

Technical Catalogue 2017

Dear Sir/Madam,

Please accept our Technical Catalogue for fire ventilation systems, which contains detailed information on the use, design, versions, manufacture and equipment, methods of installation and technical parameters of our fire dampers and valves.

Every appliance dispatched from „MERCOR” S.A. factories to a Customer is thoroughly verified in accordance with the highest quality management standards and subject to a range of approval tests. We are proud to provide safety through our operations.

We are looking forward to doing business with you.

The „MERCOR” S.A. Team

The electronic version of our Technical Catalogue is available at www.mercor.com.pl

Fire ventilation systems

Technical Catalogue 2017

Edited by: „MERCOR” S.A.- Fire Ventilation Systems Department

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FIRE VENTILATION SYSTEMS

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**PRODUCT CONFIGURATOR
AT WWW.MERCOR.COM.PL**



- ▶ **EIS120**
- ▶ Certificate of constancy of performance 1488-CPD-0203/W, 1396-CPR-0114.
- ▶ Dampers certified for compliance with EN 15650.
- ▶ Dampers qualified under EN 13501-3 and tested under EN 1366-2.
- ▶ Cut-off dampers with the fire resistance independent of airflow direction and installation side.
- ▶ Lower acoustic noise and hydraulic resistance in the system with reduced partition thickness.

1.1. application

The mcr FID S/S c/P low-resistance cut-off dampers are designed for use in general ventilation systems, where those systems pass through vertical and horizontal construction partitions. The dampers are intended, for example, for systems with increased acoustic requirements. During a fire, the dampers preserve the fire resistance of the construction partition where ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and burning fumes to the remaining part of the building which is not on fire. During normal system operation, the damper blade is open. In case of fire, the damper blade closes.

The dampers cannot be operated in systems exposed to dust, except for when they are included in a special, individually developed programme of service and technical inspections.

1.2. design

perforation and intumescent gasket

casing

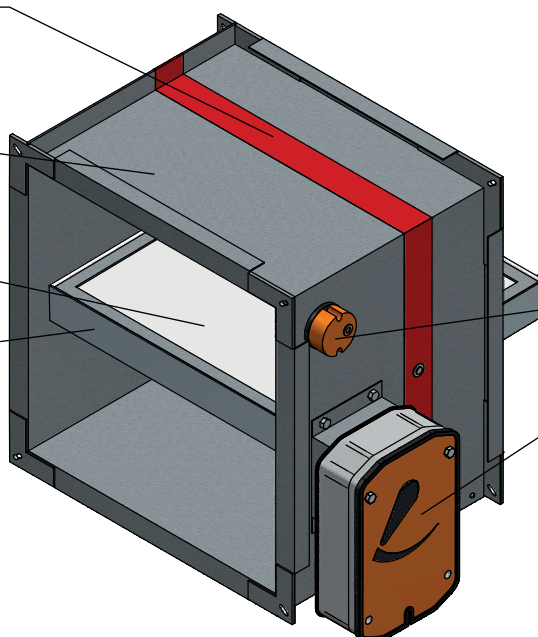
damper blade

gasket

damper blade
protection frame

trigger thermoelectric or thermal

trigger control mechanism
(e.g. actuator with a return spring)



The mcr FID S/S/ c/P cut-off fire dampers consist of a casing with a rectangular cross section, a moving damper blade and a trigger control mechanism, which is activated remotely or automatically when the thermal or thermoelectric trigger is tripped. Standard damper casing is made of galvanised steel sheet. For chemically aggressive environments, special manufacture casing is used, in which steel elements are made of 1.4404 acid-proof steel sheet, while other elements are impregnated.

The casing total length is at least 296 mm. In the middle part, in which the damper blade is placed, the casing is perforated - perforation width is 30 mm. On the inner side of the casing, around the damper blade, there is an intumescent gasket. The damper blade is made of a fire-proof panel with the total thickness of 30 mm.

The damper blade is covered with steel reinforcement profile on blade perimeter. The inner surface is equipped with „P“-type ventilation gasket, which ensures the tightness of dampers at the ambient temperature. Both ends of the fire damper casing are finished with flange connections.

1.3. versions

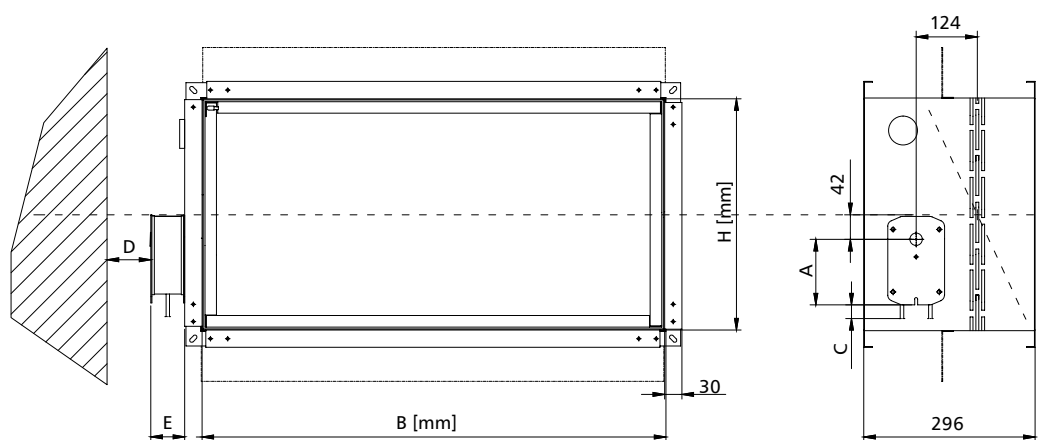
1.3.1. mcr FID S/S c/P – the cut-off fire damper for ventilation ducts with an actuator with a return spring – damper closing and opening with an actuator

During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically or remotely when the power supply is cut off.

The mcr FID S/S c/P dampers are equipped with a Belimo trigger control mechanisms **BFL**, **BFN**, **BF-TL** and **EXBF** axial actuator with a return spring, powered with 24 V AC/DC or 230 V AC, with thermoelectric trigger 72°C (optionally it is possible to use triggers with the nominal tripping temperature of 95°C). BFL, BFN, BF-TL and EXBF series actuators are equipped with limit switches used to monitor the blade position. Furthermore, the mechanical position indicator is placed on the actuator.

The thermoelectric trigger is equipped with a test switch and a power supply indicator (LED).

Dampers with Belimo actuators: analogue BFL, BFN, digital BF-TL, EXBF explosion proof actuators close thanks to thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when the power supply voltage is applied to the actuator terminals. Furthermore, dampers with those actuators may be opened manually using a key.

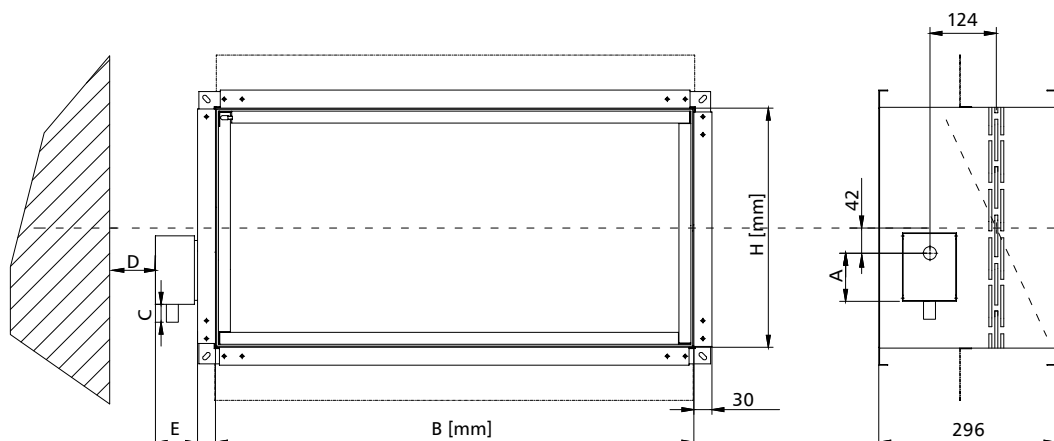


mechanism	A	C	D	E
BFN	157	30	75	57
BFL	138	30	75	53
BF24TL-ST	198	10	75	65
EXBF	225	55	75	175

1.3.2. mcr FID S/S c/P – the cut-off fire damper for ventilation ducts with a spring drive and thermal trigger

During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically.

The mcr FID S/S c/P dampers are equipped with a **RST** trigger control mechanism with a spring drive (without an integrated thermal trigger). In this case, a thermal trigger rated at 74°C (optionally 95°C) is installed outside the damper mechanism, on the damper blade itself. After the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. On the RST mechanism, there is a mechanical indicator of blade position. It is possible to equip the damper with WK1 or WK2 limit switches used to signal the blade position state.

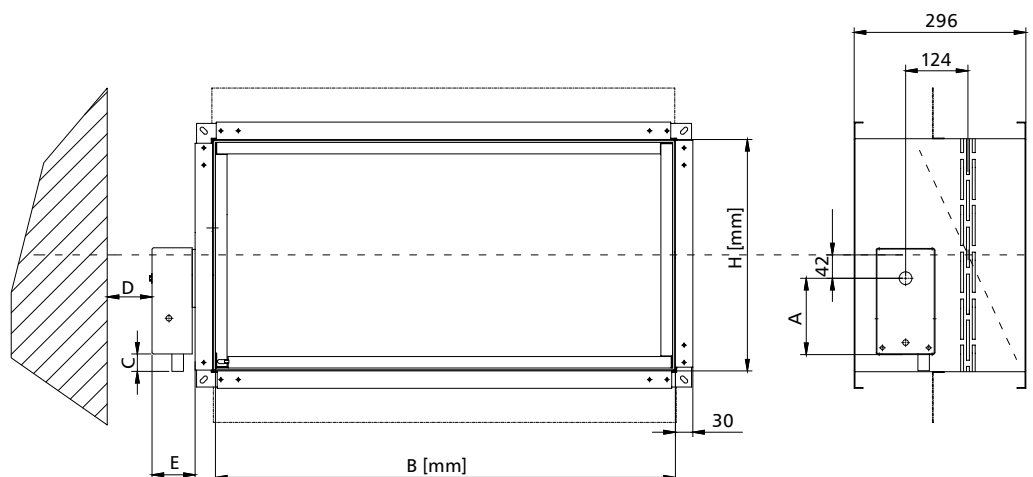


mechanism	A	C	D	E
RST	50	30	75	70

1.3.3. mcr FID S/S c/P – the cut-off fire damper for ventilation ducts with a spring drive and an integrated thermal trigger, optionally equipped with an electromagnetic trigger and limit switches

During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically or, in case of a damper with an electromagnetic trigger, additionally remotely by using the fire automation.

The mcr FID S/S c/P dampers are equipped with a **RST-KW1** trigger control mechanism with a spring drive and a cam lever system. A thermal trigger rated at 74°C (optionally at 95°C) is integrated with the damper mechanism. After the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. On the RST-KW1 mechanism, there is a mechanical blade position indicator. It is possible to equip a trigger control mechanism with an electromagnetic trigger, activated by the application („pulse”) or removal („break”) of the power supply voltage and with limit switches used to signal the damper blade position state. The mechanism has a function to test and blade button-release. Blade re-opening is activated manually.



mechanism	A	C	D	E
RST-KW1	130	30	75	80

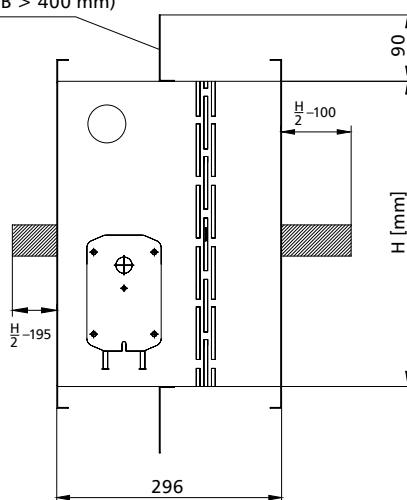
1.4. dimensions

Rectangular dampers:

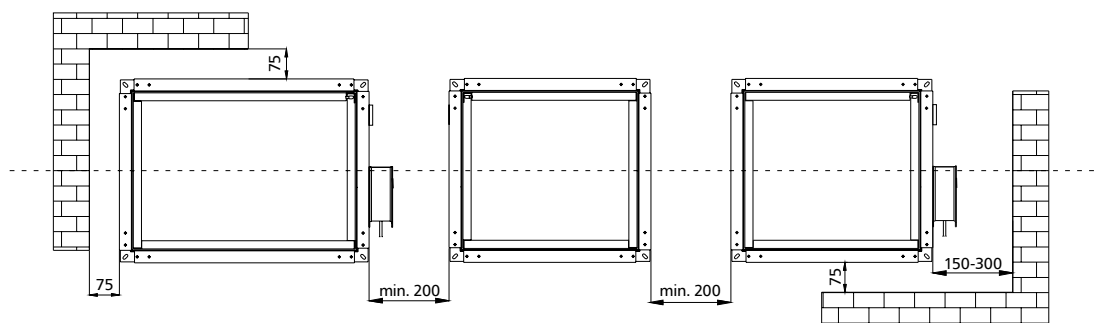
- nominal width B: from 200 mm to 800 mm
- nominal height H: from 200 mm to 400 mm
- the maximum cross-section surface of one damper up to 0.32 m²

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (in 1 mm increments, in the given range).

mounting flange
(for dampers with the dimension of B > 400 mm)



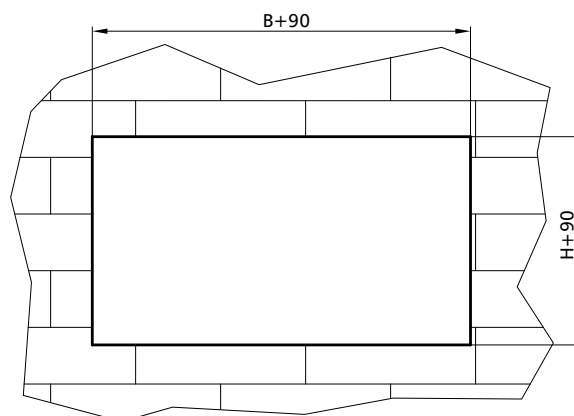
Distance between the installations and partitions



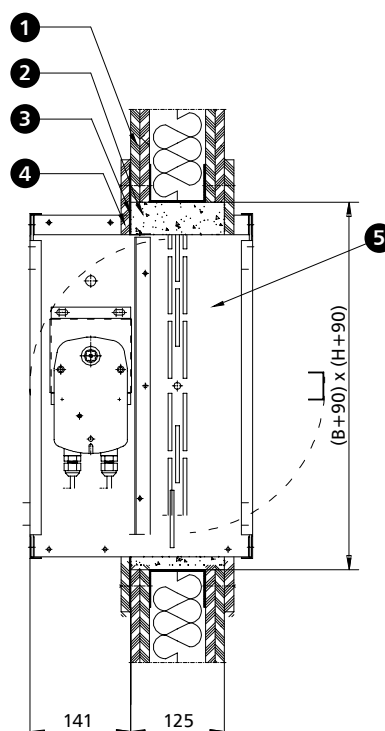
1.5. installation

The mcr FID S/S c/P rectangular dampers are EI120(ve ho i↔o)S-rated when installed in concrete partitions with the thickness of at least 110 mm, made of full bricks or cellular concrete blocks with the thickness of at least 115 mm, lightweight walls of cardboard-plaster panels on a steel framework with the thickness of at least 125 mm and the resistance class of not less than EI120 and concrete ceilings with the thickness of at least 150 mm.

1.5.1. preparation of installation openings



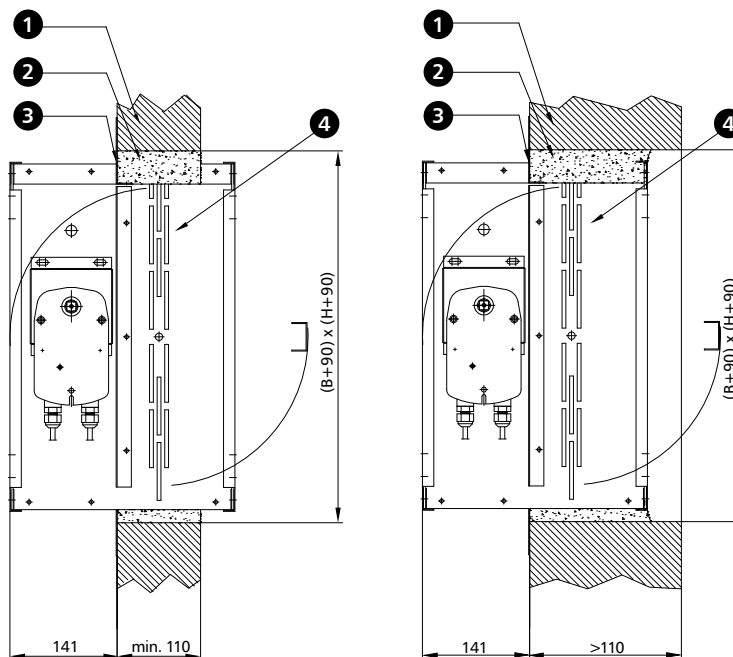
1.5.2. sample installation in lightweight walls of plaster-cardboard panels



1. lightweight wall
2. sealing - plaster mortar*
3. mounting flange - embedding border
4. circumferential belt of 100 x 12.5 plaster-cardboard panels
5. fire damper mcr FID S

*it is possible to use a different sealing which ensures the required fire resistance

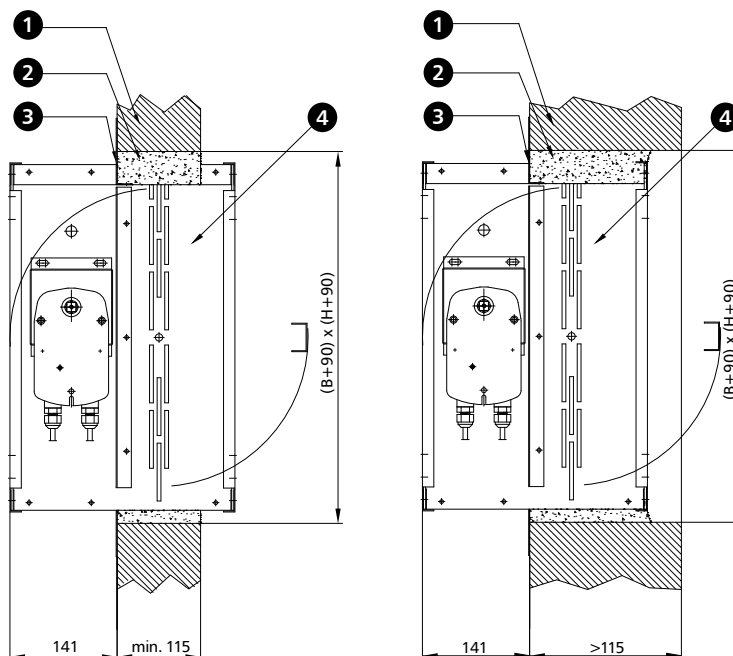
1.5.3. sample installation in concrete walls



1. rigid wall
2. sealing - cement or cement-lime masonry mortar*
3. mounting flange - embedding border
4. fire damper mcr FID S

*it is possible to use a different sealing which ensures the required fire resistance

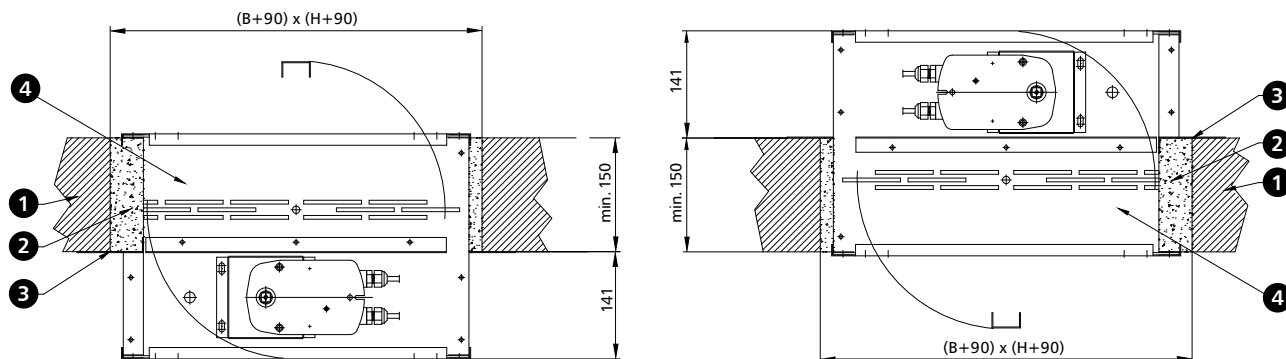
1.5.4. sample installation in masonry walls



1. rigid wall
2. sealing - cement or cement-lime masonry mortar*
3. mounting flange - embedding border
4. fire damper mcr FID S

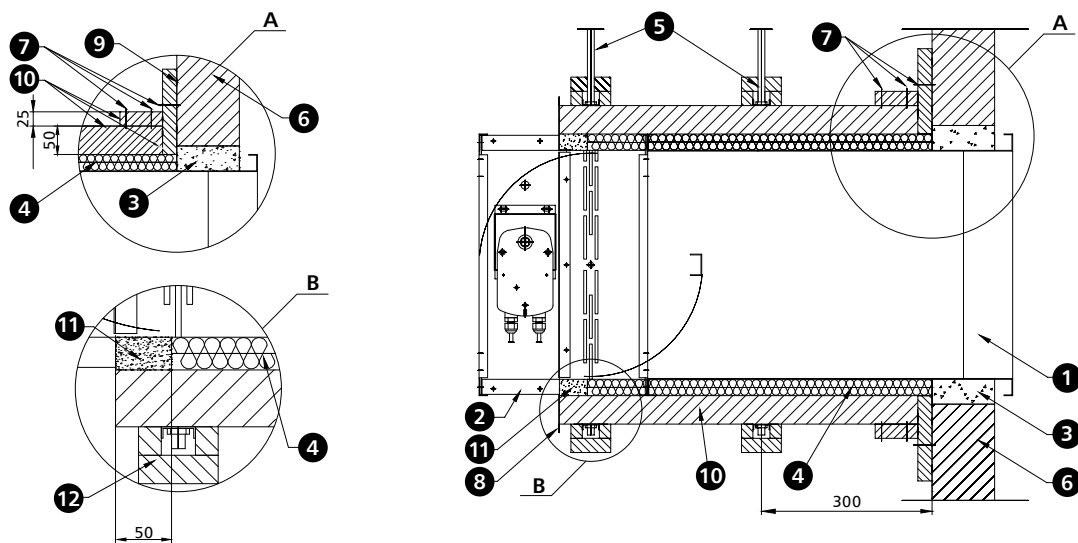
*it is possible to use a different sealing that ensures the required fire resistance

If the damper is installed in a wall with the thickness of less than 115 mm, the wall thickness should be increased along the damper circumference by installing a belt of panels or other construction elements to the required thickness.

1.5.5. sample installation in ceilings


1. ceiling
2. sealing - cement or cement-lime masonry mortar*
3. mounting flange - embedding border
4. fire damper mcr FID S

*it is possible to use a different sealing which ensures the required fire resistance

1.5.6. sample installation outside the fire partition


1. ventilation duct
2. fire damper mcr FID S
3. e.g. cement mortar*
4. mineral wool with the density of at least 80 kg/m³ and thickness 30 mm, A1 class
5. suspension rod M12
6. wall
7. ST3,5x50 screw

8. angle - casting limits
9. board joints sealed with a bonding agent, e.g. Promat H 84
10. non-combustible board with the thickness corresponding to the fire rating of the fire partition (e.g. Promat L500 for EI120 - thickness 50 mm)
11. e.g. gypsum mortar
12. suspension rod insulation

*it is possible to use a different sealing which ensures the required fire resistance

Fire damper installation with a vertical axis of rotation

Installation must be specified in the design plans and specifications and selected when ordering. Fire damper dimensions BxH are specified for the fire damper with a horizontal axis of rotation.

1.6. technical parameters of mcr FID S/S c/P rectangular dampers

B – nominal width [mm]
H – nominal height [mm]

v – velocity [m/s]
Sk – duct cross-section [m²]
Se – damper active cross-section [m²]

Q – flow [m³/h]
dp – pressure drop [Pa]
L_{WA} – damper noise level [dB]

			height H [mm]														
			200					250					300				
			v [m/s]	Sk [m²]	Se [m²]	Q [m³/h]	dp [Pa]	L _{WA} [dB]	Sk [m²]	Se [m²]	Q [m³/h]	dp [Pa]	L _{WA} [dB]	Sk [m²]	Se [m²]	Q [m³/h]	dp [Pa]
width B [mm]	200	4	0.04	0.033	468	7	27	0.05	0.043	612	6	26	0.06	0.053	756	6	28
		6			702	15	37			918	13	37			1 134	13	38
		8			936	26	45			1 224	24	45			1 512	22	44
		10			1 170	41	51			1 530	37	50			1 890	34	50
	250	4	0.05	0.041	585	6	27	0.0625	0.053	765	6	27	0.075	0.066	945	5	26
		6			878	14	37			1 148	13	38			1 418	11	37
		8			1 170	24	45			1 530	23	45			1 890	20	44
		10			1 463	38	50			1 913	36	51			2 363	31	50
	300	4	0.06	0.049	702	6	27	0.075	0.064	918	6	28	0.09	0.079	1 134	4	26
		6			1 053	13	38			1 377	13	38			1 701	10	36
		8			1 404	24	45			1 836	22	46			2 268	18	44
		10			1 755	37	51			2 295	35	51			2 835	28	49
	350	4	0.07	0.057	819	6	27	0.0875	0.074	1 071	5	27	0.105	0.092	1 323	4	25
		6			1 229	13	38			1 607	11	37			1 985	9	35
		8			1 638	22	45			2 142	20	45			2 646	16	43
		10			2 048	35	51			2 678	31	50			3 308	25	49
	400	4	0.08	0.065	936	5	27	0.1	0.085	1 224	4	25	0.12	0.105	1 512	4	24
		6			1 404	12	38			1 836	9	35			2 268	8	34
		8			1 872	22	45			2 448	17	43			3 024	14	42
		10			2 340	34	51			3 060	26	49			3 780	22	47
	450	4	0.09	0.073	1 053	5	27	0.1125	0.096	1 377	3	22	0.135	0.118	1 701	3	23
		6			1 580	11	37			2 066	7	33			2 552	7	33
		8			2 106	20	45			2 754	13	40			3 402	13	41
		10			2 633	31	50			3 443	20	46			4 253	20	47
	500	4	0.1	0.081	1 170	4	26	0.125	0.106	1 530	3	23	0.15	0.131	1 890	3	23
		6			1 755	10	36			2 295	8	34			2 835	7	34
		8			2 340	18	44			3 060	13	41			3 780	13	41
		10			2 925	28	50			3 825	21	47			4 725	20	47
550	4	0.11	0.089	1 287	4	25	0.1375	0.117	1 683	3	23	0.165	0.144	2 079	3	22	
	6			1 931	9	36			2 525	7	33			3 119	6	33	
	8			2 574	17	43			3 366	13	41			4 158	12	40	
	10			3 218	26	49			4 208	20	47			5 198	18	46	
600	4	0.12	0.098	1 404	3	21	0.15	0.128	1 836	3	20	0.18	0.158	2 268	2	20	
	6			2 106	7	32			2 754	6	31			3 402	5	31	
	8			2 808	12	39			3 672	10	38			4 536	10	38	
	10			3 510	19	45			4 590	16	44			5 670	15	44	
650	4	0.13	0.106	1 521	3	22	0.1625	0.138	1 989	3	21	0.195	0.171	2 457	2	20	
	6			2 282	7	32			2 984	6	31			3 686	5	30	
	8			3 042	12	40			3 978	10	39			4 914	9	38	
	10			3 803	19	46			4 973	16	45			6 143	14	44	
700	4	0.14	0.114	1 638	3	21	0.175	0.149	2 142	2	20	0.21	0.184	2 646	2	19	
	6			2 457	6	32			3 213	5	31			3 969	5	30	
	8			3 276	12	39			4 284	10	38			5 292	8	37	
	10			4 095	18	45			5 355	15	44			6 615	13	43	
750	4	0.15	0.122	1 755	3	21	0.1875	0.159	2 295	2	20	0.225	0.197	2 835	2	20	
	6			2 633	6	31			3 443	5	31			4 253	5	30	
	8			3 510	11	39			4 590	10	38			5 670	8	38	
	10			4 388	17	45			5 738	15	44			7 088	13	43	
800	4	0.16	0.130	1 872	2	20	0.2	0.170	2 448	2	20	0.24	0.210	3 024	2	19	
	6			2 808	5	30			3 672	5	30			4 536	4	29	
	8			3 744	10	38			4 896	9	38			6 048	8	37	
	10			4 680	15	43			6 120	14	44			7 560	12	43	

The mcr FID S fire damper selection program is available at www.mercor.com.pl, in the Architect and Designer Zone.

1.6. technical parameters of mcr FID S/S c/P rectangular dampers

B – nominal width [mm]

H – nominal height [mm]

v – velocity [m/s]

Sk – duct cross-section [m²]Se – damper active cross-section [m²]Q – flow [m³/h]

dp – pressure drop [Pa]

L_{WA} – damper noise level [dB]

		height H [mm]									
		350					400				
	v	Sk	Se	Q	dp	L _{WA}	Sk	Se	Q	dp	L _{WA}
	[m/s]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]
width B [mm]	200	4	0.07	0.063	900	5	0.08	0.073	1 044	5	26
		6			1 350	12			1 566	11	37
		8			1 800	21			2 088	19	44
		10			2 250	32			2 610	30	50
	250	4	0.0875	0.078	1 125	4	0.1	0.091	1 305	4	25
		6			1 688	10			1 958	9	35
		8			2 250	17			2 610	16	43
		10			2 813	27			3 263	25	49
	300	4	0.105	0.094	1 350	4	0.12	0.109	1 566	4	24
		6			2 025	10			2 349	8	35
		8			2 700	17			3 132	15	42
		10			3 375	27			3 915	23	48
	350	4	0.1225	0.109	1 575	4	0.14	0.127	1 827	4	25
		6			2 363	9			2 741	8	36
		8			3 150	15			3 654	15	43
		10			3 938	24			4 568	23	49
	400	4	0.14	0.125	1 800	3	0.16	0.145	2 088	3	23
		6			2 700	8			3 132	7	34
		8			3 600	13			4 176	12	41
		10			4 500	21			5 220	19	47
	450	4	0.1575	0.141	2 025	3	0.18	0.163	2 349	3	21
		6			3 038	7			3 524	6	32
		8			4 050	13			4 698	10	39
		10			5 063	20			5 873	16	45
	500	4	0.175	0.156	2 250	2	0.2	0.181	2 610	2	20
		6			3 375	5			3 915	5	31
		8			4 500	10			5 220	9	38
		10			5 625	15			6 525	14	44
	550	4	0.1925	0.172	2 475	2	0.22	0.199	2 871	2	20
		6			3 713	5			4 307	5	30
		8			4 950	8			5 742	8	38
		10			6 188	13			7 178	13	43
	600	4	0.21	0.188	2 700	2	0.24	0.218	3 132	2	19
		6			4 050	4			4 698	4	28
		8			5 400	8			6 264	7	36
		10			6 750	12			7 830	11	42
	650	4	0.2275	0.203	2 925	2	0.26	0.236	3 393	2	18
		6			4 388	4			5 090	4	29
		8			5 850	8			6 786	7	36
		10			7 313	12			8 483	11	42
	700	4	0.245	0.219	3 150	2	0.28	0.254	3 654	2	18
		6			4 725	4			5 481	4	29
		8			6 300	7			7 308	7	36
		10			7 875	11			9 135	11	42
	750	4	0.2625	0.234	3 375	2	0.3	0.272	3 915	2	17
		6			5 063	4			5 873	4	28
		8			6 750	7			7 830	6	35
		10			8 438	11			9 788	10	41
	800	4	0.28	0.250	3 600	2	0.32	0.290	4 176	2	18
		6			5 400	4			6 264	4	28
		8			7 200	7			8 352	6	36
		10			9 000	11			10 440	10	41

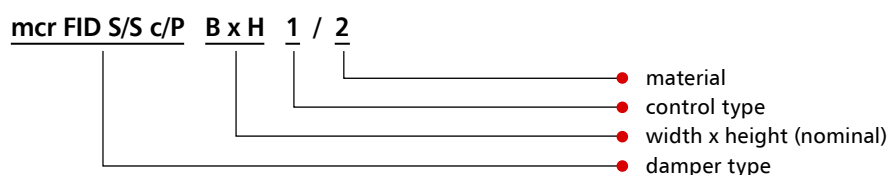
The mcr FID S fire damper selection program is available at www.mercor.com.pl, in the Architect and Designer Zone.

1.7. estimated weights of mcr FID S/S c/P dampers for rectangular ventilation ducts [kg]

		width B [mm]							
		200	250	300	400	500	600	700	800
height H [mm]	200	7,5	8	9	10	11	14	16	18
	250	8	9,5	10	11	14	15	17	19
	300	9	10,5	11	12	15	16	18	20
	350	10	11,5	12	13	16	17	19	21
	400	11	12,5	13,5	14	18	19	21	22

For dampers with no actuator, subtract ~1 kg.

1.8. marking



1 – control:

- RST trigger control mechanism
 - RST** – thermal trigger
 - RST/WK1** – thermal trigger + limit switch (closed blade signal)
 - RST/WK2** – thermal trigger + limit switch (open/closed blade signal)
- RST-KW1 trigger control mechanism
 - RST-KW1/S** – thermal trigger
 - RST-KW1/S/WK2** – thermal trigger + limit switch (open/closed blade signal)
 - RST-KW1/24I** – thermal trigger + „pulse“ electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
 - RST-KW1/24P** – thermal trigger + „break“ electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
 - RST-KW1/230I** – thermal trigger + „pulse“ electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
 - RST-KW1/230P** – thermal trigger + „break“ electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
- Belimo trigger control mechanism
 - BF24TL-T-ST** (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control
 - EXBF24-T** – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC
 - EXBF230-T** – explosion proof actuator with a return spring in the Ex version, U = 230 V AC
 - BFL24-T** – actuator with a return spring, U = 24 V AC/DC
 - BFL230-T** – actuator with a return spring, U = 230 V AC
 - BFL24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
 - BFN24-T** – actuator with a return spring, U = 24 V AC/DC
 - BFN230-T** – actuator with a return spring, U = 230 V AC
 - BFN24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system

2 – material

- [no symbol]** – galvanised steel, Zn 275 g/m² coating
- KN** – 1.4404 acid-proof stainless steel

example marking:

mcr FID S/S c/P 400 x 400 BFL24-T

EIS120 low-resistance cut-off damper with a 24 V compact Belimo actuator with limit switches.

Chapter 12 - power supply and control (p. 141) contains:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper,
- location of trigger control mechanisms in relation to the damper - production standards.

PRODUCT CONFIGURATOR
AT WWW.MERCOR.COM.PL



CE
1396-CPR-0103

CE
1488-CPR-0422/W



ATEST HIGIENICZNY
IFH
CERTYFIKACJA PRODUKTU



- ▶ **EIS120**
- ▶ Certificate of constancy of performance 1488-CPR-0422/W and 1396-CPR-0103.
- ▶ Dampers certified for compliance with EN 15650.
- ▶ Dampers qualified under EN 13501-3 and tested under EN 1366-2.
- ▶ Cut-off dampers with the fire resistance independent of airflow direction and installation side.
- ▶ Dampers for rectangular and circular ventilation ducts.

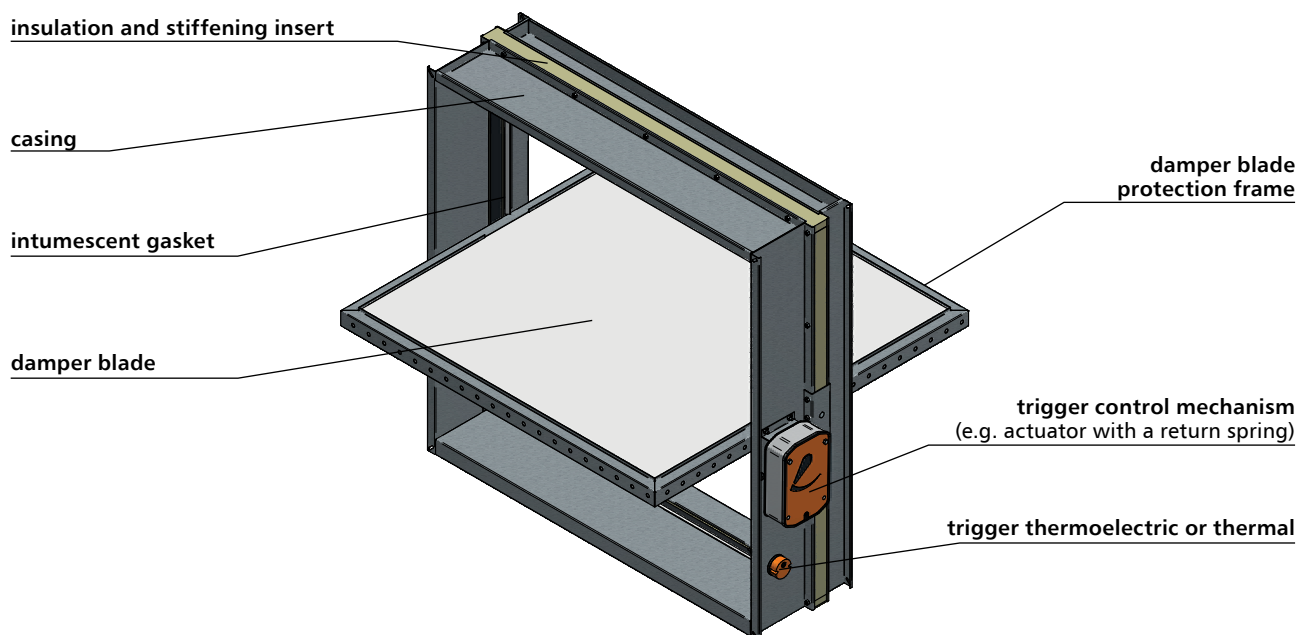
2.1. application

The mcr FID S/S p/P and mcr FID S/S p/O cut-off dampers are designed for use in general ventilation systems, where those systems pass through construction partitions.

During a fire, the dampers preserve the fire resistance of the construction partition where ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and burning fumes to the remaining part of the building which is not on fire. During normal system operation, the damper blade is open. In case of fire, the damper blade closes.

Additionally mcr FID S/S dampers may be used as relief dampers in gas extinguishing systems, in which case they are equipped with drives without thermoelectric or thermal triggers.

2.2. design



The mcr FID S/S cut-off dampers consist of a casing with a rectangular (mcr FID S/S p/P) or circular (mcr FID S/S p/O) cross-section, made of two segments separated with a fire-proof panel with the cross-section of 20 x 40 mm, a moving damper blade and a trigger control mechanism, which is activated remotely or automatically by tripping a thermal or thermoelectric trigger. Standard damper casing is made of galvanised steel sheet. For chemically aggressive environments, special manufacture casing is used, in which steel elements are made of 1.4404 acid-proof steel sheet, while other elements are impregnated. The casing total length is at least 296 mm. Dampers may be made with an extension element, in such case the casing length is 400 mm.

The damper blade is made of a fire-proof panel with the total thickness of 40 mm, edge is covered with a reinforcement metal profile. The inner side of the fire damper casing is equipped with an intumescent gasket. There are stop profiles fastened to the inner casing surface, which limit the rotating motion of the damper blade. The stop profiles are finished with a polyethylene ventilation-grade seal. In dampers with a rectangular cross-section, both ends are finished with flange connections, and in circular dampers, with nipple, muff or flange connections.

2.3. versions

2.3.1. mcr FID S/S – the cut-off fire damper for ventilation ducts with an actuator with a return spring – damper closing and opening with an actuator

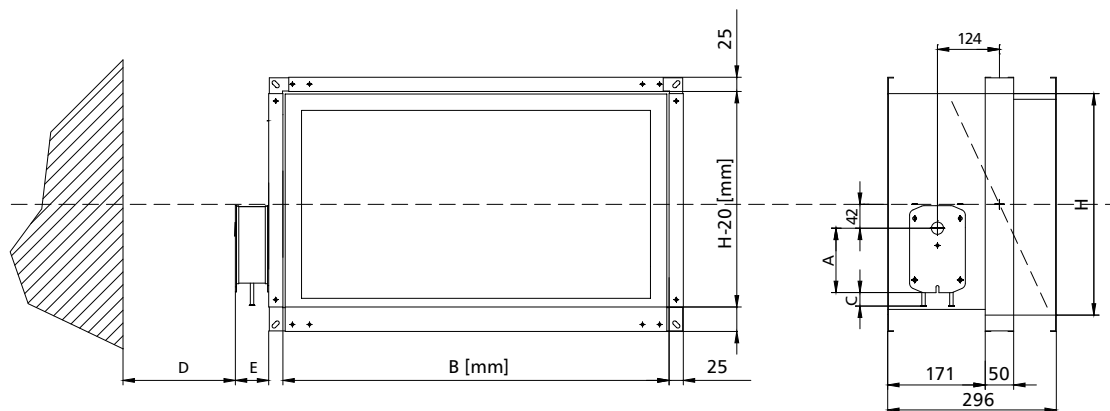
During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically or remotely when the power supply is cut off.

The mcr FID S/S c/P dampers are equipped with a trigger control Belimo mechanisms **BF, BFL, BFN, BF-TL, EXBF** - axial actuator with a return spring, powered with 24 V AC/DC or 230 V AC, with thermoelectric trigger 72°C (optionally it is possible to use triggers with the nominal tripping temperature of 95°C). BFL-series actuators are used in dampers with the height up to 600 mm and the diameter up to 550 mm. BFN-series actuators are used in dampers with the height up to 1000 mm and the diameter up to 630 mm.

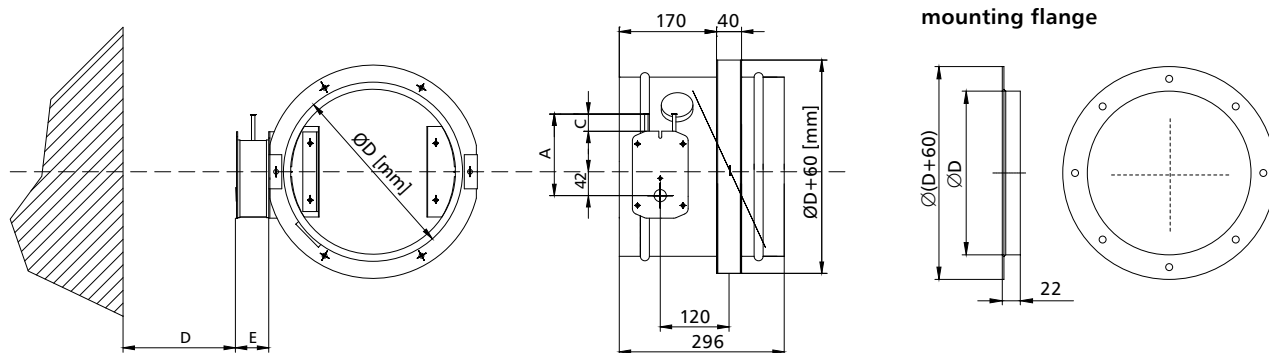
BF, BFL, BFN, BF-TL, EXBF series actuators are equipped with limit switches used to monitor the blade position. Furthermore, the mechanical position indicator is placed on the actuator.

The thermoelectric trigger is equipped with a test switch and a power supply indicator (LED).

Dampers with Belimo actuators: analogue BF, BFL, BFN, digital BF-TL, EXBF explosion proof actuators close thanks to thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when the power supply voltage is applied to the actuator terminals. Furthermore, dampers with those actuators may be opened manually using a key.



mechanism	A	C	D	E
BFN	157	30	75	62
BFL	138	30	75	58
BF24TL-ST	198	10	75	70
EXBF	225	55	75	175
BF	198	10	75	70

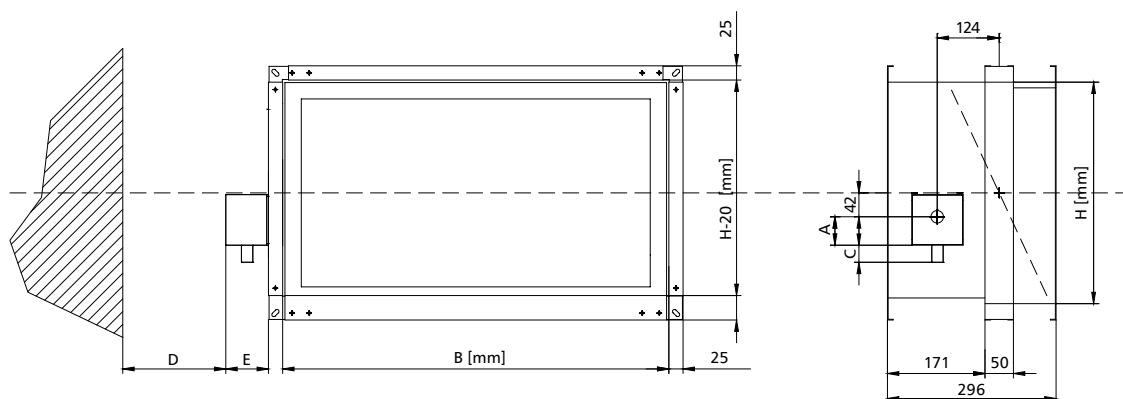


mechanism	A	C	D	E
BFN	157	30	75	42
BFL	138	30	75	38
BF24TL-ST	198	10	75	50
EXBF	225	55	75	160
BF	198	10	75	50

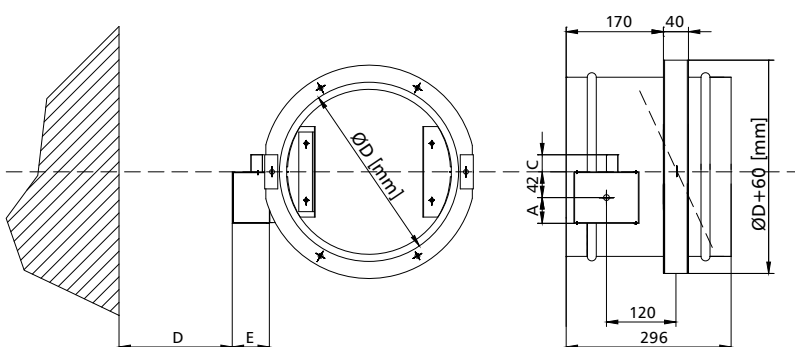
2.3.2. mcr FID S/S – the cut-off fire damper for ventilation ducts with a spring drive and thermal trigger

During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically.

The mcr FID S/S dampers are equipped with a **RST** trigger control mechanism with a drive spring (without an integrated thermal trigger). In this case, a thermal trigger 74°C (optionally 95°C) is installed outside the damper mechanism, on the damper blade itself. After the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. On the RST mechanism, there is a mechanical blade position indicator. It is possible to equip the damper with WK1 or WK2 limit switches used to signal the blade position state.



mechanism	A	C	D	E
RST	50	30	75	75

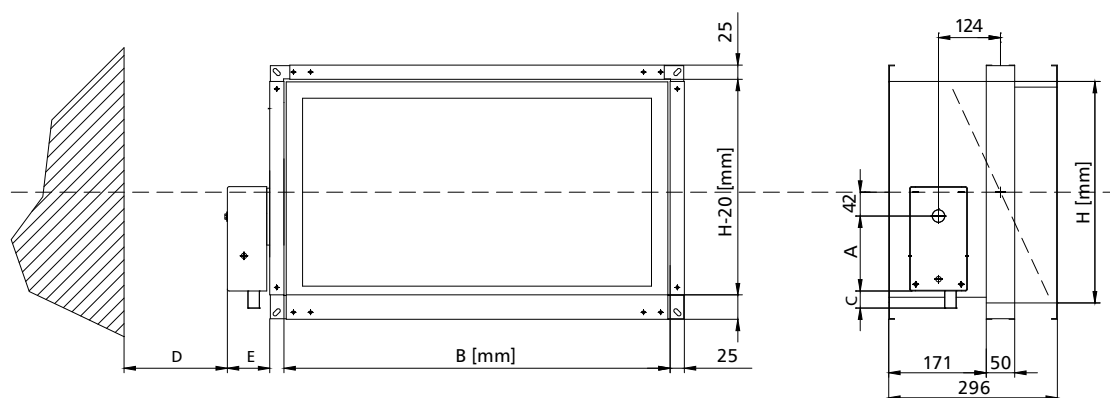


mechanism	A	C	D	E
RST	40	30	75	55

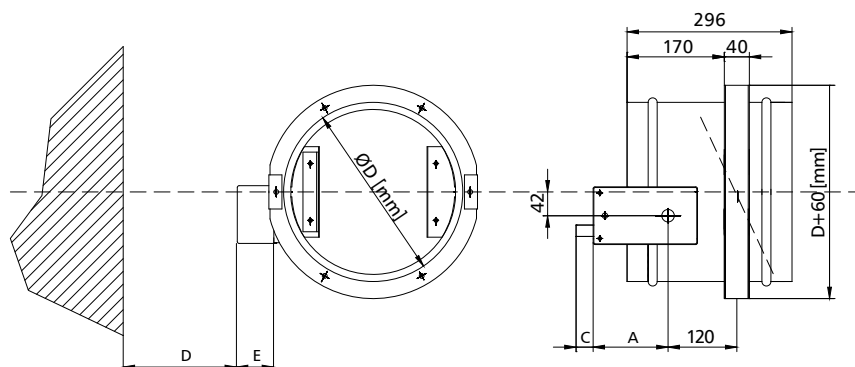
2.3.3. mcr FID S/S – the cut-off fire damper for ventilation ducts with a spring drive and an integrated thermal trigger, optionally equipped with an electromagnetic trigger and limit switches

During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically or, in case of a damper with an electromagnetic trigger, additionally remotely using the fire automation.

The mcr FID S/S dampers are equipped with a **RST-KW1** trigger control mechanism with a drive spring and a cam-lever system. A thermal trigger 74°C (optionally at 95°C) is integrated with the damper mechanism. After the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. On the RST-KW1 mechanism, there is a mechanical blade position indicator. It is possible to equip a trigger control mechanism with an electromagnetic trigger activated by the application („pulse”) or removal („break”) of the power supply voltage and with limit switches used to signal the blade position state. The mechanism has a function to test and blade button-release. Blade re-opening is activated manually. It is not required to dismantle the system to replace the thermal trigger. The RST-KW1 mechanism may be replaced with an electric actuator.



mechanism	A	C	D	E
RST-KW1	130	30	75	85



mechanism	A	C	D	E
RST-KW1	130	30	75	65

2.4. dimensions

Rectangular dampers:

- nominal width B: from 200 mm to 1500 mm
- nominal height H: from 200 mm to 1500 mm
- the maximum cross-section surface of one damper: up to 1.8 m²

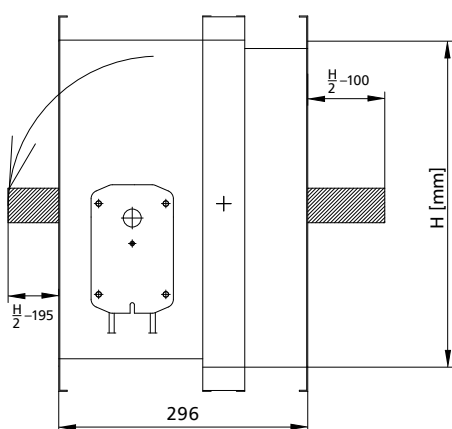
Apart from the standard dimensions, fire dampers can be manufactured with intermediate dimensions (in 1 mm increments, in the given range).

Circular dampers:

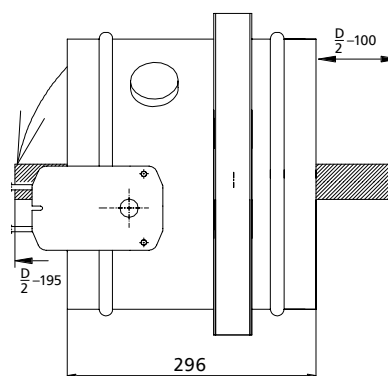
- nominal diameter D from 125 mm to 630 mm

Apart from the standard dimensions, fire dampers can be manufactured with intermediate dimensions (in 1 mm increments, in the given range).

mcr FID S/S p/P damper



mcr FID S/S p/O damper



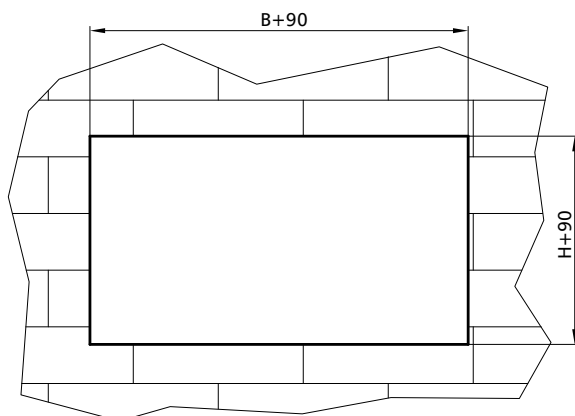
2.5. installation

The mcr FID S/S p/P rectangular dampers are EI120(ve ho i↔o)-rated when installed in concrete partitions made of full bricks or cellular concrete blocks with the thickness of at least 110 mm, lightweight walls of cardboard-plaster panels on a steel framework with the thickness of at least 125 mm and the resistance class of not less than EI120 and concrete ceilings with the thickness of at least 150 mm.

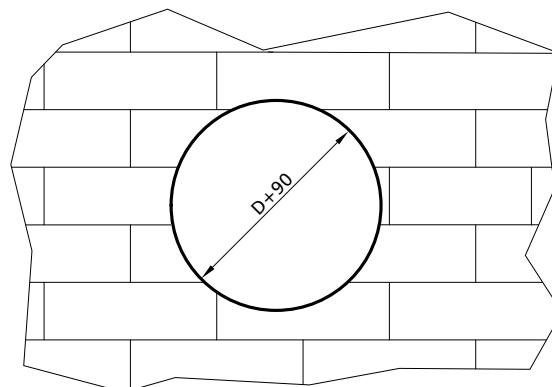
The mcr FID S/S p/O circular dampers are EI120(ve ho i↔o)-rated when installed in concrete partitions made of full bricks or cellular concrete blocks with the thickness of at least 110 mm, lightweight walls of cardboard-plaster panels on a steel framework with the thickness of at least 125 mm and the resistance class of not less than EI120 and concrete ceilings with the thickness of at least 150 mm.

2.5.1. preparation of installation openings

mcr FID S/S p/P damper

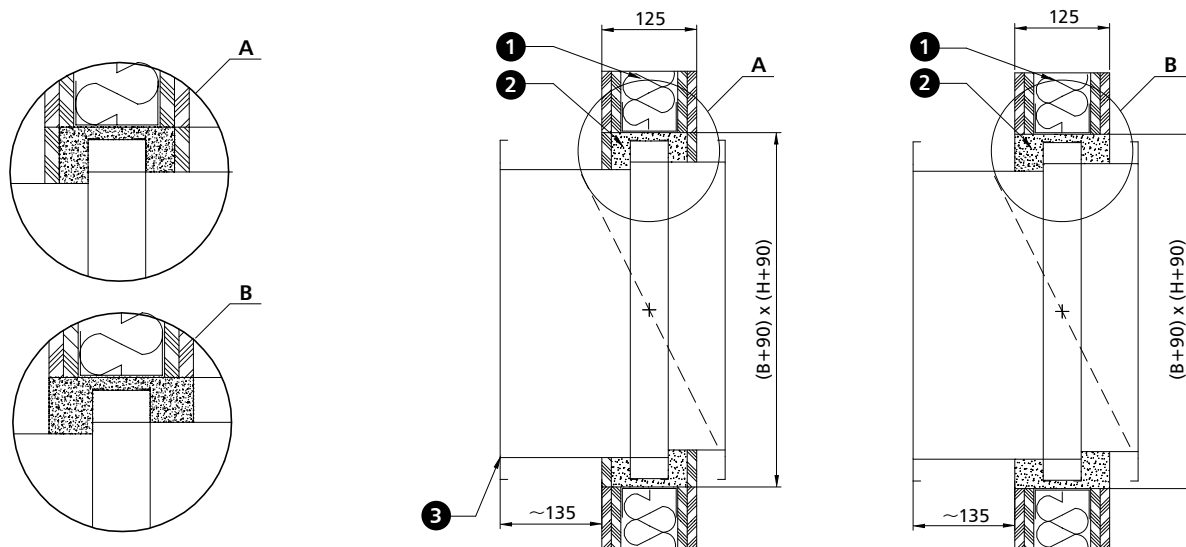


mcr FID S/S p/O damper



2.5.2. sample installation in lightweight walls of plaster-cardboard panels

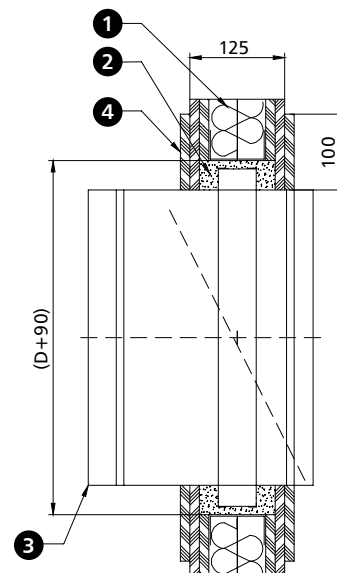
mcr FID S/S p/P damper



- 1. lightweight wall
- 2. sealing - plaster mortar*
- 3. fire damper mcr FID S

*it is possible to use a different sealing which ensures the required fire resistance

mcr FID S/S p/O damper

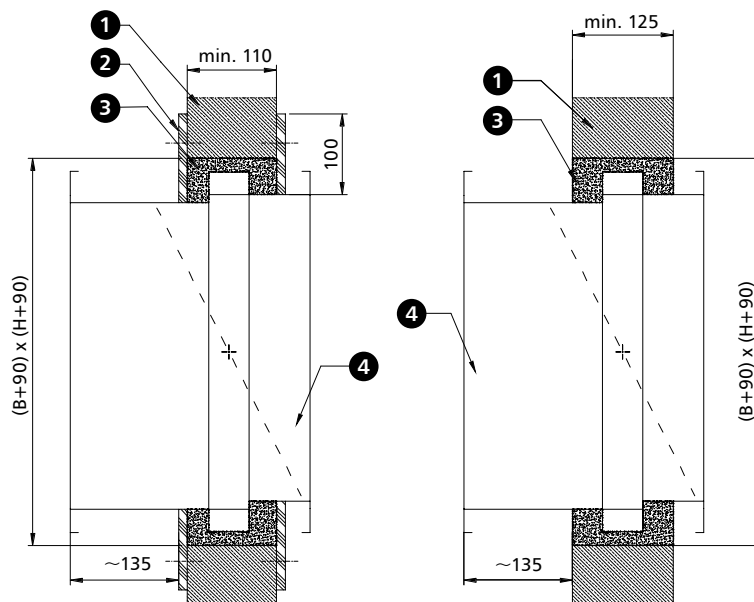


- 1. lightweight wall
- 2. sealing - plaster mortar*
- 3. fire damper mcr FID S
- 4. circumferential gypsum board trim

*it is possible to use a different sealing which ensures the required fire resistance

2.5.3. sample installation in concrete and masonry walls

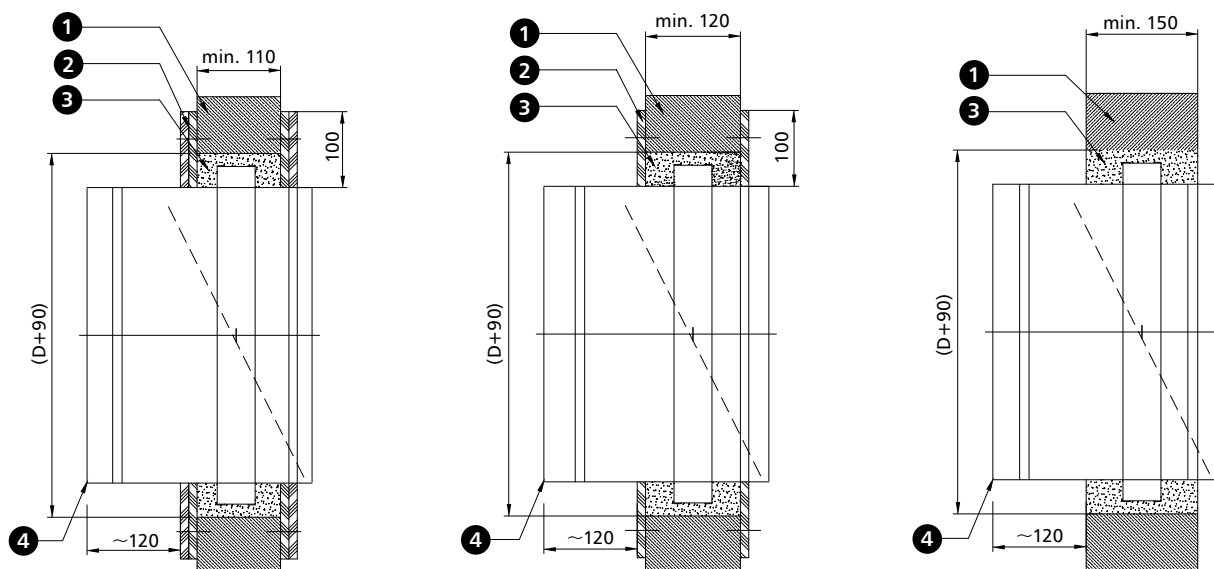
mcr FID S/S p/P damper



1. rigid wall - concrete, cellular concrete or bricks
2. circumferential band of plaster-cardboard panels
3. sealing - concrete, cement or cement-lime masonry mortar*
4. fire damper mcr FID S

*it is possible to use a different sealing which ensures the required fire resistance

mcr FID S/S p/O damper

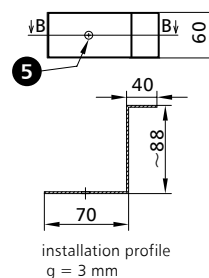
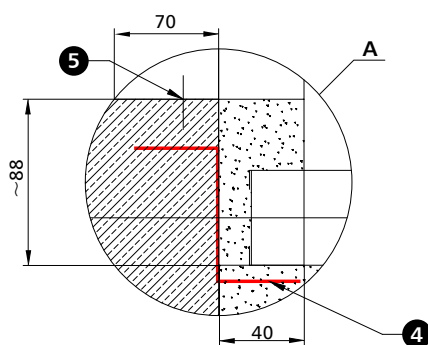
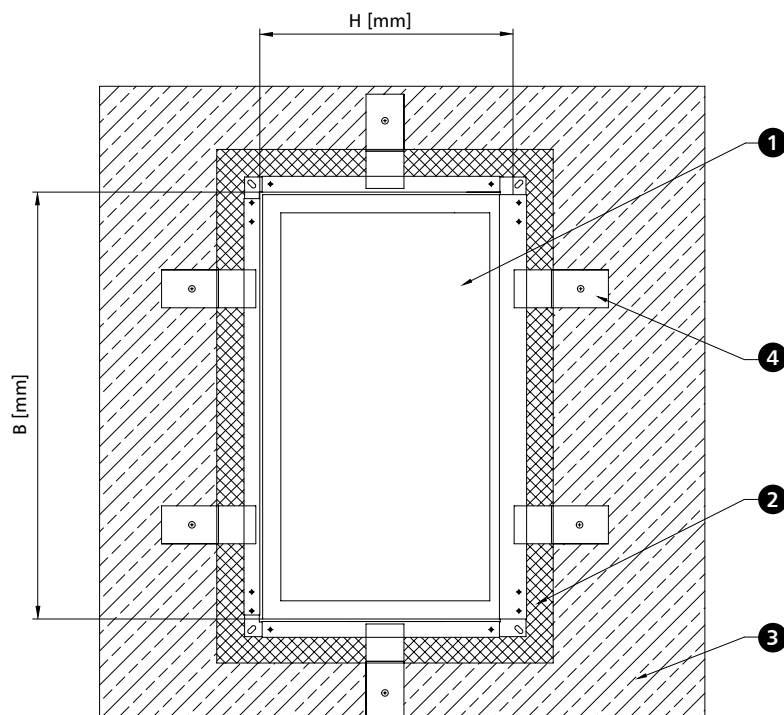
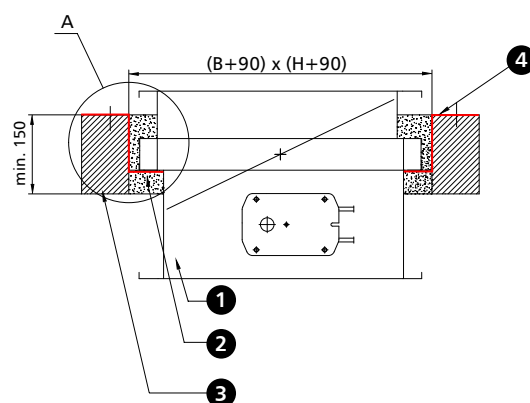
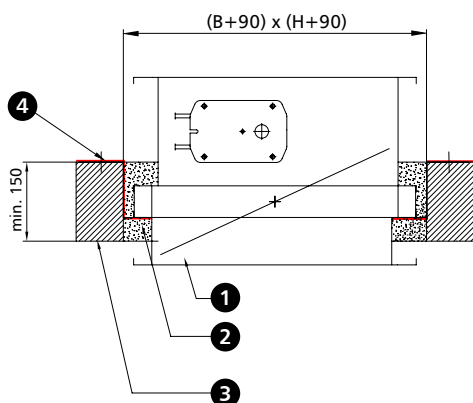


1. rigid wall - concrete, cellular concrete or bricks
2. circumferential gypsum board trim
3. sealing - concrete, cement or cement-lime masonry mortar*
4. fire damper mcr FID S

*it is possible to use a different sealing which ensures the required fire resistance

2.5.4. sample installation in ceilings

mcr FID S/S p/P damper

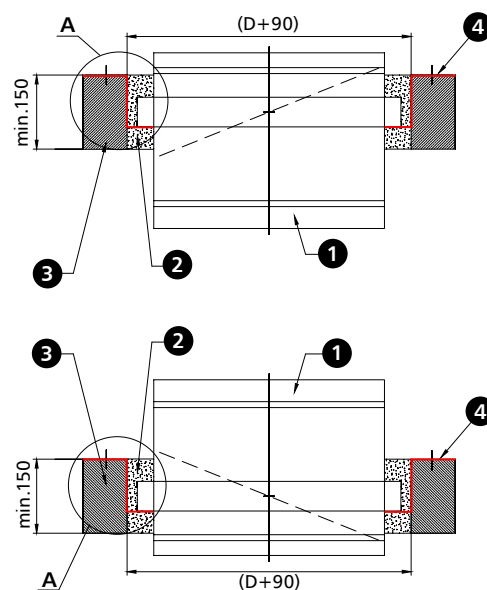
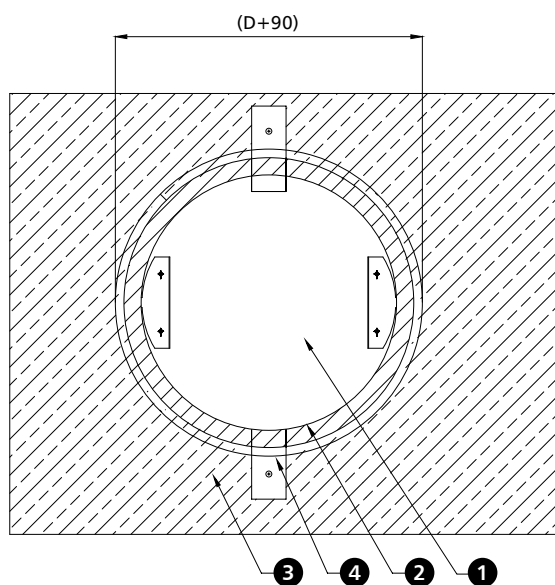


- 1. fire damper mcr FID S
- 2. sealing - concrete, cement or cement-lime masonry mortar*
- 3. ceiling

- 4. installation profile $g = 3 \text{ mm}$
- 5. steel expansion plug

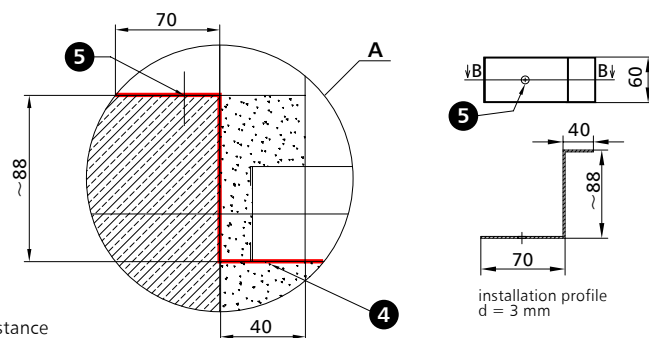
*it is possible to use a different sealing which ensures the required fire resistance

mcr FID S/S p/O damper



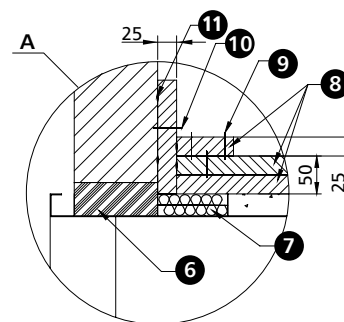
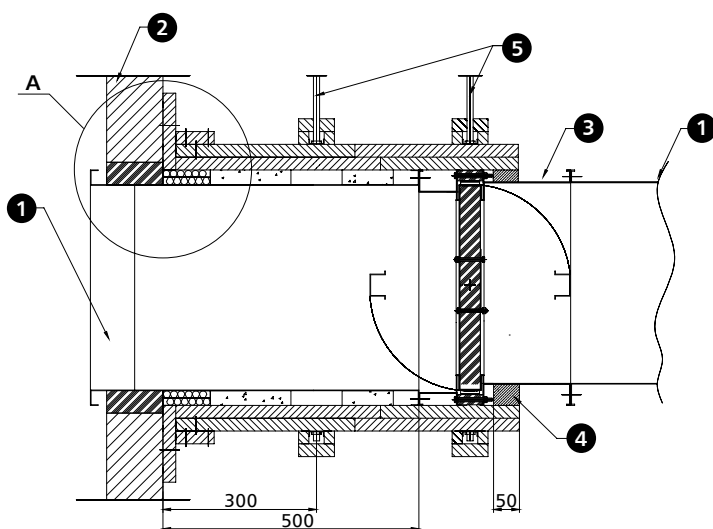
1. fire damper mcr FID S
2. sealing - concrete, cement or cement-lime masonry mortar*
3. ceiling
4. installation profile d = 3 mm
5. steel expansion plug

*it is possible to use a different sealing which ensures the required fire resistance



2.5.5. sample installation outside the fire partition

mcr FID S/S p/P damper

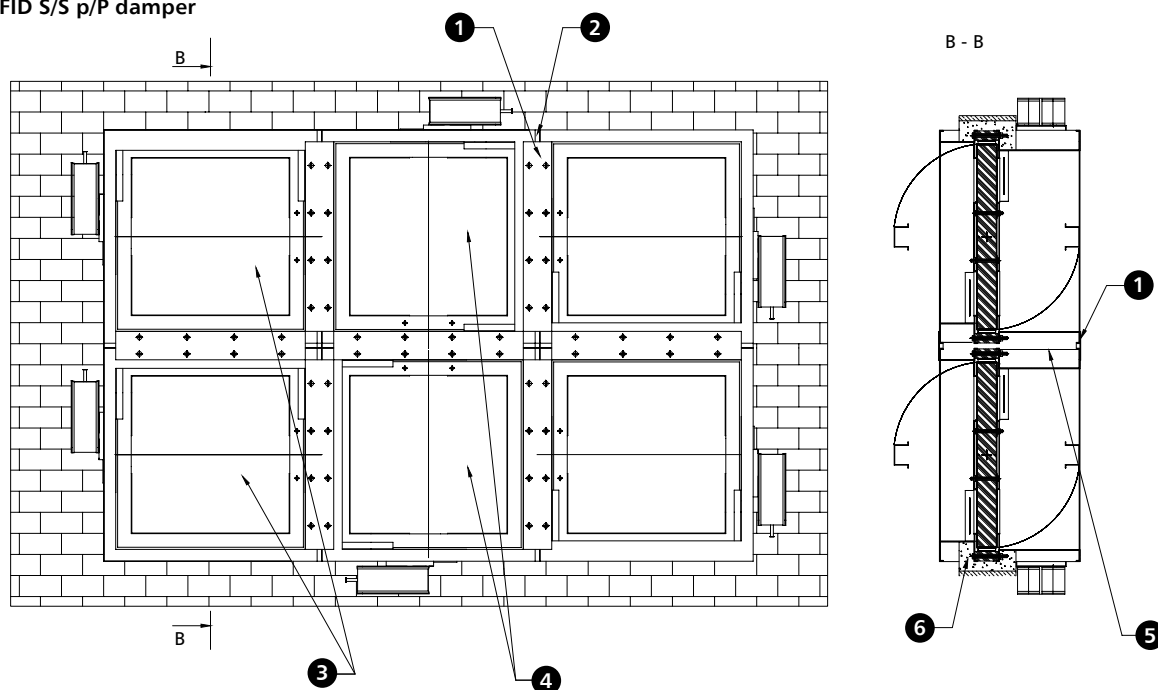


1. ventilation duct
2. rigid wall - concrete, cellular concrete or bricks
3. fire damper mcr FID S
4. gypsum filling
5. duct suspension
6. sealing (cement or cement-lime masonry mortar)*
7. mineral wool with the density of at least 80 kg/m³, A1 class
8. Ridurit fire retardant board
9. screws 3.5 x 50 at ~150 mm centres
10. steel expansion anchor Ø8 x 80 mm
11. board joints sealed with Conlit Glue

*it is possible to use a different sealing which ensures the required fire resistance

2.5.6. sample installation in sets

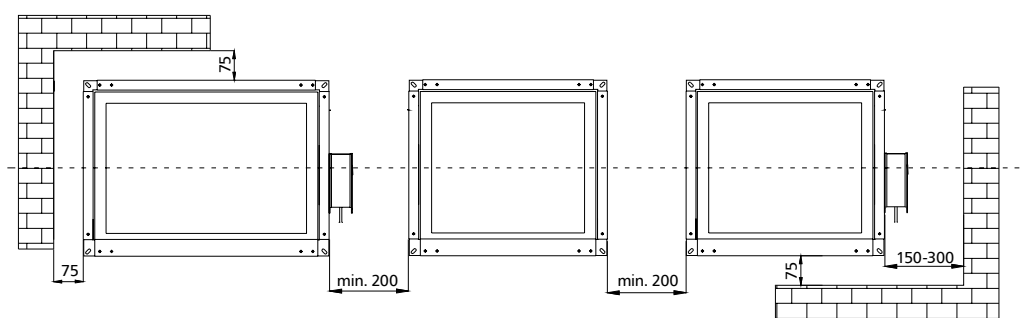
mcr FID S/S p/P damper



1. installation flat bar, width 60 mm
2. 10 mm gaps between damper flanges
3. dampers mcr FID S turned by 180°
4. dampers mcr FID S turned by 90° and 270°
5. fire resistant material, e.g. mineral wool with the density of at least 80 kg/m³, A1 class
6. sealing - concrete, cement or cement-lime masonry mortar*

*it is possible to use a different sealing which ensures the required fire resistance

Distance between systems and partitions



Installation of the damper with a vertical axis of rotation

Such installation must be clearly stated in the draft documentation and mentioned in the order. The dimensions of the damper BxH should be given as to the damper with a horizontal axis of rotation.

2.6.2. technical parameters of mcr FID S/S p/O circular dampers

D – nominal diameter [mm]

v – velocity [m/s]

Sk – duct cross-section [m²]

Se – damper active cross-section [m²]

Q – flow [m³/h]

dp – pressure drop [Pa]

L_{WA} – damper noise level [dB]

D [mm]	v [m/s]	Sk [m ²]	Se [m ²]	Q [m ³ /h]	dp [Pa]	L _{WA} [dB]	D [mm]	v [m/s]	Sk [m ²]	Se [m ²]	Q [m ³ /h]	dp [Pa]	L _{WA} [dB]
250	2	0.0491	0.0392	281	1	15	450	2	0.1590	0.1410	1 015	1	16
	4			560	4	24		4			2 030	4	25
	6			890	8	28		6			3 045	10	35
	8			1 130	11	33		8			4 060	18	41
315	2	0.0779	0.0653	478	1	18	500	2	0.1963	0.1763	1 269	1	18
	4			949	4	24		4			2 538	4	24
	6			1 400	8	30		6			3 807	8	33
	8			1 880	16	35		8			5 076	15	40
355	2	0.0989	0.0847	610	1	17	560	2	0.2462	0.2238	1 611	1	16
	4			1 220	5	24		4			3 222	3	24
	6			1 830	11	34		6			4 834	7	33
	8			2 440	20	40		8			6 445	13	39
400	2	0.1256	0.1096	789	1	17	630	2	0.3116	0.2864	2 062	1	20
	4			1 578	5	25		4			4 124	2	22
	6			2 367	11	34		6			6 186	5	33
	8			3 156	10	41		8			8 247	9	40

The mcr FID S fire damper selection program is available at www.mercor.com.pl, in the Architect and Designer Zone.

2.7.1. estimated weights of mcr FID S/S p/P dampers for rectangular ventilation ducts [kg]

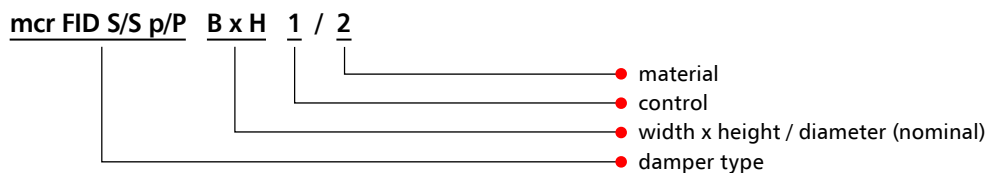
		width B [mm]														
		200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
height H [mm]	200	9.5	9.7	10	10	15	17	17.5	19	22	25	28	30	33	39	45
	250	9.5	10	11	11	16	17.5	18	21	24	27	29	32	34	45	48
	300	10	11	11	12	17	20	21	23	26	28	31	34	38	50	51
	350	11	11	11	16	18	20.5	23	26	28	29	33	35	36	52	53
	400	10	11	12	18	19	21	25	29	30	33	35	36	39	54	55
	500	15	16	17	19	20	23	27	32	33	35	38	40	44	55	56
	600	17	17.5	20	21	30	26	30	35	37	39	43	48	52	56	58
	700	17.5	18	21	23	30	35	35	40	42	44	47	52	54	57	65
	800	20	21	22	24	29	35	37	41	43	49	52	57	60	62	78
	900	22	25	25	28	33	35	39	43	47	53	56	60	62	64	82
	1000	23	29	28	33	36	42	43	49	53	56	59	65	67	69	98
	1100	26	30	31	35	38	42	47	56	59	62	63	69	71	73	101
	1200	32	33	35	36	40	49	53	56	61	71	72	73	85	86	105
	1300	39	40	38	39	44	52	57	59	78	79	80	81	92		
	1400	–	–	48	39	48	56	63	65	80	82	85	87			
	1500	–	–	50	50	52	58	68	71	82	98	115	120			

For dampers with no actuator, subtract ~1 kg.

2.7.2. estimated weights of mcr FID S/S p/O dampers for circular ventilation ducts [kg]

diameter D [mm]	RST, RST-KW1	actuator
125	4	5
160	5	6
200	6	7
250	7	8
315	9	10
355	12	13
400	14	15
500	16	17
630	20	21

2.8. marking



1 – control:

- RST trigger control mechanism
 - RST** – thermal trigger
 - RST/WK1** – thermal trigger + limit switch (closed blade signal)
 - RST/WK2** – thermal trigger + limit switch (open/closed blade signal)
- RST-KW1 trigger control mechanism
 - RST-KW1/S** – thermal trigger
 - RST-KW1/S/WK2** – thermal trigger + limit switch (open/closed blade signal)
 - RST-KW1/24I** – thermal trigger + „pulse” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
 - RST-KW1/24P** – thermal trigger + „break” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
 - RST-KW1/230I** – thermal trigger + „pulse” electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
 - RST-KW1/230P** – thermal trigger + „break” electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
- Belimo trigger control mechanism
 - BF24-T** – actuator with a return spring, U = 24 V AC/DC
 - BF230-T** – actuator with a return spring, U = 230 V AC
 - BF24TL-T-ST** (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control
 - EXBF24-T** – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC
 - EXBF230-T** – explosion proof actuator with a return spring in the Ex version, U = 230 V AC
 - BF24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
 - BFL24-T** – actuator with a return spring, U = 24 V AC/DC
 - BFL230-T** – actuator with a return spring, U = 230 V AC
 - BFL24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
 - BFN24-T** – actuator with a return spring, U = 24 V AC/DC
 - BFN230-T** – actuator with a return spring, U = 230 V AC
 - BFN24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system

2 – material

- [no symbol]** – galvanised steel, Zn 275 g/m² coating
- KN** – 1.4404 acid-proof stainless steel

example marking:

mcr FID S/S p/P 400 x 400 BFL24-T

EIS120 cut-off fire damper with a 24 V compact Belimo actuator with limit switches.

mcr FID S/S p/O Ø400 RST / WK2

EIS120 cut-off fire damper with a trigger rated at 72°C and a partition opening and closing limit switch.

Chapter 12 - power supply and control (p. 141) contains:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper,
- location of trigger control mechanisms in relation to the damper - manufacture standards.

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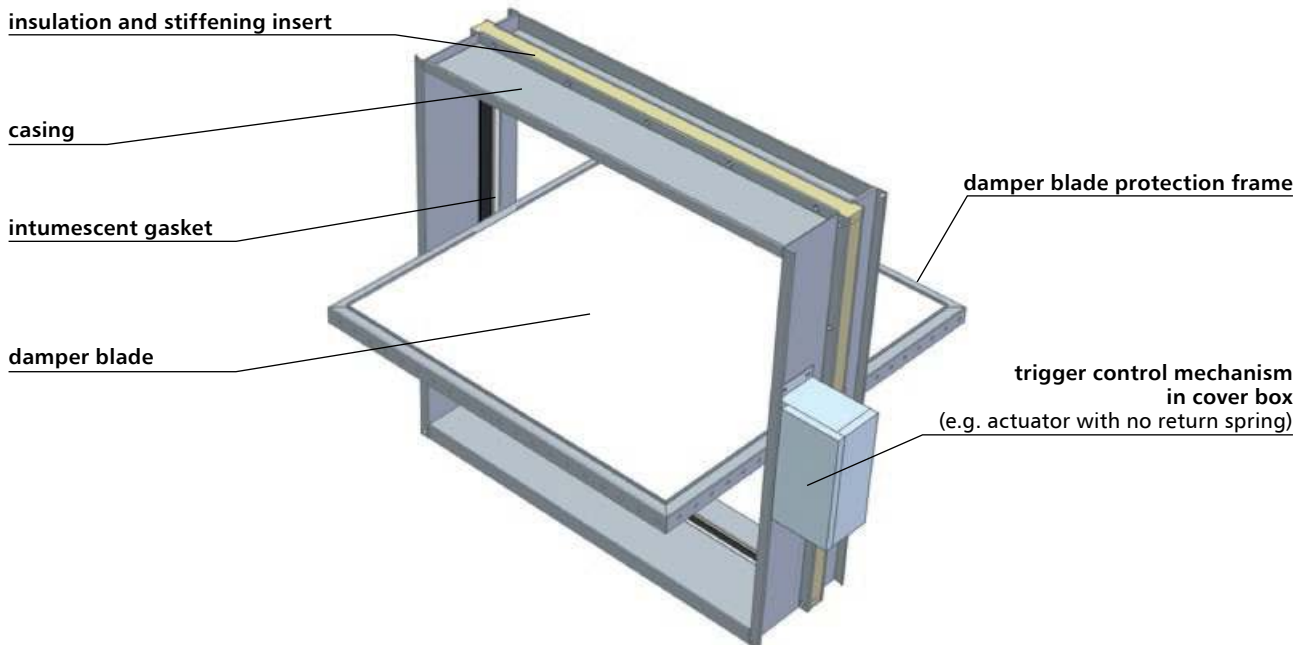


- ▶ **EIS120**
- ▶ **Certificate of constancy of performance 1488-CPR-0448/W.**
- ▶ **Dampers certified for compliance with EN 12101-8.**
- ▶ **Dampers qualified under EN 13501-4 and tested under EN 1366-10.**
- ▶ **Smoke exhaust dampers with the fire resistance independent of airflow direction and installation side.**

3.1. application

The mcr FID S/V p/P, mcr FID S/V-M p/P smoke exhaust dampers are intended for installation in automatically operated fire ventilation systems. Dampers mcr FID S/V p/P are used in fire ventilation systems, while dampers marked mcr FID S/V-M p/P are used in mixed systems - fire and comfort ventilation systems. They support both single and multiple fire zones in a building. They prevent the spreading of fire, smoke and burning fumes into the adjacent zones. During normal system operation, the blade of the damper is open or closed depending on damper function. The damper blade opens in the zone on fire and dampers close in other zones.

3.2. design



The mcr FID S/V p/P, mcr FID S/V-M p/P smoke exhaust dampers consist of a casing with a rectangular cross-section, made of two segments separated with a fire-proof panel with the cross-section of 20 x 40 mm, a moving damper blade and a remotely activated actuator. Standard damper casing is made of galvanised steel sheet. For chemically aggressive environments, special manufacture casing is used, in which steel elements are made of 1.4404 acid-proof steel sheet, while other elements are impregnated. The casing total length is at least 296 mm. Dampers may be made with an extension element, in which case the casing length is 400 mm.

The damper blade is made of a fire-proof panel with the total thickness of 40 mm, which is covered with a reinforcement steel profile. The inner side of the fire damper casing features an intumescent gasket. There are stop profiles fastened to the inner casing surface, which limit the rotating motion of the damper blade. The stop shaped are lined with a polyethylene ventilation-grade seal.

3.3. versions

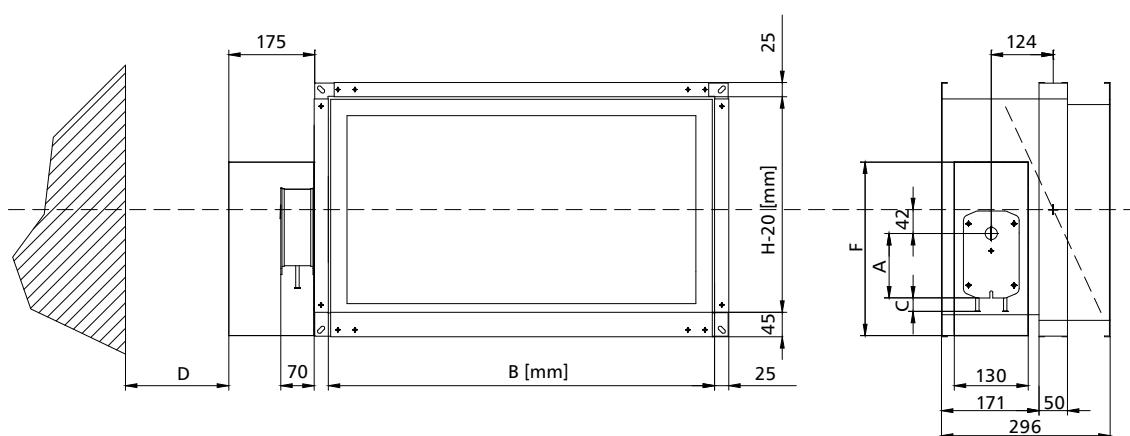
3.3.1. mcr FID S/V p/P, mcr FID S/V-M p/P – smoke exhaust fire damper for multi-zone fire ventilation systems with an actuator – damper closing and opening with an actuator

During normal operation, the damper blade of the fire damper remains open or closed. In case of fire, the blade of the damper in the zone on fire opens, while in other zones the damper blades are closed - the dampers are remotely activated by applying the power supply.

The mcr FID S/V p/P, mcr FID S/V-M p/P dampers are equipped with a Belimo trigger control mechanisms **BE** or **BLE** series axial actuator, powered with 24 V AC/DC or 230 V AC. BLE-series actuators are used in mcr FID S/V-M p/P dampers with the surface of not more than 0.75 m² and in mcr FID S/V-M p/P with the surface of not more than 1.25 m².

BE and BLE series actuators are equipped with limit switches used to monitor the blade position. Furthermore, the mechanical position indicator is placed on the actuator.

Dampers with Belimo BE or BLE series actuators close and open when the voltage is applied to the actuator terminals.



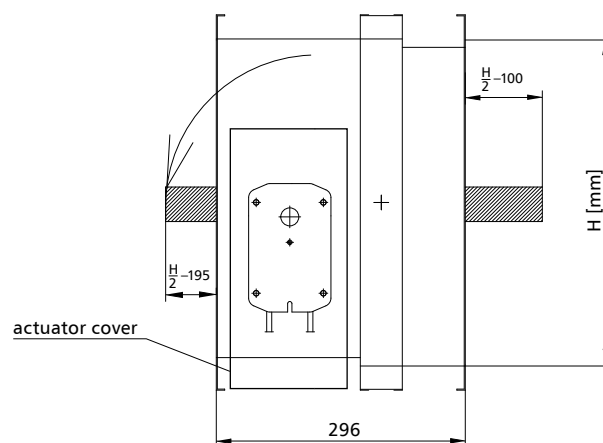
mechanism	A	C	D	E	F
BE	198	10	75	81	345
BLE	130	30	75	70	305

3.4. dimensions

Rectangular dampers:

- nominal width B: from 200 mm to 1500 mm
- nominal height H: from 200 mm to 1500 mm
- the maximum cross-section surface of one damper up to:
 - 1.5 m² for mcr FID S/V p/P dampers,
 - 1.25 m² for mcr FID S/V-M p/P dampers.

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (in 1 mm increments, in the given range).

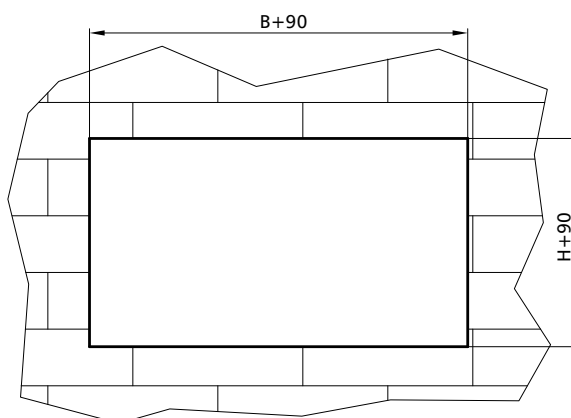


3.5. installation

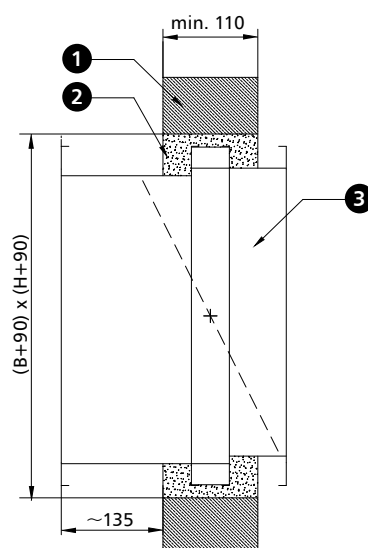
The mcr FID S/V p/P rectangular dampers are EI120($V_{ew} i \leftrightarrow o$)S1000C₃₀₀AA multi-rated if installed in concrete partitions made of full bricks or cellular blocks with the thickness of at least 110 mm.

The mcr FID S/V-M p/P rectangular dampers are EI120($V_{ew} i \leftrightarrow o$)S1500C₁₀₀₀₀AA multi-rated if installed in concrete partitions made of full bricks or cellular blocks with the thickness of at least 110 mm.

3.5.1. preparation of installation openings



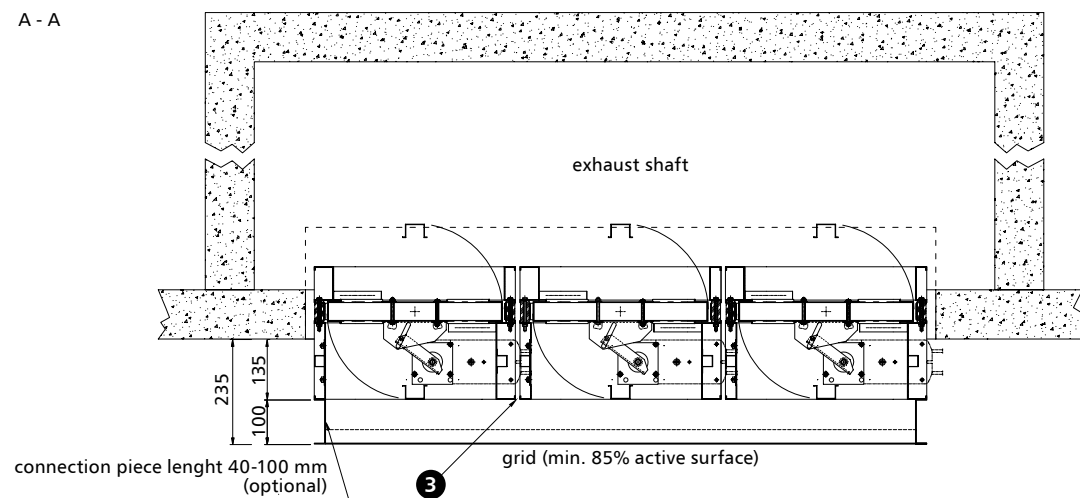
3.5.2. sample installation in concrete and masonry walls



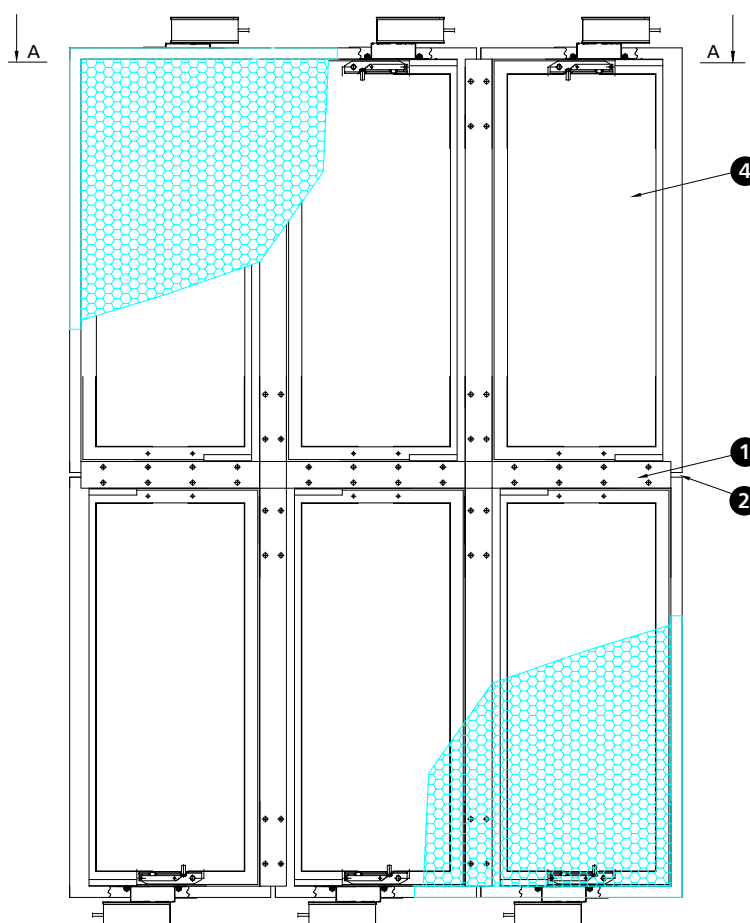
1. rigid wall - concrete, cellular concrete or bricks
2. sealing - concrete, cement or cement-lime masonry mortar*
3. fire damper mcr FID S

*it is possible to use a different sealing which ensures the required fire resistance

3.5.3. sample installation in sets



The height of H=400 mm ensures that the partition does not protrude outside the damper casing on the actuator side. To attach a guard grid (grill), a connection piece - lenght: 40-100 mm is required.



1. installation flat bar, width 60 mm
2. 10 mm gaps between damper flanges
3. fire resistant material, e.g. mineral wool with the density of at least 80 kg/m³, A1 class
4. fire damper mcr FID S

Installation of the damper with a vertical axis of rotation

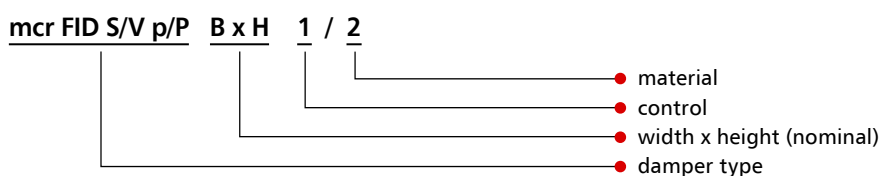
Such installation must be clearly stated in the draft documentation and mentioned in the order. The dimensions of the damper BxH should be given as to the damper with a horizontal axis of rotation.

3.7. estimated weights of mcr FID S/V p/P, mcr FID S/V-M p/P rectangular dampers [kg]

		width B [mm]														
		200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
height H [mm]	200	9.5	9.7	10	10	15	17	17.5	19	22	25	28	30	33	39	45
	250	9.5	10	11	11	16	17.5	18	21	24	27	29	32	34	45	48
	300	10	11	11	12	17	20	21	23	26	28	31	34	38	50	51
	350	11	11	11	16	18	20.5	23	26	28	29	33	35	36	52	53
	400	10	11	12	18	19	21	25	29	30	33	35	36	39	54	55
	500	15	16	17	19	20	23	27	32	33	35	38	40	44	55	56
	600	17	17.5	20	21	30	26	30	35	37	39	43	48	52	56	58
	700	17.5	18	21	23	30	35	35	40	42	44	47	52	54	57	65
	800	20	21	22	24	29	35	37	41	43	49	52	57	60	62	78
	900	22	25	25	28	33	35	39	43	47	53	56	60	62	64	82
	1000	23	29	28	33	36	42	43	49	53	56	59	65	67	69	98
	1100	26	30	31	35	38	42	47	56	59	62	63	69	71		
	1200	32	33	35	36	40	49	53	56	61	71	72	73			
	1300	39	40	38	39	44	52	57	59	78	79	80				
	1400	42	45	48	39	48	56	63	65	80	82					
	1500	45	48	50	50	52	58	68	71	82	98					

For dampers with no actuator, subtract ~1 kg.

3.8. marking



1 – control:

- Belimo trigger control mechanism
- BE24** – actuator with no return spring, U = 24 V AC/DC
- BLE24** – actuator with no return spring, U = 24 V AC/DC
- BE24-ST** (with the BKNE230-24 option) – actuator with no return spring, U = 24 V AC/DC, with a plug for the SBS Control system
- BLE24-ST** (with the BKNE230-24 option) – actuator with no return spring, U = 24 V AC/DC, with a plug for the SBS Control system
- BE230** – actuator with no return spring, U = 230 V AC
- BLE230** – actuator with no return spring, U = 230 V AC

2 – material

- [no symbol] – galvanised steel, Zn 275 g/m² coating
- KN** – 1.4404 acid-proof stainless steel

example marking:

mcr FID S/V p/P 400 x 400 BLE24

Smoke exhaust damper for fire ventilation systems with a 24 V compact Belimo actuator with limit switches.

Chapter 12 - power supply and control (p. 141) contains:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper,
- location of trigger control mechanisms in relation to the damper - manufacture standards.

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- ▶ **EIS120, E180S**
- ▶ Certificate of constancy of performance 1488-CPR-0467/W and 1396-CPR-0098.
- ▶ Dampers certified for compliance with EN 15650.
- ▶ Dampers qualified under EN 13501-3 and tested under EN 1366-2.
- ▶ Cut-off dampers with the fire resistance independent of airflow direction and installation side.
- ▶ Lower acoustic noise and hydraulic resistance in the system with reduced partition thickness.

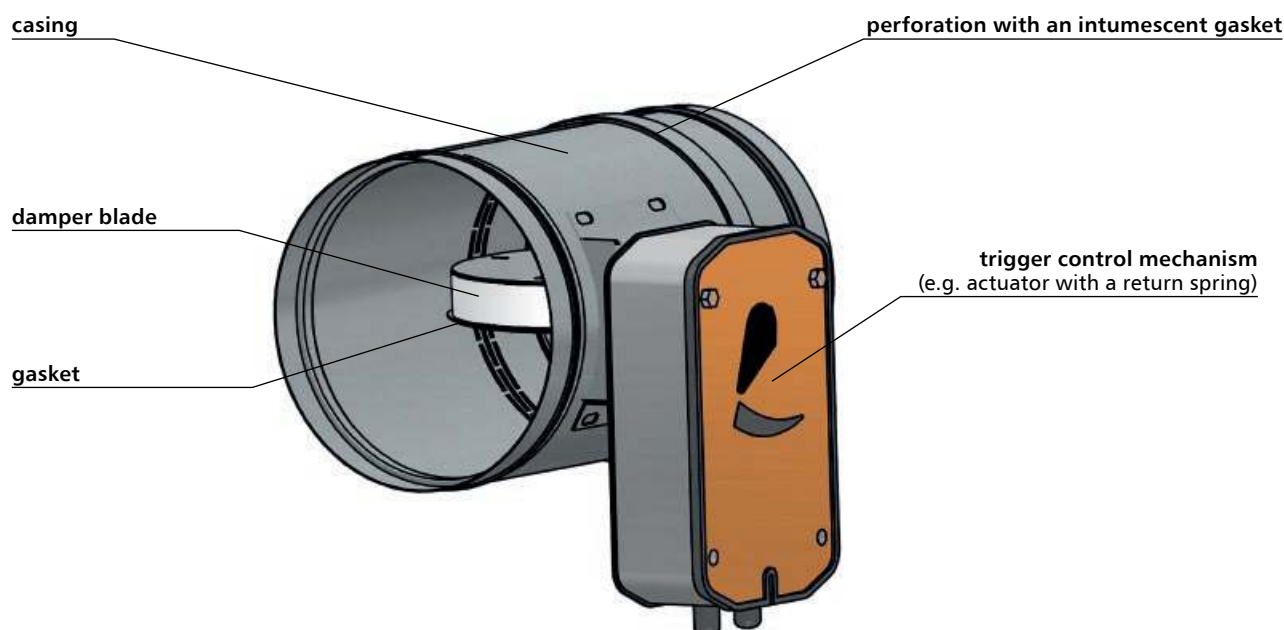
4.1. application

The mcr FID PRO low-resistance cut-off dampers are designed for use in residential ventilation systems, where those systems pass through vertical and horizontal construction partitions. They are installed e.g. in systems with increased acoustic requirements.

During a fire, the dampers preserve the fire resistance of the construction partition where ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and burning fumes to the remaining part of the building not on fire. During normal system operation, the damper blade is open. In case of fire, the damper blade closes.

The dampers cannot be operated in systems exposed to dust, except for when they are included in a special, individually developed programme of service and technical inspections.

4.2. design



The mcr FID PRO cut-off fire dampers consist of a casing with a circular cross section, a moving damper blade and a trigger control mechanism, which is activated remotely or automatically when the thermal or thermoelectric trigger is tripped. Standard damper casing is made of galvanised steel sheet. For chemically aggressive environments, special manufacture casing is used, in which steel elements are made of 1.4404 acid-proof steel sheet, while other elements are impregnated.

In the middle part, in which the damper blade is placed, the casing is perforated - perforation width is 20 mm. On the damper circumference, around the closed damper blade, there is an intumescent gasket. The damper blade is made of a fire-proof panel with the total thickness of 20 mm.

The damper blade is coated with steel sheet on both sides for mechanical reinforcement and reduced friction resistance. The damper circumference has a ventilation gasket installed, which ensures the tightness of dampers at the ambient temperature. Both ends of the casing are finished nipple (standard) or muff connection.

4.3. versions

4.3.1. mcr FID PRO – the cut-off fire damper for ventilation ducts with an actuator with a return spring – damper closing and opening with an actuator

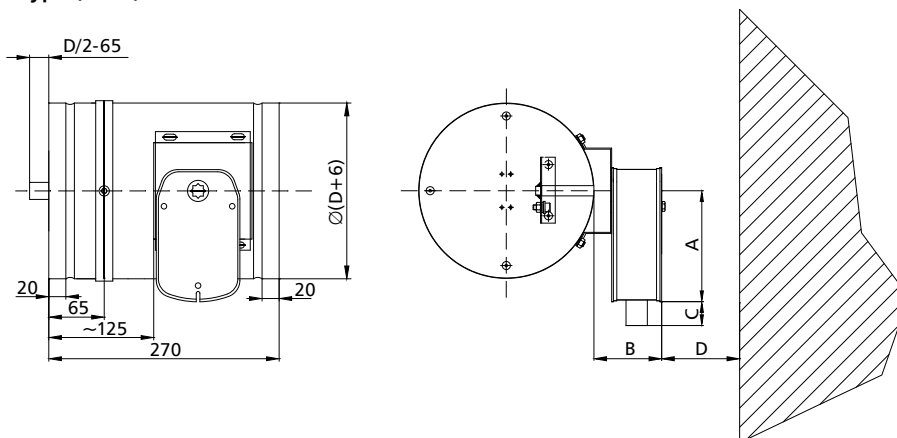
During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically or remotely when the power supply is cut off.

The mcr FID PRO dampers are equipped with a Belimo trigger control mechanisms **BFL**, **EXBF** or **BF-TL** axial actuator with a return valve, powered with 24 V AC/DC or 230 V AC, with thermoelectric trigger 72°C (optionally it is possible to use triggers with the nominal tripping temperature of 95°C). The actuators are equipped with limit switches used to monitor the blade position. Furthermore, the mechanical position indicator is placed on the actuator.

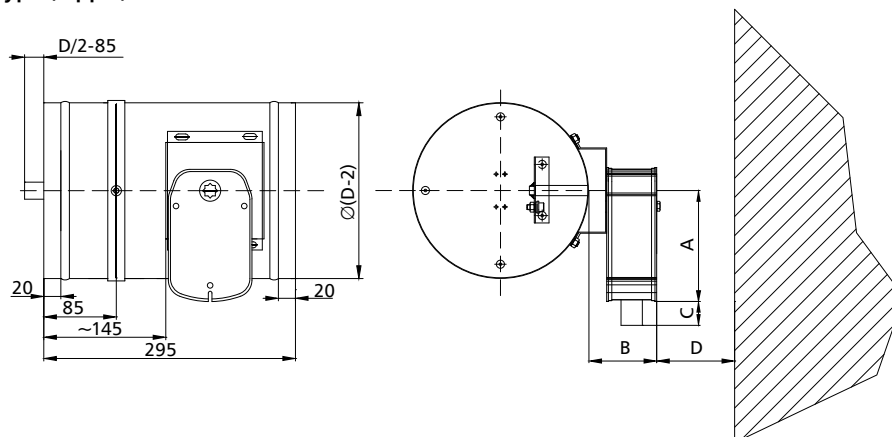
The thermoelectric trigger is equipped with a test switch and a power supply indicator (LED).

Dampers with Belimo actuators: analogue BFL, digital BF-TL, EXBF explosion proof actuators close as a result of thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when the power supply voltage is applied to the actuator terminals. Furthermore, dampers with those actuators may be opened manually using a key.

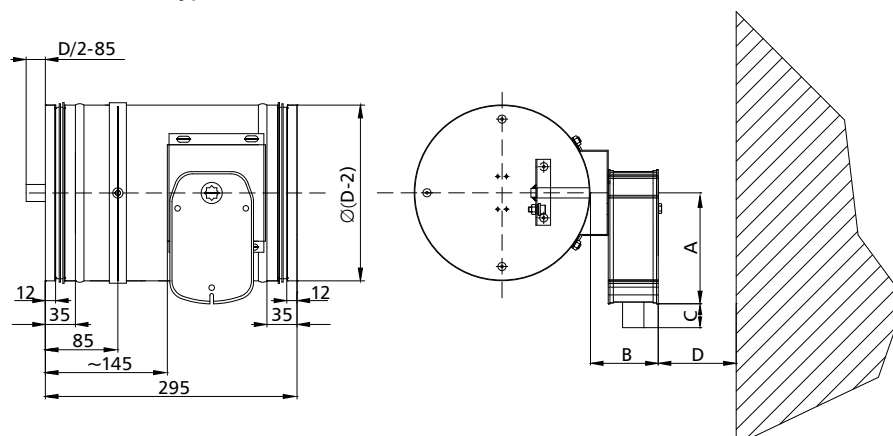
female connection type (muff)



male connection type (nipple)

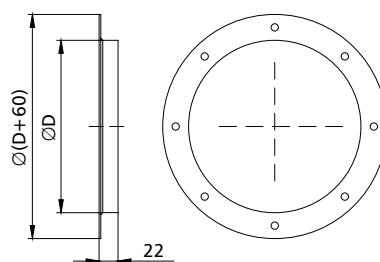


version with circumferential seal type F



mechanism	A	B	C	D
BFL	138	74	30	75
BF24TL-ST	198	85	10	75
EXBF	225	190	55	100

flange connection



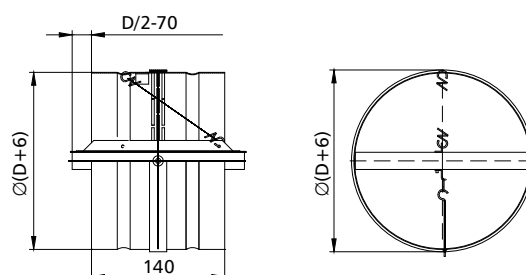
Spacing and quantities of openings according to EN 12220 (dimensions of flanges with circular intersection for comfort ventilation purposes).

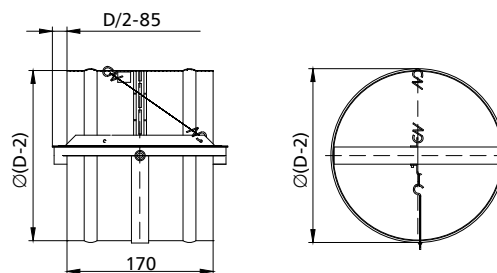
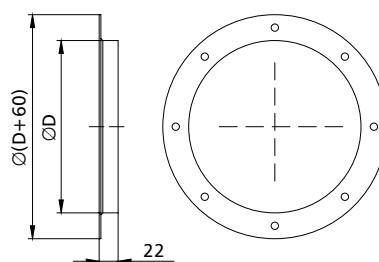
4.3.2. mcr FID PRO – the cut-off fire damper for ventilation ducts with a spring drive and thermal trigger

During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically.

The mcr FID PRO dampers are equipped with a **RST** trigger control mechanism with a drive spring (without an integrated thermal trigger). In this case, a thermal trigger 74°C (optionally 95°C) is installed outside the damper mechanism, on the damper blade itself. After the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. It is possible to equip the damper with a WK1 or WK2 limit switch used to signal the blade position state.

female connection type (muff)



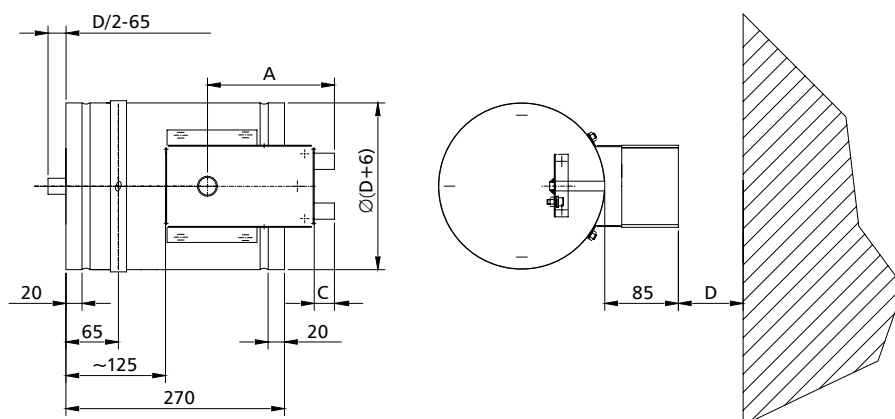
male connection type (nipple)

flange connection


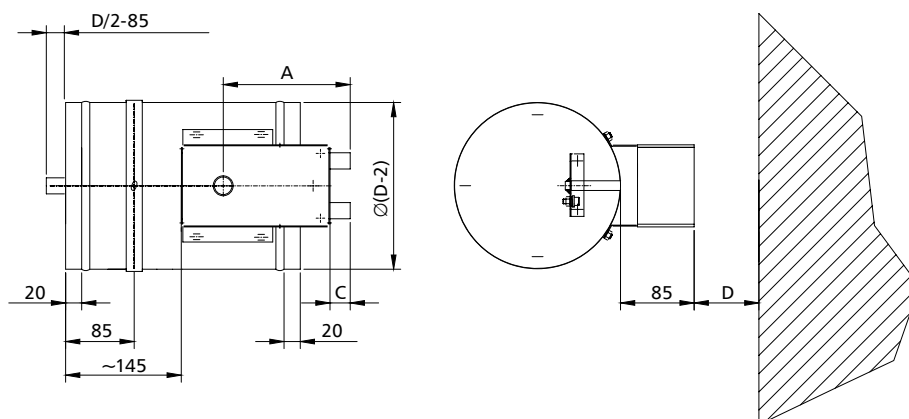
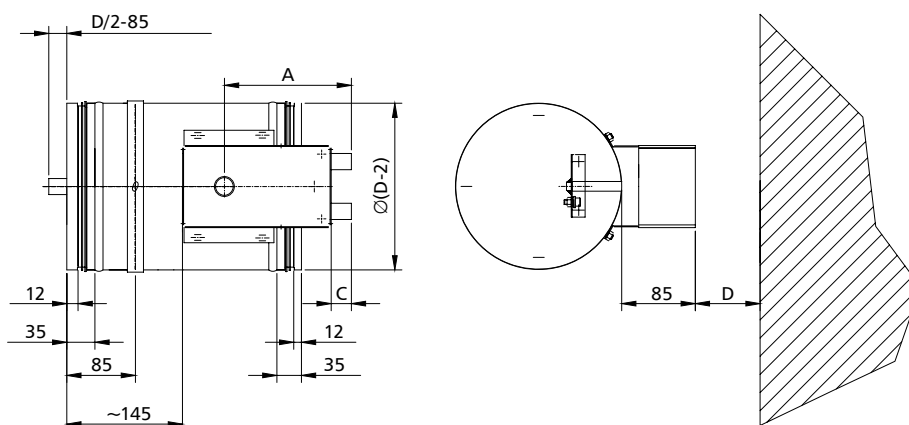
Spacing and quantities of openings according to EN 12220 (dimensions of flanges with circular intersection for comfort ventilation purposes).

4.3.3.
mcr FID PRO – the cut-off fire damper for ventilation ducts with a spring drive and an integrated thermal trigger, optionally equipped with an electromagnetic trigger and limit switches

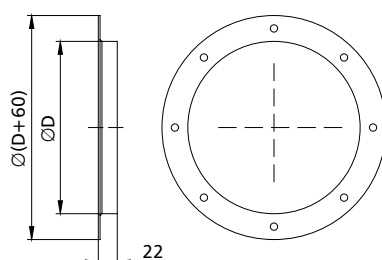
During normal operation, the damper blade of the fire damper remains open. In case of fire, the blade closes automatically or, in case of a damper with an electromagnetic trigger, additionally using the fire automation.

The mcr FID PRO dampers are equipped with a **RST-KW1** trigger control mechanism with a drive spring and a cam-lever system. A thermal trigger 74°C (optionally at 95°C) is integrated with the damper mechanism. After the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. On the RST-KW1 mechanism, there is a mechanical indicator of blade position. It is possible to equip a trigger control mechanism with an electromagnetic trigger activated by the application („pulse”) or removal („break”) of the power supply voltage and with limit switches used to signal the blade position state. The mechanism has function to test and blade button-release. Blade re-opening is activated manually using a key. It is not required to dismantle the system to replace the thermal trigger. The RST-KW1 mechanism may be replaced with an electric actuator.

female connection type (muff)


male connection type (nipple)

version with circumferential seal type F


mechanizm	A	C	D
RST-KW1	130	30	75

flange connection


Spacing and quantities of openings according to EN 12220 (dimensions of flanges with circular intersection for comfort ventilation purposes).

4.4. dimensions
Circular dampers:

- nominal diameter D from 100 mm to 315 mm

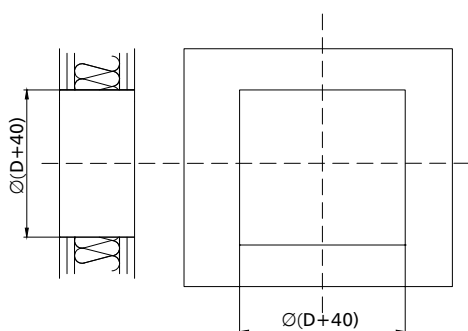
Apart from the standard dimensions there is a possibility to produce dampers with intermediate dimensions (in 1 mm increments, in the given range).

4.5. installation

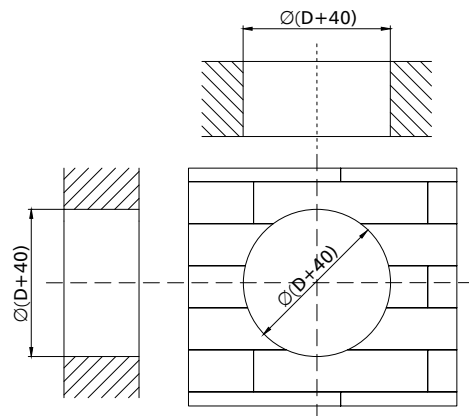
The mcr FID PRO circular dampers are EI120(ve ho i↔o)S-rated when installed in concrete partitions made of full bricks or cellular concrete blocks with the thickness of at least 125 mm, lightweight walls of cardboard-plaster panels on a steel framework with the thickness of at least 125 mm and the resistance class of not less than EI120 and concrete ceilings with the thickness of at least 150 mm. Additionally dampers mcr FID PRO with diameter 201-315 mm installed in concrete ceilings are E180(ho i↔o)S-rated.

4.5.1. preparation of installation openings

in light plaster-cardboard walls

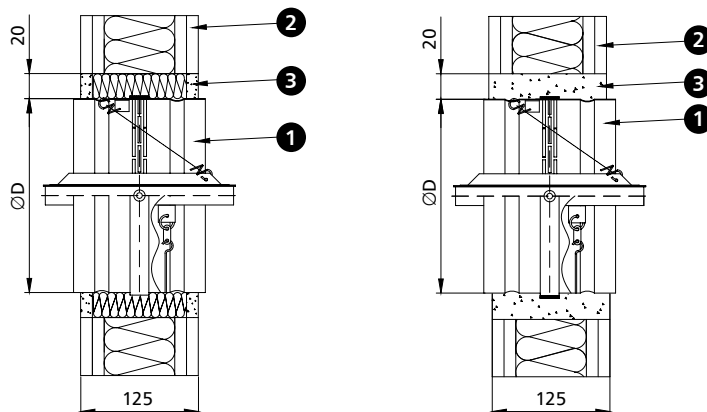


in rigid walls and ceilings

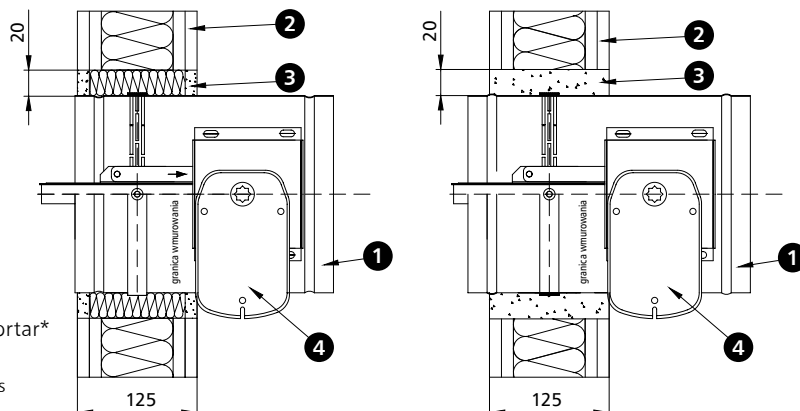


4.5.2. sample installation in lightweight walls of plaster-cardboard panels

mcr FID PRO damper with a RST mechanism



mcr FID PRO damper with a BFL or RST-KW1 mechanism

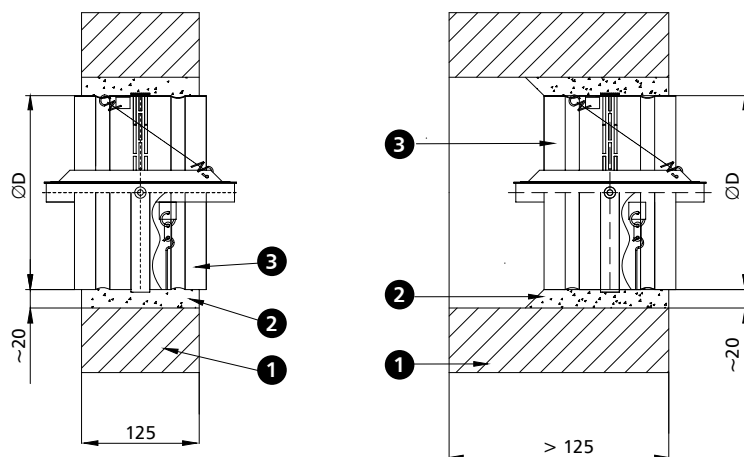


1. fire damper mcr FID PRO
2. lightweight wall
3. sealing - mineral wool with the density of at least 80 kg/m³, A1 class and/or plaster mortar*
4. trigger control mechanism

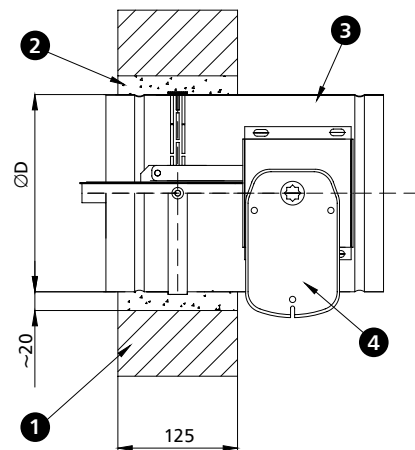
*it is possible to use a different sealing which ensures the required fire resistance

4.5.3. sample installation in concrete and masonry walls

mcr FID PRO damper with a RST mechanism



mcr FID PRO damper with a BFL or RST-KW1 mechanism

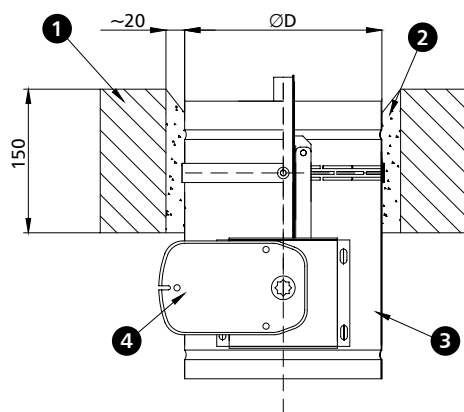


1. rigid wall - concrete, cellular concrete or bricks
2. sealing - concrete, cement or cement-lime masonry mortar*
3. fire damper mcr FID PRO
4. trigger control mechanism

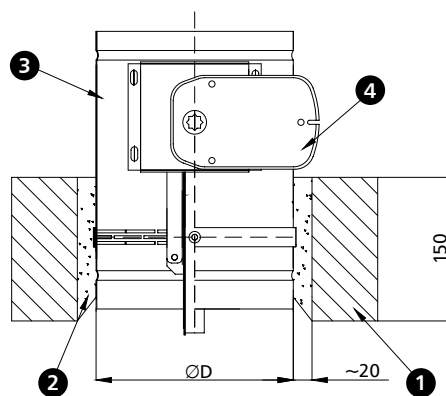
*it is possible to use a different sealing which ensures the required fire resistance

4.5.4. sample installation in ceilings

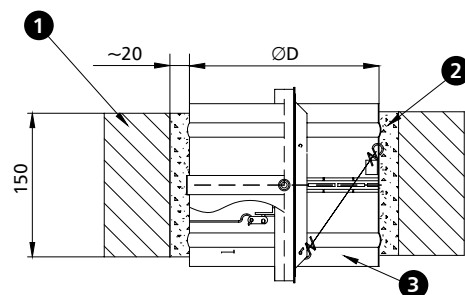
mcr FID PRO damper with a BFL or RST-KW1 mechanism



mcr FID PRO damper with a BFL or RST-KW1 mechanism

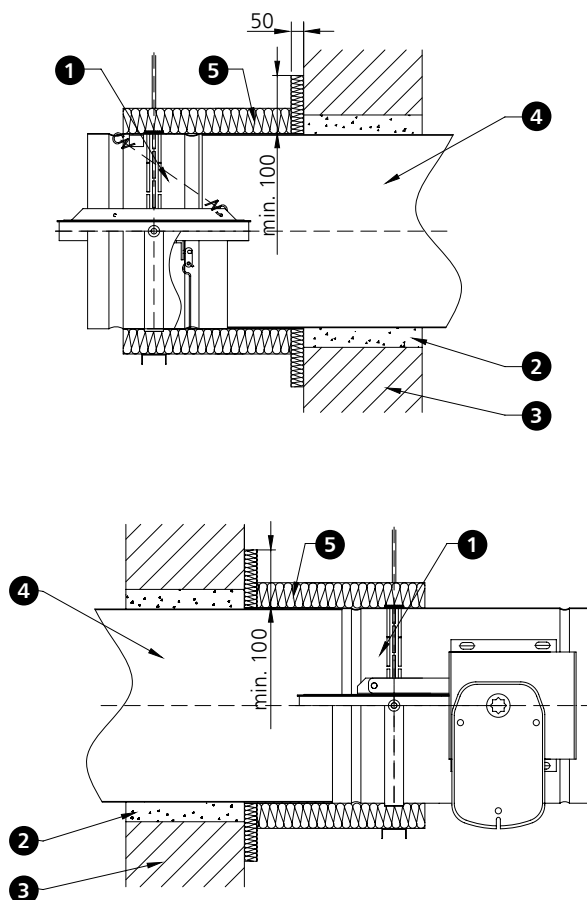


mcr FID PRO damper with a RST mechanism

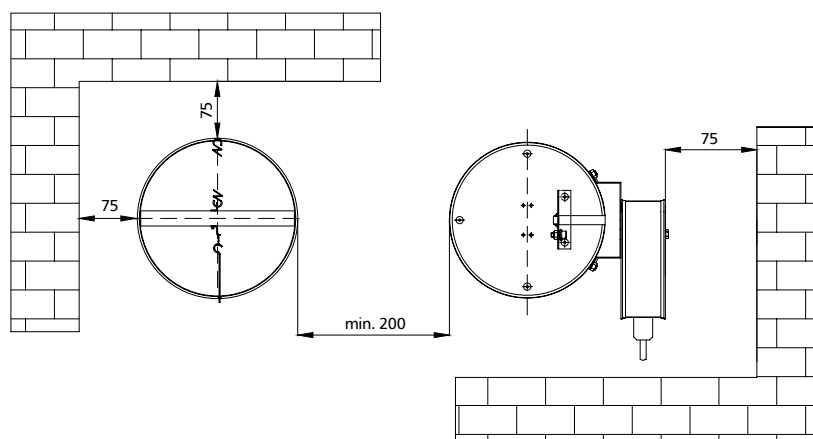


1. ceiling
2. sealing - concrete, cement or cement-lime masonry mortar*
3. fire damper mcr FID PRO
4. trigger control mechanism

*it is possible to use a different sealing which ensures the required fire resistance

4.5.5. sample installation outside the fire partition


- 1. fire damper mcr FID PRO
 - 2. e.g. cement mortar*
 - 3. wall
 - 4. ventilation duct
 - 5. mineral wool with the density of at least 80 kg/m^3 and thickness 30 mm, A1 class
- *it is possible to use a different sealing which ensures the required fire resistance

Distance between systems and partitions


4.6. technical parameters of mcr FID PRO circular dampers

D – nominal diameter [mm]
v – velocity [m/s]

Sk – duct cross-section [m²]
Se – damper active cross-section [m²]
Q – flow [m³/h]

weff – velocity measured on the damper active surface [m/s]
dp – pressure drop [Pa]
L_{WA} – damper noise level [dB]

mcr FID PRO 100

d [mm]	Sk [m ²]	Se [m ²]	v [m/s]	Q [m ³ /h]	weff [m/s]	dp [Pa]	L _{WA} [dB]
100	0.0079	0.0057	2.0	41	2.8	4.5	21
			4.0	81	5.5	14	29
			6.0	122	8.3	26	37
			8.0	163	11.1	42	43

mcr FID PRO 125

d [mm]	Sk [m ²]	Se [m ²]	v [m/s]	Q [m ³ /h]	weff [m/s]	dp [Pa]	L _{WA} [dB]
125	0.0123	0.0095	2.0	69	2.6	3	19
			4.0	137	5.2	10	27
			6.0	206	7.8	20	36
			8.0	274	10.4	33	42

mcr FID PRO 160

d [mm]	Sk [m ²]	Se [m ²]	v [m/s]	Q [m ³ /h]	weff [m/s]	dp [Pa]	L _{WA} [dB]
160	0.0201	0.0166	2.0	119	2.4	2	17
			4.0	239	4.8	6	23
			6.0	358	7.3	15	34
			8.0	477	9.7	24	41

mcr FID PRO 200

d [mm]	Sk [m ²]	Se [m ²]	v [m/s]	Q [m ³ /h]	weff [m/s]	dp [Pa]	L _{WA} [dB]
200	0.0314	0.027	2.0	194	2.3	1	16
			4.0	389	4.7	5	21
			6.0	583	7.0	11	33
			8.0	778	9.3	20	40

mcr FID PRO 250

d [mm]	Sk [m ²]	Se [m ²]	v [m/s]	Q [m ³ /h]	weff [m/s]	dp [Pa]	L _{WA} [dB]
250	0.0491	0.0391	2.0	282	2.5	2	18
			4.0	564	5.0	4	21
			6.0	846	7.5	7	29
			8.0	1127	10.0	10	33

mcr FID PRO 315

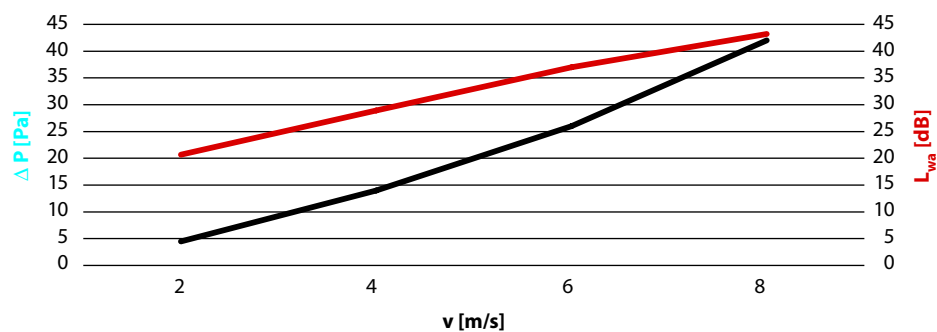
d [mm]	Sk [m ²]	Se [m ²]	v [m/s]	Q [m ³ /h]	weff [m/s]	dp [Pa]	L _{WA} [dB]
315	0.0779	0.0654	2.0	471	2.4	2	18
			4.0	942	4.8	4	23
			6.0	1413	7.1	7	31
			8.0	1884	9.5	13	39

The mcr FID PRO fire damper selection program is available at www.mercor.com.pl, in the Architect and Designer Zone.

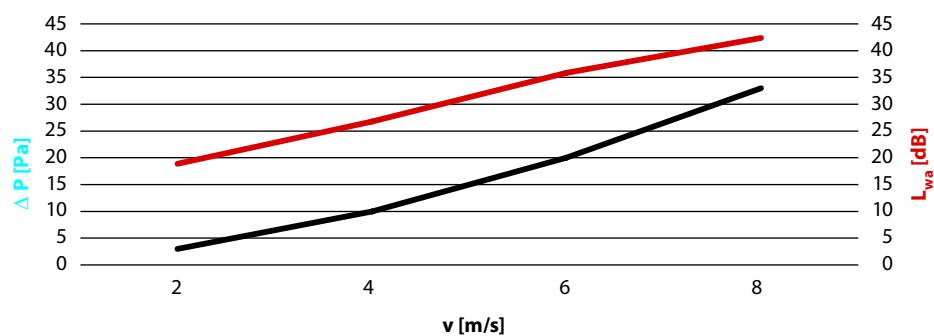
4.6.1 flow characteristics in circular mcr FID PRO dampers

— pressure drop on a damper
 — damper noise level

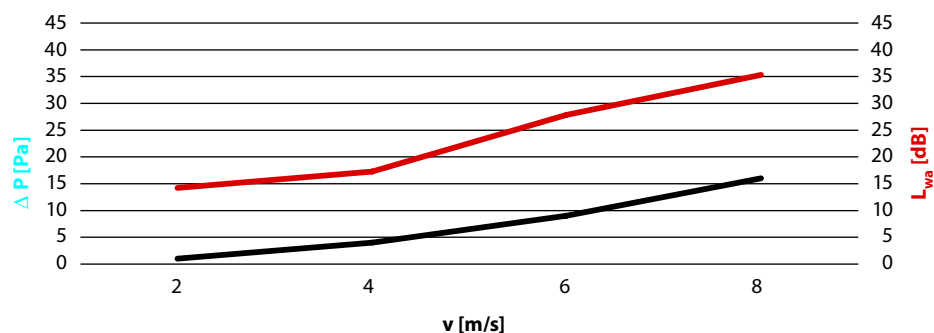
mcr FID PRO 100



mcr FID PRO 125



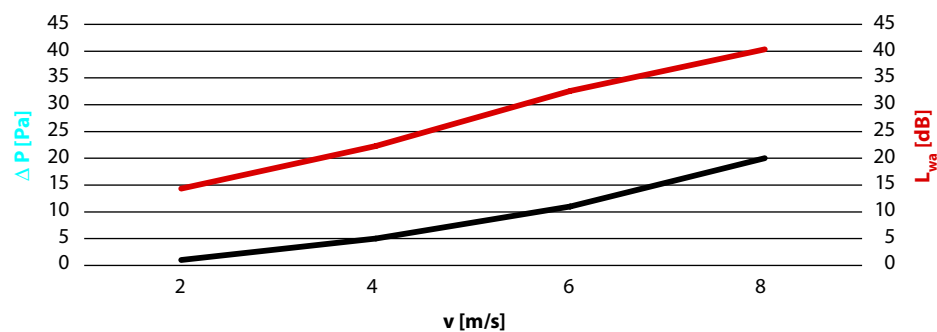
mcr FID PRO 160



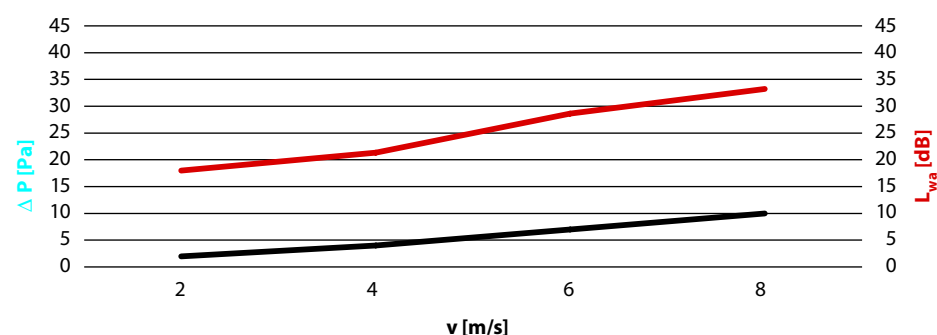
4.6.1 flow characteristics in circular mcr FID PRO dampers

— pressure drop on a damper
— damper noise level

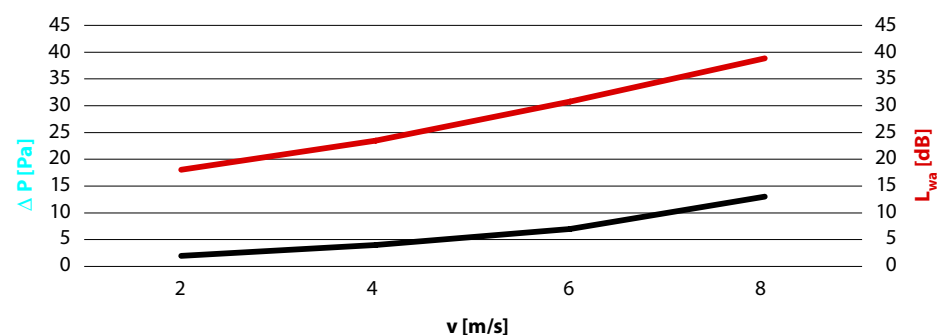
mcr FID PRO 200



mcr FID PRO 250

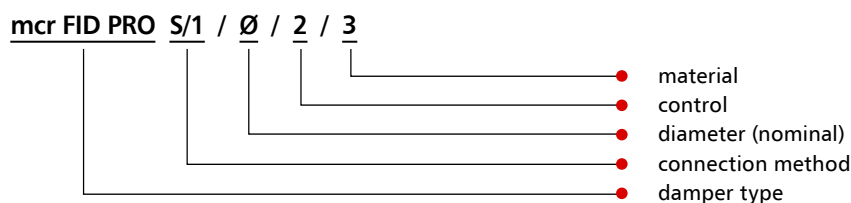


mcr FID PRO 315



4.7. estimated weights of mcr FID PRO dampers for circular ventilation ducts [kg]

diameter D [mm]	RST	actuator/RST-KW1
100	0.7	3
125	0.9	3.2
160	1.2	3.6
200	1.7	4.2
250	2.1	4.6
315	2.6	5.1

4.8. marking

1 – connection method:

- N** or [no symbol] – male connection (nipple)
- M** – female connection (muff)
- K** – flange

2 – control:

- RST trigger control mechanism
 - RST** – thermal trigger
 - RST/WK1** – thermal trigger + limit switch (closed blade signal)
 - RST/WK2** – thermal trigger + limit switch (open/closed blade signal)
- RST-KW1 trigger control mechanism
 - RST-KW1/S** – thermal trigger
 - RST-KW1/S/WK2** – thermal trigger + limit switch (open/closed blade signal)
 - RST-KW1/24I** – thermal trigger + „pulse“ electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
 - RST-KW1/24P** – thermal trigger + „break“ electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
 - RST-KW1/230I** – thermal trigger + „pulse“ electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
 - RST-KW1/230P** – thermal trigger + „break“ electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
- Belimo trigger control mechanism
 - BF24TL-T-ST** (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control
 - EXBF24-T** – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC
 - EXBF230-T** – explosion proof actuator with a return spring in the Ex version, U = 230 V AC
 - BFL24-T** – actuator with a return spring, U = 24 V AC/DC
 - BFL230-T** – actuator with a return spring, U = 230 V AC
 - BFL24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system

3 – material:

- [no symbol] – galvanised steel, Zn 275 g/m² coating
- KN** – 1.4404 acid-proof stainless steel

example marking:
mcr FID PRO Ø125 BFL24-T

EIS120 low-resistance cut-off damper with a 24 V compact Belimo actuator with a thermoelectric trigger and limit switches.

mcr FID PRO Ø125 RST/WK1

EIS120 low-resistance cut-off fire damper with a trigger rated at 74°C and a partition closing limit switch.

Chapter 12 - power supply and control (p. 141) contains:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper,
- location of trigger control mechanisms in relation to the damper - manufacture standards.

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- ▶ **EIS120**
- ▶ **Certificate of constancy of performance 1396-CPR-0092.**
- ▶ **Valves certified for compliance with EN 15650.**
- ▶ **Valves qualified under EN 13501-3 and tested under EN 1366-2.**

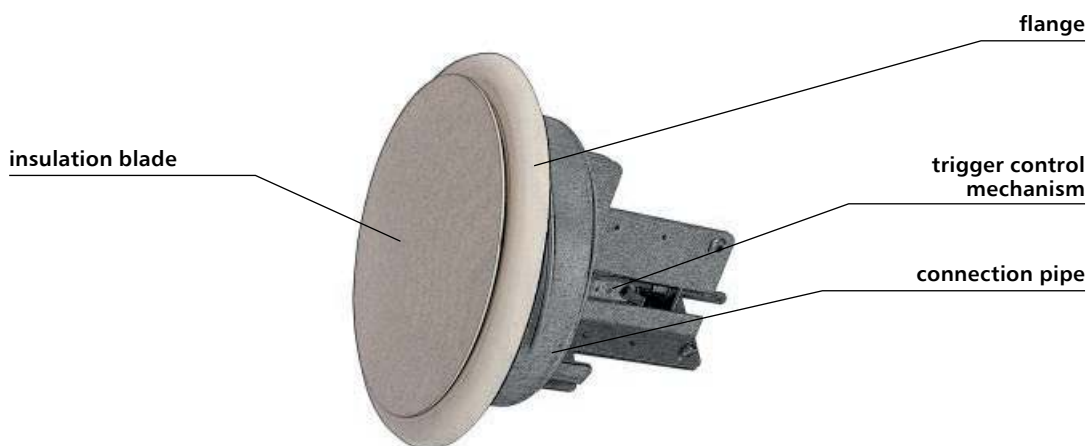
5.1. application

The mcr ZIPP cut-off fire valves are designed for installation at the ends of the general ventilation system, where those systems pass through construction partitions. They are used to separate the fire hazard zone from other parts of the building and to transfer air through construction partitions. During normal system operation, the valves are open. In case of fire, the valves close.

Furthermore, the mcr ZIPP cut-off fire valves may be used to close transfer openings, in which case they are installed without connection ducts.

Valves may also be used in the systems which are protecting escape routes from smoke, in which case they remain open during the fire and ensure the supply of fresh air to escape routes. As the fire develops further, the valves are automatically closed as a result of thermal trigger tripping, which prevents the spreading of fire and smoke to other rooms.

5.2. design



The mcr ZIPP cut-off valves consist of a casing with a circular cross-section, a moving cut-off partition (cover), a connection stub pipe and a trigger control mechanism activated when the thermal or electromagnetic trigger trips, with the automatic trip of the thermal trigger overrides the remote power supply application or disconnection.

The connection stub pipe is made of galvanised steel sheet. The valve flange is made of powder-painted steel sheet. The insulation blade of the valve is made of fire protection material, coated on the outside with powder-painted steel sheet. The blade is placed on a treaded, moving guiding pin, which enables the adjustment of performance (active surface) of the valve by tightening the cover.

During normal operation, cut-off valves remain open. The valve switches to safe mode (closes):

- automatically, by the thermal trigger tripping (RST trigger control mechanism),
- remotely, by the electromagnetic and thermal trigger tripping (RST+EK trigger control mechanism).

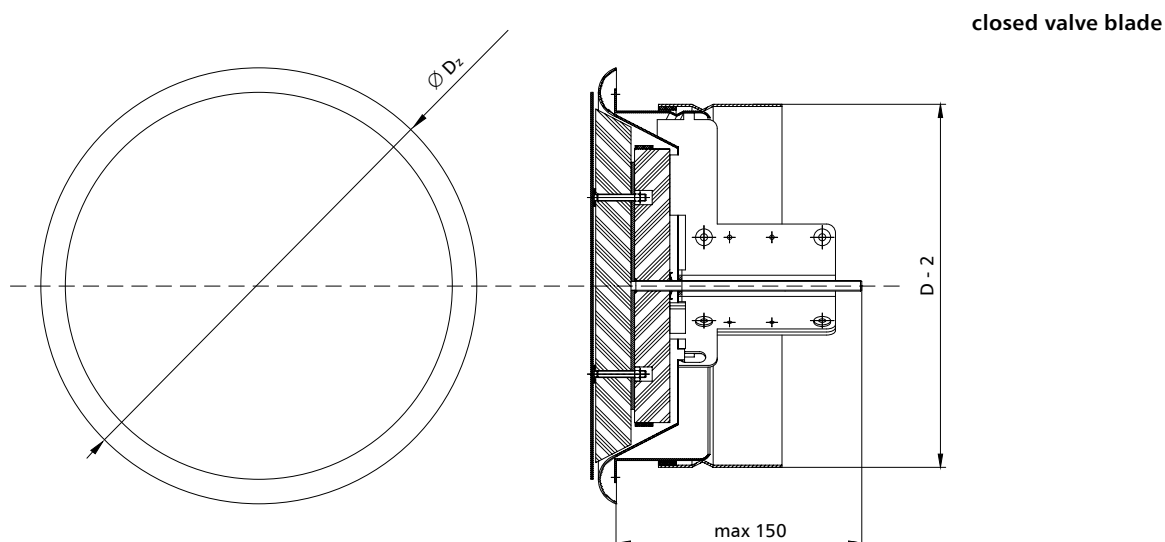
As a standard the valves are painted in RAL 9010.

5.3. versions

5.3.1. mcr ZIPP RST – the cut-off fire valve for ventilation ducts with a thermal trigger

During normal operation, the insulation blade of the fire valve remains open. In case of fire, the blade closes automatically.

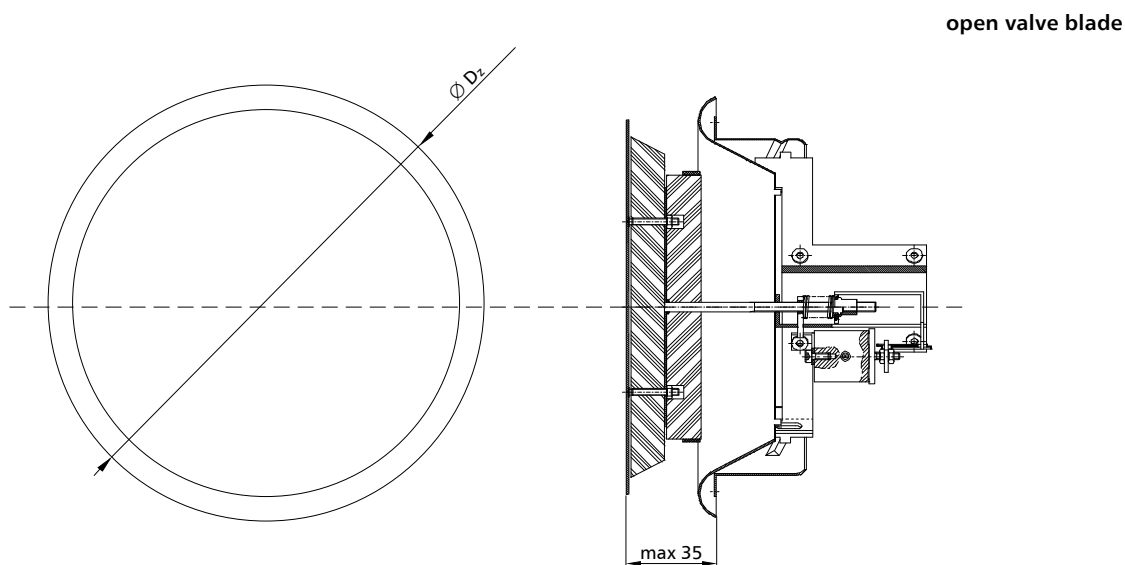
The mcr ZIPP RST valves are equipped with a RST trigger control mechanism with a thermal trigger 74°C (optionally, it is possible to use triggers with the nominal tripping temperature of 95°C) and a drive spring. After the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. It is possible to equip the valves with a WK1 limit switch used to signal the blade position state.



5.3.2. mcr ZIPP RST+EK – the cut-off fire valve for ventilation ducts with an electromagnetic and thermal trigger

During normal operation, the insulation blade of the fire valve remains open. In case of fire, the blade closes automatically or remotely by applying or cutting off the power supply.

The mcr ZIPP RST+EK valves are equipped with a trigger control mechanism with a thermal trigger 74°C (optionally 95°C), a drive spring and an electromagnetic trigger tripped by the power supply application („pulse”) or removal („break”). The use of a MP230/24 conversion element enables tripping the blade with 230 V AC voltage. The valve is equipped with a WK1 limit switch used to signal the blade position state.



5.4. dimensions

Circular valves:

- nominal diameters D: 100 mm, 125 mm, 160 mm, 200 mm.

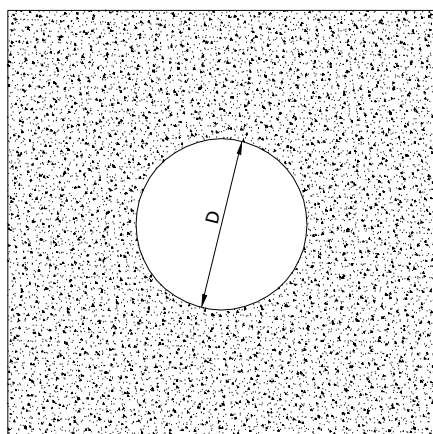
5.5. installation

The mcr ZIPP valves are EI120 (ve ho o↔i)S-rated when installed in concrete partitions made of full bricks or cellular concrete blocks with the thickness of at least 110 mm, light walls of cardboard-plaster panels on a steel framework with the thickness of at least 125 mm and the resistance class of not less than EI120 and concrete ceilings with the thickness of at least 150 mm.

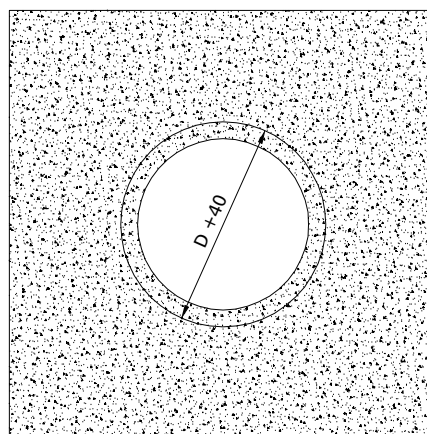
In the case of ductless installation, the valves have the resistance of EI120 (ho i↔o).

5.5.1. preparation of installation openings

in lightweight plaster-cardboard walls

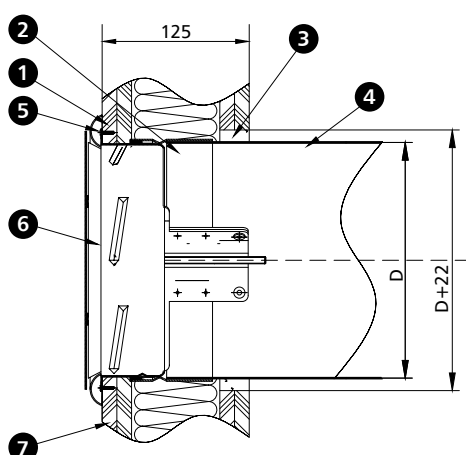


in rigid walls and ceilings



5.5.2. sample installation in lightweight walls of plaster-cardboard panels on a steel framework

duct installation



1. plaster-cardboard panel
2. extension connecting pipe
3. sealing - plaster mortar*
4. ventilation duct
5. screw for plaster-cardboard
6. mcr ZIPP valve
7. lightweight plaster-cardboard wall

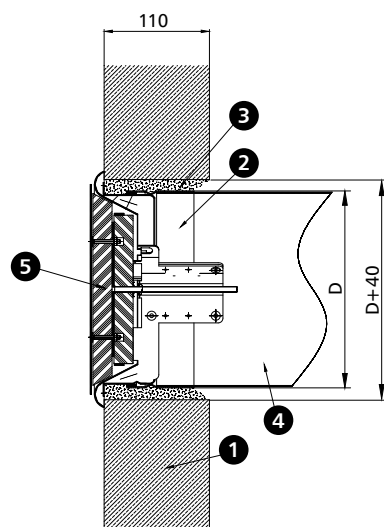
*it is possible to use a different sealing which ensures the required fire resistance

5.5.3. sample installation in rigid walls

duct installation

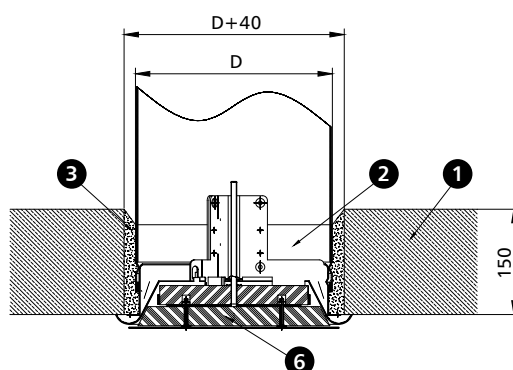
1. rigid concrete or masonry wall
2. extension connection pipe
3. sealing - plaster or cement mortar*
4. duct
5. mcr ZIPP valve

*it is possible to use a different sealing which ensures the required fire resistance



5.5.4. sample installation in ceilings

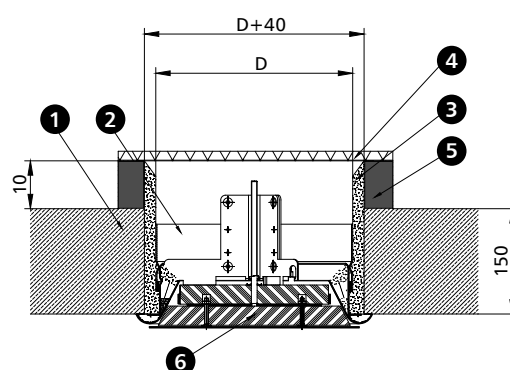
duct installation



1. ceiling
2. extension connecting pipe
3. sealing - plaster or cement mortar*
4. guard grid (not included)
5. circumferential trim or duct cover with suitable height
6. mcr ZIPP valve

*it is possible to use a different sealing which ensures the required fire resistance

ductless installation



5.6. technical parameters of mcr ZIPP valves

Se – damper active cross-section [m²]

Sk – duct cross-section [m²]

D – nominal diameter [mm]

diameter D [mm]	100	125	160	200
Se	0.0027	0.0055	0.0111	0.0191
Sk	0.0079	0.0123	0.0201	0.0314

Flow characteristics

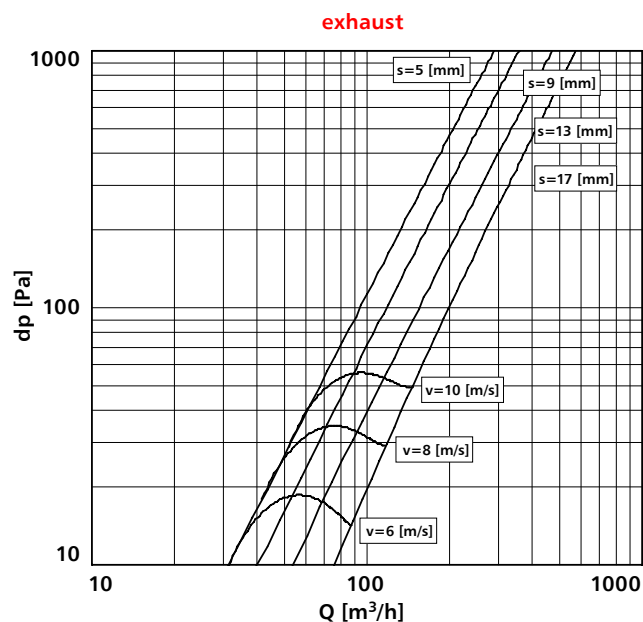
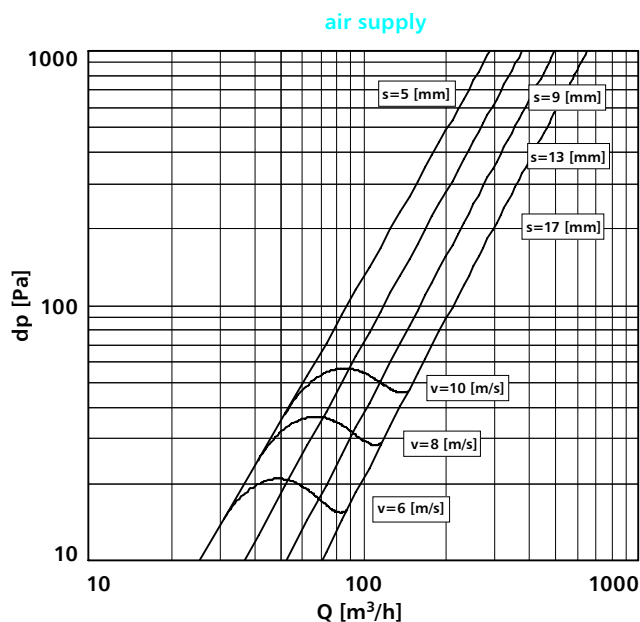
dp – pressure drop [Pa]

s – valve opening [mm]

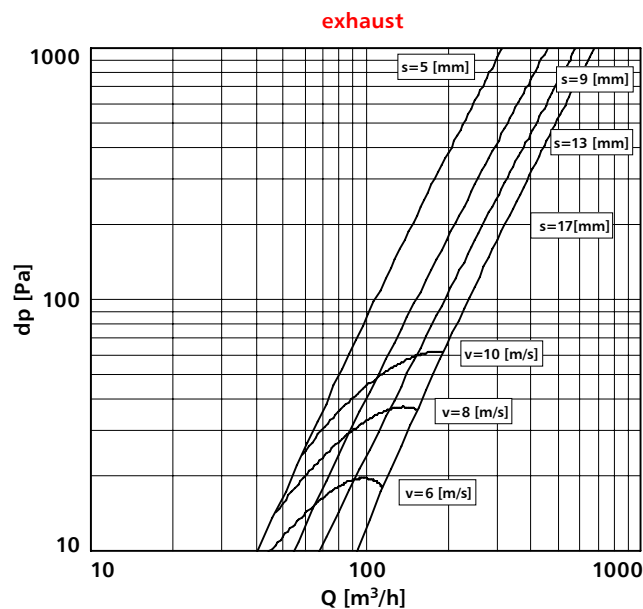
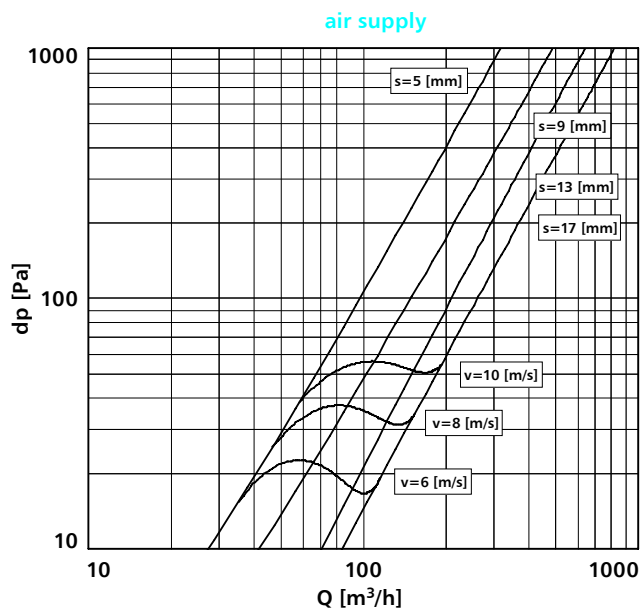
v – velocity [m/s]

Q – flow [m³/h]

mcr ZIPP 100 flow characteristics



mcr ZIPP 125 flow characteristics



Flow characteristics

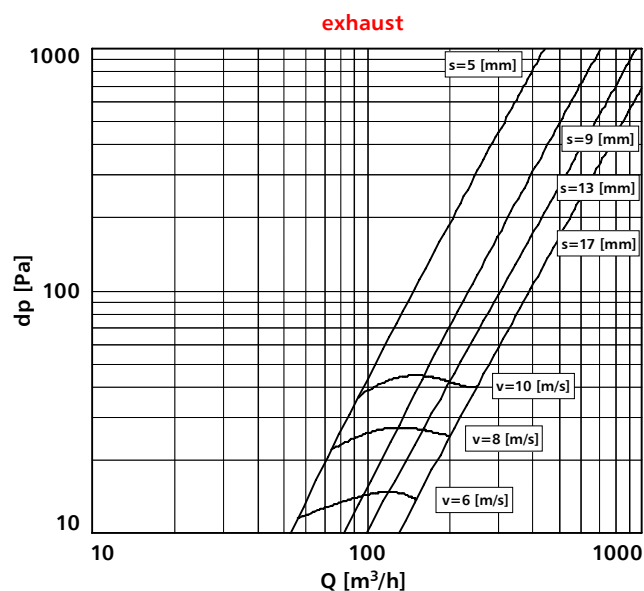
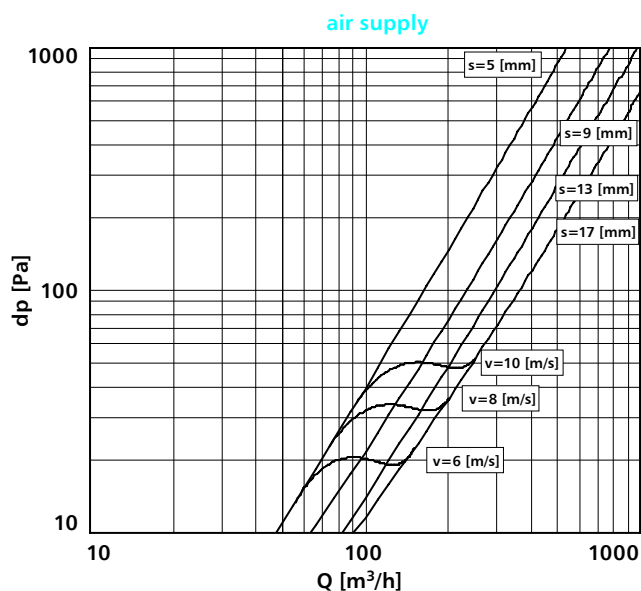
 Δp – pressure drop [Pa]

 s – valve opening [mm]

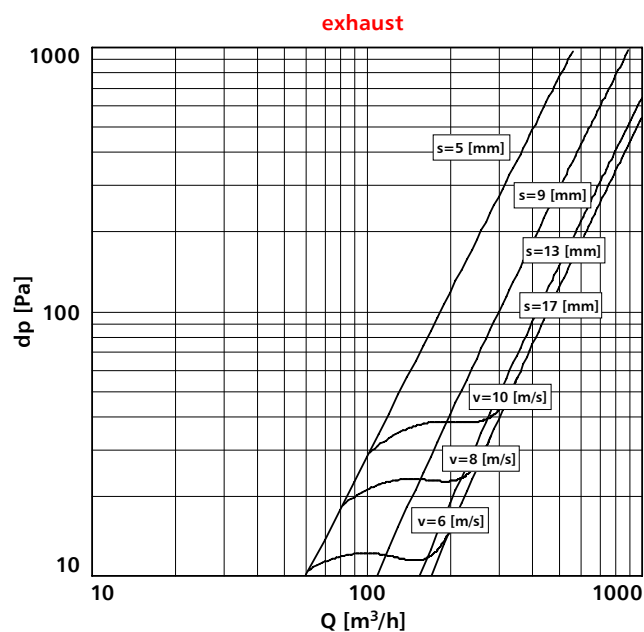
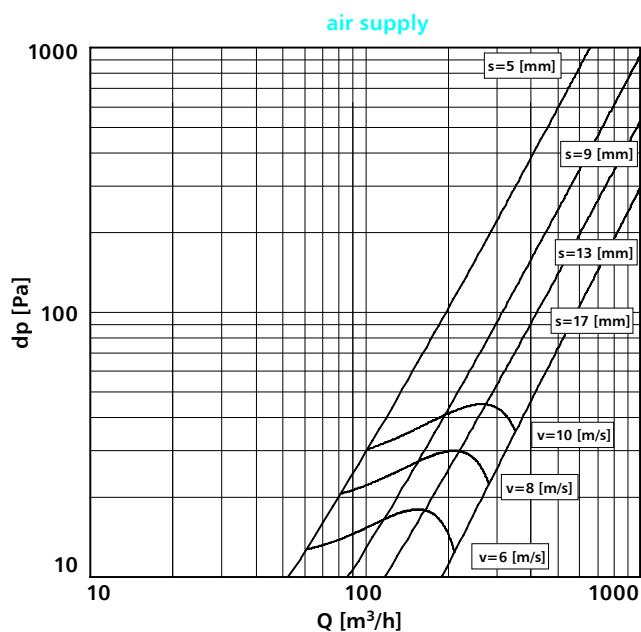
 v – velocity [m/s]

 Q – flow [m^3/h]

mcr ZIPP 160 flow characteristics



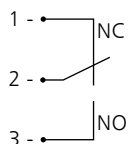
mcr ZIPP 200 flow characteristics



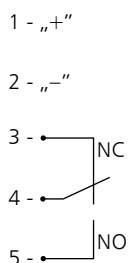
5.7. trigger control mechanisms – specifications and connection diagram

manufacture type	RST	RST+WK1	RST+EKI	RST+EKP	MP230/24
thermal trigger	+	+	+	+	-
limit switch	-	250 V AC / 5A	250V AC / 5A	250 V AC / 5A	-
rated voltage	-	-	24 V DC	24 V DC	230 V AC / output 24 V DC
power consumption	-	-	3.5 W	1.8 W	2 W

electric connection diagram for the mcr ZIPP RST+WK1 valve

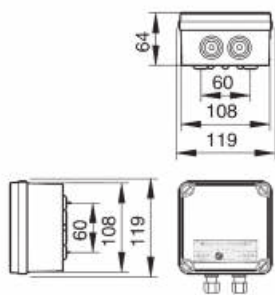


electric connection diagram for the mcr ZIPP RST+EKI valve or RST + EKP



note: the position of limit switch in standby (open valve)

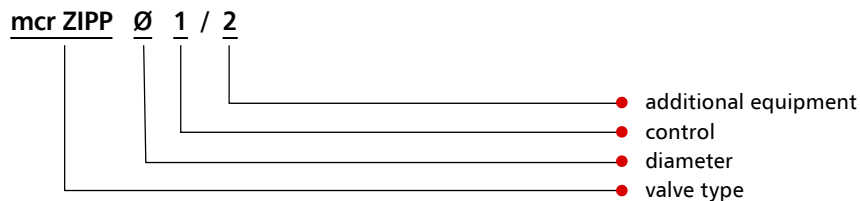
diagram and dimensions of the MP230/24 conversion unit



5.8. weights of the mcr ZIPP valves [kg]

D [mm]	RST	RST+EK
100	0.9	1
125	1.5	1.6
160	1.7	1.8
200	2.7	2.8

5.9. marking

**1 – control:**

- RST trigger control mechanism
RST – thermal trigger
- RST+EK trigger control mechanism
RST+EKI24 – thermal trigger + „pulse” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
RST+EKP24 – thermal trigger + „break” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)

2 – additional equipment:

- WK1** – limit switch (closed blade signal)
- MP230/24** – conversion unit – possible to power with the voltage of 230 V AC
- RMK** – extension connecting pipe

example marking:**mcr ZIPP Ø125 RST**

EIS120 cut-off fire valve with a thermal trigger rated at 74°C.

mcr ZIPP Ø125 RST + WK1

EIS120 cut-off fire valve with a thermal trigger rated at 74°C and a limit switch.

mcr ZIPP Ø125 RST + EKP24

EIS120 cut-off fire valve with a thermal trigger rated at 74°C and a „break” electromagnetic trigger, U = 24 V DC and a limit switch.

mcr ZIPP Ø125 RST+EKI24+MP230/24

EIS120 cut-off fire valve with a thermal trigger rated at 74°C and a „pulse” electromagnetic trigger, U = 24 V DC, a limit switch and a 230 V AC to 24 V DC voltage conversion unit.

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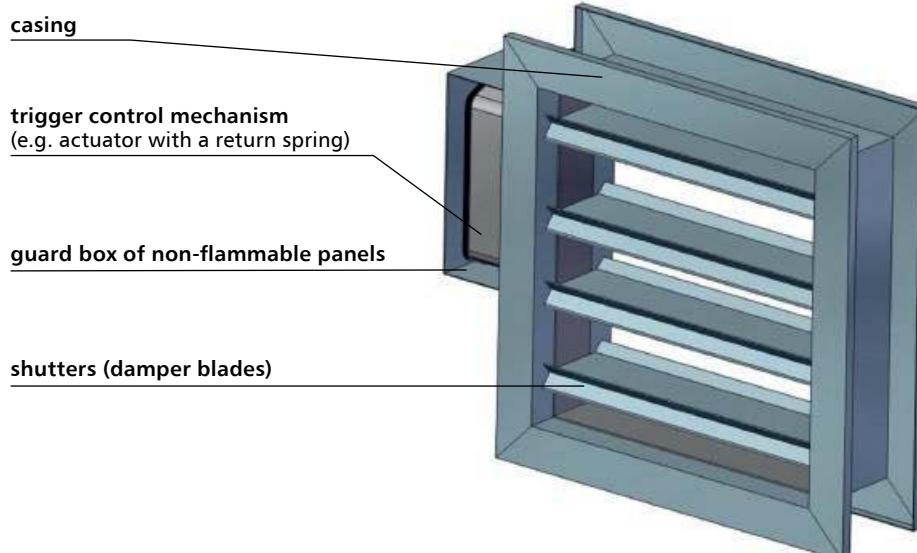
- ▶ **EIS60, ES120**
- ▶ **Certificate of constancy of performance 1396-CPR-P0097.**
- ▶ **Dampers certified for compliance with EN 15650.**
- ▶ **Dampers qualified under EN 13501-3 and tested under EN 1366-2.**
- ▶ **Narrow shutter cut-off dampers.**

6.1. application

The mcr WIP/S multi-blade cut-off dampers are designed for use in general ventilation systems, where those systems pass through construction partitions. The mcr WIP dampers are particularly useful for systems with a silencer elbow or supply and extract grill.

During a fire, the dampers preserve the fire resistance of the construction partition where ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and burning fumes to the remaining part of the building which is not on fire. During normal system operation, the shutters are open. In case of fire, the shutters close.

6.2. design



The mcr WIP/S cut-off dampers consist of a casing with a rectangular cross section, a moving multiple damper blades - shutters rotating on their axes and a trigger control mechanism which is tripped remotely or automatically by tripping a thermoelectric trigger. Damper casing is made of a galvanised or stainless steel sheet. Its integral part is a flange of silicate-cement panels. The inner side of the fire damper casing is equipped with an intumescent gasket. The casing total length is 140 mm.

The shutter surface is covered with galvanised or stainless steel sheet. Each blade with the thickness of 15 mm is filled with a plaster panel. The damper blades rotate on their axes, which consist of two steel pins.

Square and rectangular dampers are made with 50 mm flanges that enable the correct installation of dampers in ventilation ducts. In a circular duct, the damper is made as square with a circular connection.

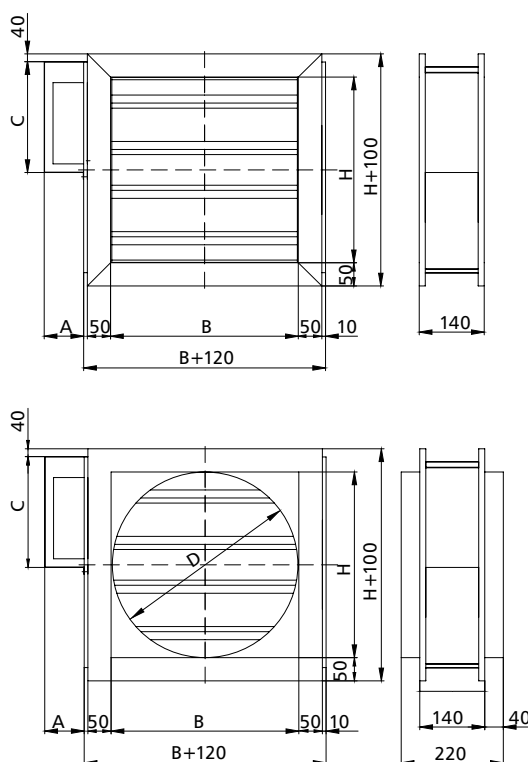
6.3. versions

6.3.1. mcr WIP/S – the cut-off fire damper for ventilation ducts with an actuator with a return spring – damper closing and opening with an actuator

During normal operation, the damper blades of the fire damper remain open. In case of fire, the shutters close automatically or remotely by cutting off the power supply.

The mcr WIP/S dampers are equipped with a Belimo trigger control mechanisms **BFL, BFN, BF, BF-TL, EXBF** axial actuator with a return spring, powered with 24 V AC/DC or 230 V AC, with thermoelectric trigger 72°C (optionally it is possible to use triggers with the nominal tripping temperature of 95°C). BFL, BFN, BF series actuators are equipped with limit switches used to monitor the blade position. Furthermore, the mechanical position indicator is placed on the actuator.

Dampers with Belimo actuators: analogue BFL, BFN, BF, digital BF-TL, EXBF explosion proof actuators close thanks to thermoelectric trigger tripping or power supply cut off as a result of the actuator return spring action. The dampers open when the power supply voltage is applied to the actuator terminals. Furthermore, dampers with those actuators may be opened manually using a key.

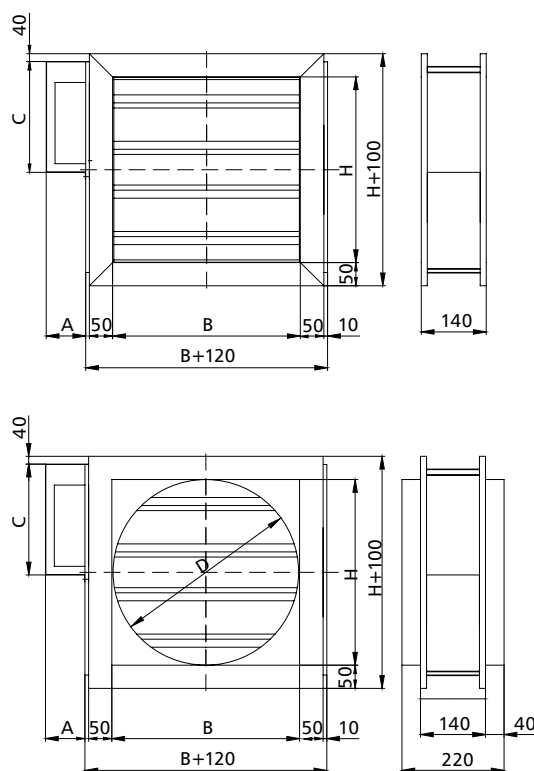


mechanism	A	C
BFN	125	325
BFL	125	275
BF	125	325
BF24TL-ST	125	325
EXBF	175	400

6.3.2. mcr WIP/S – the cut-off fire damper for ventilation ducts with a spring drive and an integrated thermal trigger, optionally equipped with an electromagnetic trigger and limit switches

During normal operation, the cut-off shutters of the fire damper remain open. In case of fire, the shutters close automatically or, in case of a damper with an electromagnetic trigger, additionally using the fire automation.

The mcr WIP/S dampers are equipped with a **RST-KW1** trigger control mechanism with a drive spring and a cam-lever system. A thermal trigger 74°C (optionally at 95°C) is integrated into the damper mechanism. After the nominal temperature is exceeded, the thermal trigger is tripped and the shutters close. On the RST-KW1 mechanism, there is a mechanical blades position indicator. It is possible to equip a trigger control mechanism with an electromagnetic trigger activated by the application („pulse”) or removal („break”) of the power supply voltage and with limit switches used to signal the blades position state. The mechanism is equipped with test and blades button-release functions. Blades re-opening is activated manually using a key.



mechanism	A	C
RST-KW1	165	275

6.4. dimensions

Rectangular dampers:

- nominal width B: from 120 mm to 1000 mm
- nominal height H: from 160 mm to 1000 mm
- the maximum cross-section surface of one damper up to 1 m²

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (in 1 mm increments, in the given range).

Square fire dampers may also be fitted with round connectors for the spigot connection to the round ducts.

6.5. installation

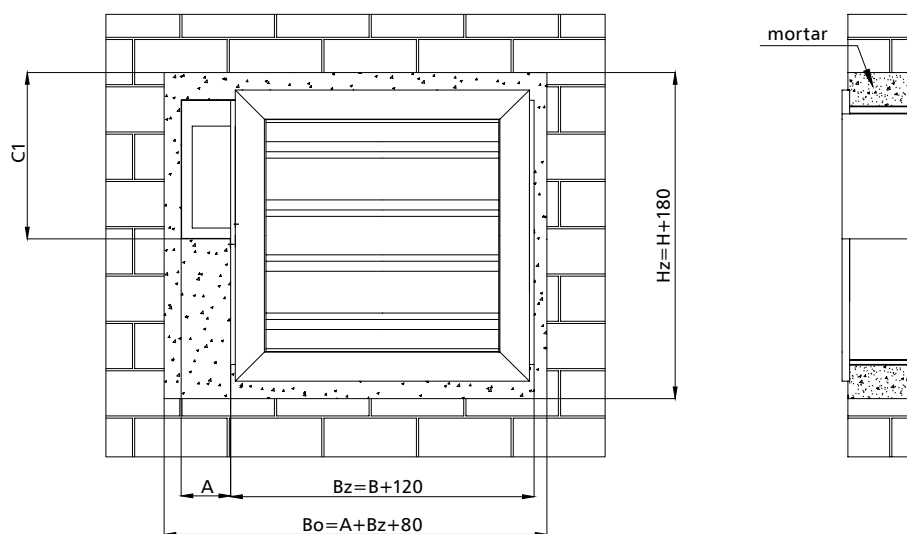
The mcr WIP/S rectangular dampers are EI60(ve i↔o)S-rated and E120(ve i↔o)S-rated when installed in concrete partitions with the thickness of at least 110 mm, made of full bricks or cellular concrete blocks with the thickness of at least 115 mm, lightweight walls with the resistance rating of not less than EI60.

6.5.1. preparation of installation openings

The minimum dimensions of the installation opening that permits correct installation of the mcr WIP/S damper is:

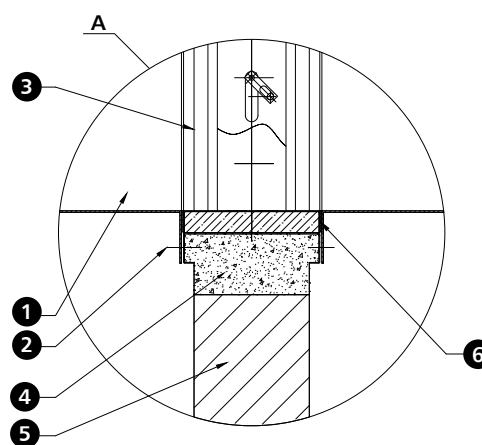
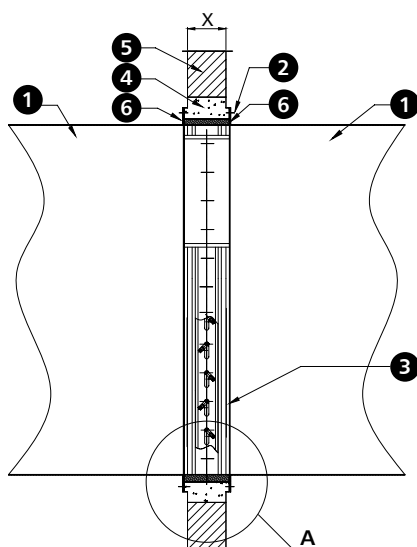
$$B_o = (A + B_z + 80) \text{ mm}$$

$$H_o = (H + 180) \text{ mm}$$



	BF	BFL	BFN	RST-KW1	EXBF
C1 [mm]	385	335	385	335	460
A [mm]	125	125	125	165	175

6.5.2. sample installation in concrete or masonry walls



1. ventilation duct
2. screw ST4.2x16

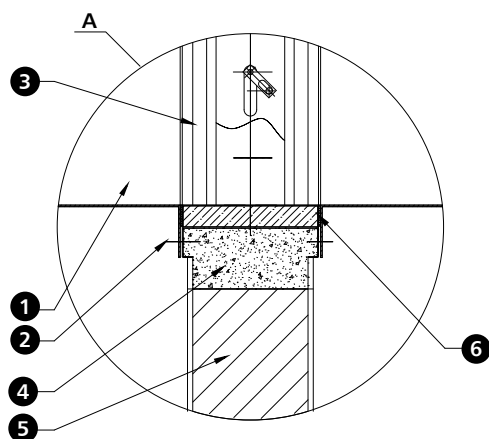
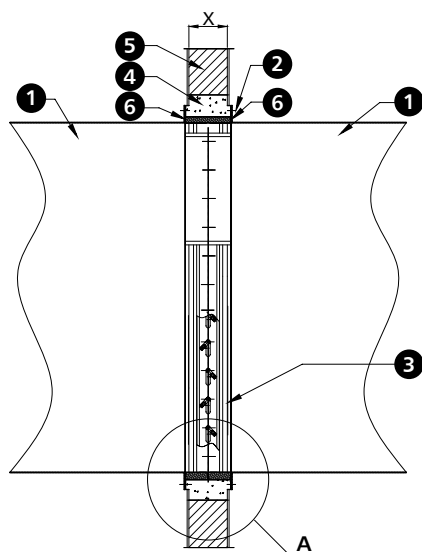
3. fire damper mcr WIP
4. sealing - e.g. cement masonry mortar*

*it is possible to use a different sealing which ensures the required fire resistance

5. masonry wall
X. wall thickness

6. heat resistant gasket

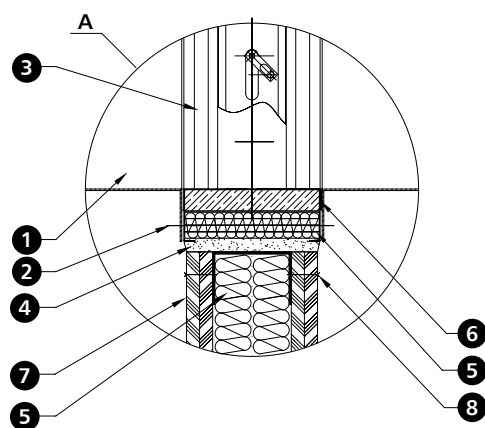
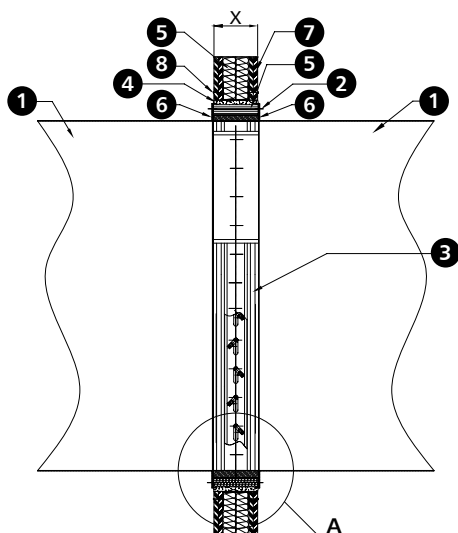
6.5.3. sample installation in concrete block or full brick walls



- 1. ventilation duct
- 2. screw ST4.2x16
- 3. fire damper mcr WIP
- 4. sealing - e.g. cement masonry mortar*
- 5. wall of concrete blocks or full bricks
- 6. heat resistant gasket
- X. wall thickness

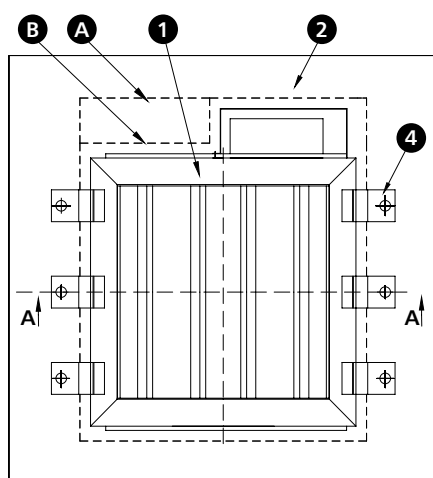
*it is possible to use a different sealing which ensures the required fire resistance

6.5.4. sample installation in lightweight walls

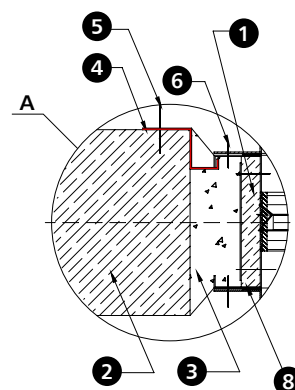
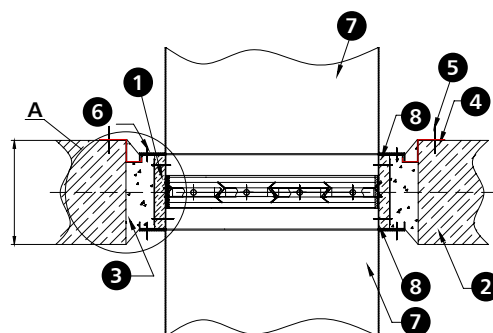


- 1. ventilation duct
- 2. screw ST4.2x16
- 3. fire damper mcr WIP
- 4. sealing - e.g. cement masonry mortar*
- 5. mineral wool with the density of at least 80 kg/m³, A1 class
- 6. heat resistant gasket
- 7. lightweight wall
- 8. screw ST5.5x38
- X. wall thickness

*it is possible to use a different sealing which ensures the required fire resistance

6.5.5. sample installation in ceiling


A - A

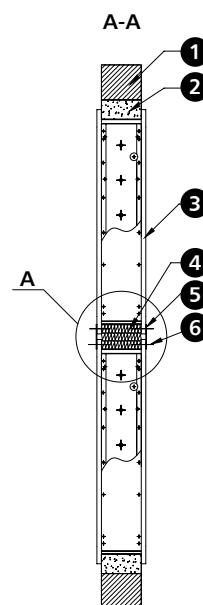
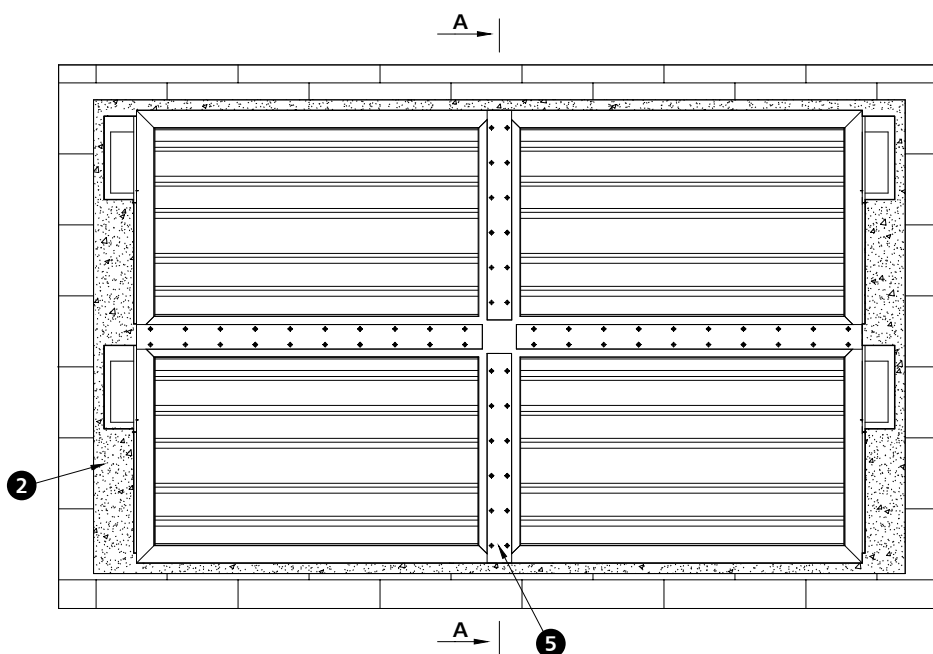


1. fire damper mcr WIP
2. ceiling
3. e.g. cement mortar*

4. mounting bracket
5. steel expansion anchor with M6 metal screw
6. ST4.2x16 screw

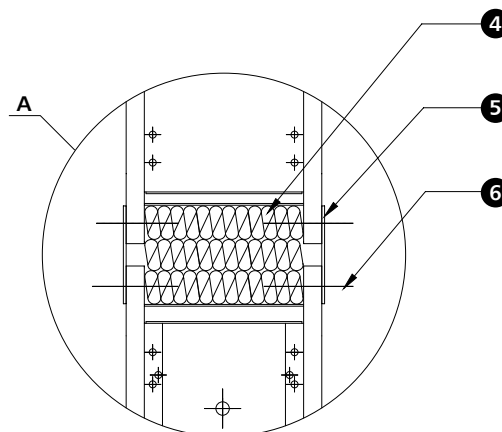
7. ventilation duct
8. heat resistant gasket
- A./B. construction opening

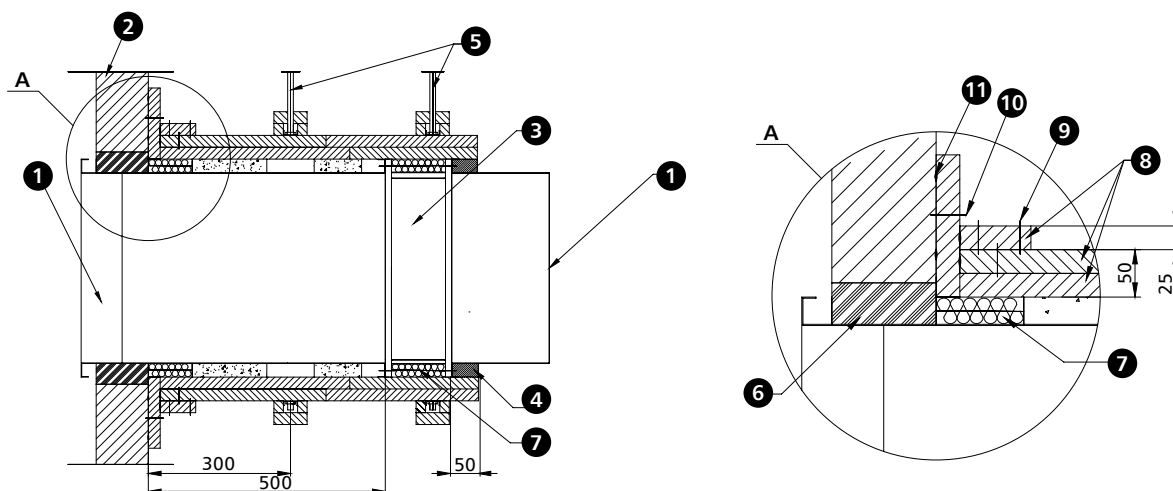
*it is possible to use a different sealing which ensures the required fire resistance

6.5.6 sample installation in a multiple set (a battery of four dampers)


1. e.g. masonry wall
2. e.g. cement mortar*
3. fire damper mcr WIP
4. mineral wool with the density of at least 80 kg/m³, A1 class
5. installation flat bar with the width of 70 mm
6. screw ST8x16

*it is possible to use a different sealing which ensures the required fire resistance



6.5.7. sample installation outside the fire partition


1. ventilation duct
2. fire partition
3. fire damper mcr WIP
4. gypsum filling

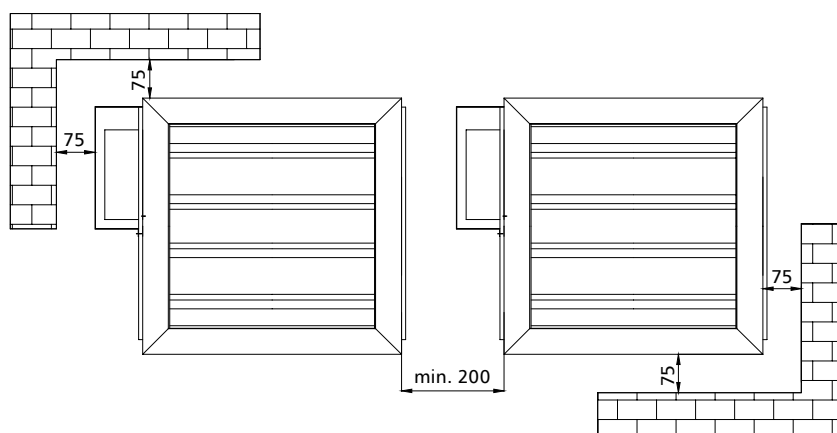
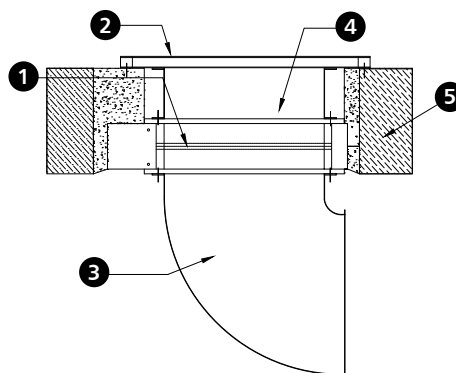
5. duct suspension
6. sealing (cement or cement-lime masonry mortar)*
7. mineral wool with the density of at least 80 kg/m³, A1 class

8. Ridurit fire retardant board
9. screws 3.5 x 50 – spacing: ~150 mm
10. steel expansion anchor Ø8 x 80 mm
11. board joints sealed with Conlit Glue

*it is possible to use a different sealing which ensures the required fire resistance

Fire damper installation with vertical rotation axis of the louvers

The fire damper can operate with vertical axis of louver rotation with the top or bottom-mounted mechanism.

Distance between systems and partitions

Example applications - installation with masking cover


1. fire damper mcr WIP
2. masking cover
3. ventilation duct
4. duct - ventilation straight connection pipe
5. wall, ceiling

For mcr WIP/S fire damper with louvers (no single-blade), available free space in front or behind of the fire damper can be used for the installation of its system components including the masking cover, silencer or leading the duct along the wall, using bends or reducer couplings.

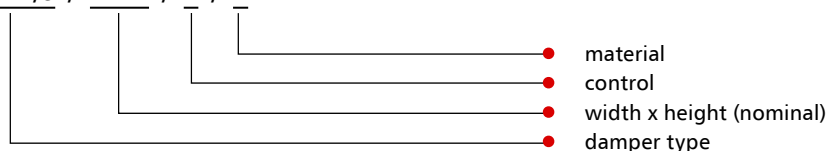
6.7. estimated weights of mcr WIP/S dampers for rectangular ducts [kg]

		width B [mm]									
		200	250	300	400	500	600	700	800	900	1000
height H [mm]	200	10	10	10	10	15	17	18	19	22	25
	250	10	10	11	11	16	18	18	21	24	27
	300	10	11	11	12	17	20	21	23	26	28
	350	11	11	11	16	18	21	23	26	28	30
	400	12	12	14	18	19	21	25	29	30	33
	500	15	16	17	19	20	23	27	32	33	35
	600	17	18	20	21	23	26	30	35	37	39
	700	18	18	21	23	25	28	32	35	38	40
	800	20	21	22	24	29	35	37	41	43	49
	900	22	25	25	28	33	35	39	43	49	52
	1000	23	29	32	33	36	42	43	47	53	60

The table shows the weights of dampers with RST-KW1 trigger control mechanisms or actuators.

6.8. marking

mcr WIP/S / B x H / 1 / 2



1 – control:

- RST-KW1 trigger control mechanism
 - RST-KW1/S** – thermal trigger
 - RST-KW1/S/WK2** – thermal trigger + limit switch (open/closed blade signal)
 - RST-KW1/24I** – thermal trigger + „pulse“ electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
 - RST-KW1/24P** – thermal trigger + „break“ electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
 - RST-KW1/230I** – thermal trigger + „pulse“ electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
 - RST-KW1/230P** – thermal trigger + „break“ electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
- Belimo trigger control mechanism
 - BF24-T** – actuator with a return spring, U = 24 V AC/DC
 - BF230-T** – actuator with a return spring, U = 230 V AC
 - BF24TL-T-ST** (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control
 - EXBF24-T** – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC
 - EXBF230-T** – explosion proof actuator with a return spring in the Ex version, U = 230 V AC
 - BF24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
 - BFL24-T** – actuator with a return spring, U = 24 V AC/DC
 - BFL230-T** – actuator with a return spring, U = 230 V AC
 - BFL24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
 - BFN24-T** – actuator with a return spring, U = 24 V AC/DC
 - BFN230-T** – actuator with a return spring, U = 230 V AC
 - BFN24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system

2 – material:

- [no symbol]** – galvanised steel, Zn 275 g/m² coating
- KN** – 1.4404 acid-proof stainless steel

example marking:

mcr WIP/S 400 x 400 BFL24-T

EIS60 multi-blade cut-off damper with a 24 V compact Belimo actuator with limit switches.

Chapter 12 - power supply and control (p. 141) contains:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper,
- location of trigger control mechanisms in relation to the damper - manufacture standards.

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ITI
CERTYFIKACJA PRODUKTU



- ▶ EI₁₆₀, EI₁₂₀, EI₁₂₀, EI₁₂₀
- ▶ Technical Approval AT-15-9582/2015, Certificate of Conformity CZ-ITB-2415/W.
- ▶ Certificate of constancy of performance 1396-CPR-0097.
- ▶ Dampers qualified under EN 13501-2, EN 13501-3 and tested under EN 1366-2.
- ▶ Transfer shutter dampers.

7.1. application

The mcr WIP/T transfer dampers are intended for installation in automatically operated fire ventilation systems. They are installed in fire walls without connecting ventilation ducts and retain their fire resistance during the fire. During normal operation, damper blades are open, what enables the supply of fresh air to escape routes, protecting them from smoke, or to the space, in which air exchange or supply through vertical construction partitions is required.

It is possible to use a closed transfer damper, in which the shutters open to transfer compensation air upon the receipt of an alarm signal from the fire signalling centre.

The mcr WIP/T-G dampers are used as relief dampers, e.g. in gas extinguishing systems. In that case, they are equipped with drives without thermoelectric triggers. Shutter closing and opening is achieved through dedicated control units.

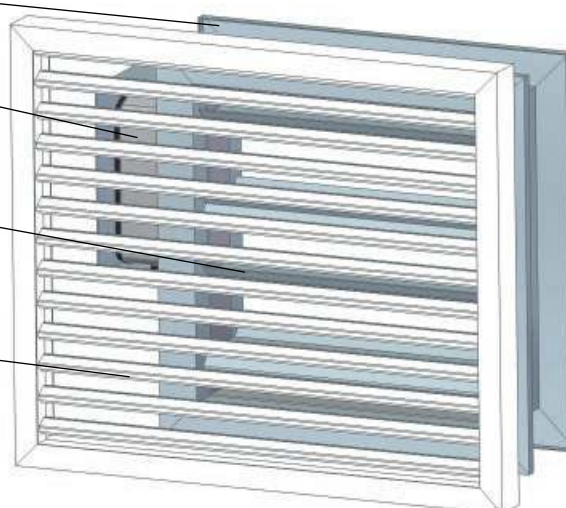
7.2. design

casing

trigger control mechanism
(e.g. actuator with a return spring)

shutters (damper blades)

duct cover



The mcr WIP/T transfer and relief dampers mcr WIP/T-G consist of a casing with a rectangular cross section, a moving multiple damper blades - shutters rotating on their axes and a trigger control mechanism which is tripped remotely or automatically by tripping a thermal trigger (only mcr WIP/T). Damper casings are made of a galvanised or stainless steel sheet. Its integral part is a flange of silicate-cement panels. The inner side of the fire damper casing is equipped with an intumescent gasket. The casing total length is 140 mm.

The shutter surface is covered with galvanised or stainless steel sheet. Each blade has the thickness of 15 mm and is filled with a plaster panel. The damper blades rotate on their axes, which consist of two steel pins. Transfer dampers must be protected with duct covers.

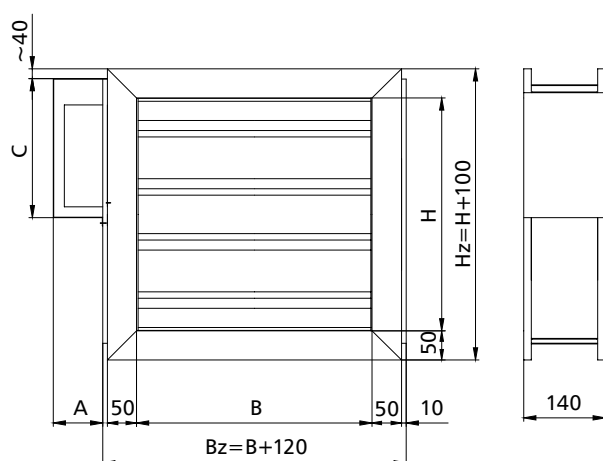
7.3. versions

7.3.1. mcr WIP/T – the transfer fire damper with an axial actuator with a return spring – damper closing and opening with an actuator

During normal operation, the shutters of the fire damper remain open or closed. In case of fire, the shutters shift or remain in standby.

The mcr WIP/T dampers are equipped with a Belimo trigger control mechanisms **BFL**, **BFN**, **BF**, **BF-TL** and **EXBF** axial actuator with a return valve, powered with 24 V AC/DC or 230 V AC, with thermoelectric trigger 72°C (optionally it is possible to use triggers with the nominal tripping temperature of 95°C). BFL, BFN, BF series actuators are equipped with limit switches used to monitor the blades position. Furthermore, the mechanical position indicator is placed on the actuator.

Dampers with Belimo actuators: analogue BFL, BFN, BF, digital BF-TL, EXBF explosion proof actuators close as a result of thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when the power supply voltage is applied to the actuator terminals. Furthermore, dampers with those actuators may be opened manually using a key.



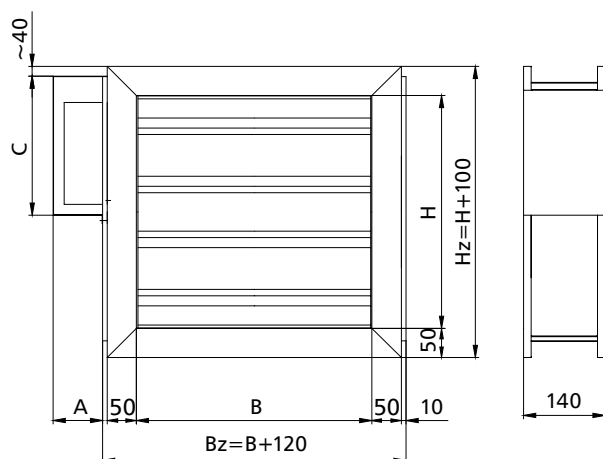
mechanism	A	C
BFN	125	325
BFL	125	275
BF	125	325
BF24TL-ST	125	325
EXBF	175	400
BLE	125	275
BE	125	325

7.3.2. WIP/T-G – the relief fire damper with an actuator with a return spring – damper closing and opening with an actuator

During normal operation, the shutters of the relief damper remain open or closed. In case of fire, the shutters are shifted remotely by dedicated control units.

The mcr WIP/T-G dampers are equipped with a Belimo trigger control mechanisms **BFL**, **BFN**, **BF** series axial actuator with a return spring, powered with 24 V AC/DC or 230 V AC without a thermoelectric trigger. BFL, BFN, BF series actuators are equipped with limit switches used to monitor the blades position. Furthermore, the blades mechanical position indicator is placed on the actuator.

The mcr WIP/T-G relief dampers are designed e.g. to release the extinguishing medium from the space, in which the gas extinguishing system was used. Dampers have no thermal triggers installed. Damper closing and opening is triggered by a suitable control device, according to the fire protection design prepared for the specific building.



mechanism	A	C
BFN	125	325
BFL	125	275
BF	125	325

7.4. dimensions

Rectangular dampers:

- nominal width B: from 120 mm to 1000 mm
- nominal height H: from 160 mm to 1000 mm
- the maximum cross-section surface of one damper up to 1 m²

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (in 1 mm increments, in the given range).

7.5. installation

The mcr WIP/T, mcr WIP/T-G rectangular dampers are EI₆₀-rated and EI₁₂₀-rated according to the Technical Approval in the case of installation in concrete or reinforced concrete partitions with the thickness of at least 110 mm, made of full bricks or concrete blocks with the thickness of at least 110 mm, made of hollow bricks or cellular concrete blocks with the thickness of at least 110 mm.

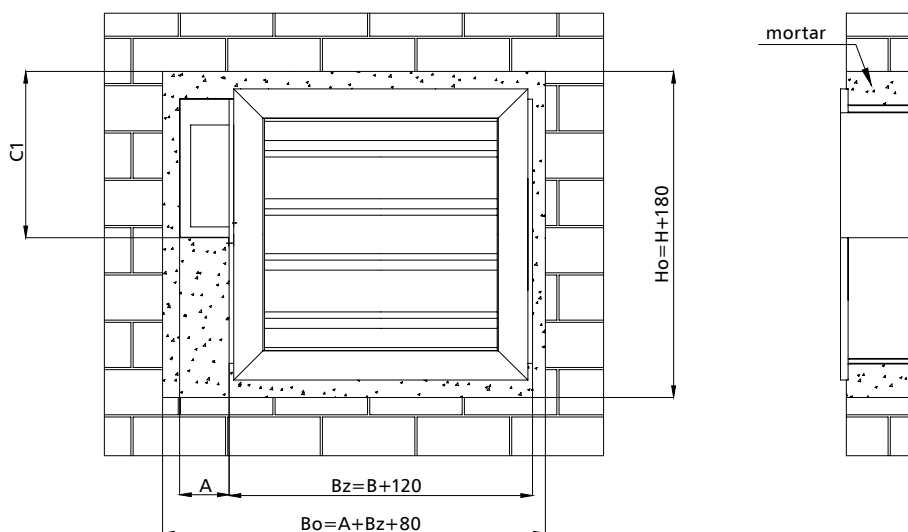
mcr WIP/T rectangular dampers are EI120(ve i↔o) / E120(ve i↔o)-rated in case of installation in concrete or reinforced concrete partitions with the thickness of at least 110 mm, made of full bricks or concrete blocks with the thickness of at least 110 mm, made of hollow bricks or cellular concrete blocks with the thickness of at least 110 mm.

7.5.1. preparation of installation openings

The minimum dimensions of the installation opening that allows correct installation of the mcr WIP/T or mcr WIP/T-G damper is:

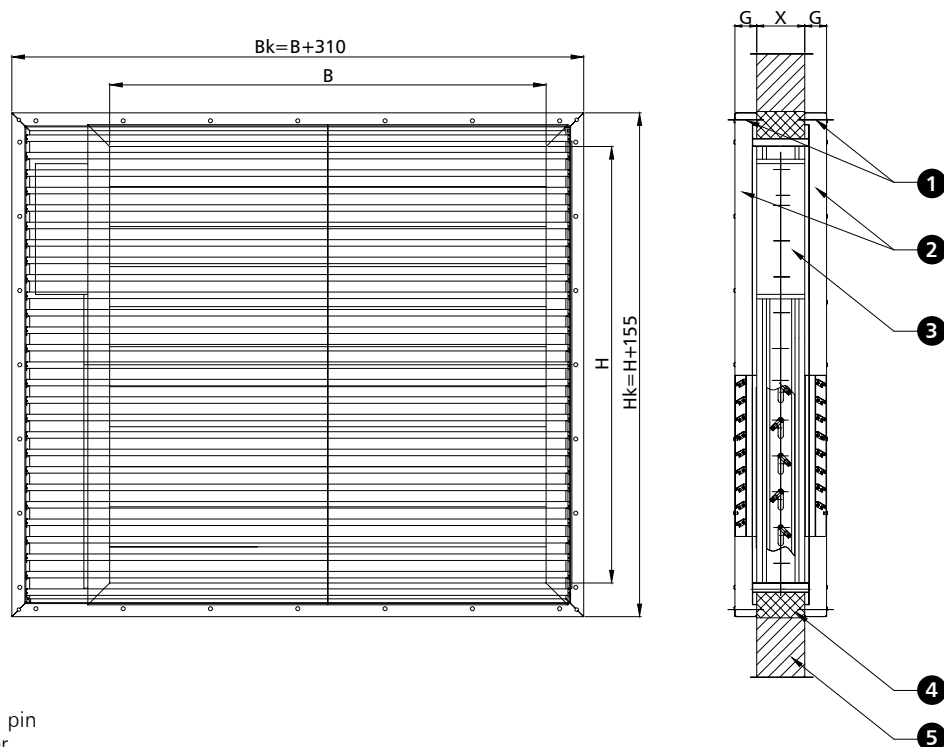
$$B_o = (A + B_z + 80) \text{ mm}$$

$$H_o = (H + 180) \text{ mm}$$



	BF	BFL	BFN	EXBF	BE	BLE
C1 [mm]	385	335	385	460	385	335
A [mm]	125	125	125	175	125	125

7.5.2. sample installation in concrete block or full brick walls

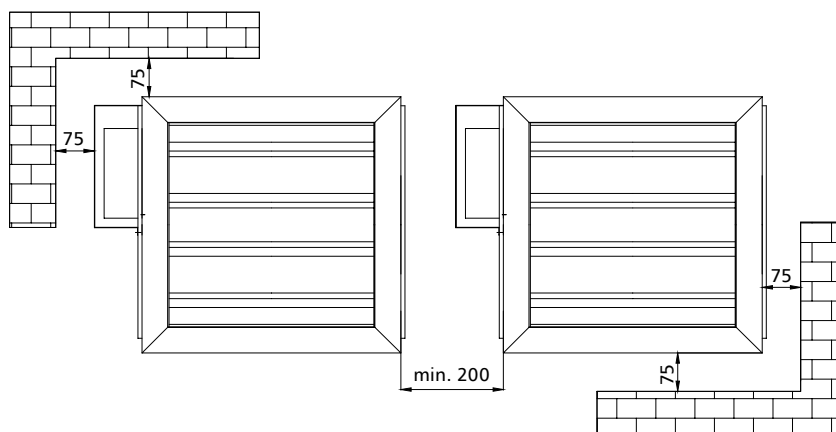


1. mounting pin
2. duct cover
3. fire damper mcr WIP
4. e.g. cement mortar*
5. e.g. masonry wall

*it is possible to use a different sealing which ensures the required fire resistance

The thickness of the duct cover "G" is 50 mm for wall thickness up to 110 mm. For walls thicker than 110 mm manufacturer allows thickness of cover below 50 mm. For walls wider than dampers thickness, 30 mm duct covers can be used. The duct cover can be made of galvanized steel or stainless steel and painted any RAL color (standard RAL 9010).

Distance between systems and partitions

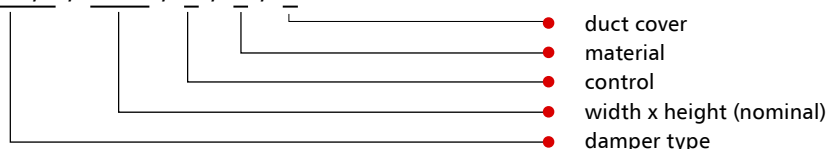


7.7. estimated weights of mcr WIP/T, mcr WIP/T-G dampers [kg]

		width B [mm]									
		200	250	300	400	500	600	700	800	900	1000
height H [mm]	200	10	10	10	10	15	17	18	19	22	25
	250	10	10	11	11	16	18	18	21	24	27
	300	10	11	11	12	17	20	21	23	26	28
	350	11	11	11	16	18	21	23	26	28	30
	400	12	12	14	18	19	21	25	29	30	33
	500	15	16	17	19	20	23	27	32	33	35
	600	17	18	20	21	23	26	30	35	37	39
	700	18	18	21	23	25	28	32	35	38	40
	800	20	21	22	24	29	35	37	41	43	49
	900	22	25	25	28	33	35	39	43	49	52
	1000	23	29	32	33	36	42	43	47	53	60

7.8. marking

mcr WIP/T / B x H / 1 / 2 / 3



1 – control:

- Belimo trigger control mechanism
- BF24-T** – actuator with a return spring, U = 24 V AC/DC
- BF230-T** – actuator with a return spring, U = 230 V AC
- BF24TL-T-ST** (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control
- EXBF24-T** – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC
- EXBF230-T** – explosion proof actuator with a return spring in the Ex version, U = 230 V AC
- BF24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
- BFL24-T** – actuator with a return spring, U = 24 V AC/DC
- BFL230-T** – actuator with a return spring, U = 230 V AC
- BFL24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
- BFN24-T** – actuator with a return spring, U = 24 V AC/DC
- BFN230-T** – actuator with a return spring, U = 230 V AC
- BFN24-T-ST** (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
- BE24** – actuator with no return spring, U = 24 V AC/DC
- BLE24** – actuator with no return spring, U = 24 V AC/DC
- BE230** – actuator with no return spring, U = 230 V AC/DC
- BLE230** – actuator with no return spring, U = 230 V AC/DC

2 – material:

- [no symbol]** – galvanised steel, Zn 275 g/m² coating
- KN** – 1.4404 acid-proof stainless steel

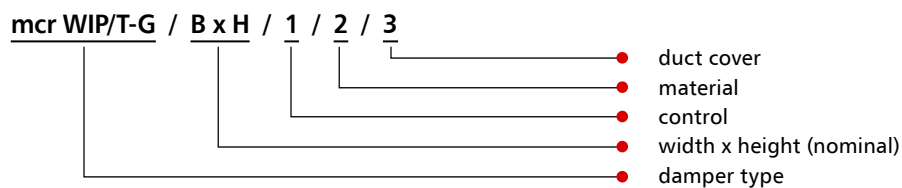
3 – duct cover:

- MSTx1** – single duct cover
- MSTx2** – double duct cover

example marking:

mcr WIP/T 400 x 400 BFL24-T

E120 multi-blade transfer damper with a 24 V compact Belimo actuator with limit switches.



1 – control:

- Belimo trigger control mechanism
- BF24** – actuator with a return spring, U = 24 V AC/DC
- BF230** – actuator with a return spring, U = 230 V AC
- BFL24** – actuator with a return spring, U = 24 V AC/DC
- BFL230** – actuator with a return spring, U = 230 V AC
- BFN24** – actuator with a return spring, U = 24 V AC/DC
- BFN230** – actuator with a return spring, U = 230 V AC

2 – material:

- [no symbol]** – galvanised steel, Zn 275 g/m² coating
- KN** – 1.4404 acid-proof stainless steel

3 – duct cover:

- MSTx1** – single duct cover
- MSTx2** – double duct cover

example marking:

mcr WIP/T-G 400 x 400 BFL24

EI120 multi-blade relief damper with a 24 V compact Belimo actuator with limit switches.

Chapter 12 - power supply and control (p. 141) contains:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper,
- location of trigger control mechanisms in relation to the damper - manufacture standards.

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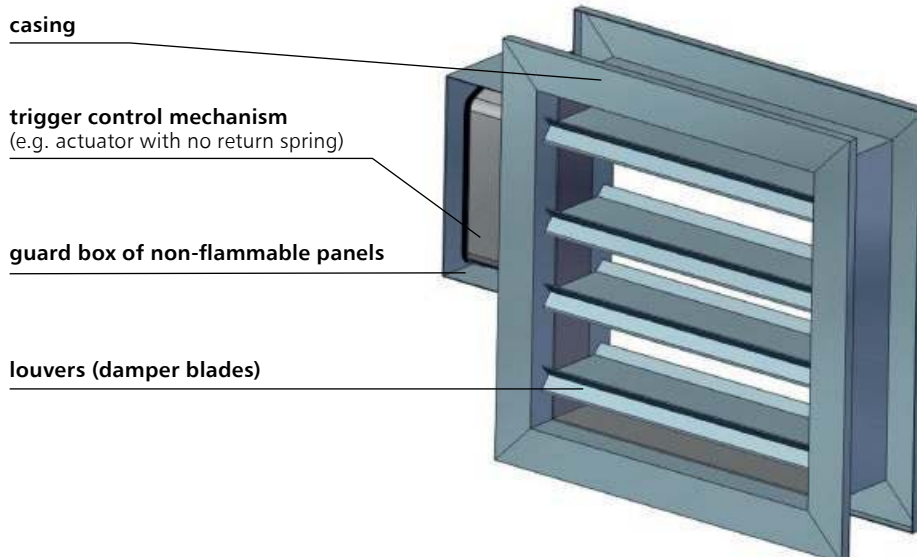


- ▶ **EI120**
- ▶ **Certificate of constancy of performance 1396-CPR-0117.**
- ▶ **Dampers certified for compliance with EN 12101-8.**
- ▶ **Dampers qualified under EN 13501-4 and tested under EN 1366-10.**
- ▶ **Narrow louvered fire dampers for fire ventilation systems.**

8.1. application

Multi-blade mcr WIP/V, mcr WIP/V-M fire dampers are designed for use in automatic fire ventilation systems. mcr WIP/V fire dampers are used in fire ventilation systems, mcr WIP/V-M fire dampers are used in mixed systems, combining both fire and comfort ventilation systems. The devices prevent fire, smoke and fire gases propagation to the adjacent areas. During normal operation, the fire damper is in open or closed position depending on its function. In the fire-covered area, the fire damper is open, whereas it remains closed in the other areas. mcr WIP/V, mcr WIP/V-M fire dampers due to their design are intended for use in systems, where the components such as a silencer, bend or supply/return grille are installed downstream of the fire damper.

8.2. design



mcr WIP/V, mcr WIP/V-M fire dampers consist of a rectangular casing, movable multiple blades rotating around their axis and a remote trigger control mechanism. Damper casing is made of galvanised or stainless steel sheet. Its integral part is a flange of silicate-cement panels. An intumescent seal and the ventilation seals are installed on the inside to ensure air tightness. The damper casing total length is 140 mm.

The louver surface (blades) is covered with galvanised or stainless steel sheet. Each louver with the thickness of 15 mm is filled with a plaster panel. The damper blades revolve on their axes, which consist of two steel pins.

Square and rectangular dampers are made with 50 mm flanges that enable the correct installation of dampers in ventilation ducts. In a circular duct, the damper is made as square with a circular connection.

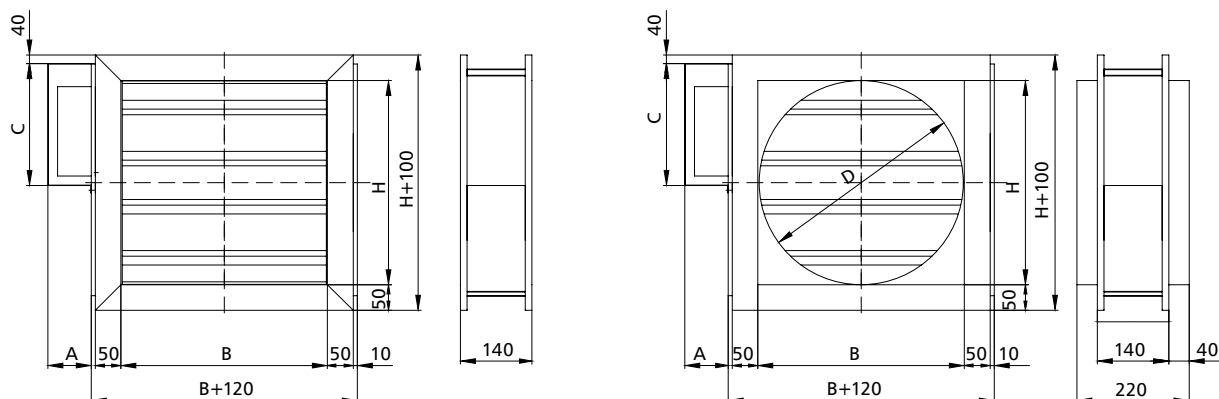
8.3. versions

8.3.1. mcr WIP/V, mcr WIP/V-M – smoke exhaust fire damper for multi-zone fire ventilation systems with an actuator – damper closing and opening with an actuator

During normal operation, the fire dampers are opened or closed. In case of fire, the fire damper louvers are opened in the fire-covered area and closed in the other areas - the fire damper is released remotely by feeding the supply voltage to the trigger control mechanism.

mcr WIP/V, mcr WIP/V-M fire dampers are equipped with a Belimo trigger control mechanisms **BLE**, **BE** axial actuator without the return spring (24 V AC/DC or 230 V AC). BLE, BE series actuators are equipped with limit switches used to monitor the damper blade position. Furthermore, the mechanical position indicator is placed on the actuator.

Fire dampers with Belimo BLE, BE actuators can be opened/closed by supplying voltage to the actuator terminals. Furthermore, dampers with those actuators may be opened/closed manually using a key.



mechanism	A	C
BLE	125	275
BE	125	325

8.4. dimensions

Rectangular dampers:

- nominal width B: from 120 mm to 1000 mm
- nominal height H: from 160 mm to 1000 mm
- the maximum cross-section surface of one damper up to 1 m²

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (in 1 mm increments, in the given range).

Square fire dampers may also be fitted with round connectors for the spigot connection to the round ducts.

8.5. installation

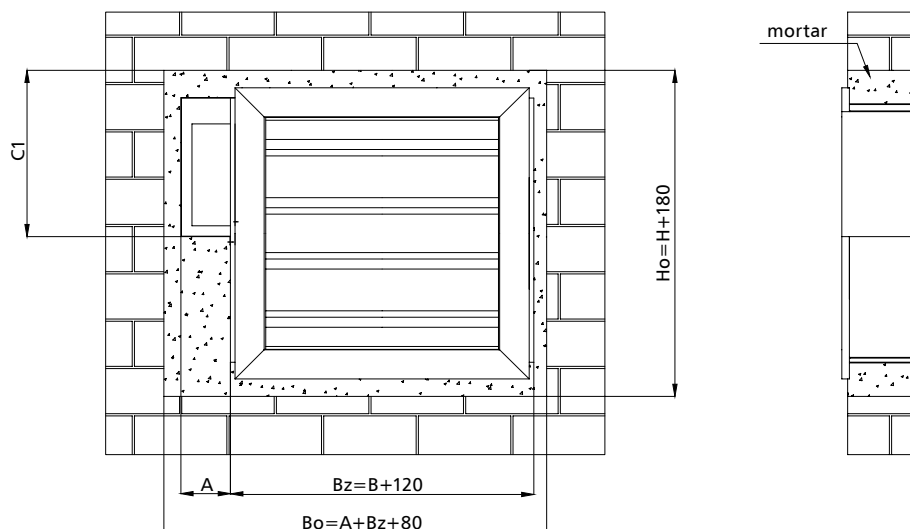
Rectangular mcr WIP/V, mcr WIP/V-M fire dampers are class EI120($V_{ed} \leq 1000$)C₁₀₀₀AA multi devices, if installed in a concrete partition, min. 110 mm thick made of full bricks or cellular concrete blocks, min. thickness 115 mm.

8.5.1. preparation of installation openings

The minimum dimensions of the installation opening that permits correct installation of the mcr WIP/V, mcr WIP/V-M damper are:

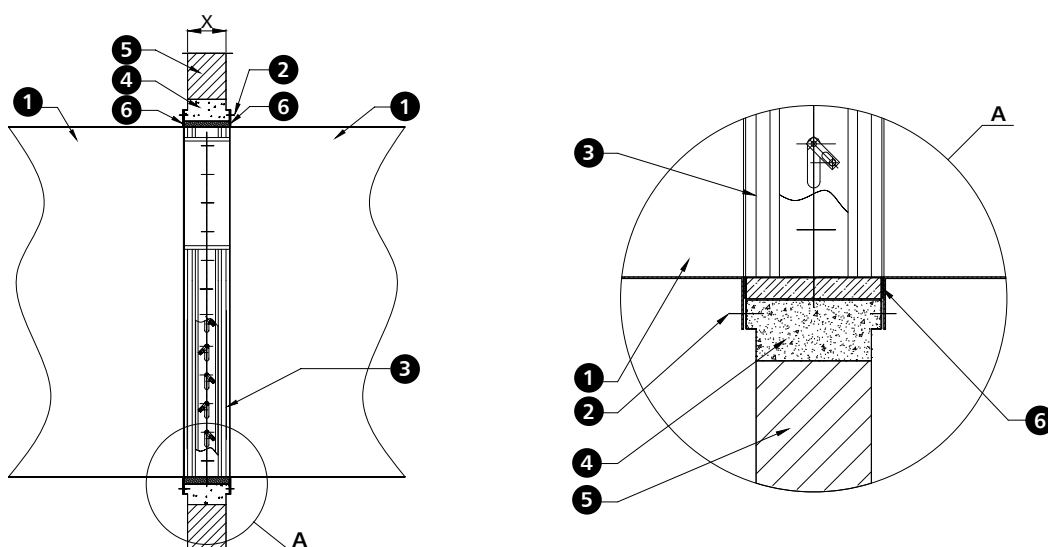
$$B_o = (A + B_z + 80) \text{ mm}$$

$$H_o = (H + 180) \text{ mm}$$



	BE	BLE
C1 [mm]	385	335
A [mm]	125	125

8.5.2. sample installation in concrete or masonry walls

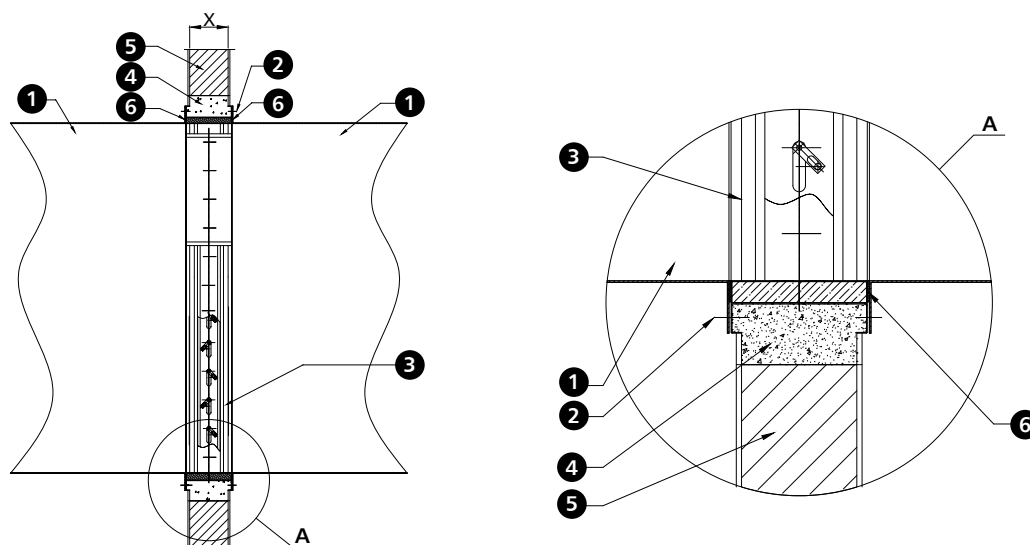


- 1. smoke ventilation duct
- 2. ST4.2x16 screw
- 3. fire damper mcr WIP
- 4. sealing - e.g. masonry cement mortar*
- 5. masonry wall
- 6. heat resistant gasket

X. wall thickness

*it is possible to use a different sealing which ensures the required fire resistance

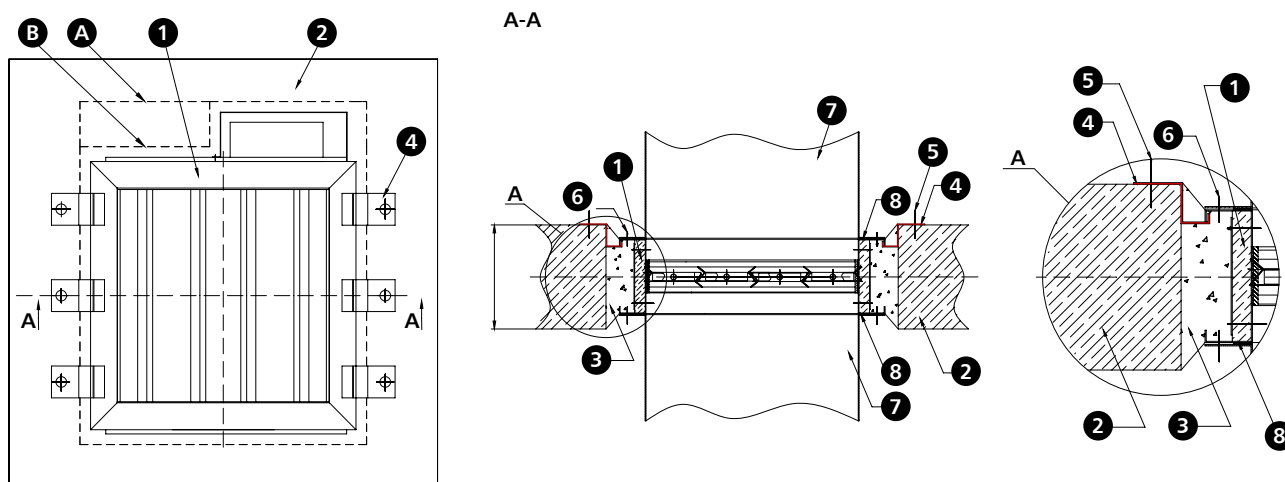
8.5.3. sample installation in concrete block or full brick walls



- 1. smoke ventilation duct
- 2. ST4.2x16 screw
- 3. fire damper mcr WIP
- 4. sealing - cement masonry mortar*
- 5. wall of concrete blocks or full bricks
- 6. heat resistant gasket
- X. wall thickness

*it is possible to use a different sealing which ensures the required fire resistance

8.5.4. sample installation in ceiling

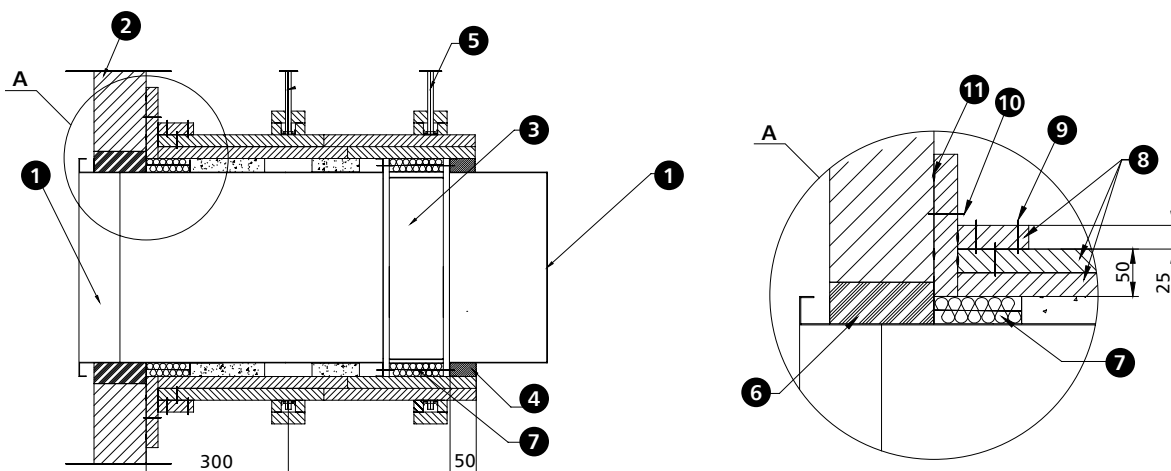


- 1. fire damper mcr WIP
- 2. ceiling
- 3. e.g. cement mortar*
- 4. mounting bracket
- 5. steel expansion anchor with M6 metal screw
- 6. ST4.2x16 screw

- 7. ventilation duct
- 8. heat resistant gasket
- A./B. construction opening

*it is possible to use a different sealing which ensures the required fire resistance

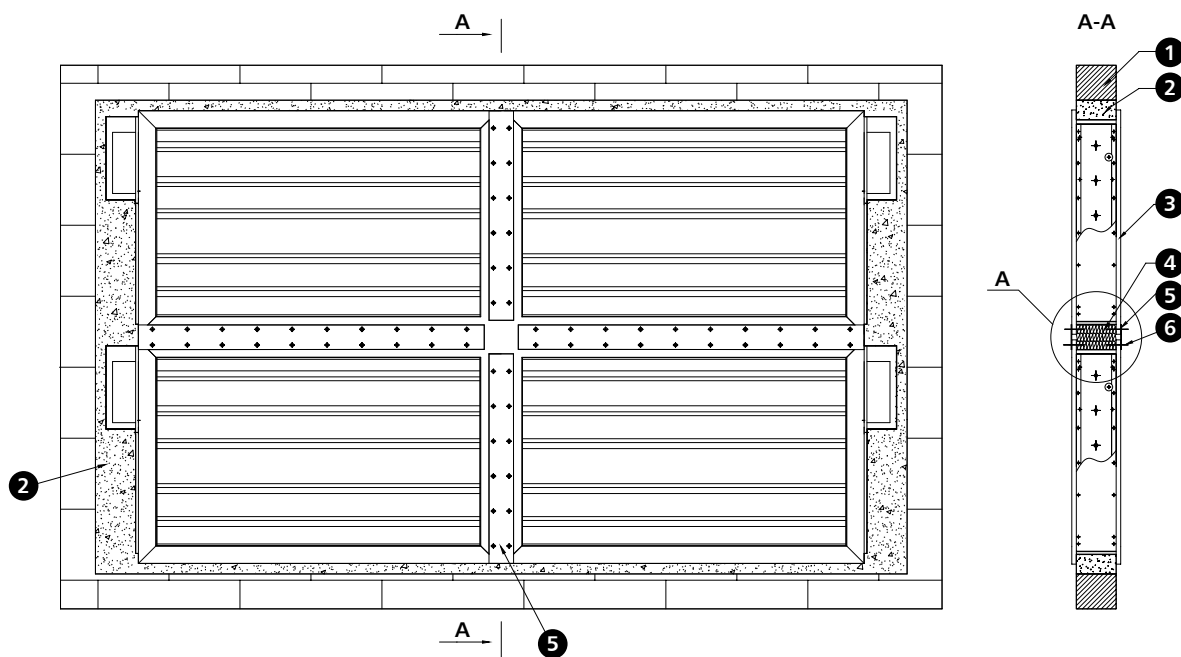
8.5.5. sample installation outside the fire partition



- | | | |
|------------------------|--|--|
| 1. ventilation duct | 5. duct suspension | 9. screws 3.5 x 50 spacing: ~150 mm |
| 2. partition | 6. sealing (cement or cement-lime masonry mortar)* | 10. steel expansion anchor Ø8 x 80 mm |
| 3. fire damper mcr WIP | 7. mineral wool with the density of at least 80 kg/m ³ , A1 class | 11. board joints sealed with Conlit Glue |
| 4. gypsum filling | 8. Ridurit fire retardant board | |

*it is possible to use a different sealing which ensures the required fire resistance

8.5.6. sample installation in a multiple set (a battery of four dampers)



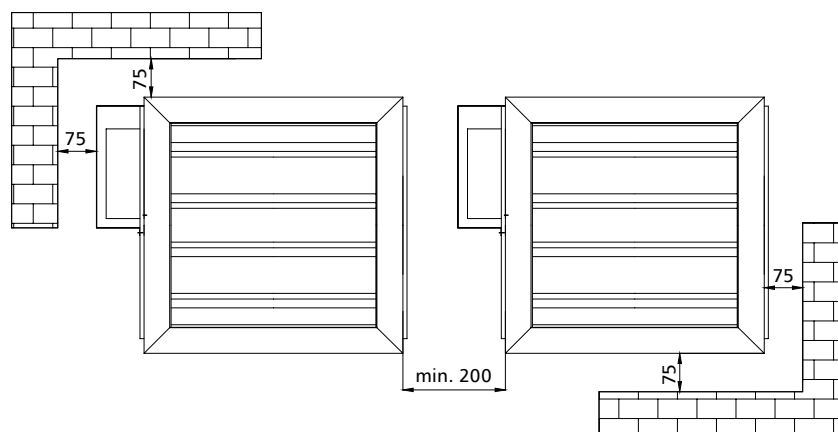
- | |
|--|
| 1. e.g. masonry wall |
| 2. e.g. cement mortar* |
| 3. fire damper mcr WIP |
| 4. mineral wool with the density of at least 80 kg/m ³ , A1 class |
| 5. installation flat bar with the width of 70 mm |
| 6. ST8x16 screw |

*it is possible to use a different sealing which ensures the required fire resistance

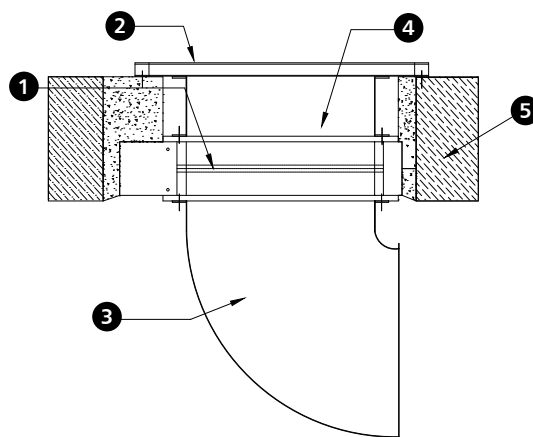
Fire damper installation with vertical rotation axis of the louvers

The fire damper can operate with a vertical axis of louver rotation with the top or bottom-mounted mechanism.

Distance between systems and partitions



Example applications - installation with masking cover



1. fire damper mcr WIP
2. masking cover
3. ventilation duct
4. duct - ventilation straight connection pipe
5. wall, ceiling

If a mcr WIP/V, mcr WIP/V-M damper is used, thanks to the louvers (no single-plane partition) it is possible to use the space in front of and behind the damper for such system elements as a duct cover or a rectangular silencer or to route a duct along the wall using a duct bend or reduction.

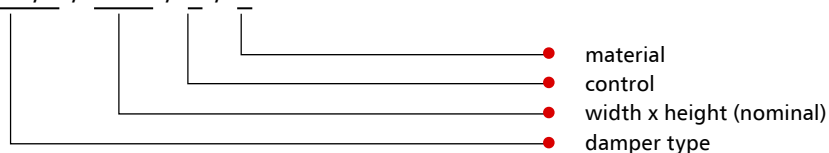
8.7. estimated weights of mcr WIP/V, mcr WIP/V-M dampers [kg]

		width B [mm]									
		200	250	300	400	500	600	700	800	900	1000
height H [mm]	200	10	10	10	10	15	17	18	19	22	25
	250	10	10	11	11	16	18	18	21	24	27
	300	10	11	11	12	17	20	21	23	26	28
	350	11	11	11	16	18	21	23	26	28	30
	400	12	12	14	18	19	21	25	29	30	33
	500	15	16	17	19	20	23	27	32	33	35
	600	17	18	20	21	23	26	30	35	37	39
	700	18	18	21	23	25	28	32	35	38	40
	800	20	21	22	24	29	35	37	41	43	49
	900	22	25	25	28	33	35	39	43	49	52
	1000	23	29	32	33	36	42	43	47	53	60

The table shows the weights of dampers with trigger control mechanisms or actuators.

8.8. marking

mcr WIP/V / B x H / 1 / 2



1 – control:

- Belimo trigger control mechanism
- BE24** – actuator with no return spring, U = 24 V AC/DC
- BE24-ST** (with the BKNE230-24 option) – actuator with no return spring, U = 24 V AC/DC, with a SBS Control system
- BE230** – actuator with no return spring, U = 230 V AC/DC
- BLE24** – actuator with no return spring, U = 24 V AC/DC
- BLE24-ST** (with the BKNE230-24 option) – actuator with no return spring, U = 24 V AC/DC, with a SBS Control system
- BLE230** – actuator with no return spring, U = 230 V AC/DC

2 – material:

- [no symbol]** – galvanised steel, Zn 275 g/m² coating
- KN** – 1.4404 acid-proof stainless steel

example marking:

mcr WIP/V 400 x 400 BLE24

Louvered fire damper with a compact 24 V Belimo actuator with limit switches.

Chapter 12 - power supply and control (p. 141) contains:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper,
- location of trigger control mechanisms in relation to the damper - manufacture standards.

**PRODUCT CONFIGURATOR
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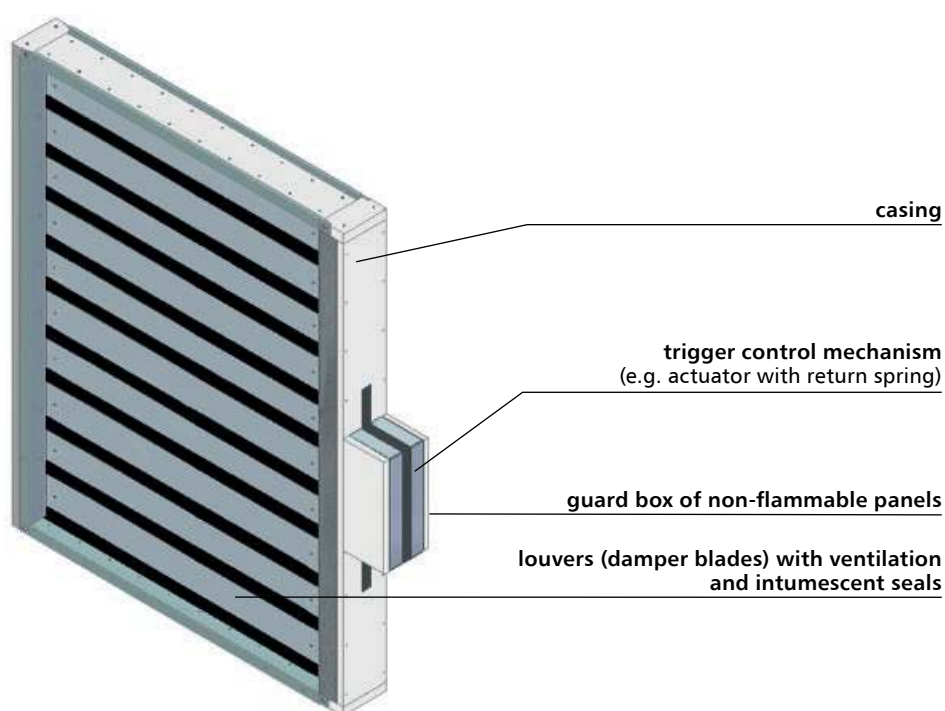
- ▶ **EI120S, EI90S, ES120**
- ▶ Certificate of constancy of performance 2434-CPR-0003.
- ▶ Dampers certified for compliance with EN 15650.
- ▶ Dampers qualified under EN 13501-3 and tested under EN 1366-2.
- ▶ Narrow louvered fire dampers.

9.1. application

The mcr WIP PRO/S multi-blade cut-off dampers are designed for use in general ventilation systems, where those systems pass through construction partitions. mcr WIP PRO/S dampers are particularly useful for systems with a silencer, elbow or supply and extract grill.

During a fire, they preserve the fire resistance of the construction partition where ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and burning fumes to the remaining part of the building which is not on fire. During normal operation, the fire damper louvers are open. In case of fire, the fire damper louvers are closed.

9.2. design



Multi-blade mcr WIP PRO/S damper consists of a rectangular casing made of two steel sections joined with a non-combustible plate using rivets and galvanized steel fasteners, a set of movable blades rotating around their axis and a trigger control mechanism. The fire damper casing is made of fire resistant panels and galvanized steel „C” shape profiles. The device is reinforced on both sides with steel corners. Intumescent and ventilation seals are installed on the inside. Each fire damper blade is made of two 20 mm thick fire resistant plates. Intumescent seal and ventilation seals fixed with staples are installed at the entire blade length. The blades rotate around the axis made by two steel pins. Each pin is mounted in a brass sleeve mounted on a vertical side H of the fire damper casing.

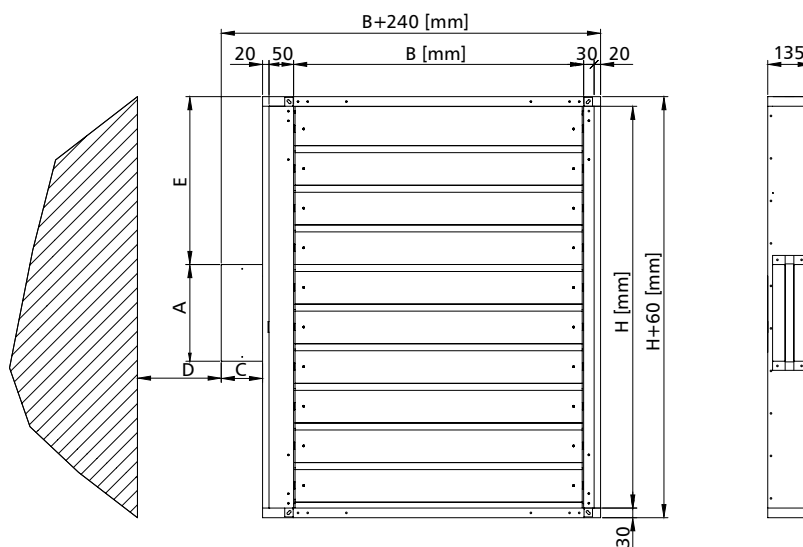
9.3. versions

9.3.1. mcr WIP PRO/S S – the cut-off fire damper for ventilation ducts with an actuator with a return spring – damper closing and opening with an actuator

During normal operation, the cut-off shutters of the fire damper remain open. In case of fire, the louvers close automatically or remotely by cutting off the power supply.

The mcr WIP PRO/S dampers feature a Belimo trigger control mechanisms **BFL, BFN, BF, BF-TL** axial actuator with a return spring, powered with 24 V AC/DC or 230 V AC, with thermoelectric trigger 72°C (optionally it is possible to use triggers with the nominal tripping temperature of 95°C). BFL, BFN, BF series actuators are equipped with limit switches used to monitor the blades position. Furthermore, the mechanical position indicator is placed on the actuator.

Fire dampers with analogue BFL, BFN, BF or digital BF-TL Belimo actuators are closed by the thermoelectric trigger or power cut-off as a result of the actuator return spring action. The dampers open when the power supply voltage is applied to the actuator terminals. Furthermore, dampers with those actuators may be opened manually using a key.



mechanism	A	C	D	E
BF, BFL, BFN	298	120	75	formula*

* shown in below table

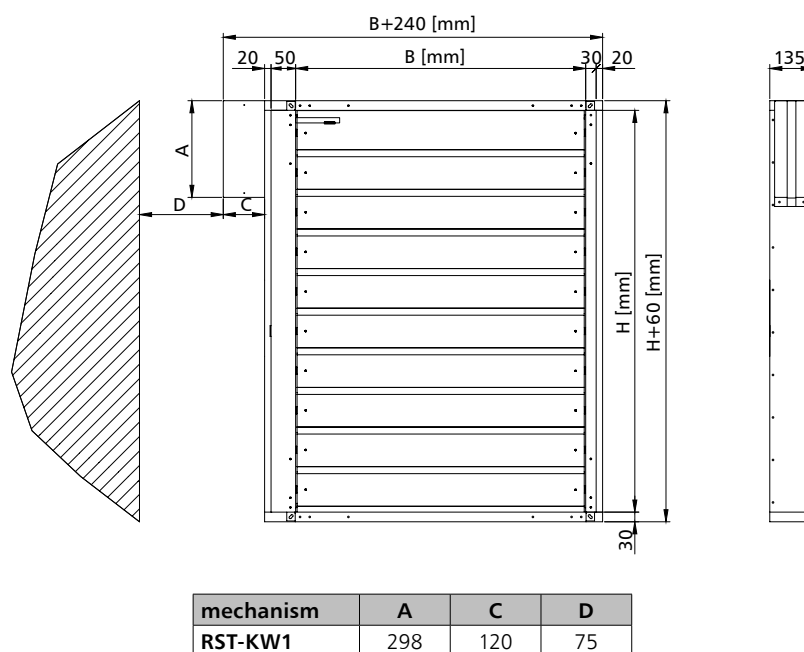
for the even number of blades	for the odd number of blades
$E [mm] = (H/2 - 123) + 30$	$E [mm] = (H/2 - 61.5) + 30$

Number of blades = $H/123$.

9.3.2. mcr WIP PRO/S – the cut-off fire damper for ventilation ducts with a spring drive and an integrated thermal trigger, optionally equipped with an electromagnetic trigger and limit switches

During normal operation, the cut-off shutters of the fire damper remain open. In case of fire, the shutters close automatically or, in case of a damper with an electromagnetic trigger, additionally using the fire automation.

The mcr WIP PRO/S dampers are equipped with a **RST-KW1** trigger control mechanism with a drive spring and a cam-lever system. A thermal trigger 74°C (optionally at 95°C or 120°C) is integrated into the damper mechanism. After the nominal temperature is exceeded, the thermal trigger is tripped and the louvers close. On the RST-KW1 mechanism, there is a mechanical indicator of blades position. It is possible to equip a trigger control mechanism with an electromagnetic trigger activated by the application („pulse”) or removal („break”) of the power supply voltage and with limit switches used to signal the blades position state. The mechanism features test and blades button-release functions. Blades re-opening is activated manually.



9.4. dimensions - rectangular dampers

Installation in walls:

- nominal width B: from 110 mm to 900 mm
- nominal height H: from 263 mm to 1250 mm
- the maximum cross-section surface of one damper up to 1.125 m²

Installation in ceilings:

- nominal width B: from 110 mm to 1000 mm
- nominal height H: from 263 mm to 1000 mm
- the maximum cross-section surface of one damper up to 1 m²

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (in 1 mm increments, in the given range).

Square fire dampers may also be fitted with round connectors for the spigot connection to the round ducts.

9.5. installation

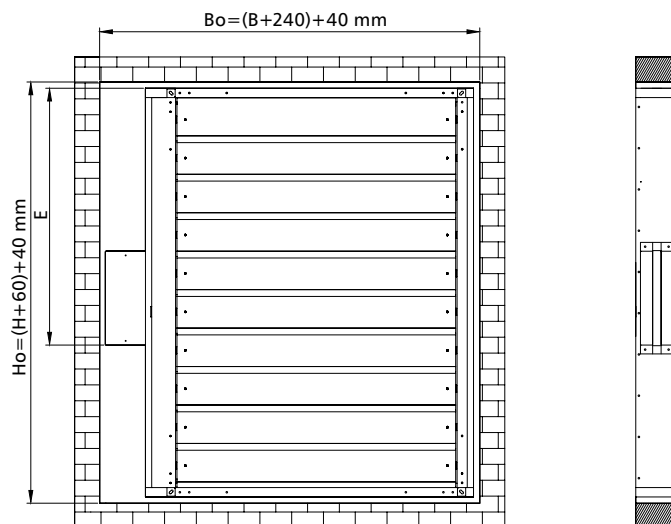
Rectangular mcr WIP PRO/S fire dampers are class EI120($v_e \leftrightarrow o$)S-rated devices, when installed in a concrete partition, min. 110 mm thick, made of common bricks or aerated concrete blocks, min. thickness 115 mm or stud partitions with min. EI120 fire rating and class EI90($h_o \leftrightarrow o$)S / EI20($h_o \leftrightarrow o$)S-rated devices, when installed in floor slabs, min. 150 mm thick.

9.5.1. preparation of installation openings

The minimum dimensions of the installation opening that permits correct installation of the mcr WIP PRO/S damper is:

$$B_o = (B + 240) + 40 \text{ mm}$$

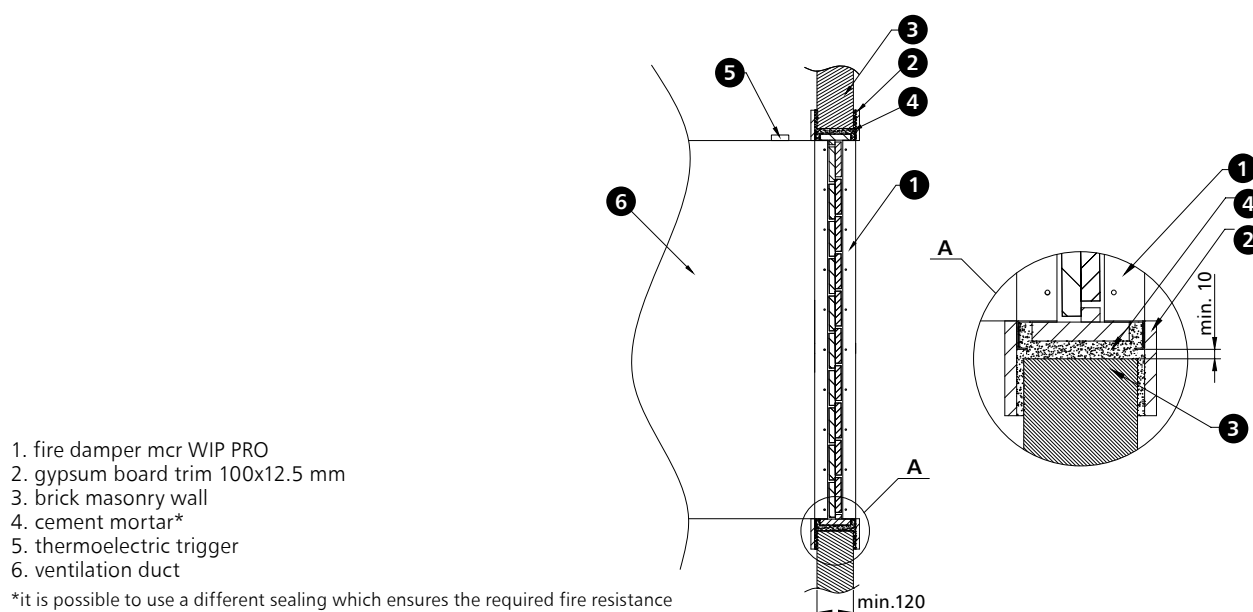
$$H_o = (H + 60) + 40 \text{ mm}$$

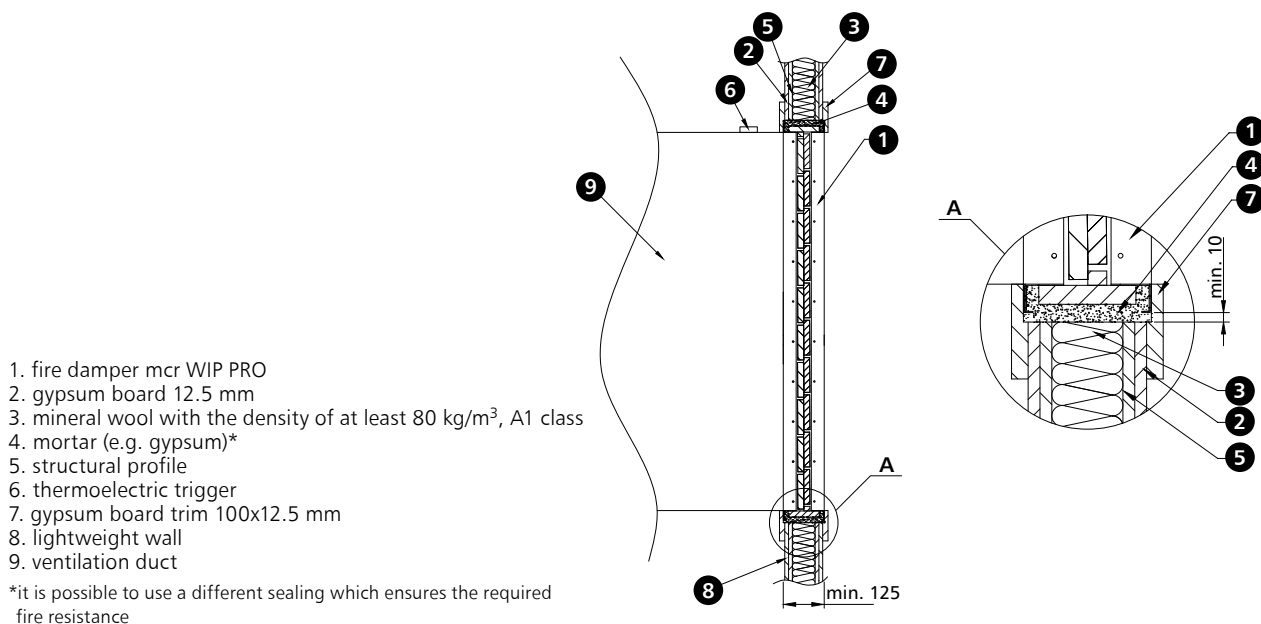
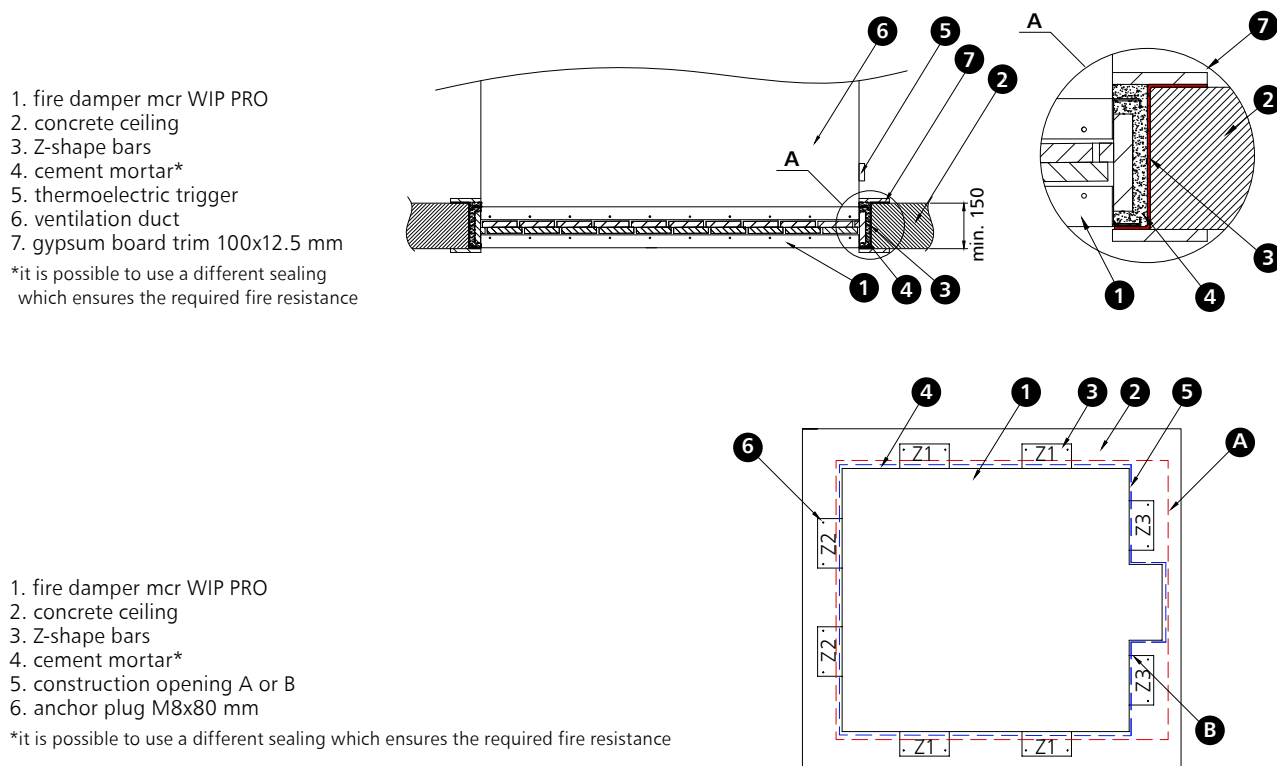


Dimension E (distance from the top fire damper edge to the edge of the trigger control mechanism box) - depending on the dimension H and the trigger control mechanism used:

mechanism	for the even number of blades	for the odd number of blades
BF, BFL, BFN	$E [\text{mm}] = (H/2 - 123) + 30$	$E [\text{mm}] = (H/2 - 61.5) + 30$
RST-KW1	$E [\text{mm}] = 0$	$E [\text{mm}] = 0$

9.5.2. sample installation in concrete block or full brick walls

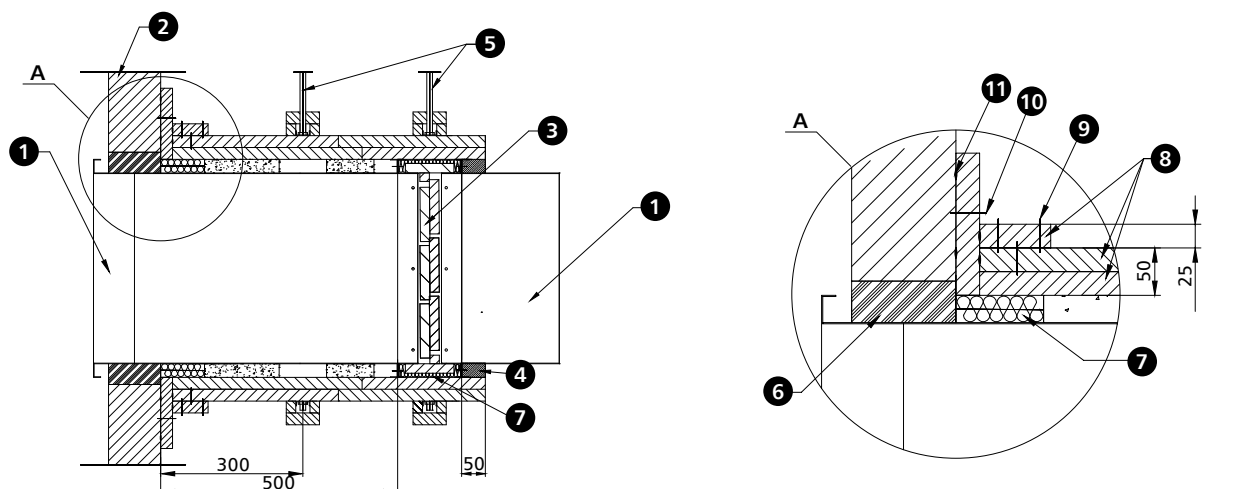


9.5.3. sample installation in lightweight walls

9.5.4. sample installation in ceilings


For mcr WIP PRO/S damper installation in the floor slab, use Z1/Z2/Z3 fasteners compatible with the fire damper and construction opening „5" width as per the guidelines in the operation and maintenance manual. Z1, Z2, Z3 fasteners are not included with the fire damper.

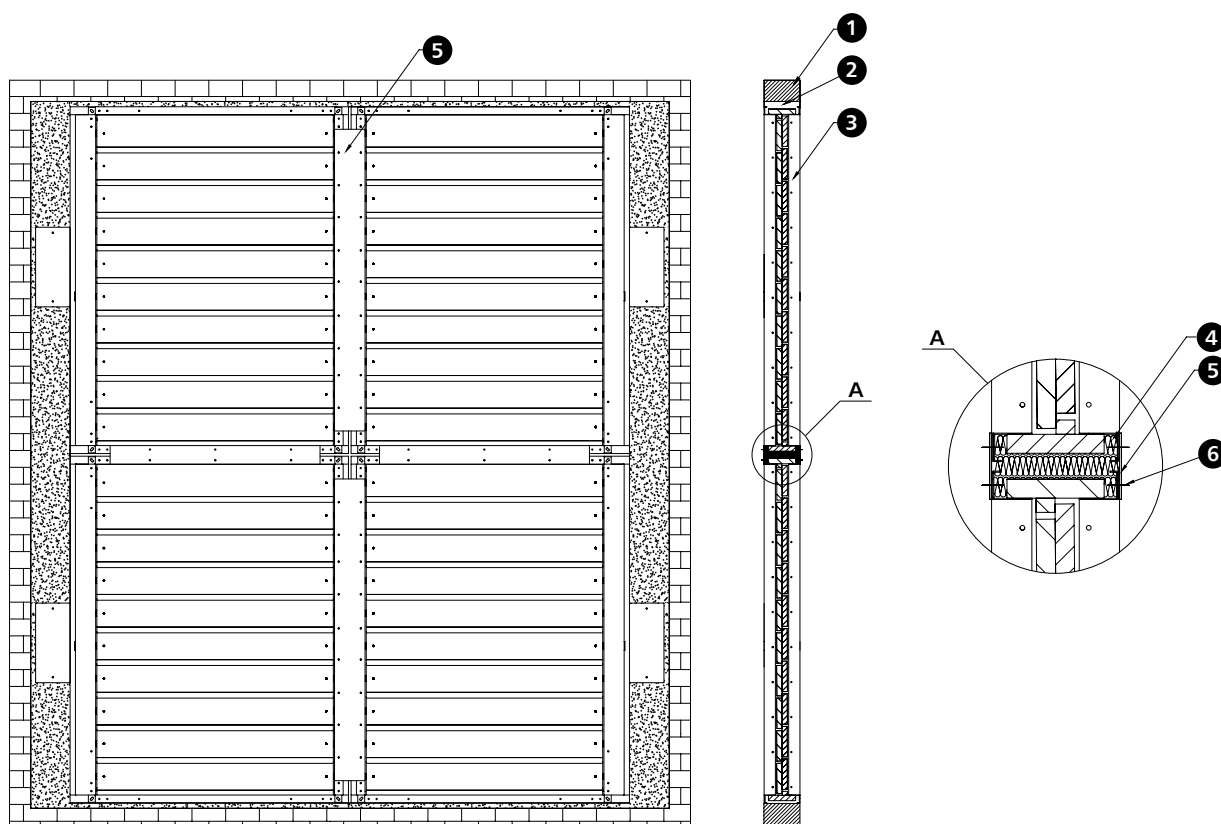
For construction openings with a cut-out for the trigger control mechanism box **B**, use standard Z3 fasteners.

For construction openings in form of a regular rectangular **A**, extend the Z3 fasteners by 120 mm.

9.5.5. sample installation outside the fire partition


- | | | |
|----------------------------|--|--|
| 1. ventilation duct | 5. duct suspension | 9. screws 3.5 x 50 spacing: ~150 mm |
| 2. partition | 6. sealing (cement or cement-lime masonry mortar)* | 10. steel expansion anchor Ø8 x 80 mm |
| 3. fire damper mcr WIP PRO | 7. mineral wool with the density of at least 80 kg/m ³ , A1 class | 11. board joints sealed with Conlit Glue |
| 4. gypsum filling | 8. Ridurit fire retardant board | |

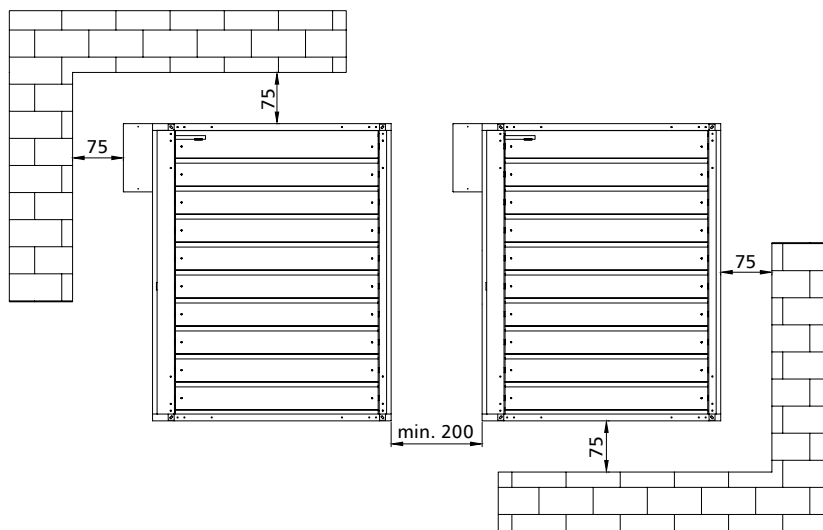
*it is possible to use a different sealing which ensures the required fire resistance

9.5.6. sample installation in a multiple set (a battery of four dampers)


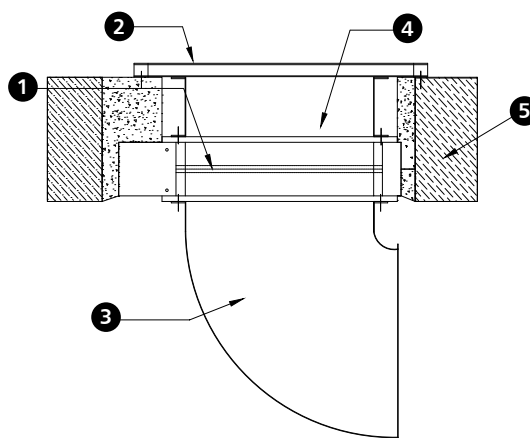
- | | |
|--|---|
| 1. e.g. masonry wall | 5. steel flat bar, dimensions: |
| 2. e.g. cement mortar* | - vertical H: width 110 mm, thickness 2 mm |
| 3. fire damper mcr WIP PRO | - horizontal B: width 70 mm, thickness 2 mm |
| 4. mineral wool with the density of at least 80 kg/m ³ , A1 class | 6. ST8x16 screw |

*it is possible to use a different sealing which ensures the required fire resistance

Distance between systems and partitions



Example applications - installation with masking cover



1. fire damper mcr WIP
2. masking cover
3. ventilation duct
4. duct - ventilation straight connection pipe
5. wall, ceiling

If a mcr WIP/V, mcr WIP/V-M damper is used, with the louvers (no single-plane partition) it is possible to use the space in front of and behind the damper for such system elements as a masking cover or a rectangular silencer or to route a duct along the wall using a duct bend or reduction.

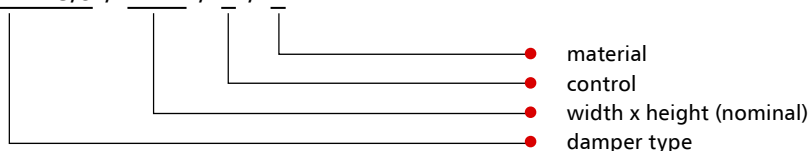
9.7. estimated weights of mcr WIP PRO/S dampers for rectangular ventilation ducts [kg]

		height H [mm]										
		263	300	400	500	600	700	800	900	1000	1100	1250
width B [mm]	110	3	3	4	5	7	8	9	10	11	13	14
	150	4	4	6	8	9	11	12	14	16	17	20
	200	5	6	8	10	12	15	17	19	21	23	27
	250	7	8	12	13	16	18	21	24	27	29	33
	300	8	9	12	16	19	22	25	29	32	35	40
	350	9	11	15	18	22	26	30	34	37	41	47
	400	11	12	17	21	25	30	34	38	43	47	54
	500	14	16	21	27	32	37	43	48	54	59	67
	600	16	19	25	32	38	45	51	58	64	71	81
	700	19	22	30	37	45	52	60	68	75	83	94
	800	22	25	34	43	51	60	69	77	86	95	108
	900	25	29	38	48	58	68	77	87	97	106	128

The table shows the weights of dampers with RST-KW1 type trigger control mechanisms or actuators.

9.8. marking

mcr WIP PRO/S / B x H / 1 / 2



1 – control:

- RST-KW1 trigger control mechanism

RST-KW1/S – thermal trigger

RST-KW1/S/WK2 – thermal trigger + limit switch (open/closed blade signal)

RST-KW1/24I – thermal trigger + „pulse“ electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)

RST-KW1/24P – thermal trigger + „break“ electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)

RST-KW1/230I – thermal trigger + „pulse“ electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)

RST-KW1/230P – thermal trigger + „break“ electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)

- Belimo trigger control mechanism

BF24TL-T-ST (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control

EXBF24-T – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC

EXBF230-T – explosion proof actuator with a return spring in the Ex version, U = 230 V AC

BFL24-T – actuator with a return spring, U = 24 V AC/DC

BFL230-T – actuator with a return spring, U = 230 V AC

BFL24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system

BFN24-T – actuator with a return spring, U = 24 V AC/DC

BFN230-T – actuator with a return spring, U = 230 V AC

BFN24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system

2 – material:

[no symbol] – galvanised steel, Zn 275 g/m² coating

KN – 1.4404 acid-proof stainless steel

example marking:

mcr WIP PRO/S 400 x 400 BFL24-T

Louvered fire damper EIS120 with a compact 24 V Belimo actuator with limit switches.

Chapter 12 - power supply and control (p. 141) contains:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper,
- location of trigger control mechanisms in relation to the damper - manufacture standards.

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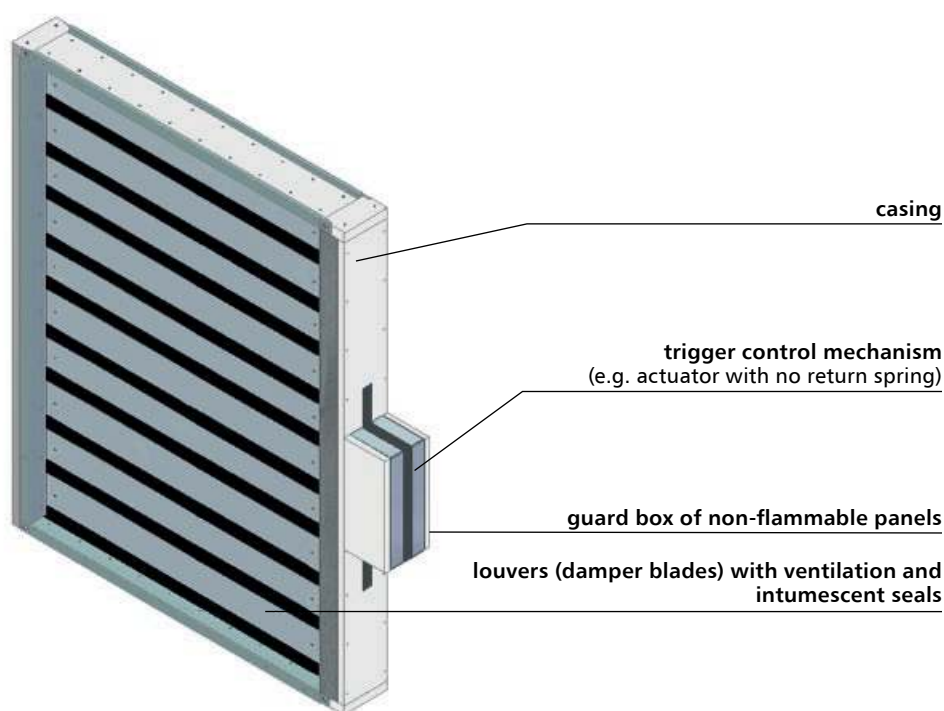


- ▶ **EIS120, EIS90, ES120**
- ▶ **Certificate of constancy of performance 1396-CPR-0115.**
- ▶ **Dampers certified for compliance with EN 12101-8.**
- ▶ **Dampers qualified under EN 13501-4 and tested under EN 1366-10.**
- ▶ **Narrow louvered fire dampers for fire ventilation systems.**

10.1. application

Multi-blade mcr WIP PRO/V, mcr WIP PRO/V-M fire dampers for use in automatic fire ventilation systems. mcr WIP PRO/V fire dampers are used in fire ventilation systems, mcr WIP PRO/V-M fire dampers are used in mixed systems, combining both fire and comfort ventilation systems. The devices prevent fire, smoke and fire gases propagation to the adjacent areas. During normal operation, the fire damper is in open or closed position depending on its function. In the fire-covered area, the fire damper is open, whereas it remains closed in the other areas. mcr WIP PRO/V, mcr WIP PRO/V-M fire dampers due to their design are intended for use in systems, where the components such as a silencer, bend or supply/return grille are installed downstream of the fire damper.

10.2. design



Multi-blade mcr WIP PRO/V, mcr WIP PRO/V-M dampers consist of a rectangular casing made of two steel sections joined with a non-combustible plate using rivets and galvanized steel fasteners, a set of movable blades rotating around their axis and a trigger control mechanism. The fire damper casing is made of fire resistant panels and galvanized steel „C” shape profiles. The device is reinforced on both sides with steel corners. Intumescent and ventilation seals are installed on the inside. Each fire damper blade is made of two 20 mm thick fire resistant plates. Intumescent seal and ventilation seals fixed with staples are installed at the entire blade length. The blades rotate around the axis made by two steel pins. Each pin is mounted in a brass sleeve mounted on a vertical side H of the fire damper casing.

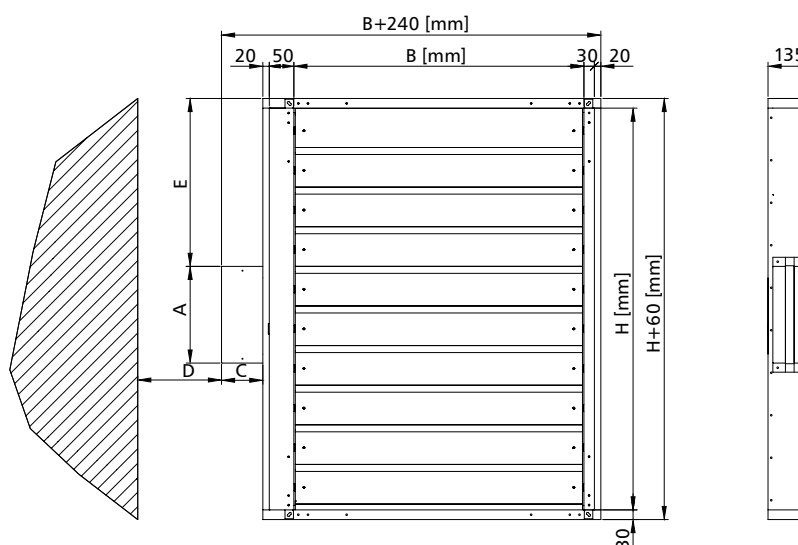
10.3. versions

10.3.1. mcr WIP PRO/V, mcr WIP PRO/V-M fire damper for multi-zone fire ventilation systems with actuator - damper opened/closed with an actuator.

During normal operation, the louvers are open or closed. In case of fire, the fire damper louvers are opened in the fire-covered area and closed in the other areas - the fire damper is released remotely by feeding the supply voltage to the trigger control mechanism.

mcr WIP PRO/V, mcr WIP PRO/V-M fire dampers feature a Belimo trigger control mechanisms **BLE, BE** axial actuator without the return spring (24 V AC/DC or 230 V AC). BLE, BE series actuators are equipped with limit switches used to monitor the blade position. Furthermore, the mechanical blade position indicator is placed on the actuator.

mcr WIP PRO/V, mcr WIP PRO/V-M fire dampers with Belimo BLE, BE actuators are opened or closed by supplying voltage to the actuator terminals. Furthermore, dampers with those actuators may be opened/closed manually using a key.



mechanism	A	C	D	E
BF, BFL, BFN	298	120	75	formula*

* shown in below table

for the even number of blades	for the odd number of blades
$E \text{ [mm]} = (H/2 - 123) + 30$	$E \text{ [mm]} = (H/2 - 61.5) + 30$

Number of blades = $H/123$.

10.4. dimensions

Rectangular dampers:

- nominal width B: from 110 mm to 900 mm
- nominal height H: from 263 mm to 1250 mm
- the maximum cross-section surface of one damper up to 1.125 m²

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (in 1 mm increments, in the given range).

Square fire dampers may also be fitted with round connectors for the spigot connection to the round ducts.

10.5. installation

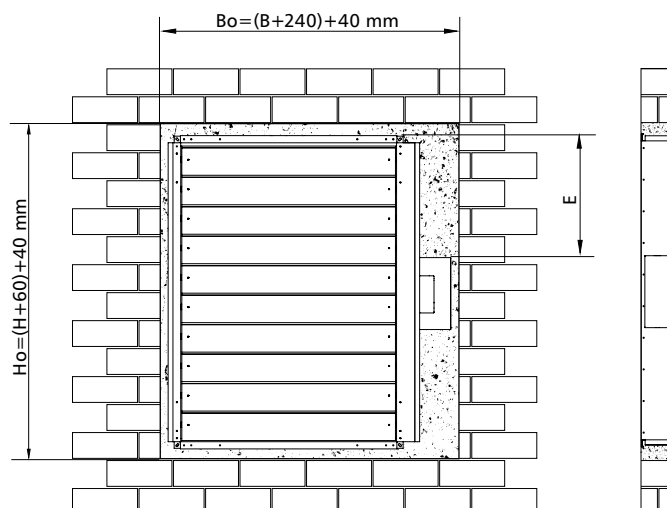
Rectangular mcr WIP PRO/V, mcr WIP PRO/V-M fire dampers are class EI120($v_{e,i} \leftrightarrow o$)S-rated devices, if installed in concrete partitions, min. 110 mm thick, made of common bricks or aerated concrete blocks, min. thickness 115 mm or stud partitions with min. EI120 fire rating.

10.5.1. preparation of installation openings

The minimum dimensions of the installation opening that permits correct installation of the mcr WIP PRO/V, mcr WIP PRO/V-M damper is:

$$B_o = (B + 240) + 40 \text{ mm}$$

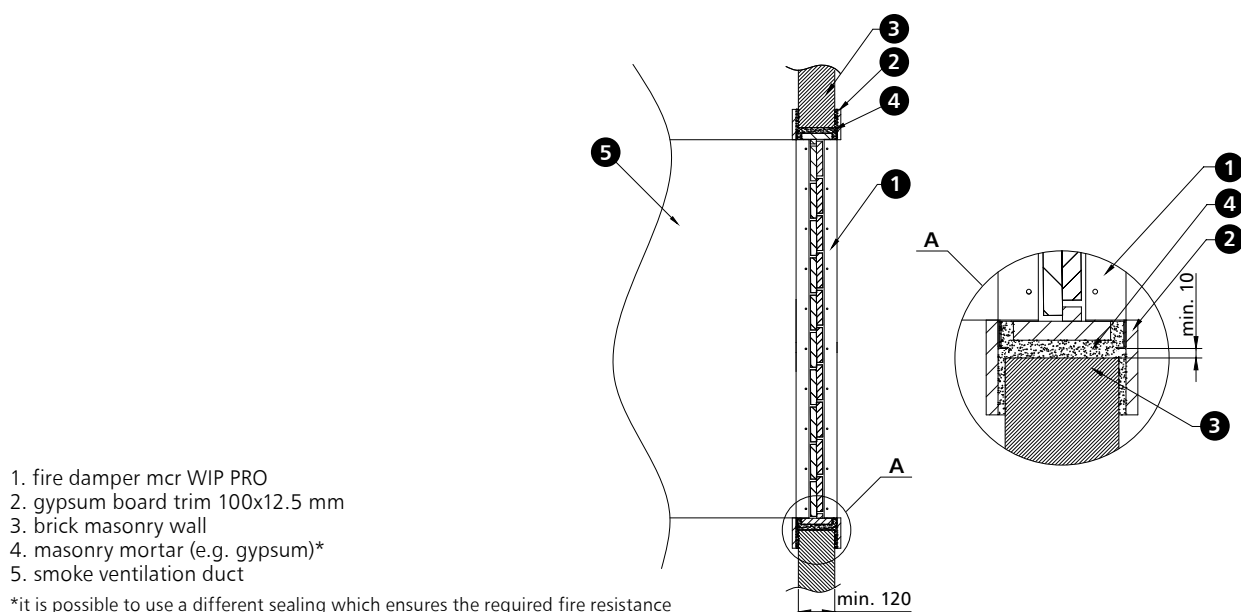
$$H_o = (H + 60) + 40 \text{ mm}$$



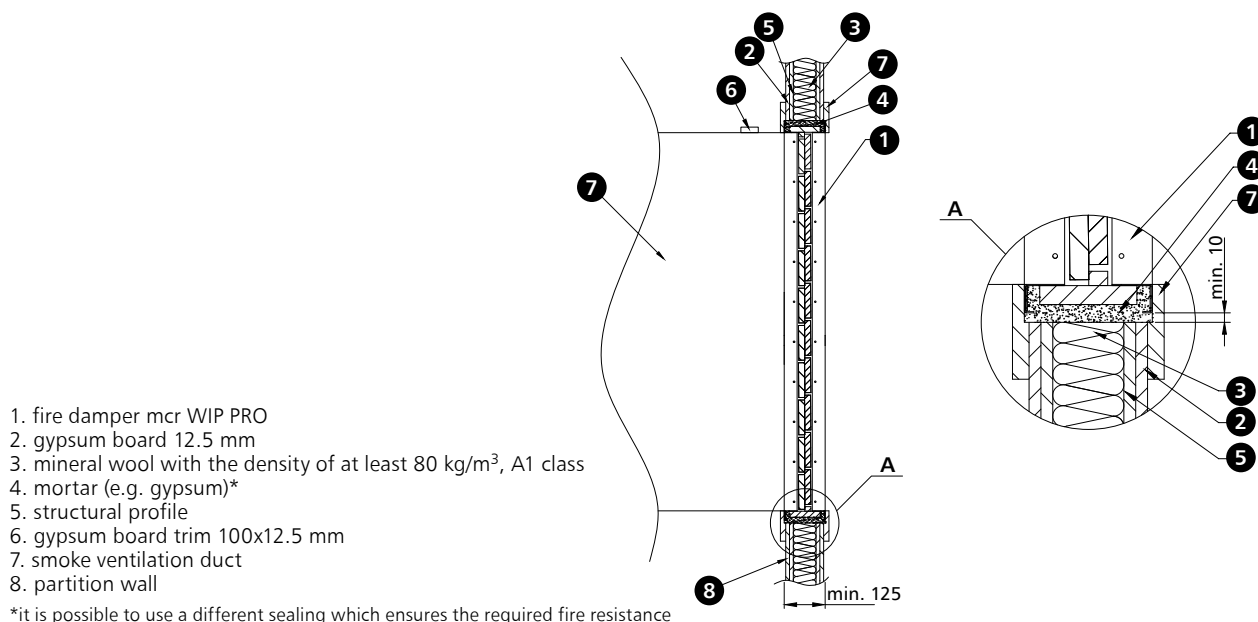
Dimension E (distance from the top fire damper edge to the edge of the trigger control mechanism box) - depending on the dimension H and the trigger control mechanism used:

mechanism	for the even number of blades	for the odd number of blades
BE, BLE	$E [\text{mm}] = (H/2 - 123) + 30$	$E [\text{mm}] = (H/2 - 61.5) + 30$

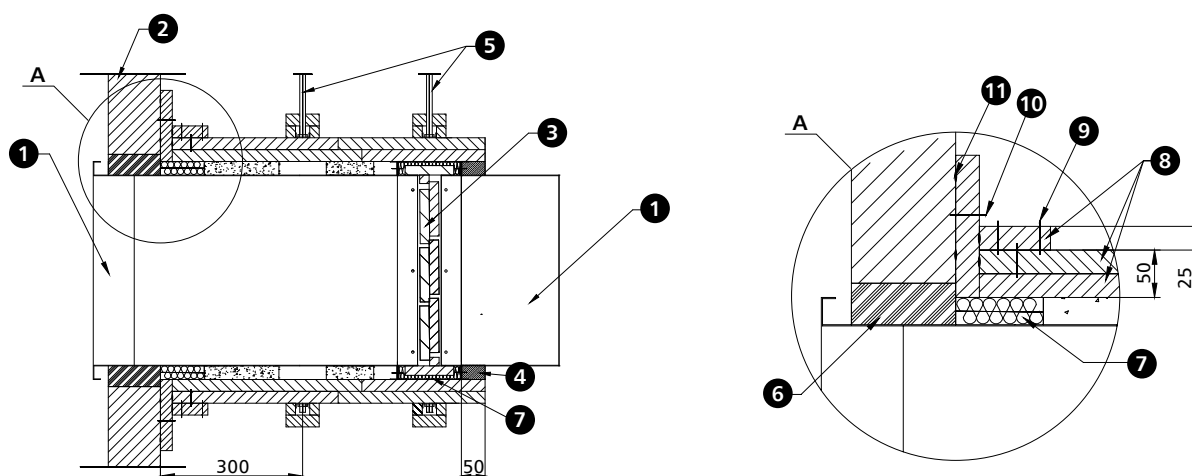
10.5.2. sample installation in concrete block or full brick walls



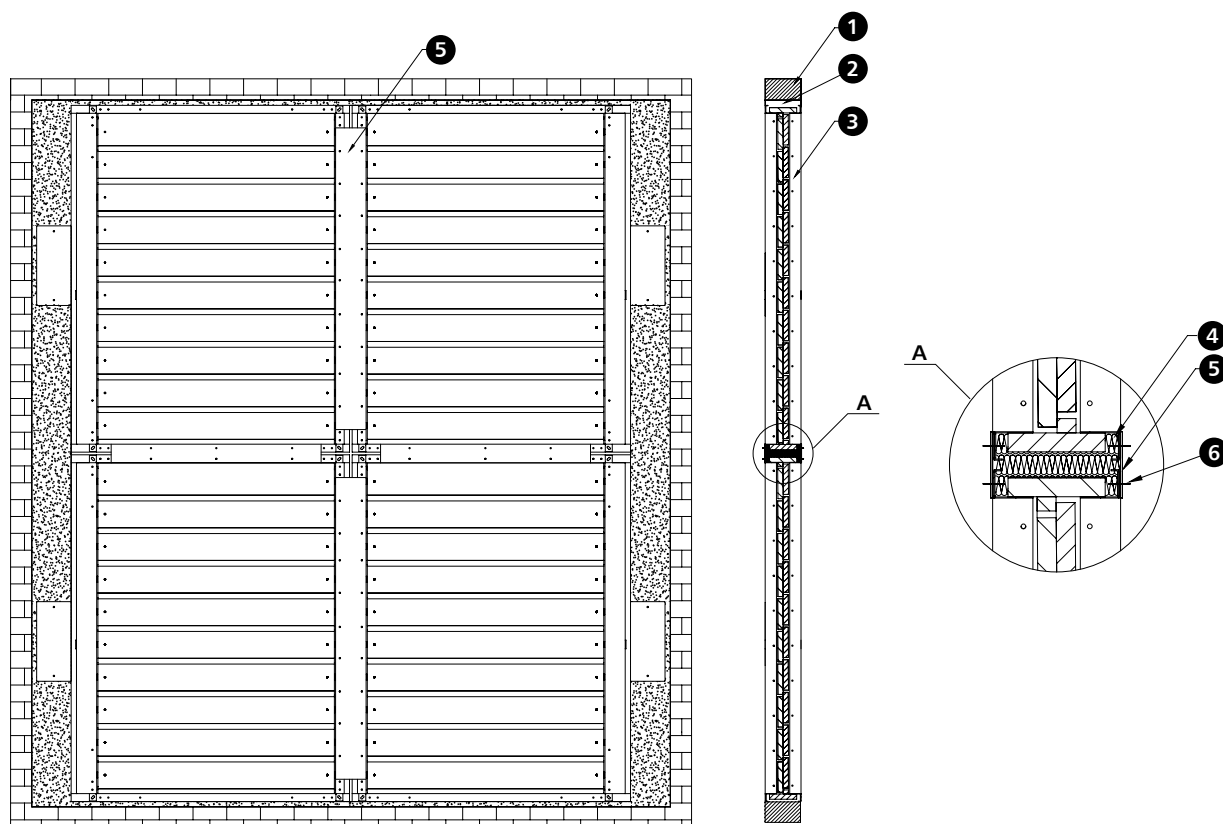
10.5.3. sample installation in lightweight walls



10.5.4. sample installation outside the fire partition



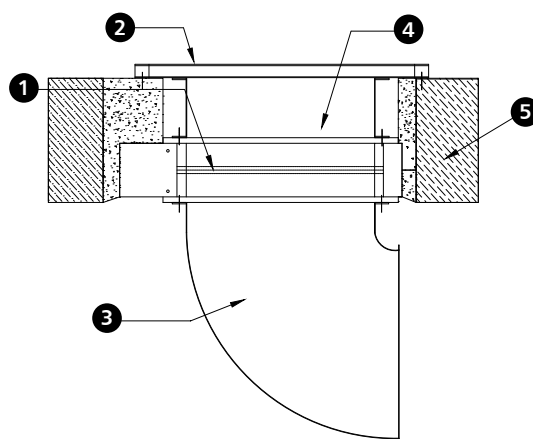
10.5.5. sample installation in a multiple set (a battery of four dampers)



- 1. e.g. masonry wall
- 2. e.g. cement mortar*
- 3. fire damper mcr WIP PRO
- 4. mineral wool with the density of at least 80 kg/m³, A1 class
- *it is possible to use a different sealing which ensures the required fire resistance

- 5. steel flat bar, dimensions:
 - vertical H: width 110 mm, thickness 2 mm
 - horizontal B: width 70 mm, thickness 2 mm
- 6. ST8x16 screw

Example applications - installation with end cap



- 1. fire damper mcr WIP
- 2. duct cover
- 3. ventilation duct
- 4. duct - ventilation straight connection pipe
- 5. wall, ceiling

If a mcr WIP/V, mcr WIP/V-M damper is used, thanks to the shutters (no single-plane partition) it is possible to use the space in front of and behind the damper for such system elements as a duct cover or a rectangular silencer or to route a duct along the wall using a duct bend or reduction.

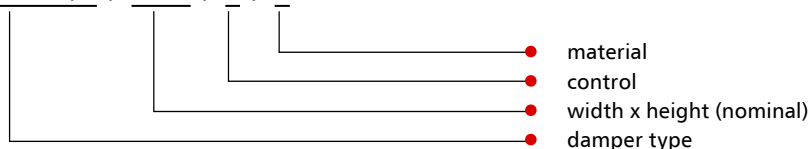
10.7. estimated weights of mcr WIP PRO/V, mcr WIP PRO/V-M dampers [kg]

		height H [mm]										
		263	300	400	500	600	700	800	900	1000	1100	1250
width B [mm]	110	3	3	4	5	7	8	9	10	11	13	14
	150	4	4	6	8	9	11	12	14	16	17	20
	200	5	6	8	10	12	15	17	19	21	23	27
	250	7	8	12	13	16	18	21	24	27	29	33
	300	8	9	12	16	19	22	25	29	32	35	40
	350	9	11	15	18	22	26	30	34	37	41	47
	400	11	12	17	21	25	30	34	38	43	47	54
	500	14	16	21	27	32	37	43	48	54	59	67
	600	16	19	25	32	38	45	51	58	64	71	81
	700	19	22	30	37	45	52	60	68	75	83	94
	800	22	25	34	43	51	60	69	77	86	95	108
	900	25	29	38	48	58	68	77	87	97	106	128

The table shows the weights of dampers with RST-KW1 type trigger control mechanisms or actuators.

10.8. marking

mcr WIP PRO/V / B x H / 1 / 2



1 – control:

- Belimo trigger control mechanism

BE24 – actuator with no return spring, U = 24 V AC/DC

BE24-ST (with the BKNE230-24 option) – actuator with no return spring, U = 24 V AC/DC, with a SBS Control system

BE230 – actuator with no return spring, U = 230 V AC/DC

BLE24 – actuator with no return spring, U = 24 V AC/DC

BLE24-ST (with the BKNE230-24 option) – actuator with no return spring, U = 24 V AC/DC, with a SBS Control system

BLE230 – actuator with no return spring, U = 230 V AC/DC

2 – material:

[no symbol] – galvanised steel, Zn 275 g/m² coating

KN – 1.4404 acid-proof stainless steel

example marking:

mcr WIP PRO/V 400 x 400 BLE24

Louvered fire damper EIS120 with a compact 24 V Belimo actuator with limit switches.

Chapter 12 - power supply and control (p. 141) contains:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper,
- location of trigger control mechanisms in relation to the damper - manufacture standards.

**PRODUCT CONFIGURATOR
AT WWW.MERCOR.COM.PL**



- ▶ **E120**
- ▶ **Certificate of constancy of performance 0832-CPR-P0001.**
- ▶ **Dampers certified for compliance with EN 15650.**
- ▶ **Dampers qualified under EN 13501-3 and tested under EN 1366-2.**
- ▶ **Narrow cut-off dampers with a stainless steel curtain with a large active surface.**

11.1. application

The mcr FS fire dampers with a thermal trigger are used in vertical construction partitions to allow the air to flow through. The purpose of the dampers is to maintain the fire resistance of the partition, in which they are installed.

During normal operation, the dampers remain open. The dampers switch to safe mode (close):

- automatically, by the thermal trigger tripping at 72°C,
- manually (in test mode), by pressing the manual release button (trigger control mechanism),
- remotely, by the EM electromagnetic trigger tripping (optional).

Dampers with EM electromagnetic triggers (optional) close as a result of power supply cut-off due to the action of return springs in the damper. The dampers open upon the application of the power supply to trigger terminals and upon manual lifting of the steel curtain.

Dampers with a thermal trigger control mechanism close as a result of the action of the drive spring in the damper, activated by the triggering of the thermal trigger or manually, by pressing the dedicated button on the panel. The dampers are opened manually, by lifting the steel curtain and locking it in the trigger control mechanism clamps.

The mcr FS curtain dampers used in the systems protecting escape routes from smoke remain open during the fire, which ensure the supply of fresh air to escape routes. If the fire develops further, the dampers are automatically closed as a result of thermal trigger tripping to prevent the spreading of fire.

11.2. design

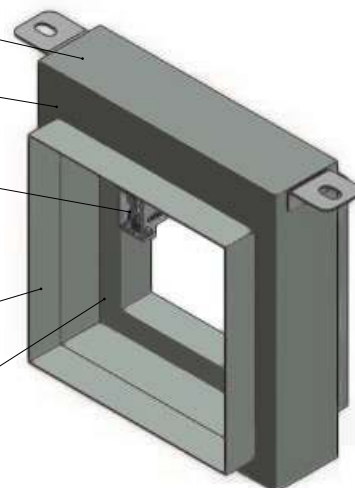
steel cut-off curtain under casing

casing

trigger control mechanism
(thermal trigger - panel at 72°C)

connection pipe

ribbon springs



The mcr FS dampers consist of a double casing with a rectangular cross section, a moving blade in the form of a falling foldable curtain and a trigger control mechanism (panel), which is activated remotely or automatically when the thermal trigger is tripped. The damper casing is made of galvanised steel sheet. The casing total length is 90 mm for rectangular dampers and 92 mm for circular dampers. On two sides, each damper is equipped with a connection piece with the length of 38 mm for rectangular dampers and 60 mm for circular dampers. The damper curtain is made of stainless steel sheet. The steel flat bar on casing exterior is installed to tighten the device after its activation.

The mechanism of curtain the mcr FS dampers, which moves the curtain, consists of two ribbon springs, placed inside of the damper sides, along its height. If the allowed temperature is exceeded in the casing, the trigger control mechanism is triggered and the spring-powered curtain is lowered. It is possible to equip the damper with an EM mechanism for remote control.

11.3. versions

11.3.1. mcr FS I/F – cut-off fire damper for E120(ve ho i↔o) rigid walls and ceilings



The mcr FS I/F damper is suitable for installation in rigid walls.

The cut-off curtain of stainless steel falls when the temperature of 72°C is exceeded or if the voltage is removed from the EM trigger control mechanism (optional).

The damper may be equipped with a MSSP curtain closing limit switch or a MSDP curtain closing and opening limit switch.

11.3.2. mcr FS DWFX-C – cut-off damper for E120(ve i↔o) lightweight walls



The mcr FS DWFX-C damper is suitable for installation in newly constructed lightweight walls.

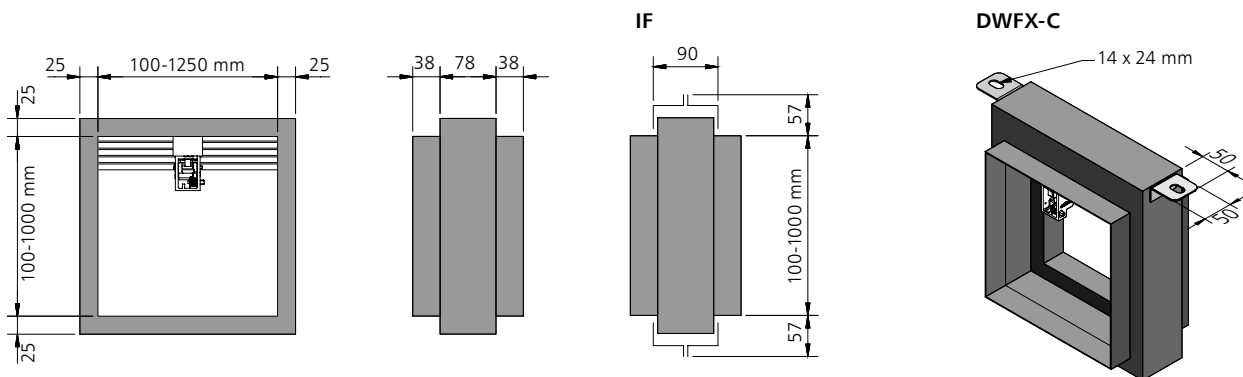
The cut-off curtain of stainless steel falls when the temperature of 72°C is exceeded or if the voltage is removed from the EM trigger control mechanism (optional).

The damper may be equipped with a MSSP curtain closing limit switch or a MSDP curtain closing and opening limit switch.

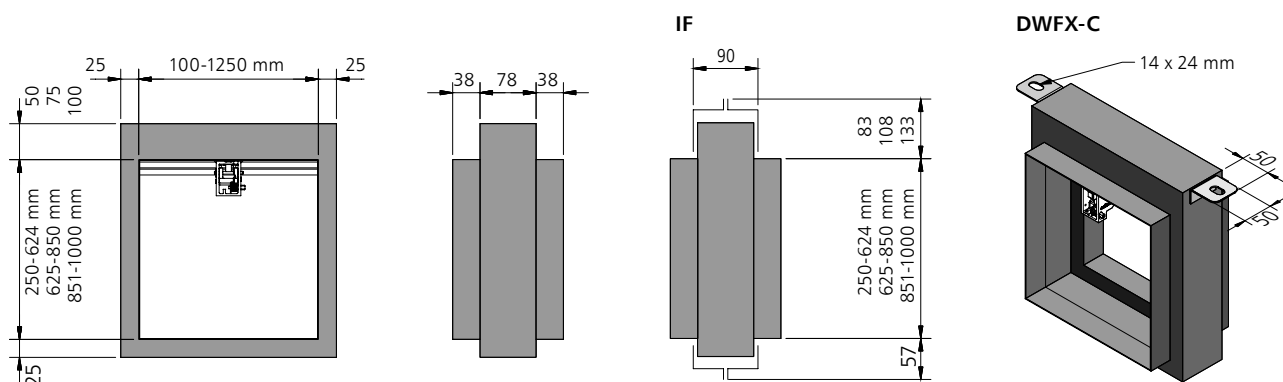
11.4. dimensions

The mcr FS transfer dampers are manufactured in three series:

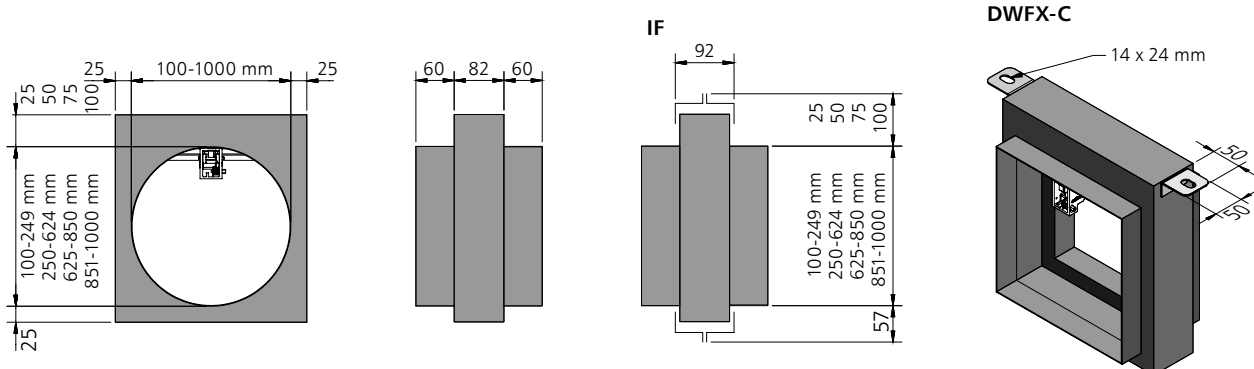
101 series (rectangular dampers) with a curtain partly in the air stream – from 100x100 mm to 1250x1000 mm.



201 series (rectangular dampers) with a curtain outside the air stream – from 100x250 mm to 1250x1000 mm.



301 series (circular dampers) with a curtain outside the air flow – from D100 to D1000 mm.



Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (in 1 mm increments in the given range).

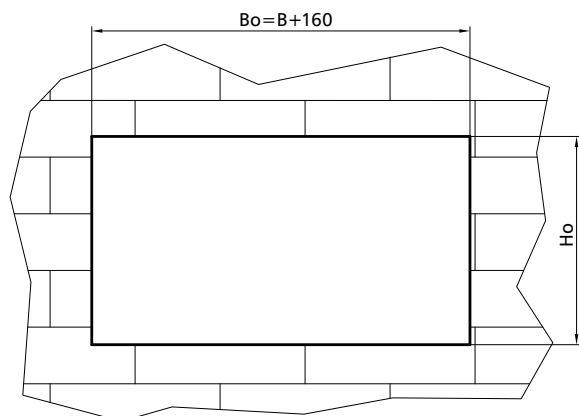
11.5. installation

The mcr FS I/F dampers are E120(ve i↔o)-rated if installed in concrete partitions, made of full bricks or cellular concrete blocks with the thickness of at least 110 mm and concrete ceilings with the thickness of at least 150 mm.

The mcr FS DWFX-C dampers are E120(ve i↔o)-rated if installed in lightweight walls of cardboard-plaster panels, on a steel framework with the thickness of at least 125 mm.

11.5.1. preparation of installation openings

version mcr FS I/F

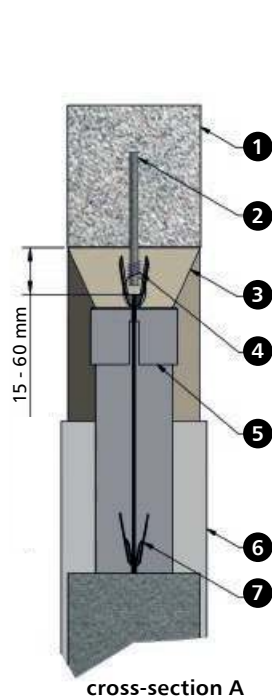


$H_o = H + 160^*$ for mcr FS 101 I/F
 $H_o = H + 180^*$ for mcr FS 201 I/F 250-624 mm
 $H_o = H + 205^*$ for mcr FS 201 I/F 625-850 mm
 $H_o = H + 230^*$ for mcr FS 201 I/F 851-1000 mm
 * applies also to mcr FS 301 I/F

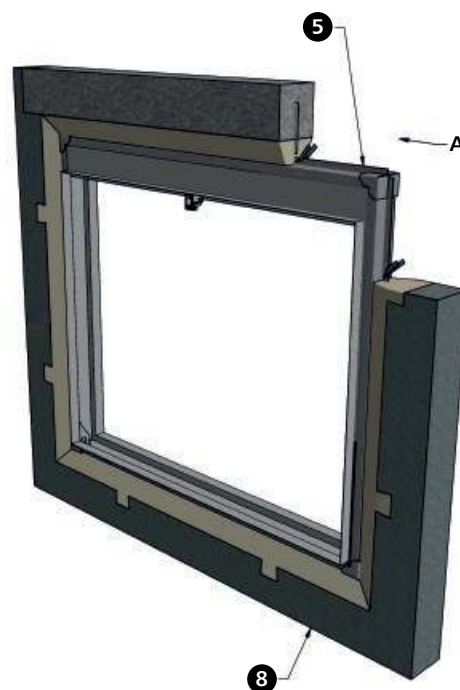
version mcr FS DWFX-C

The dampers are installed during the construction of the plaster-cardboard panel wall (the damper is embedded in the wall of panels).

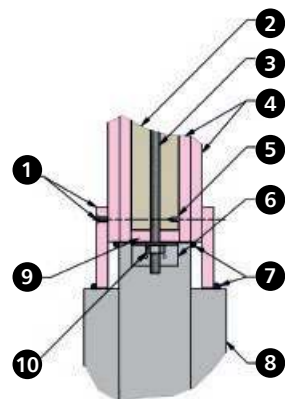
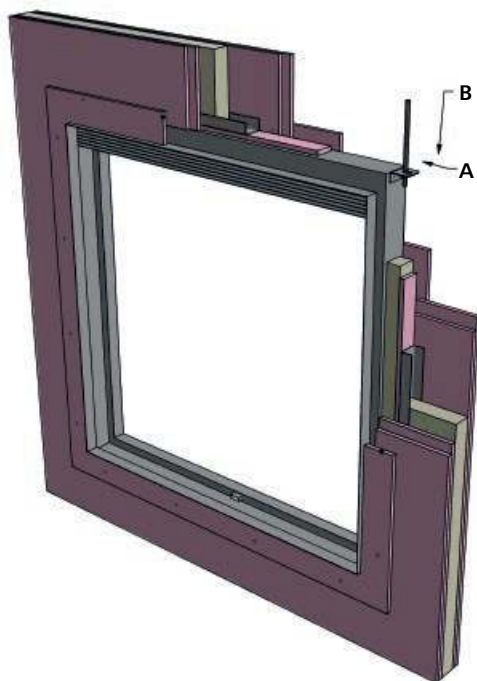
11.5.2. sample installation of mcr FS I/F dampers



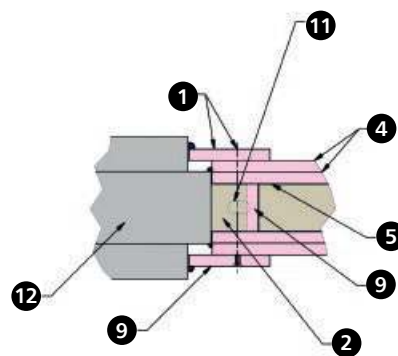
cross-section A



1. lintel
2. steel anchors $\varnothing$ min. 6.5 mm
3. 4:1 sand-cement mortar
4. steel wire $\varnothing$ 1.5 mm binding the anchors with frame runners
5. installation frame
6. fire damper mcr FS
7. frame runners - for bending sideways and downwards
8. rigid partition

11.5.3. sample installation of mcr FS DWFX-C dampers


cross-section A



cross-section B

1. circumferential band of 12.5 x 100 mm plaster-cardboard panels around the damper bolted to the plaster-cardboard wall (300 mm), to the UD50 profile
2. mineral wool 33 kg/m³
3. rod M10 (pin)
4. 2 x 12.5 mm two-sided plaster-cardboard panels
5. UD50 profile
6. angle bar welded to both ends of the casing
7. low-expansion intumescent compound around the damper, on both sides
8. damper casing
9. 12.5 mm trim
10. nut M10
11. angle bar with an opening
12. fire damper mcr FS

11.5.4. sample installation of mcr FS dampers with duct covers

NOTE: **Minimum wall thickness: 155 mm.**

B x H damper dimensions

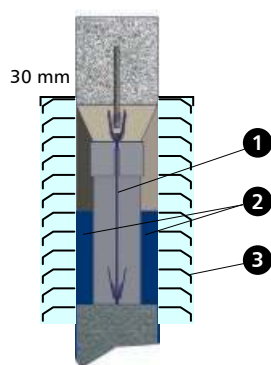
Bz x Hz damper external dimensions

Bk x Hk duct cover dimensions

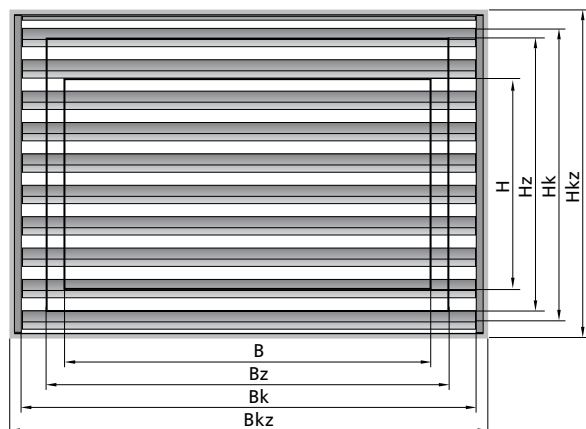
Bkz x Hkz duct cover external dimensions

type\size	H	Hz	Hk	Hkz
mcr FS 101 I/F	100-1000	H+114	H+160	H+210
mcr FS 201 I/F	250-624	H+140	H+180	H+230
mcr FS 201 I/F	625-850	H+165	H+205	H+255
mcr FS 201 I/F	851-1000	H+190	H+230	H+280

type\size	B	Bz	Bk	Bkz
mcr FS 101 I/F	100-1000	B+114	B+160	B+210
mcr FS 201 I/F	100-1000	B+114	B+160	B+210

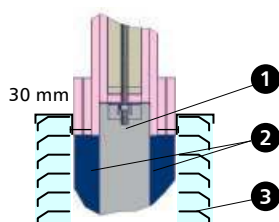


1. fire damper mcr FS
2. duct - ventilation straight connection piece
3. duct cover

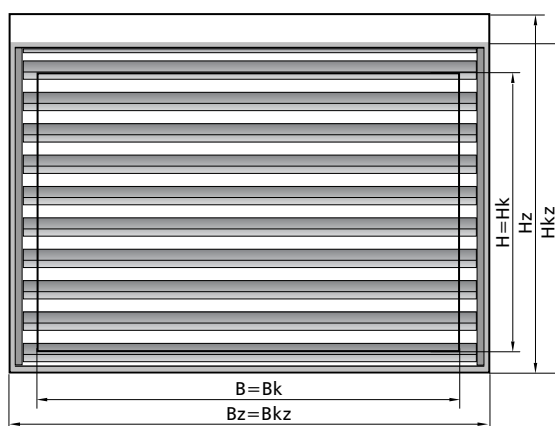


type\size	H	Hz	Hk	Hkz
mcr FS 101 / DWFX-C	100-1000	H+50	H	H+50
mcr FS 201 / DWFX-C	250-624	H+75	H	H+50
mcr FS 201 / DWFX-C	625-850	H+100	H	H+50
mcr FS 201 / DWFX-C	851-1000	H+125	H	H+50

type\size	B	Bz	Bk	Bkz
mcr FS 101 / DWFX-C	100-1000	B+50	B	B+50
mcr FS 201 / DWFX-C	100-1000	B+50	B	B+50



1. fire damper mcr FS
2. duct - ventilation straight connection piece
3. duct cover



11.6. technical parameters

damper active surface in relation to the B and H nominal and Bz and Hz total dimensions

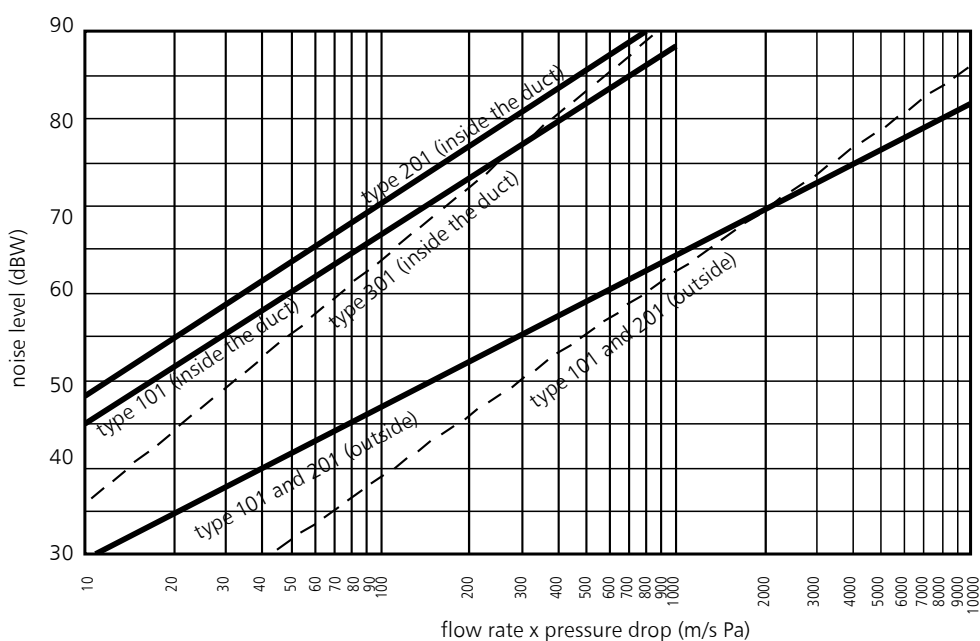
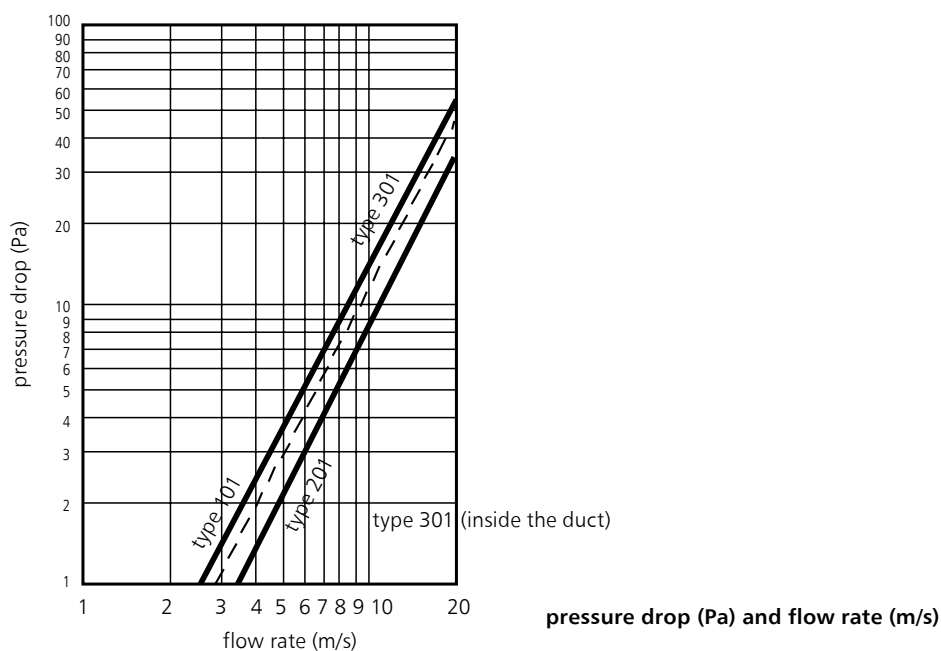
101 series														
H \ B	100	200	300	400	500	600	700	800	900	1000	1100	1200	1250	
100	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10	0.11	0.12	0.13	150
200	0.02	0.04	0.06	0.08	0.10	0.12	0.14	0.16	0.18	0.20	0.22	0.24	0.25	250
300	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.37	350
400	0.03	0.07	0.11	0.15	0.19	0.23	0.27	0.31	0.35	0.39	0.43	0.47	0.49	450
500	0.04	0.09	0.14	0.19	0.24	0.29	0.34	0.39	0.44	0.49	0.54	0.59	0.62	550
600	0.05	0.11	0.17	0.23	0.29	0.35	0.41	0.47	0.53	0.59	0.65	0.71	0.74	650
700	0.05	0.12	0.19	0.26	0.33	0.40	0.47	0.54	0.61	0.68	0.75	0.82	0.85	750
800	0.04	0.12	0.20	0.28	0.36	0.44	0.52	0.60	0.68	0.76	0.84	0.92	0.96	850
900	0.04	0.13	0.22	0.31	0.40	0.49	0.58	0.67	0.76	0.85	0.94	1.03	1.07	950
1000	0.03	0.13	0.23	0.33	0.43	0.53	0.63	0.73	0.83	0.93	1.03	1.13	1.18	1050
	150	250	350	450	550	650	750	850	950	1050	1150	1250	1300	Bz \ Hz

201 series														
H \ B	100	200	300	400	500	600	700	800	900	1000	1100	1200	1250	
250	0.03	0.05	0.08	0.10	0.13	0.15	0.18	0.20	0.23	0.25	0.28	0.30	0.31	325
300	0.03	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.38	375
400	0.04	0.08	0.12	0.16	0.20	0.24	0.28	0.32	0.36	0.40	0.44	0.48	0.50	475
500	0.05	0.10	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50	0.55	0.60	0.63	575
600	0.06	0.12	0.18	0.24	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.75	675
700	0.07	0.14	0.21	0.28	0.35	0.42	0.49	0.56	0.63	0.70	0.77	0.84	0.88	800
800	0.08	0.16	0.24	0.32	0.40	0.48	0.56	0.64	0.72	0.80	0.88	0.96	1.00	900
900	0.09	0.18	0.27	0.36	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.13	1025
1000	0.10	0.20	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00	1.10	1.20	1.25	1125
	150	250	350	450	550	650	750	850	950	1050	1150	1250	1300	Bz \ Hz

301 series										
D	100	200	300	400	500	600	700	800	900	1000
active surface	0.01	0.03	0.07	0.13	0.20	0.28	0.38	0.50	0.64	0.79
Hz	150	250	375	475	575	675	800	900	1025	1125
Bz	150	250	350	450	550	650	750	850	950	1050

The mcr FS fire damper selection program is available at www.mercor.com.pl, in the Architect and Designer Zone.

11.6.1. flow characteristics



flow rate (m/s) x pressure drop (Pa) and noise level (dBW)

acoustic power spectrum
for mcr FS dampers (outside)

frequency	Hz	63	125	250	500	1k	2k	3k	4k
typ 101	dB	10	7	3	9	13	20	30	33
typ 201	dB	10	7	3	9	13	20	30	33
typ 301	dB	13	10	3	7	11	12	26	42

acoustic power spectrum
for mcr FS dampers (inside the duct)

frequency	Hz	63	125	250	500	1k	2k	3k	4k
typ 101	dB	4	12	16	18	22	20	32	38
typ 201	dB	4	11	17	19	22	30	33	40
typ 301	dB	4	10	16	18	21	24	30	38

11.7. weights of mcr FS curtain dampers

approximate weights of dampers [kg]																			
active opening dimensions □Ø(mm)	100	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000
101 series/DWFX-C	1.6	2.1	2.8	3.5	4.2	5.0	5.7	6.9	7.5	8.6	9.5	10.9	12.0	13.1	13.8	15.2	16.7	18.1	19.0
101 series/ I/F	3.8	4.6	5.7	6.8	8.0	9.2	10.7	11.8	12.9	14.1	15.8	17.9	19.1	20.2	21.4	23.3	25.2	27.4	29.2
201 series/DWFX-C	-	-	-	4.1	4.6	5.4	6.0	7.1	8.0	9.3	10.5	12.1	12.7	14.4	16.0	17.5	19.0	20.5	22.0
201 series/ I/F	-	-	-	7.4	8.5	9.6	10.4	12.6	13.8	15.3	16.8	18.0	20.3	21.7	23.6	25.5	27.6	29.8	31.0
301 series/DWFX-C	2.3	3.0	4.0	5.4	6.5	7.6	8.8	10.2	11.7	13.2	14.9	16.9	18.7	20.5	22.4	24.5	26.7	28.8	31.0
301 series/ I/F	4.4	5.5	6.9	9.0	10.4	11.7	13.6	15.5	16.5	18.5	20.3	22.2	42.5	27.8	30.4	32.8	35.2	38.9	42.0

11.8. options

11.8.1. EM trigger control mechanism

mechanism operation description:

The EM mechanism is designed to operate mcr FS transfer dampers. After the removal of the power supply voltage the mechanism lock is released, which causes in the steel cord movement and damper operation. The mechanism is not equipped with a drive (return) spring. That spring is installed directly on the damper.

versions:

- EM24 – mechanism supplied with the voltage of 24 V AC/DC – released by the removal of the power supply voltage
- EM240 – mechanism supplied with the voltage of 230 V AC – released by the removal of the power supply voltage



specifications

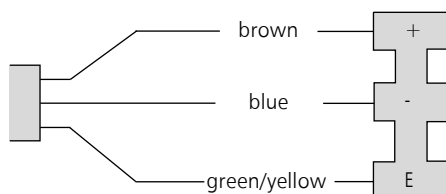
	EM24	EM240
power supply voltage	24 V AC / DC	230 V AC 50 Hz
rated current	120 m A	10 m A
electrical connection	wire 3 x 0.75 mm ²	
weight	1.6 kg	1.6 kg

electrical diagram of the mechanism

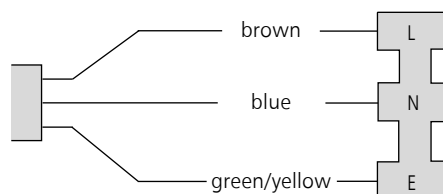
mechanism power supply

brown lead – „+“ supply or „L“
blue lead – mass „-“ or „N“
green-yellow lead - ground „E“

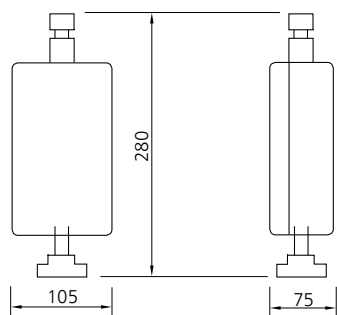
24 V AC/DC



230 V AC



mechanism dimensions



11.8.2. MSSP and MSDP independent limit switches

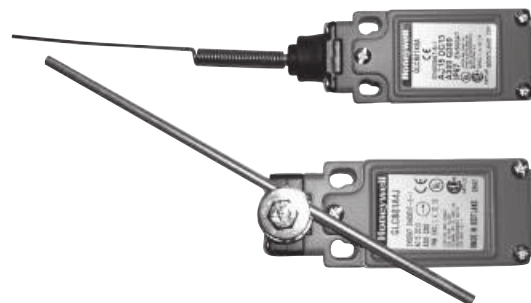
operation description:

The limit switch is used to signal the position of the fire damper partition.

versions:

MSSP – single switch – closed partition damper signaling.

MSDP – assembly of two switches – closed and open partition damper signaling.



specifications

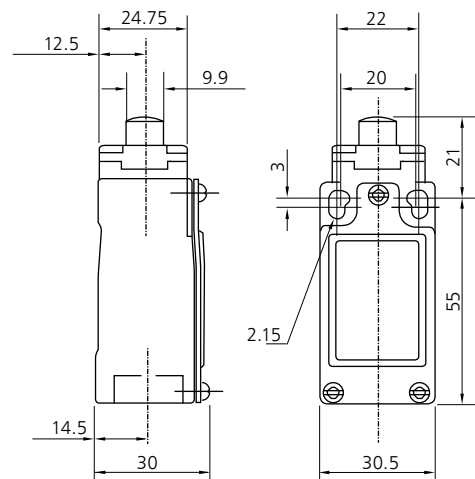
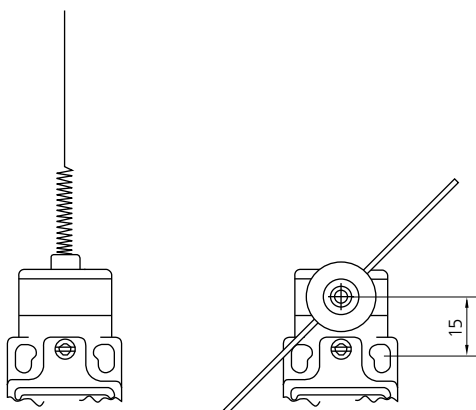
MSSP and MSDP limit switch	1NO/1NC SPDT (switching contact)
limit switch operating temperature	-25°C do +85°C
service durability	5 000 000 cycles
voltage	300 V AC i 250 V DC
current	10 A
head version	„cat whiskers” or „steel rod”
ingress protection rating	IP 66

electrical diagram of the mechanism

MSSP – single limit switch. closed damper signaling:

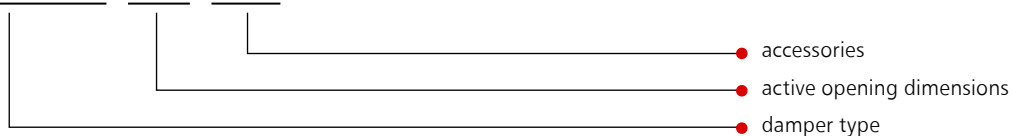
MSDP – two limit switches:

- contacts 13 and 14 NO (normally open)
- contacts 21 and 22 NC (normally closed)



11.9.

marking

mcr FS 201 / IF / B x H / MSSP**type:**

mcr FS 101 - square or rectangular damper with a curtain partly in the air stream

mcr FS 201 - square or rectangular damper with a curtain outside the air stream

mcr FS 301 - circular damper with a curtain outside the air stream

+ IF - installation frame for rigid partitions

+ DWFX-C - frame for installation before the assembly of dry partition walls

accessories:

MSSP - single limit switch (closed damper signaling)

MSDP - two single limit switches (closed and open damper signalling)

EM24 - electromagnetic trigger (power supply voltage of 24 V AC/DC)

EM240 - electromagnetic trigger (power supply voltage of 230 V AC)

MKPZ - masking cover x 1 front. x 2 front and rear

12.1. cooperation with smoke exhaust/cut-off dampers - drive quick selection table

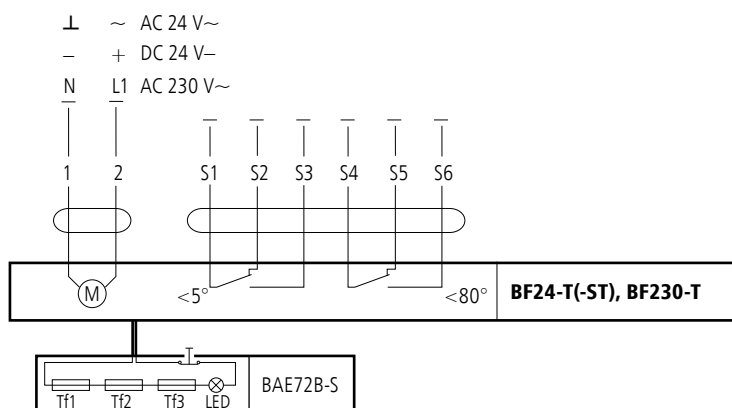
	mcr FID S/S c/P	mcr FID S/S p/P mcr FID S/S p/O	mcr FID S/V p/P mcr FID S/V-M p/P	mcr FID PRO	mcr WIP/S	mcr WIP/T	mcr WIP/T-G	mcr WIP/V mcr WIP/V-M	mcr WIP PRO/S	mcr WIP PRO/V mcr WIP PRO/V-M
BF24-T (-ST)		X			X	X			X	
BF230-T		X			X	X			X	
BFL24-T (-ST)	X	X		X	X	X			X	
BFL230-T	X	X		X	X	X			X	
BFN24-T (-ST)	X	X			X	X			X	
BFN230-T	X	X			X	X			X	
BE24			X			X		X		X
BE230			X			X		X		X
BLE24			X			X		X		X
BLE230			X			X		X		X
EXBF24-T	X	X		X	X	X			X	
EXBF230-T	X	X		X	X	X			X	
BF24TL-T (-ST)	X	X		X	X	X			X	
RST	X	X		X						
RST/WK1	X	X		X						
RST/WK2	X	X		X						
RST-KW1/S	X	X		X						
RST-KW1/S/WK2	X	X		X	X	X	X		X	
RST-KW1/24I	X	X		X						
RST-KW1/24P	X	X		X					X	
RST-KW1/230I	X	X		X						
RST-KW1/230P	X	X		X					X	
BF24 (-ST)							X			
BF230							X			
BFL24 (-ST)							X			
BFL230							X			
BFN24 (-ST)							X			
BFN230							X			

12.2. actuators

12.2.1. BF electric actuators

Specifications	BF24 (BF24-T)	BF230 (BF230-T)
power supply	AC 24 V 50/60 Hz DC 24 V	AC 220-240 V 50/60 Hz
power demand: - for spring tensioning - for holding	7 W 2 W	8 W 3 W
sizing (apparent power)	10 VA	11 VA
protection class	III	II
ingress protection rating	IP 54	IP 54
auxiliary circuit breaker: - activation position	2 x EPU 3 (0.5) A 250 V 5°, 80°	2 x EPU 3 (0.5) A 250 V~ 5°, 80°
torque: - motor - return spring	18 Nm 12 Nm	18 Nm 12 Nm
cable connection: - motor (length: 0.9 m) - auxiliary circuit breaker	2 x 0.75 mm ² 6 x 0.75 mm ²	2 x 0.75 mm ² 6 x 0.75 mm ²
movement time (0-90°): - motor - return spring	120 s ~16 s	120 s ~16 s
operating temperature range	-30 ... +50°C	-30 ... +50°C
sound intensity level: - motor - return spring	max 45 dB (A) ~63 dB (A)	max 45 dB (A) ~63 dB (A)

electrical diagram of the BF...-T series actuator:



note: 24 V connection through a safety transformer.

To disconnect the 230 V actuator from the mains, the gap of at least 3 mm between the contacts (when off) is required in the switch.

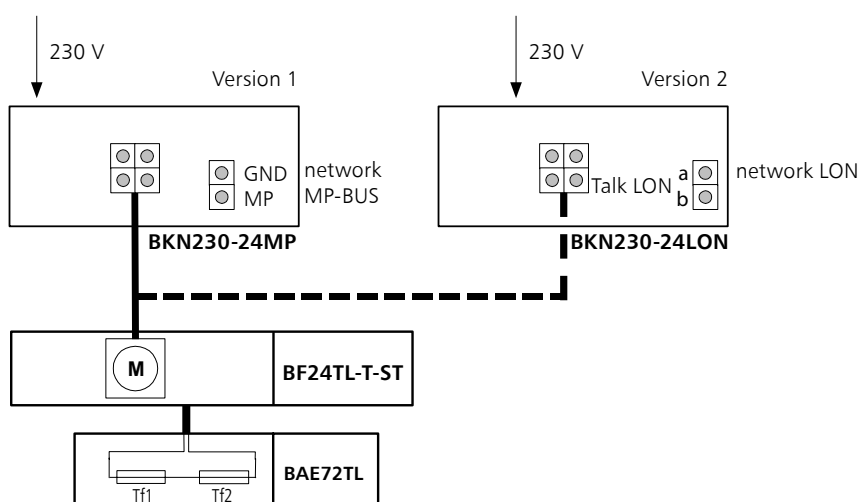
It is possible to connect further actuators in parallel.

Check the power consumption.

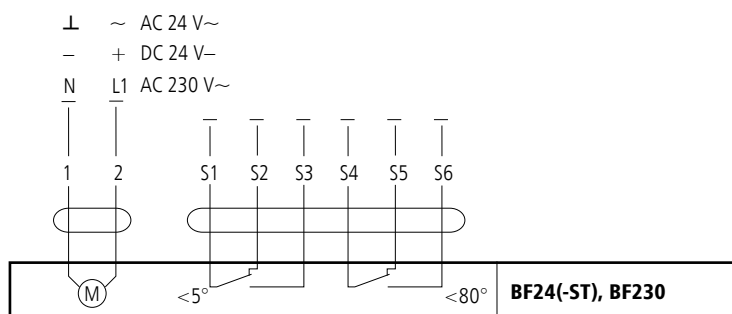
note:

The location of the actuator limit switches is shown for the no voltage position.

electrical diagram of the BF24TL-T(-ST) and BF24TL(-ST) actuator:



electrical diagram of the BF series actuator:



note: 24 V connection through a safety transformer.

To disconnect the 230 V actuator from the mains, the gap of at least 3 mm between the contacts (when off) is required in the switch.

It is possible to connect further actuators in parallel.

Check the power consumption.

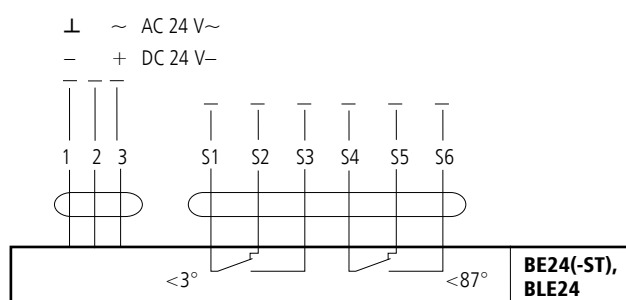
note:

The location of the actuator limit switches is shown for the no voltage position.

12.2.2. BE, BLE electric actuators

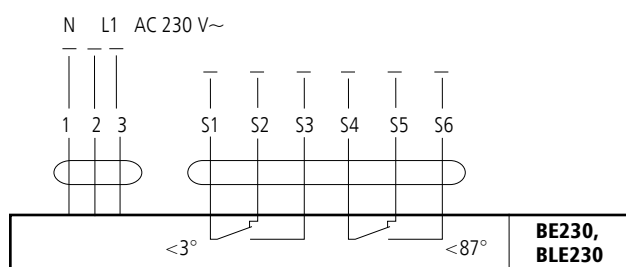
Specifications	BE24. BE24-ST	BE230	BLE24	BLE230
power supply	AC 24 V 50/60 Hz DC 24 V	AC 230 V 50/60 Hz	AC 24 V 50/60 Hz DC 24 V	AC 230 V 50/60 Hz
power demand: - in movement - for holding	12 W 0.5 W	8 W 0.5 W	7.5 W 0.5 W	5 W 0.5 W
sizing (apparent power)	18 VA	15 VA	9 VA	12 VA
protection class	III	II	III	II
ingress protection rating	IP 54	IP 54	IP 54	IP 54
auxiliary circuit breaker: - activation position	2 x SPDT 6 (1.5) A AC 250 V 5°, 80°	2 x SPDT 6 (1.5) A AC 250 V 5°, 80°	2 x EPU 3 (0.5) A 250 V 5°, 80°	2 x EPU 3 (0.5) A 250 V~ 5°, 80°
torque - motor	40 Nm	40 Nm	15 Nm	15 Nm
movement time (0-90°) - motor	< 60 s for 90°	< 60 s for 90°	< 30 s for 90°	< 30 s for 90°
operating temperature range	-30 ... +50°C	-30 ... +50°C	-30 ... +50°C	-30 ... +50°C
sound intensity level	~62 dB (A)	~62 dB (A)	~62 dB (A)	~62 dB (A)

electrical diagram of the BE, BLE series actuator:



note:

The actuator operation control requires routing three wire system to it. The actuator rotation sense is changed by the application of the power supply voltage to the terminal 2 or 3, depending on the desired direction.



note: 24 V connection through a safety transformer.

To disconnect the 230 V actuator from the mains, the gap of at least 3 mm between the contacts (when off) is required in the switch.

It is possible to connect further drives in parallel. Check the power consumption.

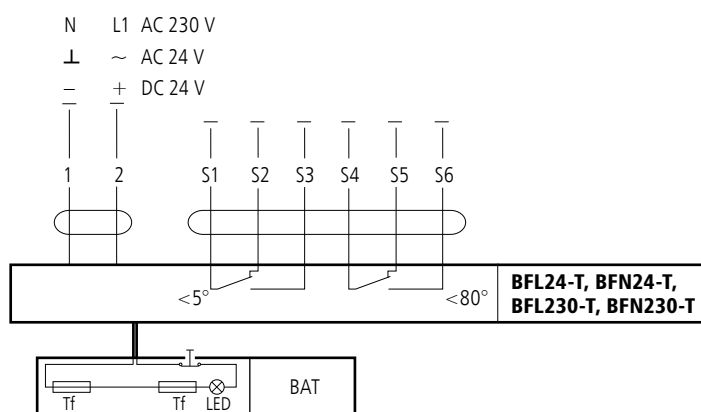
note:

The location of the actuator limit switches is shown for the no voltage position.

12.2.3. BFL, BFN electric actuators

Specifications	BFL24 (BFL24-T)	BFL230 (BFL230-T)	BFN24 (BFN24-T)	BFN230 (BFN230-T)
power supply	AC 24 V 50/60 Hz DC 24 V	AC 220-240 V 50/60 Hz	AC 24 V 50/60 Hz DC 24 V	AC 220-240 V 50/60 Hz
power demand: - for spring tensioning - for holding	2.5 W 0.7 W	3.5 W 1.1 W	4 W 1.4 W	5 W 2.1 W
sizing (apparent power)	4 VA	6.5 VA	6 VA	10 VA
protection class	III	II	III	II
ingress protection rating	IP 54	IP 54	IP 54	IP 54
auxiliary circuit breaker: - activation position	2 x SPDT 3 (0.5) A AC 250 V 5°, 80°	2 x SPDT 3 (0.5) A AC 250 V 5°, 80°	2 x EPU 3 (0.5) A 250 V 5°, 80°	2 x EPU 3 (0.5) A 250 V 5°, 80°
torque: - motor - return spring	4 Nm 3 Nm	4 Nm 3 Nm	9 Nm 7 Nm	9 Nm 7 Nm
cable connection: - motor (length: 0.9 m) - auxiliary circuit breaker	2 x 0.75 mm ² 6 x 0.75 mm ²	2 x 0.75 mm ² 6 x 0.75 mm ²	2 x 0.75 mm ² 6 x 0.75 mm ²	2 x 0.75 mm ² 6 x 0.75 mm ²
movement time (0-90°): - motor - return spring	< 60 s ~20 s	< 60 s ~20 s	< 60 s ~20 s	< 60 s ~20 s
operating temperature range	-30 ... +55°C	-30 ... +55°C	-30 ... +55°C	-30 ... +55°C
sound intensity level: - motor - return spring	max 43 dB (A) ~62 dB (A)	max 43 dB (A) ~62 dB (A)	max 55 dB (A) ~67 dB (A)	max 55 dB (A) ~67 dB (A)

electrical diagram of the BFL...-T, BFN...-T series actuator:



note: 24 V connection through a safety transformer.

To disconnect the 230 V actuator from the mains, the gap of at least 3 mm between the contacts (when off) is required in the switch.

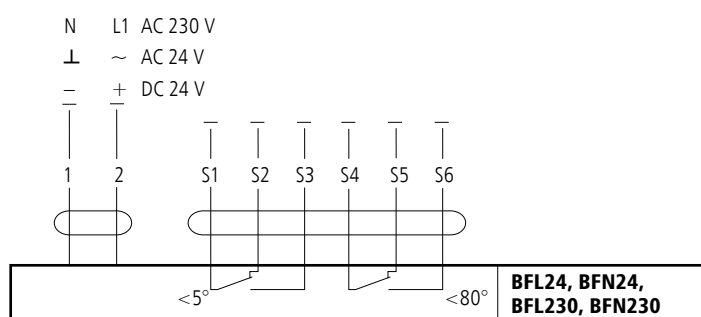
It is possible to connect further actuators in parallel.

Check the power consumption.

note:

The location of the actuator limit switches is shown for the no voltage position.

electrical diagram of the BFL, BFN series actuator:



note: 24 V connection through a safety transformer.

To disconnect the 230 V actuator from the mains, the gap of at least 3 mm between the contacts (when off) is required in the switch.

It is possible to connect further actuators in parallel.

Check the power consumption.

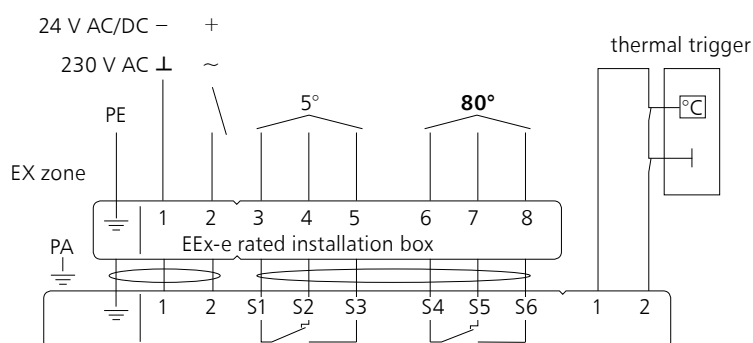
note:

The location of the actuator limit switches is shown for the no voltage position.

12.2.4. EXBF actuators

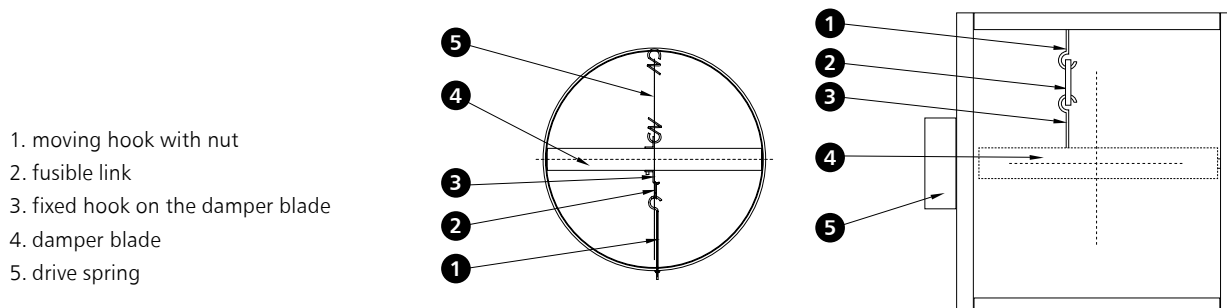
Specifications	EXBF B 001 2 ...0 N 000	EXBF A 001 2 ...0 N 000
zone	1, 2, 21, 22	
ATEX-rating	II 2 GD EEx d IIC T6	
power supply	24 V AC $\pm 20\%$ 50/60 Hz / 24 V DC -10/+20%	230 V AC $\pm 14\%$ 50/60 Hz
power demand: - for spring tensioning - for holding	7 W 2 W	8 W 3 W
sizing (apparent power)	10 VA	11 VA
ingress protection rating	IP 66	IP 66
auxiliary circuit breaker: - activation position	2 x SPDT 6 A (3) max 250 V AC 5°, 80°	2 x SPDT 6 A (3) max 250 V AC 5°, 80°
torque: - motor - return spring	18 Nm 12 Nm	18 Nm 12 Nm
movement time (90°C): - motor - return spring	150 s ~20 s	150 s ~20 s
ambient temperature	-30 ... +50°C	-30 ... +50°C

connection diagram for EXBF and EXBF...-T actuators:



12.3. RST trigger control mechanisms

In the RST version the WK1 limit switches are independent units installed inside the fire damper casing. The thermal trigger is on the damper blade. The driving spring is installed on the damper blade or in a guard box on its casing.



Independent limit switches – RST version

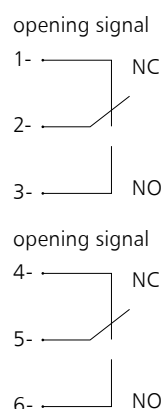
WK1 – limit switch (closed damper blade signal)

WK2 – limit switch (closed/open damper blade signal)

Switch specifications

WK1 and WK2 limit switch	1xNO/1xNC SPDT 5 A, 230 V AC
limit switch operating temperature	-25 ... +85°C
casing	plastic

electric connection diagram of WK1 and WK2 limit switches



note:

When the damper blade closes, the closed indication limit switch is switched over (contacts 2-3 are closed).

12.4. RST-KW1 mechanisms

	RST-KW1/S	RST-KW1/S/WK2	RST-KW1/24I	RST-KW1/24P	RST-KW1/230I	RST-KW1/230P
rated voltage	–	–	24 V - 48 V DC	24 V - 48 V DC	230 AC	230 AC
power consumption	–	–	3.5 W	1.6 W	2 W	2 W
thermal trigger	74°C (optionally 95°C)					
connections - trigger	–	–	wire 0.6 m, 2 x 0.5 mm²			
connections - limit switches	–	wire 0.6 m, 6 x 0.5 mm²				
limit switch	–	2 x NO/NC 5A. 230 V AC				
movement time	max. 2 s					
mechanism operation control (closing)	–	–	voltage application „pulse“	voltage removal „break“	voltage application „pulse“	voltage removal „break“
mechanism operation control (opening)	manual	manual	manual	manual	manual	manual
pulse width	max. 1 s					

description of electrical connections:

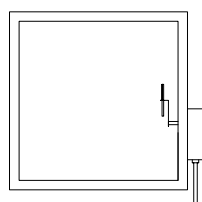
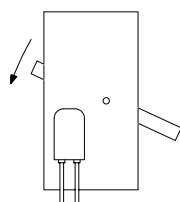
RST-KW1 mechanism power supply	closing limit switch	opening limit switch
wire number: 1-2	wire number: 3-4 – NO (normally open)	wire number: 6-7 – NO (normally open)
	wire number: 4-5 – NC (normally closed)	wire number: 7-8 – NC (normally closed)

12.5. manufacture standards

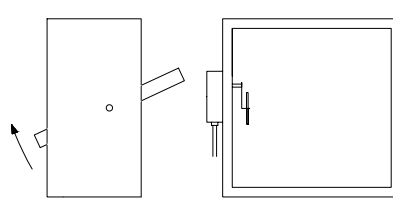
damper type	description	standard	option
mcr FID S/S c/P	right damper	X	
	inverse damper		X
	left damper		X
	actuator normal to the axis flow	X	
	actuator along the axis flow		
mcr FID S/S p/P mcr FID S/V p/P	right damper	X	
	inverse damper		X
	left damper		X
	actuator normal to the axis flow	X	
	actuator along the axis flow		X
mcr FID S/S p/O	right damper	X	
	inverse damper		
	left damper		
	actuator normal to the axis flow	X	
	BF actuator along the v (exception)	X	
mcr FID PRO	right damper	X	
	inverse damper		
	left damper		
	actuator normal to the axis flow	X	
	actuator along the axis flow		X
mcr WIP	right damper		
	inverse damper		X
	left damper	X	
	actuator normal to the axis flow	X	
	actuator along the axis flow		
mcr WIP PRO	right damper		X
	inverse damper		X
	left damper	X	
	actuator normal to the axis flow	X	
	actuator along the axis flow		

mcr FID S/S c/P damper

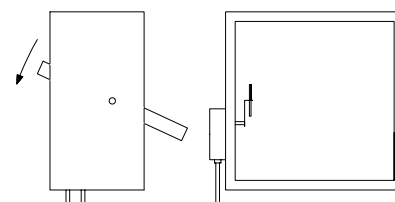
right damper standard



inverse damper
(wires downward)

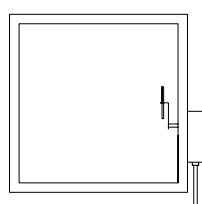
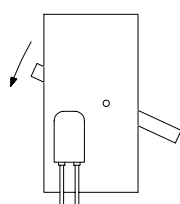


left damper

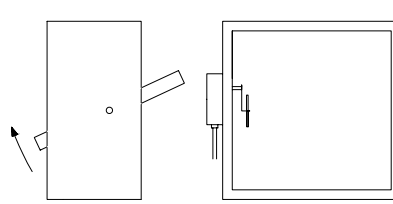


mcr FID S/S p/P, mcr FID S/S p/O, mcr FID S/V p/P damper

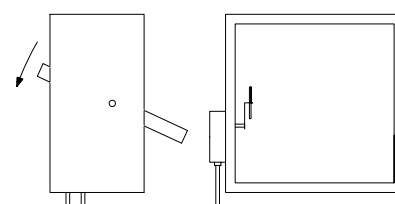
right damper standard



inverse damper
(wires downward)

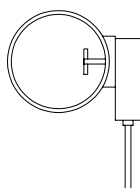
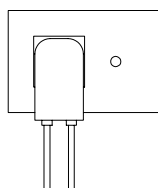


left damper

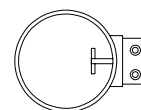
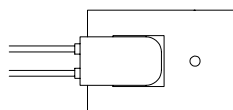


mcr FID PRO/S damper

right damper
standard

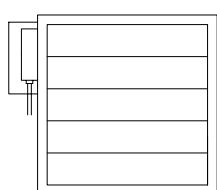


actuator along the axis flow

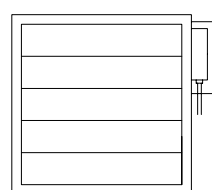
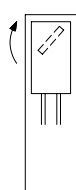


mcr WIP/S, mcr WIP/V, mcr WIP/V-M, mcr WIP/T, mcr WIP/T-G damper

left damper
standard

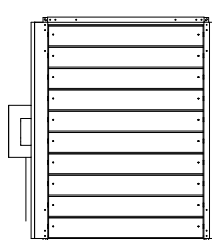
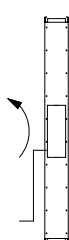


inverse damper
(wires downward)

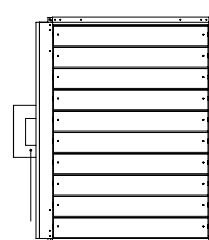
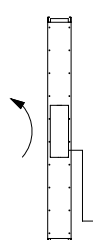


mcr WIP PRO/S, mcr WIP PRO/V, mcr WIP PRO/V-M damper with an actuator

left damper
standard



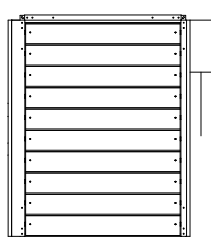
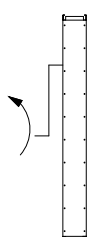
inverse damper
reversed cable outlet



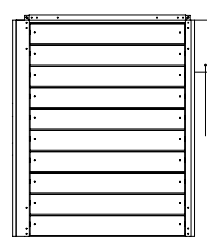
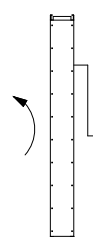
installation in reversed horizontal and vertical position available

mcr WIP PRO/S, mcr WIP PRO/V, mcr VIP PRO/V-M damper with RST-KW1 mechanism

left damper
standard



inverse damper
reversed cable outlet



installation in reversed horizontal and vertical position available