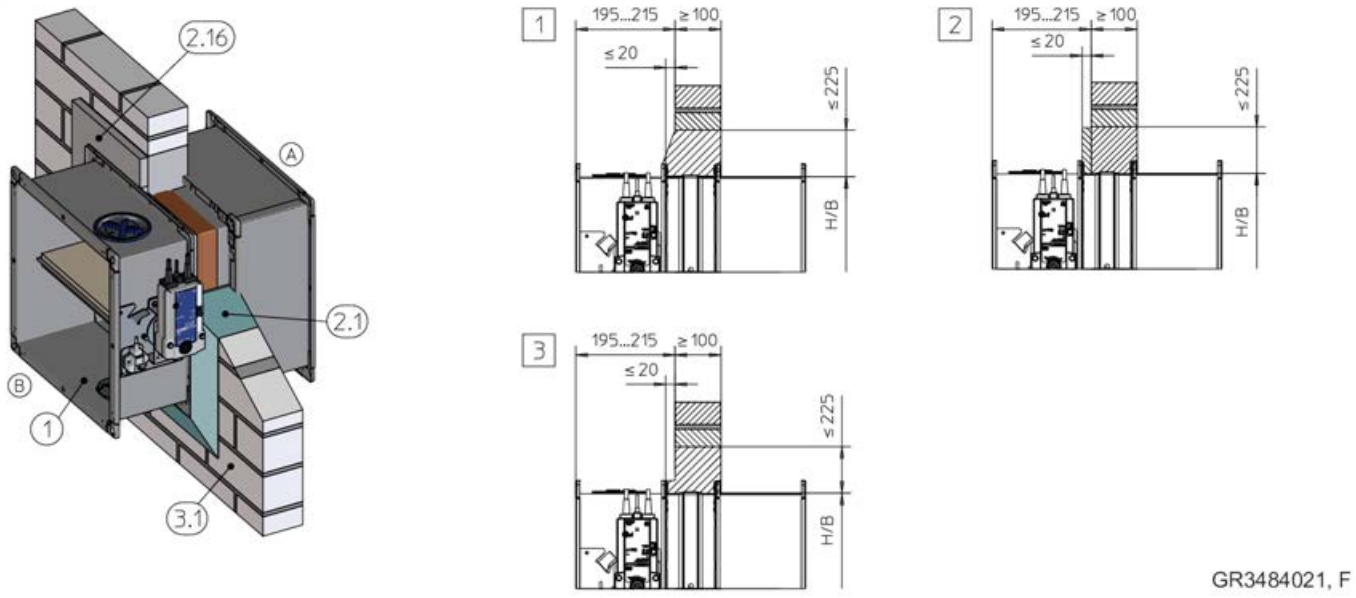


Fig. 56: Mortar-based installation into a solid wall

1	FK2-EU	3.1	Solid wall
2.1	Mortar, alternatively closing the perimeter gap with mortar and sloping plaster finish	1 – 3	Up to EI 120 S
2.16	Cement plaster		

Mortar-based installation into gypsum wallboard

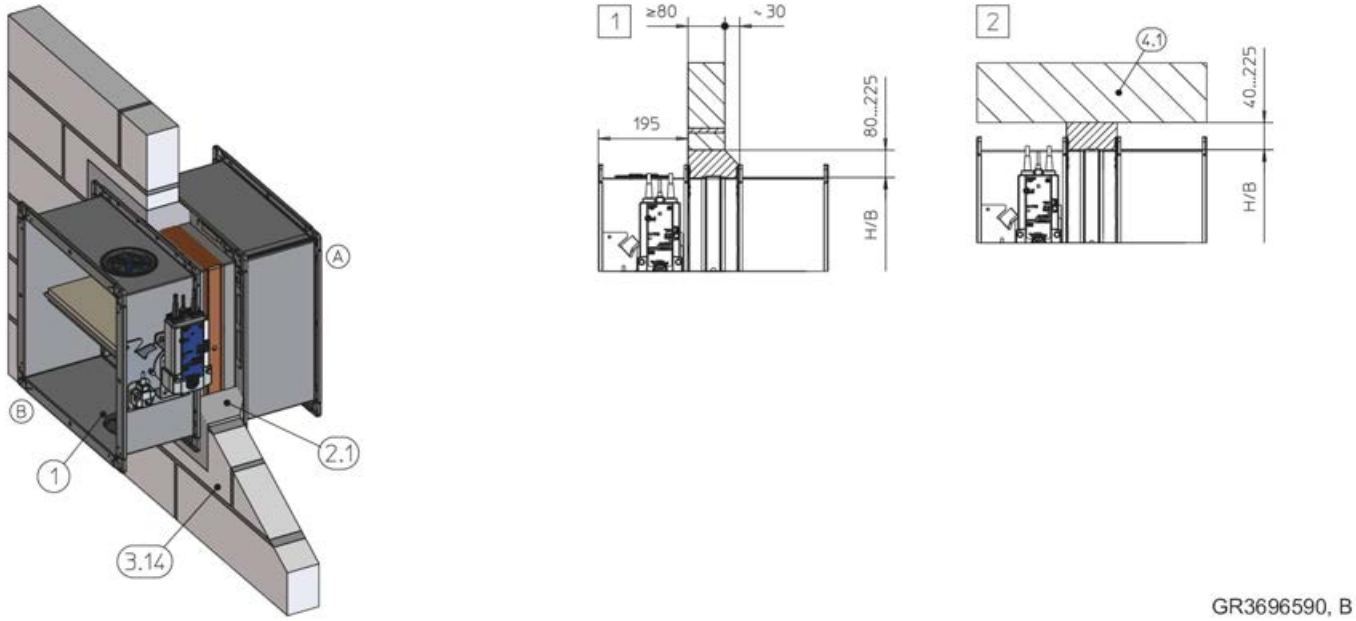


Fig. 57: Mortar-based installation into gypsum wallboard

1	FK2-EU	4.1	Solid ceiling slab
2.1	Mortar	1 2	Up to EI 90 S
3.14	Solid wall made of gypsum wallboard EN 12859 (formerly DIN 18163)		

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

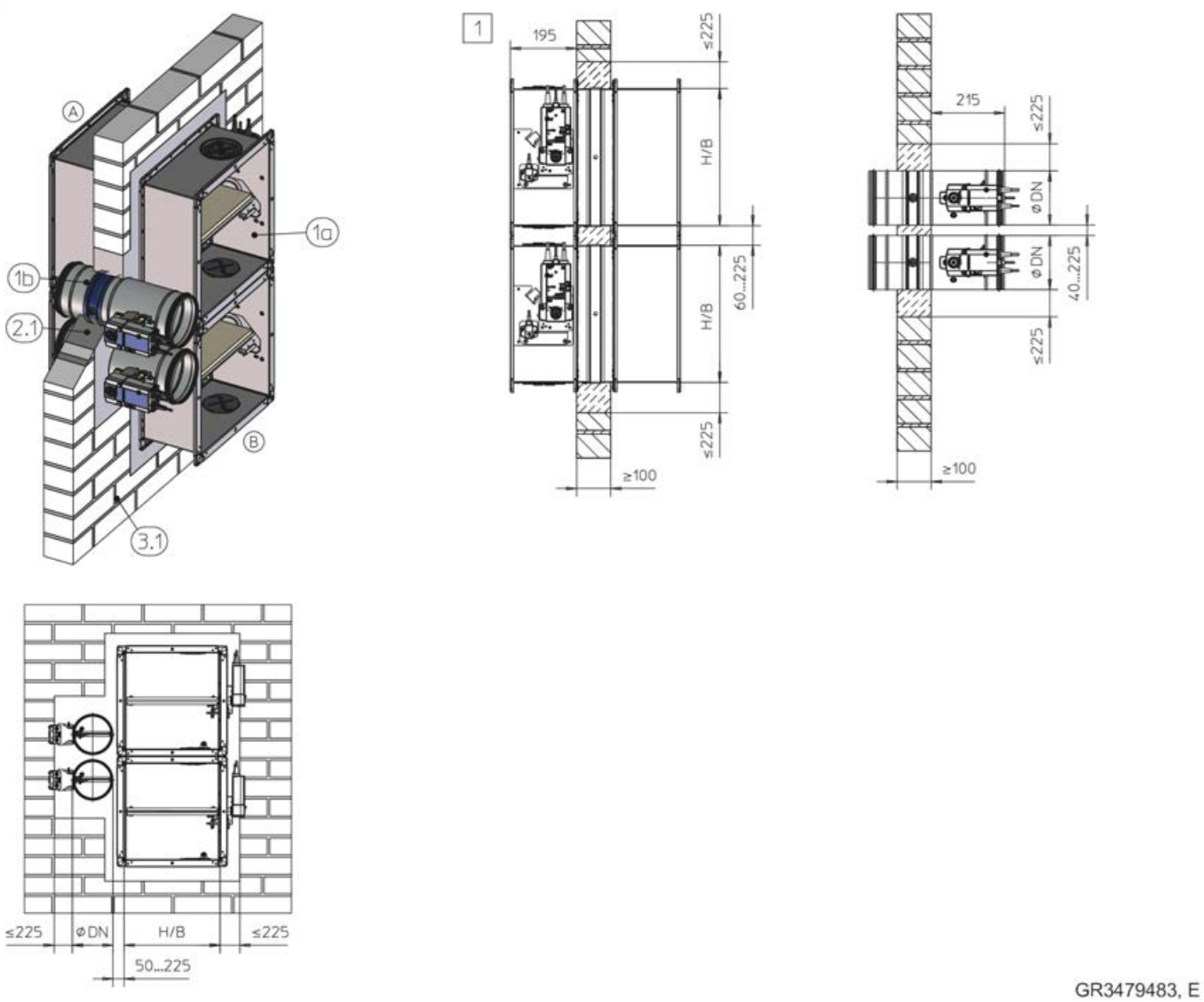


Fig. 58: Mortar-based installation into a solid wall, FK2-EU and FKRS-EU combined

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

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For FKRS-EU installation details see the FKRS-EU installation and operating manual.
- Distance to load-bearing structural elements ≥ 40 mm

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

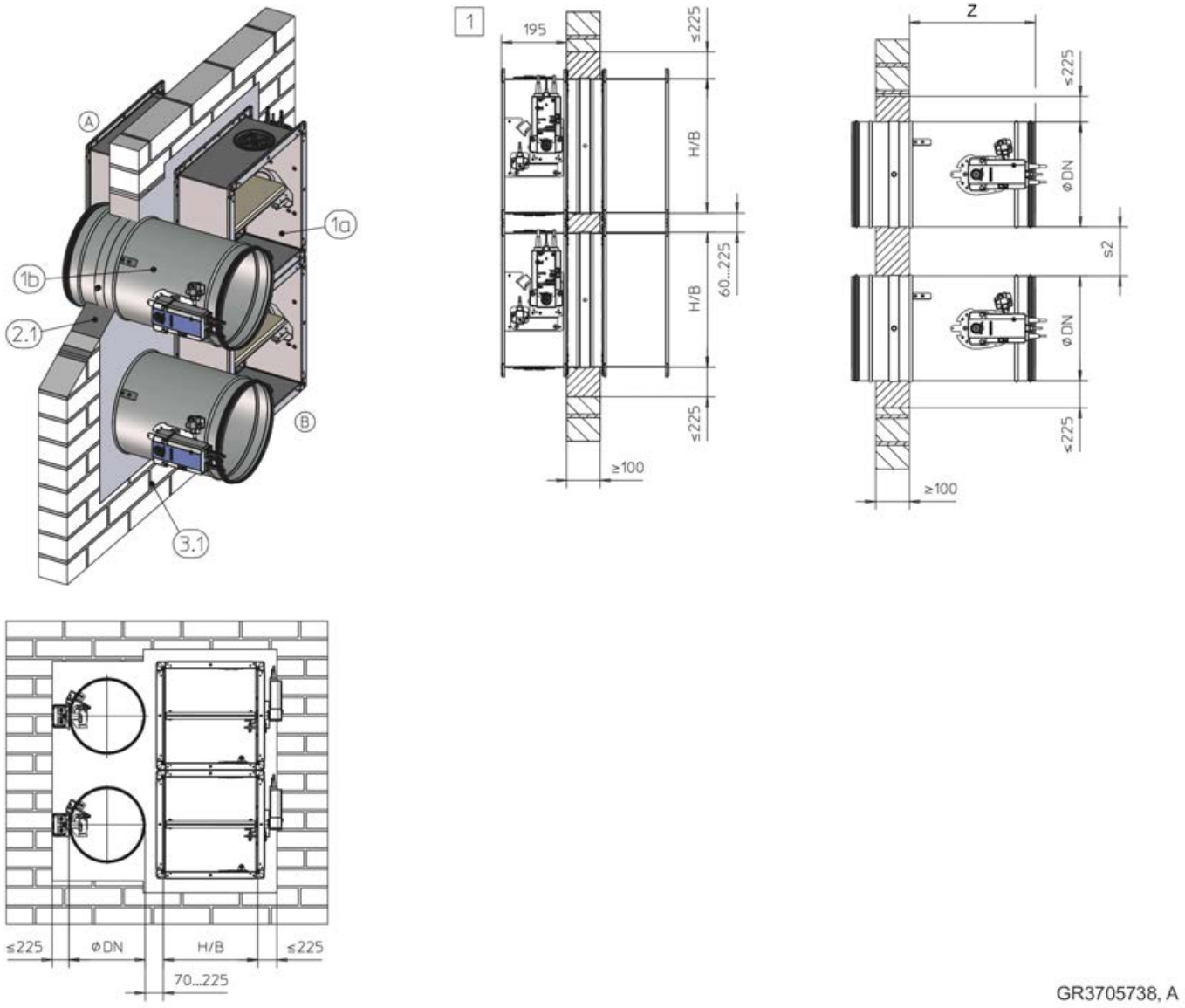


Fig. 59: Mortar-based installation into a solid wall, FK2-EU and FKR-EU combined

1a	FK2-EU up to B × H ≤ 800 × 400 mm		With flange 342 mm
1b	FKR-EU	s2	With spigot 40 – 225 mm
2.1	Mortar		With flange 80 – 225 mm
3.1	Solid wall	1	Up to EI 90 S
Z	With spigot 370 mm		

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request.
- For FKR-EU installation details see the FKR-EU installation and operating manual.
- Distance to load-bearing structural elements ≥ 40 mm

Additional requirements: mortar-based installation into solid walls / gypsum wallboard

- Solid wall / gypsum wallboard, *on page 44*
- Casing length L = 305 or 500 mm

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

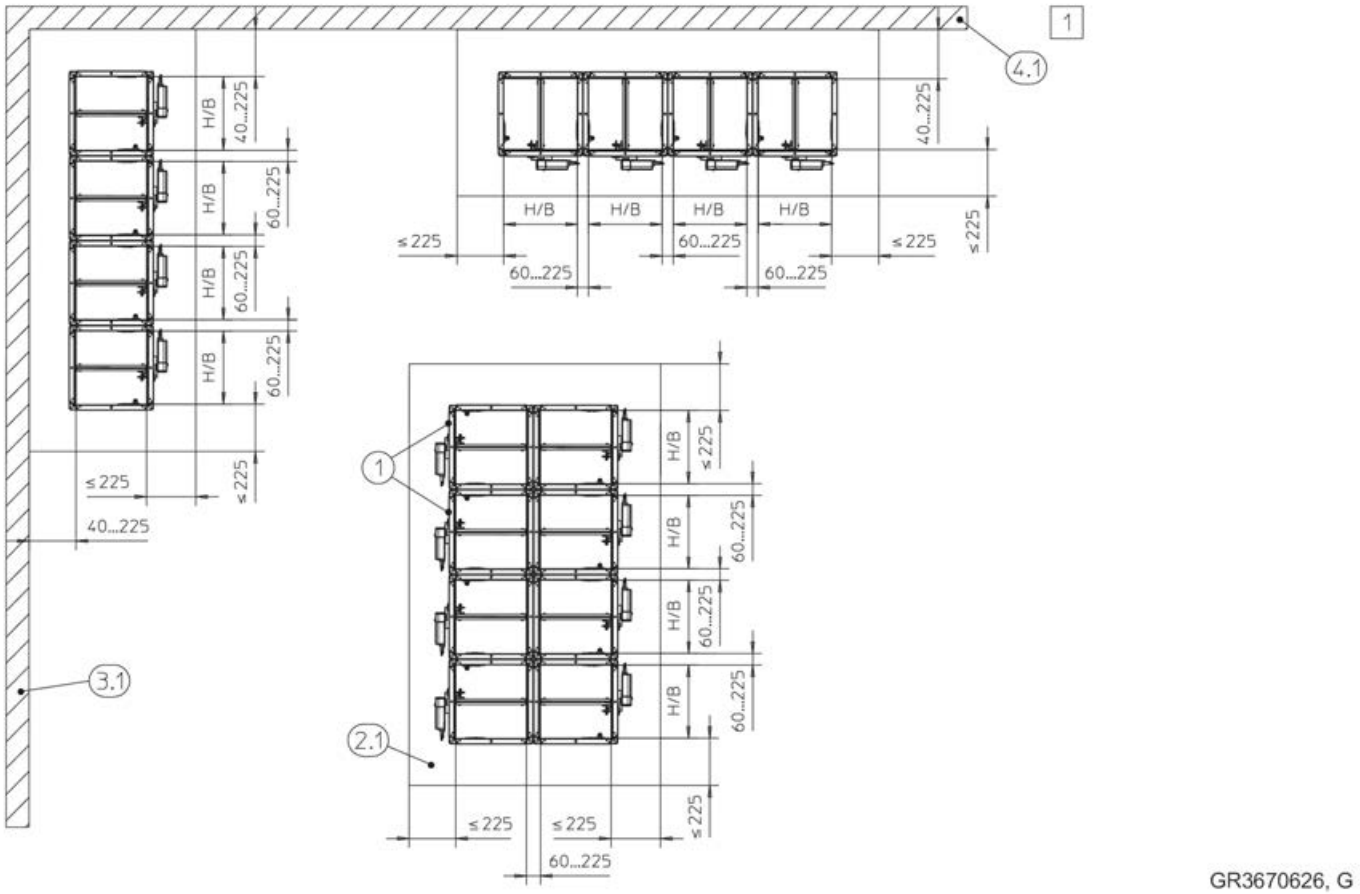


Fig. 60: Mortar-based installation – multiple installation into one installation opening

1 FK2-EU
2.1 Mortar
3.1 Solid wall (load-bearing structural element)
4.1 Solid ceiling slab (load-bearing structural element)
[1] Up to EI 90 S

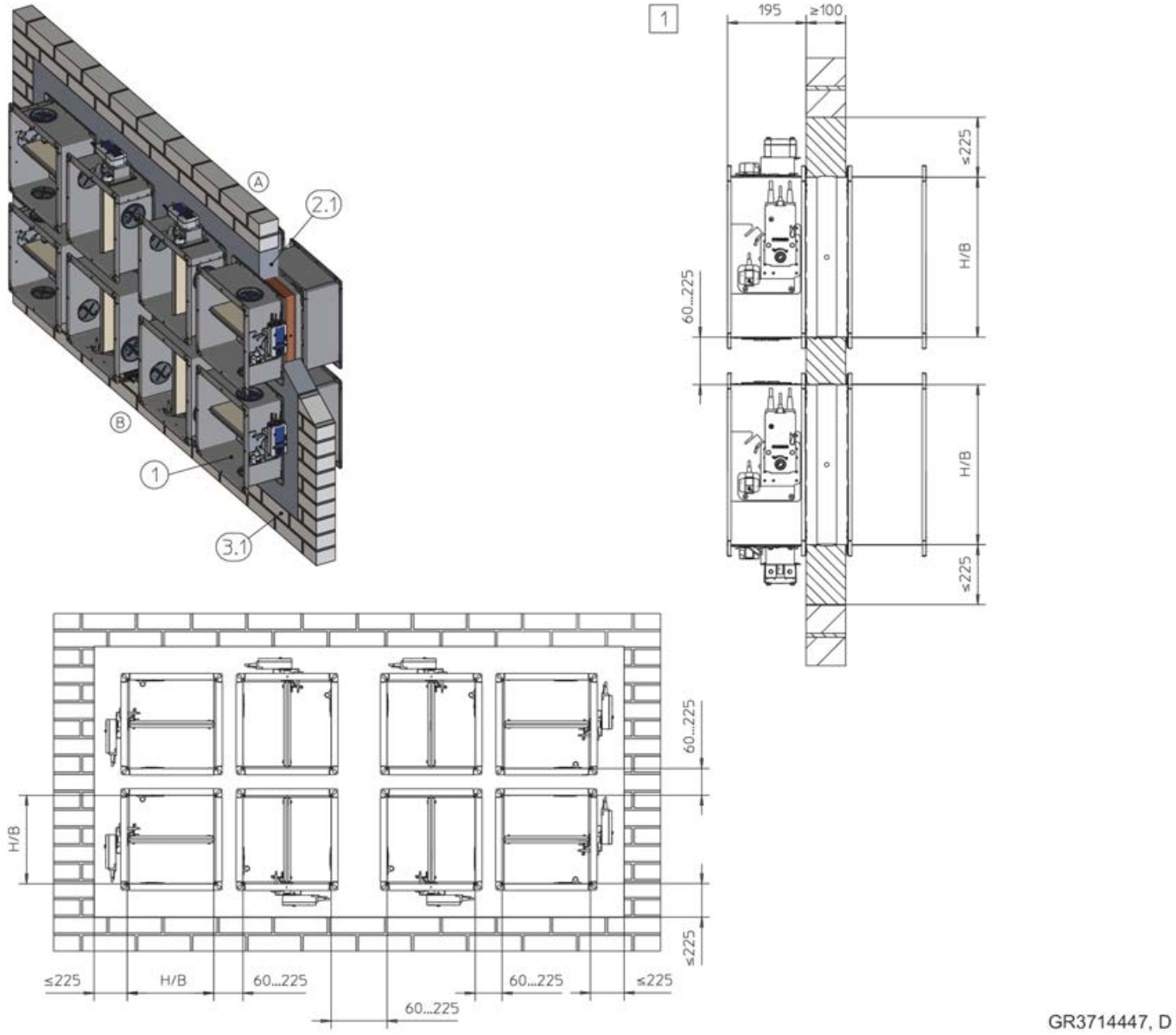


Fig. 61: Mortar-based installation – multiple installation into one installation opening

1 FK2-EU
2.1 Mortar
3.1 Solid wall
[1] Up to EI 90 S

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

- Solid wall, *on page 44*
- Casing length L = 305 or 500 mm
- Total fire damper area (B × H) ≤ 4.8 m²
- The possible number of fire dampers in an installation opening depends on the sizes of the fire dampers (B × H) and on the total fire damper area (4.8 m²)
- The dampers can be arranged in one or two rows.
- Distance to load-bearing structural elements ≥ 40 mm
- If the actuators are located between the fire dampers, sufficient clear space for inspection must be provided.
- Maximum mortar bed width 225 mm; provide a lintel or brick partition if necessary.

5.4.4 Mortar-based installation – 4 dampers with a common duct

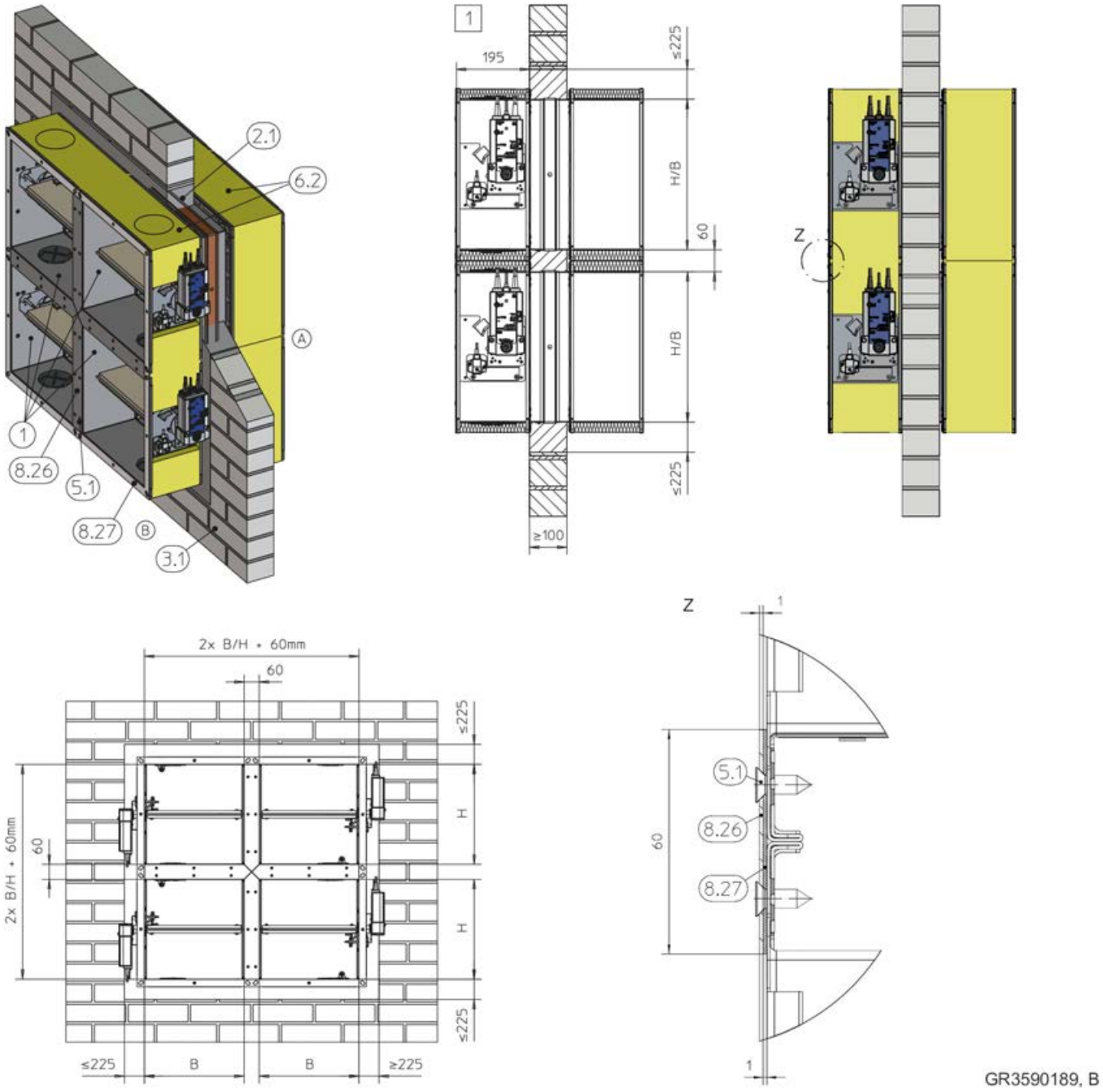


Fig. 62: Mortar-based installation – 4 dampers with a common duct

1	FK2-EU	6.2	Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, d ≥ 30 mm
2.1	Mortar	8.26	Sheet metal cover, t = 1 mm (by others)
3.1	Solid wall	8.27	Seal
5.1	Self-tapping screws, spacing ~ 150 mm	[1]	Up to EI 120 S

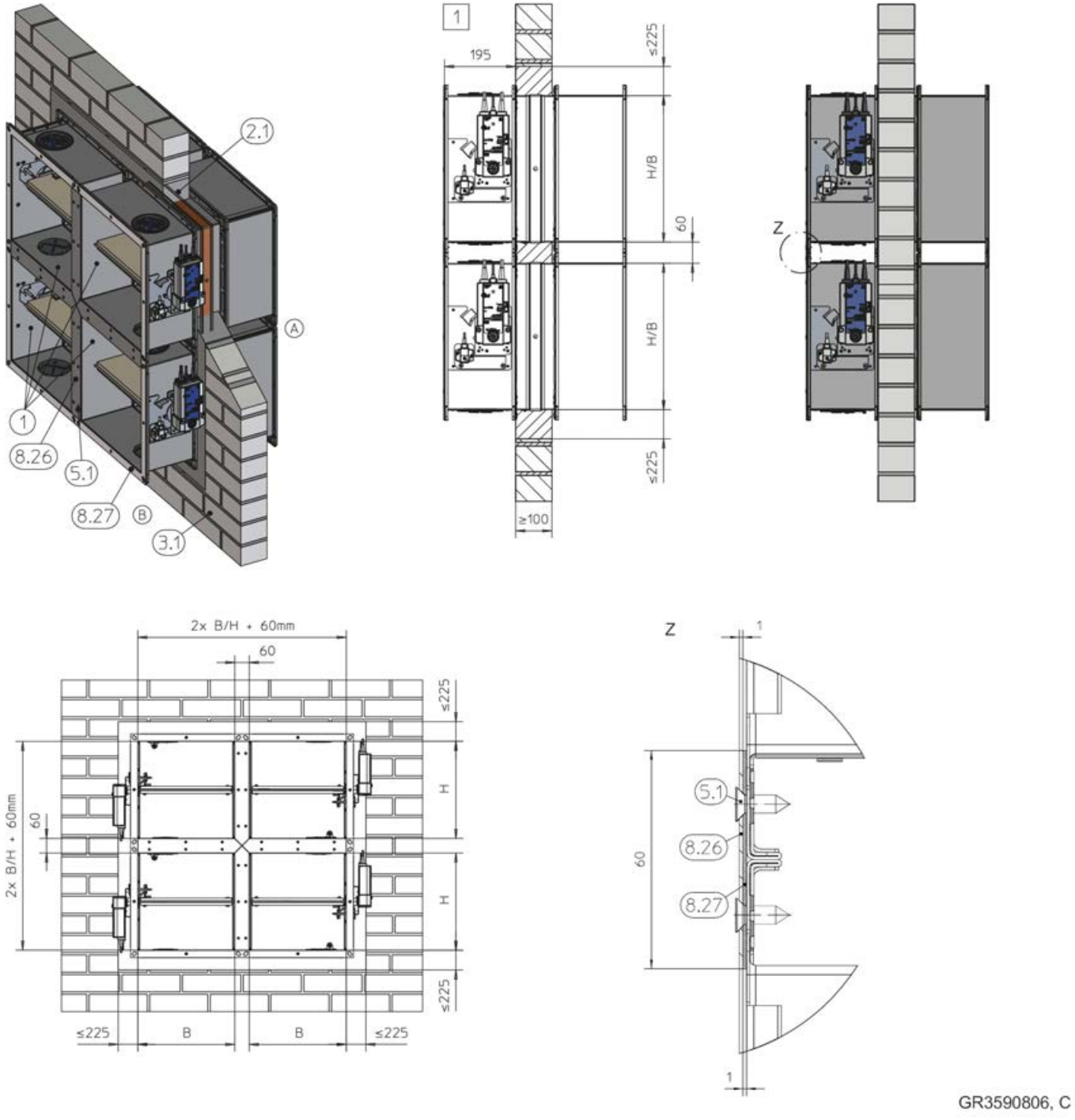


Fig. 63: Mortar-based installation – 4 dampers with a common duct

1	FK2-EU	8.26	Sheet metal cover, t = 1 mm (by others)
2.1	Mortar	8.27	Seal
3.1	Solid wall	[1]	Up to EI 90 S
5.1	Self-tapping screws, spacing ~ 150 mm		

Additional requirements: mortar-based installation – 4 dampers with a common duct

- Solid wall, *on page 44*
- Casing length L = 500 mm
- 4 dampers, up to 4.8 m^2 total fire damper area (common duct)
- Combination of 4 fire dampers next to and on top of one another, connection/sealing with sheet metal covers (by others).
- Place the sheet metal covers (galvanised steel, at least 1 mm, approx. 60 mm wide, L = 2 × B / H + 60 mm) onto a duct seal and fix them with self-tapping screws spaced approx. 150 mm apart.
- Close off the perimeter gaps and the gaps between the damper casings with mortar.
- For EI 120 S: Place mineral wool (6.2) around the perimeters of both the operating and installation sides; do not cover the operating elements, otherwise the function of the damper will be impaired. Inspection accesses and the product sticker must remain accessible.
- Distance to load-bearing structural elements ≥ 40 mm

5.4.5 Mortar-based installation with partial mortaring

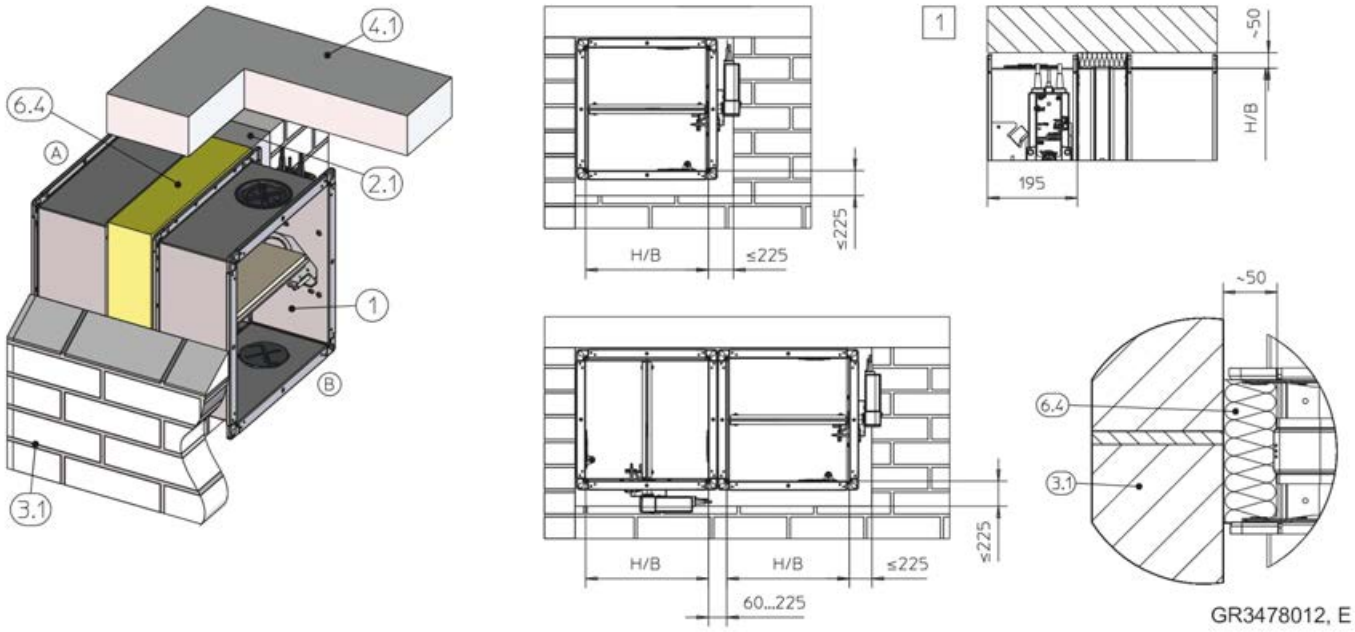


Fig. 64: Mortar-based installation into a solid wall, with partial mortaring

1 FK2-EU
2.1 Mortar
3.1 Solid wall
4.1 Solid ceiling slab
6.4 Mineral wool, ≥ 1000 °C, ≥ 140 kg/m³
[1] Up to EI 90 S

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

- Solid wall, *on page 44*
- Casing length L = 305 or 500 mm
- 60 – 225 mm distance between two FK2-EU in one installation opening

1. Seal the difficult to access gaps between FK2-EU and the wall or ceiling with cut-to-size mineral wool, placed firmly between the flanges and the structural element, leaving no gaps.
2. Close off the remaining gaps (on 2 or 3 sides) with mortar.

5.4.6 Dry mortarless installation into a solid wall with existing installation subframe E1/E2 and installation kit E3

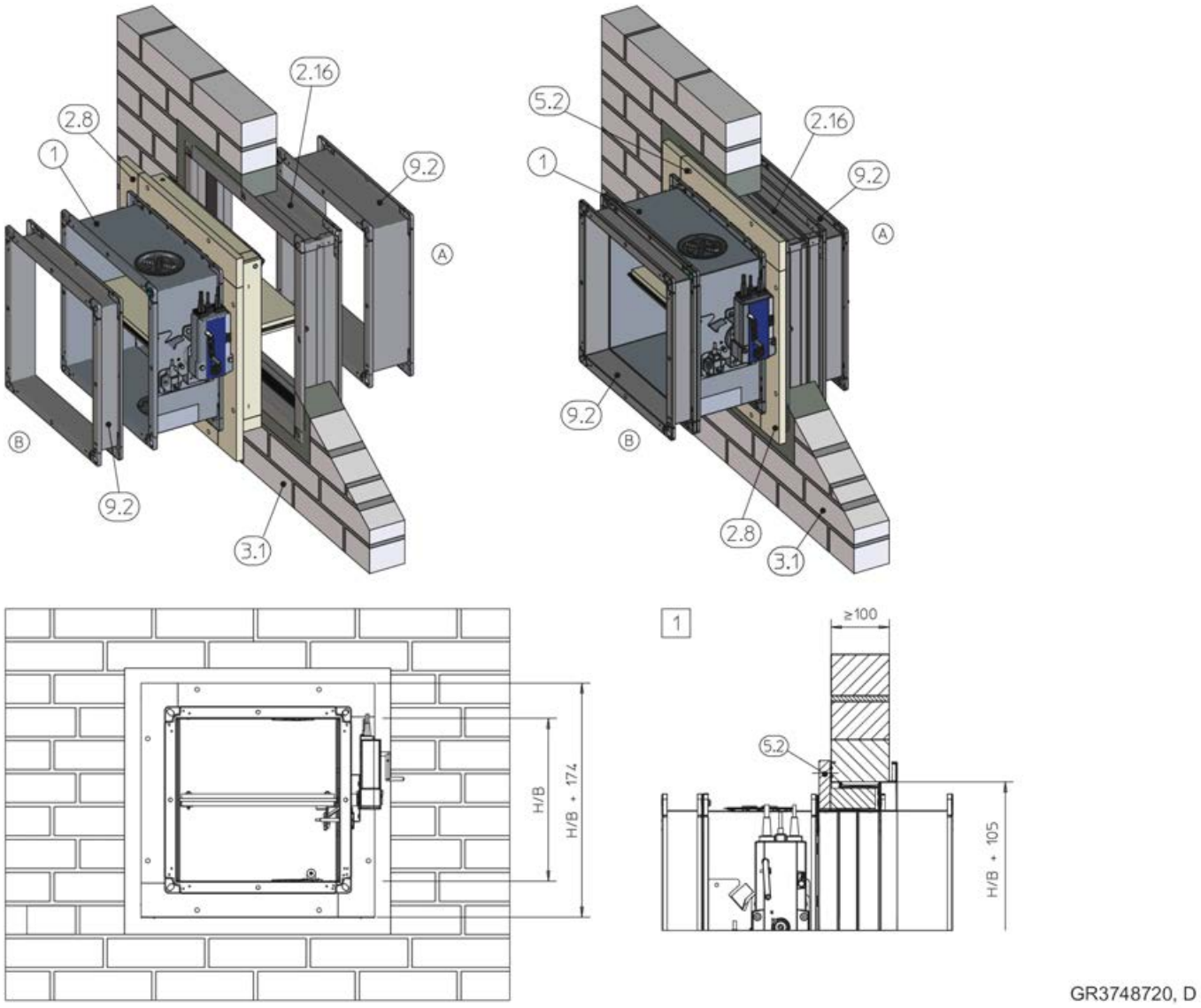


Fig. 65: Dry mortarless installation into a solid wall with existing installation subframe E1/E2 and installation kit E3

1 FK2-EU
2.8 Installation kit E3 consists of:
2.16 Existing installation subframe E1/E2 for FK-K90 / FK-EU
3.1 Solid wall
5.2 Hexagon head screw M8 × 30 mm (reused from existing installation kit)
9.2 Extension piece or duct
[1] Up to EI 120 S

Additional requirements: dry mortarless installation into a solid wall with existing installation subframe E1/E2 and installation kit E3

- Solid wall, ↳ *on page 44*
- Casing length L = 305 mm with extension pieces on both sides
- Installation of FK2-EU with installation kit E3 into an existing installation subframe E1/E2 for FK-K90/FK-EU
- Distance between two FK2-EU ≥ 200 mm
- Distance to load-bearing structural elements ≥ 75 mm
- Mount installation kit E3 onto the fire damper, ↳ *5.3.2 'Installation kit E3 – supply package and assembly' on page 50*
- Push the fire damper together with installation kit E3 into the existing installation subframe E1/E2 and fix it with screws M8 × 30 mm (4 – 12 screws, depending on damper size).
- Attach the fire damper to the duct.

5.4.7 Dry mortarless installation into a solid wall, with installation kit EW

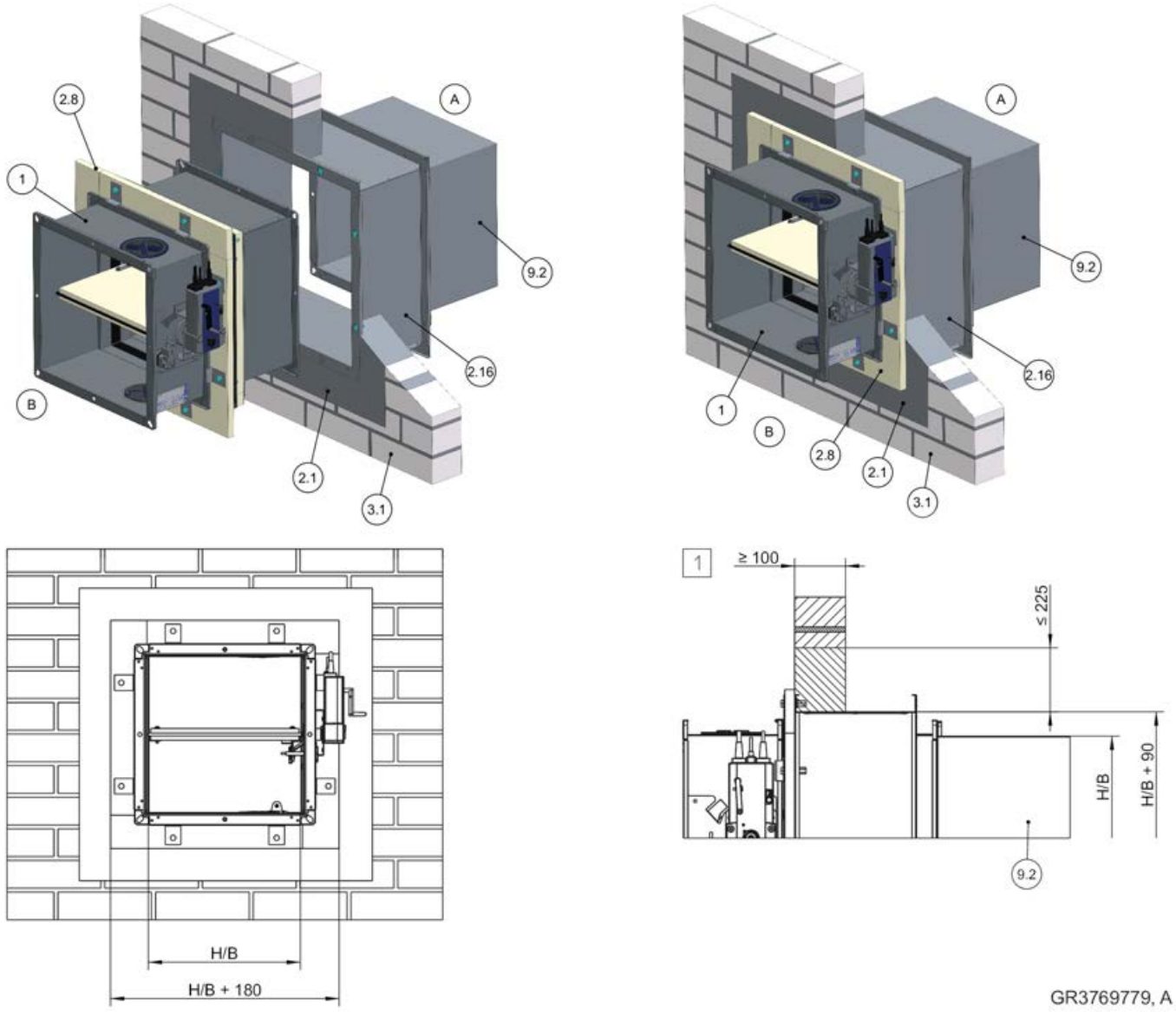


Fig. 66: Dry mortarless installation into a solid wall, with installation kit EW

1	FK2-EU
2.1	Mortar
2.8	Installation kit EW
2.16	Installation subframe
3.1	Solid wall
5.2	Hexagon head screw M8 × 35 mm
5.15	Bracket
9.2	Extension piece or duct
1	Up to EI 120 S

Additional requirements: dry mortarless installation into a solid wall with existing installation subframe and installation kit EW

- Solid wall, *on page 44*
- Casing length L = 500 mm
- Distance between two FK2-EU ≥ 200 mm
- Distance to load-bearing structural elements ≥ 75 mm

1. Mount installation kit EW onto the fire damper, *5.3.3 'Installation kit EW – supply package and assembly' on page 53*
2. Fix the installation subframe (2.16) with perimeter mortaring in the solid wall in such a way that the flange with the blind rivet nuts is flush with the wall.
3. Once the mortar has cured, push the FK2-EU with installation kit EW into the installation subframe (2.16) and fix it with screws M8 × 35 mm (4 – 12 screws, depending on damper size).

4. ▸ Attach the fire damper to the duct.

5.4.8 Mortar-based installation with flexible ceiling joint

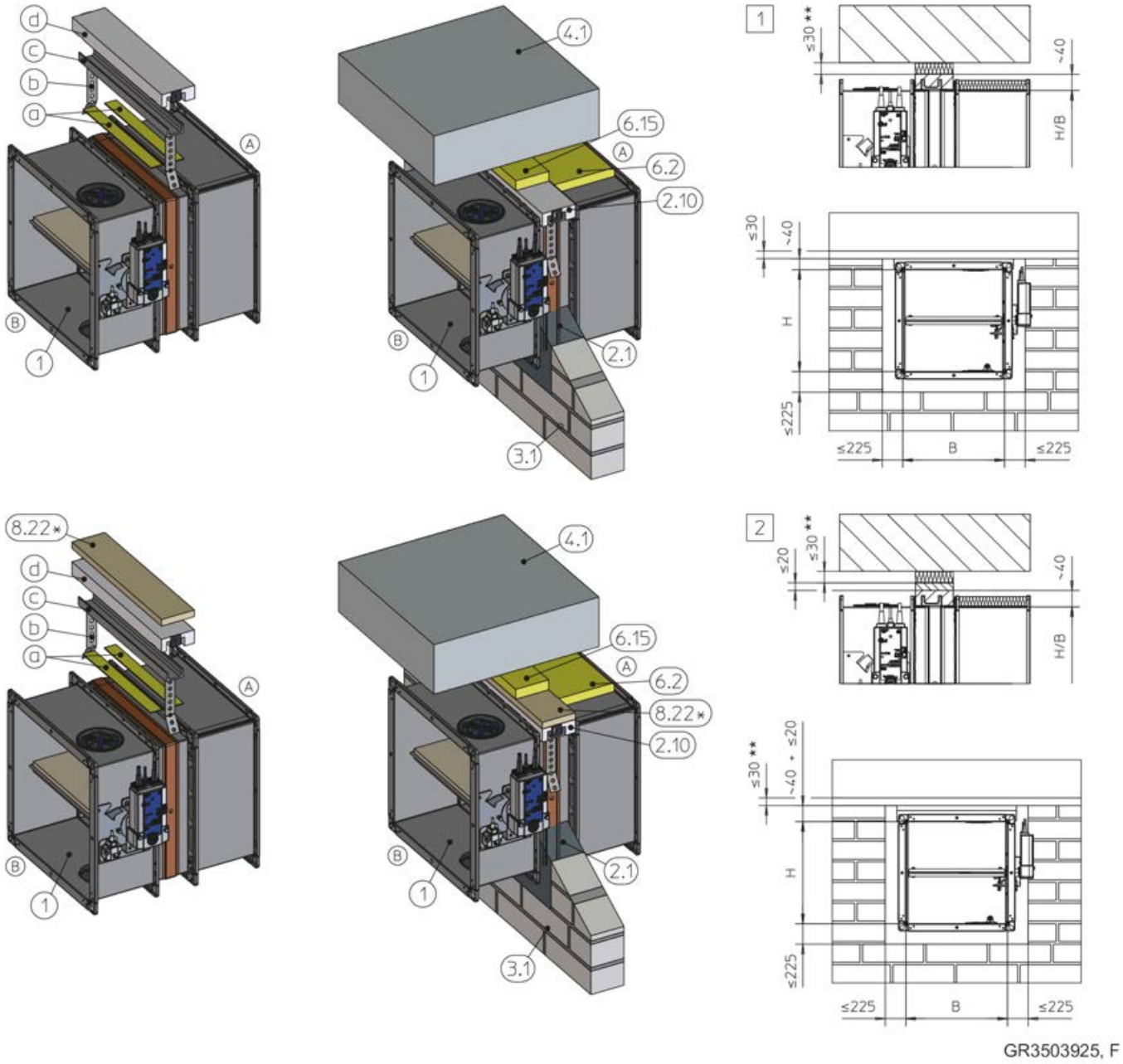


Fig. 67: Mortar-based installation into a solid wall with flexible ceiling joint, with installation kit GM

1	FK2-EU
2.1	Mortar
2.10	Installation kit GM, consisting of:
a	Mineral wool (B = 70 mm, cut into two equal parts (by others) 2 × 35 mm)
b	Fixing tab
c	Steel channel
days	Calcium silicate board
3.1	Solid wall
4.1	Solid ceiling slab
6.2	Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, d ≥ 30 mm
6.15	Mineral wool, depending on the flexible ceiling joint**
8.22	Calcium silicate board, alternatively mineral wool ≥ 1000°C, ≥ 140 kg/m³, d ≤ 20 mm (by others, if required)
1 2	Up to EI 90 S

(1) and (2.10) are part of the supply package.

*If there is a difference of up to 20 mm between a calcium silicate board (d) and the upper edge of a wall, you may use a calcium silicate reinforcing board (8.22) or mineral wool (8.22) to compensate for the difference.

**The gap between the ceiling and installation kit GM may be up to 30 mm after the ceiling has subsided. In case of a larger gap the fire damper has to be installed below a lintel.

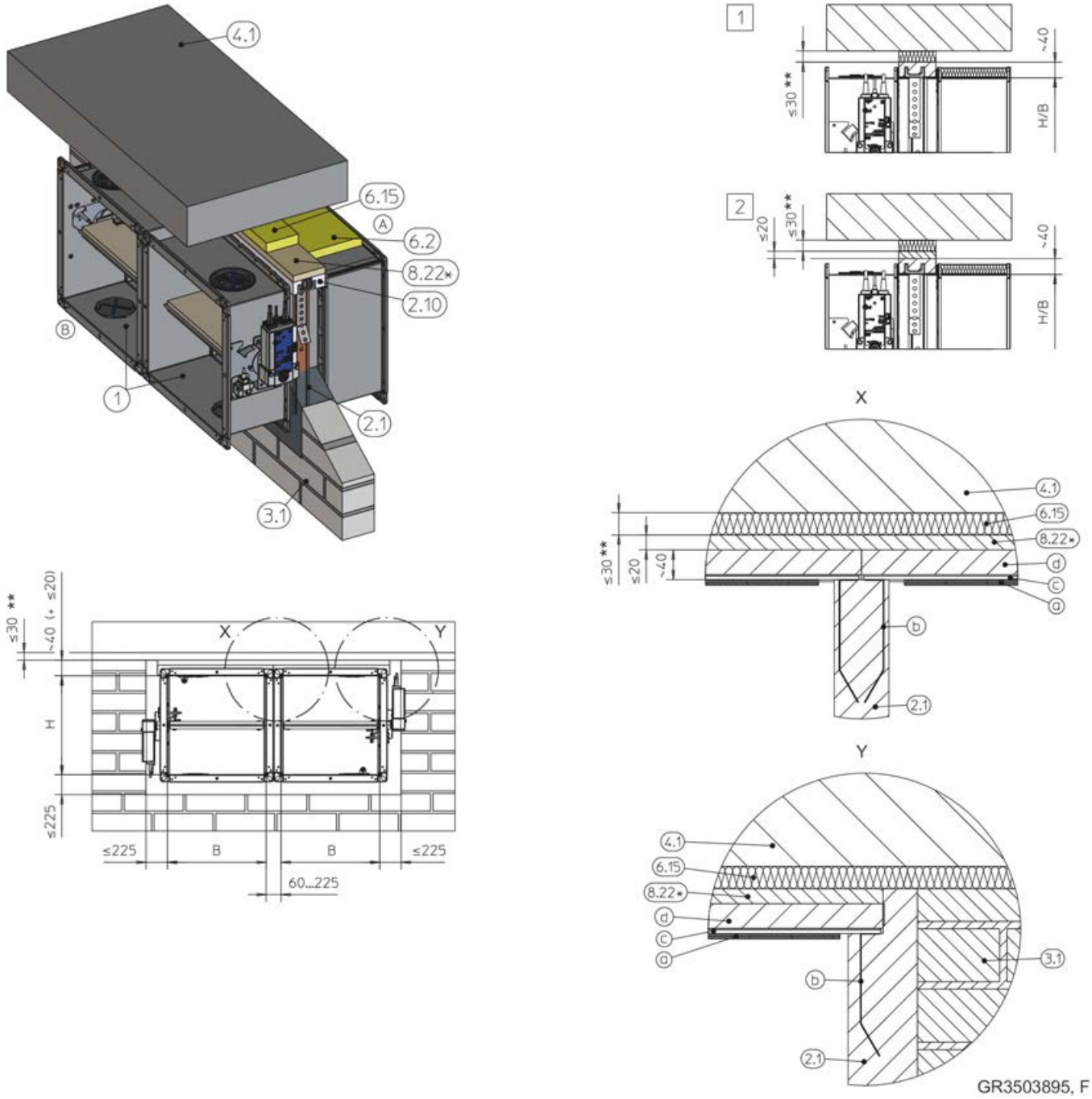


Fig. 68: Mortar-based installation into a solid wall with flexible ceiling joint (with installation kit GM), side-by-side installation

1	FK2-EU
2.1	Mortar
2.10	Installation kit GM, consisting of:
a	Mineral wool
b	Fixing tab
c	Steel channel
days	Calcium silicate board
3.1	Solid wall
4.1	Solid ceiling slab
6.2	Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, d ≥ 30 mm
6.15	Mineral wool, depending on the flexible ceiling joint**
8.22	Calcium silicate board, alternatively mineral wool ≥ 1000°C, ≥ 140 kg/m³, d ≤ 20 mm, if required
1 2	Up to EI 90 S

(1) and (2.10) are part of the supply package.

*If there is a difference of up to 20 mm between a calcium silicate board (d) and the upper edge of a wall, you may use a calcium silicate reinforcing board (8.22) or mineral wool (8.22) to compensate for the difference.

**The gap between the ceiling and installation kit GM may be up to 30 mm after the ceiling has subsided. In case of a larger gap the fire damper has to be installed below a lintel.

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

- Solid wall, *on page 44*
- Horizontal installation (shaft)
- Casing length L = 500 mm
- 60 – 225 mm distance between two FK2-EU fire dampers in one installation opening (the distance must be wide enough to allow for professional mortaring between the dampers).
- 40 mm distance between the fire damper and the upper edge of a solid wall, with (8.22) up to 60 mm
- Installation of FK2-EU into solid walls, with installation kit GM, *on page 40*
- Mount installation kit GM onto the fire damper, *5.3.4 'Installation kit GM – supply package and assembly' on page 56*

1. Assembling the installation kit:
   - Place mineral wool (a) in the upper groove of the fire damper casing.
   - Bend the fixing tabs (b) on the steel channel (c) and place them on the mineral wool.
   - Place the calcium silicate board (d) on the steel channel. Ensure that the entire wide side is in contact with the flange and that the upper edge is flush with the upper edge of the wall.
   - If necessary, place the calcium silicate reinforcing board or the mineral wool (8.22) on the damper and secure it in position.
2. Seal the gaps between the damper casing and the wall at the bottom and at the sides up to the top edge of the wall with mortar.
3. Place mineral wool (6.2), ≥ 30 mm thick, on the damper casing up to the installation side flange so that it fits tightly.
4. Use mineral wool (depending on the flexible ceiling joint) above the installation kit.

5.4.9 Dry mortarless installation on the face of a solid wall, with installation kit WA

Wall attachment and mortared-in duct

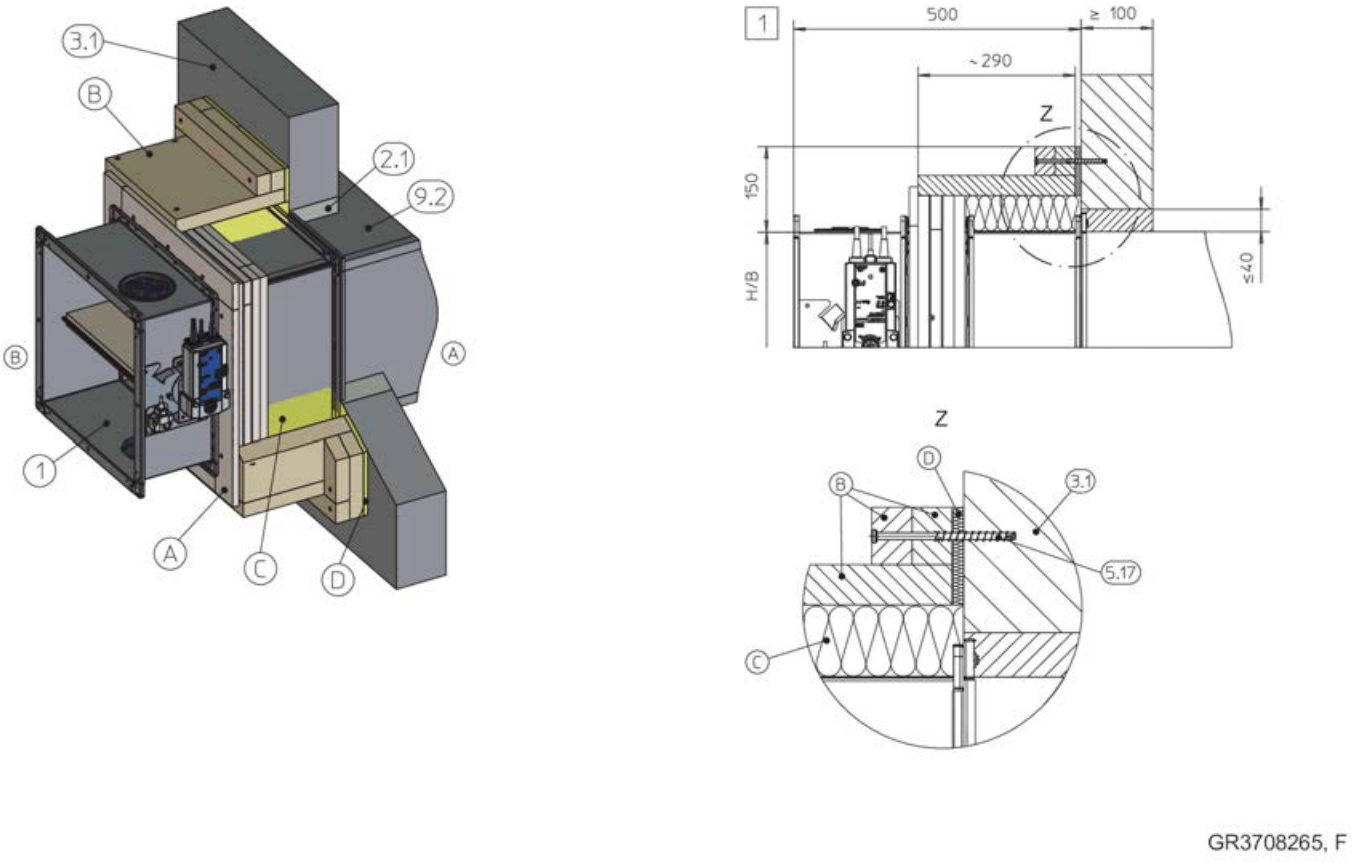


Fig. 69: Dry mortarless installation on the face of a solid wall (concrete wall shown) with installation kit WA (wall attachment and mortared-in duct)

1	FK2-EU
2.1	Mortar
2.5	Installation kit WA, *5.3.5 'Installation kit WA – supply package and assembly' on page 57*, consists of:
A	Installation kit (2 × B section and 2 × H section)
B	Multilayer sections (2 × B section and 2 × H section)
C	Cut mineral wool parts (2 × B section and 2 × H section), ≥ 1000°C, ≥ 80 kg/m³, d = 60 mm
D	Mineral wool strips (2 × B side and 2 × H side), ≥ 1000 °C, ≥ 40 kg/m³, t = 10 mm
3.1	Solid wall / concrete wall
5.17.1**	Hilti anchor bolt ® HUS ∅ 6 mm x 120 mm (8 – 20 anchors, depending on damper size)
9.2	Duct (sheet steel)
1	Up to EI 90 S

Note:

** Anchor bolts supplied for fixing to concrete walls. For masonry walls use equivalent fire-rated anchor bolts with suitability certificate that are suitable for the wall or ceiling slab can also be used; push through installation is also possible.

Installation on the face of a wall, with cut hole or other opening

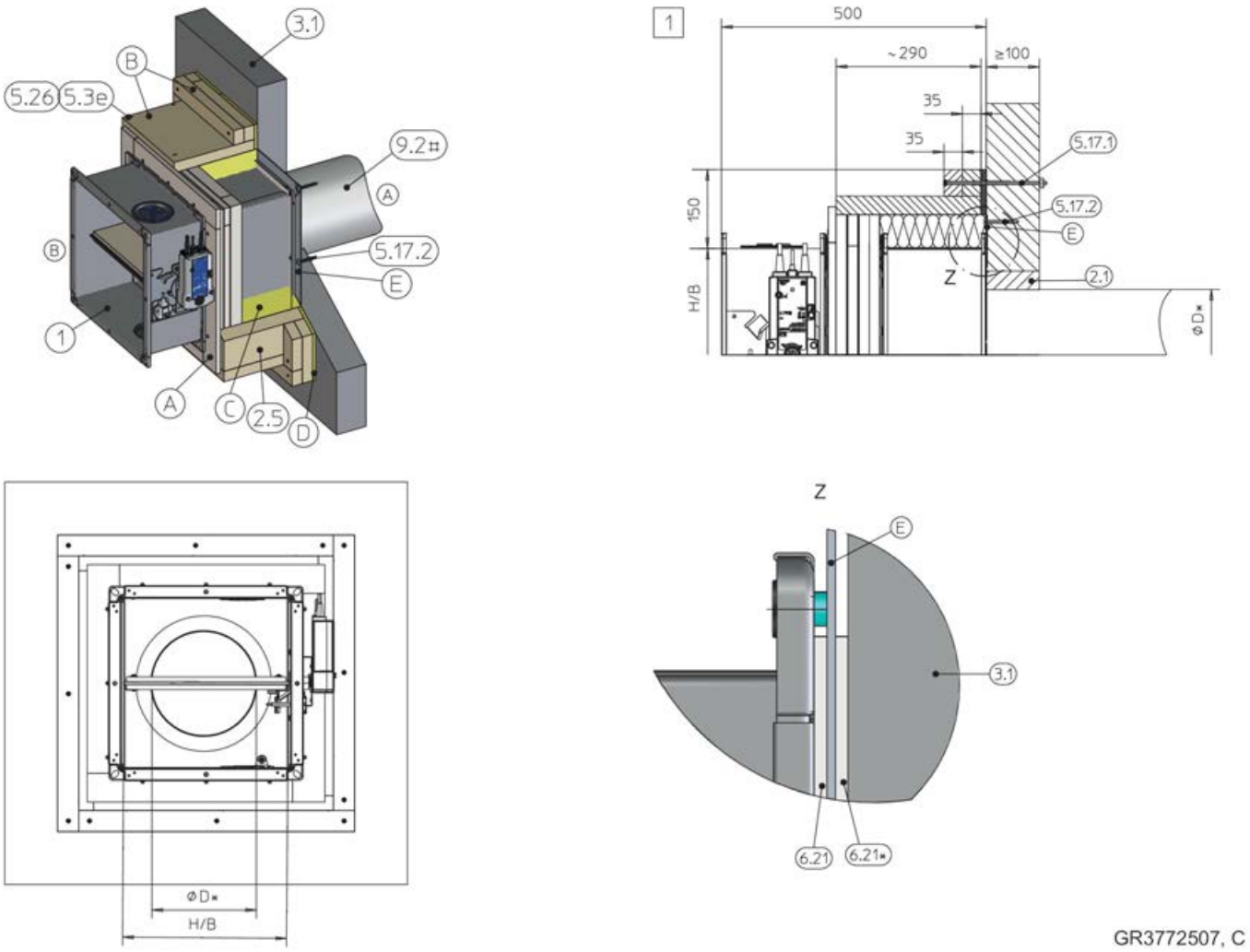


Fig. 70: Dry mortarless installation on the face of a solid wall with installation kit WA (with cut hole or other opening)

1	FK2-EU
2.1	Mortar
2.5	Installation kit WA, ↳ *5.3.5 'Installation kit WA – supply package and assembly' on page 57* , consists of:
A	Installation kit (2 × B section and 2 × H section)
B	Multilayer sections (2 × B section and 2 × H section)
C	Cut mineral wool parts (2 × B section and 2 × H section), ≥ 1000°C, ≥ 80 kg/m³, d = 60 mm
D	Mineral wool strips (2 × B side and 2 × H side), ≥ 1000 °C, ≥ 40 kg/m³, t = 10 mm
E	Wall face frame with Kerafix seal
3.1	Solid wall
5.3e	Chipboard screw ∅ 5 mm × 70 mm (16 – 28 screws, depending on damper size)
5.17.1**	Hilti anchor bolts ® HUS ∅ 6 mm × 120 mm (8 – 20 anchor bolts, depending on damper size)
5.17.2**	Anchor bolts with pan head 6 × 60 mm
5.26	Steel wire clip, 63 mm (by others)
9.2	Duct (sheet steel)
*	D < H and B; the movement of the damper blade must not be impaired
#	Duct as an option
1	Up to EI 90 S

Note:

** Anchor bolts supplied for fixing to concrete walls. For masonry walls use equivalent fire-rated anchor bolts with suitability certificate that are suitable for the wall or ceiling slab can also be used; push through installation is also possible.

Additional requirements: dry mortarless installation on the face of solid walls, with installation kit WA

- Solid wall, *on page 44*
- Casing length L = 500 mm
- ≥ 150 mm distance between the fire damper and adjacent structural elements
- ≥ 300 mm distance between two fire dampers
- Installation of FK2-EUon the face of solid walls and ceiling slabs, with installation kit WA, *on page 40*
- Mount installation kit WA onto the fire damper, *5.3.5 'Installation kit WA – supply package and assembly' on page 57*
- Attach installation kit WA without a wall face frame (E) to a mortared-in duct, see Fig. 69 ; or use a wall face frame (E) and attach the installation kit to a cut hole, wall opening or duct that is flush with the wall, see Fig. 70
- The movement of the damper blade must not be impaired when a wall face frame (E) is used. The damper height must hence not exceed 400 mm.
- The size of the wall opening is ≤ B × H of the fire damper.

5.4.10 Dry mortarless installation remote from solid walls with installation kit WE

Dry mortarless installation remote from solid walls with installation kit WE (wall attachment)

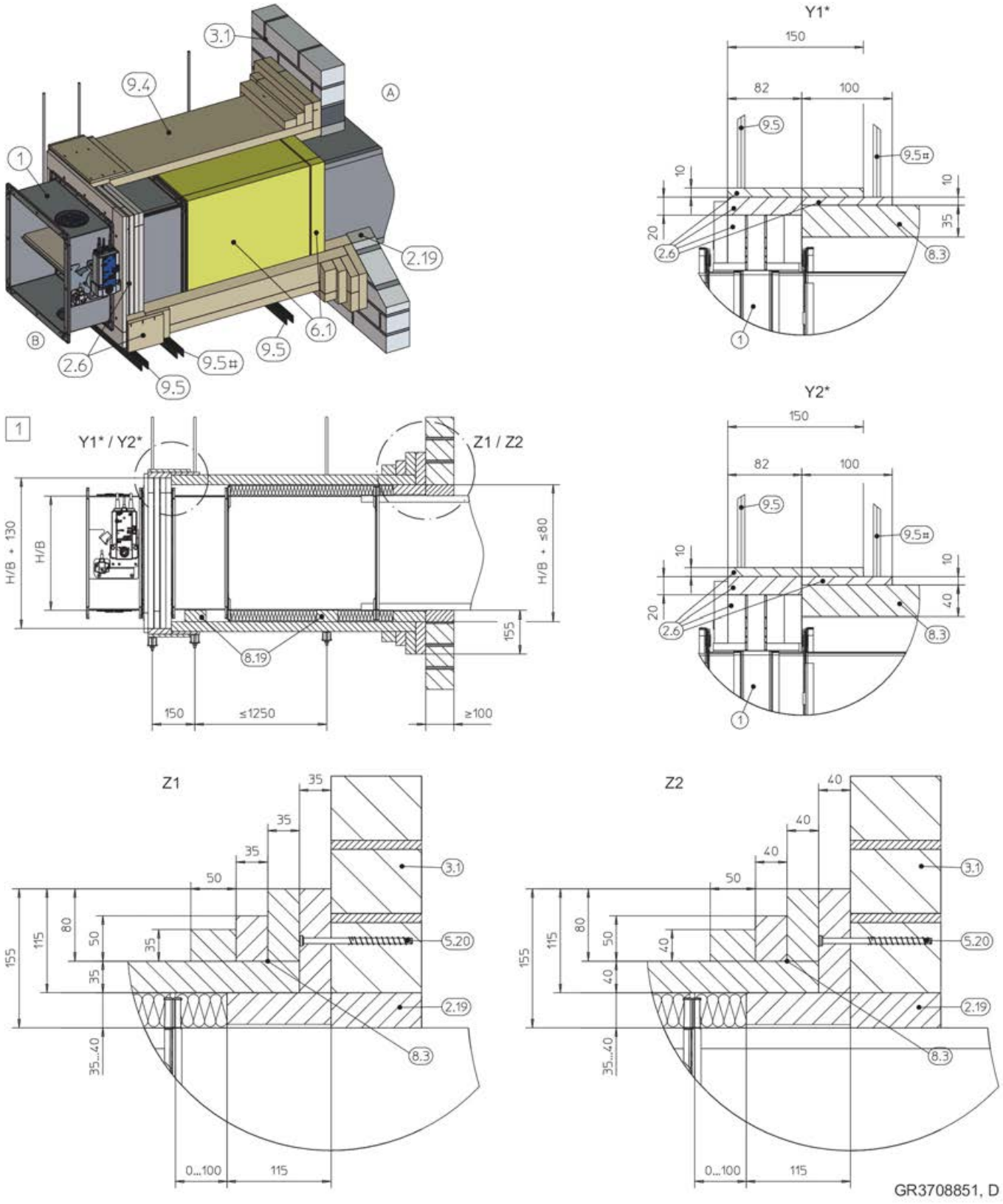


Fig. 71: Dry mortarless installation remote from solid walls with installation kit WE (wall attachment)

1 FK2-EU
2.6 Installation kit WE, *5.3.6 'Installation kit WE – supply package and assembly' on page 61*, including:
A Installation kit (2 × B section and 2 × H section)
B Plasterboard strips (6 × B section and 6 × H section)
2.19 Joint filler (suitable Promat® filler, Promat® ready-to-use filler or mortar according to the installation and operating manual)
3.1 Solid wall, wall attachment on 4 sides according to Promat® manual, construction 478, latest edition
5.20 Screw, Fischer® FFS 7.5 × 82 mm or equivalent (suitable for the type of wall)
6.1 Mineral wool, ≥ 1000 °C, ≥ 40 kg/m³, d = 40 mm, only with B × H > 800 × 400 mm
8.3 PROMATECT®-LS35 or -L500, d = 35 mm or 40 mm, or AD40
8.19 PROMATECT® LS35 or PROMATECT® L500 firestop board, d = 35 mm or 40 mm, or AD40
9.4 Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition
9.5 Suspension of FK2-EU(by others), *5.13.2 'Suspending fire dampers installed remote from solid walls and ceiling slabs' on page 229*
Damper sizes > 1000× 600 mm require two suspension points underneath the damper, at a distance of 150 mm from each other
[1] Up to EI 90 S (horizontal installation position)

Dry mortarless installation remote from solid walls with installation kit WE (installation variant)

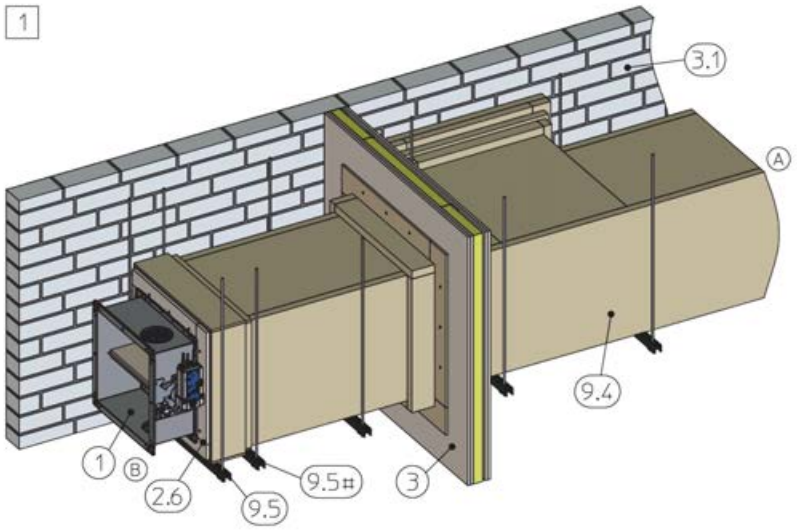


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Fig. 72: Dry mortarless installation remote from solid walls with installation kit WE (installation variant)

1 FK2-EU
2.6 Installation kit WE, *5.3.6 'Installation kit WE – supply package and assembly' on page 61*
3 Lightweight partition wall or solid wall (if any), wall penetration and wall attachment (on 4 sides) according to Promat® manual, construction 478, latest edition
3.1 Solid wall, wall penetration and wall attachment (on 4 sides) according to Promat® manual, construction 478, latest edition
9.4 Sheet steel duct with fire-resistant cladding and suspension system according to Promat® manual, construction 478, latest edition (from B × H > 800 × 400 mm plus 6.1)
9.5 Suspension of FK2-EU(by others), *5.13.2 'Suspending fire dampers installed remote from solid walls and ceiling slabs' on page 229*
[1] Up to EI 90 S (horizontal installation position)

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

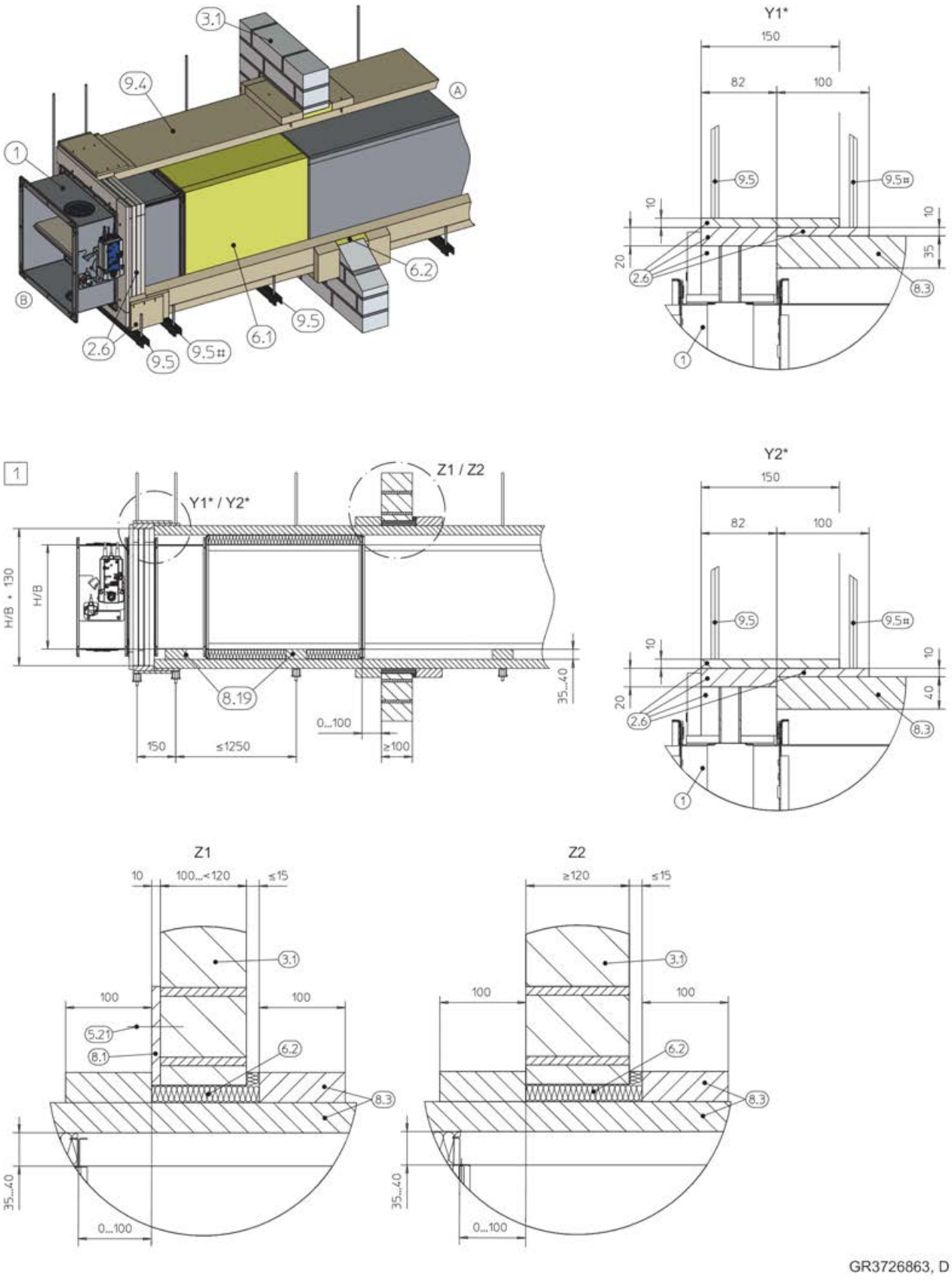


Fig. 73: Dry mortarless installation remote from solid walls with installation kit WE (wall penetration)

1 FK2-EU

8.1 PROMATECT®-H, d = 10 mm

2.6 Installation kit WE, *5.3.6 'Installation kit WE – supply package and assembly' on page 61*, including:
A Installation kit (2 × B section and 2 × H section)
B Plasterboard strips (6 × B section and 6 × H section)
3.1 Solid wall, wall penetration on 4 sides according to Promat® manual, construction 478, latest edition
5.21 Screw / anchor
6.1 Mineral wool, ≥ 1000 °C, ≥ 40 kg/m³, d = 40 mm, only from B × H > 800 × 400 mm
6.2 Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³
8.3 PROMATECT®-LS35 or -L500, d = 35 mm or 40 mm, or AD40
8.19 PROMATECT® LS35 or PROMATECT® L500 firestop board, d = 35 mm or 40 mm, or AD40
9.4 Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition
9.5 Suspension of FK2-EU(by others), *5.13.2 'Suspending fire dampers installed remote from solid walls and ceiling slabs' on page 229*
Damper sizes > 1000× 600 mm require two suspension points underneath the damper, at a distance of 150 mm from each other
* Even out the joints between the plasterboard strips with Promat filler or compound
1 Up to EI 90 S (horizontal installation position)

Additional requirements: dry mortarless installation remote from solid walls with installation kit WE

- Solid wall, *on page 44*
- Casing length L = 500 mm
- Cladding on 4 sides
- Horizontal installation position
- Sheet steel ducts without any openings, with fire-resistant cladding on 4 sides for any length (fittings with cladding according to instructions from Promat®)
- ≥ 155 mm distance between the fire damper and the wall or ceiling slab (≥ 110 mm with wall penetration)
- ≥ 310 mm distance between two fire dampers (≥ 300 mm with wall penetration)
- Installation of FK2-EU remote form walls and ceilings, with installation kit WE, *on page 40*
- Mount installation kit WE onto the fire damper, *5.3.6 'Installation kit WE – supply package and assembly' on page 61*
- Depending on the thickness of the cladding (35 or 40 mm), you will have to even out the joints between the sections of the installation kit (2.6) with Promat filler or compound (1 to 3 mm).

Note: Fire damper and duct must be suspended *229* .

5.4.11 Dry mortarless installation remote from solid walls with installation kit WE 120 and mineral wool

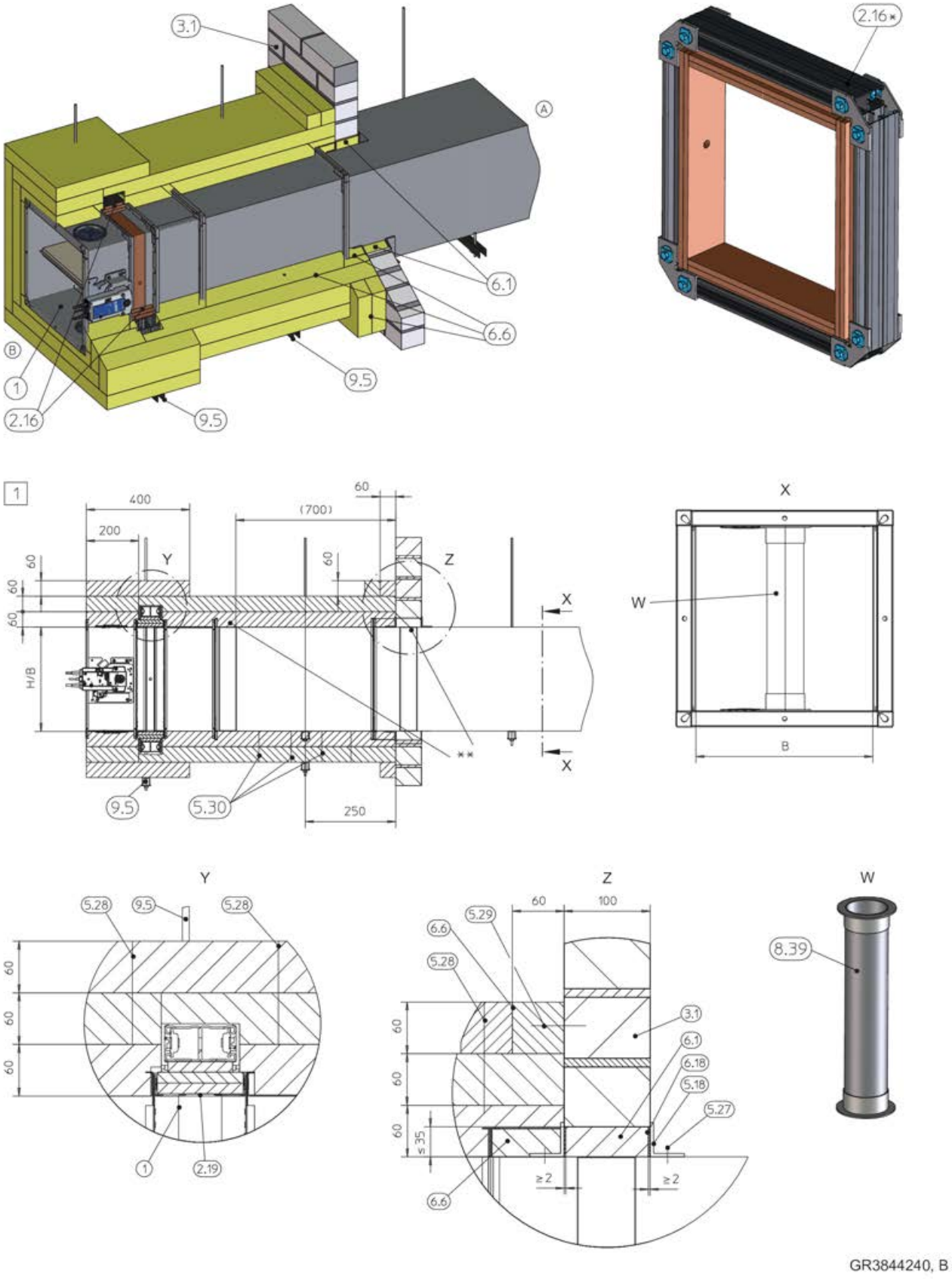


Fig. 74: Dry mortarless installation remote from solid walls with installation kit WE 120 (wall attachment)

1 FK2-EU ≤ 1000 × 600 mm
2.16 Installation kit (by others), ↳ *'Installation kit (2.16, by others)' on page 94*
2.19 Joint filler (suitable Promat® filler or Promat® ready-to-use filler)
3.1 Solid wall
5.18 L section, steel, 40 × 40 × 4 mm, around the perimeter
5.27 Self-tapping screw, ≥ Ø 5.9, a ≤ 100 mm
5.28 Fastener, Fire Spring 120 mm (spacing as 5.30)
5.29 Screw, Fischer® FFS 7.5 × 112 mm T30
5.30 PAROC insulated pin, see PAROC instructions
6.1 Perimeter gap with mineral wool, ≥ 1000 °C, ≥ 50 kg/m³
6.6 Mineral wool slab, PAROC Hvac Fire Slab Black-Coat
60 mm thick, ≥ 180 kg/m³, joints covered with PAROC Blackcoat Tape
6.18 Coating, Pyro-Safe® DG-SC or Sibralit DX
8.39 Spiral duct D = 80 mm for stiffening, with raised edge
9.5 Suspension of FK2-EU(by others), ↳ *5.13.2 'Suspending fire dampers installed remote from solid walls and ceiling slabs' on page 229*
Threaded rod sizes ↳ *see table*
Distances > 1250 mm require suspension
* Screw-fixing of fire-rated plasterboard strips is not shown
** Duct, with spiral duct 8.39 for stiffening, from B > 500 mm
1 Up to EI 120 S (horizontal installation position)

Installation kit (2.16, by others)

Description	Number
Fire-rated plasterboard strip 100 × 12.5 mm	8 pieces (4 × B section, 4 × H section)
Fire-rated plasterboard strip 75 × 12.5 mm	4 pieces (2 × B section, 2 × H section)
Hilti double channel MQ-41 DF	4 pieces (2 × B section, 2 × H section)
Hilti angle bracket MQW-P2	8 units
Channel connector MQN-C	16 units

Size of threaded rod

B × H [mm]	Suspension
≤ 800 × 200	M10
≤ 1000 ×600	M12

Additional requirements: dry mortarless installation remote from solid walls with installation kit WE 120

- Solid wall, ↳ *on page 44*
- Casing length L = 500 mm
- Mineral wool insulation on 4 sides, fixed with insulated pins according to PAROC® instructions
- Horizontal installation position
- Sheet steel ducts without any openings, with fire-resistant cladding on 4 sides for any length (fittings with cladding according to instructions from PAROC®)
- ≤ 35 mm perimeter gap between duct and wall opening
- ≥ 180 mm distance between the fire damper and adjacent structural elements
- ≥ 360 mm distance between two fire dampers

Note: Fire damper and ducting must be suspended ↳ *Page 229* .

5.4.12 Dry mortarless installation with fire batt

Dry mortarless installation with fire batt into a solid wall

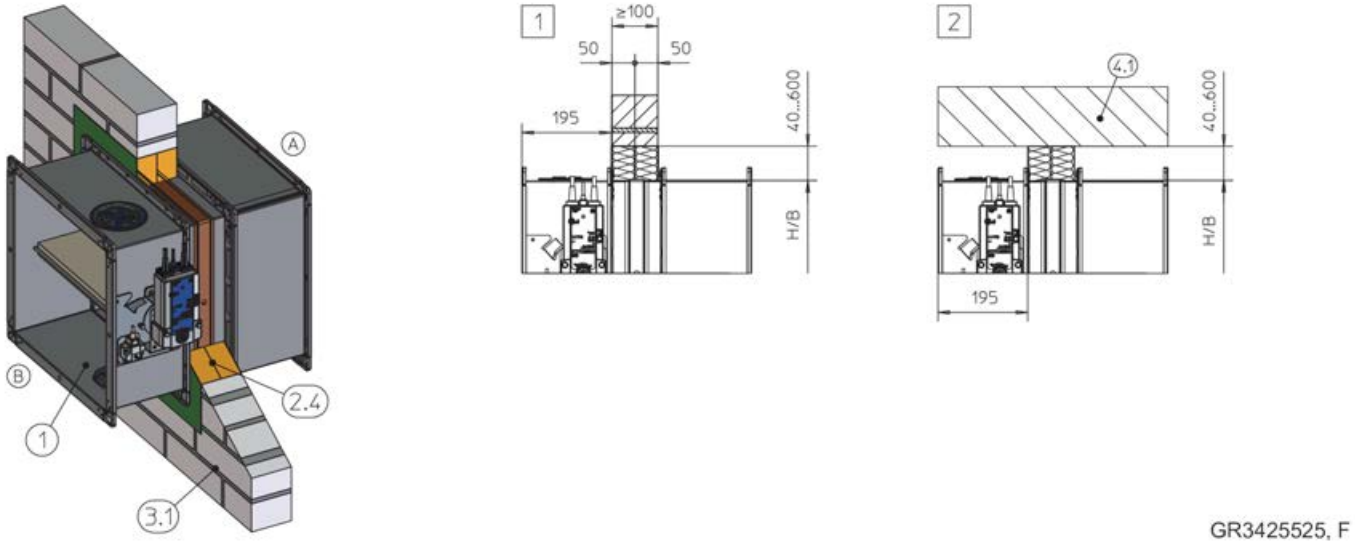


Fig. 75: Dry mortarless installation with fire batt into a solid wall

1	FK2-EU
2.4	Coated board system
3.1	Solid wall
4.1	Solid ceiling slab
1 2	up to EI 120 S: B × H = 200 × 100 – 800 × 400 mm (horizontal installation position) Up to EI 90 S: B × H = 200 × 100 – 1500 × 800 mm

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

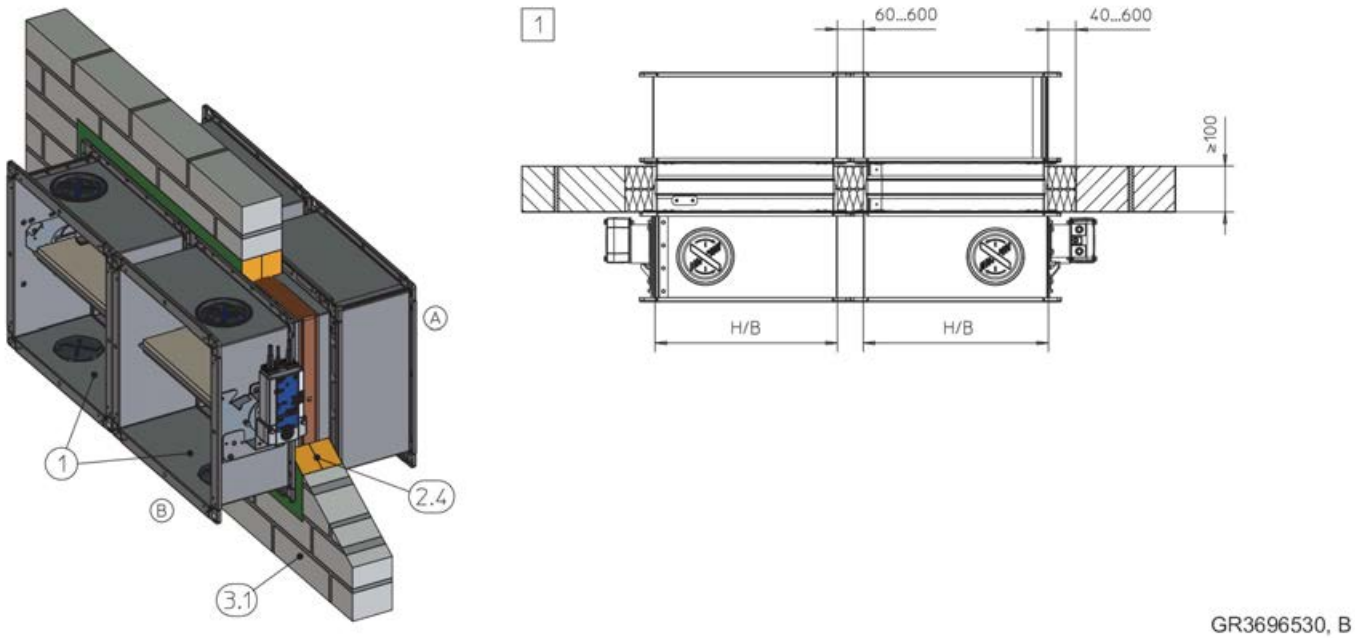


Fig. 76: Dry mortarless installation into a solid wall, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FK2-EU
2.4	Coated board system
3.1	Solid wall
1	Up to EI 90 S

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

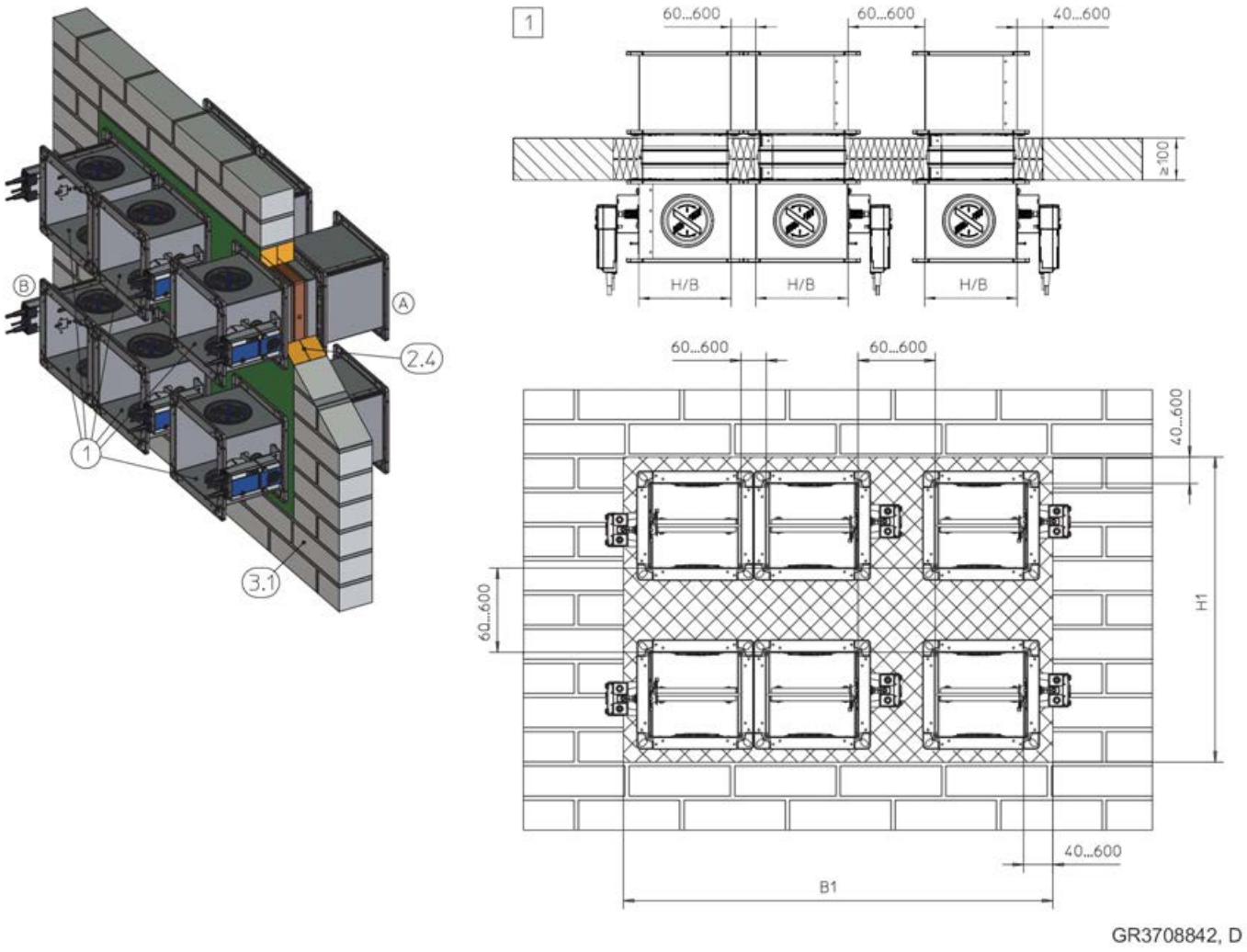


Fig. 77: Dry mortarless installation into a solid wall, with a fire batt, multiple installation, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1 FK2-EU
2.4 Coated board system
3.1 Solid wall
[1] Up to EI 90 S

For multiple installation please note:

- Total fire damper area: 2.4 m² max.
- The possible number of fire dampers in a fire batt depends on the sizes of the fire dampers (B × H) and on the total fire damper area (2.4 m²).
- Maximum fire batt size: B1 x H1, depending on manufacturer
- Distance to load-bearing structural elements ≥ 40 mm
- Vertical or horizontal installation position

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

- Solid wall, ↳ *on page 44*
- Casing length L = 305 or 500 mm
- Fire batt systems, installation details, distances / dimensions, ↳ *on page 41*
- Suspension and fixing, ↳ *Chapter 5.13 'Fixing the fire damper' on page 228* ↳ *5.13.3 'Fixing the damper when a fire batt is used' on page 230*

5.5 Lightweight partition walls

5.5.1 General

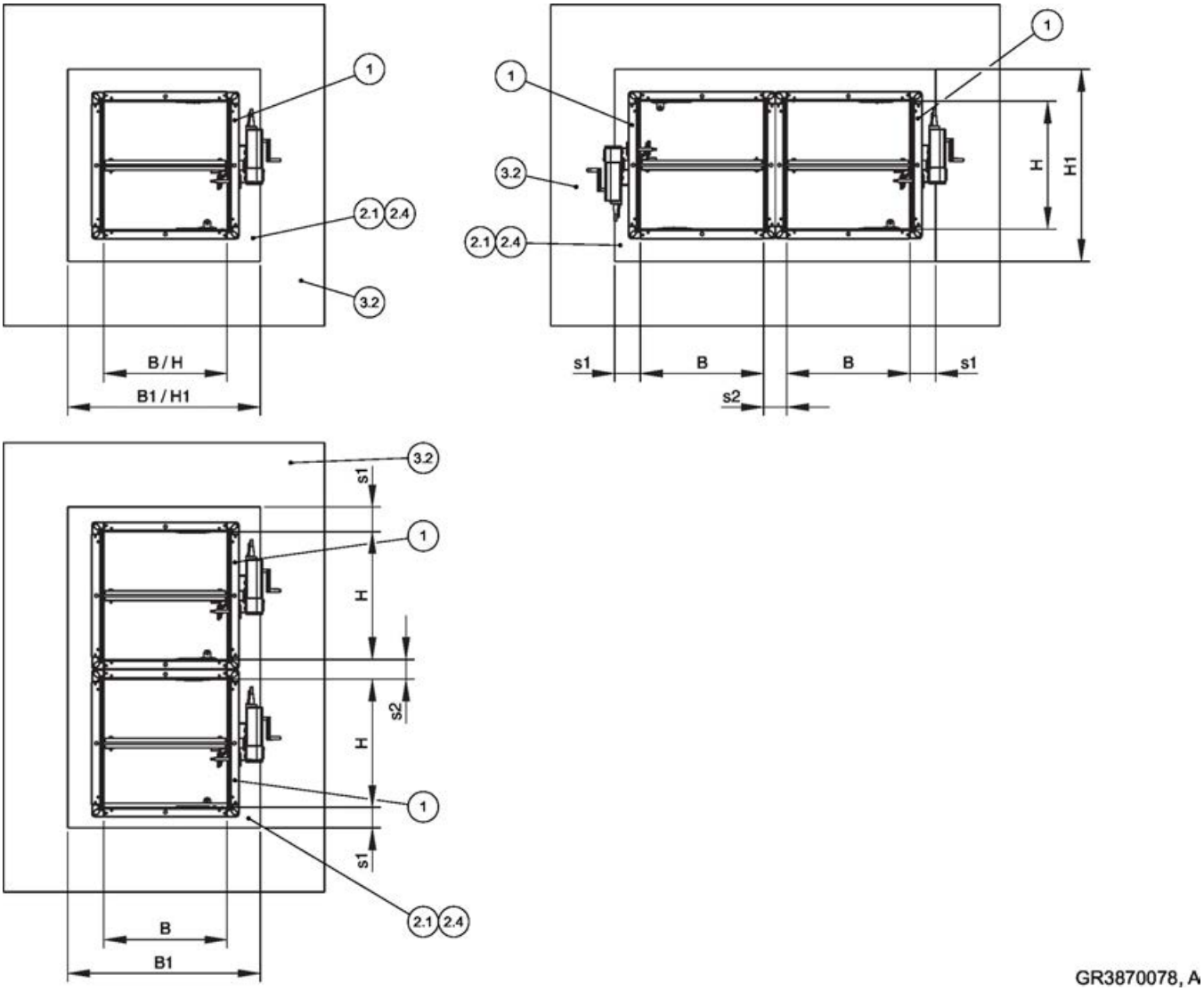


Fig. 78: Lightweight partition walls with metal support structure – arrangement/distances

1 FK2-EU
2.1 Mortar
2.4 Coated board system
3.2 Lightweight partition wall, cladding on both sides
s1 Perimeter gap, *on page 37*
s2 Distance between the fire dampers, *'Distances' on page 36*

Installation type	Installation opening [mm]			
	B1	H1	s1	s2
Mortar-based installation	[1]B + 450 max.	H + 450 max.	≤ 225	60 [4] – 225
Dry mortarless installation with installation kit ES [1, 2]	B + 140	H + 140	central installation	
Dry mortarless installation with fire batt [3]	B + 80 to 1200	H + 80 to 1200	40 – 600	60 [4] – 600

[1] Trim panels are optional or according to installation details

[2] Installation opening tolerance ± 2 mm

[3] Trim panels required according to installation details

[4] With length 305 mm and installation of fire dampers on top of each other, the distance between FK2-EU dampers has to be at least 75 mm.

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

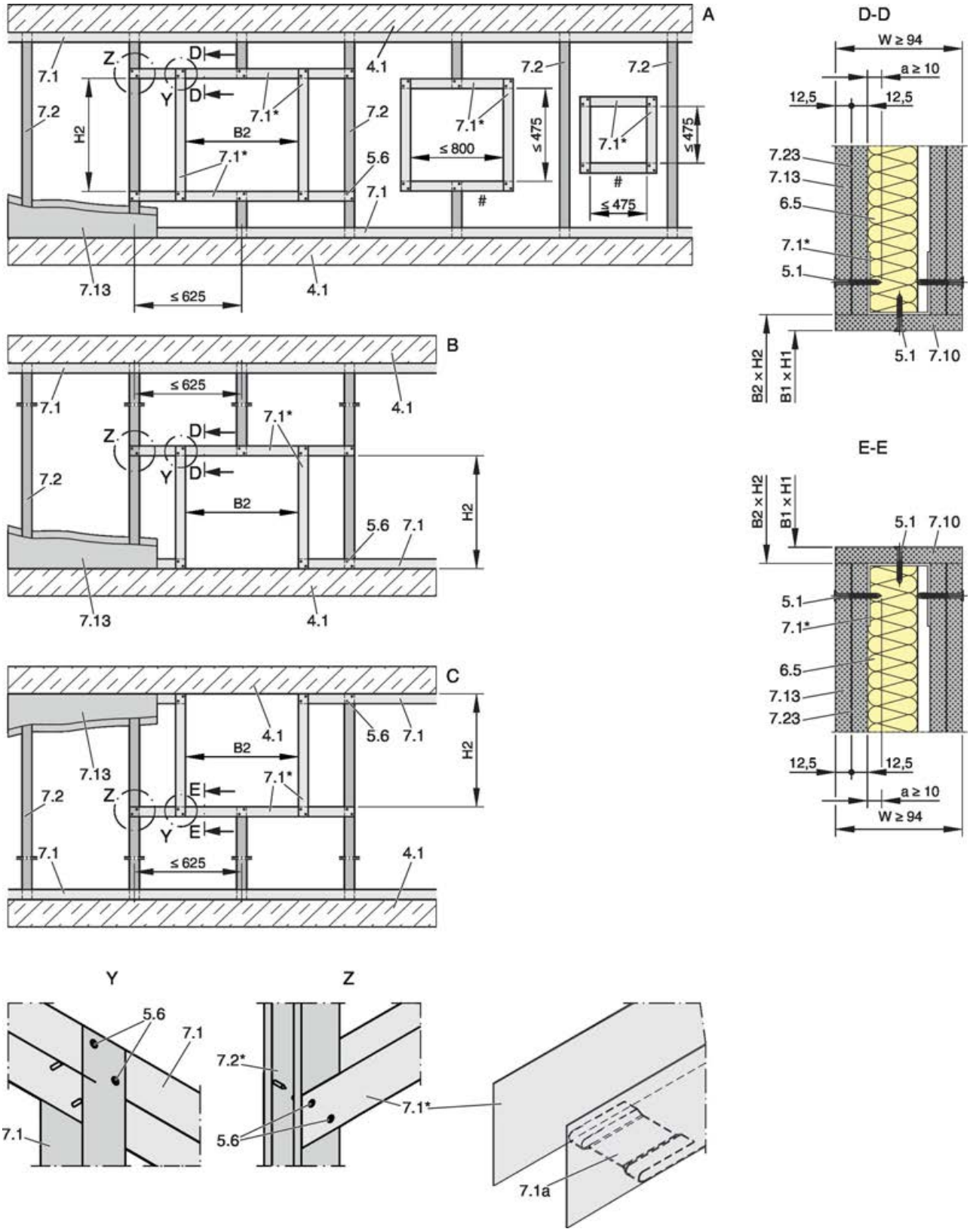


Fig. 79: Lightweight partition wall with metal support structure and cladding on both sides, explanation see Fig. 80

Compartment wall with metal support structure and cladding on both sides

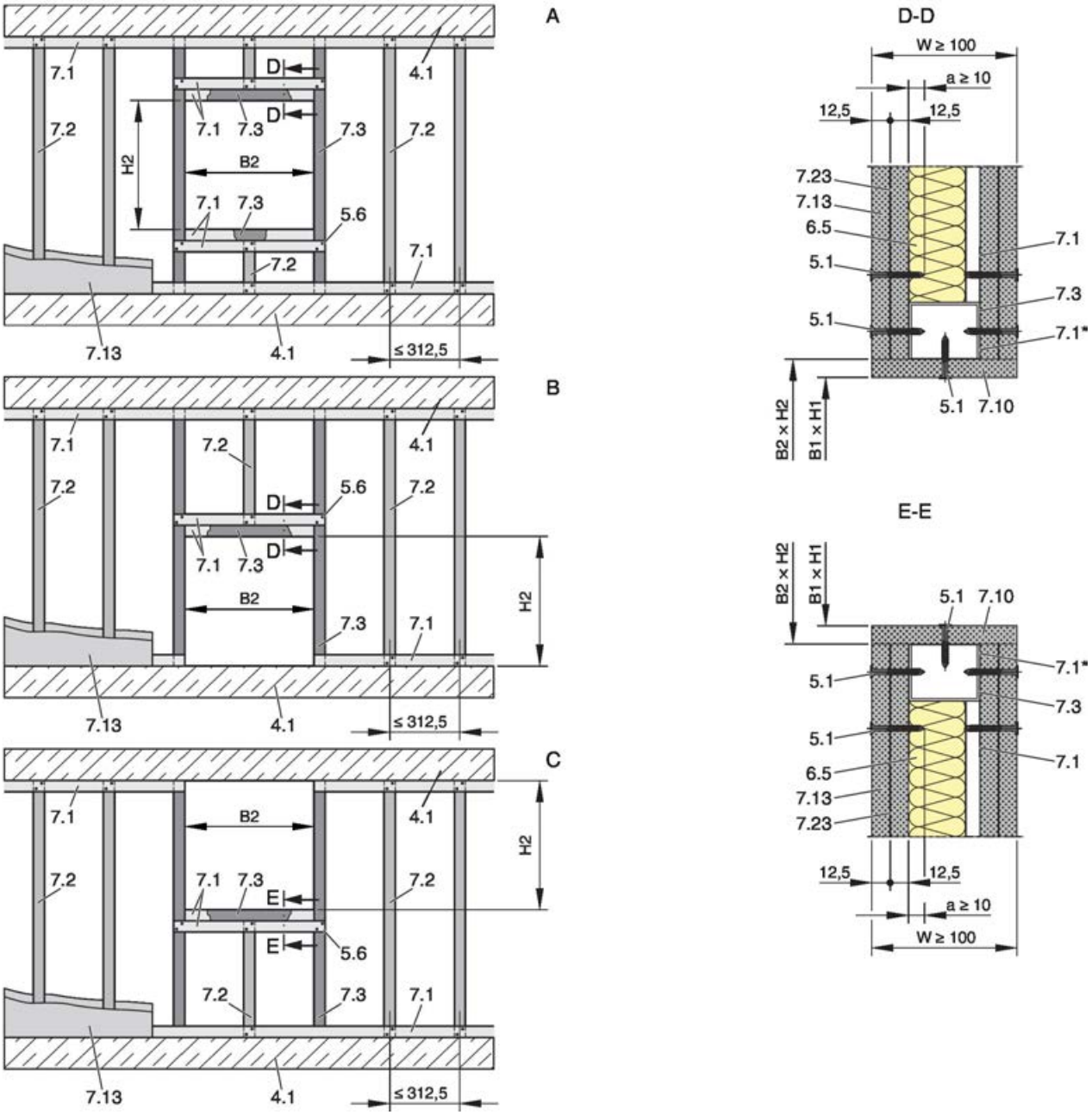


Fig. 80: Compartment wall with metal support structure and cladding on both sides

A	Lightweight partition wall with metal support structure or steel support structure / compartment wall / safety partition wall	7.2	CW section
		7.3	UA section
		7.10	Trim panels according to installation details
B	Lightweight partition wall with metal support structure or steel support structure / compartment wall / safety partition wall, installation near the floor	7.13	Cladding
		7.23	Sheet steel insert (if any, depends on wall manufacturer)
		B1 × H1	Installation opening
C	Lightweight partition wall with metal support structure or steel support structure / compartment wall / safety partition wall, installation near the ceiling	B2 × H2	Opening in the metal support structure (without trim panels: B2 = B1, H2 = H1)
		*	Closed side of metal section must face the installation opening
4.1	Solid ceiling slab / solid floor	#	Arrangement may vary
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

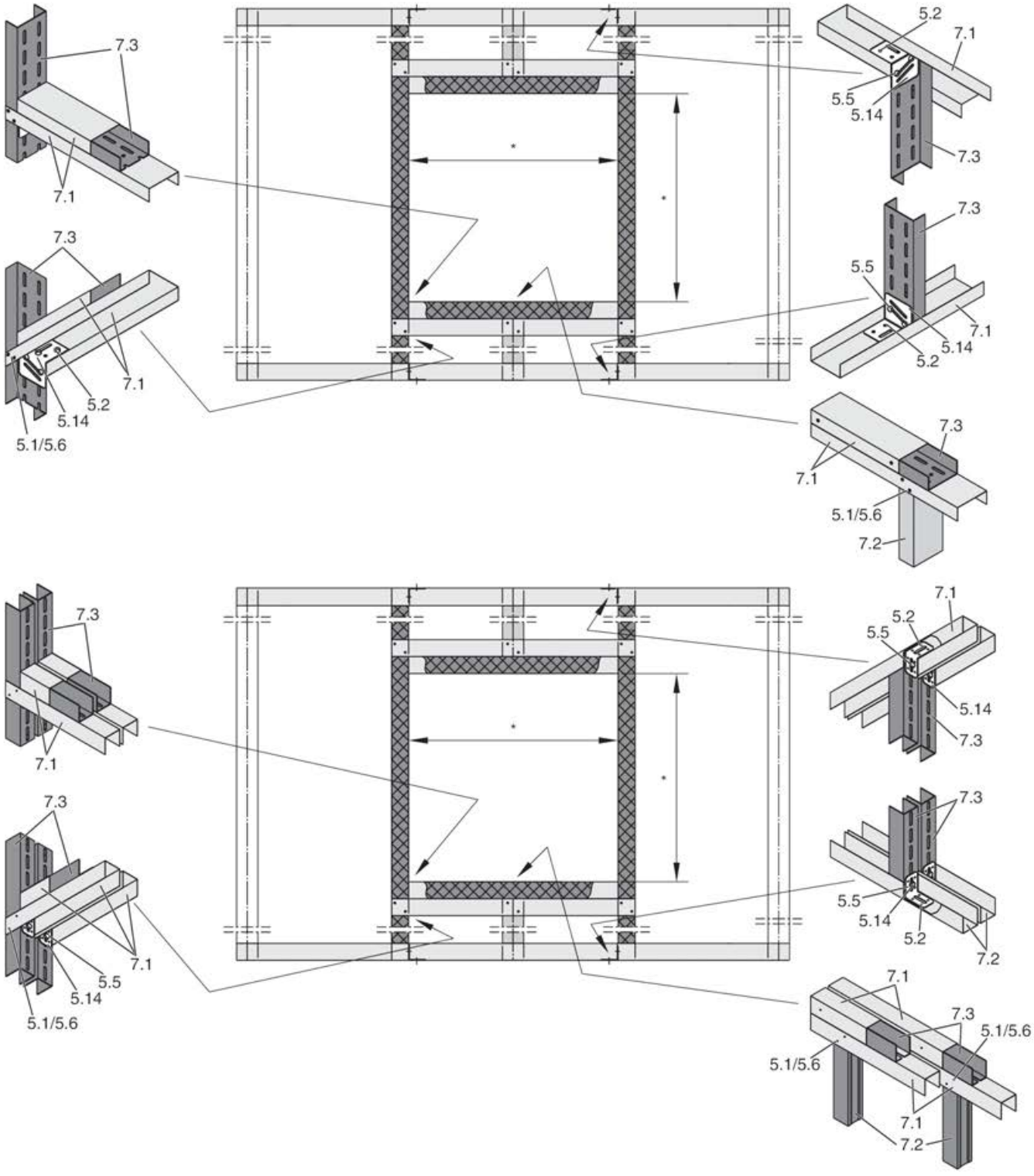


Fig. 81: Metal support structure for a compartment wall, single stud system and double stud system

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		

Installation at a later stage

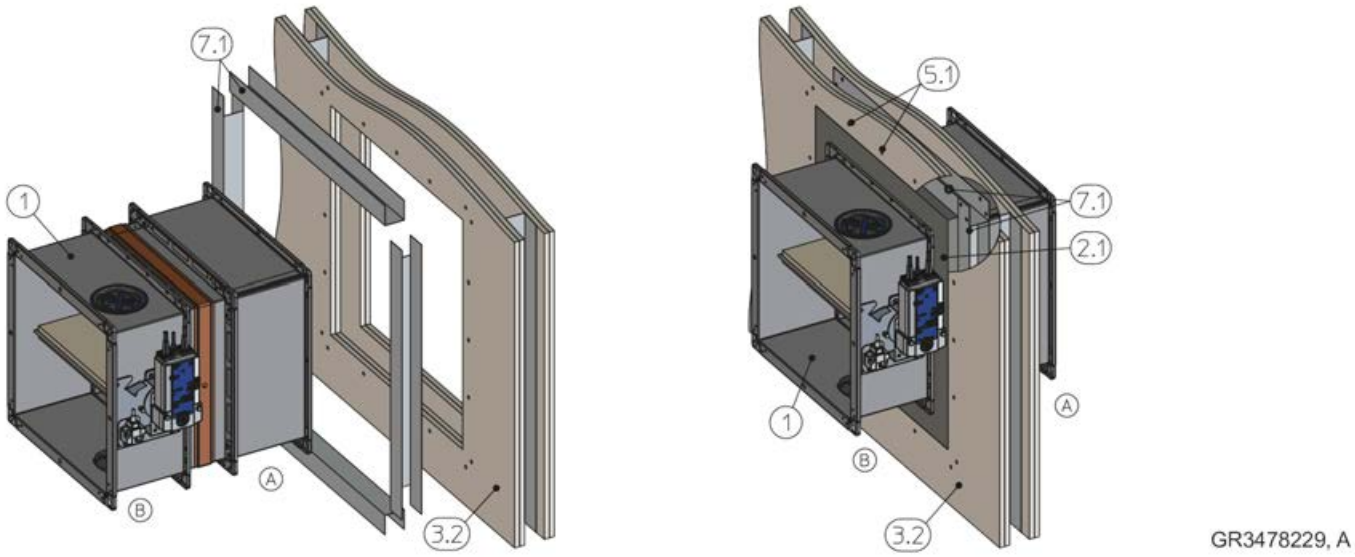


Fig. 82: Installation into a lightweight partition wall at a later stage, for clear installation openings of ≤ 475 mm between two regular studs, illustration shows mortar-based installation (applies also to dry mortarless installation)

1 FK2-EU
2.1 Mortar
3.2 Lightweight partition wall with metal support structure, cladding on both sides
5.1 Dry wall screw, screw spacing ≤ 100 mm
7.1 UW sections, cut to size (by others), overlapping

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

- Lightweight partition wall or compartment wall,
  ↳ *on page 44*
- The structural safety of the wall must be ensured (by others). Compensation measures, especially with regard to large installation openings (such as for multiple installation), must be determined on a case to case basis (by others).

5.5.2 Mortar-based installation

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

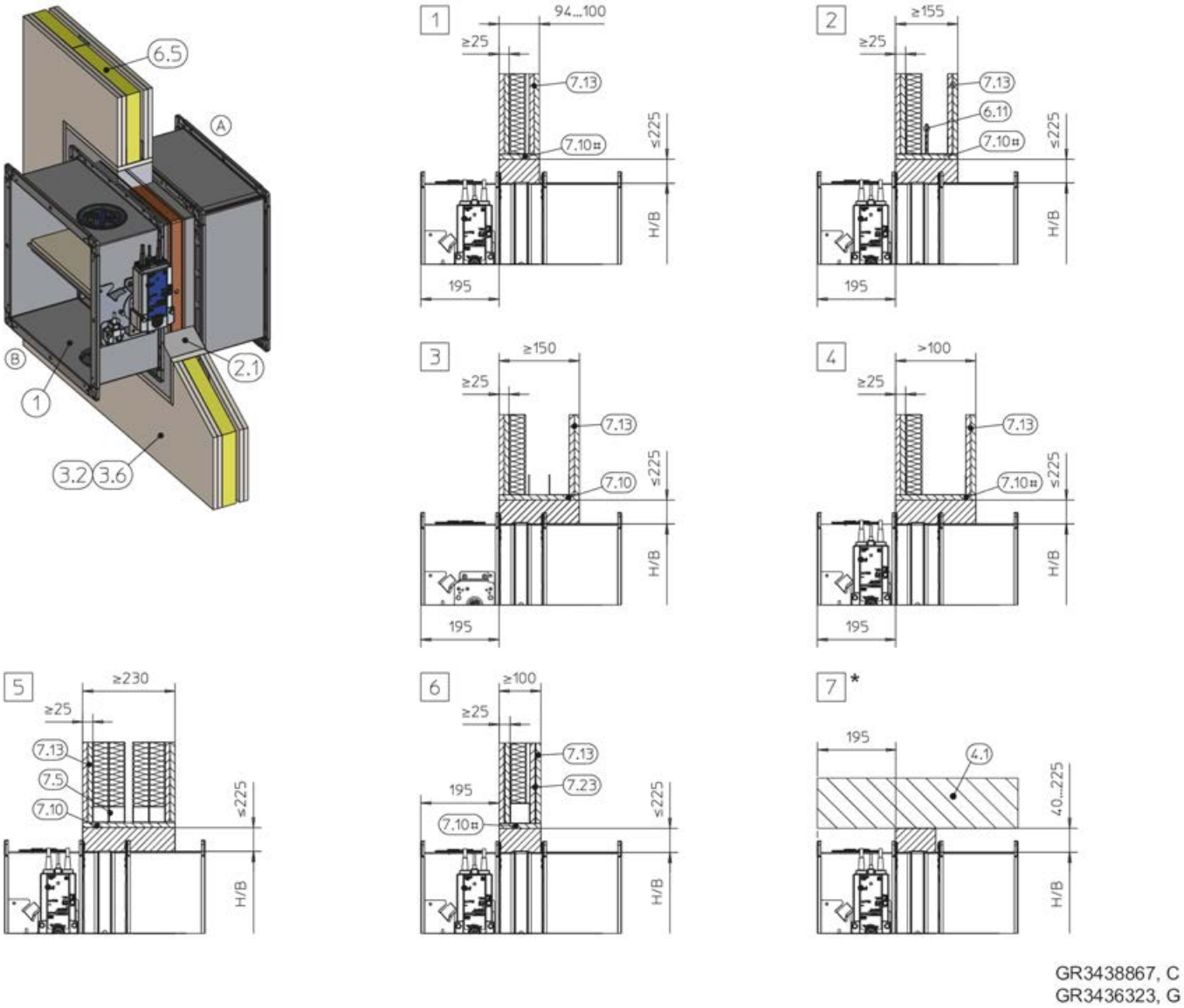


Fig. 83: Mortar-based installation into a lightweight partition wall, compartment wall or safety partition wall

1	FK2-EU	7.5	Steel support structure (box section)
2.1	Mortar	7.10	Trim panels
3.2	Lightweight partition wall with metal support structure, cladding on both sides	7.10#	Optional trim panels
		7.13	Cladding
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	7.23	Sheet steel insert depending on wall manufacturer
4.1	Solid ceiling slab / solid floor	*	Installation near the floor as in 7
6.5	Mineral wool (depending on wall construction)	1 – 7	Up to EI 120 S
6.11	Insulating strip (depending on wall construction)		

Mortar-based installation into a lightweight partition wall

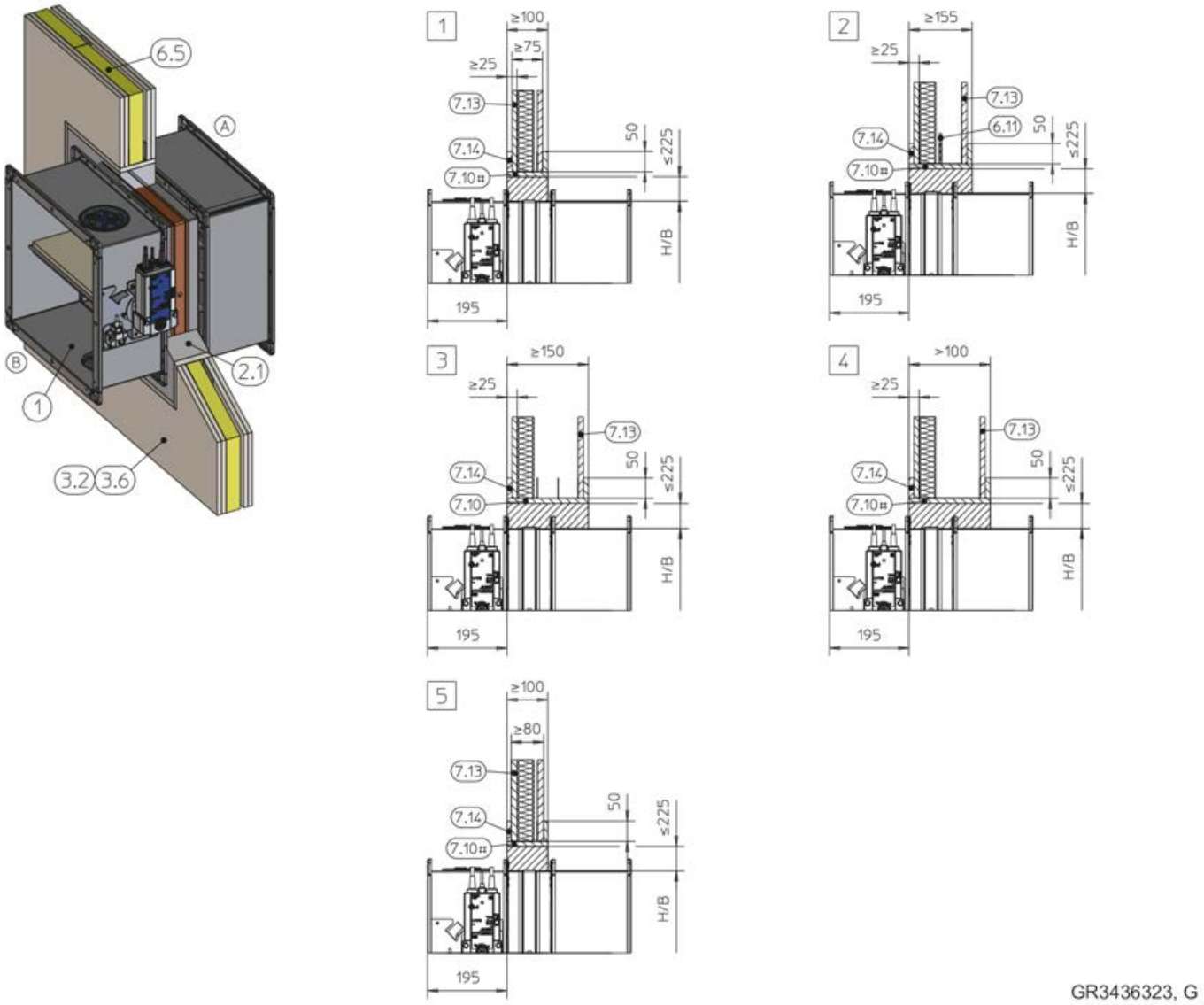


Fig. 84: Mortar-based installation into a lightweight partition wall

1	FK2-EU	7.10#	Optional trim panels
2.1	Mortar	7.13	Cladding
3.2	Lightweight partition wall with metal support structure, cladding on both sides	7.14	Reinforcing board of the same material as the wall
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	*	Installation near the floor as in 7
6.5	Mineral wool (depending on wall construction)	1 – 4	EI 30 S
6.11	Insulating strip (depending on wall construction)	5	Up to EI 60 S
7.10	Trim panels		

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

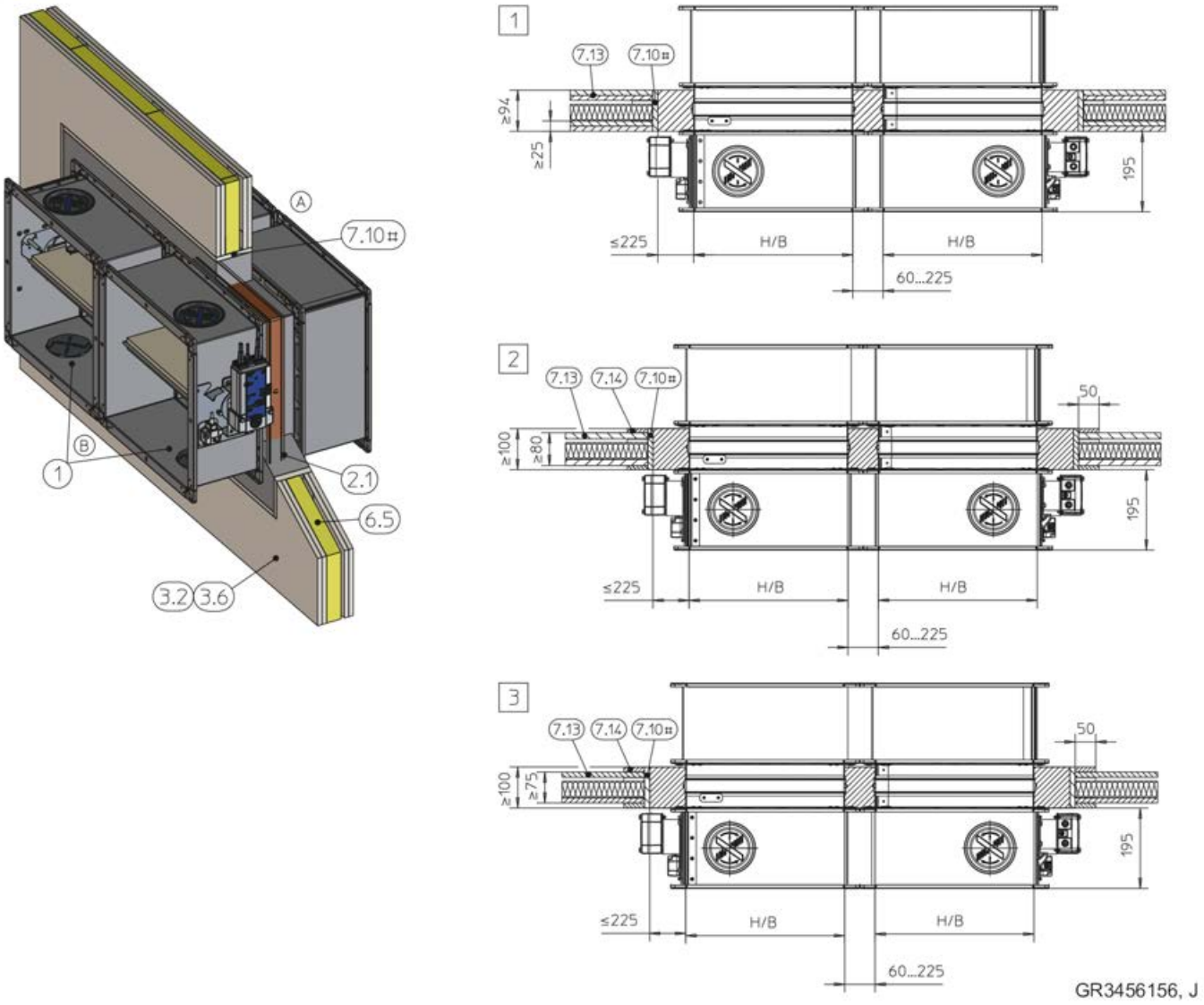


Fig. 85: Mortar-based installation into a lightweight partition wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FK2-EU
2.1	Mortar
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)
7.10#	Trim panels according to installation details Fig. 83 and Fig. 84
7.13	Cladding
7.14	Reinforcing board of the same material as the wall
1	Up to EI 120 S
2	Up to EI 60 S
3	EI 30 S

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

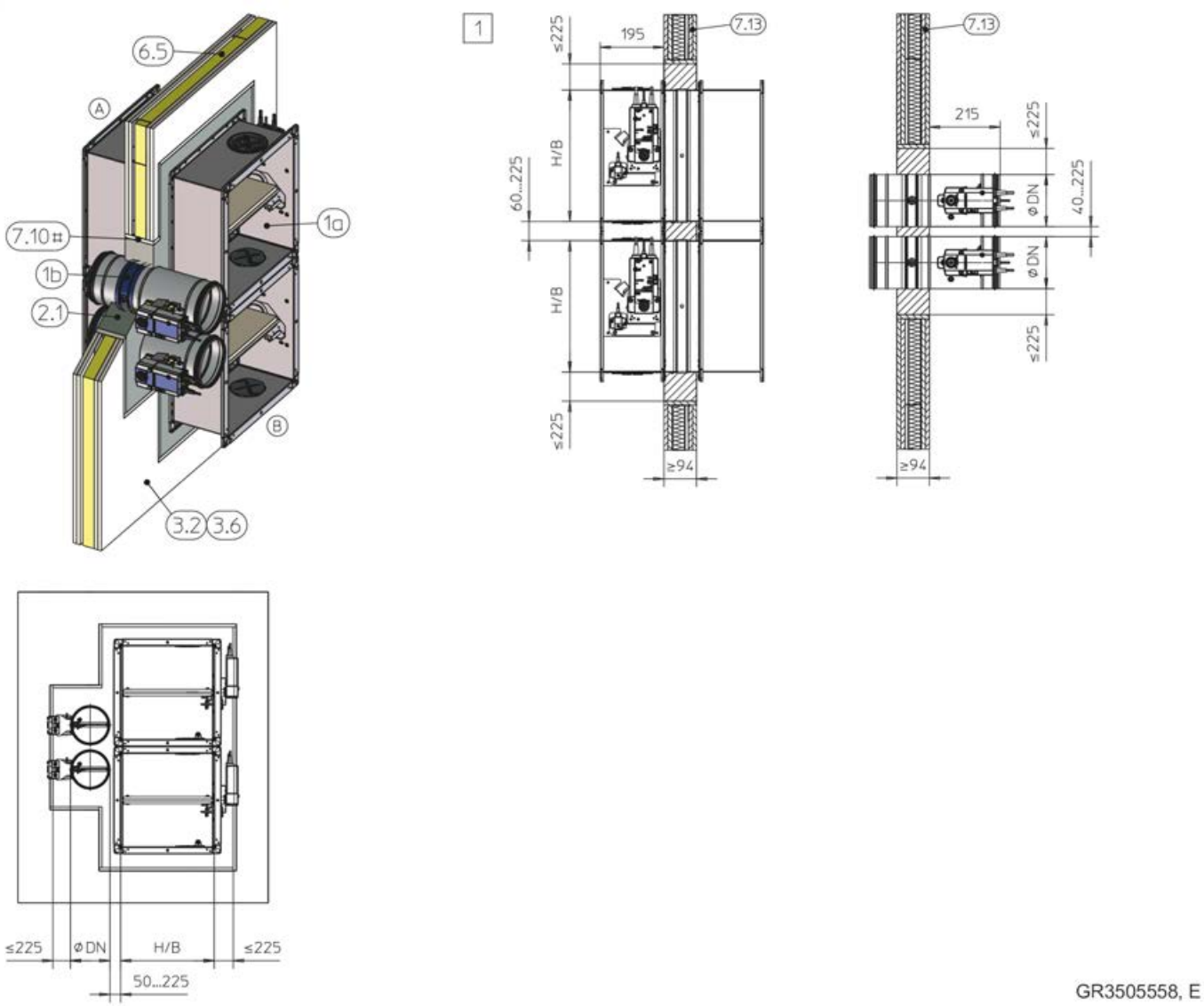


Fig. 86: Mortar-based installation into a lightweight partition wall, FK2-EU and FKRS-EU combined

1a	FK2-EU up to B × H ≤ 800 × 400 mm	6.5	Mineral wool (depending on wall construction)
1b	FKRS-EU	7.10#	Trim panels according to installation details Fig. 83 and Fig. 84
2.1	Mortar	7.13	Cladding
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		

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For FKRS-EU installation details see the FKRS-EU installation and operating manual.
- Distance to load-bearing structural elements ≥ 40 mm

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

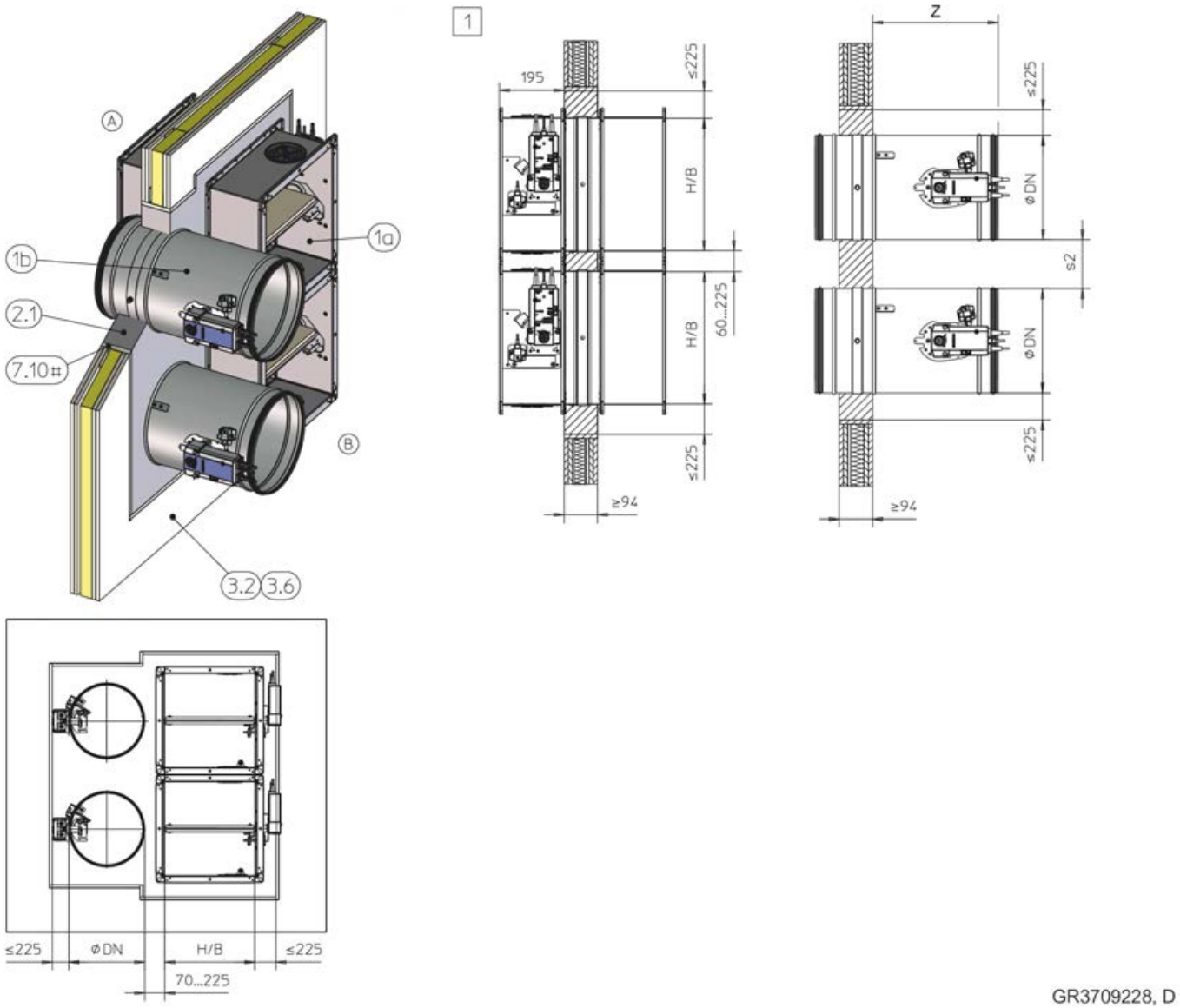


Fig. 87: Mortar-based installation into a lightweight partition wall, FK2-EU and FKR-EU combined

1a	FK2-EU up to B × H ≤ 800 × 400 mm
1b	FKR-EU
2.1	Mortar
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
7.10#	Trim panels according to installation details Fig. 83 and Fig. 84
Z	Construction with spigot 370 mm Construction with flange 342 mm
s2	With spigot 40 – 225 mm With flange 80 – 225 mm
1	Up to EI 90 S

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For FKR-EU installation details see the FKR-EU installation and operating manual.
- Distance to load-bearing structural elements ≥ 40 mm

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

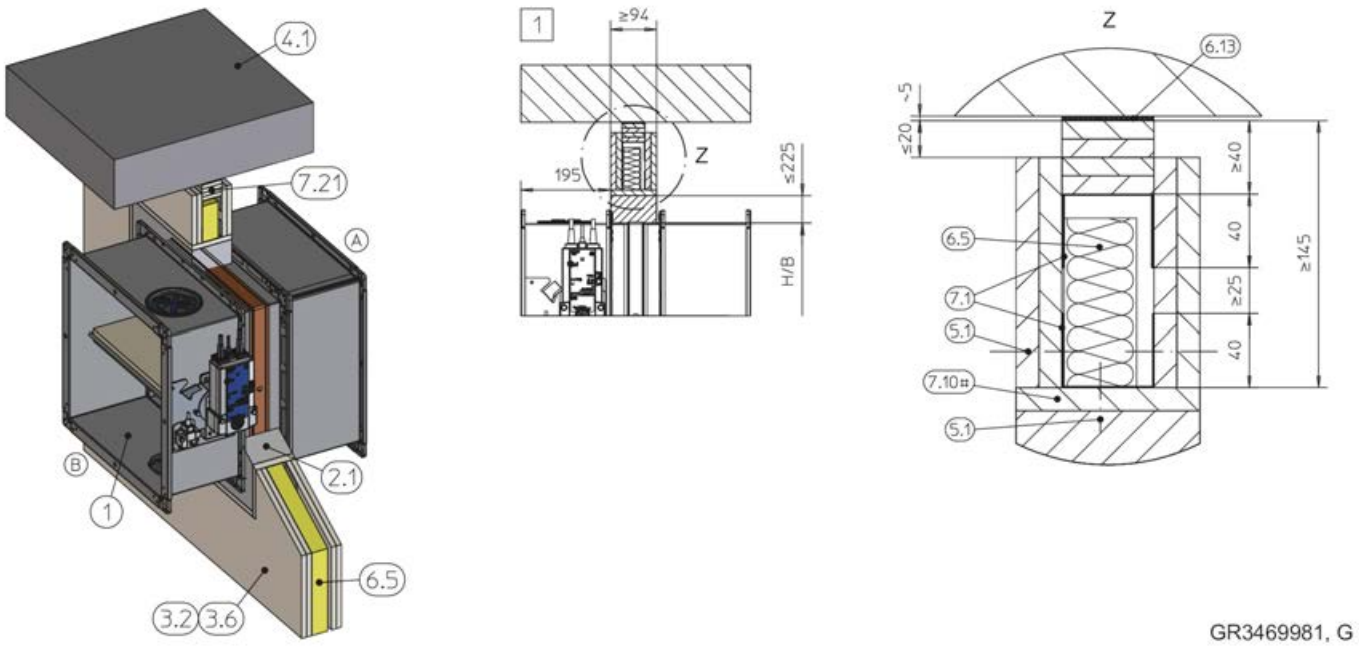


Fig. 88: Mortar-based installation into a lightweight partition wall, below a flexible ceiling joint

1	FK2-EU	6.5	Mineral wool (depending on wall construction)
2.1	Mortar	6.13	Mineral wool strips A1, filler as an alternative (if required to even out an uneven wall)
3.2	Lightweight partition wall with metal support structure, cladding on both sides	7.1	UW section
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	7.10#	Trim panels according to installation details Fig. 83 and Fig. 84
4.1	Solid ceiling slab	7.21	Ceiling joint strips (e.g. 4 × ≥ 10 mm)
5.1	Dry wall screw	[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: mortar-based installation into lightweight partition walls and compartment walls

- Lightweight partition wall, *on page 44*
- Casing lengths L = 305 and 500 mm
- 60 – 225 mm distance between two FK2-EU dampers of the same size in one installation opening (deviations upon request).
- Distance to load-bearing structural elements ≥ 40 mm
- If the fire dampers have different sizes, the perimeter gap must not exceed ≤ 225 mm

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

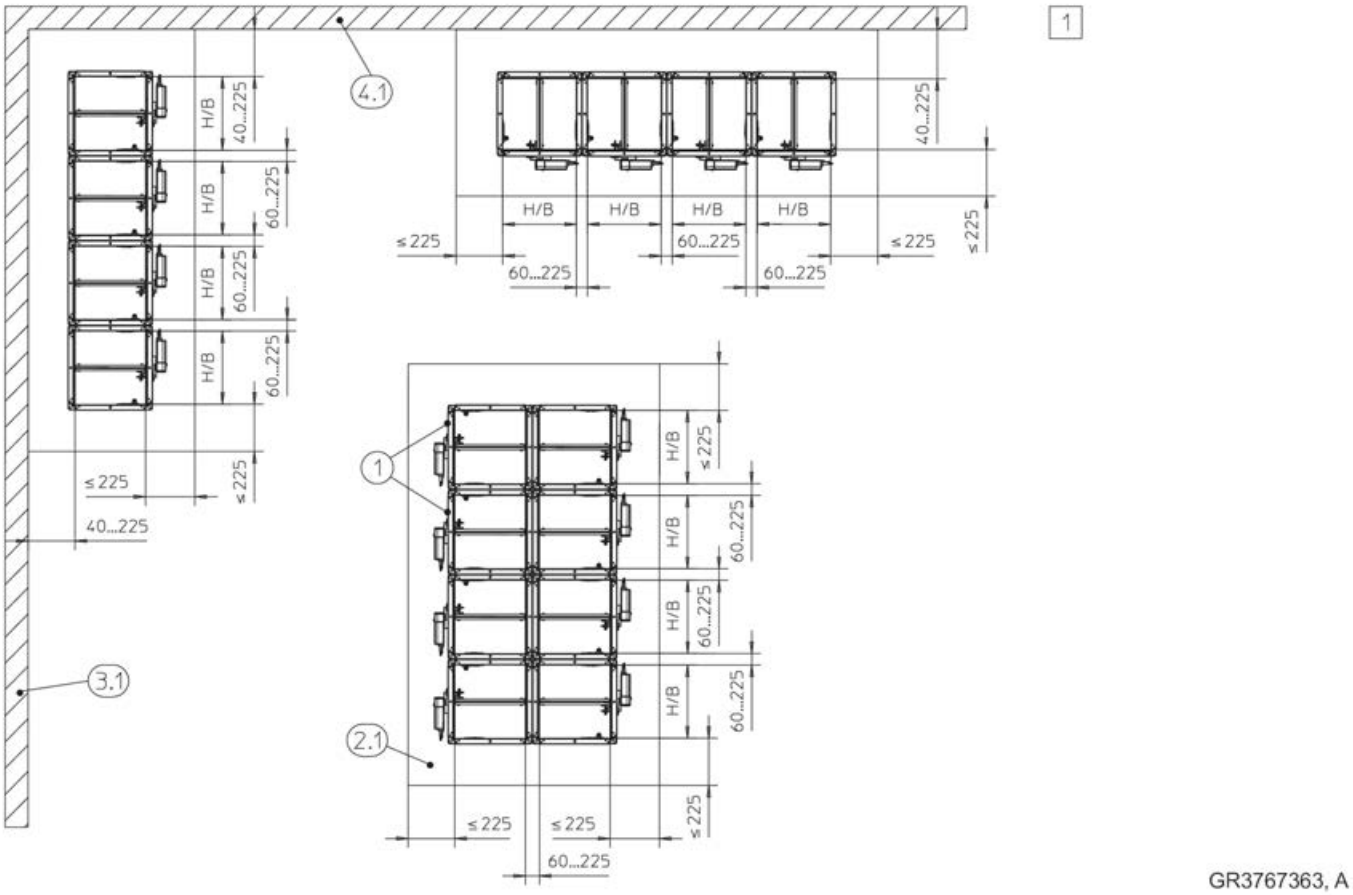


Fig. 89: Mortar-based installation – multiple installation into one installation opening

1 FK2-EU
2.1 Mortar
3.1 Solid wall (load-bearing structural element)
4.1 Solid ceiling slab (load-bearing structural element)
[1] Up to EI 90 S

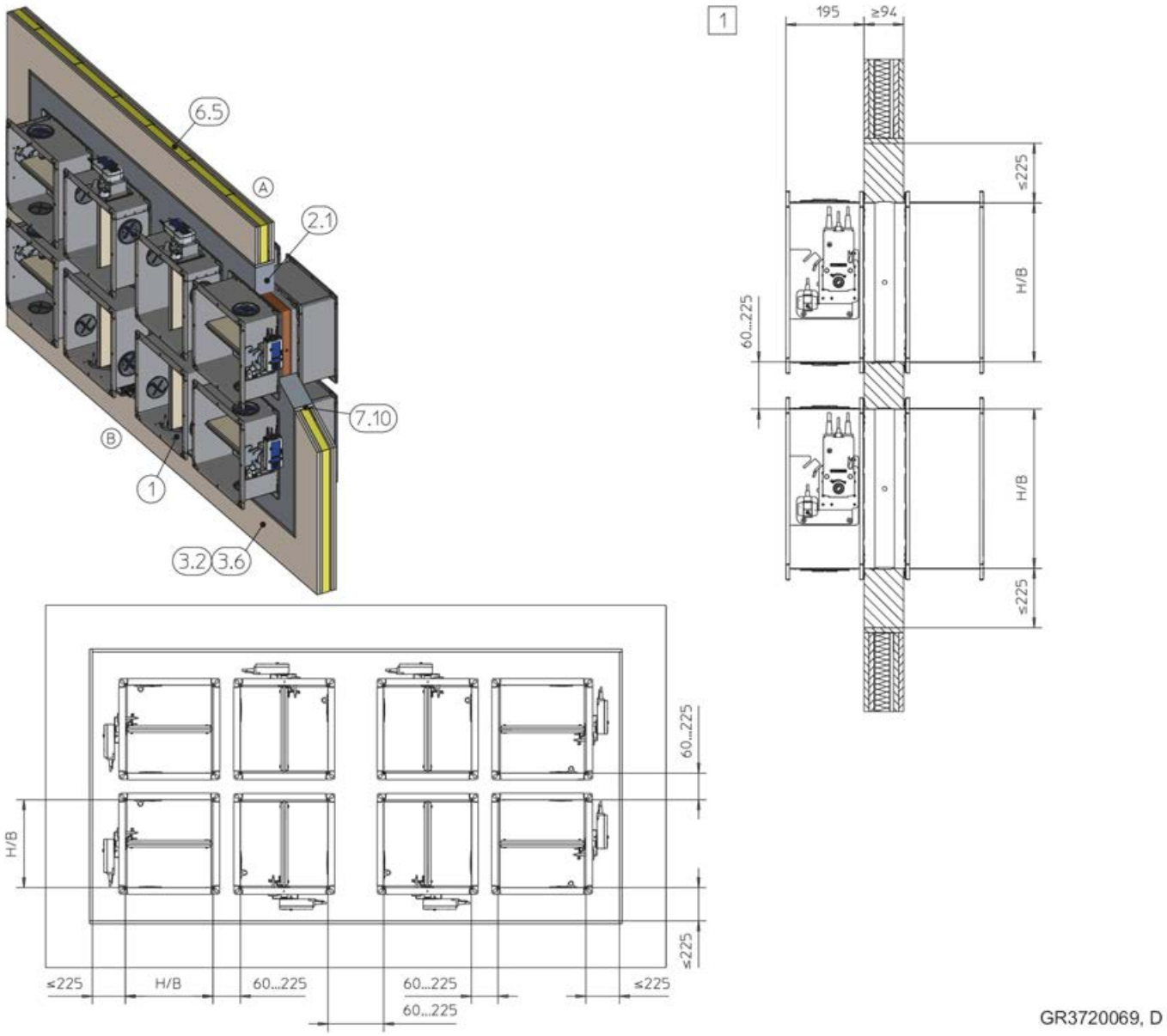


Fig. 90: Mortar-based installation – multiple installation into one installation opening

1 FK2-EU
2.1 Mortar
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)
7.10 Trim panels
[1] Up to EI 90 S

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

- Lightweight partition wall, *on page 44*
- Casing length L = 305 or 500 mm
- Total fire damper area (B × H) ≤ 4.8 m²
- The possible number of fire dampers in an installation opening depends on the sizes of the fire dampers (B × H) and on the total fire damper area (4.8 m²)
- The dampers can be arranged in one or two rows.
- Distance to load-bearing structural elements ≥ 40 mm
- If the actuators are located between the fire dampers, sufficient clear space for inspection must be provided.
- The mortar bed width must not exceed 225 mm, provide separate trimmers if necessary.

5.5.4 Mortar-based installation – 4 dampers with a common duct

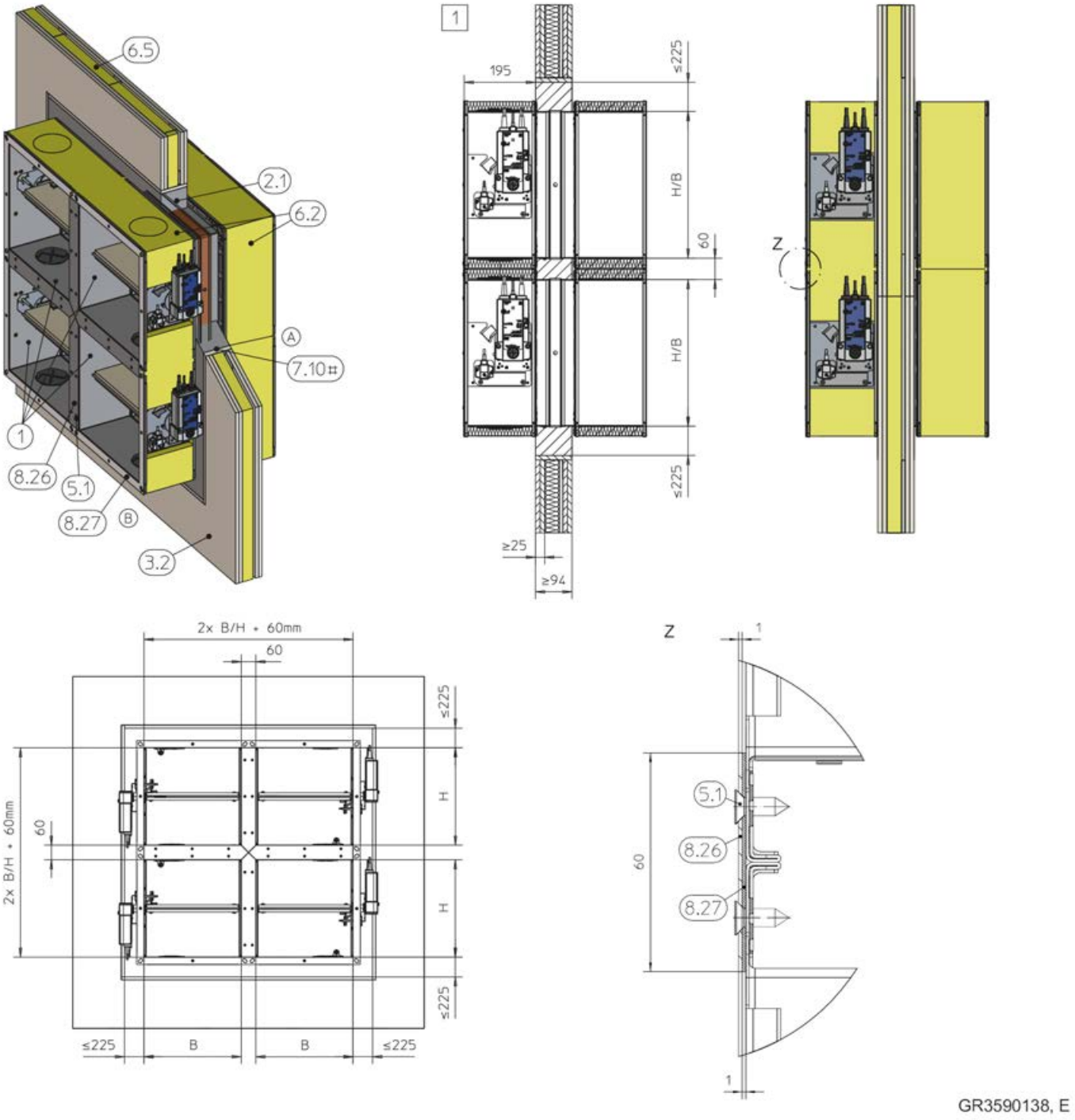


Fig. 91: Mortar-based installation – 4 dampers with a common duct

1	FK2-EU	7.10#	Trim panels according to installation details Fig. 83 and Fig. 84
2.1	Mortar	7.13	Cladding
3.2	Lightweight partition wall with metal support structure, cladding on both sides	8.26	Sheet metal cover, t = 1 mm (by others)
5.1	Self-tapping screws, spacing ~ 150 mm	8.27	Seal
6.2	Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, d ≥ 30 mm	[1]	Up to EI 120 S
6.5	Mineral wool (depending on wall construction)		

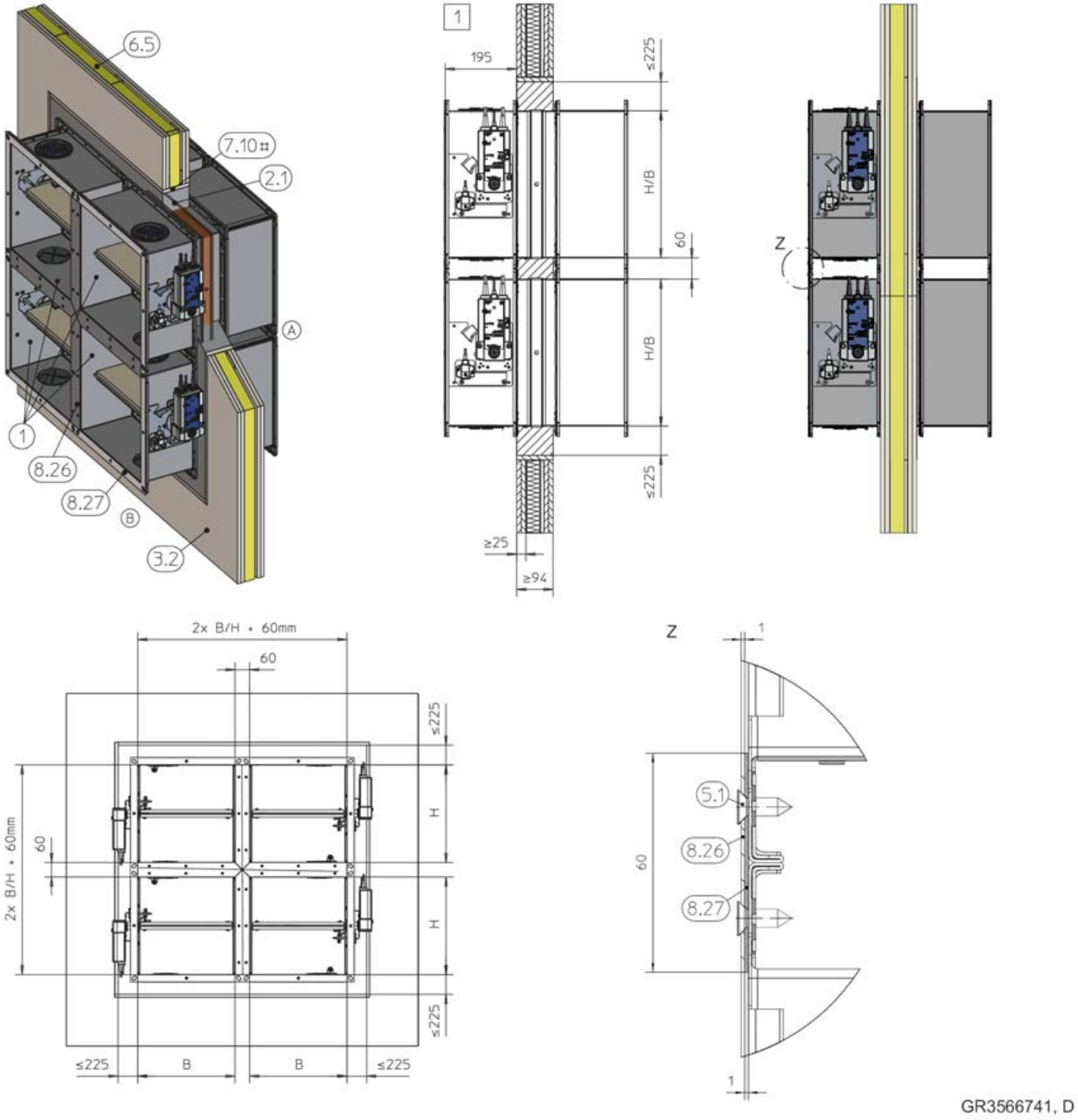


Fig. 92: Mortar-based installation – 4 dampers with a common duct

1	FK2-EU	7.10#	Trim panels according to installation details Fig. 83 and Fig. 84
2.1	Mortar		
3.2	Lightweight partition wall with metal support structure, cladding on both sides	8.26	Sheet metal cover, t = 1 mm (by others)
		8.27	Seal
5.1	Self-tapping screws, spacing ~ 150 mm	[1]	Up to EI 90 S
6.5	Mineral wool (depending on wall construction)		

Additional requirements: mortar-based installation – 4 dampers with a common duct

- Lightweight partition wall (except compartment wall), *on page 44*
- Casing length L = 500 mm
- 4 dampers, up to 4.8 m^2 total fire damper area (common duct)
- Combination of 4 fire dampers next to and on top of one another, connection/sealing with sheet metal covers (by others).
- Place the sheet metal covers (galvanised steel, at least 1 mm, approx. 60 mm wide, L = 2 × B / H + 60 mm) onto a duct seal and fix them with self-tapping screws spaced approx. 150 mm apart.
- Close off the perimeter gaps and the gaps between the damper casings with mortar.
- For EI 120 S: Place mineral wool (6.2) around the perimeters of both the operating and installation sides; do not cover the operating elements, otherwise the function of the damper will be impaired. Inspection accesses and the product sticker must remain accessible.
- Distance to load-bearing structural elements ≥ 40 mm

5.5.5 Dry mortarless installation with installation kit ES

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

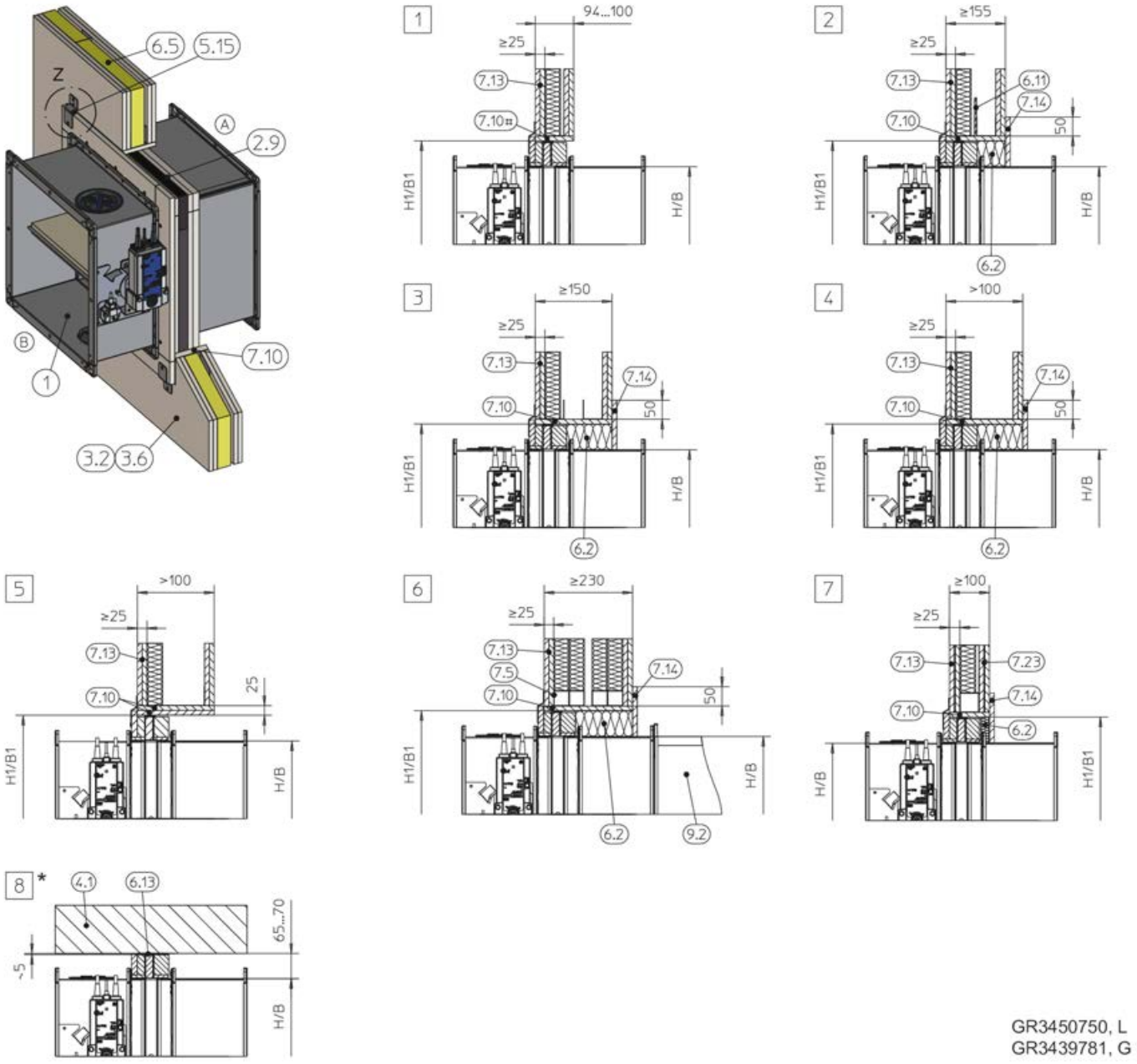


Fig. 93: Dry mortarless installation into a lightweight partition wall, with installation kit ES

1	FK2-EU
2.9	Installation kit ES
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 / solid floor
5.15	Bracket
6.2	Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³
6.5	Mineral wool (depending on wall construction)
6.11	Insulating strip (depending on wall construction)
6.13	Mineral wool strips A1, filler as an alternative (if required to even out an uneven wall)
7.5	Steel support structure (box section)
7.10	Trim panels
7.10#	Optional trim panels
7.13	Cladding
7.14	Reinforcing board of the same material as the wall
7.23	Sheet steel insert depending on wall manufacturer
9.2	Extension piece or duct
*	Installation near the floor as in 8
H1/B1	Installation opening, see table *98*
Z	For fixing, see Fig. 23 to Fig. 25
1 – 8	up to EI 120 S: B × H > 800 × 400 – 1500 × 800 mm Up to EI 90 S: B × H = 200 × 100 – 1500 × 800 mm

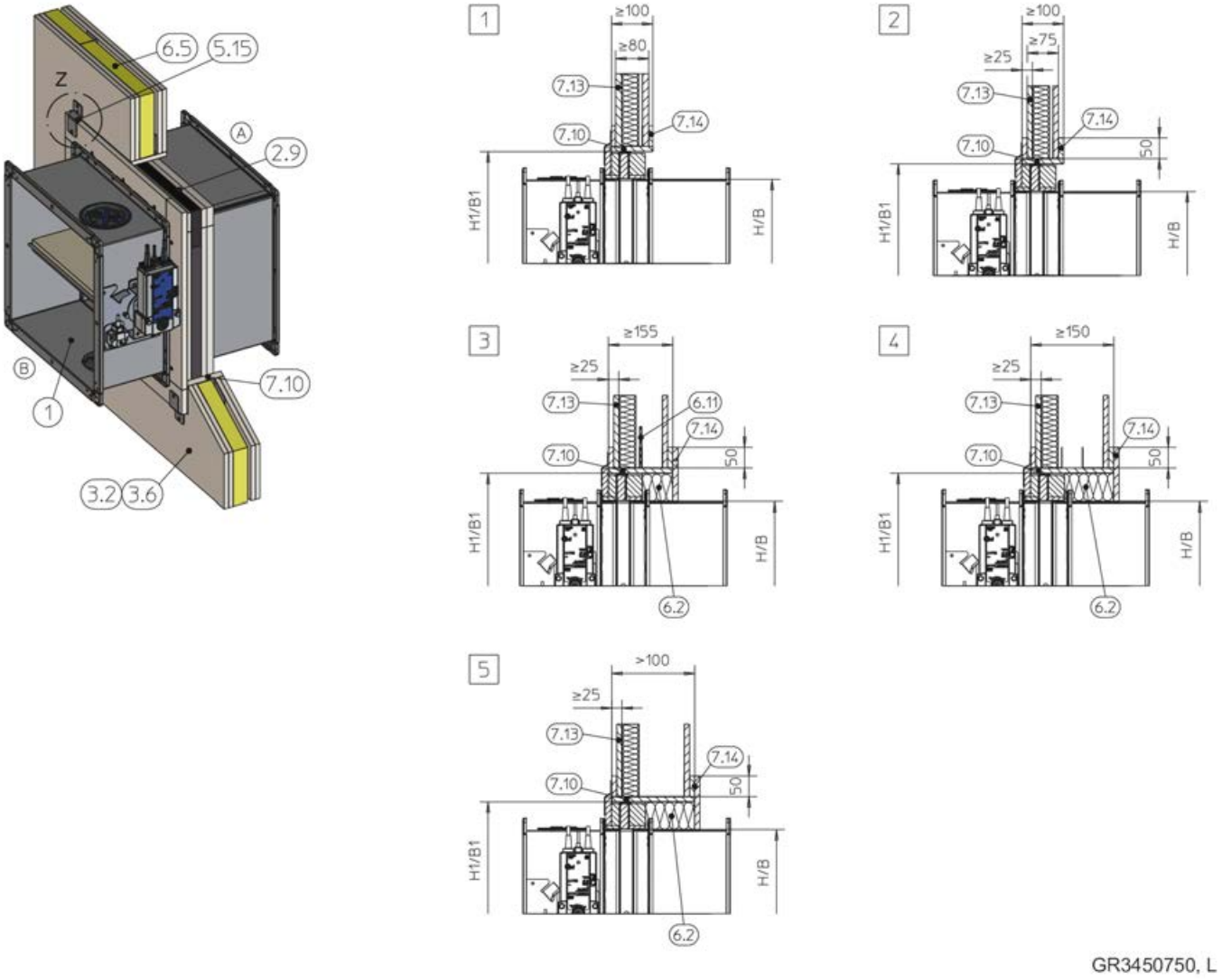


Fig. 94: Dry mortarless installation into a lightweight partition wall, with installation kit ES

1	FK2-EU	7.10	Trim panels
2.9	Installation kit ES	7.13	Cladding
3.2	Lightweight partition wall with metal support structure, cladding on both sides	7.14	Reinforcing board of the same material as the wall
3.6	Compartment wall or safety partition wall with metal support structure, cladding on both sides	H1/B1	Installation opening, see table *98*
5.15	Bracket	Z	For fixing, see Fig. 23 to Fig. 25
6.2	Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³ (required for wall thicknesses > 100 mm)	1	up to EI 60
6.5	Mineral wool (depending on wall construction)	2 – 5	EI 30 S
6.11	Insulating strip (depending on wall construction)		

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

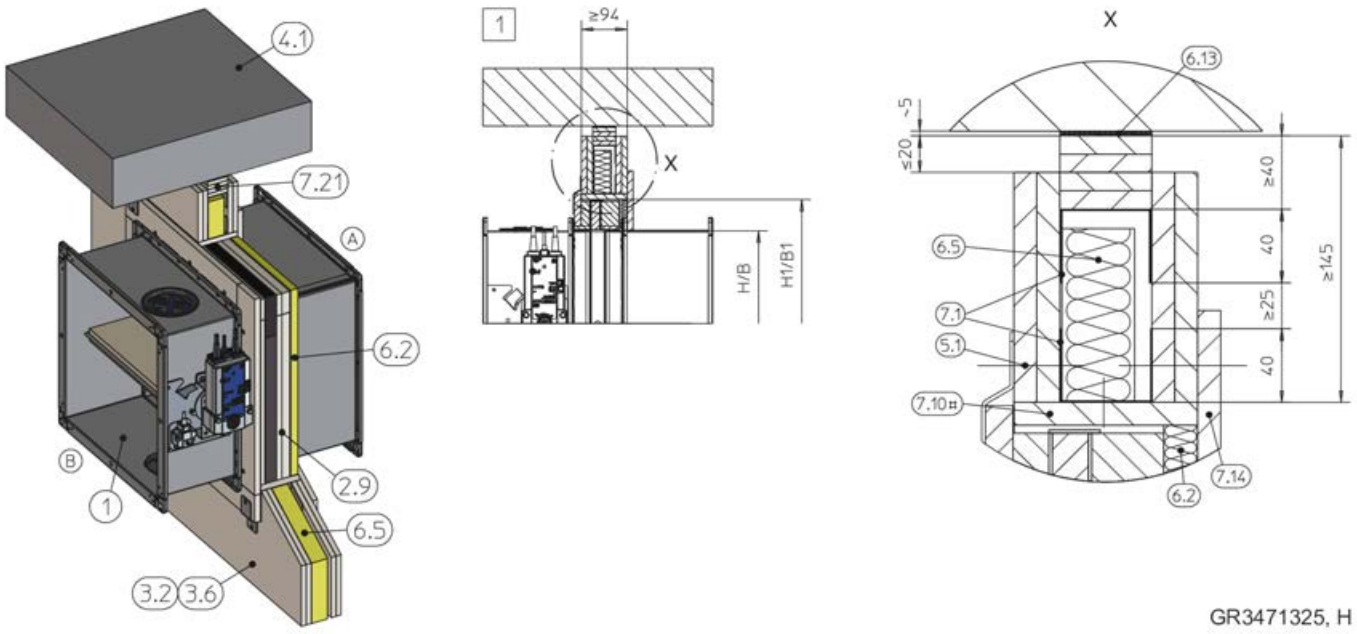


Fig. 95: Dry mortarless installation into a lightweight partition wall, below a flexible ceiling joint

1	FK2-EU
2.9	Installation kit ES
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
5.15	Bracket
6.2	Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³
6.5	Mineral wool (depending on wall construction)
6.13	Mineral wool strips A1, filler as an alternative (if required to even out an uneven wall)
7.1	UW section
7.10#	Optional trim panels
7.14	Reinforcing board of the same material (required if W > 100 mm)
7.21	Ceiling joint strips (e.g. 4 × ≥10 mm)
H1/B1	Installation opening, see table *98*
Z	For fixing, see Fig. 23 to Fig. 25
1	up to EI 120 S: B × H > 800 × 400 – 1500 × 800 mm Up to EI 90 S: B × H = 200 × 100 – 1500 × 800 mm

Additional requirements: dry mortarless installation with installation kit ES in lightweight partition walls

- Lightweight partition wall, *on page 44*
- Casing length L = 500 mm
- Distance between the fire damper and adjacent structural elements ≥ 80 / 120 mm (depending on the position of the brackets)
- 65 – 70 mm distance between the fire damper with a shortened installation kit and load-bearing structural elements, see Fig. 93 / Fig. 94 , detail 6
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Ensure accessibility from the rear.
- For wall thicknesses > 100 mm, 2-layer trim panels (2-layer trim panels on three sides for installations near the ceiling) can be used as an alternative to the rear closure from 6.2 and 7.14.

1. Mount the installation kit onto the fire damper, *5.3.1 'Installation kit ES – supply package and assembly' on page 47* .
2. Position the fire damper in the centre of the installation opening and fix it with brackets and dry wall screws to the metal frame, see Fig. 23 to Fig. 25 .

5.5.6 Dry mortarless installation with mineral wool

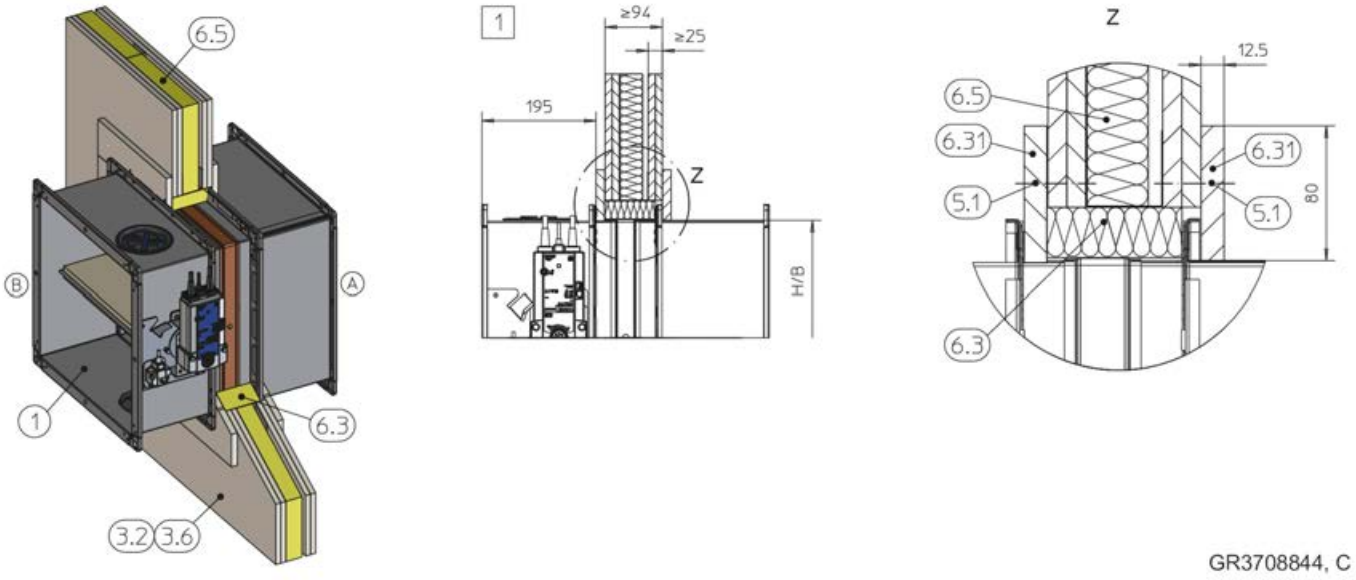


Fig. 96: Dry mortarless installation into a lightweight partition wall, with mineral wool

1 FK2-EU
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, metal support structure for compartment walls see Fig. 80 and Fig. 81
4.1 Solid ceiling slab / solid floor
5.1 Dry wall screw
6.3 Mineral wool, ≥ 1000 °C, ≥ 100 kg/m³, d = 40 mm
6.5 Mineral wool (depending on wall construction)
6.31 Fire-rated plasterboard strips, d = 12.5 mm
[1] Up to EI 60 S

Note:

Wall thickness shown = 100 mm. For wall thicknesses > 100 mm, close off the area between the installation side (A) of the fire damper and the installation opening up to the wall thickness with mineral wool strips (6.3).

Additional requirements: dry mortarless installation into lightweight partition walls, with mineral wool

- Lightweight partition wall, *on page 44*
- Casing length L = 500 mm
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Distance to load-bearing structural elements ≥ 80 mm

1. Create a clear opening with B + 74 (±2) mm and H + 86 (±2) mm.
2. Cut mineral wool strips (6.3) and fire-rated plasterboard strips (6.31) to size.
3. Place mineral wool strips and fire-rated plasterboard strips on the operating side (B) firmly around the damper casing and secure them; if necessary, use joint filler to keep them in place.
4. Push the fire damper into the installation opening and screw the fire-rated plasterboard strips on the operating side (B) to the metal support structure (screw spacing approx. 150 mm).
5. Attach the fire-rated plasterboard strips on the installation side (A) and screw them to the metal support structure (screw spacing approx. 150 mm).

5.5.7 Dry mortarless installation with fire-rated gypsum board or plasterboard

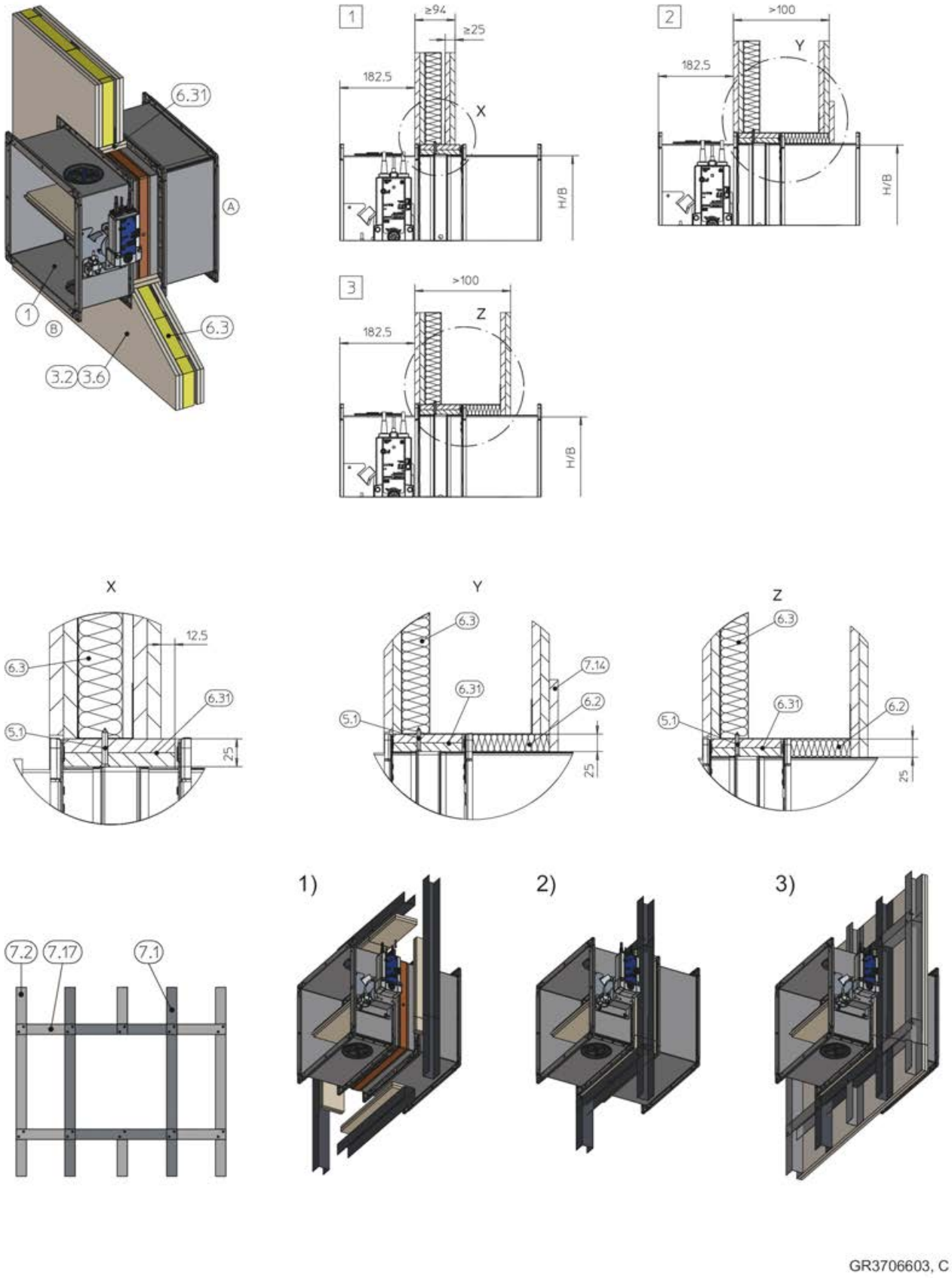


Fig. 97: Dry mortarless installation with fire-rated gypsum board or plasterboard into lightweight partition walls

1	FK2-EU	6.31	Fire-rated gypsum board or plasterboard
2.19	Joint filler or compound		strips, d = 12.5 mm, 98 mm wide

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, metal support structure for compartment walls see Fig. 80 and Fig. 81
5.1	Dry wall screw
6.3	Mineral wool, ≥ 1000 °C, ≥ 100 kg/m³

Additional requirements: dry mortarless installation into lightweight partition walls, with fire-rated gypsum board or plasterboard

- Lightweight partition wall (except compartment walls, safety partition walls and walls to provide radiation protection), *on page 44*
- Casing length L = 500 mm
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Distance to load-bearing structural elements ≥ 65 mm

1. Cut fire-rated gypsum board or plasterboard panels to size and screw-fix them to the metal sections; leave no gaps; the metal sections have to be suitable for the installation opening.

2. Close off the grooves on the fire damper installation side around the perimeter with joint filler or compound (2.19), place the plasterboard strips on 4 sides around the fire damper and screw-fix the sections together at the intersection points.

3. Position the fire damper at the desired position in the metal stud wall and screw it.

	Cut parts: 4 × B + 16 mm and 4 × H + 33 mm
7.1	UW section
7.2	CW section
7.17	Trimmers, UW sections
1 – 3	Up to EI 90 S

5.5.8 Dry mortarless installation with flexible ceiling joint and installation kit GL... / GLK...

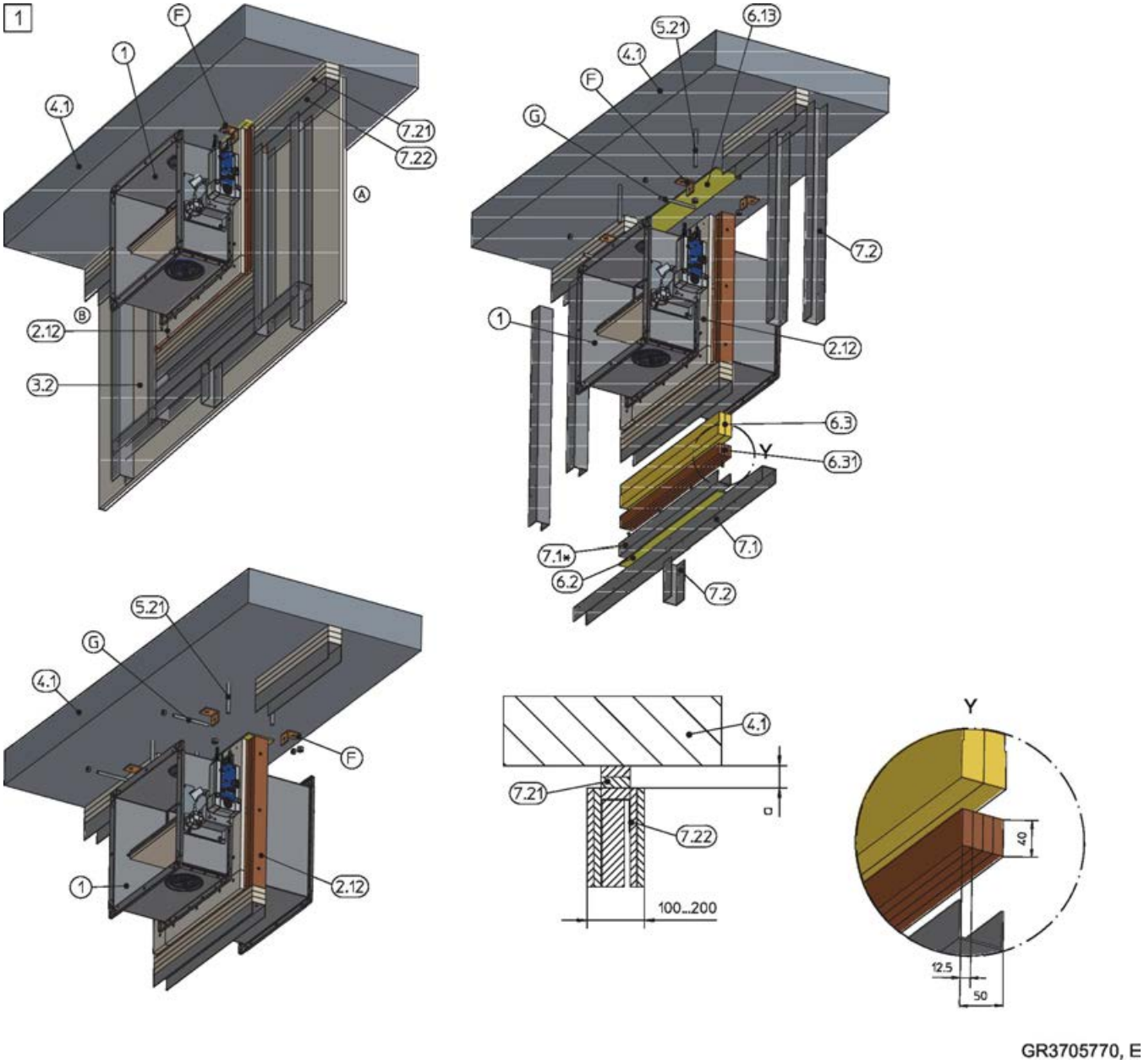


Fig. 98: Dry mortarless installation into a lightweight partition wall, with flexible ceiling joint and installation kit GL.., more installation details Fig. 99

1	FK2-EU
2.12	Installation kit GL..., ↪ *5.3.8 'Installation kit GL – supply package and assembly' on page 66*
FL	Steel bracket 57 × 40 × 5 mm (4 ×)
G	Threaded rod M10 × 130 mm (4 ×)
3.2	Lightweight partition wall with metal support structure, cladding on both sides
4.1	Solid ceiling slab
5.21	Fire-rated steel anchors, M8, with suitability certificate; for fire resistance; push through installation is also possible
6.2	Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, t = 10 mm
6.3	Mineral wool, approx. 100 kg/m³ (following subsidence), t = 50 mm (without joints) or t = 25 mm, seams should be staggered
6.13	Mineral wool strips A1, filler as an alternative (to even out an uneven ceiling)
6.31	Fire rated plasterboard strips, d = 12.5 mm; alternatively Promatect® H sections, as wide as the stud frame, screw-fixed
7.1*	UW section, screw-fixed to bottom trimmers
7.2	CW section
7.21	Ceiling joint strips
7.22	Ceiling joint section
a	Subsidence of the ceiling slab
1	Up to EI 90 S

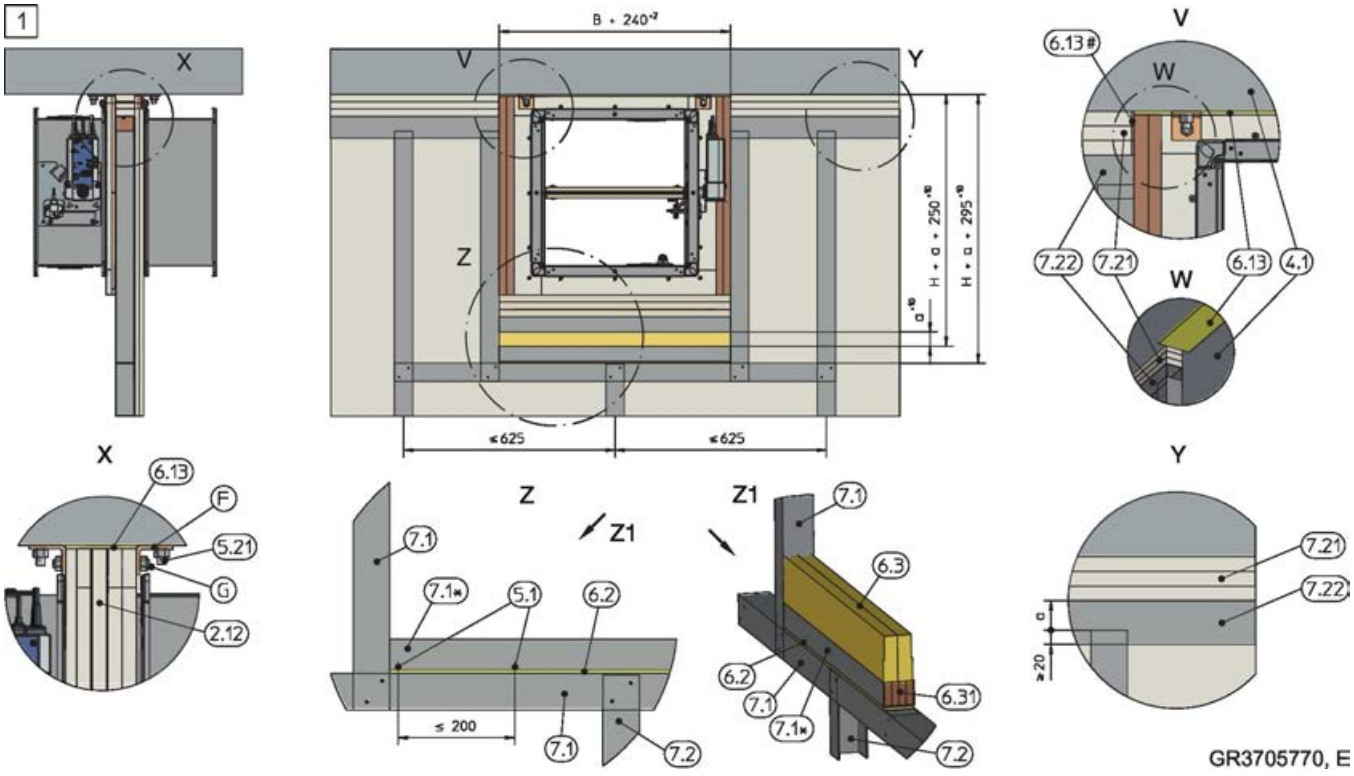


Fig. 99: Dry mortarless installation into a lightweight partition wall, with flexible ceiling joint and installation kit GL.., more installation details Fig. 98

2.12 Installation kit GL..., ↪ *5.3.8 'Installation kit GL – supply package and assembly' on page 66*
FL Steel bracket 57 × 40 × 5 mm (4 ×)
G Threaded rod M10 × 130 mm (4 ×)
4.1 Solid ceiling slab
5.1 Dry wall screw *
5.21 Fire-rated steel anchors, M8, with suitability certificate; for fire resistance; push through installation is also possible
6.2 Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, t = 10 mm
6.3 Mineral wool, approx. 100 kg/m³ (following subsidence), t = 50 mm (without joints) or t = 25 mm, seams should be staggered
6.13 Mineral wool strips A1, filler as an alternative (to even out an uneven ceiling)
6.13# Joint compound ≤ 5 mm, if required for assembly
6.31 Fire rated plasterboard strips, d = 12.5 mm; alternatively Promatect® H sections, as wide as the stud frame, screw-fixed
7.1* UW section, screw-fixed to bottom trimmers
7.2 CW section
7.21 Ceiling joint strips
7.22 Ceiling joint section
a Subsidence of the ceiling slab
1 Up to EI 90 S

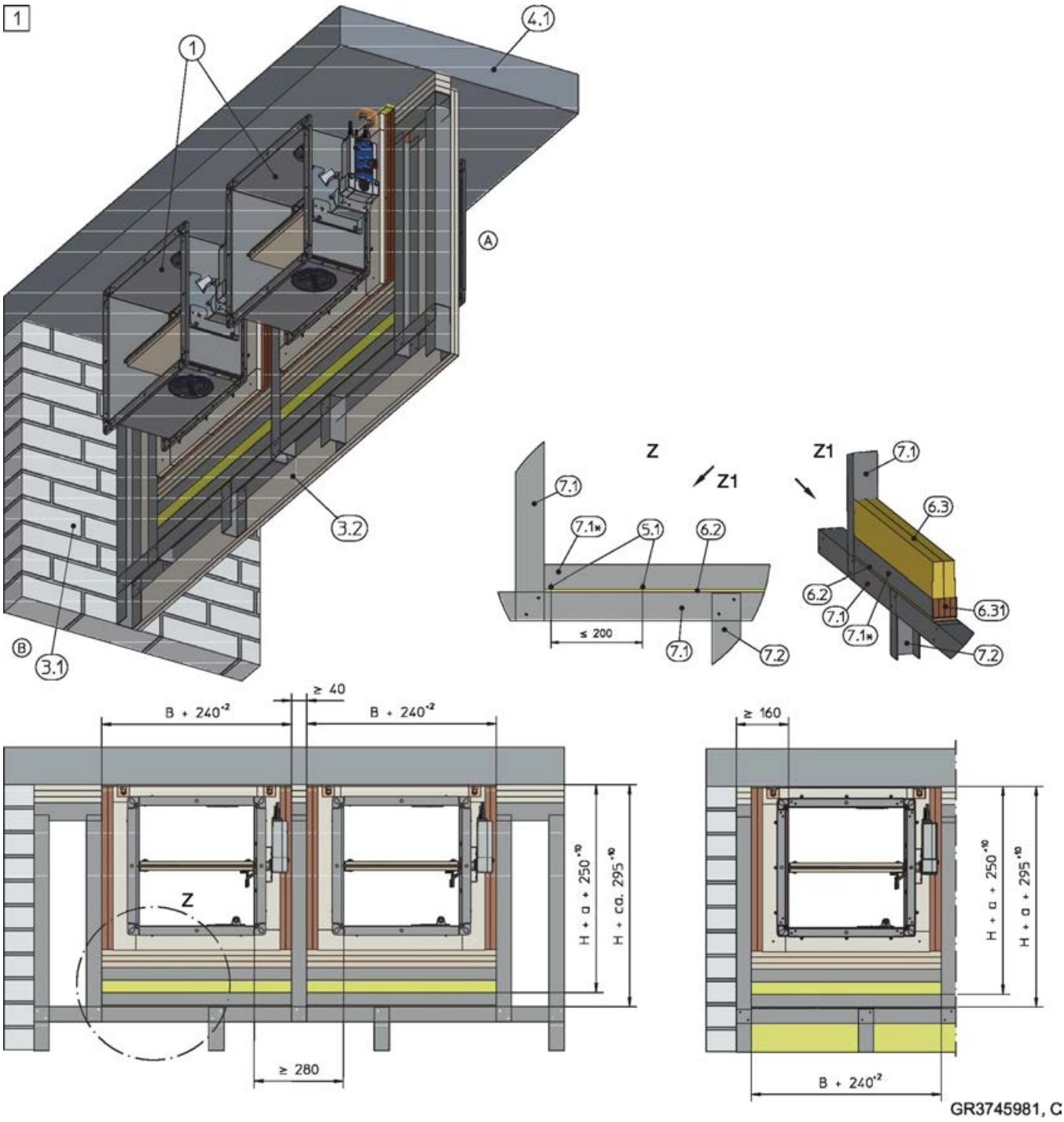


Fig. 100: Dry mortarless installation into a lightweight partition wall with flexible ceiling joint and installation kit GL..., installation of two FK2-EU fire dampers side by side in separate installation openings

1 FK2-EU
3.1 Solid wall
3.2 Lightweight partition wall with metal support structure, cladding on both sides
4.1 Solid ceiling slab
5.1 Dry wall screw *
6.2 Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, t = 10 mm
6.3 Mineral wool, approx. 100 kg/m³ (following subsidence), t = 50 mm (without joints) or t = 25 mm, seams should be staggered
6.31 Fire rated plasterboard strips, d = 12.5 mm; alternatively Promatect® H sections, as wide as the stud frame, screw-fixed
7.1 UW section
7.1* UW section, screw-fixed to bottom trimmers
7.2 CW section
a Subsidence of the ceiling slab
[1] up to EI 90 S (separate installation openings)

Note: For more installation details see Fig. 98

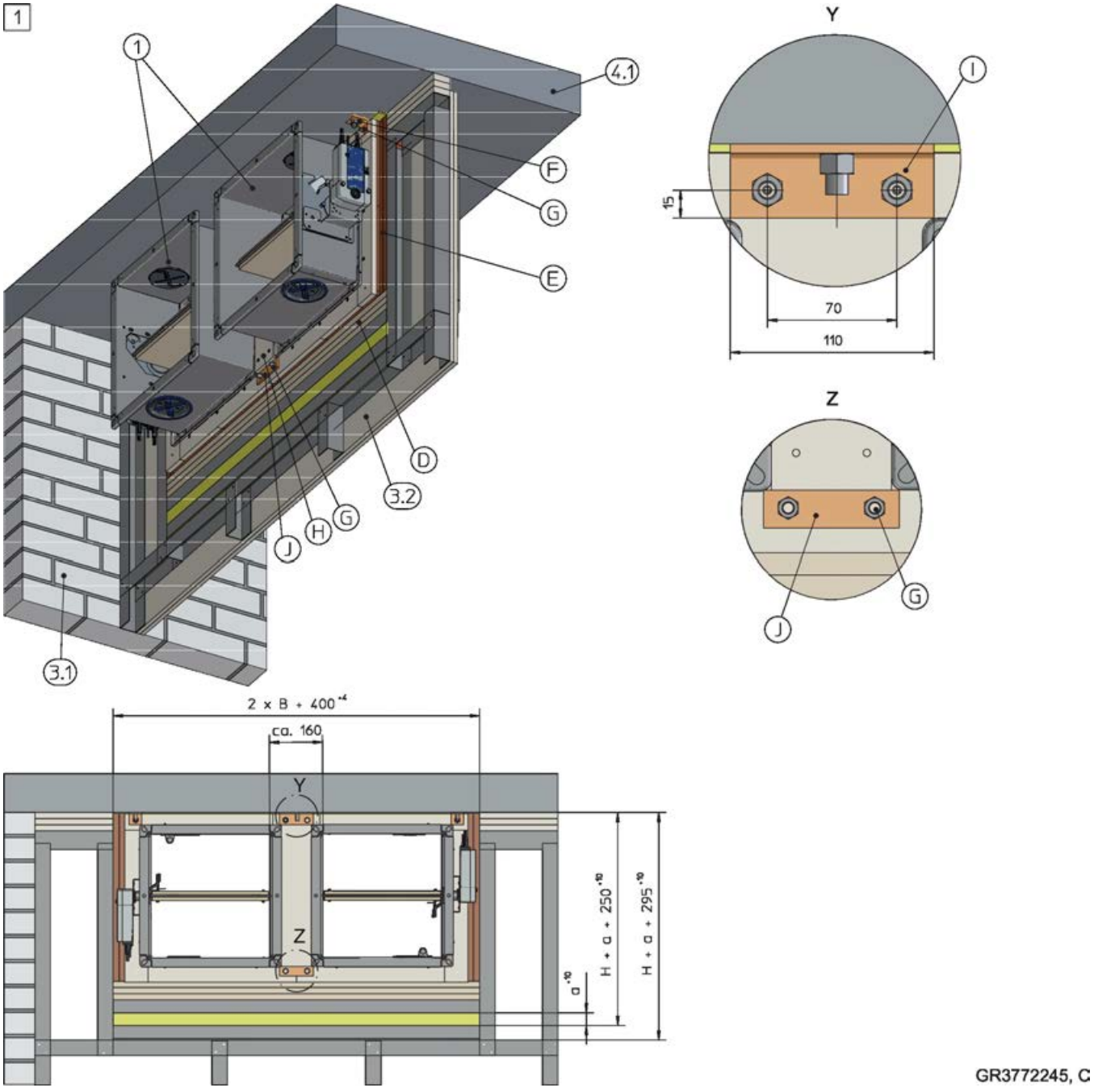
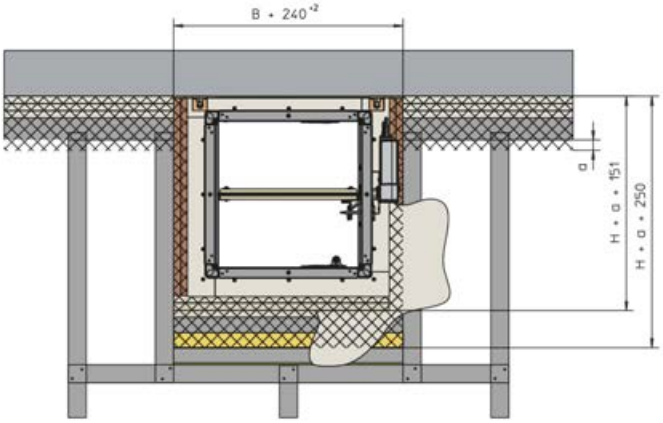


Fig. 101: Dry mortarless installation into a lightweight partition wall, with flexible ceiling joint and installation kit GLK..., installation of two equally high FK2-EU fire dampers (B ≤ 600 mm) side by side into one installation opening

1	FK2-EU, B ≤ 600 mm
2.12	Installation kit GLK..., *5.3.8 'Installation kit GL – supply package and assembly' on page 66*
D	Multilayer section with metal channel at the bottom (depending on wall thickness)
E	Multilayer H sections (1 × right side, 1 × left side, depending on wall thickness)
FL	Steel bracket, 57 × 40 × 5 mm (4 ×)
G	Threaded rod M10 × 130 mm with nuts (11 mm holes in the installation kit required, by others)
H	Cover plate in the middle (2 ×)
I	Angle bracket, 110 × 34 × 5 mm (2 ×)
J	Mending plate, steel, 110 × 30 × 5 mm (2 ×)
3.1	Solid wall
3.2	Lightweight partition wall with metal support structure, cladding on both sides
4.1	Solid ceiling slab
a	Subsidence of the ceiling slab
1	up to EI 90 S (one installation opening, with B < 600 mm)

Note: For more installation details see Fig. 98

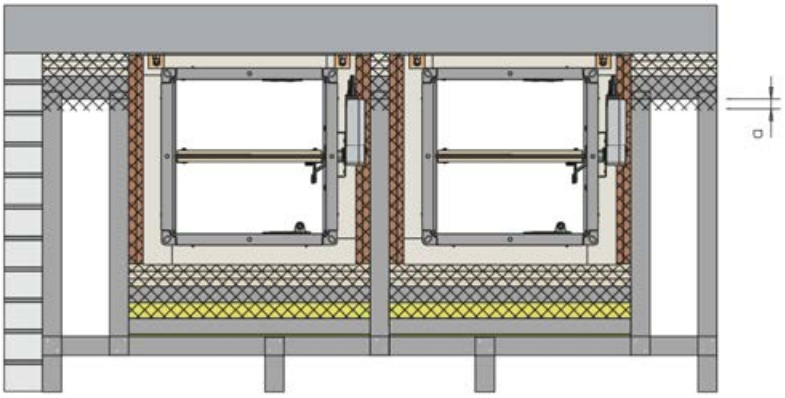
Specify the intended fire damper position when you order the dampers; more ordering information upon request.



GR3705770, E

Fig. 102: Dry mortarless installation into a lightweight partition wall, with flexible ceiling joint

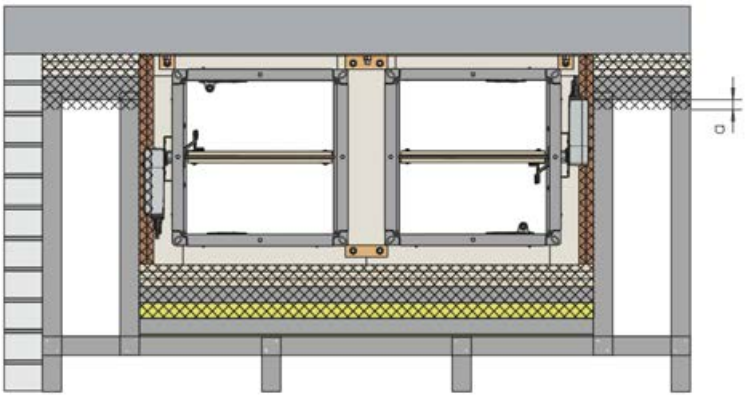
a Subsidence of the ceiling slab



GR3745981, C

Fig. 103: Dry mortarless installation into a lightweight partition wall, with flexible ceiling joint, installation of two FK2-EU fire dampers side by side in separate installation openings

a Subsidence of the ceiling slab



GR3772245, C

Fig. 104: Dry mortarless installation into a lightweight partition wall, with flexible ceiling joint, installation of two fire FK2-EU fire dampers side by side in one installation opening

a Subsidence of the ceiling slab

Note: No screws in the shaded area to fix the cladding to the metal support structure or fire damper.

Installation of fire dampers side by side

If you intend to install two fire dampers of the same height side by side, these fire dampers have to be factory prepared accordingly. Specify this when you order the fire dampers.

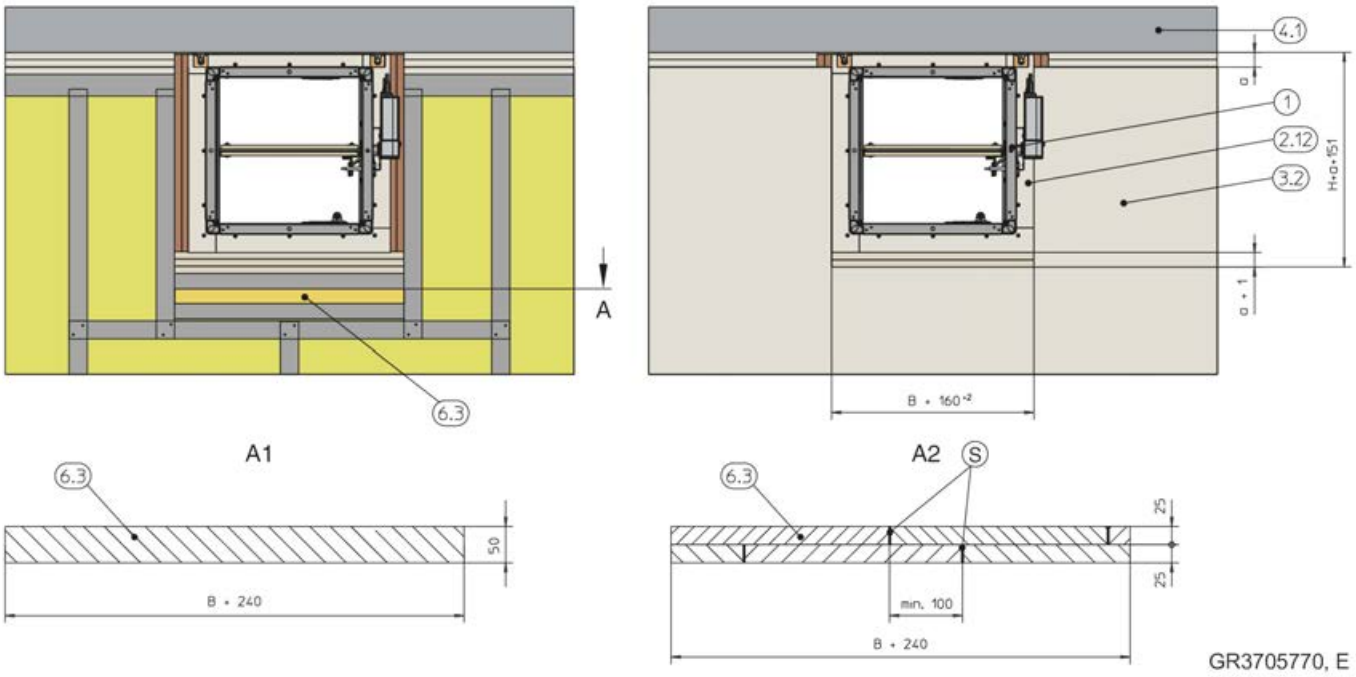


Fig. 105: Dry mortarless installation into a lightweight partition wall, with flexible ceiling joint, illustration shows GL100

1 FK2-EU
2.12 Installation kit GL..., ↬ *5.3.8 'Installation kit GL – supply package and assembly' on page 66*
3.2 Lightweight partition wall with metal support structure, cladding on both sides
4.1 Solid ceiling slab
6.3 Mineral wool, approx. 100 kg/m³ (following subsidence),
illustration shows GL100: t = 50 mm (A1 shown without seams) or t = 25 mm (A2 shown with seams), seams should be staggered
A Top view A – mineral wool (6.3)
S Seams
a Subsidence of the ceiling slab

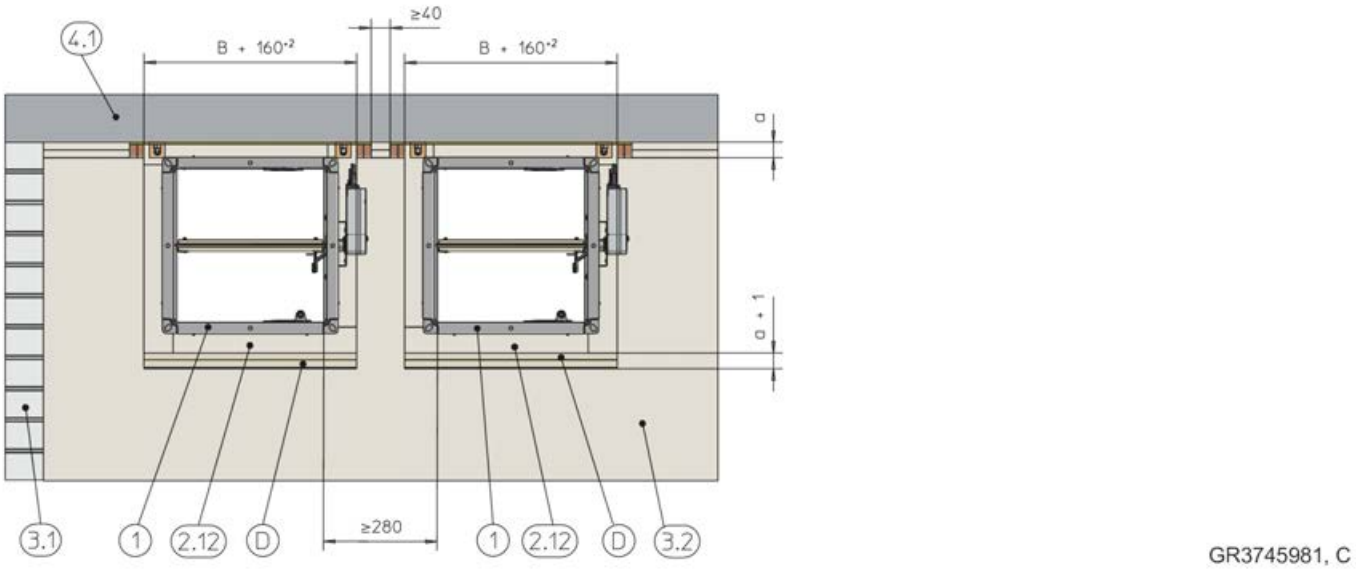


Fig. 106: Dry mortarless installation into a lightweight partition wall, with flexible ceiling joint, installation of two FK2-EU fire dampers side by side in separate installation openings, illustration shows GL100

1 FK2-EU
2.12 Installation kit GL..., ↬ *5.3.8 'Installation kit GL – supply package and assembly' on page 66*
D Multilayer section with metal channel at the bottom (depending on wall thickness)
3.1 Solid wall
3.2 Lightweight partition wall with metal support structure, cladding on both sides
4.1 Solid ceiling slab
a Subsidence of the ceiling slab

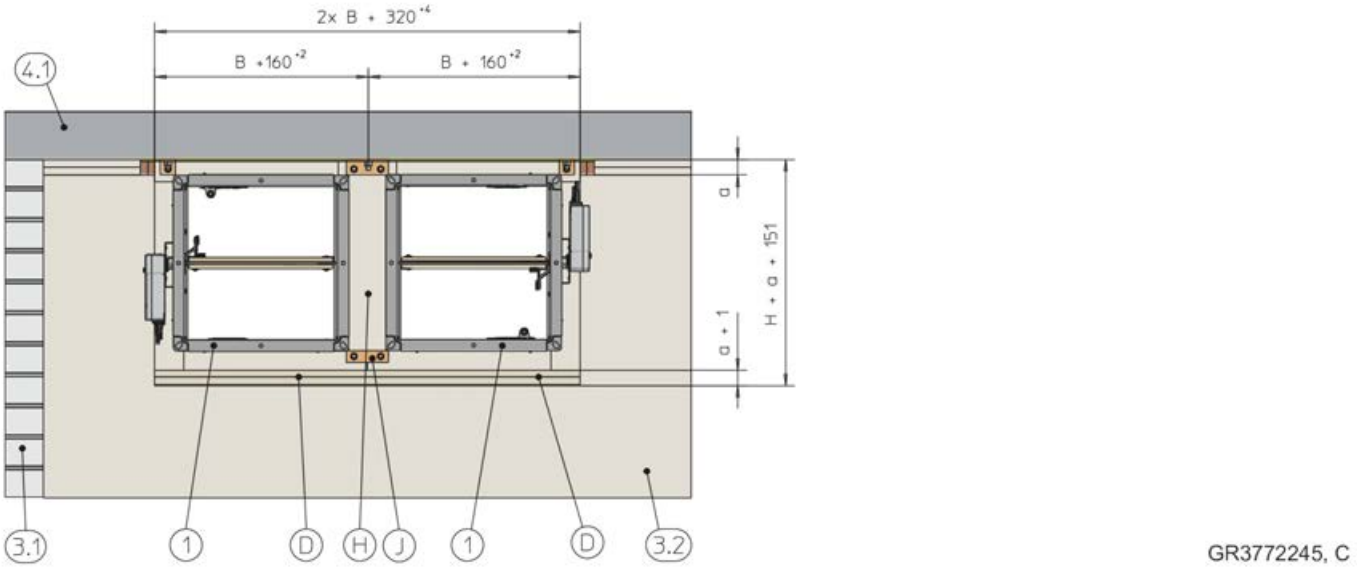


Fig. 107: Dry mortarless installation into a lightweight partition wall, with flexible ceiling joint, installation of two FK2-EU fire dampers side by side in one installation opening, illustration shows GLK100

1	FK2-EU, B ≤ 600 mm
2.12	Installation kit GLK..., ↬ *5.3.8 'Installation kit GL – supply package and assembly' on page 66*
D	Multilayer section with metal channel at the bottom (depending on wall thickness)
H	Cover plate in the middle (2 ×)
J	Mending plate, steel, 110 × 30 × 5 mm (2 ×)
3.1	Solid wall
3.2	Lightweight partition wall with metal support structure, cladding on both sides
4.1	Solid ceiling slab
a	Subsidence of the ceiling slab

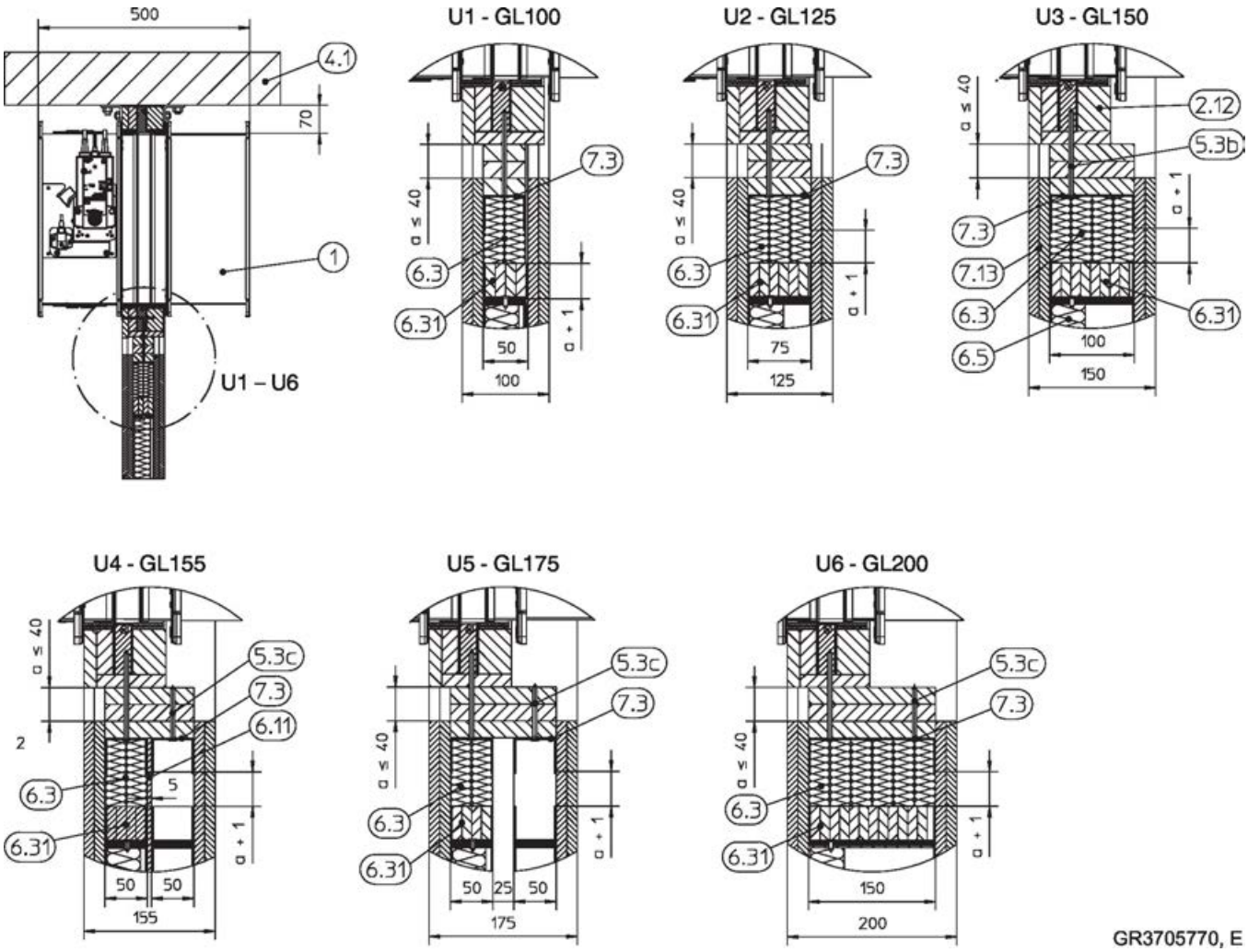


Fig. 108: Dry mortarless installation into a lightweight partition wall, with flexible ceiling joint and installation kit GL... – wall thicknesses

1	FK2-EU	6.11	Insulating strip
2.12	Installation kit GL..., ↬ *5.3.8 'Installation kit GL – supply package and assembly' on page 66*	6.31	Fire-rated plasterboard strips, 12.5 × 40 × (B + 240), alternatively Promatect H sections
4.1	Solid ceiling slab	7.3	Metal section (supply package)
5.3b	Chipboard screw 5 × 100 mm	7.13	Wall cladding
5.3c	Chipboard screw 5 × 60 mm	U1 – U6	Up to EI 90 S
6.3	Mineral wool, approx. 100 kg/m³ (following subsidence), t = 50 mm (without seam) or 25 mm, seams should be staggered	a	Subsidence of the ceiling slab
6.5	Mineral wool (depending on wall construction)		

Installation kit GL

In factory assembled GL installation kits the figure applies to the thickness of a wall with double layer cladding (12.5 mm) on both sides. For example: GL125 is suitable for a wall with double layer cladding (2 × 12.5 mm) on both sides with a 75 mm wide support section. Other cladding thicknesses or number of claddings on request.

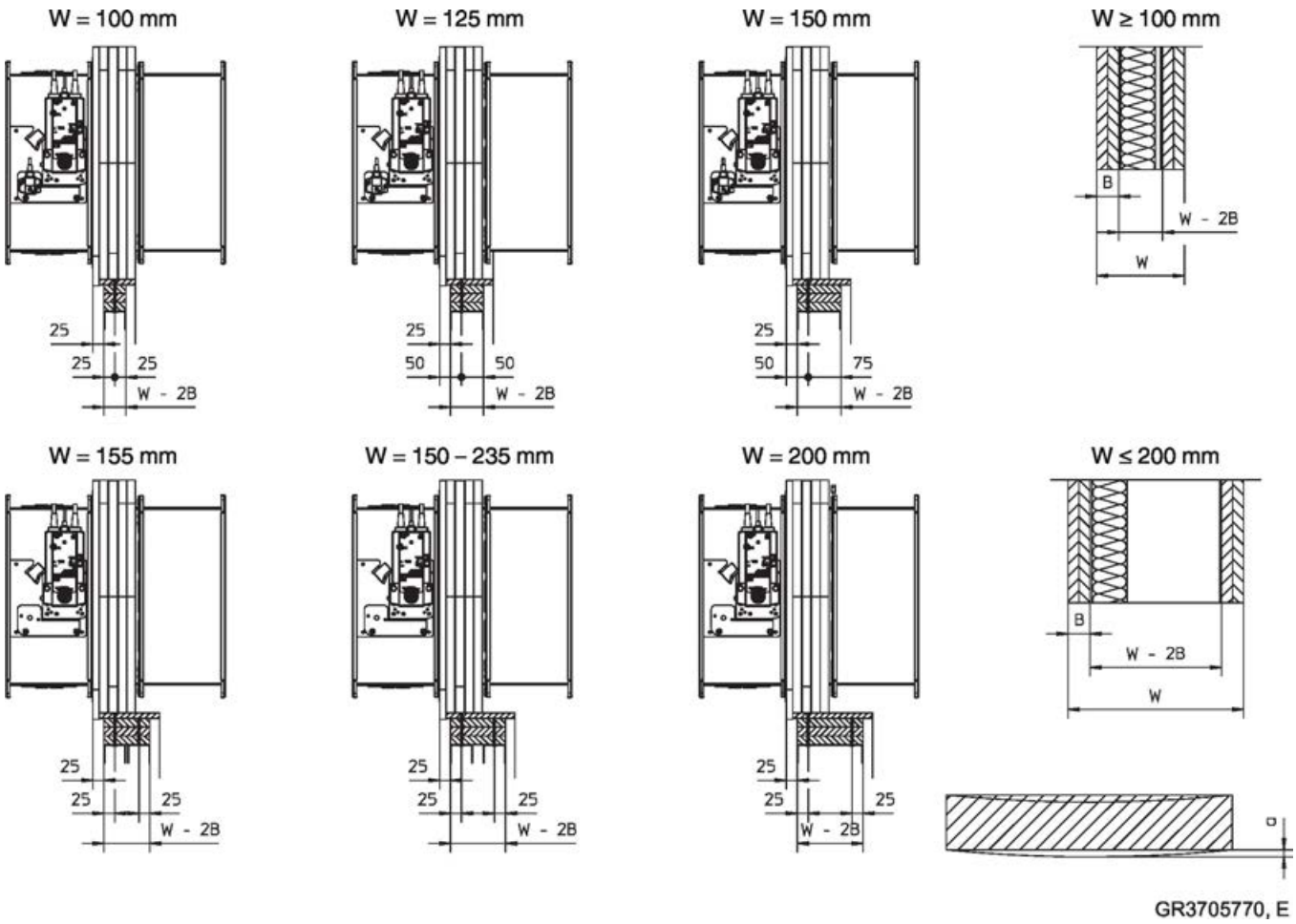


Fig. 109: Dry mortarless installation into a lightweight partition wall, with flexible ceiling joint and installation kit GL... – wall thicknesses

Additional requirements

- Lightweight partition wall, *on page 44*, Installation details for compartments walls, safety partition walls and walls to provide radiation protection are available upon request
- Casing length L = 500 mm
- Subsidence of the ceiling slab a ≤ 40 mm
- 70 mm distance between the fire damper and a load-bearing ceiling; ≥ 200 mm distance between the fire damper and a load-bearing wall
- ≥ 280 mm distance between two fire dampers (separate installation openings)
- Distance between two fire dampers = 160 mm (one installation opening with two FK2-EU fire dampers with B ≤ 600 mm). Specify this variant with your order.
- Horizontal installation position only

1. Mount installation kit GL... onto the fire damper, *5.3.8 'Installation kit GL – supply package and assembly' on page 66*
2. Even out the surface of the ceiling slab (6.13).
3. Place fire-rated anchors with suitability certificate and suitable for the solid ceiling slab (push through installation is also possible).
4. Install the fire damper on the face of the ceiling slab and attach the ceiling joint strip (7.21) in such a way that there is no gap between the strip and installation kit GL; gaps ≤ 3 mm between ceiling joint strip and installation kit can be sealed of with filler (6.13).
5. Complete surrounding parts of the support structure according to the illustration.
6. Create multilayer section made from 6.31, B + 160 mm and as deep as the metal section, then place in the UW section (7.1*).
7. Fill the area below the metal section (7.3) up to the multilayer section made from 6.31 completely with mineral wool (6.3). Attach mineral wool with staggered seams, see Fig. 105 . Mineral wool for dampers of smaller widths can be fitted without seams.

8. No screws must be used in the marked area to fix the cladding to the metal support structure, see Fig. 102 . The wall has to be clad up to ≤ 2 mm to the left and right of the installation kit.

5.5.9 Dry mortarless installation remote from a lightweight partition wall, with installation kit WE

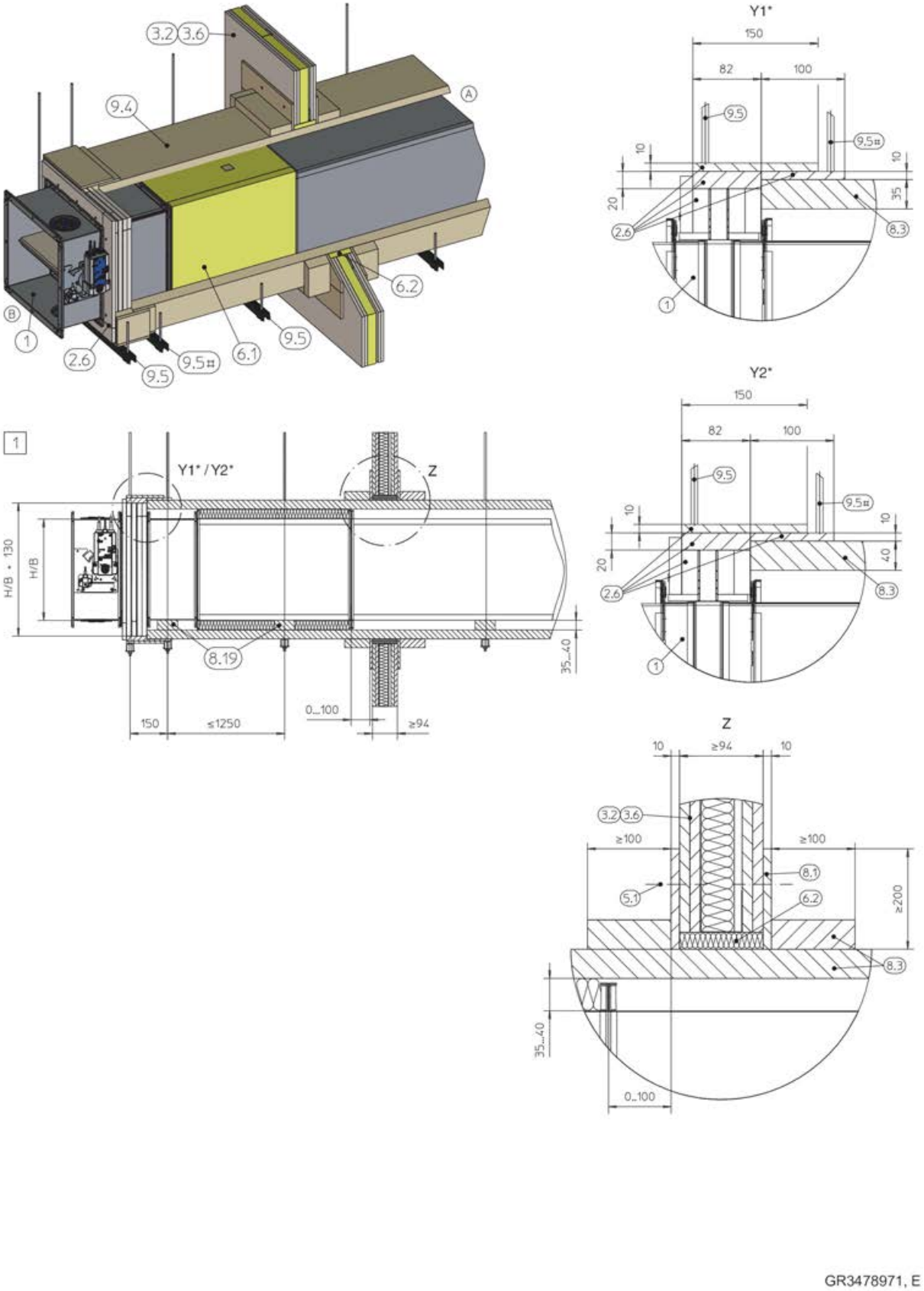


Fig. 110: Dry mortarless installation remote from a lightweight partition wall, with installation kit WE

1 FK2-EU

8.2 PROMATECT®-H, d = 20 mm

2.6 Installation kit WE, *5.3.6 'Installation kit WE – supply package and assembly' on page 61*
3.2 Lightweight partition wall with metal support structure, cladding on both sides, (if any), wall penetration (on 4 sides) according to Promat® manual, construction 478, latest edition
3.6 Compartment wall or safety partition wall with metal support structure, cladding on both sides
5.1 Dry wall screw
6.1 Mineral wool, ≥ 1000 °C, ≥ 40 kg/m³, d = 40 mm, only with B × H > 800 × 400 mm
6.2 Mineral wool, ≥ 1000 °C, ≥ 80 kg/m³, d = 20 mm
8.1 PROMATECT®-H, d = 10 mm
8.3 PROMATECT® LS35 or L500, d = 35 mm or 40 mm, or AD40
8.19 PROMATECT® LS35 or PROMATECT® L500 firestop board, d = 35 mm or 40 mm, or AD40
9.4 Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition
9.5 Suspension of FK2-EU(by others), *5.13.2 'Suspending fire dampers installed remote from solid walls and ceiling slabs' on page 229*
Damper sizes > 1000× 600 mm require two suspension points underneath the damper, at a distance of 150 mm from each other
* Even out the joints between the plasterboard strips with Promat filler or compound
1 Up to EI 90 S (horizontal installation position)

Additional requirements: dry mortarless installation with installation kit WE remote from lightweight partition walls

- Lightweight partition wall, *on page 44*
- Casing length L = 500 mm
- Horizontal installation position
- Sheet steel ducts without any openings, with fire-resistant cladding (fittings with cladding according to instructions from Promat®)
- ≥ 270 mm distance to the wall or ceiling slab
- ≥ 350 mm distance between two fire dampers
- Enough clear space is required to mount the installation kit onto the fire damper.
- Installation of FK2-EU remote form walls and ceilings, with installation kit WE, *on page 40*
- Mount installation kit WE onto the fire damper, *5.3.6 'Installation kit WE – supply package and assembly' on page 61*

Note: Fire damper and duct must be suspended *229* .

5.5.10 Dry mortarless installation with fire batt

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

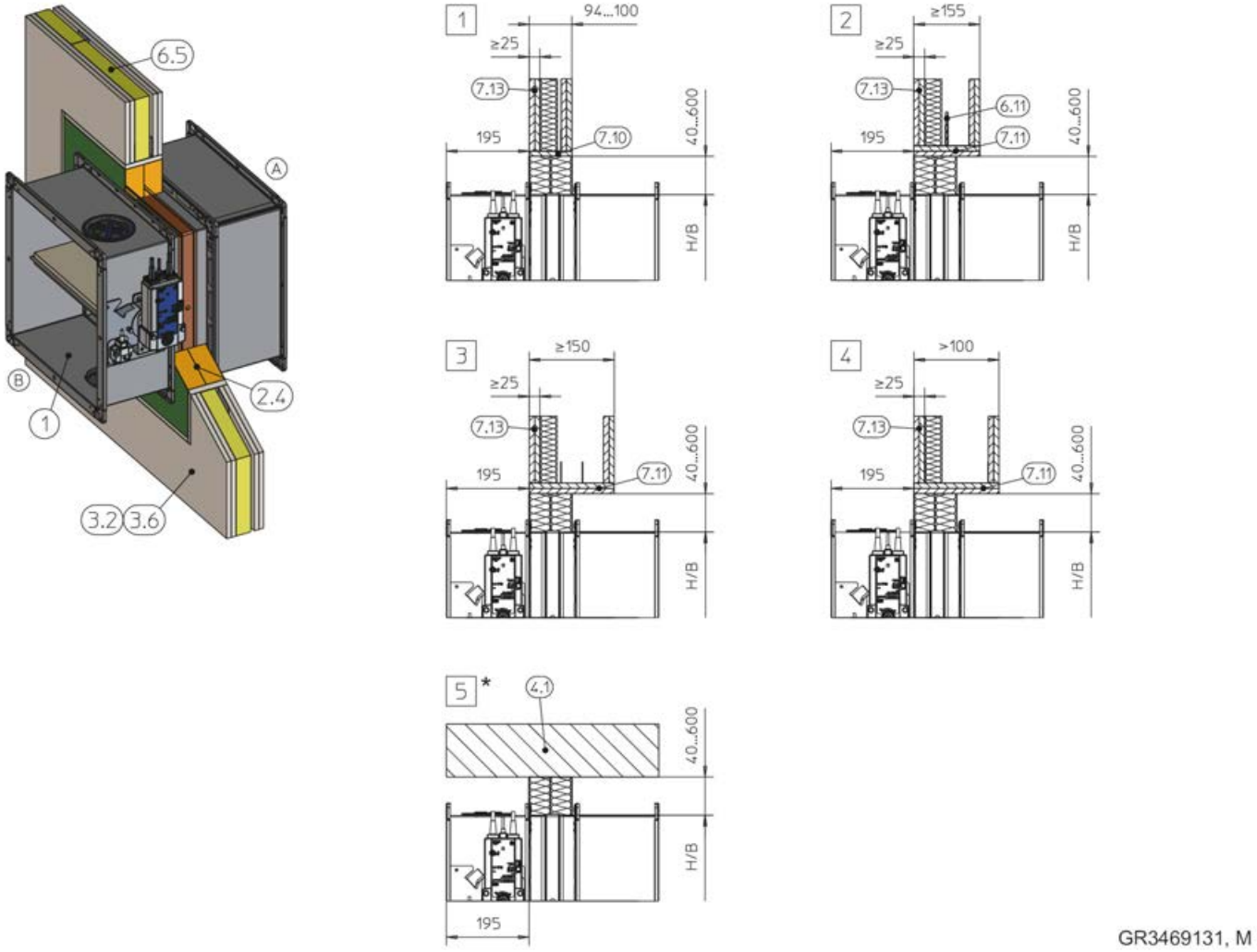


Fig. 111: Dry mortarless installation into a lightweight partition wall, with a fire batt

1	FK2-EU
2.4	Coated board system
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 / solid floor
6.5	Mineral wool (depending on wall construction)
6.11	Insulating strip (depending on wall construction)
7.10	Trim panels, up to W ≤ 100 mm (optional)
7.11	Trim panels, double layer
7.13	Cladding
*	Installation near the floor as in 5
1 – 4	up to EI 120 S: B × H = 200 × 100 – 800 × 400 mm (horizontal installation position) Up to EI 90 S: B × H = 200 × 100 – 1500 × 800 mm
5	EI 30 to EI 120 S

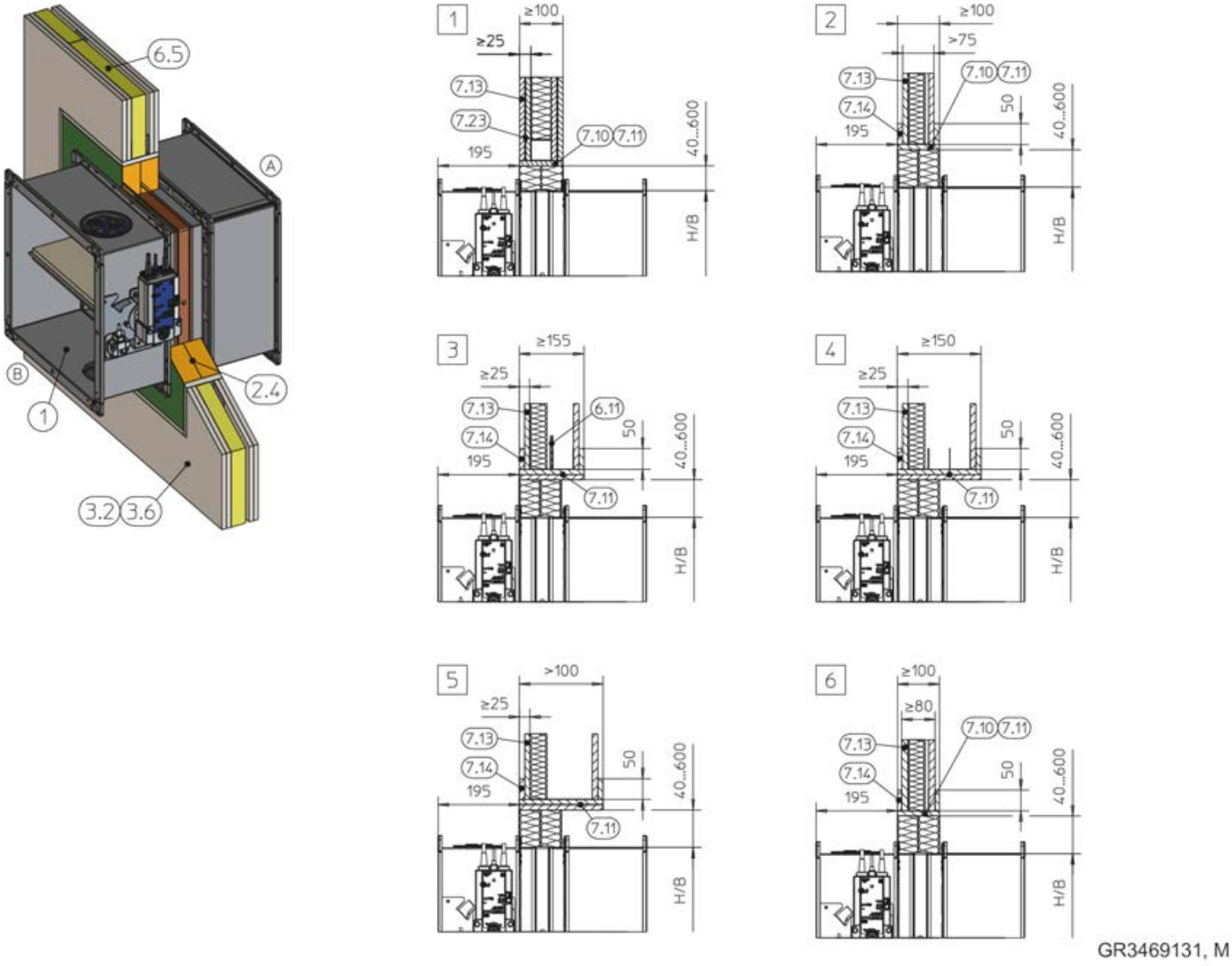


Fig. 112: Dry mortarless installation into a lightweight partition wall, with a fire batt

1	FK2-EU
2.4	Coated board system
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)
6.11	Insulating strip (depending on wall construction)
7.10	Trim panels, up to W ≤ 100 mm (optional)
7.11	Trim panels, double layer
7.13	Cladding
7.14	Reinforcing board of the same material as the wall
7.23	Sheet steel insert depending on wall manufacturer
1	up to EI 120 S: B × H = 200 × 100 – 800 × 400 mm (horizontal installation position) Up to EI 90 S: B × H = 200 × 100 – 1500 × 800 mm
2 – 5	EI 30 S
6	Up to EI 60 S

Dry mortarless installation with fire batt, flange to flange

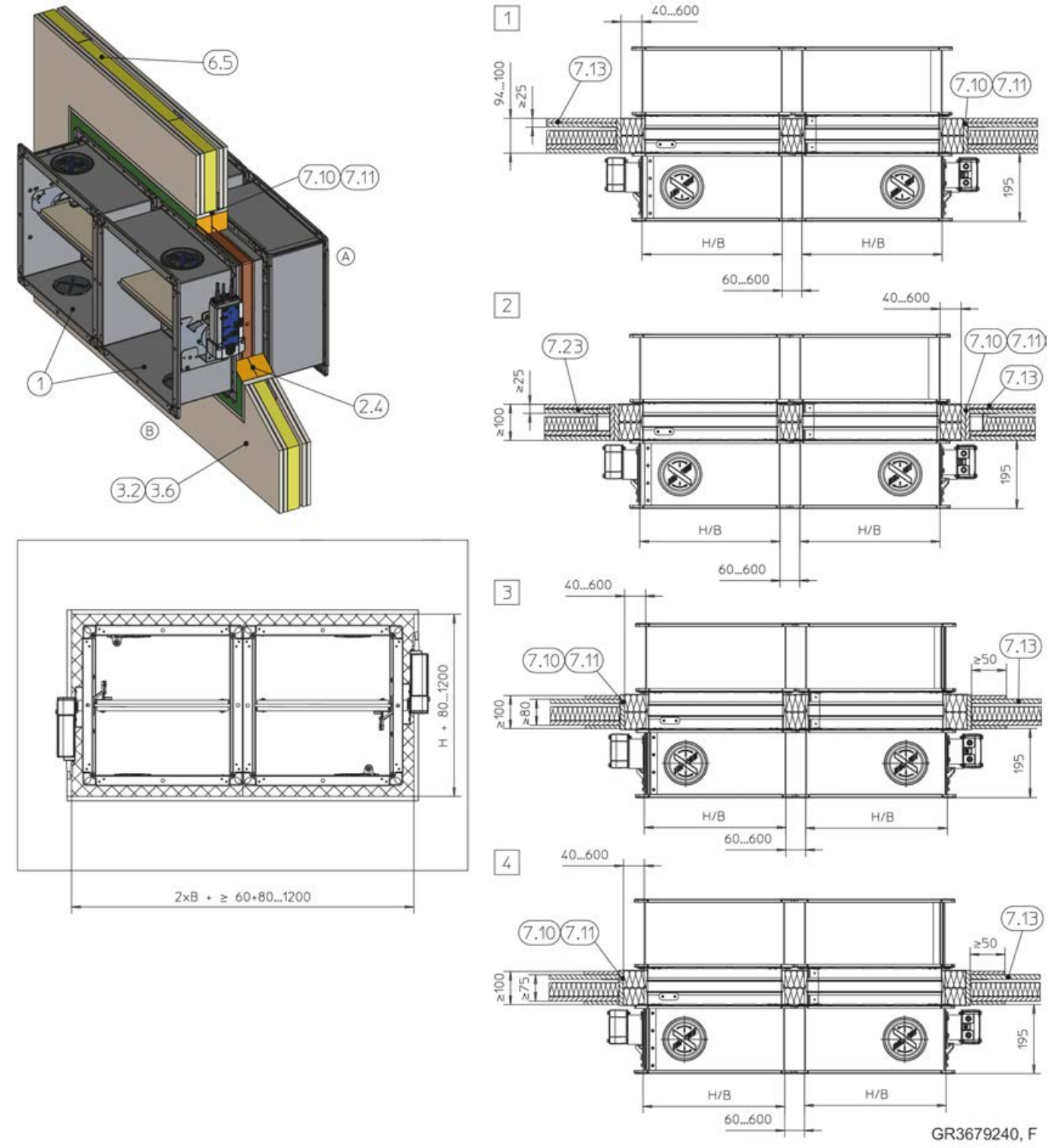


Fig. 113: Dry mortarless installation into a lightweight partition wall, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FK2-EU	7.11	Trim panels, double layer
2.4	Coated board system	7.13	Cladding
3.2	Lightweight partition wall with metal support structure, cladding on both sides	7.23	Sheet steel insert depending on wall manufacturer
3.6	Compartment wall with metal support structure, cladding on both sides	1 2	Up to EI 90 S
6.5	Mineral wool (depending on wall construction)	3	Up to EI 60 S
		4	EI 30 S

7.10 Trim panels, up to W ≤ 100 mm (optional)

Dry mortarless installation with fire batt, multiple installation, flange to flange

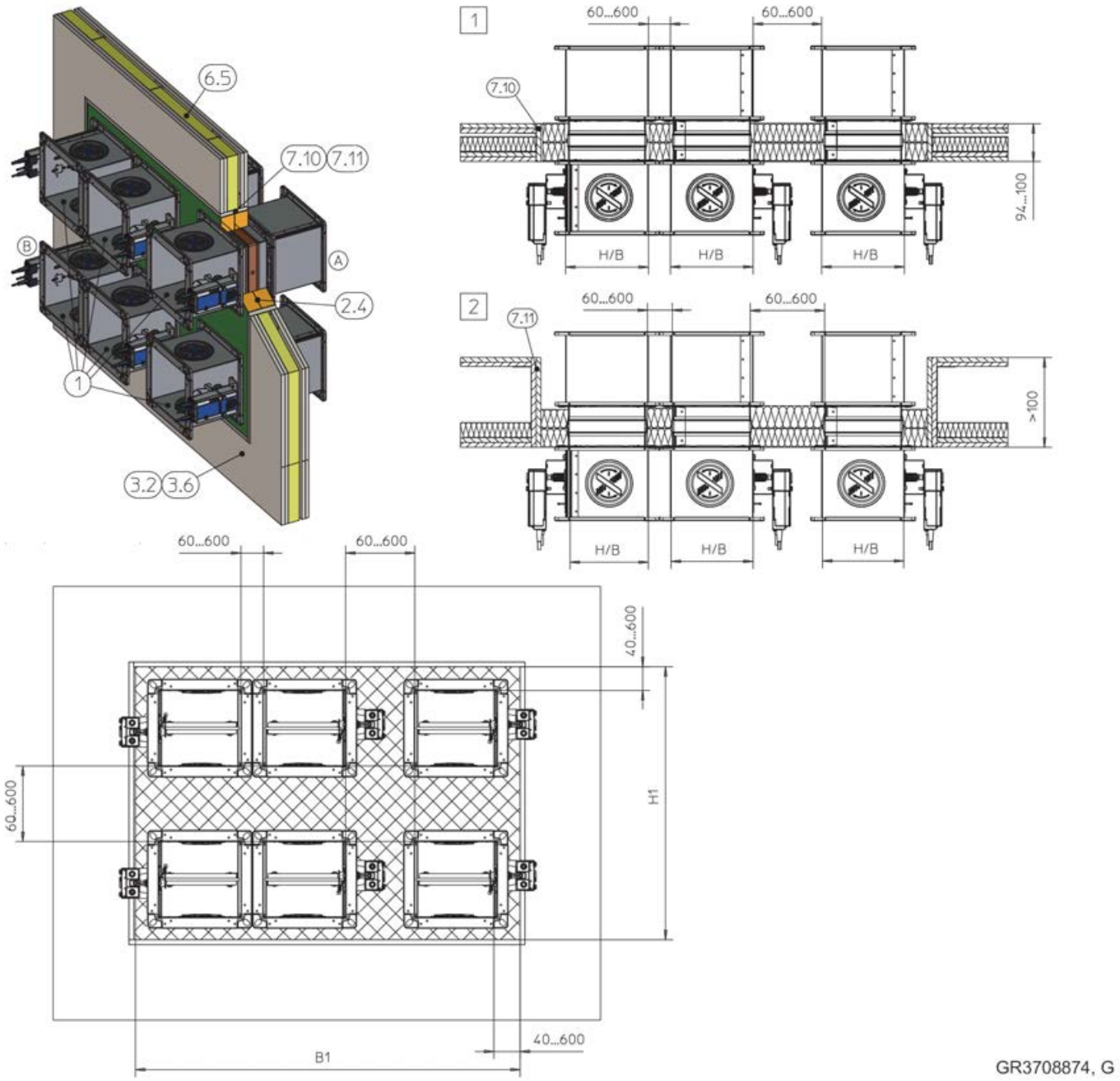


Fig. 114: Dry mortarless installation into a lightweight partition wall, with a fire batt, multiple installation, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1 FK2-EU
2.4 Coated board system
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)
7.10 Trim panels, up to W ≤ 100 mm (optional)
7.11 Trim panels, double layer
1 2 Up to EI 90 S

For multiple installation please note:

- Total fire damper area: 2.4 m² max.
- The possible number of fire dampers in a fire batt depends on the sizes of the fire dampers (B × H) and on the total fire damper area (2.4 m²).
- Maximum fire batt size: B1 x H1, depending on manufacturer
- Distance to load-bearing structural elements ≥ 40 mm

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

- Lightweight partition wall, ↳ *on page 44*
- Casing length L = 305 or 500 mm
- Fire batt systems, installation details, distances / dimensions, ↳ *on page 41*
- Suspension and fixing, ↳ *Chapter 5.13 'Fixing the fire damper' on page 228* ↳ *5.13.3 'Fixing the damper when a fire batt is used' on page 230*

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

5.6.1 General

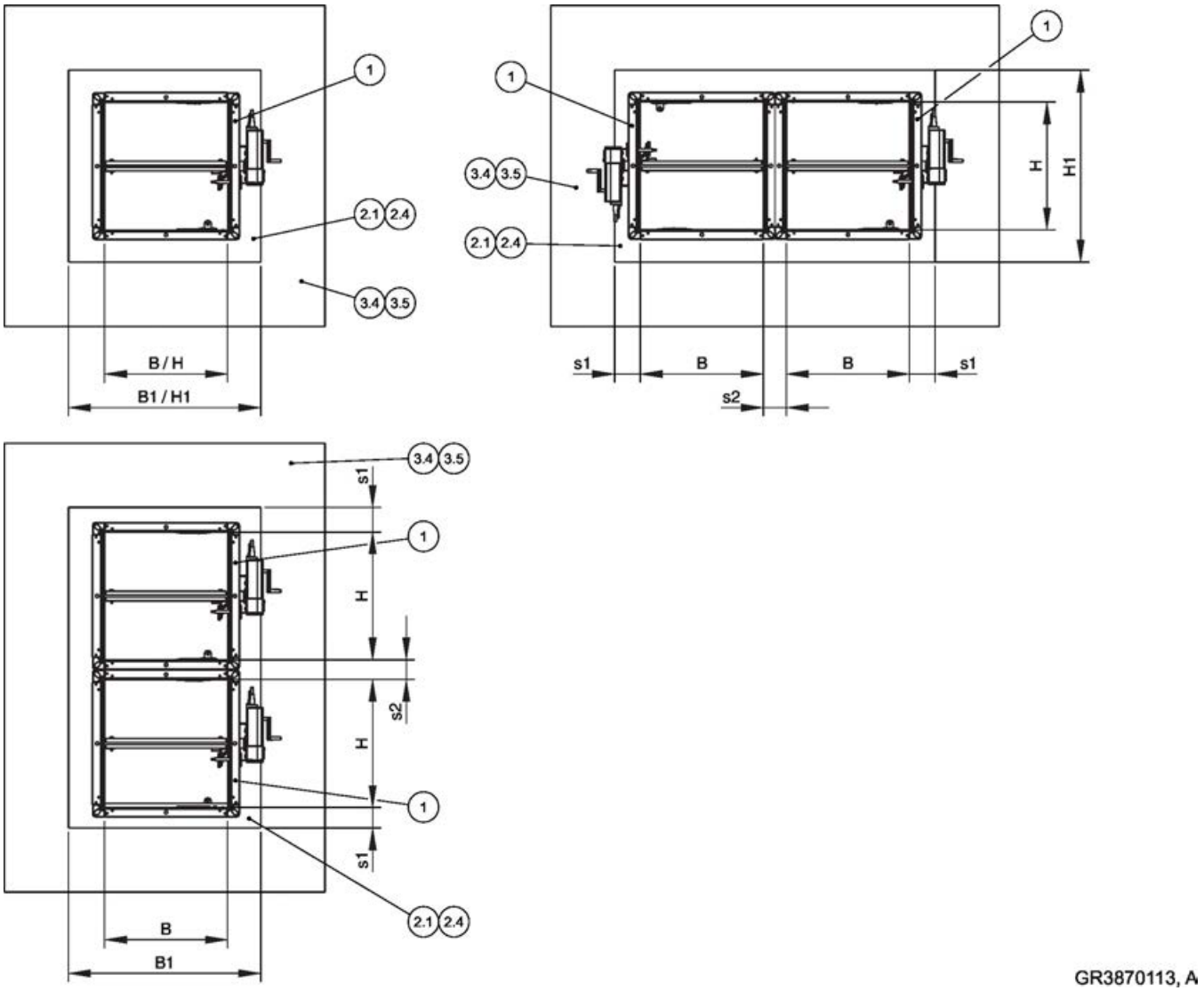


Fig. 115: Solid walls – arrangement / distances

1 FK2-EU
2.1 Mortar
2.4 Coated board system
3.4 Timber stud wall, cladding on both sides
3.5 Half-timbered construction, cladding on both sides
s1 Perimeter gap, ↳ *on page 37*
s2 Distance between the fire dampers, ↳ *'Distances' on page 36*

Installation type	Installation opening [mm]			
	B1	H1	s1	s2
Mortar-based installation	B + 450 max.	H + 450 max.	≤ 225	60 [2] – 225
Dry mortarless installation with installation kit ES [1]	B + 140	H + 140	central installation	
Dry mortarless installation with fire batt	B + 80 to 1200	H + 80 to 1200	40 – 600	60 [2] – 600

[1] Installation opening tolerance ± 2 mm

[2] With length 305 mm and installation of fire dampers on top of each other, the distance between FK2-EU fire dampers has to be at least 75 mm.

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

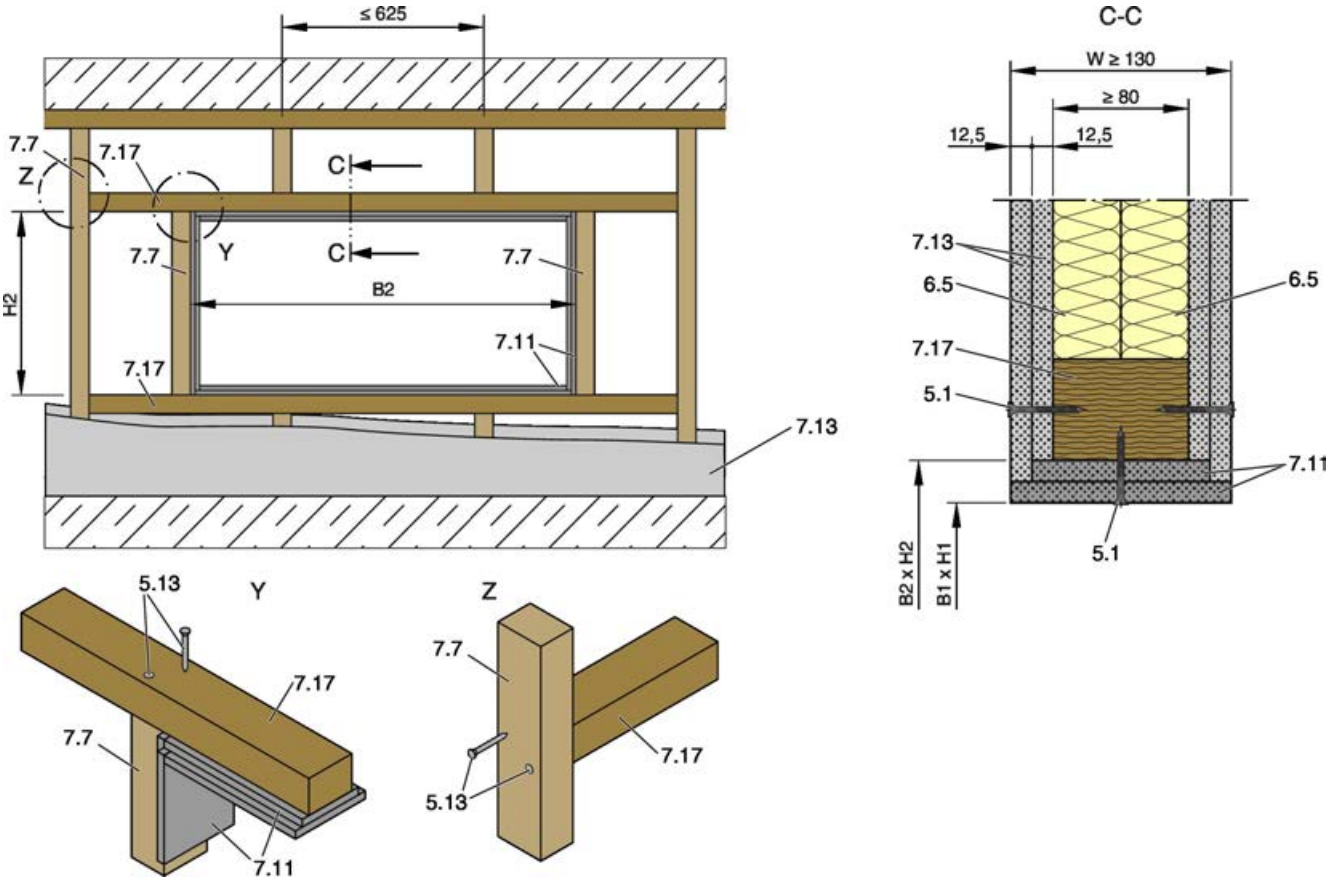


Fig. 116: Lightweight partition wall with timber support structure and cladding on both sides

5.1	Dry wall screw
5.13	Wood screw or pin
6.5	Mineral wool (depending on wall construction)
7.7	Timber stud, at least 60 × 80 mm *
7.11	Trim panels, double layer, staggered joints
7.13	Cladding, see installation details
7.17	Trimmers, timber stud / nogging, at least 60 × 80 mm*
B1 × H1	Clear installation opening
B2 × H2	Opening in the half-timbered construction
*	At least 60 × 60 mm up to EI 60 S

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

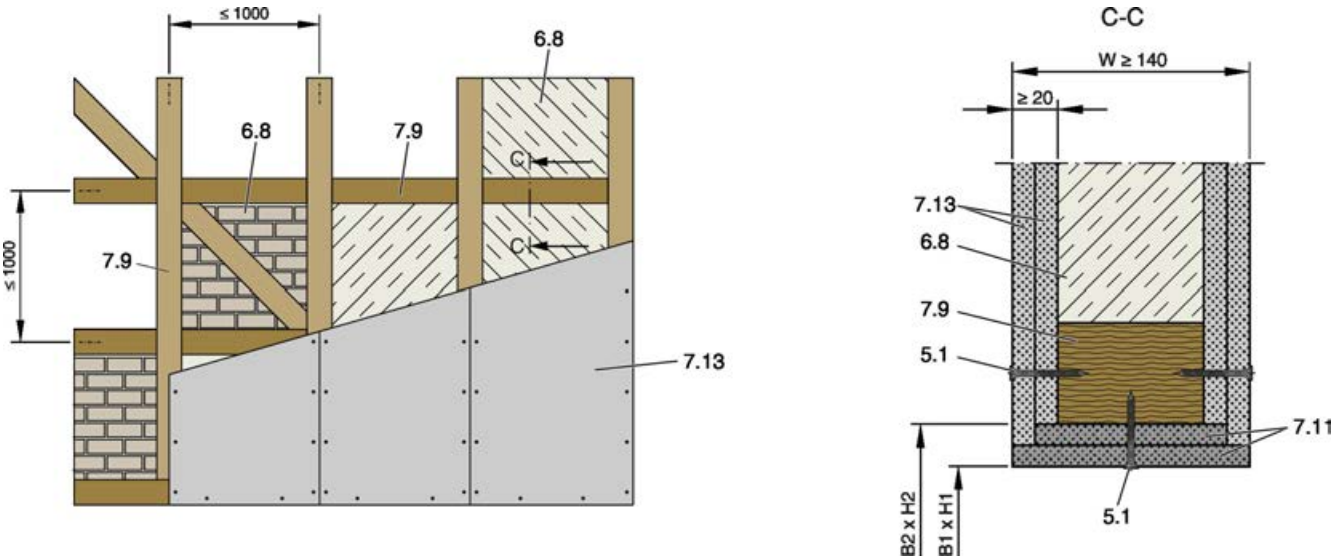


Fig. 117: Lightweight partition wall, half-timbered construction with cladding on both sides

5.1 Dry wall screw
6.8 Infill (cavities completely filled with mineral wool ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)
7.9 Timber structure
7.11 Trim panels, double layer, staggered joints
7.13 Cladding, see installation details
B1 × H1 Clear installation opening
B2 × H2 Opening in the half-timbered construction

Additional requirements: lightweight partition walls with timber studs

- Timber stud wall or half-timbered construction,
  ↳ *on page 45*
- The structural safety of the wall must be ensured (by others). Compensation measures, especially with regard to large installation openings (such as for multiple installation), must be determined on a case to case basis (by others).

5.6.2 Mortar-based installation

Timber studs

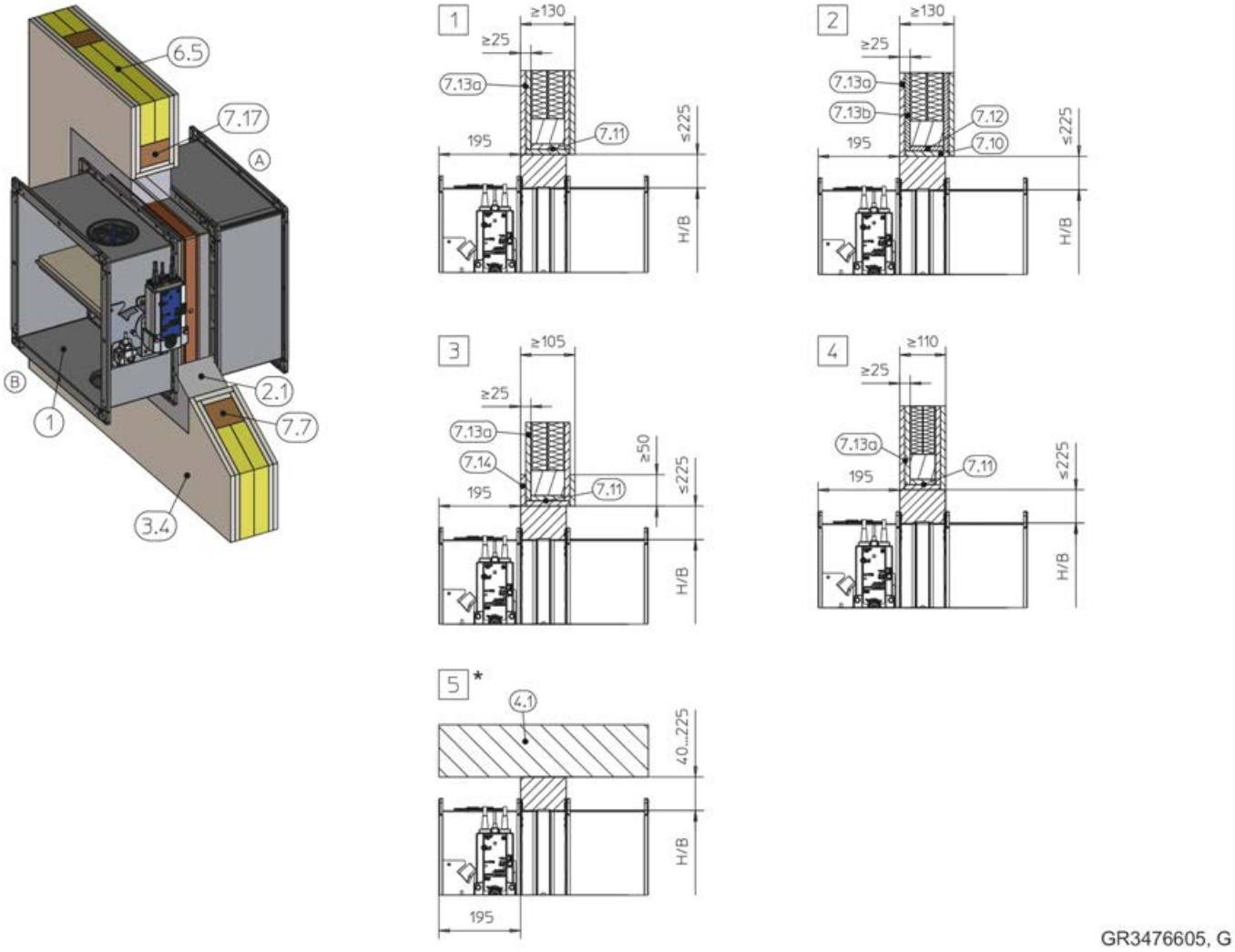


Fig. 118: Mortar-based installation into a lightweight partition wall with timber support structure

1	FK2-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 support structure, at least 60 × 80 mm (min. 60 × 60 mm with F60)
7.10	Trim panels (fire-resistant)
7.11	Trim panels, double layer with staggered joints, fire-resistant
7.12	Trim panels, wood sheet, at least 600 kg/³
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, at least 60 × 80 mm (at least 60 × 60 mm with F60)
*	Installation near the floor as in 5
1	Up to EI 120 S
2 3	EI 30 S
4	Up to EI 60 S
5	EI 30 to EI 120 S

Timber support structure, flange to flange

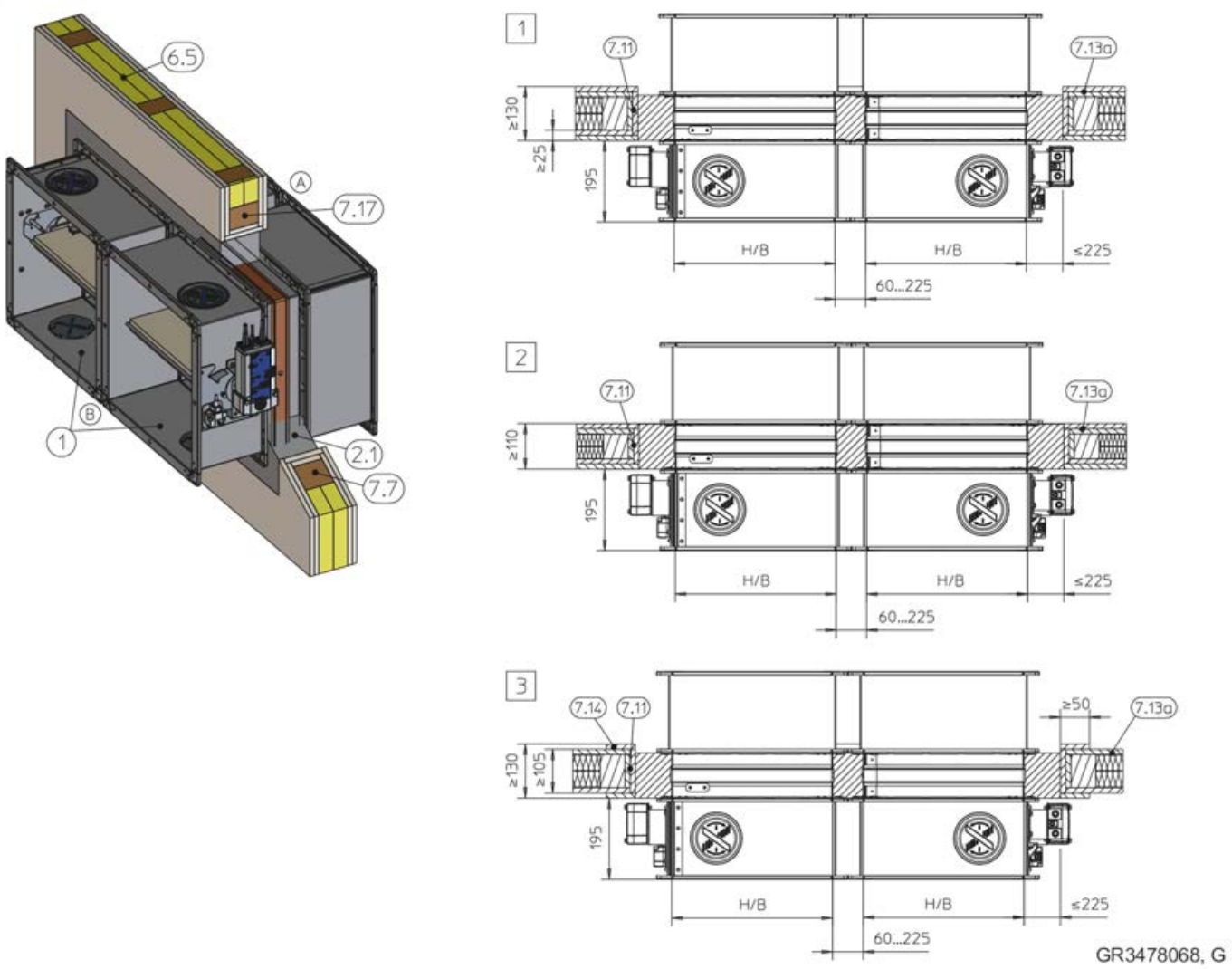


Fig. 119: Mortar-based installation into a lightweight partition wall with timber support structure, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FK2-EU
2.1	Mortar
3.4	Timber stud wall (also timber panel constructions), cladding on both sides
6.5	Mineral wool (depending on wall construction)
7.7	Timber stud / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
7.11	Trim panels, double layer with staggered joints, fire-resistant
7.13a	Cladding, fire-resistant
7.14	Reinforcing board of the same material as the wall
7.17	Trimmers, timber stud / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
1	Up to EI 120 S
2	Up to EI 60 S
3	EI 30 S

Timber support structure, FK2-EU and FKRS-EU combined

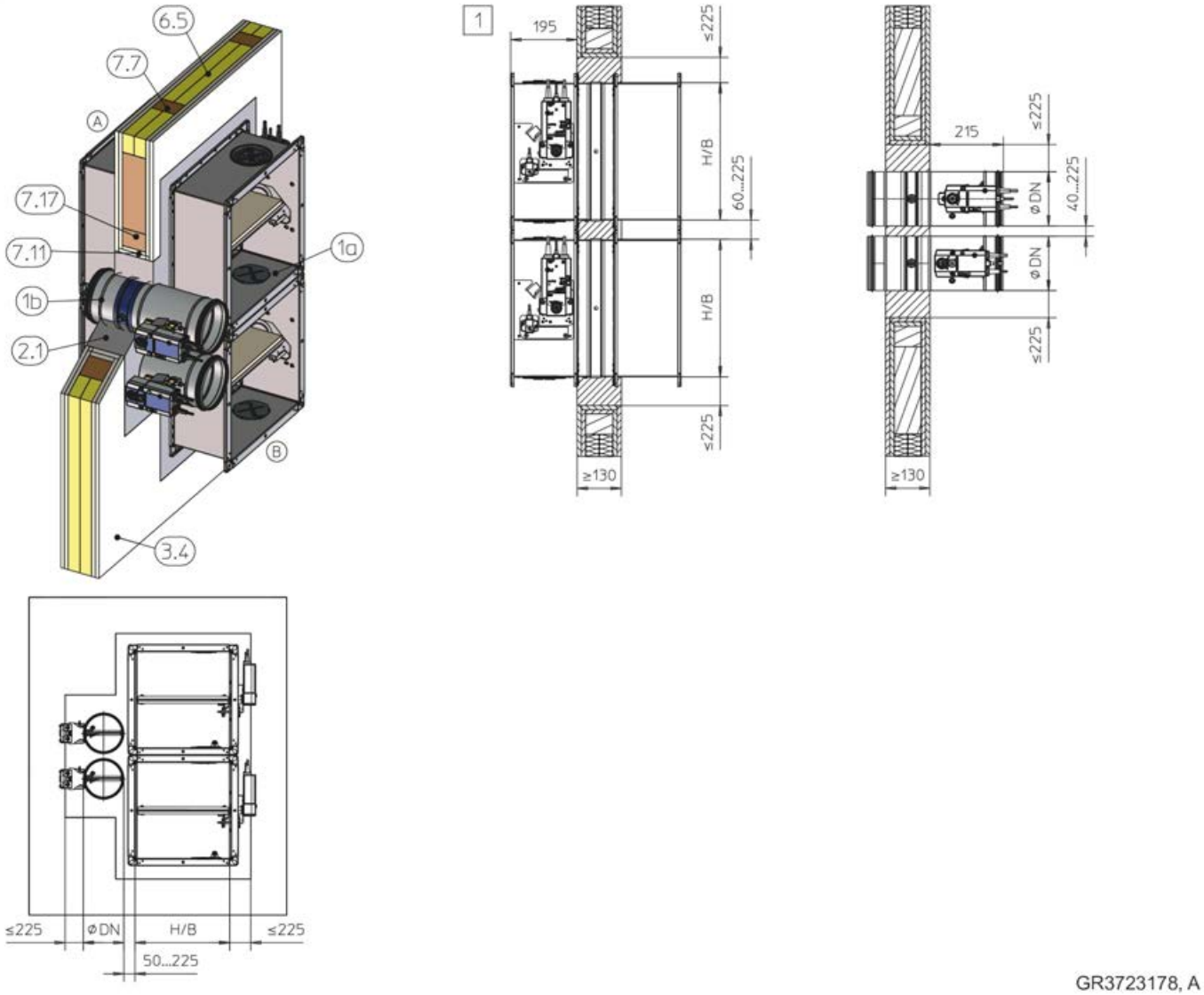


Fig. 120: Mortar-based installation into a lightweight partition wall with timber support structure, FK2-EU and FKRS-EU combined

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

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For FKRS-EU installation details see the FKRS-EU installation and operating manual.
- Distance to load-bearing structural elements ≥ 40 mm

Timber support structure, FK2-EU and FKR-EU combined

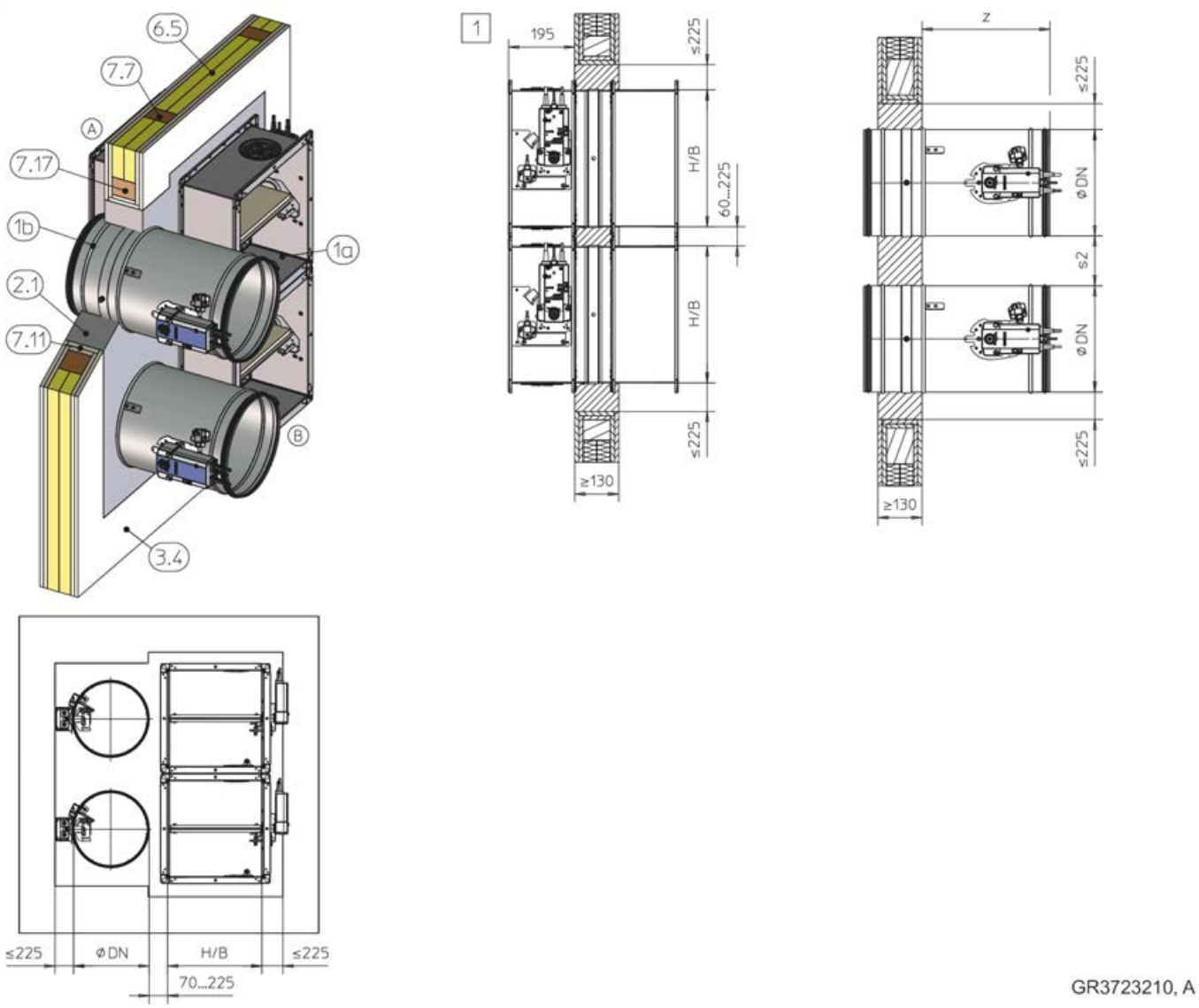


Fig. 121: Mortar-based installation into a lightweight partition wall with timber support structure, FK2-EU and FKR-EU combined

1a	FK2-EU up to B × H ≤ 800 × 400 mm
1b	FKR-EU
2.1	Mortar
3.4	Timber stud wall (also timber panel constructions), cladding on both sides
6.5	Mineral wool (depending on wall construction)
7.7	Timber stud / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
7.11	Trim panels, double layer with staggered joints, fire-resistant
7.17	Trimmers, timber stud / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
Z	Construction with spigot 370 mm Construction with flange 342 mm
s2	With spigot 40 – 225 mm With flange 80 – 225 mm
1	Up to EI 90 S

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For FKR-EU installation details see the FKR-EU installation and operating manual.
- Distance to load-bearing structural elements ≥ 40 mm

Timber structure

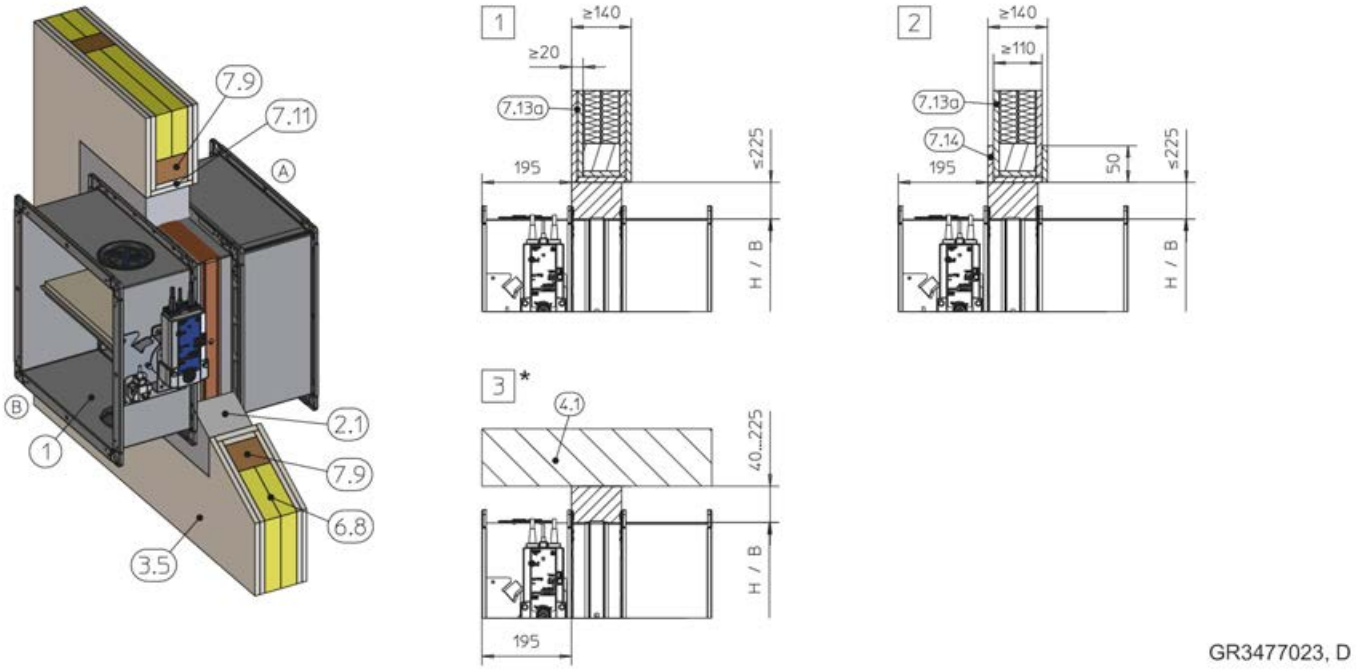


Fig. 122: Mortar-based installation into a lightweight partition wall, half-timbered construction

1	FK2-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	Timber structure
7.11	Trim panels, double layer with staggered joints, fire-resistant
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

Half-timbered construction, flange to flange

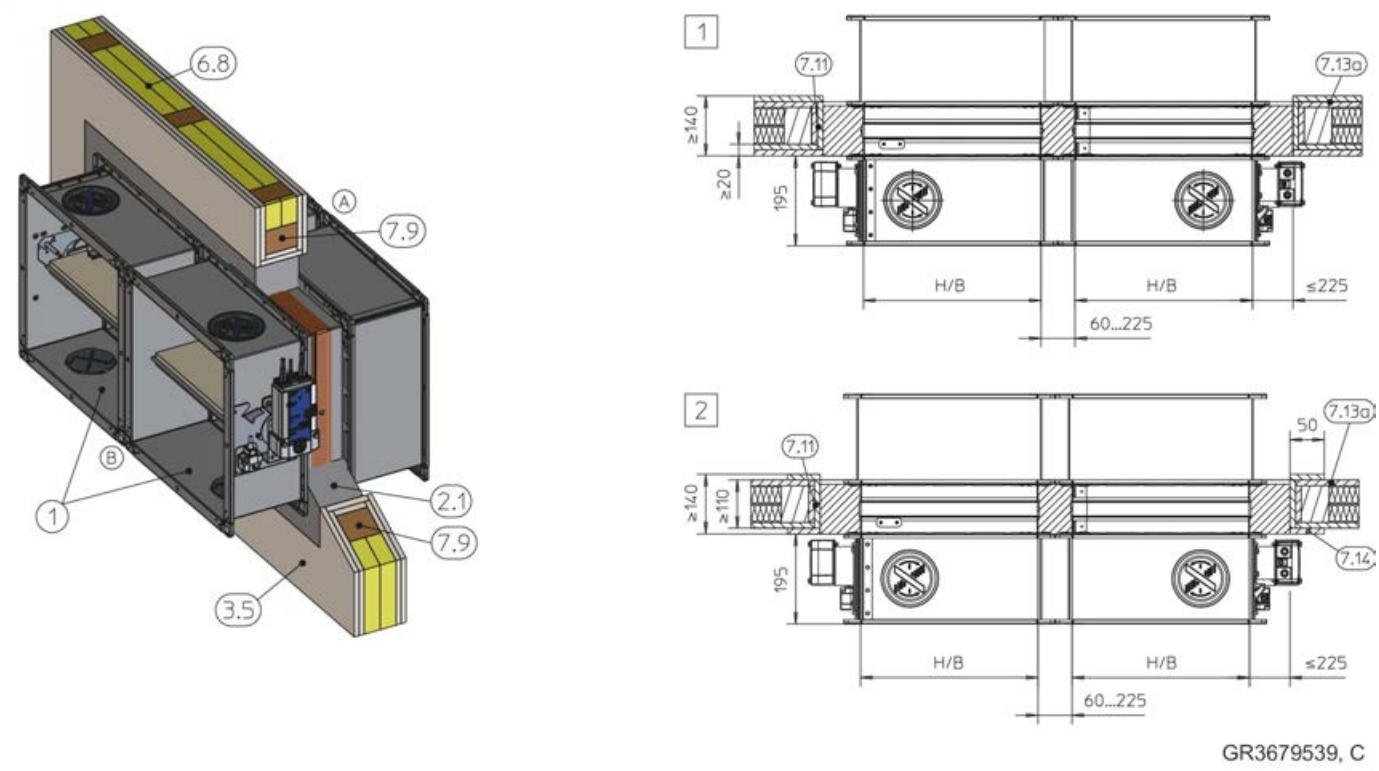


Fig. 123: Mortar-based installation into a lightweight partition wall, half-timbered construction, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FK2-EU
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	Timber structure
7.11	Trim panels, double layer with staggered joints, fire-resistant
7.13a	Cladding, fire-resistant
7.14	Reinforcing board of the same material as the wall
1	Up to EI 120 S
2	EI 30 S

Half-timbered construction, FK2-EU and FKRS-EU combined

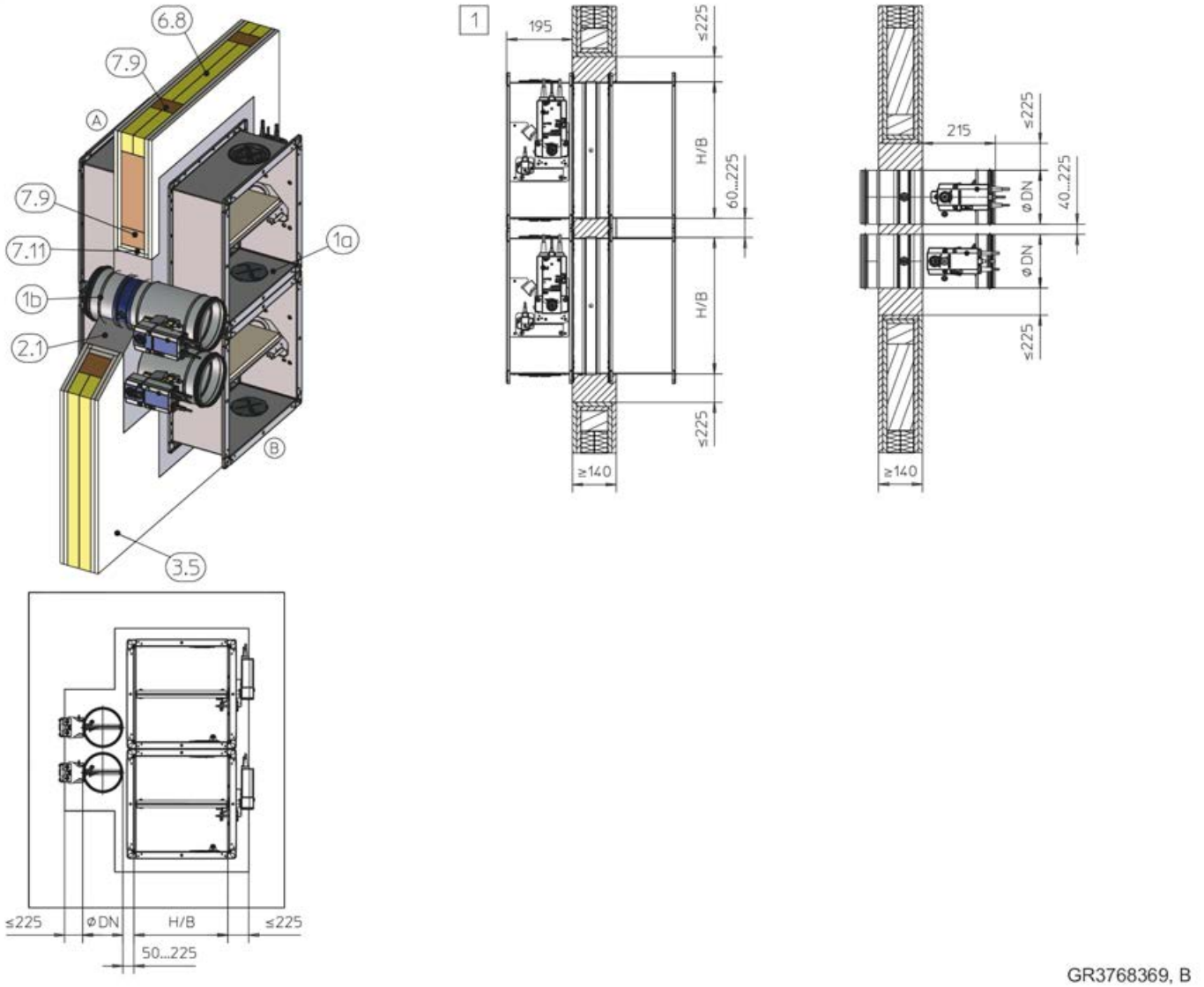


Fig. 124: Mortar-based installation into a lightweight partition wall, half-timbered construction, FK2-EU and FKRS-EU combined

1a FK2-EUup to B × H ≤ 800 × 400 mm
1b FKRS-EU
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 Timber structure
7.11 Trim panels, double layer with staggered joints, fire-resistant
[1] Up to EI 90 S

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For FKR-EU installation details see the FKR-EU installation and operating manual.
- Distance to load-bearing structural elements ≥ 40 mm

Half-timbered construction, FK2-EU and FKR-EU combined

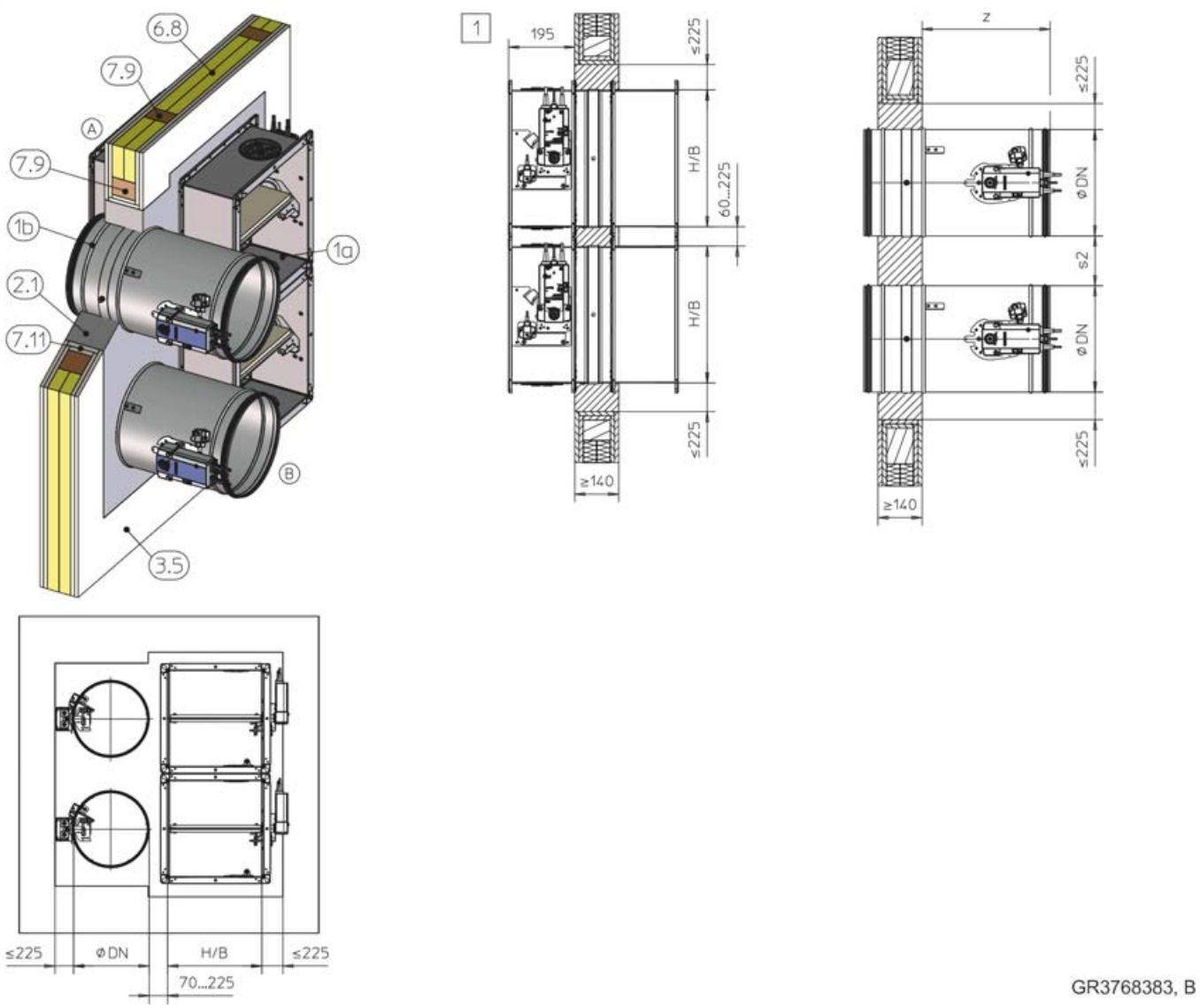


Fig. 125: Mortar-based installation into lightweight partition wall, half-timbered construction, FK2-EU and FKR-EU combined

1a	FK2-EU up to B × H ≤ 800 × 400 mm	7.11	Trim panels, double layer with staggered joints, fire-resistant
1b	FKR-EU		
2.1	Mortar	Z	Construction with spigot 370 mm Construction with flange 342 mm
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)	s2	With spigot 40 – 225 mm With flange 80 – 225 mm
		1	Up to EI 90 S
7.9	Timber structure		

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For FKR-EU installation details see the FKR-EU installation and operating manual.
- Distance to load-bearing structural elements ≥ 40 mm

Additional requirements: mortar-based installation into lightweight partition walls with timber support structure

- Timber stud wall or half-timbered construction,
  ↳ *on page 45*
- Casing lengths L = 305 and 500 mm

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

Timber stud wall

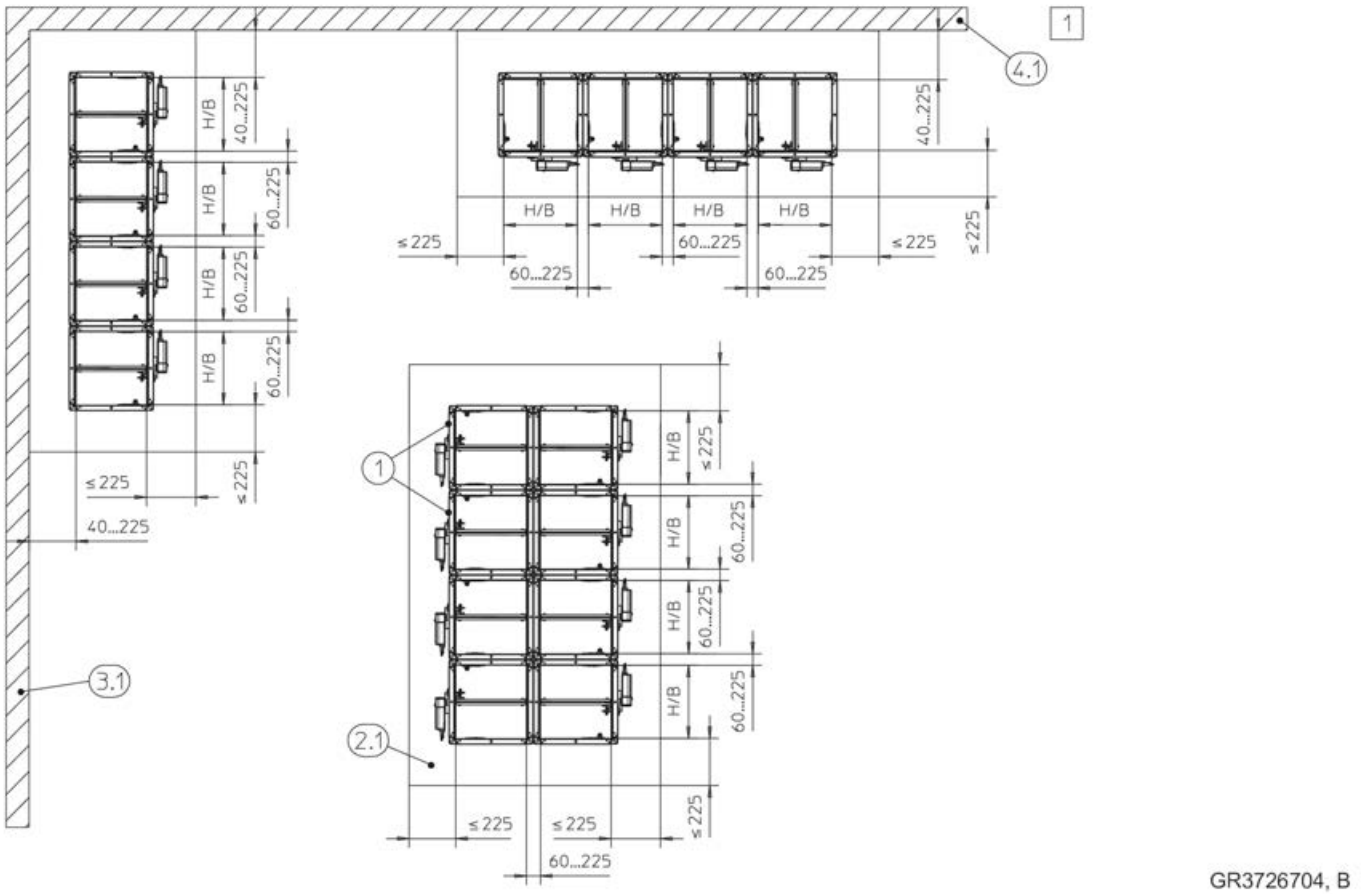


Fig. 126: Mortar-based installation – multiple installation into one installation opening (timber stud wall / half-timbered construction)

1 FK2-EU
2.1 Mortar
3.1 Solid wall (load-bearing structural element)
4.1 Solid ceiling slab (load-bearing structural element)
[1] Up to EI 90 S

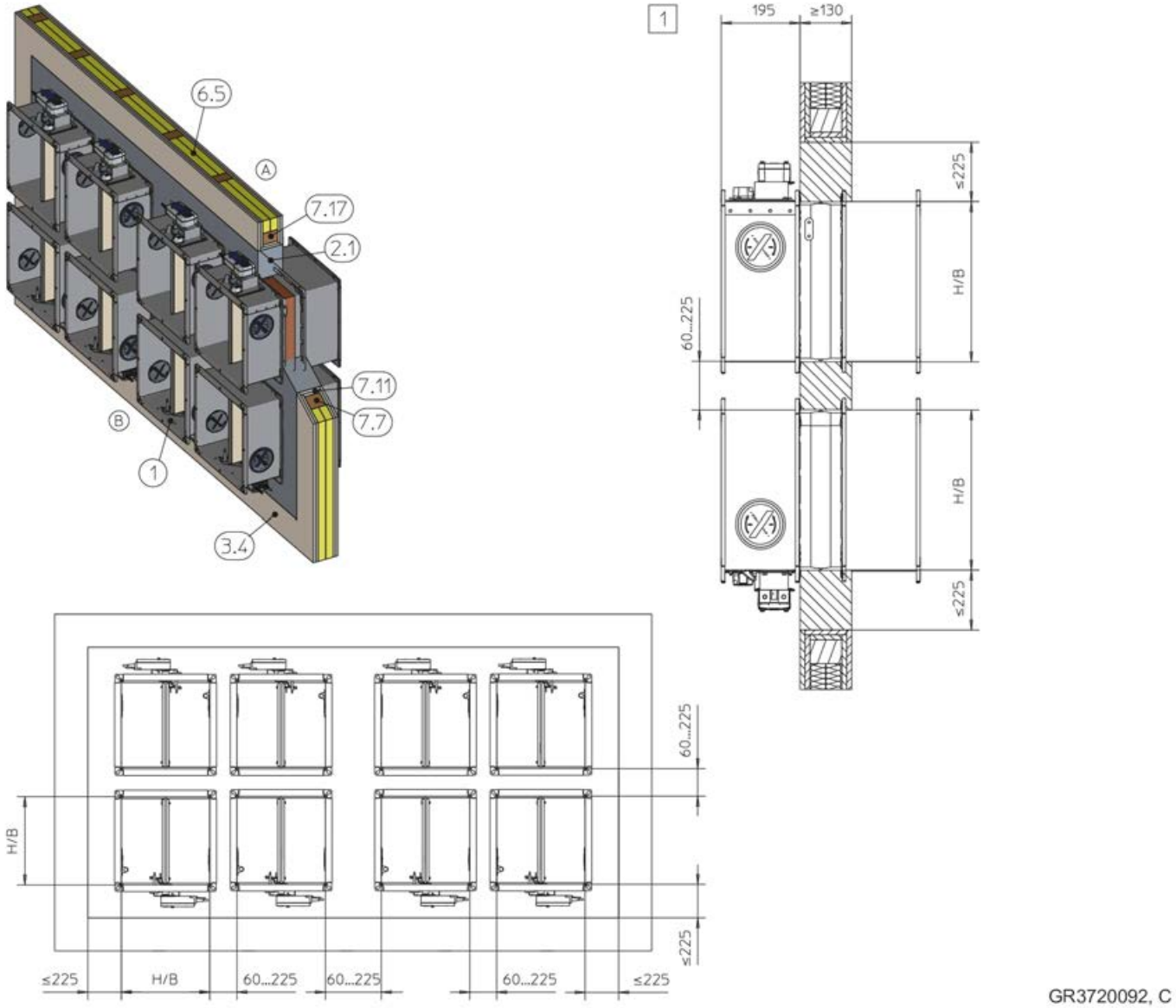


Fig. 127: Mortar-based installation – multiple installation into one installation opening in a timber stud wall

1 FK2-EU
2.1 Mortar
3.4 Timber stud wall (also timber panel constructions), cladding on both sides
6.5 Mineral wool (depending on wall construction)
7.7 Timber support structure, at least 60 × 80 mm (at least 60 × 60 mm with F60)
7.11 Trim panels, double layer with staggered joints, fire-resistant
7.17 Trimmers, timber stud / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
[1] Up to EI 90 S

Half-timbered wall

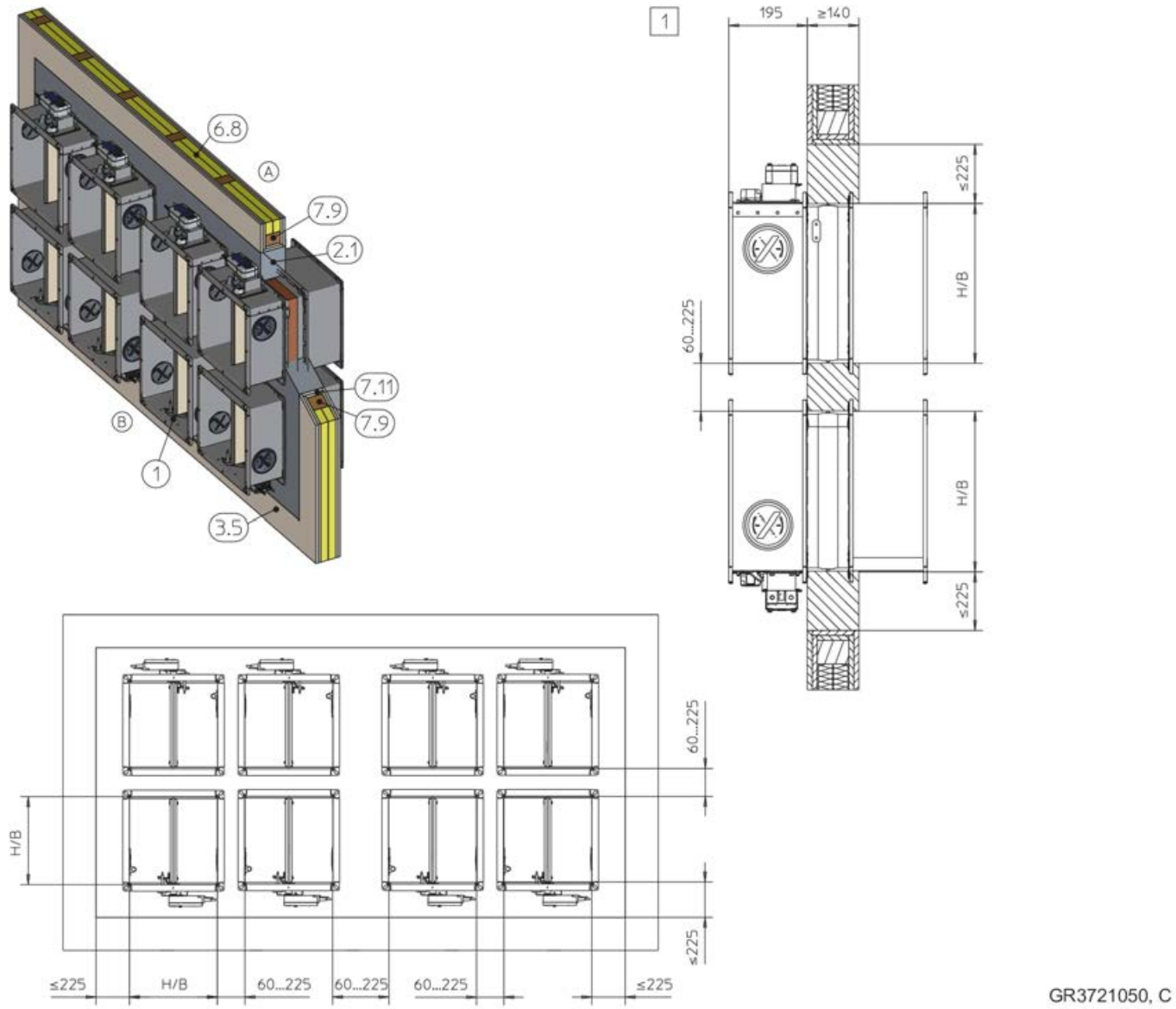


Fig. 128: Mortar-based installation – multiple installation into one installation opening in a half-timbered construction

1 FK2-EU
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 Timber structure
7.11 Trim panels, double layer with staggered joints, fire-resistant
[1] Up to EI 90 S

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

- Timber stud wall or half-timbered construction, ↳ *on page 45*
- Casing length L = 305 or 500 mm
- Total fire damper area (B × H) ≤ 4.8 m²
- The possible number of fire dampers in an installation opening depends on the sizes of the fire dampers (B × H) and on the total fire damper area (4.8 m²)
- The dampers can be arranged in one or two rows.
- Distance to load-bearing structural elements ≥ 40 mm
- If the actuators are located between the fire dampers, sufficient clear space for inspection must be provided.
- The mortar bed width must not exceed 225 mm, provide separate trimmers if necessary.

5.6.4 Mortar-based installation – 4 dampers with a common duct

Timber stud wall

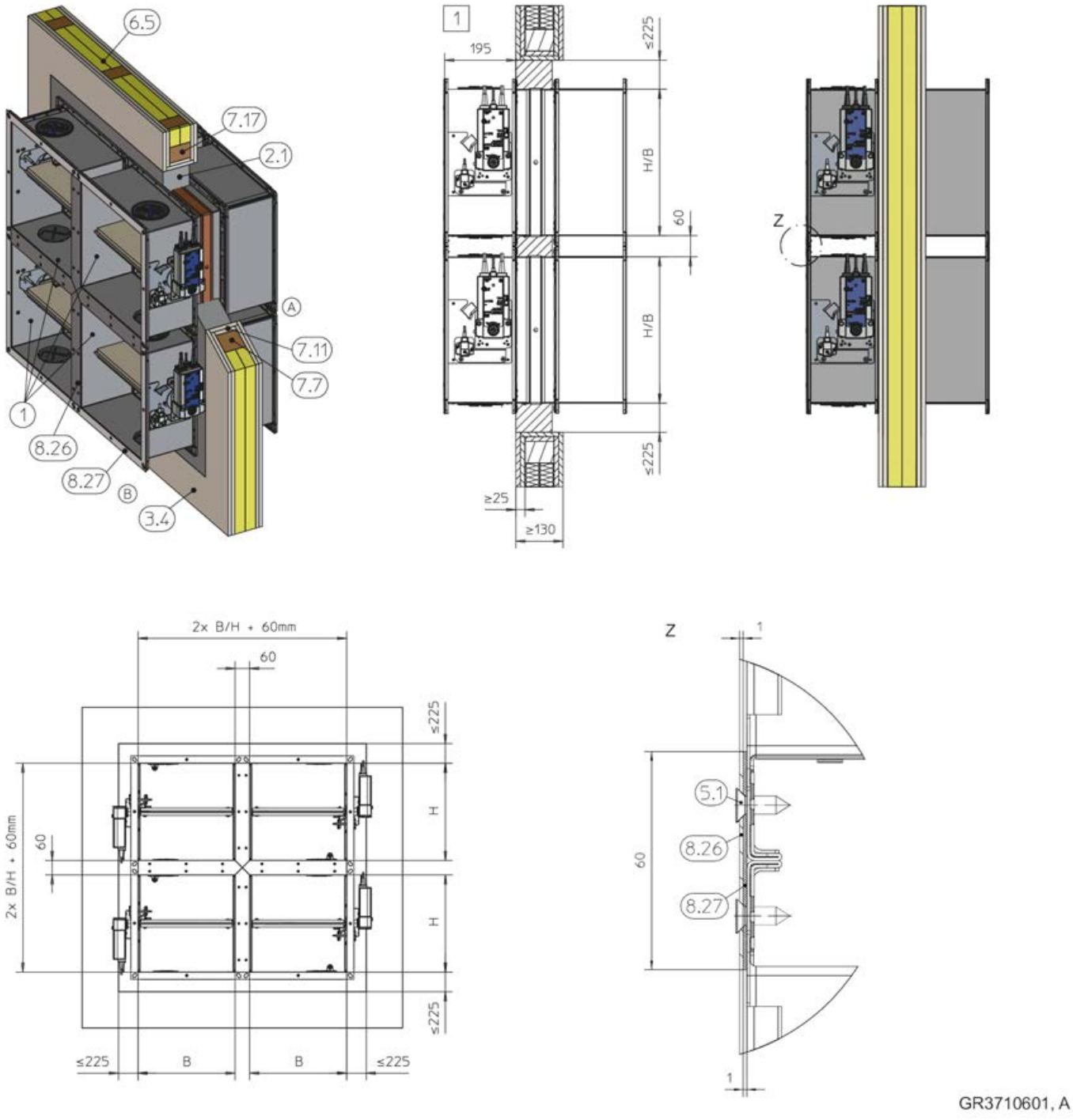


Fig. 129: Mortar-based installation – 4 dampers with a common duct, timber stud wall

1	FK2-EU	7.11	Trim panels, double layer with staggered joints, fire-resistant
2.1	Mortar	7.17	Trimmers, timber stud / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
3.4	Timber stud wall (also timber panel constructions), cladding on both sides	8.26	Sheet metal cover, t = 1 mm (by others)
5.1	Self-tapping screws, spacing ~ 150 mm	8.27	Seal
6.5	Mineral wool (depending on wall construction)	[1]	Up to EI 90 S
7.7	Timber support structure, at least 60 × 80 mm (at least 60 × 60 mm with F60)		

Half-timbered wall

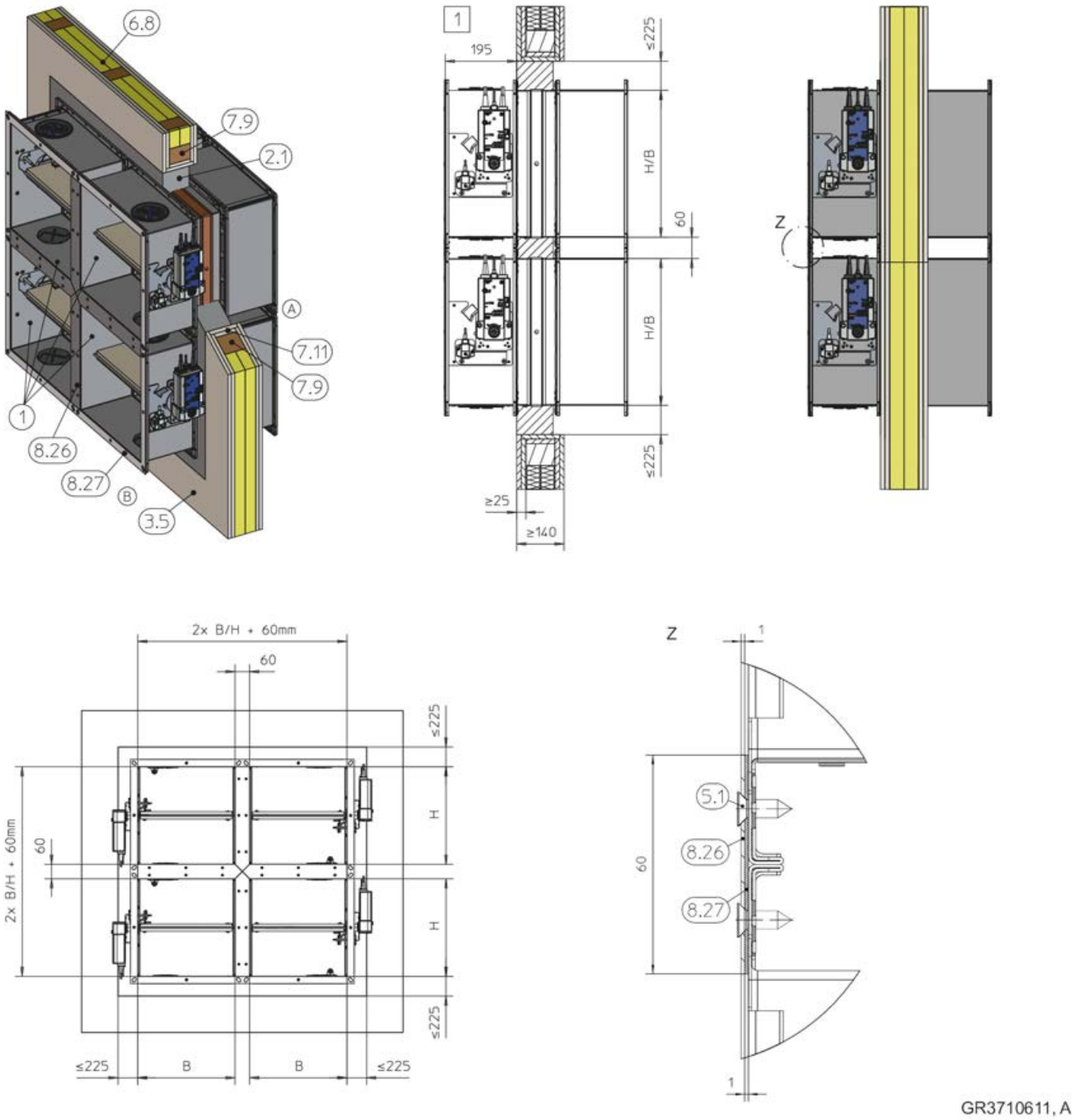


Fig. 130: Mortar-based installation – 4 dampers with a common duct, half-timbered construction

1	FK2-EU	7.9	Timber structure
2.1	Mortar	7.11	Trim panels, double layer with staggered joints, fire-resistant
3.5	Half-timbered construction, cladding on both sides		
5.1	Self-tapping screws, spacing ~ 150 mm	8.26	Sheet metal cover, t = 1 mm (by others)
6.8	Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)	8.27	Seal
		[1]	Up to EI 90 S

Additional requirements: mortar-based installation – 4 dampers with a common duct

- Timber stud wall or half-timbered construction,
  ↳ *on page 45*
- Casing length L = 500 mm
- 4 dampers, up to 4.8 m^2 total fire damper area (common duct)
- Combination of 4 fire dampers next to and on top of one another, connection/sealing with sheet metal covers (by others).
- Place the sheet metal covers (galvanised steel, at least 1 mm, approx. 60 mm wide, L = 2 × B / H + 60 mm) onto a duct seal and fix them with self-tapping screws spaced approx. 150 mm apart.
- Close off the perimeter gaps and the gaps between the damper casings with mortar.
- For EI 120 S: Place mineral wool (6.2) around the perimeters of both the operating and installation sides; do not cover the operating elements, otherwise the function of the damper will be impaired. Inspection accesses and the product sticker must remain accessible.
- Distance to load-bearing structural elements ≥ 40 mm

5.6.5 Dry mortarless installation with installation kit ES

Timber stud wall

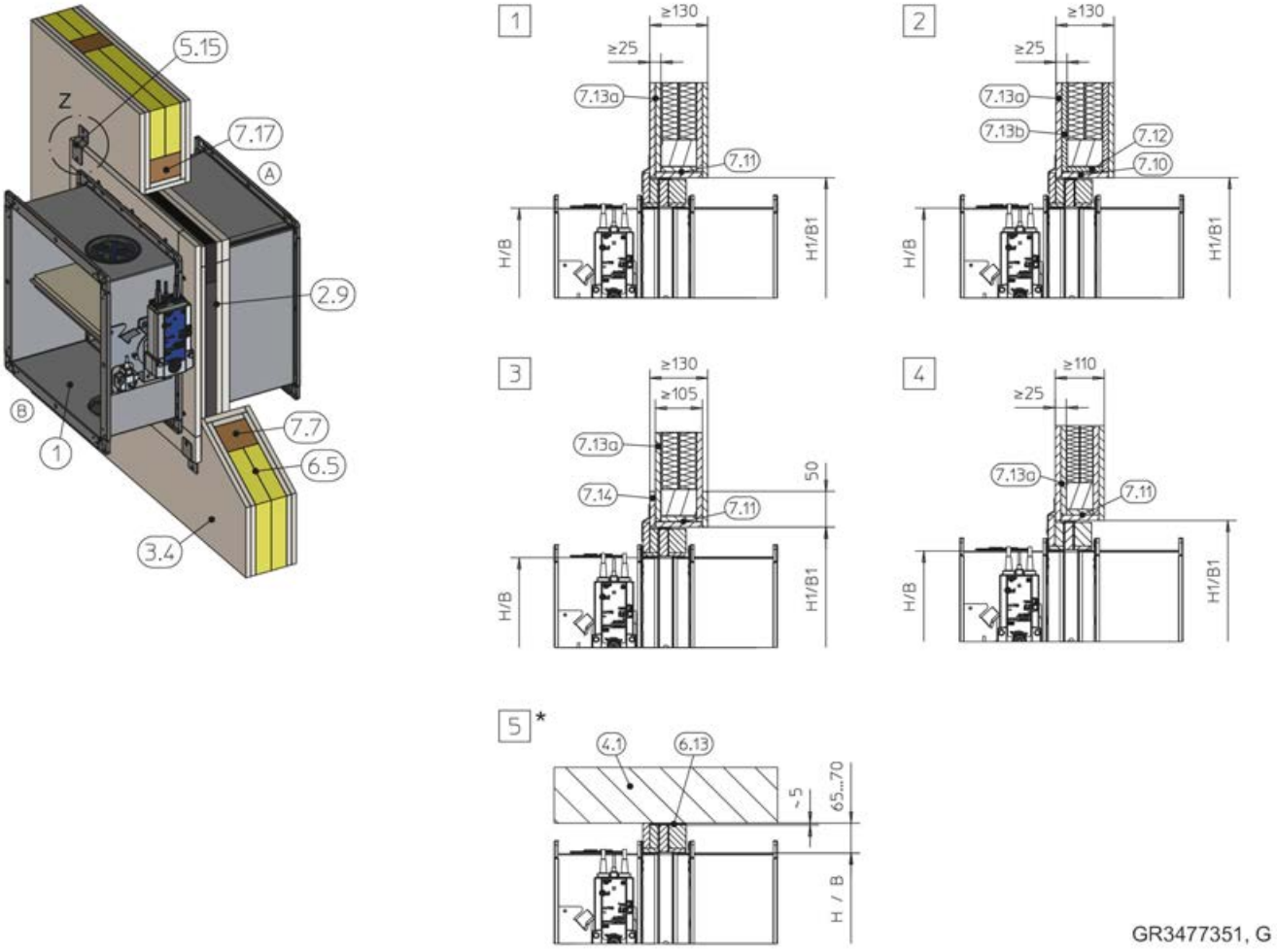


Fig. 131: Dry mortarless installation into a lightweight partition wall with timber support structure, with installation kit ES

1	FK2-EU
2.9	Installation kit ES
3.4	Timber stud wall (also timber panel constructions), cladding on both sides
4.1	Solid ceiling slab / solid floor
5.15	Bracket
6.5	Mineral wool (depending on wall construction)
6.13	Mineral wool strips A1, filler as an alternative (to even out an uneven floor or ceiling slab)
7.7	Timber stud / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
7.10	Trim panels (fire-resistant)
7.11	Trim panels, double layer with staggered joints, fire-resistant
7.12	Trim panels, wood sheet, at least 600 kg/³
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, at least 60 × 80 mm (at least 60 × 60 mm with F60)
*	Installation near the floor as in 5
H1/B1	Installation opening, see table *138*
Z	For fixing, see Fig. 23 to Fig. 25
1	up to EI 120 S: B × H > 800 × 400 – 1500 × 800 mm Up to EI 90 S: B × H = 200 × 100 – 1500 × 800 mm
2 3	EI 30 S
4	Up to EI 60 S
5	EI 30 to EI 120 S (horizontal installation position)

Half-timbered wall

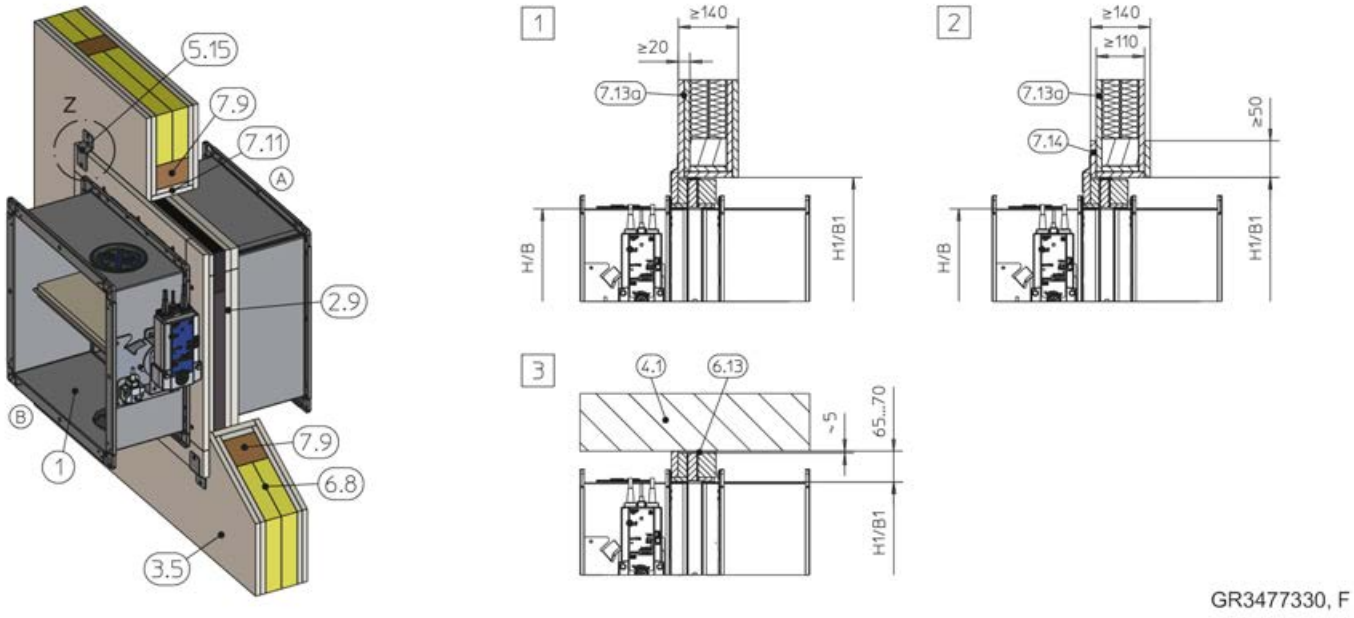


Fig. 132: Dry mortarless installation into a half-timbered construction, with installation kit ES

1 FK2-EU
2.9 Installation kit ES
3.5 Half-timbered construction, cladding on both sides
4.1 Solid ceiling slab
5.15 Bracket
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, filler as an alternative (to even out an uneven floor or ceiling slab)
7.9 Timber structure
7.11 Trim panels, double layer with staggered joints, fire-resistant
7.13a Cladding, fire-resistant
7.14 Reinforcing board of the same material as the wall
H1/B1 Installation opening, see table *138*
Z For fixing, see Fig. 23 to Fig. 25
1 up to EI 120 S:
B × H > 800 × 400 – 1500 × 800 mm
Up to EI 90 S:
B × H = 200 × 100 – 1500 × 800 mm
2 EI 30 S
3 EI 30 to EI 120S

Additional requirements: dry mortarless installation into lightweight partition walls with timber studs and half-timbered constructions, with installation kit ES

- Timber stud wall or half-timbered construction, *on page 45*
- Casing length L = 500 mm
- Distance between the fire damper and adjacent structural elements 80 mm / 120 mm (depending on the position of the brackets)
- 65 – 70 mm distance between the fire damper with a shortened installation kit and load-bearing structural elements
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Ensure accessibility from the rear.

1. Mount the installation kit onto the fire damper, *5.3.1 'Installation kit ES – supply package and assembly' on page 47* .
2. Position the fire damper in the centre of the installation opening and fix it with brackets and dry wall screws to the timber stud frame or half-timbered construction, see Fig. 23 to Fig. 25 .

5.6.6 Dry mortarless installation with mineral wool

Timber stud wall

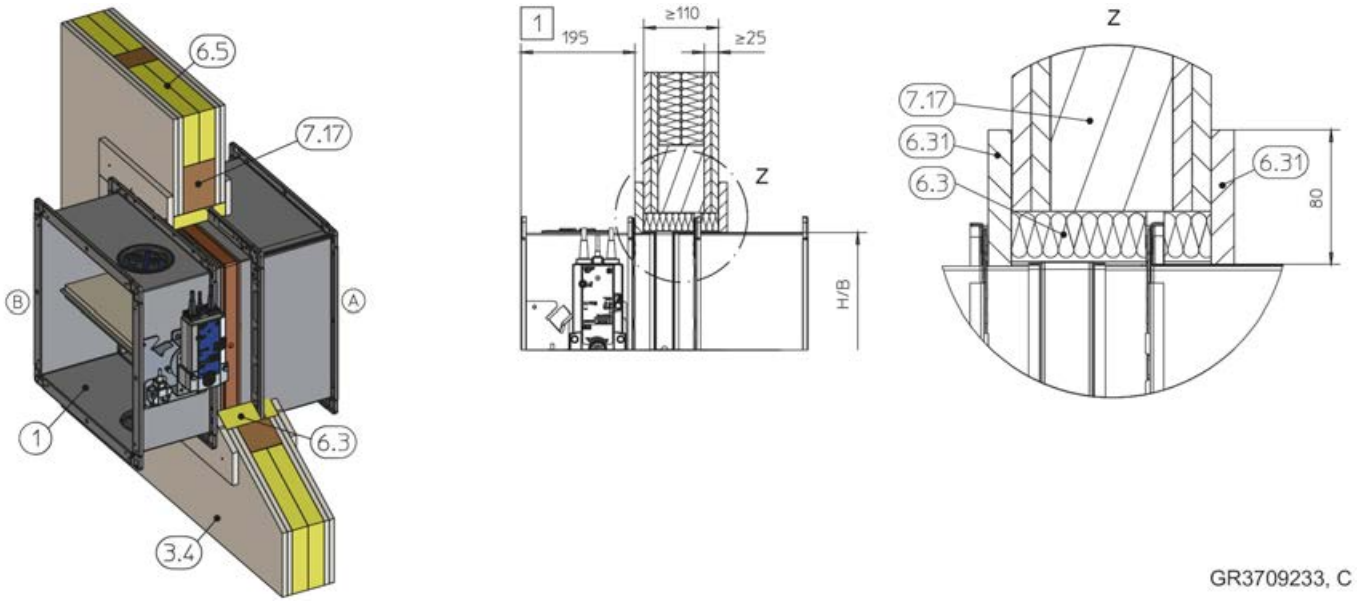


Fig. 133: Dry mortarless installation into a lightweight partition wall with timber support structure

1	FK2-EU	6.31	Fire-rated plasterboard strips, d = 12.5 mm
3.4	Timber stud wall (also timber panel constructions), cladding on both sides	7.17	Trimmers, timber stud / nogging, at least 60 × 80 mm
6.3	Mineral wool, ≥ 1000 °C, ≥ 100 kg/m³, d = 40 mm	[1]	Up to EI 60 S
6.5	Mineral wool (depending on wall construction)		

Half-timbered wall

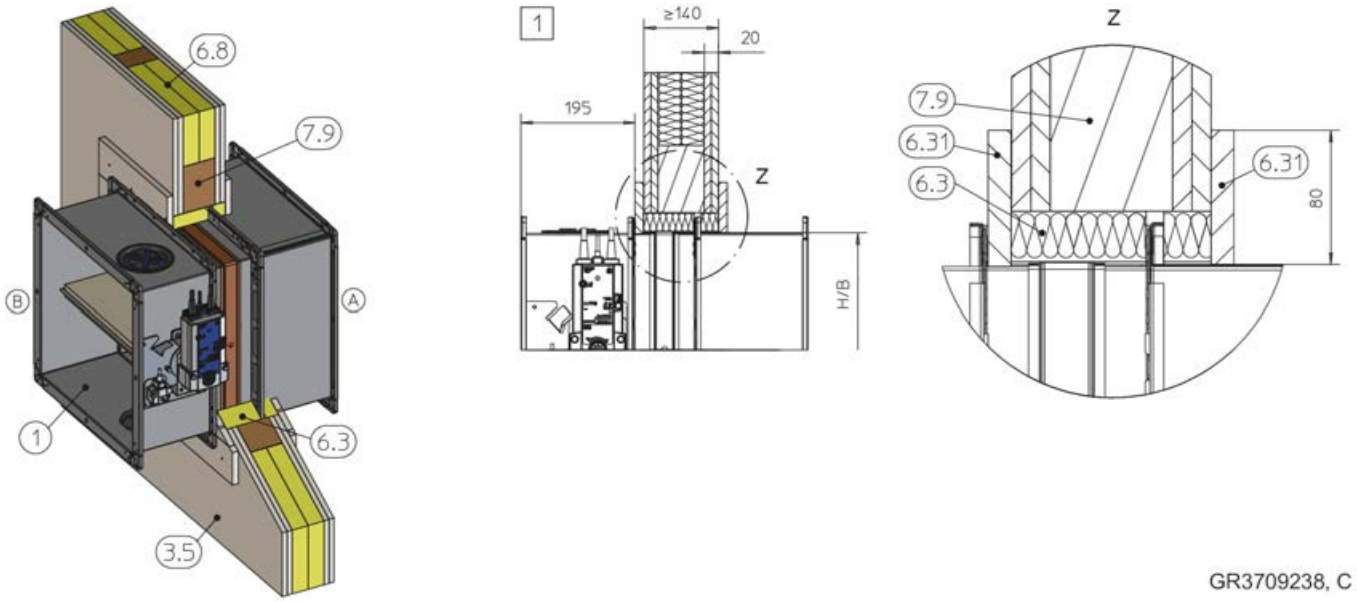


Fig. 134: Dry mortarless installation into a half-timbered construction, with mineral wool

1	FK2-EU	6.31	Fire-rated plasterboard strips, d = 12.5 mm
3.5	Half-timbered construction, cladding on both sides	7.9	Timber structure
6.3	Mineral wool, ≥ 1000 °C, ≥ 100 kg/m³, d = 40 mm	[1]	Up to EI 60 S
6.8	Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)		

Additional requirements: dry mortarless installation into lightweight partition walls with timber support structure and half-timbered constructions, with mineral wool

- Timber stud wall or half-timbered construction,
  ↳ *on page 45*
- Casing length L = 500 mm
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Distance to load-bearing structural elements ≥ 80 mm

1. ▸ Create a clear opening with B + 74 (±2) mm and H + 86 (±2) mm.
2. ▸ Cut mineral wool strips (6.3) and fire-rated plasterboard strips (6.31) to size.
3. ▸ Place mineral wool strips and fire-rated plasterboard strips on the operating side (B) around the damper casing and secure them (use filler to secure them if necessary).
4. ▸ Push the fire damper into the installation opening; screw-fix fire-rated plasterboard strips on the operating side (B) to the perimeter timber stud frame / half-timbered construction (screw spacing approx. 150 mm).
5. ▸ Attach the fire-rated plasterboard strips on the installation side (A) and screw-fix them to the perimeter timber stud frame / half-timbered construction (screw spacing approx. 150 mm).

5.6.7 Dry mortarless installation with fire batt

Timber studs

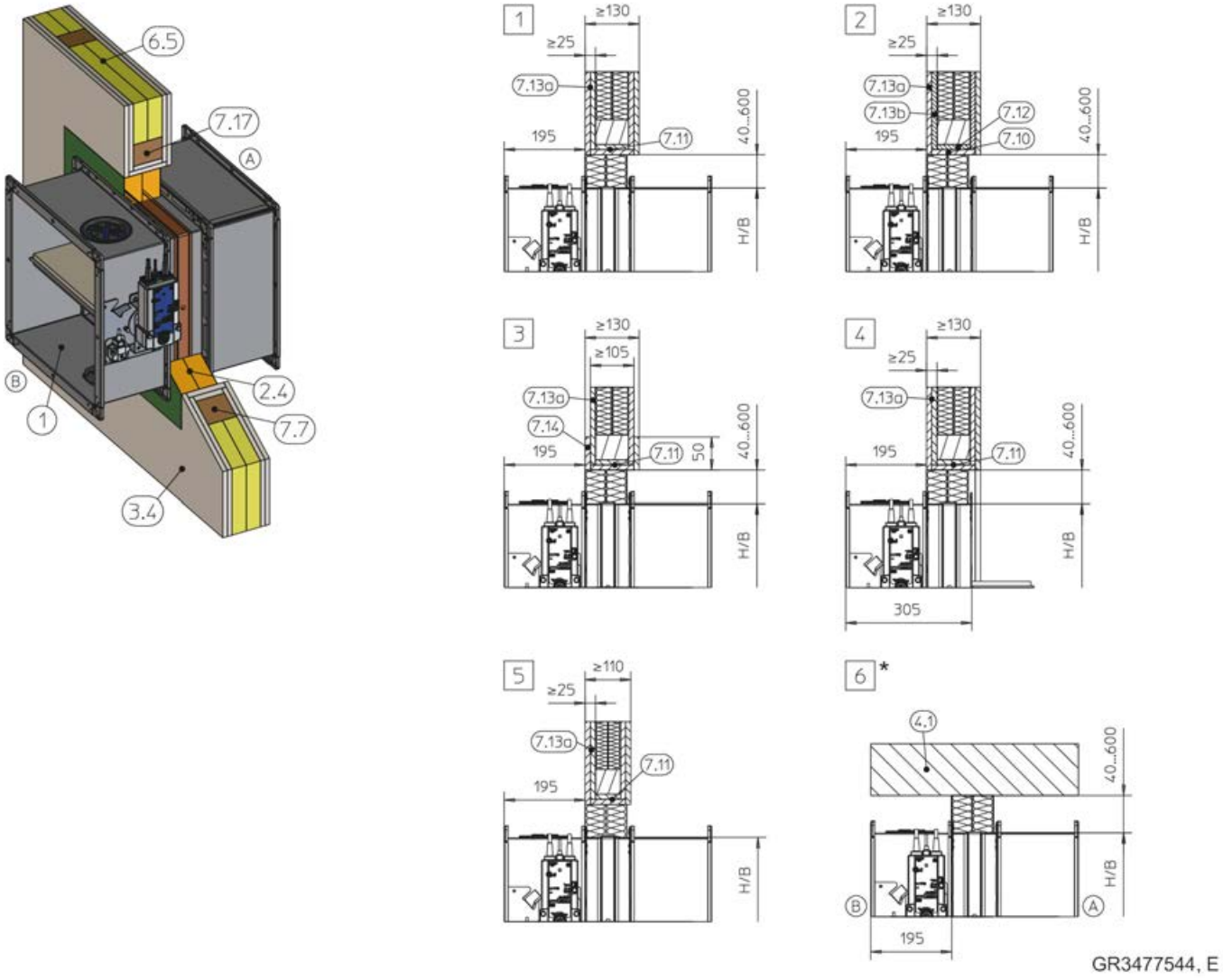


Fig. 135: Dry mortarless installation into a lightweight partition wall with timber support structure, with a fire batt

1	FK2-EU
2.4	Coated board system
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 / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
7.10	Trim panels (fire-resistant)
7.11	Trim panels, double layer with staggered joints, fire-resistant
7.12	Trim panels, wood sheet, at least 600 kg/³
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, at least 60 × 80 mm (at least 60 × 60 mm with F60)
*	Installation near the floor as in 6
1 4	Up to EI 120 S: B × H = 200 × 100 – 800 × 400 mm (horizontal installation position) Up to EI 90 S: B × H = 200 × 100 – 1500 × 800 mm
2 3	EI 30 S
5	Up to EI 60 S
6	EI 30 to EI 120 S

Timber support structure, flange to flange

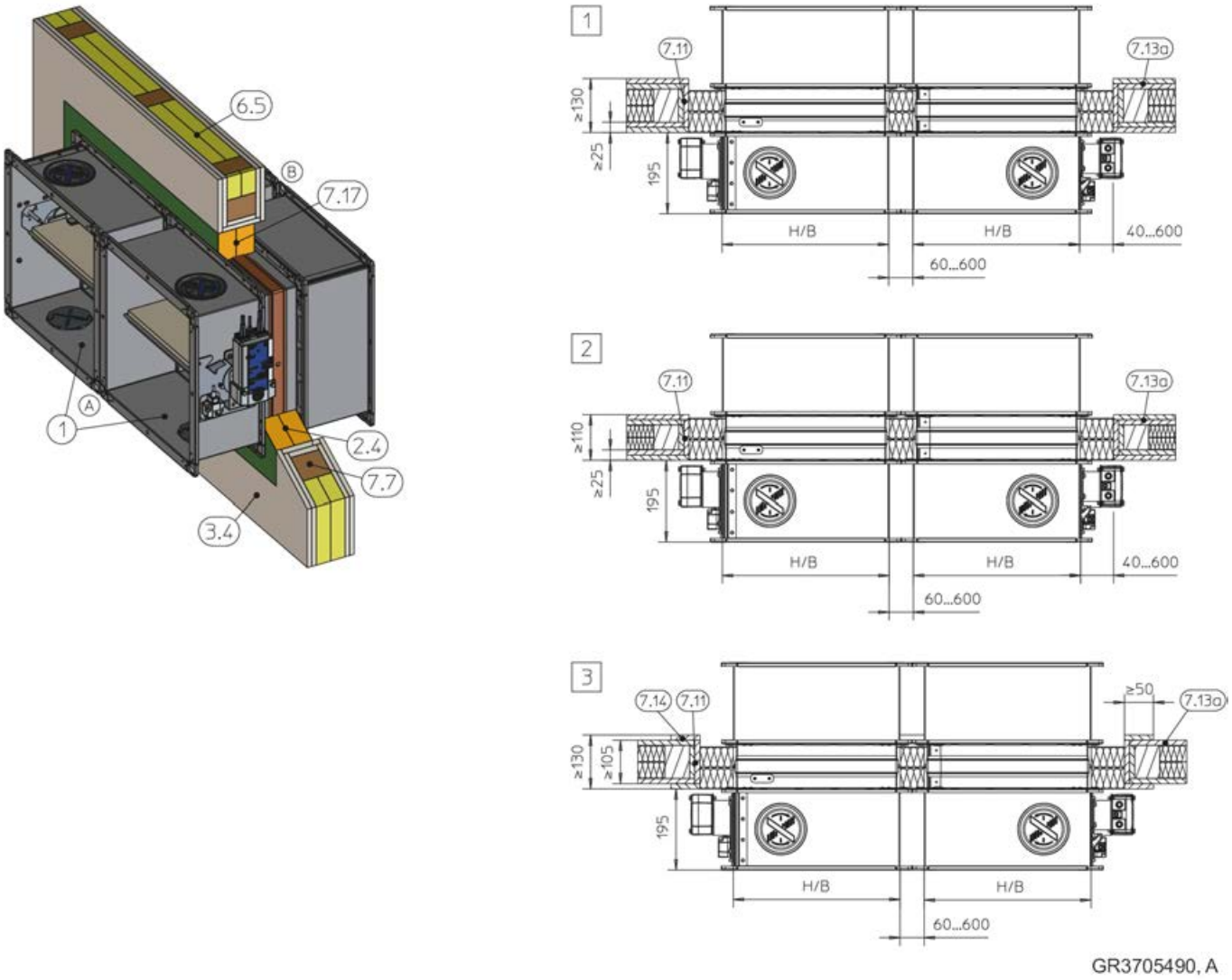


Fig. 136: Dry mortarless installation into a lightweight partition wall with timber support structure, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FK2-EU
2.4	Coated board system
3.4	Timber stud wall (also timber panel constructions), cladding on both sides
6.5	Mineral wool (depending on wall construction)
7.7	Timber stud / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
7.11	Trim panels, double layer with staggered joints, fire-resistant
7.13a	Cladding, fire-resistant
7.14	Reinforcing board of the same material as the wall
7.17	Trimmers, timber stud / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
1	Up to EI 90 S
2	Up to EI 60 S
3	EI 30

Timber structure

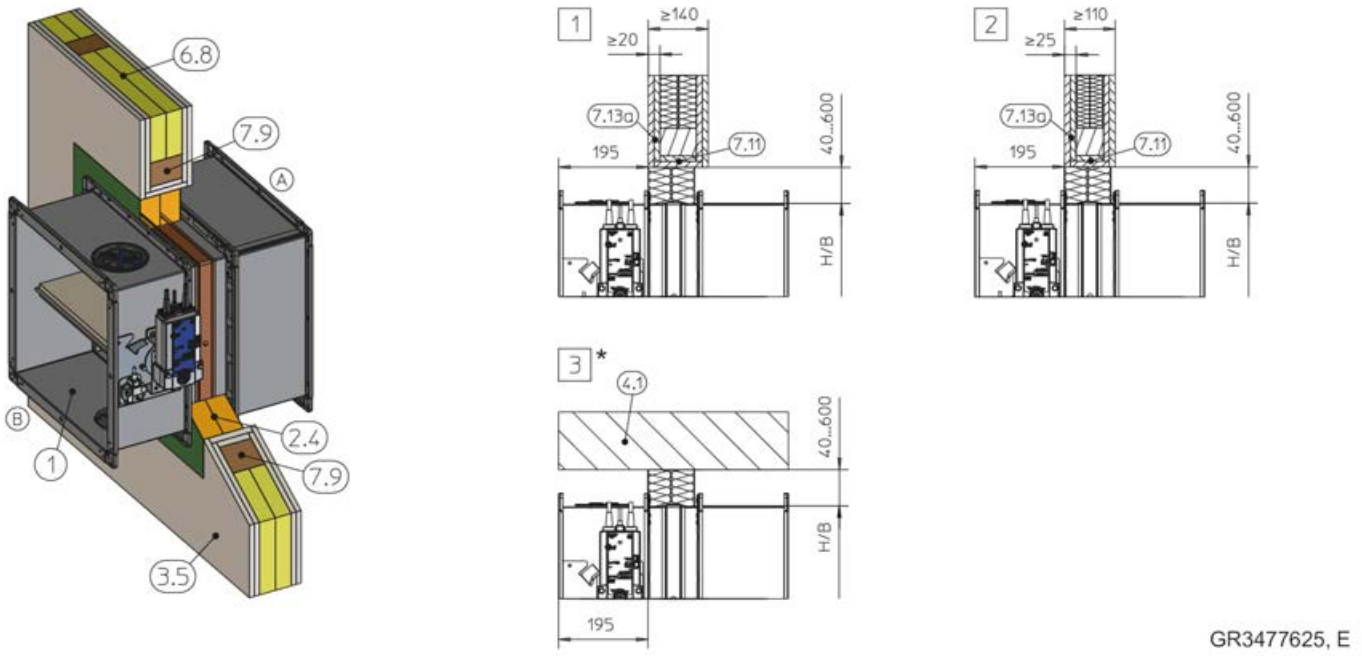


Fig. 137: Dry mortarless installation into a half-timbered construction, with fire batt

1	FK2-EU
2.4	Coated board system
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	Timber structure
7.11	Trim panels, double layer with staggered joints, fire-resistant
7.13a	Cladding, fire-resistant
*	Installation near the floor as in 3
1 4	Up to EI 120 S: B × H = 200 × 100 – 800 × 400 mm (horizontal installation position) Up to EI 90 S: B × H = 200 × 100 – 1500 × 800 mm
2	EI 30 S
3	EI 30 S to EI 120 S

Half-timbered construction, flange to flange

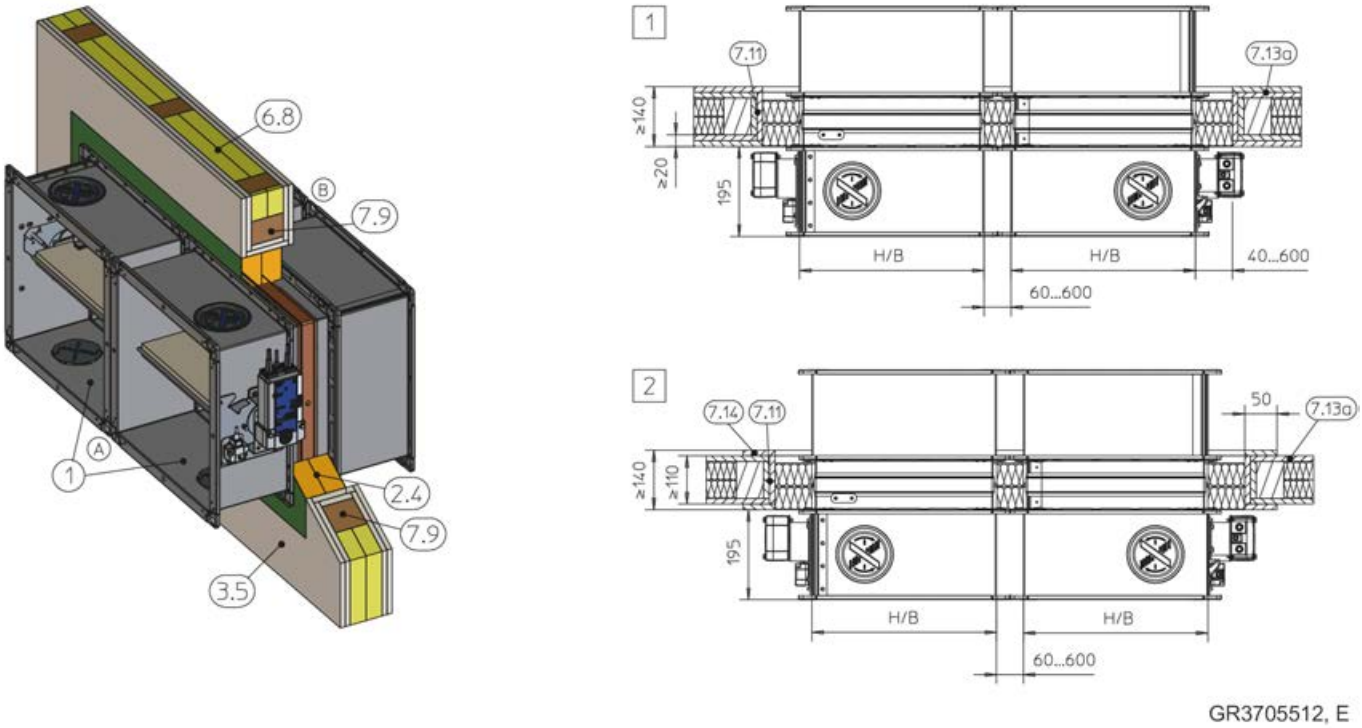


Fig. 138: Dry mortarless installation into a half-timbered construction, with a fire batt, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FK2-EU
2.4	Coated board system
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	Timber structure
7.11	Trim panels, double layer with staggered joints, fire-resistant
7.13a	Cladding, fire-resistant
7.14	Reinforcing board of the same material as the wall
1	Up to EI 90 S
2	EI 30 S

Timber support structure, multiple installation, flange to flange

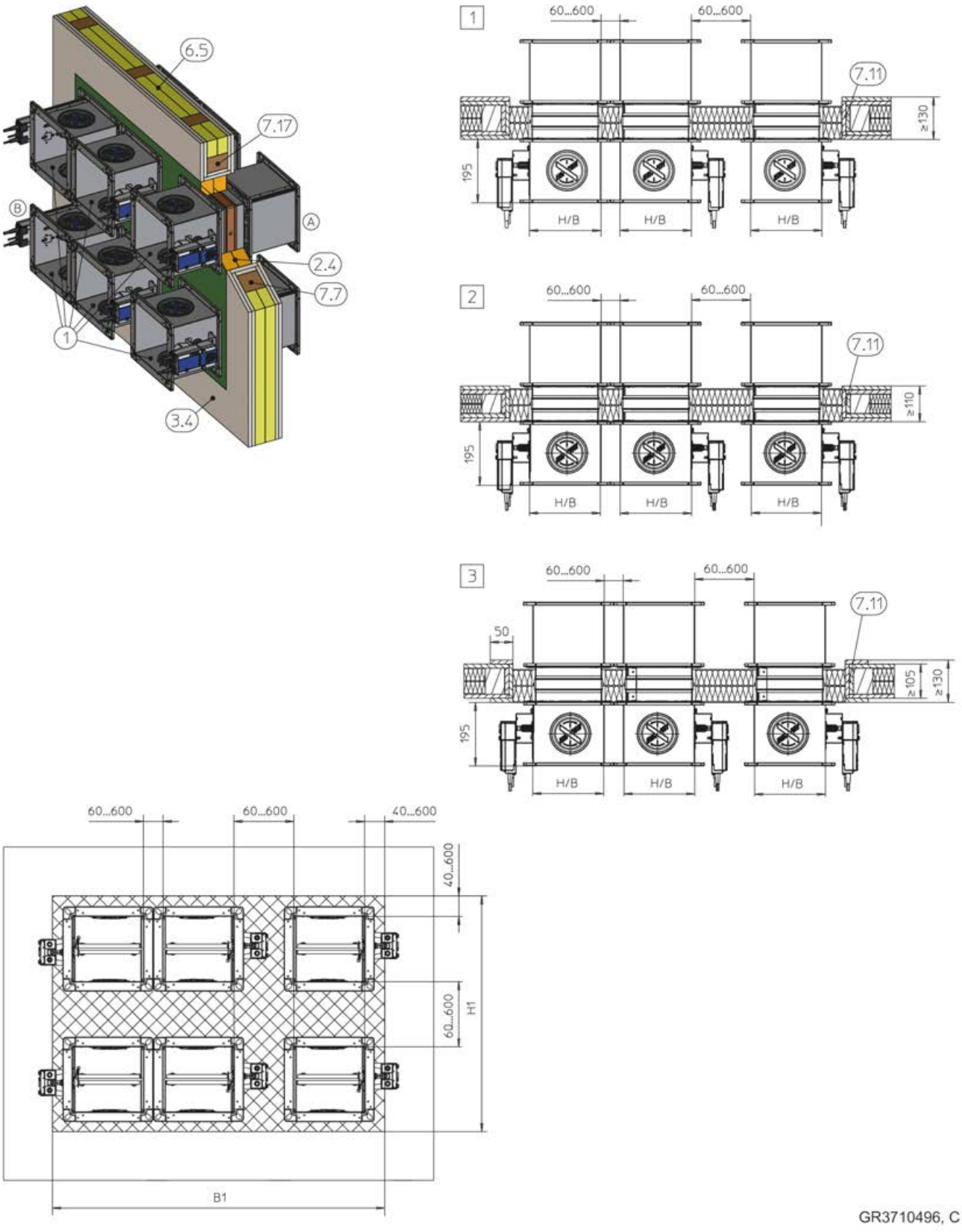


Fig. 139: Dry mortarless installation into a lightweight partition wall with timber support structure, with a fire batt, multiple installation, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FK2-EU
2.4	Coated board system
3.4	Timber stud wall (also timber panel constructions), cladding on both sides
6.5	Mineral wool (depending on wall construction)
7.7	Timber stud / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
7.11	Trim panels, double layer with staggered joints, fire-resistant
7.17	Trimmers, timber stud / nogging, at least 60 × 80 mm (at least 60 × 60 mm with F60)
1	Up to EI 90 S
2	Up to EI 60 S
3	EI 30 S

For multiple installation please note:

- Total fire damper area: 2.4 m² max.
- The possible number of fire dampers in a fire batt depends on the sizes of the fire dampers (B × H) and on the total fire damper area (2.4 m²).
- Maximum fire batt size: B1 x H1, depending on manufacturer
- Distance to load-bearing structural elements ≥ 40 mm

Timber support structure, multiple installation, flange to flange

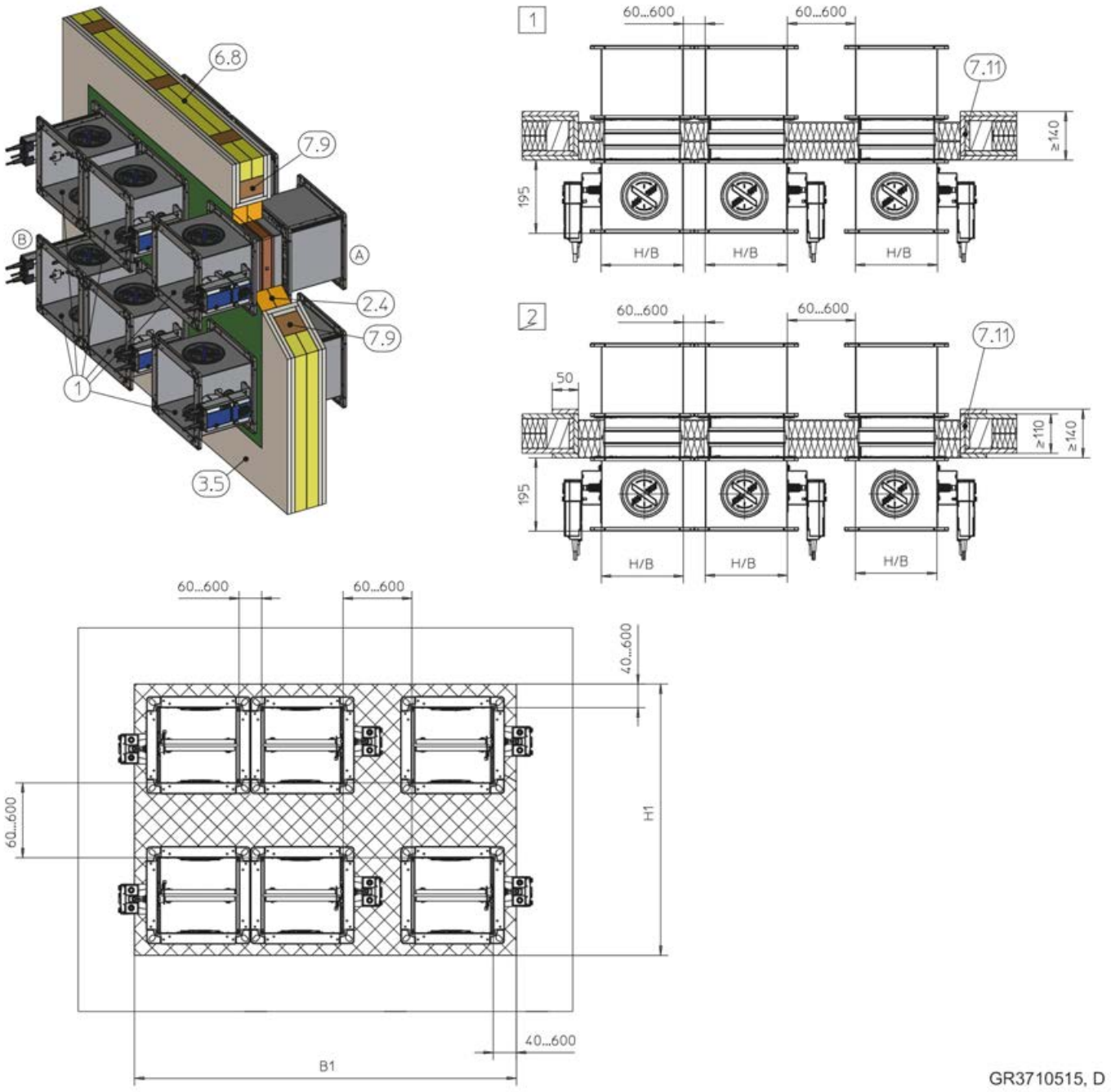


Fig. 140: Dry mortarless installation into a half-timbered construction, with a fire batt, multiple installation, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FK2-EU	7.9	Timber structure
2.4	Coated board system	7.11	Trim panels, double layer with staggered joints, fire-resistant
3.5	Half-timbered construction, cladding on both sides	1	Up to EI 90 S
6.8	Infill (cavities completely filled with mineral wool ≥ 1000 °C, ≥ 50 kg/m³, or bricks, aerated concrete, lightweight concrete, reinforced concrete or clay)	2	EI 30 S

For multiple installation please note:

- Total fire damper area: 2.4 m² max.
- The possible number of fire dampers in a fire batt depends on the sizes of the fire dampers (B × H) and on the total fire damper area (2.4 m²).
- Maximum fire batt size: B1 x H1, depending on manufacturer
- Distance to load-bearing structural elements ≥ 40 mm

Additional requirements: dry mortarless installation with fire batt in lightweight partition walls with timber support structure and half-timbered constructions

- Timber stud wall or half-timbered construction, ↳ *on page 45*
- Casing lengths L = 305 and 500 mm
- EI 120 S: ≥ 200 mm distance between two fire dampers in separate installation openings
- Fire batt systems, installation details, distances / dimensions, ↳ *on page 41*
- Suspension and fixing, ↳ *Chapter 5.13 'Fixing the fire damper' on page 228* ↳ *5.13.3 'Fixing the damper when a fire batt is used' on page 230*

5.7 Solid wood walls

5.7.1 General

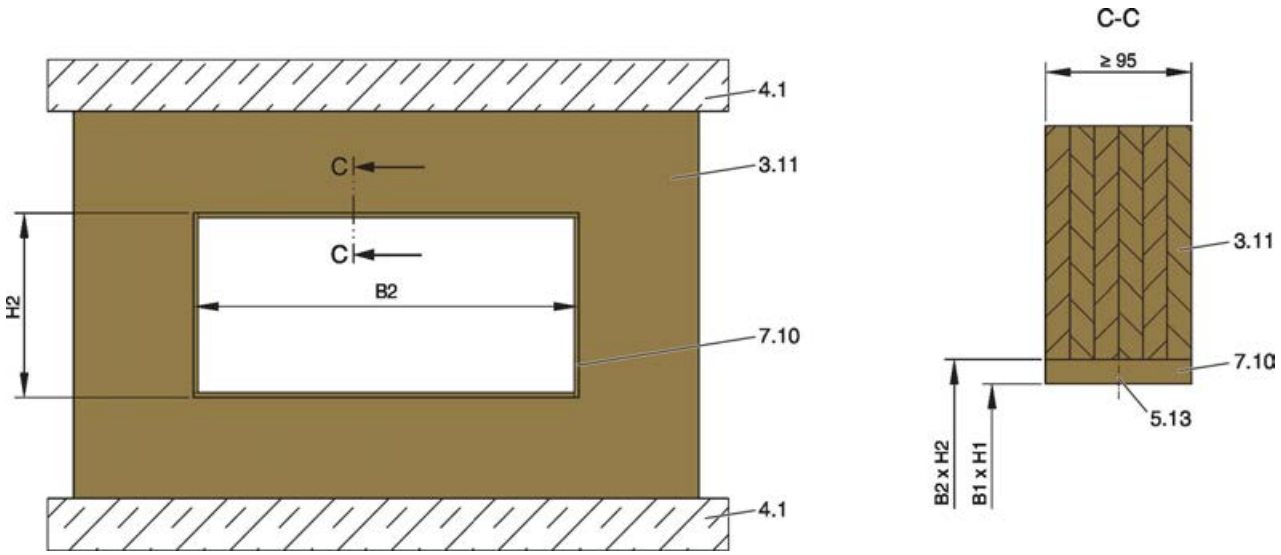


Fig. 141: Solid wood wall

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)
B1 × H1 Clear installation opening
B2 × H2 Opening in a solid wood wall / CLT wall (without trim panels: B2 = B1, H2 = H1)

Installation type	Installation opening [mm]			
	B1	H1	B2	H2
Mortar-based installation	B + 450 max.	H + 450 max.	B1 + (2 × trim panels)	H1 + (2 × trim panels)
Dry mortarless installation with installation kit ES [1]	B + 140	H + 140		
Dry mortarless installation with fire batt	B + 80 to 1200	H + 80 to 1200		

[1] Installation opening tolerance ± 2 mm

Additional requirements: solid wood walls

- Solid wood wall or CLT wall, *on page 45*

5.7.2 Mortar-based installation

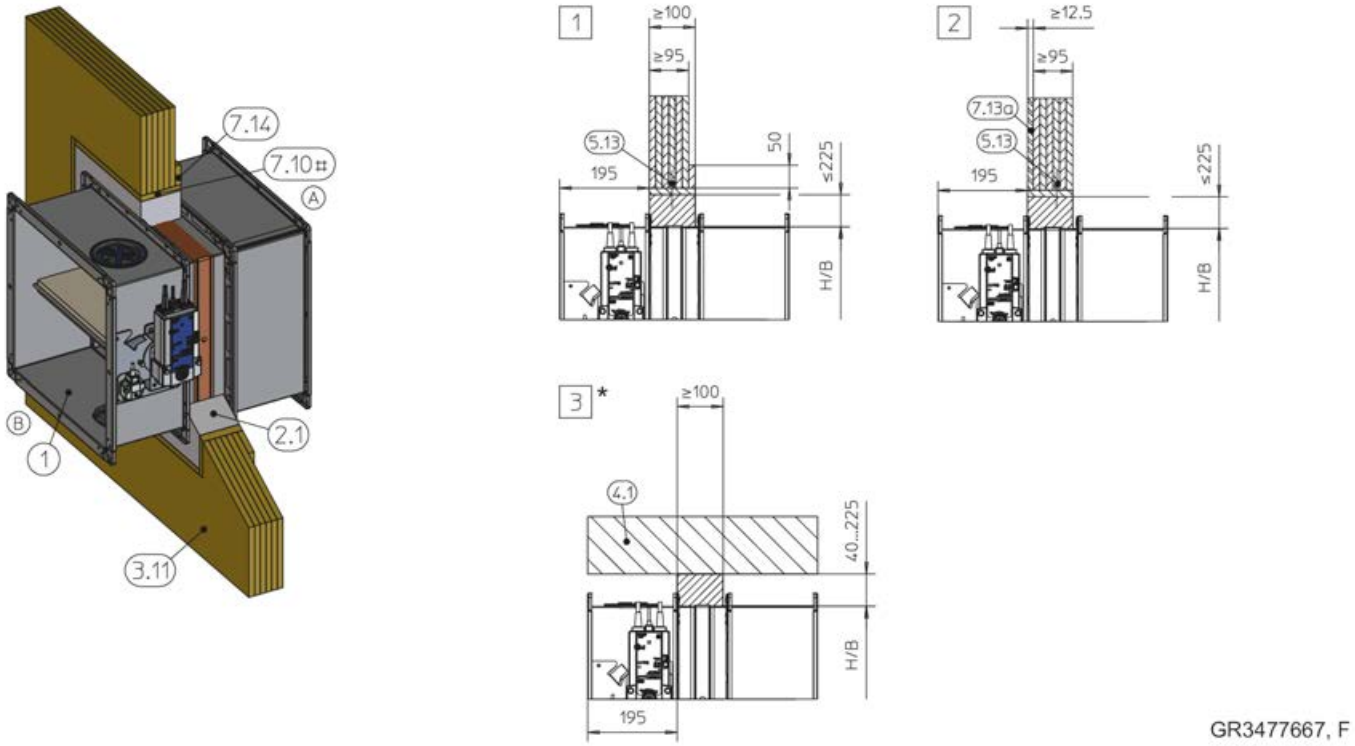


Fig. 142: Mortar-based installation into a solid wood wall or CLT wall

1	FK2-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#	Optional trim panels
7.13a	Cladding, fire-resistant
7.14	Reinforcing board of the same material as the wall (required on operating or installation side if W < 100 mm)
*	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 45*
- Casing lengths L = 305 and 500 mm
- ≥ 200 mm distance between two fire dampers in separate installation openings

5.7.3 Dry mortarless installation with installation kit ES

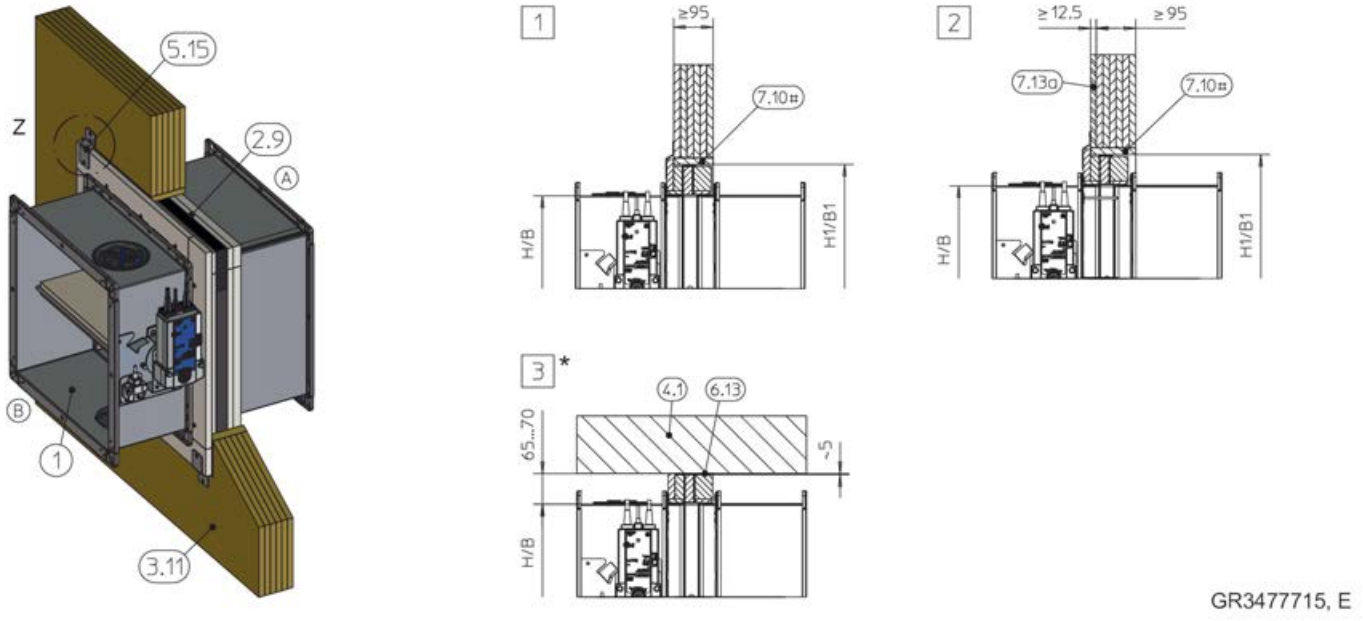


Fig. 143: Dry mortarless installation into a solid wood wall or CLT wall, with installation kit ES

1	FK2-EU	7.10#	Optional trim panels
2.9	Installation kit ES	7.13a	Cladding, fire-resistant
3.11	Solid wood wall / CLT wall	*	Installation near the floor as in 3
4.1	Solid ceiling slab	H1/B1	Installation opening, see table *168*
5.15	Bracket	Z	For fixing, see Fig. 23 to Fig. 25
6.13	Mineral wool strips A1, filler as an alternative (to even out an uneven floor or ceiling slab)	1 – 3	Up to EI 90 S

Additional requirements: dry mortarless installation into solid wood walls, with installation kit ES

- Solid wood wall or CLT wall, *on page 45*
- Casing length L = 500 mm
- Distance between the fire damper and adjacent structural elements approx. 80 / 120 mm (depending on the position of the brackets)
- 65 to 70 mm distance between the fire damper with a shortened installation kit and load-bearing structural elements, see detail 3
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Ensure accessibility from the rear.

1. Mount the installation kit onto the fire damper, *5.3.1 'Installation kit ES – supply package and assembly' on page 47* .
2. Position the fire damper in the centre of the installation opening and fix it with brackets and dry wall screws to the solid wood wall, see Fig. 23 to Fig. 25 .

5.7.4 Dry mortarless installation with mineral wool

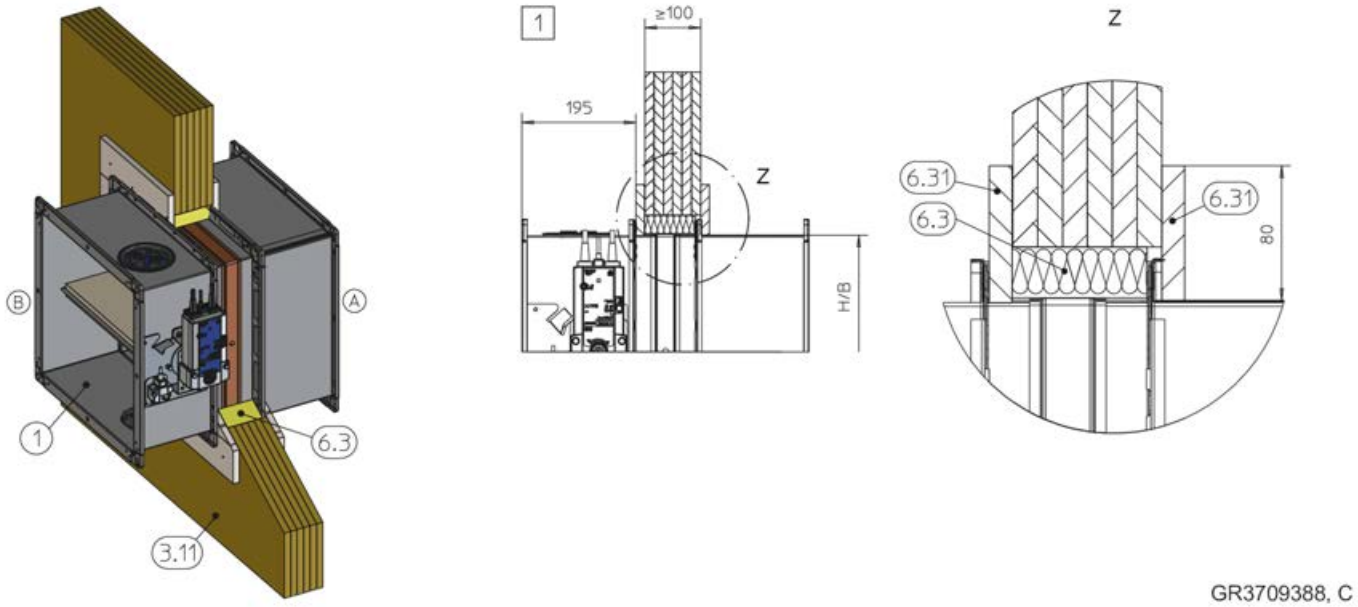


Fig. 144: Dry mortarless installation into a solid wood or CLT cwall, with mineral wool

1	FK2-EU	6.31	Fire-rated plasterboard strips, d = 12.5 mm
3.11	Solid wood wall / CLT wall	1	Up to EI 60 S
6.3	Mineral wool, ≥ 1000 °C, ≥ 100 kg/m³		

Note:

Wall thickness shown = 100 mm. For wall thicknesses > 100 mm, close off the area between the installation side (A) of the fire damper and the installation opening with mineral wool strips (6.3) to achieve the same thickness as the wall.

Additional requirements: dry mortarless installation into lightweight partition walls with timber support structure and half-timbered constructions, with mineral wool

- Solid wood wall or CLT wall, *on page 45*
- Casing length L = 500 mm
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Distance to load-bearing structural elements ≥ 80 mm

1. Create a clear installation opening, B + 74 (± 2) mm and H + 86 (± 2) mm.
2. Cut mineral wool strips (6.3) and fire-rated plasterboard strips (6.31) to size.
3. Place mineral wool strips and fire-rated plasterboard strips on the operating side (B) around the damper casing and secure them; use filler to secure them if necessary.
4. Push the fire damper into the installation opening; screw-fix the fire-rated plasterboard strips on the operating side (B) to the wall (screw spacing approx. 150 mm).
5. Attach fire-rated plasterboard strips to the installation side (A) and screw-fix them to the wall (screw spacing approx. 150 mm).

5.7.5 Dry mortarless installation with fire batt

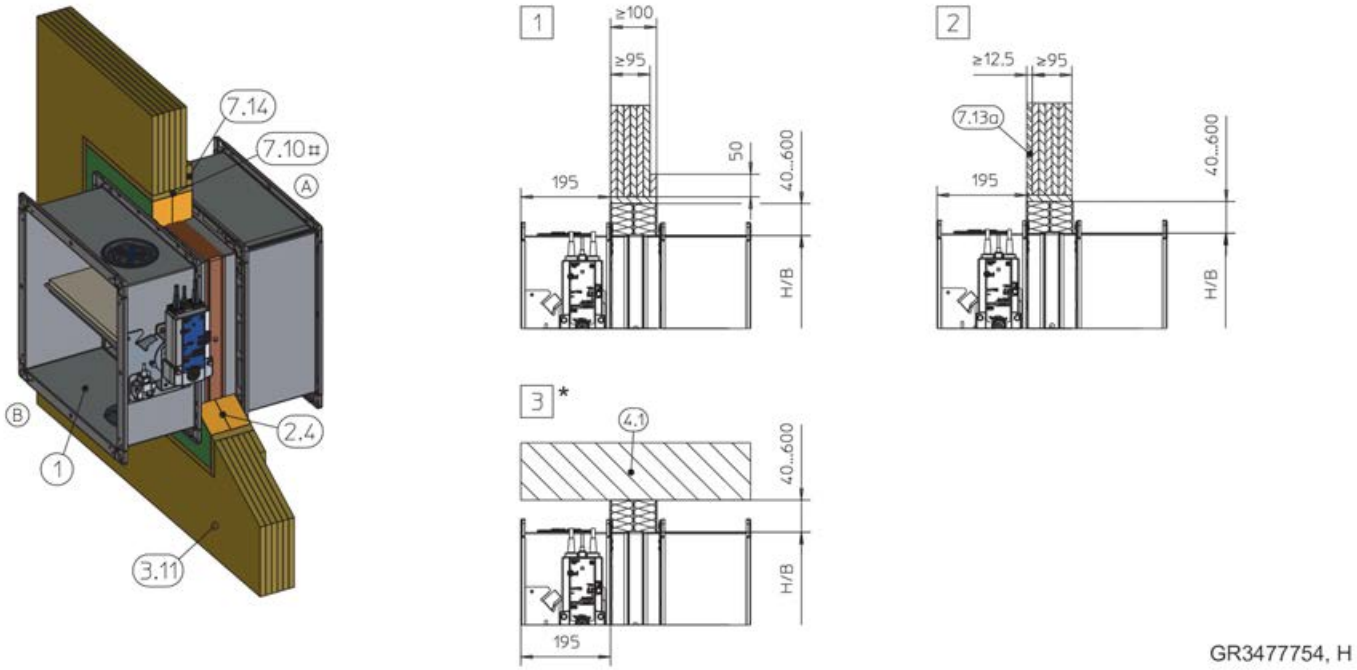


Fig. 145: Dry mortarless installation into a timber wall or CLT wall, with a fire batt

1	FK2-EU
2.4	Coated board system
3.11	Solid wood wall / CLT wall
4.1	Solid ceiling slab / solid floor
7.10#	Optional trim panels
7.13a	Cladding, fire-resistant
7.14	Reinforcing board of the same material as the wall (required on operating or installation side if W < 100 mm)
*	Installation near the floor as in 3
1 – 3	Up to EI 90 S

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

- Solid wood wall or CLT wall, ↳ *on page 45*
- Casing length L = 305 or 500 mm
- Fire batt systems, installation details, distances / dimensions, ↳ *on page 41*
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Suspension and fixing, ↳ *Chapter 5.13 'Fixing the fire damper' on page 228* ↳ *5.13.3 'Fixing the damper when a fire batt is used' on page 230*

5.8 Shaft walls with metal support structure

5.8.1 General

Shaft walls with metal support structure and cladding on one side

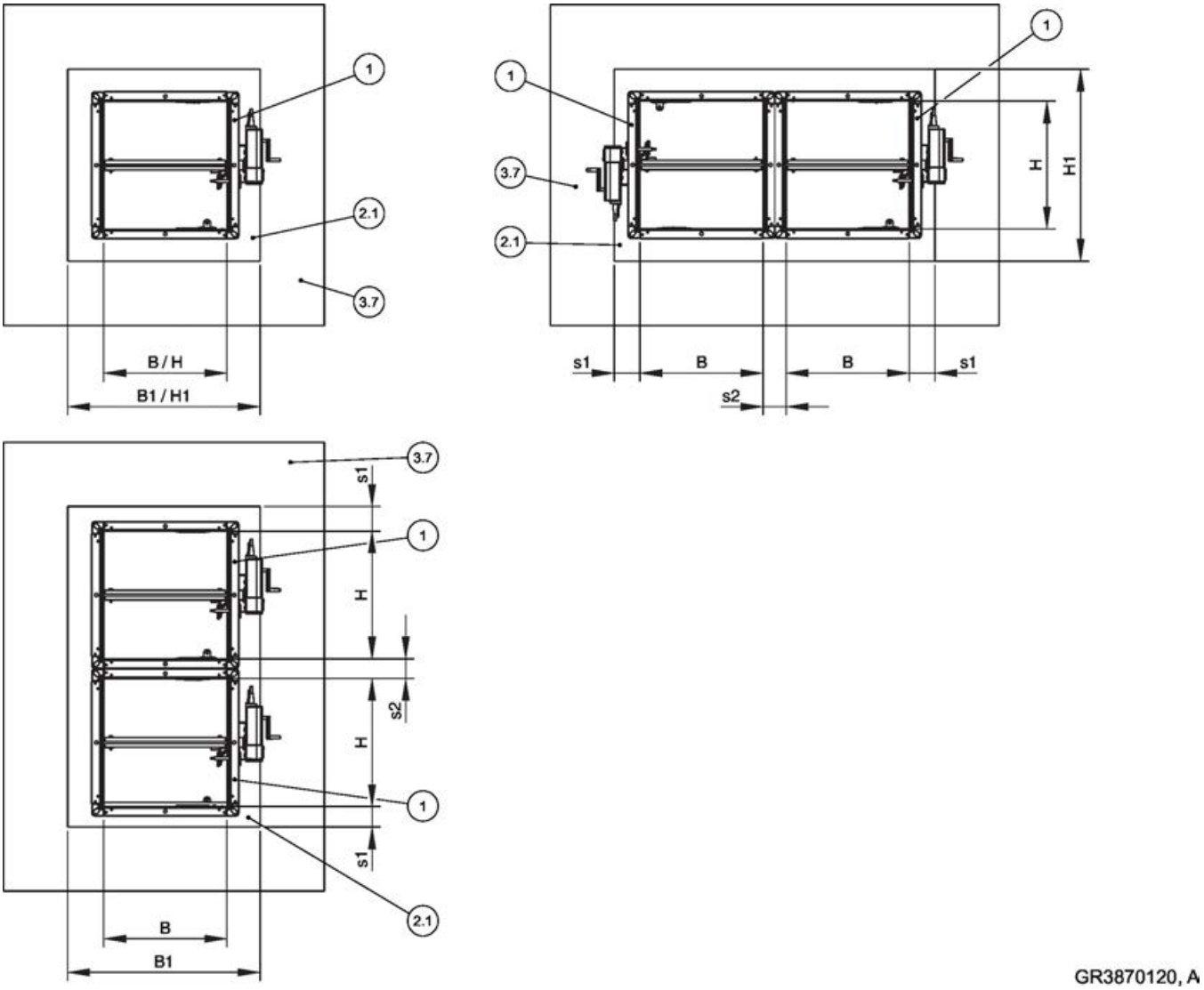


Fig. 146: Lightweight partition walls with metal support structure – arrangement/distances

1 FK2-EU
2.1 Mortar
3.7 Shaft wall with metal support structure, cladding on one side
s1 Perimeter gap, ↳ *on page 37*
s2 Distance between the fire dampers, ↳ *'Distances' on page 36*

Installation type	Installation opening [mm]			
	B1	H1	s1	s2
Mortar-based installation	B + 450 max.	H + 450 max.	≤ 225	60 [3] – 225
Dry mortarless installation with installation kit ES[1, 2]	B + 140	H + 140	central installation	

[1] Optional trim panels (single layer)
[2] Installation opening tolerance ± 2 mm
[3] With length 305 mm and installation of fire dampers on top of each other, the distance between FK2-EU fire dampers has to be at least 75 mm.

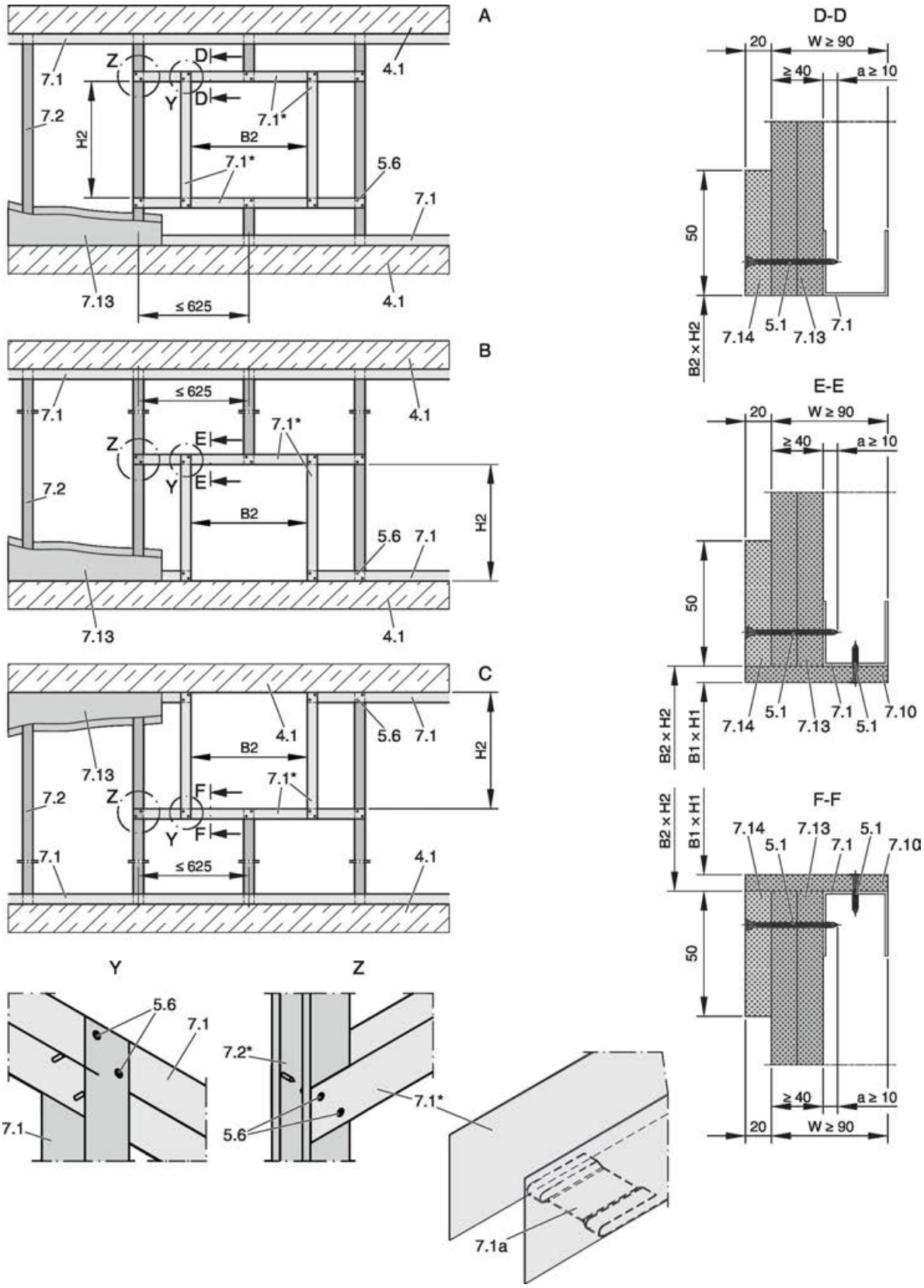


Fig. 147: Shaft wall with metal support structure and cladding on one side (detailed views shown with W = 90 mm)

A	Shaft wall	7.2	CW section
B	Shaft wall, installation near the floor	7.10	Optional trim panels, according to installation details
C	Shaft wall, installation near the ceiling	7.13	Cladding
4.1	Solid ceiling slab / solid floor		
5.1	Dry wall screw		

5.6	Screw or steel rivet
7.1	UW section
7.1a	UW section, either cut in and bent or cut off
7.14	Reinforcing board of the same material as the wall
B1 × H1	Installation opening
B2 × H2	Opening in the metal support structure (without trim panels: B2 = B1, H2 = H1)
*	Closed side of metal section must face the installation opening

Additional requirements: shaft walls with metal support structure

- Shaft wall with metal support structure,
  ↯ *on page 45*
- The structural safety of the wall must be ensured (by others). Compensation measures, especially with regard to large installation openings (such as for multiple installation), must be determined on a case to case basis (by others).

5.8.2 Mortar-based installation

Mortar-based installation into shaft wall with metal support structure

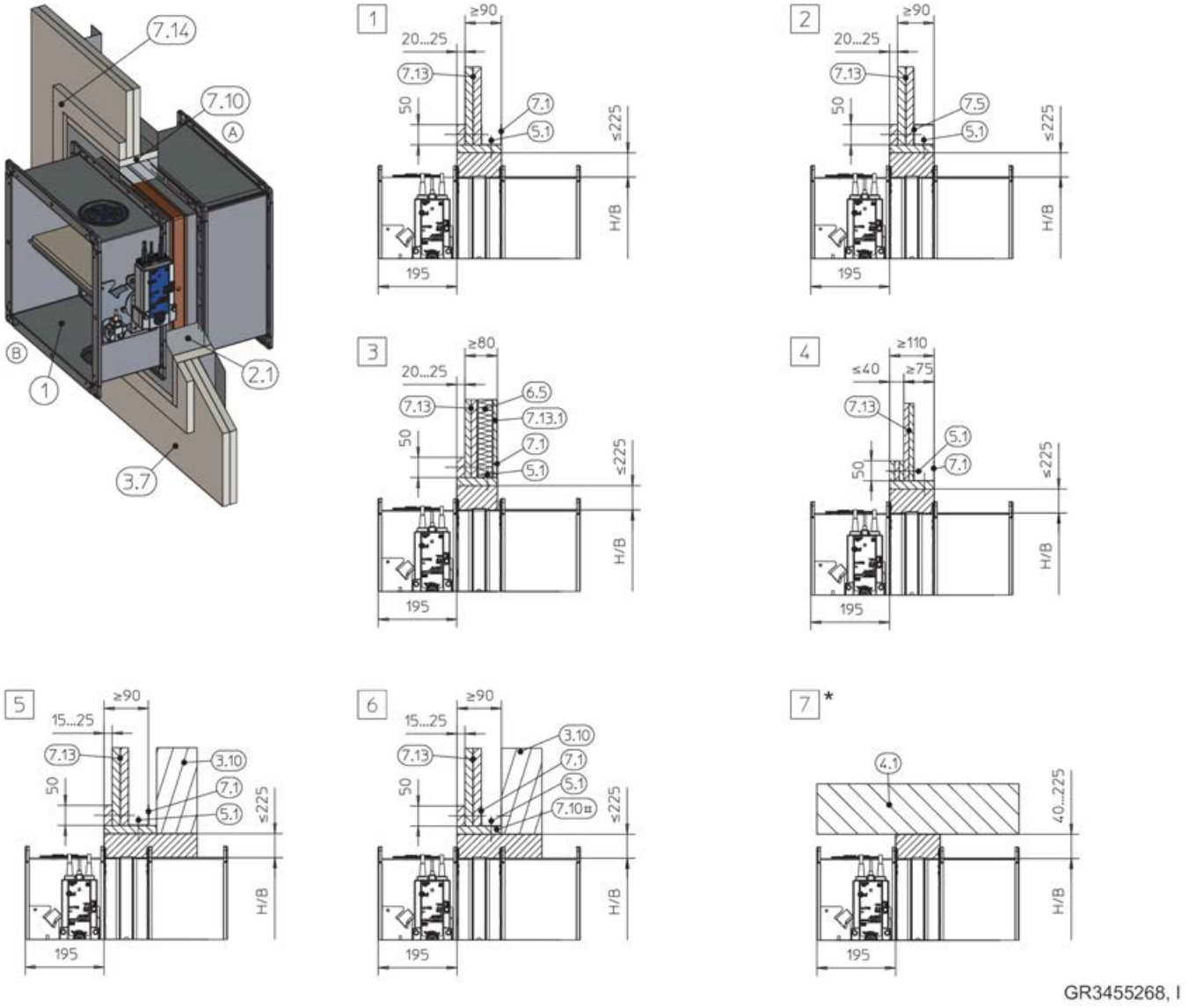


Fig. 148: Mortar-based installation into shaft wall with metal support structure

1	FK2-EU (actuator on the outside of the shaft)	7.10	Trim panels
2.1	Mortar	7.10#	Optional trim panels
3.7	Shaft wall with metal support structure, cladding on one side	7.13	Cladding
		7.13.1	Cladding, single-layer, fire-resistant
3.10	Wall without adequate fire resistance rating	7.14	Reinforcing board of the same material as the wall
4.1	Solid ceiling slab / solid floor		
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	Up to EI 90 S

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

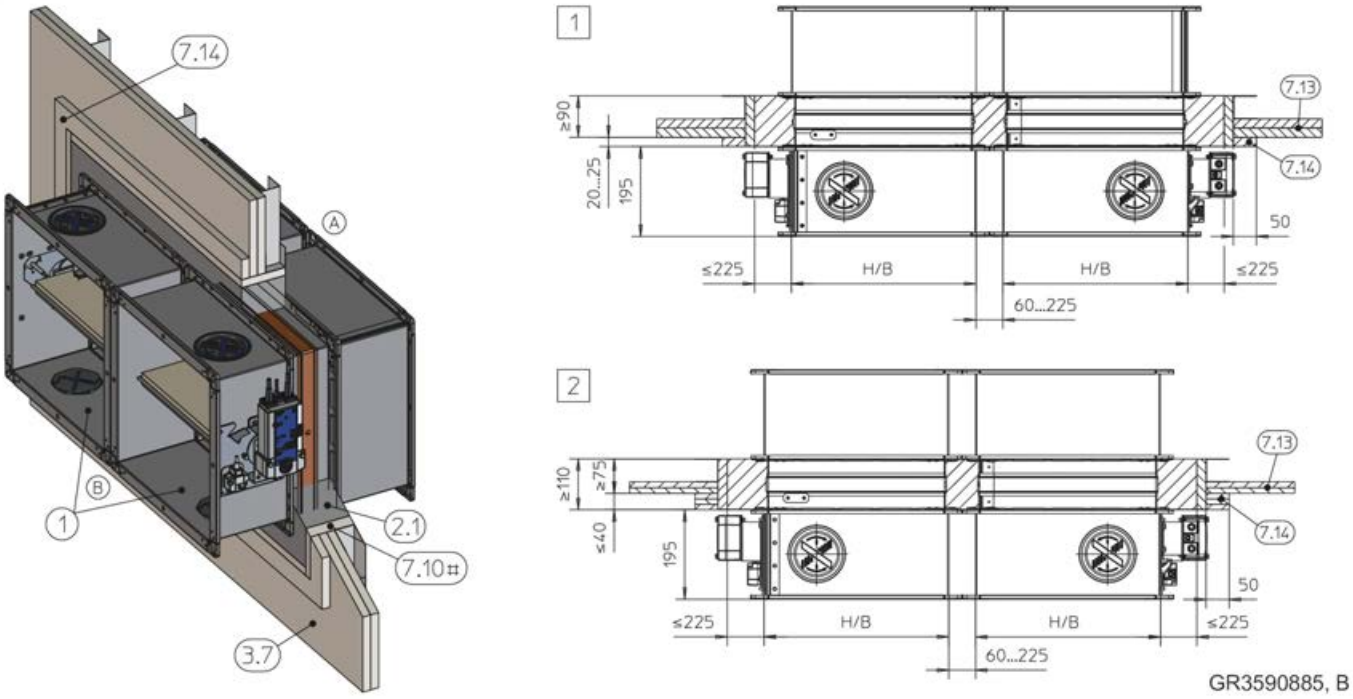


Fig. 149: Mortar-based installation into a shaft wall, flange to flange, illustration shows side by side installation (applies also to installation of dampers on top of each other)

1	FK2-EU
2.1	Mortar
3.7	Shaft wall with metal support structure, cladding on one side
7.10#	Optional trim panels
7.13	Cladding, two layers
7.14	Reinforcing board of the same material as the wall
1	Up to EI 90 S
2	EI 30 S

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

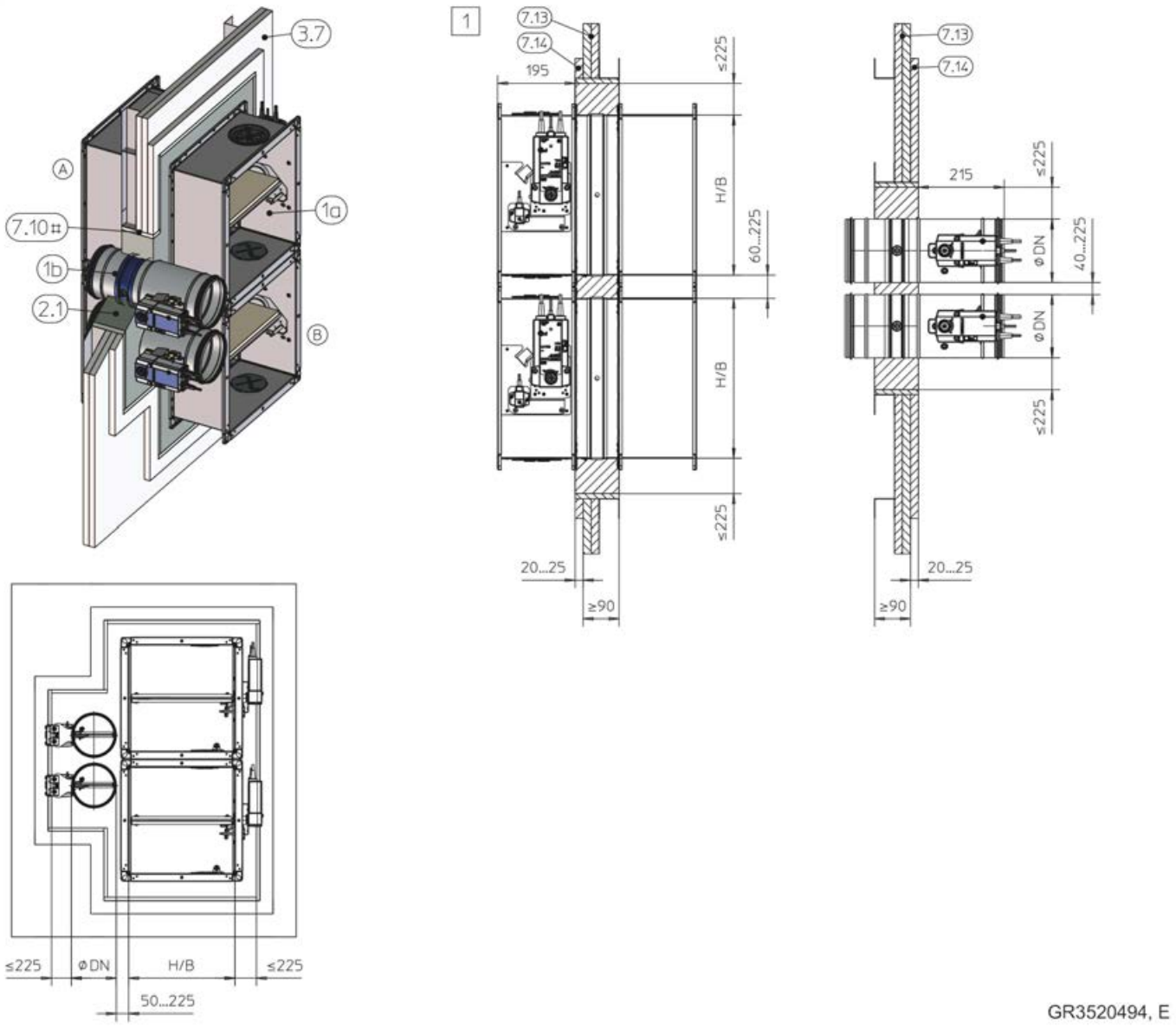


Fig. 150: Mortar-based installation into a shaft wall, FK2-EU and FKRS-EU combined

1a	FK2-EU up to B × H ≤ 800 × 400 mm
1b	FKRS-EU
2.1	Mortar
3.7	Shaft wall with metal support structure, cladding on one side
7.10#	Optional trim panels
7.13	Cladding
7.14	Reinforcing board of the same material as the wall
1	Up to EI 90 S

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For FKRS-EU installation details see the FKRS-EU installation and operating manual.
- Distance to load-bearing structural elements ≥ 40 mm

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

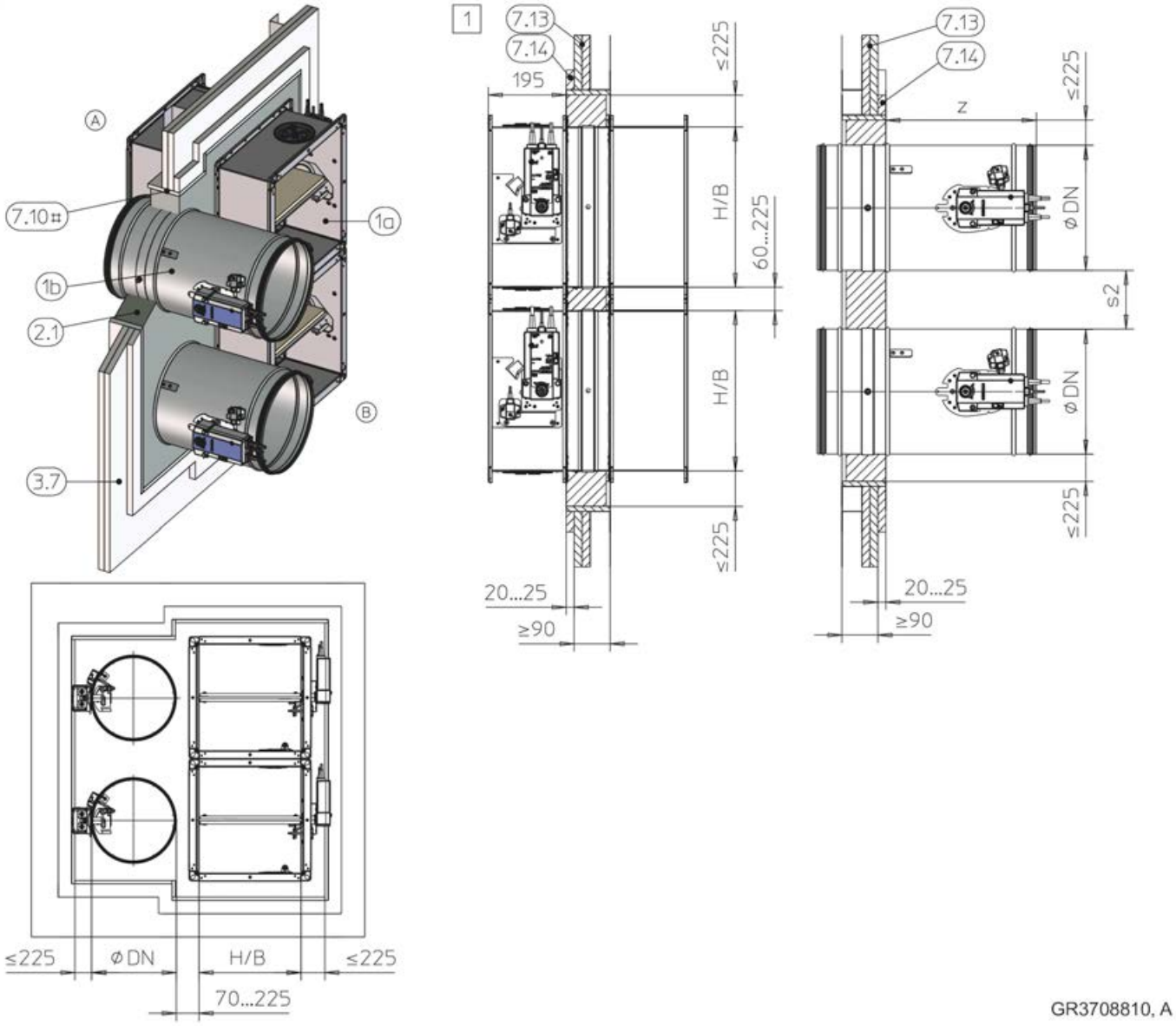


Fig. 151: Mortar-based installation into a shaft wall, FK2-EU and FKR-EU combined

1a	FK2-EU up to B × H ≤ 800 × 400 mm	7.14	Reinforcing board of the same material as the wall
1b	FKR-EU		
2.1	Mortar	s2	With spigot 40 – 225 mm
3.7	Shaft wall with metal support structure, cladding on one side		With flange 80 – 225 mm
		z	Construction with spigot 370 mm
7.10#	Optional trim panels		Construction with flange 342 mm
7.13	Cladding	1	Up to EI 90 S

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side or on top of each other) are possible. Details are available upon request. For FKR-EU installation details see the FKR-EU installation and operating manual.
- Distance to load-bearing structural elements ≥ 40 mm

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

- Shaft wall with metal support structure,
  ↳ *on page 45*
- Casing length L = 305 or 500 mm

5.8.3 Dry mortarless installation with installation kit ES

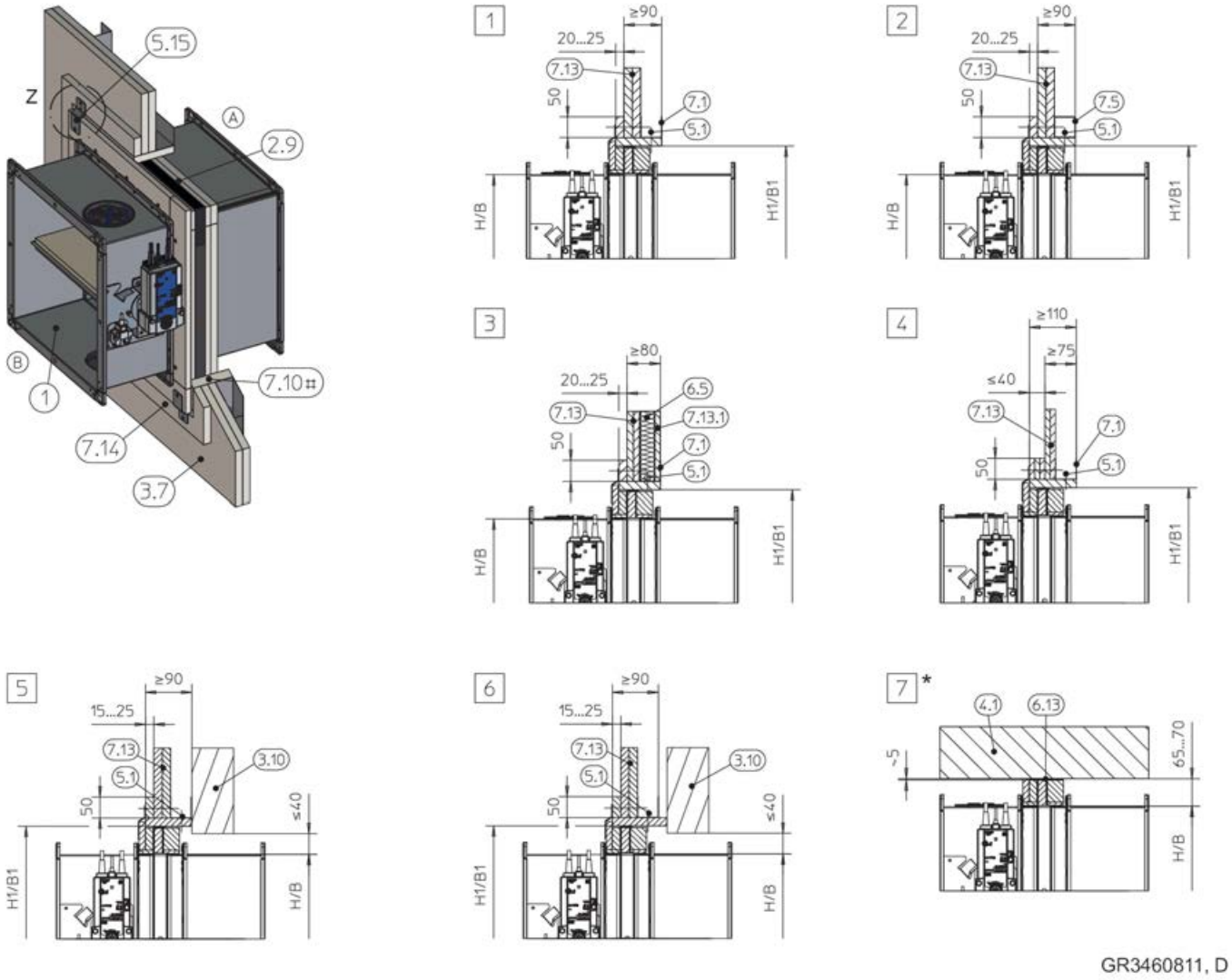


Fig. 152: Dry mortarless installation into a shaft wall with metal support structure, with installation kit ES

1	FK2-EU
2.9	Installation kit ES
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 (by others)
5.15	Bracket
6.5	Mineral wool (depending on wall construction)
6.13	Mineral wool strips A1, filler as an alternative (to even out an uneven floor or ceiling slab)
7.1	UW section
7.5	Steel support structure (box section)
7.10#	Optional trim panels
7.13	Cladding
7.13.1	Cladding, single-layer
7.14	Reinforcing board of the same material as the wall
*	Installation near the floor as in 7
H1/B1	Installation opening, see table *173*
Z	For fixing, see Fig. 23 to Fig. 25
1 – 3	Up to EI 90 S
4 – 6	EI 30 S
7	EI 30 S to EI 90 S

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

- Shaft wall with metal support structure, *on page 45*
- Casing length L = 500 mm
- Distance between the fire damper and adjacent structural elements ≥ 80 / 120 mm (depending on the position of the brackets)
- 65 to 70 mm distance between the fire damper with a shortened installation kit and load-bearing structural elements, see detail 7
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Ensure accessibility from the rear.

1. Mount the installation kit onto the fire damper, *5.3.1 'Installation kit ES – supply package and assembly' on page 47* .
2. Position the fire damper in the centre of the installation opening and fix it with brackets and dry wall screws to the metal frame, see Fig. 23 to Fig. 25 .

5.9 Shaft walls without metal support structure

5.9.1 General

Shaft wall without metal support structure and with cladding on one side

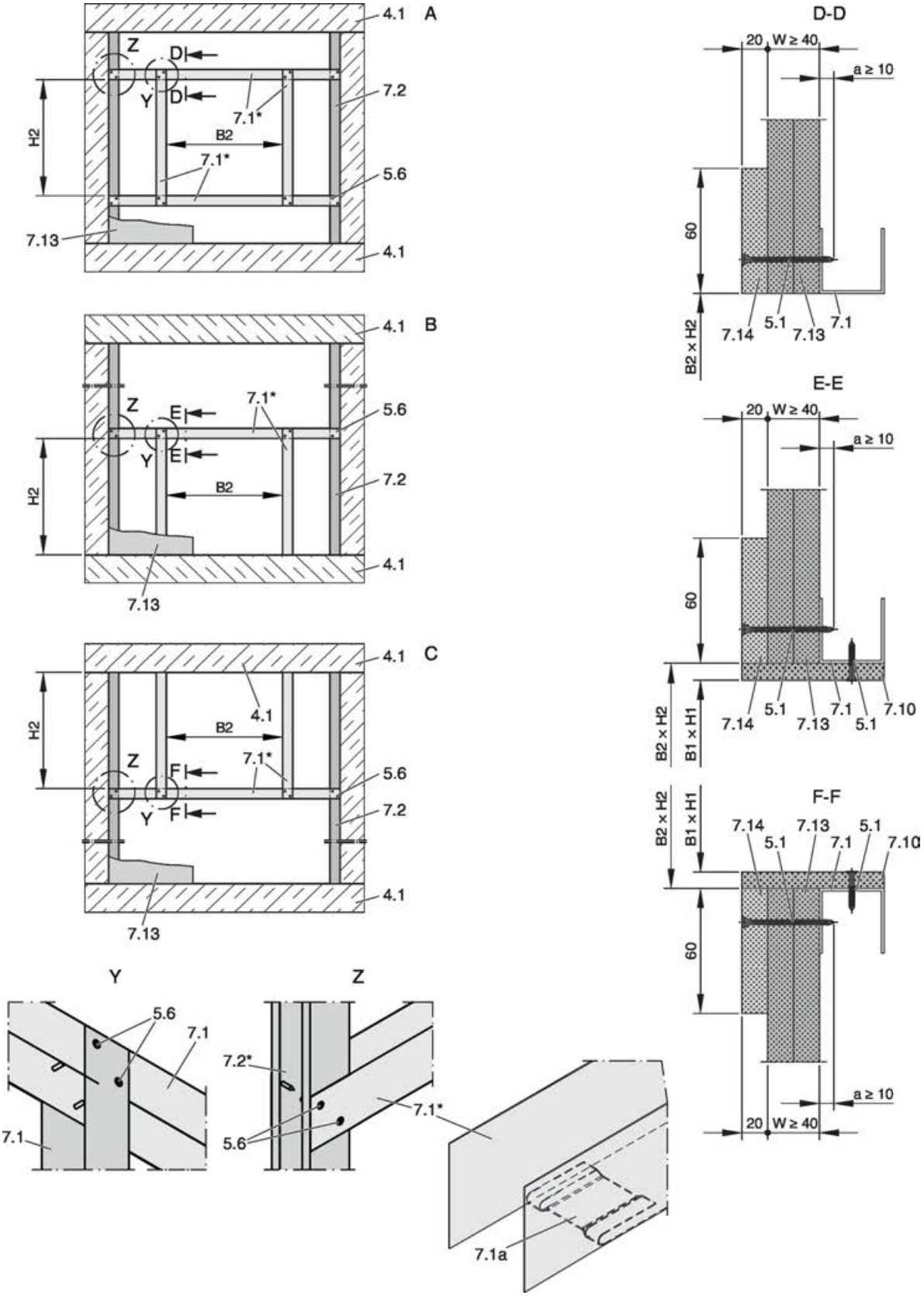


Fig. 153: Shaft wall without metal support structure and with cladding on one side

A	Shaft wall
B	Shaft wall, installation near the floor
C	Shaft wall, installation near the ceiling
4.1	Solid ceiling slab / solid floor
5.1	Dry wall screw
5.6	Screw or steel rivet
7.1	UW section
7.1a	UW section, cut and bent
7.2	CW section
7.10	Trim panels, according to installation details
7.13	Double layer cladding on one side
7.14	Reinforcing board of the same material as the wall, according to installation details
B1 × H1	Installation opening
B2 × H2	Opening in the metal support structure (without trim panels: B2 = B1, H2 = H1)
*	Closed side of metal section must face the installation opening

Installation type	Installation opening [mm]			
	B1	H1	B2	H2
Dry mortarless installation with dry mortarless installation kit ES[1, 2]	B + 140	H + 140	B1 + (2 × trim panels)	H1 + (2 × trim panels)

[1)] Optional trim panels (12.5 mm max. when used with installation kit ES)

[2)] Installation opening tolerance ± 2 mm

Additional requirements

- Shaft wall without metal support structure,
  on page 45

5.9.2 Dry mortarless installation with installation kit ES

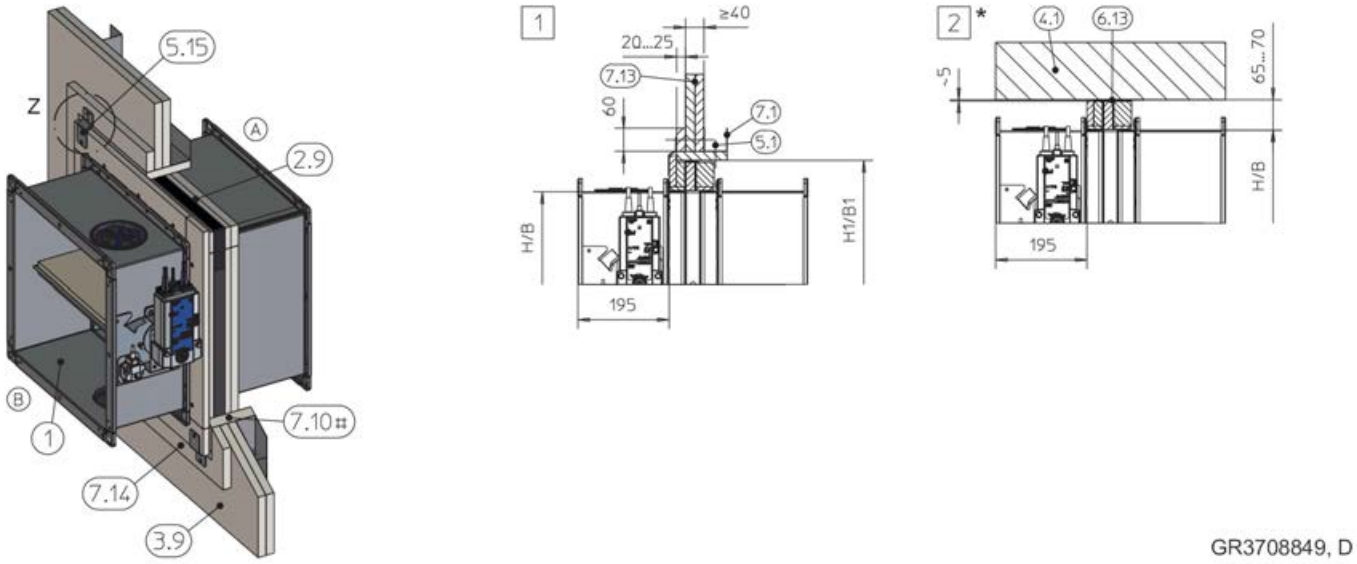


Fig. 154: Dry mortarless installation into a shaft wall without metal support structure, with installation kit ES

1	FK2-EU (actuator on the outside of the shaft)
2.9	Installation kit ES
3.9	Shaft wall without metal support structure, cladding on one side
4.1	Solid ceiling slab / solid floor
5.1	Dry wall screw (by others)
5.15	Bracket
6.13	Mineral wool strips A1, filler as an alternative to even out an uneven floor or ceiling slab
7.1	UW section
7.10#	Optional trim panels
7.13	Cladding, fire-resistant
7.14	Reinforcing board of the same material as the wall
*	Installation near the floor as in 3
H1/B1	Installation opening, see table *184*
Z	For fixing, see Fig. 23 to Fig. 25
1 2	Up to EI 90 S

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

- Shaft wall without metal support structure, *on page 45*
- Casing length L = 500 mm
- Distance between the fire damper and adjacent structural elements ≥ 80 / 120 mm (depending on the position of the brackets)
- 65 – 70 mm distance between the fire damper with a shortened installation kit and load-bearing structural elements
- ≥ 200 mm distance between two fire dampers in separate installation openings
- Ensure accessibility from the rear.

1. Mount the installation kit onto the fire damper, *5.3.1 'Installation kit ES – supply package and assembly' on page 47* .
2. Position the fire damper in the centre of the installation opening and fix it with brackets and dry wall screws to the shaft wall, see Fig. 23 to Fig. 25 .

5.10 Solid ceiling slabs

5.10.1 General

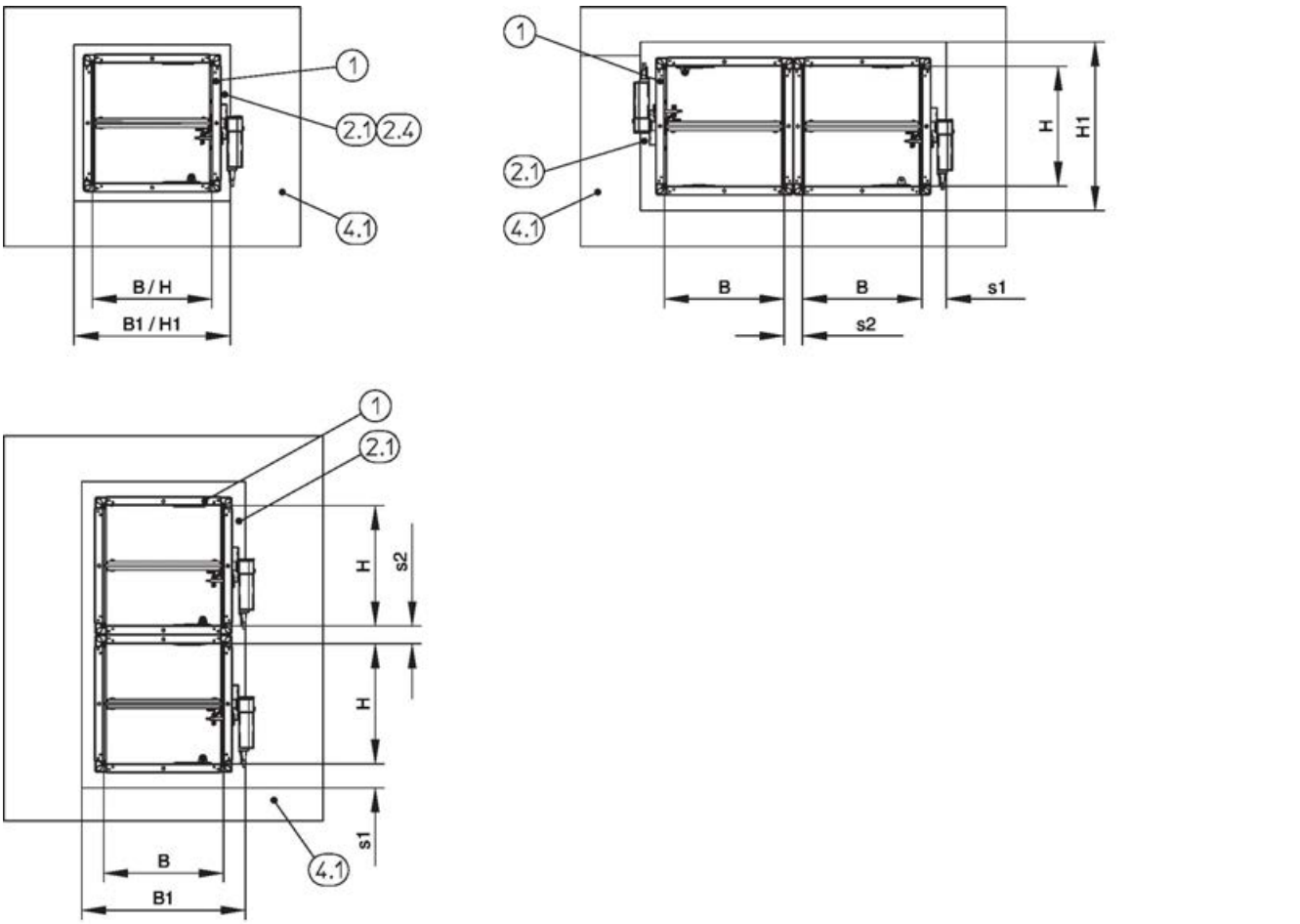


Fig. 155: Solid ceiling slabs – arrangement / distances

1 FK2-EU
2.1 Mortar
2.4 Coated board system
4.1 Solid ceiling slab
s1 Perimeter gap, *on page 37*
s2 Distance between the fire dampers, *'Distances' on page 36*

Installation type	Installation opening [mm]		Distance [mm]	
	B1	H1	s1	s2
Mortar-based installation	B + 450 max.	H + 450 max.	≤ 225	60 [1] – 225
Dry mortarless installation with fire batt	B + 80 to 1200	H + 80 to 1200	40 – 600	60 [1] – 600

[1] With length 305 mm and installation of fire dampers on top of each other, the distance between FK2-EU dampers has to be at least 75 mm.

Additional requirements: solid ceiling slabs

- Solid ceiling slab, *on page 46*
- Distances and installation orientation, *'Distances' on page 36*
- The structural safety of the ceiling slab as well as the attachment of the mortar or concrete to the ceiling slab must be ensured (by others). Compensation measures, especially with regard to large installation openings (such as for multiple installation), must be determined on a case to case basis (by others).

5.10.2 Mortar-based installation into solid ceiling slabs

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

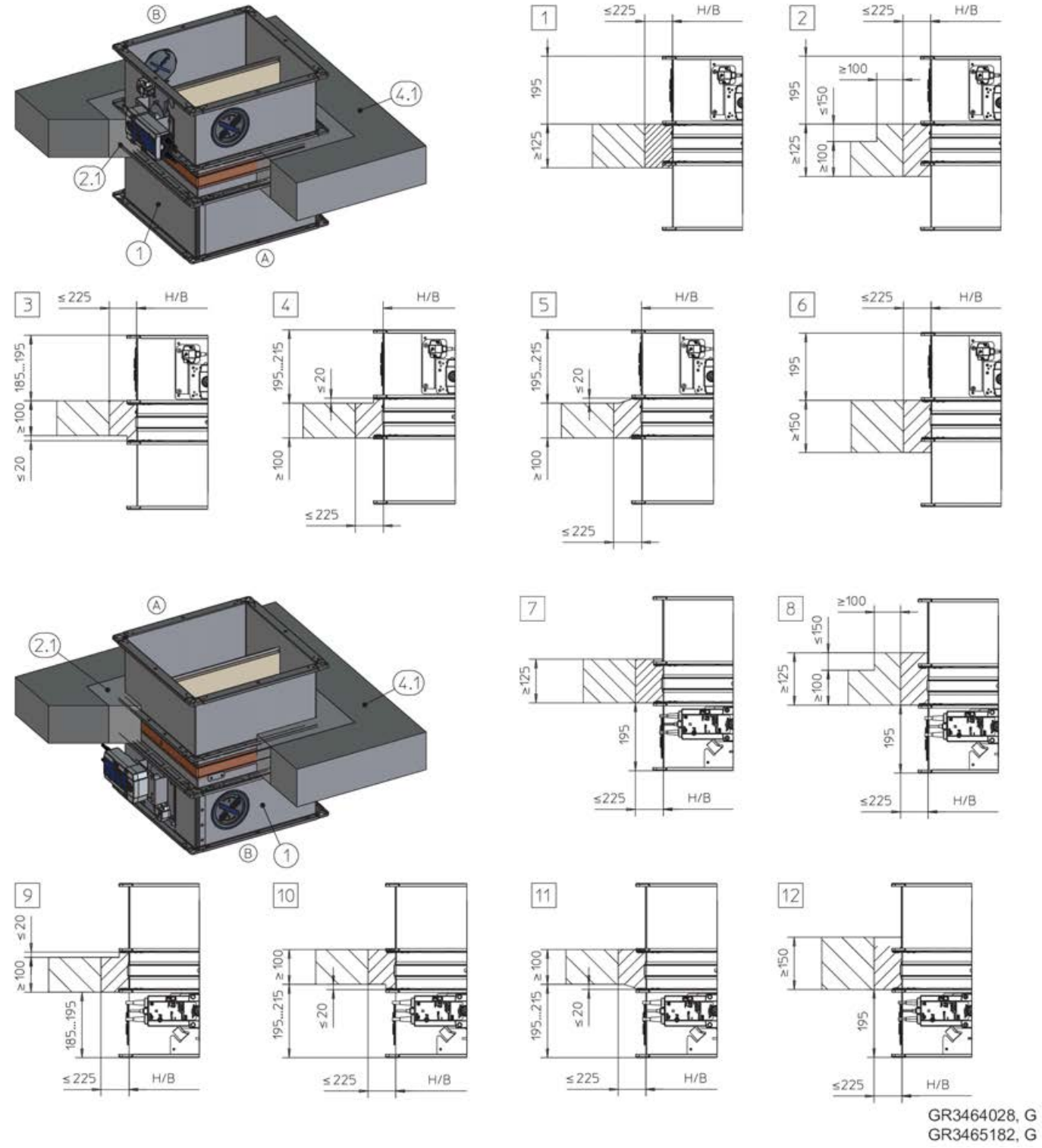


Fig. 156: Mortar-based installation into a solid ceiling slab, suspended or upright

1	FK2-EU
2.1	Mortar
4.1	Solid ceiling slab
1 – 5	Up to EI 120 S
6	Up to EI 180 S
7 – 11	Up to EI 120 S
12	Up to EI 180 S

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

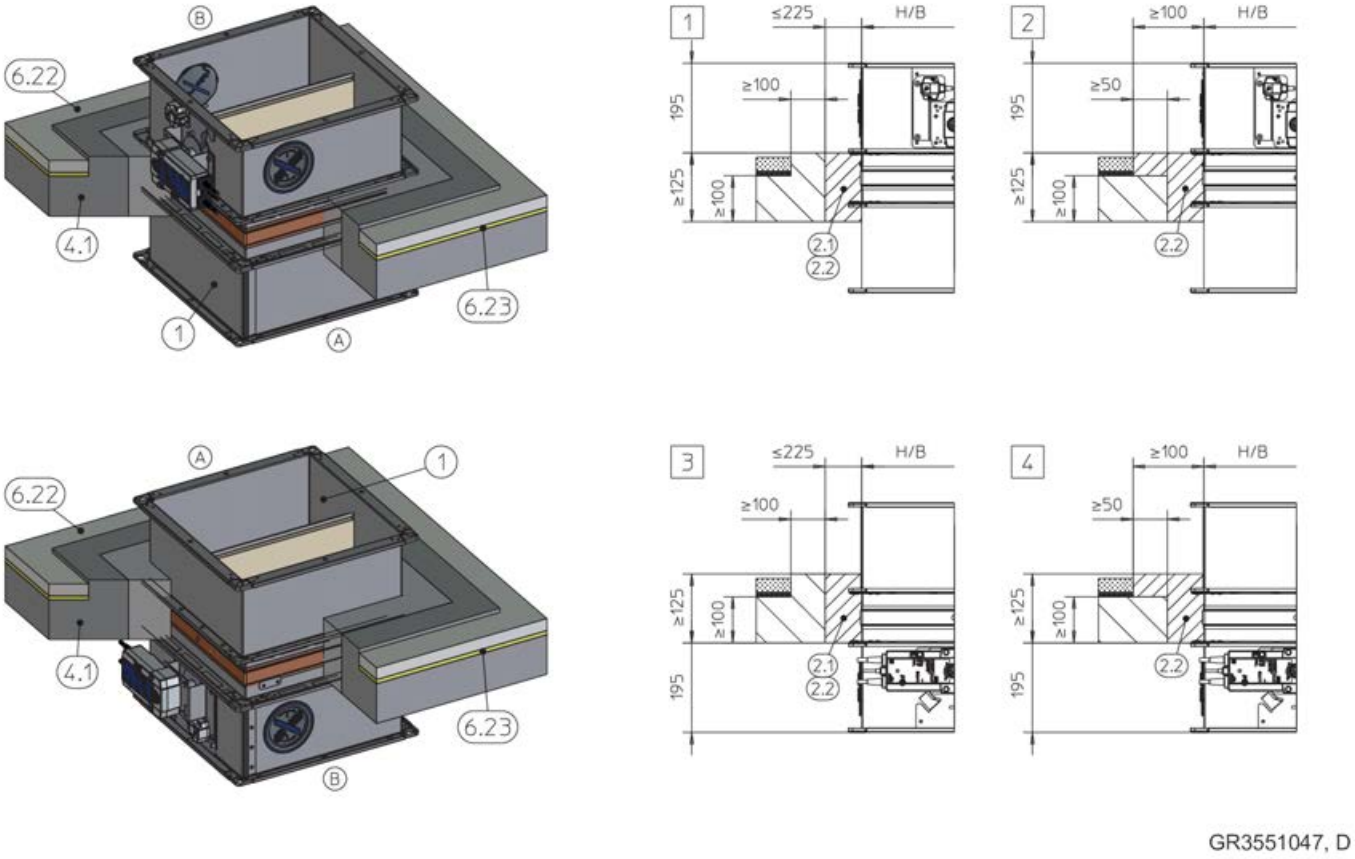


Fig. 157: Mortar-based installation into a solid ceiling slab with screed and footfall sound insulation, suspended or upright

1	FK2-EU	6.22	Screed
2.1	Mortar	6.23	Footfall sound insulation
2.2	Reinforced concrete	1 – 4	Up to EI 120 S
4.1	Solid ceiling slab		

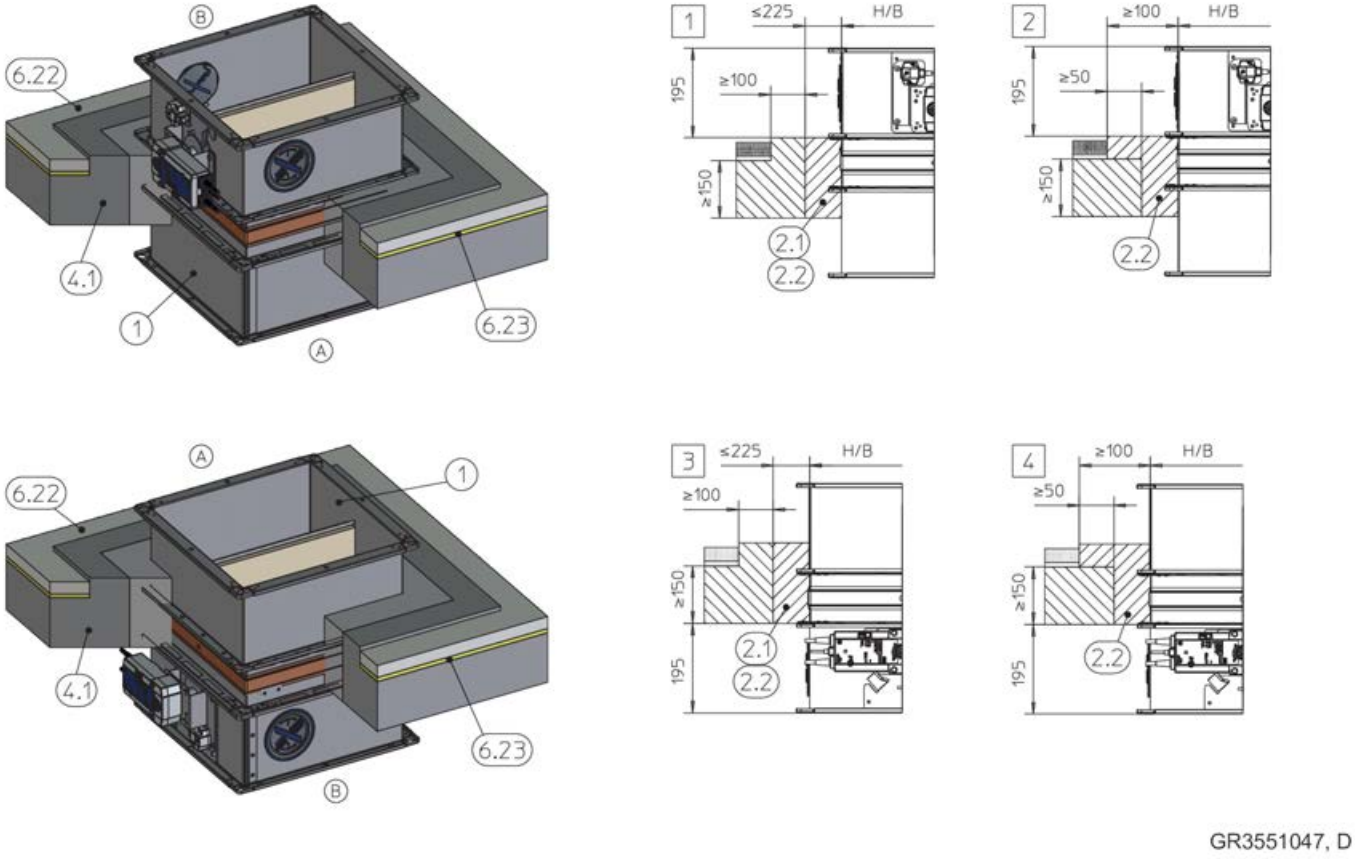


Fig. 158: Mortar-based installation into a solid ceiling slab with screed and footfall sound insulation, suspended or upright

1	FK2-EU	6.22	Screed
2.1	Mortar	6.23	Footfall sound insulation
2.2	Reinforced concrete	1 – 4	Up to EI 180 S
4.1	Solid ceiling slab		

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

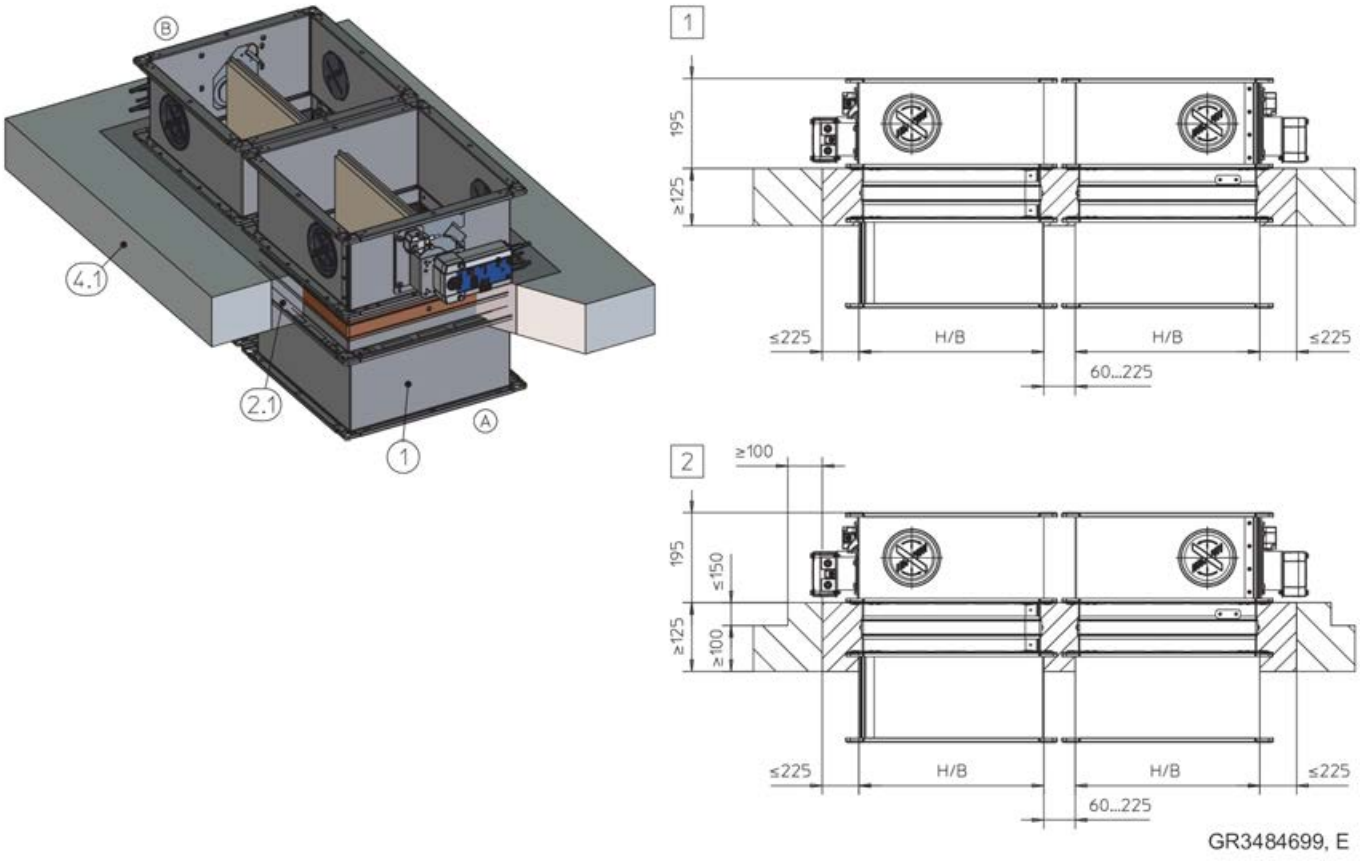


Fig. 159: Mortar-based installation into a solid ceiling slab, flange to flange, illustration shows upright installation (applies also to suspended installation)

1 FK2-EU
2.1 Mortar
4.1 Solid ceiling slab
1 2 Up to EI 120 S

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

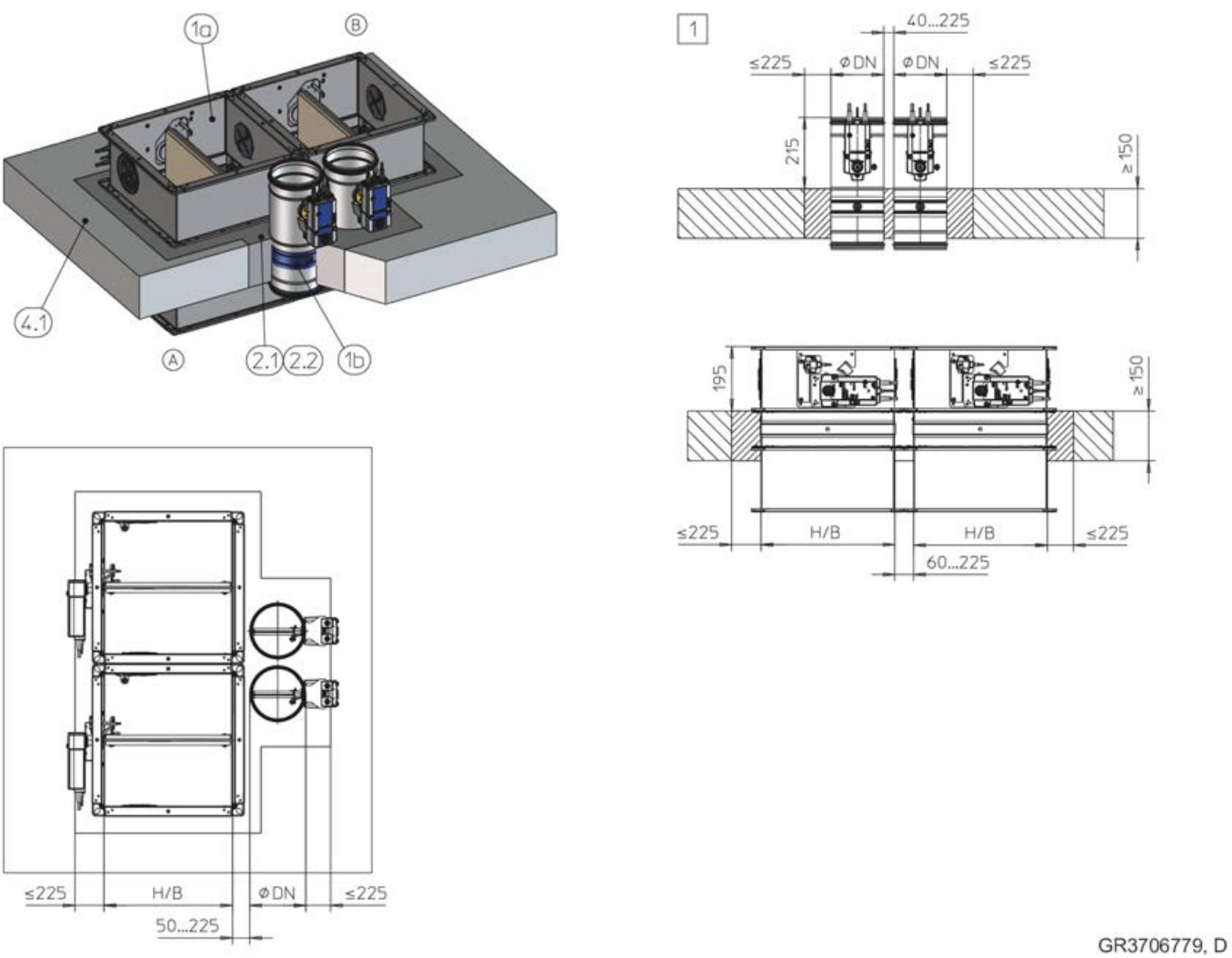


Fig. 160: Mortar-based installation into a solid ceiling slab, FK2-EU and FKRS-EU combined, illustration shows upright installation (applies also to suspended installation)

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

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side) are possible. Details are available upon request.
  For FKRS-EU installation details see the FKRS-EU installation and operating manual.
- The structural safety of the ceiling slab as well as the attachment of the mortar or concrete to the ceiling slab and the requirement of any reinforcement must be ensured (by others).

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

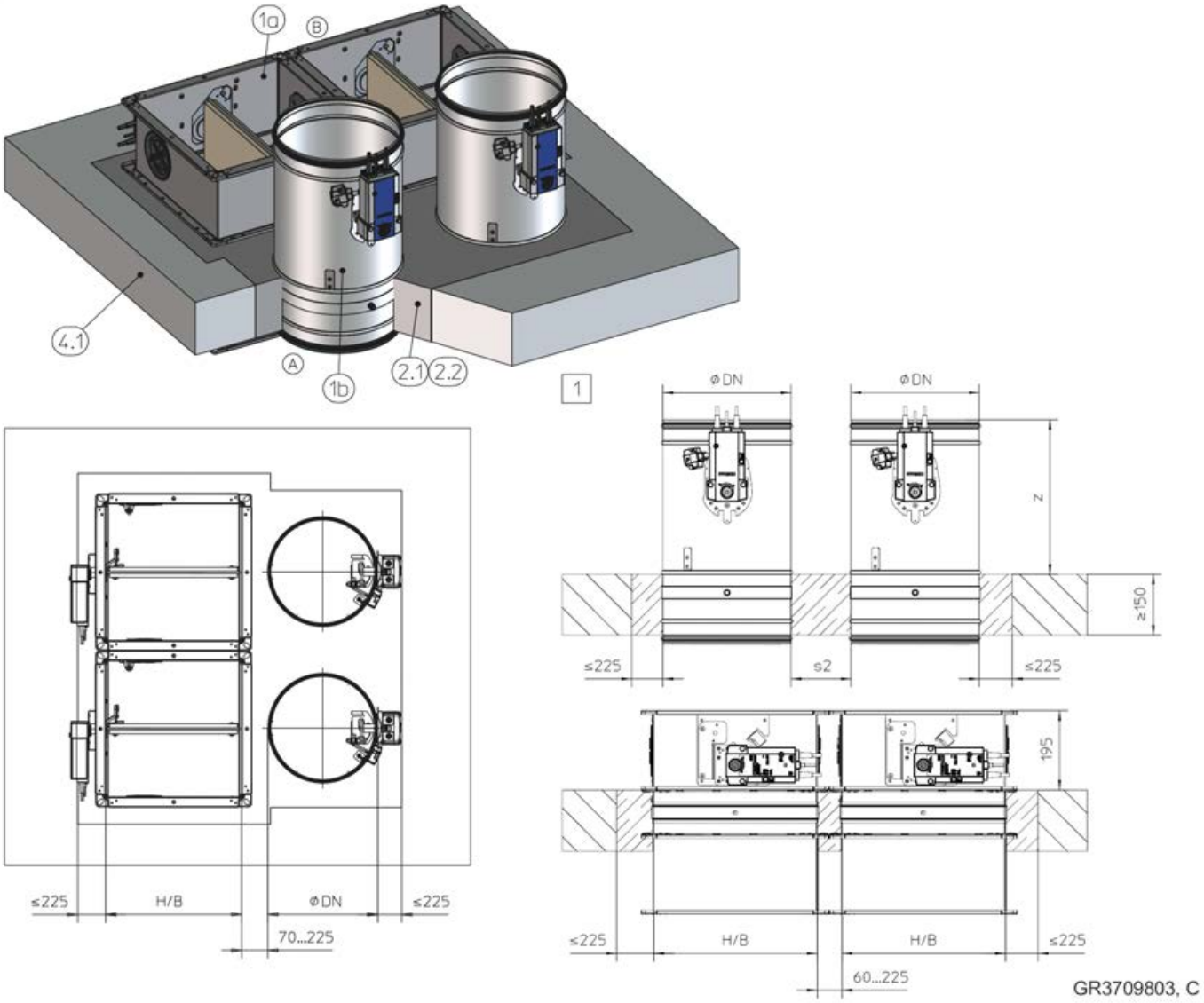


Fig. 161: Mortar-based installation into a solid ceiling slab, FK2-EU and FKR-EU combined, illustration shows upright installation (applies also to suspended installation)

1a	FK2-EU up to B × H ≤ 800 × 400 mm	s2	With spigot 40 – 225 mm With flange 80 – 225 mm
1b	FKR-EU		
2.1	Mortar	z	Construction with spigot 370 mm Construction with flange 342 mm
2.2	Concrete		
4.1	Solid ceiling slab	1	Up to EI 90 S

For combined installation please note:

- Total fire damper area ≤ 1.2 m².
- Other arrangements (side by side) are possible. Details are available upon request.
  For FKR-EU installation details see the FKR-EU installation and operating manual.
- The structural safety of the ceiling construction as well as the attachment of the mortar or concrete to the ceiling and the requirement of any reinforcement must be evaluated and ensured (by others).

Additional requirements: mortar-based installation into solid ceiling slabs

- Solid ceiling slab, *on page 46*
- Casing length L = 305 or 500 mm
- Distance to load-bearing structural elements ≥ 40 mm

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

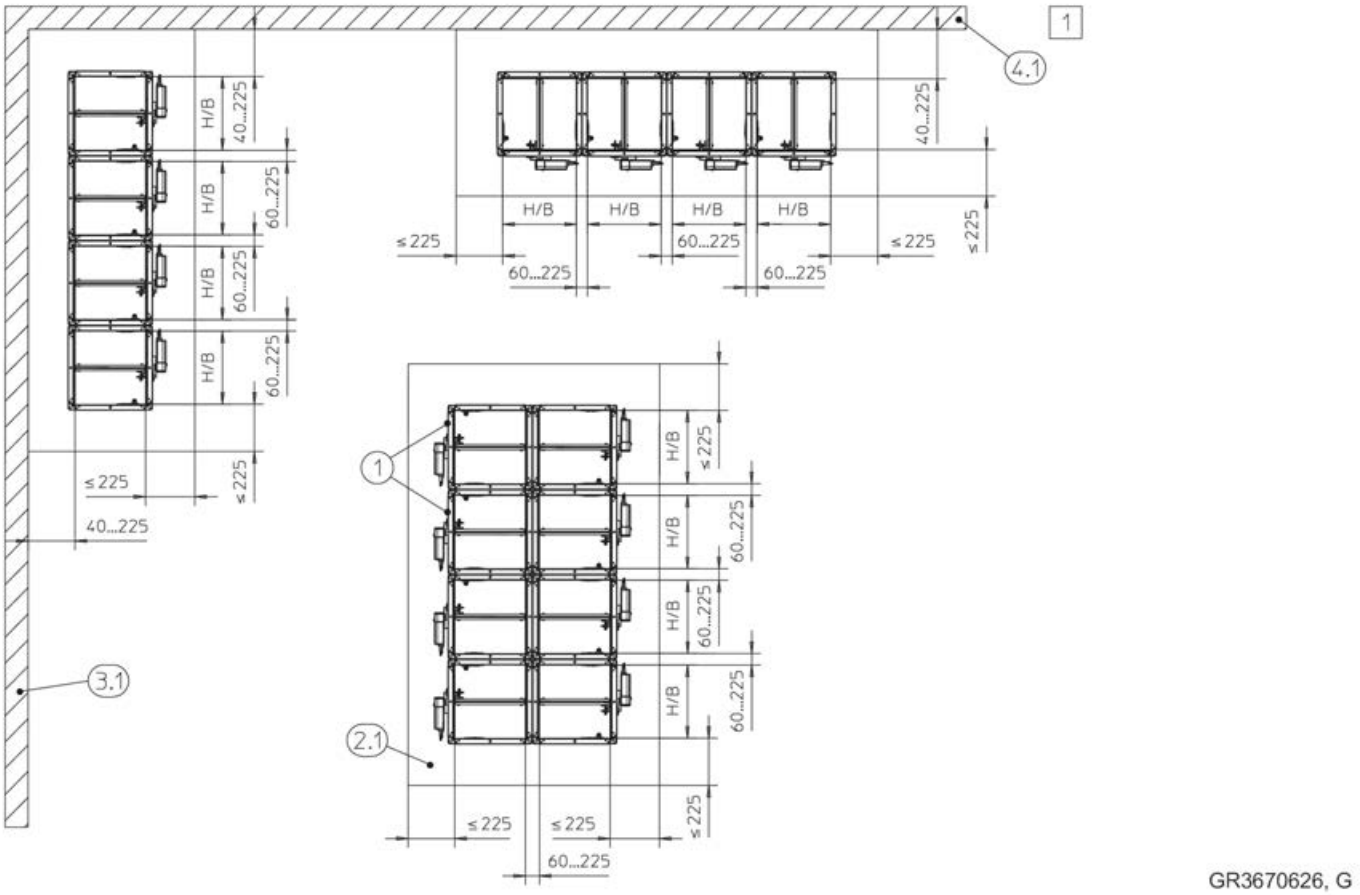


Fig. 162: Mortar-based installation – multiple installation into one installation opening

1 FK2-EU
2.1 Mortar
3.1 Solid wall (load-bearing structural element)
4.1 Solid ceiling slab (load-bearing structural element)
[1] Up to EI 90 S

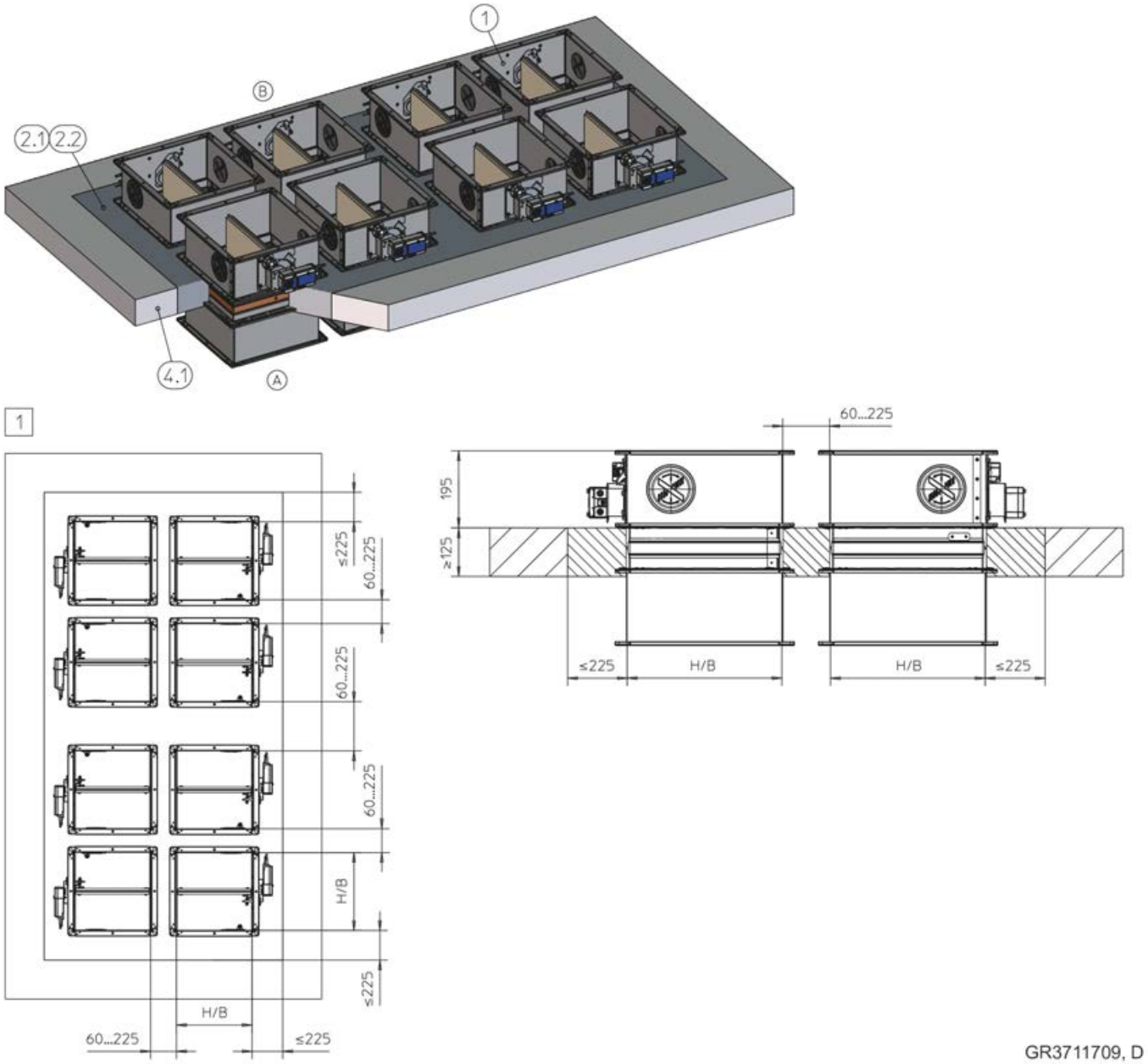


Fig. 163: Mortar-based installation – multiple installation into one installation opening, illustration shows upright installation (applies also to suspended installation)

1 FK2-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 46*
- Casing length L = 305 or 500 mm
- Total fire damper area (B × H) ≤ 4.8 m²
- The possible number of fire dampers in an installation opening depends on the sizes of the fire dampers (B × H) and on the total fire damper area (4.8 m²)

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.

5.10.4 Mortar-based installation into a concrete base

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

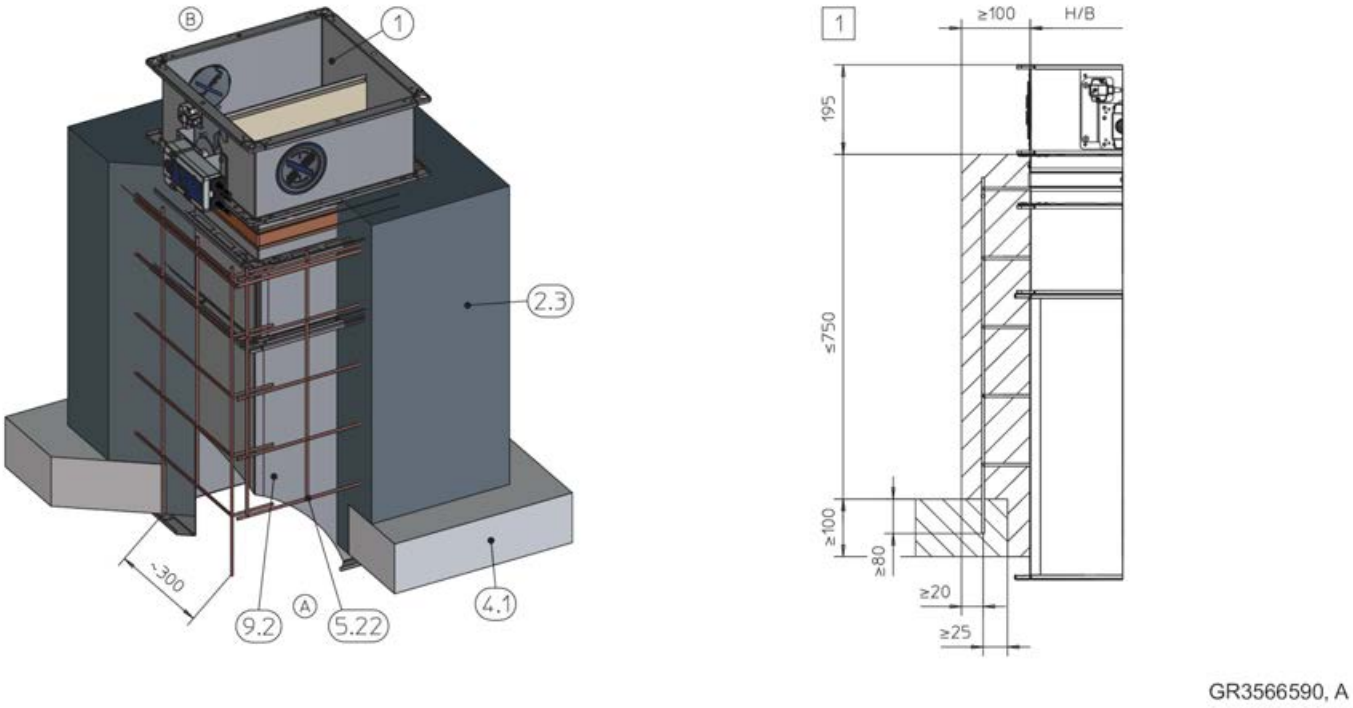


Fig. 164: Mortar-based installation with concrete base into a solid ceiling slab, upright

1 FK2-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
9.2 Extension piece or duct
[1] Up to EI 120 S

Note:

- EI 120 S applies also to two FK2-EU fire dampers installed 60 – 225 mm apart.

Minimum number of fixing points in the ceiling slab

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

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

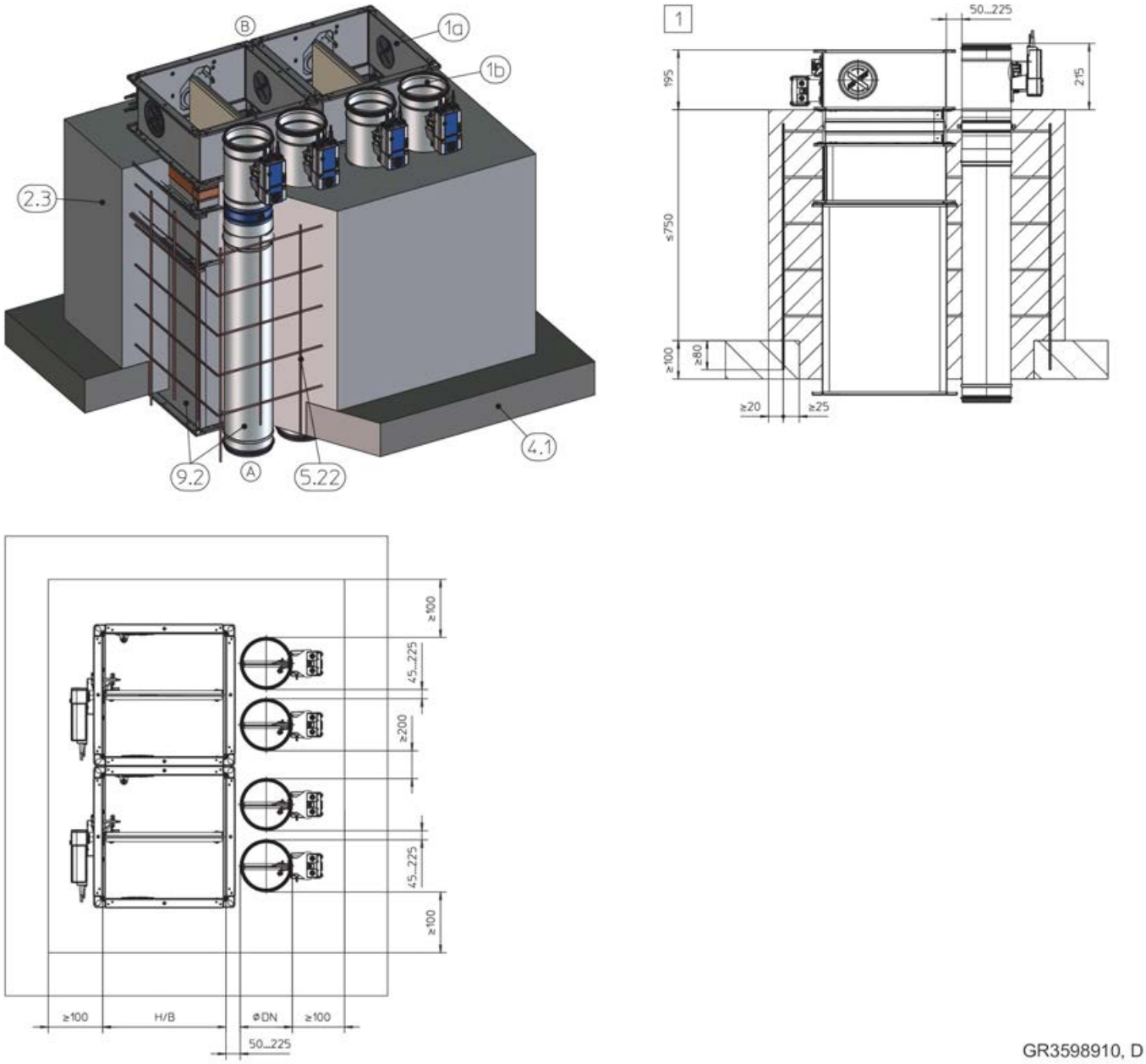


Fig. 165: Mortar-based installation with concrete base into a solid ceiling slab, upright, FK2-EU and FKRS-EU combined

1a	FK2-EU up to B × H ≤ 800 × 400 mm	5.22	Steel fabric, ∅ ≥ 8 mm, mesh aperture 150 mm, or equivalent, for number of fixing points see table
1b	FKRS-EU		
2.3	Concrete base	9.2	Extension piece or duct
4.1	Solid ceiling slab	1	Up to EI 90 S

For combined installation please note:

- Combined installation up to 1.2 m² total fire damper area.

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

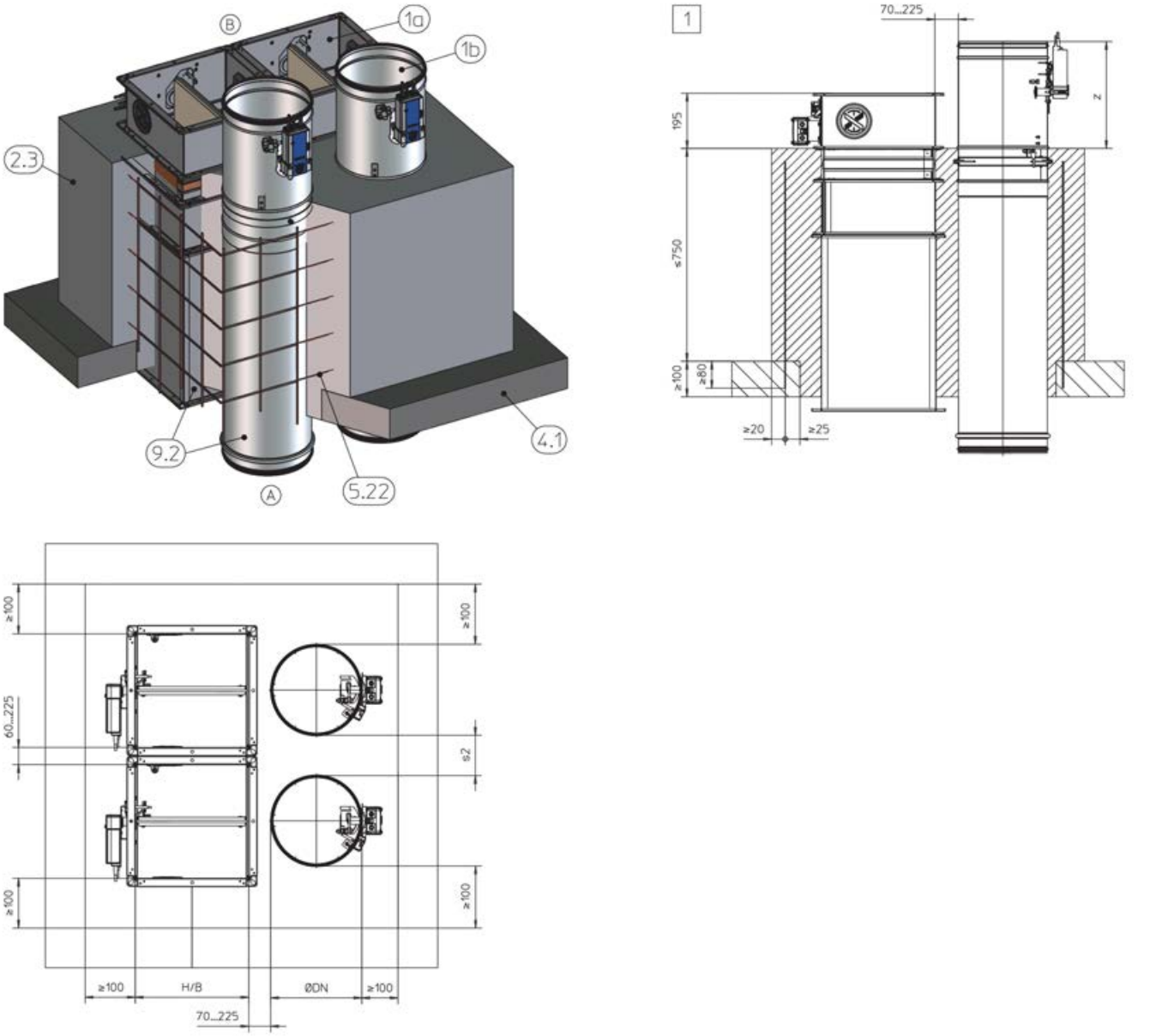


Fig. 166: Mortar-based installation with concrete base into a solid ceiling slab, upright, FK2-EU and FKR-EU combined

1a	FK2-EU up to B × H ≤ 800 × 400 mm	s2	With spigot 40 – 225 mm With flange 80 – 225 mm
1b	FKR-EU		
2.3	Concrete base	Z	Construction with spigot 370 mm Construction with flange 342 mm
4.1	Solid ceiling slab		
5.22	Steel fabric, ∅ ≥ 8 mm, mesh aperture 150 mm, or equivalent, for number of fixing points see table	1	Up to EI 90 S
9.2	Extension piece or duct		

For combined installation please note:

- Combined installation up to 1.2 m² total fire damper area.

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

- Solid ceiling slab, *on page 46*
- Casing length L = 305 or 500 mm
- If the distance to adjacent solid walls is 40 – 100 mm and if the concrete base has been professionally attached, no reinforcement is required on the wall side.
- Concrete bases with H ≤ 150 mm do not require reinforcement
- ≥ 60 – 225 mm distance between two FK2-EU fire dampers
- Distance to load-bearing structural elements ≥ 40 mm

1. Screw the new fire damper to the existing, dysfunctional fire damper or to the duct.

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

2. Create a concrete base according to Fig. 164 to Fig. 166 or equivalent.

Combined installation FK2-EU - FKRS-EU / FKR-EU

- ≥ 45 – 225 mm distance between two FKRS-EU fire dampers
- ≥ 200 mm distance between two pairs of FKRS-EU fire dampers
- ≥ 50 – 225 mm distance to FKRS-EU fire dampers
- ≥ 70 – 225 mm distance to FKR-EU fire dampers (80 – 225 mm with flange-to-flange installation)

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

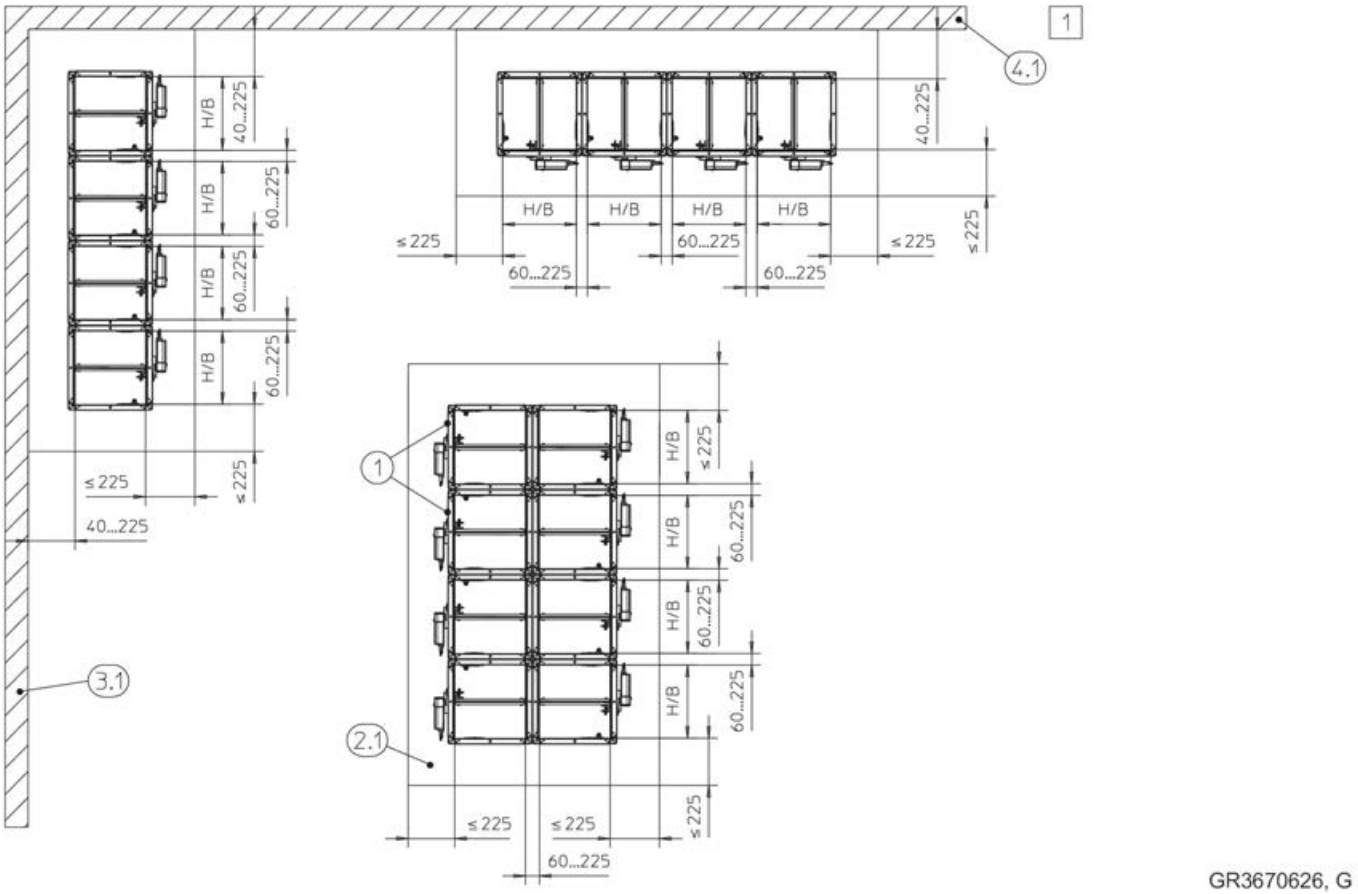


Fig. 167: Mortar-based installation – multiple installation into one installation opening

1 FK2-EU
2.1 Mortar
3.1 Solid wall (load-bearing structural element)
4.1 Solid ceiling slab (load-bearing structural element)
1 Up to EI 90 S

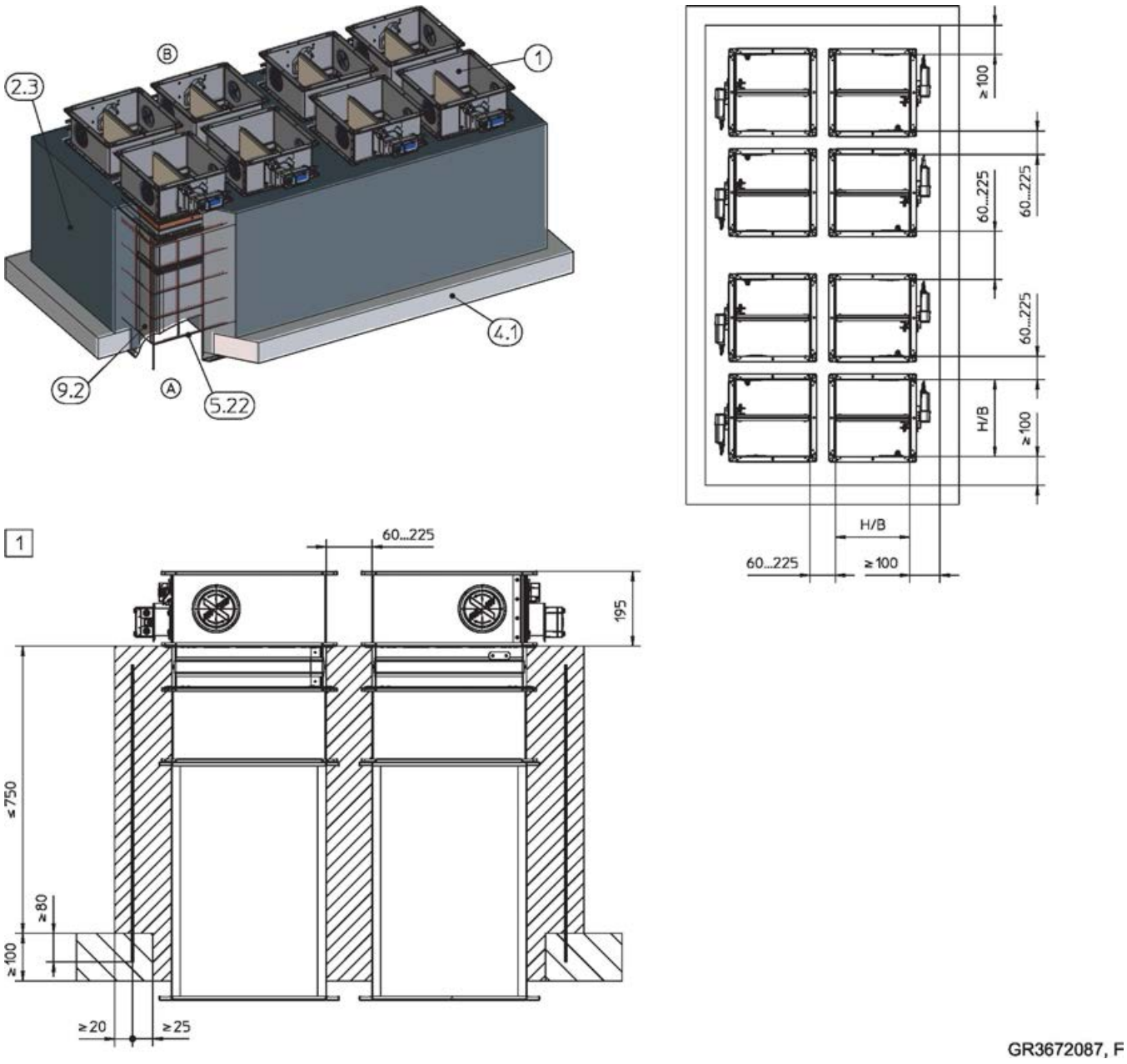


Fig. 168: Mortar-based installation with concrete base into a solid ceiling slab, upright, multiple installation

1 FK2-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
9.2 Extension piece or duct
1 Up to EI 90 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	–	–	–

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

- Solid ceiling slab, *on page 46*
- The total fire damper area must not exceed ≤ 4.8 m²
- The possible number of fire dampers depends on the sizes of the fire dampers (B × H) and on the total fire damper area (4.8 m²)
- The dampers can be arranged in one or two rows

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.

5.10.6 Mortar-based installation into hollow concrete block ceilings

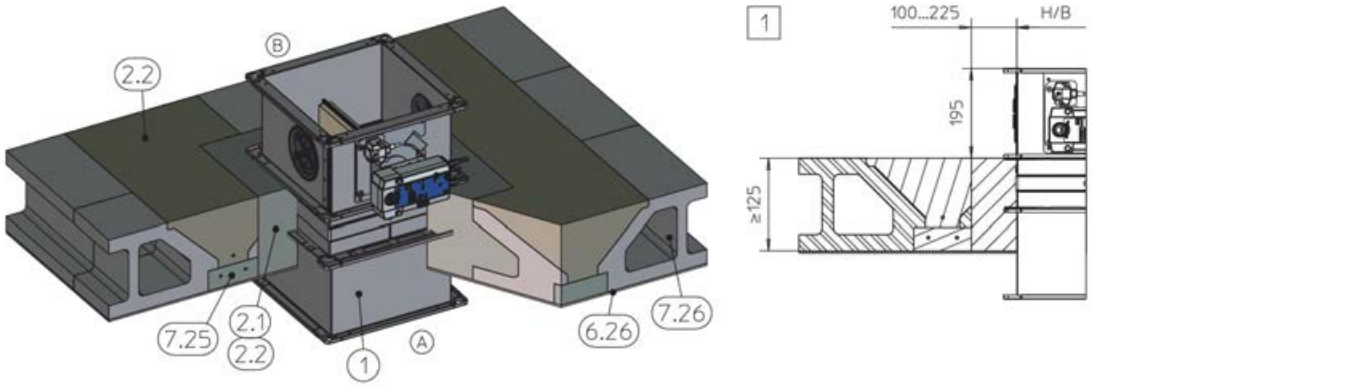


Fig. 169: Mortar-based installation into hollow concrete block ceilings (illustration shows upright installation, applies also to suspended installation)

1 FK2-EU
2.1 Mortar
2.2 Concrete
6.26 Cement plaster*
7.25 Reinforced concrete beam*
7.26 Hollow concrete block*
* The illustration is an example; other ceiling constructions may be possible depending on make and local conditions
[1] Up to EI 90 S

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

- Hollow concrete block ceiling, *on page 46*
- Casing length L = 305 or 500 mm
- Distance to load-bearing structural elements ≥ 40 mm
  - 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.

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.

5.10.7 Mortar-based installation into hollow core slabs

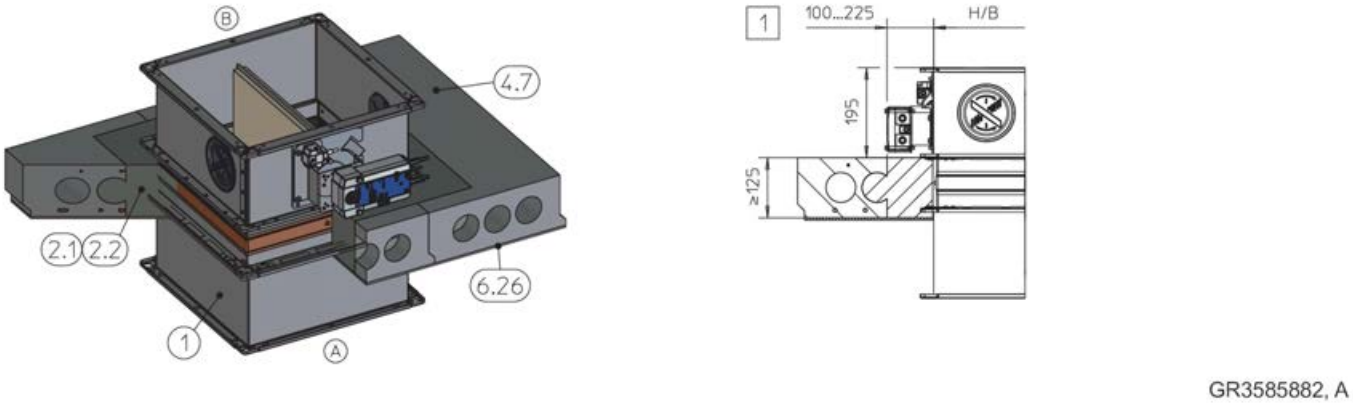


Fig. 170: Mortar-based installation into hollow core slabs, illustration shows upright installation (applies also to suspended installation)

1 FK2-EU
2.1 Mortar
2.2 Concrete
4.7 Reinforced hollow core slab*
6.26 Cement plaster*
* The illustration is an example; other ceiling constructions may be possible depending on make and local conditions
[1] Up to EI 90 S

Additional requirements: mortar-based installation into hollow core slabs

- Hollow core slab, *on page 46*
- Casing length L = 305 or 500 mm
- Distance to load-bearing structural elements ≥ 40 mm
  - 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.

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.

5.10.8 Mortar-based installation into ribbed ceilings

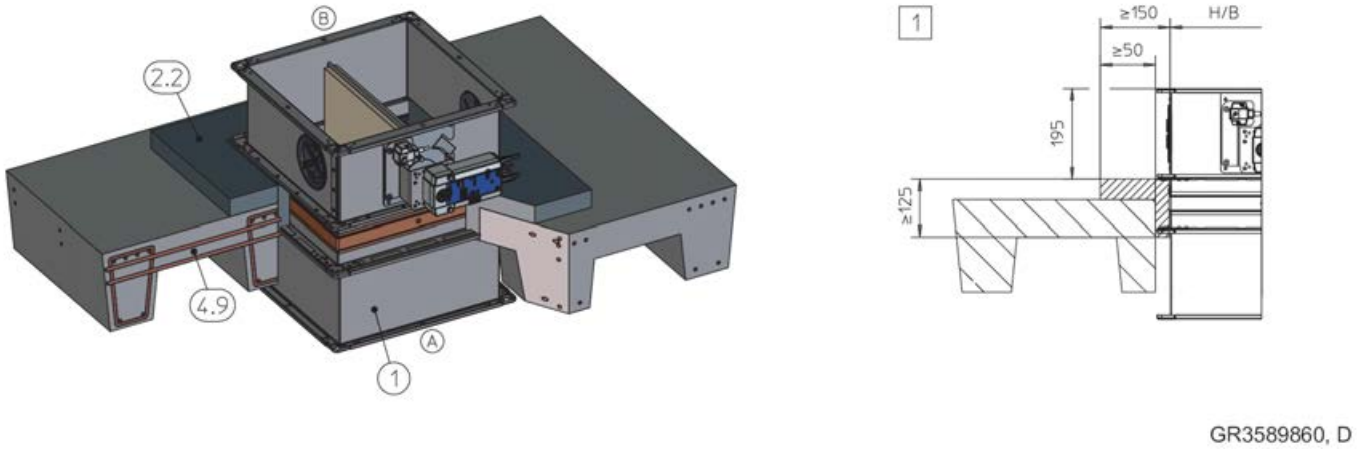


Fig. 171: Mortar-based installation into ribbed ceilings, illustration shows upright installation (applies also to suspended installation)

1 FK2-EU
2.2 Concrete
4.9 Reinforced ribbed ceiling*

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

Additional requirements: mortar-based installation into ribbed ceilings

- Ribbed ceiling, *on page 46*
- Casing length L = 305 or 500 mm
- Concrete bases H < 150 mm do not require reinforcement
- Distance to load-bearing structural elements ≥ 40 mm

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.

5.10.9 Mortar-based installation into composite ceilings

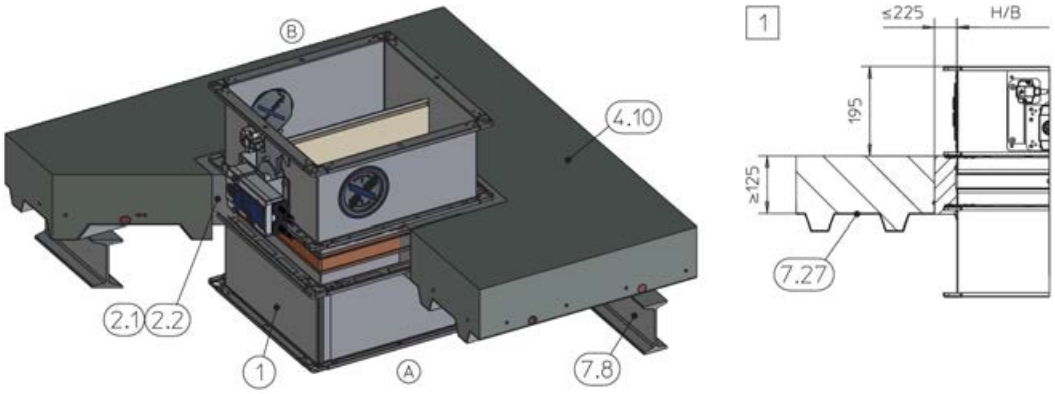


Fig. 172: Mortar-based installation into composite ceilings, illustration shows upright installation (applies also to suspended installation)

1 FK2-EU
2.1 Mortar
2.2 Concrete
4.10 Composite ceiling*
7.8 Steel girder
7.27 Box profile sheet
* The illustration is an example; other ceiling constructions may be possible depending on make and local conditions
[1] Up to EI 90 S

Additional requirements: mortar-based installation into composite ceilings

- Composite ceiling, *on page 46*
- Casing length L = 305 or 500 mm
- Distance to load-bearing structural elements ≥ 40 mm

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.

5.10.10 Mortar-based installation in conjunction with wooden beam ceilings

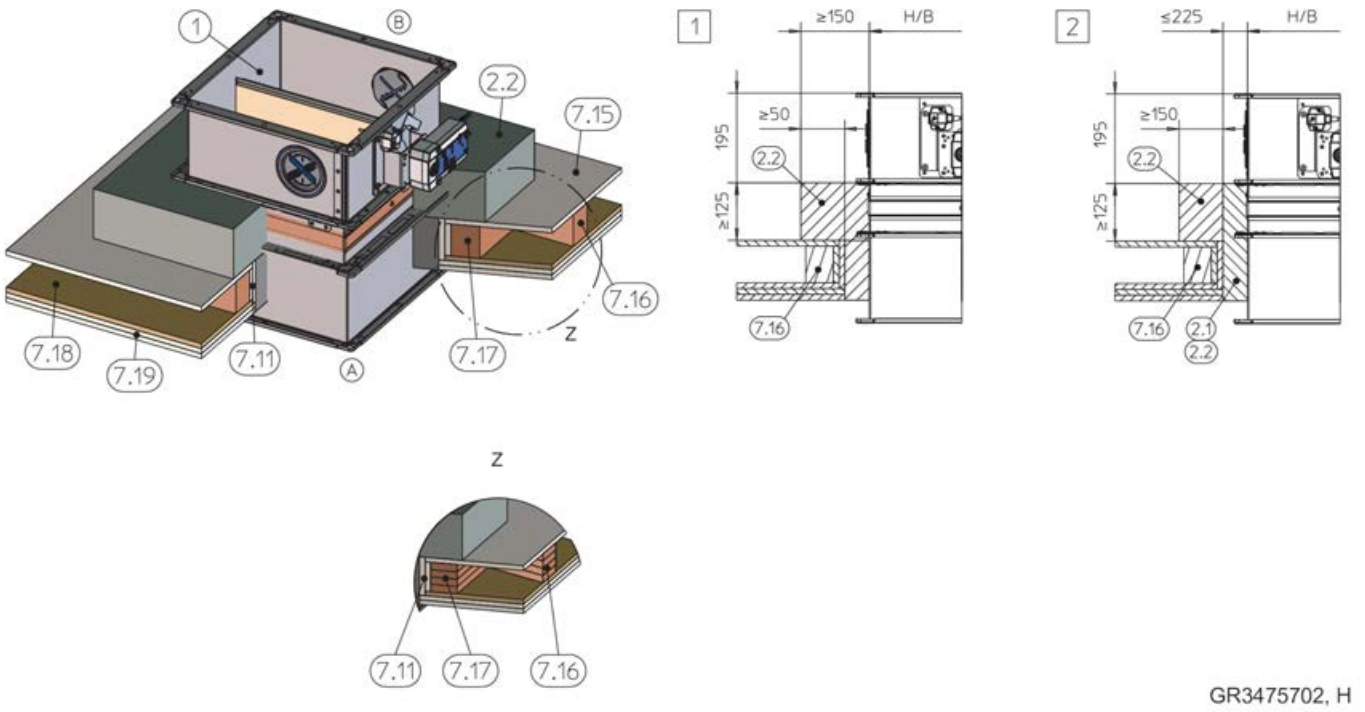


Fig. 173: Mortar-based installation into a solid ceiling slab in conjunction with a wooden beam or glulam ceiling, upright (the illustration is an example and also applies to other ceiling constructions with wooden beams)

1	FK2-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 / glulam (reduce distances between wooden beams to the size of the installation opening)
7.17	Trimmers, wooden beam / glulam
7.18	Formwork
7.19	Fire-resistant cladding (depending on ceiling)
1 2	Up to EI 90 S

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

- Fire-resistant wooden beam ceilings or glulam ceilings, *on page 46*
- Casing length L = 305 or 500 mm
- ≥ 60 mm distance between two fire dampers. When you install two fire dampers side by side into the same opening, the concrete bed between the two fire dampers must not exceed 225 mm.
- Distance to load-bearing structural elements ≥ 40 mm

1. Concrete cover around the perimeter of the installation opening has to be at least 50 mm. Professionally connect the trimmers.
2. Create a partial concrete ceiling around the fire damper, ≥ 150 mm, ≥ 125 mm thick.

> ***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.*

5.10.11 Mortar-based installation in conjunction with solid wood ceilings

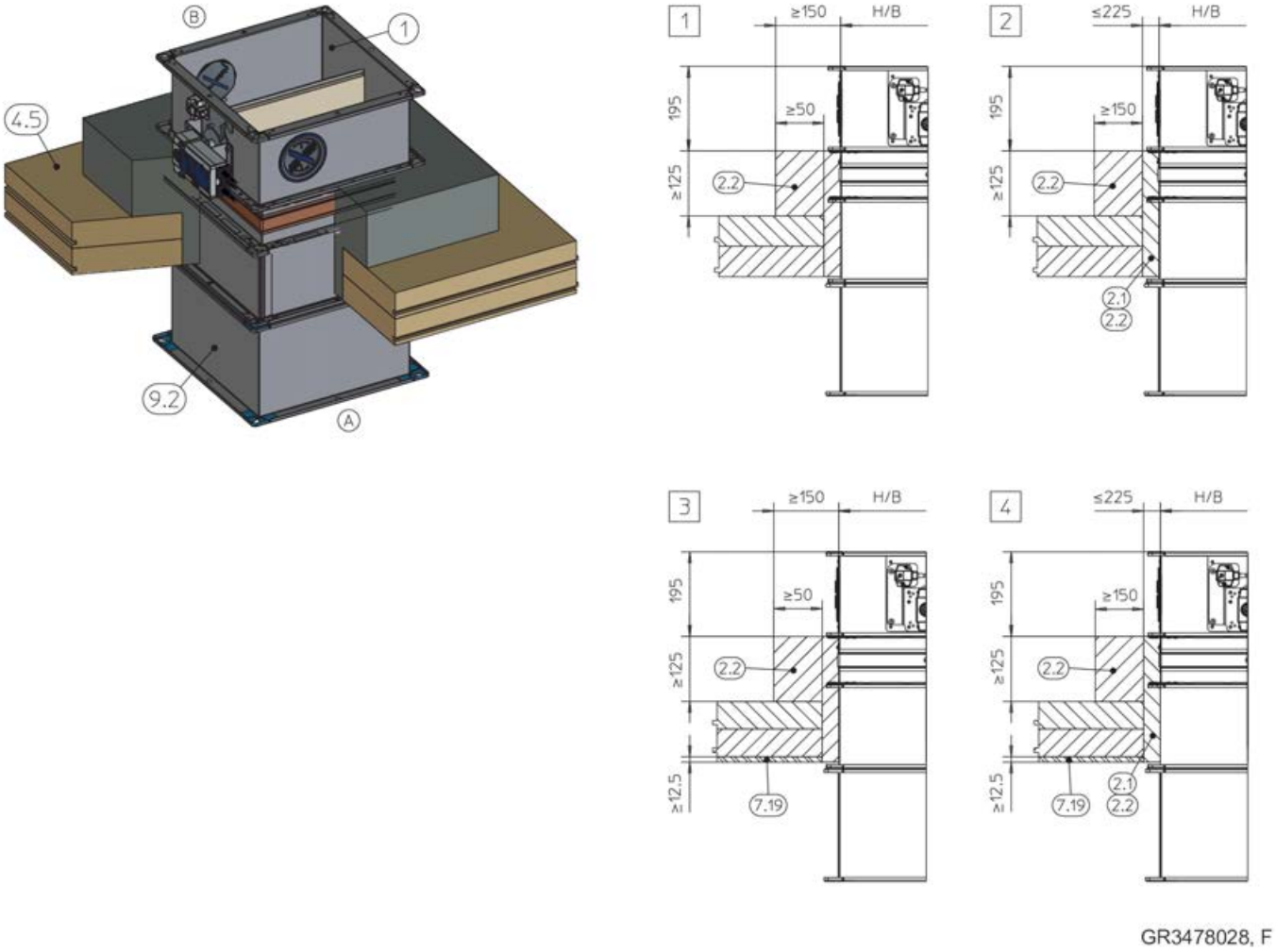


Fig. 174: Mortar-based installation into a solid ceiling slab in conjunction with a solid wood ceiling, upright (the illustration is an example; installation into other types of solid wood ceiling systems may be possible depending on local conditions)

1 FK2-EU
2.1 Mortar
2.2 Reinforced concrete
4.5 Solid wood ceiling
7.19 Fire-resistant cladding
9.2 Extension piece or duct
1 – 4 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 46*
- Casing length L = 305 or 500 mm
- ≥ 60 mm distance between two fire dampers. When you install two fire dampers side by side into the same opening, the concrete bed between the two fire dampers must not exceed 225 mm.
- Distance to load-bearing structural elements ≥ 40 mm

1. Concrete cover around the perimeter of the installation opening has to be at least 50 mm.
2. Create a partial concrete ceiling around the fire damper, ≥ 150 mm, ≥ 125 mm thick.

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.

5.10.12 Mortar-based installation in conjunction with lightweight ceilings

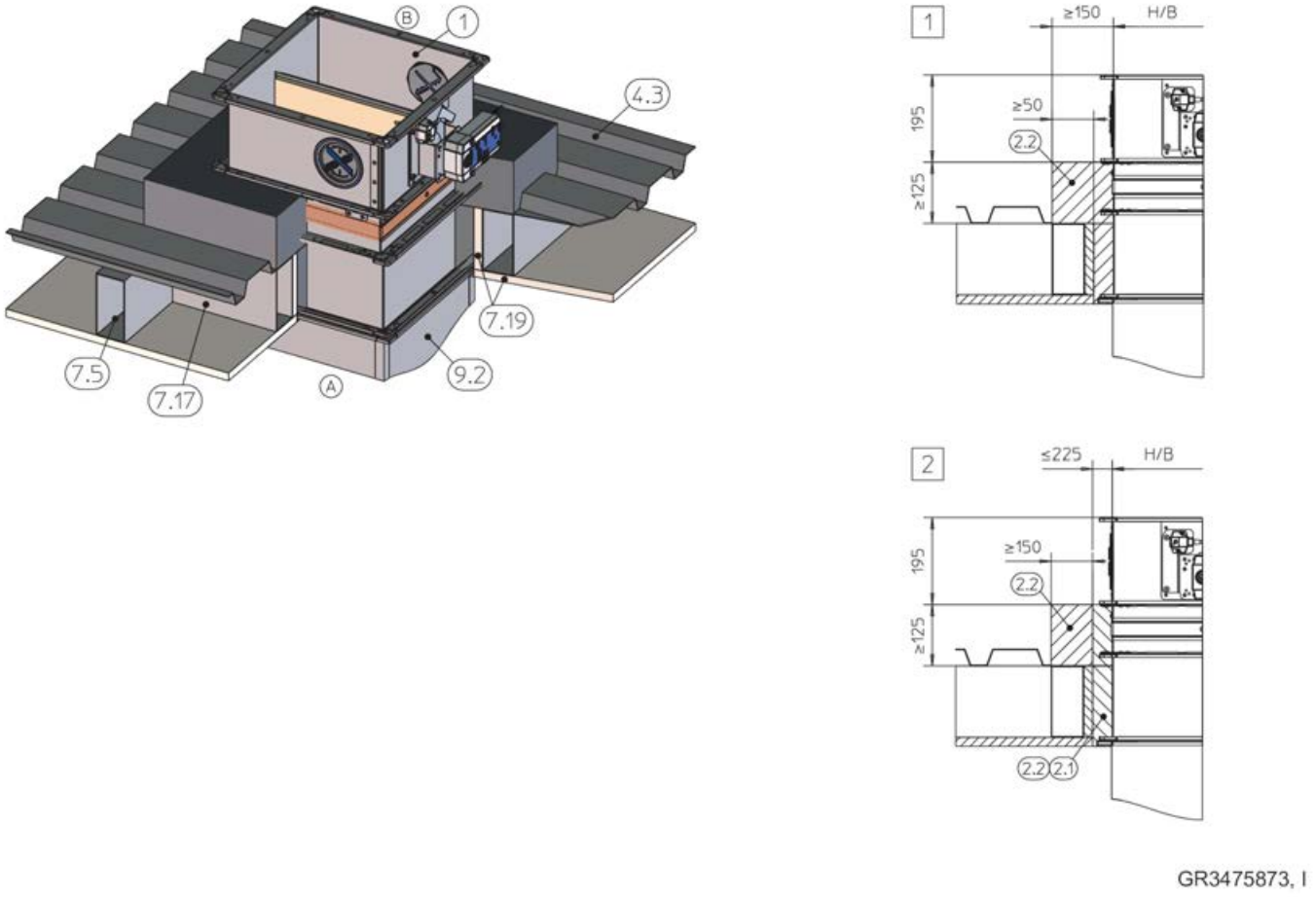


Fig. 175: Mortar-based installation in conjunction with a lightweight ceiling (Cadolto system), upright

1 FK2-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 Extension piece or duct
1 2 Up to EI 120 S

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

- Modular ceiling, (Cadolto system), *on page 46*
- Casing length L = 305 or 500 mm
- ≥ 60 mm distance between two fire dampers. When you install two fire dampers side by side into the same opening, the concrete bed between the two fire dampers must not exceed 225 mm.
- Distance to load-bearing structural elements ≥ 40 mm

1. ▸ Concrete cover around the perimeter of the installation opening has to be at least 50 mm.
2. ▸ Create a partial concrete ceiling around the fire damper, ≥ 150 mm, ≥ 125 mm thick.

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.

5.10.13 Dry mortarless installation above or below a solid ceiling slab with installation kit WA

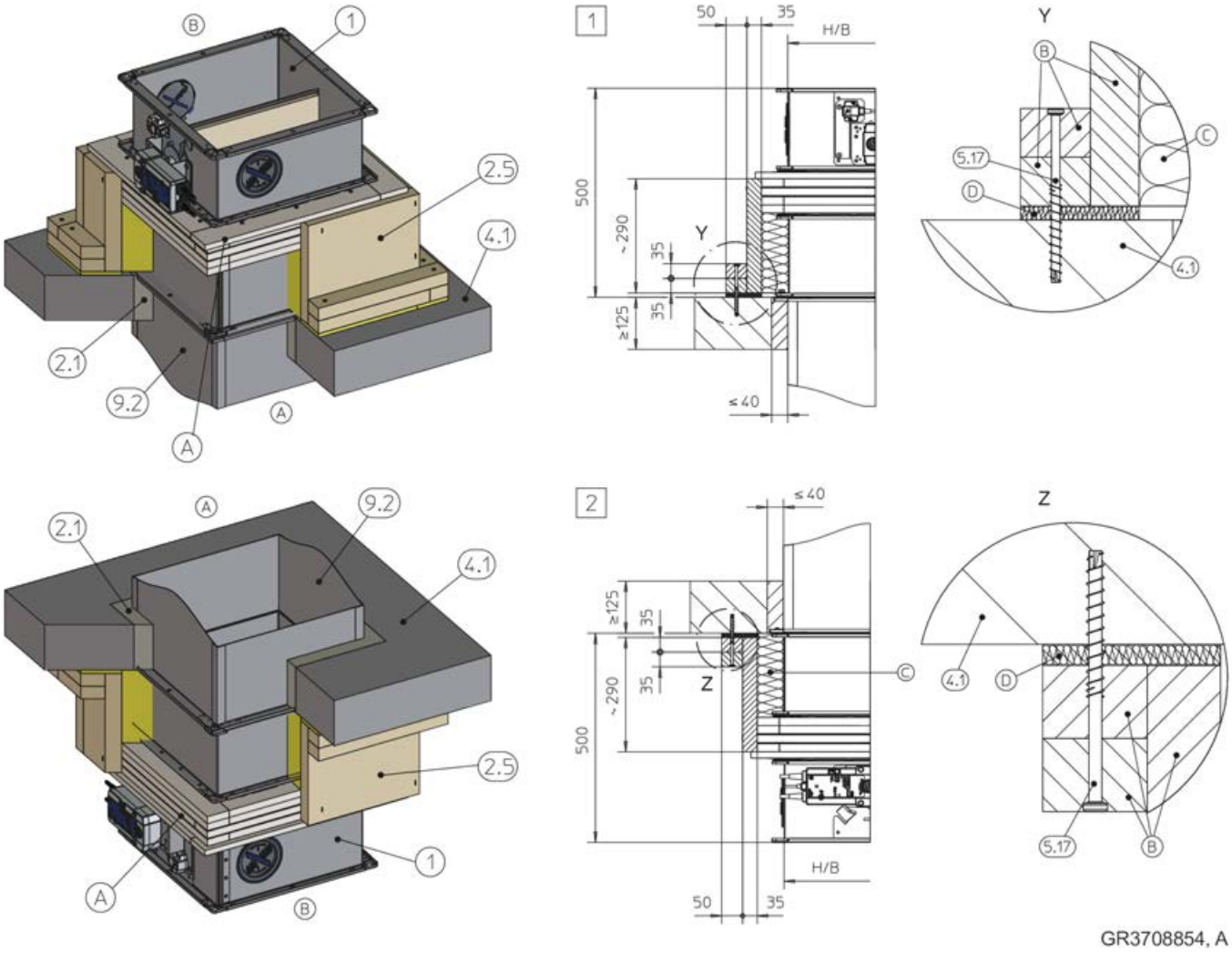


Fig. 176: Dry mortarless installation above a solid ceiling slab with installation kit WA

1	FK2-EU
2.1	Mortar
2.5	Installation kit WA, ↳ *5.3.5 'Installation kit WA – supply package and assembly' on page 57*, consists of:
A	Installation kit (2 × B section and 2 × H section)
B	Multilayer section (2 × B section and 2 × H section)
C	Cut mineral wool parts (2 × B section and 2 × H section), ≥ 1000°C, ≥ 80 kg/m³, d = 60 mm
D	Mineral wool strips (2 × B side and 2 × H side), ≥ 1000 °C, ≥ 40 kg/m³, t = 10 mm
4.1	Solid ceiling slab
5.17	Hilti ® HUS anchor ∅ 6 mm (120 mm) As an alternative, equivalent fire-rated anchors with suitability certificate (by others) that are suitable for the wall or ceiling slab can also be used; push through installation is also possible
9.2	Extension piece or duct
1 2	Up to EI 90 S

Additional requirements: dry mortarless installation above or below a solid ceiling slab with installation kit WA

- Solid ceiling slab, ↳ *on page 46*
- Casing length L = 500 mm
- Cladding on 4 sides
- ≥ 150 mm distance between the fire damper and adjacent structural elements
- ≥ 300 mm distance between two fire dampers
- Installation of FK2-EU on the face of a solid wall or ceiling slab, with installation kit WA, ↳ *on page 40*
- Mount installation kit WA onto the fire damper, ↳ *5.3.5 'Installation kit WA – supply package and assembly' on page 57*

5.10.14 Dry mortarless installation remote from solid ceiling slabs, with installation kit WE

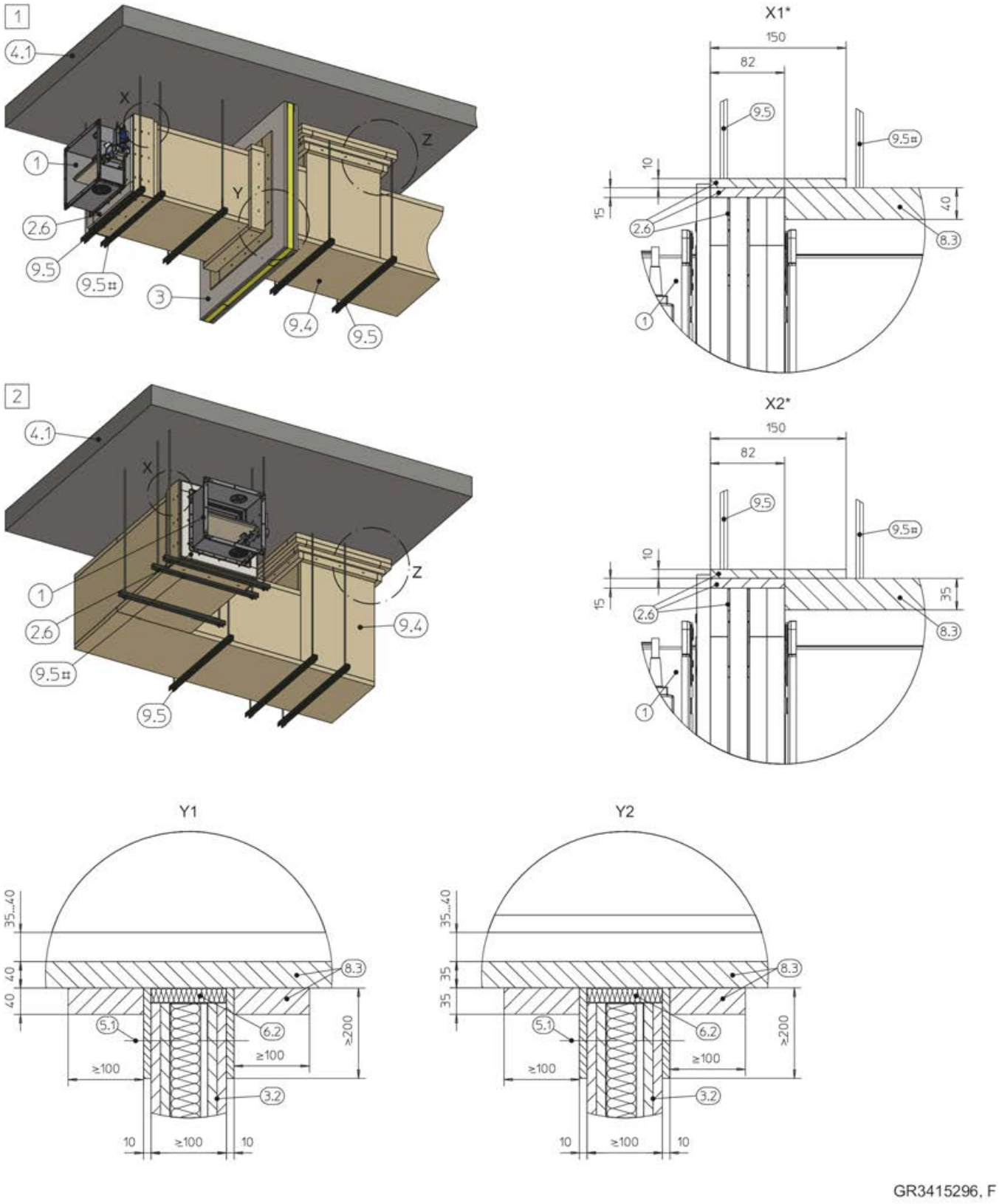


Fig. 177: Dry mortarless installation remote from solid ceiling slabs, with installation kit WE, key to illustration
Fig. 178

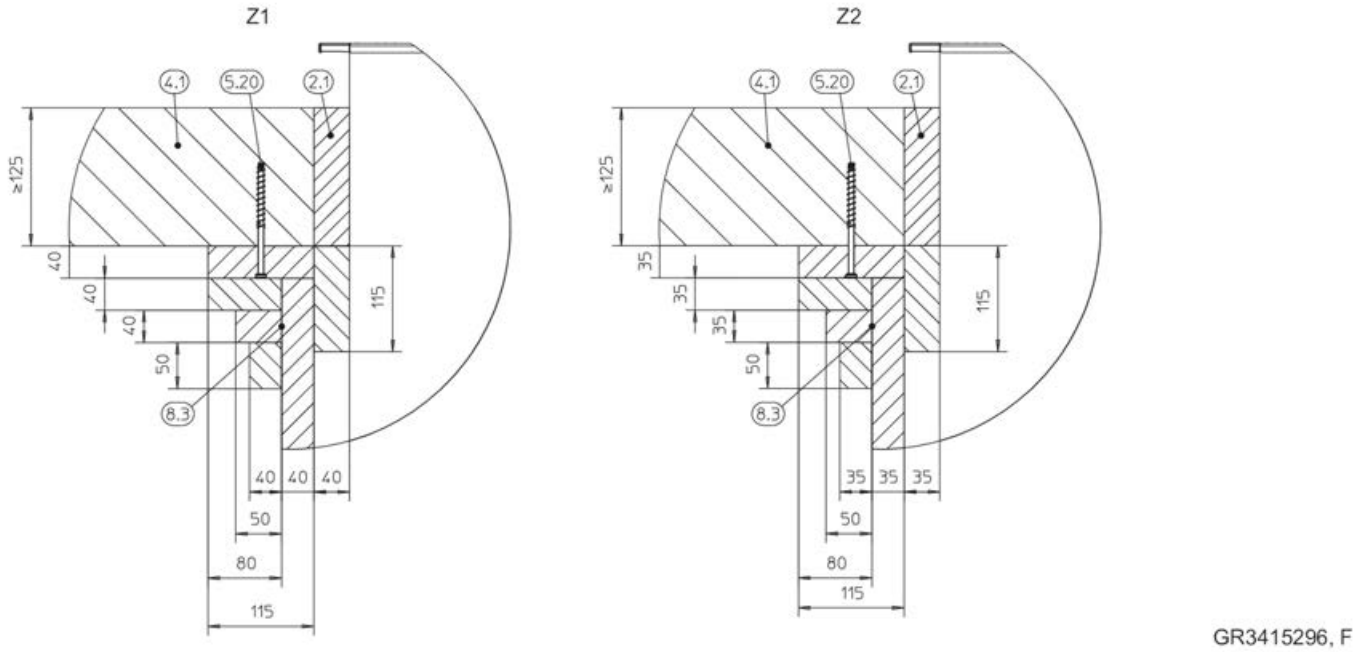


Fig. 178: Dry mortarless installation remote from solid ceiling slabs, with installation kit WE

1 FK2-EU
2.1 Mortar
2.6 Installation kit WE, ↳ *5.3.6 'Installation kit WE – supply package and assembly' on page 61* , including:
A Installation kit (2 × B section and 2 × H section)
B Plasterboard strips (6 × B section and 6 × H section)
3 Lightweight partition wall or solid wall (if any), wall penetration (4 sides) according to Promat® manual, construction 478, latest edition
4.1 Solid ceiling slab, attachment of the cladding to the solid ceiling slab (4 sides) according to Promat® manual, construction 478, latest edition
5.20 Screw, Fischer® FFS 7.5 × 82 mm or equivalent (push through installation is also possible)
6.2 Mineral wool ≥ 1000 °C, ≥ 80 kg/m³
8.3 PROMATECT®-LS35 or -L500, d = 35 mm or 40 mm, or AD40
9.4 Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition
9.5 Suspension of FK2-EU (by others) , see ↳ *229*
Damper sizes > 1000× 600 mm require two suspension points underneath the damper, at a distance of 150 mm from each other
1 2 Up to EI 90 S (horizontal installation position)

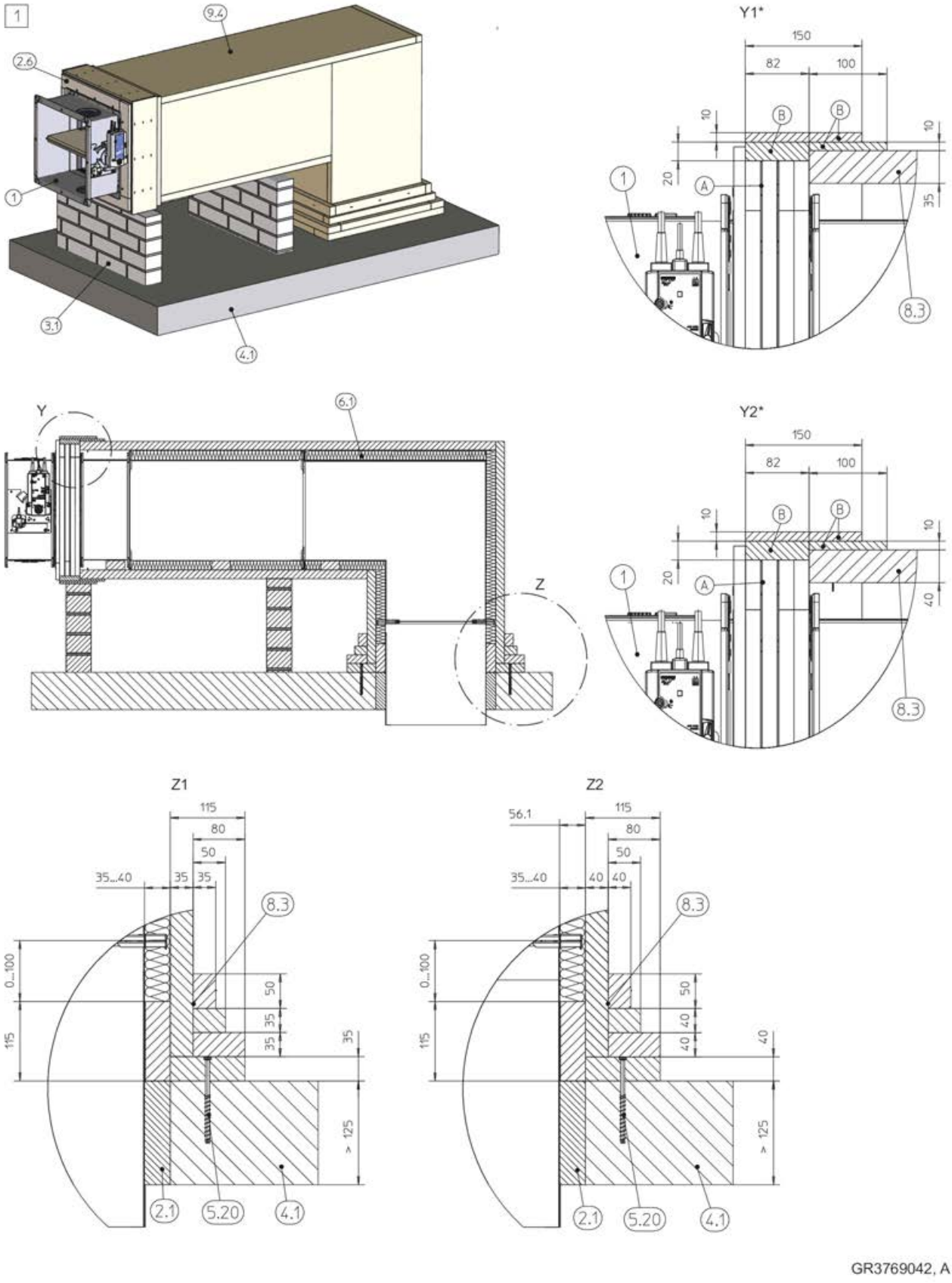


Fig. 179: Dry mortarless installation remote from solid ceiling slabs, with installation kit WE

1 FK2-EU
2.1 Mortar
5.20 Screw, Fischer® FFS 7.5 × 82 mm or equivalent (push through installation is also possible)
6.1 Mineral wool, ≥ 1000 °C, ≥ 40 kg/m³, only from B × H > 800 × 400 mm

2.6 Installation kit WE, *5.3.6 'Installation kit WE – supply package and assembly' on page 61* , consists of:
A Installation kit (2 × B section and 2 × H section)
B Plasterboard strips (6 × B section and 6 × H section)
3.1 Solid wall
4.1 Solid ceiling slab
8.3 PROMATECT®-LS35 or -L500, d = 35 mm or 40 mm, or AD40
9.4 Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition
* Even out the joints between the plasterboard strips with Promat filler or compound
1 Up to EI 90 S (horizontal installation position)

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

- Solid ceiling slab, *on page 46*
- Casing length L = 500 mm
- Cladding on 4 sides
- Horizontal installation position
- ≥ 155 mm distance between the fire damper and adjacent structural elements
- ≥ 230 mm distance to the ceiling slab
- ≥ 310 mm distance between two fire dampers
- Sheet steel duct with fire-resistant cladding made from panels *38*
- Installation of FK2-EU remote form walls and ceilings, with installation kit WE, *on page 40*
- Mount installation kit WE onto the fire damper, *5.3.6 'Installation kit WE – supply package and assembly' on page 61*
- For more information on making the cladding, mineral wool infill and firestop board see *5.4.10 'Dry mortarless installation remote from solid walls with installation kit WE' on page 89*

5.10.15 Dry mortarless installation with fire batt

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

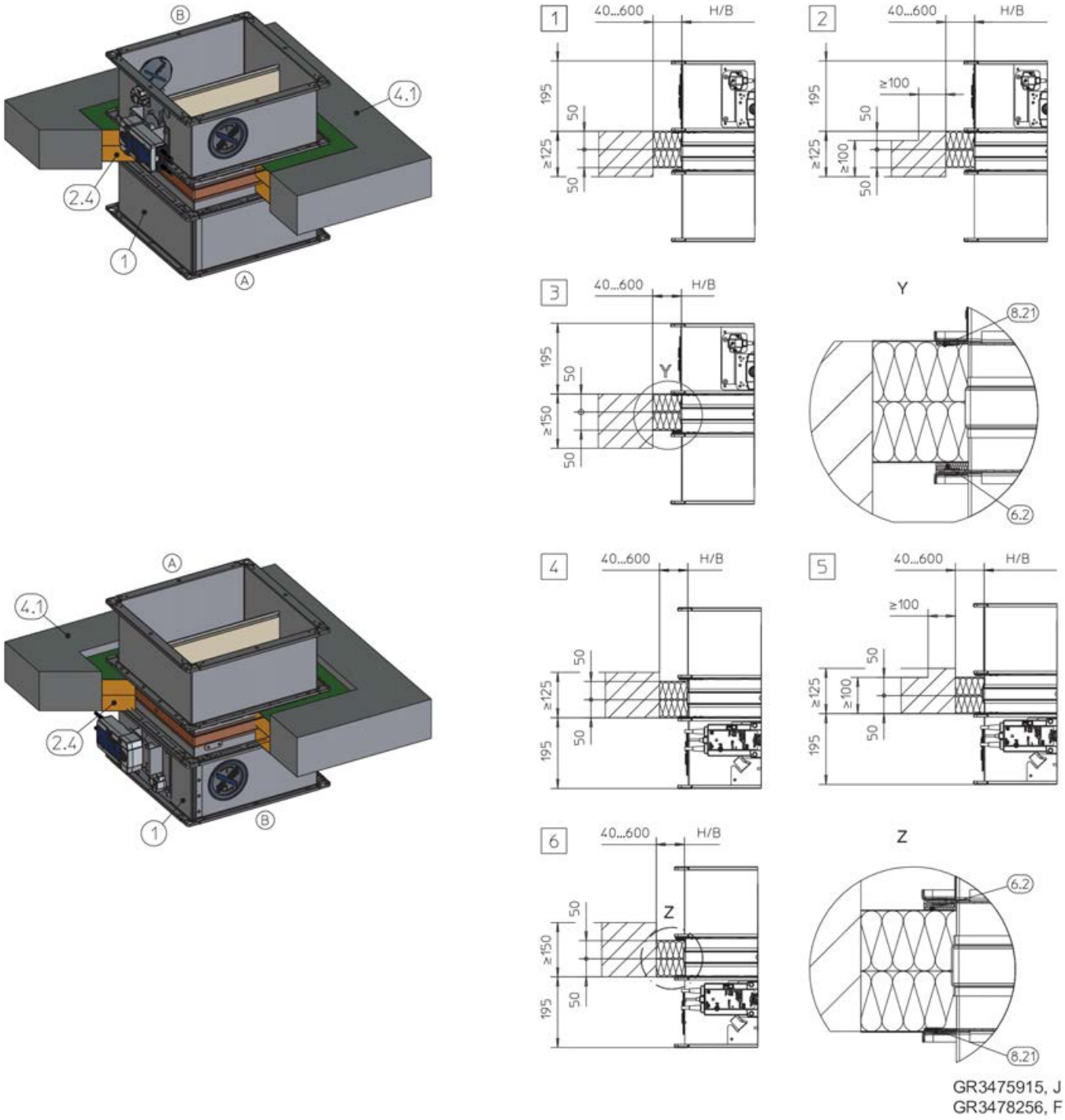


Fig. 180: Dry mortarless installation into a solid ceiling slab, with a fire batt, upright and suspended

1	FK2-EU
2.4	Coated board system
4.1	Solid ceiling slab
6.2	Mineral wool ≥ 1000 °C, ≥ 80 kg/m³
8.21	Firestop sealant
1 2 4	Up to EI 90 S
5	
3 6	UP to EI 120 S (D ≥ 150 mm): B × H = 200 × 100 – 800 × 400 mm

Dry mortarless installation with fire batt into solid walls, flange to flange

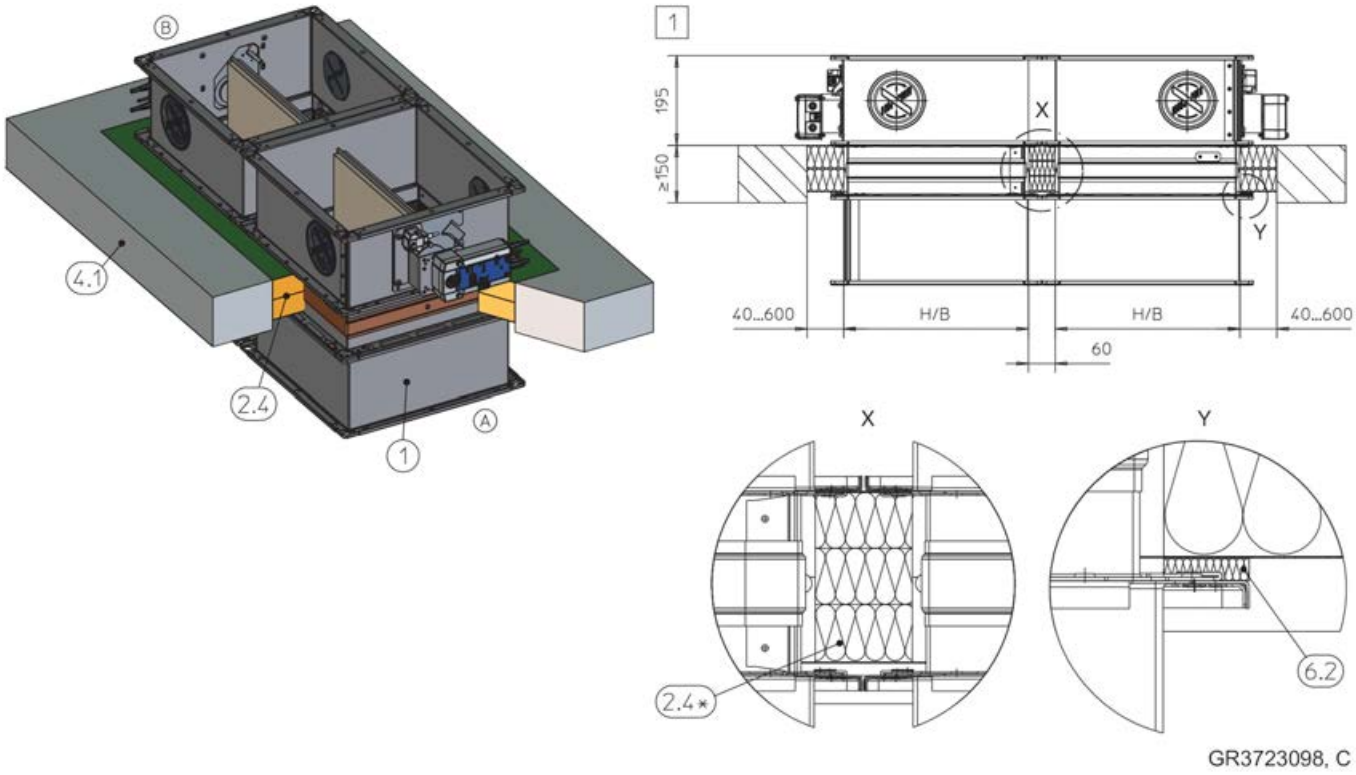


Fig. 181: Dry mortarless installation into a solid ceiling slab, flange to flange, illustration shows upright installation (applies also to suspended installation)

1 FK2-EU
2.4 Coated board system
4.1 Solid ceiling slab
6.2 Mineral wool ≥ 1000 °C, ≥ 80 kg/m³
* Mineral wool ≥ 1000 °C, ≥ 140 kg/m³, 3 strips 70 × 35 mm
[1] Up to EI 90 S

Dry mortarless installation with fire batt into a solid wall, multiple installation, flange to flange

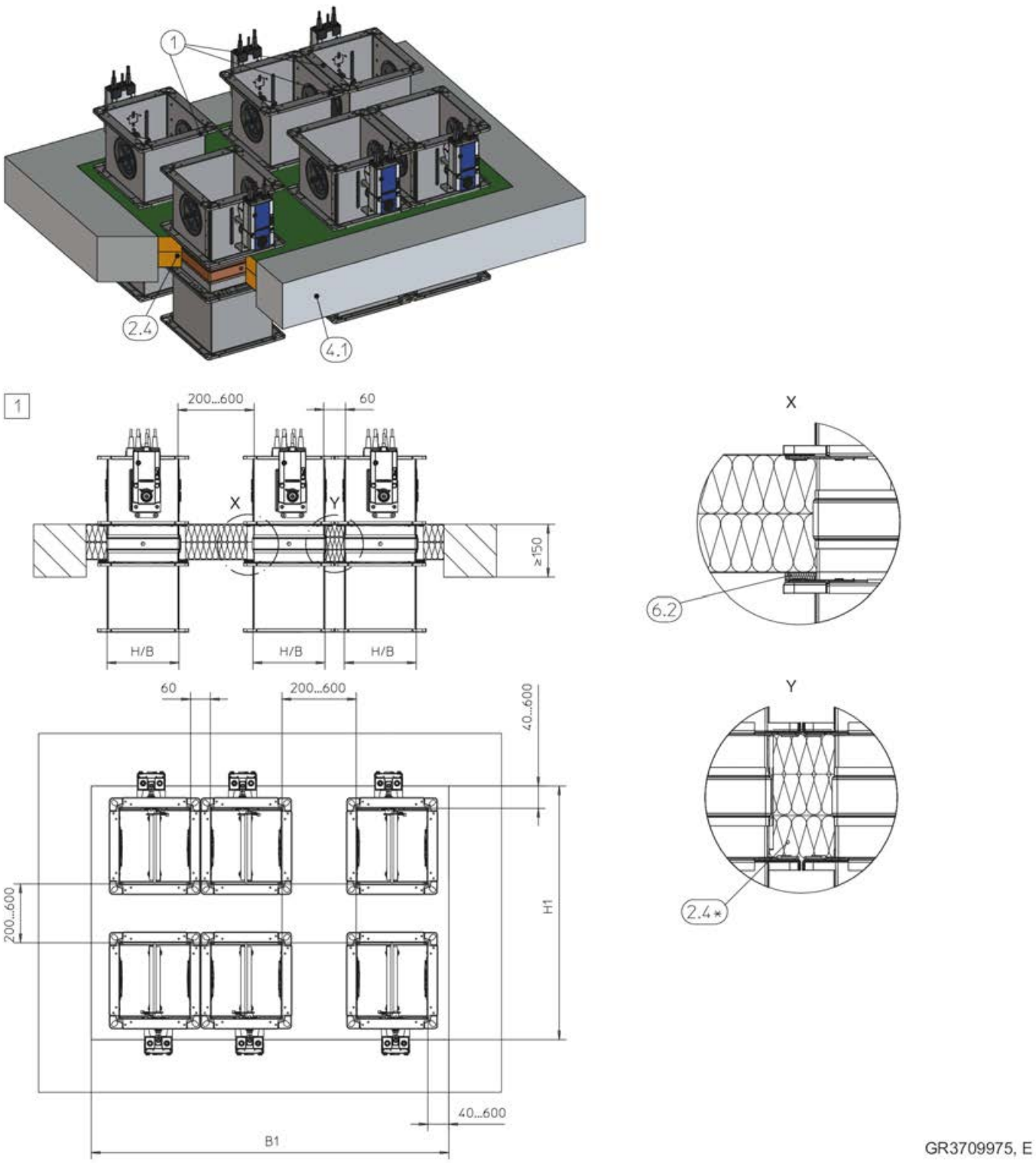


Fig. 182: Dry mortarless installation with fire batt into a solid ceiling slab, multiple installation, flange to flange, illustration shows upright installation (applies also to suspended installation)

1 FK2-EU
2.4 Coated board system
4.1 Solid ceiling slab
6.2 Mineral wool ≥ 1000 °C, ≥ 80 kg/m³
* Mineral wool ≥ 1000 °C, ≥ 140 kg/m³, 3 strips 70 × 35 mm
[1] Up to EI 90 S

For multiple installation please note:

- Total fire damper area: 2.4 m² max.
- The possible number of fire dampers when arranged in pairs in a fire batt depends on the sizes of the fire dampers (B × H) and on the total fire damper area (2.4 m²).
- B1 x H1 maximum fire batt size (depends on the the manufacturer).

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

- Solid ceiling slab, ↬ *on page 46*
- Casing length L = 305 or 500 mm
- Fire batt systems, installation details, distances / dimensions, ↬ *on page 41*
- Suspension and fixing, ↬ *Chapter 5.13 'Fixing the fire damper' on page 228* ↬ *5.13.3 'Fixing the damper when a fire batt is used' on page 230*
- Distance to load-bearing structural elements ≥ 40 mm

5.11 Solid wood ceilings

5.11.1 Mortar-based installation into solid wood ceilings

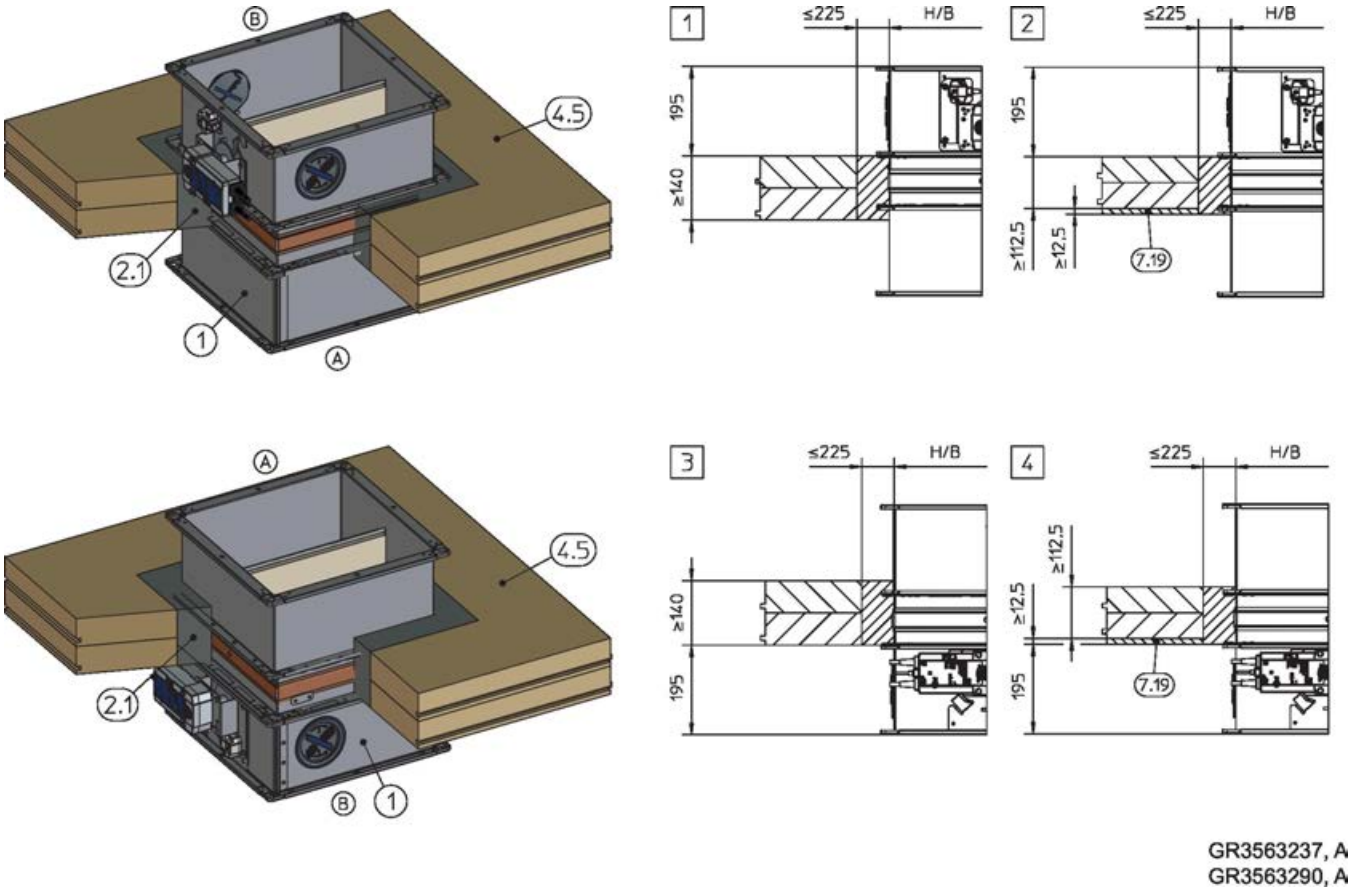


Fig. 183: Mortar-based installation into a solid wood ceiling, suspended or upright

1 FK2-EU
2.1 Mortar
4.5 Solid wood ceiling
7.19 Fire-resistant cladding
1 – 4 Up to EI 90 S

Additional requirements: mortar-based installation into solid wood ceilings

- Solid wood ceiling, *on page 46*
- Casing length L = 305 or 500 mm
- ≥ 75 mm distance between the fire damper and load-bearing structural elements
- ≥ 200 mm distance between two fire dampers in separate installation openings

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.

5.11.2 Dry mortarless installation into solid wood ceilings, with installation kit ES

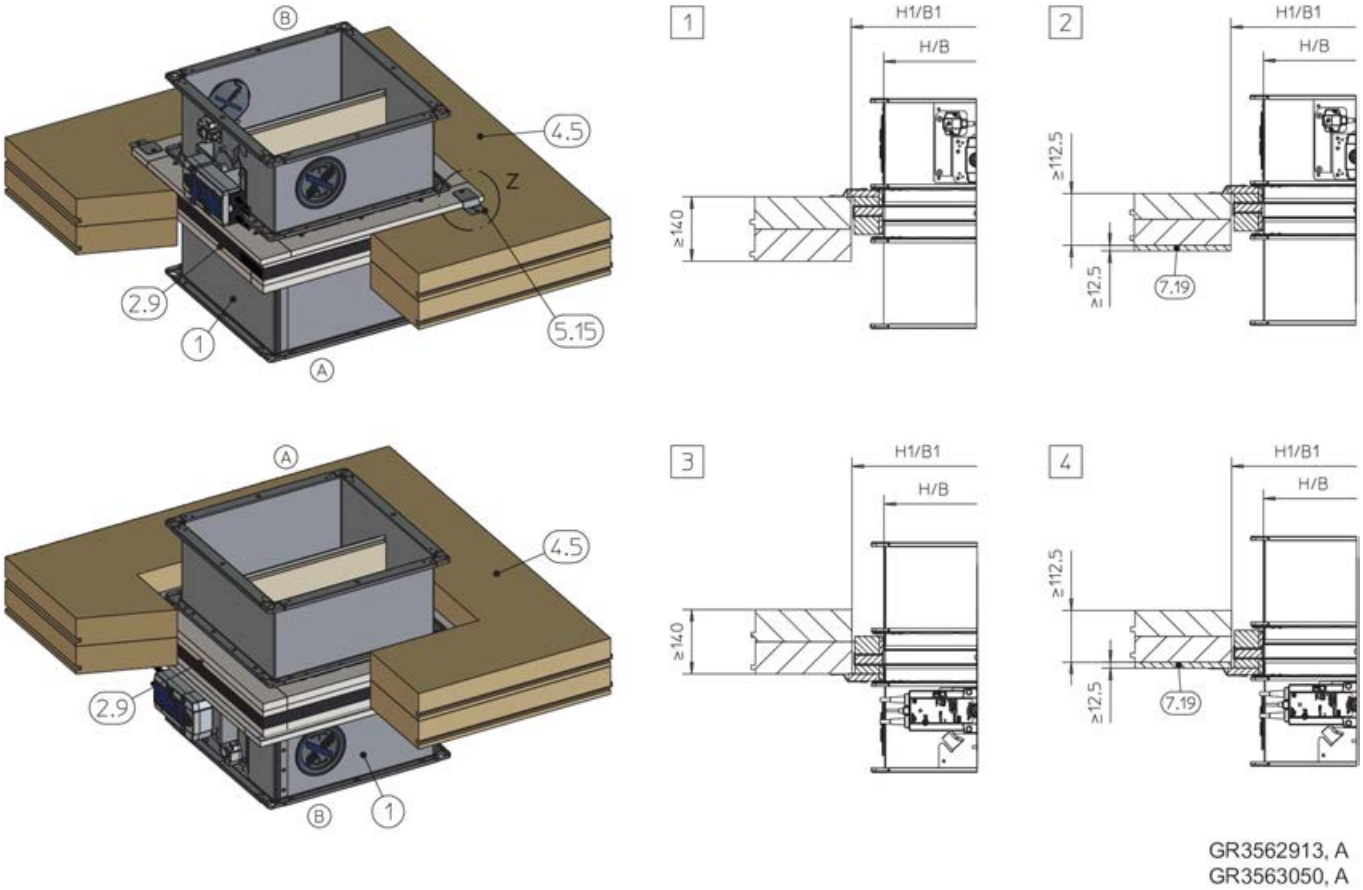


Fig. 184: Dry mortarless installation with installation kit ES into solid wood ceiling, upright and suspended

1	FK2-EU
2.9	Installation kit ES
4.5	Solid wood ceiling
5.15	Bracket
7.19	Fire-resistant cladding
H1/B1	Clear installation opening B/H + 140 ±2 mm
Z	For fixing, see Fig. 23 to Fig. 25
1 – 4	Up to EI 90 S

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

- Solid wood ceiling, *on page 46*
- Casing length L = 500 mm
- Approx. 80 / 120 mm distance between the fire damper and adjacent structural elements (depending on the position of the brackets)
- ≥ 200 mm distance between two fire dampers in separate installation openings

1. Mount the installation kit onto the fire damper, *5.3.1 'Installation kit ES – supply package and assembly' on page 47* .
2. Position the fire damper in the centre of the installation opening and fix it with brackets and dry wall screws to the solid wood ceiling, Fig. 23 to Fig. 25 .

5.12 Wooden beam ceilings

5.12.1 Mortar-based installation into wooden beam ceilings

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

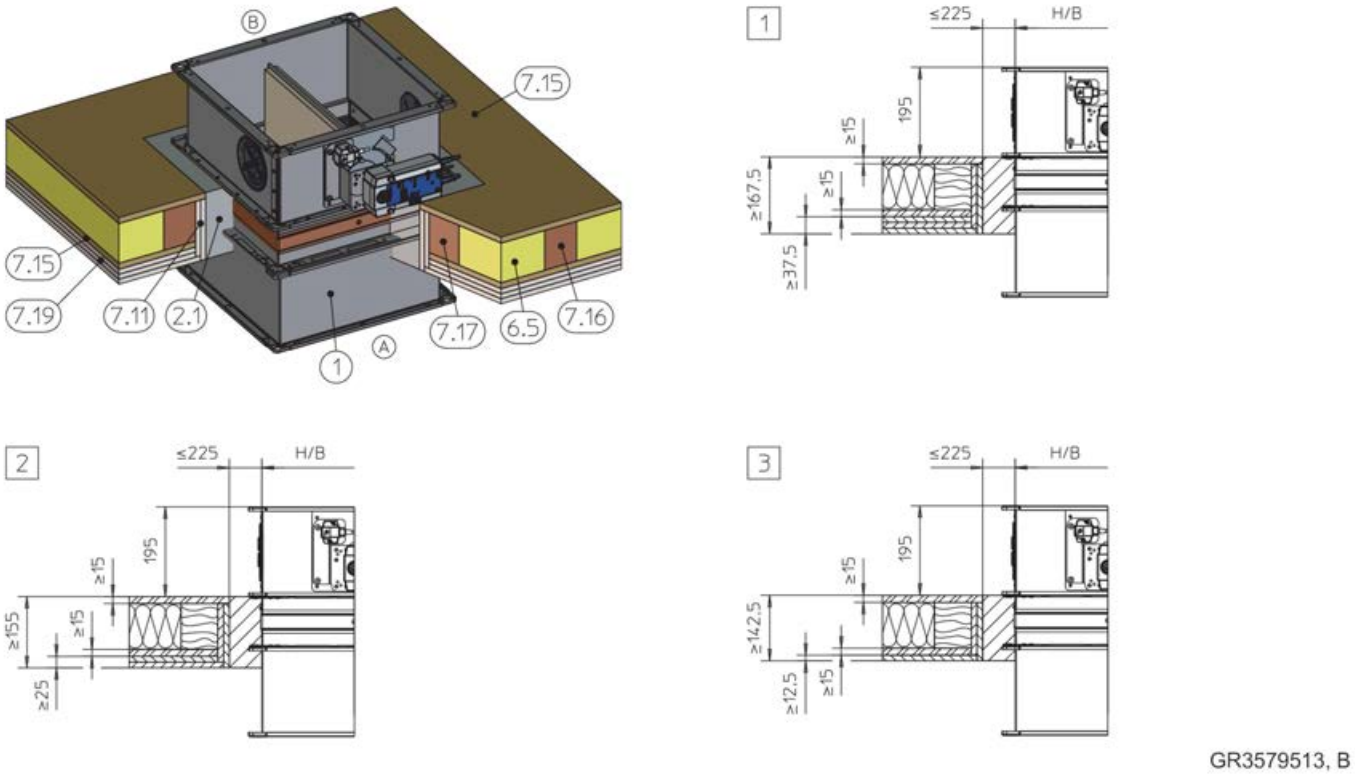


Fig. 185: Mortar-based installation into wooden beam or glulam ceiling, upright (illustration is an example; other ceiling constructions upon request)

1	FK2-EU
2.1	Mortar
6.5	Mineral wool infill if required
7.11	Trim panel, same construction as 7.19
7.15	Wood sheet, at least 600 kg/m³
7.16	Wooden beam / glulam at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)
7.17	Trimmers, wooden beam ceiling / glulam 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 / glulam ceiling, suspended

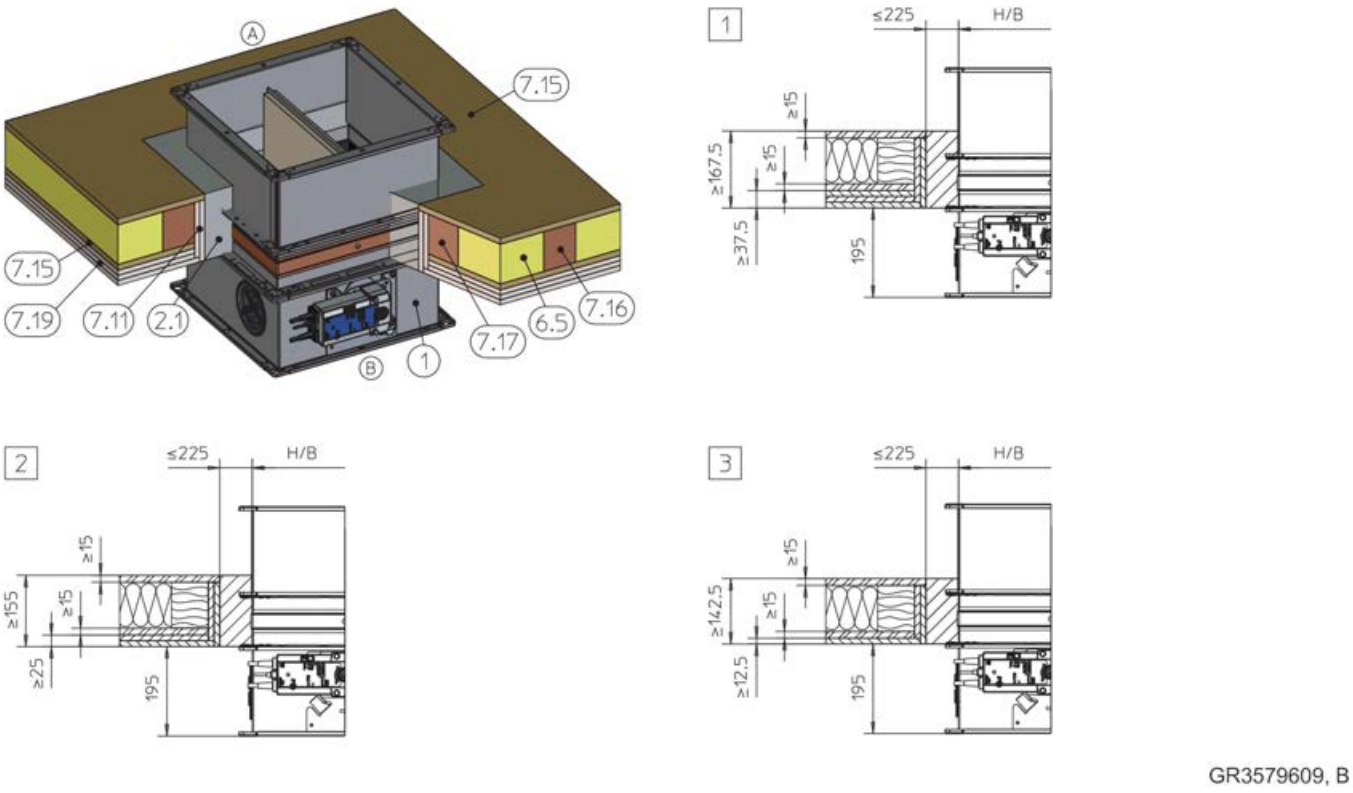


Fig. 186: Mortar-based installation into a wooden beam ceiling / glulam ceiling, suspended (the illustration is an example; other ceiling constructions may be possible upon request)

1 FK2-EU
2.1 Mortar
6.5 Mineral wool infill if required
7.11 Trim panel, same construction as 7.19
7.15 Wood sheet, at least 600 kg/m³
7.16 Wooden beam / glulam at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)
7.17 Trimmers, wooden beam ceiling / glulam 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 glulam ceilings

- Wooden beam ceiling, *on page 46*
- Casing length L = 305 or 500 mm
- ≥ 40 mm distance between the fire damper and load-bearing structural elements
- ≥ 200 mm distance between two fire dampers in separate installation openings

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.

5.12.2 Dry mortarless installation into wooden beam ceilings, with installation kit ES

Dry mortarless installation into wooden beam ceilings or glulam ceilings, upright, with installation kit TQ

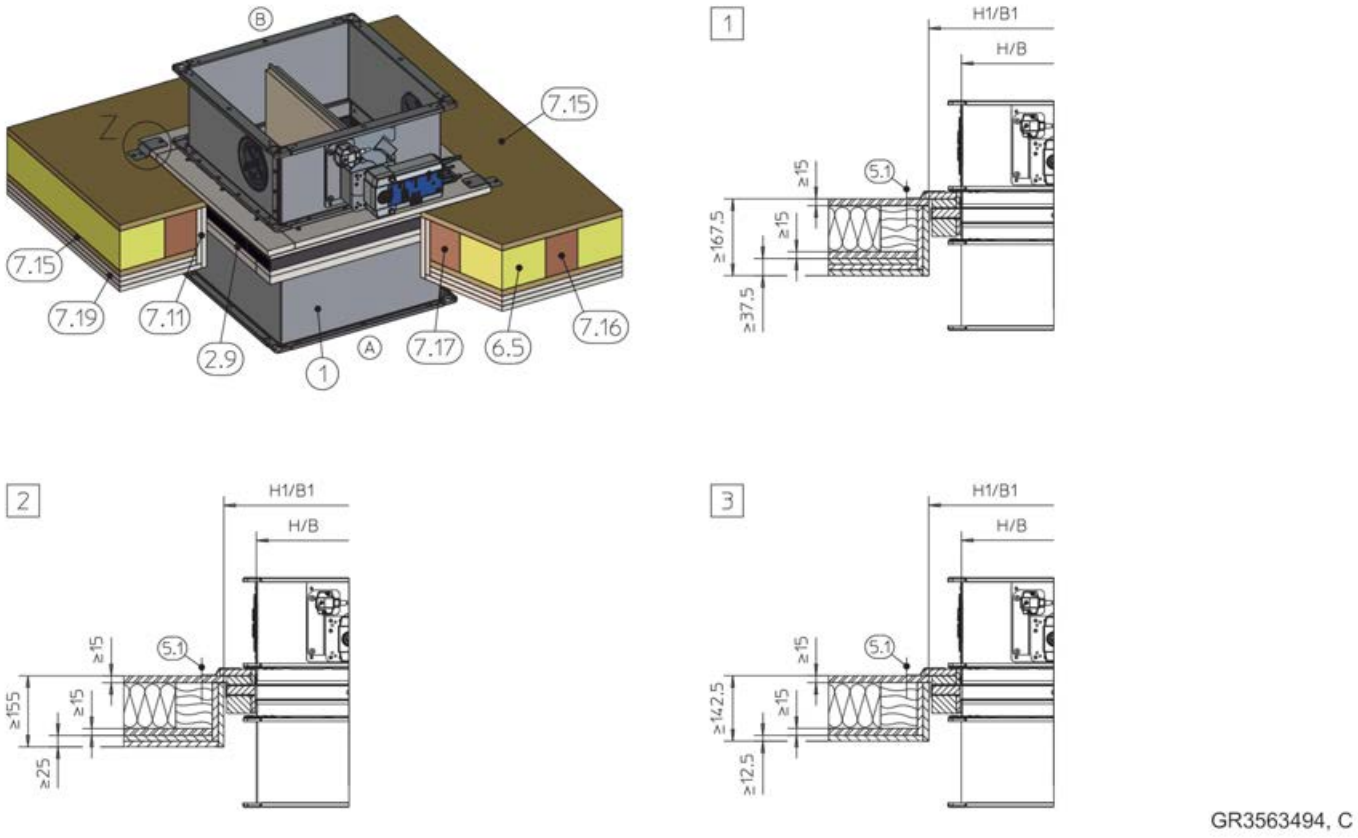


Fig. 187: Dry mortarless installation into wooden beam or glulam ceilings, upright, with installation kit ES (other ceilings upon request)

1	FK2-EU
2.9	Installation kit ES
5.1	Dry wall screw
6.5	Mineral wool infill depending on ceiling construction
7.11	Trim panel, d = 25 mm, same construction as 7.19
7.15	Wood sheet, at least 600 kg/m³
7.16	Wooden beam / glulam at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)
7.17	Trimmers, wooden beam ceiling / glulam ceiling at least 100 × 80 mm
7.19	Fire-resistant cladding (depending on ceiling)
H1/B1	Clear installation opening B/H + 140 ±2 mm
Z	For fixing, see Fig. 23 to Fig. 25
1	Up to EI 90 S
2	Up to EI 60 S
3	EI 30 S

Dry mortarless installation into a wooden beam or glulam ceiling, suspended, with installation kit ES

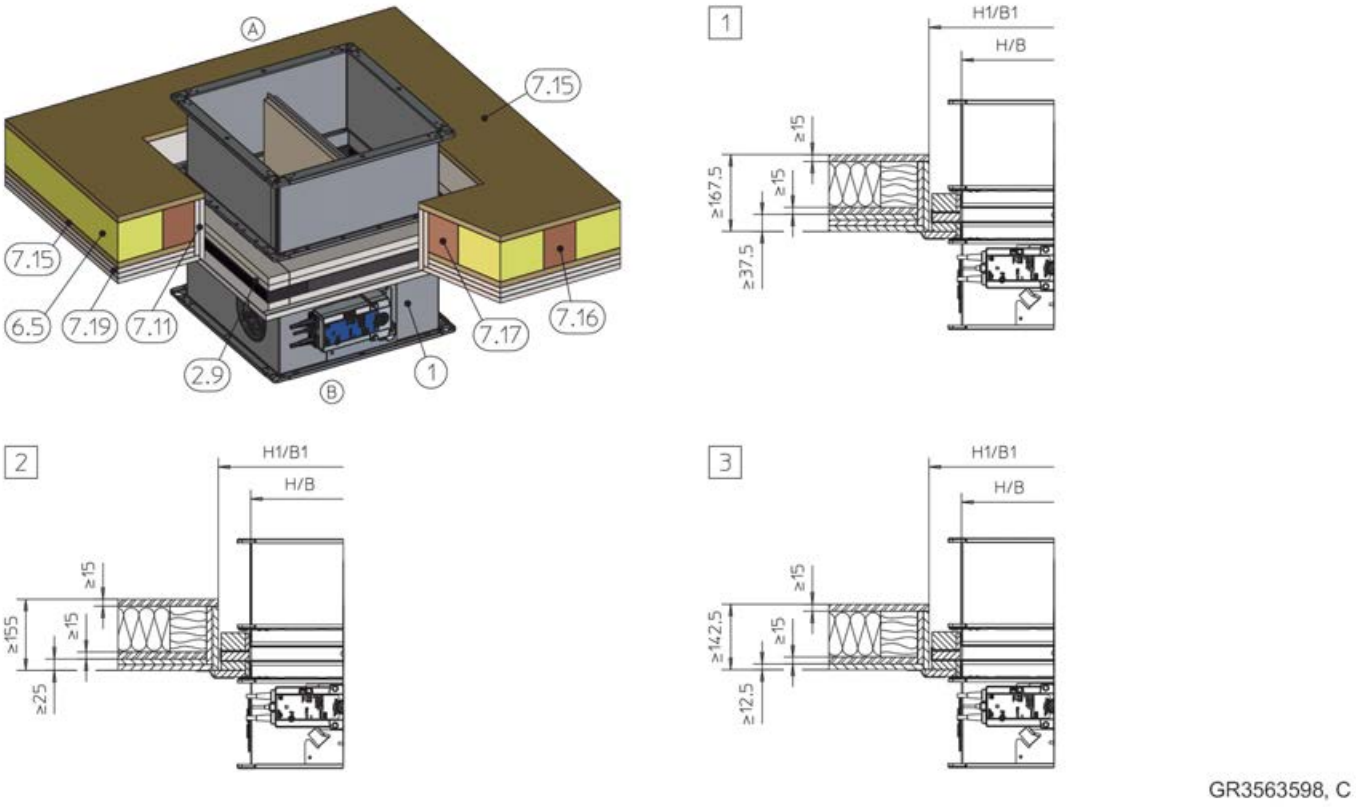


Fig. 188: Dry mortarless installation into a wooden beam or glulam ceiling, suspended, with installation kit ES (other ceiling constructions may be possible upon request)

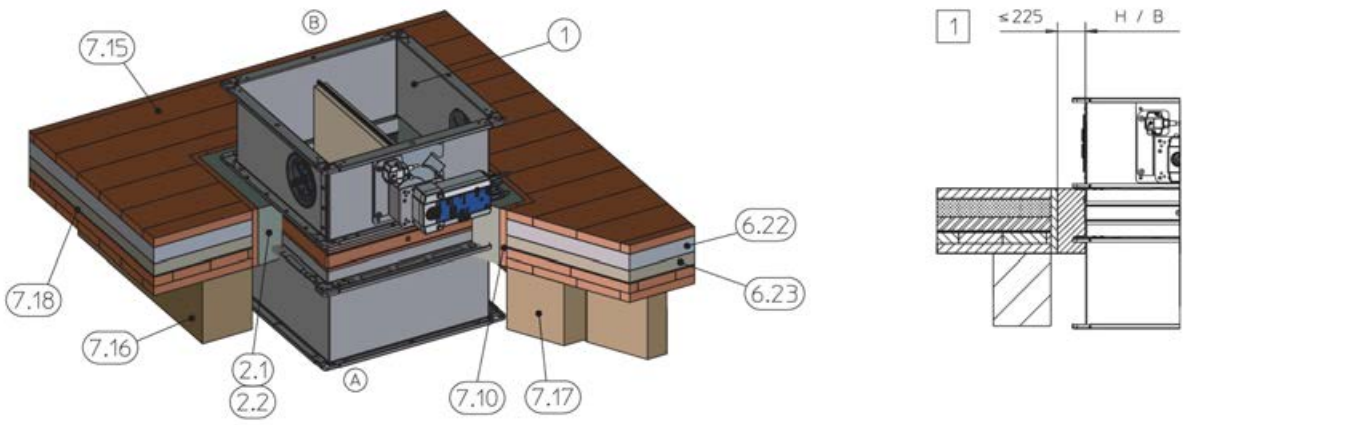
1	FK2-EU
2.9	Installation kit ES
6.5	Mineral wool infill depending on ceiling construction
7.11	Trim panel, d = 25 mm, same construction as 7.19
7.15	Wood sheet, at least 600 kg/m³
7.16	Wooden beam / glulam at least 100 × 80 mm (reduce distances between wooden beams to the size of the installation opening)
7.17	Trimmers, wooden beam ceiling / glulam ceiling at least 100 × 80 mm
7.19	Fire-resistant cladding (depending on ceiling)
H1/B1	Clear installation opening B/H + 140 ±2 mm
Z	For fixing, see Fig. 23 to Fig. 25
1	Up to EI 90 S
2	Up to EI 60 S
3	EI 30 S

Additional requirements: dry mortarless installation into wooden beam or glulam ceilings, with installation kit ES

- Wooden beam ceiling, *on page 46*
- Casing length L = 500 mm
- Approx. 80 / 120 mm distance between the fire damper and adjacent structural elements (depending on the position of the brackets)
- ≥ 200 mm distance between two fire dampers in separate installation openings

1. Mount the installation kit onto the fire damper, *5.3.1 'Installation kit ES – supply package and assembly' on page 47* .
2. Position the fire damper in the centre of the installation opening and fix it with brackets and dry wall screws to the wooden beams, see Fig. 23 to Fig. 25 .

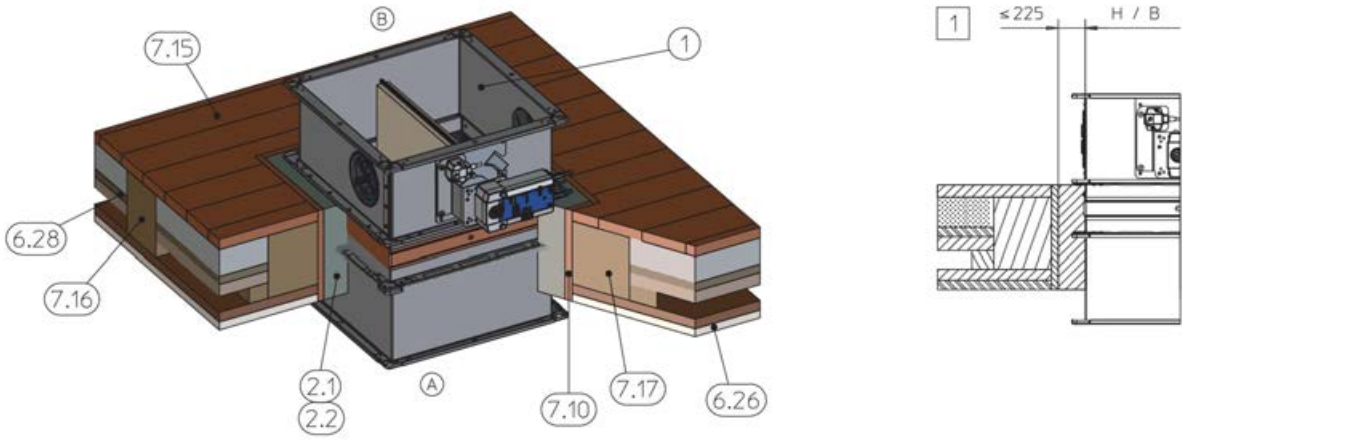
5.12.3 Mortar-based installation into historic wooden beam ceilings



GR3672353, C

Fig. 189: Mortar-based installation into historic wooden beam ceilings, illustration shows upright installation (applies also to suspended installation)

1	FK2-EU
2.1	Mortar
2.2	Concrete
6.22	Screed*
6.23	Footfall sound insulation*
7.10	Trim panels
7.15	Wooden floorboard / flooring*
7.16	Wooden beam
7.17	Trimmers, wooden beam
7.18	Formwork*
*	The illustration is an example; other ceiling constructions may be possible depending on make and local conditions
1	EI 30 S



GR3673324, C

Fig. 190: Mortar-based installation into historic wooden beam ceilings, illustration shows upright installation (applies also to suspended installation)

1	FK2-EU
2.1	Mortar
2.2	Concrete
6.26	Cement plaster*
6.28	Ceiling filling*
7.10	Trim panels
7.15	Wooden floorboard / flooring*
7.16	Wooden beam
7.17	Trimmers, wooden beam
*	The illustration is an example; other ceiling constructions may be possible depending on make and local conditions
1	EI 30 S

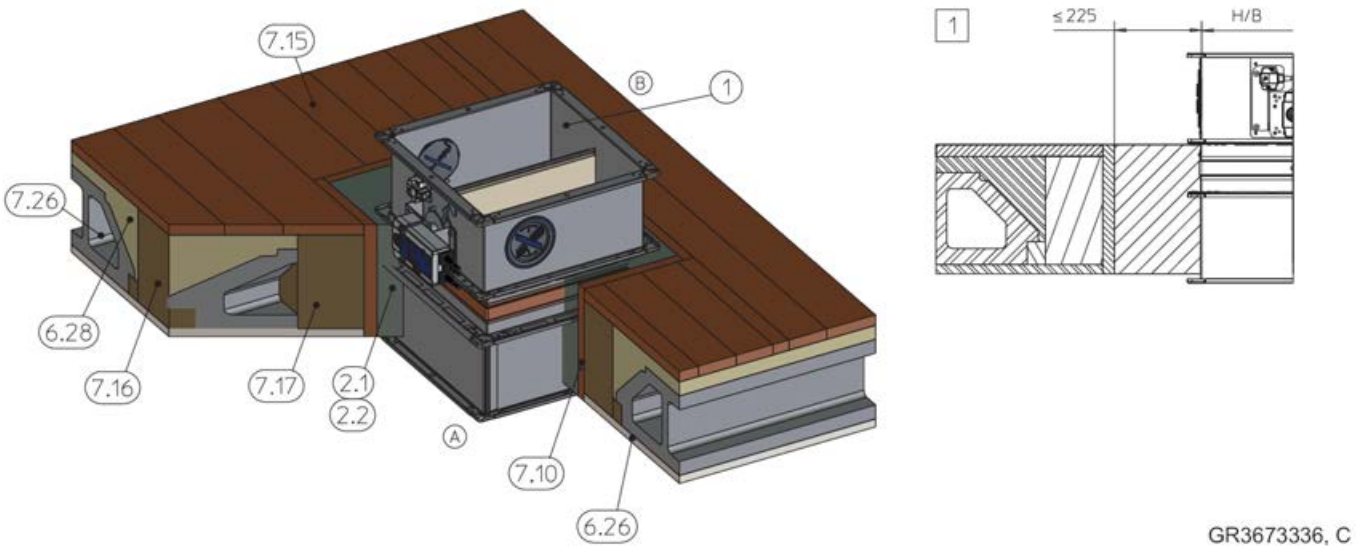


Fig. 191: Mortar-based installation into historic wooden beam ceilings, illustration shows upright installation (applies also to suspended installation)

1	FK2-EU
2.1	Mortar
2.2	Concrete
6.26	Cement plaster*
6.28	Ceiling filling*
7.10	Trim panels
7.15	Wooden floorboard / flooring*
7.16	Wooden beam
7.26	Hollow concrete block*
*	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 46*
- Casing length L = 305 or 500 mm
- ≥ 75 mm distance between the fire damper and load-bearing structural elements
- ≥ 200 mm distance between two fire dampers in separate installation openings

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.

5.13 Fixing the fire damper

5.13.1 General

For installation remote from walls and ceilings and installation with fire batt, the fire dampers must be suspended with steel threaded rods (M10 – M12).

The rods have to be fixed to the ceiling slab; the required fire resistance must not be compromised. Use only fire-rated steel anchors with suitability certificate. Instead of anchors, you can use threaded rods and secure them using nuts and washers. Secure the threaded rods above the ceiling using steel nuts and washers. Threaded rods up to 1.50 m long do not require any insulation; longer rods do require insulation (according to Promat® work sheet 478, for example). Load the suspension system only with the weight of the fire damper, ducting must be suspended separately.

Weight [kg]: *Chapter 2.2 'FK2-EU with fusible link' on page 11 Chapter 2.3 'FK2-EU with spring return actuator' on page 14 Chapter 2.4 'FK2-EU with spring return actuator and duct smoke detector' on page 21 Chapter 2.5 'FK2-EU with fusible link and cover grille as air transfer unit' on page 22 Chapter 2.6 'FK2-EU with spring return actuator and duct smoke detector as air transfer damper' on page 23 .*

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).

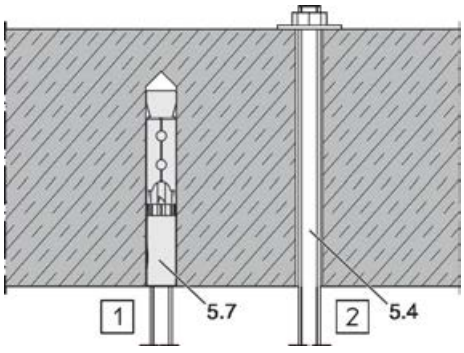


Fig. 192: Fixing to the ceiling slab

5.4 Threaded rod
5.7 Fire-rated anchor (with suitability certificate)
1 Fixing with wallplugs with suitability certificate for fire safety engineering
2 Fixing with threaded rod and push through installation

5.13.2 Suspending fire dampers installed remote from solid walls and ceiling slabs

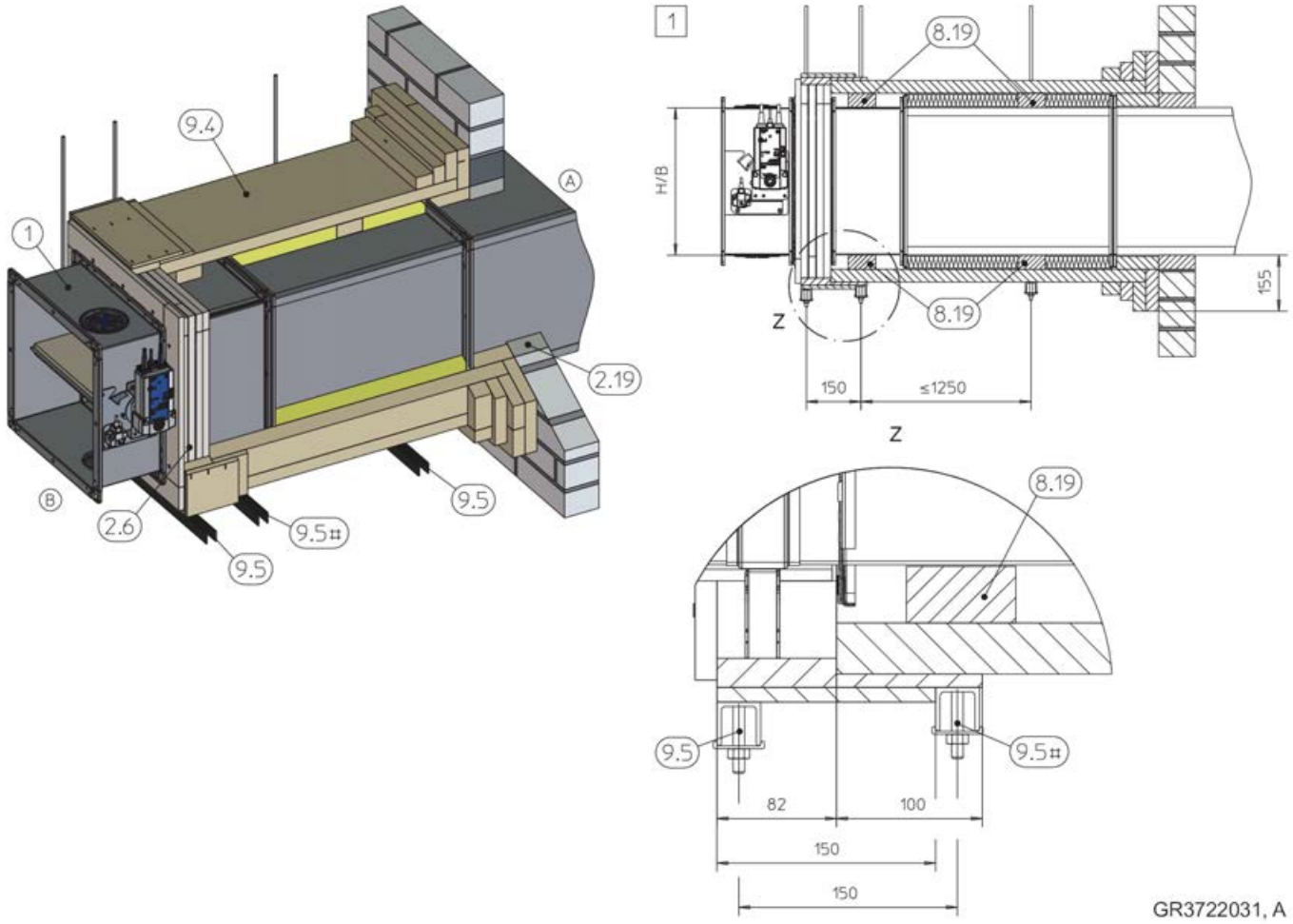


Fig. 193: Dry mortarless installation with installation kit WE

1 FK2-EU
2.6 Installation kit WE, ↬ *5.3.6 'Installation kit WE – supply package and assembly' on page 61*
2.19 Joint filler (suitable Promat® filler, Promat® ready-to-use filler or mineral wool, ≥ 1000 °C, ≥ 80 kg/m³ or mortar according to the installation and operating manual)
8.19 PROMATECT® LS firestop board, d = 35 mm
9.4 Sheet steel duct with fire-rated cladding and suspension system according to Promat® manual, construction 478, latest edition
9.5 Suspension system (by others) consisting of:
a Threaded rod
M10: B × H ≤ 800 × 200 mm
M12: B × H ≤ 1000 × 600 mm
M12#: B × H > 1000 × 600 mm
b Hilti® mounting rail MQ 41 × 3 mm or equivalent
c Hilti® drilled plate MQZ L13 or equivalent
days Hexagon nut with washer
Damper sizes > 1000× 600 mm require two suspension points underneath the damper, at a distance of 150 mm from each other
[1] Up to EI 90 S (horizontal installation position)

5.13.3 Fixing the damper when a fire batt is used

Horizontal duct

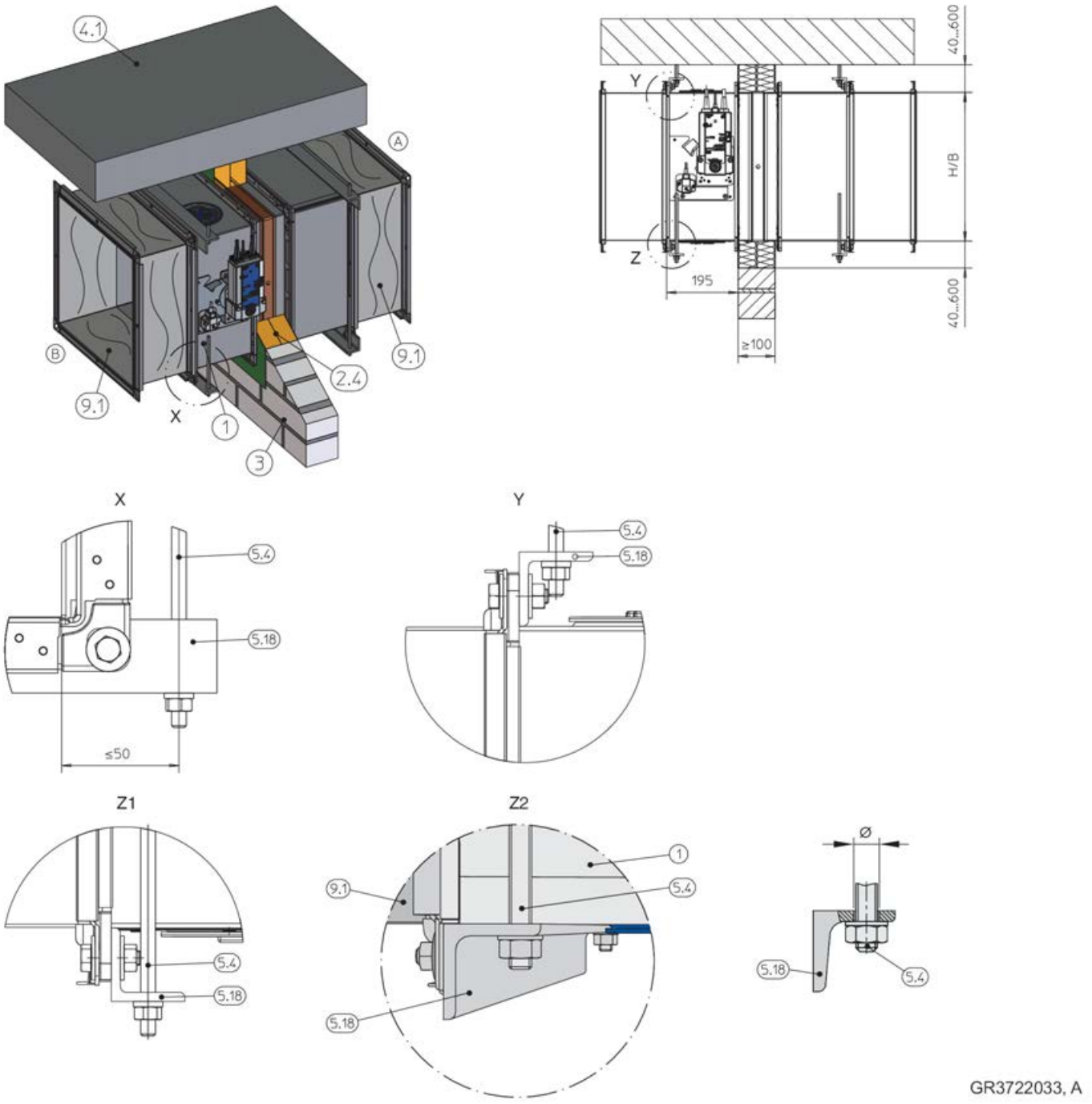


Fig. 194: Fixing of FK2-EU, wall installation with a fire batt

1	FK2-EU	5.18	Steel angle section to EN 10056-1, L ≥ 40 mm × 40 mm × 5 mm, galvanised or painted, or equivalent
2.4	Coated board system		
3	Wall, solid wall shown		
4.1	Solid ceiling slab	9.1	Flexible connector (recommended)
5.4	Threaded rod M12 with washer and nut	Z1	Suspension from EI 90 S
		Z2	Suspension up to EI 60 S

Note: Each fire damper has to be suspended both on the operating side and on the installation side. The suspension has to be fixed either to the top **or** to the bottom of the flange.

Vertical duct

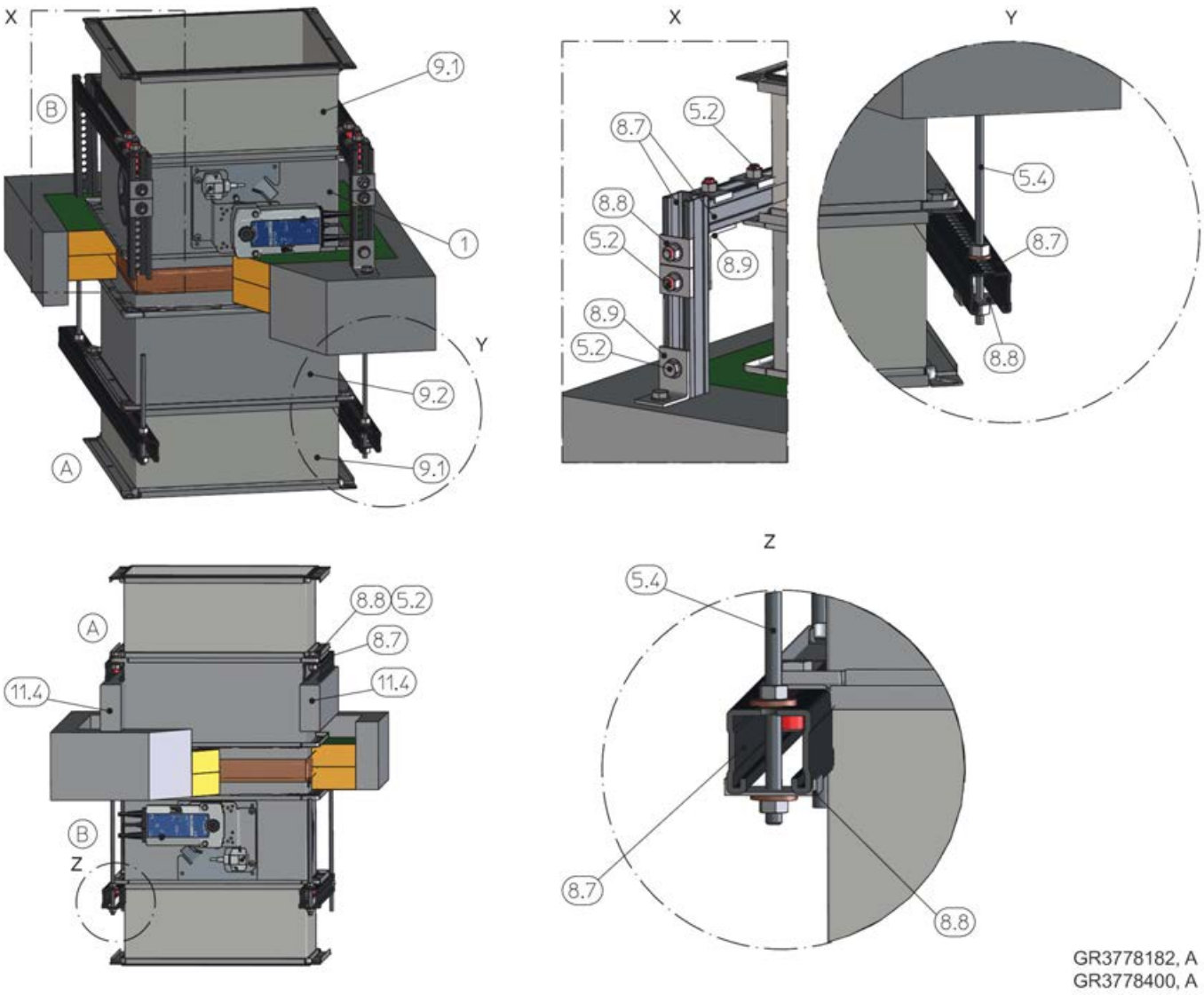


Fig. 195: Suspension in fire batt, FK2-EU upright or suspended

1	FK2-EU	8.9	System bracket, Varifix ANSHWNKL-PRFL36-90GRAD or Müpro mounting bracket 90°, galvanised, or equivalent
5.2	Screw M10 × 70 mm, with washer and nut		
5.4	Threaded rod M12 with washer and nut		
8.7	Mounting rail Würth Varifix 36 × 36 × 2.5 or Müpro MPC 38/40 or equivalent	9.1	Flexible connector (recommended)
		9.2	Extension piece
8.8	Fixing bracket, Varifix or Müpro MPC or equivalent	11.4	Underlay material, non-combustible

Note:

- Installation of the fire damper in vertical ducts with a fire batt from EI 90 S requires the fire damper to be fixed both above and below the ceiling slab, see Fig. 195 . The fire damper should be suspended along the shorter casing sides if at all possible.
- When installing adjacent to a solid wall, fixing the steel bracket to the solid wall is also permissible. The equivalence of the fastening must be ensured on site.

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.

6 Accessories

Extension pieces

When there are cover grilles, circular spigots, flexible connectors, moulds, etc., you may have to use an extension piece for certain heights. See the table for the required lengths.

Extension pieces [mm]			
L	**H**	**Operating side**	**Installation side**
305	100 – 400	–	195
	405 – 800	195	2 × 195
500	100 – 400	–	–
	405 – 800	195	195

Open blade protrusion [mm]															
H	**100**	**150**	**200**	**250**	**300**	**350**	**400**	**450**	**500**	**550**	**600**	**650**	**700**	**750**	**800**
x	-204	-179	-154	-129	-104	-79	-54	-29*	-4*	21*	46*	71*	96*	121*	146*
y															
L = 305	-8*	17*	42*	67*	92*	117*	142*	167**	192**	217**	242**	267**	292**	317**	342**
L = 500	-204	-179	-154	-129	-104	-79	-54	-29*	-4*	21*	46*	71*	96*	121*	146*

* One extension piece required

** Two extension pieces required

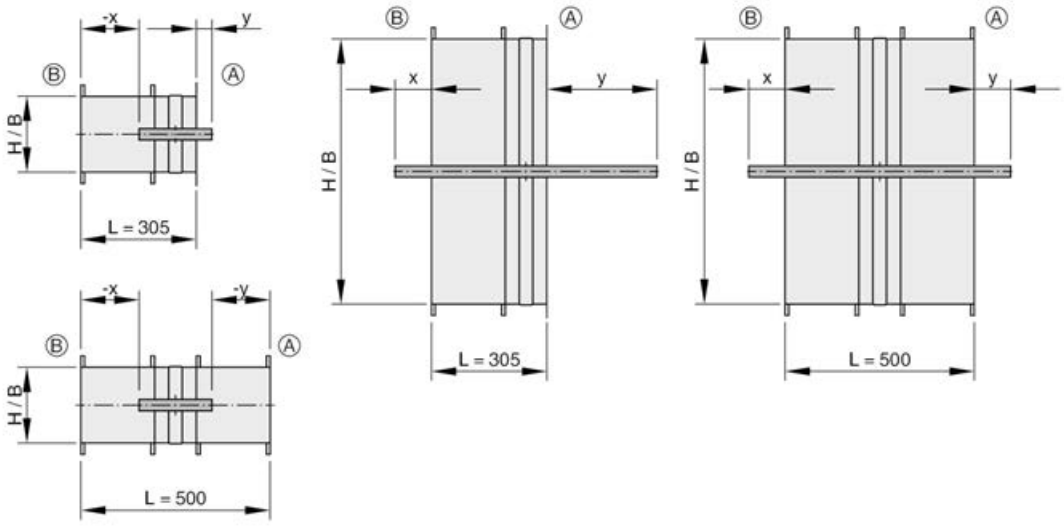


Fig. 196: Open blade protrusion

A Installation side
B Operating side

Note

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

Flexible connectors

Flexible connectors are used to avoid both tension and compression.

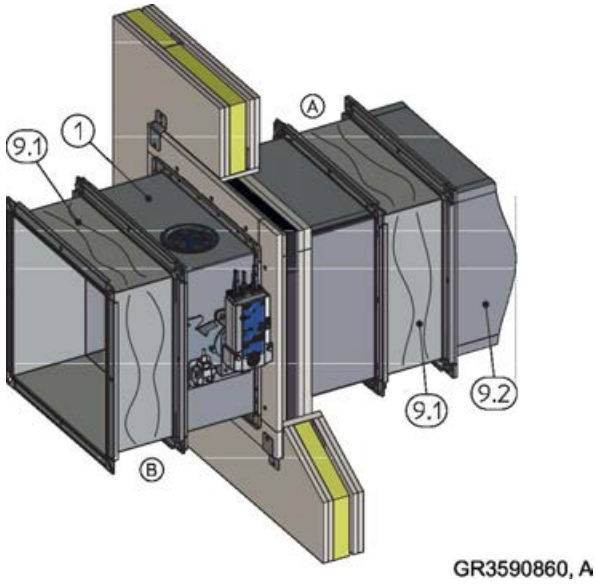


Fig. 197: Fire damper with flexible connectors

1 FK2-EU
9.1 Flexible connector
9.2 Duct

Circular spigot

For the connection of circular ducts.

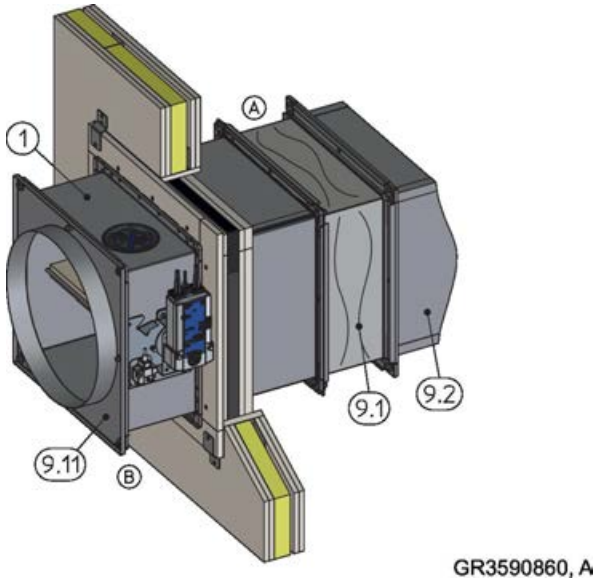


Fig. 198: Fire damper with circular spigots

1 FK2-EU (square)
9.1 Flexible connector
9.2 Duct
9.11 Circular spigot

Cover grilles

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

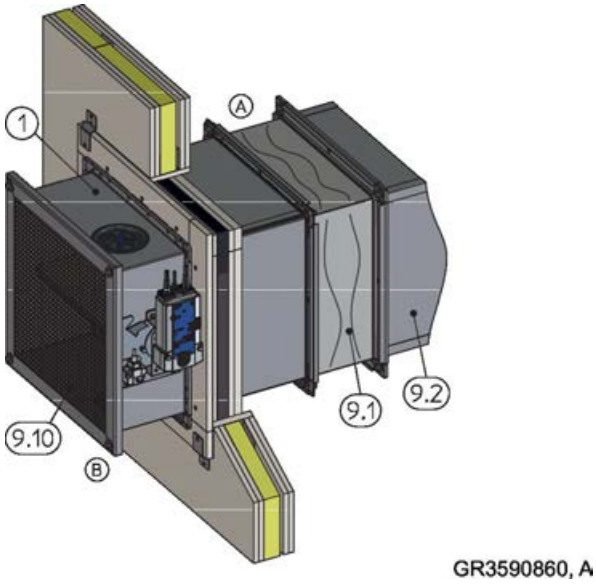


Fig. 199: Fire damper with cover grille

1 FK2-EU
9.1 Flexible connector
9.2 Duct
9.10 Cover grille, galvanised steel, mesh aperture 10 mm

Connecting subframe

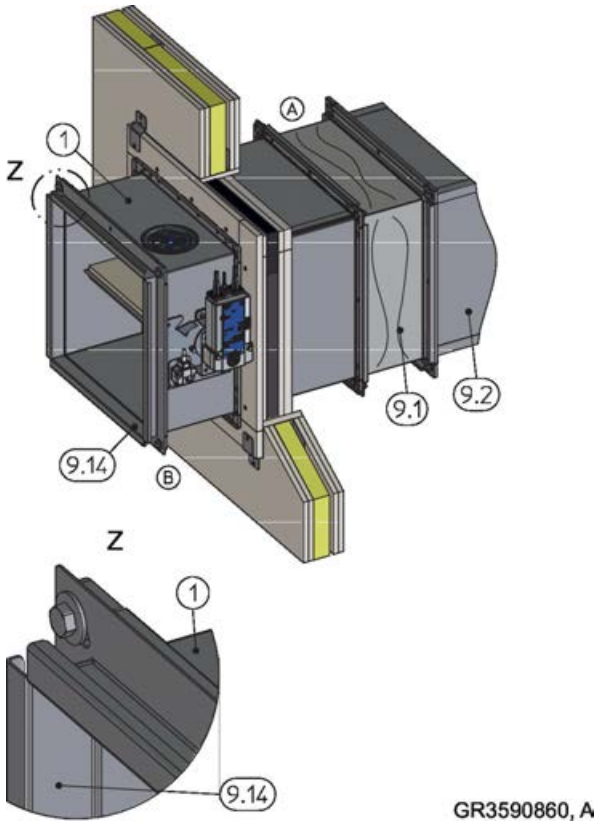


Fig. 200: Fire damper with connecting subframe

1 FK2-EU
9.1 Flexible connector
9.2 Duct
9.14 Connecting subframe

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 connecting cables are sized by others depending on the supply voltage (230 V or 24 V), the cable length and the power consumption and number of actuators.

7.2 Limit switches (fire dampers with fusible link)

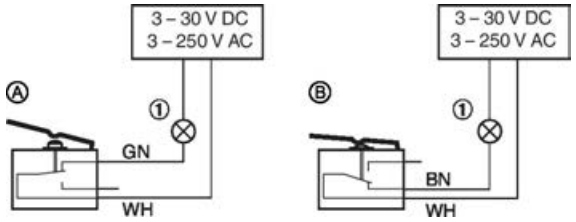


Fig. 201: Wiring of limit switches, example

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. 201
- 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 FK2-EU".

7.3 Spring return actuator

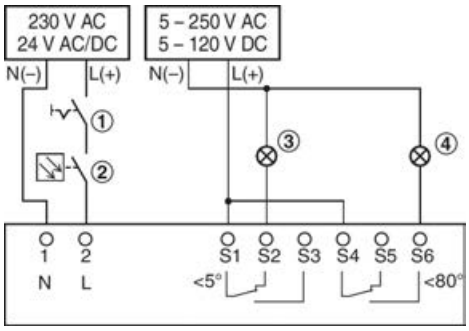


Fig. 202: Actuator connection, example

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 FK2-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

General

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

⚠ 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.

8.2 Functional test with automatic control unit

Functional test with automatic control unit

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

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

TROXNETCOM systems such as TNC-EASYCONTROL or AS-interface meet all these requirements. For more informationen see *www.troxtechnik.com* .

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

8.3 Fire damper with fusible link

8.3.1 Fusible link – size 1

damper blade position indicator

The position of the damper blade (1.2) is indicated by the position of the handle (1.6).

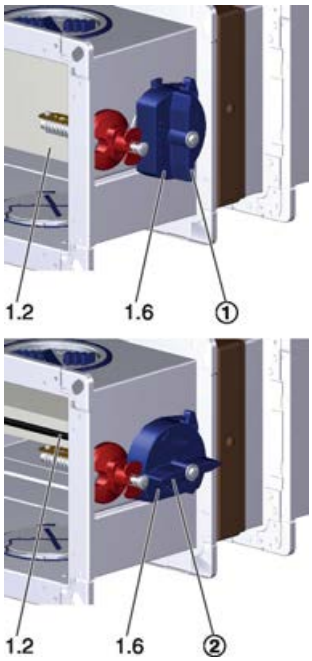


Fig. 203: damper blade position indicator

1. ▸ Damper blade (1.2) is closed.
2. ▸ Damper blade (1.2) is open.

Close the damper blade

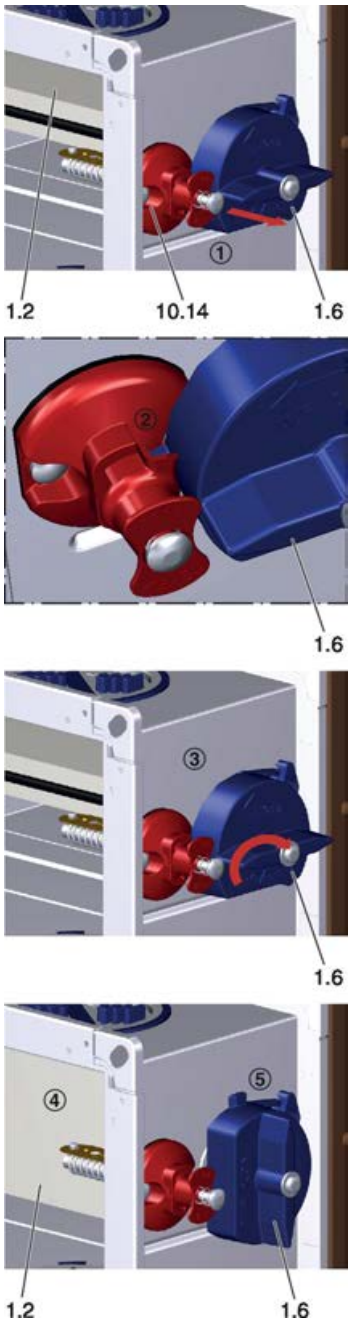


Fig. 204: Close the damper blade

Requirement

- Fire damper 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 (1.2) is closed and
5. ▸ the handle (1.6) shows that the damper blade (1.2) is closed.

Opening the damper blade

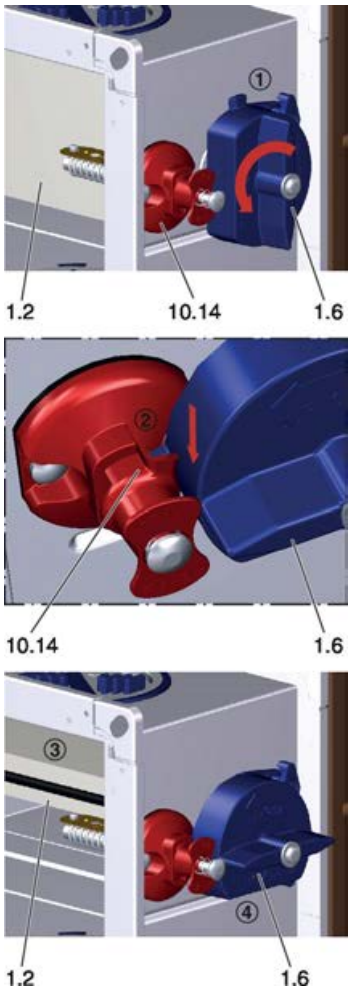


Fig. 205: Opening the damper blade

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 (1.2) is now open and
4. ▸ the handle (1.6) indicates that the damper blade (1.2) is open.

8.3.2 Fusible link – sizes 2 and 3

damper blade position indicator

The position of the damper blade (1.2) is indicated by the red arrow on the cover of the handle (1.6).

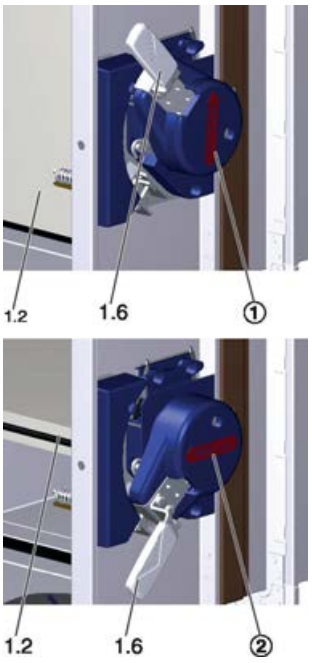


Fig. 206: damper blade position indicator

1. ▸ Damper blade (1.2) is closed.
2. ▸ Damper blade (1.2) is open.

Close the damper blade

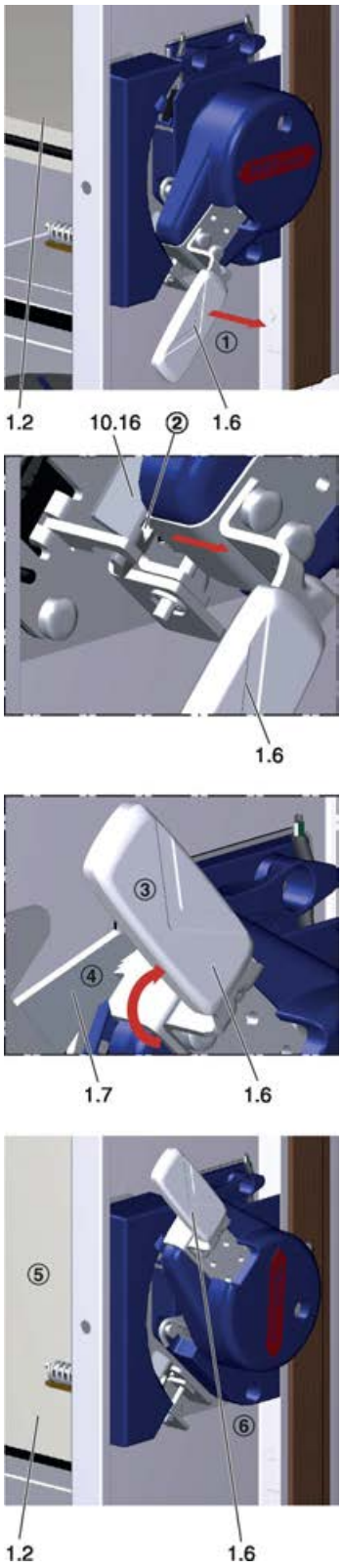


Fig. 207: Close the damper blade

Requirement

- The damper blade is OPEN.

1. ▸ Lift the handle (1.6) in the direction of the arrow so that the
2. ▸ handle (1.6) no longer protrudes into the hole of the fusible link holder lever (10.16).
3. ▸ The handle (1.6) swivels automatically into the direction of the arrow (clockwise)
4. ▸ and locks into the CLOSED position on the interlock (1.7).
5. ▸ The damper blade (1.2) is now closed and
6. ▸ the red arrow on the handle (1.6) indicates that the damper blade (1.2) is closed.

Opening the damper blade

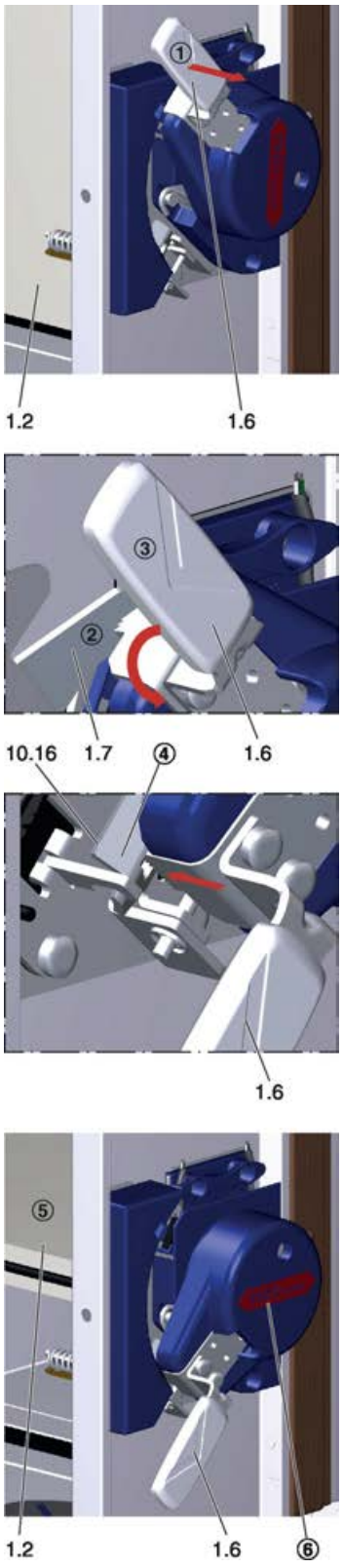


Fig. 208: Opening the damper blade

Requirement

- The damper blade is CLOSED.

1. ▸ Lift the handle (1.6) in the direction of the arrow until
2. ▸ the handle (1.6) is no longer engaged with the interlock (1.7).
3. ▸ Turn the handle (1.6) in the direction of the arrow (anti-clockwise) without lifting it further.
4. ▸ The handle (1.6) locks into the OPEN position in the hole of the fusible link holder lever (10.16).
5. ▸ The damper blade (1.2) is now open and
6. ▸ the red arrow on the handle (1.6) indicates that the damper blade (1.2) is open.

8.4 Fire damper with spring return actuator

8.4.1 Spring return actuator – BFL... / BFN...

Status indicator

Fig. 209: 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. 210: damper blade position indicator

1 Damper blade is closed
2 Damper blade is open

Closing/opening the damper blade with spring return actuator

Fig. 211: Functional test (illustration shows FK2-EU with BFN actuator in OPEN position)

⚠ CAUTION!

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

Requirement

- Power is being supplied

1. Push the toggle switch (1) and keep it pushed.
   ⇨ This interrupts the power supply, and the damper blade closes.
2. Check if the damper blade is CLOSED, check run time.
3. Release the toggle switch (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. 212: Functional test (without power supply)

DANGER!

Danger due to malfunction of the fire damper.

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

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

Requirement

- The damper blade is CLOSED

1. Insert the crank handle (1) into the opening for the spring winding mechanism.
2. Turn the crank handle in the direction of the arrow (2) to just short of the travel stop and hold it.
3. Set the interlock (3) to "Lock closed"
   ⇨ The damper blade remains in the OPEN position.
4. Remove the crank handle.

Close the fire damper

Fig. 213: Functional test (without power supply)

CAUTION!

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

Requirement

- The damper blade is OPEN

Set the interlock (3) to "Lock opened"
⇨ The damper blade is released and closes.

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 248* .

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 and air conditioning system is running must be inspected before they are opened again in order to ensure their correct function ↳ *'Inspection' on page 245* .

10 Maintenance

10.1 General

General safety notes

DANGER!

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

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

CAUTION!

Danger due to inadvertently actuating the fire damper. Inadvertent actuation of the damper blade or other parts can lead to injuries.

Make sure that the damper blade cannot be released inadvertently.

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

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

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

Functional test

The functional reliability of the fire damper 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:

- EN 13306
- DIN 31051
- EN 15423

The function of fire dampers with a spring return actuator can also be tested with an automatic control unit ↳ *'Functional test with automatic control unit' on page 237* .

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 248* . 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 ↳ *237* .

10.2 Replacing the fusible link

10.2.1 Fusible link – size 1

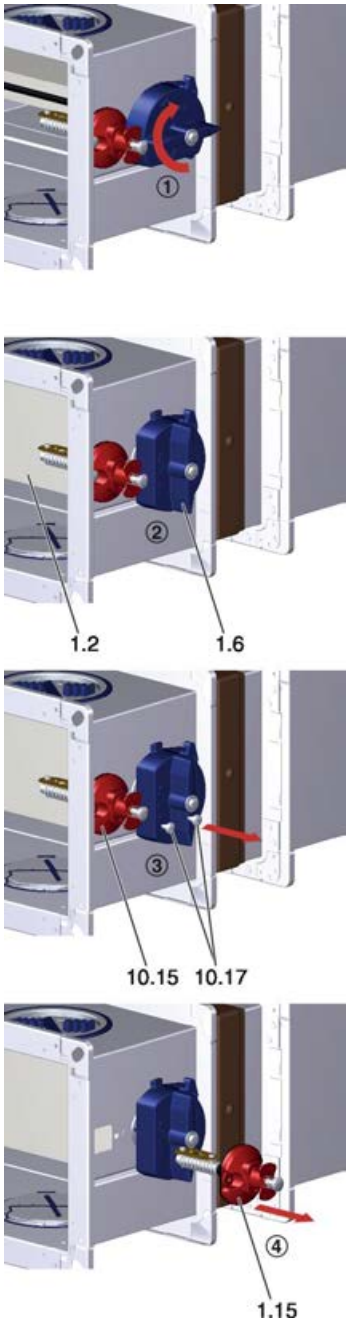


Fig. 214: Removing the fusible link holder

1. Close the damper blade.
2. The handle (1.6) shows that the damper blade (1.2) is closed.
3. Loosen the screws (10.17) on the fusible link holder (10.15).
4. Remove the fusible link holder (10.15) from the fire damper.

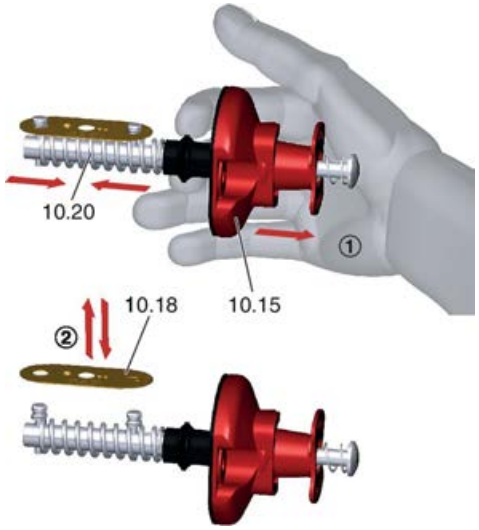


Fig. 215: Replacing the fusible link

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).

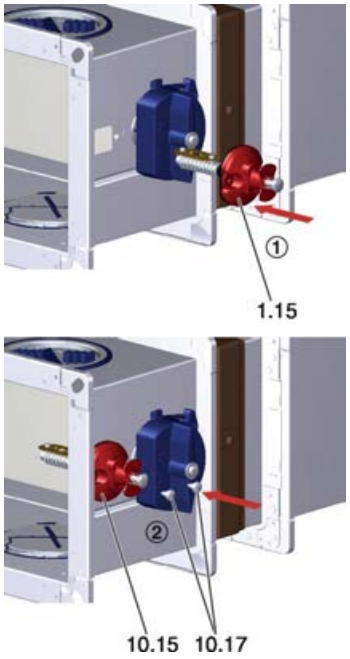


Fig. 216: Install the fusible link holder

1. Insert the fusible link holder (10.15) into the fire damper and
2. fasten with screws (10.17).

   ⇨ Carry out functional test.

10.2.2 Fusible link – sizes 2 and 3

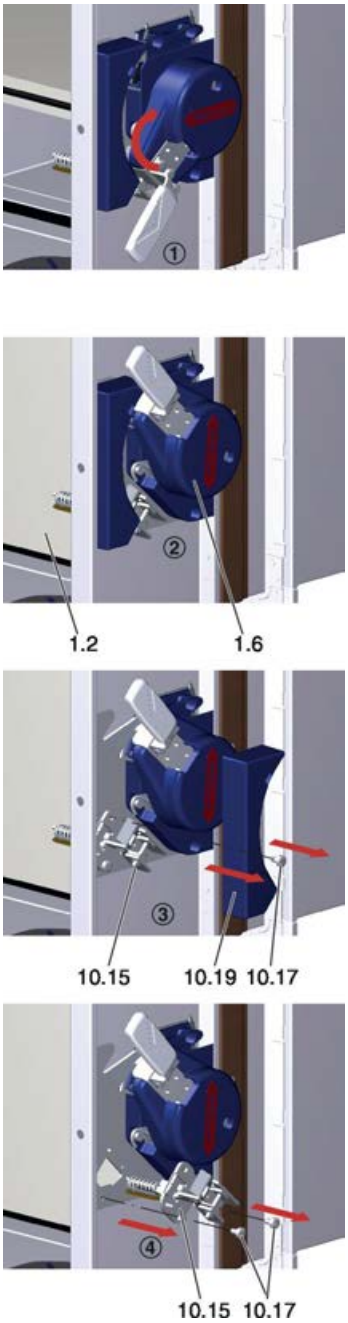


Fig. 217: Removing the fusible link holder

1. Close the damper blade.
2. The red arrow on the cover of the handle (1.6) indicates that the damper blade (1.2) is closed.
3. Loosen the screw (10.17) on the fusible link holder (10.15) and pull away the cover (10.19) in the direction of the arrow.
4. Loosen the screws (10.17) on the fusible link holder (10.15) and remove the fusible link holder from the fire damper.

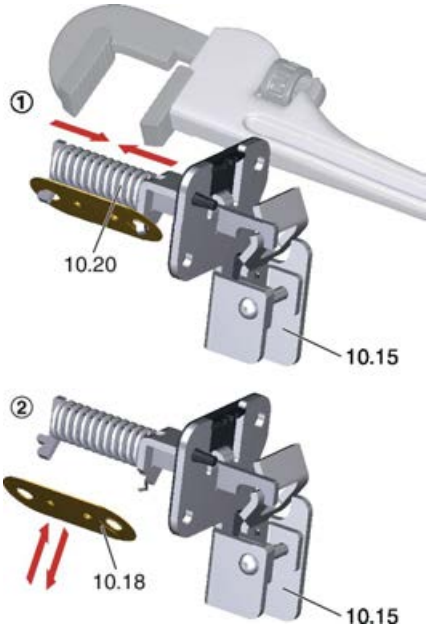


Fig. 218: Replacing the fusible link

1. Press together the spring (10.20) of the fusible link holder (10.15) as shown in the direction of the arrow, e.g. with a water pump pliers.
2. Remove old fusible link (10.18), hook in new fusible link (10.18).

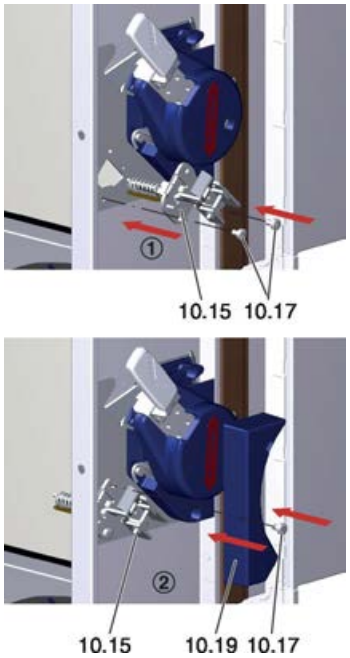


Fig. 219: Install the fusible link holder

1. Put fusible link holder (10.15) back into the fire damper and fix it with screws (10.17).
2. Position the cover (10.19) over the fusible link holder (10.15) and fasten with screw (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 *33* – 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 ductwork/cover grille/flexible connector *Chapter 6 'Accessories' on page 233* ■ Connection according to this manual – Establish correct connection	Specialist personnel
	Power supply to the spring return actuator ■ Power supply according to spring return actuator rating plate – Provide 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 *238* ■ 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 *242* ■ 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

Final decommissioning

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

Removal

DANGER!

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

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

1. ▸ Disconnect the wiring.
2. ▸ Remove the ducts.
3. ▸ Close the damper blade
4. ▸ Remove the fire damper.

Disposal

For disposal, the fire damper must be disassembled.

ENVIRONMENT!

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

12 Nomenclature

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

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

Item no.	Description
2	**Materials for fire damper installation**
2.1	Mortar or gypsum mortar
2.2	Reinforced concrete / Non-reinforced concrete
2.3	Reinforced concrete base
2.4	Coated board system
2.5	Installation kit WA / WA2
2.6	Installation kit WE / WE2
2.7	Installation kit WV
2.8	Installation kit E1 / E2 / E3
2.9	Installation kit ES
2.10	Installation kit GM
2.11	Installation kit TQ / TQ2
2.12	Installation kit GL / GL2
2.13	Installation kit GL100
2.14	Lintel
2.15	
2.16	Installation subframe
2.17	Hilti CFS-BL fire stop block
2.18	Installation block ER with cover plate

Item no.	Description
2	**Materials for fire damper installation**
2.19	Joint filler (Promat® filler, Promat® ready-to-use putty; mineral wool ≥ 80 kg / m³, ≥ 1000 °C or mortar)

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

Item no.	Description
4	**Ceilings**
4.1	Solid ceiling slab / solid floor
4.2	Wooden beam ceiling
4.3	Modular ceiling, Cadolto system
4.4	Partial concrete ceiling with reinforcement
4.5	Solid wood ceiling
4.6	False ceiling
4.7	Reinforced hollow chamber ceiling
4.8	Hollow stone ceiling
4.9	Ribbed ceiling

Item no.	Description
4	**Ceilings**
4.10	Composite ceiling
4.11	Historical wooden beam ceiling, fire resistance properties ≥ F 30
4.12	Panelled ceiling

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 pieces, depending on the damper size)
5.3e	Chipboard screw 5 × 70 mm (16 - 28 pieces, depending on the 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	Wallplugs with fire suitability certificate for fire resistance
5.8	Anchor M8 – M12
5.9	Steel bracket
5.10	Fixing tab
5.11	Floor mounting plate
5.12	Cover plate
5.13	Wood screw or pin
5.14	Angle bracket
5.15	Bracket
5.16	Wall connection frame
5.17	Anchor bolt
5.18	L-bracket according to EN 10056-1 galvanised, painted or similar, according to installation detail
5.19	Connecting clip

Item no.	Description
5	**Fixing material**
5.20	Screw Fischer® FFS 7.5 × 82 mm or equivalent
5.21	Screw / wallplug
5.22	Steel fabric, ∅ ≥ 8 mm, mesh aperture 150 mm or equivalent
5.23	Clamp, e.g. Hilti MP-MX, Valraven BIS HD 500, or equivalent
5.24	Sheet-metal strip
5.25	Plasterboard screw
5.26	Steel wire clip

Item no.	Description
6	**Filling and coating material**
6.1	Mineral wool ≥ 1000 °C, ≥ 40 kg/m³
6.2	Mineral wool ≥ 1000 °C, ≥ 80 kg/m³
6.3	Mineral wool ≥ 1000 °C, ≥ 100 kg/m³
6.4	Mineral wool ≥ 1000 °C, ≥ 140 kg/m³
6.5	Mineral wool (depending on wall construction) / ceiling construction, mineral wool filling on request
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, thickness 2.5 mm
6.11	Insulating strip (depending on wall construction)
6.12	Intumescent seal
6.13	Mineral wool strips 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	

Item no.	Description
6	**Filling and coating material**
6.19	Mineral wool > 1000°C, > 80 kg/m³, panel material around the perimeter, leave out the actuator and release mechanism; inspection accesses must remain accessible
6.20	Sleeve (can be ordered separately)
6.21	Kerafix 2000 sealing tape
6.22	Screed
6.23	Footfall sound insulation
6.24	Elastomer foam (synthetic rubber) of fire rating class B-S3, D0
6.25	Mineral wool or glass wool fill
6.26	Plaster
6.27	Holding plate on both sides, 90 × 140 × 1.5 mm
6.28	Ceiling fill
6.29	Mineral wool Paroc HVAC Fire Mat
6.30	Double layer 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

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
7.7	Timber stud, at least 60 × 80 mm
7.8	Steel girder
7.9	Timber structure
7.10	Trim panels (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

Item no.	Description
7	**Supporting construction**
7.13b	Cladding, wood sheet, at least 600 kg/³
7.13.1	Cladding, single-layer, adjusted
7.14	Reinforcing strip
7.15	Wooden floorboard / floor tile / wood sheet min. 600 kg/m³
7.16	Wooden beam / glued laminated timber
7.17	Trimmers in general
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 design
7.25	Reinforced concrete support
7.26	Hollow stone
7.27	Profile sheet metal

Item no.	Description
8	**Material for extended applications**
8.1	PROMATECT®-H 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
8.8	Fixing bracket, Varifix or Müpro MPC or equivalent
8.9	Bracket, Varifix ANSHWNKL-PRFL36-90GRAD or Müpro mounting bracket 90°, galvanised, or equivalent
8.10	Large gears
8.11	Actuator
8.12	Actuator mounting plate
8.13	Small gears
8.14	Connecting cable

Item no.	Description
8	**Material for extended applications**
8.15	Adjustment screws
8.16	Actuator mounting plate
8.17	Cover
8.18	Junction box
8.19	Outlay from 8.3
8.20	Promaseal®-Mastic intumescent sealant
8.21	Fire-resistant sealant CFS-S ACR CW
8.22	Calcium silicate board, or alternatively mineral wool ≥ 1000°C, ≥ 140 kg/m³
8.23	Foam rubber seal
8.24	Retaining plate on both sides, sheet steel ≥ 1 mm thick
8.25	Bracket, e.g. Hilti MM-B-30 or equivalent
8.26	Blanking plate, t = 1 mm
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	Outlay from 8.30
8.33	Outlay from 8.31
8.34	Sealing tape type Flexan
8.35	Intumescent material
8.36	Promaxon® construction plate type A, d = 20 mm
8.37	Steel bracket
8.38	OWA adhesive
8.39	Spigots, comprising spiral duct and 2 × raised edge

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

Item no.	Description
9	**Accessories**
9.5	Suspension
9.6	Repair damper blade
9.7	Damper blade
9.8	Rivet axis
9.9	Plate
9.10	Cover grilles
9.11	Circular spigot
9.12	Clamping ring
9.13	Reinforcement bracket
9.14	Profile connecting frame
9.15	T-piece

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

Item no.	Description
10	**Release mechanisms**
10.20	Spring
10.21	Z-sheet

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

13 Change history

The table shows all changes made to this document.

Version no.	Date	Author	Comment / change
1	2022-03-18	PB	■ New application: – Installation – solid walls – dry mortarless installation with mineral wool, remote from solid walls, ↳ *Chapter 5.4.11 'Dry mortarless installation remote from solid walls with installation kit WE 120 and mineral wool' on page 93* ■ New document ID – A00000081905 Version 4 –> A00000092715 Version 1 ■ Minor corrections

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