Installation and operating manual GB/en

Fire damper

Type FKR-EU

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

Read the instructions prior to performing any task!

TROX® TECHNIK
The art of handling air

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

Translation of the original
M375EE3, 4, GB/en
03/2017

General information

About this manual

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

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

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

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

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

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

Copyright

TROX Technical Service

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

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

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

Limitation of liability

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

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

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

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

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

We reserve the right to make technical changes.

Defects liability

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

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

Safety notes

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

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

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

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

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

ENVIRONMENT!
Environmental pollution hazard.

Tips and recommendations

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

Safety notes as part of instructions

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

Example:

1. ▸ Untighten the screw.
2. ▸

   CAUTION!
   Danger of finger entrapment when closing the lid.

   Be careful when closing the lid.
3. ▸ Tighten the screw.

Specific safety notes

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

Warning signs	Type of danger
⚠	Warning – danger zone.

1 Safety

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 air and extract air systems (only room air conditioning 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.
- Modifications of the fire damper and the use of replacement parts that have not been approved by TROX are not permitted.

Incorrect use

WARNING!

Danger due to incorrect use!

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

Never use the fire damper

– 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 skilled qualified personnel must carry out work.

The following degrees of qualification are required for the work described in the operating manual:

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

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

2 Technical data

2.1 General data

Nominal sizes DN	315 – 800 mm
Casing lengths	495 and 550 mm
Volume flow rate range	up to 6000 l/s up to 21600 m³/h (at 12 m/s)
Differential pressure range	up to 2000 Pa
Temperature range [1, 3, 4]	-20 °C ... 50 °C
Release temperature	72 °C or 95 °C (for warm air ventilation systems)
Upstream velocity [2, 3]	≤ 8 m/s with fusible link, ≤ 12 m/s with spring return actuator
Closed blade air leakage	EN 1751, Class 4
Casing air leakage	EN 1751, Class C
EC conformity	■ Construction Products Regulation (EU) no. 305/2011 ■ EN 15650 – Ventilation for buildings – Fire dampers ■ EN 13501-3 – Classification – Part 3: Fire resisting ducts and fire dampers ■ EN 1366-2 – Fire resistance tests for service installations – Part 2: Fire dampers ■ EN 1751 Ventilation for buildings – Air terminal devices
Declaration of performance	DoP / FKR-EU / DE / 003

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

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

[3] For explosion-proof constructions of the FKR-EU see the corresponding operating manual

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

Rating plate

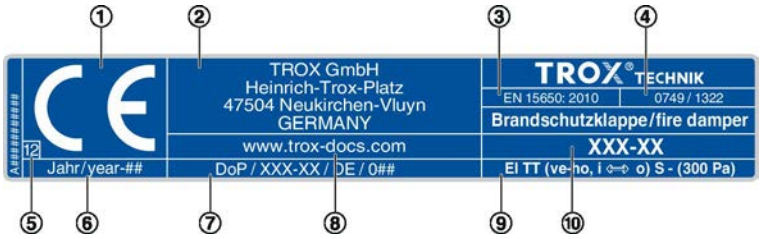


Fig. 1: Rating plate (example)

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 15*
10 Type

2.2 FKR-EU with fusible link

Dimensions and weight

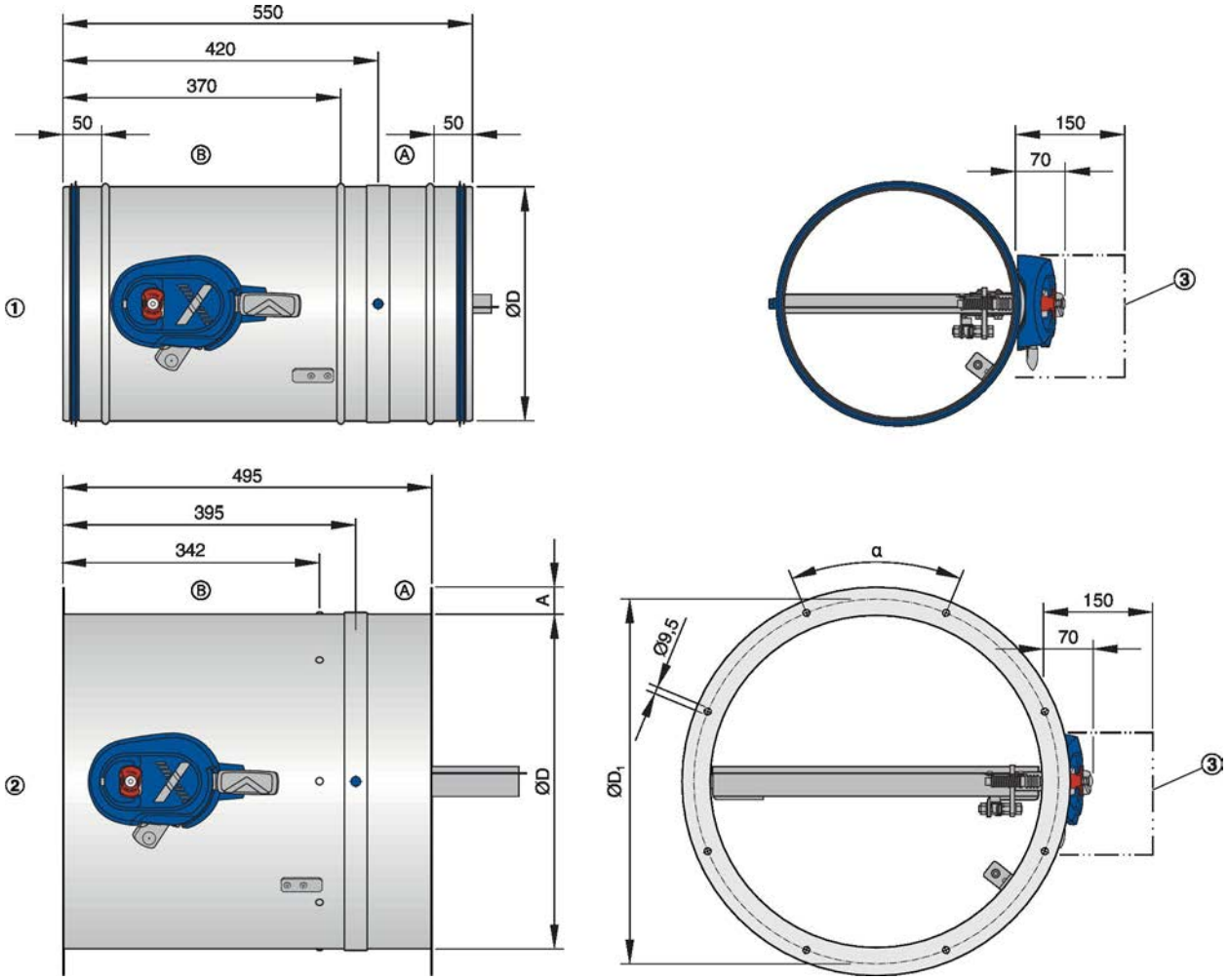


Fig. 2: FKR-EU with fusible link

1 Spigot construction
2 Flange construction
3 Keep clear to provide access for operation

Ⓐ Installation side
Ⓑ Operating side

Dimensions [mm] / Weight [kg]									
Nominal size DN	**315**	**355**	**400**	**450**	**500**	**560**	**630**	**710**	**800**
ØD	314	354	399	449	499	559	629	709	799
A		31				36			
$ØD_1$	352	392	438	488	538	600	670	750	840
α			45 °				30 °		22.5 °
No. of holes			8				12		16
Weight of FKR-EU	6.8	7.3	8.5	14.1	16.4	18	21.3	25.7	28.6
Weight of FKR-EU with spigot and installation kit TQ	19.5	21.8	25	33.1	37.8	42.6	49.7	58.7	67.3

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

2.3 FKR-EU with spring return actuator

Dimensions and weight

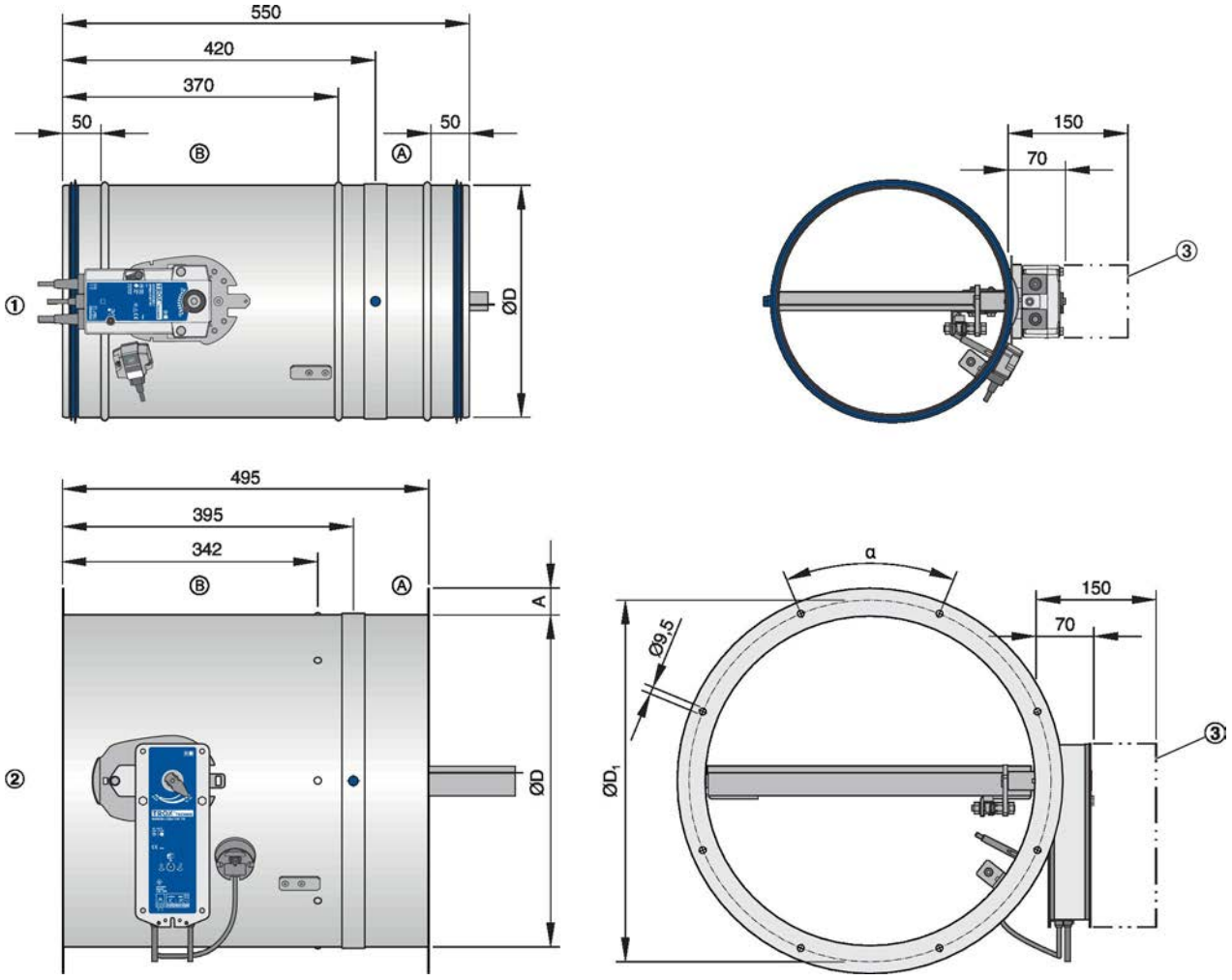


Fig. 3: FKR-EU with spring return actuator

1 Spigot construction
2 Flange construction
3 Keep clear to provide access for operation

Ⓐ Installation side
Ⓑ Operating side

Dimensions [mm] / Weight [kg]									
Nominal size DN	**315**	**355**	**400**	**450**	**500**	**560**	**630**	**710**	**800**
ØD	314	354	399	449	499	559	629	709	799
A		31				36			
$ØD_1$	352	392	438	488	538	600	670	750	840
α			45 °				30 °		22.5 °
No. of holes			8				12		16
Weight of FKR-EU	8.2	8.7	9.9	16.7	19.0	20.6	23.9	28.3	31.3
Weight of FKR-EU with spigot and installation kit TQ	21.3	23.6	26.8	36.1	40.8	45.6	52.7	61.7	70.3

Spring return actuator BFN...			
Construction variant		**230-T TR**	**24-T-ST TR**
Supply voltage		230 V AC, 50/60 Hz	24 V AC/DC, 50/60 Hz
Functional range		198 ... 264 V AC	19.2 ... 28.8 V AC 21.6 ... 28.8 V DC
Power rating	Spring compression	5 W	4 W
	Hold position	2.1 W	1.4 W
	Rating	10 VA	6 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		II	
Protection level		IP 54	
Storage temperature		-40 ... 55 °C	
Ambient temperature		-30 ... 55 °C [1]	
Ambient humidity		≤ 95% rh, no condensation	
Connecting cable	Actuator	1 m / 2 × 0.75 mm² (free of halogens)	
	Limit switch	1 m / 6 × 0.75 mm² (free of halogens)	

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

Spring return actuator BF...			
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 compression	8.5 W	7 W
	Hold position	3 W	2 W
	Rating	11 VA	10 VA
Running time	Actuator / spring return	< 120 s / approx. 16 s	
Limit switch	Type of contact	2 changeover contacts	
	Switching voltage	5 ... 120 V DC / 5 ... 250 V AC	
	Switching current	1 mA ... 6 A	
	Contact resistance	< 100 mΩ	
IEC protection class		II	III
Protection level		IP 54	
Storage temperature		-40 ... 50 °C	
Ambient temperature		-30 ... 50 °C [1]	
Ambient humidity		≤ 95 % RH, non-condensing	
Connecting cable	Actuator	1 m / 2 × 0.75 mm² (free of halogens)	
	Limit switch	1 m / 6 × 0.75 mm² (free of halogens)	

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

3 Transport and storage

Delivery check

Check delivered items immediately after arrival for transport damage and completeness. In case of any damage or an incomplete shipment, contact the shipping company and your supplier immediately.

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

Colour hues on the damper blade

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

Transport on site

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

Storage

If the unit has to be stored temporarily:

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

Packaging

Properly dispose of packaging material.

4 Parts and function

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

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

To ensure proper functioning of the fire damper, a test can be carried out. *60*

4.1 FKR-EU with fusible link

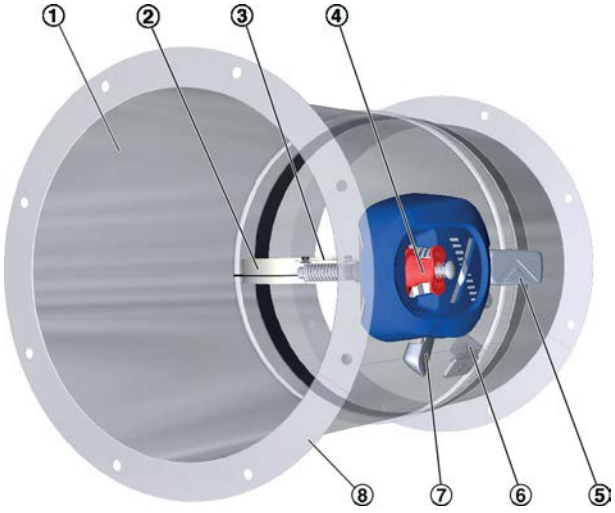


Fig. 4: FKR-EU with flange and fusible link

1 Casing
2 Damper blade with seal
3 Fusible link
4 Release mechanism
5 Handle
6 Travel stop for CLOSED position
7 Release tab
8 Flange

Functional description

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

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

4.2 FKR-EU with spring return actuator

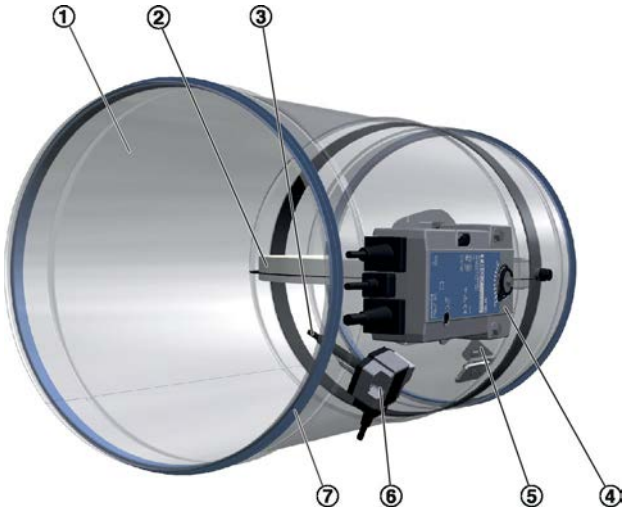


Fig. 5: FKR-EU with spigot and spring return actuator

1 Casing
2 Damper blade with seal
3 Temperature sensor
4 Spring return actuator BFN / BF
5 Travel stop for CLOSED position
6 Thermoelectric release mechanism
7 Lip seal

Functional description

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

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

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

5 Installation

5.1 Installation situations

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

Supporting construction	Installation location	Minimum thickness [mm]	Class of performance of the fire damper EI TT (ve–ho, i ↔ o) S	Installation type	Installation details on page
Solid walls	in	100	EI 120 S	N	*18*
Solid ceiling slabs	in	100 (150)[2]	EI 120 S	N	*20*
	in, with concrete base	100	EI 120 S	N	*27*
	in, combined with wooden beam ceilings	100	EI 90 S	N	*25*
	in, combined with modular ceilings [1]	100	EI 120 S	N	*26*
Lightweight partition walls	in, with metal support structure, cladding on both sides	98	EI 90 S	N	*31*
				E	*36*
		75	EI 30 S	N	*31*
				E	*36*
	in, with timber stud wall (also timber panel construction), cladding on both sides	130	EI 90 S	N	*41*
		130	EI 90 S	E	*44*
		105	EI 30 S	N	*41*
		105	EI 30 S	E	*44*
	in, half-timbered constructions, cladding on both sides	140	EI 90 S	N	*43*
		140	EI 90 S	E	*45*
		115	EI 30 S	N	*43*
		115	EI 30 S	E	*45*
Fire walls	in, with metal support structure, cladding on both sides	100	EI 90 S	N	*49*
				E	*50*
Shaft walls	in, **with** Metal support structure, cladding on one side	90	EI 90 S	N	*53*
	in, **with** Metal support structure, additional safety board, cladding on one side	90	EI 90 S	N	*53*

[1] Cadolto system

[2] Thickness increased near the installation opening

N = Mortar-based installation

E = Installation kit

Supporting construction	Installation location	Minimum thickness [mm]	Class of performance of the fire damper EI TT (ve–ho, i ↔ o) S	Installation type	Installation details on page
	in, **with** Steel support structure, cladding on one side	90	EI 90 S	N	53
	in, **None** Metal support structure, cladding on one side	50	EI 90 S	N	55

[1] Cadolto system

[2] Thickness increased near the installation opening

N = Mortar-based installation

E = Installation kit

5.2 Safety notes on 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 foil) to protect them from mortar and dripping water.
– Do not remove the transport and installation protection (if any) until installation is complete.

Please note:

- Control elements, electric actuator and inspection access panel must remain accessible for maintenance.
- Loads imposed on the casing may impair the function of the fire damper. Install and connect the damper in such a way that no loads will be imposed on the installed damper.
- Before installation: Perform a functional test, then close the fire damper. 60
- Protect the fire damper from humidity and condensation as they will damage the fire damper.
- A maximum of two FKR-EU units are allowed to be installed in a common installation opening.

Extension pieces

To simplify the connection of the duct after installation, the fire damper should be extended with a suitable extension piece on the installation side.

Installation position

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

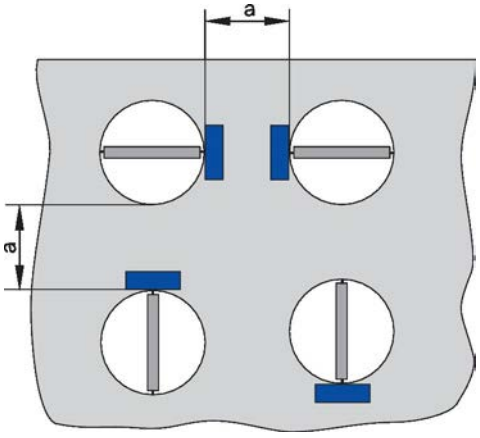


Fig. 6: Blade shaft horizontal or vertical

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

Perimeter gap »s«

With mortar-based installation the perimeter gap »s« must not exceed 60 mm (wall) or 90 mm (ceiling). The perimeter gap »s« must be large enough such that mortar can be filled in even in case of thicker walls. The gap must be large enough such that mortar can be filled in. We recommend a gap of at least 20 mm.

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

Mortars for mortar-based installation

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

The following mortars are acceptable:

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

Mineral wool as filling material

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

5.3.1 After installation

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

5.4 Solid walls

5.4.1 Mortar-based installation

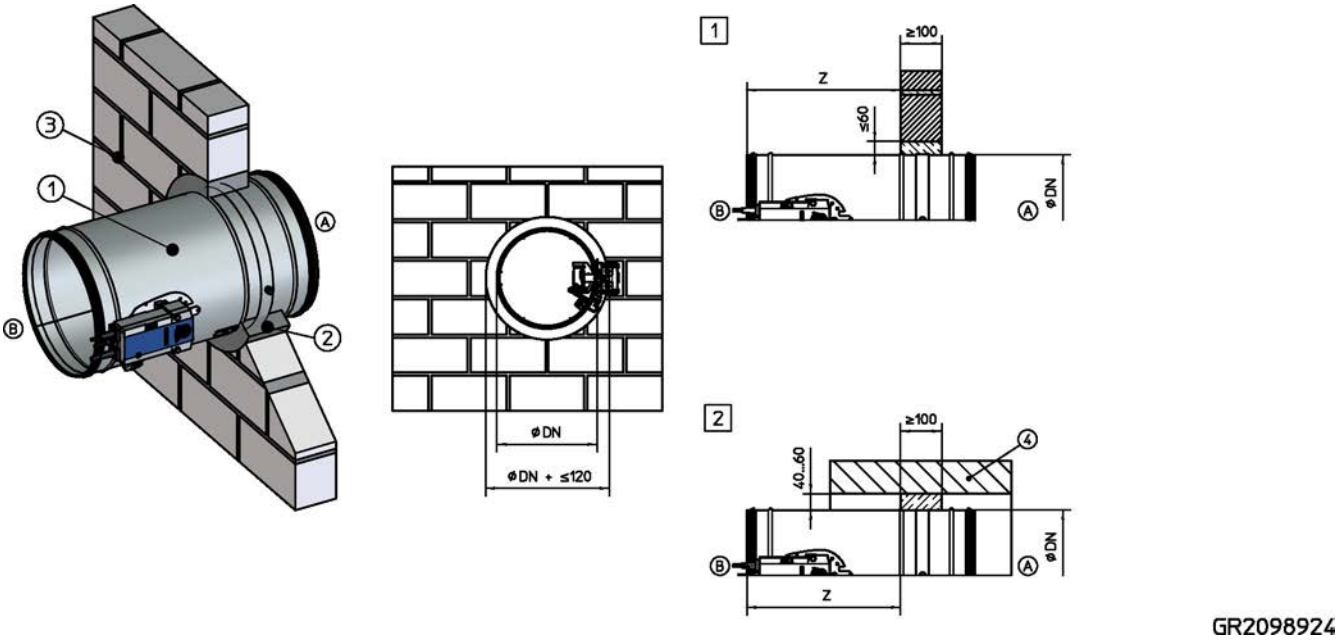


Fig. 7: Mortar-based installation into a solid wall

1 FKR-EU
2 Mortar
3 Solid wall
4 Solid ceiling slab
z Spigot construction 370 mm, flange construction 342 mm

1 Up to EI 120 S
2 Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

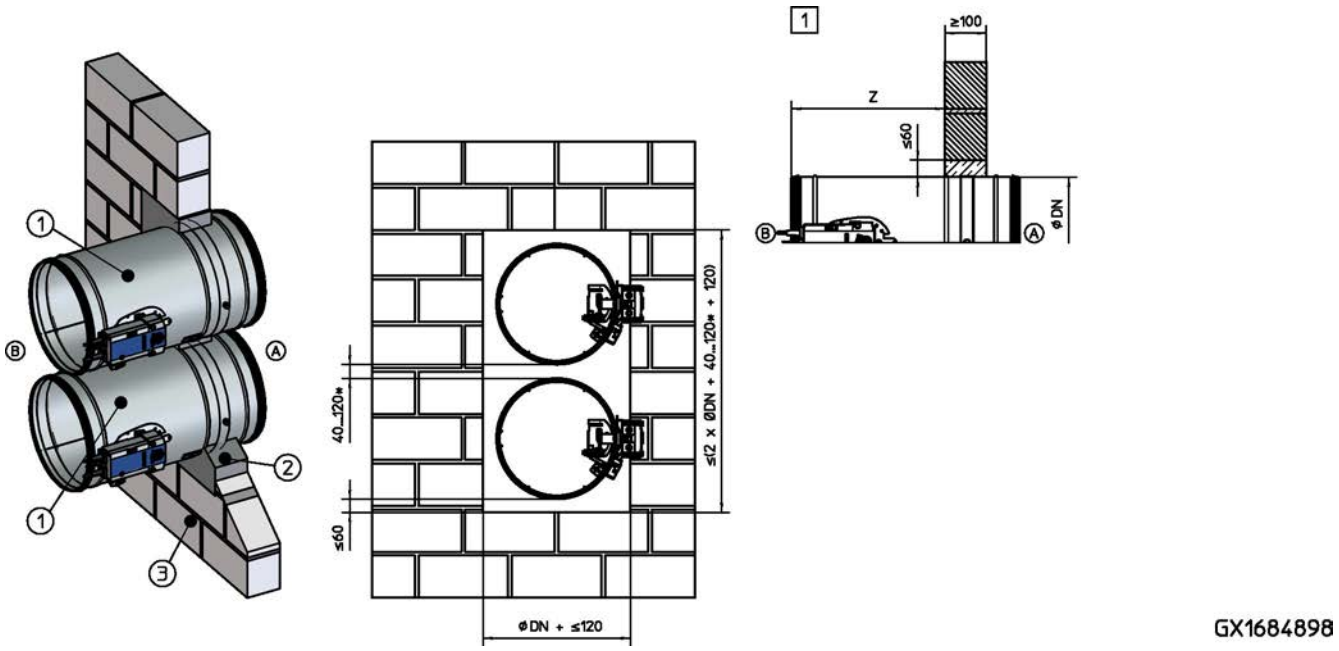


Fig. 8: Mortar-based installation in solid wall, "flange to flange", one below the other (drawn) or side by side

1 FKR-EU
2 Mortar
3 Solid wall
z Spigot construction 370 mm, flange construction 342 mm

* with flange construction 80...120 mm
1 Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Materials:

- Mortar *'Mortars for mortar-based installation' on page 17*

Requirements

- Performance class up to EI 120 S
- Solid walls or fire walls made of, for example, concrete, aerated concrete, masonry, or solid gypsum wallboards according to EN 12859 (without open spaces), gross density ≥ 350 kg/m³ and W ≥ 100 mm
- ≥ 40 mm distance to load-bearing structural elements
- Distance between two fire dampers ≥ 40 mm, with flange construction ≥ 80 mm ("flange to flange")

1. Make installation opening through cut hole or opening, ∅DN + maximum 120 mm. When you install two fire dampers in the same opening, the mortar bed between the two fire dampers must not exceed 120 mm.
2. Push the fire damper into the installation opening and secure it. When doing this, the spacing dimension *[z]* must be observed, see Fig. 7 or Fig. 8.

   If the wall thickness is >115 mm, extend the fire damper on the installation side with an extension piece or a spiral duct.
3. Close off the perimeter gap »s« with mortar. The depth of mortar bed is not allowed to be less than 100 mm (close larger installation openings according to the wall structure, e.g. masonry work).

Installation into a wall under construction

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

5.5 Solid ceiling slabs

5.5.1 Mortar-based installation into solid ceiling slabs

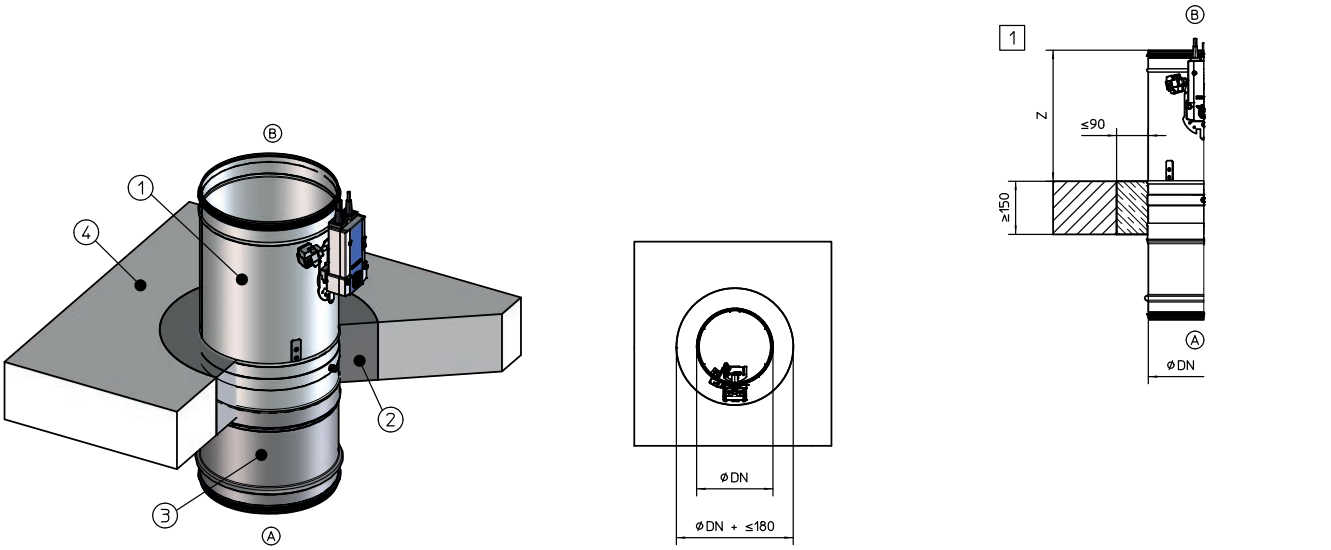


Fig. 9: Mortar-based installation into solid ceiling slab, upright

1 FKR-EU
2 Mortar
3 Extension piece
4 Solid ceiling slab

z Spigot construction 370 mm, flange construction 342 mm
1 Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

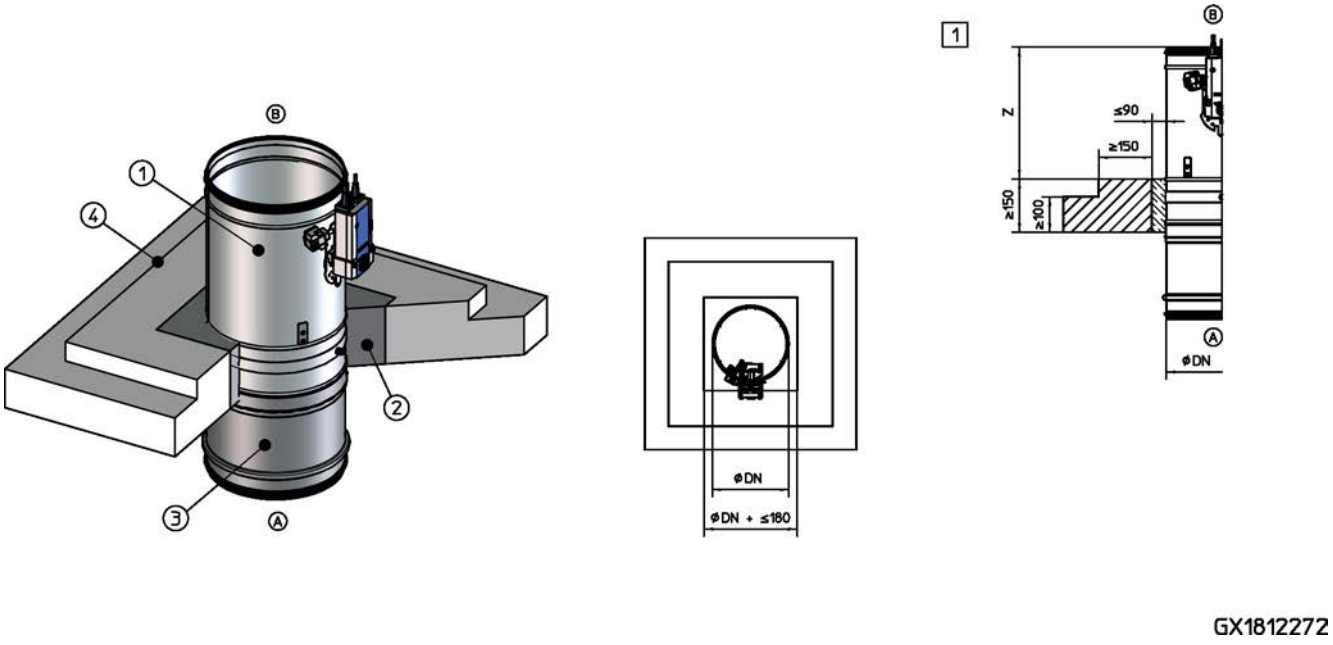


Fig. 10: Mortar-based installation into solid ceiling slab, upright

1 FKR-EU
2 Mortar
3 Extension piece
4 Solid ceiling slab

z Spigot construction 370 mm, flange construction 342 mm
1 Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

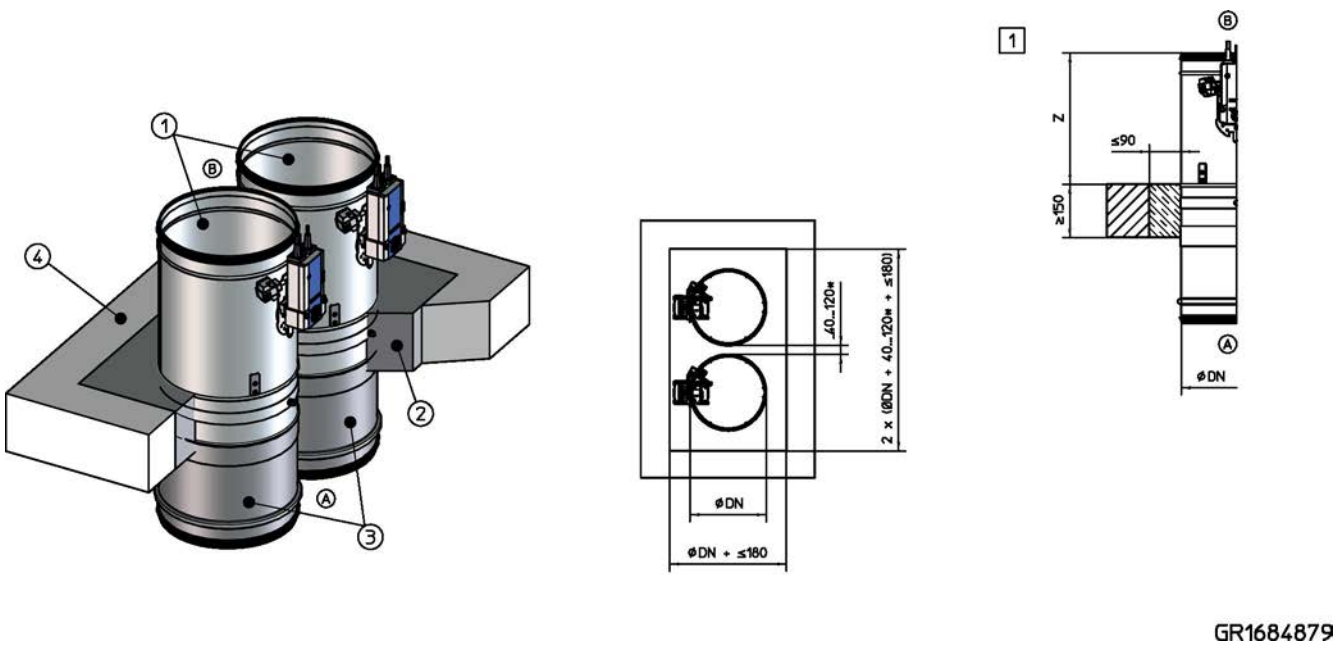


Fig. 11: Mortar-based installation into solid ceiling slab, upright, "flange to flange"

1 FKR-EU
2 Mortar
3 Extension piece
4 Solid ceiling slab
z Spigot construction 370 mm, flange construction 342 mm

* with flange construction 80...120 mm
1 Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

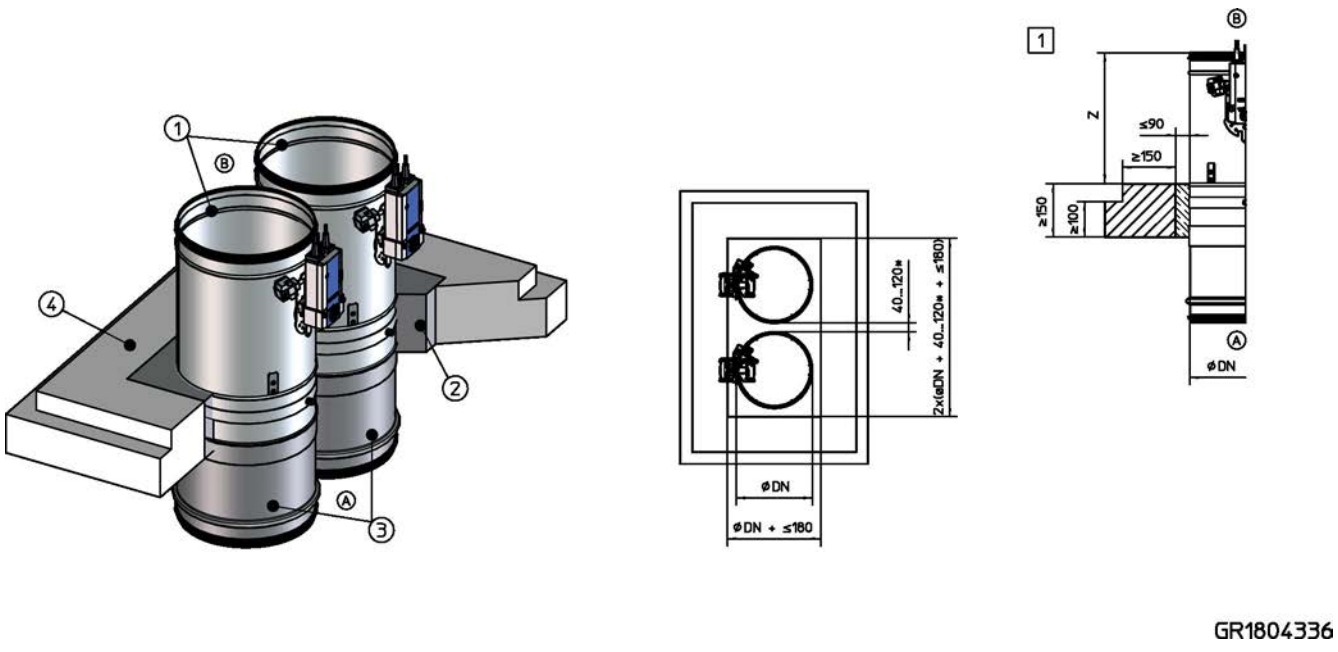


Fig. 12: Mortar-based installation into solid ceiling slab, upright, "flange to flange"

1 FKR-EU
2 Mortar
3 Extension piece
4 Solid ceiling slab
z Spigot construction 370 mm, flange construction 342 mm

* with flange construction 80...120 mm
1 Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

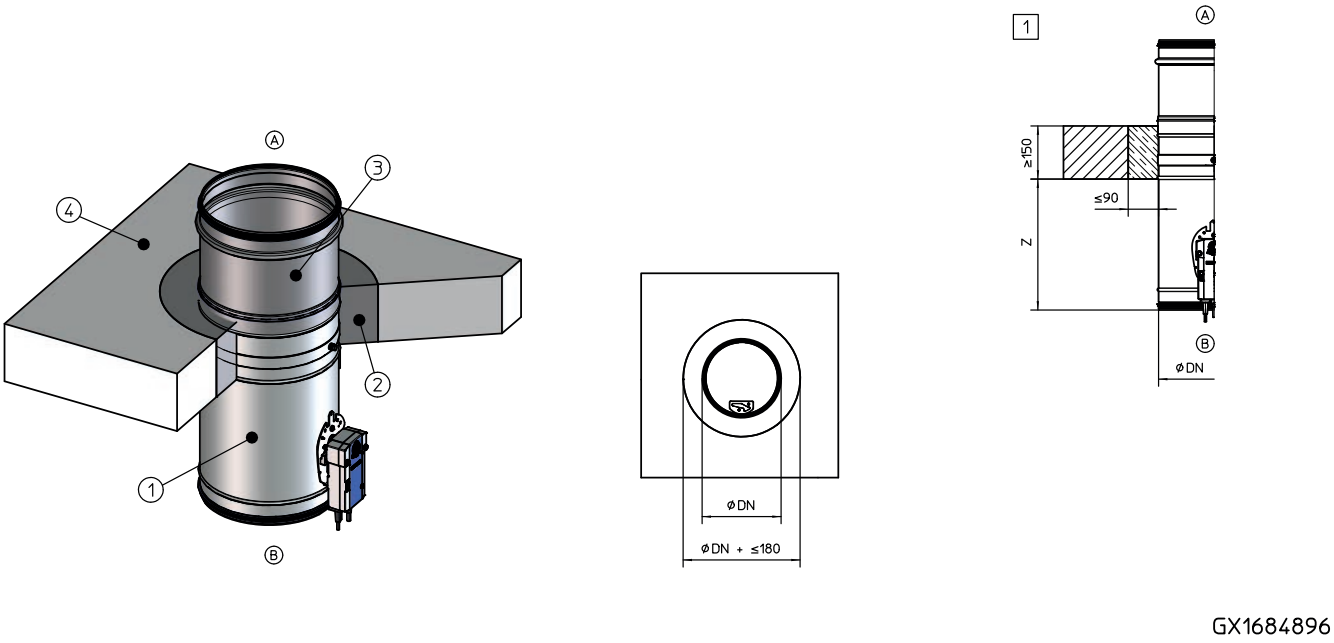


Fig. 13: Mortar-based installation into solid ceiling slab, suspended

1 FKR-EU
2 Mortar
3 Extension piece
4 Solid ceiling slab

z Spigot construction 370 mm, flange construction 342 mm
1 Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

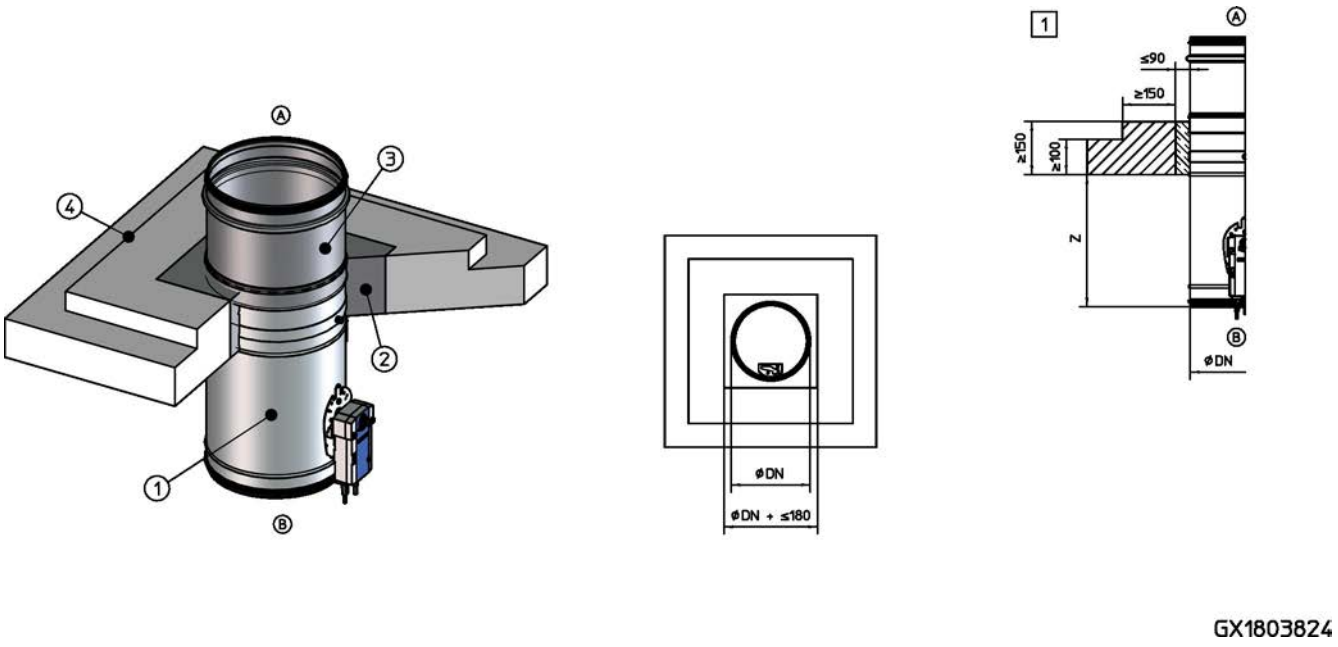


Fig. 14: Mortar-based installation into solid ceiling slab, suspended

1 FKR-EU
2 Mortar
3 Extension piece
4 Solid ceiling slab

z Spigot construction 370 mm, flange construction 342 mm
1 Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

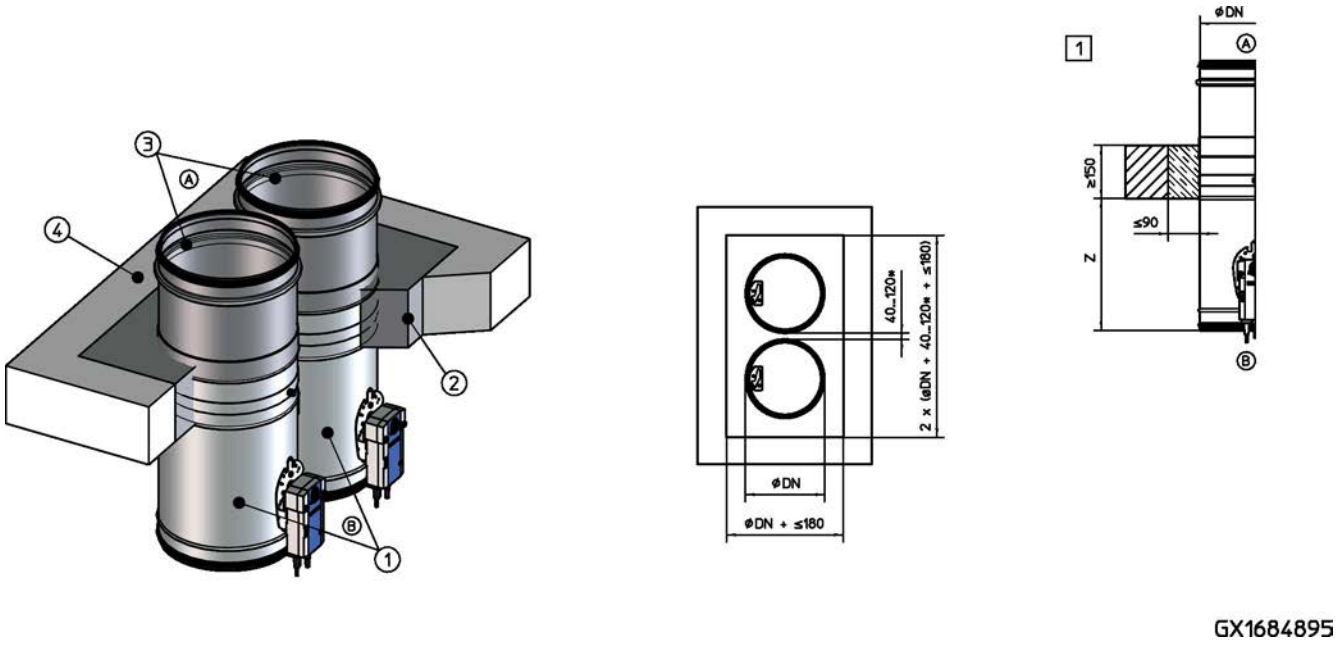


Fig. 15: Mortar-based installation into solid ceiling slab, suspended, "flange to flange"

1 FKR-EU
2 Mortar
3 Extension piece
4 Solid ceiling slab
z Spigot construction 370 mm, flange construction 342 mm

* with flange construction 80...120 mm
1 Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

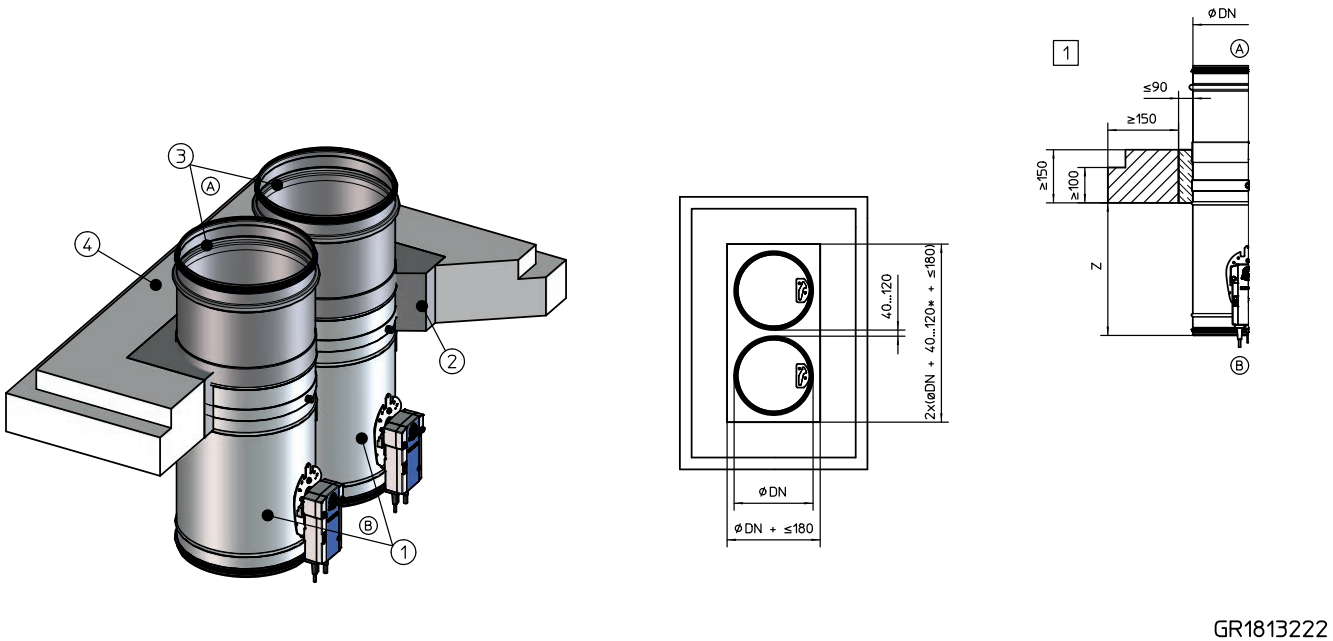


Fig. 16: Mortar-based installation into solid ceiling slab, suspended, "flange to flange"

1 FKR-EU
2 Mortar
3 Extension piece
4 Solid ceiling slab
z Spigot construction 370 mm, flange construction 342 mm

* with flange construction 80...120 mm
1 Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Materials:

- Mortar *'Mortars for mortar-based installation' on page 17*

Requirements

- Performance class up to EI 120 S
- Solid ceiling slabs without open spaces, made of concrete or aerated concrete, gross density ≥ 600 kg/m³ and D ≥ 100 mm (thickness increased to D ≥ 150 mm where required).
- ≥ 40 mm distance to load-bearing structural elements
- Distance between two fire dampers ≥ 40 mm, with flange construction ≥ 80 mm ("flange to flange"). When you install two fire dampers next to each other into the same opening, the mortar bed between the two fire dampers must not exceed 120 mm (reinforcement according to structural requirements).

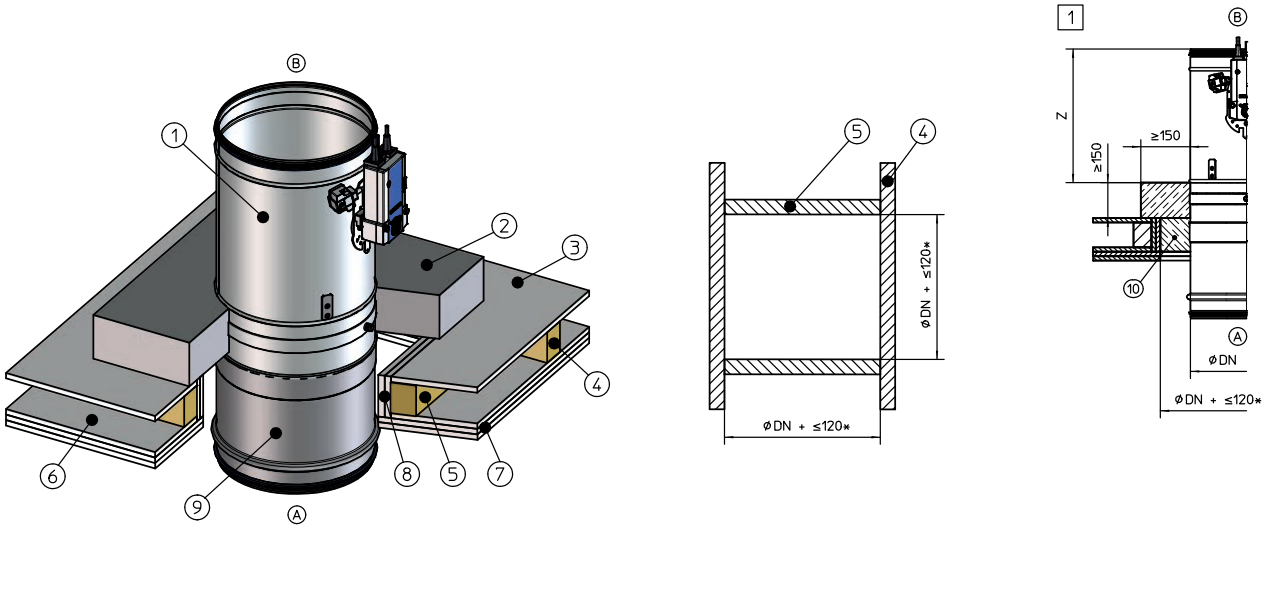
1. Create an installation opening in compliance with the local structural requirements. ∅D = ∅DN + maximal 180 mm.
2. Push the fire damper into the installation opening and secure it. When doing this, the spacing dimension *[z]* must be observed, see Fig. 9 to Fig. 16.

   Extend the fire damper with an extension piece or a spiral duct on the installation side.
3. Close off the perimeter gap »s« with mortar. The mortar bed depth must be at least 100 mm.

Installation while completing the ceiling slab

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

5.5.2 Mortar-based installation into wooden beam ceilings



GX1865094

Fig. 17: Mortar-based installation into a wooden beam ceiling up to EI 90 S, upright installation (shown; other structures upon request)

1 FKR-EU
2 Reinforced concrete
3 Wooden floorboard / floor tile
4 Wooden beams (distances between beams have to be reduced to fit the size of the installation opening)
5 Timber beam joist
6 Formwork
7 Fire-resistant cladding (according to the local structural conditions)
8 Trim panels
9 Extension piece or duct
10 Concrete (optional)
z Spigot construction 370 mm, flange construction 342 mm
* Can be increased to account for the thickness of the trim panels
[1] Up to EI 90 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Materials:

- Concrete

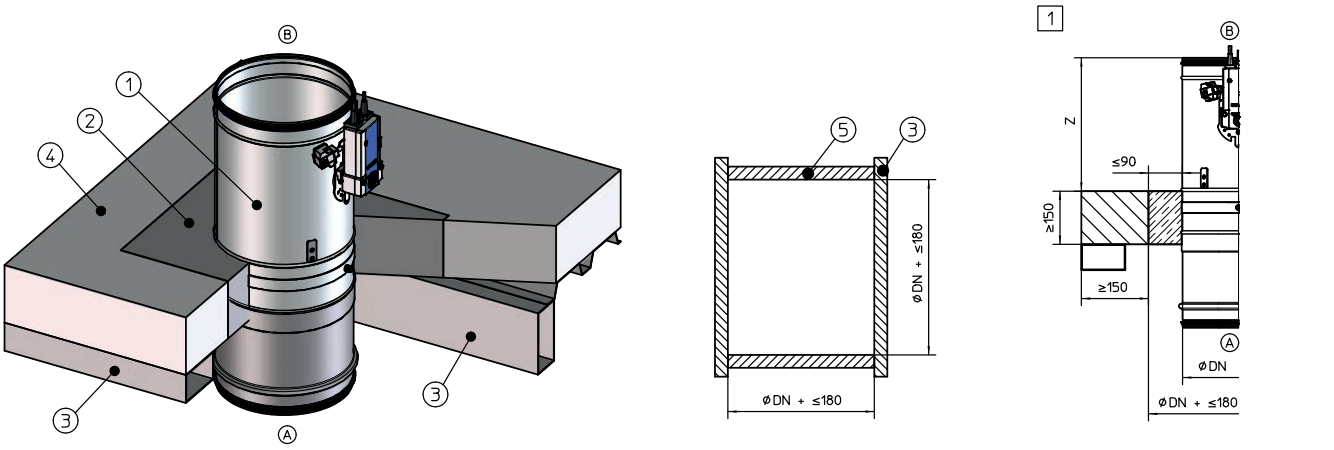
Requirements

- Performance class up to EI 90 S
- Wooden beam ceiling with fire-resistant cladding
- ≥ 40 mm distance to load-bearing structural elements
- ≥ 40 mm distance between two fire dampers, 80 mm for flange construction ("flange to flange"). When you install two dampers next to each other into the same opening, the concrete bed between the two fire dampers must not exceed 120 mm.

1. ▸ Create an installation opening, ∅DN + 120 mm max. Professionally connect the trimmers.
2. ▸ Push the fire damper into the installation opening and secure it. When doing this, the spacing dimension *[z]* must be observed, see Fig. 17.

   Extend the fire damper with an extension piece or a spiral duct on the installation side.
3. ▸ Create a partial concrete ceiling around the fire damper, with ≥ 150 mm reinforcement, ≥ 150 mm thick; or install the damper into a concrete ceiling later, with a perimeter mortar infill.
4. ▸ Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete, have to be evaluated and ensured by others.

5.5.3 Mortar-based installation into lightweight ceilings



TR1864875

Fig. 18: Mortar-based installation into a lightweight ceiling up to EI 120 S, upright installation

1 FKR-EU
2 Mortar or concrete
3 Lightweight ceiling (Cadolto modular ceiling system), installation according to manufacturer's instructions and general appraisal certificate
4 Partial concrete ceiling with reinforcement
5 Steel sections

z Spigot construction 370 mm, flange construction 342 mm
1 Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Materials:

- Mortar or concrete *'Mortars for mortar-based installation' on page 17*

Requirements

- Performance class up to EI 120 S
- Modular ceiling (Cadolto)
- ≥ 40 mm distance to load-bearing structural elements
- ≥ 40 mm distance between two fire dampers, 80 mm for flange construction ("flange to flange"). When you install two fire dampers next to each other into the same opening, the concrete bed between the two fire dampers must not exceed 120 mm.

1. Create an installation opening, ∅DN + 180 mm max. Provide and professionally connect the steel sections around the opening in the lightweight ceiling.
2. Push the fire damper into the installation opening and secure it. When doing this, the spacing dimension *[z]* must be observed, see Fig. 18.

   Extend the fire damper with an extension piece or a spiral duct on the installation side.
3. Create a partial concrete ceiling around the fire damper, with ≥ 150 mm reinforcement, ≥ 150 mm thick; or install the damper into a concrete ceiling later, with a perimeter mortar infill.
4. Structural and fire resistance properties of the ceiling construction, including the attachment to the concrete, have to be evaluated and ensured by others.

5.5.4 Mortar-based installation into concrete base

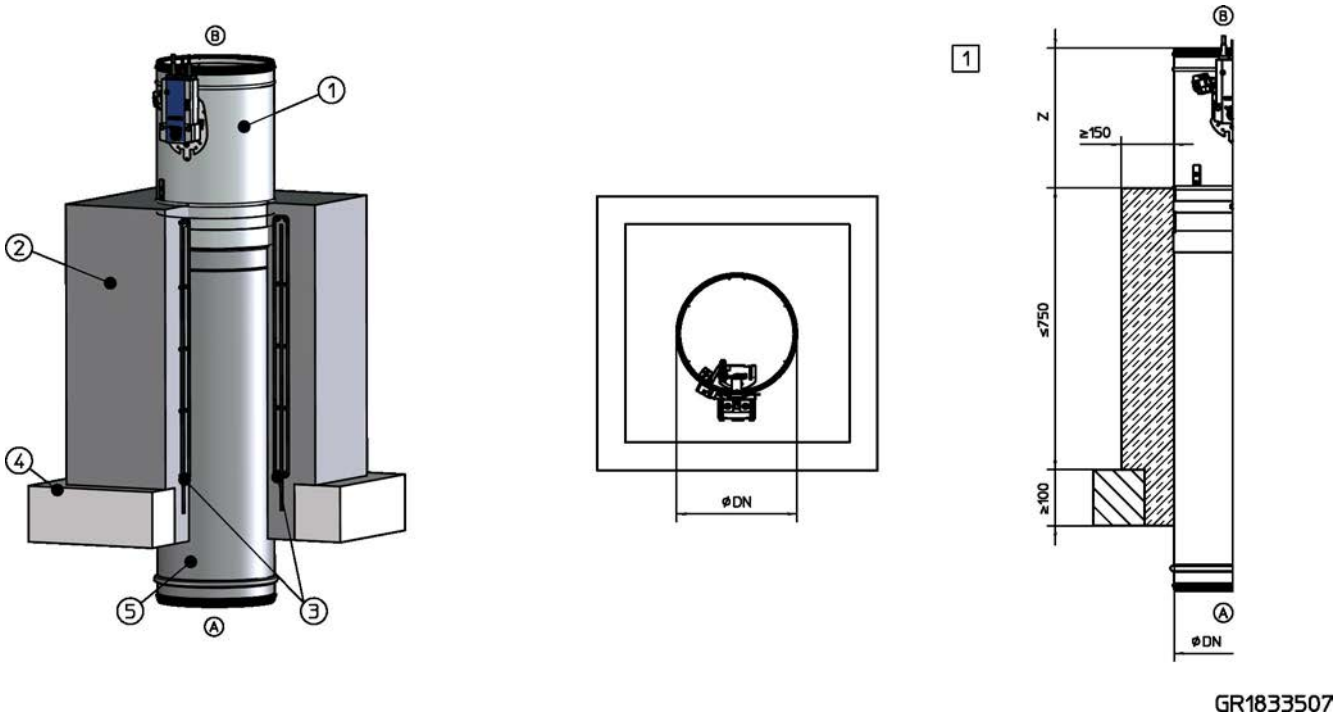


Fig. 19: Mortar-based installation with concrete base into a solid ceiling slab, up to EI 120 S

1 FKR-EU
2 Reinforced concrete base
3 Concrete base according to the reinforcement plan, see Fig. 20
4 Solid ceiling slab
5 Duct
z Spigot construction 370 mm, flange construction 342 mm
[1] Up to EI 120 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Requirements

- Performance class up to EI 120 S
- Solid ceiling slabs without open spaces, made of concrete or aerated concrete, gross density ≥ 600 kg/m³ and D ≥ 100 mm
- ≥ 40 mm distance to load-bearing structural elements.
- ≥ 40 mm distance between two fire dampers, 80 mm for flange construction

1. ▸ Attach the new fire damper to the old fire damper or to the ductwork.

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.

2. ▸ Create concrete base, for a reinforcement plan (or similar, e.g. with steel fabric) see Fig. 20. When doing this, the spacing dimension *[z]* must be observed, see Fig. 19.

No reinforcement is required for bases with a height of ≤ 100 mm.

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

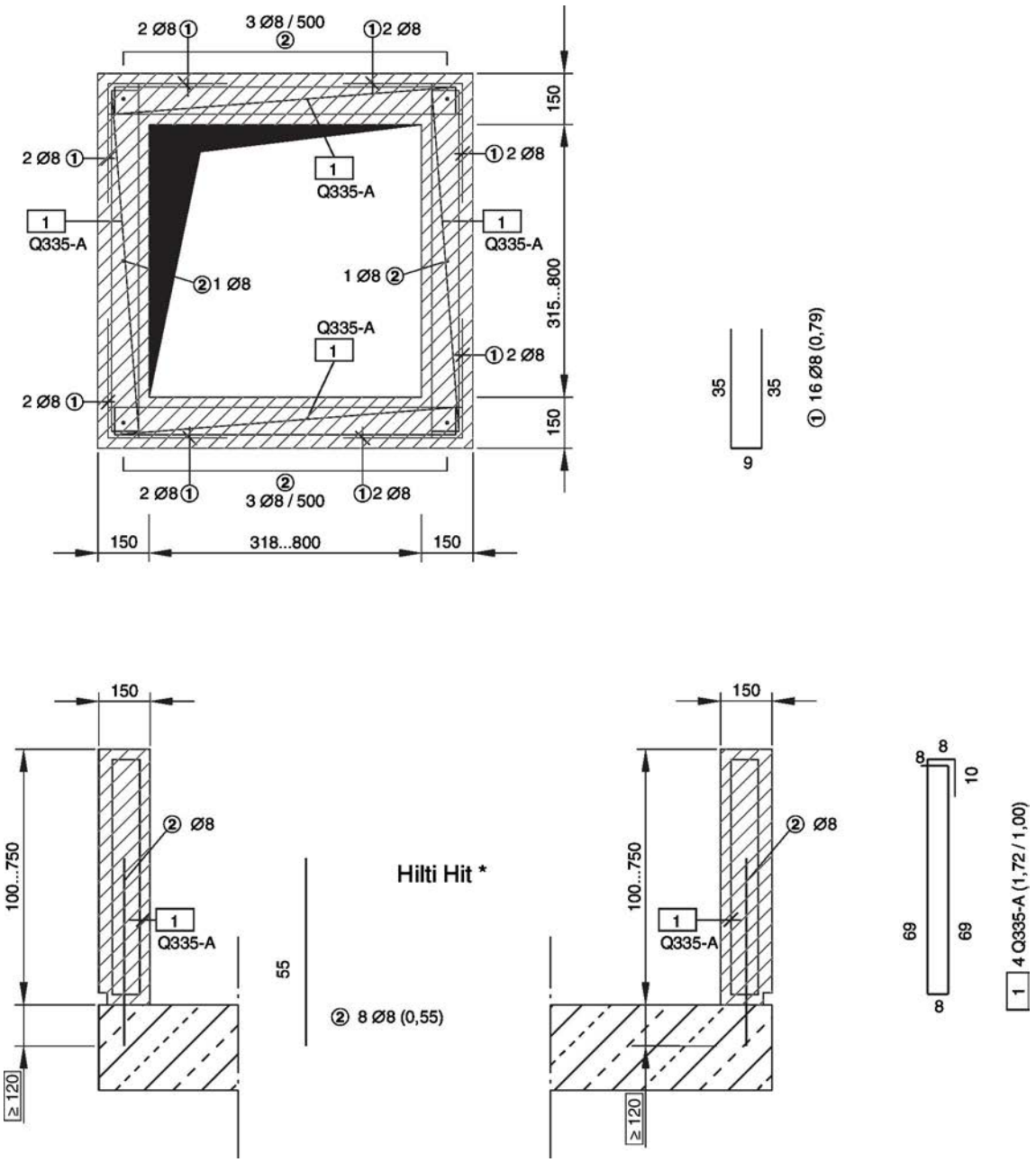


Fig. 20: Reinforcement plan for concrete bases with a height of 100 to 750 mm

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

5.6 Lightweight partition walls

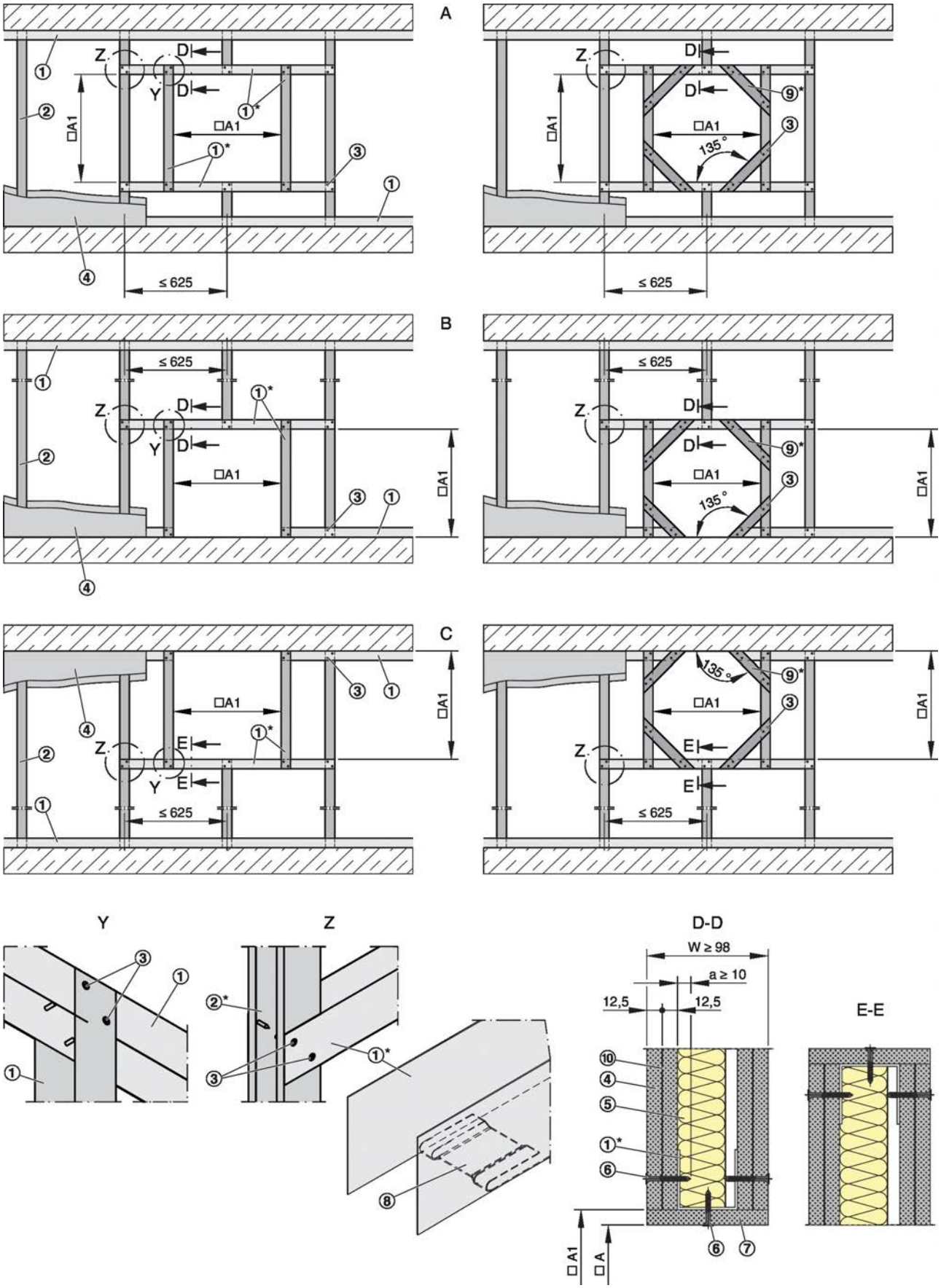


Fig. 21: Lightweight partition wall with metal support structure and cladding on both sides

A Lightweight partition wall
B Lightweight partition wall, installation near the floor
C Lightweight partition wall, installation near the ceiling
1 UW section
2 CW section
3 Screw or steel rivet
4 Double layer cladding, on both sides of the metal stud system
5 Mineral wool (depending on wall construction)
6 Dry wall screw
7 Trim panels (screw-fixed to the metal support structure), according to installation details
8 Fold the tab inward or cut it off
9 UW section, only for mortar-based installation, nominal sizes ∅DN 450 - 800
10 Sheet steel insert (according to usability certificate, e.g. for a safety partition wall)
□A Installation opening ↳ *Table on page 30*
□A1 Opening in the metal support structure (without trim panels: □A =□A1) ↳ *Table on page 30*
* Closed end must face installation opening

Requirements

- Lightweight partition wall, safety partition wall or wall to provide radiation protection, with metal support structure or steel substructure and cladding on both sides, with European classification to EN 13501-2 or equivalent national classification
- Cladding on both sides made of gypsum bonded or cement bonded panel materials, of fibre-reinforced gypsum or of fire-rated calcium silicate boards, wall thickness W ≥ 98 mm
- ≤ 625 mm distance between metal studs
- Additional layers of cladding (up to two layers if stated in the usability certificate for the wall) and double stud constructions are approved.
- Duct connection with flexible connector (recommended)
- Trim panels have to be screw-fixed to the support structure

Erecting a wall and creating an installation opening

- Erect the lightweight partition wall according to the manufacturer's instructions.
- Create an installation opening, see :
  - Provide the installation opening in the metal support structure with support sections.
  - In case of mortar-based installation of fire dampers from nominal size ∅450, install four additional sections ⑨ at an angle of 45° in order to reinforce the metal support structure.

Installation opening □A [mm]									
Installation type	**Nominal size ∅DN**								
	315	**355**	**400**	**450**	**500**	**560**	**630**	**710**	**800**
Mortar-based installation [1]	□A = ∅DN + max. 120 mm □A1 = □A + (2 × trim panel)								
Dry mortarless installation with installation kit TQ [1, 2, 3]	435	475	520	570	620	680	750	830	920

[1)] Optional trim panels

[2)] Installation opening tolerance + 2 mm

[3)] Installation kit TQ is available only for FKR-EU with spigot

5.6.1 Mortar-based installation

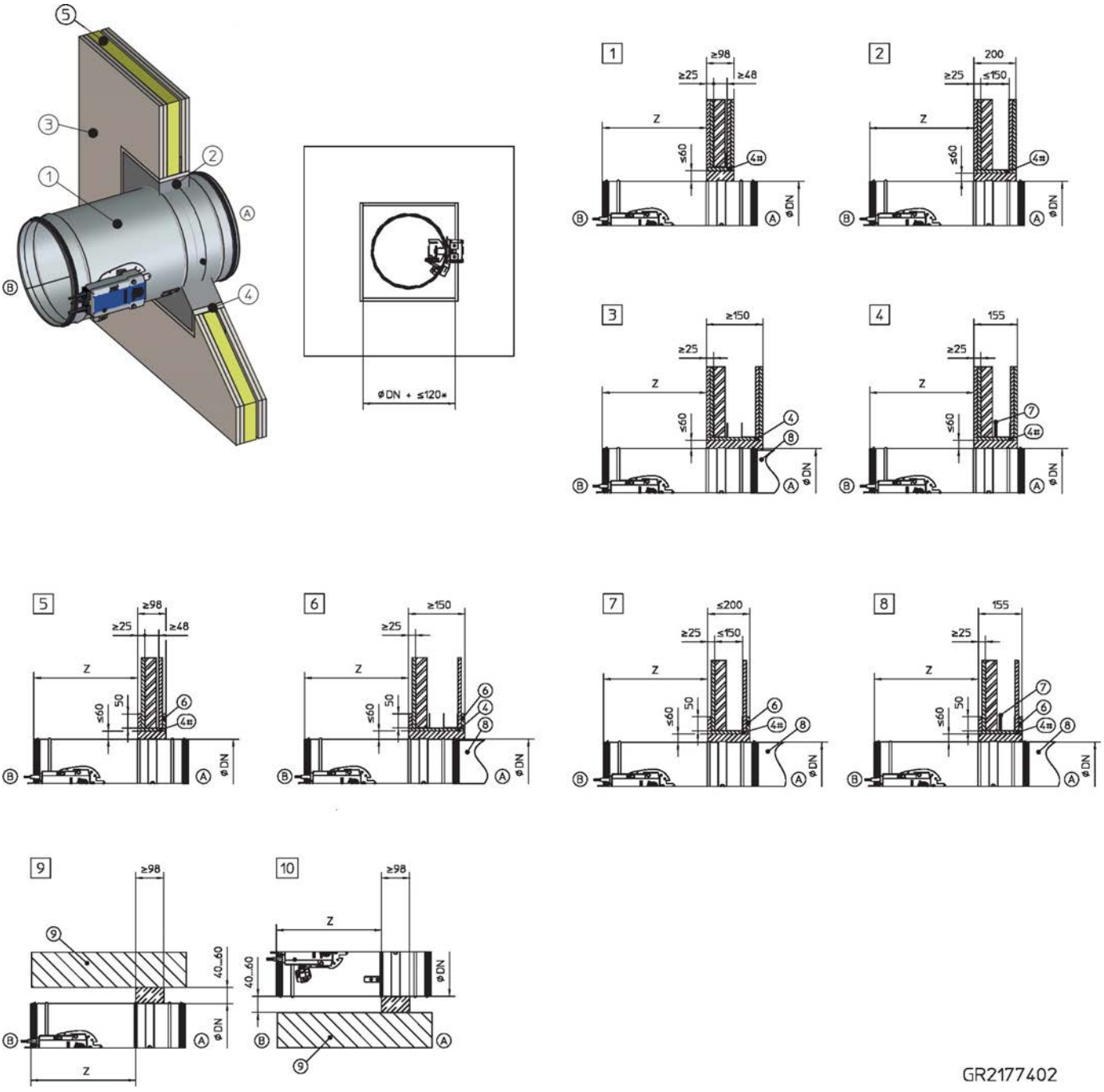


Fig. 22: Mortar-based installation into a lightweight partition wall

1	FKR-EU	z	Spigot construction 370 mm, flange construction 342 mm
2	Mortar	*	Can be increased to account for the thickness of the trim panels
3	Lightweight partition wall	#	optional
4	Trim panels (screw-fixed to the metal support structure)	1 – 4	Up to EI 90 S
5	Mineral wool depending on wall construction	5 – 8	Up to EI 30 S
6	Reinforcing board (screw-fixed to the metal support structure all round)	9 – 10	Up to EI 90 S
7	Insulating strip (depending on wall construction)	Ⓐ	Installation side
8	Extension piece or duct	Ⓑ	Operating side
9	Solid ceiling slab / solid floor		

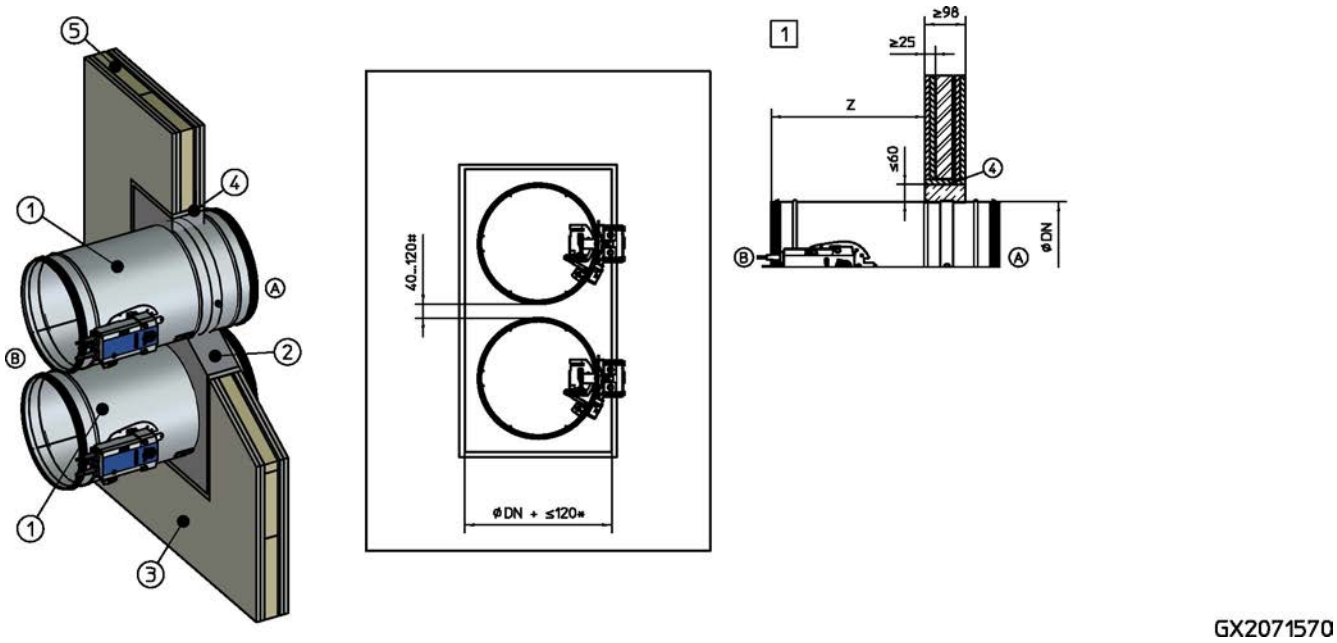


Fig. 23: Mortar-based installation in lightweight partition wall, "flange to flange", one below the other (drawn) or side by side

1 FKR-EU (up to ∅DN = 400 mm)
2 Mortar
3 Metal support structure, safety partition wall or wall to provide radiation protection
4 Trim panels (screw-fixed to the metal support structure), see installation details Fig. 22
5 Mineral wool depending on wall construction
z Spigot construction 370 mm, flange construction 342 mm

* Can be increased to account for the thickness of the trim panels
\# with flange construction 80...120 mm
[1] Up to EI 90 S
Ⓐ Installation side
Ⓑ Operating side

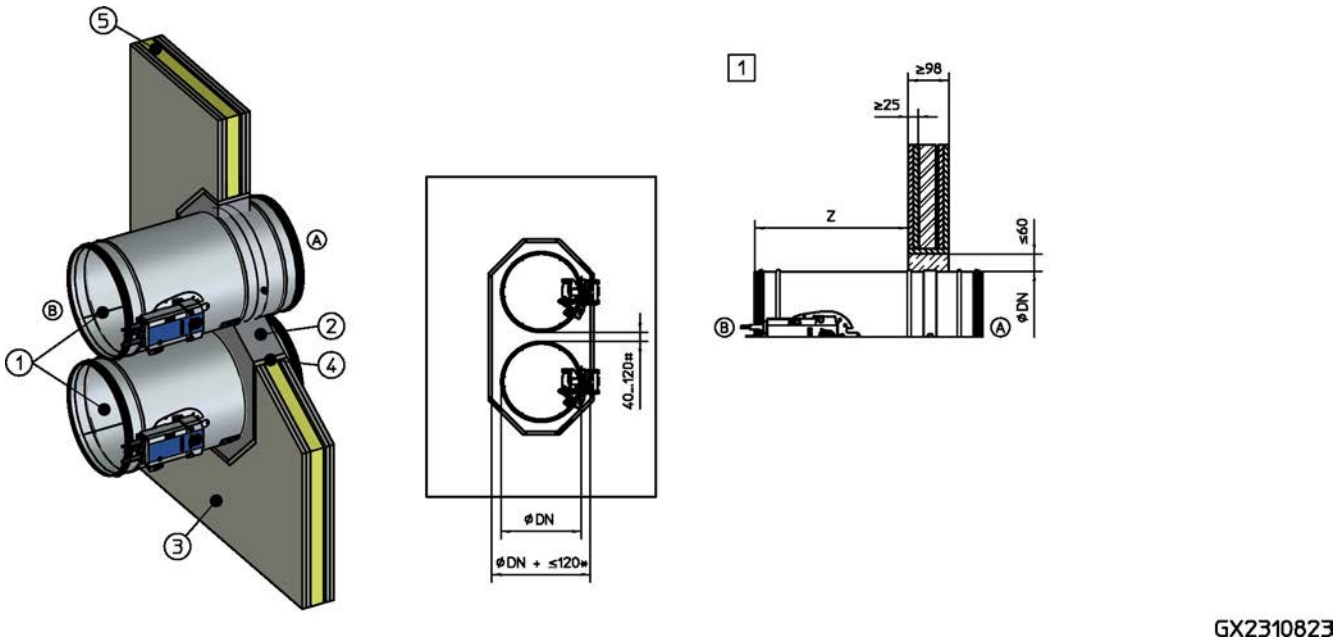


Fig. 24: Mortar-based installation in lightweight partition wall, "flange to flange", one below the other (drawn) or side by side

1 FKR-EU (from ∅DN = 450 mm)
2 Mortar
3 Lightweight partition wall
4 Trim panels (screw-fixed to the metal support structure), see installation details Fig. 22
5 Mineral wool depending on wall construction
z Spigot construction 370 mm, flange construction 342 mm

* Can be increased to account for the thickness of the trim panels
\# with flange construction 80...120 mm
1 Up to EI 90 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Materials:

- Mortar *'Mortars for mortar-based installation' on page 17*

Requirements

- Performance class up to EI 90 S
- Lightweight partition wall, safety partition wall or wall to provide radiation protection with metal support structure or steel substructure and cladding on both sides, W ≥ 98 mm, additional specifications *on page 29*.
- ≥ 40 mm distance to load-bearing structural elements(75 mm with F30 lightweight partition walls).
- ≥ 200 mm distance between two fire dampers (separate installation opening) Distance between two fire dampers if installed "flange to flange" 40...120 mm or 80...120 mm in flange construction (one installation opening). "Flange to flange" installation is possible only for fire dampers of the same size. ≥ 200 mm distance between two fire dampers installed in F30 lightweight partition walls.
- Duct connection with flexible connector (recommended)

1. Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening *on page 29*.
2. Push the fire damper into the installation opening and secure it. When doing this, the spacing dimension *[z]* must be observed, see Fig. 22 to Fig. 24.

   If the wall thickness is > 115 mm, extend the fire damper on the installation side with an extension piece or a spiral duct (attachment or provided by others).
3. Close off the perimeter gap »s« with mortar.

5.6.2 Mortar-based installation underneath flexible ceiling joint

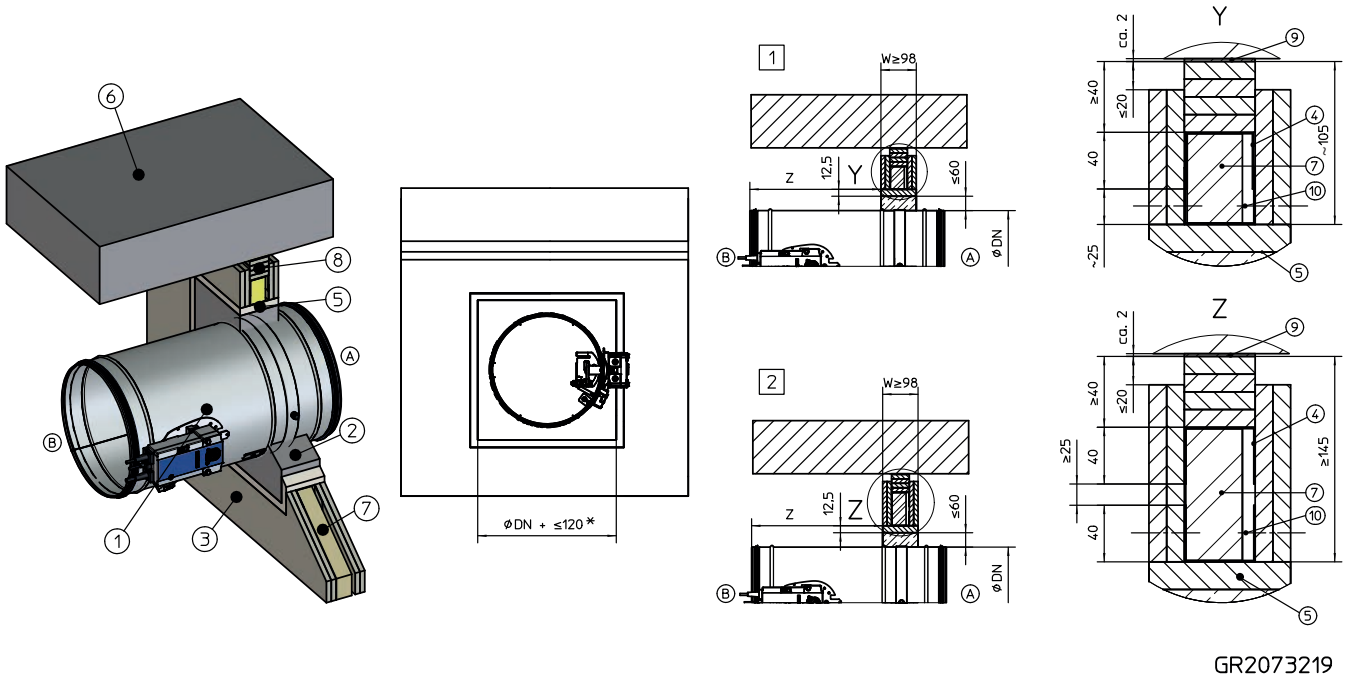


Fig. 25: Mortar-based installation in lightweight partition wall with flexible ceiling joint (drawing shows flexible ceiling joint acc. to DIN 4102)

1 FKR-EU
2 Mortar
3 Metal stud wall
4 Metal support structure (must have an opening in area ⑩ at detail "Y")
5 Trim panels (screw-fixed to the metal support structure), optional, see installation details Fig. 22
6 Solid ceiling slab
7 Mineral wool (depending on wall construction)
8 Ceiling joint strips, e.g. 4 × ≥ 10 mm
9 Mineral fibre strips, A1, alternatively filling material (depending on the wall construction)
10 Dry wall screw
z Spigot construction 370 mm, flange construction 342 mm
* Can be increased to account for the thickness of the trim panels
[1] Up to EI 90 S
[2] Up to EI 90 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Materials:

- Mortar *'Mortars for mortar-based installation' on page 17*

Requirements

- Performance class up to EI 90 S
- Lightweight partition walls with metal support structure and cladding on both sides, W ≥ 98 mm; detailed specification *on page 29*.
- ≥ 200 mm distance between two fire dampers (separate installation opening) If two equally sized dampers are installed in one installation opening, the distance between them must be 40...120 mm or 80...120 mm (flange version).
- Duct connection with flexible connector (recommended)

1. Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening *on page 29*.
2. Push the fire damper into the installation opening and secure it. When doing this, the spacing dimension *[z]* must be observed, see Fig. 25.

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

3. ▸ Close off the perimeter gap »s« with mortar.

5.6.3 Dry mortarless installation with square installation kit TQ

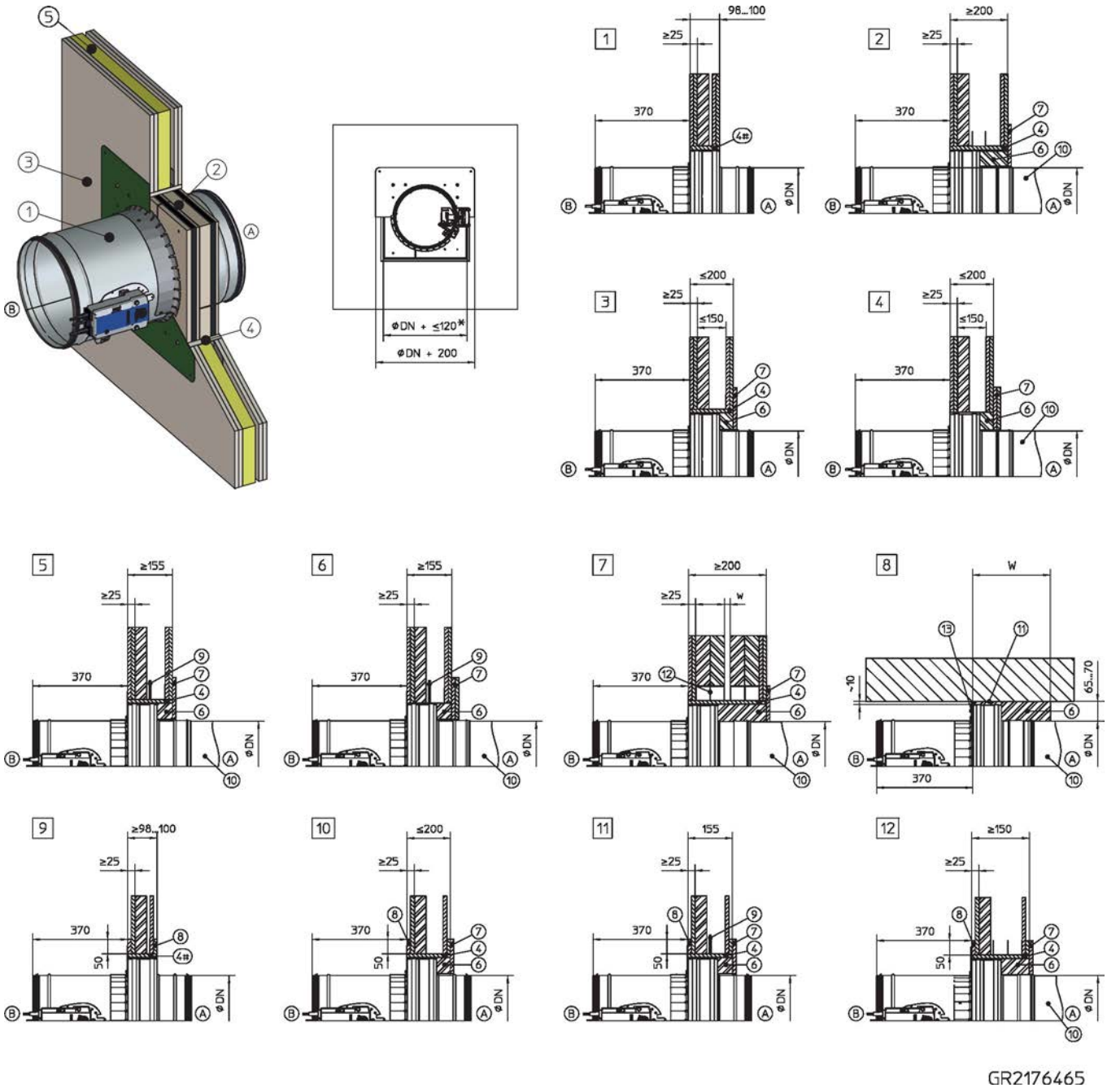


Fig. 26: Dry mortarless installation in lightweight partition wall with square installation kit TQ

1	FKR-EU
2	Installation kit TQ (factory assembled)
3	Lightweight partition wall
4	Trim panels (screw-fixed to the metal support structure)
5	Mineral wool depending on wall construction
6	Mineral wool, ≥ 1000 ° C, ≥ 50 kg/m³, alternatively gypsum mortar
7	Reinforcing board made of wall panels (reinforcing board or alternatively wall cladding on the back, up to the fire damper casing)
8	Reinforcing board
9	Insulating strip (depending on wall construction)
10	Extension piece
11	Mineral wool, ≥ 1000 ° C, ≥ 80 kg/m³, alternatively gypsum mortar
12	Steel support structure
13	Cover plate, shortened by others
*	Can be increased to account for the thickness of the trim panels
#	optional
1 – 8	Up to EI 90 S
9 – 12	EI 30 S
Ⓐ	Installation side
Ⓑ	Operating side

Personnel:

- Specialist personnel

Requirements

- Performance class up to EI 90 S
- Lightweight partition walls with metal support structure or steel support structure and cladding on both sides, W ≥ 98 mm, detailed specification *on page 29*.
- Distance from the fire damper to load-bearing structural elements 40 mm (due to design ≥ 60 mm in connection with shortened cover plate)
- ≥ 200 mm distance between two fire dampers
- Duct connection with flexible connector (recommended)

1. Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening *on page 29*
2. Position the fire damper with the square installation kit in the centre of the installation opening and push it in up to the cover plate.

   If the wall thickness is >115 mm , extend the fire damper on the installation side with an extension piece or a spiral duct.
3. Fix the cover plate with dry wall screws (∅ ≥ 4.2 mm) to the metal support structure; nominal size NW up to 400 mm: 4 screws; nominal size NW from 450 mm: 12 screws.
4. If the wall thickness is ≥ 125 mm, fill the rear gap with mineral wool or gypsum mortar and seal it with reinforcing strips made of the same material as the wall Fig. 26.

5.6.4 Dry mortarless installation with square installation kit and flexible ceiling joint

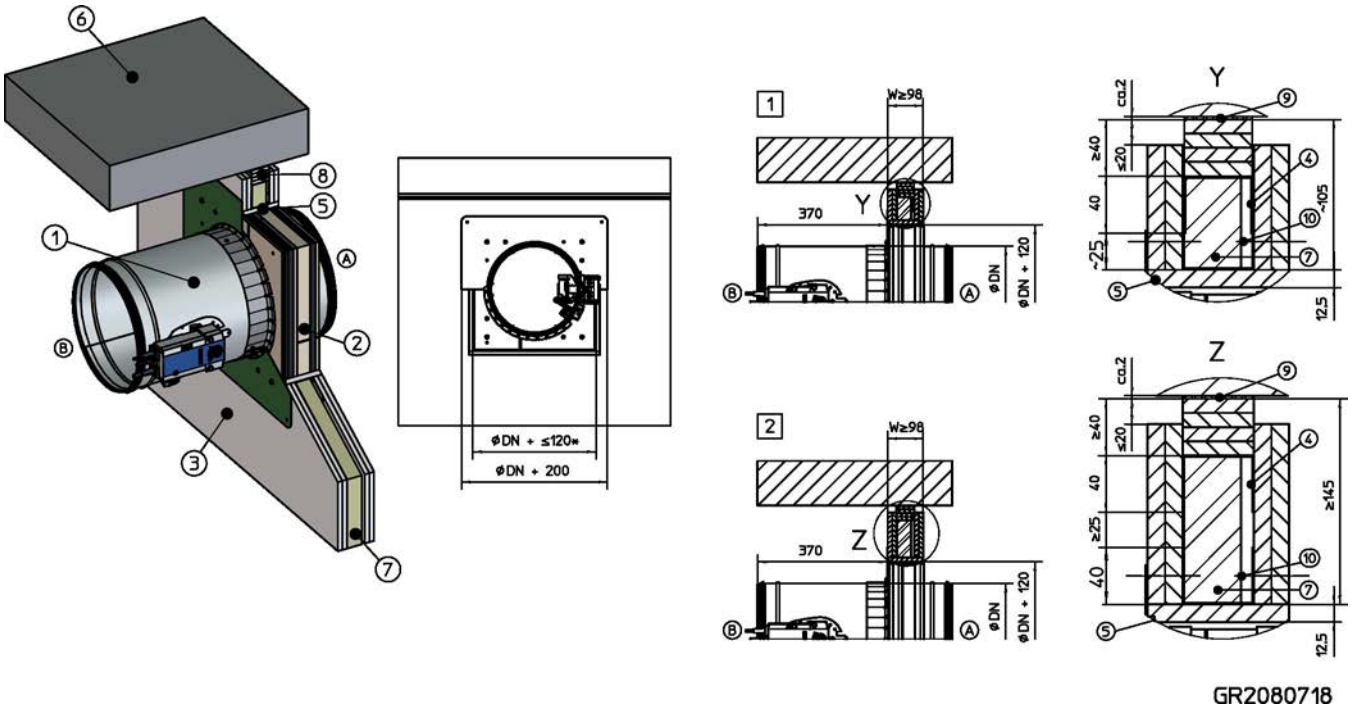


Fig. 27: Dry mortarless installation in lightweight partition wall with square installation kit TQ and flexible ceiling joint (drawing shows flexible ceiling joint acc. to DIN 4102)

1 FKR-EU
2 Installation kit TQ (factory assembled)
3 Metal stud wall
4 Metal support structure (must have an opening in area ⑩ at detail "Y")
5 Trim panels (screw-fixed to the metal support structure), optional, see installation details Fig. 26
6 Solid ceiling slab
7 Mineral wool (depending on wall construction)
8 Ceiling joint strips (e.g. 4 × ≥ 10 mm)
9 Mineral fibre strips, A1, alternatively filling material (depending on the wall construction)
10 Dry wall screw
* Can be increased to account for the thickness of the trim panels
[1] Up to EI 90 S
[2] Up to EI 90 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Requirements

- Performance class up to EI 90 S
- Lightweight partition walls with metal support structure and cladding on both sides, W ≥ 98 mm; detailed specification *on page 29*.
- ≥ 200 mm distance between two fire dampers
- Duct connection with flexible connector (recommended)

1. Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening *on page 29*
2. Position the fire damper with the square installation kit in the centre of the installation opening and push it in up to the cover plate.

   If the wall thickness is > 115 mm, extend the fire damper on the installation side with an extension piece or a spiral duct (attachment or provided by others).
3. Fix the cover plate with dry wall screws (∅ ≥ 4.2 mm) to the metal support structure; nominal size NW up to 400 mm: 4 screws; nominal size NW from 450 mm: 12 screws.
4. If the wall thickness is ≥ 125 mm, fill the rear gap with mineral wool or gypsum mortar and seal it with reinforcing strips made of the same material as the wall, see Fig. 26

5.7 Lightweight partition walls with timber support structure

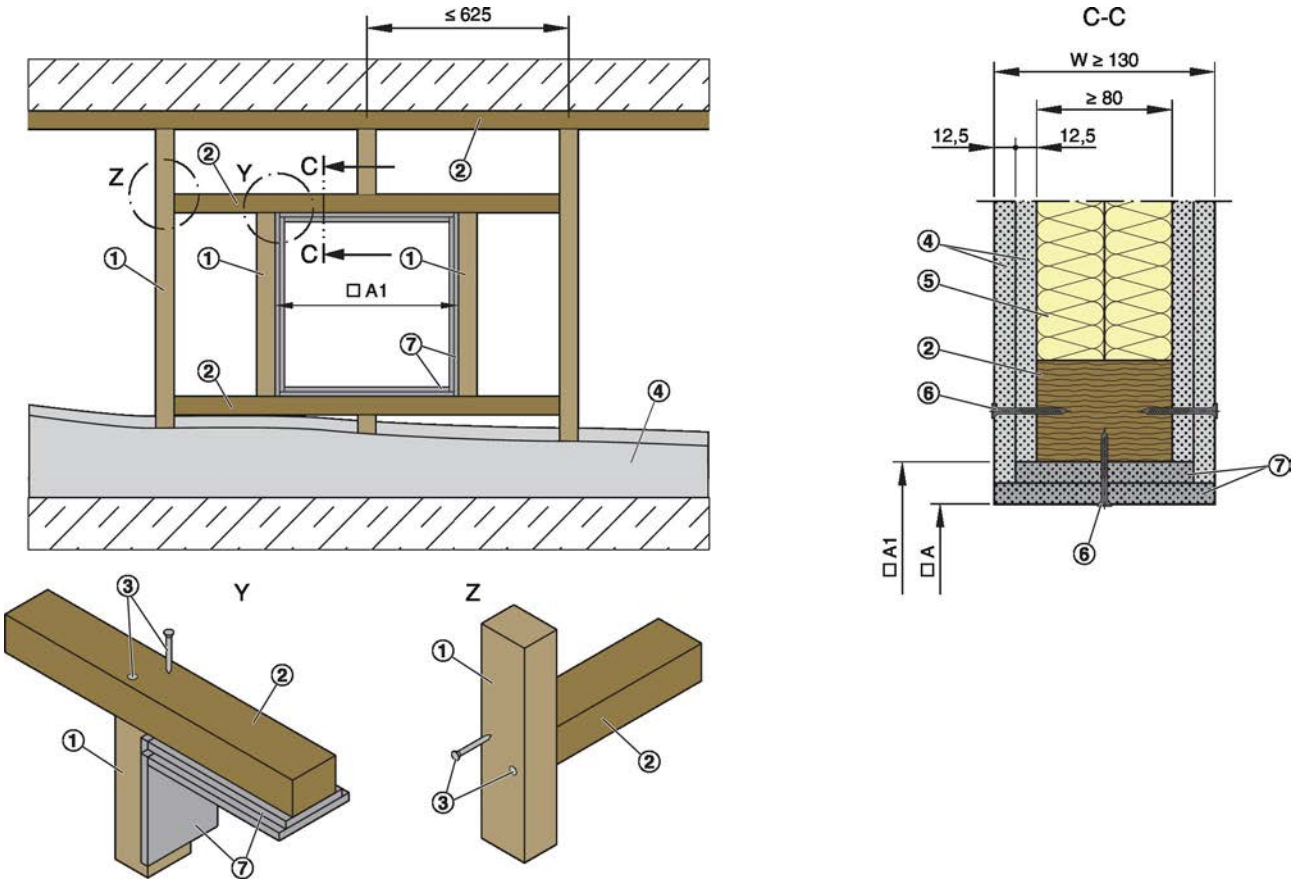


Fig. 28: Lightweight partition wall with timber support structure and cladding on one side

1 Timber stud, at least 60 × 80 mm
2 Horizontal timber section, at least 60 × 80 mm
3 Screw or pin
4 Double layer cladding on both sides of the timber support structure
5 Mineral wool (depending on wall construction)
6 Screw
7 Trim panels, double layer, staggered joints
□A Clear installation opening
□A1 Opening in the timber support structure, □A1 = □A + (4 trim panels)

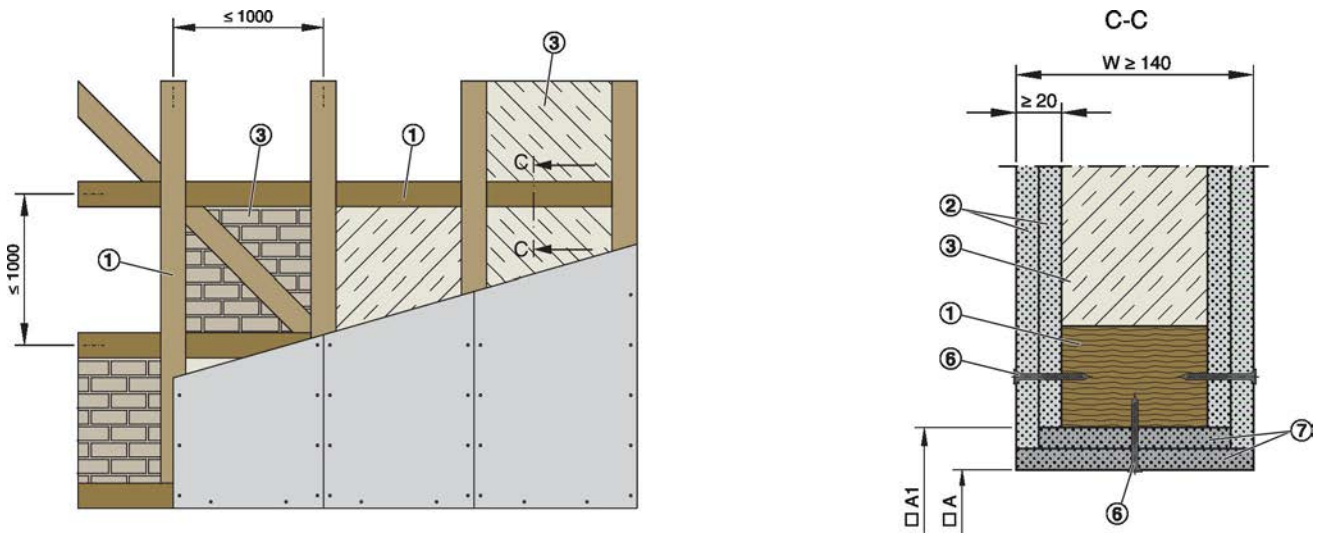


Fig. 29: Lightweight partition wall, half-timbered construction with cladding on both sides

1 Half-timbered construction
2 Double layer cladding, on both sides of the half-timbered construction
3 Infilling*
6 Screw
7 Trim panels, double layer, staggered joints
* Cavities completely filled with mineral wool ≥ 50 kg/m³, bricks, aerated concrete, lightweight concrete, reinforced concrete or clay
□A Clear installation opening
□A1 Opening in the half-timbered construction, □A1 = □A + (4 trim panels)

Requirements

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

Erecting a wall and creating an installation opening

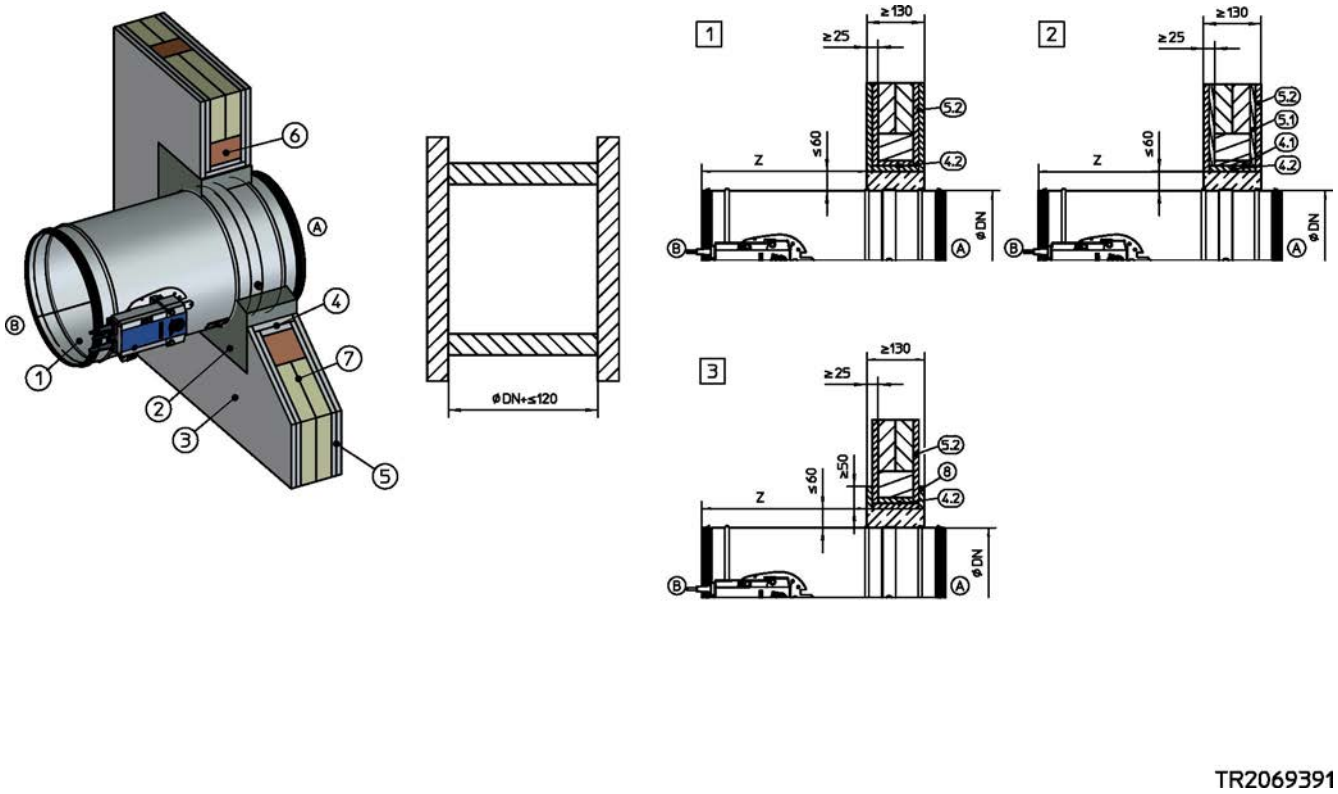
- Erect the timber stud wall according to the manufacturer's instructions.
- Create an installation opening in the timber support structure with timber studs ①, horizontal timber sections ② and trim panels ⑦; or create an installation opening in the half-timbered construction ① with trim panels ⑦, see Fig. 28 or Fig. 29.

Installation opening □A [mm]									
Installation type	**Nominal size ∅DN**								
	315	**355**	**400**	**450**	**500**	**560**	**630**	**710**	**800**
Mortar-based installation	□A = ∅DN + max. 120 mm □A1 = □A + (4 × trim panel)								
Dry mortarless installation with installation kit TQ[1, 2]	435	475	520	570	620	680	750	830	920

[1)] Installation opening tolerance + 2 mm

[2)] Installation kit TQ is available only for FKR-EU with spigot

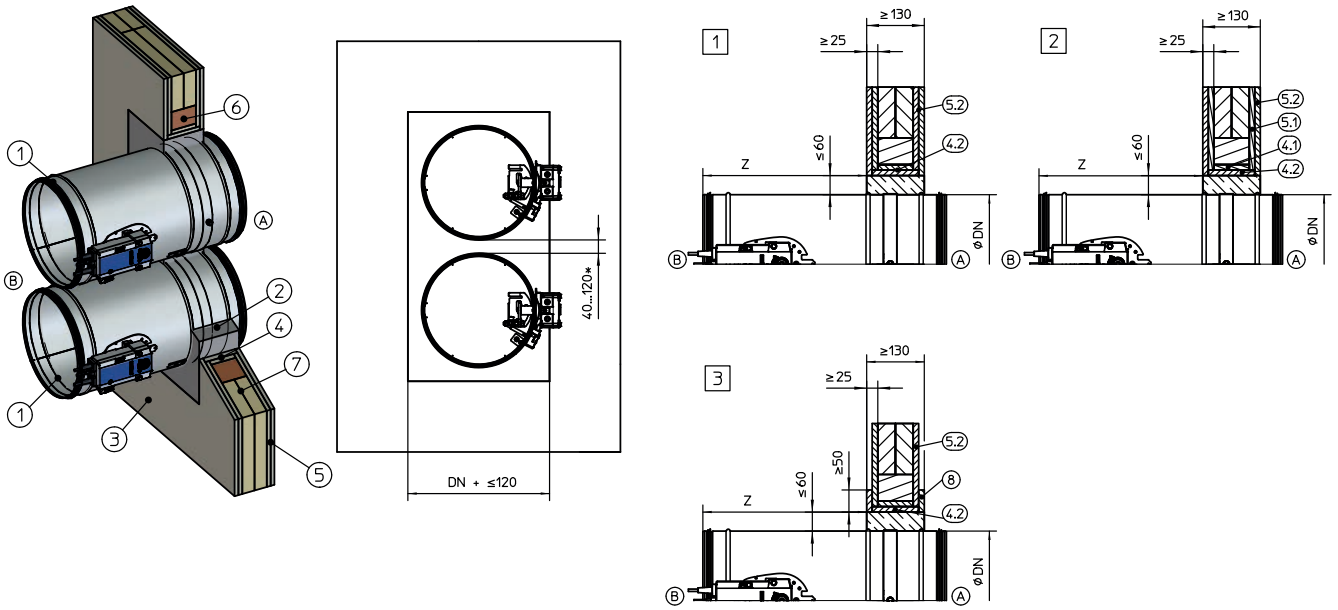
5.7.1 Mortar-based installation



TR2069391

Fig. 30: Mortar-based installation into a lightweight partition wall with timber support structure

1 FKR-EU
2 Mortar
3 Timber stud wall
4 Trim panels
4.1 Trim panels, wood sheet, at least 600 kg/m³
4.2 Trim panels (fire-resistant)
5 Wall cladding
5.1 Wall cladding, wood sheet, at least 600 kg/m³
5.2 Wall cladding (fire-resistant)
6 Horizontal timber section / stud, at least 60 x 80 mm
7 Mineral wool depending on wall construction
8 Reinforcing board
z Spigot construction 370 mm, flange construction 342 mm
[1] Up to EI 90 S
[2] EI 30 S (timber panel constructions and timber frames)
[3] EI 30 S
Ⓐ Installation side
Ⓑ Operating side



TR2075063

Fig. 31: Mortar-based installation in lightweight partition wall with timber support structure, "flange to flange", one below the other (drawn) or side by side

1 FKR-EU
2 Mortar
3 Timber stud wall
4 Trim panels
4.1 Trim panels, wood sheet, at least 600 kg/m³
4.2 Trim panels (fire-resistant)
5 Wall cladding
5.1 Wall cladding, wood sheet, at least 600 kg/m³
5.2 Wall cladding (fire-resistant)
6 Horizontal timber section / stud, at least 60 x 80 mm
7 Mineral wool depending on wall construction
8 Reinforcing board
z Spigot construction 370 mm, flange construction 342 mm
* with flange construction 80...120 mm
1 Up to EI 90 S
2 EI 30 S (timber panel constructions and timber frames)
3 EI 30 S
Ⓐ Installation side
Ⓑ Operating side

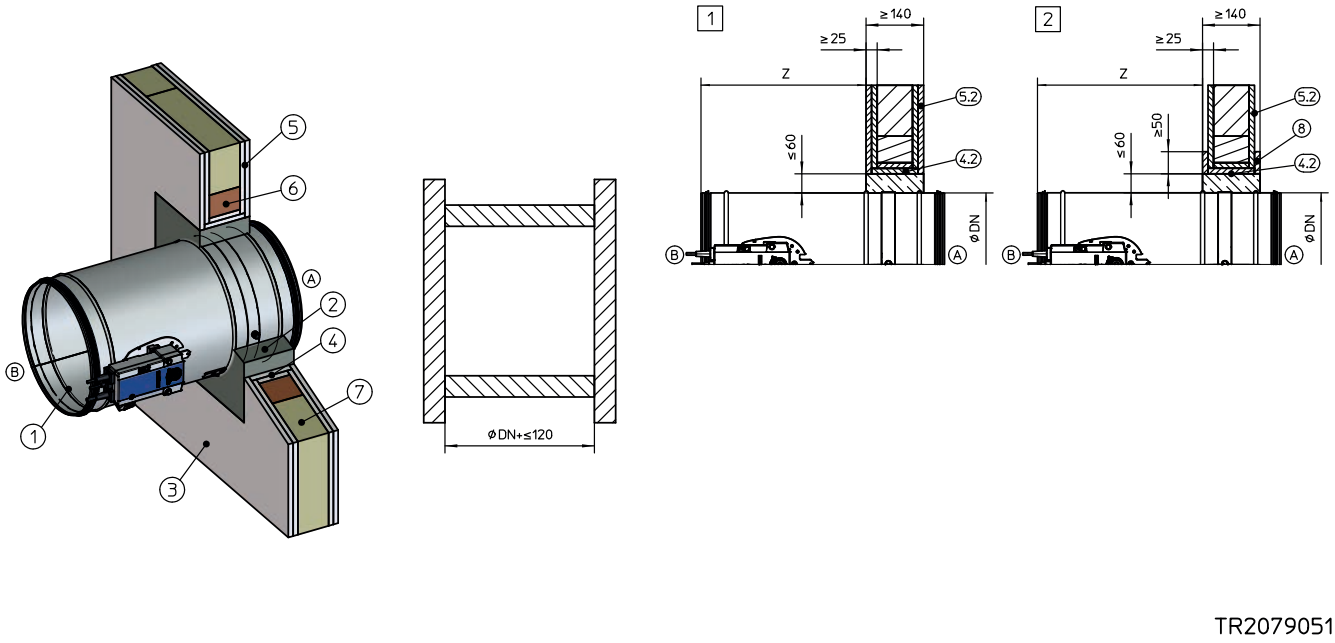


Fig. 32: Mortar-based installation into a lightweight partition wall, half-timbered construction

1 FKR-EU
2 Mortar
3 Half-timbered wall
4.2 Trim panels
5.2 Wall cladding
6 Half-timbered construction
7 Infilling*
8 Reinforcing board
z Spigot construction 370 mm, flange construction 342 mm
* Cavities completely filled with mineral wool ≥ 50 kg/m³, bricks, aerated concrete, lightweight concrete, reinforced concrete or clay
1 Up to EI 90 S
2 EI 30 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Materials:

- Mortar *'Mortars for mortar-based installation' on page 17*

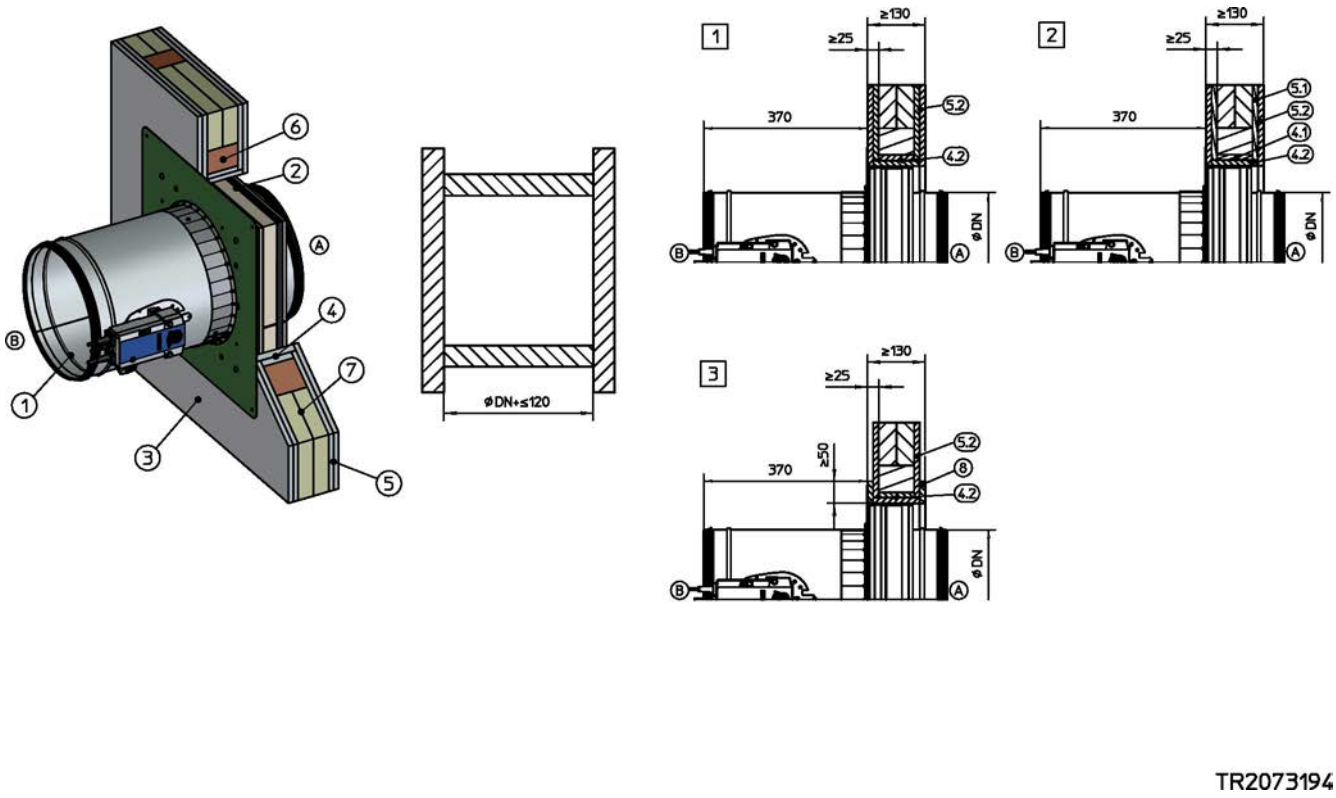
Requirements

- Performance class up to EI 90 S
- Lightweight partition walls with timber support structure and cladding on both sides, W ≥ 130 mm; half-timbered construction W ≥ 140 mm; other specifications *on page 39*.
- ≥ 40 mm distance to load-bearing structural elements
- ≥ 200 mm distance between two fire dampers (separate installation opening) Distance between two fire dampers if installed "flange to flange" 40...120 mm or 80...120 mm in flange construction (one installation opening).
- Only installation of two equally sized FKR-EU units into one installation opening (deviations upon request)
- Duct connection with flexible connector (recommended)

1. Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening *on page 39*.
2. Push the fire damper into the installation opening and secure it. When doing this, the spacing dimension *[z]* must be observed, see Fig. 30 to Fig. 32.

   Extend the fire damper with an extension piece or a spiral duct on the installation side.
3. Close off the perimeter gap »s« with mortar.

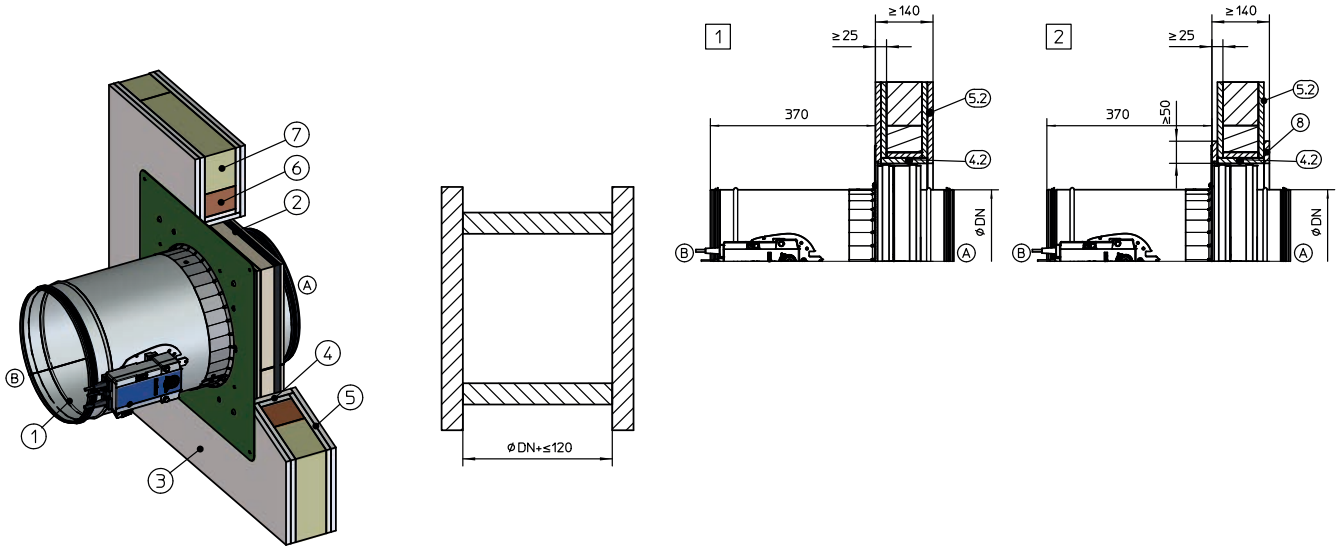
5.7.2 Dry mortarless installation with square installation kit TQ



TR2073194

Fig. 33: Dry mortarless installation into a lightweight partition wall with timber support structure and square installation kit TQ

1 FKR-EU
2 Installation kit TQ (factory assembled)
3 Timber stud wall
4 Trim panels
4.1 Trim panels, wood sheet, at least 600 kg/m³
4.2 Trim panels (fire-resistant)
5 Wall cladding
5.1 Wall cladding, wood sheet, at least 600 kg/m³
5.2 Wall cladding (fire-resistant)
6 Horizontal timber section / stud, at least 60 x 80 mm
7 Mineral wool depending on wall construction
8 Reinforcing board
[1] Up to EI 90 S
[2] EI 30 S (timber panel constructions and timber frames)
[3] EI 30 S
Ⓐ Installation side
Ⓑ Operating side



TR2079854

Fig. 34: Dry mortarless installation into a lightweight partition wall with half-timbered construction and square installation kit TQ

1 FKR-EU
2 Installation kit TQ (factory assembled)
3 Half-timbered wall
4.2 Trim panels
5.2 Wall cladding
6 Half-timbered construction
7 Infilling*
8 Reinforcing board
* Cavities completely filled with mineral wool ≥ 50 kg/m³, bricks, aerated concrete, lightweight concrete, reinforced concrete or clay
1 Up to EI 90 S
2 EI 30 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Requirements

- Performance class up to EI 90 S
- Lightweight partition walls with timber support structure and cladding on both sides, W ≥ 130 mm; half-timbered construction W ≥ 140 mm; other specifications *on page 39*.
- Distance from the fire damper to load-bearing structural elements ≥ 75 mm (for design reasons ≥ 100 mm)
- ≥ 200 mm distance between two fire dampers
- Duct connection with flexible connector (recommended)

1. Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening *on page 39*.
2. Position the fire damper with the square installation kit in the centre of the installation opening and push it in up to the cover plate.
3. Fix the cover plate with dry wall screws (∅ ≥ 4.2 mm) to the timber support structure all round; nominal size NW up to 400 mm: 4 screws; nominal size NW from 450 mm: 12 screws.

5.8 Fire walls

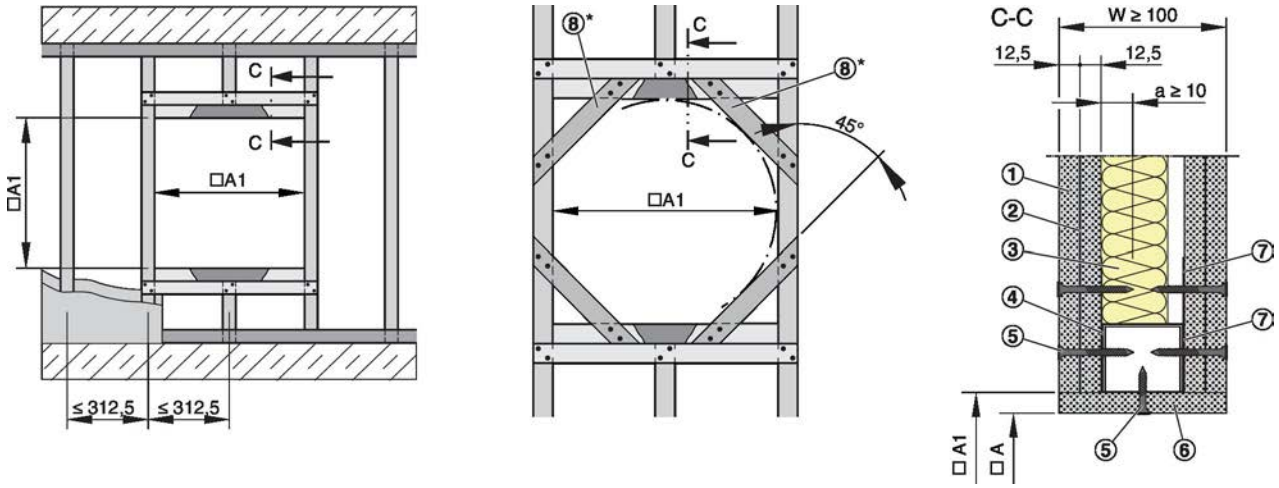


Fig. 35: Fire wall

1	Double layer cladding, on both sides of the metal stud system	7	UW section
2	Sheet steel insert	8	UW section, for nominal sizes ∅DN 450 - 800
3	Mineral wool (depending on wall construction)	□A	Installation opening ↳ *Table on page 46*
4	UA section	□A1	Opening in the metal support structure (without trim panels: □A =□A1) ↳ *Table on page 46*
5	Dry wall screw	*	Closed end must face installation opening
6	Optional trim panels		

Requirements

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

Erecting a wall and creating an installation opening

- Erect the lightweight partition wall according to the manufacturer's instructions.
- Create an installation opening, see Fig. 35:
- – Provide the installation opening in the metal support structure with support sections.
  – In case of mortar-based installation of fire dampers from nominal size ∅450, install four additional sections ⑧ at an angle of 45° in order to reinforce the metal support structure.

Installation opening □A [mm]									
Installation type	**Nominal size ∅DN**								
	315	**355**	**400**	**450**	**500**	**560**	**630**	**710**	**800**
Mortar-based installation [1]	□A = ∅DN + max. 120 mm □A1 = □A + (2 × trim panel)								
Dry mortarless installation with installation kit TQ[1, 2]	435	475	520	570	620	680	750	830	920

[1)] Optional trim panels

[2)] Installation opening tolerance + 2 mm

Metal stud system

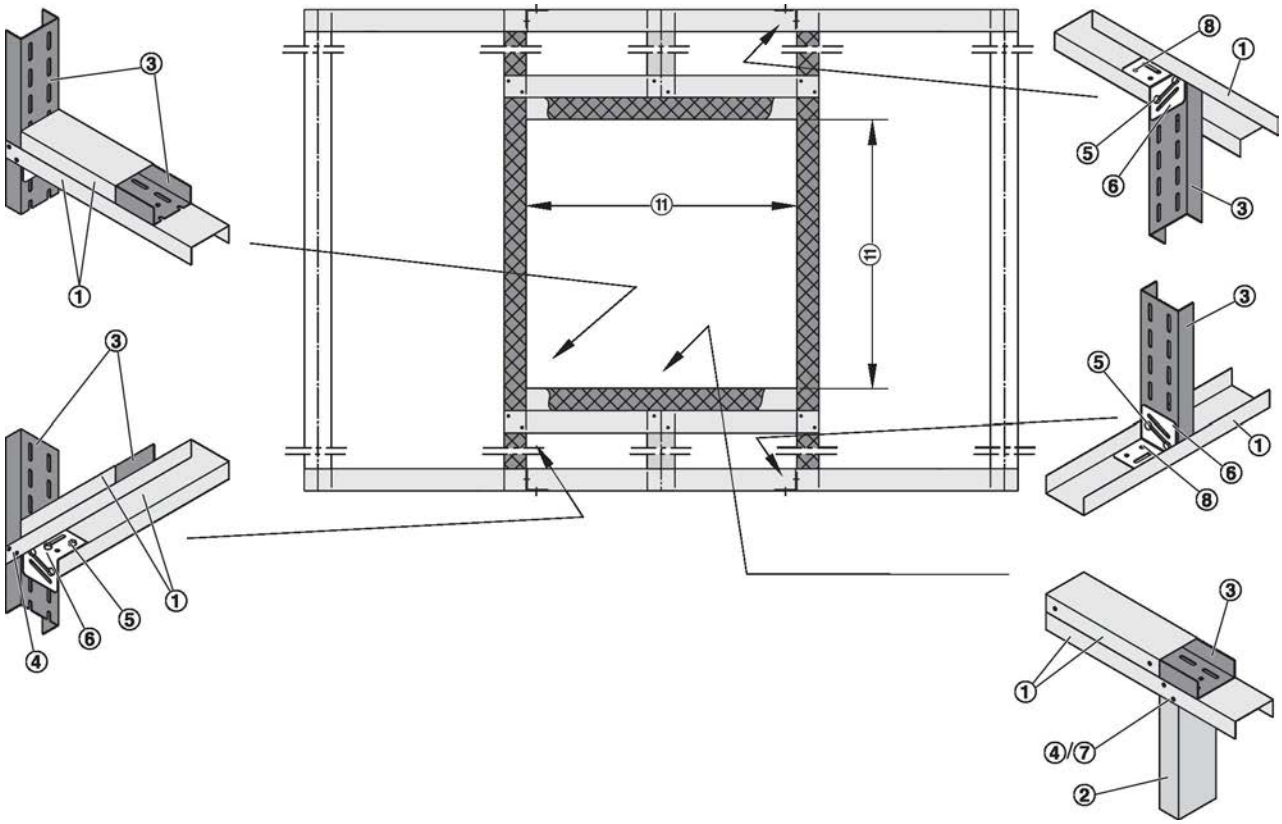


Fig. 36: Single stud system

1 UW section
2 CW section
3 UA section
4 Dry wall screw TB
5 Carriage bolt, L ≤ 50 mm, with nut and washer
6 Bracket
7 Steel rivet Ø 4 mm
8 2 × screw, Ø 6 mm, with anchor or hammer-in fixing
9 Dry wall screw Ø 3.9 × 35 mm
10 UA connecting bracket; construction elements according to manufacturer's instructions
11 Installation opening depending on installation type
on page 46

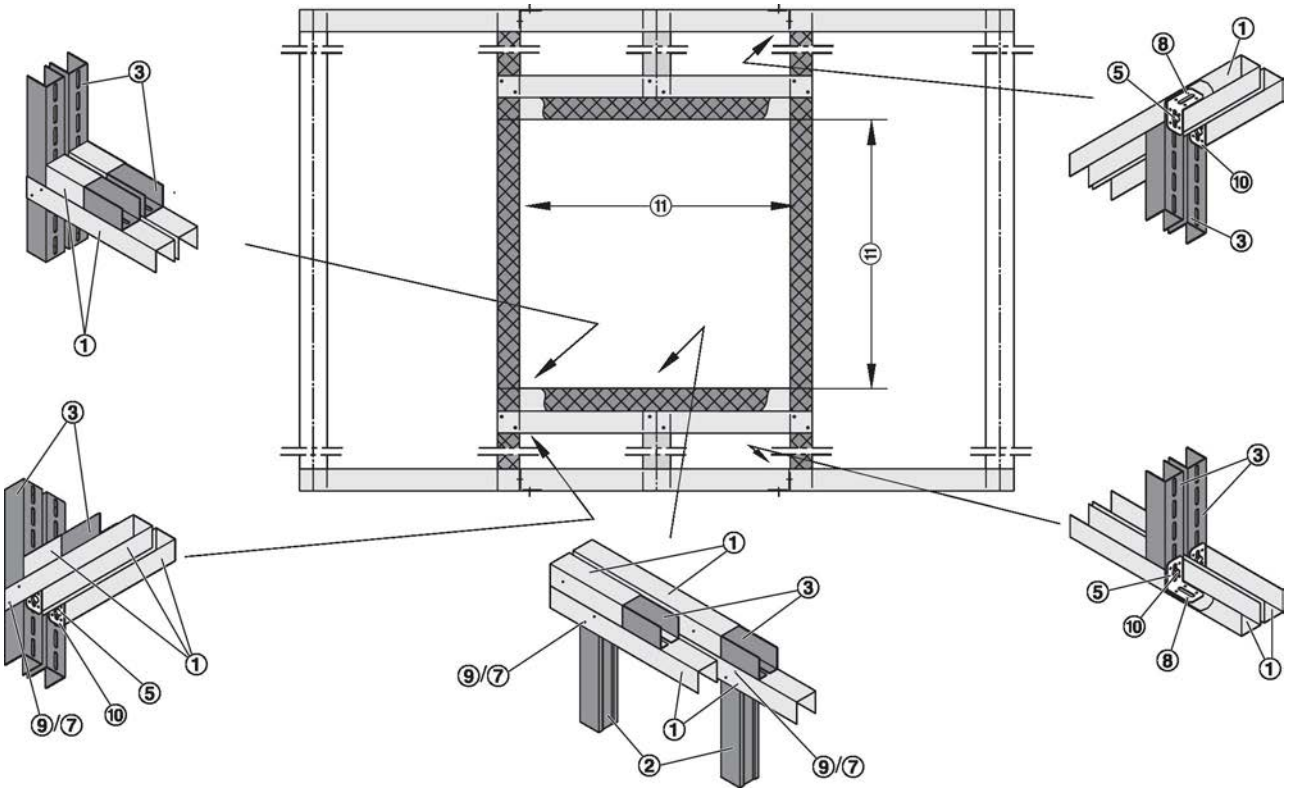


Fig. 37: Double stud system

1 UW section
2 CW section
3 UA section
4 Dry wall screw TB
5 Carriage bolt, L ≤ 50 mm, with nut and washer
6 Bracket
7 Steel rivet Ø 4 mm
8 2 × screw, Ø 6 mm, with anchor or hammer-in fixing
9 Dry wall screw Ø 3.9 × 35 mm
10 UA connecting bracket; construction elements according to manufacturer's instructions
11 Installation opening depending on installation type
on page 46

5.8.1 Mortar-based installation

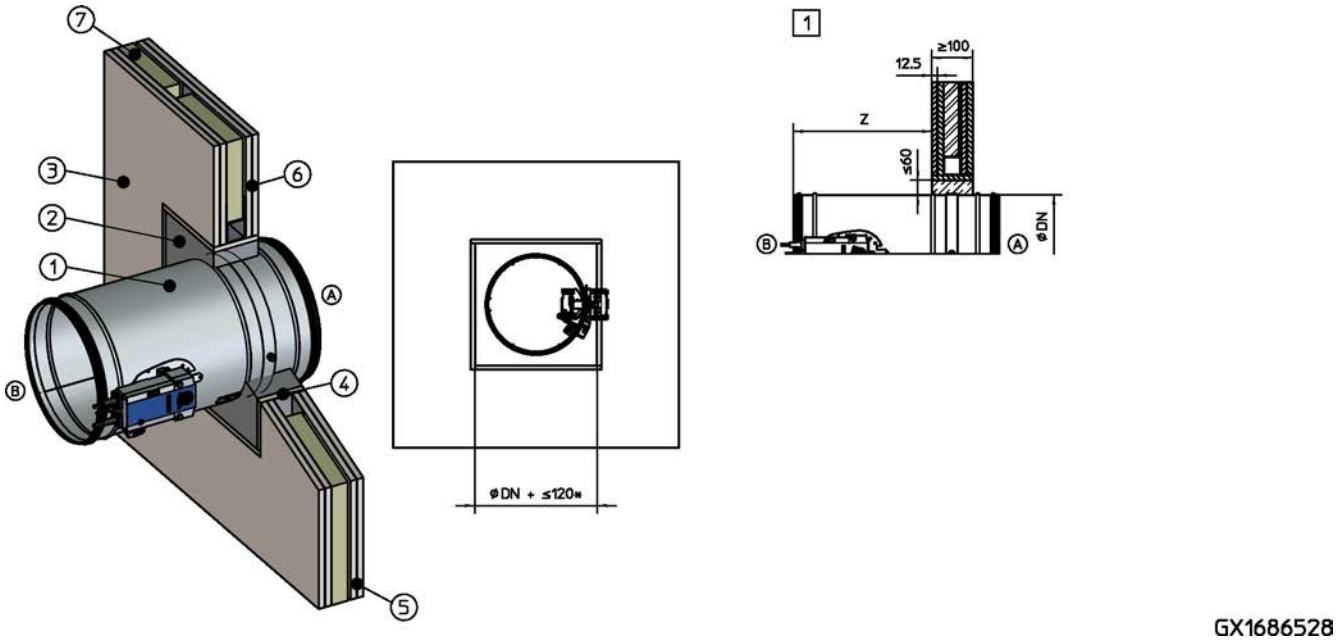


Fig. 38: Mortar-based installation in fire or safety partition wall

1 FKR-EU
2 Mortar
3 Fire or safety partition wall
4 Optional trim panels
5 Cladding
6 Sheet steel insert (depending on wall construction)
7 Mineral wool (depending on wall construction)
z Spigot construction 370 mm, flange construction 342 mm
* Can be increased to account for the thickness of the trim panels
1 Up to EI 90 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Materials:

- Mortar *'Mortars for mortar-based installation' on page 17*

Requirements

- Performance class up to EI 90 S
- Fire walls with metal support structure and cladding on both sides, W ≥ 100 mm; detailed specification *on page 46*.
- ≥ 40 mm distance to load-bearing structural elements
- ≥ 200 mm distance between two fire dampers (separate installation opening) Distance between two fire dampers if installed "flange to flange" 40...120 mm or 80...120 mm in flange construction (one installation opening). "Flange to flange" installation is possible only for fire dampers of the same size.
- Duct connection with flexible connector (recommended)

1. Erect the fire wall according to the manufacturer's instructions and create an installation opening *on page 46*.
2. Push the fire damper into the installation opening and secure it. When doing this, the spacing dimension *[z]* must be observed, see Fig. 38.

   If the wall thickness is > 115 mm, extend the fire damper on the installation side with an extension piece or a spiral duct (attachment or provided by others).
3. Close off the perimeter gap »s« with mortar.

5.8.2 Dry mortarless installation with square installation kit TQ

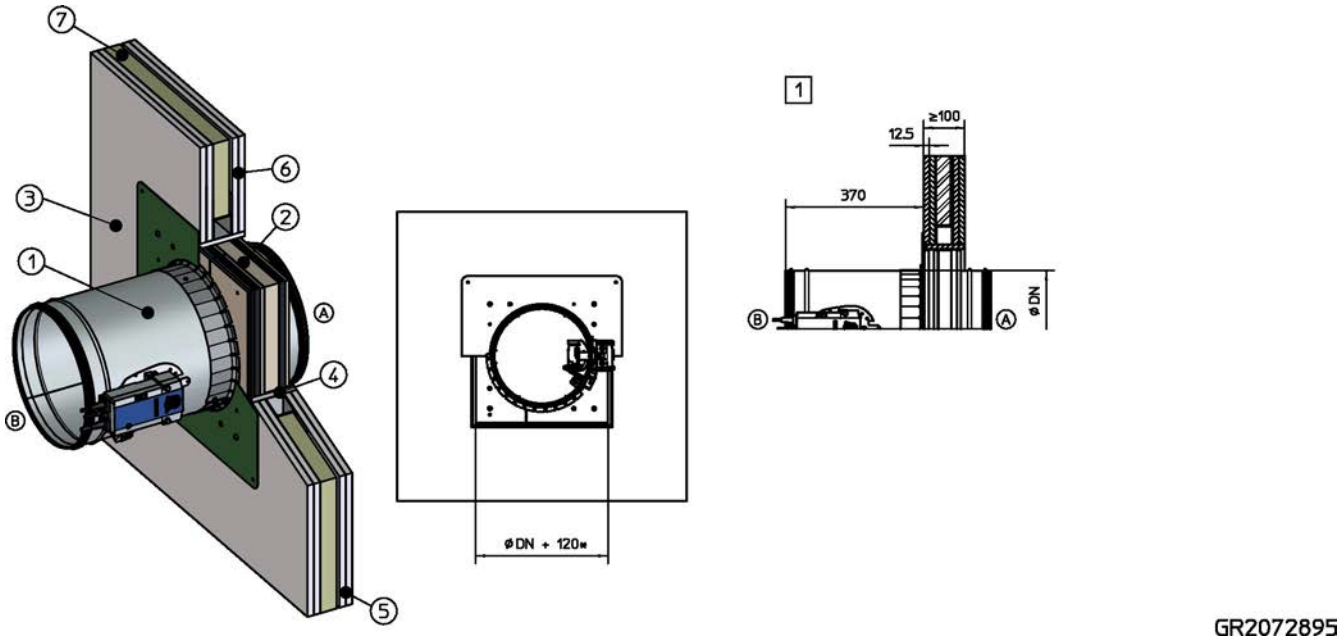


Fig. 39: Dry mortarless installation in fire or safety partition wall with square installation kit TQ

1	FKR-EU	7	Mineral wool depending on wall construction
2	Installation kit TQ (factory assembled)	*	Can be increased to account for the thickness of the trim panels
3	Fire or safety partition wall		
4	Optional trim panels	1	Up to EI 90 S
5	Cladding	Ⓐ	Installation side
6	Sheet steel insert depending on wall manufacturer	Ⓑ	Operating side

Personnel:

- Specialist personnel

Requirements

- Performance class up to EI 90 S
- Fire walls with metal support structure and cladding on both sides, W ≥ 100 mm; detailed specification ↳ *on page 46*.
- Distance from fire damper to load-bearing structural elements ≥ 75 mm (due to design 100 mm all-round)
- ≥ 200 mm distance between two fire dampers
- Duct connection with flexible connector (recommended)

1. Erect the fire wall according to the manufacturer's instructions and create an installation opening ↳ *on page 46*.
2. Position the fire damper with the square installation kit in the centre of the installation opening and push it in up to the cover plate.

   If the wall thickness is >115 mm, extend the fire damper on the installation side with an extension piece or a spiral duct.
3. Fix the cover plate with dry wall screws (∅ ≥ 4.2 mm, a ≥ 10 mm) to the metal support structure; nominal size NW up to 400 mm: 4 screws; nominal size NW from 450 mm: 12 screws.

5.9 Shaft walls with metal support structure

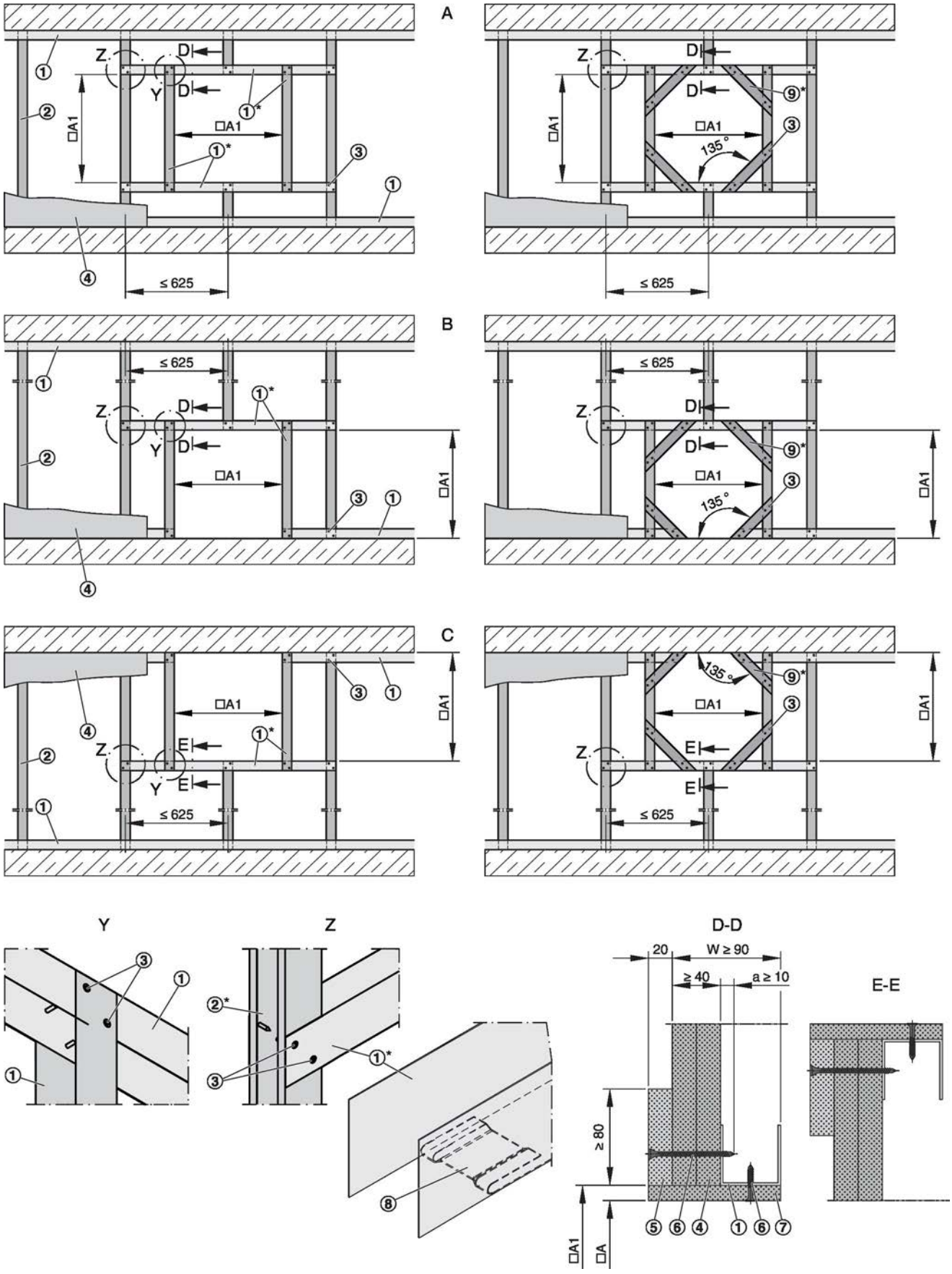


Fig. 40: Shaft walls with metal support structure and cladding on one side

A	Shaft wall	6	Dry wall screw
B	Shaft wall, installation near the floor	7	Optional trim panels
C	Shaft wall, installation near the ceiling	8	Fold the tab inward or cut it off
1	UW section	9	UW section, nominal sizes ∅DN 450 - 800
2	CW section	□A	Installation opening ↳ *Table on page 52*
3	Screw or steel rivet	□A1	Opening in the metal support structure (without trim panels: □A =□A1) ↳ *Table on page 52*
4	Double layer cladding, on one side of the metal stud system	*	Closed end must face installation opening
5	Reinforcing board		

Requirements

- Shaft walls with metal support structure or steel substructure and cladding on one side, with European classification according to EN 13501-2 or equivalent national classification
- Cladding on one side made of gypsum bonded or cement bonded panel materials, of fibre-reinforced gypsum or of fire-rated calcium silicate boards, wall thickness W ≥ 90 mm
- Additional reinforcing board near the fire damper, 20 mm thick
- ≤ 625 mm distance between metal studs
- Wall construction according to the manufacturer's instructions
- Duct connection with flexible connector (recommended)

Erecting a wall and creating an installation opening

- Erect the shaft wall according to the manufacturer's instructions and create an installation opening, see Fig. 40
  - Provide the installation opening in the metal support structure with support sections.
  - In case of mortar-based installation of fire dampers from nominal size ∅DN 450, install four additional sections ⑨ at an angle of 45° in order to reinforce the metal support structure.

Installation opening □A [mm]									
Installation type	**Nominal size ∅DN**								
	315	**355**	**400**	**450**	**500**	**560**	**630**	**710**	**800**
Mortar-based installation [1]	□A = ∅DN + max. 120 mm □A1 = □A + (2 × trim panel)								

[1)] Optional trim panels

5.9.1 Mortar-based installation

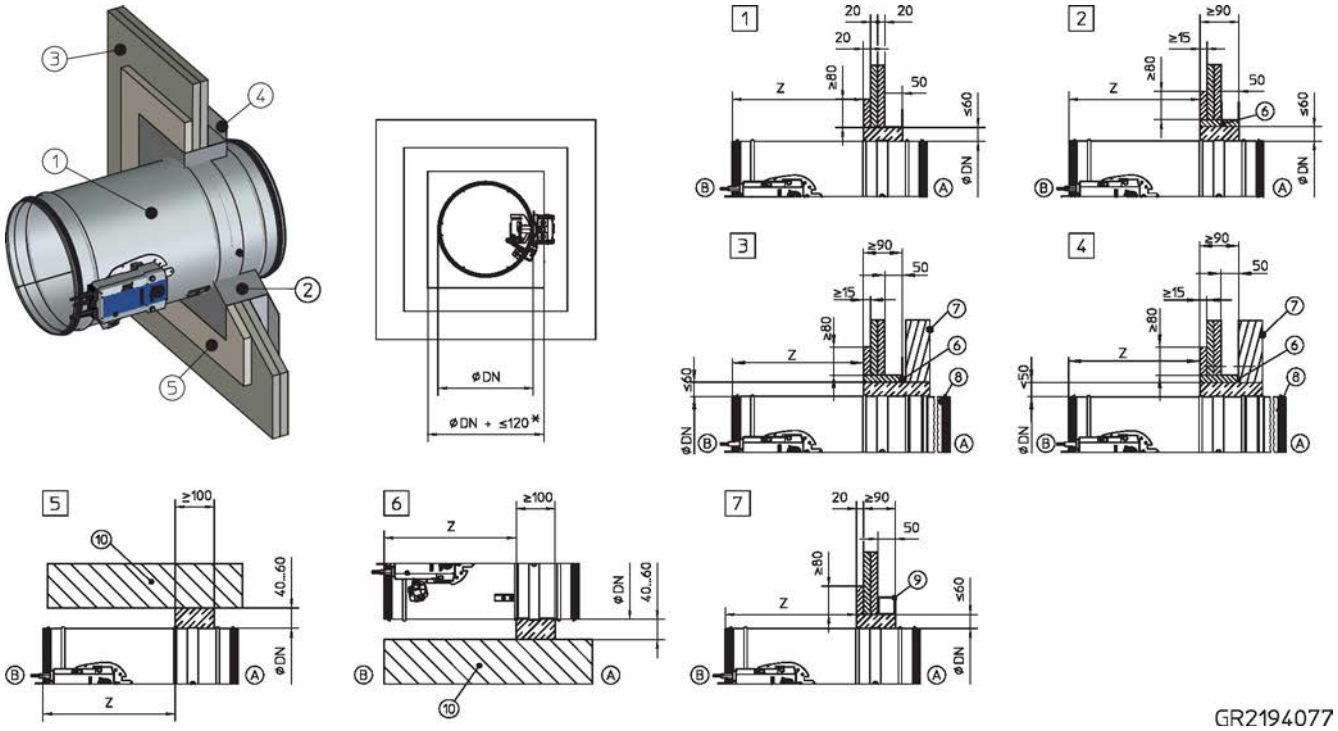


Fig. 41: Mortar-based installation into shaft wall with metal support structure

1	FKR-EU	10	Solid ceiling slab / solid floor
2	Mortar	z	Spigot construction 370 mm, flange construction 342 mm
3	Shaft wall with metal support structure	*	Can be increased to account for the thickness of the trim panels
4	Metal section	1	Up to EI 90 S
5	Reinforcing board	2 – 4	EI 30 S
6	Optional trim panels	5 – 7	Up to EI 90 S
7	Wall without adequate fire resistance rating	Ⓐ	Installation side
8	Extension piece	Ⓑ	Operating side
9	Steel support structure		

Personnel:

- Specialist personnel

Materials:

- Mortar *'Mortars for mortar-based installation' on page 17*

Requirements

- Performance class up to EI 90 S
- Shaft walls with metal support structure or steel substructure and cladding on one side, with European classification according to EN 13501-2 or equivalent national classification *on page 51*
- ≥ 40 mm distance to load-bearing structural elements. In additional safety boards 3 and 4 the distance from load-bearing structural elements is ≥ 75 mm.
- ≥ 200 mm distance between two fire dampers
- Duct connection with flexible connector (recommended)

1. Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening with a reinforcing board *on page 51*
2. Push the fire damper into the installation opening and secure it. When doing this, the spacing dimension *[z]* must be observed, see Fig. 41.
3. Close off the perimeter gap »s« with mortar.
4. If the wall thickness is > 115 mm, extend the fire damper on the installation side with an extension piece or a spiral duct (attachment or provided by others).

5.10 Shaft walls without metal support structure

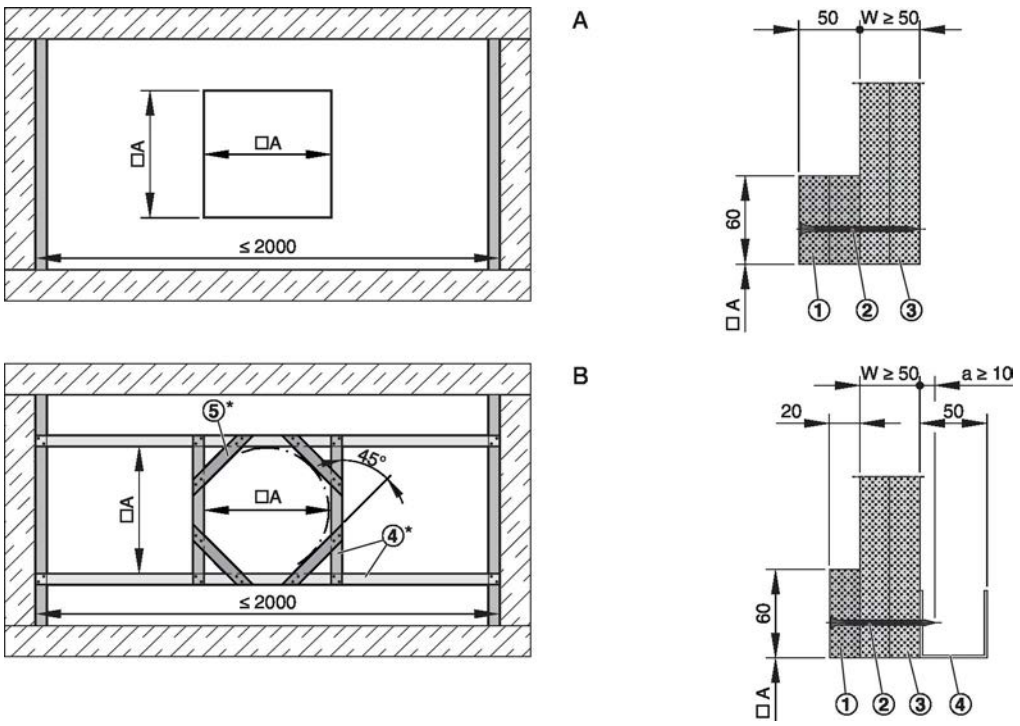


Fig. 42: Shaft wall <u>without</u> metal support structure and cladding on one side

A	Wall construction for nominal sizes ∅315 – 400 mm	4	UW section
B	Wall construction for nominal sizes ∅450 – 800 mm	5	UW section, for nominal sizes ∅DN 450 - 800
1	Reinforcing board	□A	Installation opening ↳ *Table on page 55*
2	Dry wall screw	*	Closed end must face installation opening
3	Double layer cladding, on one side of the metal stud system		

Requirements

- Shaft walls <u>without</u> metal support structure and cladding on one side, with European classification according to EN 13501-2 or equivalent national classification
- Cladding on one side made of gypsum bonded or cement bonded panel materials, of fibre-reinforced gypsum or of fire-rated calcium silicate boards, wall thickness W ≥ 50 mm
- Additional reinforcing board near the fire damper, at least 20 mm or 50 mm thick (depending on the nominal size of the fire damper)
- Wall construction according to the manufacturer's instructions
- Wall width ≤ 2,000 mm
- Duct connection with flexible connector (recommended)

Erecting a wall and creating an installation opening

- Erect the shaft wall according to the manufacturer's instructions and create an installation opening with reinforcing strips, see Fig. 42
- – Option A: Create an opening in the cladding and reinforce it along the perimeter.
  – Option B: Provide the installation opening in the metal support structure with support sections. Install four additional sections at an angle of 45° in order to reinforce the metal support structure.
  Fix the cladding and reinforce the installation opening along the perimeter.

Installation opening □ A [mm]									
Installation type	**Nominal size ∅DN**								
	315	**355**	**400**	**450**	**500**	**560**	**630**	**710**	**800**
Mortar-based installation	□A = ∅DN + max. 120 mm								

5.10.1 Mortar-based installation

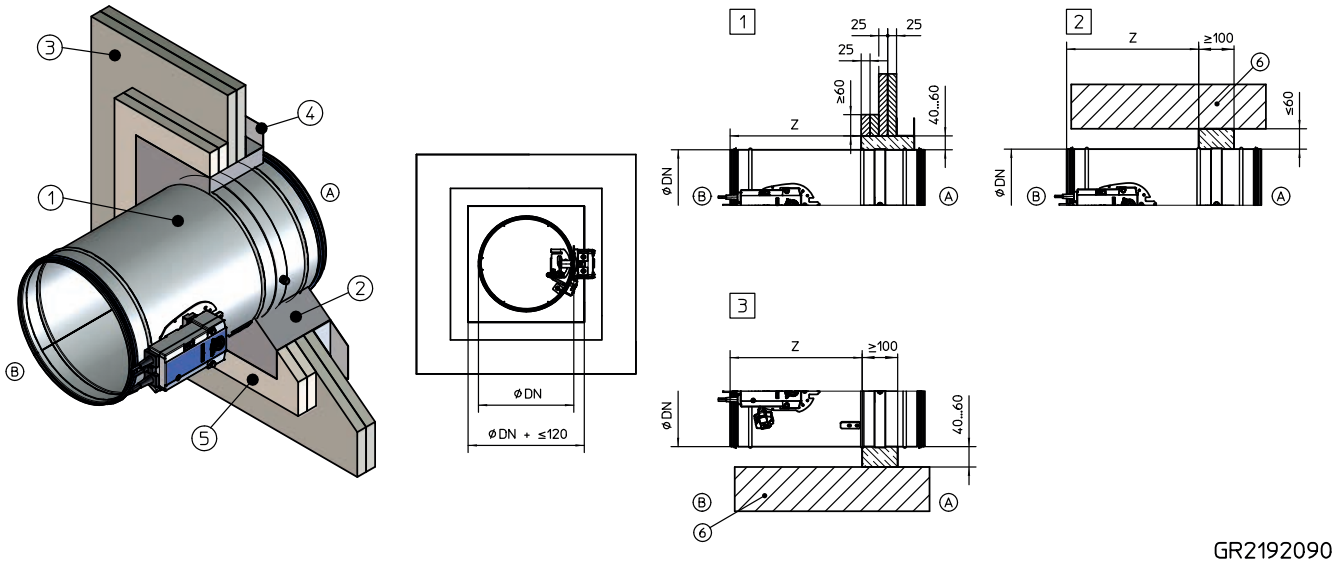


Fig. 43: Mortar-based installation into shaft wall without metal support structure

1 FKR-EU
2 Mortar
3 Shaft wall
4 Reinforcing section from DN 450 mm
5 Reinforcing board
up to ∅ DN 400 mm 2 × 25 mm GFRP,
from ∅DN 450 mm 1 × 20 mm GFRP
6 Solid ceiling slab / solid floor
z Spigot construction 370 mm,
flange construction 342 mm
1 – 3 Up to EI 90 S
Ⓐ Installation side
Ⓑ Operating side

Personnel:

- Specialist personnel

Materials:

- Mortar *'Mortars for mortar-based installation' on page 17*

Requirements

- Performance class up to EI 90 S
- Shaft walls without metal support structure but with cladding on one side, with European classification according to EN 13501-2 or equivalent national classification *on page 54*
- ≥ 40 mm distance to load-bearing structural elements
- ≥ 200 mm distance between two fire dampers
- Duct connection with flexible connector (recommended)

1. Erect the lightweight partition wall according to the manufacturer's instructions and create an installation opening with a reinforcing board *on page 54*
2. Push the fire damper into the installation opening and secure it. When doing this, the spacing dimension *[z]* must be observed, see Fig. 43.
3. Close off the perimeter gap »s« with mortar.

6 Connecting the ductwork

6.1 Ducts

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

6.2 Removing the transport/installation protection

The fire dampers are shipped with a transport/installation protection. In case of mortar-based installation this protection must not be removed until the mortar has hardened. To remove the transport/installation protection, pull it out of the fire damper on the operating side.

6.3 Limiting duct expansion

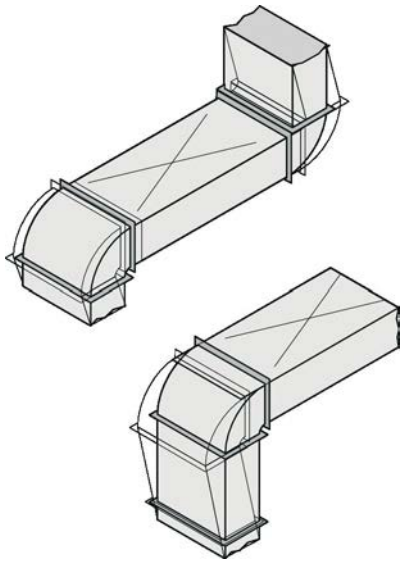


Fig. 44: Limiting loads

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

The expansion of ducts in the event of a fire can be compensated by brackets and turns, Fig. 44.

Note

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

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

- in lightweight partition walls
- in lightweight shaft walls

6.4 Fire damper accessories

Extension pieces

When there are cover grilles, flexible connectors, circular duct bends, etc., you may have to use an extension piece for certain nominal sizes. See tables for the required lengths.

Arrangement of extension pieces when a cover grille is used

Extension piece [mm]				
Nominal size	Operating side		Installation side	
	FKR-EU with spigot	FKR-EU with flange	FKR-EU with spigot	FKR-EU with flange
315	175	–	175	175
355	175	–	175	175
400	175	–	175	175
450	175	–	370	175
500	175	–	370	370
560	175	–	370	370
630	175	–	370	370
710	175	–	370	370
800	175	175	370	370

Position of extension piece when flexible connectors are used

Extension piece [mm]				
Nominal size	Operating side		Installation side	
	FKR-EU with spigot	FKR-EU with flange	FKR-EU with spigot	FKR-EU with flange
315	–	–	175	175
355	–	–	175	175
400	–	–	175	175
450	–	–	370	175
500	–	–	370	370
560	–	–	370	370
630	–	–	370	370
710	–	175	370	370
800	175	175	370	370

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.

Cover grille

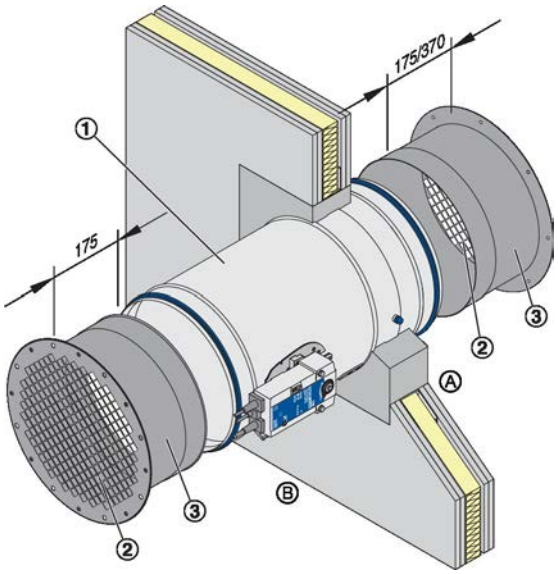


Fig. 45: FKR-EU with cover grille

1 FKR-EU
2 Cover grille, optionally on installation or operating side
3 Extension piece
Ⓐ Installation side
Ⓑ Operating side

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

Flexible connectors

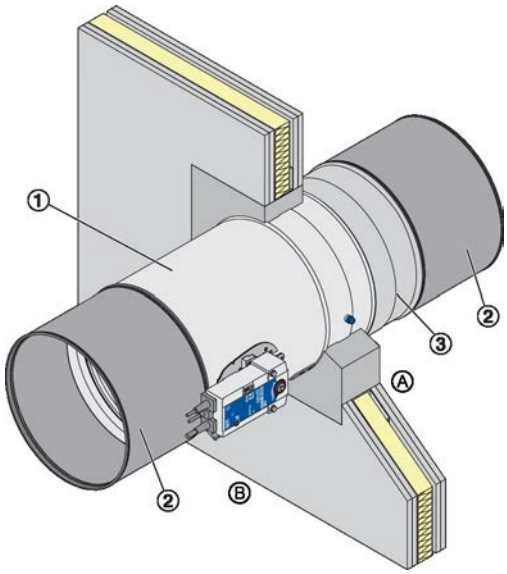


Fig. 46: FKR-EU with flexible connectors

1 FKR-EU
2 Flexible connector
3 Extension piece
Ⓐ Installation side
Ⓑ Operating side

The flexible connectors should be installed in such a way that they can compensate both tension and compression. Flexible ducts can be used as an alternative. If flexible connectors are used, equipotential bonding must be ensured. ↳ *Chapter 7.3 'Equipotential bonding' on page 59*

6.5 Inspection access

Type FKR-EU fire dampers do not have an inspection access. The interior of the fire damper should remain accessible for internal visual inspection and cleaning. Depending on the installation configuration it may be necessary to provide inspection panels in the connecting ducts.

7 Making electrical connections

General safety notes

DANGER!

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

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

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

Personnel:

- Skilled qualified electrician

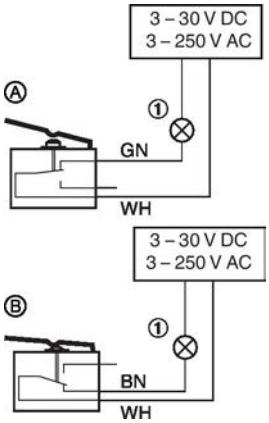


Fig. 47: Wiring of limit switches, example

1 Indicator light or relay, to be provided by others

- The limit switches must be connected according to the wiring example Fig. 47
- Indicator lights or relays may be connected as long as the performance specifications are taken into consideration.
- Connection boxes must be fixed to the adjoining structure (wall or ceiling slab). They must not be fixed to the fire damper.

Type of connection	Limit switch	Damper blade	Electric circuit
Ⓐ NC contact	not actuated	CLOSED or OPEN position is not reached	closed
Ⓑ NO contact	actuated	CLOSED or OPEN position is reached	closed

Note: For the wiring of explosion-proof limit switches, see the "Supplementary operating manual FKR-EU-Ex"

7.2 Connecting the spring return actuator

Personnel:

- Skilled qualified electrician

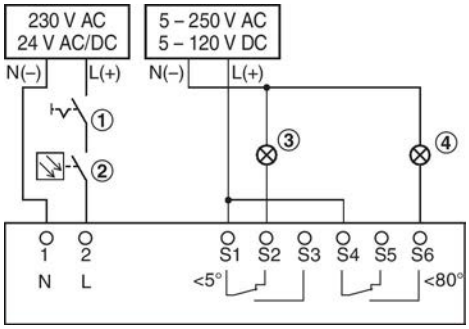


Fig. 48: Actuator connection, example

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

- The fire damper may be equipped with a spring return actuator for a supply voltage of 230 V AC or 24 V AC/DC. See the performance data on the rating plate *on page 11*.
- 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 the wiring of explosion-proof drives, see the "Supplementary operating manual FKR-EU-Ex"

Actuators with 24 V AC/DC

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

7.3 Equipotential bonding

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

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

8 Functional test

General

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

8.1 Fire damper with fusible link

Closing the damper blade

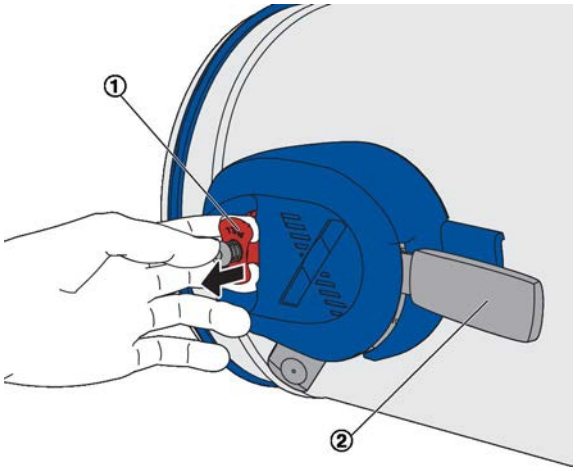


Fig. 49: Closing the damper blade

⚠ CAUTION!

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

Requirement

- The damper blade is OPEN

1. ▸ Grasp the release mechanism ① as shown with the thumb and middle fingers.
2. ▸ Pull the release mechanism towards you with both fingers.

   ⇨ The damper blade closes and the handle ② locks into the CLOSED position.

Opening the damper blade

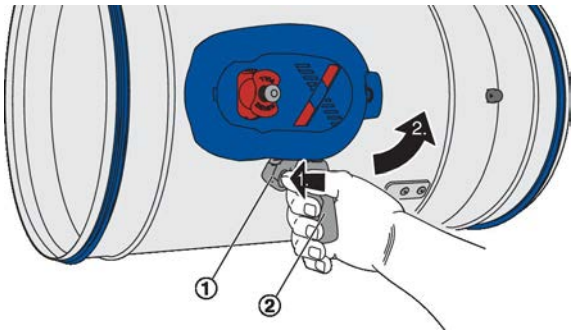


Fig. 50: Opening the damper blade

Requirement

- The damper blade is CLOSED

1. ▸ With your right hand grasp the handle ② as shown and press down the release tab ① with your thumb. Pull the handle towards you and hold it.
2. ▸ Then turn the handle anti-clockwise to the travel stop.

   ⇨ The handle locks into the OPEN position.

Damper blade position indicator

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

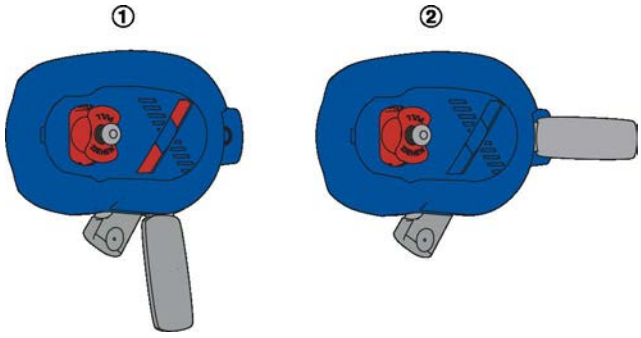


Fig. 51: Damper blade position indicator

1 Damper blade is closed
2 Damper blade is open

8.2 Fire damper with spring return actuator

8.2.1 Spring return actuator BFN...

Status indicator

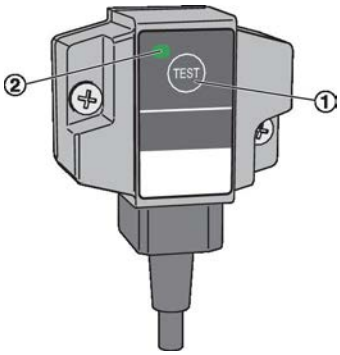


Fig. 52: Thermoelectric release mechanism BAT

1 Toggle switch for functional test
2 LED

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

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

Damper blade position indicator

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

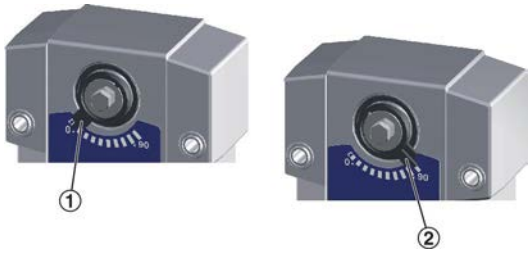


Fig. 53: Damper blade position indicator

1 Damper blade is closed
2 Damper blade is open

Closing/opening the damper blade with spring return actuator

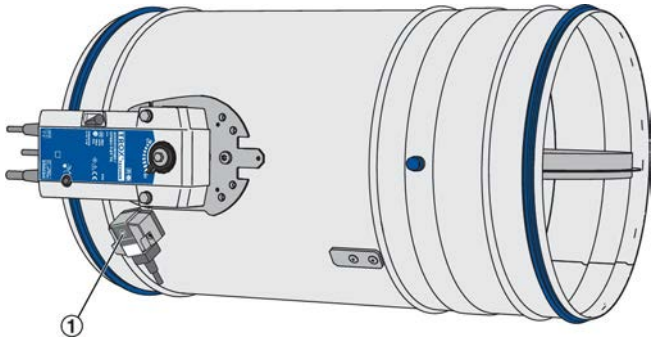


Fig. 54: Functional test

⚠ CAUTION!

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

Requirement

- Power is being supplied

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

Opening the damper blade using the crank handle

Fig. 55: Functional test (without power supply)

DANGER!

Danger due to malfunction of the fire damper.

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

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

Requirement

- The damper blade is CLOSED

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

Closing the damper blade

Fig. 56: Functional test (without power supply)

CAUTION!

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

Requirement

- The damper blade is OPEN

▸ Set the interlock ③ to 🔓
⇨ The damper blade is released and closes.

8.2.2 Spring return actuator BF...

Status indicator

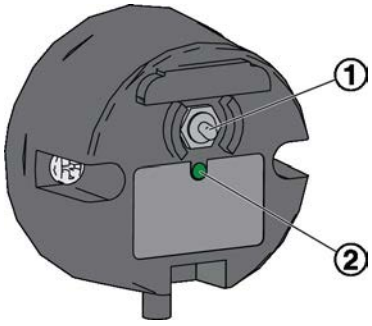


Fig. 57: Thermoelectric release mechanism BAE

1 Toggle switch for functional test
2 LED

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

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

Damper blade position indicator

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

Fig. 58: Damper blade position indicator

1 Damper blade is closed
2 Damper blade is open

Closing/opening the damper blade with spring return actuator

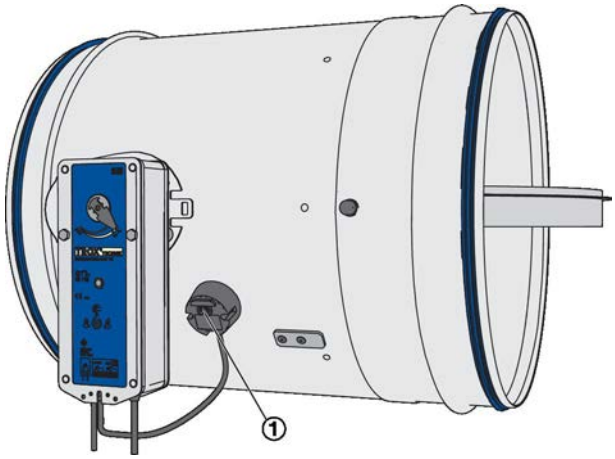


Fig. 59: Functional test

⚠ CAUTION!

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

Requirement

- Power is being supplied

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

Opening the damper blade using the crank handle

Fig. 60: 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. (The crank handle is clip-fixed to the connecting cable.)
2. Turn the crank handle into the direction of the arrow ② to just short of the travel stop.
3. Then quickly rotate the crank handle by approx. 90° towards the 'lock' position.

   ⇨ The damper blade remains in the OPEN position.
4. Remove the crank handle.

Closing the damper blade using the crank handle

Fig. 61: 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

1. Insert the crank handle ① into the opening for the spring-winding mechanism. (The crank handle is clip-fixed to the connecting cable.)
2. Rotate the crank handle by approx. 90° towards the 'unlock' position until a click can be heard.

   ⇨ The damper blade is released and closes.
3. Remove the crank handle.

8.3 Functional test with automatic control unit

Functional test with automatic control unit

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

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

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

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

9 Commissioning

Before commissioning

Before commissioning, each fire damper must be inspected to determine and assess its actual condition. The inspection measures to be taken are listed in the table on *on page 70*.

Operation

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

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

CLOSED fire dampers

Fire dampers which close while the ventilation and air conditioning system is running must be inspected before they are opened again in order to ensure their correct function 'Inspection' on page 67.

10 Maintenance

10.1 General

General safety notes

DANGER!

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

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

CAUTION!

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

Make sure that the damper blade cannot be released inadvertently.

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

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

Functional test

The functional reliability of the fire damper must be tested at least every six months; this has to be arranged by the owner or operator. If two consecutive tests, one 6 months after the other, are successful, the next test can be conducted one year later.

The functional test must be carried out in compliance with the basic maintenance principles of the following standards:

- EN 13306
- DIN 31051
- EN 15423

The function of fire dampers with a spring return actuator can also be tested with an automatic control unit ↳ *'Functional test with automatic control unit' on page 65*.

Maintenance

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

Cleaning

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

Inspection

The fire damper must be inspected before commissioning. After commissioning, the function has to be tested in regular intervals. Local requirements and building regulations must be complied with. The inspection measures to be taken are listed under ↳ *on page 70*. 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 ↳ *60* is required after any repair work.

10.2 Lubricating points

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

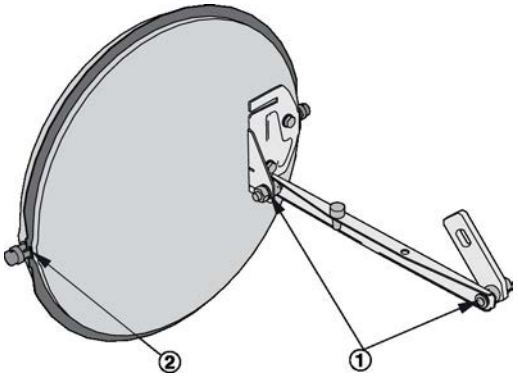


Fig. 62: Lubricating points

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

10.3 Replacing the fusible link

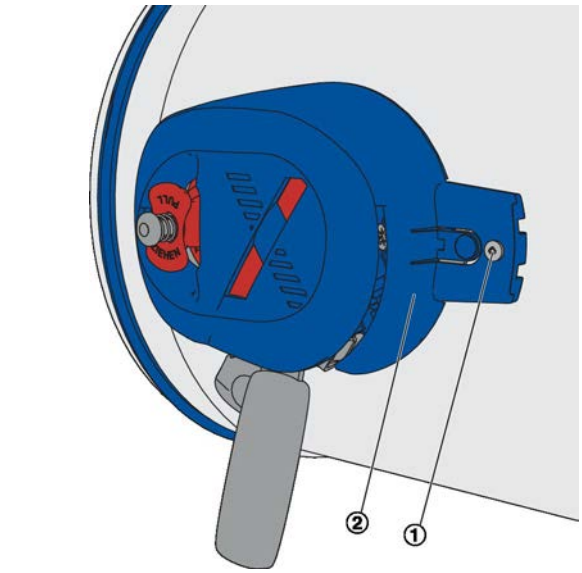


Fig. 63: Removing the cover

1. ▸ Close the damper blade.
2. ▸ Loosen the screw ① of the cover ②.

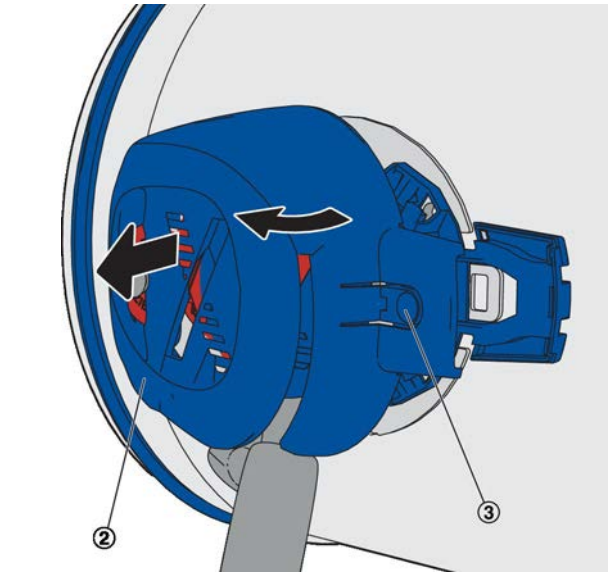


Fig. 64: Removing the cover

3. ▸ Press the button ③ on the cover ② and turn the cover into the direction of the arrow. Remove the cover by pulling it towards you.

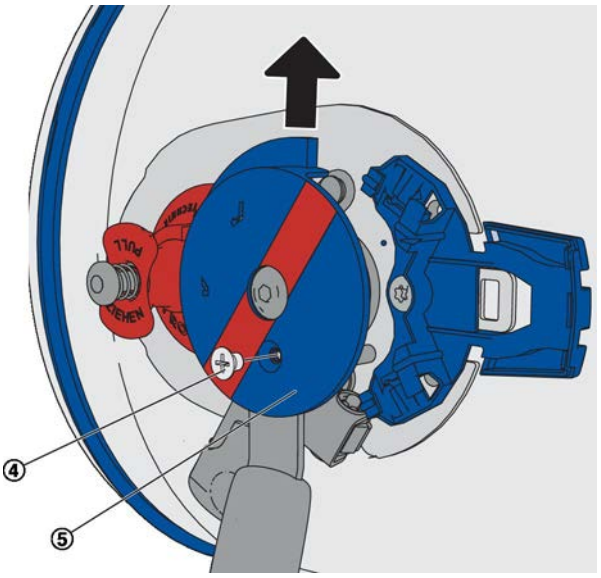


Fig. 65: Removing the indicator disc

4. ▸ Loosen the screw ④ and pull off the indicator disc ⑤ from above

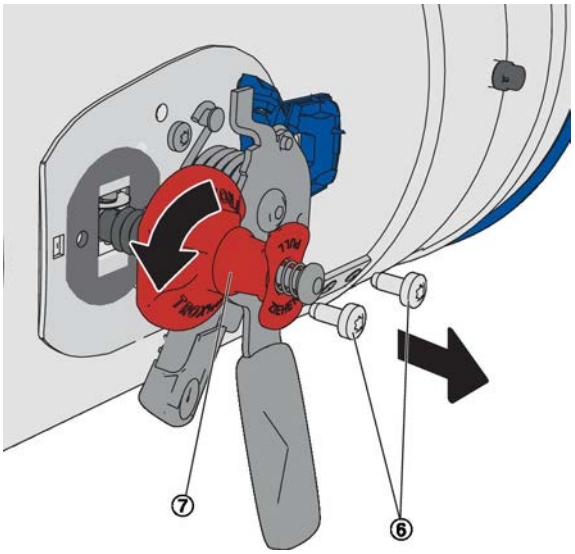


Fig. 66: Demounting the release mechanism

5. Loosen and remove the screws ⑥ of the release mechanism ⑦; pull the release mechanism towards you while at the same time turning it by 90°.

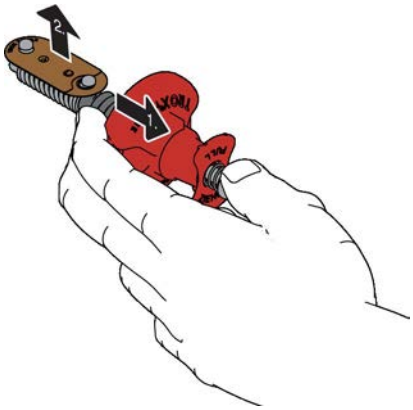


Fig. 67: Replacing the fusible link

6. Grasp the release mechanism as shown. Move your middle fingers into the direction of the arrow.
7. Remove the used fusible link.
8. Insert the new fusible link.
9. Push the release mechanism back into the fire damper and fix it with the screws ⑥.

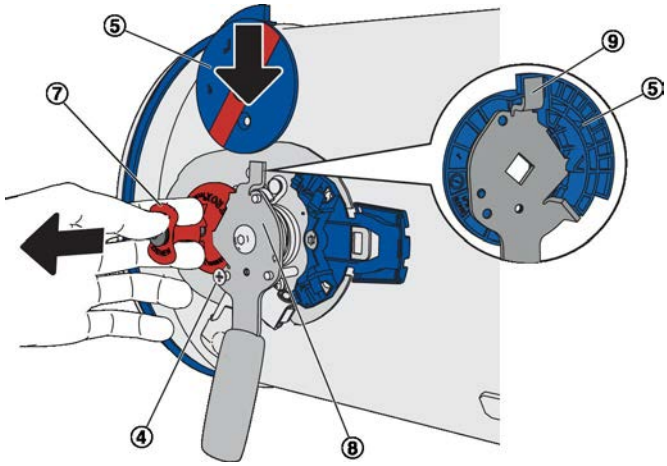


Fig. 68: Mounting the indicator disc

10. Pull the release mechanism ⑦ towards you and hold it. Slide the indicator disc ⑤ from above onto the lever ⑧. Make sure that the indicator disc engages in the tab ⑨. Fix the indicator disc with the screw ④.

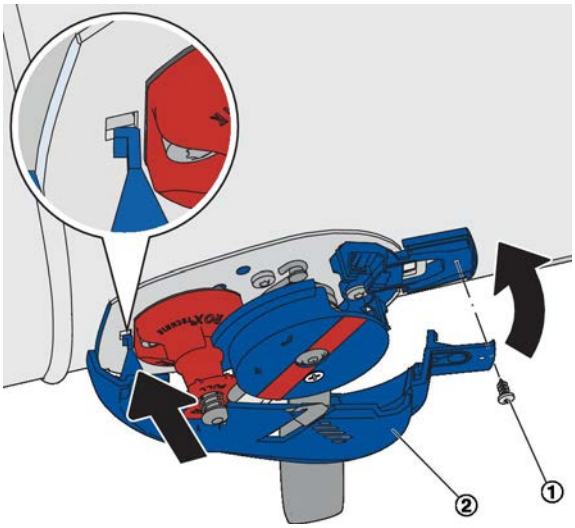


Fig. 69: Mounting the cover

11. Hook the cover ② into place and turn it into the direction of the arrow. The cover locks into place. Fix the cover with the screw ①.
12. Carry out functional test.

10.4 Maintenance

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 *16* – Install the fire damper correctly.	Specialist personnel
	Transport and installation protection, if any ■ Transport/installation protection removed – Remove transport/installation protection	Specialist personnel
	Connection of ductwork/cover grille/flexible connector *56* ■ 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 power supply	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) *60* ■ 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) *61* ■ 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 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 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, depending on the degree of contamination

Item to be checked

- Required condition
  - Remedial action if necessary

11 Decommissioning, removal and disposal

Final decommissioning

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

Removal

DANGER!

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

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

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

Disposal

For disposal, the fire damper must be disassembled.

ENVIRONMENT!

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

12 Index