



The space-saving solution
Maintenance-free

FK90K fire dampers

- Sizes 100 x 100 to 800 x 250
- Exceptionally high volume flows - Minimum pressure drop - Extremely quiet
- For universal use with a wide range of applications
- Fire classification: EI 30/60/90 ($v_e - h_o, i \leftrightarrow o$) S C₁₀₀₀₀
- Hygiene certificate
- Environmental Product Declaration according to ISO 14025 and EN 15804

FK90K fire dampers

Features and characteristics

Casing made of calcium silicate
 Nominal width B: 100 mm to 800 mm
 Nominal height H: 100 mm to 250 mm
 Length: 260 mm
 Leak tightness class C according to EN 1751

Damper blade
 can be installed both horizontally and vertically
 - replaceable -

Elastomer lip seal
 - frictionless sealing -

Large free cross-section
 Maximum volume flow
 Minimum pressure drop
 Extremely low sound power level

All-round enclosed thermal release elements
 70°C or 95°C
Option:
 Corrosion-resistant release element 70°C

Fully enclosed:

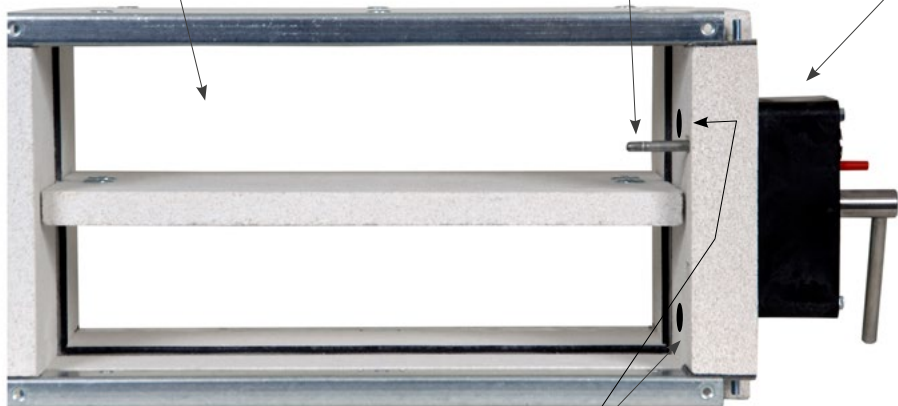
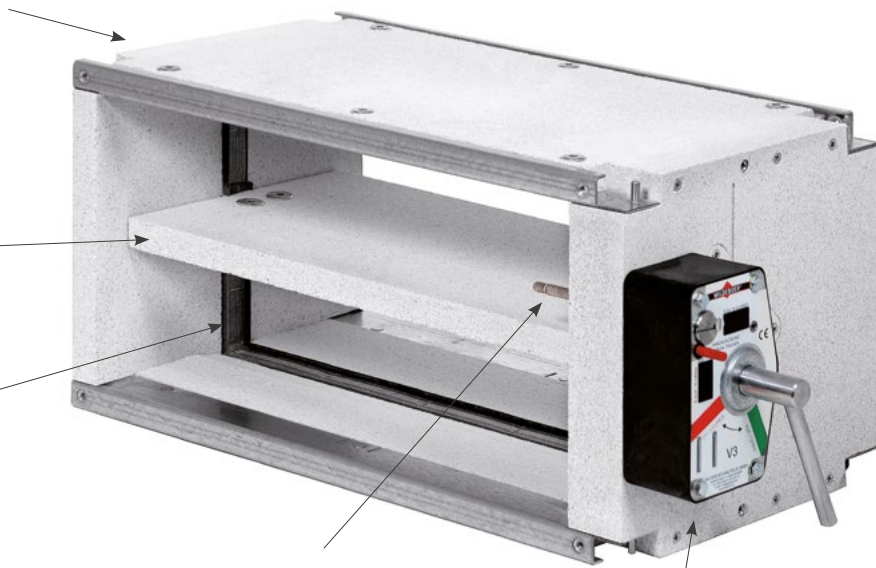
- Operation unit
- Release mechanism
- Release element

Thermal-mechanical release mechanism for single handed operation
Option:
 Electric actuators

Connection holes for profiles from 20 mm in height
Option:
 Profiles with epoxy resin powder coating

Control openings (inspection openings) for viewing both sides of the damper blade

Option:
 Factory-mounted **installation subframe ER5** made of calcium silicate for **sliding ceiling connection in metal stud walls with cladding on both sides.**



FK90K fire dampers

Description

Maintenance-free **FK90K fire dampers according to EN 15650**

Fire classifications: **EI 30/60/90 (v_e - h_o, i ↔ o) S C₁₀₀₀₀**

Declaration of performance: **DoP no.: CPR/FK90K/002**

Environmental Product Declaration ISO 14025, EN 15804: **EPD-WBB-20130080-IBA1-DE**

Additional national approvals in Germany:

- Building materials: Z-56.4212-993
- FK90K fire dampers are essentially made from non-combustible building materials.

Casing and exchangeable damper blade made of abrasion- and corrosion-resistant calcium silicate, galvanized steel components. Connection profiles for connections with screws, clamps and sliding rails. Permanently durable elastomer lip seals in walls of casing. Leak tightness class C according to EN 1751.

Option: galvanized steel components (connection profiles) also with epoxy resin powder coating.

Enclosed, maintenance-free drive mechanism in the area of the casing wall as a self-locking transmission for break-proof torque transmission. Sealed drive axles made of stainless steel, with red metal bearings. Thermal release mechanisms for 70°C or 95°C nominal temperature. The operation units can be actuated manually or electrically. → see page 4

Release mechanisms, operation units and electric actuators are enclosed and fitted with spring returns. They are maintenance-free, can be connected in a form-locking or

force-fitting manner, are easy to replace and can be easily retrofitted as required.

For installation with horizontal or vertical damper blade axles. Air inflow from any connection side. Connection to ventilation ducts made of non-combustible or combustible materials, including protective grilles.

Options:

- With **installation subframe ER5** for sliding ceiling connections with drops of up to 40 mm in metal stud walls with cladding on both sides.
→ see pages 6, 22 to 24, 35
- With **set of gaskets DS** for installation remote from rigid walls and ceilings and metal stud walls.
→ see pages 6, 28 to 33, 35

Widths B [mm]: 100 - 150 - 200 - 250 - 300
400 - 500 - 600 - 700 - 800

Heights H [mm]: 100 - 125 - 150 - 175 - 200 - 225 - 250

Length L [mm]: 260

All dimensions can be combined.

FK90K fire dampers in these sizes achieve fire resistance periods of up to 90 minutes if they are installed in accordance with the following stipulations.

Installation types in or removed from rigid walls and ceilings and metal stud walls with a minimum thickness and fire resistance period are possible.

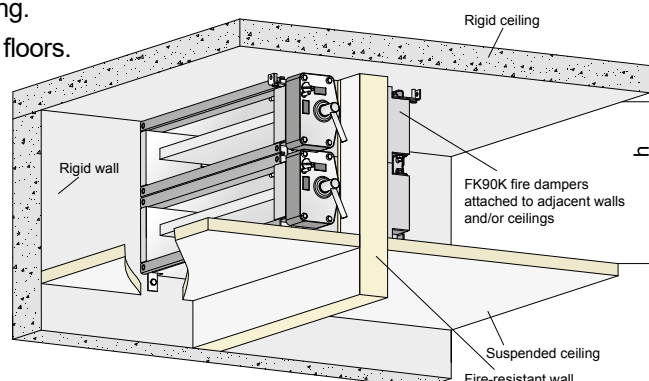
If the walls, ceilings have a fire resistance period of less than 90 or 60 minutes, the fire resistance period of the FK90K fire damper is reduced accordingly; partly if the minimum thickness is lower.

Particularly suitable in situations where limited space is available for installation

Example of installation in suspended ceiling.

The same method can be used for raised floors.

Ventilation ducts are not shown.



Minimum dimension h = 145 mm, when using one FK90K fire damper with H = 100 mm.

In this example h ≥ 290 mm with two FK90K fire dampers in a stacked arrangement.

FK90K fire dampers

Release mechanisms and actuators

FK90K fire dampers, series FK92K, are fitted with maintenance-free thermal-mechanical release mechanisms or with thermal-electrical release mechanisms on the spring return actuators. **Release** occurs at a nominal temperature of **70°C** or **95°C**. Coated release elements provide increased corrosion protection.

Electric spring return actuators also close the fire dampers if the supply voltage is interrupted. They reopen the fire dampers as soon as the voltage is present again.

Release mechanisms and operation units can be replaced on site!

Thermal-mechanical release mechanism - Standard - with 70°C release element; protection class IP54.

Option: with coated 70°C release element.

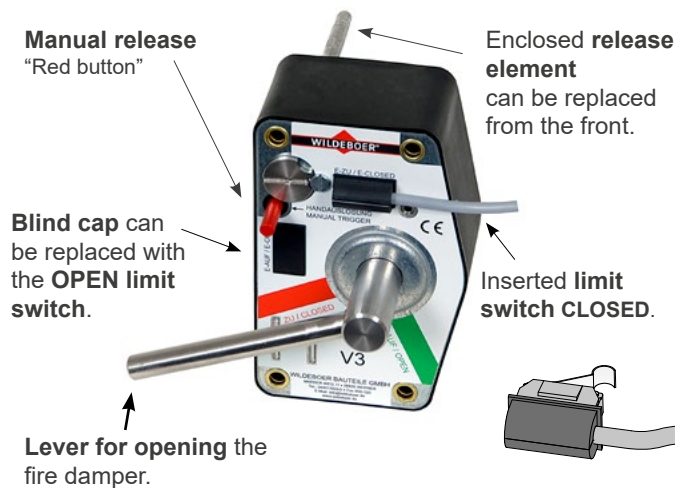
Option: with coated 95°C release element.

Option: with **limit switch**

E Changeover with gold-plated contacts for 5 A at 250 V AC or 24 V DC; protection class IP67; 1 m silicone free connection cable 3 x 0.34 mm².

One or two can be plugged in for the CLOSED and/or OPEN position indicator instead of blind caps.

Option: with **remote release**, mounted on thermal-mechanical release mechanism. ⇒ see page 35



Option: **Electric spring return actuator - Standard** - with 70°C release element; protection class IP54.

M220-10/H 230 V AC; 6.5 VA / 3 W; $I_{\max \leq 5 \text{ ms}} = 4 \text{ A}$

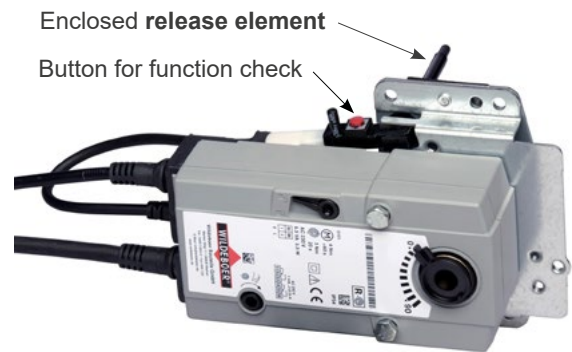
M24-10/H 24 V AC/DC; 4 VA / 2.5 W; $I_{\max \leq 5 \text{ ms}} = 8.3 \text{ A}$

Runtime: Opening < 60 s, closing ≈ 20 s

CLOSED/OPEN position indicators via limit switches for 0.5 A at ≤ 250 V AC or for 1 mA up to 3 A at 5 up to 250 V DC.

Halogen-free connection cable; 1 m long; 2 x 0.75 mm² and 6 x 0.75 mm². The AMP connector plugs are detachable.

Option: with 95°C release element.



Option: **Electric spring return actuator**

with 70°C release element; protection class IP54.

M220-9/H 230 V AC; 9,2 VA; $I_{\max \leq 2 \text{ ms}} = 0.27 \text{ A}$.

M24-9/H 24 V AC/DC; 6.1 VA / 3.5 W; $I_{\max \leq 2 \text{ ms}} = 3.5 \text{ A}$.

Runtime: Opening ≈ 60 s, closing ≈ 21 s.

CLOSED/OPEN position indicators via limit switch for 5 A at ≤ 240 V AC.

Halogen-free connection cable; 0.9 m long; 2 x 0.75 mm² and 6 x 0.75 mm². The AMP connector plugs are detachable.

Option: with 95°C release element.



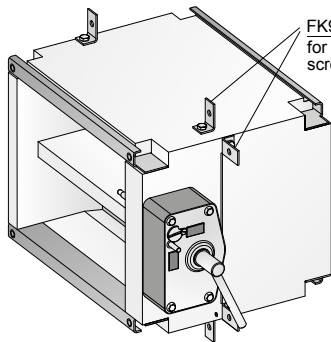
FK90K fire dampers

Special installation types, installation locations, hygiene

Fasten fire dampers in walls and ceilings so they are protected from shearing.

This is done in or on the walls and ceilings to be protected. With FK90K fire dampers, fastening to adjacent walls and ceilings is also possible.

Fastening to walls and ceilings to be protected

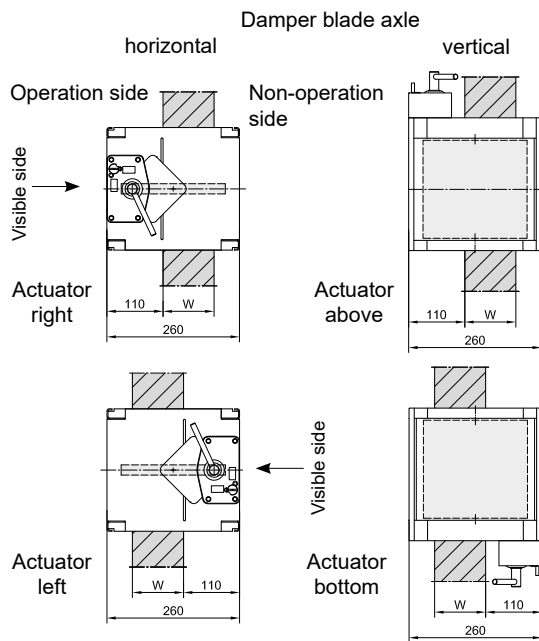


FK90K corner bracket for attachment by screw mounting

Use of FK90K angle bracket
⇒ see pages 14 to 33

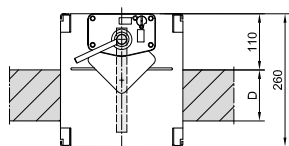
With larger wall thicknesses, the FK90K angle brackets on the reverse side are within the walls. Openings in the wall must be sealed using a suitable material; mineral wool or gypsum joint filler as applicable.

Horizontal installation positions W = Wall

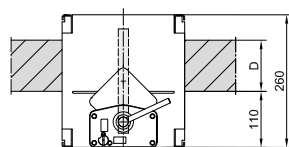


Vertical installation positions

D = ceiling
Horizontal damper blade axle



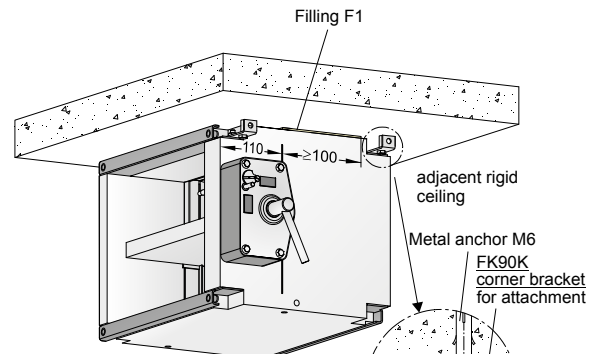
Actuator above the ceiling



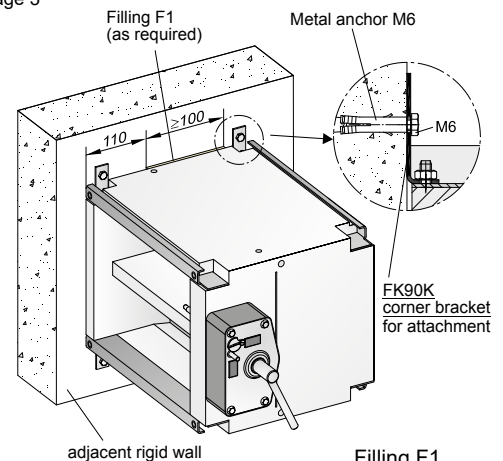
Actuator underneath the ceiling

The release mechanisms and actuators are always located to the H-side on the casing of the fire dampers. ↑ see pages 6 and 7

Fastening to adjacent walls, ceilings, floors



FK90K corner bracket can also be turned through 90° and mounted on the operation side.
⇒ see page 3



Filling F1
⇒ see page 16

FK90K fire dampers

- satisfy the **hygiene requirements** according to VDI 6022-1, VDI 3803-1, DIN EN 13779
- do not **promote the growth of microorganisms¹⁾ (fungi, bacteria)**. This reduces the risk of infection for people and also the necessary cleaning and disinfection work!
- are **resistant to disinfectants²⁾**

www.HYG.de **Geprüfte Qualität**

Hygiene-Institut
des Ruhrgebiets
Institut für Umwelthygiene und Toxikologie

HY *geprüft*

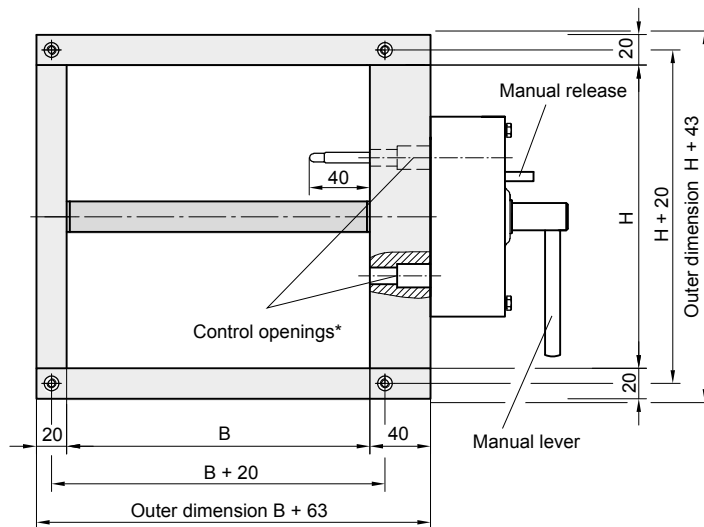
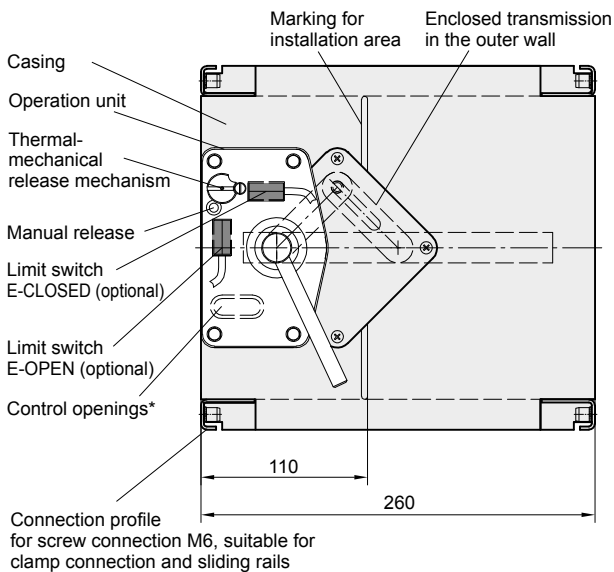
Nur gültig in Verbindung mit zugehörigem Zertifikat unter [www.wildeboer.de!](http://www.wildeboer.de)

¹⁾ The corresponding **resistance of the materials to fungi and bacteria** was verified by testing the microbial metabolic potential according to DIN EN ISO 846 for all materials in the FK90K fire dampers.

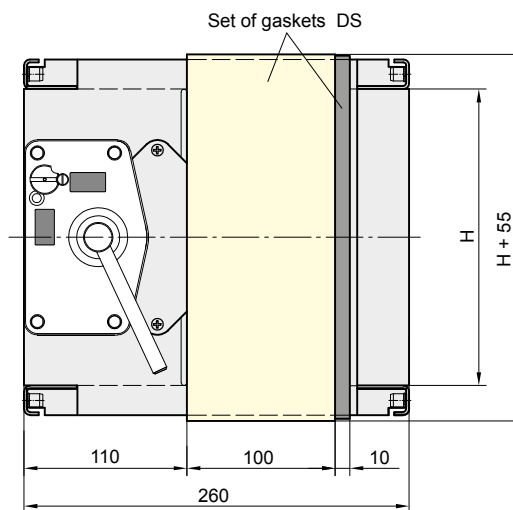
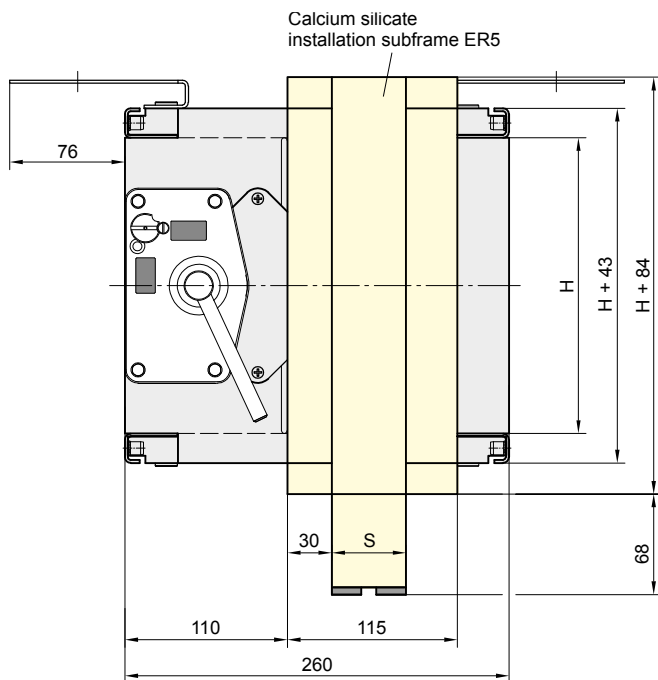
²⁾ The **resistance to disinfectants** of the materials in the FK90K fire dampers was tested with the disinfectant groups of active ingredients **alcohol and quaternary compounds**. These disinfectants are on the list by the Robert Koch Institute, and were used in accordance with the specifications in the list of disinfectants by the Disinfectants Commission in the German Association for Applied Hygiene (VAH). It has been verified that FK90K fire dampers can withstand normal use of disinfectants and disinfection methods.

FK90K fire dampers

Data sheet (1)



* Two control openings below the release mechanism



FK90K fire damper with installation subframe ER5 made of calcium silicate, for sliding ceiling connections with drops up to 40 mm in metal stud walls with cladding on both sides.

Stud profile depths $s = 50 \text{ mm}$ to 125 mm .

Factory-assembled.

⇒ see pages 22 to 24, 35

Weight allowance +70% in addition to standard weight.

⇒ see page 28

FK90K fire damper with set of gaskets DS

For installation remote from rigid walls and ceilings and from metal stud walls with cladding on both sides.

⇒ see pages 28 to 33, 35

All dimensions in mm

FK90K fire dampers

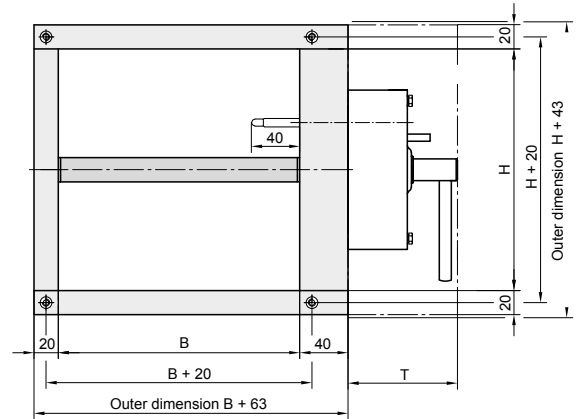
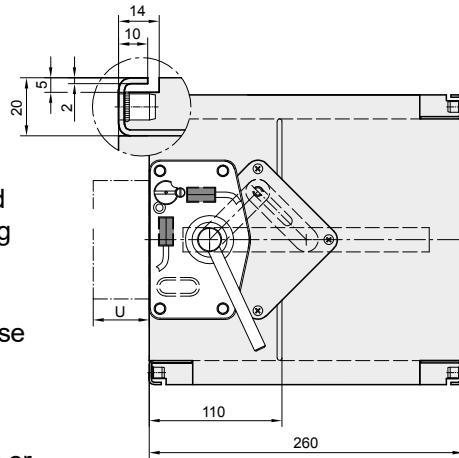
Data sheet (2)

Maximum excess lengths of mechanical and electrical equipment parts.

Additional space must be provided for installation, electrical connections and maintenance; observe the cable entry points.

Damper blade: It is situated inside the fire damper casing even in the open position. Thus no excess length!

To allow access to the release mechanisms and actuators for operational reasons, a clearance, in addition to "T", from adjacent walls, ceilings or other fire dampers of 400 mm is recommended.



All dimensions in mm

Thermal-mechanical release mechanisms are marked with **V3** or **V5**. The height-dependent allocations must not be changed!

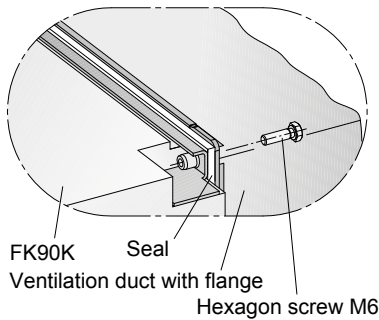
H	
< 175	V5
≥ 175	V3

Size-independent excess lengths

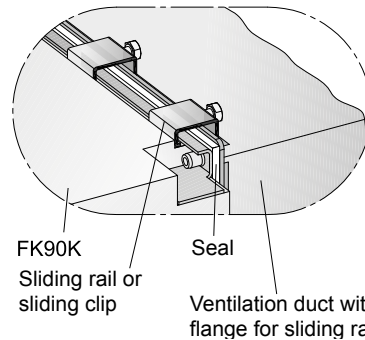
	T	U
Thermal-mechanical release mechanism	95	-
Actuators M220-10/H, M24-10/H	75	140
Actuators M220-9/H, M24-9/H	90	120

Ventilation duct connections

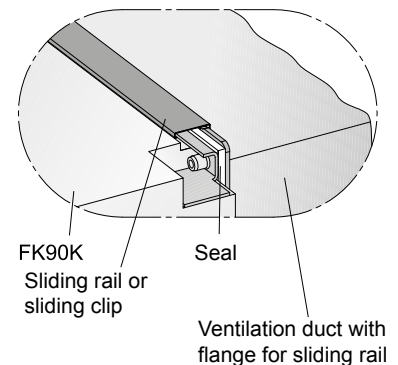
- with screws



- with screw terminals



- with sliding rails

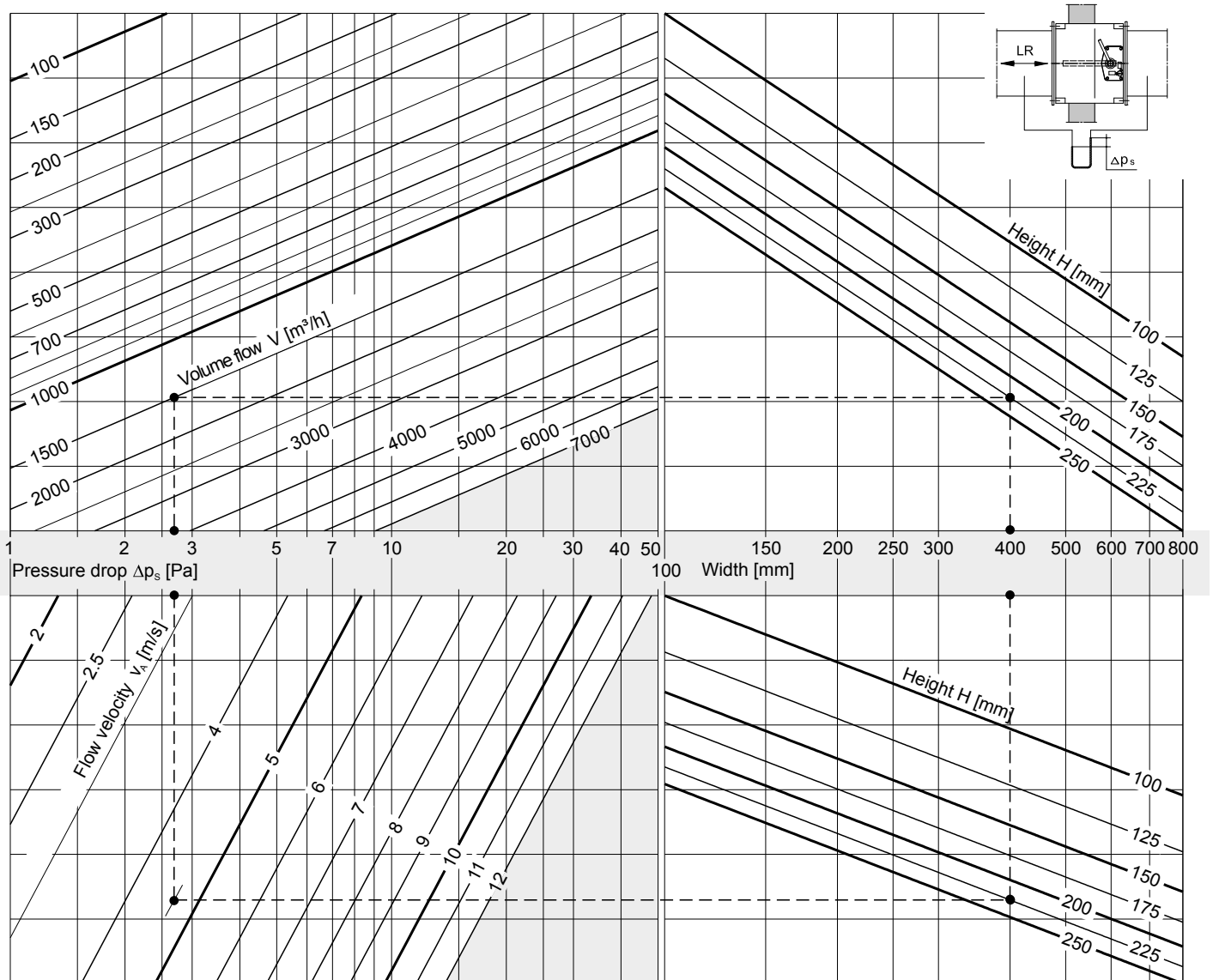


Operating range, closing and opening

- FK90K fire dampers are suitable for volume flows up to 7000 m³/h, inflow velocities of up to 12 m/s and operating pressures of up to 1500 Pa.
- The application boundaries marked in the nomograms must be complied with. ⇒ see pages 8 to 11
- FK90K fire dampers are quick-closing, apart from the versions with electric actuators. Due to the flow dynamics, if the fire damper is triggered at high inflow velocities, this may cause pressure surges accompanied by multiplication of operating pressures, which in turn may lead to considerable damage to the ventilation and air conditioning system. Additionally, when shut-off dampers are closed, the volume flows are distributed among other parallel dampers that are still open. This may lead to excessive stress, in particular at high operating pressures, large volume flows and large cross-sections. Electric actuators should be used under such conditions. These actuators close the fire dampers relatively slowly and in addition, deactivation of the fan can be triggered via the OPEN limit switch.
- The torques of the electric actuators are sufficient for all fire damper sizes, which means they can be fully opened when the fan is in operation.
- Whenever possible, it must be ensured that the inflows and outflows at the fire dampers are the same.
- FK90K fire dampers with electric actuator can be used for OPEN/CLOSED volume flow control.

FK90K fire dampers Dimensioning (1)

Pressure drop with ventilation duct connection on both sides



Inflow cross-section A_A [m²]

H \ W	100	150	200	250	300	400	500	600	700	800
100	0.010	0.015	0.020	0.025	0.030	0.040	0.050	0.060	0.070	0.080
125	0.013	0.019	0.025	0.031	0.038	0.050	0.063	0.075	0.088	0.100
150	0.015	0.023	0.030	0.038	0.045	0.060	0.075	0.090	0.105	0.120
175	0.018	0.026	0.035	0.044	0.053	0.070	0.088	0.105	0.123	0.140
200	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120	0.140	0.160
225	0.023	0.034	0.045	0.056	0.068	0.090	0.113	0.135	0.158	0.180
250	0.025	0.038	0.050	0.063	0.075	0.100	0.125	0.150	0.175	0.200

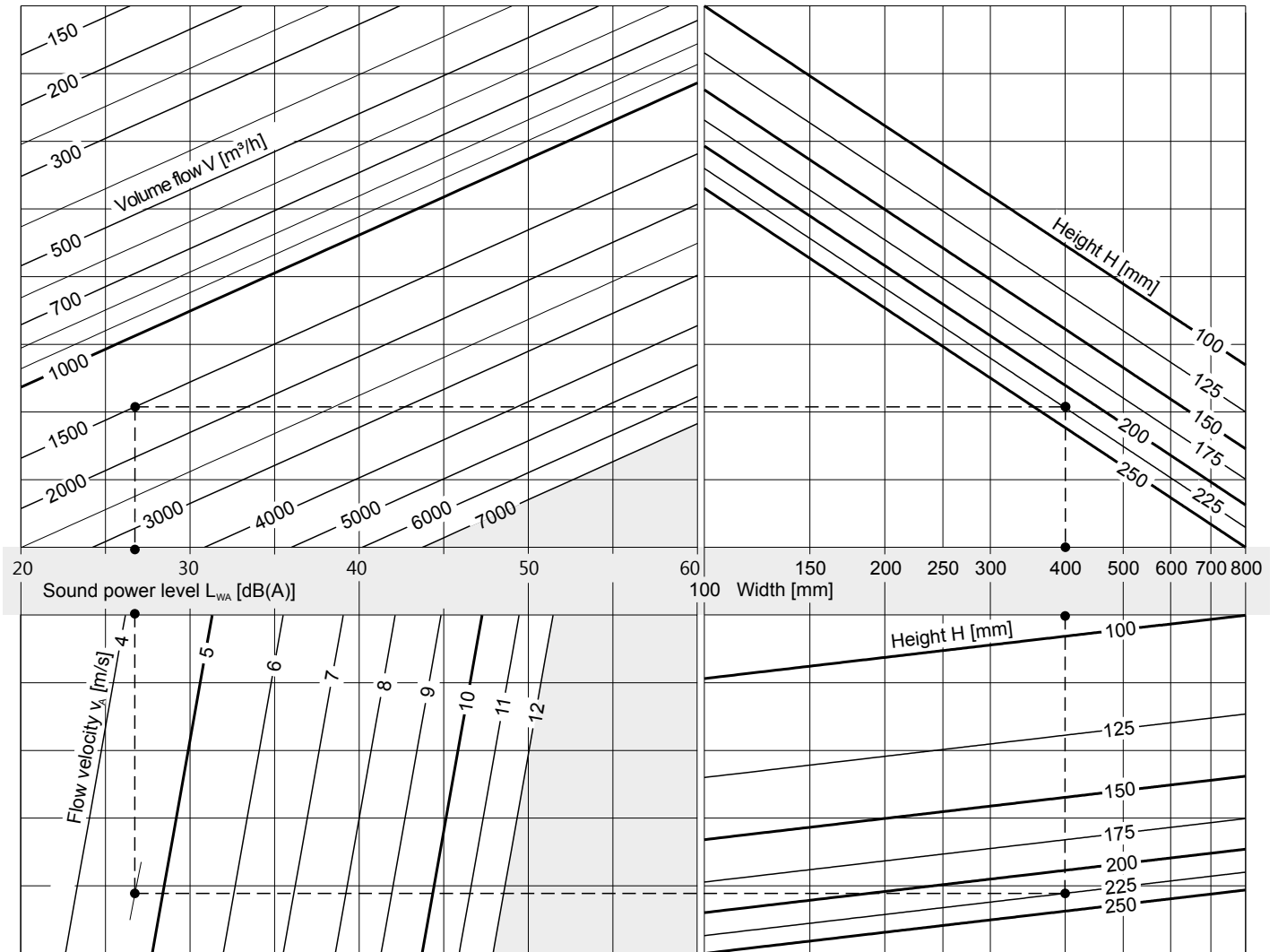
Free cross-section A_{free} [m²]

H \ W	100	150	200	250	300	400	500	600	700	800
100	0.008	0.012	0.016	0.020	0.024	0.032	0.040	0.048	0.056	0.064
125	0.011	0.016	0.021	0.026	0.032	0.042	0.053	0.063	0.074	0.084
150	0.013	0.020	0.026	0.033	0.039	0.052	0.065	0.078	0.091	0.104
175	0.016	0.023	0.031	0.039	0.047	0.062	0.078	0.093	0.109	0.124
200	0.018	0.027	0.036	0.045	0.054	0.072	0.090	0.108	0.126	0.144
225	0.021	0.031	0.041	0.051	0.062	0.082	0.103	0.123	0.144	0.164
250	0.023	0.035	0.046	0.058	0.069	0.092	0.115	0.138	0.161	0.184

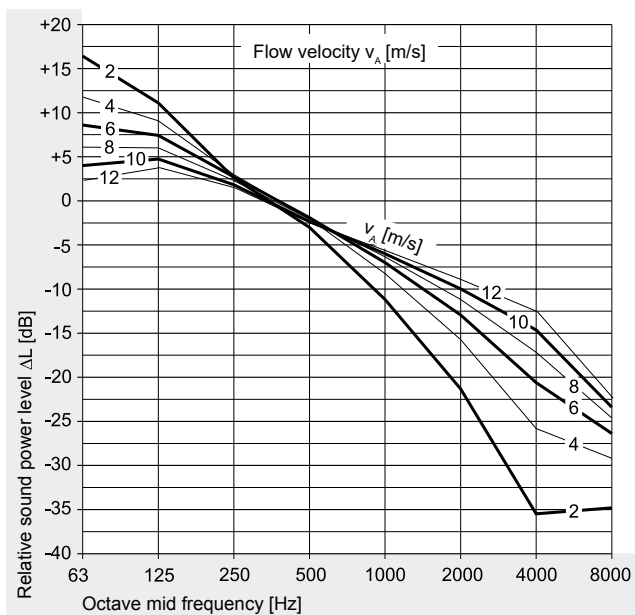
Nomenclature ⇒ see page 10

FK90K fire dampers Dimensioning (2)

Sound power level with ventilation duct connection on both sides



Relative sound power level ΔL



Example:

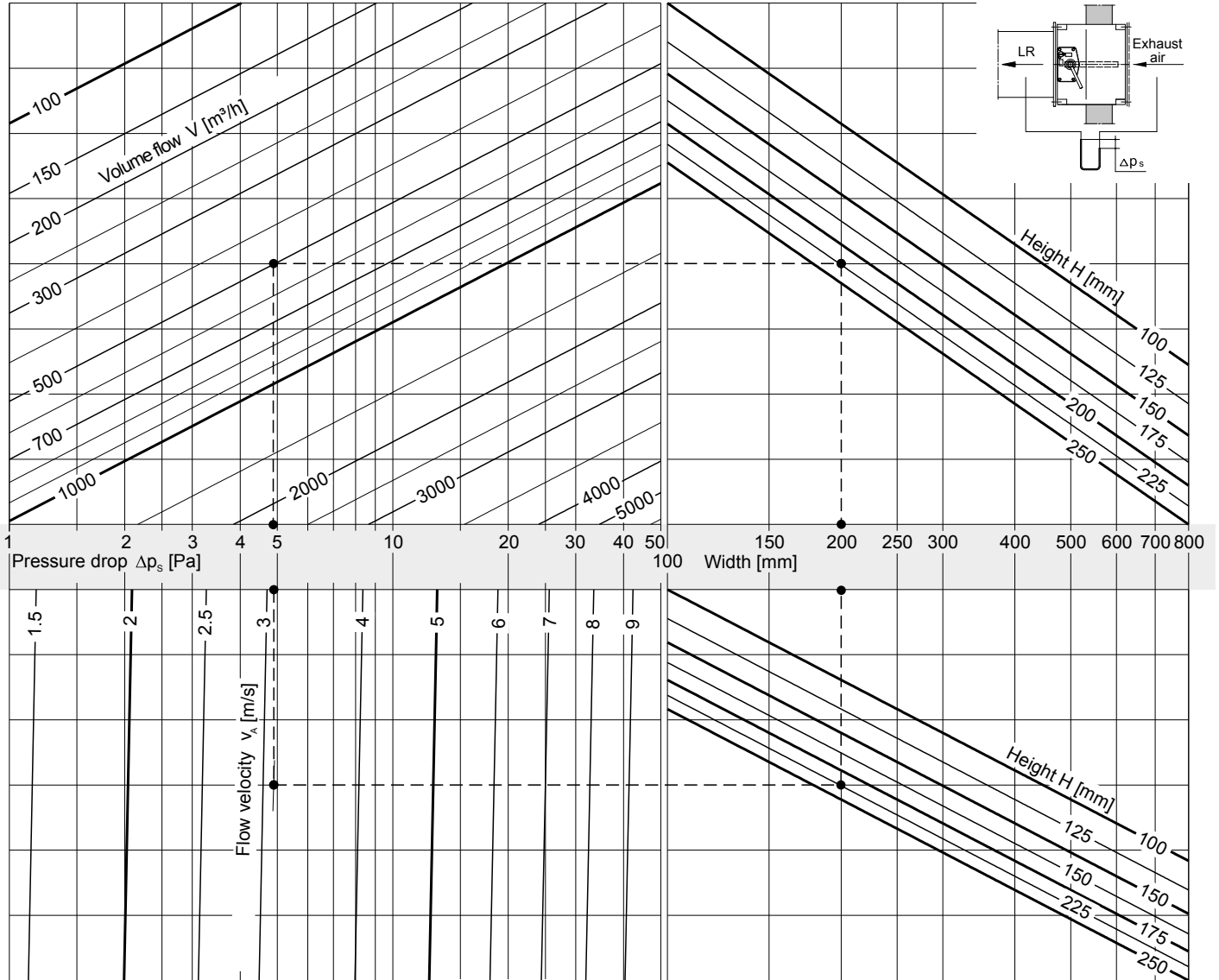
- V = 1500 m³/h
- B = 400 mm
- H = 225 mm
- A_A = 0.09 m²
- A_{free} = 0.082 m²
- Δp_s = 2.7 Pa
- v_A = 4.6 m/s
- L_{WA} = 27 dB(A)

Sound power level L_{W-Oct} for the octave mid frequencies

f [Hz]	63	125	250	500	1000	2000	4000	8000
L _{WA} [dB(A)]	27	27	27	27	27	27	27	27
ΔL _{4.6 m/s} [dB]	11	9	3	-2	-8	-15	-24	-28
L _{W-Oct} [dB]	38	36	30	25	19	12	3	-

FK90K fire dampers Dimensioning (3)

Pressure drop with ventilation duct connection on one side, and free incoming flow with protective grille



Inflow cross-section A_A [m²]

H \ W	100	150	200	250	300	400	500	600	700	800
100	0.010	0.015	0.020	0.025	0.030	0.040	0.050	0.060	0.070	0.080
125	0.013	0.019	0.025	0.031	0.038	0.050	0.063	0.075	0.088	0.100
150	0.015	0.023	0.030	0.038	0.045	0.060	0.075	0.090	0.105	0.120
175	0.018	0.026	0.035	0.044	0.053	0.070	0.088	0.105	0.123	0.140
200	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.120	0.140	0.160
225	0.023	0.034	0.045	0.056	0.068	0.090	0.113	0.135	0.158	0.180
250	0.025	0.038	0.050	0.063	0.075	0.100	0.125	0.150	0.175	0.200

Free cross-section [m²] including protective grille

H \ W	100	150	200	250	300	400	500	600	700	800
100	0.008	0.012	0.016	0.020	0.024	0.032	0.040	0.048	0.056	0.064
125	0.010	0.015	0.020	0.025	0.030	0.040	0.050	0.060	0.070	0.080
150	0.012	0.018	0.024	0.030	0.036	0.048	0.060	0.072	0.084	0.096
175	0.014	0.021	0.028	0.035	0.042	0.056	0.070	0.083	0.098	0.112
200	0.016	0.024	0.032	0.040	0.048	0.064	0.080	0.095	0.111	0.128
225	0.018	0.027	0.036	0.045	0.054	0.072	0.090	0.107	0.125	0.143
250	0.020	0.030	0.040	0.050	0.060	0.080	0.100	0.119	0.139	0.159

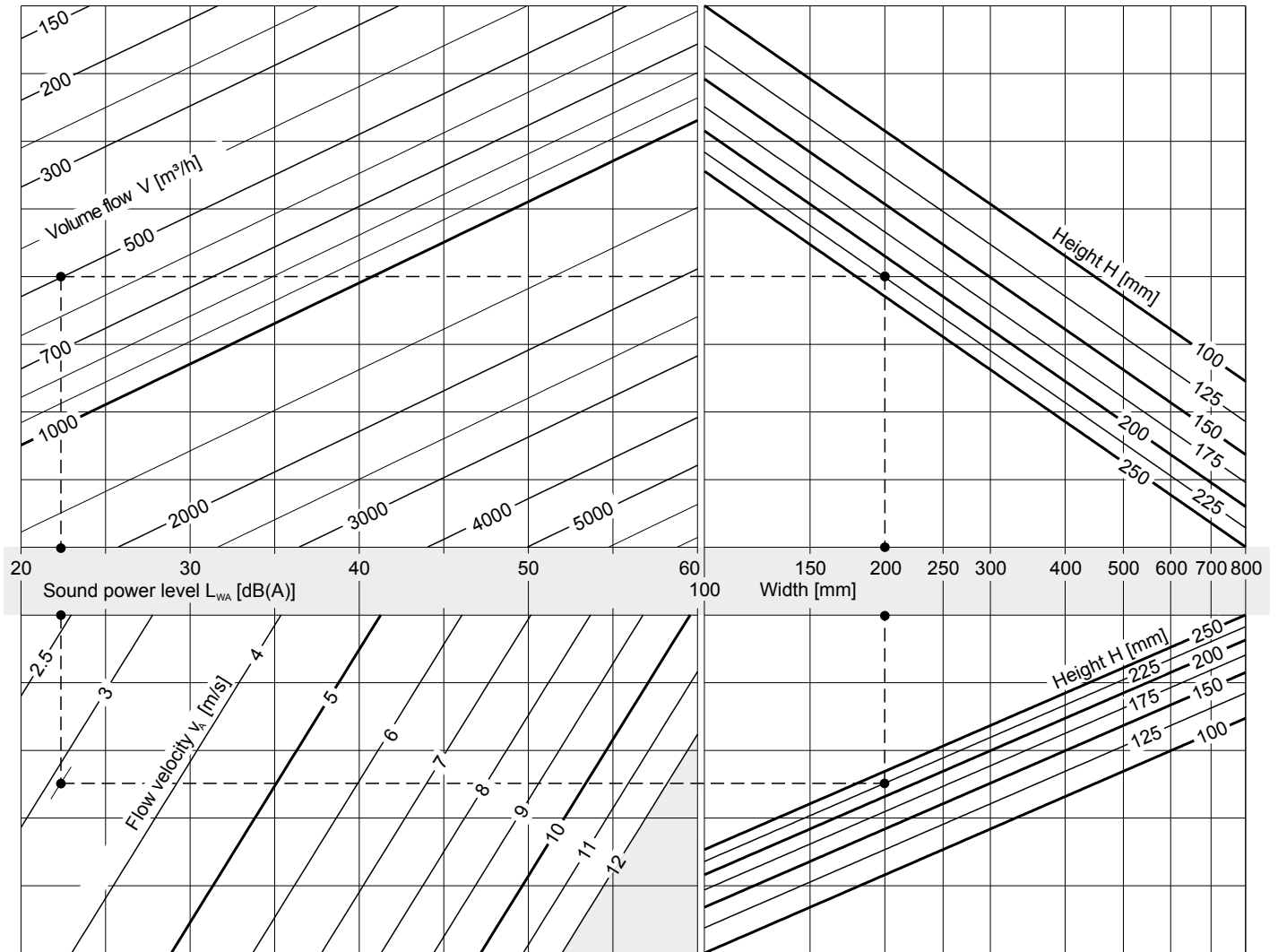
Nomenclature

B [mm]	Width	v_A [m/s]	Flow velocity in inflow cross-section (inflow velocity)	L_{W-Oct} [dB]	Octave sound power level
H [mm]	Height	Δp_s [Pa]	Static pressure drop	ΔL [dB]	Relative sound power level to L_{WA}
A_A [m ²]	Inflow cross-section B x H	L_{WA} [dB(A)]	A-weighted, area-corrected sound power level	f [Hz]	Octave mid frequency
A_{free} [m ²]	Free cross-section				
V [m ³ /h]	Volume flow				

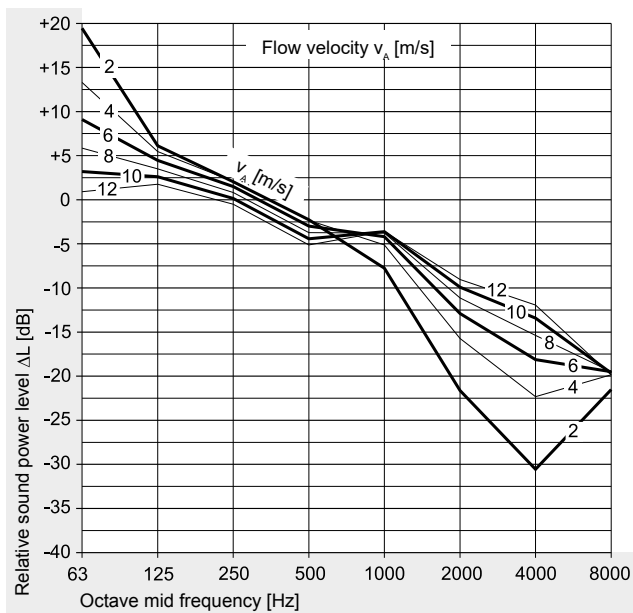
$L_{W-Oct} = L_{WA} + \Delta L$

FK90K fire dampers Dimensioning (4)

Sound power level with ventilation duct connection on one side, and free incoming flow with protective grille



Relative sound power level ΔL



Example:

- V = 500 m³/h
- B = 200 mm
- H = 225 mm
- A_A = 0.045 m²
- A_{free} = 0.041 m², or 0.036 m² with protective grille
- Δp_s = 4.9 Pa
- v_A = 3.1 m/s
- L_{WA} = 22 dB(A)

Sound power level L_{W-Oct} for the octave mid frequencies

f [Hz]	63	125	250	500	1000	2000	4000	8000
L _{WA} [dB(A)]	22	22	22	22	22	22	22	22
ΔL _{3.1 m/s} [dB]	16	6	2	-2	-6	-18	-25	-20
L _{W-Oct} [dB]	38	28	24	20	16	4	-	2

FK90K fire dampers Fast selection (1)

Ventilation duct connection on both sides

Volume flow V [m³/h] (pressure drop Δp_s [Pa]) for specified sound power level L_{WA} [dB(A)]

H \ B	100	150	200	250	300	400	500	600	700	800	
$L_{WA} = 20$ [dB(A)]	100	110 (4)	170 (3)	220 (3)	280 (3)	340 (3)	440 (3)	550 (2)	670 (2)	770 (2)	880 (2)
	125	150 (4)	220 (3)	290 (3)	370 (3)	440 (3)	580 (2)	730 (2)	870 (2)	1010 (2)	1150 (2)
	150	180 (3)	270 (3)	360 (3)	450 (3)	540 (2)	720 (2)	900 (2)	1070 (2)	1250 (2)	1430 (2)
	175	220 (3)	330 (3)	430 (3)	540 (2)	640 (2)	850 (2)	1060 (2)	1270 (2)	1490 (2)	1690 (2)
	200	250 (3)	380 (3)	500 (2)	620 (2)	750 (2)	990 (2)	1230 (2)	1480 (2)	1720 (2)	1960 (2)
	225	290 (3)	430 (3)	570 (2)	710 (2)	850 (2)	1130 (2)	1410 (2)	1680 (2)	1960 (2)	2230 (2)
	250	320 (3)	480 (3)	640 (2)	790 (2)	950 (2)	1260 (2)	1570 (2)	1880 (2)	2190 (2)	2500 (2)
H/B	100	150	200	250	300	400	500	600	700	800	
$L_{WA} = 25$ [dB(A)]	100	140 (6)	210 (5)	280 (5)	350 (4)	420 (4)	550 (4)	690 (3)	830 (3)	960 (3)	1100 (3)
	125	180 (5)	270 (4)	370 (4)	460 (4)	550 (4)	720 (3)	900 (3)	1080 (3)	1260 (3)	1430 (3)
	150	230 (5)	340 (4)	450 (4)	560 (4)	670 (3)	890 (3)	1110 (3)	1330 (3)	1550 (3)	1770 (3)
	175	270 (5)	400 (4)	540 (4)	670 (4)	800 (3)	1060 (3)	1320 (3)	1580 (3)	1840 (3)	2100 (3)
	200	310 (4)	470 (4)	620 (4)	770 (3)	930 (3)	1230 (3)	1530 (3)	1840 (3)	2140 (3)	2440 (2)
	225	360 (4)	530 (4)	710 (3)	880 (3)	1050 (3)	1400 (3)	1750 (3)	2080 (3)	2430 (2)	2770 (2)
	250	400 (4)	600 (4)	790 (3)	990 (3)	1180 (3)	1570 (3)	1950 (3)	2340 (2)	2720 (2)	3100 (2)
H/B	100	150	200	250	300	400	500	600	700	800	
$L_{WA} = 30$ [dB(A)]	100	180 (9)	260 (7)	350 (7)	430 (6)	520 (6)	690 (5)	860 (5)	1030 (5)	1190 (5)	1360 (4)
	125	230 (8)	340 (7)	450 (6)	570 (6)	680 (6)	900 (5)	1120 (5)	1340 (4)	1560 (4)	1780 (4)
	150	280 (7)	420 (6)	560 (6)	700 (5)	840 (5)	1110 (5)	1380 (4)	1660 (4)	1930 (4)	2200 (4)
	175	340 (7)	500 (6)	670 (6)	830 (5)	990 (5)	1320 (4)	1640 (4)	1970 (4)	2290 (4)	2620 (4)
	200	390 (7)	580 (6)	770 (5)	960 (5)	1150 (5)	1530 (4)	1900 (4)	2280 (4)	2660 (4)	3030 (3)
	225	440 (6)	660 (6)	880 (5)	1090 (5)	1310 (4)	1740 (4)	2170 (4)	2600 (4)	3020 (3)	3440 (3)
	250	500 (6)	740 (5)	980 (5)	1230 (5)	1470 (4)	1950 (4)	2430 (4)	2910 (4)	3380 (3)	3860 (3)
H/B	100	150	200	250	300	400	500	600	700	800	
$L_{WA} = 35$ [dB(A)]	100	220 (13)	320 (11)	430 (10)	540 (10)	640 (9)	850 (8)	1060 (8)	1270 (7)	1480 (7)	1690 (7)
	125	280 (11)	420 (10)	560 (9)	700 (9)	840 (8)	1120 (8)	1390 (7)	1670 (7)	1940 (6)	2210 (6)
	150	350 (11)	520 (9)	700 (9)	870 (8)	1040 (8)	1380 (7)	1720 (7)	2060 (6)	2390 (6)	2730 (6)
	175	420 (10)	620 (9)	830 (8)	1030 (8)	1230 (7)	1640 (7)	2040 (6)	2450 (6)	2850 (6)	3250 (5)
	200	480 (10)	720 (9)	960 (8)	1200 (7)	1430 (7)	1900 (6)	2370 (6)	2830 (6)	3300 (5)	3760 (5)
	225	550 (9)	820 (8)	1090 (8)	1360 (7)	1630 (7)	2160 (6)	2690 (6)	3220 (5)	3750 (5)	4280 (5)
	250	620 (9)	920 (8)	1220 (7)	1520 (7)	1820 (6)	2420 (6)	3020 (5)	3610 (5)	4200 (5)	4800 (5)
H/B	100	150	200	250	300	400	500	600	700	800	
$L_{WA} = 40$ [dB(A)]	100	270 (19)	400 (17)	540 (16)	670 (14)	800 (14)	1060 (12)	1320 (11)	1580 (11)	1840 (10)	2100 (10)
	125	350 (17)	530 (16)	700 (14)	870 (13)	1040 (12)	1390 (11)	1730 (11)	2070 (10)	2410 (9)	2750 (9)
	150	440 (17)	650 (14)	870 (13)	1080 (12)	1290 (12)	1710 (11)	2130 (10)	2550 (9)	2970 (9)	3390 (8)
	175	520 (16)	770 (14)	1030 (12)	1280 (12)	1530 (11)	2040 (10)	2540 (9)	3040 (9)	3540 (8)	4040 (8)
	200	600 (15)	900 (13)	1190 (12)	1480 (11)	1780 (10)	2360 (9)	2940 (9)	3520 (8)	4100 (8)	4680 (8)
	225	680 (14)	1020 (12)	1350 (11)	1690 (11)	2020 (10)	2680 (9)	3350 (9)	4000 (8)	4660 (8)	5310 (7)
	250	770 (14)	1140 (12)	1520 (11)	1890 (10)	2260 (10)	3010 (9)	3740 (8)	4480 (8)	5220 (7)	5950 (7)
H/B	100	150	200	250	300	400	500	600	700	800	
$L_{WA} = 45$ [dB(A)]	100	340 (30)	500 (26)	670 (24)	830 (22)	990 (20)	1320 (19)	1640 (17)	1970 (16)	2290 (16)	2610 (15)
	125	440 (27)	660 (24)	870 (22)	1080 (20)	1300 (19)	1720 (17)	2150 (16)	2570 (15)	2990 (14)	3420 (14)
	150	540 (25)	810 (22)	1070 (20)	1340 (19)	1600 (18)	2130 (16)	2650 (15)	3180 (14)	3700 (13)	4220 (13)
	175	650 (24)	960 (21)	1280 (19)	1590 (18)	1910 (17)	2530 (15)	3150 (14)	3780 (13)	4400 (13)	5010 (12)
	200	750 (23)	1110 (20)	1480 (18)	1840 (17)	2210 (16)	2930 (14)	3650 (13)	4380 (13)	5100 (12)	5810 (11)
	225	850 (22)	1270 (19)	1680 (17)	2100 (16)	2510 (15)	3330 (14)	4160 (13)	4970 (12)	5790 (12)	6600 (11)
	250	950 (21)	1420 (18)	1890 (17)	2350 (15)	2810 (15)	3740 (13)	4650 (12)	5570 (12)	6490 (11)	
H/B	100	150	200	250	300	400	500	600	700	800	
$L_{WA} = 50$ [dB(A)]	100	420 (46)	620 (39)	830 (36)	1030 (33)	1230 (31)	1640 (29)	2040 (27)	2440 (25)	2850 (24)	3250 (23)
	125				1350 (31)	1610 (29)	2140 (26)	2670 (24)	3190 (23)	3720 (22)	4240 (21)
	150										
	175										
	200										
	225										
	250										

FK90K fire dampers Fast selection (2)

With ventilation duct connection on one side, and free incoming flow with protective grille

Volume flow V [m³/h] (pressure drop Δp_s [Pa]) for specified sound power level L_{WA} [dB(A)]

H \ B	100	150	200	250	300	400	500	600	700	800	
$L_{WA} = 20$ [dB(A)]	100	130 (7)	180 (6)	230 (6)	280 (5)	330 (5)	410 (5)	500 (4)	580 (4)	670 (4)	740 (4)
	125	160 (7)	220 (6)	280 (5)	340 (5)	390 (5)	500 (4)	610 (4)	700 (4)	800 (4)	900 (4)
	150	180 (6)	260 (6)	330 (5)	390 (5)	460 (5)	580 (4)	700 (4)	820 (4)	940 (4)	1050 (3)
	175	210 (6)	290 (5)	370 (5)	450 (5)	520 (4)	670 (4)	800 (4)	940 (4)	1070 (3)	1190 (3)
	200	230 (6)	330 (5)	410 (5)	500 (4)	580 (4)	740 (4)	900 (4)	1050 (3)	1190 (3)	1340 (3)
	225	260 (6)	360 (5)	460 (5)	550 (4)	640 (4)	820 (4)	990 (4)	1160 (3)	1320 (3)	1480 (3)
	250	280 (5)	390 (5)	500 (4)	610 (4)	700 (4)	900 (4)	1080 (3)	1260 (3)	1440 (3)	1610 (3)
$L_{WA} = 25$ [dB(A)]	100	160 (11)	220 (9)	280 (8)	340 (8)	390 (7)	500 (7)	600 (6)	710 (6)	800 (6)	900 (5)
	125	190 (10)	260 (8)	340 (8)	410 (7)	470 (7)	600 (6)	730 (6)	850 (6)	970 (5)	1080 (5)
	150	220 (9)	310 (8)	390 (7)	470 (7)	550 (6)	710 (6)	850 (6)	990 (5)	1130 (5)	1270 (5)
	175	250 (9)	350 (8)	450 (7)	540 (6)	630 (6)	800 (6)	970 (5)	1130 (5)	1290 (5)	1440 (5)
	200	280 (8)	390 (7)	500 (7)	600 (6)	710 (6)	900 (5)	1080 (5)	1270 (5)	1440 (5)	1610 (4)
	225	310 (8)	430 (7)	550 (6)	670 (6)	780 (6)	990 (5)	1200 (5)	1400 (5)	1590 (4)	1780 (4)
	250	340 (8)	470 (7)	600 (6)	730 (6)	850 (6)	1080 (5)	1310 (5)	1530 (5)	1740 (4)	1940 (4)
$L_{WA} = 30$ [dB(A)]	100	190 (15)	260 (13)	340 (12)	410 (11)	480 (11)	600 (9)	730 (9)	850 (8)	970 (8)	1090 (8)
	125	230 (14)	320 (12)	410 (11)	490 (10)	570 (10)	730 (9)	880 (8)	1030 (8)	1170 (7)	1310 (7)
	150	260 (13)	370 (11)	480 (11)	570 (10)	670 (9)	850 (8)	1030 (8)	1200 (7)	1360 (7)	1530 (7)
	175	300 (12)	420 (11)	540 (10)	650 (9)	760 (9)	970 (8)	1170 (7)	1360 (7)	1560 (7)	1740 (6)
	200	340 (12)	480 (11)	600 (9)	730 (9)	850 (8)	1090 (8)	1310 (7)	1530 (7)	1740 (6)	1950 (6)
	225	370 (11)	520 (10)	670 (9)	810 (9)	940 (8)	1200 (7)	1450 (7)	1690 (7)	1920 (6)	2150 (6)
	250	410 (11)	570 (10)	730 (9)	880 (8)	1030 (8)	1310 (7)	1580 (7)	1850 (6)	2100 (6)	2350 (6)
$L_{WA} = 35$ [dB(A)]	100	230 (22)	320 (19)	410 (17)	490 (16)	570 (15)	730 (14)	880 (13)	1030(12)	1170(11)	1310(11)
	125	270 (19)	390 (18)	490 (16)	590 (15)	690 (14)	880 (13)	1070(12)	1240(11)	1410(11)	1580(10)
	150	320 (19)	450 (16)	570 (15)	690 (14)	810 (13)	1030(12)	1240(11)	1450(11)	1650(10)	1850(10)
	175	360 (17)	510 (15)	650 (14)	790 (13)	920 (13)	1170 (11)	1410(11)	1650(10)	1880(10)	2100 (9)
	200	410 (17)	570 (15)	730 (14)	880 (13)	1030 (12)	1310 (11)	1580(10)	1850(10)	2100 (9)	2360 (9)
	225	450 (16)	630 (14)	810 (13)	980 (12)	1140 (12)	1450 (11)	1750(10)	2040 (9)	2320 (9)	2600 (9)
	250	490 (16)	690 (14)	880 (13)	1070 (12)	1240 (11)	1580 (10)	1910(10)	2230 (9)	2540 (9)	2840 (8)
$L_{WA} = 40$ [dB(A)]	100	270 (30)	390 (28)	490 (24)	590 (23)	690 (21)	880 (20)	1070(18)	1240(17)	1420(17)	1590(16)
	125	330 (28)	470 (26)	590 (23)	720 (22)	840 (20)	1070 (18)	1290(17)	1500(16)	1710(15)	1920(15)
	150	390 (28)	540 (23)	690 (21)	840 (20)	980 (19)	1240 (17)	1500(16)	1750(15)	2000(15)	2230(14)
	175	440 (26)	620 (23)	790 (21)	950 (19)	1110 (18)	1420 (17)	1710(15)	2000(15)	2270(14)	2540(13)
	200	490 (24)	690 (21)	880 (20)	1070 (18)	1240 (17)	1590 (16)	1920(15)	2230(14)	2540(13)	2850(13)
	225	540 (23)	770 (21)	980 (19)	1180 (18)	1370 (17)	1750 (15)	2110(14)	2460(13)	2810(13)	3140(12)
	250	590 (23)	840 (20)	1070 (18)	1290 (17)	1500 (16)	1920 (15)	2310(14)	2690(13)	3070(12)	3430(12)
$L_{WA} = 45$ [dB(A)]	100	330 (44)	470 (40)	600 (36)	720 (33)	840 (32)	1070 (29)	1290(27)	1500(25)	1710(24)	1920(23)
	125	400 (42)	560 (36)	720 (33)	870 (31)	1010 (29)	1290 (27)	1560(25)	1810(23)	2070(22)	2310(21)
	150	470 (40)	660 (35)	840 (32)	1010 (29)	1180 (28)	1500 (25)	1810(23)	2120(22)	2410(21)	2700(20)
	175	530 (37)	750 (33)	950 (30)	1150 (28)	1340 (26)	1710 (24)	2070(22)	2410(21)	2740(20)	3070(19)
	200	600 (36)	840 (32)	1070 (29)	1290 (27)	1500 (25)	1920 (23)	2310(21)	2700(20)	3070(19)	3440(18)
	225	660 (35)	930 (31)	1180 (28)	1420 (25)	1660 (24)	2120 (22)	2560(21)	2980(19)	3390(18)	3800(18)
	250	720 (33)	1010 (29)	1290 (27)	1560 (25)	1810 (23)	2310 (21)	2790(20)	3260(19)	3710(18)	4150(17)
$L_{WA} = 50$ [dB(A)]	100	400 (65)	560 (56)	720 (52)	870 (49)	1010 (45)	1290 (42)	1560(39)	1820(37)	2070(35)	2320(33)
	125	480 (60)	680 (53)	870 (49)	1050 (45)	1220 (42)	1560 (39)	1880(36)	2190(34)	2500(32)	2790(31)
	150	560 (56)	790 (50)	1010 (45)	1220 (42)	1430 (40)	1820 (37)	2190(34)	2560(32)	2910(30)	3260(29)
	175	640 (54)	900 (47)	1150 (43)	1390 (40)	1620 (38)	2070 (35)	2500(32)	2910(30)	3320(29)	3710(28)
	200	720 (52)	1010 (45)	1290 (42)	1560 (39)	1820 (37)	2320 (33)	2790(31)	3260(29)	3710(28)	4150(26)
	225	790 (50)	1120 (44)	1430 (40)	1720 (37)	2010 (35)	2560 (32)	3090(30)	3600(28)	4100(27)	4590(26)
	250	870 (49)	1220 (42)	1560 (39)	1880 (36)	2190 (34)	2790 (31)	3380(29)	3940(27)	4480(26)	5020(25)

FK90K fire dampers

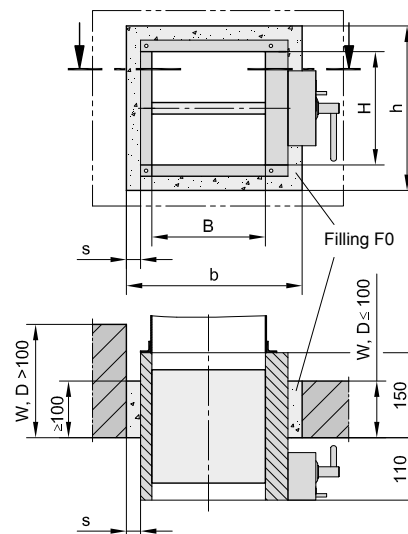
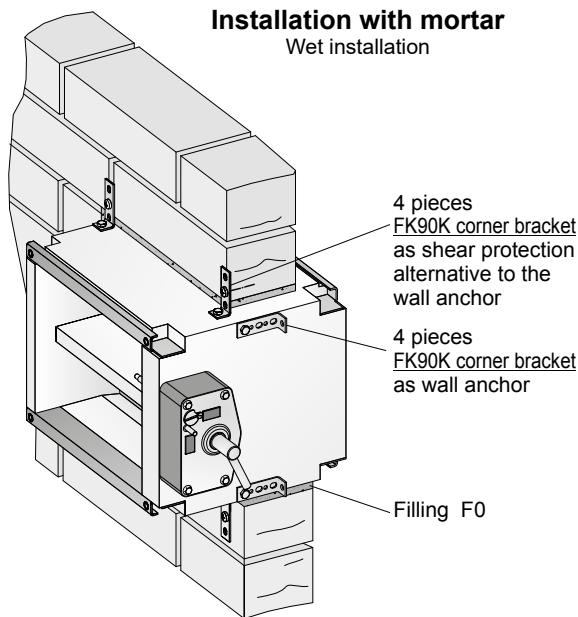
Installation in rigid walls and ceilings (1)

Installation with mortar or mineral wool

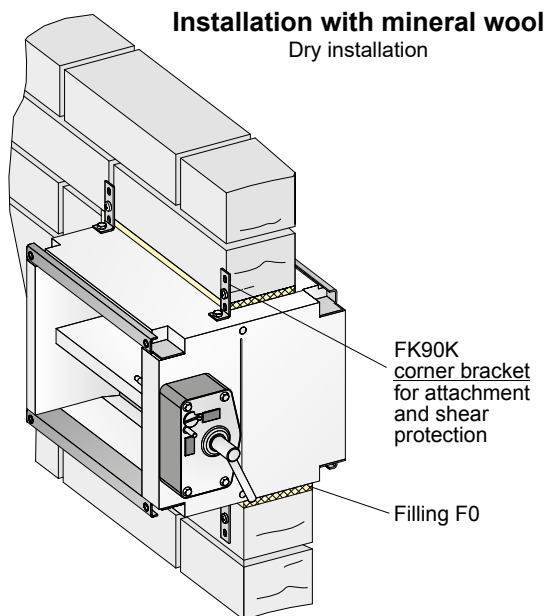
Construction types: The rigid walls and ceilings can be made of concrete, lightweight concrete, porous concrete (aerated concrete) or plaster. They can be a masonry or wallboard construction and must have a bulk density of $\geq 450 \text{ kg/m}^3$. Walls may also be configured as fire walls, shaft walls, shafts or ducts.

The **minimum thicknesses W, D [mm]** shown opposite are required to install the FK90K fire dampers:

Fire resistance period in minutes	30 60	30 60 90
Rigid walls	70	95
Rigid ceilings	-	100



A specific installation opening is not required when building the wall or ceiling!



Installation openings and filling F0

Filling gap "s" completely and continuously with fillings F0. A minimum clear width is recommended for:

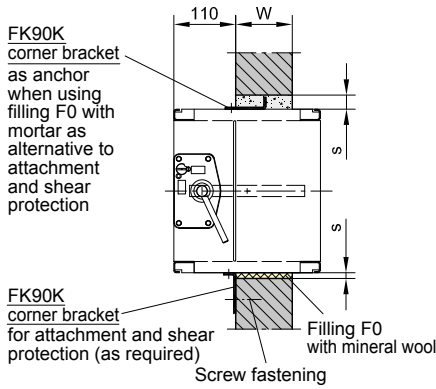
- Installation with **mortar**
 $b \times h = (B + 110 \text{ mm}) \times (H + 90 \text{ mm})$
 Then $s = 25 \text{ mm}$ as continuous gap.
 With mortar (wet installation) of group II or III according to DIN 1053 or classes M2.5, M5, M10 or M20 according to EN 998-2, or with the corresponding fire protection mortar or gypsum mortar.
- Installation with **mineral wool**
 $b \times h = (B + 100 \text{ mm}) \times (H + 80 \text{ mm})$
 Then $s = 20 \text{ mm}$ as continuous gap.
 With mineral wool (dry installation without mortar only if $s \leq 20 \text{ mm}$) as approx. 100-mm-wide plate strip or as mineral wool infill, each with a density of $\geq 80 \text{ kg/m}^3$ and melting point of $\geq 1000^\circ\text{C}$.

FK90K fire dampers, connected to ventilation ducts made of metal, but without flexible connectors, must be installed so that they are protected from shearing. When installing with mortar, the fire damper casing must bind permanently with the filling; 4 **FK90K corner brackets** can be used as wall anchors. Alternatively, **FK90K corner brackets** are suitable as screw fastenings. This can be performed on walls which are to be protected or on adjacent walls or ceilings with rigid construction types. \Rightarrow also see pages 3, 5 and 16

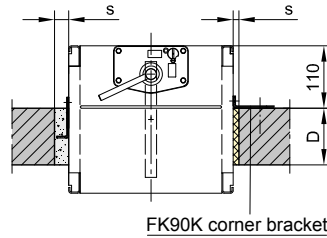
FK90K fire dampers

Installation in rigid walls and ceilings (2)

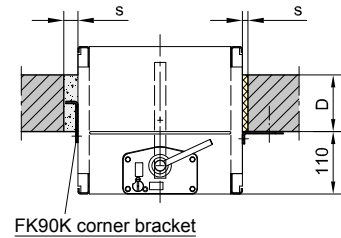
Installation in walls



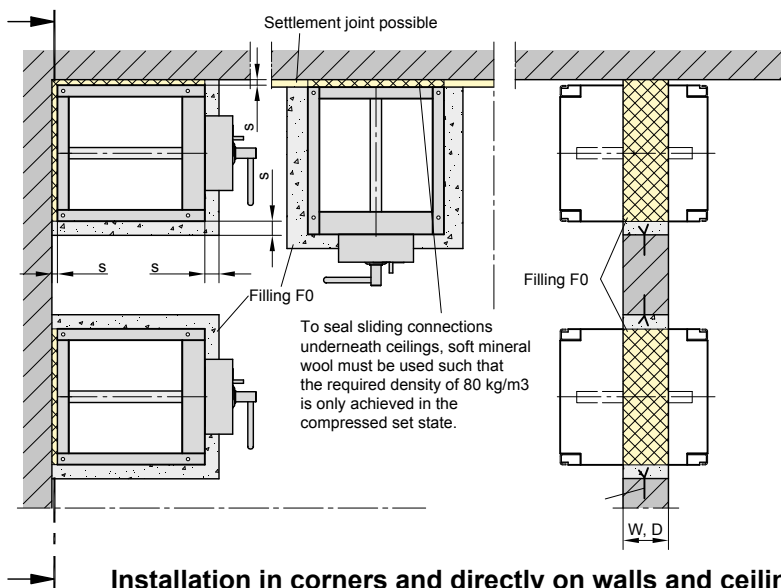
Installation in ceilings



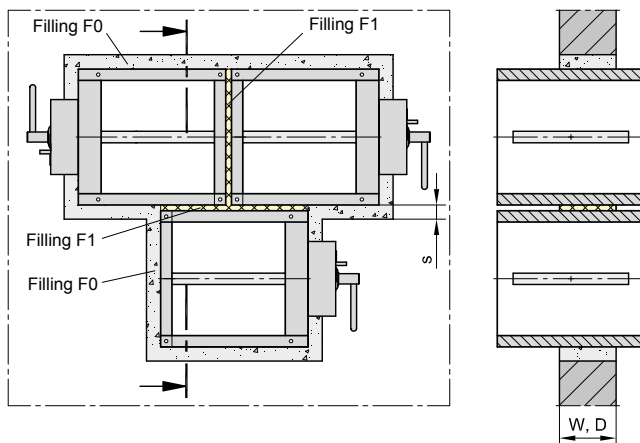
Installation suspended in ceilings



Installation in hard-to-reach installation openings



Installation in corners and directly on walls and ceilings "Partial mortaring"



Installation side-by-side

For filling the gap "s"

- Filling F0 ⇒ see page 14

Note: Fillings F0 made of mineral wool in corners and directly against walls and ceilings is permitted with "partial mortaring" for gaps with $s \leq 50$ mm.

- Filling F1 ⇒ see page 16

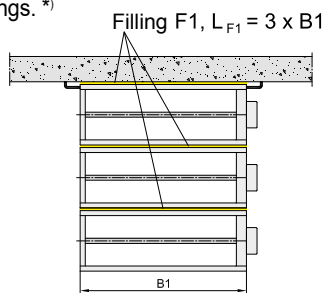
If FK90K fire dampers are fastened in corners and directly under ceilings on adjacent walls and/or ceilings, ventilation ducts made of metal can also be connected without flexible connectors. However, the filling F0, if made of mineral wool, must be replaced with filling F1.

⇒ see pages 5, 16 and 36

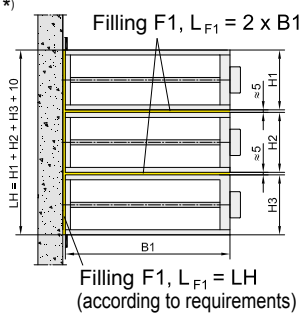
FK90K fire dampers

Multiple installation in walls with fixings to adjacent rigid walls and ceilings

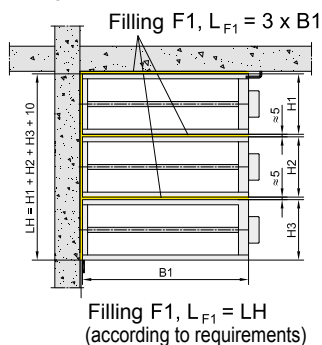
- Up to 3 units stacked above one another on rigid ceilings. *)



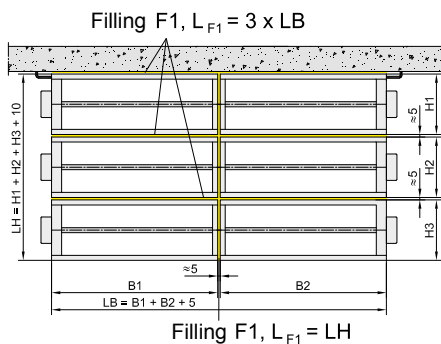
- Up to 3 units stacked above one another on rigid walls. *)



- Up to 3 units in the corners of rigid walls and rigid ceilings. *)

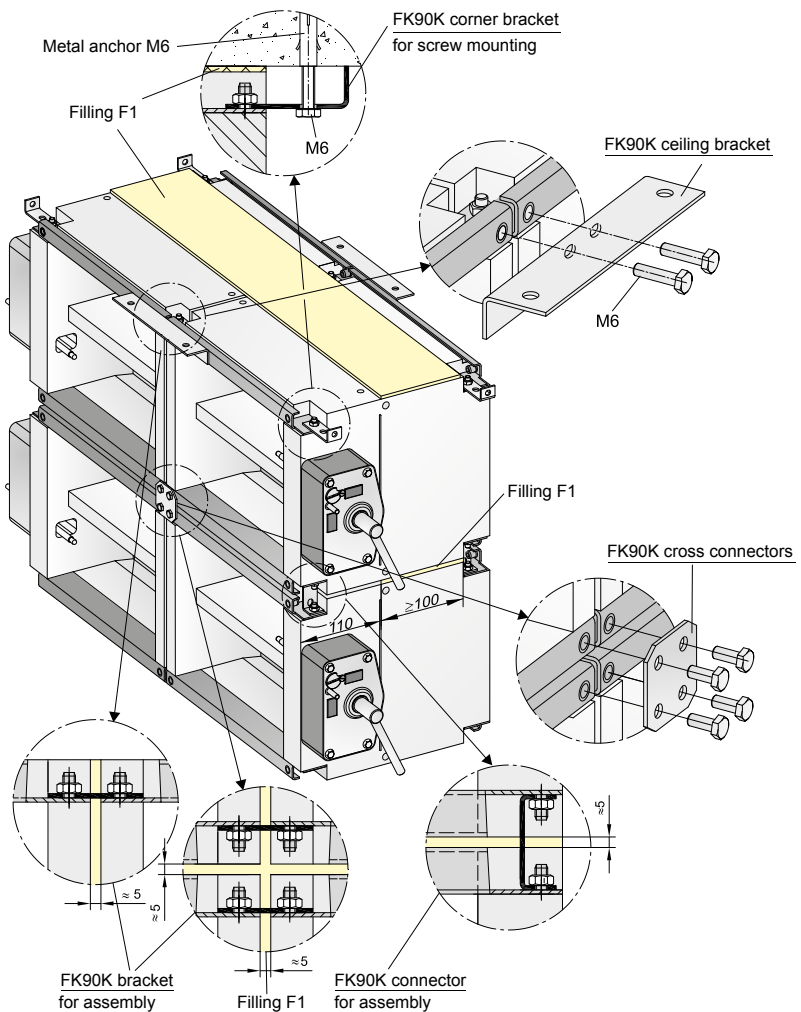


- Up to 3 units with the same width stacked above one another in pairs on rigid ceilings.



Outer dimensions H_1, H_2, H_3, W_1, W_2 ⇒ see page 6
 L_{F1}, LH, LB : Lengths of F1 infill strips

*) shown with horizontal damper blade axes. The same procedure basically applies for installation with vertical damper blade axes. ⇒ see page 5



For this type of multiple installation FK90K fire dampers generally must be connected with flexible connectors. ⇒ see page 34

FK90K fire dampers on adjacent walls or ceilings must lie flush against the surface. Unevenness must be smoothed out with plaster or compensated for with fillings F1.

Fillings F1

- are approx. 6 mm thick resilient, non-combustible mineral sealants with a melting point of $\geq 1000^\circ\text{C}$, e.g. 100-mm-wide strips made of calcium-magnesium silicate (⇒ see page 36). Mineral wool can also be used and must have a density of $\geq 80 \text{ kg/m}^3$ when compressed.
- must be used between FK90K fire dampers when installing multiple fire dampers or for assembly with FK90K connectors and to act as a seal between the FK90K fire dampers and adjacent ceilings.
- can be used as compensating elements and/or to provide a seal between FK90K fire dampers and adjacent walls, if the walls are not sufficiently level.

Filling F1 ⇒ see page 36; fillings for other gap ⇒ see pages 14 to 33

Each FK90K fire damper is supplied with one pack containing 4 x FK90K corner brackets. Additional FK90K angle brackets, FK90K connectors, FK90K cross connectors and FK90K ceiling brackets must be ordered separately. ⇒ see page 36

FK90K fire dampers

Installation in metal stud walls (1a) General

Wall types

The walls, shaft walls, facings, fire walls, etc. must be produced according to the manufacturer's specifications or technical standards. General building authority test certificates (AbP) must be observed in Germany.

Consideration must be given to specifications for design, fire resistance period and fire safety classification, specified wall widths, wall heights and wall thicknesses, and dimensionings for studding and cladding.

The wall types and sub-structures require **cross-sections A-A** with a suitable design.

⇒ see pages 19 to 26

- Flexible walls of the "metal stud wall" type can be clad on one side or both sides. The cladding may be single-layer or multi-layer, depending on the fire resistance period.

In general, shaft walls and facings should be clad on one side. Shaft walls without metal studs should only be fastened at the side. ⇒ see pages 25 and 26

Fire walls and safety partition walls are made of metal studs with several layers of cladding on both sides and may contain sheet metal inlays. ⇒ see page 27

- Metal stud walls can be produced with or without mineral wool between the metal studs.
- Cladding made of DF type gypsum boards according to EN 520 or equivalent cladding material (fire-resistant plasterboards, cement-bound boards, calcium silicate boards, etc.) must be fixed in a manner appropriate to the wall in question.
- In the perimeter area of the FK90K fire dampers, cladding must be secured with drywall screws of a suitable length and a diameter of ≥ 3.9 mm at spacings of ≤ 200 mm or ≤ 150 mm. ⇒ see pages 19 to 32
- Profiles for metal stud walls are described by DIN 18182 and EN 14195, and constructions by DIN 18183.
- FK90K fire dampers may be installed in metal stud walls with **up to 1000 mm metal stud spacing** (span), and have been tested accordingly.

- The required bay rails and stiffeners should be used for installing FK90K fire dampers in metal stud walls so as to produce circumferential frames. Intersections must be connected with two blind rivets made from steel with diameters of 4 to 5 mm or with drywall screws with diameters of ≥ 3.5 mm and lengths of ≥ 10 mm.

Two-way prefixing may also be performed by means of clinching (crimping), as is typical in dry construction. Two joint points should be used.

In addition, the claddings must be connected to the metal framework at the intersections using double-connected screw fastenings.

The following **minimum thickness W [mm]** is required for installing FK90K fire dampers:

Fire resistance period in minutes		30 60	30 60 90
Metal stud walls with cladding on both sides	≥ 1 -layer cladding	70	-
	≥ 2 -layer cladding	-	95
Shaft walls made from wall boards, at least 2 layers	with metal studs	-	90
	without metal studs	-	40

Details according to wall types:

⇒ see pages 19 to 33

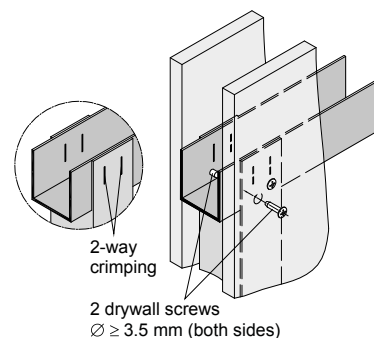
- **Gap "s"** on installation openings must be filled:
 - **Gap s ≤ 20 mm** must be filled with **fillings F2** made of strips of non-combustible **mineral wool** (also mineral wool infill), approx. 100 mm wide, ≥ 80 kg/m³ density, $\geq 1000^\circ\text{C}$ melting point, or alternatively using mats made of calcium-magnesium silicate (e.g. filling F1).

Clear width of **installation openings**:

$$b \times h = (B + 100^{-30} \text{ mm}) \times (H + 80^{-30} \text{ mm})$$

- **Butt joints s ≤ 2 mm to 5 mm** must be sealed or filled with **gypsum joint filler**. This installation is possible in walls with thicknesses $W \leq 115$ mm. Clear width of **installation openings**:

$$b \times h = (B + 67 \text{ mm}) \times (H + 47 \text{ mm})$$



FK90K fire dampers

Installation in metal stud walls (1b) Metal framework

Installation openings for FK90K fire dampers require cut-outs in the cladding. In the metal studs, trimmers or special arrangements may be necessary.

Sub-structures of metal stud walls consist of CW profiles as supports. These should be set on the floor and on the ceiling in UW profiles fastened to the floor and ceiling. Supports adjoining rigid walls are then attached to these profiles.

Installation openings for FK90K fire dampers should be produced, as described above, as circumferentially sealed frames made of profiles. Sealed profile webs are possible, if required, using box-shaped nesting. The mineral wool fillings or the fire damper casing abut against these profiles. Exceptions are possible with installation openings which have an accurate fit.

Severed supports will require trimmers which can simultaneously serve as the frame for the installation openings. Trimmers are needed for installation openings with widths larger than the spans.

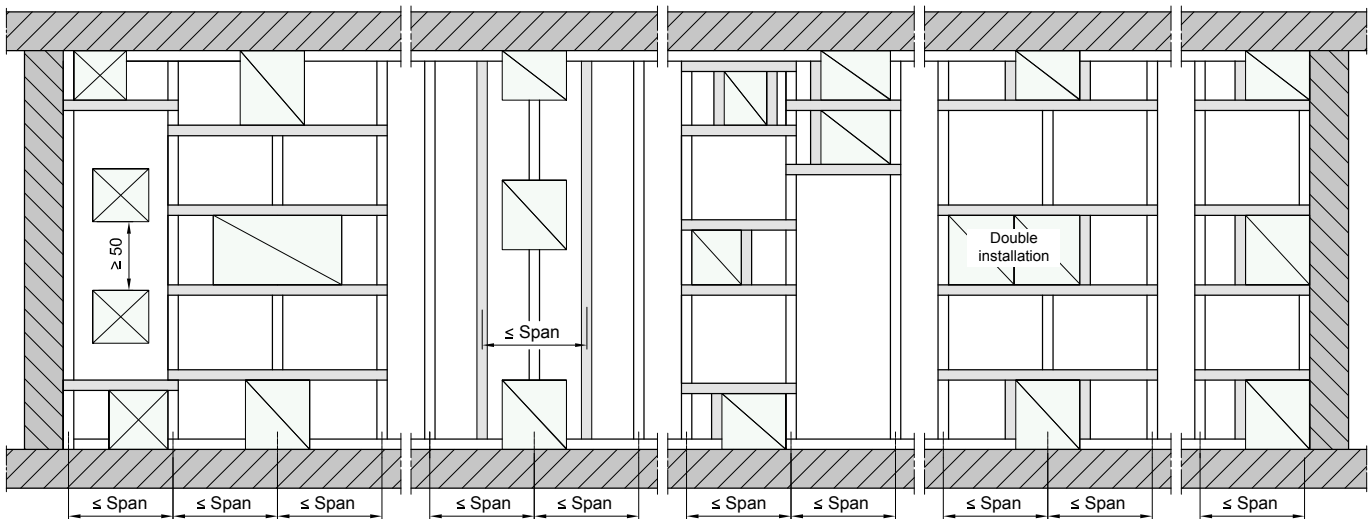
Examples of installation openings

Butt joints $s \leq 2$ up to 5 mm / Only if $W \leq 115$ mm

Sealing or filling with gypsum joint filler

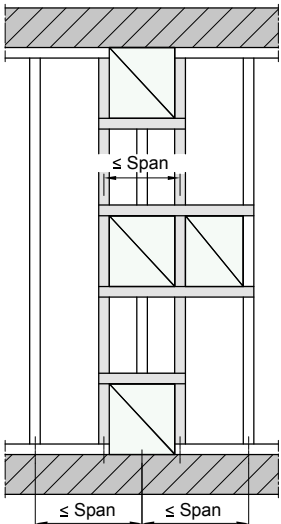
Gap $s \leq 20$ mm

Filling with filling F2 (mineral wool)



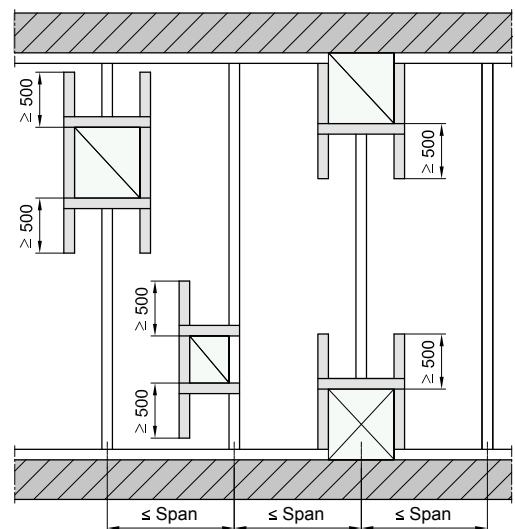
Depending on the type of wall, suitable connections can be used to **interrupt profiles on ceilings and floors** for the purpose of installing FK90K fire dampers. → see pages 19 to 21 and 26

Trimmers, as shown for retroactive installation, require additional metal studs on the left and right. These should be set in the floor and ceiling profiles.



For this purpose, the wall can be cut and new openings created. New claddings must then be attached to the added and existing studs, making sure to maintain the necessary overlaps.

Surplus studs can be removed as long as the intended spans are not exceeded.

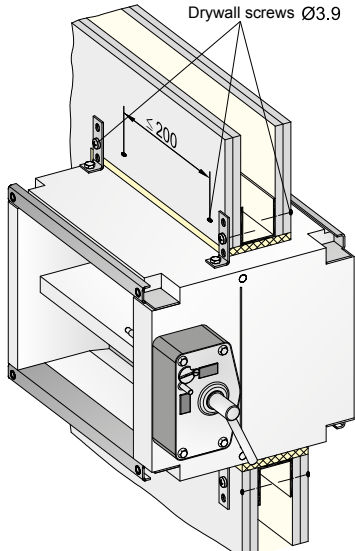


For **H trimmers** with horizontal profiles above and below the installation opening and with vertical profiles on the right and left edge, non-adjacent vertical profiles must be ≥ 500 mm longer. Cladding for these profiles must be screwed on with spacing of ≤ 200 mm.

FK90K fire dampers

Installation in metal stud walls (2a)

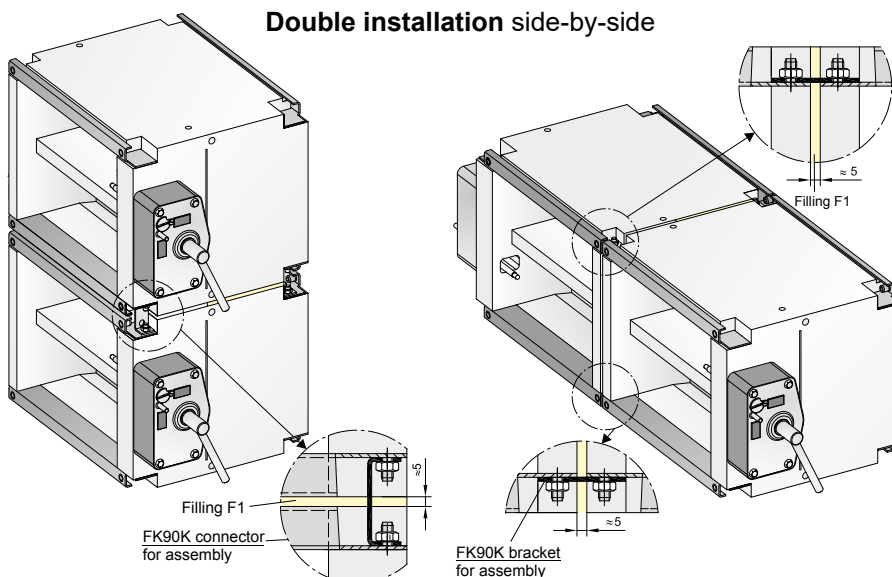
Gap $s \leq 20$ mm must be continuously sealed with fillings F2 (mineral wool).



Installation principle

- Installation locations, shut-off damper blade axis positions, actuator arrangements in walls (W) \Rightarrow see page 5
- Framework - constructions and cross-sections A-A for different wall types \Rightarrow also see pages 20 to 21
- Filling F1 \Rightarrow see page 16
- Filling F2 \Rightarrow see page 17
- Dimensions of installation openings \Rightarrow see page 17

Fill gap at rear between framework and ventilation duct (extension, flexible connector) with mineral wool as required.



Create one unit by screwing two fire dampers together using 4 FK90K brackets or FK90K connectors and install both together. \Rightarrow also see page 16

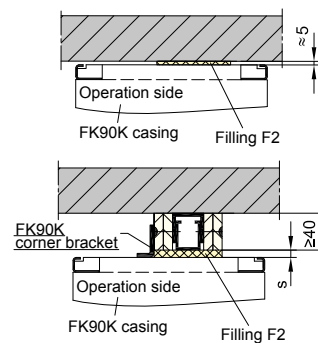
Installation with mineral wool

Types of metal stud walls with cladding on both sides \Rightarrow see pages 17 and 18

The **minimum thicknesses W [mm]** shown opposite are required for installing the FK90K fire dampers:

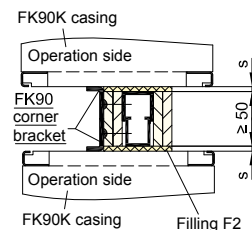
Fire resistance period in minutes		30	30
		60	60
Metal stud walls with cladding on both sides	≥ 1 -layer cladding	70	-
	≥ 2 -layer cladding	-	95

Connections to rigid walls, ceilings, floors



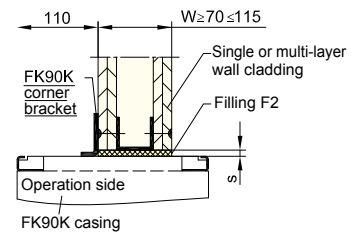
Installation with short spacings

Minimum distance between bay rails or studs



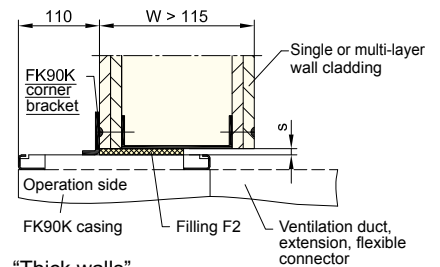
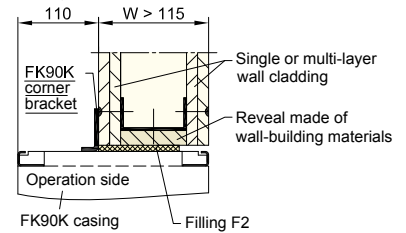
Cross-sections A - A

Wall thicknesses W ≤ 115 mm

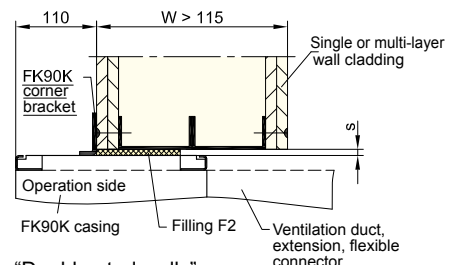


Wall thicknesses W > 115 mm

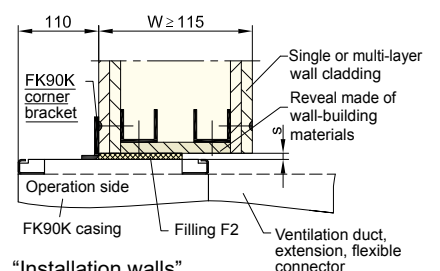
Ideally to be constructed with reveal!



"Thick walls"



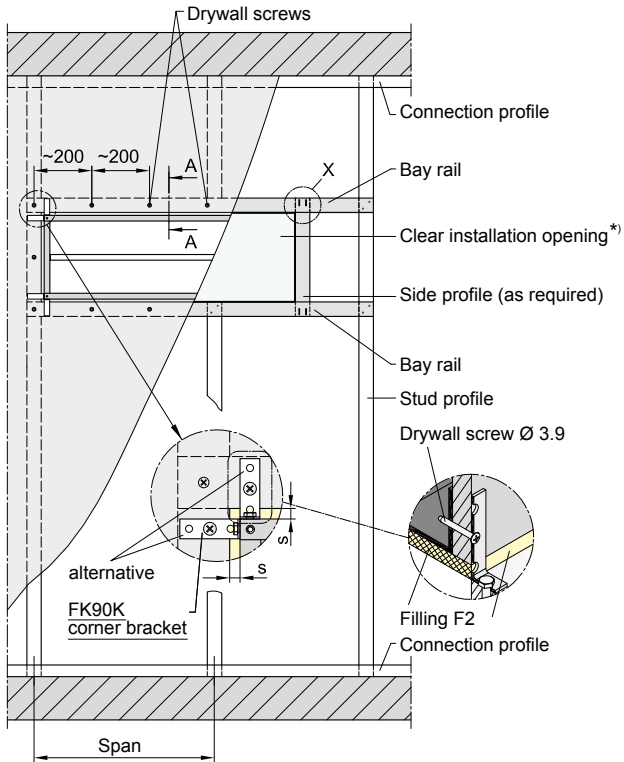
"Double-stud walls"



"Installation walls"

FK90K fire dampers

Installation in metal stud walls (2b)



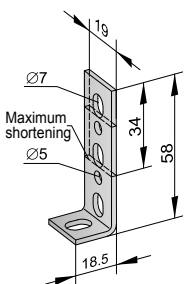
The installation details for the cross-sections A-A vary, depending on the wall type and connection.
 ⇒ see pages 19 and 21

*) If reveals are present, their thicknesses must be added to the dimension of the installation opening.

All dimensions in mm

Detail X: When **securing using 2-way crimping**, the claddings must be also connected to the metal studs via double-connected screw fastenings at the intersections.

⇒ see page 17

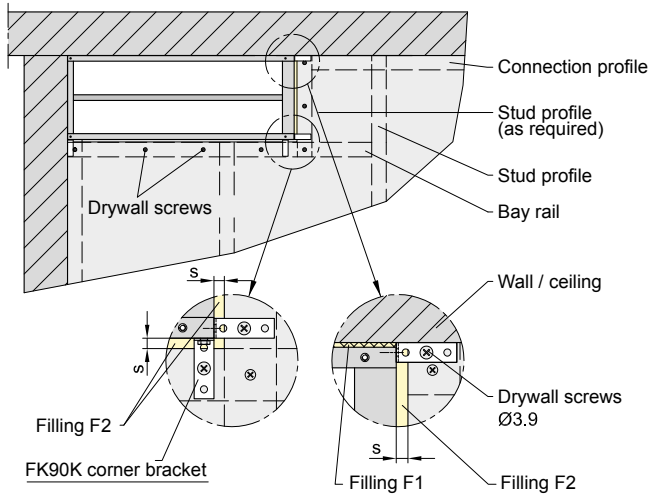


FK90K corner brackets can be shortened on site by max. 34 mm

Connection to ceilings and corners of adjacent walls and ceilings with solid construction

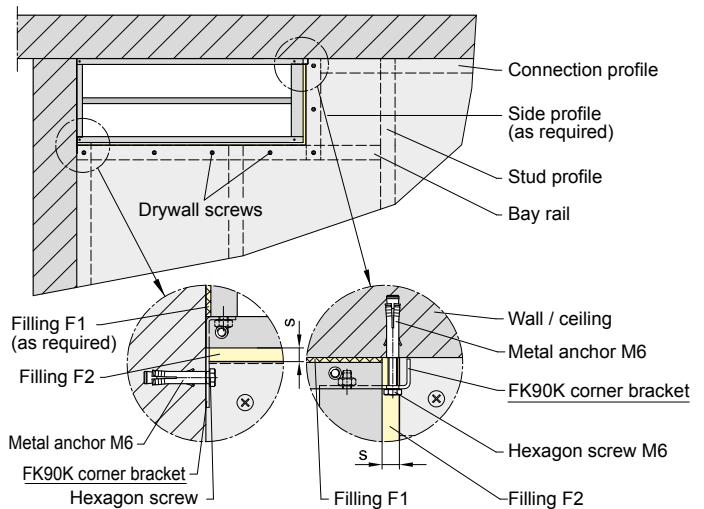
• Fixing to the wall to be protected

Connect ventilation ducts using flexible connectors. ⇒ see page 34



• Fixing to adjacent rigid wall and ceiling

Ventilation ducts **must not** be connected using flexible connectors.
 ⇒ see page 34



FK90K fire dampers must whenever possible lie flush against adjacent walls or ceilings; apply a levelling plaster coat beforehand if necessary.

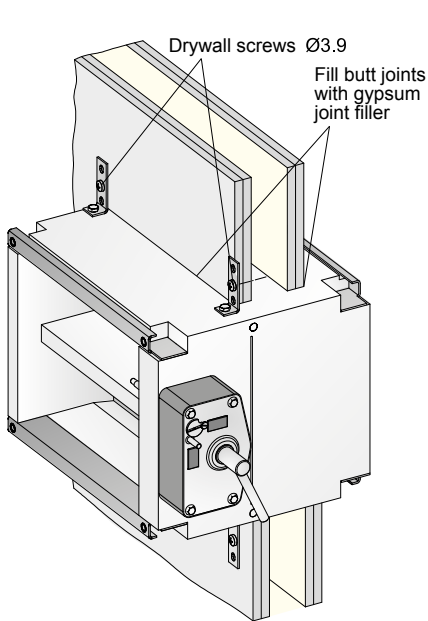
To fill the gap "s" ⇒ see pages 16 and 17

- Filling F1 ⇒ see page 16
- Filling F2 ⇒ see page 17

FK90K fire dampers

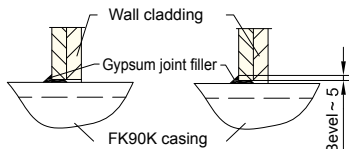
Installation in metal stud walls (2c)

Subsequent installation in metal stud walls with $W \geq 70$ to ≤ 115 mm wall thickness. Butt joints $s \leq 2$ to 5 mm sealed with gypsum joint filler.

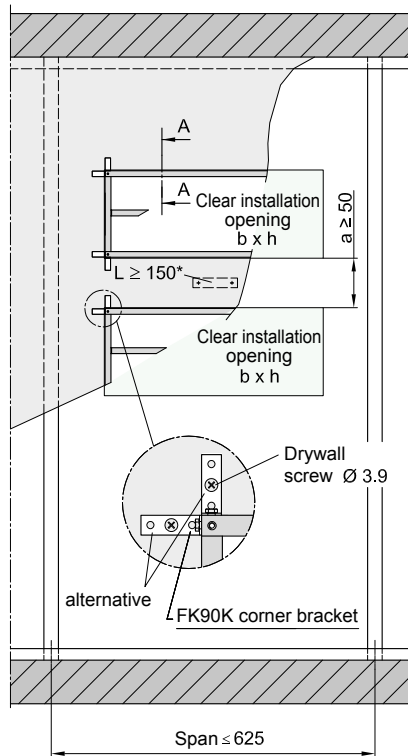


Installation principle

without bay rails or reinforcements in framework with installation openings with a sufficient precision fit.

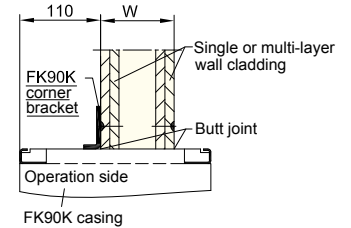


Filling butt joints (examples)

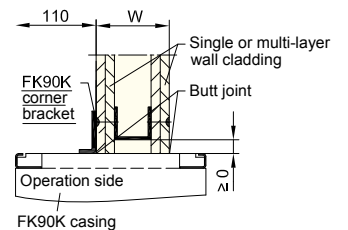


*) The distances between the fire dampers must be $a \geq 50$ mm. CW metal stud wall profiles of ≥ 150 mm in length must be used in this instance. The claddings on both sides must be fastened to these using two drywall screws of the required length.

Cross-sections A-A

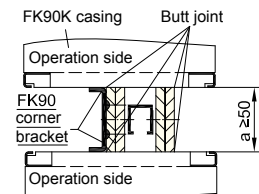


Installation without bay rails and stiffening elements

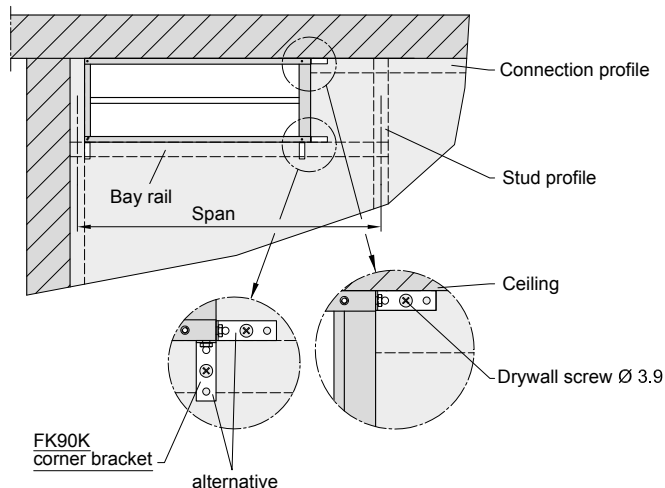


Installation and layout of bay rails and stiffening elements for trimmers in the framework.

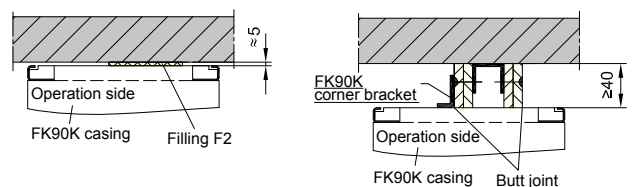
Installation with spacing



Installation in corners and under ceilings



Connections at rigid walls and ceilings

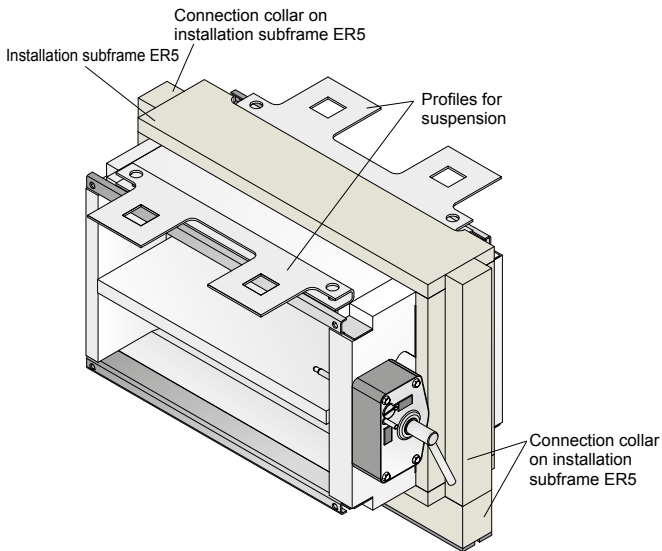


- Installation locations, shut-off damper blade axis positions, actuator arrangements in walls (W) ⇒ see page 5
- Framework layouts and cross-sections A-A for different wall types ⇒ also see pages 18 to 27
- Filling F1 ⇒ see page 16
- Dimensions of installation openings ⇒ see page 17

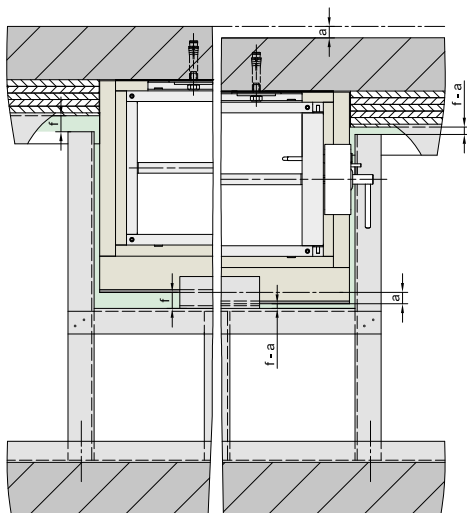
All dimensions in mm

FK90K fire dampers

Installation in metal stud walls (3a) Sliding ceiling connection

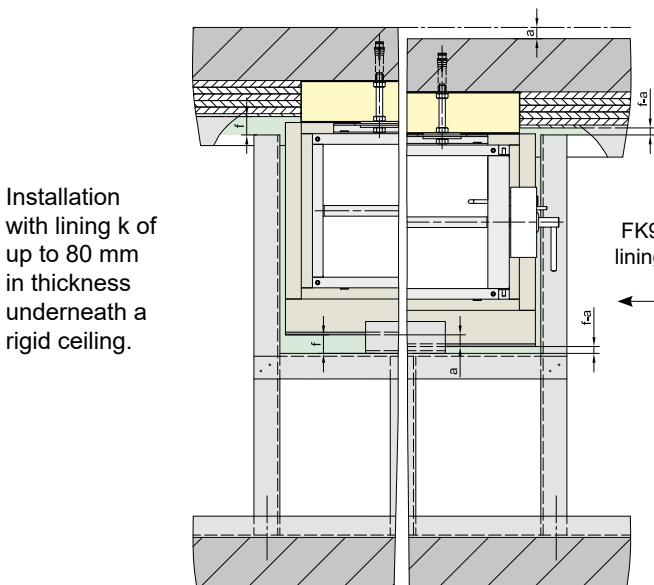


FK90K fire damper with installation subframe ER5

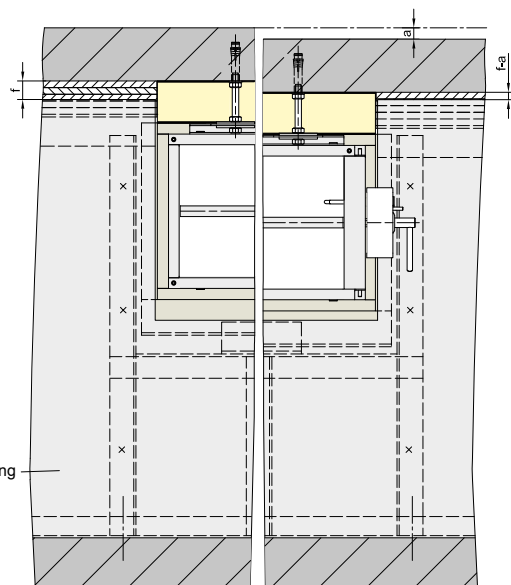


Function and installation principle

The half-sections show the installed state on the left, and a state lowered by a dimension $a \leq f \leq 40$ mm on the right.



FK90K fire damper with lining k in metal stud wall
 ← no cladding
 → cladding



Installation with ER5 installation frame for sliding ceiling connection

Types of metal stud walls with cladding on both sides

⇒ see pages 17 and 18

The following **minimum thickness W [mm]** shown is required for installing the FK90K fire dampers:

Fire resistance period in minutes	30
	60
	90
Walls with ≥ 2 -layer cladding on both sides	95

- Sliding ceiling connections are required where a ceiling drop of $f \geq 10$ mm is expected.

The designs of the expansion joints are described in DIN 4102-4 for a drop of $f \leq 20$ mm. Designs for a drop of $f \leq 40$ mm, for instance, include general building authority test certificates (AbP). Conventional installation of fire dampers is only possible in a wall area that is far below the ceiling connections of up to 200 mm in height.

- FK90K fire dampers with installation subframes ER5, on the other hand, can be fitted directly below rigid ceilings, or with a clearance of 30 mm to 80 mm. They guide the sliding ceiling connection around the FK90K fire damper. This is fastened in such a way that it lowers together with the ceiling and the ventilation ducts. As shear forces can also be absorbed, the ventilation ducts do not have to be flexibly connected with the elastic supports.

- Order information:

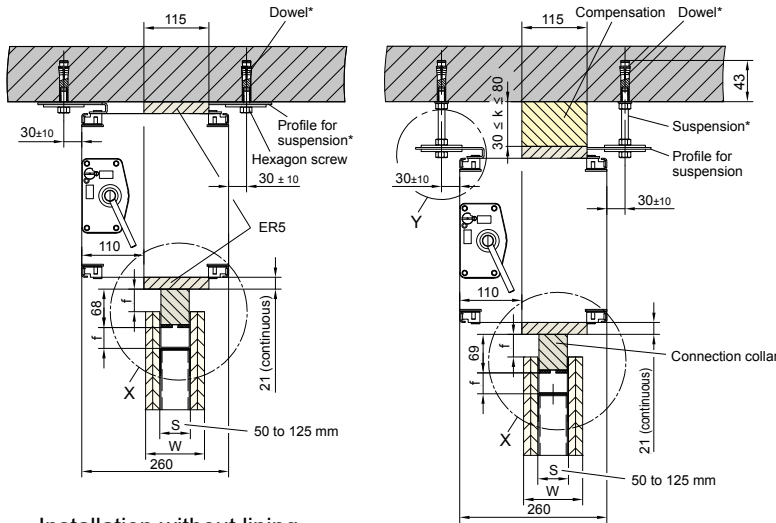
"Actuator on left", "Actuator on right" (shown)

Stud profile depths $S = 50, 60, 75, 85, 100, 125$ mm

⇒ see pages 6, 23 and 24

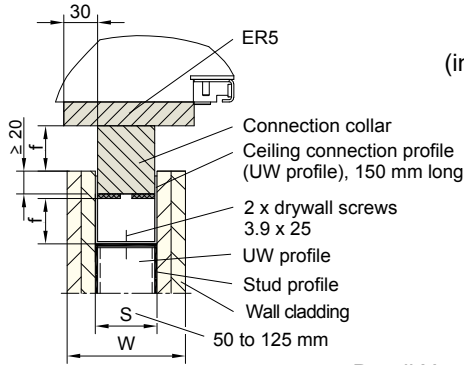
FK90K fire dampers

Installation in metal stud walls (3b) Sliding ceiling connection

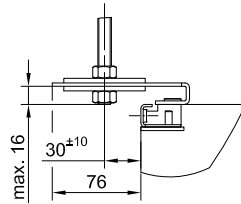


Installation without lining

Installation with lining
k = 30 to 80 mm
(including compensation)



Detail X

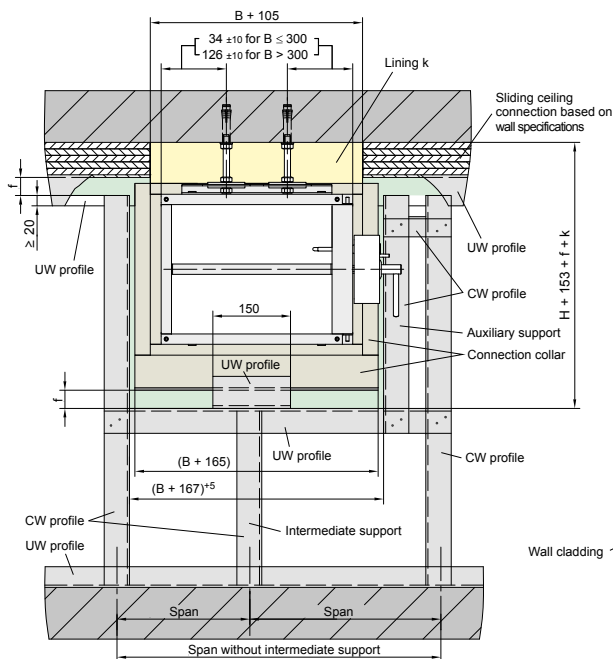


Detail Y

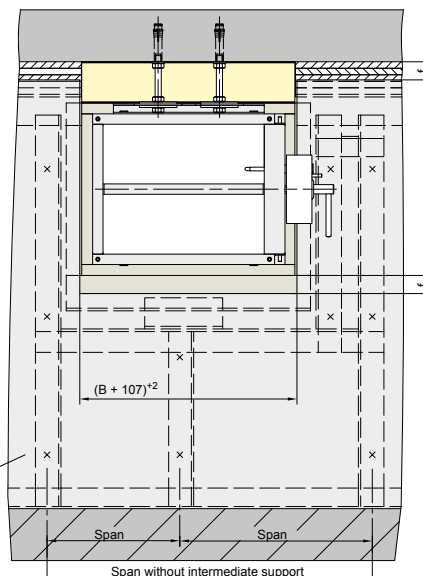
*) Supplied together with installation subframe ER5. The installation instructions for the plugs must be observed! The Zykon drills with drive-in mandrels needed for installation can be supplied as optional items.

Installation

- Installation subframes ER5 must fit the stud profile depth "S" of the metal studs.
 - Installation subframes ER5 can be installed directly below rigid ceilings or with a space of 30 to 80 mm. The space must be sealed with a lining k attached to the ceiling and made from 115 mm wide strips of calcium silicate board with a bulk density of $\geq 500 \text{ kg/m}^3$.
 - **The surfaces of the ceilings must be smooth and even!** If required, levelling work should also be performed (plastering, smoothing etc.). Gaps and joints between the installation subframe ER5, the lining k and the ceiling must be levelled out and sealed in a manner appropriate to the wall in question. Any gaps remaining in the reveal between the connection collar and ceiling connection profiles must be sealed; either using strips made of wallboard and/or gypsum filler or with mineral wool strips (melting point $\geq 1000 \text{ }^\circ\text{C}$ and $\geq 80 \text{ kg/m}^3$ bulk density) and non-combustible adhesive.
 - Fire dampers with installation subframes ER5 should be screwed onto the rigid ceiling using the M12 suspension components provided, and should then be aligned.
 - The metal studs can then be positioned, whereby intermediate supports and lateral auxiliary supports must be fitted underneath the FK90K fire dampers if required due to the spans.
- There must also be clearances for incorporating the planned ceiling drop below the attached FK90K fire dampers in the area of the CW profiles, any CW intermediate supports, UW profiles and claddings.
- Wall claddings must be attached according to general building authority test certificates and technical standards.



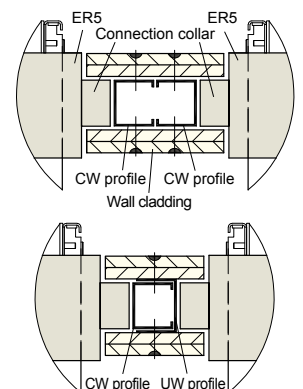
Installation and arrangement of the metal studs



Cladded wall

Examples for installation of two fire dampers next to each other

- one installation opening is required for each fire damper.
- The respective profiles can be interleaved.



All dimensions in mm

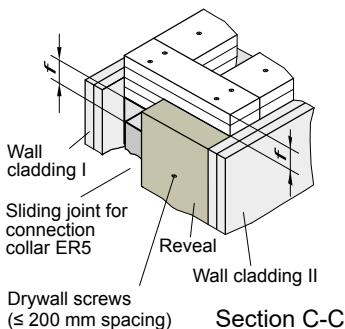
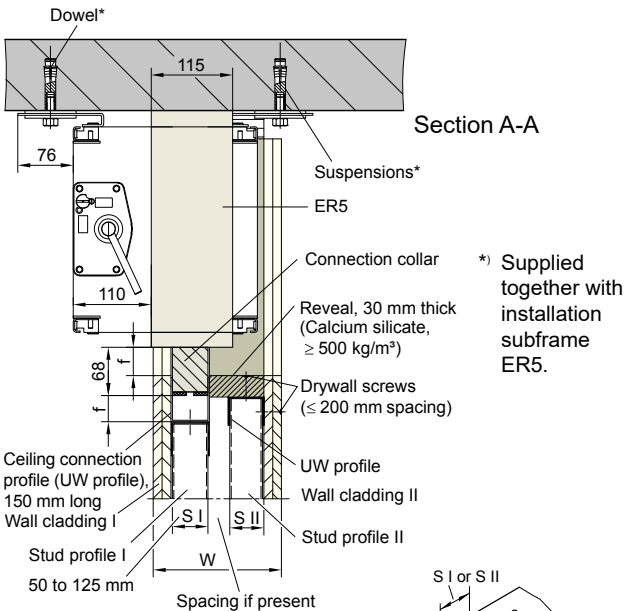
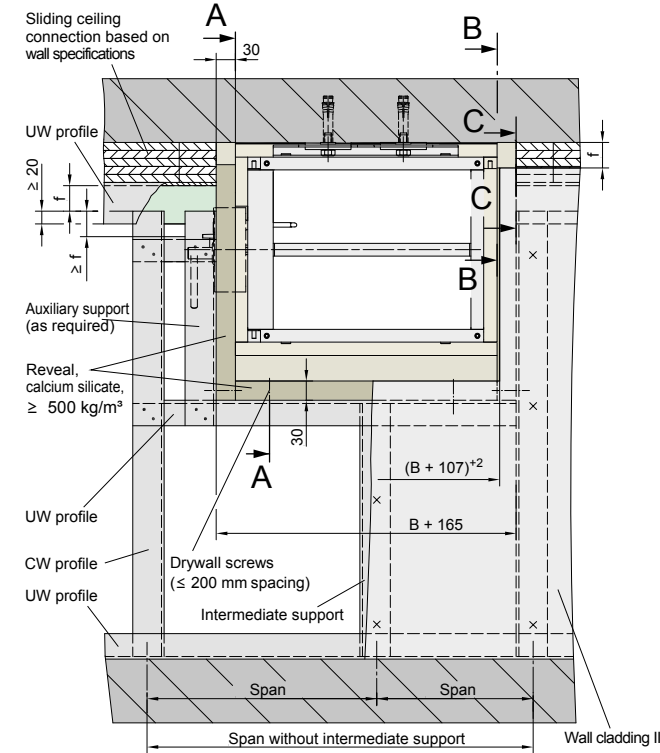
FK90K fire dampers

Installation in metal stud walls (3c) Sliding ceiling connection

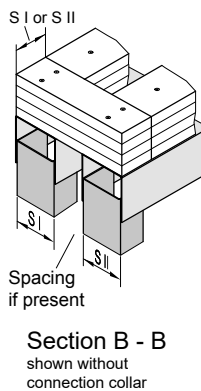
These views relate to the back of the wall or the non-operation side of the FK90K fire damper!

Installation in double-studded walls

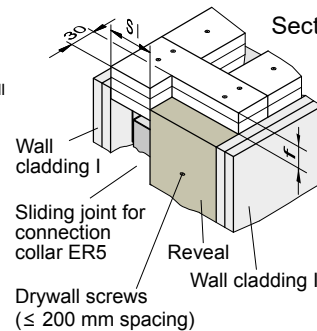
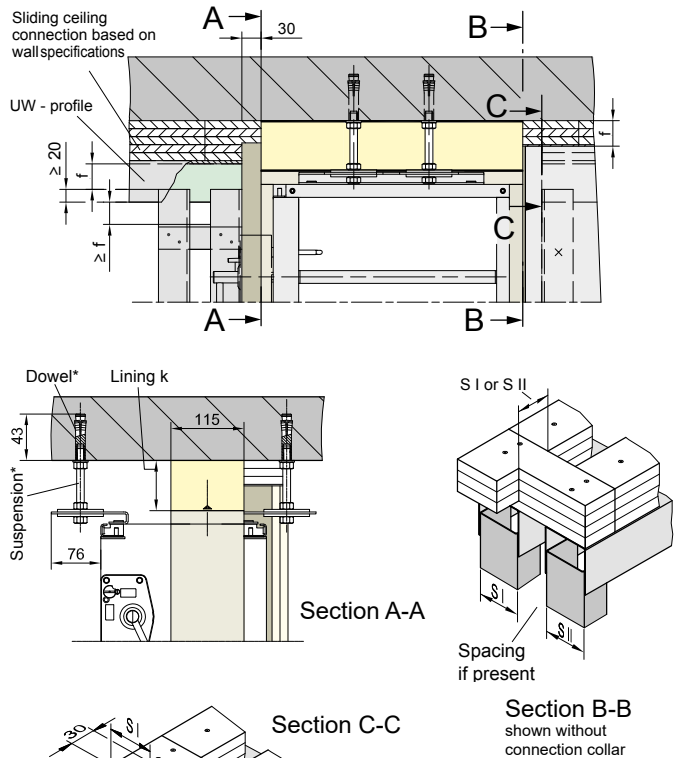
• Directly underneath ceilings



*) Supplied together with installation subframe ER5.



• with lining for spacing of ≤ 80 mm from ceilings



Drywall screws (≤ 200 mm spacing)

• The installation of FK90K fire dampers is in principle unchanged.
⇒ see page 23

- Installation subframes ER5 must match the web height S I of the metal studs I, whose profiles should have the corresponding stud profile depths.
- The metal studs II contain a recess that is framed by the wall profiles. Accordingly, the strips of wall cladding material (e.g. plasterboard) attached to the ceiling are severed and sealed at the front (section C-C).
- The profiles surrounding the recess on the metal studs II have reveals made from 30-mm-thick calcium silicate boards. These are guided up to the ceiling leaving a gap f for the drop (section B-B) and attached to the metal stud profiles using drywall screws at ≤ 200 mm centres.
- If the metal studs have claddings on both sides, then the sliding joint for the connection collar of the installation subframe ER5 will lie between cladding I and the reveal attached to cladding II (section B-B).
- Joints should be filled as usual for this type of wall.

All dimensions in mm

FK90K fire dampers

Installation in shaft walls with and without metal studs (1)

Installation in shaft walls with cladding on one side, with or without metal studs

Types of metal stud walls with cladding

⇒ see pages 17 and 18

The **minimum thicknesses W [mm]** shown opposite are required for installing the FK90K fire dampers:

- Width and height of the shaft walls:

Metal studs according to AbP	Width	Height
with	unlimited	according to AbP
without	according to general building authority test certificates (AbP) and limited to ≤ 2.5 m	according to general building authority test certificates (AbP)

For the restricted dimensions, refer to the general building authority test certificates (AbP). They depend on the size of the framework profiles or the boundary fixations, and the type and thickness of the cladding.

- Dimensions of installation openings b x h ⇒ see page 17
- If the span of the framework is smaller than the width of the fire damper (with a horizontal axis, or height with a

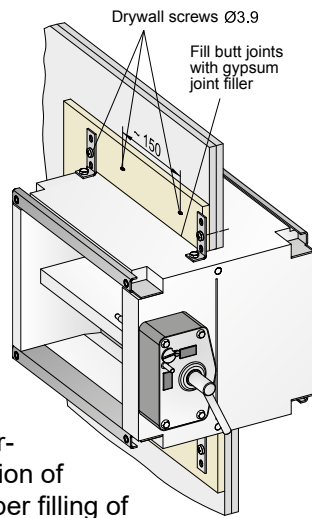
Shaft walls made of wall boards, at least 2-layer	Fire resistance period in minutes	30
		60
		90
	with metal studs	90
	without metal studs	40

vertical axis), the side profiles must be fitted with a 500 mm excess length. If smaller dimensions are available, then the side profiles must be butted up against the connection profiles and secured as usual for this type of wall. Stud profiles (supports) can replace side profiles.

- For FK90K fire dampers with dimensions within the span of the framework, the bay rails should be connected to the stud profiles according to standard practice in wall construction.
- Walls without framework require laterally adjacent rigid walls with angle profiles, onto which the freely spanned single-layer or multi-layer wall cladding and extended bay rails of the circumferential frame of the FK90K fire dampers should be attached.
- Securing using 2-way crimping ⇒ see page 17

Installation with butt joints $s \leq 2$ to 5 mm

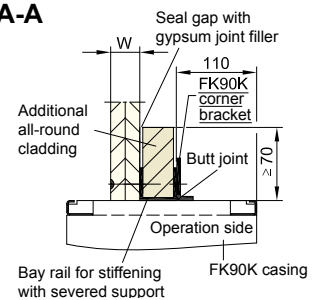
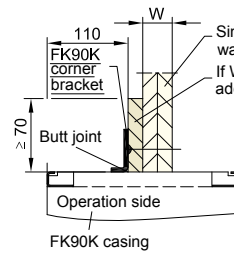
Filling with gypsum joint filler



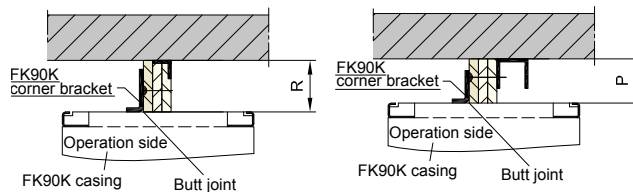
For information of proper filling of joints

⇒ see pages 17, 21

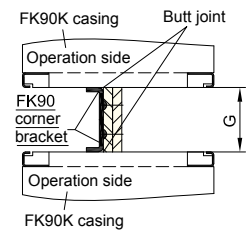
Cross-sections A-A



Connections to rigid walls, ceilings, floors



Installation with short spacings



Cross-sections A-A on the left show the installation of FK90K fire dampers with the operation side on the wall side with cladding.

Cross-sections A-A on the right show the installation of FK90K fire dampers with the operation side on the profile side of the wall without cladding. The profiles of the circumferential frame must be completely filled to a height of at least 70 mm with strips of wall cladding material, or with construction boards made from calcium silicate, ≥ 500 kg/m³. FK90K brackets must be attached.

Minimum spacings [mm]

Wall thickness	G		P	R
	with walls without metal studs	with metal studs		
< 50 mm*)	≥ 160	≥ 70	≥ 70	≥ 70
≥ 50 mm	≥ 160	≥ 50	≥ 40	≥ 35

*) Wall thicknesses < 50 mm must be increased on all sides to ≥ 60 mm with a width of 70 mm.

FK90K angle brackets can be shortened by max. 34 mm in order to maintain the minimum spacings. ⇒ see page 20

When installing FK90K fire dampers with the **operation side** on the uncladded wall side (metal stud side), the **profiles, which are circumferential at the rear, must be filled** with wall cladding materials.

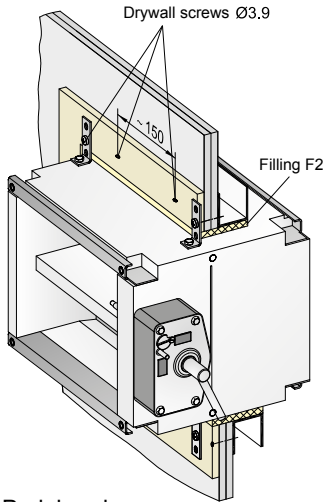
⇒ see cross-sections A-A, pages 25, 26

Joints should be filled according to standard practice in wall construction.

FK90K fire dampers

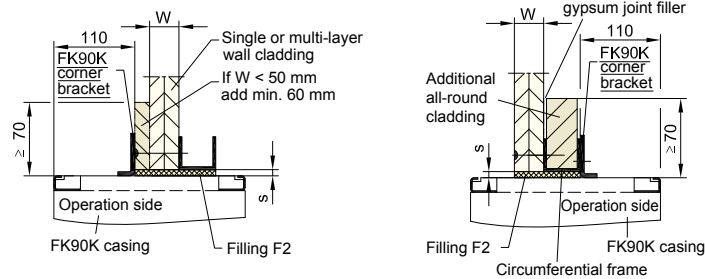
Installation in shaft walls with and without metal studs (2)

Installation with gap $s \leq 20$ mm and filling F2

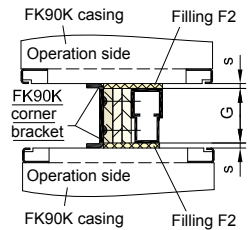


Peripheral bay rails and stiffening elements are required for installation with filling F2.

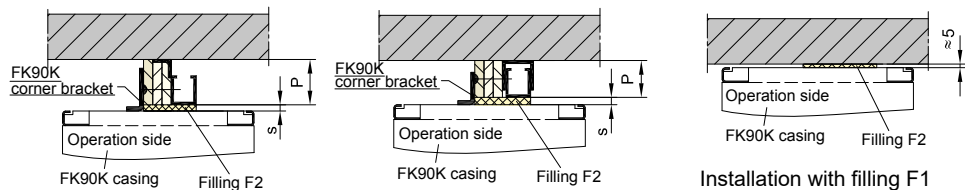
Cross-sections A-A



Installation with short spacings



Connections to rigid walls, ceilings, floors

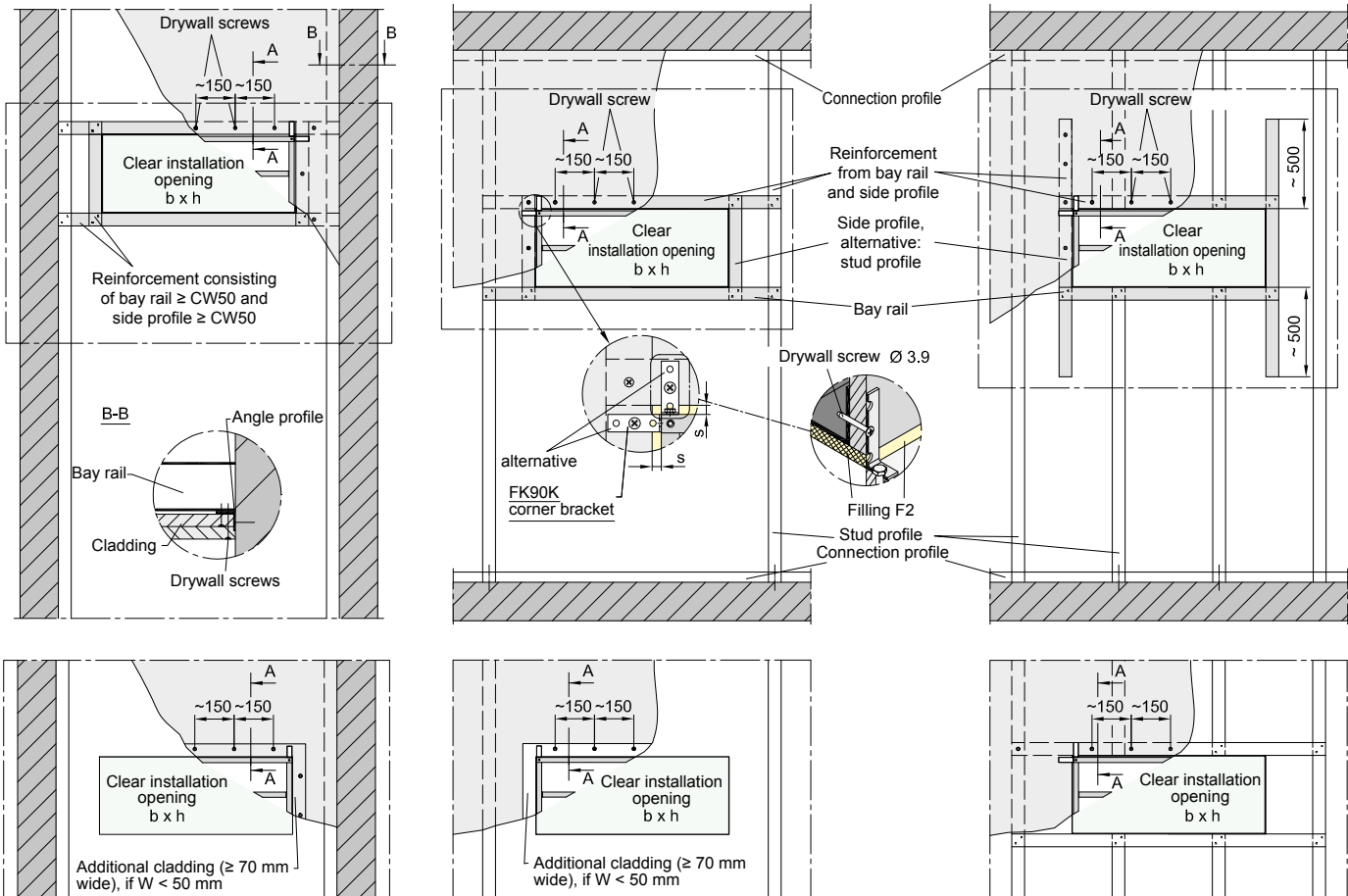


Installation with filling F1 directly below ceilings requires fillings F2, bay rails, stiffening elements and fastenings on two or three sides. => for information see page 20

- Filling of gap "s", fillings F1 and F2 => see pages 16 and 17

All dimensions in mm

Framework (gap $s \leq 20$ mm with filling F2 and filled butt joints $s \leq 2$ to 5 mm => also see pages 17 and 18)

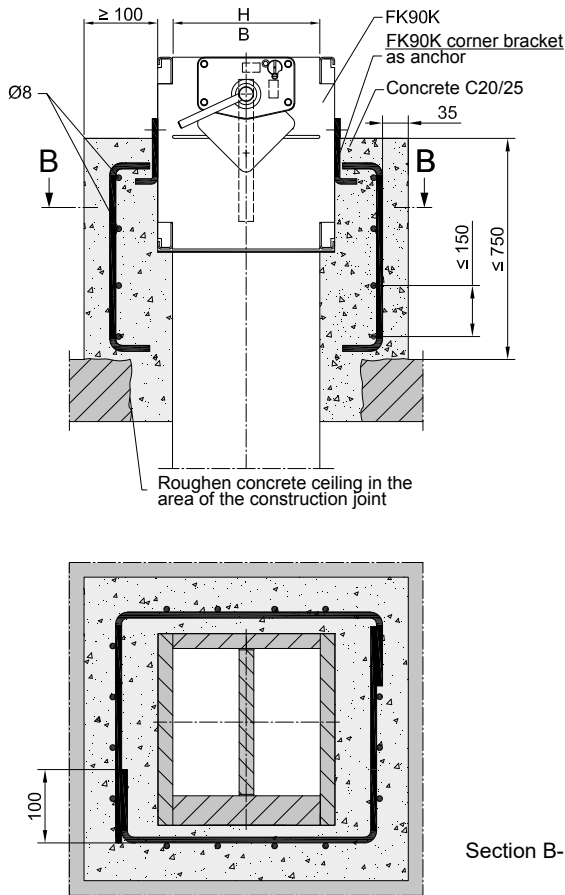


The following installation types without bay rails are for precision-fit installation openings and only for joints filled with gypsum joint filler $s \leq 2$ to 5 mm.

Above: Bay rail with H-trimmer
Below: Bay rail with lateral fixing

FK90K fire dampers

Base installation on rigid ceilings / metal stud walls as fire walls



Installation remote from and above rigid ceilings in ventilation ducts made of concrete

The following **minimum thickness D [mm]** is required for installation of the FK90K fire dampers:

Fire resistance period in minutes	30 / 60 / 90
Solid concrete ceilings	100

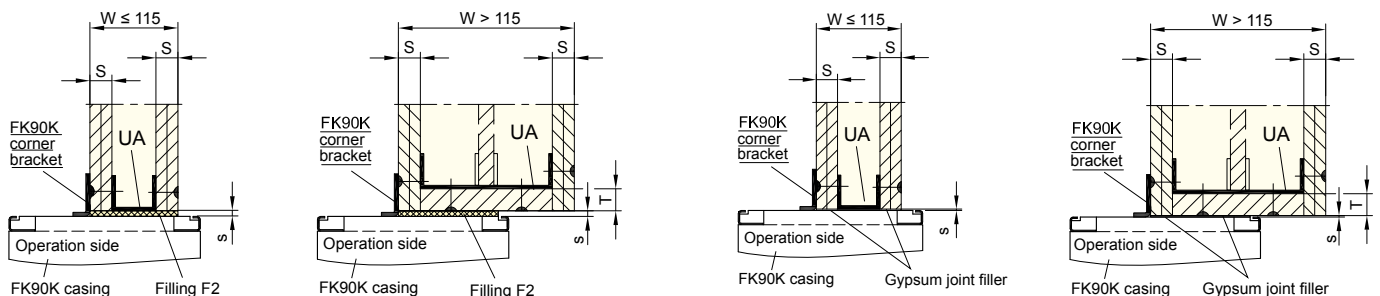
- Production according to general construction rules.
Dimensioning according to DIN 1045 and DIN 4102-4.
- Cover made of concrete C 20/25, ≥ 100 mm thick, ≤ 750 mm high.
 - Reinforcement made of reinforcing steel $\varnothing \geq 8$ mm. Vertical spacing ≤ 150 mm, sealed all round horizontally ≤ 150 mm. Alternative: welded steel wire mesh Q 335 A.
 - Reinforcing steel overlap $C_{nom} \geq 35$ mm for environments with up to moderate humidity (exposure class XC3).
 - To bond the concrete, it is generally necessary to roughen the concrete ceiling and, where applicable, the reveal.

Metal stud walls as fire walls or safety partition walls must be classified as EI 60-M or higher according to DIN EN 13501-2, or be designed in accordance with a general building authority test certificate (AbP). Claddings must be applied on both sides with at least 2 layers, and may contain sheet steel inserts. The studs, bay rails and reinforcements adjacent to FK90K fire dampers must be made up of UA profiles. For structural reasons, further reinforcements may be necessary for wall heights of > 5 m.

Fire resistance period in minutes	60 / 90
Minimum thickness W [mm] of the metal stud walls	105

Cross-sections A-A

Circumferential lining with $T \geq 20$ -mm-thick boards made of calcium silicate or with $T \geq S$ -thick boards made of the same material(s) used for the wall cladding.

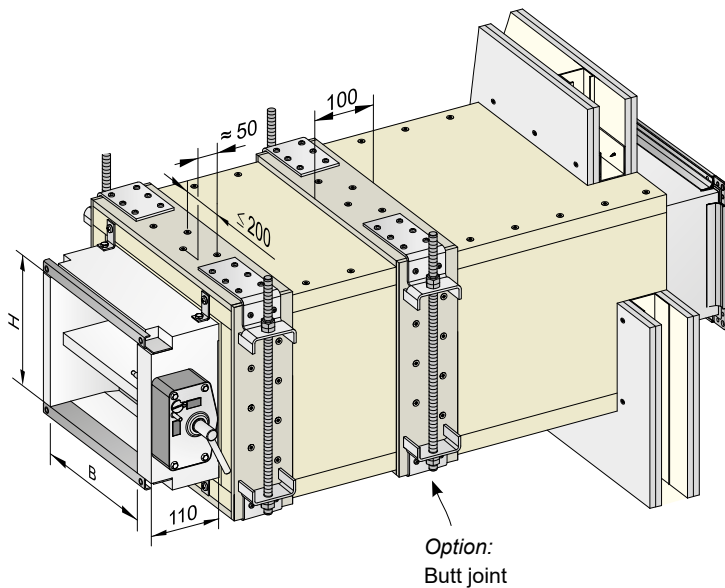


Installation with the filling F2, gap $s \leq 20$ mm
 ⇒ see pages 17 to 20

Installation with butt joints $s \leq 2$ to 5 mm
 Filling with gypsum joint filler. ⇒ see pages 17 and 21

FK90K fire dampers

Installation remote from (1) rigid walls and ceilings and metal stud walls



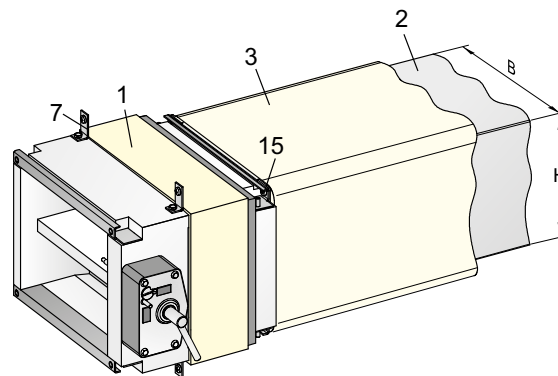
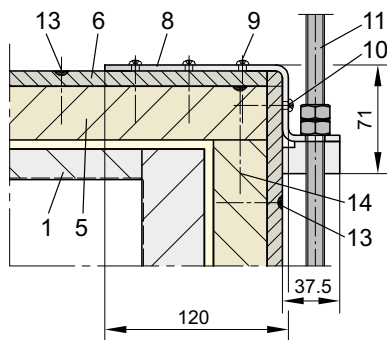
Installation with set of gaskets DS on ventilation ducts with a fire resistance period remote from rigid walls and ceilings and metal stud walls.

The following **minimum thicknesses W, D [mm]** are required for installing the FK90K fire dampers:

Fire resistance period in minutes	30
	60
	90
Rigid walls and ceilings	100
Metal stud walls with ≥ 2 -layer cladding on both sides	95

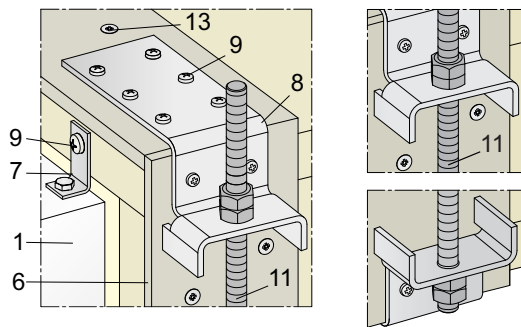
Details on wall types and ceilings \Rightarrow see pages 14, 17 and 18

Suspensions



FK90K fire damper with set of gaskets DS (1) on ventilation duct (2) wrapped in mineral wool (3). Shown without claddings or suspension.

Parts list \Rightarrow see page 29



FK90K fire dampers installed remote from walls are generally suspended using steel threaded rods arranged in pairs. These should be attached to ceilings according to the fire resistance period. Threaded rods that end above the ceilings can be secured there with nuts and washers made of steel. If plugs are used for fastening to ceilings, follow the manufacturer's specifications. End plates can be used to distribute the load acting on the threaded rod across multiple fastenings.

Threaded rods of up to 1.50 m in length can be left unclad. Cladding is required for longer threaded rods (e.g. according to Promat® work-sheet 478).

With FK90K fire dampers installed remote from ceilings, the weight forces are transferred to the ceiling via the sheet steel ventilation duct.

Permissible weight G for a suspension fixture with two **threaded rods made of steel** with 90 minute^o fire resistance period:

Size	M8	M10	M12
A _s [mm ²]	36.6	58.0	84.3
Weight G [kg]	44	70	104

A_s: Tensile stress cross-section according to DIN 13
^o Stress limit $\sigma \leq 6$ N/mm² according to DIN 4102-4

Weight [kg] FK90K fire dampers with standard design

H/B	100	150	200	250	300	400	500	600	700	800
100	7	8	8	9	9	11	12	13	15	16
125	7	8	9	10	10	11	13	14	15	16
150	8	9	9	10	10	12	13	14	16	17
175	8	9	9	10	11	12	14	15	17	18
200	8	9	10	11	11	12	14	15	17	18
225	9	10	10	11	11	13	15	16	18	19
250	9	10	10	11	12	13	15	16	18	19

2 kg must be added for motor drives.

Weights of the suspension, ventilation duct, insulation, cladding, etc. should be factored in.

FK90K fire dampers

Installation remote from (2) rigid walls and ceilings and metal stud walls

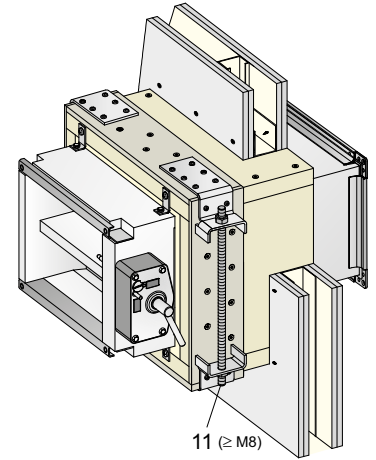
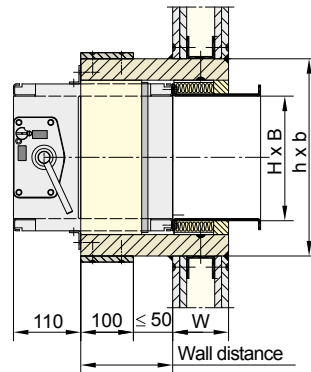
Example:

FK90K fire damper directly in front of a metal stud wall

Installation opening

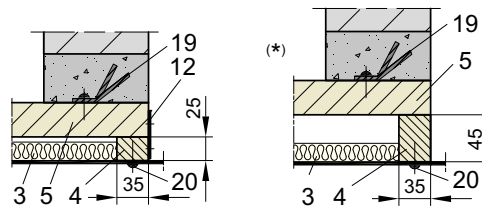
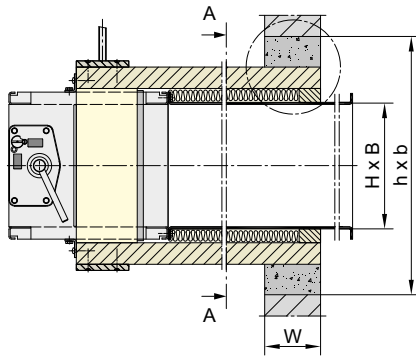
$$b \times h \approx (B + 145) \times (H + 125)$$

Securing of the threaded rods to ceilings can be omitted if the distance from the wall is ≤ 150 mm.



(*) The H-sides of the FK90K fire damper with release mechanism are shown here.

Route ventilation duct with cladding through rigid walls

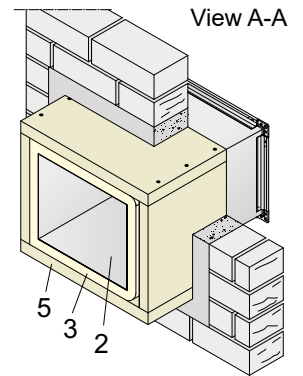


Installation opening

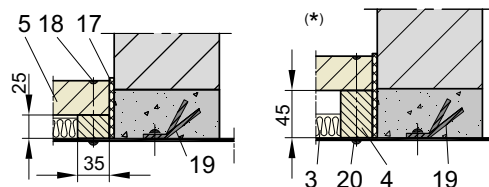
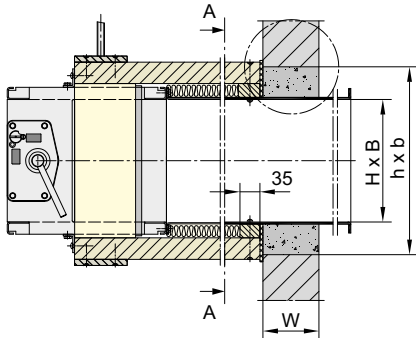
$$b \times h \approx (B + 145) \times (H + 125)$$

+ mortar gap as required.

Mortar anchors (19) or suitable concrete screws should be inserted at ≤ 200 mm centres.



Attach ventilation duct with cladding to rigid walls

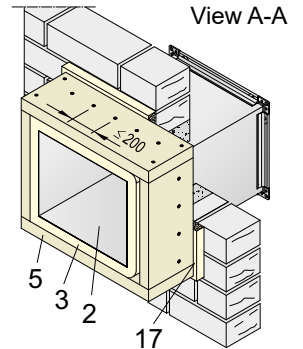


Installation opening

$$b \times h \approx (B + 5) \times (H + 5)$$

+ mortar gap as required.

Mortar anchors (19) or suitable concrete screws should be inserted at ≤ 200 mm centres.



Parts list on pages 28 to 33:

- | | | |
|--|---|--|
| <ul style="list-style-type: none"> 1 FK90K fire damper with set of gaskets DS. 2 Ventilation duct made from sheet steel. 3 Mineral wool clad in aluminium foil 40 kg/m³, 20 mm thick, >1000°C melting point. 4 Frame made of 35 mm Promat[®] LS fire protection boards for connecting the cladding (5) to the ventilation duct (2) or ceiling. Bond (4) and (5) with Promat[®] adhesive K84. 5 Cladding made of 35 mm thick Promat[®] LS fire protection boards.
Cladding must be produced according to the Promat[®] Worksheet 478. 6 100 mm wide additional cladding made from Promat[®] H boards, 10 mm thick. Bond to (5) with Promat[®] K84 adhesive | <ul style="list-style-type: none"> 7 FK90K angle bracket(*) including screws M5 x 10*). 8 FK90K / FR90 corner bracket*+). 9 Round head chipboard screw 4 x 45 mm*). 10 Round head chipboard screw 5 x 70 mm*). 11 Threaded rod M8 to M12 with secured nuts. 12 Bracket(*) including screws (21)* for connection (4) and (5).
Number of brackets per B-side:
2 x 1 piece if B ≥ 250 mm;
2 x 2 pieces, if B ≥ 500 mm. 13 Drywall screw 3.9 x 35. 14 Chipboard screw 4 x 60. 15 Threaded screw M6 x 12. | <ul style="list-style-type: none"> 17 Compress seal made of mineral wool (3) to ≈ 8 mm. 18 Chipboard screw 4 x 45 mm. 19 Mortar anchor or concrete screws. 20 Lens screw 3.9 x 25. 21 Drywall screw 3.9 x 55. 22 Attach angular steel frame $\geq 30 \times 30 \times 4$ with $\varnothing 4.8$ mm solid rivets or with screws M6 to (2). 23 Filling attached to the ceiling, consisting of calcium silicate boards ≥ 500 kg/m³ |
|--|---|--|

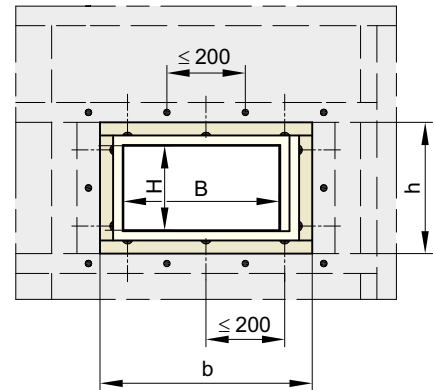
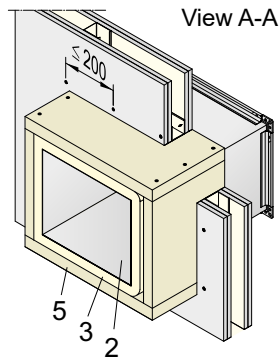
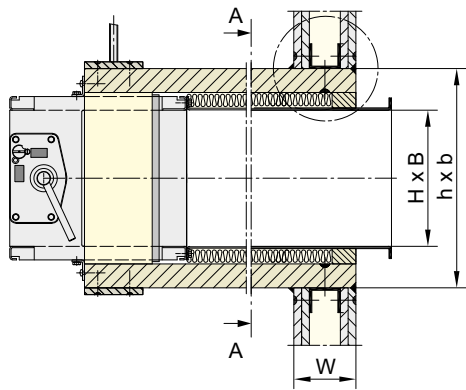
(*) Supplied as kit together with FK90K fire damper with set of gaskets DS.
+ Order additional FK90K / FR90 corner brackets. \Rightarrow see page 36
Screws, mortar anchors and rivets should in general be installed at ≤ 200 mm centres.

FK90K fire dampers

Installation remote from (3) metal stud walls

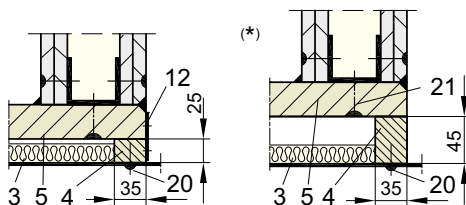
Metal stud walls must be clad on both sides with at least 2 layers of 12.5-mm DF gypsum board according to DIN EN 520, and can be filled with or without mineral wool. The installation openings b x h feature circumferential frames consisting of wall profiles, which should be connected to the wall stud profiles (CW profiles). ⇒ See page 17 for details

Route ventilation duct with cladding through metal stud walls



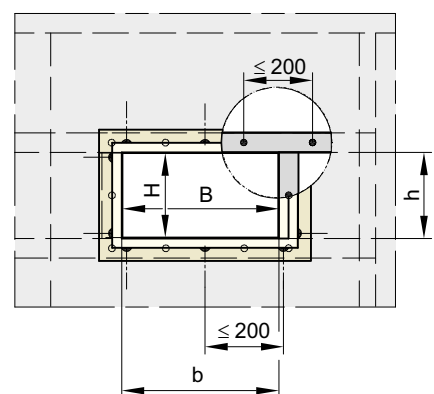
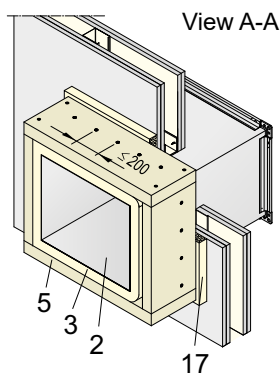
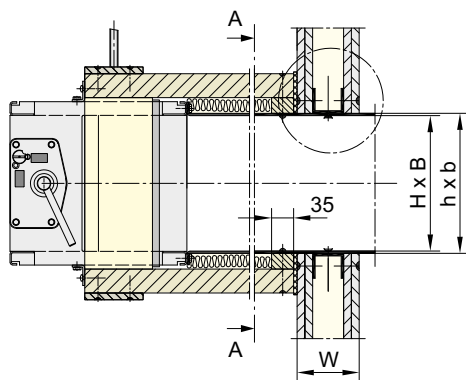
Installation opening

$$b \times h \approx (B + 145) \times (H + 125)$$



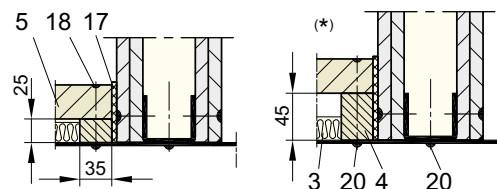
(*) The H-sides of the FK90K fire damper with release mechanism are shown here.

Attach ventilation duct with cladding to metal stud walls

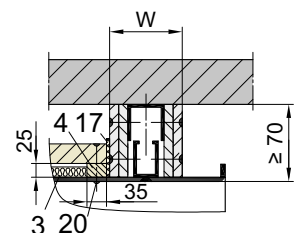
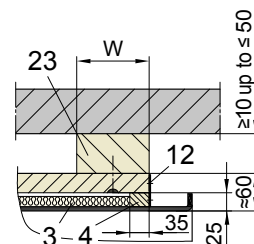
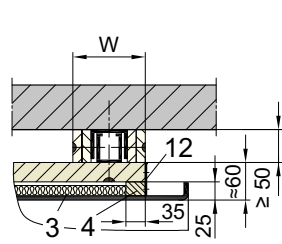
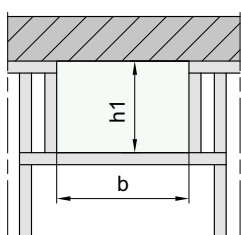


Installation opening

$$b \times h \approx (B + 5) \times (H + 5)$$



Connections to rigid ceilings



Installation opening

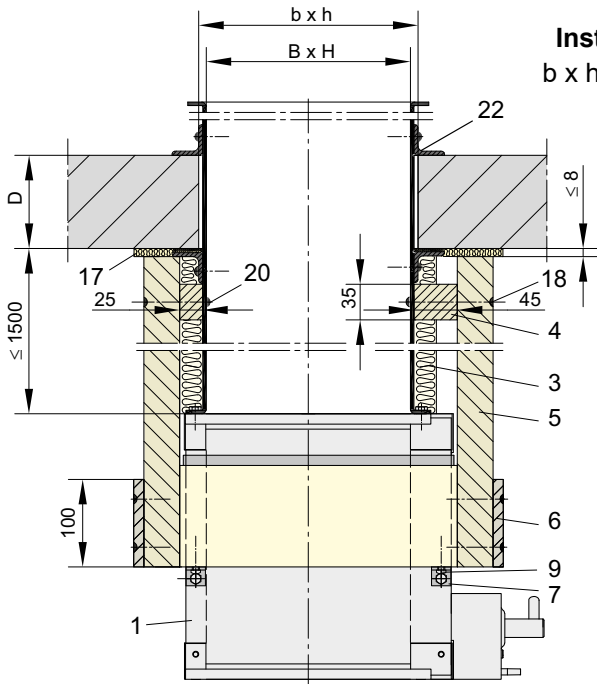
$$b \times h_1 \approx (B + 145) \times (H + 125 + \text{ceiling spacing})$$

Parts list ⇒ see page 29

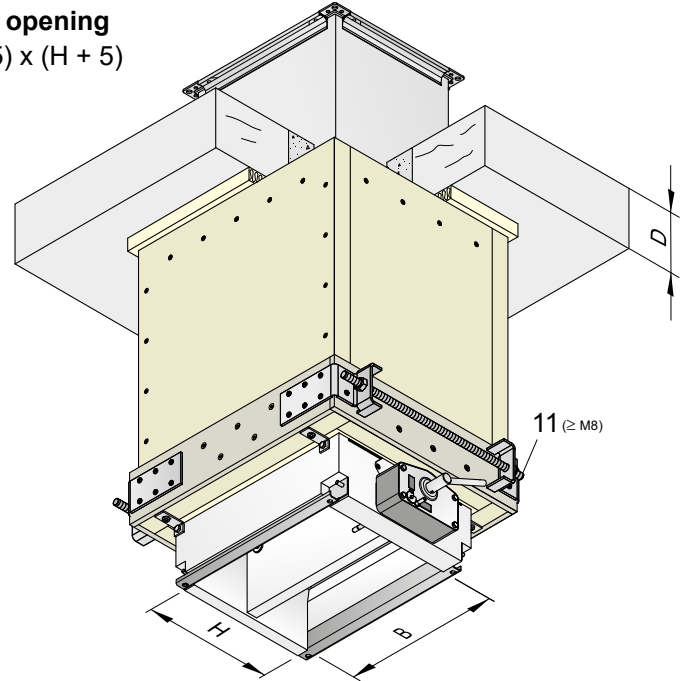
FK90K fire dampers

Installation remote from (4) rigid ceilings

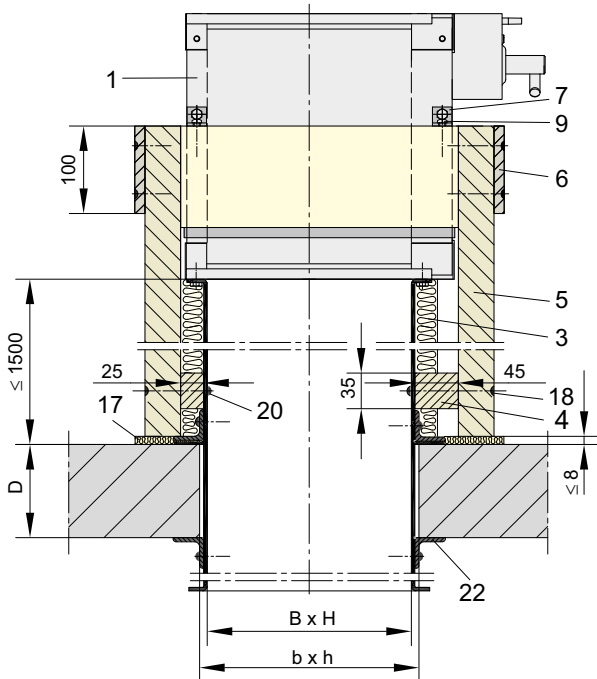
FK90K fire damper below the ceiling



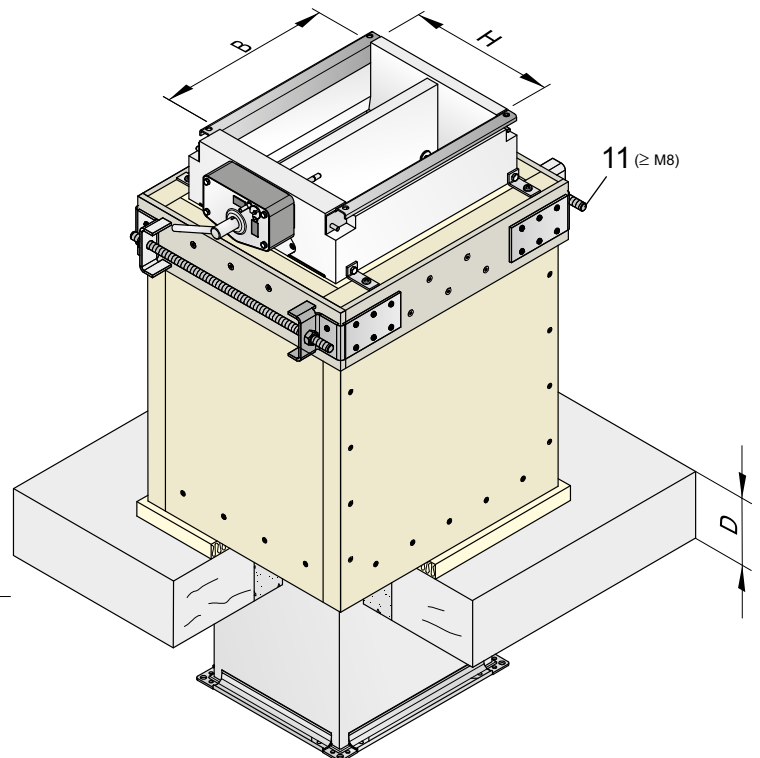
Installation opening
 $b \times h \approx (B + 5) \times (H + 5)$



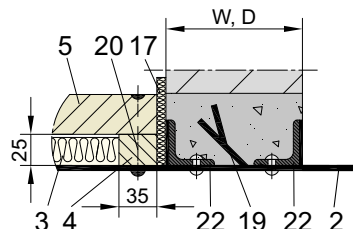
FK90K fire damper above the ceiling



Installation opening
 $b \times h \approx (B + 5) \times (H + 5)$



Alternative installation of the ventilation duct (2) with angular steel frame (22) in walls and ceilings in solid construction.

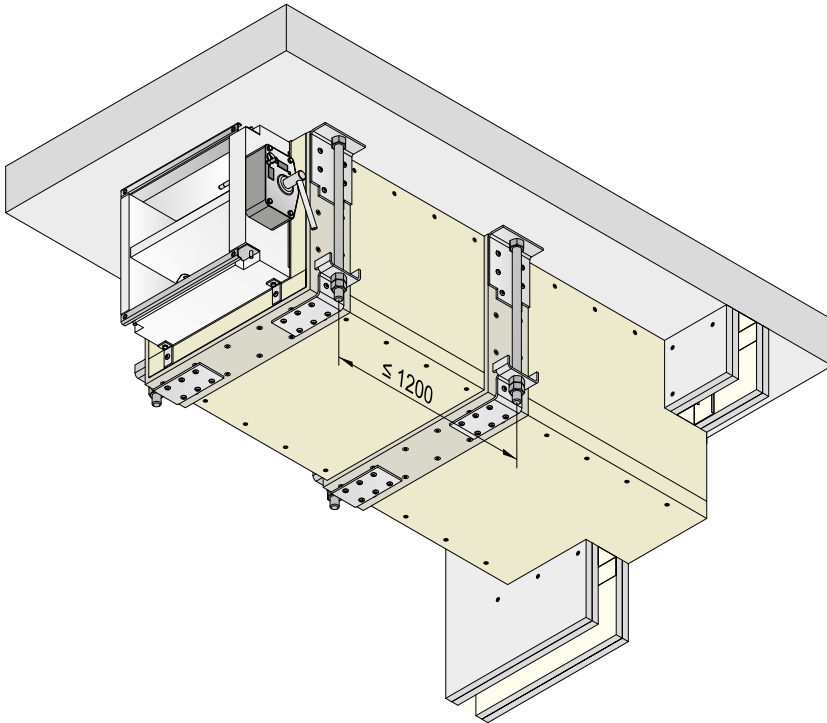


Parts list ⇒ see page 29

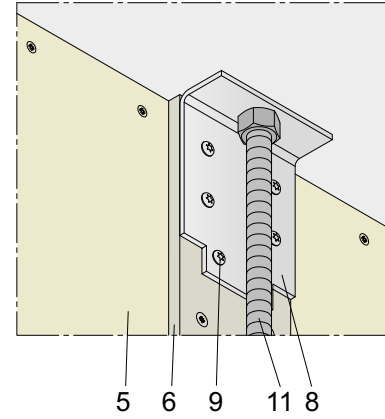
FK90K fire dampers

Installation remote from (5a) rigid walls or metal stud walls under rigid ceilings

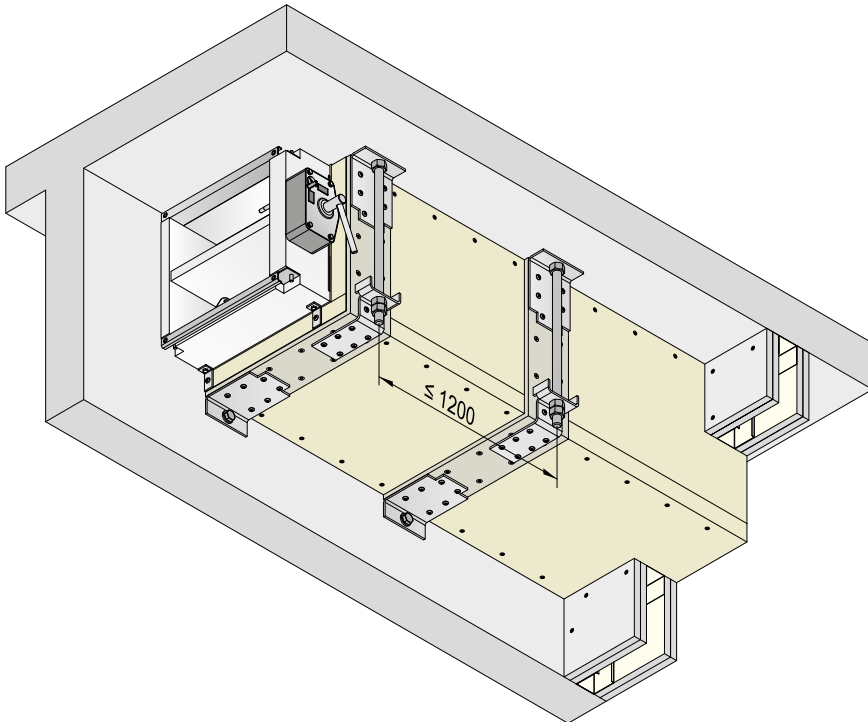
Ventilation duct with cladding on 3 sides



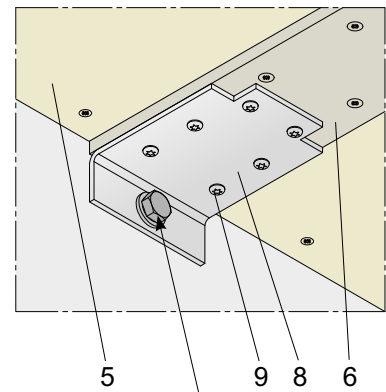
Suspension from rigid ceilings



Ventilation duct with cladding on 2 sides



Fastening to rigid walls



Dowel or through-drilling installation

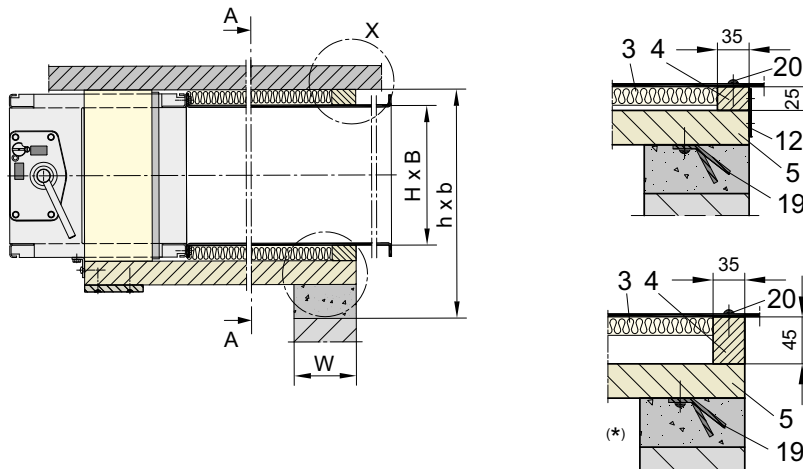
Installing FK90K fire dampers with set of gaskets DS ⇒ see pages 28 and 33

Parts list ⇒ see page 29

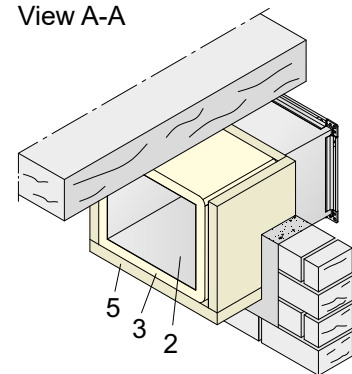
FK90K fire dampers

Installation remote from (5b) rigid walls or metal stud walls under rigid ceilings

Route ventilation duct with cladding through rigid walls

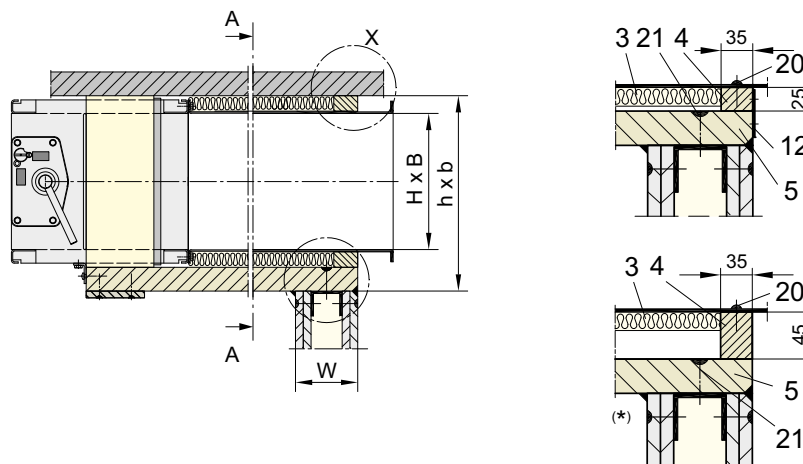


View A-A

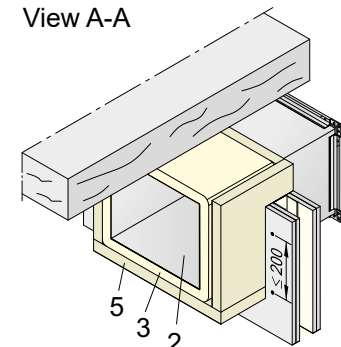


(*) The H-sides of the FK90K fire damper with release mechanism are shown here.

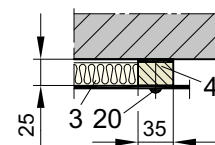
Route ventilation duct with cladding through metal stud walls



View A-A



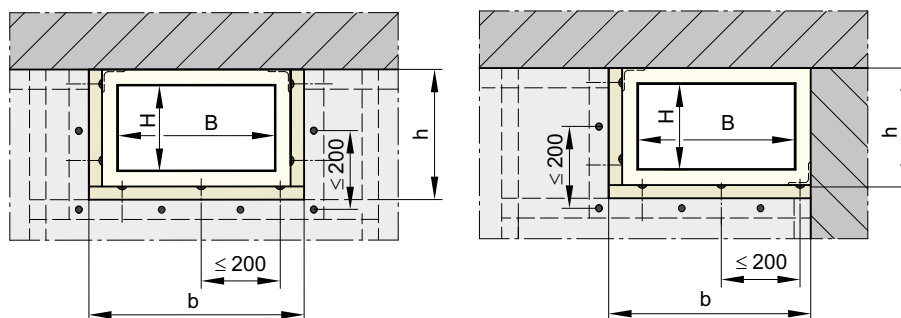
Detail X



The metal stud walls must be fitted with cladding of at least 2 layers, with 12.5 mm DF gypsum boards according to EN 520. They can be filled with or without mineral wool. The installation openings $b \times h$ feature circumferential frames consisting of wall profiles, which should be connected to the wall stud profiles (CW profiles). → See page 17 for details

From a width B of > 500 mm, supports must be installed in the ventilation duct according to DIN 4102-4.

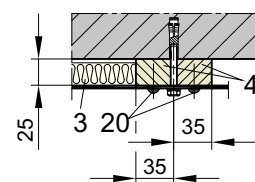
Connections underneath rigid ceilings (floors) and onto a rigid wall



Installation opening:
 $b \times h \approx (B + 145) \times (H + 88)$

Installation opening:
 $b \times h \approx (B + 108) \times (H + 88)$

Alternative ceiling fastening



Parts list ⇒ see page 29

FK90K fire dampers

Installation/functional test and servicing/maintenance-free

Installation

- FK90K fire dampers must be installed based on the instructions in this user manual.

Structural requirements for walls, ceilings, ventilation ducts etc. must be met by the customer.

The general technical regulations and national statutory regulations must be observed during installation.

In Germany, this specifically relates to the "Guideline on fire protection requirements pertaining to ventilation systems" (*Lüftungsanlagenrichtlinie* - LüAR).

- FK90K fire dampers may be connected to ventilation ducts made from non-combustible and combustible materials, as well as to flexible connectors.

Thermal expansions must not exert significant forces in the event of fire. If required, compensatory measures must be taken for this purpose, for example, suitable line laying or the installation of flexible connectors made from combustible materials.

- In Germany, **release mechanisms** for a nominal temperature of 95°C are permitted for hot air heating and for building areas with sprinkler systems in some cases.

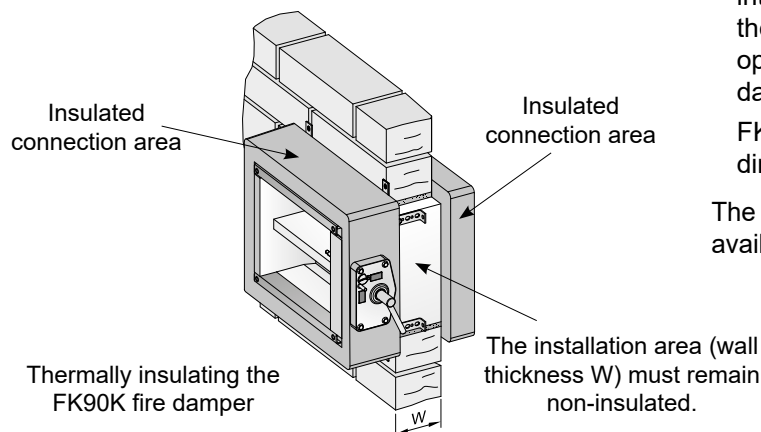
• FK90K fire dampers

- Do not need spacing to separate them from combustible materials.
- Are suitable for all installation positions.
- May be installed "flange-to-flange", even in metal stud walls.

- **Electric wiring** must be performed on site.

- **Potential equalisation conductors** to bridge flexible connectors on fire dampers can be fastened with metal screws if they are made of copper and have a cross section of up to 6 mm², or if they are made of aluminium.

- Connection areas of the FK90K fire dampers can be **thermally insulated**, for example, to protect from **condensation** in external air inlets. Flame-retardant, closed-cell foam can be used, for example Armaflex. Otherwise laminated mineral wool must be used.



Functional testing and servicing

- Fire dampers must be serviced by the owner and tested periodically for correct functioning. The intervals largely depend on the system operation. The relevant regulations should be followed.

- Functional tests are limited to the release and re-opening of the FK90K fire dampers. This can be performed by remote control with an electrical actuator.

- Repairs or service work are required in the event of malfunctions.

Original spare parts must be used for this.

- Cleaning work required in ventilation systems for hygiene reasons must be performed in an operation-dependent manner, and also includes the fire dampers.

Feature: Maintenance-free

- FK90K fire dampers of the series FK92K are maintenance-free due to fully enclosed components, corrosion-resistant materials and precise manufacturing.

The drive mechanism is made of stainless steels and housed in enclosed casings, which means it is not directly in the air stream. The release mechanisms and actuators are also configured accordingly.

There is no need for regular cleaning and lubrication, which would otherwise be necessary.

Sealants and all other materials are designed durably and for a long service life.

- The reliability of the FK90K fire dampers is due to the special drive mechanism with dead-centre positions in the opened and closed positions. This ensures secure closing and locking, and reliable signalling of the limit positions.

This is the only way to carry out remote-controlled functional checks and automation reliably.

- Manual functional checks are limited to the closing and opening of the FK90K fire dampers.

- Two control openings are provided for inspecting the interior of the fire dampers; one above and one below the damper blade. The position and size of these openings are specially adapted to the FK90K fire dampers and are fully adequate.

FK90K fire dampers are largely insensitive to dust and dirt.

The **operating instructions** for FK90K fire dampers are available to download online at www.wildeboer.eu.

FK90K fire dampers

Order data for FK90K fire dampers (series FK92K)

	FK92K -	-	-	-	-	-
Size						
B [mm] x H [mm]						
⇒ see page 3						
Factory-mounted options:						
• ER5 Installation subframe for sliding ceiling connection						
Stud profile depths: 50/60/75/85/100/125						
Actuator: left / right						
⇒ see ¹⁾ and pages 2, 6 and 22 to 24						
• DS Set of gaskets for installation remote from rigid walls and ceilings and metal stud walls.						
⇒ see ²⁾ and pages 6, 28 to 33						
Option: Casing design						
• Galvanized steel components with epoxy resin coating						
⇒ see page 3						
Option: Nominal temperature						
• 95°C						
• 70°C corrosion-resistant						
For thermal-mechanical release mechanisms						
⇒ see page 4						
Option: Limit switch installed in the mechanical release mechanism.						
• E-CLOSED } or E - CLOSED + E - OPEN						
• E-OPEN } These limit switches can be combined with the following remote releases.						
Option: Remote release mounted onto the mechanical release mechanism. ³⁾						
• GU24 } Magnetic clamps						
• WU220 }						
• G24 } Lifting solenoids						
• W220 }						
• P } Pneumatic cylinders						
• P2 }						
Option: Electrical actuators ⁴⁾						
• M220-10/H } Standard						
• M24-10/H }						
• M220-9/H						
• M24-9/H						

¹⁾ Installation subframes ER5 are only supplied factory-assembled.

Delivery includes screws and plugs for fastening. ⇒ see pages 22 to 24

²⁾ Set of gaskets DS factory-mounted or supplied for retrofitting on site.

Supplied with FK90K/FR90 corner bracket, FK90K angle, FK90K bracket and screws.

The customer needs to provide threaded rods, nuts and metal anchors. ⇒ see pages 28 to 33

³⁾ For a description and specifications, refer to version 5.0 of the user manual for the FK90 fire damper.

⁴⁾ Actuators with thermal-electrical release mechanisms and limit switches.

Ordering accessories ⇒ see pages 36 and 37

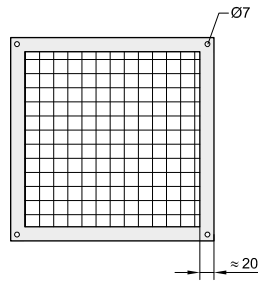
FK90K fire dampers

Accessories (1)

Protective grille

stamped from ≥ 1 mm thick galvanized sheet steel, 20 mm mesh size, $\approx 70\%$ free cross-section.

Available dimensions: B x H



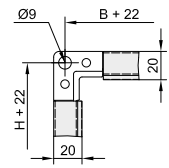
Flexible connectors

made of PVC-coated polyester fabric, cadmium-free, minimum of 100-mm axial expansion absorption at 210-mm stretched length, with connection frame. With hygiene certificate.

Building material class: B1 DIN 4102.

Temperature-resistant: -20°C to $+70^{\circ}\text{C}$.

Available dimensions: B x H

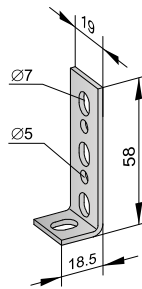


Connection frame profile

FK90K corner bracket

can be screwed to FK90K fire dampers in the threaded holes provided. For use as mortar anchor, shear protection and for screwing to walls and ceilings.

4 pieces per pack, including screws and nuts ($\varnothing 6$ mm), for attachment to the fire damper.*



Use

\Rightarrow see pages 5, 14 to 16, 19 to 21, 25 to 33

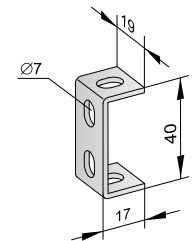
FK90K connector

for stacking of two or three FK90K fire dampers using the factory-installed threaded bolts.

Number of fire dampers in a stacked arrangement	2	3
Required: Number of connectors	4	8

4 pieces per pack, including nuts for the threaded bolts.

Use \Rightarrow see pages 16 and 19



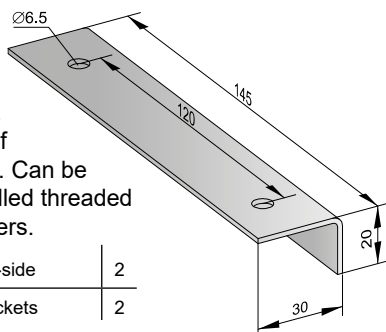
FK90K ceiling bracket

for attaching two FK90K fire dampers side-by-side, and two or three stacked if required, on rigid ceilings. Can be screwed into factory-installed threaded holes in FK90K fire dampers.

Number of fire dampers side-by-side	2
Required: number of ceiling brackets	2

2 pieces per pack, including screws ($\varnothing 6$ mm) for fastening to the (upper) fire dampers.*

Use \Rightarrow see page 16



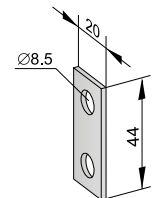
FK90K brackets

for side-by-side installation of two FK90K fire dampers using the factory-installed threaded bolts.

Number of fire dampers side-by-side	2
Required: Number of brackets	4

4 pieces per pack, including nuts for the threaded bolts.

Use \Rightarrow see pages 16 and 19



FK90K filling F1

as 6-mm-thick and 100-mm-wide strips made of calcium-magnesium silicate with $\geq 1000^{\circ}\text{C}$ melting point.

Each pack contains 1 strip, length 1.25 m.

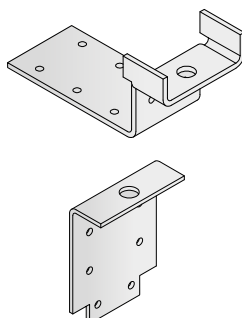
Use, determining consumption quantities \Rightarrow see pages 13 to 21

FK90K/FR90 corner brackets

for suspending claddings of the ventilation ducts to butt joints on site.

Pack of 4 pieces for corner connections, 2 pieces for mounting directly under ceilings, including screws.

\Rightarrow see parts list page 29, item 8



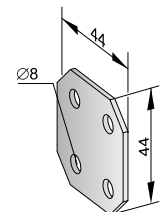
FK90K cross connectors

for installation of two FK90K fire dampers side-by-side, and two or three stacked.

Number of fire dampers in a stacked arrangement	2	3
Required: Number of cross connectors	2	4

2 pieces per pack, including screws for attaching to the fire dampers.

Use \Rightarrow see page 14



* Plugs, and bolts if required, for attaching to walls and ceilings are not included.

FK90K fire dampers

Accessories (2)

Simplified electrical connection

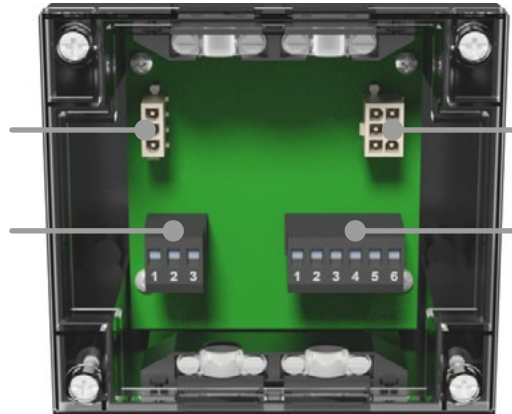
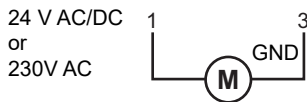
Connection box for fire dampers with spring return actuator.

The electrical connections are made in the connection box using plug-in screw terminals. Motor connection lines are fitted with AMP connectors as standard and cannot be accidentally reversed.

Plastic casing 140 mm x 110 mm, 67 mm high, protection class II, protection rating IP40.

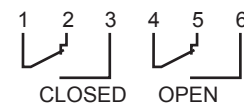
Actuator connection plug
3-pin AMP connector

Mains connection
Plug-in screw terminals



Limit switch connector plug
6-pin AMP connector

Redirection limit switch
Plug-in screw terminals



The illustration shows the de-energised operating position where the fire dampers are closed.

AB-01 for spring return actuators M24-10/H, M24-9/H

AB-02 for spring return actuators M220-10/H, M220-9/H

BS2 communication system Wildeboer-Net

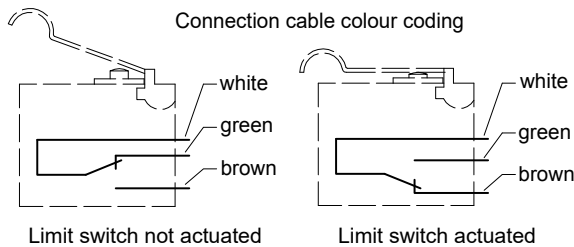
⇒ see information on the back page and BS2 User Manual 7.1

FK90K fire dampers

Electrical connections

Limit switches on thermal-mechanical release mechanisms

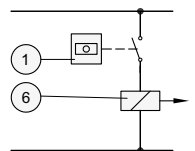
The CLOSED limit switches are actuated when the fire damper is closed, and the OPEN limit switches are actuated when the fire damper is open.



Remote release

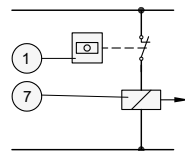
W220, G24

Closed during current flow



WU220, GU24

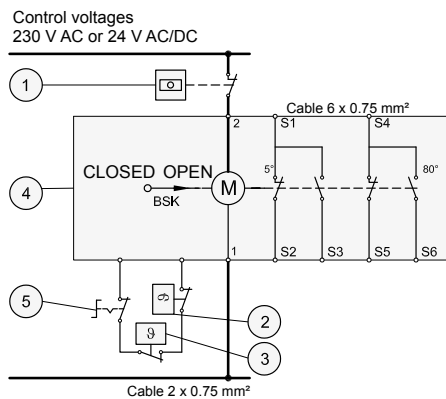
Closed during power interruption



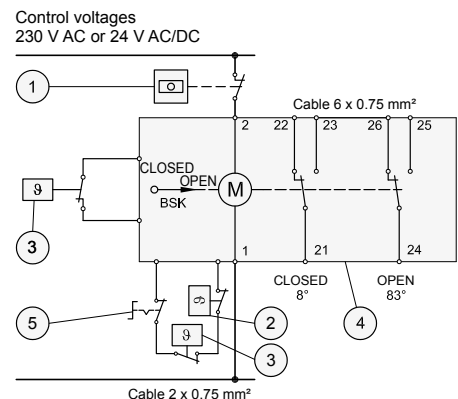
Control voltages 230 V AC or 24 V DC

- 1 Thermostats, smoke detectors and switches must only be installed if required. On site delivery.
 - 2 Thermal-electric release element 70°C or 95°C inside the fire damper casing.
 - 3 Temperature cut-off approx. 70°C outside the fire damper casing.
 - 4 Electric actuator with limit switches for OPEN-CLOSED position indicator.
- The illustration shows the de-energised operating position where the fire dampers are closed.**
- The switches on the connection cables can be removed if they are not being used.
 - Due to their in-built thermal release elements, all actuators must be stored at temperatures not exceeding 50°C!
- 5 Button for function check
 - 6 Lifting solenoid
 - 7 Magnetic clamp
- The right to allow for delivery variations from the versions shown remains reserved.

Actuators M220-10/H, M24-10/H



Actuators M220-9/H, M24-9/H



Connection box for fire dampers with electric spring return actuators M220-10/H, M24-10/H, M220-9/H, M24-9/H
⇒ see pages 37 and 39

FK90K fire dampers

Specification text

Maintenance-free fire dampers according to EN 15650 with 90-minute fire resistance period and fire classifications EI 30/60/90 (ve - ho, i ↔ o) S C 10000. Air-tight casing, leak tightness class C according to EN 1751. Casing and exchangeable damper blade made of abrasion- and corrosion-resistant calcium silicate, galvanized steel components. Permanently durable elastomer lip seals in walls of casing. Connection profiles for screw connections, sliding rails and screw terminals. With unrestricted freedom of damper blade movement in all sizes. Operating pressures up to 1500 Pa. Minimum pressure drop and exceptionally low sound power level. Fully enclosed, maintenance-free slider crank drive in the casing wall, as a self-locking drive mechanism for break-proof torque transmission. Sealed drive axles made of stainless steel, with red metal bearings. For installation with horizontal or vertical shut-off damper blade axes without minimum spacing with mortar, mineral wool or equivalent. Installation in and remote from rigid walls and ceilings and in and remote from metal stud walls. Can be screwed to adjacent walls and ceilings to save space, direct connection to ventilation ducts made of non-combustible or combustible materials or with protective grilles. Enclosed maintenance-free thermal release mechanism 70°C / 95°C.

- For manual single-handed operation
 - Corrosion-resistant release element 70°C
 - with (two) electrical limit switch(es) for signalling the damper blade positions (CLOSED, OPEN, CLOSED and OPEN)
- with electric actuator 230 V AC or 24 V DC for remote control and functional checks
- Connection profiles and other galvanized steel components powder coated with epoxy resin
- with installation subframe ER5 for sliding ceiling connections in metal stud walls
- with set of gaskets DS for installation remote from rigid walls and ceilings and metal stud walls

Verification of compliance with the hygiene requirements according to VDI 6022-1, VDI 3803-1, DIN EN 13779, the necessary resistance of the materials to micro-organisms (fungi, bacteria) and disinfectant resistance. With Environmental Product Declaration according to ISO 14025 and EN 15804.

.....	Pc	Width:	.....	mm		
		Height:	.....	mm		
		Length:	260	mm		
		Volume flow:	.....	m ³ /h		
		Pressure drop:	.....	Pa		
		Sound power level:	.....	dB (A)		
		Manufacturer:	WILDEBOER			
		Type/series:	FK90K/FK92K		deliver:	.....
					install:	.....

Protective grille for FK90K fire dampers without connecting ducts for protecting flow-through openings. Stamped with 20 mm mesh size made of at least 1 mm thick galvanized sheet steel.

.....	pc	Width:	.....	mm		
		Height:	.....	mm		
		Manufacturer:	WILDEBOER		deliver:	.....
					install:	.....

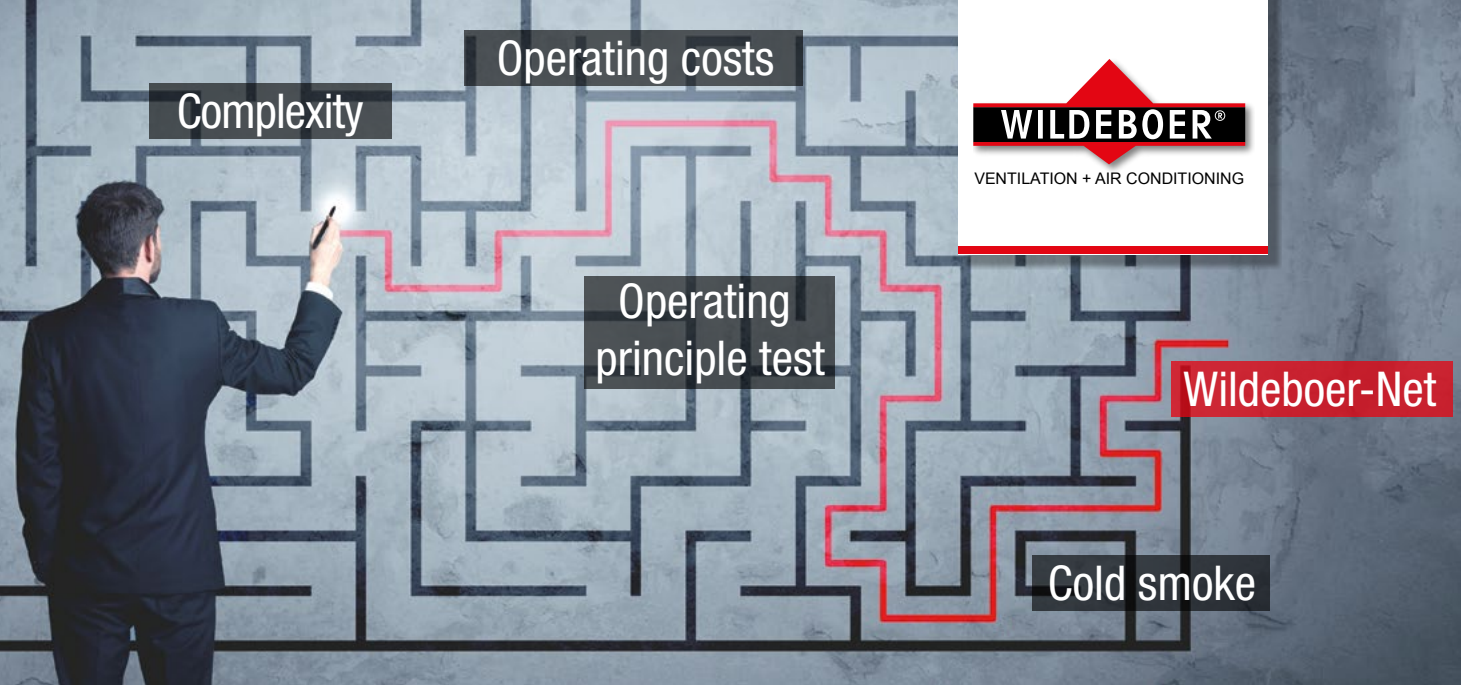
Flexible connectors for FK90K fire dampers, made from polyester with a cadmium-free coating, with connection frame. Stretched length around 210 mm, 100 mm axial expansion absorption, building material class B1 according to DIN 4102. With hygiene certificate.

.....	pc	Width:	.....	mm		
		Height:	.....	mm		
		Manufacturer:	WILDEBOER		deliver:	.....
					install:	.....

Connection box for spring return actuators with AMP connector on connecting lines for transmission via plug-in screw terminals to on-site line. Plastic casing IP40.

.....	pc	AB-01 for 24 V AC/DC				
		Manufacturer:	WILDEBOER		deliver:	.....
					install:	.....
.....	pc	AB-02 for 230 V AC				
		Manufacturer:	WILDEBOER		deliver:	.....
					install:	.....

Select texts not highlighted in bold as required!



Existing problems:

- The system design, installation, programming and commissioning of conventional control systems in buildings is complex.
- Preventing smoke spreading is a challenge.
- Recurring functional tests are time-consuming, affect operation and incur high costs.
- Fire dampers have to operate reliably. Changes in the building control system always require new operating principle testing.



Our response:

- Special plug-and-play functionality allows control systems for fire dampers to be designed, built and connected in parent hierarchy without any measuring and control expertise.
- Detect smoke and close fire dampers reliably and in good time via flexible release groups.
- The BS2 communication system "Wildeboer-Net" performs functional testing in less than 10 minutes in all.
- The BS2 communication system "Wildeboer-Net" controls and safeguards the functioning of fire dampers. Changes in the building control system have no effect.



The solution:

BS2 communication system Wildeboer-Net

Network your fire protection and significantly minimise the cost of planning, installation and testing. The BS2 communication system "Wildeboer-Net" lays all the groundwork for you. Don't miss out on these benefits. We would be glad to advise you.



Watch explanatory video on YouTube
wildeboer.eu/youtube



BS2 communication system Wildeboer-Net

- Optimum system solution combined with our maintenance-free fire dampers

Wildeboer Bauteile GmbH

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