mcr FID S/S c/P

low-resistance single-blade cut-off fire dampers for comfort ventilation systems

PRODUCT CONFIGURATOR AT WWW.MERCOR.COM.PL

1488-CPR-0203/W

1396-CPR-0114

ATEST HIGIENICZNY

CERTYFIKACJA PRODUKTU

- 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.**

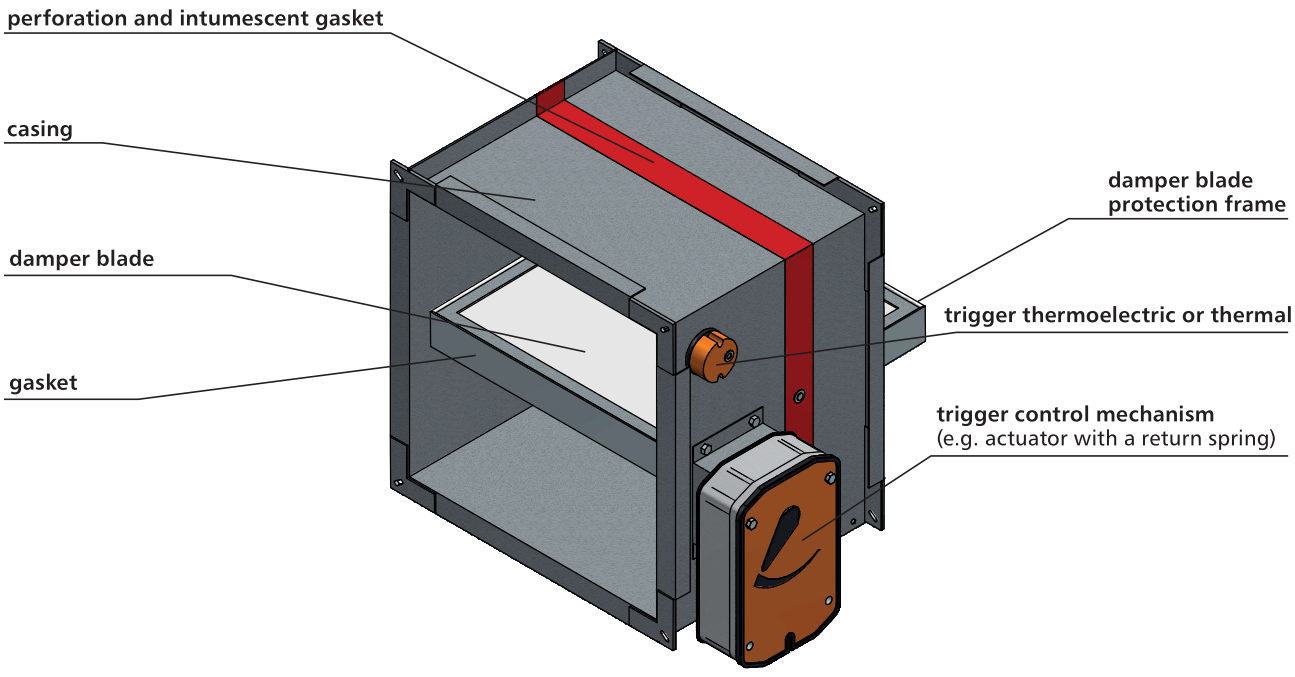
1.1. application

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



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

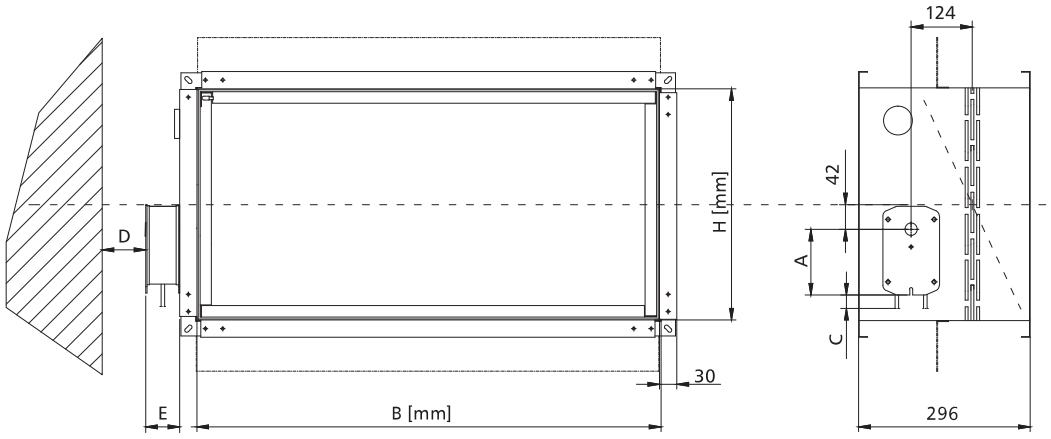
1.3.1. mcr FID S/S c/P – the cut-off fire damper for ventilation ducts with an actuator with a return spring – damper closing and opening with an actuator

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.

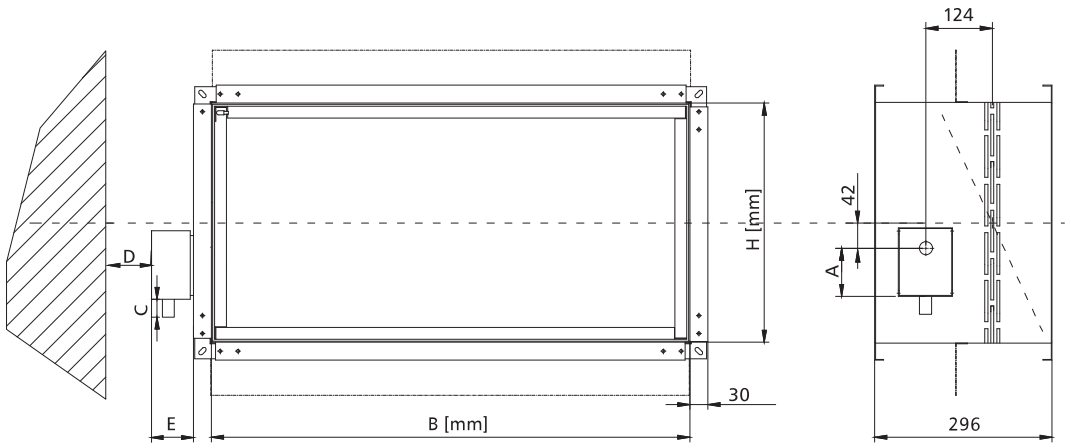


mechanism	A	C	D	E
BFN	157	30	75	57
BFL	138	30	75	53
BF24TL-ST	198	10	75	65
EXBF	225	55	75	175

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.

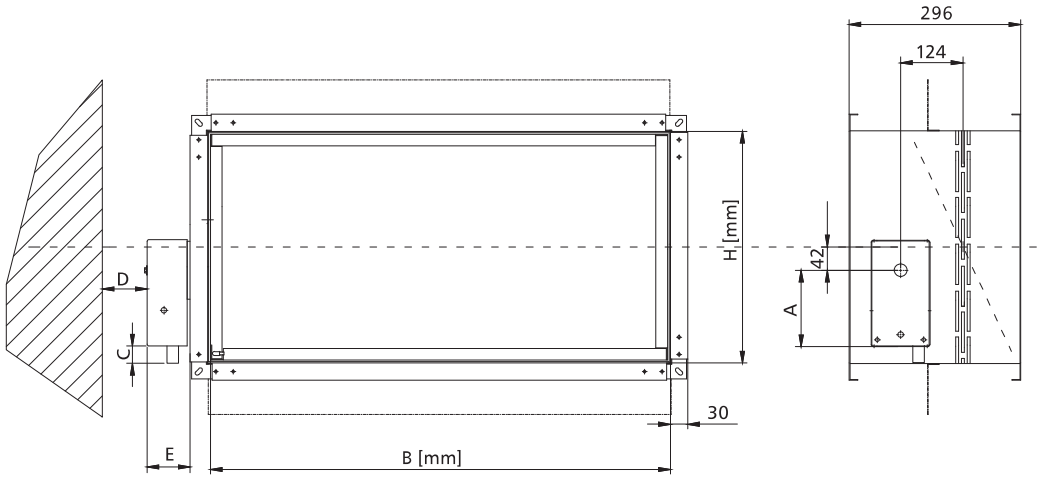


mechanism	A	C	D	E
RST	50	30	75	70

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.



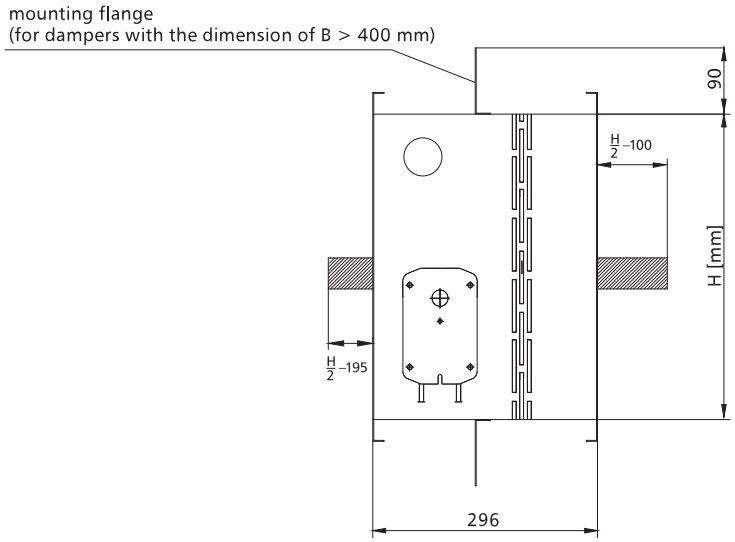
mechanism	A	C	D	E
RST-KW1	130	30	75	80

1.4. dimensions

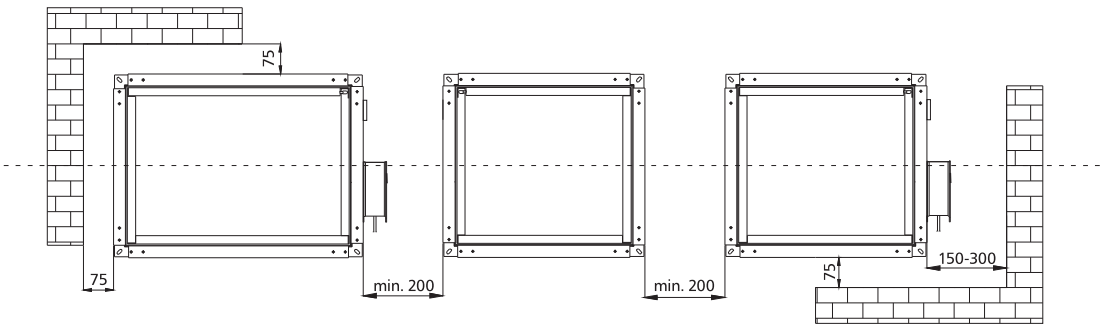
Rectangular dampers:

- 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 m^2

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



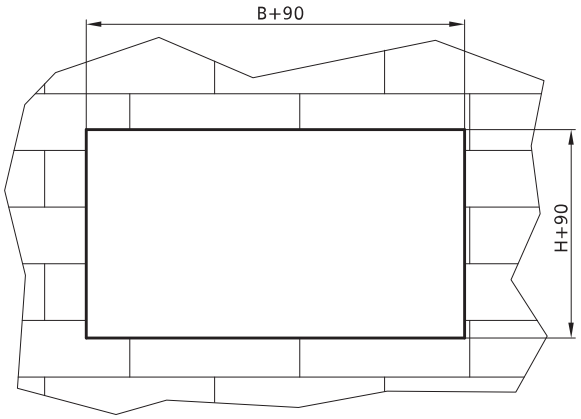
Distance between the installations and partitions



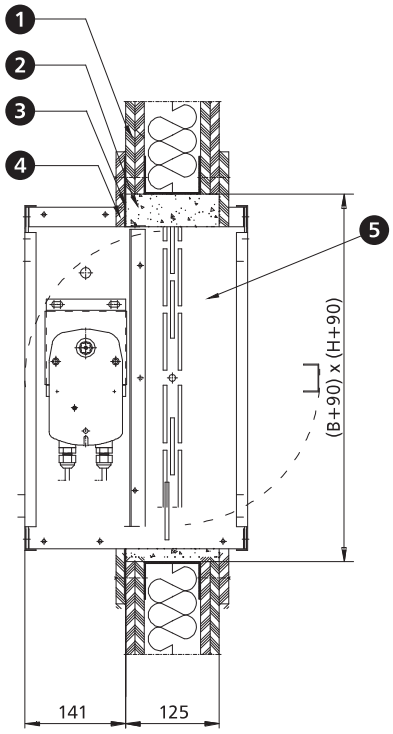
1.5. installation

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



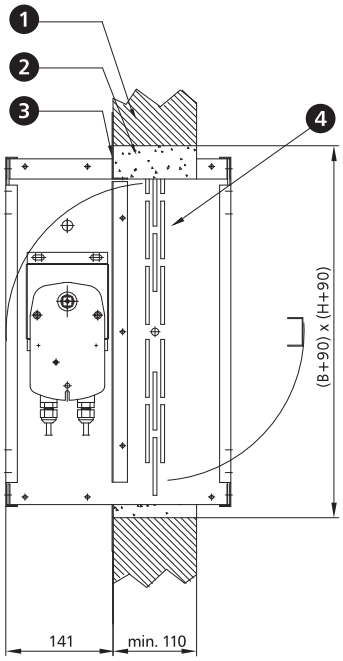
1.5.2. sample installation in lightweight walls of plaster-cardboard panels

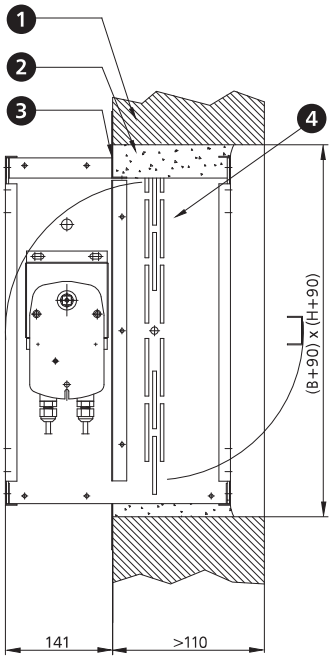


1. lightweight wall
2. sealing - plaster mortar*
3. mounting flange - embedding border
4. circumferential belt of 100 x 12.5 plaster-cardboard panels
5. fire damper mcr FID S

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

1.5.3. sample installation in concrete walls

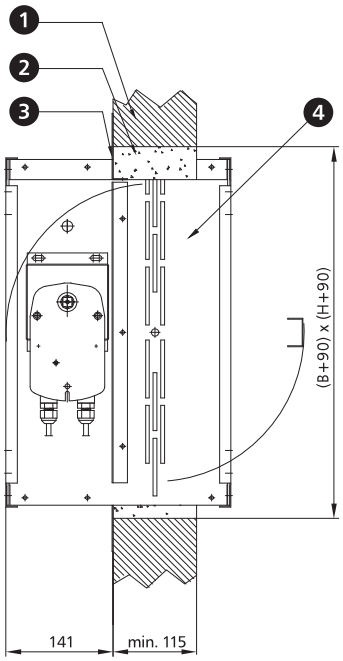


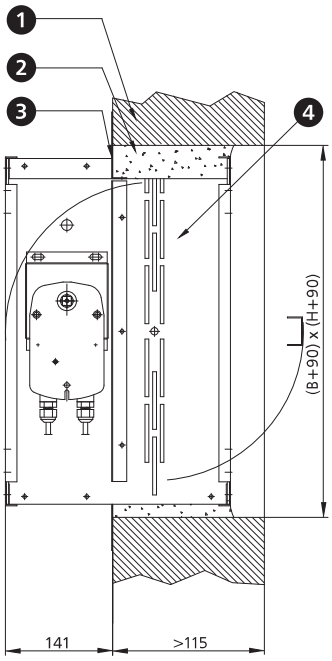


1. rigid wall
2. sealing - cement or cement-lime masonry mortar*
3. mounting flange - embedding border
4. fire damper mcr FID S

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

1.5.4. sample installation in masonry walls



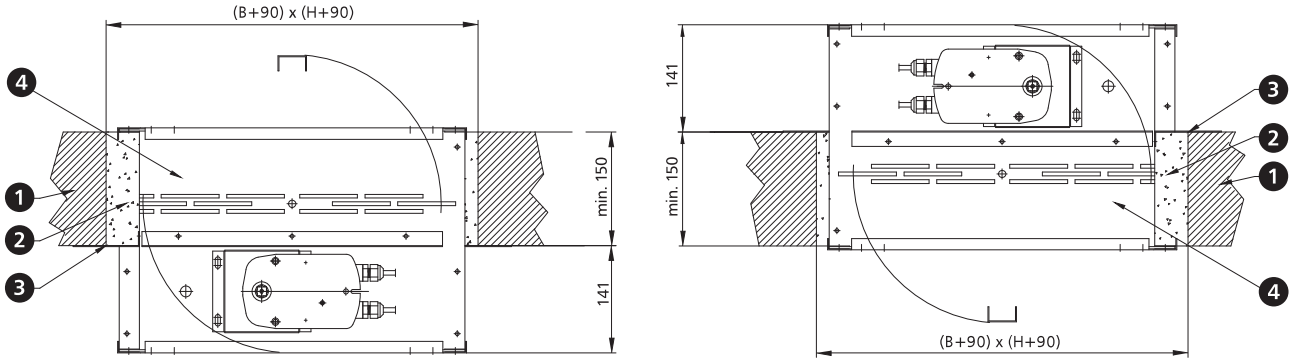


1. rigid wall
2. sealing - cement or cement-lime masonry mortar*
3. mounting flange - embedding border
4. fire damper mcr FID S

*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.

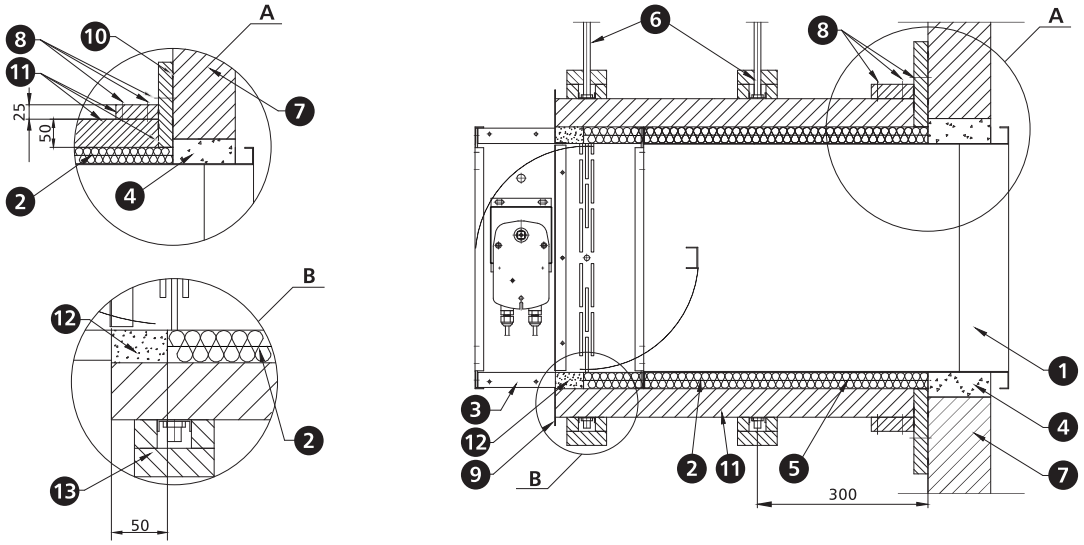
1.5.5. sample installation in ceilings



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. ST4.2x16 screw
3. fire damper mcr FID S
4. e.g. cement mortar*
5. mineral wool with the density of at least 80 kg/m^3 and thickness 30 mm, A1 class
6. suspension rod M12
7. wall
8. ST3,5x50 screw
9. angle - casting limits
10. board joints sealed with a bonding agent, e.g. Promat H 84
11. non-combustible board with the thickness corresponding to the fire rating of the fire partition (e.g. Promatect L500 for EI120 - thickness 50 mm)
12. e.g. gypsum mortar
13. 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 [m^2]
Se – damper active cross-section [m^2]

Q – flow [m^3/h]
dp – pressure drop [Pa]
L_{WA} – damper noise level [dB]

width B [mm]	height H [mm]	v [m/s]	200 Sk [m^2]	200 Se [m^2]	200 Q [m^3/h]	200 dp [Pa]	200 L_{WA} [dB]	250 Sk [m^2]	250 Se [m^2]	250 Q [m^3/h]	250 dp [Pa]	250 L_{WA} [dB]	300 Sk [m^2]	300 Se [m^2]	300 Q [m^3/h]	300 dp [Pa]	300 L_{WA} [dB]
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 [m^2]
Se – damper active cross-section [m^2]

Q – flow [m^3/h]
dp – pressure drop [Pa]
L_{WA} – damper noise level [dB]

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

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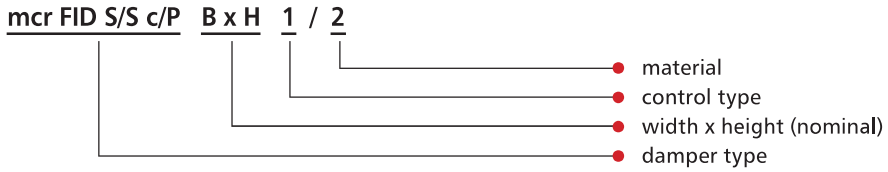
1.7. estimated weights of mcr FID S/S c/P dampers for rectangular ventilation ducts [kg]

height H [mm]	width B [mm]							
	200	**250**	**300**	**400**	**500**	**600**	**700**	**800**
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/m^2 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.