mcr WIP/S

multi-blade cut-off fire dampers for comfort ventilation systems

PRODUCT CONFIGURATOR AT WWW.MERCOR.COM.PL

CE 1396-CPR-0097

ATEST HIGIENICZNY

FIRES

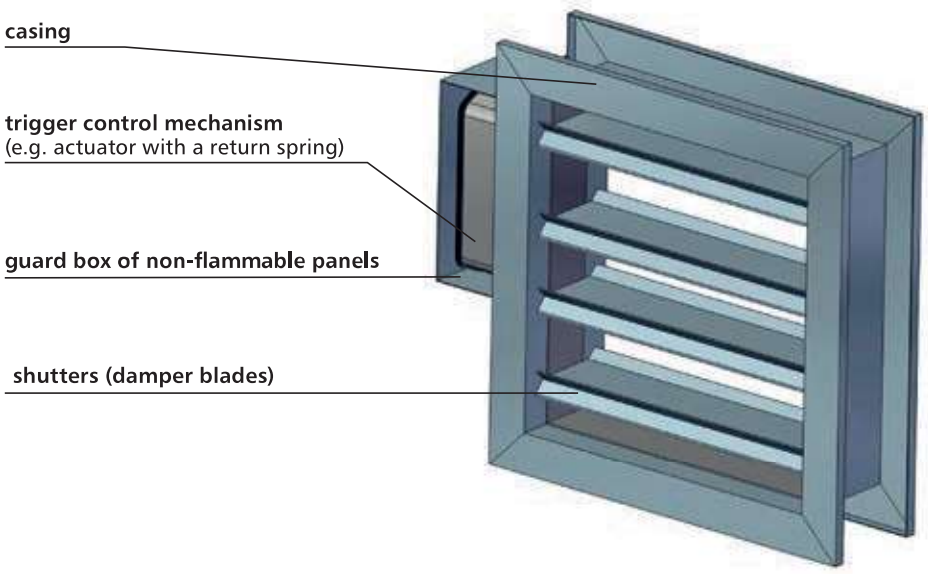
- **EIS60, ES120**
- **Certificate of constancy of performance 1396-CPR-P0097.**
- **Dampers certified for compliance with EN 15650.**
- **Dampers qualified under EN 13501-3 and tested under EN 1366-2.**
- **Narrow shutter cut-off dampers.**

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.

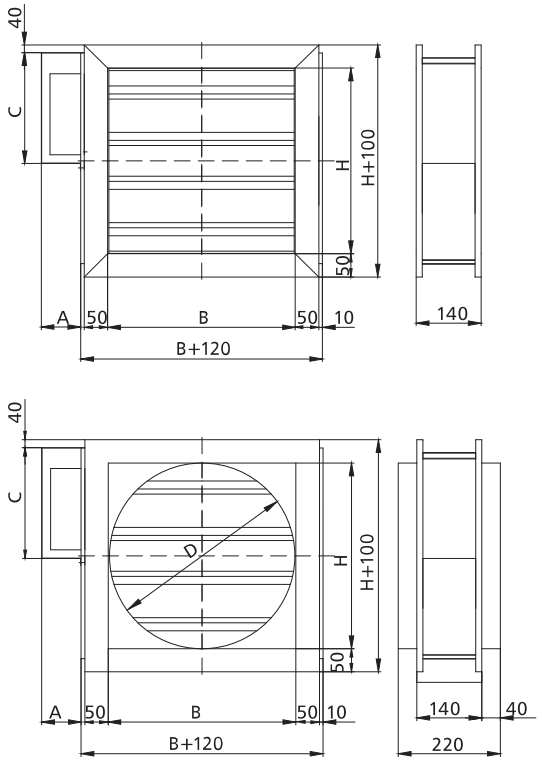
6.3. versions

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.

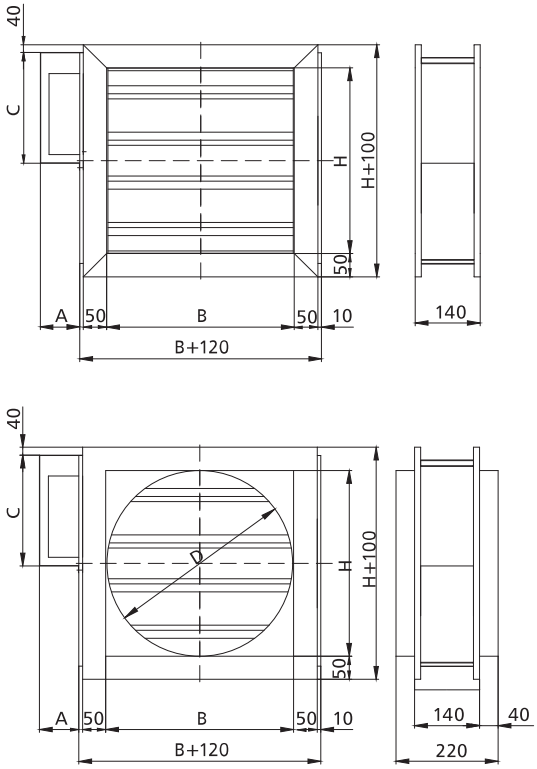


mechanism	A	C
BFN	125	325
BFL	125	275
BF	125	325
BF24TL-ST	125	325
EXBF	175	400

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 m^2

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.

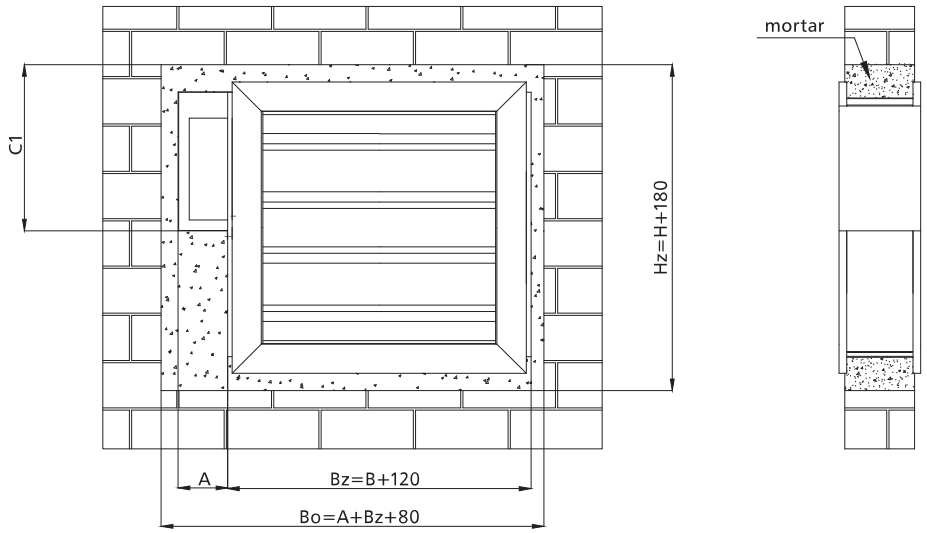
6.5. installation

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

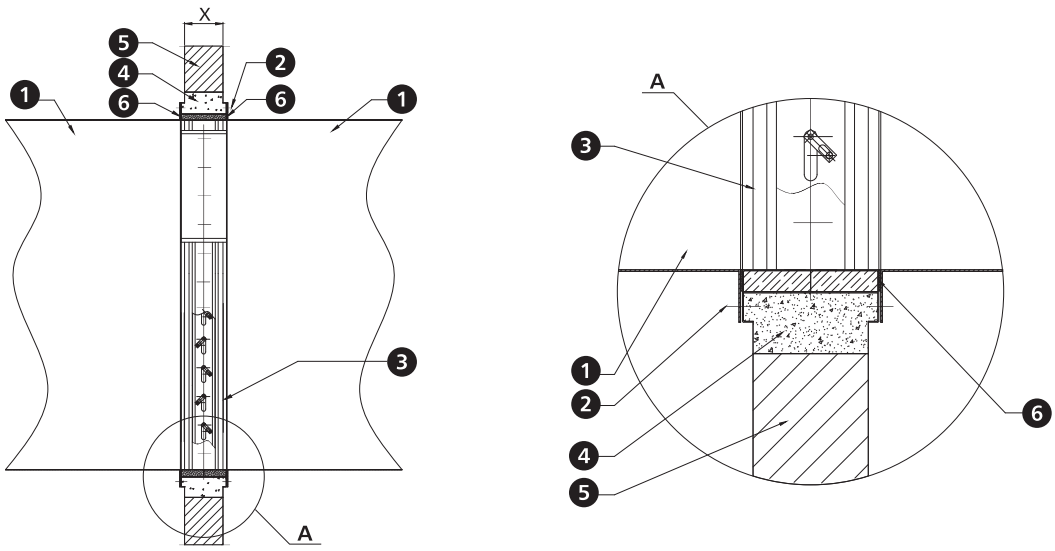
The minimum dimensions of the installation opening that permits correct installation of the mcr WIP/S damper is:

Bo = (A+Bz+80) mm
Ho = (H+180) 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

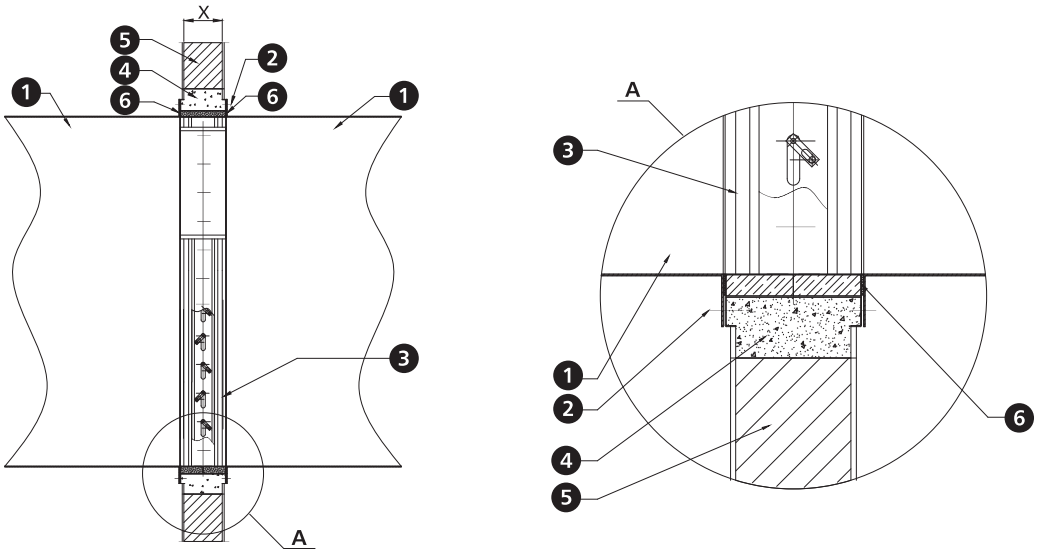


1. ventilation duct
2. screw ST4.2x16
3. fire damper mcr WIP
4. sealing - e.g. cement masonry mortar*
5. masonry wall
6. heat resistant gasket

X. wall thickness

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

6.5.3. sample installation in concrete block or full brick walls

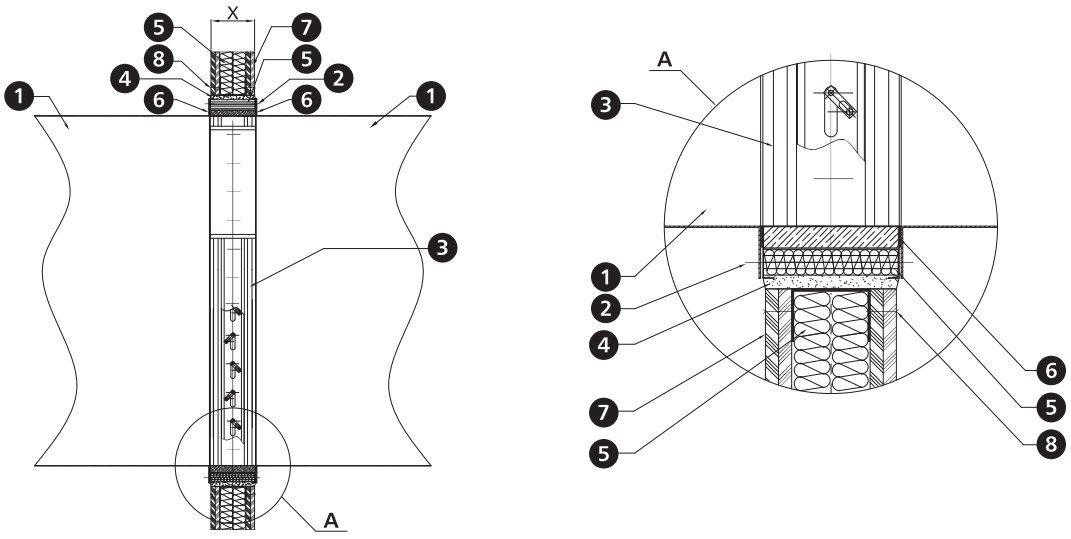


1. ventilation duct
2. screw ST4.2x16
3. fire damper mcr WIP
4. sealing - e.g. cement masonry mortar*
5. wall of concrete blocks or full bricks
6. heat resistant gasket

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

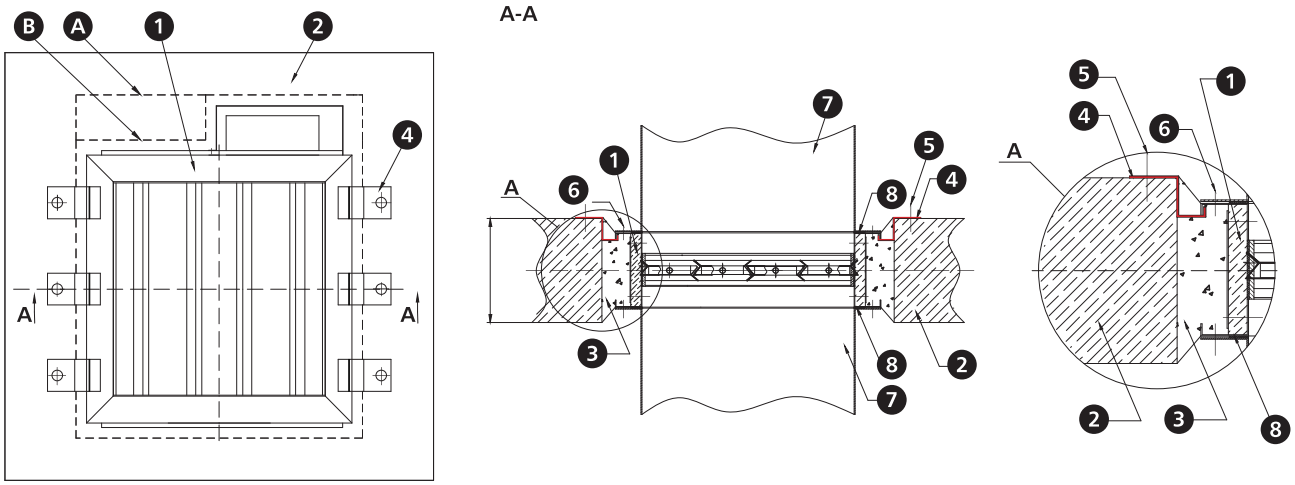


1. ventilation duct
2. screw ST4.2x16
3. fire damper mcr WIP
4. sealing - e.g. cement masonry mortar*
5. mineral wool with the density of at least 80 kg/m^3, A1 class
6. heat resistant gasket
7. lightweight wall
8. screw ST5.5x38

X. wall thickness

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

6.5.5. sample installation in ceiling

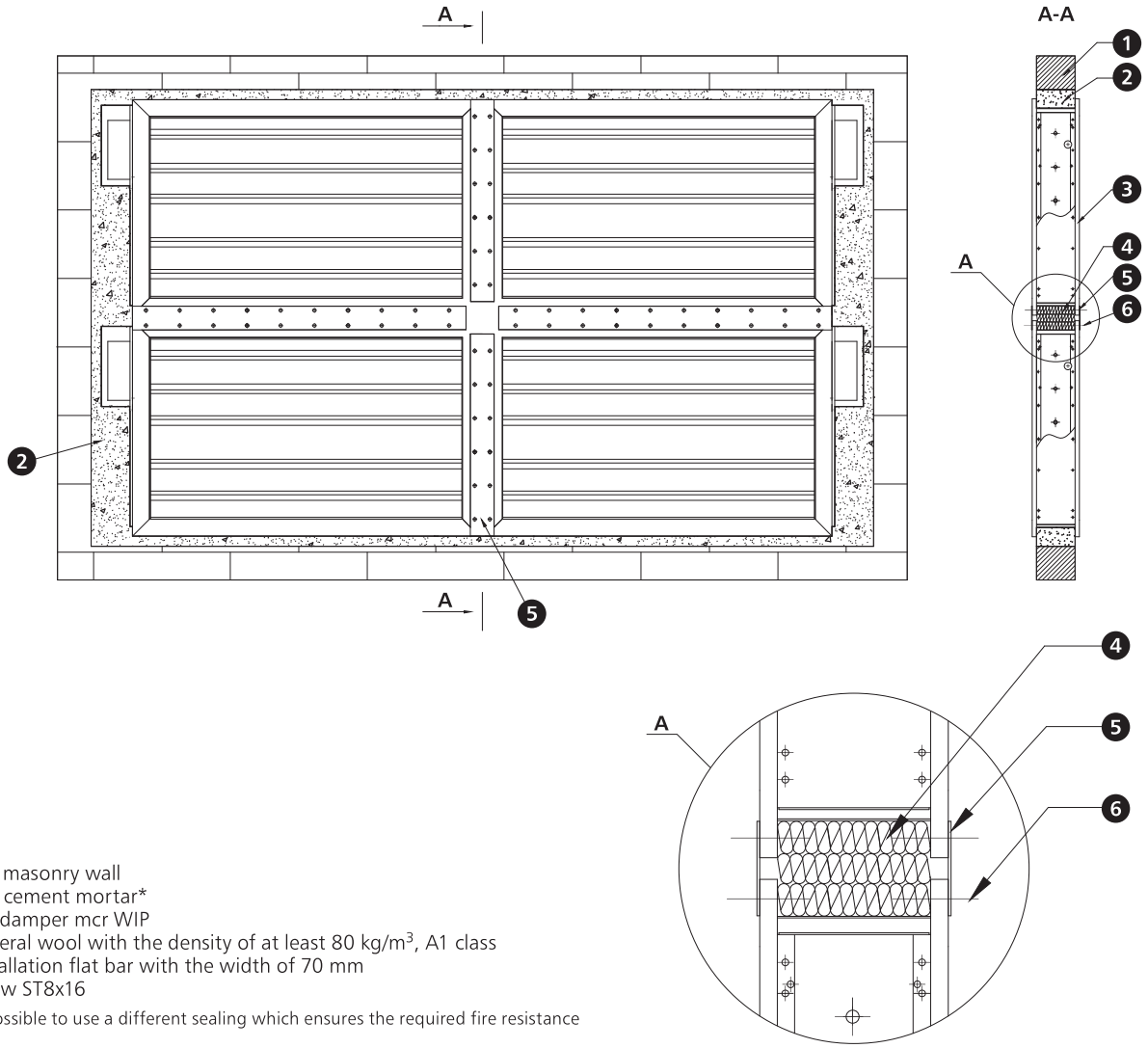


1. fire damper mcr WIP
2. ceiling
3. e.g. cement mortar*
4. mounting bracket
5. steel expansion anchor with M6 metal screw
6. ST4.2x16 screw
7. ventilation duct
8. heat resistant gasket

A./B. construction opening

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

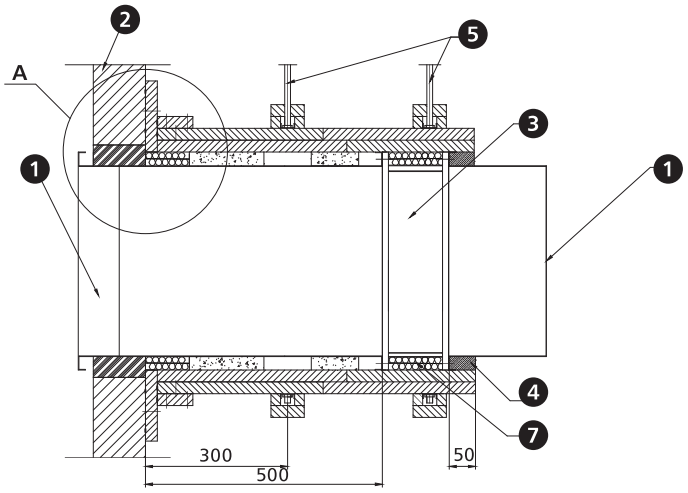
6.5.6 sample installation in a multiple set (a battery of four dampers)

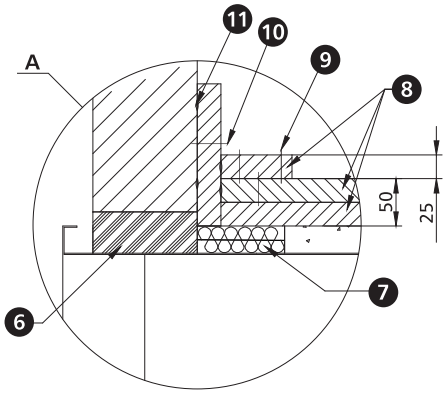


1. e.g. masonry wall
2. e.g. cement mortar*
3. fire damper mcr WIP
4. mineral wool with the density of at least 80 kg/m^3, A1 class
5. installation flat bar with the width of 70 mm
6. screw ST8x16

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

6.5.7. sample installation outside the fire partition





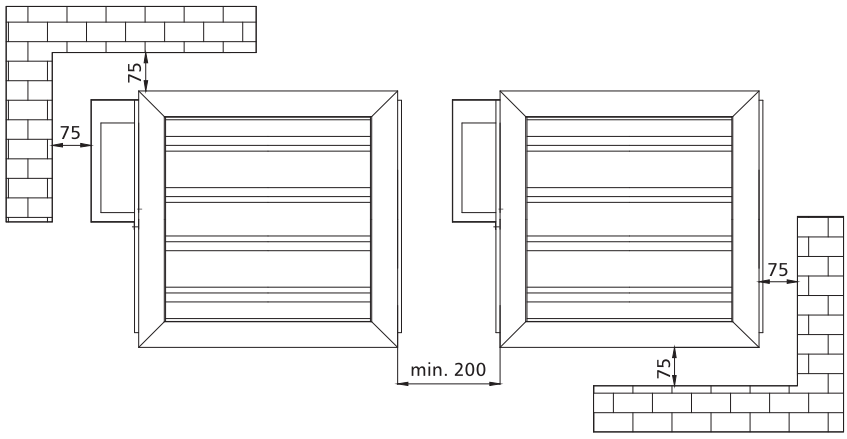
1. ventilation duct
2. fire partition
3. fire damper mcr WIP
4. gypsum filling
5. duct suspension
6. sealing (cement or cement-lime masonry mortar)*
7. mineral wool with the density of at least 80 kg/m^3, A1 class
8. Ridurit fire retardant board
9. screws 3.5 x 50 – spacing: ~150 mm
10. steel expansion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

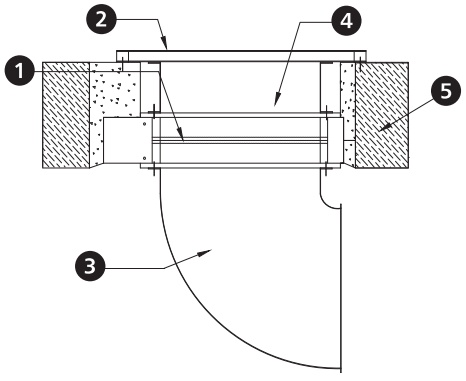
Fire damper installation with vertical rotation axis of the louvers

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.

6.6. technical parameters of mcr WIP/S 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]

		wysokość H [mm]															
		200					250					300					
width B [mm]		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]	Sk [m^2]	Se [m^2]	Q [m^3/h]	dp [Pa]	L_{WA} [dB]
	200	4	0.040	0.034	490	6	26	0.050	0.043	612	6	26	0.06	0.051	734	6	27
		6			734	13	36			918	13	37			1 102	13	37
		8			979	24	44			1 224	23	44			1 469	22	45
		10			1 224	37	49			1 530	36	50			1 836	35	50
	250	4	0.050	0.043	612	6	26	0.063	0.053	765	6	27	0.075	0.064	918	6	28
		6			918	13	37			1 148	13	38			1 377	13	38
		8			1 224	23	44			1 530	23	45			1 836	22	46
		10			1 530	36	50			1 913	36	51			2 295	35	51
	300	4	0.060	0.051	734	6	27	0.075	0.064	918	6	28	0.09	0.077	1 102	6	28
		6			1 102	13	37			1 377	13	38			1 652	13	39
		8			1 469	23	45			1 836	23	46			2 203	22	46
		10			1 836	36	51			2 295	36	52			2 754	35	52
	350	4	0.070	0.060	857	6	27	0.088	0.074	1 071	36	52	0.105	0.089	1 285	5	29
		6			1 285	13	38			1 607	13	39			1 928	12	39
		8			1 714	22	45			2 142	22	46			2 570	22	47
		10			2 142	35	51			2 678	35	52			3 213	34	52
	400	4	0.080	0.068	979	6	28	0.100	0.085	1 224	6	29	0.12	0.102	1 469	5	29
		6			1 469	13	38			1 836	13	39			2 203	12	40
		8			1 958	22	46			2 448	22	47			2 938	22	47
		10			2 448	35	52			3 060	35	53			3 672	34	53
	450	4	0.090	0.077	1 102	6	28	0.113	0.096	1 377	6	29	0.135	0.115	1 652	5	30
		6			1 652	13	39			2 066	13	40			2 479	12	40
		8			2 203	22	46			2 754	22	47			3 305	22	48
		10			2 754	35	52			3 443	35	53			4 131	34	54
	500	4	0.100	0.085	1 224	5	28	0.125	0.106	1 530	5	29	0.15	0.128	1 836	5	30
		6			1 836	12	39			2 295	12	40			2 754	12	40
		8			2 448	22	46			3 060	22	47			3 672	21	48
		10			3 060	34	52			3 825	34	53			4 590	33	54
	550	4	0.110	0.094	1 346	5	29	0.138	0.117	1 683	5	30	0.165	0.140	2 020	5	31
		6			2 020	12	39			2 525	12	40			3 029	12	41
		8			2 693	22	47			3 366	22	48			4 039	22	49
		10			3 366	34	53			4 208	34	54			5 049	34	54
	600	4	0.120	0.102	1 469	5	29	0.150	0.128	1 836	5	30	0.18	0.153	2 203	5	31
		6			2 203	12	40			2 754	12	41			3 305	12	41
		8			2 938	22	47			3 672	22	48			4 406	21	49
		10			3 672	34	53			4 590	34	54			5 508	33	54
	650	4	0.130	0.111	1 591	5	30	0.163	0.138	1 989	5	30	0.195	0.166	2 387	5	31
		6			2 387	12	40			2 984	12	41			3 580	12	41
		8			3 182	22	48			3 978	22	49			4 774	21	49
		10			3 978	34	53			4 973	34	54			5 967	33	55
	700	4	0.140	0.119	1 714	5	30	0.175	0.149	2 142	5	31	0.21	0.179	2 570	5	31
		6			2 570	12	40			3 213	12	41			3 856	12	42
		8			3 427	22	48			4 284	22	49			5 141	21	49
		10			4 284	34	54			5 355	34	55			6 426	33	55
	750	4	0.150	0.128	1 836	5	30	0.188	0.159	2 295	5	31	0.225	0.191	2 754	5	31
		6			2 754	12	40			3 443	12	41			4 131	12	42
		8			3 672	21	48			4 590	21	49			5 508	21	49
		10			4 590	33	54			5 738	33	55			6 885	32	55
	800	4	0.160	0.136	1 958	5	30	0.200	0.170	2 448	5	31	0.24	0.204	2 938	5	31
		6			2 938	12	41			3 672	12	42			4 406	12	42
		8			3 917	21	48			4 896	21	49			5 875	21	49
		10			4 896	33	54			6 120	33	55			7 344	32	55
	850	4	0.170	0.145	2 081	5	30	0.213	0.181	2 601	5	31	0.255	0.217	3 121	5	31
		6			3 121	12	40			3 902	12	41			4 682	11	42
		8			4 162	21	48			5 202	21	49			6 242	20	49
		10			5 202	32	54			6 503	32	55			7 803	31	55
	900	4	0.180	0.153	2 203	5	30	0.225	0.191	2 754	5	31	0.27	0.230	3 305	5	31
		6			3 305	12	41			4 131	12	42			4 957	11	42
		8			4 406	21	48			5 508	21	49			6 610	20	50
		10			5 508	32	54			6 885	32	55			8 262	31	55
	1000	4	0.200	0.170	2 448	5	31	0.250	0.213	3 060	5	32	0.3	0.255	3 672	5	32
		6			3 672	12	41			4 590	12	42			5 508	11	43
		8			4 896	21	49			6 120	21	50			7 344	20	50
		10			6 120	32	54			7 650	32	55			9 180	31	56

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

6.6. technical parameters of mcr WIP/S 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]	350 Sk [m^2]	350 Se [m^2]	350 Q [m^3/h]	350 dp [Pa]	350 L_{WA} [dB]	400 Sk [m^2]	400 Se [m^2]	400 Q [m^3/h]	400 dp [Pa]	400 L_{WA} [dB]	450 Sk [m^2]	450 Se [m^2]	450 Q [m^3/h]	450 dp [Pa]	450 L_{WA} [dB]
	200	4	0.070	0.060	857	6	27	0.080	0.068	979	5	27	0.090	0.077	1 102	5	28
		6			1 285	13	38			1 469	12	38			1 652	12	38
		8			1 714	22	45			1 958	22	45			2 203	22	46
		10			2 142	35	51			2 448	34	51			2 754	34	52
	250	4	0.088	0.074	1 071	6	28	0.100	0.085	1 224	5	28	0.113	0.096	1 377	5	29
		6			1 607	13	39			1 836	12	39			2 066	12	39
		8			2 142	22	46			2 448	22	46			2 754	22	47
		10			2 678	35	52			3 060	34	52			3 443	34	53
	300	4	0.105	0.089	1 285	6	29	0.120	0.102	1 469	5	29	0.135	0.115	1 652	5	30
		6			1 928	13	40			2 203	12	40			2 479	12	40
		8			2 570	22	47			2 938	22	47			3 305	22	48
		10			3 213	35	53			3 672	34	53			4 131	34	54
	350	4	0.123	0.104	1 499	5	29	0.140	0.119	1 714	5	29	0.158	0.134	1 928	5	30
		6			2 249	12	40			2 570	12	40			2 892	12	41
		8			2 999	22	47			3 427	21	48			3 856	21	48
		10			3 749	34	53			4 284	33	53			4 820	33	54
	400	4	0.140	0.119	1 714	5	30	0.160	0.136	1 958	5	30	0.180	0.153	2 203	5	31
		6			2 570	12	40			2 938	12	41			3 305	12	41
		8			3 427	22	48			3 917	21	48			4 406	21	49
		10			4 284	34	54			4 896	33	54			5 508	33	54
	450	4	0.158	0.134	1 928	5	30	0.180	0.153	2 203	5	31	0.203	0.172	2 479	5	31
		6			2 892	12	41			3 305	12	41			3 718	12	42
		8			3 856	22	48			4 406	21	49			4 957	21	49
		10			4 820	34	54			5 508	33	54			6 197	33	55
	500	4	0.175	0.149	2 142	5	30	0.200	0.170	2 448	5	31	0.225	0.191	2 754	5	32
		6			3 213	12	41			3 672	12	42			4 131	12	42
		8			4 284	21	48			4 896	21	49			5 508	21	50
		10			5 355	33	54			6 120	33	55			6 885	33	55
	550	4	0.193	0.164	2 570	5	31	0.220	0.187	2 693	5	31	0.248	0.210	3 029	5	32
		6			3 856	12	42			4 039	12	42			4 544	12	43
		8			5 141	22	49			5 386	21	49			6 059	21	50
		10			6 426	34	55			6 732	33	55			7 574	33	56
	600	4	0.210	0.179	2 570	5	31	0.240	0.204	2 938	4	28	0.270	0.230	3 305	5	32
		6			3 856	12	42			4 406	8	37			4 957	12	42
		8			5 141	21	49			5 875	14	44			6 610	21	50
		10			6 426	33	55			7 344	32	55			8 262	32	56
	650	4	0.228	0.193	2 785	5	32	0.260	0.221	3 182	5	32	0.293	0.249	3 580	5	32
		6			4 177	12	42			4 774	12	42			5 370	12	43
		8			5 569	21	50			6 365	21	50			7 160	21	50
		10			6 962	33	55			7 956	32	56			8 951	32	56
	700	4	0.245	0.208	2 999	5	32	0.28	0.238	3 427	5	32	0.315	0.268	3 856	5	33
		6			4 498	12	42			5 141	12	43			5 783	12	43
		8			5 998	21	50			6 854	21	50			7 711	21	51
		10			7 497	33	56			8 568	32	56			9 639	32	56
	750	4	0.263	0.223	3 213	5	32	0.3	0.255	3 672	5	32	0.338	0.287	4 131	5	33
		6			4 820	12	42			5 508	12	43			6 197	12	43
		8			6 426	21	50			7 344	21	50			8 262	21	51
		10			8 033	32	56			9 180	32	56			10 328	32	57
	800	4	0.280	0.238	3 427	5	32	0.32	0.272	3 917	5	33	0.360	0.306	4 406	5	32
		6			5 141	12	43			5 875	11	43			6 610	11	42
		8			6 854	21	50			7 834	20	50			8 813	20	50
		10			8 568	32	56			9 792	31	56			11 016	31	56
	850	4	0.298	0.253	3 641	5	32	0.34	0.289	4 162	5	32	0.383	0.325	4 682	5	31
		6			5 462	11	42			6 242	11	43			7 023	11	42
		8			7 283	20	50			8 323	19	50			9 364	19	49
		10			9 104	31	56			10 404	30	56			11 705	30	55
	900	4	0.315	0.268	3 856	5	32	0.360	0.306	4 406	6	35	0.405	0.344	4 957	5	31
		6			5 783	11	43			6 610	12	44			7 436	11	42
		8			7 711	20	50			8 813	26	54			9 914	19	49
		10			9 639	31	56			11 016	30	56			12 393	30	55
	1000	4	0.350	0.298	4 284	5	33	0.400	0.340	4 896	5	33	0.450	0.383	5 508	5	31
		6			6 426	11	43			7 344	11	43			8 262	11	42
		8			8 568	20	51			9 792	19	51			11 016	19	49
		10			10 710	31	56			12 240	30	57			13 770	30	55

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6.6. technical parameters of mcr WIP/S 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]	500 Sk [m^2]	500 Se [m^2]	500 Q [m^3/h]	500 dp [Pa]	500 L_{WA} [dB]	550 Sk [m^2]	550 Se [m^2]	550 Q [m^3/h]	550 dp [Pa]	550 L_{WA} [dB]	600 Sk [m^2]	600 Se [m^2]	600 Q [m^3/h]	600 dp [Pa]	600 L_{WA} [dB]
200		4	0.100	0.085	1 224	5	28	0.110	0.094	1 346	5	28	0.120	0.102	1 469	5	28
		6			1 836	12	39			2 020	12	39			2 203	12	39
		8			2 448	21	46			2 693	21	46			2 938	21	46
		10			3 060	33	52			3 366	33	52			3 672	32	52
250		4	0.125	0.106	1 530	5	29	0.138	0.117	1 683	5	29	0.150	0.128	1 836	5	29
		6			2 295	12	40			2 525	12	40			2 754	12	40
		8			3 060	21	47			3 366	21	47			3 672	21	47
		10			3 825	33	53			4 208	33	53			4 590	32	53
300		4	0.150	0.128	1 836	5	30	0.165	0.140	2 020	5	30	0.180	0.153	2 203	5	30
		6			2 754	12	40			3 029	12	41			3 305	12	41
		8			3 672	21	48			4 039	21	48			4 406	21	48
		10			4 590	33	54			5 049	33	54			5 508	32	54
350		4	0.175	0.149	2 142	5	30	0.193	0.164	2 356	5	30	0.210	0.179	2 570	5	30
		6			3 213	12	41			3 534	12	41			3 856	11	41
		8			4 284	21	48			4 712	21	49			5 141	20	48
		10			5 355	32	54			5 891	32	54			6 426	31	54
400		4	0.200	0.170	2 448	5	31	0.220	0.187	2 693	5	31	0.240	0.204	2 938	5	31
		6			3 672	12	41			4 039	12	42			4 406	11	42
		8			4 896	21	49			5 386	21	49			5 875	20	49
		10			6 120	32	54			6 732	32	55			7 344	31	55
450		4	0.225	0.191	2 754	5	31	0.248	0.210	3 029	5	32	0.270	0.230	3 305	5	31
		6			4 131	12	42			4 544	12	42			4 957	11	42
		8			5 508	21	49			6 059	21	50			6 610	20	50
		10			6 885	32	55			7 574	32	55			8 262	31	55
500		4	0.250	0.213	3 060	5	31	0.275	0.234	3 366	5	32	0.300	0.255	3 672	5	32
		6			4 590	11	42			5 049	12	43			5 508	11	43
		8			6 120	22	51			6 732	21	50			7 344	20	50
		10			7 650	32	55			8 415	32	56			9 180	31	56
550		4	0.275	0.234	3 672	5	32	0.303	0.257	4 039	5	32	0.330	0.281	4 406	5	32
		6			5 508	12	43			6 059	12	43			6 610	11	43
		8			7 344	21	50			8 078	21	50			8 813	20	50
		10			9 180	32	56			10 098	32	56			11 016	31	56
600		4	0.300	0.255	3 672	5	32	0.330	0.281	4 039	5	32	0.360	0.306	4 406	5	32
		6			5 508	11	43			6 059	11	43			6 610	11	43
		8			7 344	20	50			8 078	20	50			8 813	19	50
		10			9 180	31	56			10 098	31	56			11 016	30	56
650		4	0.325	0.276	3 978	5	33	0.358	0.304	4 376	5	33	0.390	0.332	4 774	5	33
		6			5 967	12	43			6 564	11	43			7 160	11	43
		8			7 956	21	51			8 752	20	51			9 547	19	51
		10			9 945	31	56			10 940	31	57			11 934	30	57
700		4	0.350	0.298	4 284	5	33	0.385	0.327	4 712	5	33	0.420	0.357	5 141	5	33
		6			6 426	11	43			7 069	11	44			7 711	11	44
		8			8 568	20	51			9 425	20	51			10 282	19	51
		10			10 710	31	56			11 781	31	57			12 852	30	57
750		4	0.375	0.319	4 590	5	33	0.413	0.351	5 049	5	33	0.450	0.383	5 508	5	33
		6			6 885	11	43			7 574	11	44			8 262	11	44
		8			9 180	20	51			10 098	20	51			11 016	19	51
		10			11 475	31	57			12 623	31	57			13 770	30	57
800		4	0.400	0.340	4 896	5	32	0.440	0.374	5 386	5	33	0.480	0.408	5 875	5	33
		6			7 344	11	43			8 078	11	44			8 813	10	44
		8			9 792	19	51			10 771	19	51			11 750	19	51
		10			12 240	30	56			13 464	30	57			14 688	29	57
850		4	0.425	0.361	5 202	5	32	0.468	0.397	5 722	5	33	0.510	0.434	6 242	4	33
		6			7 803	10	43			8 583	10	44			9 364	10	43
		8			10 404	19	50			11 444	19	51			12 485	18	51
		10			13 005	29	56			14 306	29	57			15 606	28	57
900		4	0.450	0.383	5 508	5	32	0.495	0.421	6 059	5	33	0.540	0.459	6 610	4	33
		6			8 262	10	43			9 088	10	44			9 914	10	41
		8			11 016	19	50			12 118	19	51			13 219	18	49
		10			13 770	29	56			15 147	29	57			16 524	28	54
1000		4	0.500	0.425	6 120	5	32	0.550	0.468	6 059	5	34	0.600	0.510	7 344	4	34
		6			9 180	10	43			9 088	10	44			11 016	10	44
		8			12 240	19	50			12 118	19	52			14 688	18	52
		10			15 300	29	56			15 147	29	58			18 360	28	57

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6.6. technical parameters of mcr WIP/S 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]	650					700					750				
	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]	Sk [m^2]	Se [m^2]	Q [m^3/h]	dp [Pa]	L_{WA} [dB]
200	4	0.130	0.111	1 591	5	29	0.140	0.119	1 714	5	29	0.150	0.128	1 836	5	29
	6			2 387	12	39			2 570	11	39			2 754	11	40
	8			3 182	21	47			3 427	20	47			3 672	20	47
	10			3 978	32	53			4 284	31	52			4 590	31	53
250	4	0.163	0.138	1 989	5	30	0.175	0.149	2 142	5	30	0.188	0.159	2 295	5	30
	6			2 984	12	40			3 213	11	40			3 443	11	40
	8			3 978	21	48			4 284	20	48			4 590	20	48
	10			4 973	32	54			5 355	31	53			5 738	31	54
300	4	0.195	0.166	2 387	5	30	0.210	0.179	2 570	5	30	0.225	0.191	2 754	5	31
	6			3 580	12	41			3 856	11	41			4 131	11	41
	8			4 774	21	49			5 141	20	48			5 508	20	49
	10			5 967	32	54			6 426	31	54			6 885	31	55
350	4	0.228	0.193	2 785	5	31	0.245	0.208	2 999	5	31	0.263	0.223	3 213	5	31
	6			4 177	11	41			4 498	11	41			4 820	11	42
	8			5 569	20	49			5 998	19	49			6 426	19	49
	10			6 962	31	55			7 497	30	54			8 033	30	55
400	4	0.260	0.221	3 182	5	31	0.280	0.238	3 427	5	31	0.300	0.255	3 672	5	32
	6			4 774	11	42			5 141	11	42			5 508	11	42
	8			6 365	20	49			6 854	19	49			7 344	19	50
	10			7 956	31	55			8 568	30	55			9 180	30	55
450	4	0.293	0.249	3 580	5	32	0.315	0.268	3 856	5	32	0.338	0.287	4 131	5	32
	6			5 370	11	42			5 783	11	42			6 197	11	43
	8			7 160	20	50			7 711	19	50			8 262	19	50
	10			8 951	31	56			9 639	30	56			10 328	30	56
500	4	0.325	0.276	3 978	5	32	0.350	0.298	4 284	5	32	0.375	0.319	4 590	5	32
	6			5 967	11	43			6 426	11	43			6 885	11	43
	8			7 956	20	50			8 568	19	50			9 180	19	51
	10			9 945	31	56			10 710	30	56			11 475	30	56
550	4	0.358	0.304	4 774	5	33	0.385	0.327	4 712	5	33	0.413	0.351	5 049	5	33
	6			7 160	11	43			7 069	11	43			7 574	11	43
	8			9 547	20	51			9 425	19	51			10 098	19	51
	10			11 934	31	57			11 781	30	56			12 623	30	57
600	4	0.390	0.332	4 774	5	33	0.420	0.357	5 141	5	33	0.450	0.383	5 508	5	33
	6			7 160	11	44			7 711	11	44			8 262	11	44
	8			9 547	20	51			10 282	19	51			11 016	19	51
	10			11 934	31	57			12 852	30	57			13 770	30	57
650	4	0.423	0.359	5 171	5	33	0.455	0.387	5 569	5	33	0.488	0.414	5 967	5	33
	6			7 757	11	44			8 354	10	43			8 951	10	44
	8			10 343	19	51			11 138	19	51			11 934	19	51
	10			12 929	30	57			13 923	29	57			14 918	29	57
700	4	0.455	0.387	5 569	5	33	0.490	0.417	5 998	5	33	0.525	0.446	6 426	5	34
	6			8 354	11	44			8 996	10	44			9 639	10	44
	8			11 138	19	51			11 995	19	51			12 852	19	52
	10			13 923	30	57			14 994	29	57			16 065	29	57
750	4	0.488	0.414	5 967	5	34	0.525	0.446	6 426	5	34	0.563	0.478	6 885	5	34
	6			8 951	11	44			9 639	10	44			10 328	10	44
	8			11 934	19	52			12 852	19	52			13 770	19	52
	10			14 918	30	57			16 065	29	57			17 213	29	58
800	4	0.520	0.442	6 365	5	33	0.560	0.476	6 854	4	29	0.600	0.510	7 344	4	34
	6			9 547	10	44			10 282	7	37			11 016	10	44
	8			12 730	19	51			13 709	11	43			14 688	18	52
	10			15 912	29	57			17 136	28	54			18 360	28	57
850	4	0.553	0.470	6 763	4	33	0.595	0.506	7 283	4	34	0.638	0.542	7 803	4	34
	6			10 144	10	43			10 924	10	44			11 705	10	44
	8			13 525	18	51			14 566	18	52			15 606	18	52
	10			16 907	28	57			18 207	28	57			19 508	28	58
900	4	0.585	0.497	7 160	4	33	0.630	0.536	7 711	4	33	0.675	0.574	8 262	4	34
	6			10 741	10	43			11 567	10	44			12 393	10	44
	8			14 321	18	51			15 422	17	51			16 524	17	52
	10			17 901	28	57			19 278	27	57			20 655	27	58
1000	4	0.650	0.553	7 956	4	33	0.700	0.595	8 568	4	34	0.750	0.638	9 180	4	34
	6			11 934	10	43			12 852	10	44			13 770	10	45
	8			15 912	18	51			17 136	17	52			18 360	17	52
	10			19 890	28	57			21 420	27	58			22 950	27	58

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6.6. technical parameters of mcr WIP/S 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]	v [m/s]	height H [mm] 800 Sk [m^2]	800 Se [m^2]	800 Q [m^3/h]	800 dp [Pa]	800 L_{WA} [dB]	850 Sk [m^2]	850 Se [m^2]	850 Q [m^3/h]	850 dp [Pa]	850 L_{WA} [dB]	900 Sk [m^2]	900 Se [m2]	900 Q [m^3/h]	900 dp [Pa]	900 L_{WA} [dB]	1000 Sk [m^2]	1000 Se [m^2]	1000 Q [m^3/h]	1000 dp [Pa]	1000 L_{WA} [dB]
200	4	0.160	0.136	1 958	5	29	0.170	0.145	2 081	5	29	0.180	0.153	2 203	5	29	0.200	0.170	2 448	5	29
	6			2 938	11	39			3 121	11	40			3 305	10	39			3 672	10	40
	8			3 917	19	47			4 162	19	47			4 406	19	47			4 896	19	47
	10			4 896	30	53			5 202	30	53			5 508	29	53			6 120	29	53
250	4	0.200	0.170	2 448	5	30	0.213	0.181	2 601	5	30	0.225	0.191	2 754	5	30	0.250	0.213	3 060	5	30
	6			3 672	11	40			3 902	11	41			4 131	10	40			4 590	10	41
	8			4 896	19	48			5 202	19	48			5 508	19	48			6 120	19	48
	10			6 120	30	54			6 503	30	54			6 885	29	54			7 650	29	54
300	4	0.240	0.204	2 938	5	31	0.255	0.217	3 121	5	31	0.270	0.230	3 305	5	31	0.300	0.255	3 672	5	31
	6			4 406	11	41			4 682	11	41			4 957	10	41			5 508	10	42
	8			5 875	19	49			6 242	19	49			6 610	19	49			7 344	19	49
	10			7 344	30	54			7 803	30	55			8 262	29	54			9 180	29	55
350	4	0.280	0.238	3 427	5	31	0.298	0.253	3 641	5	31	0.315	0.268	3 856	4	31	0.350	0.298	4 284	4	31
	6			5 141	10	41			5 462	10	42			5 783	10	41			6 426	10	42
	8			6 854	19	49			7 283	19	49			7 711	18	49			8 568	18	49
	10			8 568	29	55			9 104	29	55			9 639	28	55			10 710	28	55
400	4	0.320	0.272	3 917	5	31	0.340	0.289	4 162	5	32	0.360	0.306	4 406	4	31	0.400	0.340	4 896	4	32
	6			5 875	10	42			6 242	10	42			6 610	10	42			7 344	10	42
	8			7 834	19	49			8 323	19	50			8 813	18	49			9 792	18	50
	10			9 792	29	55			10 404	29	55			11 016	28	55			12 240	28	56
450	4	0.360	0.306	4 406	5	32	0.383	0.325	4 682	4	32	0.405	0.344	4 957	4	31	0.450	0.383	5 508	4	32
	6			6 610	10	42			7 023	10	42			7 436	10	42			8 262	10	42
	8			8 813	19	50			9 364	18	50			9 914	17	50			11 016	17	50
	10			11 016	29	56			11 705	28	56			12 393	27	55			13 770	27	56
500	4	0.400	0.340	4 896	5	32	0.425	0.361	5 202	4	32	0.450	0.383	5 508	4	32	0.500	0.425	6 120	4	32
	6			7 344	10	43			7 803	10	43			8 262	10	42			9 180	10	43
	8			9 792	19	50			10 404	18	50			11 016	17	50			12 240	17	50
	10			12 240	29	56			13 005	28	56			13 770	27	56			15 300	27	56
550	4	0.440	0.374	5 386	5	33	0.468	0.397	5 722	4	33	0.495	0.421	6 059	4	32	0.550	0.468	6 732	4	33
	6			8 078	10	43			8 583	10	43			9 088	10	43			10 098	10	43
	8			10 771	19	51			11 444	18	51			12 118	17	50			13 464	17	51
	10			13 464	29	57			14 306	28	56			15 147	27	56			16 830	27	57
600	4	0.480	0.408	5 875	5	33	0.510	0.434	6 242	4	33	0.540	0.459	6 610	4	33	0.600	0.510	7 344	4	33
	6			8 813	10	44			9 364	10	43			9 914	10	43			11 016	10	44
	8			11 750	19	51			12 485	18	51			13 219	17	51			14 688	17	51
	10			14 688	29	57			15 606	28	57			16 524	27	57			18 360	27	57
650	4	0.520	0.442	6 365	5	33	0.553	0.470	6 763	4	33	0.585	0.497	7 160	4	33	0.650	0.553	7 956	4	34
	6			9 547	10	44			10 144	10	44			10 741	10	44			11 934	10	44
	8			12 730	19	52			13 525	18	51			14 321	17	51			15 912	17	52
	10			15 912	29	57			16 907	28	57			17 901	27	57			19 890	27	57
700	4	0.560	0.476	6 854	4	33	0.595	0.506	7 283	4	33	0.630	0.536	7 711	4	33	0.700	0.595	8 568	4	33
	6			10 282	10	44			10 924	10	44			11 567	9	43			12 852	9	44
	8			13 709	18	51			14 566	17	51			15 422	17	51			17 136	17	51
	10			17 136	28	57			18 207	27	57			19 278	26	57			21 420	26	57
750	4	0.600	0.510	7 344	4	34	0.638	0.542	7 803	4	33	0.675	0.574	8 262	4	33	0.750	0.638	9 180	4	34
	6			11 016	10	44			11 705	10	44			12 393	9	44			13 770	9	44
	8			14 688	18	52			15 606	17	51			16 524	17	51			18 360	17	52
	10			18 360	28	57			19 508	27	57			20 655	26	57			22 950	26	57
800	4	0.640	0.544	7 834	4	34	0.680	0.578	8 323	4	34	0.720	0.612	8 813	4	33	0.800	0.680	9 792	4	34
	6			11 750	10	44			12 485	10	44			13 219	9	44			14 688	9	44
	8			15 667	18	52			16 646	17	52			17 626	17	52			19 584	17	52
	10			19 584	28	58			20 808	27	58			22 032	26	57			24 480	26	58
850	4	0.680	0.578	8 323	4	34	0.723	0.614	8 843	4	33	0.765	0.650	9 364	4	34	0.850	0.723	10 404	4	34
	6			12 485	10	44			13 265	9	44			14 045	9	44			15 606	9	45
	8			16 646	17	52			17 687	17	52			18 727	17	52			20 808	17	52
	10			20 808	27	58			22 109	26	57			23 409	26	58			26 010	26	58
900	4	0.720	0.612	8 813	4	34	0.765	0.650	9 364	4	34	0.810	0.689	9 914	4	34	0.900	0.765	11 016	4	34
	6			13 219	10	45			14 045	9	44			14 872	9	45			16 524	9	44
	8			17 626	17	52			18 727	17	52			19 829	17	52			22 032	16	52
	10			22 032	27	58			23 409	26	58			24 786	26	58			27 540	25	58
1000	4	0.800	0.680	9 792	4	34	0.850	0.723	10 404	4	34	0.900	0.765	11 016	4	33	1.000	0.850	12 240	4	34
	6			14 688	9	44			15 606	9	44			16 524	9	44			18 360	9	44
	8			19 584	17	52			20 808	16	52			22 032	15	51			24 480	15	52
	10			24 480	26	58			26 010	25	58			27 540	24	57			30 600	24	58

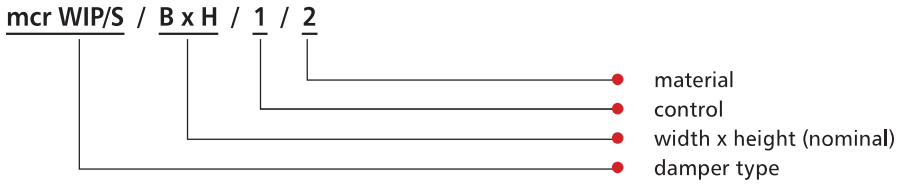
The mcr WIP fire damper selection program is available at **www.mercor.com.pl**, in the Architect and Designer Zone.

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

height H [mm] \ width B [mm]	200	250	300	400	500	600	700	800	900	1000
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



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/m^2 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.