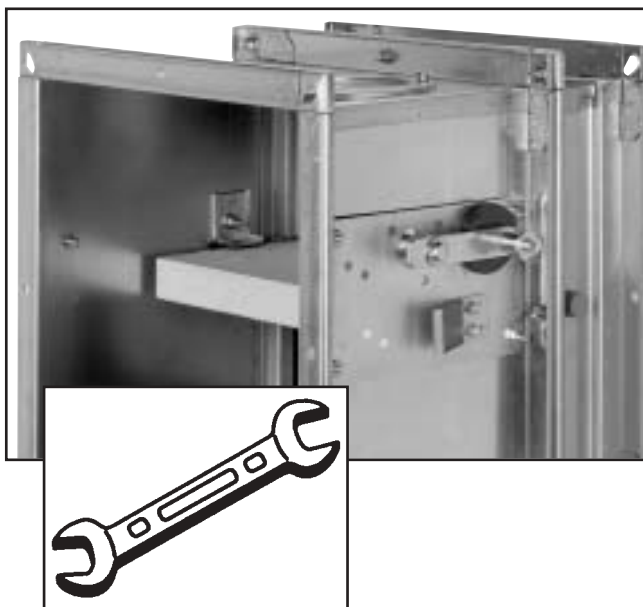


Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

M-4/2/EN/7



Assembly Instruction M-4/2/EN/7
 for the installation of fire dampers
 type FK-K90 with approval No. Z-41.3-321 and
 type FKN-K90 with approval No. Z-41.3-318

- in solid walls and ceilings
- in gypsum wall boards
- in lightweight partition walls with metal supports
- in lightweight partition walls without metal supports
- directly on to solid walls and ceilings
- outside of walls

Attention!

- Wall and ceiling version according to the standard resp. the manufacturer's information and the information of the General Building Approval
- Prior to installation
 - Check fire damper for transport damage
 - Check operativeness
 - Check approval No.
 - Observe assembly instruction
- Assembly work may be carried out only by specialists
- Observe general UV regulations
- Fire dampers are items which require an official licence for use (general building approval). You need a valid general building approval for the handing over to the building owner.

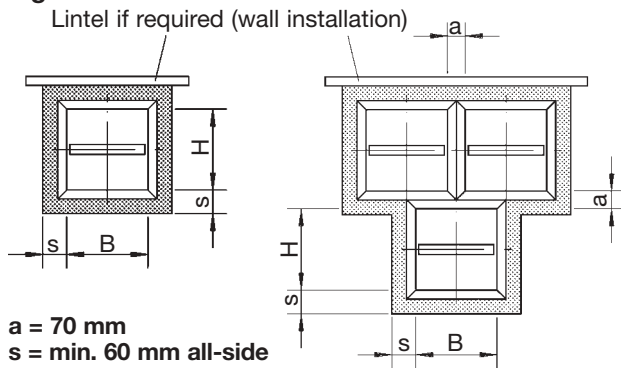
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Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

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Figure 1.1



Installation in solid walls and ceilings as well as in gypsum wall boards

Installation - also with vertical rotation axis of the damper blade - in masonry walls in accordance with DIN 1053 with a minimum thickness of 115 mm, in concrete walls with a minimum thickness of 100 mm, in aerated concrete walls and lightweight concrete walls with a minimum thickness of 75 mm (only FK-K90), in walls made of gypsum wall boards in accordance with DIN 18163 for gross densities $\geq 0.6 \text{ kg/dm}^3$ with a minimum thickness of 100 mm and in ceilings made of concrete and aerated concrete with a minimum thickness of 100 mm.

 = Mortar, concrete, approved fire protection mortar or plaster mortar


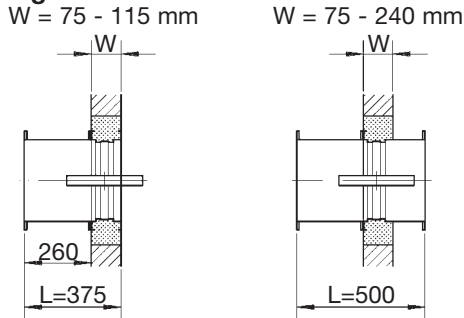
 = Mineral wool, non combustible in accordance with DIN 4102, gross density 80 - 100 kg/m³, nominal thickness = x + min. 10 mm (x = max. 50 mm), width B approx. 100 - 240 mm

Figure 1.2



If installation in walls made of aerated concrete resp. lightweight concrete with a wall thickness $W < 100 \text{ mm}$ as well as in walls made of gypsum wall boards, if partial mortaring only and if filling out the spaces "a" with mineral wool, ventilation duct connections are only permitted using flexible connectors or flexible ventilation ducts.

Figure 1.3

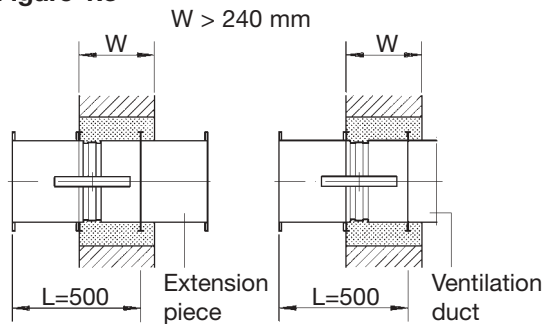
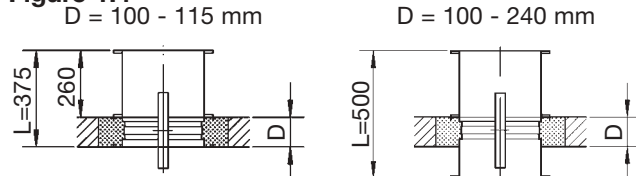


Figure 1.4



Wall installation · Ceiling installation

Figure 1.1 Installation openings

Wall installation

Figure 1.2 Wall thicknesses $W = 75 - 240 \text{ mm}$

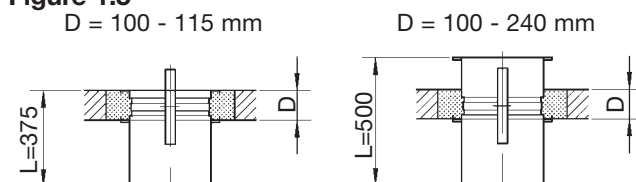
Figure 1.2 Wall thicknesses $W > 240 \text{ mm}$

Ceiling installation

Figure 1.4 Above in ceilings, ceiling thicknesses $D = 100 - 240 \text{ mm}$

Figure 1.5 Below in ceilings, ceiling thicknesses $D = 100 - 240 \text{ mm}$

Figure 1.5



Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

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Figure 1.6

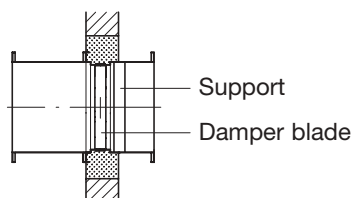
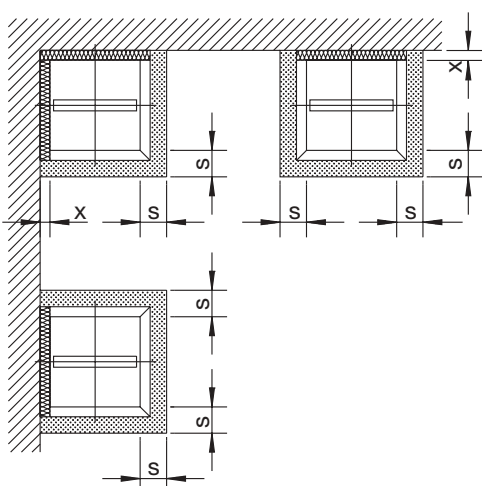
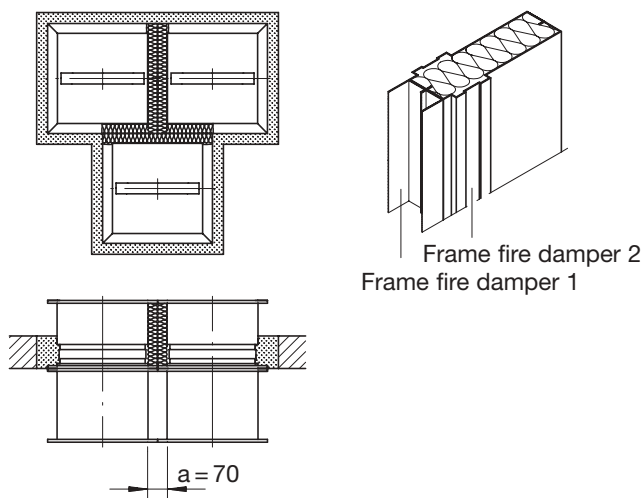


Figure 1.7



$x = 35$ up to max. 50 mm
 $s = \text{min. } 60$ mm

Figure 1.8



Assembly sequence

- Protect the fire damper casing against deformation during installation, e.g. by positioning a support, see figure 1.1, page 2, or by positioning a support in the range of the damper blade, see figure 1.6
Attention! Deformation of the casing leads to an impairment of the function; therefore the bricking in of the fire damper must be free of distortion, perpendicular and without any deformations.
- Cover the drive side in such a way that the release mechanism cannot be damaged by mortar or drops of water during bricking in
- Cover clear openings of the casing, if no ventilation duct is to be mounted before bricking in
- Push the fire damper into the wall or ceiling opening (note assembly position by square fire dampers)
- Gap "s" and spaces "a" are to be filled completely with mortar of group II or III, DIN 1053, with concrete, with approved fire protection mortar or plaster mortar
 - Gap "s" can be omitted, if the fire damper is installed in the wall or ceiling, when it is built
 - If mortaring in the wall or ceiling area is not possible, because the distances are too small, these gaps "x" may be filled with mineral wool corresponding to figure 1.7
 - Spaces "a" = 70 mm may also be filled with mineral wool, non-combustible in accordance with DIN 4102, gross density 80 - 100 kg/m³ corresponding to figure 1.8, if the walls are made of masonry in accordance with DIN 1053 or concrete or aerated concrete resp. ceilings are made of concrete
- Remove support
- Carry out the function test of the fire damper as described in the enclosed Operating and Maintenance Instruction

Wall installation · Ceiling installation

Figure 1.6 Detailed view of support

Figure 1.7 Installation with partial mortaring only

Figure 1.8 Filling out the spaces – flange to flange

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

M-4/2/EN/7

Figure 2.1

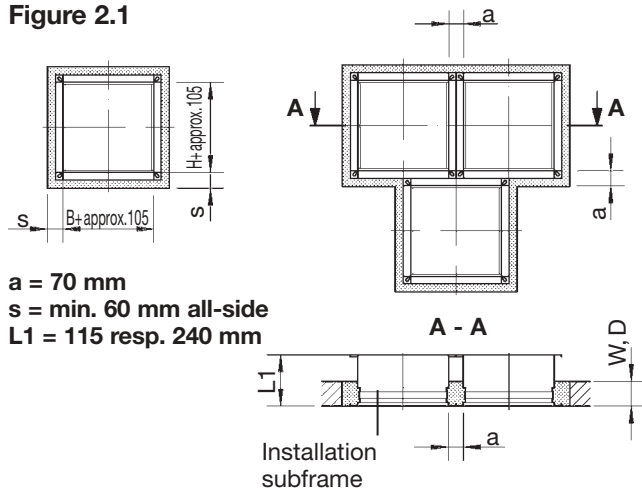


Figure 2.2

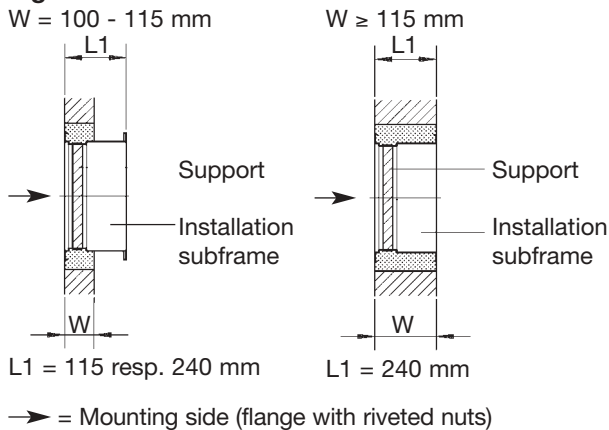
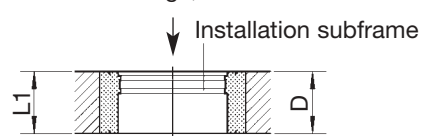
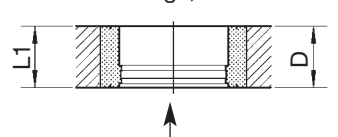


Figure 2.3

Above in ceilings, $D \geq 100 \text{ mm}$



Below in ceilings, $D \geq 100 \text{ mm}$





$L1 = 115 \text{ resp. } 240 \text{ mm at } D = 100 - 115 \text{ mm resp. } 240 \text{ mm at } D \geq 115 \text{ mm}$

↓ = Mounting side (flange with riveted nuts)

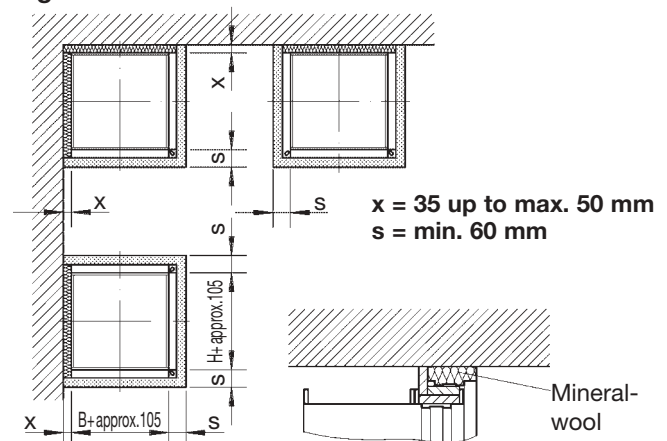
Installation in solid walls and ceilings as well as in gypsum wall boards with installation subframe

Installation - also with vertical rotation axis of the damper blade - in masonry walls in accordance with DIN 1053 with a minimum thickness of 115 mm, in concrete walls with a minimum thickness of 100 mm, in aerated concrete walls and lightweight concrete walls with a minimum thickness of 100 mm, in walls made of gypsum wall boards in accordance with DIN 18163 for gross densities $\geq 0.6 \text{ kg/dm}^3$ with a minimum thickness of 100 mm and in ceilings made of concrete and aerated concrete with a minimum thickness of 100 mm.

-  = Mortar, concrete, approved fire protection mortar or plaster mortar
-  = Mineral wool, non combustible in accordance with DIN 4102, gross density 80 - 100 kg/m³, nominal thickness = $x + \text{min. } 10 \text{ mm}$ ($x = \text{max. } 50 \text{ mm}$), width B approx. 100 - 240 mm

If installation in walls made of gypsum wall boards, if partial mortaring only and if filling out the spaces "a" with mineral wool, ventilation duct connections are only permitted using flexible connectors or flexible ventilation ducts.

Figure 2.4



Wall installation · Ceiling installation with subframe
 Figure 2.1 Installation opening · Minimum distances

Wall installation with subframe

Figure 2.2 Wall thicknesses $W \geq 100 \text{ mm}$

Ceiling installation with subframe

Figure 2.3 Above in ceilings, ceiling thicknesses $D \geq 100 \text{ mm}$ resp. below in ceilings, ceiling thicknesses $D \geq 100 \text{ mm}$

Wall installation · Ceiling installation with subframe
 Figure 2.4 Wall installation with partial mortaring only

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

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Figure 2.5

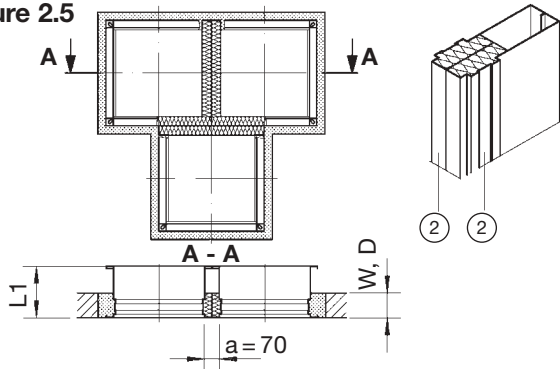


Figure 2.6

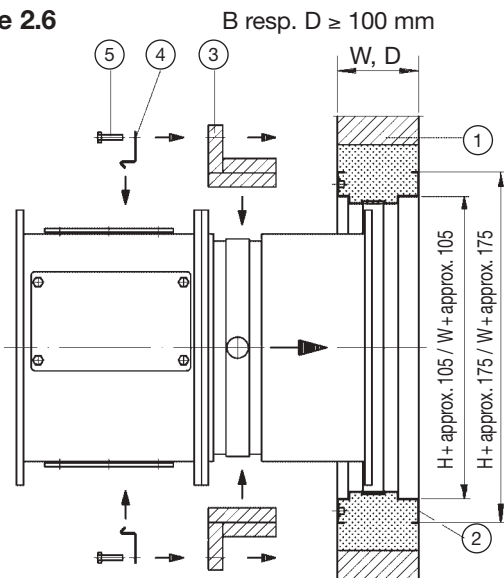
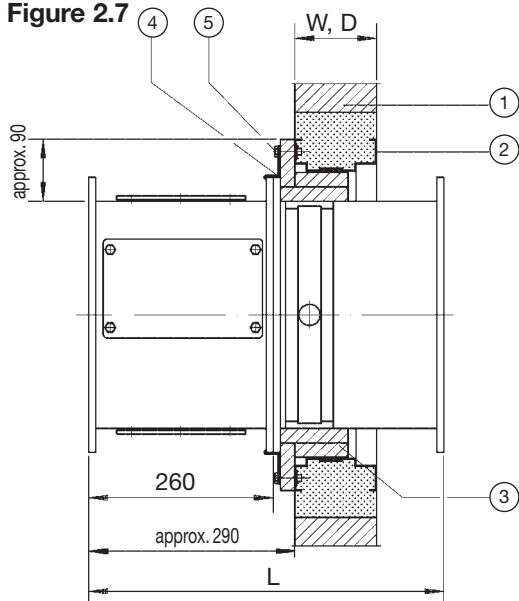


Figure 2.7



Casing length L = 375 resp. 500 mm

- ① Wall resp. ceiling
- ② Installation subframe, galvanised sheet steel
- ③ Installation kit (Promatect-H or Supalux-M)
- ④ Bracket, galvanised sheet steel
- ⑤ Hexagon bolt M8 x 35, galvanised steel

Assembly sequence

- Protect the fire damper installation subframe against deformation during installation, e.g. by positioning a support, see figure 2.2, page 4
- Attention! Deformation of the installation subframe leads to an impairment of the function; therefore the bricking in of the installation subframe must be free of distortion, perpendicular and without deformations.**
- Push the installation subframe item ② into the wall resp. ceiling opening
- Gap "s" and spaces "a" are to be filled completely with mortar of group II or III, DIN 1053, with concrete, with approved fire protection mortar or plaster mortar
 - Gap "s" can be omitted, if the installation subframe is installed in the wall or ceiling, when it is built
 - If mortaring in the wall or ceiling area is not possible, because the distances are too small, these gaps "x" may be filled with mineral wool corresponding to figure 2.4, page 4
 - Spaces "a" = 70 mm may also be filled with mineral wool, non-combustible in accordance with DIN 4102, gross density 80 - 100 kg/m³ according to figure 2.5, if the walls are made of masonry in accordance with DIN 1053 or concrete or aerated concrete resp. ceilings are made of concrete
- Remove support
- Place installation kit filling strips item ③ in the blade area around the fire damper
- Secure filling strips against shifting with adhesive tape
- Push the fire damper into the wall or ceiling opening
- Fasten the fire damper to the B-sides with brackets item ④ and hexagon bolts item ⑤ on the installation subframe item ②, see also assembly sequence on page 8 and 9
- Carry out the function test of the fire damper as described in the enclosed Operating and Maintenance Instruction

Delivery scope for installation with installation subframe

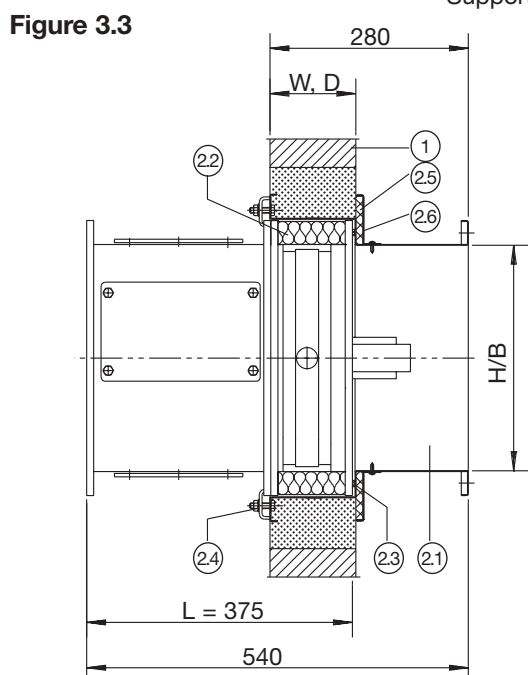
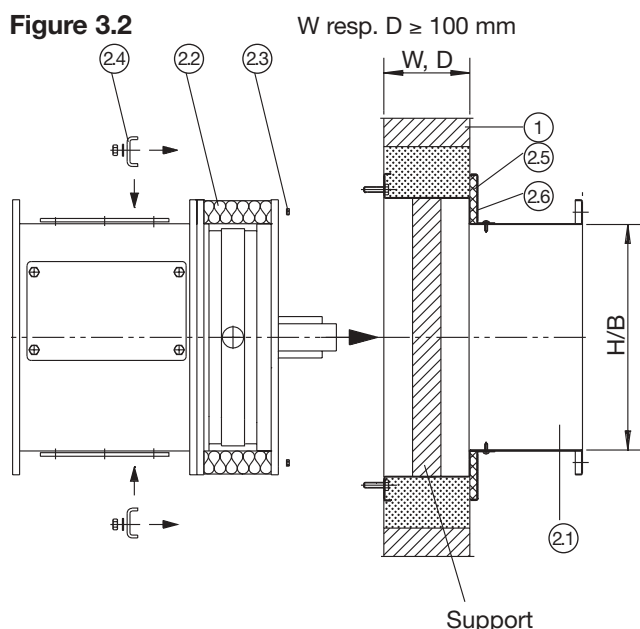
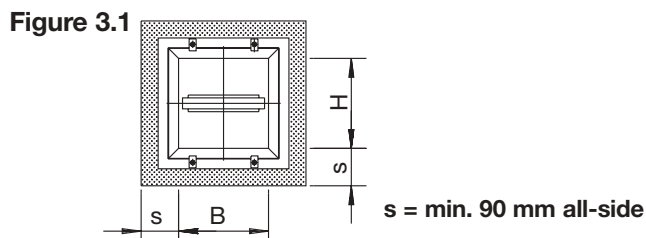
Item	No.	Description	
②	1	Installation subframe	
③	1	Installation kit	
④	*	Bracket	* No. of pieces dependent on size
⑤	*	Hexagon bolt	

Wall installation · Ceiling installation with installation subframe

- Figure 2.5 Filling out the spaces - installation subframe to installation subframe
- Figure 2.6 Assembly sequence
- Figure 2.7 Wall resp. ceiling thicknesses W resp. D ≥ 100 mm

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90


M-4/2/EN/7



Minimum distance between two fire dampers 150 mm.

Installation in solid walls and ceilings with insertion subframe - type FKN-K90

Installation - also with vertical rotation axis of the damper blade - in masonry walls in accordance with DIN 1053 with a minimum thickness of 115 mm, in concrete walls with a minimum thickness of 100 mm, in aerated concrete walls and lightweight concrete walls with a minimum thickness of 100 mm and in ceilings made of concrete and aerated concrete with a minimum thickness of 100 mm.

 = Mortar, concrete, approved fire protection mortar or plaster mortar

① Wall resp. ceiling

Assembly sequence

- Protect the insertion subframe casing against deformation during installation, e.g. by positioning a support, see figure 3.2
Attention! Deformation of the insertion subframe leads to an impairment of the function; therefore the bricking in of the insertion subframe must be free of distortion, perpendicular and without deformations.
- Push the insertion subframe into the wall resp. ceiling opening
- Gap "s" are to be filled with mortar of group II or III, DIN 1053, with concrete, with approved fire protection mortar or plaster mortar
- Gap "s" can be omitted, if the insertin subframe is installed in the wall or ceiling, when it is built
- Remove support
- Fasten the fire damper (insert insulation prior to installation) in the insertion subframe and fasten with holder, hexagon bolts, nuts and washers.
- Carry out the function test of the fire damper as described in the enclosed Operating and Maintenance Instruction

Delivery scope: Insertion subframe

Item	No.	Description
②①	1	Insertion subframe
②②	4	Insulation
②③	1	Seal
②④	4 - 10	Connecting elemnets (holder, hexagon bolt M8 x 30 with nut and washer)
②⑤	2	Cover (only for $W \leq 115 \text{ mm}$)
②⑥	2	Z-bar (only for $W \leq 115 \text{ mm}$)

Wall installation · Ceiling installation with insertion subframe

Figure 3.1 Installation opening

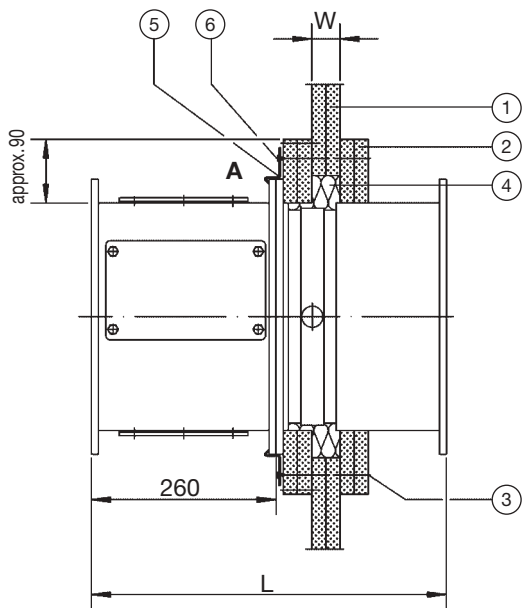
Figure 3.2 Assembly sequence

Figure 3.3 Wall resp. ceiling thicknesses W or D $\geq 100 \text{ mm}$

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

M-4/2/EN/7

Figure 4.1



Wall opening = W resp. H + approx. 80 mm
Casing length L = 500 mm
Minimum distance between two fire dampers 200 mm.

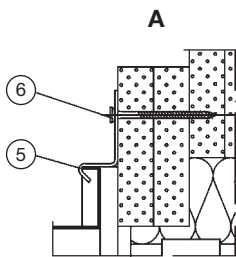
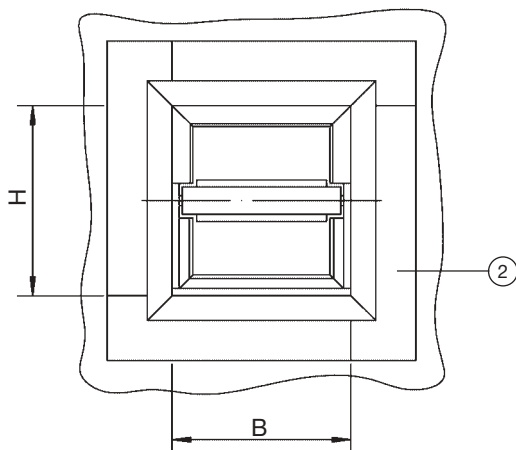


Figure 4.2



Installation in lightweight partition walls without metal supports - Type FKN-K90

Installation - also with vertical rotation axis of the damper blade - in at least 40 mm thick fire rated partition walls made of calcium silicate boards without metal supports according to the test certificate.

Ventilation duct connections are only permitted using flexible connectors or flexible ventilation ducts.

- ① Fire rated partition wall, minimum thickness 2 x 20 mm (wall construction according to the particulars of the manufacturer)
 - Partition walls up to max. 3 m height, width unlimited
 - Partition walls up to max. 5 m height, width max. 2.2 m
- ② Perimeter strips, minimum thickness 20 mm (according to the wall construction)
- ③ Dry wall screw, galvanised steel distance ≤ 200 mm round
- ④ Insulation layer, mineral fibre DIN 4102/A1, approx. 100 kg/m³, approx. 40 mm thick
- ⑤ Bracket, galvanised sheet steel; up to B = 800 mm 2 pieces per B-side from B > 800 mm 3 pieces per B-side
- ⑥ Dry wall screw, galvanised steel

Assembly sequence

- Build up the wall according to the information on this page (wall construction according to the particulars of the manufacturer)
- Fasten the fire damper to the B-sides with brackets item ⑤ and dry wall screws item ⑥ to the partition wall
 - Brackets item ⑤ up to B = 800 mm 2 pieces per B-side
 - Brackets item ⑤ from B > 800 mm 3 pieces per B-side
- For the mounting of the dry wall screws tapping holes, $\varnothing 4$ mm, need to be drilled
- Carry out the function test of the fire damper as described in the enclosed Operating and Maintenance Instruction

Delivery scope for installation in lightweight partition walls without metal supports

Item	No.	Description
⑤	6	Bracket

Figure 4.1 Wall thickness $W \geq 40$ mm
Figure 4.2 Strip arrangement

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

M-4/2/EN/7

Figure 5.1 2 subfields shown

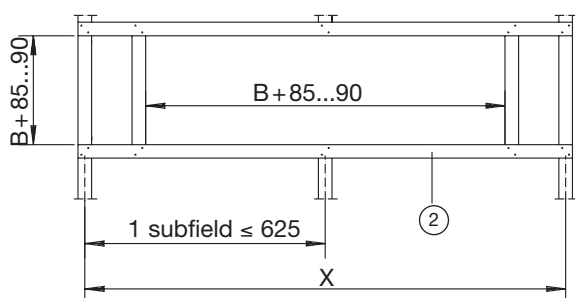


Figure 5.2 W = 100 mm shown

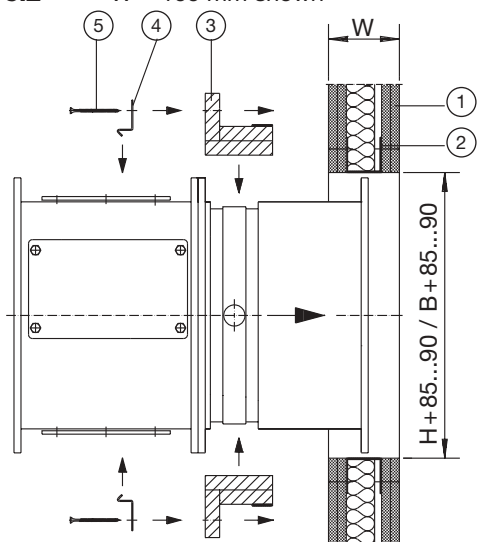
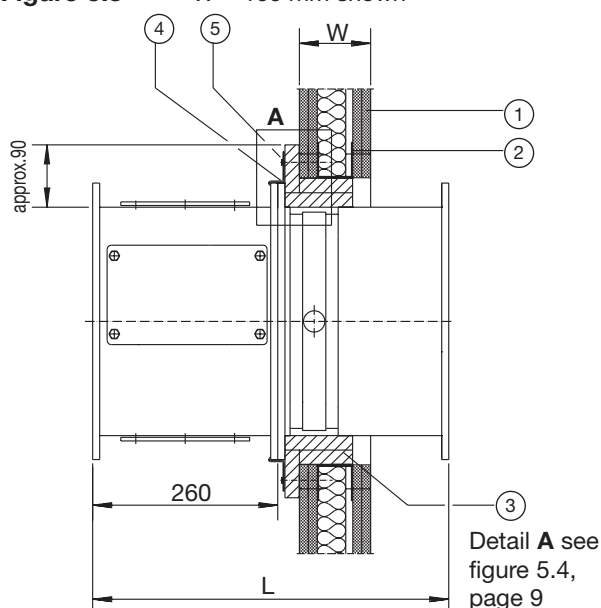


Figure 5.3 W = 100 mm shown



Casing length $L = 500$ mm
Minimum distance between two fire dampers 200 mm.

Installation in lightweight partition walls with metal supports

Installation **with installation kit** - also with vertical rotation axis of the damper blade - in finished panelled lightweight construction-, prefabricated- and shaft walls with metal supports according to the test certificate, the building authorities verification of use or the approval.

- at least 75 mm thick walls with GKF-cladding
- at least 84 mm thick fire rated partition walls made of calcium silicate boards
- at least 90 mm thick shaft walls / front shells with single and double metal support

Ventilation duct connections are only permitted using flexible connectors or flexible ventilation ducts.

- ① Partition wall / Shaft wall
(wall construction according to the particulars of the manufacturer)
 - Wall thickness $W = 75$ to 155 mm, wall height ≤ 6.0 m
 - Wall thickness $W = 175$ mm, wall height ≤ 7.0 m
 - Wall thickness $W = 200$ mm, wall height ≤ 9.0 m
 - Wall thickness $W = 90$ resp. 110 mm, wall height ≤ 3.5 resp. 5.0 m
- ② Stiffing profile (according to the wall construction)

Assembly sequence

- Build up the wall according to the information on this page
- Place filling strips items ③① and ③② in the blade area around the fire damper
- Secure filling strips against shifting with adhesive tape item ⑥
- Push the fire damper into the wall opening (note assembly position by square fire dampers)
- Fasten the fire damper to the B-sides with brackets item ④ and dry wall screws item ⑤ to the partition wall
Brackets item ④ up to $B = 800$ mm 2 pieces per B-side
Brackets item ④ from $B > 800$ mm 3 pieces per B-side
- For the mounting of the dry wall screws tapping holes, $\varnothing 4$ mm, need to be drilled
- Carry out the function test of the fire damper as described in the enclosed Operating and Maintenance Instruction

Installation in a finished panelled partition wall

Figure 5.1 Metal support structure - without panelling

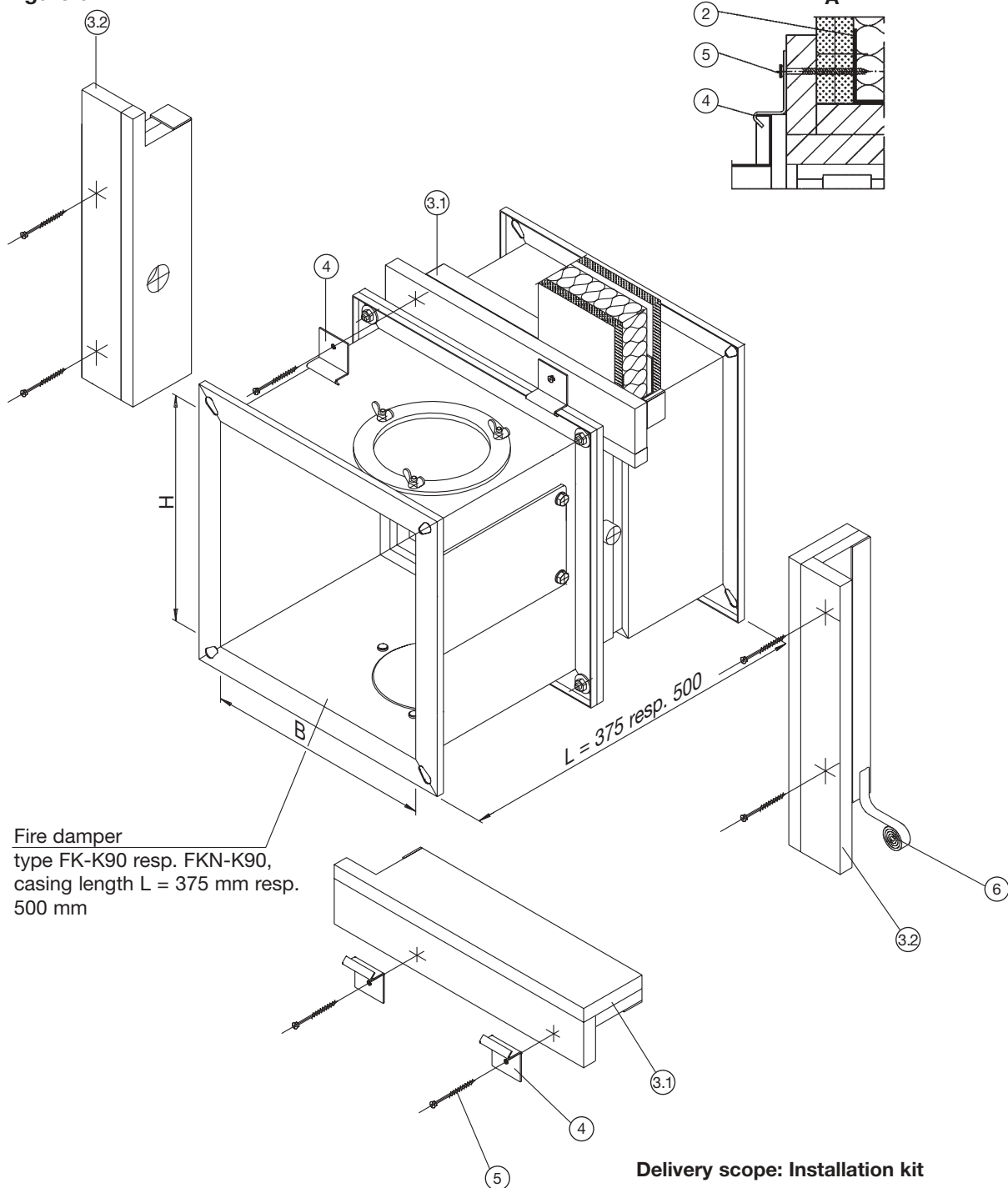
Figure 5.2 Assembly sequence

Figure 5.3 Wall thickness $W \geq 75$ mm

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

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Figure 5.4



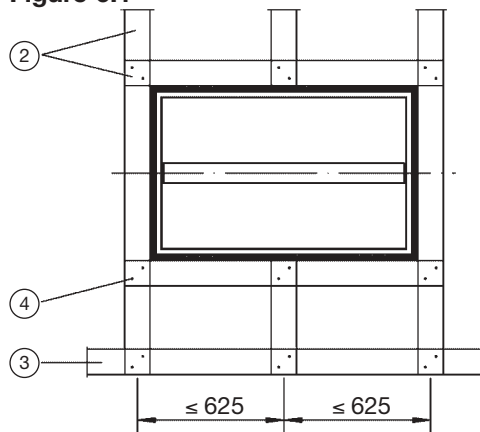
Delivery scope: Installation kit

Item	No.	Description
③.1	2	Filling strips B-part
③.2	2	Filling strips H-part
④	6	Bracket
⑤	30	Dry wall screw
⑥	1	Roll of adhesive tape

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

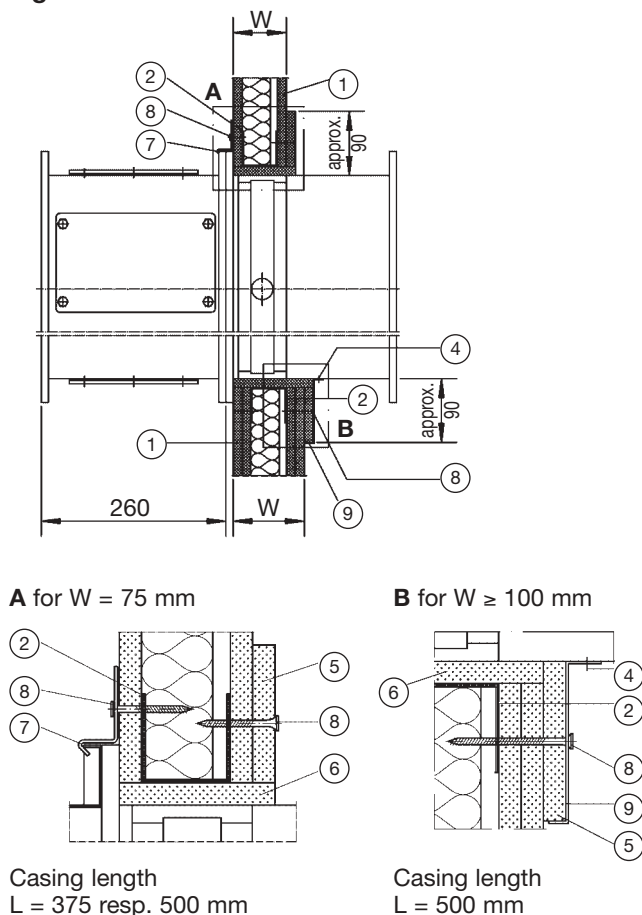
M-4/2/EN/7

Figure 6.1



Minimum distance between two fire dampers 200 mm.

Figure 6.2



Installation in lightweight partition walls with metal supports

Installation **during wall construction** - also with vertical rotation axis of the damper blade - in lightweight construction-, prefabricated- and shaft walls with metal supports according to the test certificate, the building authorities verification of use or the approval.

- at least 75 mm thick walls with GKF-cladding (type FK-K90)
- at least 100 mm thick walls with GKF-cladding (type FKN-K90)
- at least 84 mm thick fire rated partition walls made of calcium silicate boards
- at least 90 mm thick shaft walls / front shells with single and double metal support

Ventilation duct connections are only permitted using flexible connectors or flexible ventilation ducts.

- ① Partition wall / Shaft wall (wall construction according to the particulars of the manufacturer)
 - Wall thickness W = 75 to 155 mm, wall height ≤ 6.0 m (type FK-K90)
 - Wall thickness W = 100 to 155 mm, wall height ≤ 6.0 m (type FKN-K90)
 - Wall thickness W = 175 mm, wall height ≤ 7.0 m
 - Wall thickness W = 200 mm, wall height ≤ 9.0 m
 - Wall thickness W = 90 resp. 110 mm, wall height ≤ 3.5 resp. 5.0 m
- ② Stiffing profile (according to the wall construction)
- ③ U-profile (according to the wall construction)
- ④ Steel-pop-rivet
- ⑤ Cover strips, GKF-board, 12.5 mm according to DIN 18180
- ⑥ Filling strips, GKF-board according to DIN 18180
- ⑦ Brackets, galvanised sheet steel; up to B = 800 mm 2 pieces per B-side from B > 800 mm 3 pieces per B-side
- ⑧ Dry wall screw, galvanised steel
- ⑨ Z-angle profile, galvanised sheet steel, width 200 mm 1 piece B-side
- ⑩ Promatect-H or Supalux-M, minimum width = wall thickness
- ⑪ Screw / Dowel (according to the wall construction)

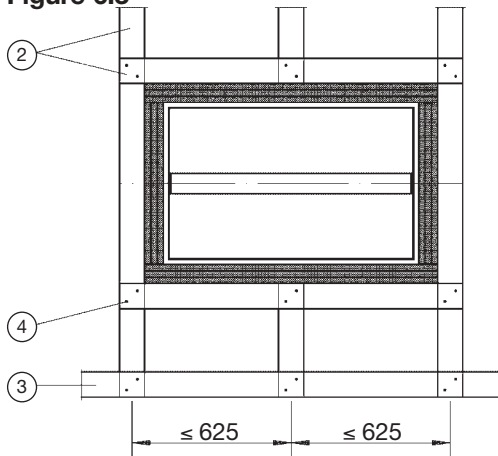
Installation during wall construction - type FK-K90

Figure 6.1 Metal support structure - without panelling
Figure 6.2 Wall thickness W = 75 mm and W ≥ 100 mm

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

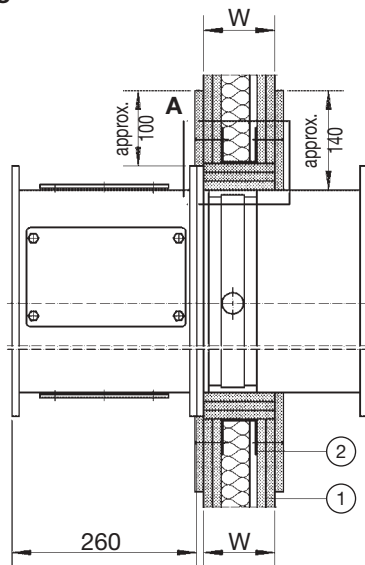
M-4/2/EN/7

Figure 6.3

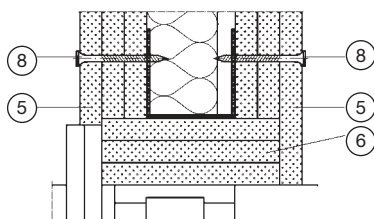


Minimum distance between two fire dampers 200 mm.

Figure 6.4



A for $W \geq 100$ mm



Casing length $L = 500$ mm

Assembly sequence

- Build up the wall according to the information on this and the previous page, so that the fire damper can be installed during construction (note assembly position by square fire dampers); around the fire damper the support structure must be designed in accordance with figure 6.1, page 10 resp. 6.3
- In the case of installation in accordance with figure 6.2, page 10 - Detail A - fasten the fire damper (type FK-K90, $W = 75$ mm) on the B-sides with brackets item ⑦ and dry wall screws item ⑧ to the support structure
- For the mounting of the dry wall screws tapping holes, $\varnothing 4$ mm, need to be drilled
- In the case of installation in accordance with figure 6.2, page 10 - Detail B - fasten the fire damper (type FK-K90, $W \geq 100$ mm) on the B-sides with Z-angle profile item ⑨ - 1 piece per B-side on B/2 - and dry wall screws item ⑧ to the support structure
- For the mounting of the dry wall screws tapping holes, $\varnothing 4$ mm, need to be drilled
- Fasten the Z-angle profile by means of steel-pop-rievet item ④ to the fire damper
- For the mounting of the steel-pop-rievet tapping holes $\varnothing 4.1$ mm, need to be drilled
- Carry out the function test of the fire damper as described in the enclosed Operating and Maintenance Instruction

Delivery scope for installation in lightweight partition walls with metal supports

Item	No.	Description
④	6	Steel-pop-rievet
⑦	6	Bracket
⑨	2	Z-angle profile

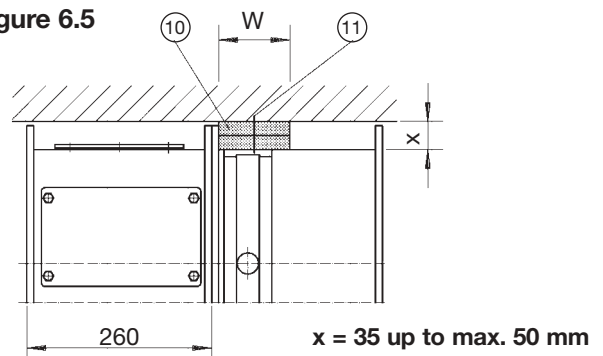
Installation during wall construction - type FKN-K90

Figure 6.3 Metal support structure - without panelling
Figure 6.4 Wall thickness $W \geq 100$ mm

Installation during wall construction - types FK-K90 · FKN-K90

Figure 6.5 Wall resp. ceiling connection,
wall thickness $W \geq 75$ mm (type FK-K90) resp.
wall thickness $W \geq 100$ mm (type FKN-K90)

Figure 6.5



Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

M-4/2/EN/7

Figure 7.1

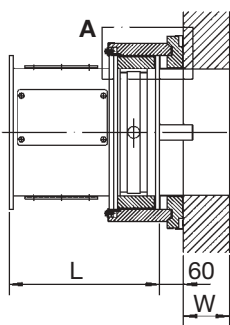


Figure 7.2

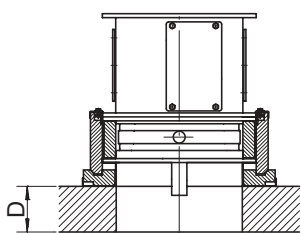


Figure 7.3

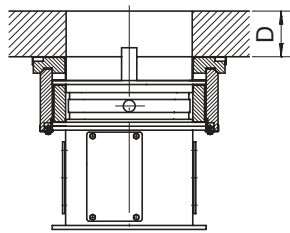


Figure 7.4

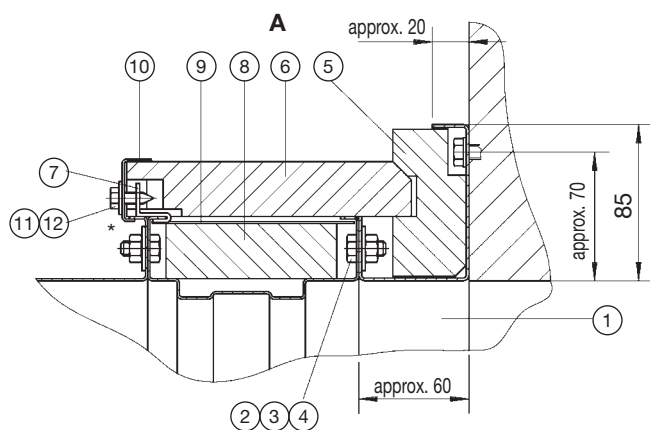
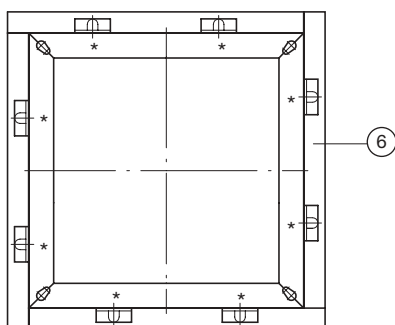


Figure 7.5



* here around the recesses (the number depends on the size), mark the flange. Note the arrangement of the panel cladding item ⑥.

Installation directly on to solid walls and ceilings

Installation - also with vertical rotation of the damper blade - directly on to masonry walls in accordance with DIN 1053 with a minimum thickness of 115 mm, concrete walls with a minimum thickness of 100 mm and directly on to concrete ceilings with a minimum thickness of 100 mm.

Ventilation duct connections are only permitted using flexible connectors or flexible ventilation ducts.

Assembly sequence

- Drill holes for the metal dowels M8 in the solid wall resp. ceiling, to do this use drilled holes in the face subframe item ① to mark the dowel positions; place the metal dowels M8 in the drilled holes
- Fasten the face subframe item ① on to the solid wall resp. ceiling using screws M8
- Mark the positions for the clamping plates item ⑦ on the damper flange using the panel cladding item ⑥, see figure 7.5. Afterwards, assemble the clamping plates item ⑦ at the marked places. Tongs are needed to assemble the clamping plates.
- Make connection between face subframe and fire damper with the fixing elements items ② to ④, paying attention to the position of the screw heads.
- Insert the strips item ⑤ in accordance with figure 7.4 and 7.6, page 13, and shift against each other so that frame joints do not contain any airways
- Place the insulations item ⑧ around the frame element of the fire damper and fix with steel strips item ⑨; beforehand slightly bend the steel strips
- Insert the panel cladding item ⑥ according to figure 7.4 and 7.6, page 13, and preassemble the U-sections item ⑩, with the associated fixing elements item ⑪ and ⑫ and the clamping plates item ⑦. Align the panel cladding against each other without any airways, then tighten the angle elements.
- Carry out the function test of the fire damper as described in the enclosed Operating and Maintenance Instruction

Figure 7.1 Installation directly on to wall, wall thicknesses $W \geq 100$ mm

Figure 7.2 Above a ceiling, ceiling thicknesses $D \geq 100$ mm

Figure 7.3 Below a ceiling, ceiling thicknesses $D \geq 100$ mm

Figure 7.4 Detail A - Surface subframe and set board lining

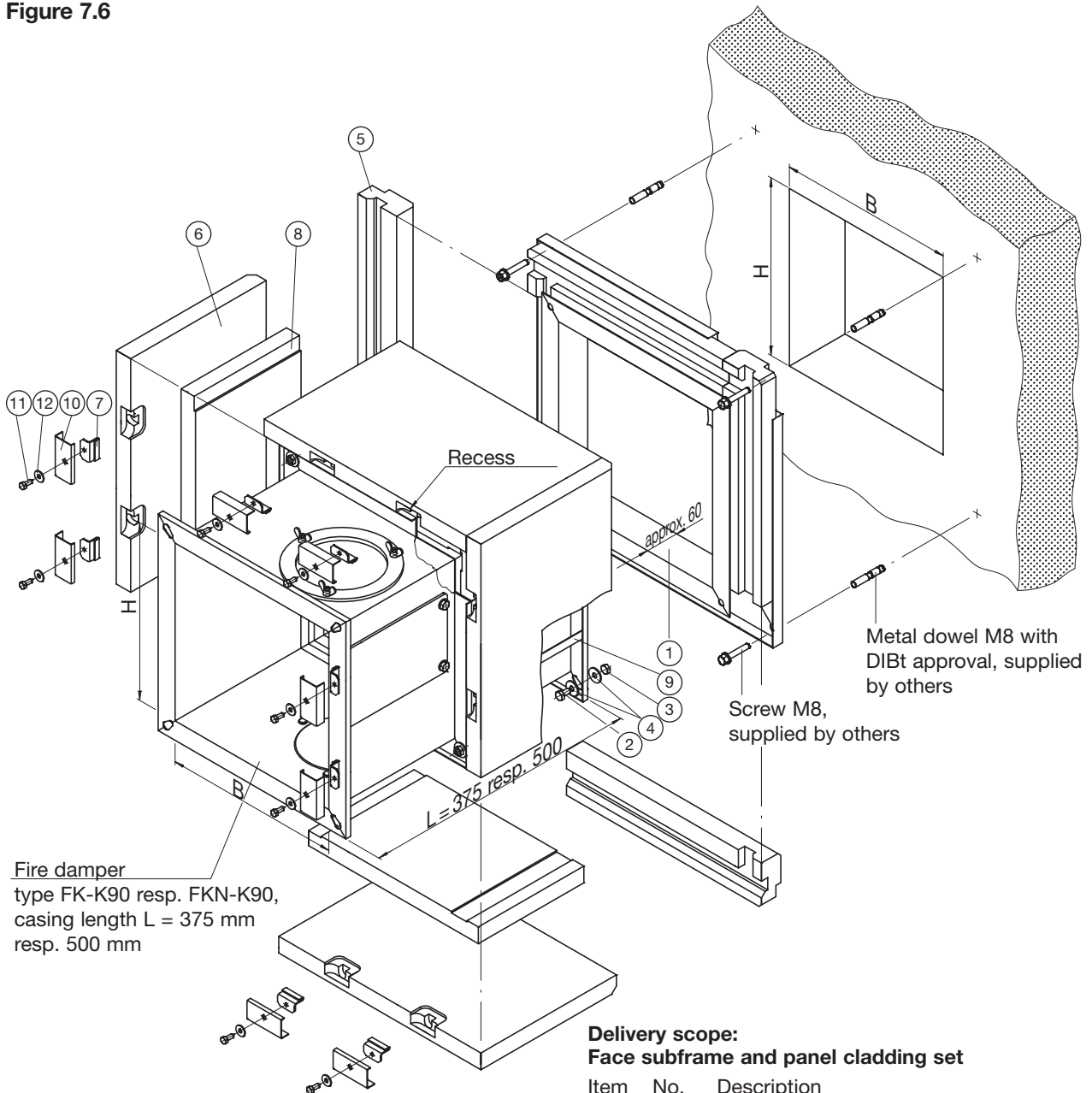
Figure 7.5 Detail "Marking the flange"

Figure 7.6 Arrangement of face subframe and panel cladding set

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

M-4/2/EN/7

Figure 7.6



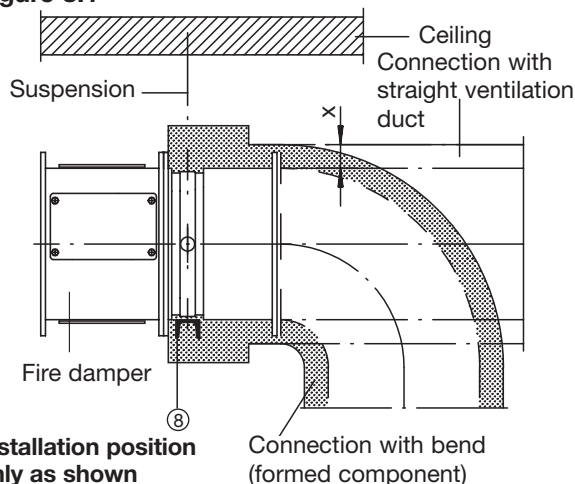
Delivery scope: Face subframe and panel cladding set

Item	No.	Description
①	1	Face subframe
②	4 - 16	Hexagon screw
③	4 - 16	Hexagon nut
④	8 - 32	Washer
⑤	4	Strip
⑥	4	Panel cladding
⑦	4 - 14	Clamping plate
⑧	4	Insulation
⑨	8	Steel strip
⑩	4 - 14	U-section
⑪	4 - 14	Self-tapping screw
⑫	4 - 14	Washer

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

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Figure 8.1

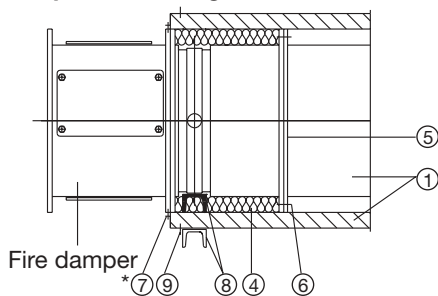


**Installation position
only as shown**

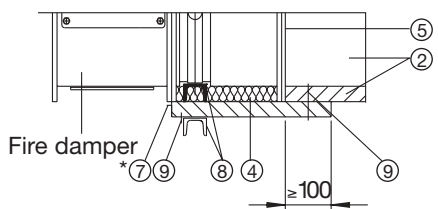
x = depending on the ventilation duct construction
Casing length L = 375 resp. 500 mm

Figure 8.2

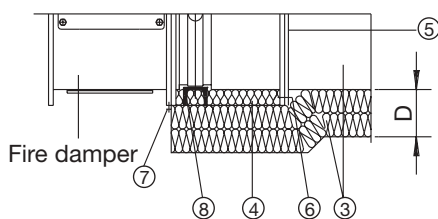
**Connection to ventilation ducts made of sheet steel with
outer panel cladding L90**



Connection to ventilation ducts made of panel material L90



**Connection to ventilation ducts made of sheet steel
with outer mineral fibre insulation L90**



D = thickness of insulation

Casing length L = 375 resp. 500 mm

Installation outside of walls

Installation - also with vertical rotation axis of the damper blade - outside of walls in conjunction with a fire resistant ventilation duct without openings made of sheet steel with outer insulation layer of mineral fibre or -panel or ventilation ducts made of panel material with proven fire resistance duration.

Ventilation duct connections are only permitted using flexible connectors or flexible ventilation ducts.

Assembly sequence

- Suspend the fire damper (see figure 9.1 to 9.4, page 15)
- During installation according to figure 8.1 assemble ventilation duct or the bends.
The bends may turn away from the horizontal damper blade axis in any direction. This is only permitted, if the bends do not affect the closing function of the damper blade; if necessary, extension pieces must be provided
- During installation according to figure 8.2 assemble ventilation duct according to the manufacturer's instructions
- Carry out the function test of the fire damper as described in the enclosed Operating and Maintenance Instruction

Approved ventilation ducts:

- Ventilation ducts made of sheet steel with outer panel cladding L90
- Ventilation ducts made of panel material L90
- Ventilation ducts made of sheet steel with outer mineral fibre insulation L90 according to DIN 4102-4, (Issue March 1994)

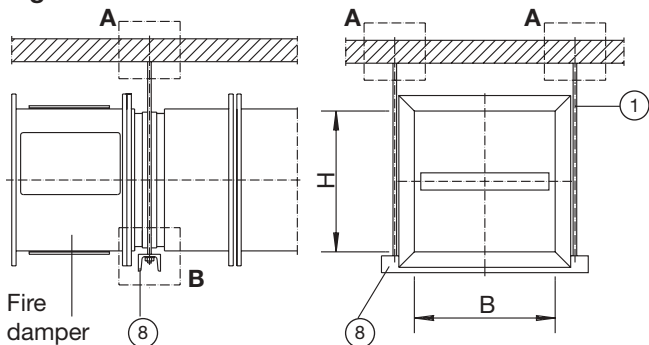
- ① Ventilation duct made of sheet steel with outer panel cladding L90
- ② Ventilation duct made of panel material L90
- ③ Ventilation duct made of sheet steel with outer mineral fibre insulation L90 according to DIN 4102-4, (Issue March 1994)
- ④ Insulation, mineral fibre DIN 4102/A1, approx. 100 kg/m³, approx. 40 mm thick
- ⑤ Seal, non-combustible in accordance with DIN 4102
- ⑥ Screw with nut M8, galvanised steel
- ⑦ Screen, 1.0 thick, galvanised steel (* optional)
- ⑧ Traverse, U50 x 38 x5, DIN 1026, galvanised steel; suspension can be arranged alternatively outside of the panel cladding
- ⑨ Joint connection, steel

Figure 8.1 Connection with straight ventilation duct / connection with bend (formed component)
Figure 8.2 Connection to ventilation ducts

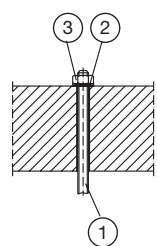
Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

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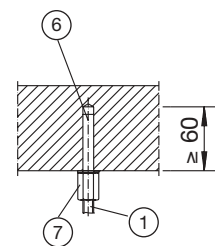
Figure 9.1



**Figure 9.2
without dowels**



with dowels



with fixing plate and dowels

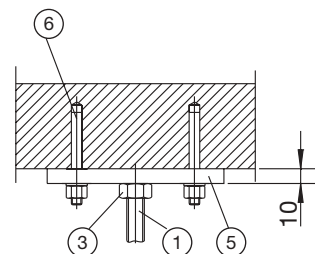


Figure 9.3

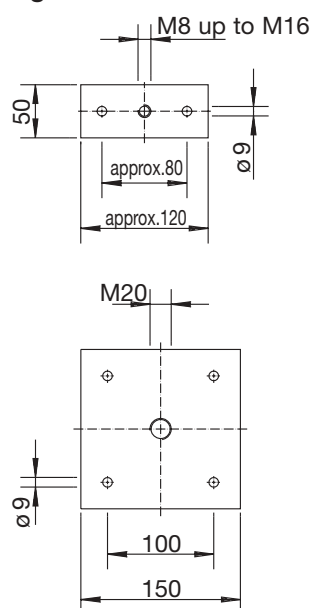
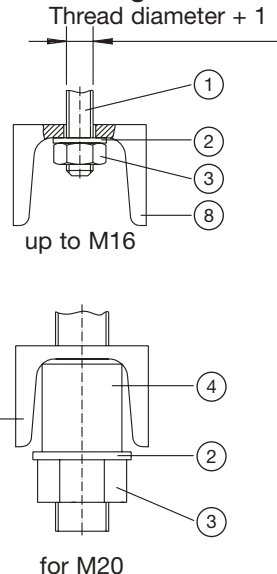


Figure 9.4



Suspensions

If the following installation situation is given, the fire dampers must be suspended:
- Outside the walls according to page 14

- ① Suspension (thread rod), M8 to M20, galvanised steel

Thread diameter	M8	M10	M12	M16	M20
F_{max} (N) per thread rod	219*	348*	506*	942*	1470*

* Weights see page 20

- ② Washer, M8 to M20, galvanised steel
③ Hexagon nut, M8 to M20, galvanised steel
④ Space tube, $\varnothing 30 \times 33$, galvanised steel
⑤ Fixing plate, min. 10 mm thick, galvanised steel
⑥ Metal dowels
- Dowels with the fire protection qualification verified by an approval-notification resp. a test certificate must be installed resp. are to be stressed as required in the approval-notification resp. the test certificate.
- Dowels without fire protection qualification must be made of steel, at least size M8 and must be fixed to a depth twice as required in the approval-notification, however the depth must be at least 60 mm. They must not be stressed with a calculated tensile loading greater than 500 N.
⑦ Screw socket, galvanised steel
⑧ Traverse, U50 x 38 x 5, DIN 1026, galvanised steel

- Figure 9.1 Suspension
Figure 9.2 Suspension - Detail A
Ceiling fixation (without resp. with dowels)
Figure 9.3 Fixing plate
Figure 9.4 Suspension - Detail B - Traverse

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

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Ref. No.	FK-K90	FKN-K90
	Fire resistance class *	
1	K30	K90
2	K30	
3	K90 *	
4	K90 *	
5	K90 *	
6	K90	
7	K90	
8	K30 if application as shown; K90 in conjunction with cover grilles	
9	K30 if connection of (L2); K90 if connection of (L1)	

Connection of ventilation ducts and cover grilles

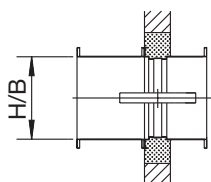
According to the general building approval, fire dampers may only be connected to ventilation ducts that are unable to exert any significant force on the fire damper or on the wall or ceiling, on account of duct construction or layout, particularly when ducts heat up in event of fire. If this is not possible, flexible connectors must be located as shown in figure 10.1, Ref. No. 7 for installation as shown in figures 1.1 (W ≥ 100 mm) to 1.5, 2.1 to 2.3, 2.6, 2.7 and 3.1 to 3.3.

For installation as shown in figures 1.2 (W < 100 mm resp. in walls made of gypsum wall boards), 1.7, 1.8, 2.4, 2.5, 2.7 (in walls made of gypsum wall boards) and 4.1 to 8.2 ventilation ducts may, in principle, only be arranged using flexible connectors as shown in figure 10.1, Ref. No. 7 and 9 (if application outside of walls and ceilings).

Figure 10.1

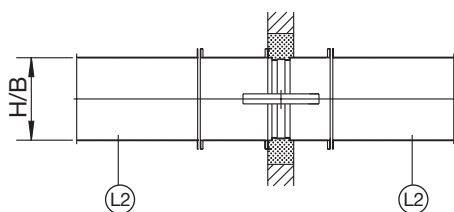
Ref. No. 1

- without ventilation ducts



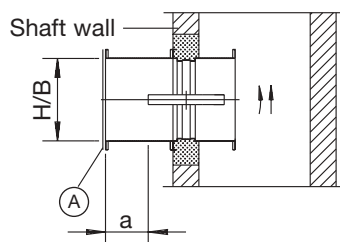
Ref. No. 2

- on both sides with combustible ventilation ducts



Ref. No. 3

- in shaft walls; cover grille on the connection frame side



↓ Closing direction
↑ Air direction

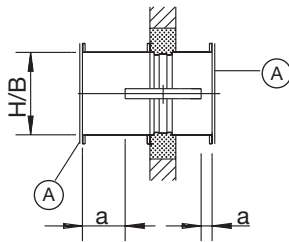
- (A) Cover grille
 - (L1) Ventilation duct made of non-combustible materials
 - (L2) Ventilation duct made of combustible material
 - (S) Flexible connectors made of materials with low or normal flammability (category B1 resp. B2 according to DIN 4102), flexible range ≥ 100 mm related to the installed situation
 - (O) Opening, e.g. for a ventilation grille, blade pitch max. 20 mm
- "d" corresponds to the largest B resp. H dimension in each case
- "a" 50 mm = minimum clearance between open damper blade and the cover grille resp. the flexible connector. Therefore extension pieces must be arranged on the fire dampers wall frame side at H = 318 mm according to figure 10.2 resp. 10.3, page 18. At H = 565 mm extension pieces must be arranged on the wall and connecting frame side according to figure 10.4 resp. 10.5, page 18.
- * Fire resistance class K90 in walls resp. ceilings with a fire resistance class min. F90 and in conjunction with cover grilles (expanded metal grille or wire mesh grille), mesh width max. 20 mm

Figure 10.1 Connection of ventilation ducts and cover grilles

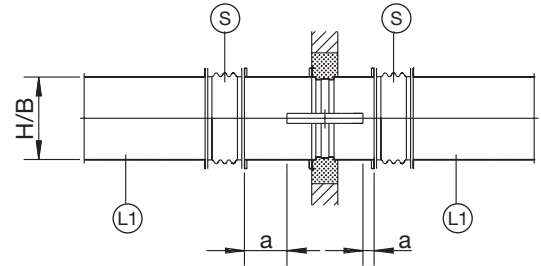
Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

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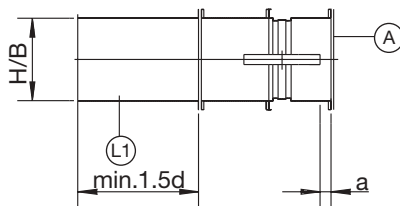
Ref. No. 4
- cover grilles on both sides



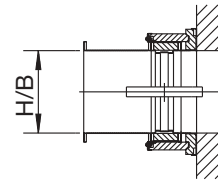
Ref. No. 7
- on both sides with flexible connectors and
non-combustible ventilation ducts



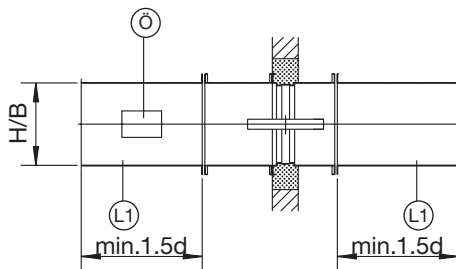
Ref. No. 5
- with one side arranged non-combustible ventilation
duct and cover grille



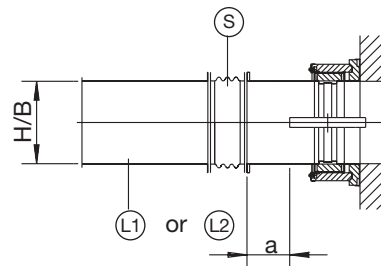
Ref. No. 8
- directly on to walls and ceilings without connected
ventilation ducts



Ref. No. 6
- on both sides with non-combustible ventilation ducts
with resp. without openings for ventilation grille made
of non-combustible materials



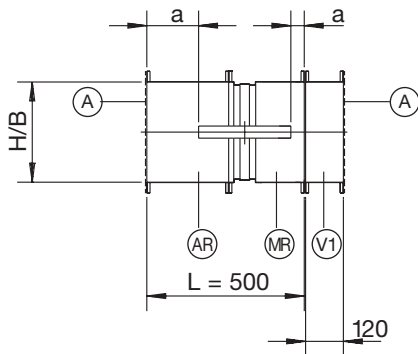
Ref. No. 9
- directly on to walls and ceilings with flexible connector
and ventilation duct



Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

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Figure 10.2



- Ⓐ Connecting frame
- Ⓜ Wall subframe
- Ⓥ Extension piece "V 120"
- Ⓥ Extension piece "V 260"
- Ⓢ Flexible connector
- Ⓐ Cover grille

"a" 50 mm = minimum clearance between open damper blade and cover grille resp. flexible connector

Figure 10.2 Arrangement of cover grilles
H = 318 to 503 mm

Figure 10.3 Arrangement of flexible connectors
H = 318 to 503 mm

Figure 10.3

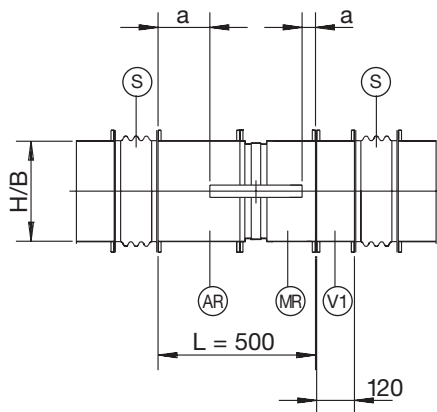


Figure 10.4 Arrangement of cover grilles
H = 565 to 797 mm

Figure 10.5 Arrangement of flexible connectors
H = 565 to 797 mm

Figure 10.4

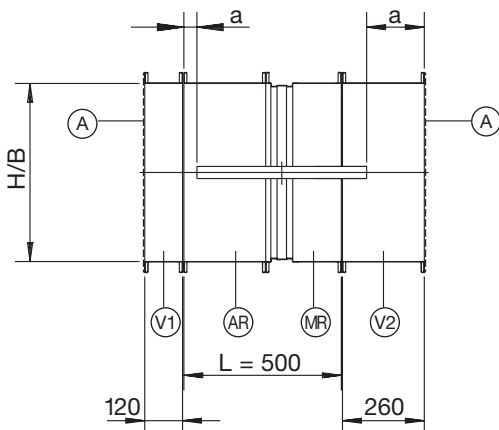
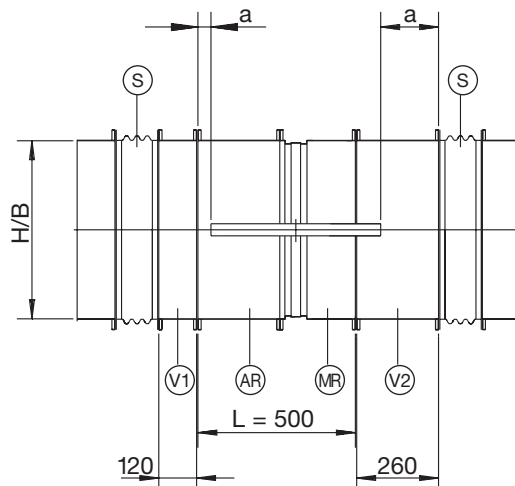


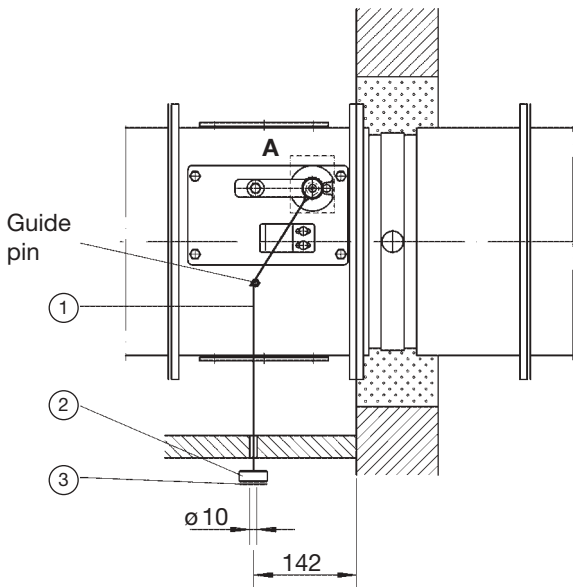
Figure 10.5



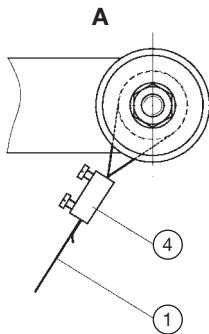
Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

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Figure 11.1



Position indicator only for horizontal installation as shown



Position indicator for false ceilings - Assembly sequence

- Provide a drilled hole, $\varnothing 10$ mm, in the false ceiling (distance of the drilled hole from the wall 80 mm and 35 mm from the side wall of the casing)
- Open the fire damper as described in the enclosed Operating and Maintenance Instruction
- Pull the steel wire item ① through the drilled hole of the weight item ②
- Guide steel wire from the false ceiling through the drilled hole in the guide pin
- Fasten end of steel wire according to figure 11.1 - Detail A - using cable clamp item ④; the weight item ② must lie on the false ceiling
- Attach self-adhesive label "F" item ③ to the weight item ②
- Carry out the function test of the fire damper as described in the enclosed Operating and Maintenance Instruction

Delivery scope

Position indicator for false ceilings

Item	No.	Description
①	1	Steel wire
②	1	Weight
③	1	Label "F"
④	1	Cable clamp


Figure 11.1 Position indicator for false ceilings

Assembly Instruction for Fire Dampers of the Types FK-K90 · FKN-K90

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Weights (approx. information in kg)

H in mm	B in mm																
	201	252	318	357	400	449	503	565	634	711	797	894	1003	1125	1262	1416	1500
201	10	11	12	13	15	16	17	18	20	22	24	26	28	30	32	35	38
	12	13	14	15	16	17	19	21	24	26	28	30	34	36	39	43	46
252	11	12	13	15	16	17	18	20	22	24	26	28	30	32	35	38	41
	13	14	15	16	17	19	21	24	26	28	30	34	36	39	43	46	50
318	12	13	15	16	17	18	20	22	24	26	28	30	32	35	38	41	45
	14	15	16	18	20	22	24	26	28	30	33	36	39	44	46	50	54
357	13	15	16	17	18	20	22	24	26	28	30	32	35	38	41	45	48
	15	16	18	19	22	24	26	28	30	32	36	39	43	47	50	54	59
400	15	16	17	18	20	22	24	26	28	30	32	35	38	41	46	48	52
	16	17	20	22	23	26	28	30	32	34	38	41	45	50	54	59	63
449			18	20	22	24	26	28	29	31	34	37	40	45	48	52	57
			22	24	26	28	30	32	35	36	40	44	49	54	59	63	68
503			20	22	24	26	28	29	30	33	36	39	45	48	52	57	62
			24	26	29	31	33	34	36	39	41	48	52	58	63	68	73
565			22	24	26	28	29	31	35	36	39	44	48	52	57	62	68
			26	28	30	33	34	37	41	44	46	52	57	63	68	74	79
634			24	26	28	29	30	33	36	39	44	48	52	57	62	67	74
			28	30	32	35	36	41	45	48	50	57	62	67	74	79	84
711			26	27	28	31	33	36	39	44	48	52	57	62	66	72	79
			30	32	34	36	39	44	48	51	54	62	66	74	79	84	89
797			27	29	32	34	36	39	44	48	52	57	62	66	69	76	84
			32	34	37	39	41	46	50	54	58	66	73	79	84	89	94

 = type FK-K90

 = type FKN-K90

For release mechanisms (starting with Z34 - see leaflet No. 4/2/EN/7) tabular value + 5 kg.

B dimensions 201 mm and 252 mm can only be combined with H dimensions 201 mm to 400 mm.