



Technical Catalogue

A low-angle, black and white photograph of several modern skyscrapers reaching towards the sky. The buildings have glass facades and some have distinctive architectural features like curved balconies or external piping. The sky is overcast.

FIRE VENTILATION SYSTEMS
FIRE DAMPERS AND FIRE VALVES

Fire ventilation systems Technical Catalogue

Edited by: "MERCOR" S.A. - Fire Ventilation Systems Department Team

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FIRE DAMPERS & SMOKE CONTROL DAMPERS AND FIRE VALVES

Table of contents

1	mcr FID B Single-blade smoke control dampers for multi-compartment fire ventilation systems	> 6
2	mcr FID S/S c/P Low-resistance single-blade cut-off fire dampers for comfort ventilation systems	> 25
3	mcr FID S/S p/P, mcr FID S/S p/O Single-blade cut-off fire dampers for comfort ventilation systems	> 42
4	mcr FID S/V p/P, mcr FID S/V-M p/P Single-blade smoke control dampers for multi-compartment fire ventilation systems	> 71
5	mcr FID PRO Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems	> 97
6	mcr FID WING Cut-off fire dampers for comfort ventilation systems	> 113
7	mcr FID 240 Cut-off fire dampers for comfort ventilation systems	> 124
8	mcr ZIPP Cut-off fire valves	> 137
9	mcr WIP/S Multi-blade cut-off fire dampers for comfort ventilation systems	> 145
10	mcr WIP/T Multi-blade transfer fire dampers	> 157
11	mcr WIP/V, mcr WIP/V-M Multi-blade smoke control dampers for multi-compartment fire ventilation systems	> 174
12	mcr WIP PRO/S Multi-blade cut-off fire dampers for comfort ventilation systems	> 188
13	mcr WIP PRO/T Multi-blade transfer fire dampers	> 205
14	mcr WIP PRO/V, mcr WIP PRO/V-M Multi-blade smoke control dampers for multi-compartment fire ventilation systems	> 230
15	mcr WIP PROV/V, mcr WIP PROV/V-M Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems	> 257
16	mcr FS Curtain fire dampers	> 299
17	mcr DOR Smoke control door dampers for fire ventilation systems	> 308
18	mcr WIP LD Multi-blade smoke control damper for multi-zone fire ventilation systems	> 334
19	Power supply and control Trigger control mechanisms	> 350

Technical Catalogue

Dear Customers!

Below you will find our Technical Catalogue for fire ventilation systems, which contains detailed information on the application, design, versions, manufacturing options and equipment, methods of installation and technical parameters of our fire dampers and valves.

Every device dispatched from the „MERCOR“ S.A. manufacturing plants 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

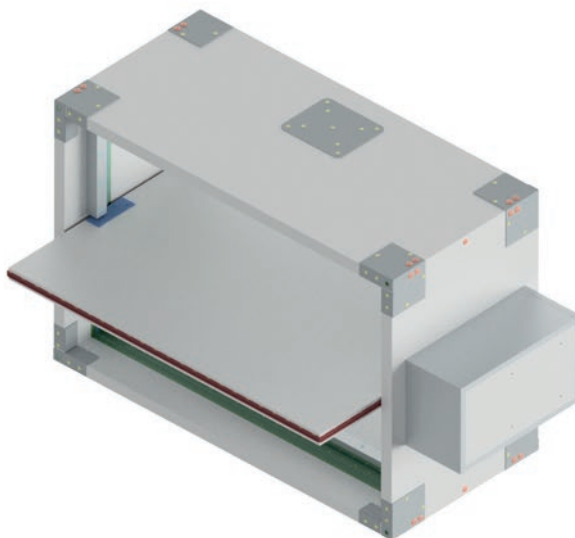
The electronic version
of our Technical Catalogue
is available at www.mercor.com.pl



> mcr FID B | Single-blade smoke control dampers for multi-compartment fire ventilation systems



downloadable models
on the website
under the designer zone tab



» EIS120, E₆₀₀ 120

- » Fire resistance class: EI120 ($v_{ed} h_{od} i \leftrightarrow o$)S1500C₁₀₀₀₀MAmulti.
- » Certificate of constancy of performance 2434-CPR-0031. Dampers certified for compliance with EN 12101-8.
- » Dampers rated under EN 13501-4 and tested under EN 1366-10.
- » Smoke control dampers resistance independent of airflow direction and installation side.
- » The structure of the partition reduces acoustic noise and hydraulic resistance in the system.
- » MA feature (the damper blade can change its position during a fire).

1.1 | Application

The mcr FID B smoke control dampers are intended for installation in manually or automatically operated fire ventilation systems. mcr FID B dampers are used in fire ventilation systems or in mixed fire and comfort ventilation systems. When installed, these devices prevent the propagation of fire, smoke and fire gases to adjacent areas. Admissible flow velocity in the connected duct is 12 m/s. During normal operation, the fire damper blade is in the open or closed position, depending on its function. The fire damper blade in the fire compartment is opened, whereas in other areas the blades remain closed. The damper blade may change its position during a fire (MA feature), depending on the needs of the rescue teams and the fire scenario.

1.2 | Design

reinforcing corners

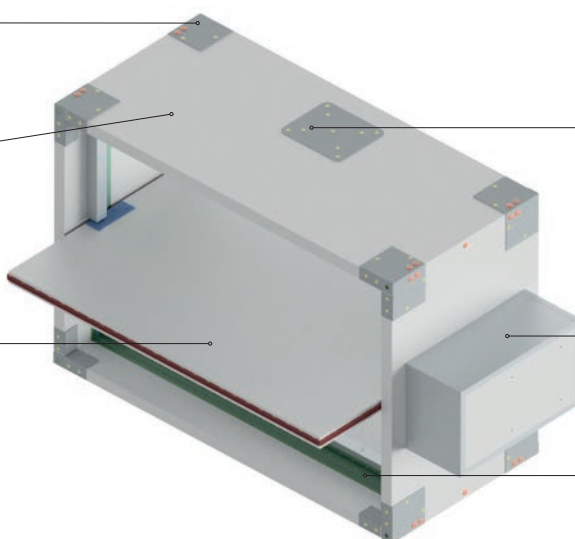
casing

damper blade

inspection access

trigger and control mechanism
in a guard casing
(e.g. actuator without return spring)

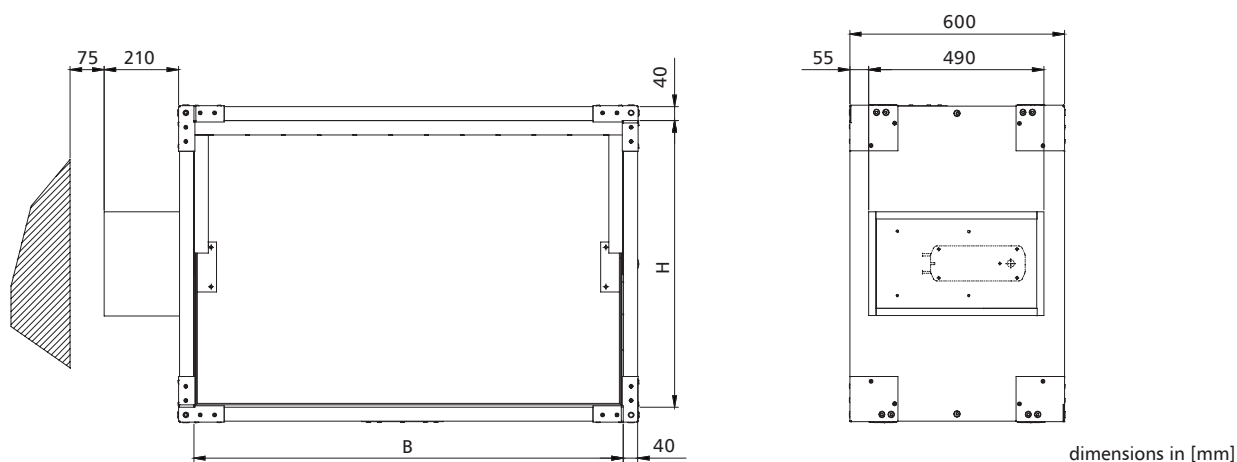
sealing system



mcr FID B smoke control dampers consist of a casing with a rectangular cross-section composed of fire-proof boards, a moving damper blade and an actuator, which is activated remotely. Special design casing with impregnated fire-proof boards are used in chemically aggressive environments. The casing total length is 600 mm. The damper blade is made of a fire-proof panel. The inner side of the fire damper casing is equipped with a sealing system. Stop profiles are attached to the inner casing surface, limiting the rotating motion of the damper blade. As a standard, the damper is equipped with an inspection access, located on one of the sides of the damper. At the corners of the casing, there are steel reinforcements with a rivet nut system, enabling the installation of masking grilles and frames for connecting steel ventilation ducts.

1.3 | Versions

1.3.1 | Closing and opening with an actuator



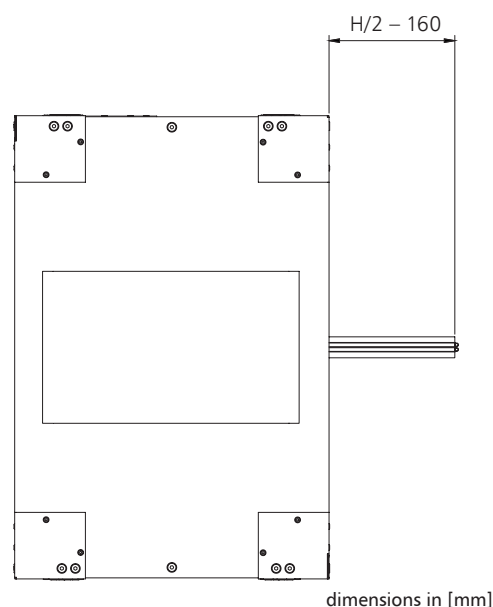
During normal operation, the damper blade of the fire damper remains open or closed. In the case of fire, the damper blade in the compartment where the fire occurs opens and the damper blades in the remaining compartments are closed – the blades are operated remotely by supplying power. The mcr FID B dampers are equipped with a trigger and control mechanism in the form of a BE, BEE, BEN, MLE, ME series axial actuator, supplied with 24 V AC/DC or 230 V AC voltage. Actuators are equipped with limit switches used to monitor the position of the damper blade. Dampers with BE, BEE, BEN, MLE or ME actuators can be opened/closed by supplying voltage to the actuator terminals.

1.4 | Dimensions

rectangular dampers:

- » nominal width B: from 200 mm to 1200 mm
- » nominal height H: from 200 mm to 800 mm
- » maximum single damper cross-section surface up to 0.96 m²
- » the design of the damper ensures that its damper blade, regardless of the dimensions of the BxH damper, does not protrude beyond the device casing on one side.

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



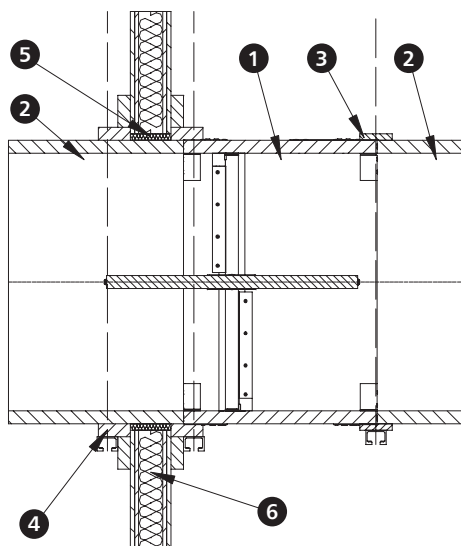
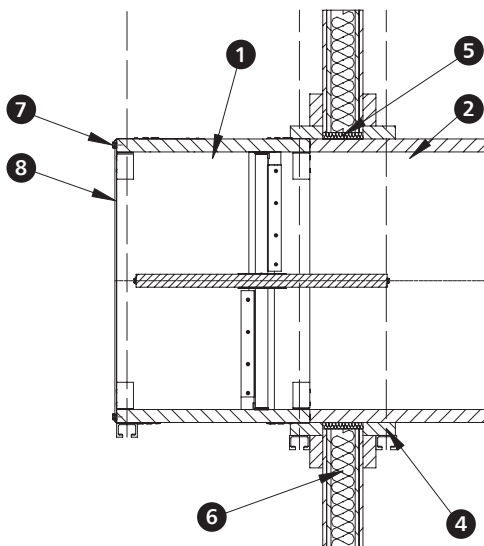
mcr FID B | Single-blade smoke control dampers for multi-compartment fire ventilation systems

1.5 | Installation

The mcr FID B rectangular dampers are rated as EI120(v_{ed} h_{od} $i \leftrightarrow o$)S1500C_{10,000} MA multi if installed on fireproof ducts rated according to EN 1366-8 and EN 1366-9.

The mcr FID B rectangular dampers are rated E₆₀₀ 120 (v_{ed} $i \leftrightarrow o$)S1500 C_{10,000} MA single in single-zone fire ventilation systems.

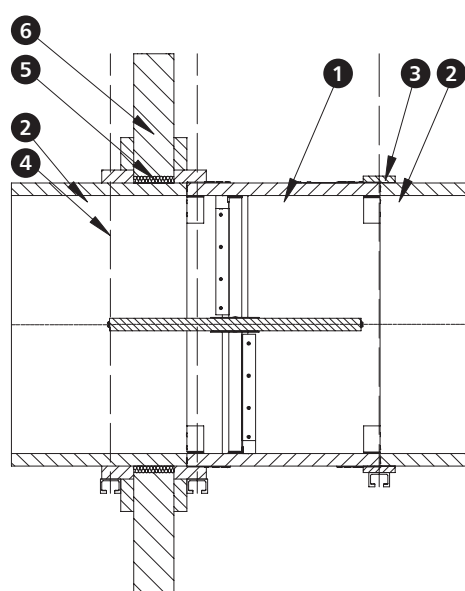
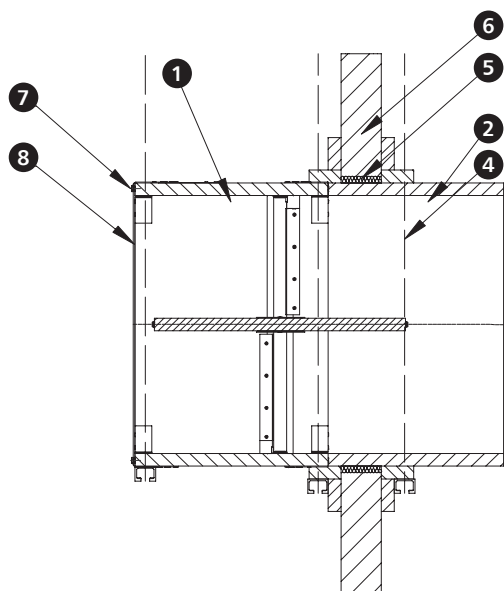
1.5.1 | Damper installation in light walls (plasterboard)



1. mcr FID B BxH smoke damper
2. multi-compartment smoke extract duct – e.g. made of fire-proof boards
3. a strip of fire-proof board along the entire length of the BxH side
4. system of installation hangers ensuring operational stability

5. fireproof duct installation penetration system
6. plasterboard wall
7. M10 x 20 bolt
8. MWB system grille (optional)

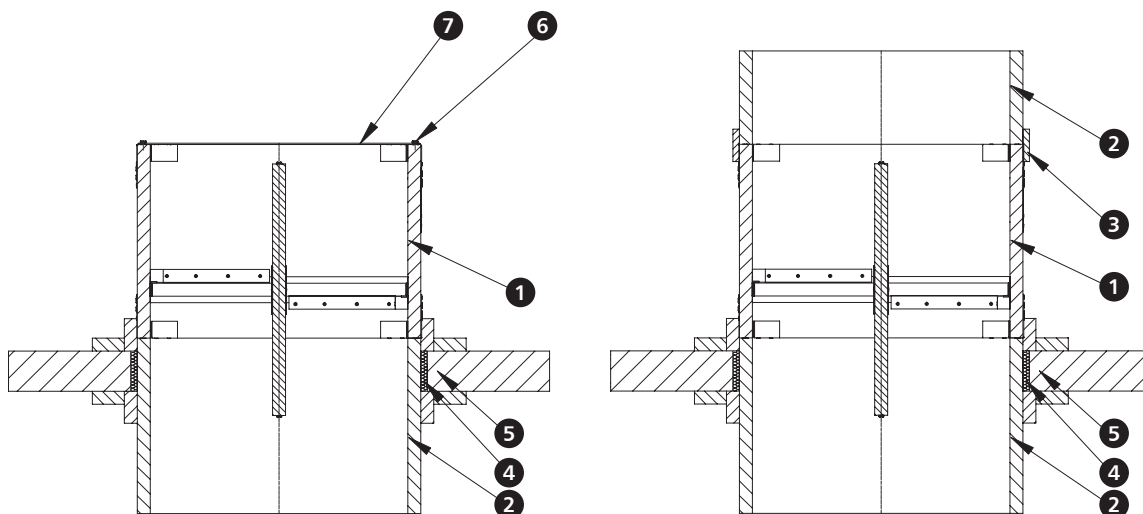
1.5.2 | Damper installation in solid walls



1. mcr FID B BxH smoke damper
2. multi-compartment smoke extract duct – e.g. made of fire-proof boards
3. a strip of fire-proof board along the entire length of the BxH side
4. system of installation hangers ensuring operational stability

5. fireproof duct installation penetration system
6. solid wall
7. M10 x 20 bolt
8. MWB system grille (optional)

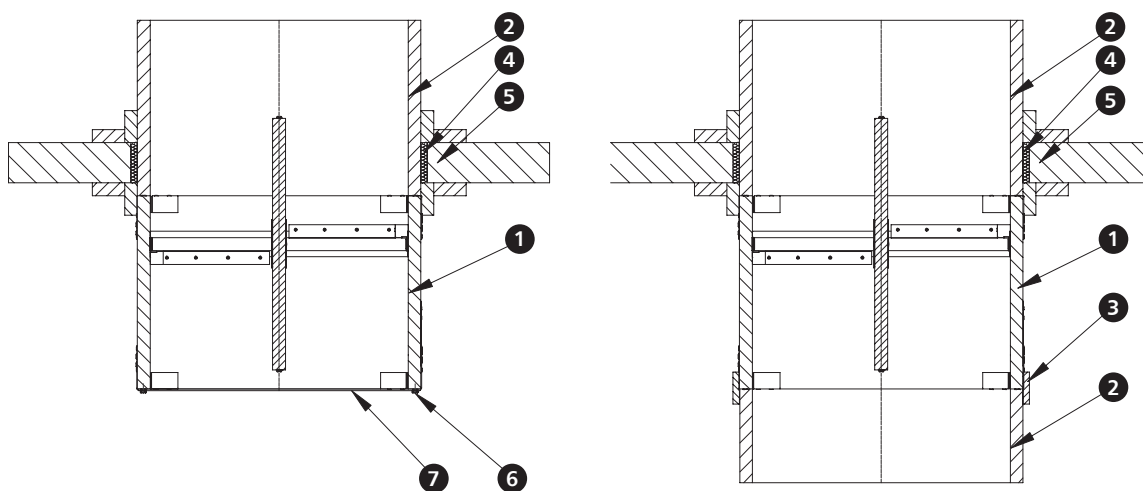
1.5.3 | Installation of damper in floor slabs – damper above the floor slab



- 1. mcr FID B BxH smoke damper
- 2. multi-compartment smoke extract duct – e.g. made of fire-proof boards
- 3. a strip of fire-proof board along the entire length of the BxH side

- 4. fireproof duct installation penetration system
- 5. floor slab
- 6. M10 x 20 bolt
- 7. MWB system grille (optional)

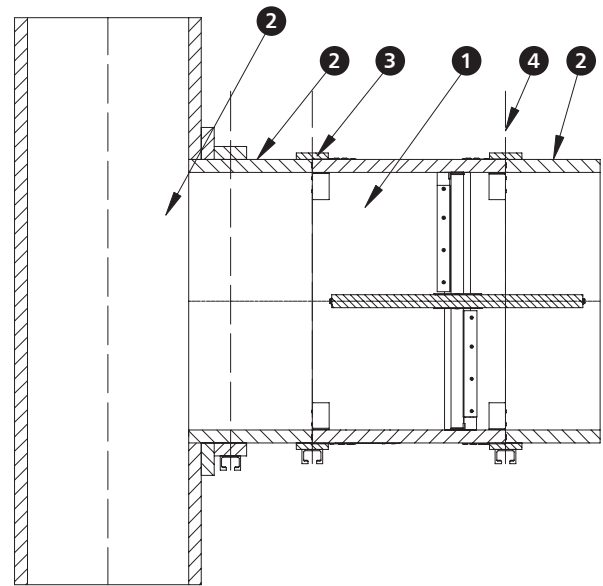
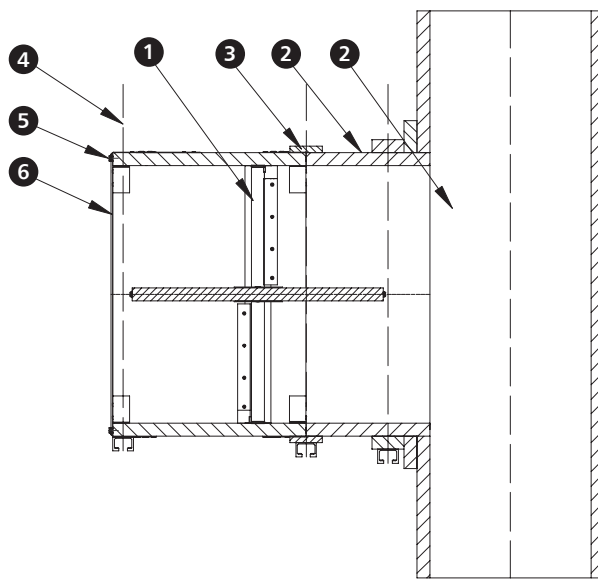
1.5.4 | Installation of damper in floor slabs – damper below the floor slab



- 1. mcr FID B BxH smoke damper
- 2. multi-compartment smoke extract duct – e.g. made of fire-proof boards
- 3. a strip of fire-proof board along the entire length of the BxH side

- 4. fireproof duct installation penetration system
- 5. floor slab
- 6. M10 x 20 bolt
- 7. MWB system grille (optional)

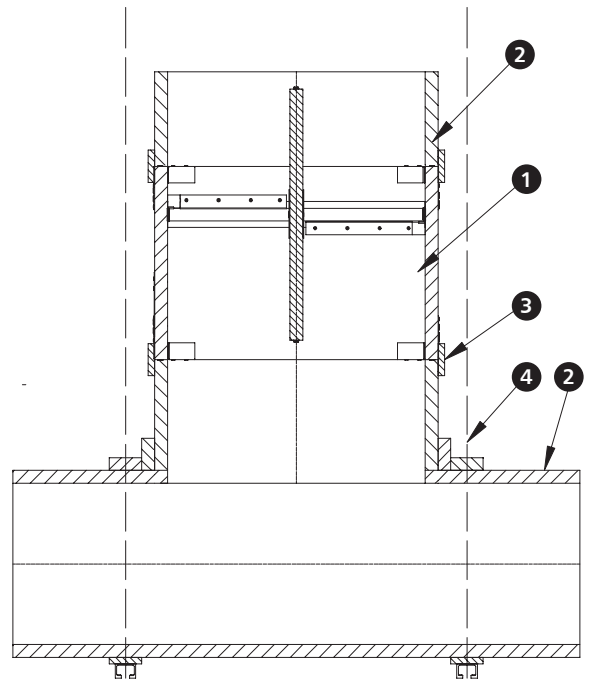
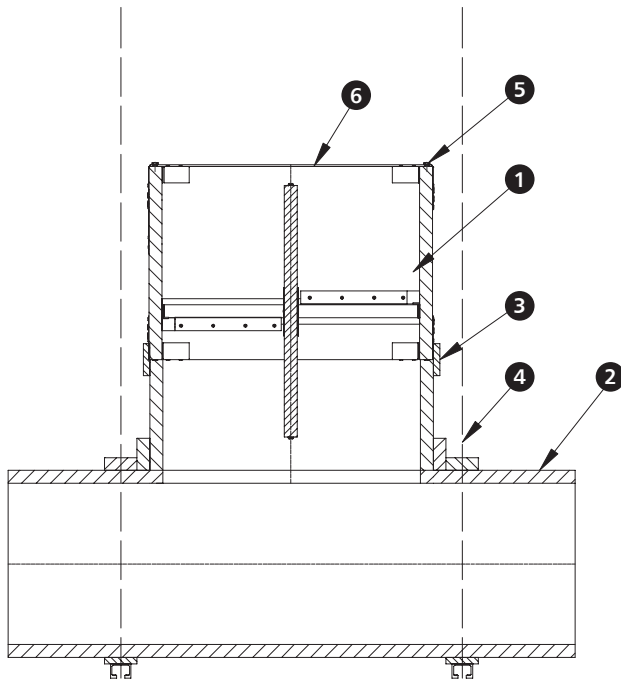
1.5.5 | Damper installation on horizontal ducts



- 1. mcr FID B BxH smoke damper
- 2. multi-compartment smoke extract duct – e.g. made of fire-proof boards
- 3. a strip of fire-proof board along the entire length of the BxH side

- 4. installation hangers system
- 5. M10 x 20 bolt
- 6. MWB system grille (optional)

1.5.6 | Damper installation on vertical ducts

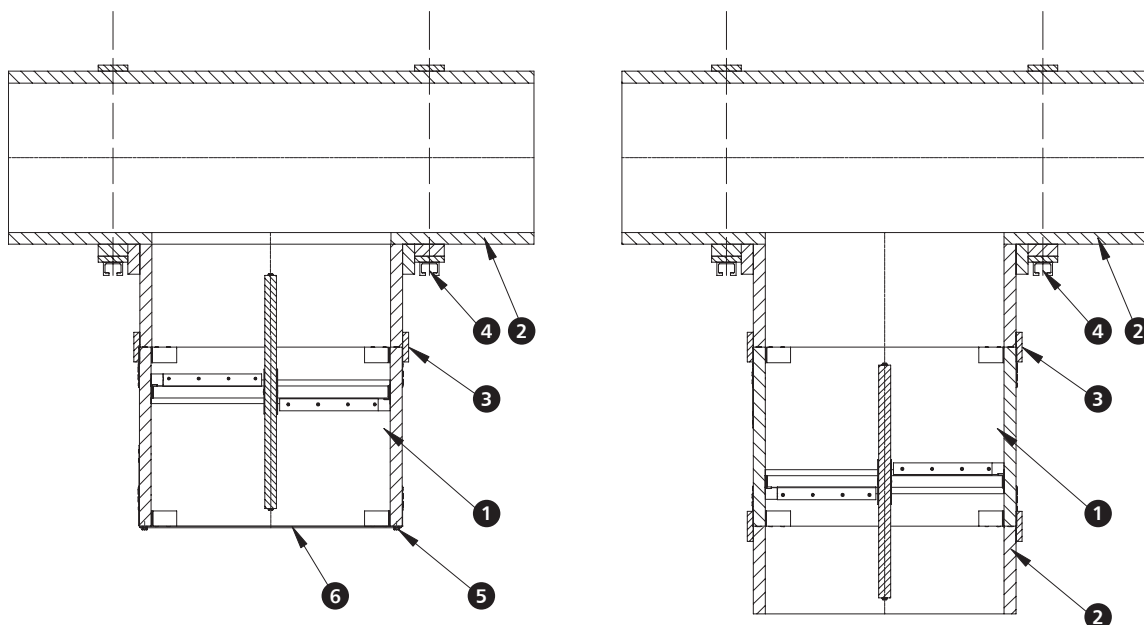


- 1. mcr FID B BxH smoke damper
- 2. multi-compartment smoke extract duct – fire-proof board
- 3. a strip of fire-proof board along the entire length of the BxH side

- 4. installation hangers system
- 5. M10 x 20 bolt
- 6. MWB system grille (optional)

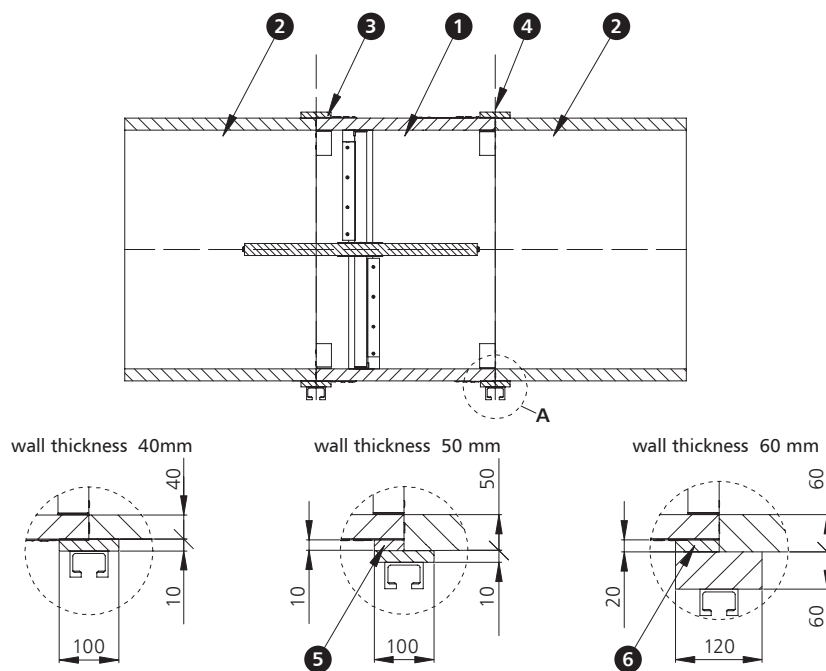
mcr FID B | Single-blade smoke control dampers for multi-compartment fire ventilation systems

1.5.7 | Damper installation on vertical ducts



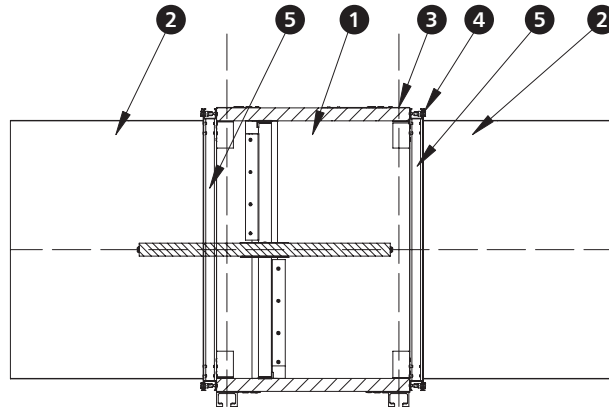
- 1. mcr FID B BxH smoke damper
- 2. multi-compartment smoke extract duct – fire-proof board
- 3. a strip of fire-proof board along the entire length of the BxH side
- 4. installation hangers system
- 5. M10 x 20 bolt
- 6. MWB system grille (optional)

1.5.8 | Damper connection with a multi-compartment duct, e.g. made of fire-proof boards with various wall thickness



- 1. mcr FID B BxH smoke damper
- 2. multi-compartment smoke extract duct – fire-proof board
- 3. a strip of fire-proof board along the entire length of the BxH side
- 4. installation hangers system
- 5. a strip of fire-proof board along the entire length of the BxH side with the dimensions 10 x 50 mm
- 6. a strip of fire-proof board along the entire length of the BxH side with the dimensions 20 x 60 mm

1.5.9 | Damper connection with single-compartment duct, e.g. made of metal sheets



- | | |
|---|----------------------|
| 1. mcr FID B BxH smoke damper | 4. M10 x 20 bolt |
| 2. single-compartment smoke extract duct – metal sheets | 5. RB mounting frame |
| 3. installation hangers system | |

Smoke extraction ducts should be made in accordance with the ducts manufacturer's guidelines. The ducts must have an adequate fire resistance rating in accordance with the fire resistance rating provided for the entire solution. Seal all connections between the damper and the ducts with the appropriate grout/glue/gaskets, ensuring that the fire resistance rating is maintained. The shut-off damper in vertical fire ventilation systems may be installed across the horizontal smoke extract duct or on the sides of the horizontal smoke extract duct or on the surface of any side of the vertical smoke extract duct. A masking grille may terminate the system.

1.6 | mcr FID B rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		200					250					300				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.040	0.029	420	9	0.050	0.039	564	9	31	0.06	0.049	708	8	32
		6			631	21			847	19	42			1 063	19	42
		8			841	37			1 129	35	49			1 417	33	50
		10			1 051	58			1 411	54	55			1 771	52	55
	250	4	0.050	0.037	526	9	0.063	0.049	706	9	32	0.075	0.062	886	8	32
		6			788	21			1 058	19	43			1 328	18	42
		8			1 051	37			1 411	35	50			1 771	31	50
		10			1 314	57			1 764	54	56			2 214	49	56
	300	4	0.060	0.044	631	9	0.075	0.059	847	8	33	0.09	0.074	1 063	8	32
		6			946	20			1 270	19	43			1 594	17	43
		8			1 261	36			1 693	34	51			2 125	30	50
		10			1 577	56			2 117	53	56			2 657	47	56
	350	4	0.070	0.051	736	9	0.088	0.069	988	8	33	0.105	0.086	1 240	7	32
		6			1 104	20			1 482	19	44			1 860	16	43
		8			1 472	36			1 976	33	51			2 480	29	50
		10			1 840	56			2 470	52	57			3 100	45	56
	400	4	0.080	0.058	841	9	0.100	0.078	1 129	8	34	0.12	0.098	1 417	7	32
		6			1 261	19			1 693	19	44			2 125	15	42
		8			1 682	35			2 258	33	52			2 834	27	50
		10			2 102	54			2 822	52	57			3 542	42	56
	450	4	0.090	0.066	946	9	0.113	0.088	1 270	7	32	0.135	0.111	1 594	7	32
		6			1 419	19			1 905	17	43			2 391	15	43
		8			1 892	35			2 540	29	51			3 188	27	50
		10			2 365	54			3 175	46	56			3 985	42	56
	500	4	0.100	0.073	1 051	9	0.125	0.098	1 411	7	32	0.15	0.123	1 771	7	32
		6			1 577	19			2 117	16	43			2 657	15	43
		8			2 102	35			2 822	28	50			3 542	26	50
		10			2 628	54			3 528	44	56			4 428	41	56
	550	4	0.110	0.080	1 156	8	0.138	0.108	1 552	7	33	0.165	0.135	1 948	6	33
		6			1 734	19			2 328	16	43			2 922	14	43
		8			2 313	34			3 105	28	51			3 897	26	51
		10			2 891	53			3 881	44	57			4 871	40	56
	600	4	0.120	0.088	1 261	8	0.150	0.118	1 693	7	33	0.18	0.148	2 125	6	33
		6			1 892	19			2 540	15	43			3 188	14	43
		8			2 523	34			3 387	27	51			4 251	26	51
		10			3 154	53			4 234	42	56			5 314	40	57
	650	4	0.130	0.095	1 367	8	0.163	0.127	1 835	6	32	0.195	0.160	2 303	6	33
		6			2 050	19			2 752	14	43			3 454	14	44
		8			2 733	34			3 669	26	50			4 605	26	51
		10			3 416	53			4 586	40	56			5 756	40	57
	700	4	0.140	0.102	1 472	8	0.175	0.137	1 976	6	33	0.21	0.172	2 480	6	34
		6			2 208	19			2 964	14	43			3 720	14	44
		8			2 943	33			3 951	26	51			4 959	26	52
		10			3 679	52			4 939	40	56			6 199	40	57

mcr FID B | Single-blade smoke control dampers for multi-compartment fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		200					250					300				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	800	4	0.160	0.117	1 682	8	0.200	0.157	2 258	6	32	0.24	0.197	2 834	6	33
		6			2 523	18			3 387	14	43			4 251	14	44
		8			3 364	32			4 516	24	51			5 668	24	52
		10			4 205	50			5 645	38	56			7 085	38	57
	900	4	0.180	0.131	1 892	7	0.225	0.176	2 540	6	32	0.27	0.221	3 188	5	32
		6			2 838	16			3 810	13	43			4 782	12	42
		8			3 784	29			5 080	23	50			6 376	21	50
		10			4 730	45			6 350	36	56			7 970	32	56
	1000	4	0.200	0.146	2 102	7	0.250	0.196	2 822	6	32	0.3	0.246	3 542	5	32
		6			3 154	16			4 234	13	43			5 314	12	43
		8			4 205	29			5 645	22	50			7 085	21	50
		10			5 256	45			7 056	35	56			8 856	32	56
	1100	4	0.220	0.161	2 313	7	0.275	0.216	3 105	5	32	0.33	0.271	3 897	5	33
		6			3 469	16			4 657	12	43			5 845	12	43
		8			4 625	29			6 209	22	50			7 793	21	51
		10			5 782	45			7 762	34	56			9 742	32	56
	1200	4	0.240	0.175	2 523	8	0.300	0.235	3 387	5	33	0.36	0.295	4 251	9	40
		6			3 784	18			5 080	12	43			6 376	20	51
		8			5 046	29			6 774	22	51			8 502	36	58
		10			6 307	45			8 467	34	57			10 627	42	60

mcr FID B | Single-blade smoke control dampers for multi-compartment fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		350					400					450				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.070	0.059	852	8	0.080	0.069	996	7	31	0.090	0.079	1 140	7	31
		6			1 279	18			1 495	17	42			1 711	15	41
		8			1 705	32			1 993	29	49			2 281	26	49
		10			2 131	50			2 491	46	55			2 851	41	54
	250	4	0.088	0.074	1 066	7	0.100	0.087	1 246	6	29	0.113	0.099	1 426	6	29
		6			1 598	16			1 868	13	40			2 138	13	40
		8			2 131	29			2 491	23	47			2 851	22	47
		10			2 664	45			3 114	36	53			3 564	35	53
	300	4	0.105	0.089	1 279	7	0.120	0.104	1 495	6	30	0.135	0.119	1 711	5	30
		6			1 918	16			2 242	13	41			2 566	12	40
		8			2 557	28			2 989	24	48			3 421	22	48
		10			3 197	44			3 737	37	54			4 277	34	54
	350	4	0.123	0.104	1 492	7	0.140	0.121	1 744	6	30	0.158	0.139	1 996	5	30
		6			2 238	15			2 616	13	41			2 994	12	41
		8			2 984	26			3 488	22	48			3 992	21	48
		10			3 730	41			4 360	35	54			4 990	33	54
	400	4	0.140	0.118	1 705	6	0.160	0.138	1 993	6	31	0.180	0.158	2 281	5	30
		6			2 557	13			2 989	13	41			3 421	12	41
		8			3 410	24			3 986	22	49			4 562	21	48
		10			4 262	37			4 982	35	55			5 702	32	54
	450	4	0.158	0.133	1 918	5	0.180	0.156	2 242	5	30	0.203	0.178	2 566	4	29
		6			2 877	12			3 363	12	41			3 849	10	40
		8			3 836	22			4 484	21	48			5 132	18	47
		10			4 795	34			5 605	32	54			6 415	28	53
	500	4	0.175	0.148	2 131	5	0.200	0.173	2 491	5	30	0.225	0.198	2 851	4	29
		6			3 197	12			3 737	11	40			4 277	9	39
		8			4 262	22			4 982	19	48			5 702	17	47
		10			5 328	34			6 228	30	54			7 128	26	52
	550	4	0.193	0.163	2 557	5	0.220	0.190	2 740	5	30	0.248	0.218	3 136	4	29
		6			3 836	12			4 110	11	41			4 704	9	40
		8			5 115	21			5 481	19	48			6 273	17	47
		10			6 394	32			6 851	30	54			7 841	26	53
	600	4	0.210	0.178	2 557	5	0.240	0.208	2 989	4	28	0.270	0.238	3 421	4	29
		6			3 836	10			4 484	8	37			5 132	9	40
		8			5 115	19			5 979	14	45			6 843	17	47
		10			6 394	29			7 474	27	53			8 554	26	53
	650	4	0.228	0.192	2 771	5	0.260	0.225	3 239	4	30	0.293	0.257	3 707	4	30
		6			4 156	10			4 858	10	40			5 560	9	40
		8			5 541	19			6 477	17	48			7 413	17	48
		10			6 926	29			8 096	27	53			9 266	26	54
	700	4	0.245	0.207	2 984	5	0.28	0.242	3 488	4	30	0.315	0.277	3 992	4	30
		6			4 476	10			5 232	10	40			5 988	9	40
		8			5 967	19			6 975	17	48			7 983	16	48
		10			7 459	29			8 719	27	54			9 979	25	53

mcr FID B | Single-blade smoke control dampers for multi-compartment fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			350						400					450				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	800	4	0.280	0.237	3 410	4	30	0.32	0.277	3 986	4	30	0.360	0.317	4 562	4	29	
		6			5 115	10	41			5 979	9	41			6 843	9	40	
		8			6 820	18	48			7 972	17	48			9 124	16	47	
		10			8 525	28	54			9 965	26	54			11 405	25	53	
	900	4	0.315	0.266	3 836	4	31	0.360	0.311	4 484	6	35	0.405	0.356	5 132	4	29	
		6			5 754	10	41			6 726	12	44			7 698	9	40	
		8			7 672	18	49			8 968	26	54			10 264	16	47	
		10			9 590	28	55			11 210	33.4	58			12 830	25	53	
	1000	4	0.350	0.296	4 262	4	30	0.400	0.346	4 982	4	31	0.450	0.396	5 702	4	29	
		6			6 394	9	41			7 474	9	42			8 554	9	40	
		8			8 525	17	48			9 965	17	49			11 405	16	47	
		10			10 656	26	54			12 456	26	55			14 256	25	53	
	1100	4	0.385	0.326	4 689	4	32	0.440	0.381	5 481	4	31	0.495	0.436	6 273	4	29	
		6			7 033	10	42			8 221	9	42			9 409	9	39	
		8			9 377	18	50			10 961	17	49			12 545	15	47	
		10			11 722	28	56			13 702	26	55			15 682	24	53	
	1200	4	0.420	0.355	5 115	4	31	0.480	0.415	5 979	4	31	0.540	0.475	6 843	4	29	
		6			7 672	9	41			8 968	9	42			10 264	9	39	
		8			10 230	16	49			11 958	16	49			13 686	15	47	
		10			12 787	25	54			14 947	25	55			17 107	24	53	

mcr FID B | Single-blade smoke control dampers for multi-compartment fire ventilation systems

B – nominal width [mm]
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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		500					550					600				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.1	0.089	1 284	6	0.110	0.099	1 428	5	29	0.120	0.109	1 572	5	29
		6			1 927	13			2 143	12	39			2 359	12	39
		8			2 569	22			2 857	21	47			3 145	21	47
		10			3 211	35			3 571	33	53			3 931	32	53
	250	4	0.125	0.112	1 606	6	0.138	0.124	1 786	5	30	0.150	0.137	1 966	5	30
		6			2 408	13			2 678	12	40			2 948	12	40
		8			3 211	22			3 571	21	48			3 931	21	48
		10			4 014	35			4 464	33	53			4 914	32	54
	300	4	0.15	0.134	1 927	5	0.165	0.149	2 143	5	30	0.180	0.164	2 359	5	30
		6			2 890	12			3 214	12	41			3 538	11	40
		8			3 853	21			4 285	21	48			4 717	19	48
		10			4 817	33			5 357	32	54			5 897	30	53
	350	4	0.175	0.156	2 248	5	0.193	0.174	2 500	5	31	0.210	0.191	2 752	5	30
		6			3 372	12			3 750	12	41			4 128	10	40
		8			4 496	21			5 000	21	49			5 504	19	48
		10			5 620	32			6 250	32	55			6 880	29	54
	400	4	0.2	0.178	2 569	5	0.220	0.198	2 857	5	30	0.240	0.218	3 145	4	30
		6			3 853	11			4 285	10	41			4 717	10	41
		8			5 138	19			5 714	19	48			6 290	18	48
		10			6 422	30			7 142	29	54			7 862	28	54
	450	4	0.225	0.201	2 890	4	0.248	0.223	3 214	4	29	0.270	0.246	3 538	4	30
		6			4 335	9			4 821	9	40			5 307	9	40
		8			5 780	17			6 428	17	47			7 076	17	48
		10			7 225	26			8 035	26	53			8 845	26	53
	500	4	0.250	0.223	3 211	4	0.275	0.248	3 571	4	29	0.300	0.273	3 931	4	29
		6			4 817	8			5 357	9	39			5 897	9	39
		8			6 422	14			7 142	15	47			7 862	15	47
		10			8 028	20			8 928	24	52			9 828	24	53
	550	4	0.275	0.245	3 853	3	0.303	0.273	4 285	4	28	0.330	0.300	4 717	4	28
		6			5 780	8			6 428	8	38			7 076	8	39
		8			7 707	13			8 571	14	46			9 435	14	46
		10			9 634	21			10 714	22	52			11 794	22	52
	600	4	0.3	0.268	3 853	3	0.330	0.298	4 285	3	28	0.360	0.328	4 717	3	28
		6			5 780	8			6 428	8	38			7 076	8	39
		8			7 707	13			8 571	13	46			9 435	13	46
		10			9 634	21			10 714	21	51			11 794	21	52
	650	4	0.325	0.290	4 175	4	0.358	0.322	4 643	3	28	0.390	0.355	5 111	3	28
		6			6 262	10			6 964	8	38			7 666	8	39
		8			8 349	17			9 285	13	46			10 221	13	46
		10			10 436	21			11 606	21	52			12 776	21	52
	700	4	0.350	0.312	4 496	3	0.385	0.347	5 000	3	28	0.420	0.382	5 504	3	29
		6			6 744	8			7 500	8	39			8 256	8	39
		8			8 991	13			9 999	13	46			11 007	13	47
		10			11 239	21			12 499	21	52			13 759	21	52

mcr FID B | Single-blade smoke control dampers for multi-compartment fire ventilation systems

B – nominal width [mm]
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v – velocity [m/s]
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S_e – damper active cross-section [m²]

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

		height H [mm]															
		500					550					600					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	800	4	0.4	0.357	5 138	3	28	0.440	0.397	5 714	3	29	0.480	0.437	6 290	3	29
		6			7 707	8	39			8 571	8	39			9 435	8	40
		8			10 276	13	46			11 428	13	47			12 580	13	47
		10			12 845	21	52			14 285	21	53			15 725	21	53
	900	4	0.45	0.401	5 780	3	28	0.495	0.446	6 428	3	29	0.540	0.491	7 076	3	30
		6			8 670	8	39			9 642	8	40			10 614	8	38
		8			11 560	13	46			12 856	13	47			14 152	13	45
		10			14 450	21	52			16 070	21	53			17 690	21	51
	1000	4	0.5	0.446	6 422	3	28	0.550	0.496	6 428	3	30	0.600	0.546	7 862	3	30
		6			9 634	8	39			9 642	8	40			11 794	8	41
		8			12 845	13	46			12 856	13	48			15 725	13	48
		10			16 056	21	52			16 070	21	54			19 656	21	54
	1100	4	0.55	0.491	7 065	4	29	0.605	0.546	7 857	4	31	0.660	0.601	8 649	3	31
		6			10 597	8	39			11 785	8	41			12 973	8	41
		8			14 129	14	47			15 713	14	49			17 297	13	49
		10			17 662	22	53			19 642	22	55			21 622	21	54
	1200	4	0.6	0.535	7 707	3	27	0.660	0.595	8 571	3	30	0.720	0.655	9 435	3	30
		6			11 560	7	38			12 856	7	40			14 152	7	40
		8			15 414	13	45			17 142	13	48			18 870	12	48
		10			19 267	20	51			21 427	20	54			23 587	19	54

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S_e – damper active cross-section [m²]

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

		height H [mm]														
		650					700					750				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.130	0.119	1 716	5	0.140	0.129	1 860	5	29	0.150	0.139	2 004	5	29
		6			2 575	11			2 791	11	40			3 007	11	40
		8			3 433	20			3 721	20	47			4 009	20	47
		10			4 291	31			4 651	31	53			5 011	31	53
	250	4	0.163	0.149	2 146	5	0.175	0.162	2 326	5	30	0.188	0.174	2 506	5	30
		6			3 218	11			3 488	11	41			3 758	11	41
		8			4 291	20			4 651	20	48			5 011	20	48
		10			5 364	31			5 814	31	54			6 264	31	54
	300	4	0.195	0.179	2 575	5	0.210	0.194	2 791	4	29	0.225	0.209	3 007	4	30
		6			3 862	10			4 186	10	40			4 510	10	40
		8			5 149	19			5 581	18	47			6 013	18	48
		10			6 437	29			6 977	28	53			7 517	28	54
	350	4	0.228	0.209	3 004	4	0.245	0.226	3 256	4	30	0.263	0.244	3 508	4	30
		6			4 506	10			4 884	10	40			5 262	10	41
		8			6 008	18			6 512	17	48			7 016	17	48
		10			7 510	28			8 140	27	53			8 770	27	54
	400	4	0.260	0.238	3 433	4	0.280	0.258	3 721	4	30	0.300	0.278	4 009	4	31
		6			5 149	10			5 581	10	41			6 013	10	41
		8			6 866	18			7 442	17	48			8 018	17	49
		10			8 582	28			9 302	27	54			10 022	27	54
	450	4	0.293	0.268	3 862	4	0.315	0.291	4 186	4	29	0.338	0.313	4 510	4	30
		6			5 793	9			6 279	9	40			6 765	9	40
		8			7 724	17			8 372	15	47			9 020	15	48
		10			9 655	26			10 465	24	53			11 275	24	53
	500	4	0.325	0.298	4 291	4	0.350	0.323	4 651	4	29	0.375	0.348	5 011	4	29
		6			6 437	9			6 977	8	40			7 517	8	40
		8			8 582	15			9 302	15	47			10 022	15	47
		10			10 728	24			11 628	23	53			12 528	23	53
	550	4	0.358	0.328	5 149	4	0.385	0.355	5 116	4	29	0.413	0.383	5 512	4	29
		6			7 724	8			7 674	8	39			8 268	8	40
		8			10 299	14			10 233	14	47			11 025	14	47
		10			12 874	22			12 791	22	53			13 781	22	53
	600	4	0.390	0.358	5 149	3	0.420	0.388	5 581	3	29	0.450	0.418	6 013	3	29
		6			7 724	8			8 372	8	39			9 020	8	40
		8			10 299	13			11 163	13	47			12 027	13	47
		10			12 874	21			13 954	21	53			15 034	21	53
	650	4	0.423	0.387	5 579	3	0.455	0.420	6 047	3	28	0.488	0.452	6 515	3	28
		6			8 368	7			9 070	7	39			9 772	7	39
		8			11 157	13			12 093	13	46			13 029	12	46
		10			13 946	20			15 116	20	52			16 286	19	52
	700	4	0.455	0.417	6 008	3	0.490	0.452	6 512	3	29	0.525	0.487	7 016	3	28
		6			9 012	7			9 768	7	39			10 524	7	39
		8			12 015	13			13 023	13	47			14 031	12	46
		10			15 019	20			16 279	20	53			17 539	19	52

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S_e – damper active cross-section [m²]

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

		height H [mm]														
		650					700					750				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	800	4	0.520	0.477	6 866	3	0.560	0.517	7 442	4	29	0.600	0.557	8 018	3	28
		6			10 299	6			11 163	7	37			12 027	6	39
		8			13 732	12			14 884	11	43			16 036	12	46
		10			17 165	18			18 605	16	47			20 045	18	52
	900	4	0.585	0.536	7 724	3	0.630	0.581	8 372	3	27	0.675	0.626	9 020	3	27
		6			11 586	6			12 558	6	37			13 530	6	38
		8			15 448	10			16 744	10	45			18 040	10	45
		10			19 310	16			20 930	16	51			22 550	16	51
	1000	4	0.650	0.596	8 582	3	0.700	0.646	9 302	3	27	0.750	0.696	10 022	3	28
		6			12 874	6			13 954	6	38			15 034	6	38
		8			17 165	10			18 605	10	45			20 045	10	46
		10			21 456	16			23 256	16	51			25 056	16	52
	1100	4	0.715	0.656	9 441	3	0.770	0.711	10 233	3	31	0.825	0.766	11 025	3	28
		6			14 161	8			15 349	8	42			16 537	6	39
		8			18 881	13			20 465	13	49			22 049	10	46
		10			23 602	21			25 582	21	55			27 562	16	52
	1200	4	0.780	0.715	10 299	3	0.840	0.775	11 163	3	30	0.900	0.835	12 027	2	28
		6			15 448	7			16 744	7	41			18 040	5	38
		8			20 598	12			22 326	12	48			24 054	10	46
		10			25 747	19			27 907	19	54			30 067	15	52

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 S_e – damper active cross-section [m²]

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

		800					
		v [m/s]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]
width B [mm]	200	4	0.160	0.149	2 148	5	29
		6			3 223	11	40
		8			4 297	19	47
		10			5 371	30	53
	250	4	0.200	0.187	2 686	5	30
		6			4 028	11	41
		8			5 371	19	48
		10			6 714	30	54
	300	4	0.240	0.224	3 223	4	30
		6			4 834	10	41
		8			6 445	18	48
		10			8 057	28	54
	350	4	0.280	0.261	3 760	4	30
		6			5 640	10	41
		8			7 520	17	48
		10			9 400	27	54
	400	4	0.320	0.298	4 297	4	31
		6			6 445	10	41
		8			8 594	17	49
		10			10 742	27	55
	450	4	0.360	0.336	4 834	4	29
		6			7 251	8	39
		8			9 668	14	47
		10			12 085	22	53
	500	4	0.400	0.373	5 371	4	29
		6			8 057	8	40
		8			10 742	14	47
		10			13 428	22	53
	550	4	0.440	0.410	5 908	3	29
		6			8 862	8	40
		8			11 817	13	47
		10			14 771	21	53

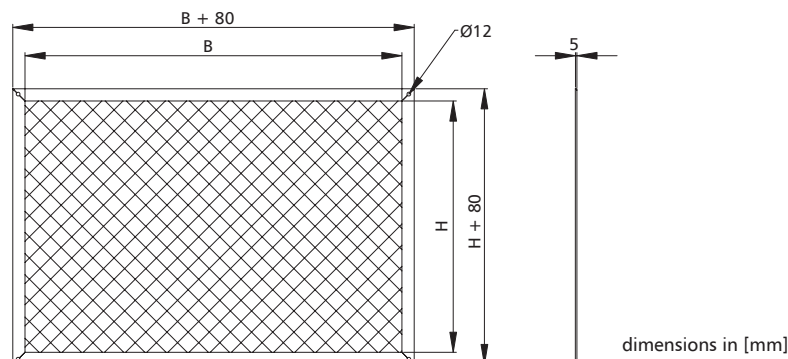
		800					
		v [m/s]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]
width B [mm]	600	4	0.480	0.448	6 445	3	29
		6			9 668	7	39
		8			12 891	13	47
		10			16 114	20	53
	650	4	0.520	0.485	6 983	3	28
		6			10 474	7	39
		8			13 965	12	46
		10			17 456	19	52
	700	4	0.560	0.522	7 520	3	28
		6			11 280	6	39
		8			15 039	12	46
		10			18 799	18	52
	800	4	0.640	0.597	8 594	3	27
		6			12 891	6	38
		8			17 188	10	45
		10			21 485	16	51
	900	4	0.720	0.671	9 668	3	28
		6			14 502	6	38
		8			19 336	10	46
		10			24 170	16	51
	1000	4	0.800	0.746	10 742	3	28
		6			16 114	6	39
		8			21 485	10	46
		10			26 856	16	52
	1100	4	0.880	0.821	11 817	3	28
		6			17 725	6	39
		8			23 633	10	46
		10			29 542	16	52
	1200	4	0.960	0.895	12 891	2	28
		6			19 336	5	39
		8			25 782	10	46
		10			32 227	15	52

1.7 | Estimated weight of the mcr FID B rectangular dampers [kg]

		width B [mm]																				
		200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1200
height H [mm]	200	26	28	29	31	33	34	36	37	39	40	42	43	45	46	48	49	51	53	54	56	57
	250	28	30	31	33	34	36	37	39	41	42	44	45	47	49	50	52	53	55	57	58	60
	300	29	31	33	34	36	38	39	41	43	44	46	48	49	51	53	54	56	58	59	61	62
	350	31	33	34	36	38	40	41	43	45	46	48	50	51	53	55	57	58	60	62	63	65
	400	33	34	36	38	40	41	43	45	47	48	50	52	54	55	57	59	61	62	64	66	68
	450	34	36	38	40	41	43	45	47	49	50	52	54	56	58	59	61	63	65	67	69	70
	500	36	37	39	41	43	45	47	49	51	52	54	56	58	60	62	64	66	67	69	71	73
	550	37	39	41	43	45	47	49	51	53	54	56	58	60	62	64	66	68	70	72	74	76
	600	39	41	43	45	47	49	51	53	55	57	59	60	62	64	66	68	70	72	74	76	78
	650	40	42	44	46	48	50	52	54	57	59	61	63	65	67	69	71	73	75	77	79	81
	700	42	44	46	48	50	52	54	56	59	61	63	65	67	69	71	73	75	77	79	81	84
	750	43	45	48	50	52	54	56	58	60	63	65	67	69	71	73	76	78	80	82	84	86
	800	45	47	49	51	54	56	58	60	62	65	67	69	71	73	76	78	80	82	84	87	89

1.8 | Accessories

1.8.1 | MWB masking grille



MWB system masking grille are designed to fulfill either supply or exhaust function. They allow for an aesthetic system termination. They come with a fixed steel mesh that covers the damper, reducing its visibility. Bolts are used to attach the masking grille body to the damper. Such a solution allows for installing the product even in the most visually-demanding applications. The masking grilles are painted in RAL 9010 as a standard (available in any colour from the RAL range on request).

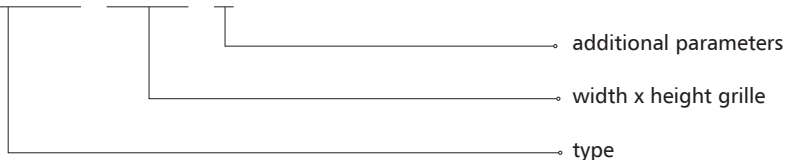
Dimensions:

- » nominal width B: from 200 to 1200 mm
- » nominal height H from 200 mm to 800 mm
- » nominal thickness G 5 mm

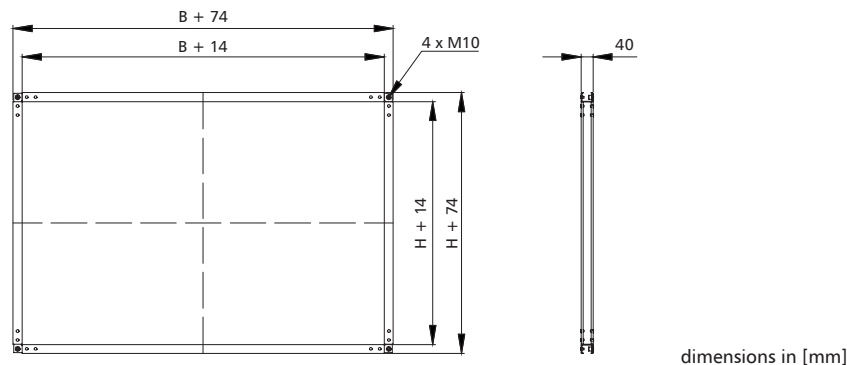
Apart from the standard dimensions, masking grilles may be manufactured with intermediate dimensions.

Marking:

mcr MWB / B x H / X



1.8.2 | RB connecting subframe



Mcr RB connection frames are used to connect a steel ventilation duct to the damper. The connection may be made using bolts in the corners of the frame, as well as using latches/hasps for ventilation ducts or self-drilling screws.

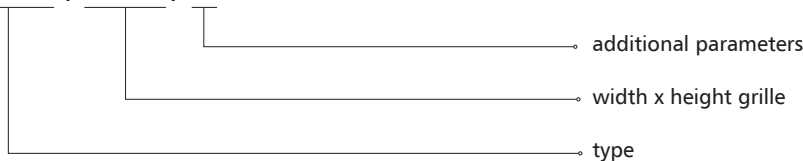
Dimensions:

- » nominal width B: from 200 to 1200 mm
- » nominal height H from 200 mm to 800 mm
- » nominal thickness G 40 mm

Apart from the standard dimensions, connection frames may be manufactured with intermediate dimensions.

Marking:

mcr RB / B x H / X



X – material

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

KN – stainless steel

KK – 1.4404 acid-proof steel

1.9 | Marking

mcr FID B B x H 1 / 2 / 3



1 - control:

» trigger control mechanism

- BE24 – actuator without a return spring, U = 24 V AC/DC
- BEE24 – actuator without a return spring, U = 24 V AC/DC
- BEN24 – actuator without a return spring, U = 24 V AC/DC
- BE230 – actuator without a return spring, U = 230 V AC
- BEE230 – actuator without a return spring, U = 230 V AC
- BEN230 – actuator without a return spring, U = 230 V AC
- MLE24 – actuator without a return spring, U = 24 V AC/DC
- MLE230 – actuator without a return spring, U = 230 V AC
- ME24 – actuator without a return spring, U = 24 V AC/DC
- ME230 – actuator without a return spring, U = 230 V AC

mcr FID B | Single-blade smoke control dampers for multi-compartment fire ventilation systems

2 - material

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

3 - additional parameters

» Control mechanism position

[no symbol] – along the damper rotation axis

» Damper axis of rotation

[no symbol] – horizontal axis of rotation

PP_D – vertical axis of rotation – mechanism at the bottom of the damper

PP_G – vertical axis of rotation – mechanism at the top of the damper

» Extended damper casing

[no symbol] – standard casing length

NOTE: separate additional parameters entered with the “/” sign

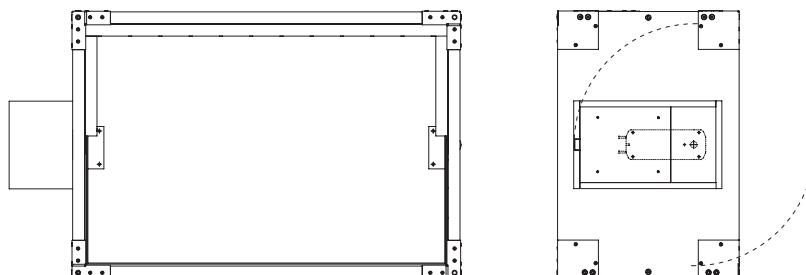
example marking:

mcr FID B 400 x 400 BEN24

Smoke control damper for fire ventilation systems with a 24 V actuator with limit switches.

1.9.1 | Design standards

» symmetrical damper



Chapter 19 - power supply and control (p. 350) contains the following information:
- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.

mcr FID S/S c/P | Low-resistance single-blade cut-off fire dampers for comfort ventilation systems



downloadable models
on the website
under the designer zone tab



- » **EIS120**
- » Fire resistance class: EI120 (v_e h_o $i \leftrightarrow o$)S.
- » Certificate of constancy of performance 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 a fire resistance rating independent of the airflow direction and installation side.
- » Lower acoustic noise and hydraulic resistance in the system achieved by reducing damper blade thickness.
- » Admissible for operation with a horizontal and vertical rotation axis.
- » Certified installation of the damper in close proximity to each other and the ceiling.
- » Pressure difference range: 2000 Pa.

2.1 | Application

mcr FID S/S c/P low-resistance cut-off dampers are designed for installation in general ventilation systems at installation passages through vertical and horizontal construction partitions. These dampers are intended, for example, for applications in systems with increased acoustic requirements.

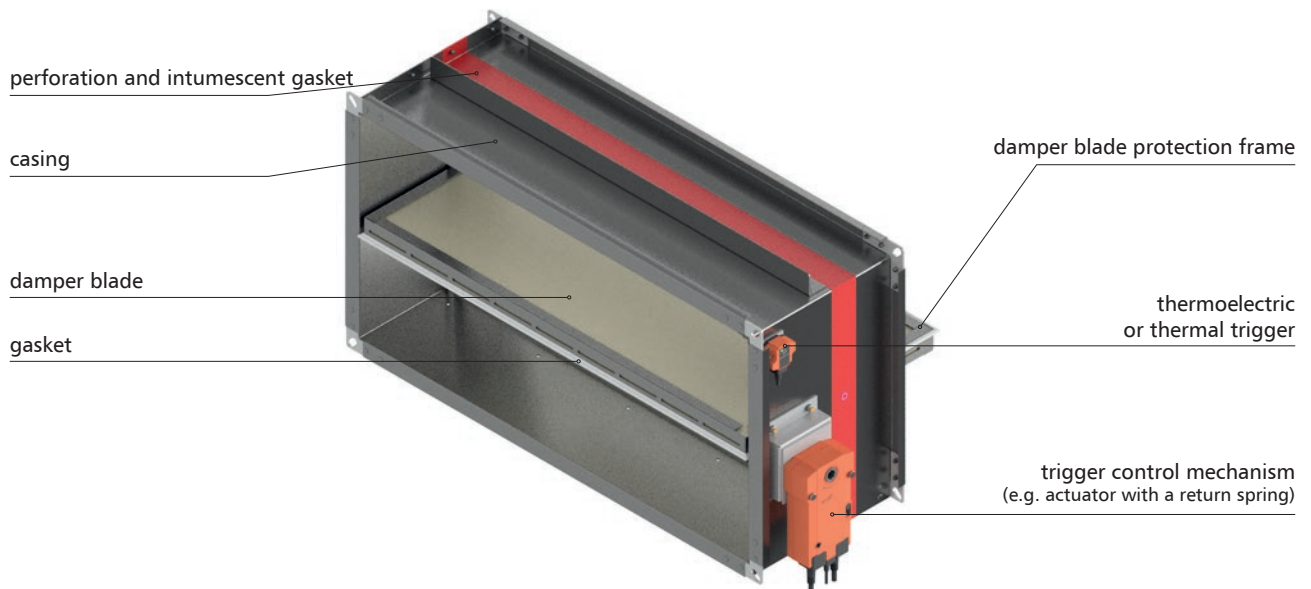
During a fire, they preserve the fire resistance rating of the construction partition that the ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and fire gasses to the remaining part of the building which is not on fire. During normal system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

The dampers cannot be operated in systems exposed to dust, unless included in a special, individually developed service and technical inspections programme. Admissible flow velocity in the connected duct is 12 m/s.

In the version designed for explosion hazard zones (EX version), the dampers can be operated in gas explosion hazard zone 1 inside and outside ventilation ducts and in dust explosion hazard zone 21 outside these ducts. The dampers have been certified in compliance with the ATEX directive 94/9/EC and meet the requirements of group II category 2G and -/2D:

- » » II 2G Ex h IIC T6 Gb
 - » » II -/2D Ex h IIIC T72° -/Db
- Ambient temperature: T_a : -20° ... +50°C

2.2 | Design



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 galvanized steel sheets (Zn 275 g/m² coating). A special casing is used for chemically aggressive environments, which features steel elements 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, where the damper blade is placed, the casing is perforated with a perforation width of 30 mm. An intumescent gasket is placed on the inner side of the casing, around the closed damper blade. The damper blade is made of a fire-proof panel with a total thickness of 30 mm.

The damper blade is embedded in a metal sheet reinforcement profile. The inner surface is equipped with a „P“-type ventilation gasket, which ensures the tightness of dampers at ambient temperature. Both ends of the fire damper casing are terminated with flange connections.

2.3 | Versions

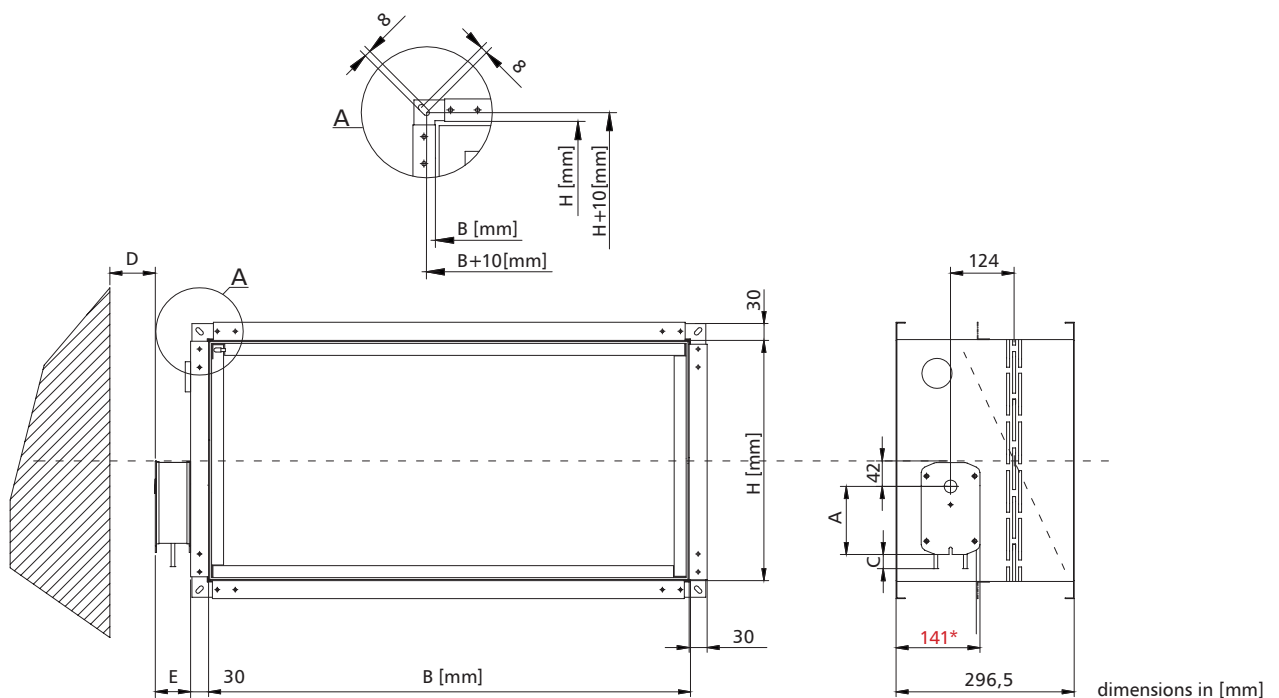
2.3.1 | Damper closing and opening with an actuator

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

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

Thermoelectric triggers are equipped with a test switch.

Dampers with actuators close as a result of the thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when power supply voltage is applied to the actuator terminals. Dampers with those actuators may be opened manually using a key.



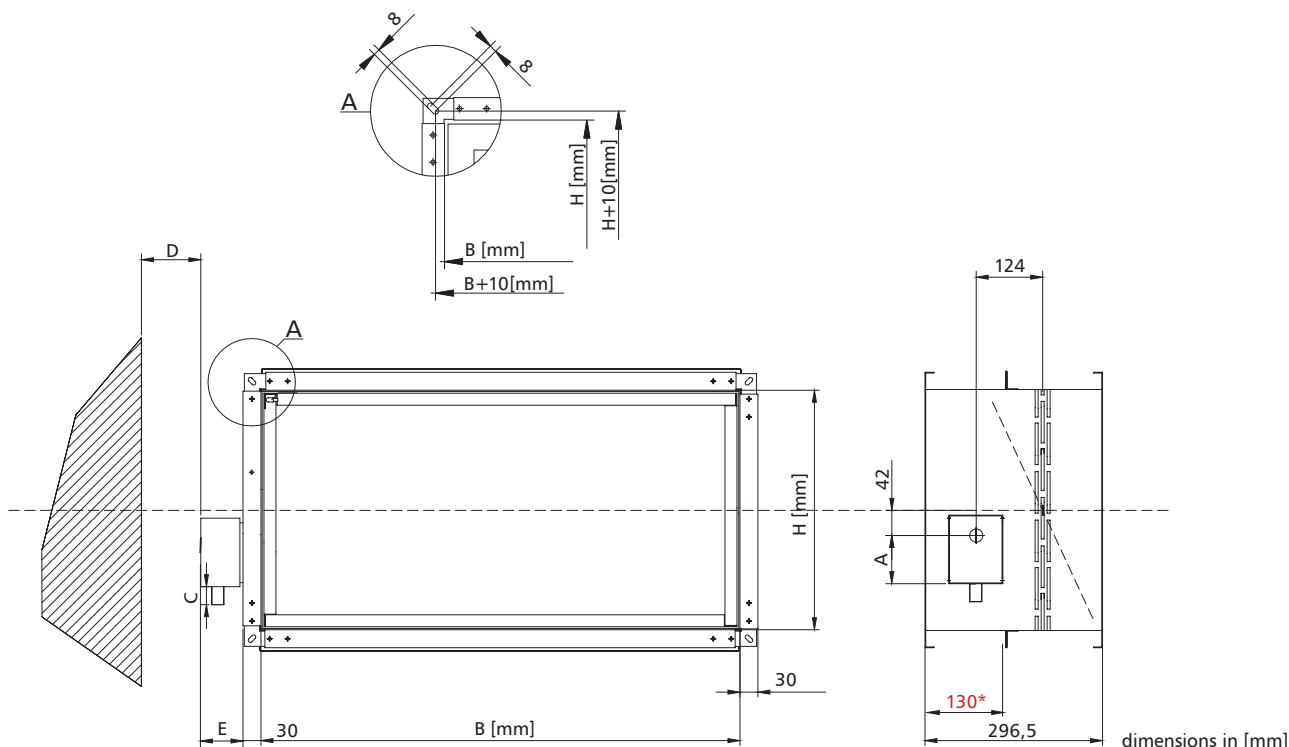
mechanism	A	C	D	E
BFN	157	30	75	57
BFL	138	30	75	53
BF24TL-ST	198	10	75	65
EXBF	225	55	75	175
QT.Ex	255	30	75	85
MF	198	30	75	70
MLF	114	30	75	62

*embedding border

2.3.2 | Cut-off fire damper for ventilation ducts with a spring drive and thermal trigger.

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

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



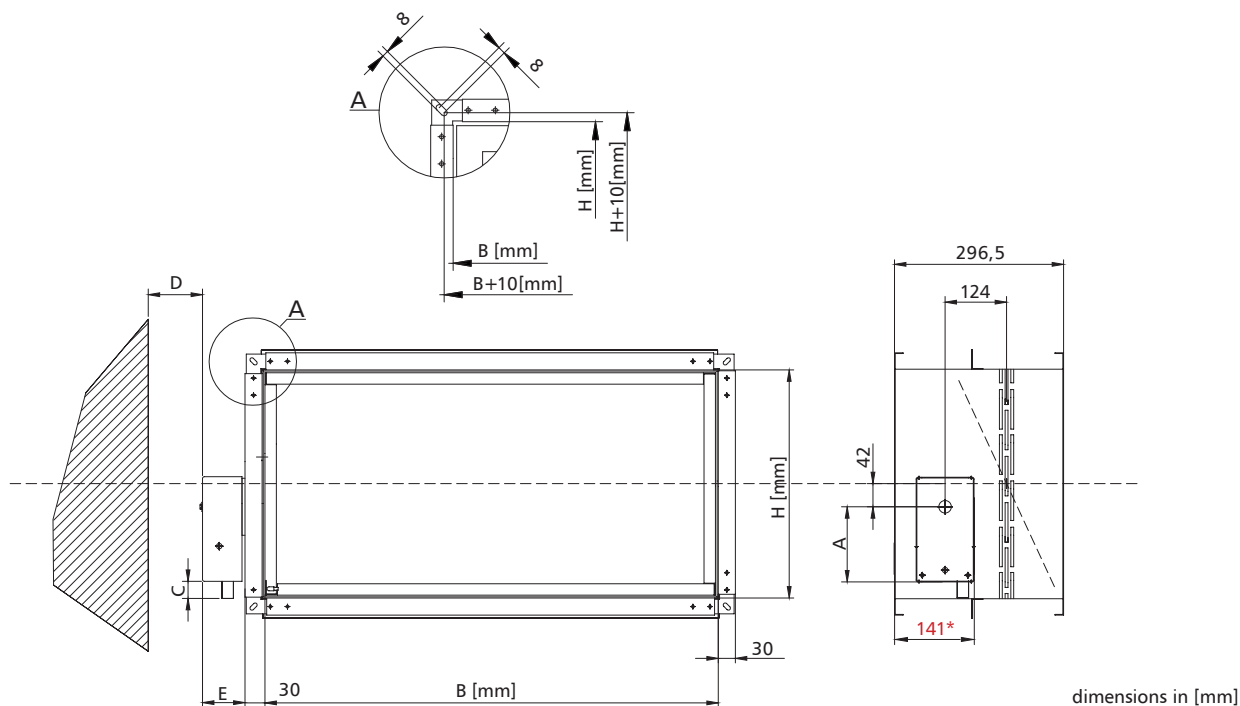
mechanism	A	C	D	E
RST	50	30	75	70

*embedding border

2.3.3 | 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 fire damper blade remains open. In case of fire, the blade closes automatically or through the fire automation system in case of a damper with an electromagnetic trigger.

mcr FID S/S c/P dampers are equipped with a KW1 trigger control mechanism with a drive spring and a cam-lever system. A 74°C thermal trigger (optionally 95°C) is integrated into the damper mechanism. Once the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. A mechanical blade position indicator is placed on the KW1 mechanism. 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. The mechanism features a test and blade button-release functions. Blade re-opening is activated manually.



mechanism	A	C	D	E
KW1	130	30	75	80

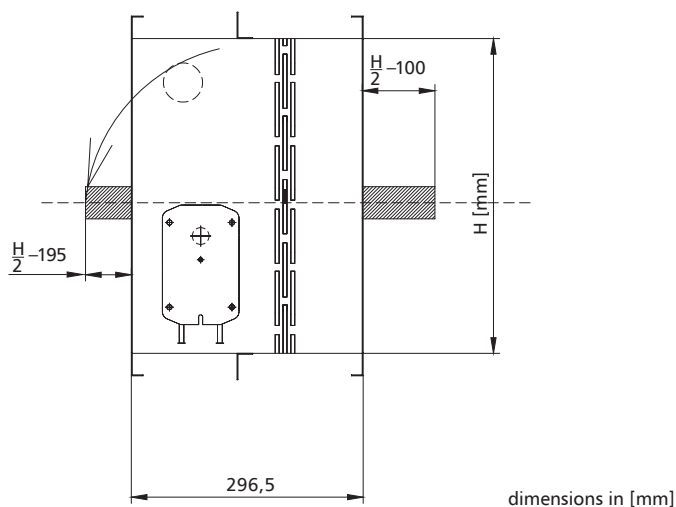
*embedding border

2.4 | Dimensions

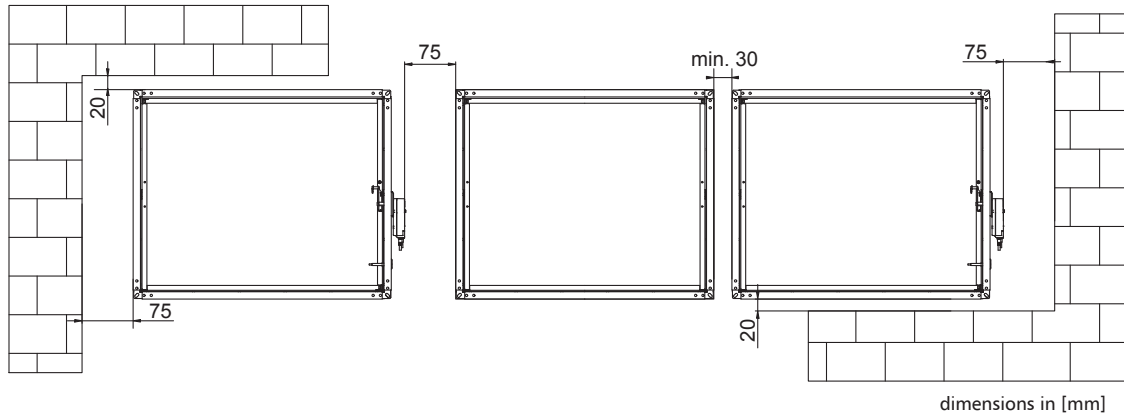
rectangular dampers:

- » nominal width B : from 100 mm to 1000 mm
- » nominal height H : from 100 mm to 800 mm
- » maximum single damper cross-section surface up to 0.8 m²

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



» Minimum distance between systems and partitions



If the installation documentation does not provide otherwise, the minimum spacing between the casings of two fire dampers is ≥ 200 mm and ≥ 75 mm between the wall or floor slab, as per the EN-1366-2 standard.

2.5 | Installation

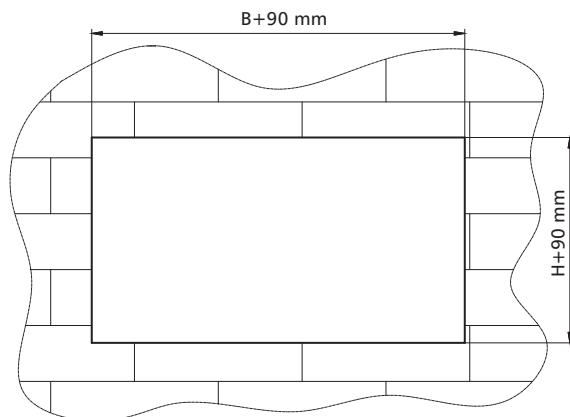
The mcr FID S/S c/P rectangular dampers have been classified in class EI120(v_e h_o i $\leftrightarrow$ o)S in a size range of up to 800 x 400 and EI120(v_e i $\leftrightarrow$ o)S in a size range of up to 1000 x 800. The dampers can be installed in concrete partitions for rigid walls/shafts with a minimum thickness of 120 mm using mortar and 125 mm using mineral wool, partitions made of full bricks or aerated concrete blocks with a min. thickness of 120 mm using mortar and 125 mm using mineral wool, light walls of gypsum boards on a steel framework with a thickness of at least 125 mm and EI120 or higher fire rating, and concrete floor slabs with a min. thickness of 150 mm. The dampers may be installed on grout or in dry installation in mineral wool with a horizontal and vertical rotation axis.

Damper installation with a vertical axis of rotation

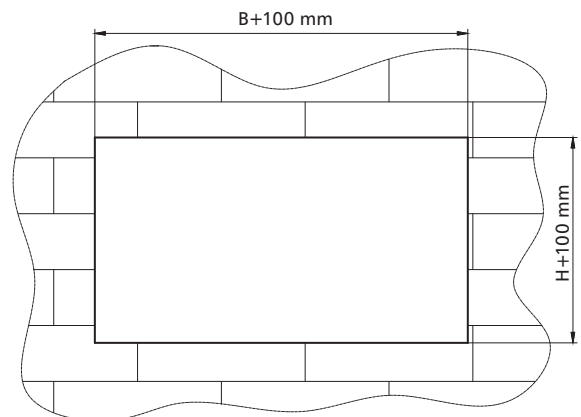
Such installation must be clearly stated in the draft documentation and reported to the damper's manufacturer in the order. BxH damper dimensions should be provided in a manner similar to the damper with a horizontal rotation axis.

2.5.1 | Preparation of installation openings

» installation openings preparation
- wet installation – preferred opening

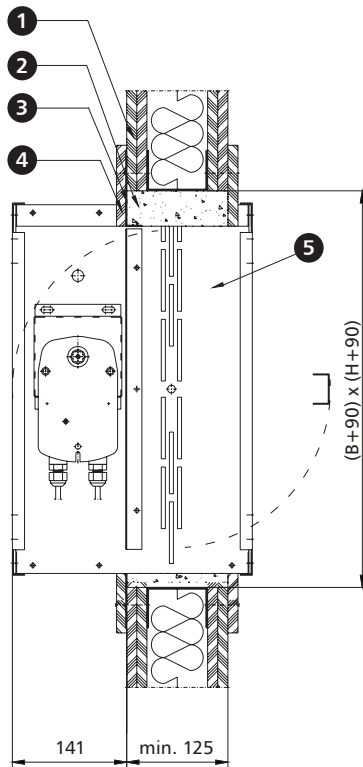


» installation openings preparation
- dry installation – preferred opening

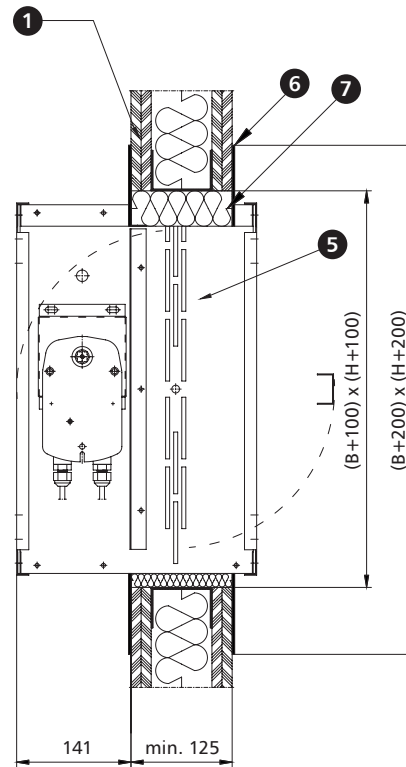


2.5.2 | Sample installation in gypsum board light walls

» WET installation



» DRY installation



dimensions in [mm]

1. light wall
2. assembly mortar*
3. mounting flange - embedding border
4. damper circumference gypsum board trim 100 x 12.5

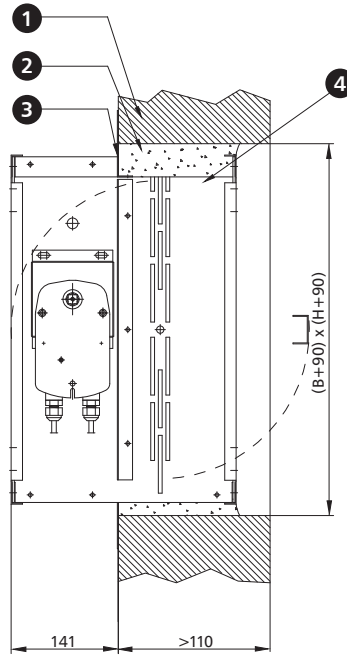
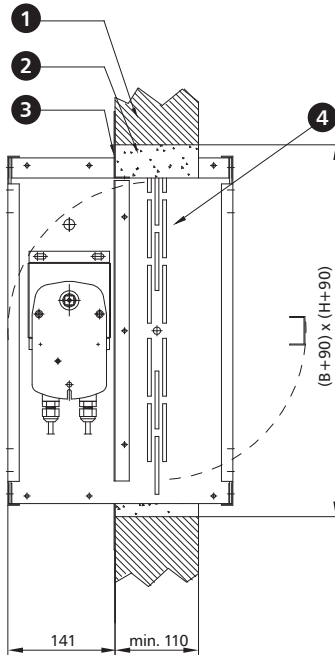
5. mcr FID S/S c/P fire damper
6. elastic fire protection grout/mass*
7. mineral wool*

* Recommended damper installation in a dry system is based on wool with a min. density of 100 kg/m³ and a fire resistance class A1, as well as on securing the contact portion between the damper and the wall and the wall itself with the elastic fire protection mass mcr Polyac Elastic with a thickness of 1 mm, as per the drawing above. Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

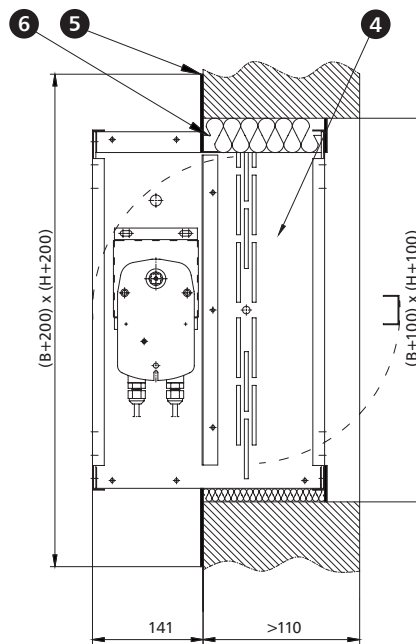
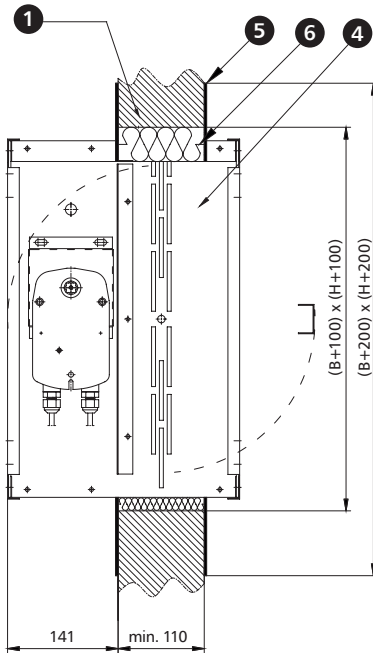
NOTE: If the damper is installed in a wall with a thickness of less than 125 mm, the wall thickness should be increased along the damper circumference by installing a belt of panels or other construction elements to the required thickness.

2.5.3 | Sample installation in concrete walls

» WET installation



» DRY installation



dimensions in [mm]

- 1. masonry wall
- 2. assembly mortar*
- 3. mounting flange - embedding border

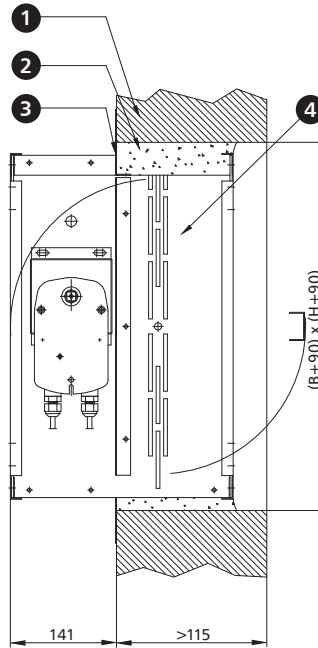
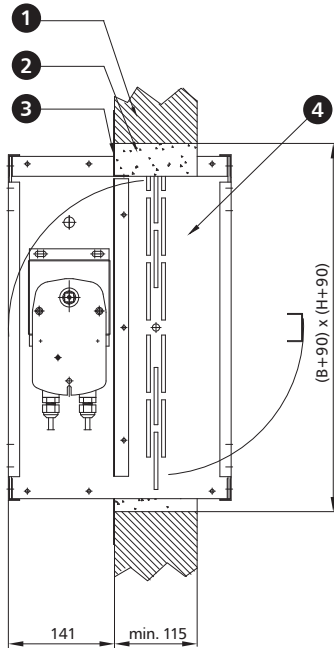
- 4. mcr FID S/S c/P fire damper
- 5. elastic fire protection grout/mass*
- 6. mineral wool*

* Recommended damper installation in a dry system is based on wool with a min. density of 100 kg/m³ and a fire resistance class A1, as well as on securing the contact portion between the damper and the wall and the wall itself with the elastic fire protection mass mcr Polylac Elastic with a thickness of 1 mm, as per the drawing above. Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

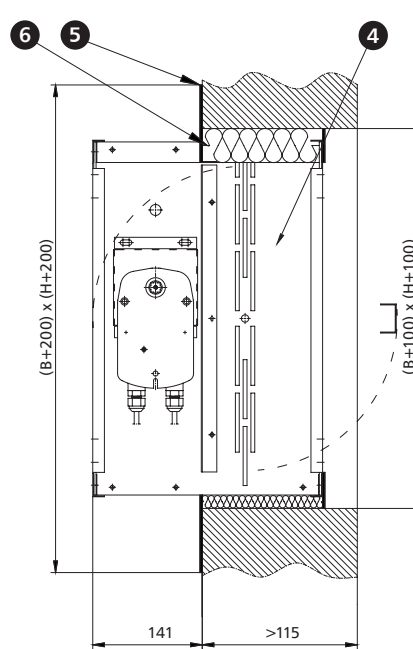
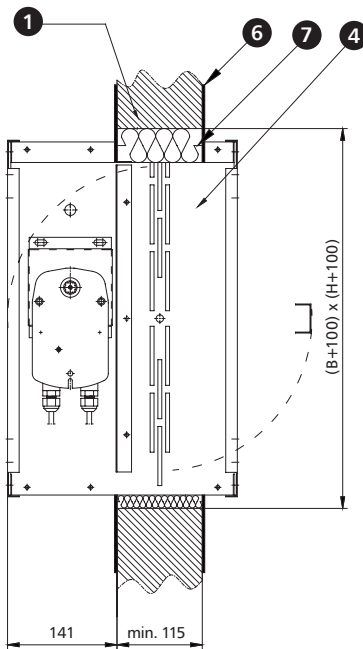
NOTE: If the damper is installed in a wall with a thickness of less than 110 mm, the wall thickness should be increased along the damper circumference by installing a belt of panels or other construction elements to the required thickness.

2.5.4 | Sample installation in masonry walls

» WET installation



» DRY installation



dimensions in [mm]

1. light wall
2. assembly mortar*
3. mounting flange - embedding border
4. damper circumference gypsum board trim 100 x 12.5

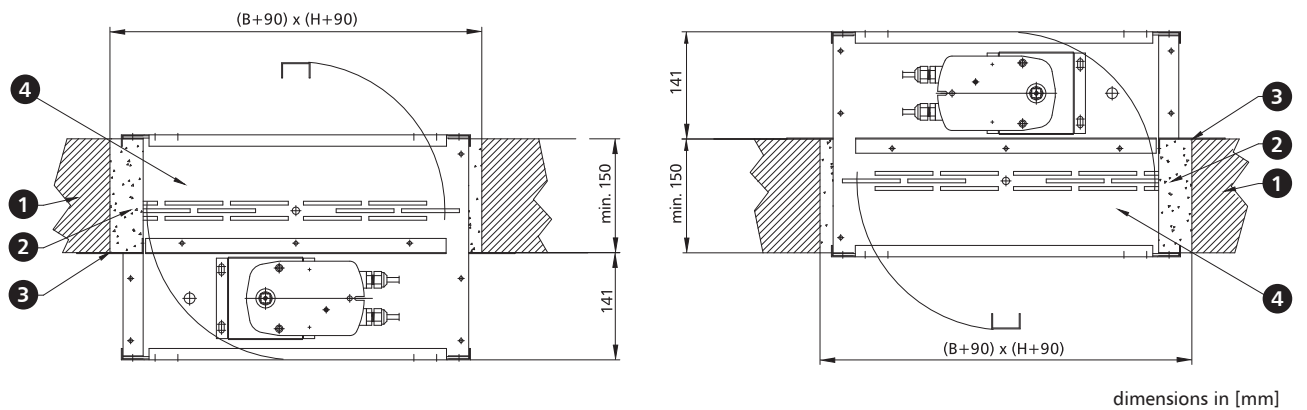
5. mcr FID S/S c/P fire damper
6. elastic fire protection grout/mass*
7. mineral wool*

* Recommended damper installation in a dry system is based on wool with a min. density of 100 kg/m³ and a fire resistance class A1, as well as on securing the contact portion between the damper and the wall and the wall itself with the elastic fire protection mass mcr Polyac Elastic with a thickness of 1 mm, as per the drawing above. Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

NOTE: If the damper is installed in a wall with a 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.

mcr FID S/S c/P | Low-resistance single-blade cut-off fire dampers for comfort ventilation systems

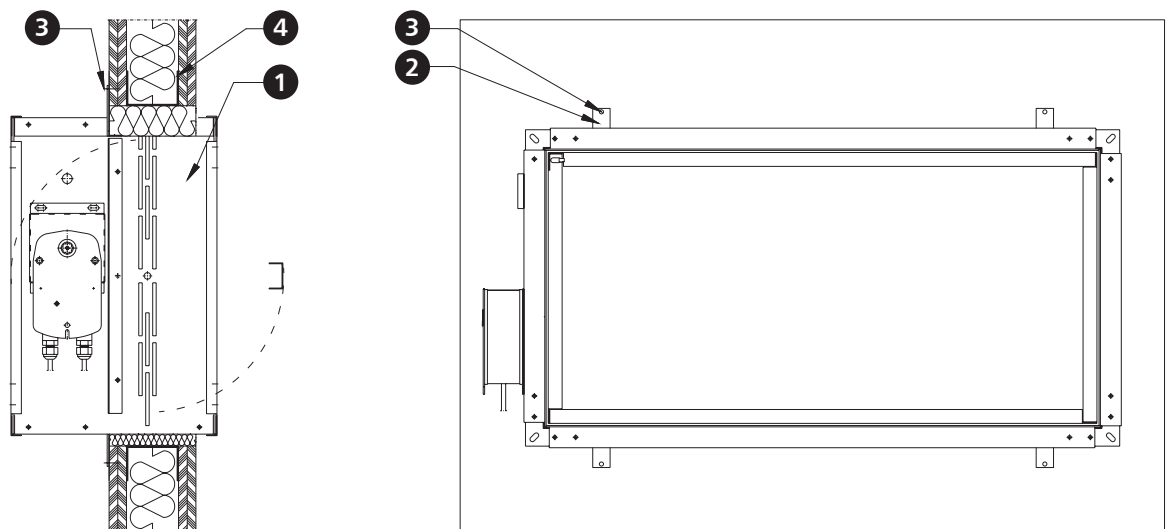
2.5.5 | Sample installation in floor slabs



- 1. floor slab
- 2. assembly mortar*
- 3. mounting flange - embedding border
- 4. mcr FID S/S c/P fire damper

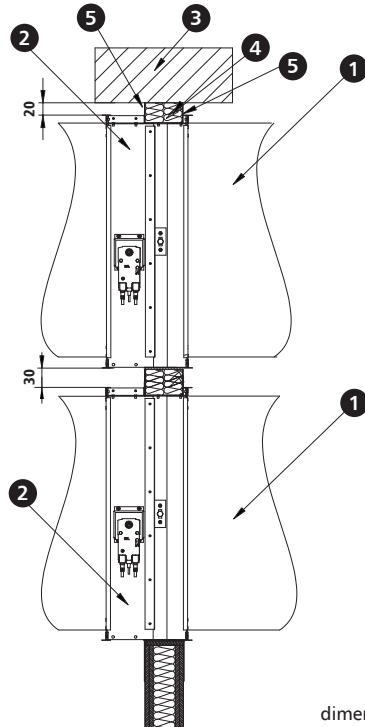
* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

2.5.6 | Sample installation with a bracket



- 1. mcr FID S/S c/P fire damper
- 2. WM installation bracket
- 3. plasterboard screw 3.5 x 20
- 4. e.g. plasterboard wall

2.5.7 | Sample installation below the floor slab



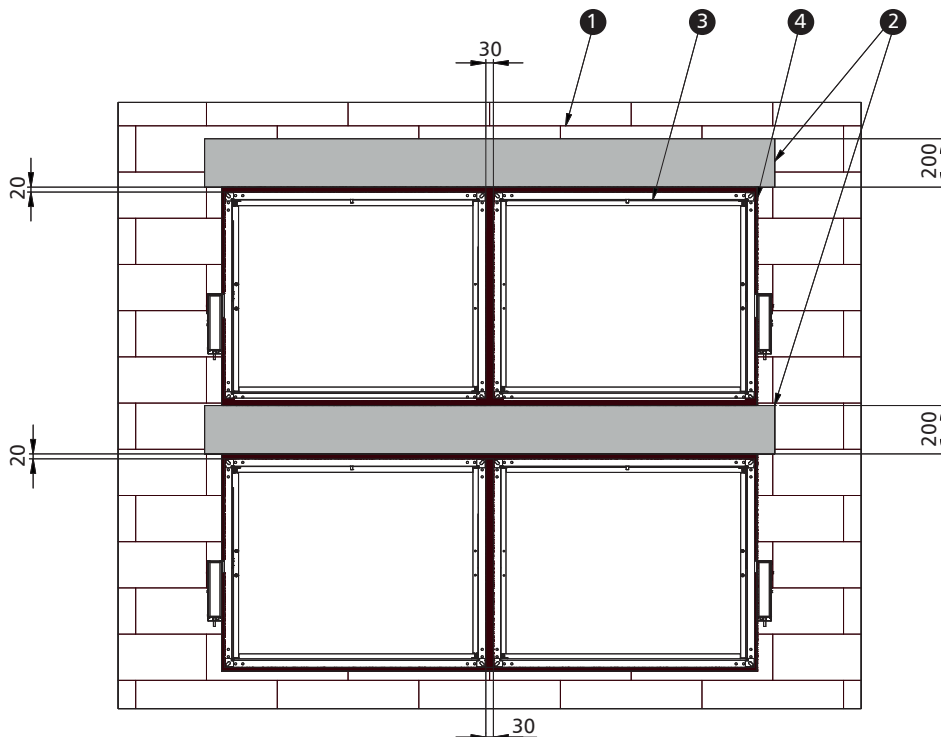
- 1. duct
- 2. mcr FID S/S c/P fire damper
- 3. floor slab
- 4. mineral wool*
- 5. elastic fire protection grout/mass*

Minimum installation distances of the damper from the ceiling according to the adjacent drawing. The damper can be installed in close proximity to another damper (damper next to damper, damper above damper, dampers diagonally positioned) provided that the minimum installation distances, as shown in the drawing, are maintained. Surrounding collars made of non-combustible material (e.g., gypsum board) with a minimum thickness of 10 mm for flexible walls and 15 mm for rigid walls are required.

* Recommended damper installation in a dry system is based on wool with a min. density of 100 kg/m³ and a fire resistance class A1, as well as on securing the contact portion between the damper and the wall and the wall itself with the elastic fire protection mass mcr PolyIac Elastic with a thickness of 1 mm, as per the drawing above. Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

dimensions in [mm]

2.5.8 | Example of modular installation



dimensions in [mm]

- 1. wall
- 2. wall element, e.g. lintel
- 3. mcr FID S/S c/P damper
- 4. assembly mortar*

Other configurations for the installation of mcr FID S/S c/P damper modules, consisting of two or more dampers, are possible, while maintaining the minimum distances between dampers as shown above.

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

2.6 | mcr FID S/S c/P rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]																					
		100					200					250					300						
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	
width B [mm]	100	4	0,01	0,006	91	10	0,02	0,016	235	6	0,025	0,021	307	6	0,03	0,026	379	5	0,03	0,026	379	5	26
		6			136	23			352	14			460	12			568	12			37		
		8			181	40			469	24			613	22			757	21			44		
		10			227	63			587	38			767	34			947	33			50		
	200	4	0,02	0,013	181	10	0,04	0,033	468	6	0,05	0,043	612	6	0,06	0,053	756	5	0,06	0,053	756	5	26
		6			272	23			702	14			918	13			1 134	12			37		
		8			363	40			936	24			1 224	24			1 512	22			44		
		10			454	63			1 170	38			1 530	37			1 890	34			50		
	250	4	0,025	0,016	227	10	0,05	0,041	585	6	0,0625	0,053	765	6	0,075	0,066	945	5	0,075	0,066	945	5	26
		6			340	23			878	14			1 148	13			1 418	11			37		
		8			454	40			1 170	24			1 530	23			1 890	20			44		
		10			567	63			1 463	38			1 913	36			2 363	31			50		
	300	4	0,03	0,019	272	10	0,06	0,049	702	6	0,075	0,064	918	6	0,09	0,079	1 134	4	0,09	0,079	1 134	4	26
		6			408	23			1 053	13			1 377	13			1 701	10			36		
		8			544	40			1 404	24			1 836	22			2 268	18			44		
		10			680	63			1 755	37			2 295	35			2 835	28			49		
	350	4	0,035	0,022	318	10	0,07	0,057	819	6	0,0875	0,074	1 071	5	0,105	0,092	1 323	4	0,105	0,092	1 323	4	25
		6			476	23			1 229	13			1 607	11			1 985	9			35		
		8			635	40			1 638	22			2 142	20			2 646	16			43		
		10			794	63			2 048	35			2 678	31			3 308	25			49		
	400	4	0,04	0,025	363	10	0,08	0,065	936	5	0,1	0,085	1 224	4	0,12	0,105	1 512	4	0,12	0,105	1 512	4	24
		6			544	23			1 404	12			1 836	9			2 268	8			34		
		8			726	40			1 872	22			2 448	17			3 024	14			42		
		10			907	63			2 340	34			3 060	26			3 780	22			48		
	450	4	0,045	0,028	408	10	0,09	0,073	1 053	5	0,1125	0,096	1 377	3	0,135	0,118	1 701	3	0,135	0,118	1 701	3	23
		6			612	23			1 580	11			2 066	7			2 552	7			33		
		8			816	40			2 106	20			2 754	13			3 402	13			41		
		10			1021	63			2 633	31			3 443	20			4 253	20			47		
	500	4	0,05	0,032	454	10	0,1	0,081	1 170	4	0,125	0,106	1 530	3	0,15	0,131	1 890	3	0,15	0,131	1 890	3	23
		6			680	23			1 755	10			2 295	8			2 835	7			34		
		8			907	40			2 340	18			3 060	13			3 780	13			41		
		10			1134	63			2 925	28			3 825	21			4 725	20			47		
	550	4	0,055	0,035	499	10	0,11	0,089	1 287	4	0,1375	0,117	1 683	3	0,165	0,144	2 079	3	0,165	0,144	2 079	3	22
		6			748	23			1 931	9			2 525	7			3 119	6			33		
		8			998	40			2 574	17			3 366	13			4 158	12			40		
		10			1247	63			3 218	26			4 208	20			5 198	18			46		
	600	4	0,06	0,038	544	10	0,12	0,098	1 404	3	0,15	0,128	1 836	3	0,18	0,158	2 268	2	0,18	0,158	2 268	2	20
		6			816	23			2 106	7			2 754	6			3 402	5			31		
		8			1089	40			2 808	12			3 672	10			4 536	10			38		
		10			1361	63			3 510	19			4 590	16			5 670	15			44		
	650	4	0,065	0,041	590	10	0,13	0,106	1 521	3	0,1625	0,138	1 989	3	0,195	0,171	2 457	2	0,195	0,171	2 457	2	20
		6			885	23			2 282	7			2 984	6			3 686	5			30		
		8			1179	40			3 042	12			3 978	10			4 914	9			38		
		10			1474	63			3 803	19			4 973	16			6 143	14			44		
	700	4	0,07	0,044	635	10	0,14	0,114	1 638	3	0,175	0,149	2 142	2	0,21	0,184	2 646	2	0,21	0,184	2 646	2	19
		6			953	23			2 457	6			3 213	5			3 969	5			30		
		8			1270	40			3 276	12			4 284	10			5 292	8			37		
		10			1588	63			4 095	18			5 355	15			6 615	13			43		
	750	4	0,075	0,047	680	10	0,15	0,122	1 755	3	0,1875	0,159	2 295	2	0,225	0,197	2 835	2	0,225	0,197	2 835	2	20
6		1021			23	2 633			6	3 443			5	4 253			5	30					
8		1361			40	3 510			11	4 590			10	5 670			8	38					
10		1701			63	4 388			17	5 738			15	7 088			13	43					
800	4	0,08	0,050	726	10	0,16	0,13	1 872	2	0,2	0,17	2 448	2	0,24	0,21	3 024	2	0,24	0,21	3 024	2	19	
	6			1089	23			2 808	5			3 672	5			4 536	4			29			
	8			1452	40			3 744	10			4 896	9			6 048	8			37			
	10			1814	63			4 680	15			6 120	14			7 560	12			43			
900	4	0,09	0,057	816	10	0,18	0,146	2 106	2	0,225	0,191	2 754	2	0,27	0,236	3 402	2	0,27	0,236	3 402	2	17	
	6			1225	23			3 159	4			4 131	4			5 103	4			27			
	8			1633	40			4 212	8			5 508	7			6 804	6			35			
	10			2041	63			5 265	12			6 885	11			8 505	10			41			
1000	4	0,1	0,063	907	10	0,2	0,163	2 340	2	0,25	0,213	3 060	1	0,3	0,263	3 780	1	0,3	0,263	3 780	1	14	
	6			1361	23			3 510	3			4 590	3			5 670	3			25			
	8			1814	40			4 680	6			6 120	6			7 560	5			32			
	10			2268	63			5 850	10			7 650	9			9 450	8			38			

mcr FID S/S c/P | Low-resistance single-blade cut-off fire dampers for comfort ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]																	
		350					400					500							
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]		
width B [mm]	100	4	0,035	0,031	451	5	26	0,04	0,036	523	5	26	0,05	0,046			667	5	26
		6			676	11	37			784	11	37					1000	10	37
		8			901	20	44			1045	19	44					1333	19	44
		10			1127	31	50			1307	30	50					1667	29	50
	200	4	0,07	0,063	900	5	26	0,08	0,073	1 044	5	26	0,1	0,093			1 332	4	26
		6			1 350	12	37			1 566	11	37					1 998	10	37
		8			1 800	21	44			2 088	19	44					2 664	18	44
		10			2 250	32	50			2 610	30	50					3 330	27	50
	250	4	0,0875	0,078	1 125	4	25	0,1	0,091	1 305	4	25	0,125	0,116			1 665	4	26
		6			1 688	10	36			1 958	9	35					2 498	9	36
		8			2 250	17	43			2 610	16	43					3 330	16	44
		10			2 813	27	49			3 263	25	49					4 163	25	50
	300	4	0,105	0,094	1 350	4	26	0,12	0,109	1 566	4	24	0,15	0,139			1 998	4	26
		6			2 025	10	36			2 349	8	35					2 997	8	36
		8			2 700	17	44			3 132	15	42					3 996	15	44
		10			3 375	27	50			3 915	23	48					4 995	23	50
	350	4	0,1225	0,109	1 575	4	25	0,14	0,127	1 827	4	25	0,175	0,162			2 331	3	25
		6			2 363	9	36			2 741	8	36					3 497	8	36
		8			3 150	15	43			3 654	15	43					4 662	14	43
		10			3 938	24	49			4 568	23	49					5 828	22	49
	400	4	0,14	0,125	1 800	3	24	0,16	0,145	2 088	3	23	0,2	0,185			2 664	3	25
		6			2 700	8	34			3 132	7	34					3 996	7	35
		8			3 600	13	42			4 176	12	41					5 328	13	43
		10			4 500	21	48			5 220	19	47					6 660	20	49
	450	4	0,1575	0,141	2 025	3	24	0,18	0,163	2 349	3	21	0,225	0,208			2 997	3	24
		6			3 038	7	34			3 524	6	32					4 496	7	35
		8			4 050	13	42			4 698	10	39					5 994	12	42
		10			5 063	20	48			5 873	16	45					7 493	18	48
	500	4	0,175	0,156	2 250	2	20	0,2	0,181	2 610	2	20	0,25	0,231			3 330	3	23
		6			3 375	5	31			3 915	5	31					4 995	6	34
		8			4 500	10	38			5 220	9	38					6 660	11	42
		10			5 625	15	44			6 525	14	44					8 325	17	47
	550	4	0,1925	0,172	2 475	2	19	0,22	0,199	2 871	2	20	0,275	0,254			3 663	2	23
		6			3 713	5	29			4 307	5	30					5 495	6	33
		8			4 950	8	37			5 742	8	38					7 326	10	41
		10			6 188	13	43			7 178	13	43					9 158	15	47
	600	4	0,21	0,188	2 700	2	18	0,24	0,218	3 132	2	22	0,3	0,278			3 996	2	22
		6			4 050	4	29			4 698	6	33					5 994	5	32
		8			5 400	8	36			6 264	10	40					7 992	9	40
		10			6 750	12	42			7 830	16	46					9 990	14	46
	650	4	0,2275	0,203	2 925	2	19	0,26	0,236	3 393	2	18	0,325	0,301			4 329	2	21
		6			4 388	4	29			5 090	4	29					6 494	5	32
		8			5 850	8	37			6 786	7	36					8 658	8	39
		10			7 313	12	42			8 483	11	42					10 823	13	45
	700	4	0,245	0,219	3 150	2	18	0,28	0,254	3 654	2	18	0,35	0,324			4 662	2	20
		6			4 725	4	28			5 481	4	29					6 993	4	31
		8			6 300	7	36			7 308	7	36					9 324	7	38
		10			7 875	11	42			9 135	11	42					11 655	12	44
750	4	0,2625	0,234	3 375	2	18	0,3	0,272	3 915	2	17	0,375	0,347			4 995	2	19	
	6			5 063	4	29			5 873	4	28					7 493	4	30	
	8			6 750	7	36			7 830	6	36					9 990	7	37	
	10			8 438	11	42			9 788	10	41					12 488	10	43	
800	4	0,28	0,25	3 600	2	18	0,32	0,29	4 176	2	18	0,4	0,37			5 328	2	18	
	6			5 400	4	29			6 264	4	28					7 992	3	29	
	8			7 200	7	36			8 352	6	36					10 656	6	36	
	10			9 000	11	42			10 440	10	42					13 320	9	42	
900	4	0,315	0,281	4 050	1	16	0,36	0,326	4 698	1	16	0,45	0,416			5 994	1	16	
	6			6 075	3	27			7 047	3	27					8 991	3	26	
	8			8 100	6	34			9 396	5	34					11 988	5	34	
	10			10 125	9	40			11 745	8	40					14 985	8	40	
1000	4	0,35	0,313	4 500	1	14	0,4	0,363	5 220	1	13	0,5	0,463			6 660	1	13	
	6			6 750	3	24			7 830	2	24					9 990	2	24	
	8			9 000	5	32			10 440	4	32					13 320	4	31	
	10			11 250	7	38			13 050	7	37					16 650	6	37	

mcr FID S/S c/P | Low-resistance single-blade cut-off fire dampers for comfort ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]																	
		600					700					800							
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]		
width B [mm]	100	4	0,06	0,056	811	5	26	0,07	0,066	955	4	26	0,08	0,076			1099	4	26
		6			1216	10	36			1432	10	36					1648	10	36
		8			1621	18	44			1909	18	44					2197	18	44
		10			2027	28	50			2387	28	50					2747	27	49
	200	4	0,12	0,113	1 620	4	26	0,14	0,133	1 908	4	26	0,16	0,153			2 196	4	26
		6			2 430	9	36			2 862	9	36					3 294	8	36
		8			3 240	16	44			3 816	15	44					4 392	14	44
		10			4 050	25	50			4 770	24	50					5 490	22	49
	250	4	0,15	0,141	2 025	4	26	0,175	0,166	2 385	4	26	0,2	0,191			2 745	3	25
		6			3 038	8	36			3 578	8	36					4 118	7	36
		8			4 050	15	44			4 770	14	44					5 490	13	43
		10			5 063	23	50			5 963	22	49					6 863	21	49
	300	4	0,18	0,169	2 430	3	25	0,21	0,199	2 862	3	25	0,24	0,229			3 294	3	25
		6			3 645	8	36			4 293	7	36					4 941	7	36
		8			4 860	14	44			5 724	13	43					6 588	12	43
		10			6 075	22	49			7 155	20	49					8 235	19	49
	350	4	0,21	0,197	2 835	3	25	0,245	0,232	3 339	3	25	0,28	0,267			3 843	3	25
		6			4 253	7	36			5 009	7	35					5 765	6	35
		8			5 670	13	43			6 678	12	43					7 686	11	43
		10			7 088	20	49			8 348	19	49					9 608	18	49
	400	4	0,24	0,225	3 240	3	25	0,28	0,265	3 816	3	24	0,32	0,305			4 392	3	24
		6			4 860	7	35			5 724	6	35					6 588	6	35
		8			6 480	12	43			7 632	11	42					8 784	10	42
		10			8 100	18	48			9 540	17	48					10 980	16	48
	450	4	0,27	0,253	3 645	3	24	0,315	0,298	4 293	3	24	0,36	0,343			4 941	2	24
		6			5 468	6	34			6 440	6	34					7 412	5	34
		8			7 290	11	42			8 586	10	42					9 882	9	42
		10			9 113	17	48			10 733	16	48					12 353	15	47
	500	4	0,3	0,281	4 050	2	23	0,35	0,331	4 770	2	23	0,4	0,381			5 490	2	23
		6			6 075	6	34			7 155	5	34					8 235	5	33
		8			8 100	10	41			9 540	9	41					10 980	9	41
		10			10 125	15	47			11 925	14	47					13 725	13	47
	550	4	0,33	0,309	4 455	2	22	0,385	0,364	5 247	2	22	0,44	0,419			6 039	2	22
		6			6 683	5	33			7 871	5	33					9 059	4	33
		8			8 910	9	41			10 494	8	40					12 078	8	40
		10			11 138	14	46			13 118	13	46					15 098	12	46
	600	4	0,36	0,338	4 860	2	22	0,42	0,398	5 724	2	21	0,48	0,458			6 588	2	21
		6			7 290	5	32			8 586	4	32					9 882	4	32
		8			9 720	8	40			11 448	8	39					13 176	7	39
		10			12 150	13	45			14 310	12	45					16 470	11	45
	650	4	0,39	0,366	5 265	2	21	0,455	0,431	6 201	2	20	0,52	0,496			7 137	2	20
		6			7 898	4	31			9 302	4	31					10 706	4	31
		8			10 530	7	39			12 402	7	39					14 274	6	38
		10			13 163	12	45			15 503	11	44					17 843	10	44
	700	4	0,42	0,394	5 670	2	20	0,49	0,464	6 678	2	19	0,56	0,534			7 686	1	19
		6			8 505	4	30			10 017	4	30					11 529	3	30
		8			11 340	7	38			13 356	6	38					15 372	6	37
		10			14 175	11	44			16 695	10	43					19 215	9	43
750	4	0,45	0,422	6 075	2	19	0,525	0,497	7 155	1	18	0,6	0,572			8 235	1	18	
	6			9 113	3	29			10 733	3	29					12 353	3	29	
	8			12 150	6	37			14 310	6	37					16 470	5	36	
	10			15 188	10	43			17 888	9	42					20 588	8	42	
800	4	0,48	0,45	6 480	1	18	0,56	0,53	7 632	1	17	0,64	0,61			8 784	1	17	
	6			9 720	3	28			11 448	3	28					13 176	3	28	
	8			12 960	5	36			15 264	5	35					17 568	5	35	
	10			16 200	9	42			19 080	8	41					21 960	7	41	
900	4	0,54	0,506	7 290	1	15	0,63	0,596	8 586	1	15	0,72	0,686			9 882	1	15	
	6			10 935	2	26			12 879	2	25					14 823	2	25	
	8			14 580	4	33			17 172	4	33					19 764	4	33	
	10			18 225	7	39			21 465	6	39					24 705	6	39	
1000	4	0,6	0,563	8 100	1	13	0,7	0,663	9 540	1	12	0,8	0,763			10 980	1	12	
	6			12 150	2	23			14 310	2	23					16 470	2	22	
	8			16 200	3	31			19 080	3	30					21 960	3	30	
	10			20 250	5	36			23 850	5	36					27 450	5	36	

The mcr FID S/S c/P fire damper selection program is available at www.mercor.com.pl in the Designer Zone.

2.7 | Estimated weights of mcr FID S/S c/P dampers for rectangular ventilation ducts [kg]

		width B [mm]											
		100	150	200	250	300	400	500	600	700	800	900	1000
height H [mm]	100	5,5	6,0	6,5	7,0	8,0	9,0	10,0	13,0	15,0	17,0	19,0	21,0
	150	6,0	6,5	7,0	7,5	8,5	9,5	10,5	13,5	15,5	17,5	19,5	21,5
	200	6,5	7,0	7,5	8,0	9,0	10,0	11,0	14,0	16,0	18,0	20,0	22,0
	250	7,0	7,5	8,0	9,5	10,0	11,0	14,0	15,0	17,0	19,0	21,0	23,0
	300	8,0	8,5	9,0	10,5	11,0	12,0	15,0	16,0	18,0	20,0	22,0	24,0
	350	9,0	9,5	10,0	11,5	12,0	13,0	16,0	17,0	19,0	21,0	23,0	25,0
	400	10,0	10,5	11,0	12,5	13,5	14,0	17,0	18,0	21,0	22,0	24,0	26,0
	500	12,0	12,5	13,0	14,5	15,5	16,0	18,0	19,0	22,0	24,0	26,0	28,0
	600	14,0	14,5	15,0	16,5	17,5	18,5	20,0	22,0	24,0	26,0	28,0	30,0
	700	16,0	16,5	17,0	18,5	19,5	20,0	22,0	24,0	26,0	28,0	30,0	32,0
	800	18,0	18,5	19,0	20,5	21,5	22,0	24,0	26,0	28,0	30,0	32,0	34,0

For dampers with no actuator, subtract ~1 kg from the weight given.

2.8 | Accessories

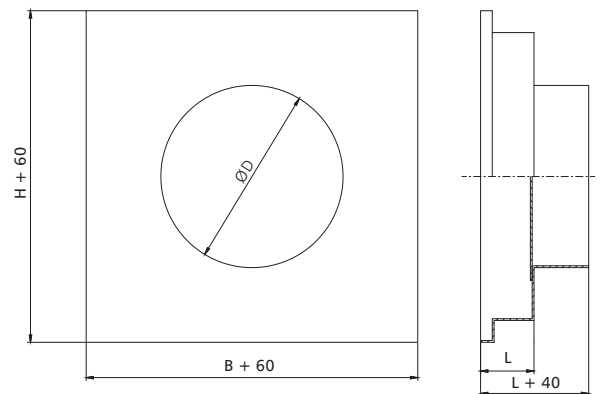
2.8.1 | mcr KRP connection stub

mcr KRP connection stubs are used to connect a circular ventilation duct to a rectangular damper. The connection is a „bare end“ pipe. The diameter of the stub pipe is 2 mm smaller than the diameter of the ventilation duct.

NOTE: due to the asymmetrical position of the fire blade in the damper casing, the connection stubs are of different lengths L, depending on the side of the damper on which they are to be used. Stubs are supplied for both sides of the damper.

Dimensions:

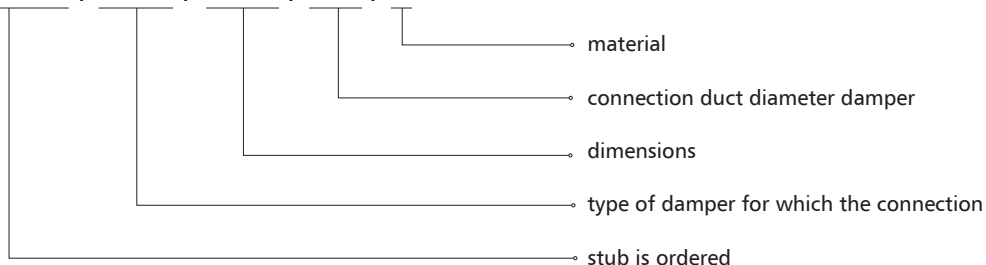
- » BxH - damper dimensions [mm]
- » ØD - diameter of the connection duct [mm]
- » L - length [mm] calculated from the formula: H/2-50 for one connection side and H/2-150 for the other connection side



dimensions in [mm]

Marking:

mcr KRP / FID S / B x H / DIA / X



X – material

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

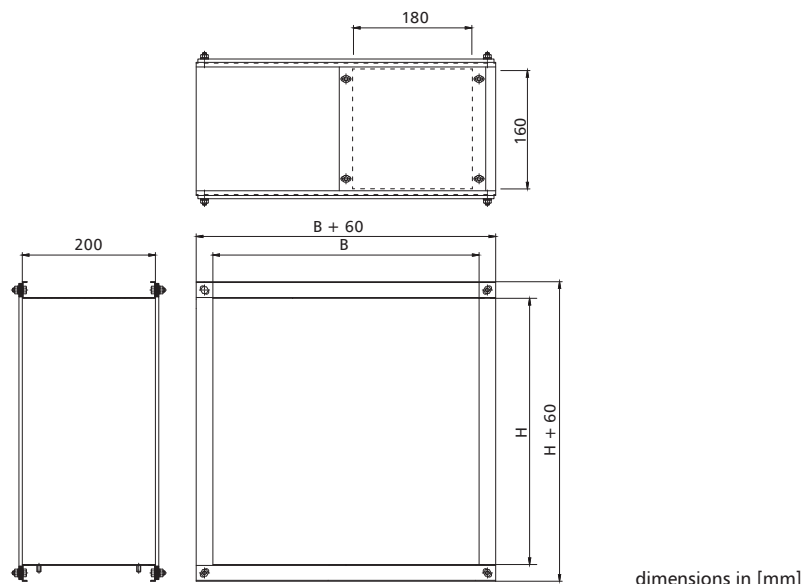
KN – stainless steel

KK – 1.4404 acid-proof steel

2.8.2 | Casing module with KRW-type inspection access

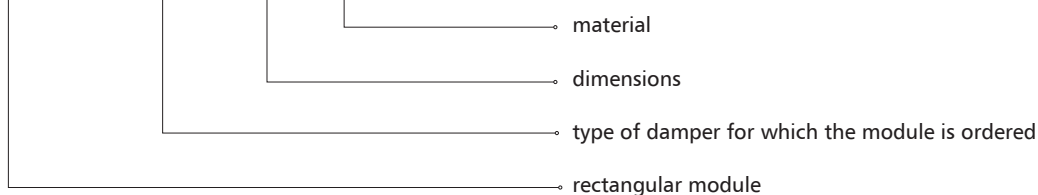
The casing modules with a KRW-type inspection access are made of sheet metal and equipped with connection flanges. The casing features an inspection access opening with a cover. The module enables to access the damper blade or a drive train quickly without having to dismantle the damper or the duct on which it is installed.

» KRW P module for rectangular damper



Marking:

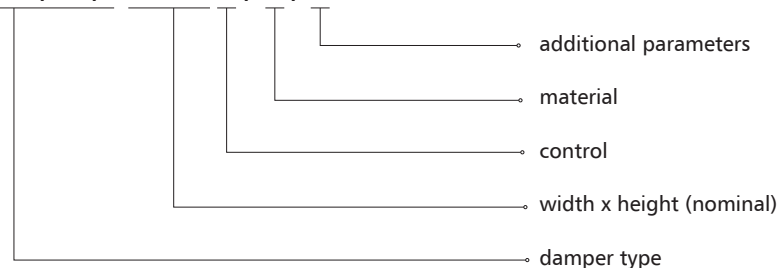
mcr KRW P / FID S / B x H / X



X – material
[no symbol] – galvanized steel, Zn 275 g/m² coating
KN – stainless steel
KK – 1.4404 acid-proof steel

2.9 | Marking

mcr FID S/S c/P B x H 1 / 2 / 3



1 - control:

» RST trigger control mechanism

RST – thermal trigger

RST/WK1 – thermal trigger + “pulse” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)

RST/WK2 – thermal trigger + “break” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade)

mcr FID S/S c/P | Low-resistance single-blade cut-off fire dampers for comfort ventilation systems

» KW1 trigger control mechanism

KW1/S – thermal trigger

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

KW1/24I/WK2 – thermal trigger + “pulse” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)

KW1/24P/WK2 – thermal trigger + “break” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade) signal)

KW1/24I/WK2 (+MP230/24) – thermal trigger + “pulse” electromagnetic trigger, U = 230 V AC

+ limit switch (open/closed blade signal)

KW1/24P/WK2 (+MP230/24) – thermal trigger + “break” electromagnetic trigger, U = 230 V AC

+ limit switch (open/closed blade signal)

» trigger and control mechanism, axial actuator

BF24TL-TN-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 / BFL24-SR-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

BFN 24-T / BFN 24-SR-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

MLF24T – actuator with a return spring, U = 24 V AC/DC

MLF230T – actuator with a return spring, U = 230 V AC

MF24T – actuator with a return spring, U = 24 V AC

MF230T – actuator with a return spring, U = 230 V AC

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

QT.Ex 230-FT.Ex – explosion proof actuator with a return spring in the Ex version, U = 230 V AC/DC

2 - material:

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

KN – stainless steel

KK – 1.4404 acid-proof steel

KKM – special design of the damper – damper and its elements made of stainless steel, additionally sleeves and their painted elements

3 - additional parameters :

» Thermoelectric and thermal triggers

[no symbol] – 72°C trigger

ZBAT95 – thermoelectric trigger for 95°C

T2-95 (MLF) – thermoelectric trigger for 95°C

T93-95 – thermal trigger for 95°C

FT.Ex-72 – thermoelectric trigger for 72°C

FT.Ex-95 – thermoelectric trigger for 95°C

» Control mechanism position

[no symbol] – perpendicular to the damper rotation axis

WOK – along the damper rotation axis

» Damper axis of rotation

[no symbol] – horizontal axis of rotation

PP_D – vertical axis of rotation – mechanism at the bottom of the damper

PP_G – vertical axis of rotation - mechanism at the top of the damper

» Design standard

[no symbol] – right damper

KL – left damper

KO – inverted damper

» Damper casing

[no symbol] – standard casing length

400 – casing with a length of 400 mm

BU – earth pin

» Installation bracket

[no symbol] – no bracket

WM – installation bracket

NOTE: separate additional parameters entered with the “/” sign

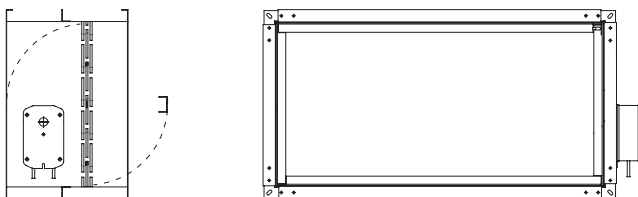
example marking:

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

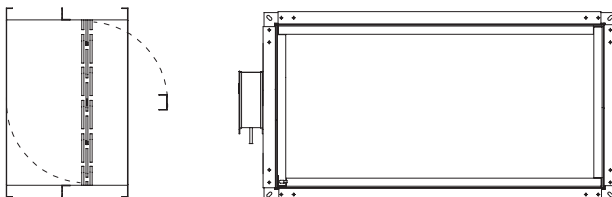
Low-resistance EIS120 cut-off damper with a 24 V actuator with limit switches.

2.9.1 | Design standard

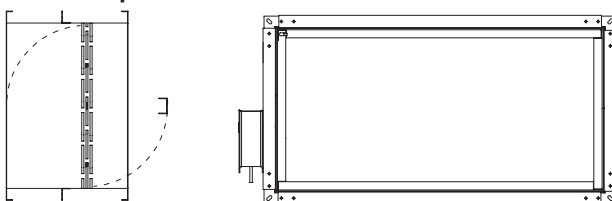
» right damper - standard



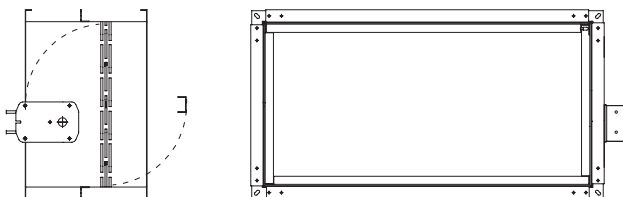
» inverted damper - (ducts facing downwards)



» left damper



» along the damper axis

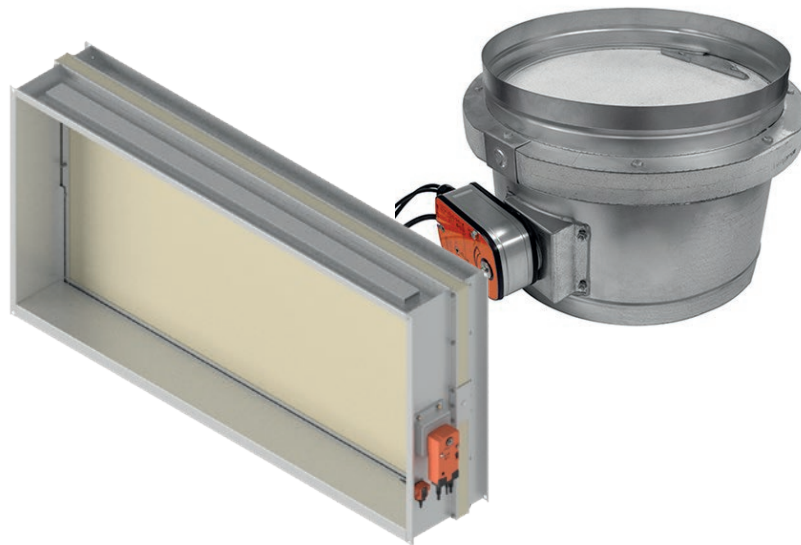


Chapter 19 - power supply and control (p. 350) contains the following information:
- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems



downloadable models
on the website
under the designer zone tab



- » **EIS120**
- » Fire resistance class: EI120 (v_e h_o $i \leftrightarrow o$)S.
- » 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 a fire resistance rating independent of the airflow direction and installation side.
- » Dampers for rectangular and circular ventilation ducts
- » Certified installation of dampers in close proximity.
- » Certified installation of dampers at a distance from construction partitions.
- » Certified modular installation.
- » Admitted operation of a damper with a horizontal and vertical rotation axis.
- » Pressure difference range: 2000 Pa.

3.1 | Application

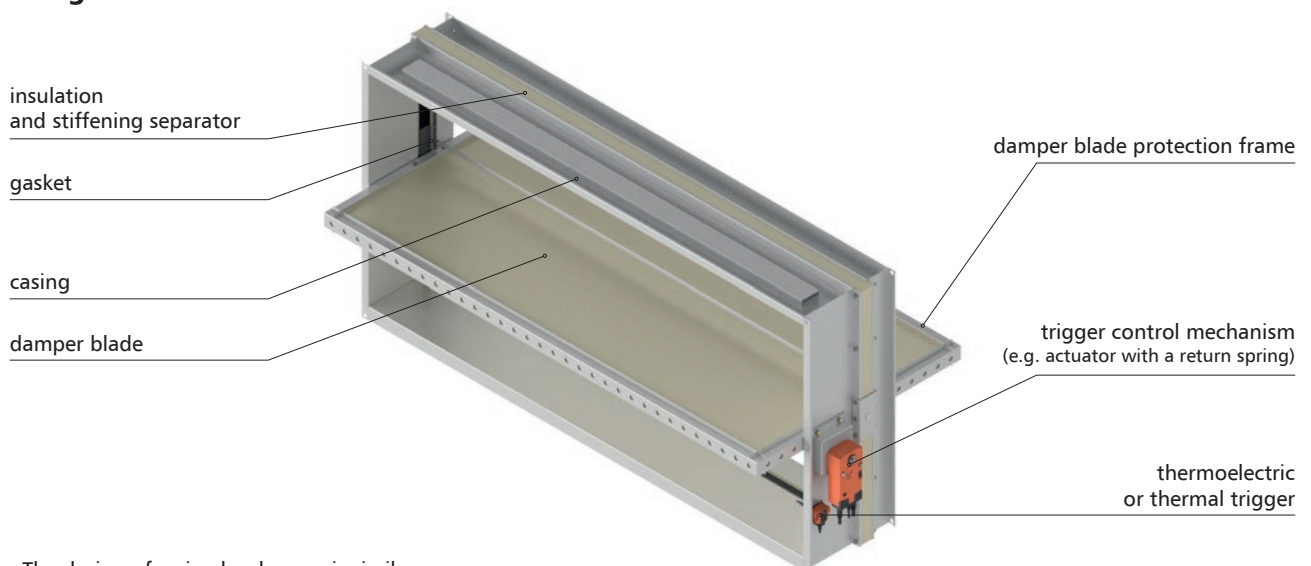
mcr FID S/S p/P, mcr FID S/S p/O cut-off dampers are designed for installation in general ventilation systems at installation passages through construction partitions.

During a fire, they preserve the fire resistance rating of the construction partition that the ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and fire gasses 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. Admissible flow velocity in the connected duct is 12 m/s.

In the version designed for explosion hazard zones (EX version), the dampers can be operated in gas explosion hazard zone 1 inside and outside ventilation ducts and in dust explosion hazard zone 21 outside these ducts. The dampers have been certified in compliance with the ATEX directive 94/9/EC and meet the requirements of group II category 2G and -/2D:

- » II 2G Ex h IIC T6 Gb
 - » II -/2D Ex h IIIC T72° -/Db
- Ambient temperature: T_a : -20° ... +50° C

3.2 | Design



- » The design of a circular damper is similar.

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

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 galvanized steel sheets. A special casing is used for chemically aggressive environments, which features steel elements made of 1.4404 (316L) 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 a 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 metal sheet reinforcement profile. The inner side of the fire damper casing is equipped with an intumescent gasket. Stop profiles are attached to the inner casing surface, limiting the rotating motion of the damper blade. Stop profiles are lined with a polyethylene ventilation gasket. In dampers with a rectangular cross-section, both ends of the casing are finished with flange connections, and in circular dampers they are finished with nipple or flange connections.

3.3 | Versions

3.3.1 | Damper closing and opening with an actuator

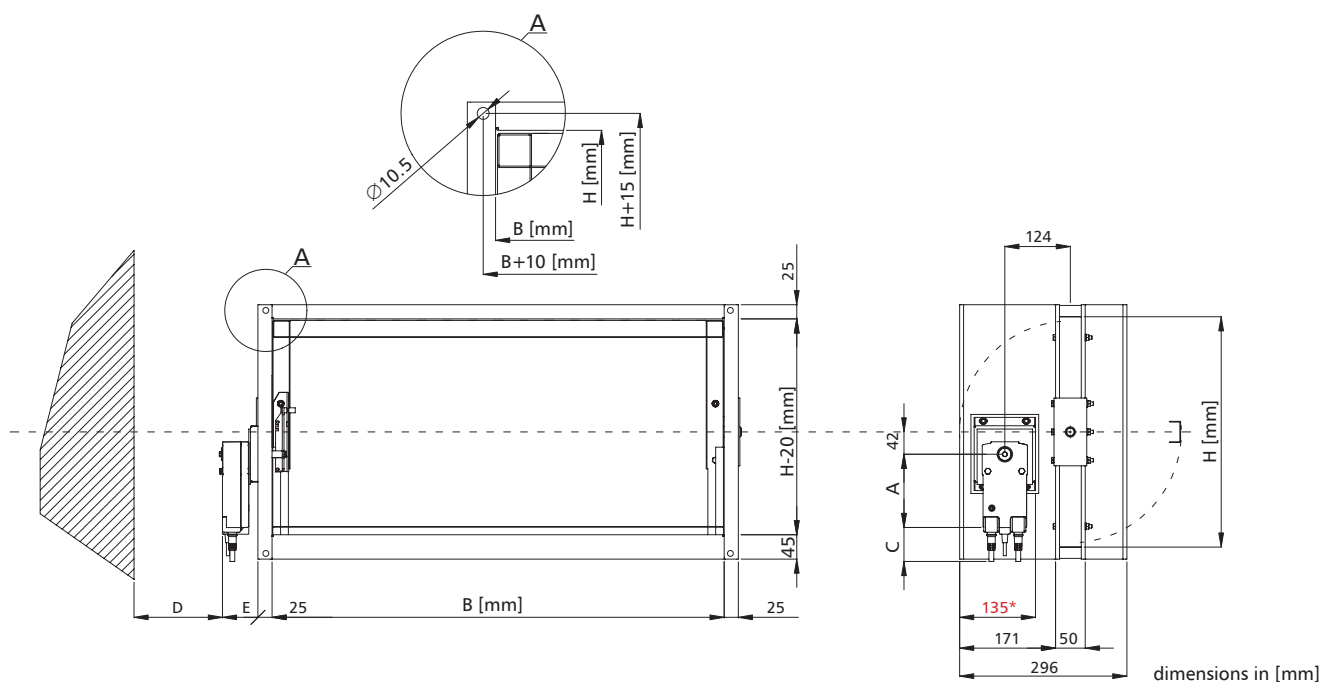
During normal operation, the fire damper blade remains open. In case of fire, the blade closes automatically or remotely when the power supply is cut off.

The mcr FID S/S dampers are equipped with a trigger control mechanism in the form of BF, BFL, BFN, BF-TL, EXBF, QT.Ex, MLF, MF series axial actuator with a return spring, supplied with 24 V AC/DC or 230 V AC, with a 72°C thermoelectric trigger (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, a mechanical position indicator is placed on the actuator.

Thermoelectric triggers are equipped with a test switch.

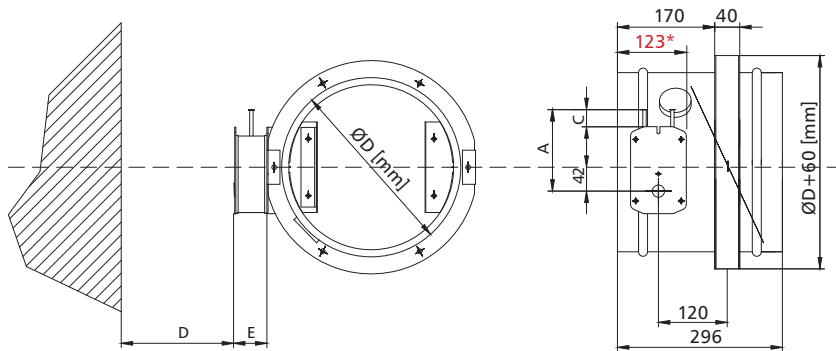
Dampers with actuators close as a result of the thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when power supply voltage is applied to the actuator terminals. Dampers with those actuators may be opened manually using a key.



mechanism	A	C	D	E
BFN	157	30	75	62
BFL/MLF	138	30	75	58
BF24TL-ST	198	10	75	70
EXBF	225	55	75	175
QT.Ex	255	30	75	85
BF/MF	198	10	75	70

*embedding border

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems



mechanism	A	C	D	E
BFN	157	30	75	42
BFL/MLF	138	30	75	38
BF24TL-ST	198	10	75	50
EXBF	225	55	75	160
QT.Ex	255	30	75	85
BF/MF	198	10	75	50

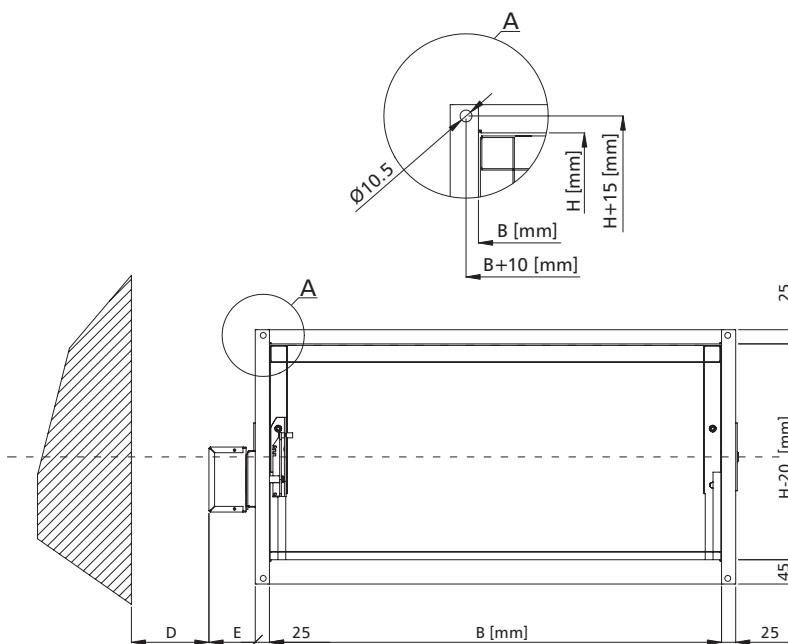
dimensions in [mm]

*embedding border

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

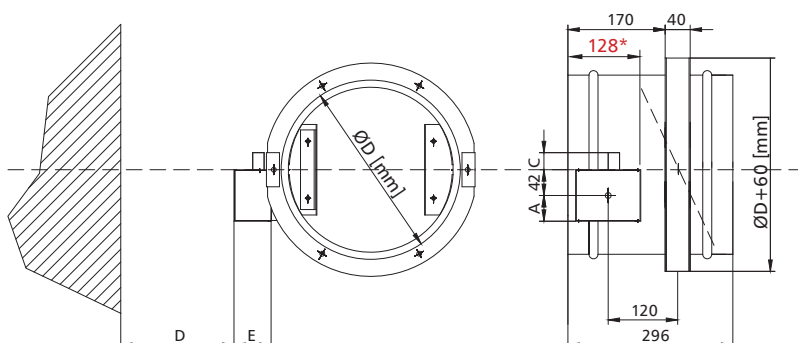
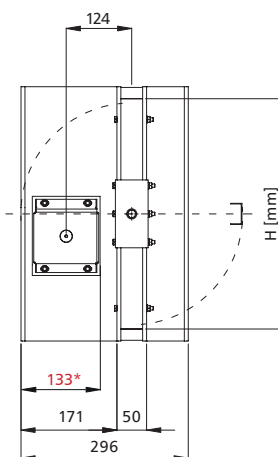
During normal operation, the fire damper blade remains open. In case of fire, the blade closes automatically.

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 74°C thermal trigger (optionally 95°C) is installed outside the damper mechanism, on the damper blade itself. Once the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. A mechanical blade position indicator is placed on the RST mechanism. It is possible to equip the damper with WK1 or WK2 limit switches used to signal the blade position.



mechanism	A	C	D	E
RST	50	30	75	75

*embedding border



mechanism	A	C	D	E
RST	40	30	75	55

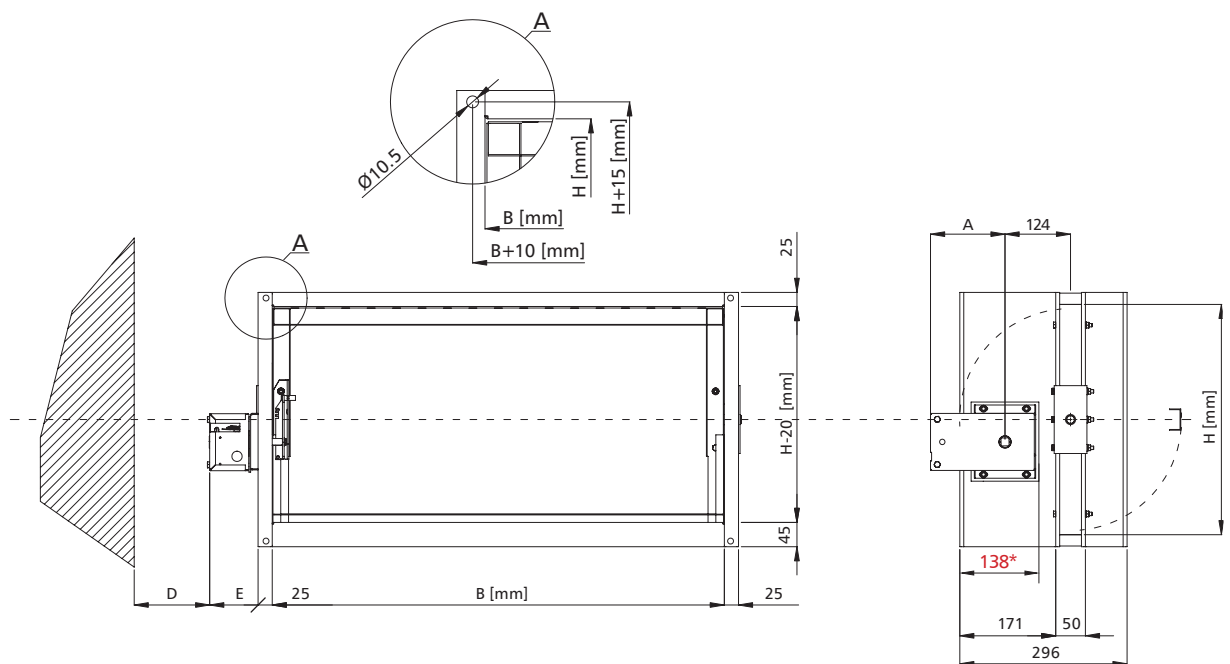
*embedding border

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

3.3.3 | mcr FID S/S – 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.

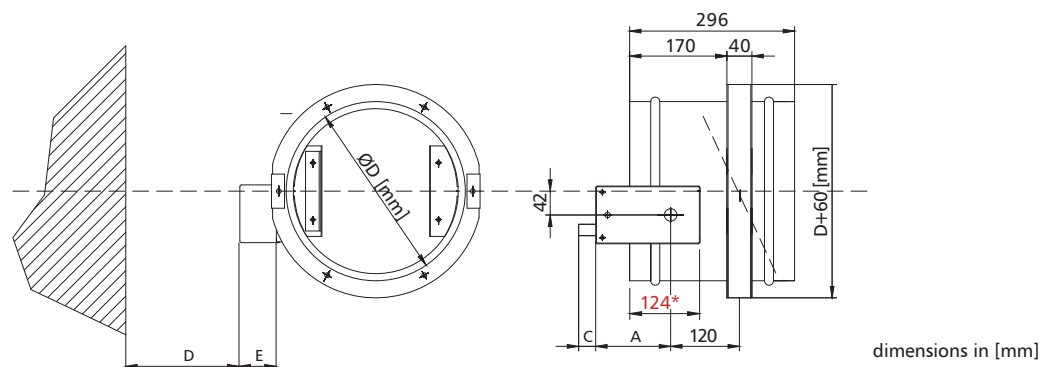
During normal operation, the fire damper blade remains open. In case of fire, the blade closes automatically or through the fire automation system in case of a damper with an electromagnetic trigger.

mcr FID S/S dampers are equipped with a KW1 trigger control mechanism with a drive spring and a cam-lever system. A 74°C thermal trigger (optionally 95°C) is integrated into the damper mechanism. Once the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. A mechanical blade position indicator is placed on the KW1 mechanism. 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. The mechanism features a test and blade button-release functions. Blade re-opening is activated manually. It is not required to dismantle the system to replace the thermal trigger. The KW1 mechanism may be replaced with an electric actuator.



mechanism	A	C	D	E
KW1	130	30	75	85

*embedding border



mechanism	A	C	D	E
KW1	130	30	75	65

*embedding border

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

3.4 | Dimensions

rectangular dampers:

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

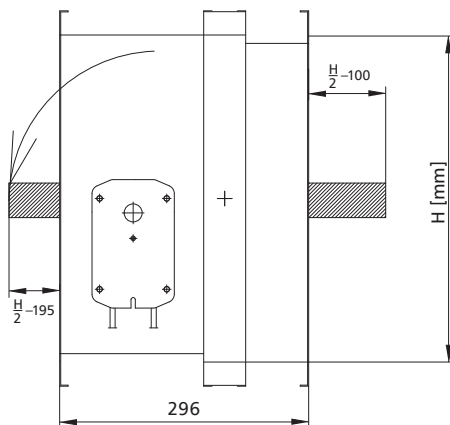
Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 1 mm increments within the given ranges).

circular dampers:

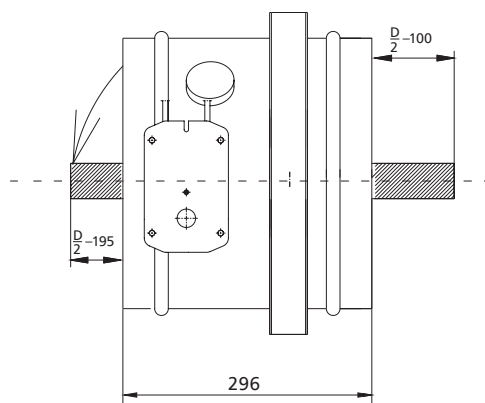
- » nominal diameter D from 250 mm to 630 mm

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

» mcr FID S/S p/P fire damper



» mcr FID S/S p/O fire damper



dimensions in [mm]

3.5 | Installation

mcr FID S/S p/P rectangular dampers have been rated as EI120(v_e h_o i↔o)S class. These dampers may be installed in the following partitions:

- » light walls/shafts made of gypsum boards with a min. thickness of 125 mm;
- » rigid walls/shafts made of blocks or hollow bricks with a min. thickness of 120 mm;
- » solid walls/shafts with a min. thickness of 120 mm;
- » solid floor slabs with a min. thickness of 150 mm.

Dampers may be installed at a distance to the vertical construction partitions, using fire-proof boards providing a fire resistance rating no lesser than the fire resistance rating of the partition.

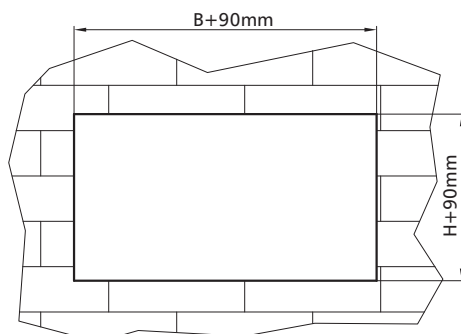
Dampers may be installed in vertical construction partitions with small distance between the dampers, equal to 60 mm.

mcr FID S/S p/O circular dampers have been rated as EI120(v_e h_o i↔o)S class. These dampers may be installed in the following partitions:

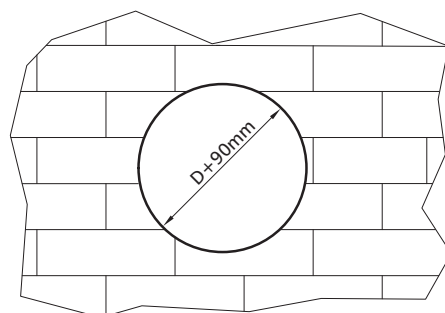
- » light walls/shafts made of gypsum boards with a min. thickness of 125 mm;
- » rigid walls/shafts made of blocks or hollow bricks with a min. thickness of 110 mm;
- » solid walls/shafts with a min. thickness of 110 mm;
- » solid floor slabs with a min. thickness of 150 mm.

3.5.1 | Preparation of installation openings

» mcr FID S/S p/P fire damper – preferred opening

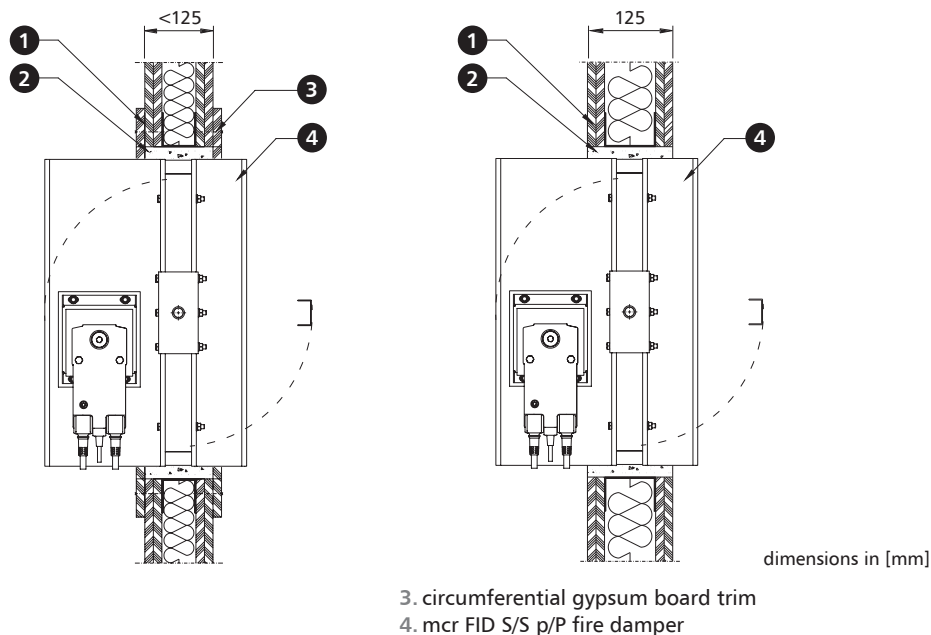


» mcr FID S/S p/O fire damper – preferred opening



3.5.2 | Sample installation in gypsum board light walls

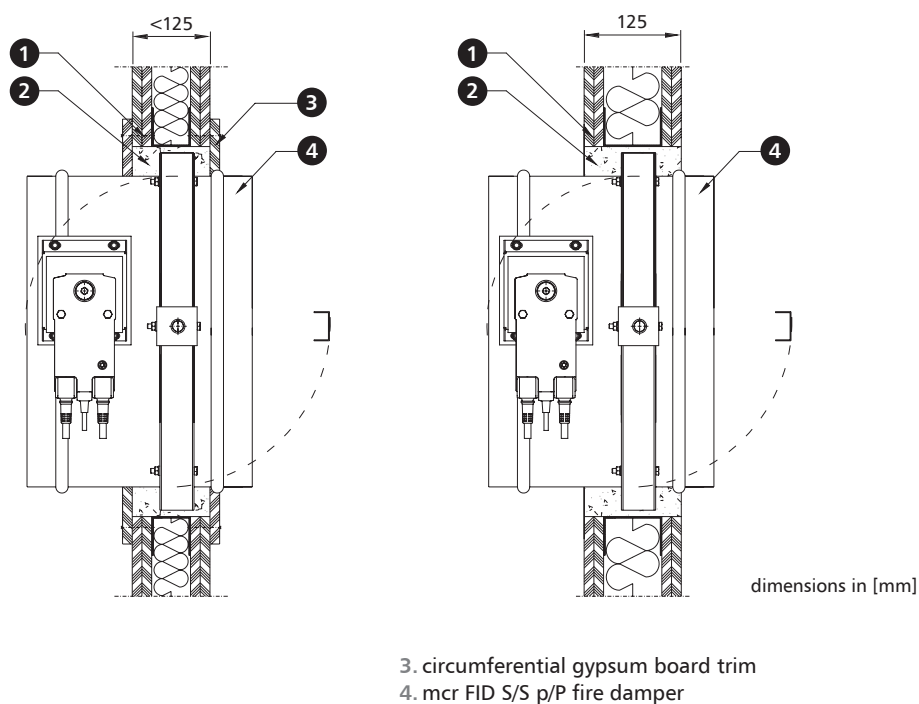
» mcr FID S/S p/P fire damper



* The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

NOTE: If the damper is installed in a wall with a thickness of less than 125 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.

» mcr FID S/S p/O fire damper



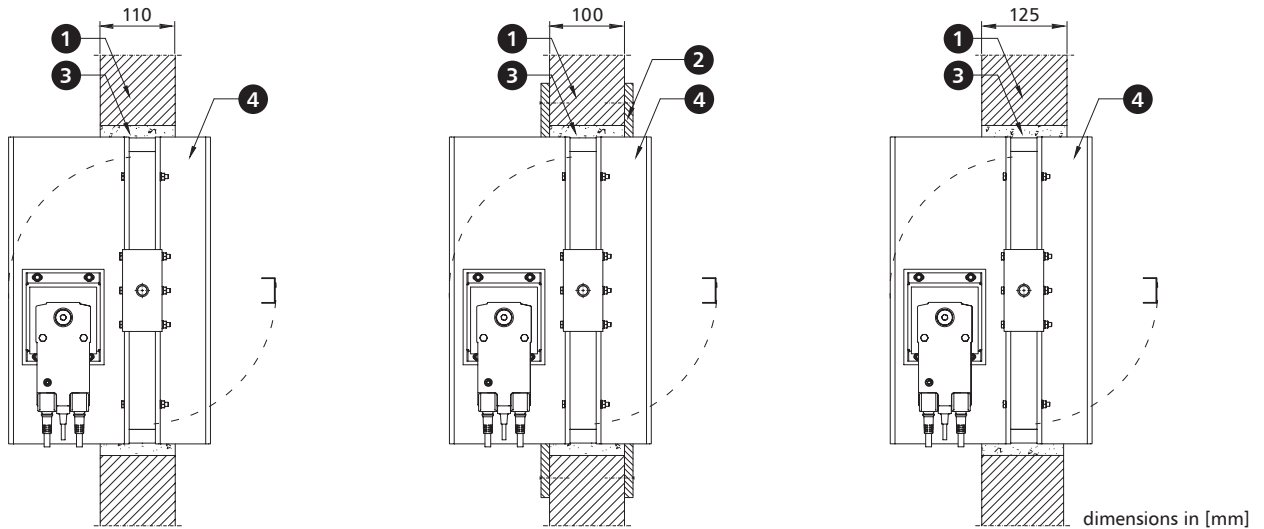
* The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

NOTE: If the damper is installed in a wall with a thickness of less than 125 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.

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

3.5.3 | Sample installation in concrete and brick walls

» mcr FID S/S p/P fire damper



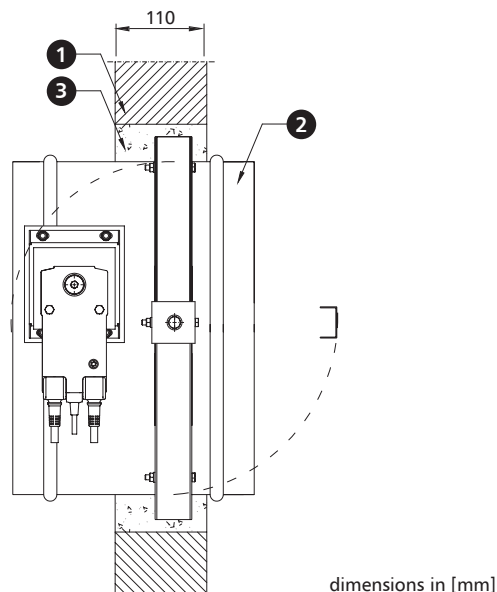
- 1. rigid wall - concrete, aerated concrete or bricks
- 2. circumferential gypsum board trim

- 3. assembly mortar*
- 4. mcr FID S/S p/P fire damper

*The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

NOTE: If the damper is installed in a wall with a thickness of less than 120 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.

» mcr FID S/S p/O fire damper



- 1. rigid wall - concrete, aerated concrete or bricks
- 2. mcr FID S/S p/O fire damper

- 3. assembly mortar*

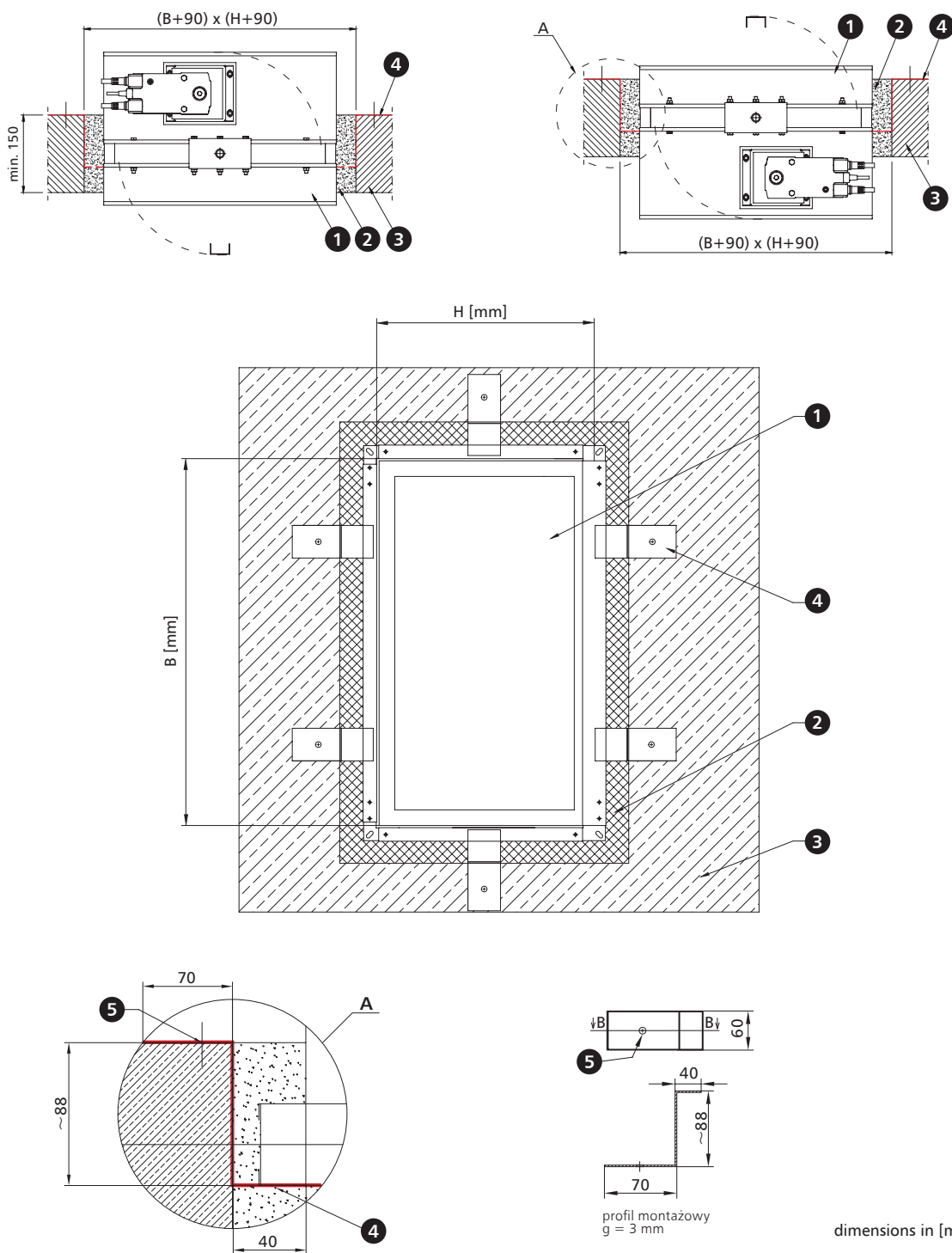
* The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

NOTE: If the damper is installed in a wall with a thickness of less than 120 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.

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

3.5.4 | Sample installation in floor slabs

» mcr FID S/S p/P fire damper



- 1. mcr FID S/S p/P fire damper
- 2. assembly mortar*
- 3. floor slab

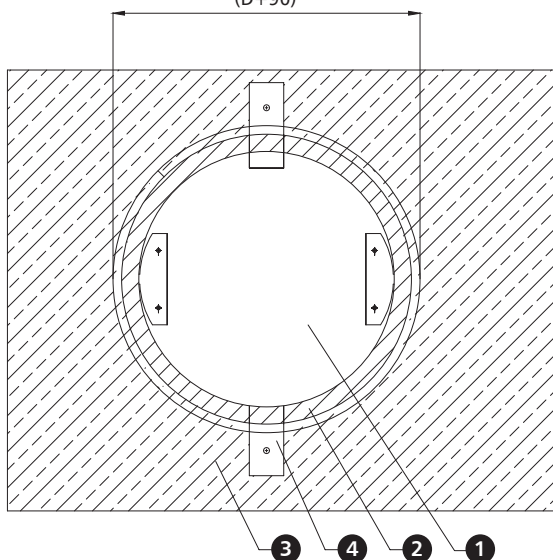
- 4. installation profile $g = 3$ mm
- 5. steel expansion plug

* The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the applied

NOTE: If the damper is installed in a floor slab with a thickness of less than 150 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.

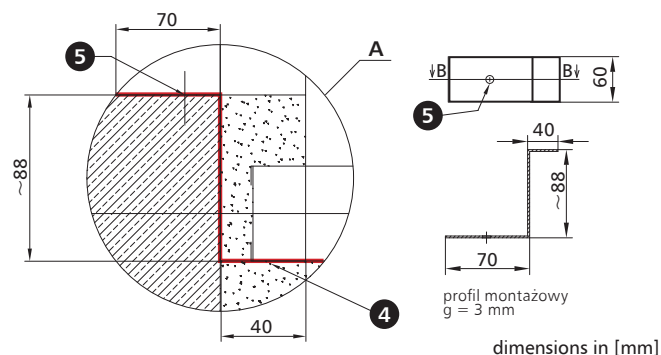
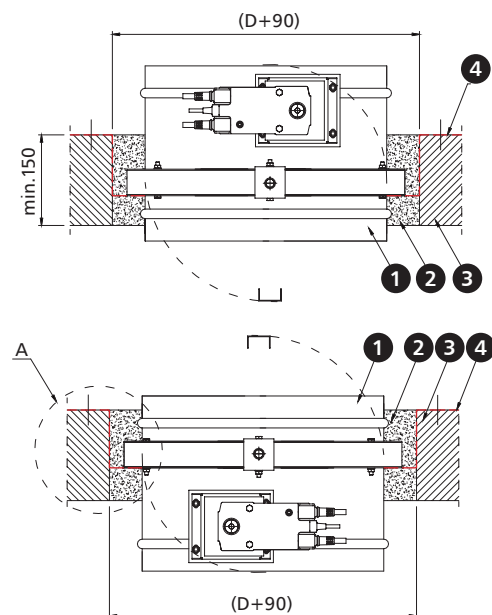
> mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

» mcr FID S/S p/O fire damper
(D+90)



1. mcr FID S/S p/O fire damper
2. assembly mortar*
3. floor slab
4. installation profile g = 3 mm
5. steel expansion plug

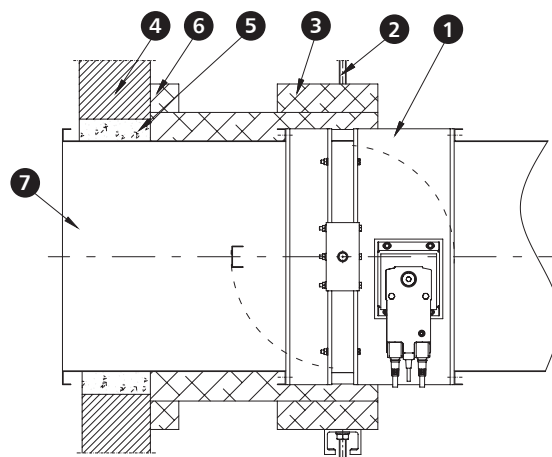
* The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.



NOTE: If the damper is installed in a floor slab with a thickness of less than 150 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.

3.5.5 | Sample installation at a distance to the construction partition

» mcr FID S/S p/P fire damper

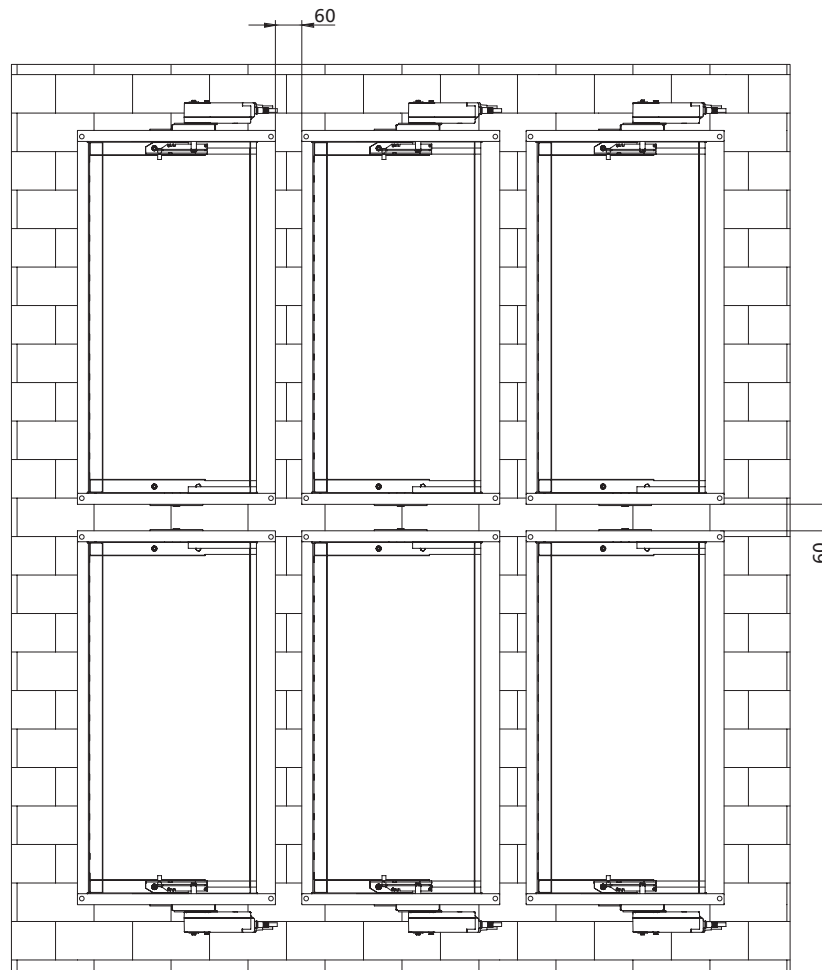


1. mcr FID S/S p/P fire damper
2. installation hangers system
3. duct and damper casing – e.g. made of fire-proof boards
4. wall

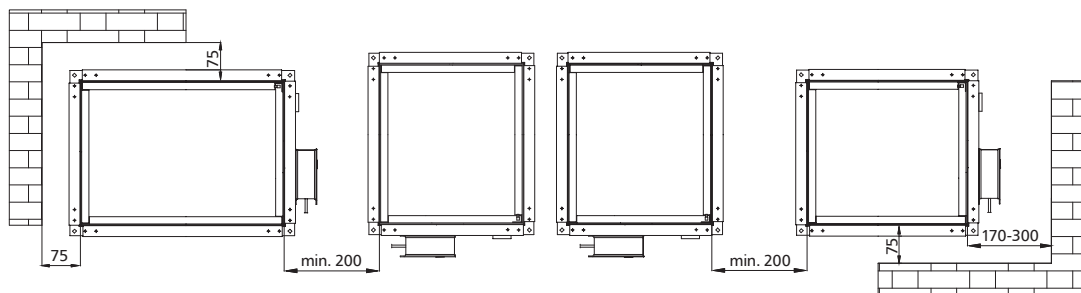
5. fireproof duct installation penetration system
6. a strip of fire-proof board along the entire length of the BxH side
7. steel ventilation duct

3.5.6 | Sample modular installation – close installation

» mcr FID S/S p/P fire damper



Minimum distance between systems and partitions



dimensions in [mm]

Distances between the dampers in PP_G and PP_D configuration may be ≥ 60 mm; if the installation documentation does not provide otherwise, the minimum spacing between the casings of two fire dampers is ≥ 200 mm and ≥ 75 mm between the wall or floor slab, as per the EN-1366-2 standard.

Damper installation with a vertical axis of rotation

Such installation must be clearly stated in the draft documentation and reported to the damper's manufacturer in the order. BxH damper dimensions should be provided in a manner similar to the damper with a horizontal rotation axis.

3.6.1 | mcr FID S/S p/P rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		200					250					300				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.040	0.029	420	8	0.050	0.039	564	7	28	0.06	0.049	708	7	29
		6			631	19			847	17	40			1 063	16	40
		8			841	34			1 129	31	48			1 417	29	48
		10			1 051	54			1 411	49	54			1 771	45	54
	250	4	0.050	0.037	526	8	0.063	0.049	706	7	29	0.075	0.062	886	7	30
		6			788	19			1 058	17	41			1 328	16	41
		8			1 051	34			1 411	31	49			1 771	29	49
		10			1 314	54			1 764	49	55			2 214	45	54
	300	4	0.060	0.044	631	8	0.075	0.059	847	7	30	0.09	0.074	1 063	7	31
		6			946	19			1 270	17	42			1 594	16	42
		8			1 261	34			1 693	31	49			2 125	28	49
		10			1 577	54			2 117	48	55			2 657	45	55
	350	4	0.070	0.051	736	8	0.088	0.069	988	7	31	0.105	0.086	1 240	7	32
		6			1 104	19			1 482	17	42			1 860	16	42
		8			1 472	34			1 976	31	50			2 480	28	50
		10			1 840	53			2 470	48	56			3 100	44	56
	400	4	0.080	0.058	841	8	0.100	0.078	1 129	7	31	0.12	0.098	1 417	7	32
		6			1 261	19			1 693	17	43			2 125	15	42
		8			1 682	34			2 258	30	50			2 834	28	50
		10			2 102	53			2 822	48	56			3 542	44	56
	450	4	0.090	0.066	946	8	0.113	0.088	1 270	7	32	0.135	0.111	1 594	7	33
		6			1 419	19			1 905	17	43			2 391	15	43
		8			1 892	33			2 540	30	51			3 188	28	51
		10			2 365	53			3 175	47	57			3 985	43	56
	500	4	0.100	0.073	1 051	8	0.125	0.098	1 411	7	32	0.15	0.123	1 771	6	31
		6			1 577	18			2 117	16	43			2 657	15	43
		8			2 102	33			2 822	30	51			3 542	27	51
		10			2 628	52			3 528	47	57			4 428	43	57
	550	4	0.110	0.080	1 156	8	0.138	0.108	1 552	7	33	0.165	0.135	1 948	6	32
		6			1 734	18			2 328	16	43			2 922	15	44
		8			2 313	33			3 105	29	51			3 897	27	51
		10			2 891	51			3 881	46	57			4 871	42	57
	600	4	0.120	0.088	1 261	8	0.150	0.118	1 693	7	33	0.18	0.148	2 125	6	32
		6			1 892	18			2 540	16	44			3 188	15	44
		8			2 523	32			3 387	29	52			4 251	26	51
		10			3 154	51			4 234	45	57			5 314	41	57
	650	4	0.130	0.095	1 367	8	0.163	0.127	1 835	7	33	0.195	0.160	2 303	6	32
		6			2 050	18			2 752	16	44			3 454	14	43
		8			2 733	32			3 669	28	51			4 605	26	51
		10			3 416	50			4 586	44	57			5 756	40	57
	700	4	0.140	0.102	1 472	7	0.175	0.137	1 976	7	34	0.21	0.172	2 480	6	33
		6			2 208	17			2 964	15	44			3 720	14	44
		8			2 943	31			3 951	28	52			4 959	25	51
		10			3 679	49			4 939	44	58			6 199	40	57

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers **for comfort ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		200					250					300				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	4	0.150	0.110	1 577	7	0.188	0.147	2 117	6	32	0.225	0.185	2 657	6	33
		6			2 365	17			3 175	15	44			3 985	14	44
		8			3 154	31			4 234	27	52			5 314	25	52
		10			3 942	48			5 292	43	58			6 642	39	57
	800	4	0.160	0.117	1 682	7	0.200	0.157	2 258	6	32	0.24	0.197	2 834	6	33
		6			2 523	17			3 387	15	44			4 251	13	43
		8			3 364	30			4 516	27	52			5 668	24	51
		10			4 205	47			5 645	42	58			7 085	38	57
	850	4	0.170	0.124	1 787	7	0.213	0.167	2 399	6	33	0.255	0.209	3 011	5	31
		6			2 681	16			3 599	14	44			4 517	13	44
		8			3 574	29			4 798	26	52			6 022	23	51
		10			4 468	46			5 998	41	58			7 528	37	57
	900	4	0.180	0.131	1 892	7	0.225	0.176	2 540	6	33	0.27	0.221	3 188	5	31
		6			2 838	16			3 810	14	44			4 782	13	44
		8			3 784	29			5 080	25	51			6 376	23	51
		10			4 730	45			6 350	40	58			7 970	36	57
	1000	4	0.200	0.146	2 102	7	0.250	0.196	2 822	6	33	0.3	0.246	3 542	5	32
		6			3 154	15			4 234	13	43			5 314	12	43
		8			4 205	28			5 645	24	51			7 085	22	51
		10			5 256	43			7 056	38	57			8 856	34	57
	1100	4	0.220	0.161	2 313	6	0.275	0.216	3 105	5	31	0.33	0.271	3 897	5	32
		6			3 469	15			4 657	13	44			5 845	11	43
		8			4 625	26			6 209	23	51			7 793	20	50
		10			5 782	41			7 762	36	57			9 742	32	56
	1200	4	0.240	0.175	2 523	6	0.300	0.235	3 387	5	32	0.36	0.295	4 251	4	30
		6			3 784	14			5 080	12	43			6 376	11	43
		8			5 046	25			6 774	22	51			8 502	19	50
		10			6 307	39			8 467	34	57			10 627	30	56
	1300	4	0.260	0.190	2 733	5	0.325	0.255	3 669	5	32	0.39	0.320	4 605	4	30
		6			4 100	13			5 504	11	42			6 908	10	42
		8			5 466	23			7 338	20	50			9 210	18	50
		10			6 833	37			9 173	32	56			11 513	28	55
	1400	4	0.280	0.204	2 943	5	0.350	0.274	3 951	4	29	0.42	0.344	4 959	4	30
		6			4 415	12			5 927	10	41			7 439	9	41
		8			5 887	22			7 903	19	50			9 919	17	49
		10			7 358	35			9 878	30	56			12 398	27	55
	1500	4	0.300	0.219	3 154	5	0.375	0.294	4 234	4	30	0.45	0.369	5 314	4	31
		6			4 730	12			6 350	10	42			7 970	9	41
		8			6 307	21			8 467	18	49			10 627	16	49
		10			7 884	33			10 584	28	55			13 284	25	55

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		350					400					450					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.070	0.059	852	6	28	0.080	0.069	996	6	29	0.090	0.079	1 140	6	29
		6			1 279	15	40			1 495	14	40			1 711	13	39
		8			1 705	27	48			1 993	25	47			2 281	24	47
		10			2 131	42	53			2 491	40	53			2 851	38	53
	250	4	0.088	0.074	1 066	6	29	0.100	0.087	1 246	6	30	0.113	0.099	1 426	6	30
		6			1 598	15	41			1 868	14	41			2 138	13	40
		8			2 131	27	49			2 491	25	48			2 851	24	48
		10			2 664	42	54			3 114	40	54			3 564	38	54
	300	4	0.105	0.089	1 279	6	30	0.120	0.104	1 495	6	31	0.135	0.119	1 711	6	31
		6			1 918	15	42			2 242	14	42			2 566	13	41
		8			2 557	27	49			2 989	25	49			3 421	24	49
		10			3 197	42	55			3 737	39	55			4 277	37	55
	350	4	0.123	0.104	1 492	6	30	0.140	0.121	1 744	6	31	0.158	0.139	1 996	5	29
		6			2 238	15	42			2 616	14	42			2 994	13	42
		8			2 984	26	50			3 488	25	50			3 992	23	49
		10			3 730	41	56			4 360	39	56			4 990	37	55
	400	4	0.140	0.118	1 705	6	31	0.160	0.138	1 993	6	32	0.180	0.158	2 281	5	30
		6			2 557	14	42			2 989	13	42			3 421	13	42
		8			3 410	26	50			3 986	24	50			4 562	23	50
		10			4 262	41	56			4 982	38	56			5 702	36	56
	450	4	0.158	0.133	1 918	6	32	0.180	0.156	2 242	6	32	0.203	0.178	2 566	5	30
		6			2 877	14	43			3 363	13	42			3 849	13	43
		8			3 836	26	51			4 484	24	50			5 132	23	50
		10			4 795	40	56			5 605	38	56			6 415	36	56
	500	4	0.175	0.148	2 131	6	32	0.200	0.173	2 491	6	33	0.225	0.198	2 851	5	31
		6			3 197	14	43			3 737	13	43			4 277	12	42
		8			4 262	25	51			4 982	24	51			5 702	22	50
		10			5 328	40	57			6 228	37	56			7 128	35	56
550	4	0.193	0.163	2 557	6	32	0.220	0.190	2 740	5	31	0.248	0.218	3 136	5	31	
	6			3 836	14	44			4 110	13	43			4 704	12	43	
	8			5 115	25	51			5 481	23	51			6 273	22	51	
	10			6 394	39	57			6 851	36	56			7 841	34	56	
600	4	0.210	0.178	2 557	6	33	0.240	0.208	2 989	5	31	0.270	0.238	3 421	5	32	
	6			3 836	13	43			4 484	13	44			5 132	12	43	
	8			5 115	24	51			5 979	23	51			6 843	21	50	
	10			6 394	38	57			7 474	36	57			8 554	34	57	
650	4	0.228	0.192	2 771	6	33	0.260	0.225	3 239	5	31	0.293	0.257	3 707	5	32	
	6			4 156	13	43			4 858	12	43			5 560	11	42	
	8			5 541	24	51			6 477	22	51			7 413	21	51	
	10			6 926	37	57			8 096	35	57			9 266	33	57	
700	4	0.245	0.207	2 984	5	31	0.28	0.242	3 488	5	32	0.315	0.277	3 992	5	32	
	6			4 476	13	44			5 232	12	43			5 988	11	43	
	8			5 967	23	51			6 975	22	51			7 983	20	50	
	10			7 459	37	57			8 719	34	57			9 979	32	57	

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers **for comfort ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		350					400					450				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	4	0.263	0.222	3 197	5	0.3	0.260	3 737	5	32	0.338	0.297	4 277	5	33
		6			4 795	13			5 605	12	44			6 415	11	43
		8			6 394	23			7 474	21	51			8 554	20	51
		10			7 992	36			9 342	33	57			10 692	31	56
	800	4	0.280	0.237	3 410	5	0.32	0.277	3 986	5	32	0.360	0.317	4 562	4	29
		6			5 115	12			5 979	11	43			6 843	11	42
		8			6 820	22			7 972	21	51			9 124	19	49
		10			8 525	35			9 965	32	57			11 405	30	55
	850	4	0.298	0.252	3 623	5	0.34	0.294	4 235	5	33	0.383	0.337	4 847	4	29
		6			5 435	12			6 353	11	43			7 271	10	41
		8			7 246	22			8 470	20	51			9 694	19	49
		10			9 058	34			10 588	31	56			12 118	29	55
	900	4	0.315	0.266	3 836	5	0.360	0.311	4 484	4	30	0.405	0.356	5 132	4	29
		6			5 754	12			6 726	11	43			7 698	10	41
		8			7 672	21			8 968	19	50			10 264	18	49
		10			9 590	33			11 210	31	57			12 830	29	55
	1000	4	0.350	0.296	4 262	5	0.400	0.346	4 982	4	30	0.450	0.396	5 702	4	29
		6			6 394	11			7 474	10	42			8 554	9	40
		8			8 525	20			9 965	18	50			11 405	17	48
		10			10 656	31			12 456	29	56			14 256	27	54
	1100	4	0.385	0.326	4 689	4	0.440	0.381	5 481	4	31	0.495	0.436	6 273	4	29
		6			7 033	10			8 221	9	41			9 409	9	40
		8			9 377	19			10 961	17	50			12 545	16	47
		10			11 722	29			13 702	27	56			15 682	25	53
	1200	4	0.420	0.355	5 115	4	0.480	0.415	5 979	4	31	0.540	0.475	6 843	3	25
		6			7 672	10			8 968	9	42			10 264	8	38
		8			10 230	17			11 958	16	49			13 686	15	46
		10			12 787	27			14 947	25	55			17 107	23	52
	1300	4	0.455	0.385	5 541	4	0.520	0.450	6 477	3	28	0.585	0.515	7 413	3	25
		6			8 312	9			9 716	8	41			11 120	8	38
		8			11 082	16			12 954	15	49			14 826	14	45
		10			13 853	26			16 193	24	55			18 533	22	51
	1400	4	0.490	0.414	5 967	3	0.560	0.484	6 975	3	28	0.630	0.554	7 983	3	25
		6			8 951	8			10 463	8	41			11 975	7	36
		8			11 935	15			13 951	14	48			15 967	13	45
		10			14 918	24			17 438	22	54			19 958	20	50
	1500	4	0.525	0.444	6 394	3	0.600	0.519	7 474	3	28	0.675	0.594	8 554	3	25
		6			9 590	8			11 210	7	40			12 830	6	34
		8			12 787	14			14 947	13	48			17 107	12	43
		10			15 984	22			18 684	20	53			21 384	19	49

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		500					550					600				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.1	0.089	1 284	5	0.110	0.099	1 428	5	28	0.120	0.109	1 572	5	28
		6			1 927	13			2 143	12	39			2 359	12	40
		8			2 569	23			2 857	22	47			3 145	21	47
		10			3 211	36			3 571	35	53			3 931	34	53
	250	4	0.125	0.112	1 606	5	0.138	0.124	1 786	5	29	0.150	0.137	1 966	5	29
		6			2 408	13			2 678	12	40			2 948	12	41
		8			3 211	23			3 571	22	48			3 931	21	48
		10			4 014	36			4 464	35	54			4 914	33	54
	300	4	0.15	0.134	1 927	5	0.165	0.149	2 143	5	30	0.180	0.164	2 359	5	30
		6			2 890	12			3 214	12	41			3 538	11	40
		8			3 853	23			4 285	22	49			4 717	21	49
		10			4 817	36			5 357	34	55			5 897	33	55
	350	4	0.175	0.156	2 248	5	0.193	0.174	2 500	5	30	0.210	0.191	2 752	5	31
		6			3 372	12			3 750	12	42			4 128	11	41
		8			4 496	22			5 000	21	49			5 504	20	49
		10			5 620	35			6 250	34	55			6 880	32	55
	400	4	0.2	0.178	2 569	5	0.220	0.198	2 857	5	31	0.240	0.218	3 145	5	31
		6			3 853	12			4 285	12	42			4 717	11	42
		8			5 138	22			5 714	21	50			6 290	20	49
		10			6 422	35			7 142	33	56			7 862	32	56
	450	4	0.225	0.201	2 890	5	0.248	0.223	3 214	5	31	0.270	0.246	3 538	5	32
		6			4 335	12			4 821	11	42			5 307	11	42
		8			5 780	22			6 428	21	50			7 076	20	50
		10			7 225	34			8 035	32	56			8 845	31	56
	500	4	0.250	0.223	3 211	5	0.275	0.248	3 571	5	32	0.300	0.273	3 931	4	29
		6			4 817	12			5 357	11	42			5 897	11	43
		8			6 422	21			7 142	20	50			7 862	19	50
		10			8 028	33			8 928	32	56			9 828	30	56
	550	4	0.275	0.245	3 853	5	0.303	0.273	4 285	5	32	0.330	0.300	4 717	4	30
		6			5 780	11			6 428	11	43			7 076	10	42
		8			7 707	21			8 571	20	50			9 435	19	50
		10			9 634	33			10 714	31	56			11 794	30	56
	600	4	0.3	0.268	3 853	5	0.330	0.298	4 285	4	30	0.360	0.328	4 717	4	30
		6			5 780	11			6 428	11	43			7 076	10	42
		8			7 707	20			8 571	19	50			9 435	18	50
		10			9 634	32			10 714	30	56			11 794	29	56
	650	4	0.325	0.290	4 175	5	0.358	0.322	4 643	4	30	0.390	0.355	5 111	4	31
		6			6 262	11			6 964	10	42			7 666	10	43
		8			8 349	20			9 285	19	50			10 221	18	50
		10			10 436	31			11 606	30	56			12 776	28	56
	700	4	0.350	0.312	4 496	4	0.385	0.347	5 000	4	30	0.420	0.382	5 504	4	31
		6			6 744	11			7 500	10	42			8 256	10	43
		8			8 991	19			9 999	18	50			11 007	17	50
		10			11 239	30			12 499	29	56			13 759	27	56

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers **for comfort ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		500					550					600				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	4	0.375	0.335	4 817	4	0.413	0.372	5 357	4	31	0.450	0.410	5 897	4	31
		6			7 225	10			8 035	10	43			8 845	9	42
		8			9 634	19			10 714	18	50			11 794	17	50
		10			12 042	29			13 392	28	56			14 742	27	56
	800	4	0.4	0.357	5 138	4	0.440	0.397	5 714	4	31	0.480	0.437	6 290	4	31
		6			7 707	10			8 571	9	42			9 435	9	42
		8			10 276	18			11 428	17	50			12 580	16	50
		10			12 845	29			14 285	27	56			15 725	26	56
	850	4	0.425	0.379	5 459	4	0.468	0.422	6 071	4	31	0.510	0.464	6 683	4	32
		6			8 189	10			9 107	9	42			10 025	9	42
		8			10 918	18			12 142	17	50			13 366	16	50
		10			13 648	28			15 178	26	56			16 708	25	56
	900	4	0.45	0.401	5 780	4	0.495	0.446	6 428	4	32	0.540	0.491	7 076	3	28
		6			8 670	9			9 642	9	42			10 614	8	39
		8			11 560	17			12 856	16	50			14 152	15	47
		10			14 450	27			16 070	25	55			17 690	24	52
	1000	4	0.5	0.446	6 422	4	0.550	0.496	6 428	3	28	0.600	0.546	7 862	3	29
		6			9 634	9			9 642	8	41			11 794	8	41
		8			12 845	16			12 856	15	49			15 725	14	49
		10			16 056	25			16 070	24	55			19 656	23	55
	1100	4	0.55	0.491	7 065	3	0.605	0.546	7 857	3	29	0.660	0.601	8 649	3	29
		6			10 597	8			11 785	8	41			12 973	7	40
		8			14 129	15			15 713	14	49			17 297	13	48
		10			17 662	24			19 642	22	55			21 622	21	54
	1200	4	0.6	0.535	7 707	3	0.660	0.595	8 571	3	29	0.720	0.655	9 435	3	29
		6			11 560	8			12 856	7	40			14 152	7	41
		8			15 414	14			17 142	13	48			18 870	12	48
		10			19 267	22			21 427	21	54			23 587	20	54
	1300	4	0.65	0.580	8 349	3	0.715	0.645	9 285	3	29	0.780	0.710	10 221	2	25
		6			12 524	7			13 928	7	40			15 332	6	39
		8			16 698	13			18 570	12	47			20 442	11	47
		10			20 873	20			23 213	19	53			25 553	18	53
	1400	4	0.7	0.624	8 991	3	0.770	0.694	9 999	2	24	0.840	0.764	11 007	2	25
		6			13 487	6			14 999	6	39			16 511	6	39
		8			17 983	12			19 999	11	47			22 015	10	46
		10			22 478	19			24 998	18	53			27 518	17	53
	1500	4	0.75	0.669	9 634	2	0.825	0.744	10 714	2	25	0.900	0.819	11 794	2	25
		6			14 450	6			16 070	6	39			17 690	5	37
		8			19 267	11			21 427	10	46			23 587	10	46
		10			24 084	17			26 784	16	52			29 484	15	51

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

B – nominal width [mm]
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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		650					700					750				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.130	0.119	1 716	5	0.140	0.129	1 860	5	29	0.150	0.139	2 004	4	26
		6			2 575	11			2 791	11	39			3 007	11	40
		8			3 433	21			3 721	20	47			4 009	19	47
		10			4 291	32			4 651	31	53			5 011	31	53
	250	4	0.163	0.149	2 146	5	0.175	0.162	2 326	5	30	0.188	0.174	2 506	4	27
		6			3 218	11			3 488	11	40			3 758	11	41
		8			4 291	20			4 651	20	48			5 011	19	48
		10			5 364	32			5 814	31	54			6 264	30	54
	300	4	0.195	0.179	2 575	5	0.210	0.194	2 791	4	28	0.225	0.209	3 007	4	28
		6			3 862	11			4 186	11	41			4 510	10	40
		8			5 149	20			5 581	19	48			6 013	19	49
		10			6 437	32			6 977	31	55			7 517	30	55
	350	4	0.228	0.209	3 004	5	0.245	0.226	3 256	4	29	0.263	0.244	3 508	4	29
		6			4 506	11			4 884	11	42			5 262	10	41
		8			6 008	20			6 512	19	49			7 016	18	49
		10			7 510	31			8 140	30	55			8 770	29	55
	400	4	0.260	0.238	3 433	4	0.280	0.258	3 721	4	29	0.300	0.278	4 009	4	30
		6			5 149	11			5 581	10	41			6 013	10	41
		8			6 866	19			7 442	19	49			8 018	18	49
		10			8 582	31			9 302	30	55			10 022	29	55
	450	4	0.293	0.268	3 862	4	0.315	0.291	4 186	4	30	0.338	0.313	4 510	4	30
		6			5 793	10			6 279	10	42			6 765	10	42
		8			7 724	19			8 372	18	49			9 020	18	50
		10			9 655	30			10 465	29	56			11 275	28	55
	500	4	0.325	0.298	4 291	4	0.350	0.323	4 651	4	30	0.375	0.348	5 011	4	30
		6			6 437	10			6 977	10	42			7 517	10	42
		8			8 582	19			9 302	18	50			10 022	17	49
		10			10 728	29			11 628	28	56			12 528	27	55
	550	4	0.358	0.328	5 149	4	0.385	0.355	5 116	4	31	0.413	0.383	5 512	4	31
		6			7 724	10			7 674	10	43			8 268	9	41
		8			10 299	18			10 233	17	49			11 025	17	50
		10			12 874	29			12 791	28	56			13 781	27	56
	600	4	0.390	0.358	5 149	4	0.420	0.388	5 581	4	31	0.450	0.418	6 013	4	31
		6			7 724	10			8 372	9	42			9 020	9	42
		8			10 299	18			11 163	17	50			12 027	16	49
		10			12 874	28			13 954	27	56			15 034	26	56
	650	4	0.423	0.387	5 579	4	0.455	0.420	6 047	4	31	0.488	0.452	6 515	4	32
		6			8 368	9			9 070	9	42			9 772	9	42
		8			11 157	17			12 093	17	50			13 029	16	50
		10			13 946	27			15 116	26	56			16 286	25	55
	700	4	0.455	0.417	6 008	4	0.490	0.452	6 512	4	32	0.525	0.487	7 016	3	28
		6			9 012	9			9 768	9	42			10 524	8	41
		8			12 015	17			13 023	16	50			14 031	15	49
		10			15 019	26			16 279	25	55			17 539	24	55

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers **for comfort ventilation systems**

B – nominal width [mm]
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S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		650					700					750					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	4	0.488	0.447	6 437	4	32	0.525	0.485	6 977	4	32	0.563	0.522	7 517	3	28
		6			9 655	9	42			10 465	9	42			11 275	8	41
		8			12 874	16	50			13 954	16	50			15 034	15	49
		10			16 092	26	56			17 442	25	56			18 792	24	56
	800	4	0.520	0.477	6 866	4	32	0.560	0.517	7 442	3	26	0.600	0.557	8 018	3	29
		6			10 299	9	42			11 163	8	39			12 027	8	42
		8			13 732	16	50			14 884	15	47			16 036	14	49
		10			17 165	25	55			18 605	24	52			20 045	23	55
	850	4	0.553	0.507	7 295	3	28	0.595	0.549	7 907	3	29	0.638	0.592	8 519	3	29
		6			10 943	8	41			11 861	8	41			12 779	8	42
		8			14 590	15	49			15 814	15	50			17 038	14	49
		10			18 238	24	55			19 768	23	55			21 298	22	55
	900	4	0.585	0.536	7 724	3	28	0.630	0.581	8 372	3	29	0.675	0.626	9 020	3	29
		6			11 586	8	41			12 558	8	42			13 530	7	40
		8			15 448	15	49			16 744	14	49			18 040	13	48
		10			19 310	23	54			20 930	22	55			22 550	21	55
	1000	4	0.650	0.596	8 582	3	28	0.700	0.646	9 302	3	29	0.750	0.696	10 022	3	30
		6			12 874	7	39			13 954	7	40			15 034	7	41
		8			17 165	14	48			18 605	13	49			20 045	13	49
		10			21 456	22	54			23 256	21	55			25 056	20	54
1100	4	0.715	0.656	9 441	3	28	0.770	0.711	10 233	3	30	0.825	0.766	11 025	3	30	
	6			14 161	7	39			15 349	7	41			16 537	6	39	
	8			18 881	13	47			20 465	12	48			22 049	12	48	
	10			23 602	20	53			25 582	19	54			27 562	18	53	
1200	4	0.780	0.715	10 299	3	28	0.840	0.775	11 163	2	25	0.900	0.835	12 027	2	25	
	6			15 448	6	37			16 744	6	39			18 040	6	40	
	8			20 598	12	46			22 326	11	47			24 054	11	47	
	10			25 747	19	52			27 907	18	54			30 067	17	53	
1300	4	0.845	0.775	11 157	2	23	0.910	0.840	12 093	2	25	0.975	0.905	13 029	2	26	
	6			16 736	6	37			18 140	6	40			19 544	5	38	
	8			22 314	11	45			24 186	10	46			26 058	10	47	
	10			27 893	17	50			30 233	16	52			32 573	16	53	
1400	4	0.910	0.834	12 015	2	23	0.980	0.904	13 023	2	26	1.050	0.974	14 031	2	26	
	6			18 023	5	34			19 535	5	38			21 047	5	38	
	8			24 031	10	44			26 047	9	45			28 063	9	46	
	10			30 038	16	50			32 558	15	52			35 078	14	51	
1500	4	0.975	0.894	12 874	2	23	1.050	0.969	13 954	2	26	1.125	1.044	15 034	2	26	
	6			19 310	5	34			20 930	5	38			22 550	4	35	
	8			25 747	9	42			27 907	9	45			30 067	8	44	
	10			32 184	14	48			34 884	14	51			37 584	13	51	

B – nominal width [mm]
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S_e – damper active cross-section [m²]

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d_p – pressure drop [Pa]
L_{WA} – damper noise level [dB]

		height H [mm]														
		800					850					900				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.160	0.149	2 148	4	0.170	0.159	2 292	4	0.180	0.169	2 436	4	0.180	0.169
		6			3 223	10			3 439	10			3 655	10		
		8			4 297	19			4 585	18			4 873	18		
		10			5 371	30			5 731	29			6 091	28		
	250	4	0.200	0.187	2 686	4	0.213	0.199	2 866	4	0.225	0.212	3 046	4	0.225	0.212
		6			4 028	10			4 298	10			4 568	10		
		8			5 371	19			5 731	18			6 091	18		
		10			6 714	29			7 164	29			7 614	28		
	300	4	0.240	0.224	3 223	4	0.255	0.239	3 439	4	0.270	0.254	3 655	4	0.270	0.254
		6			4 834	10			5 158	10			5 482	10		
		8			6 445	18			6 877	18			7 309	17		
		10			8 057	29			8 597	28			9 137	27		
	350	4	0.280	0.261	3 760	4	0.298	0.279	4 012	4	0.315	0.296	4 264	4	0.315	0.296
		6			5 640	10			6 018	10			6 396	9		
		8			7 520	18			8 024	17			8 528	17		
		10			9 400	28			10 030	28			10 660	27		
	400	4	0.320	0.298	4 297	4	0.340	0.318	4 585	4	0.360	0.338	4 873	4	0.360	0.338
		6			6 445	10			6 877	9			7 309	9		
		8			8 594	18			9 170	17			9 746	17		
		10			10 742	28			11 462	27			12 182	26		
	450	4	0.360	0.336	4 834	4	0.383	0.358	5 158	4	0.405	0.381	5 482	4	0.405	0.381
		6			7 251	9			7 737	9			8 223	9		
		8			9 668	17			10 316	17			10 964	16		
		10			12 085	27			12 895	26			13 705	26		
	500	4	0.400	0.373	5 371	4	0.425	0.398	5 731	4	0.450	0.423	6 091	4	0.450	0.423
		6			8 057	9			8 597	9			9 137	9		
		8			10 742	17			11 462	16			12 182	16		
		10			13 428	26			14 328	26			15 228	25		
	550	4	0.440	0.410	5 908	4	0.468	0.438	6 304	4	0.495	0.465	6 700	3	0.495	0.465
		6			8 862	9			9 456	9			10 050	8		
		8			11 817	16			12 609	16			13 401	15		
		10			14 771	26			15 761	25			16 751	24		
	600	4	0.480	0.448	6 445	4	0.510	0.478	6 877	3	0.540	0.508	7 309	3	0.540	0.508
		6			9 668	9			10 316	8			10 964	8		
		8			12 891	16			13 755	15			14 619	15		
		10			16 114	25			17 194	24			18 274	24		
	650	4	0.520	0.485	6 983	3	0.553	0.517	7 451	3	0.585	0.550	7 919	3	0.585	0.550
		6			10 474	8			11 176	8			11 878	8		
		8			13 965	15			14 901	15			15 837	14		
		10			17 456	24			18 626	24			19 796	23		
	700	4	0.560	0.522	7 520	3	0.595	0.557	8 024	3	0.630	0.592	8 528	3	0.630	0.592
		6			11 280	8			12 036	8			12 792	8		
		8			15 039	15			16 047	14			17 055	14		
		10			18 799	24			20 059	23			21 319	22		

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S_e – damper active cross-section [m²]

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

		height H [mm]														
		800					850					900				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	4	0.600	0.560	8 057	3	0.638	0.597	8 597	3	0.675	0.635	9 137	3	29	
		6			12 085	8			12 895	8						
		8			16 114	14			17 194	14						
		10			20 142	23			21 492	22						
	800	4	0.640	0.597	8 594	3	0.680	0.637	9 170	3	0.720	0.677	9 746	3	30	
		6			12 891	8			13 755	7						
		8			17 188	14			18 340	13						
		10			21 485	22			22 925	21						
	850	4	0.680	0.634	9 131	3	0.723	0.677	9 743	3	0.765	0.719	10 355	3	30	
		6			13 697	7			14 615	7						
		8			18 262	13			19 486	13						
		10			22 828	21			24 358	21						
	900	4	0.720	0.671	9 668	3	0.765	0.716	10 316	3	0.810	0.761	10 964	3	30	
		6			14 502	7			15 474	7						
		8			19 336	13			20 632	13						
		10			24 170	21			25 790	20						
	1000	4	0.800	0.746	10 742	3	0.850	0.796	11 462	3	0.900	0.846	12 182	2	25	
		6			16 114	7			17 194	6						
		8			21 485	12			22 925	12						
		10			26 856	19			28 656	18						
	1100	4	0.880	0.821	11 817	2	0.935	0.876	12 609	2	0.990	0.931	13 401	2	26	
		6			17 725	6			18 913	6						
		8			23 633	11			25 217	11						
		10			29 542	18			31 522	17						
	1200	4	0.960	0.895	12 891	2	1.020	0.955	13 755	2	1.080	1.015	14 619	2	26	
		6			19 336	6			20 632	5						
		8			25 782	10			27 510	10						
		10			32 227	16			34 387	16						
	1300	4	1.040	0.970	13 965	2	1.105	1.035	14 901	2	1.170	1.100	15 837	2	26	
		6			20 948	5			22 352	5						
		8			27 930	9			29 802	9						
		10			34 913	15			37 253	14						
	1400	4	1.120	1.044	15 039	2	1.190	1.114	16 047	2	1.260	1.184	17 055	2	27	
		6			22 559	5			24 071	4						
		8			30 079	9			32 095	8						
		10			37 598	14			40 118	13						
	1500	4	1.200	1.119	16 114	2	1.275	1.194	17 194	1	1.350	1.269	18 274	1	18	
		6			24 170	4			25 790	4						
		8			32 227	8			34 387	7						
		10			40 284	12			42 984	12						

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		1000					1100					1200					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]
width B [mm]	200	4	0.200	0.189	2 724	4	28	0.220	0.209	3 012	4	28	0.240	0.229	3 300	4	29
		6			4 087	9	38			4 519	9	39			4 951	9	39
		8			5 449	17	47			6 025	16	46			6 601	16	47
		10			6 811	27	53			7 531	26	53			8 251	25	53
	250	4	0.250	0.237	3 406	4	29	0.275	0.262	3 766	4	29	0.300	0.287	4 126	4	30
		6			5 108	9	39			5 648	9	40			6 188	9	40
		8			6 811	17	48			7 531	16	47			8 251	16	48
		10			8 514	27	54			9 414	25	53			10 314	25	54
	300	4	0.300	0.284	4 087	4	30	0.330	0.314	4 519	4	30	0.360	0.344	4 951	3	27
		6			6 130	9	40			6 778	9	41			7 426	8	39
		8			8 173	17	48			9 037	16	48			9 901	15	48
		10			10 217	26	54			11 297	25	54			12 377	24	54
	350	4	0.350	0.331	4 768	4	30	0.385	0.366	5 272	3	27	0.420	0.401	5 776	3	27
		6			7 152	9	41			7 908	8	40			8 664	8	40
		8			9 536	16	48			10 544	15	48			11 552	15	48
		10			11 920	26	55			13 180	24	54			14 440	24	54
	400	4	0.400	0.378	5 449	4	31	0.440	0.418	6 025	3	28	0.480	0.458	6 601	3	28
		6			8 173	9	41			9 037	8	40			9 901	8	41
		8			10 898	16	49			12 050	15	48			13 202	14	48
		10			13 622	25	55			15 062	24	55			16 502	23	54
	450	4	0.450	0.426	6 130	3	28	0.495	0.471	6 778	3	28	0.540	0.516	7 426	3	28
		6			9 195	8	40			10 167	8	41			11 139	8	41
		8			12 260	15	49			13 556	15	49			14 852	14	49
		10			15 325	24	55			16 945	23	55			18 565	22	54
	500	4	0.500	0.473	6 811	3	28	0.550	0.523	7 531	3	28	0.600	0.573	8 251	3	29
		6			10 217	8	41			11 297	8	41			12 377	7	40
		8			13 622	15	49			15 062	14	49			16 502	14	49
		10			17 028	24	55			18 828	23	55			20 628	22	55
550	4	0.550	0.520	7 492	3	28	0.605	0.575	8 284	3	29	0.660	0.630	9 076	3	29	
	6			11 238	8	41			12 426	8	42			13 614	7	40	
	8			14 985	15	49			16 569	14	49			18 153	13	48	
	10			18 731	23	55			20 711	22	55			22 691	21	55	
600	4	0.600	0.568	8 173	3	29	0.660	0.628	9 037	3	29	0.720	0.688	9 901	3	30	
	6			12 260	8	42			13 556	7	40			14 852	7	41	
	8			16 347	14	49			18 075	13	48			19 803	13	49	
	10			20 434	22	55			22 594	21	55			24 754	20	54	
650	4	0.650	0.615	8 855	3	29	0.715	0.680	9 791	3	30	0.780	0.745	10 727	3	30	
	6			13 282	7	40			14 686	7	41			16 090	7	41	
	8			17 709	14	49			19 581	13	49			21 453	12	48	
	10			22 136	22	55			24 476	21	55			26 816	20	55	
700	4	0.700	0.662	9 536	3	30	0.770	0.732	10 544	3	30	0.840	0.802	11 552	3	30	
	6			14 304	7	41			15 816	7	41			17 328	7	41	
	8			19 071	13	49			21 087	13	49			23 103	12	48	
	10			23 839	21	55			26 359	20	55			28 879	19	54	

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers **for comfort ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1000					1100					1200				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	0.750	0.710	10 217	3	30	0.825	0.785	11 297	3	30	0.900	0.860	12 377	3	31
				15 325	7	41			16 945	7	41			18 565	6	40
				20 434	13	49			22 594	12	48			24 754	12	49
				25 542	20	55			28 242	19	54			30 942	18	54
	800	0.800	0.757	10 898	3	30	0.880	0.837	12 050	3	31	0.960	0.917	13 202	2	26
				16 347	7	41			18 075	6	40			19 803	6	40
				21 796	12	48			24 100	12	49			26 404	11	48
				27 245	20	55			30 125	19	55			33 005	18	54
	850	0.850	0.804	11 579	3	30	0.935	0.889	12 803	2	26	1.020	0.974	14 027	2	26
				17 369	6	39			19 205	6	40			21 041	6	40
				23 158	12	48			25 606	11	48			28 054	11	48
				28 948	19	54			32 008	18	54			35 068	17	54
	900	0.900	0.851	12 260	2	25	0.990	0.941	13 556	2	26	1.080	1.031	14 852	2	26
				18 390	6	40			20 334	6	40			22 278	6	40
				24 520	11	48			27 112	11	48			29 704	10	47
				30 650	18	54			33 890	17	54			37 130	16	53
	1000	1.000	0.946	13 622	2	26	1.100	1.046	15 062	2	26	1.200	1.146	16 502	2	27
				20 434	6	40			22 594	5	38			24 754	5	39
				27 245	11	48			30 125	10	47			33 005	9	46
				34 056	17	54			37 656	16	53			41 256	15	53
	1100	1.100	1.041	14 985	2	26	1.210	1.151	16 569	2	27	1.320	1.261	18 153	2	27
				22 477	5	38			24 853	5	39			27 229	5	39
				29 969	10	47			33 137	9	46			36 305	9	47
				37 462	15	52			41 422	14	52			45 382	14	52
	1200	1.200	1.135	16 347	2	27	1.320	1.255	18 075	2	27	1.440	1.375	19 803	2	27
				24 520	5	39			27 112	4	36			29 704	4	36
				32 694	9	46			36 150	8	45			39 606	8	45
				40 867	14	52			45 187	13	51			49 507	13	52
	1300	1.300	1.230	17 709	2	27	1.430	1.360	19 581	2	27	1.560	1.490	21 453	1	19
				26 564	4	36			29 372	4	36			32 180	4	37
				35 418	8	45			39 162	8	45			42 906	7	44
				44 273	13	51			48 953	12	51			53 633	11	50
	1400	1.400	1.324	19 071	1	18	1.540	1.464	21 087	1	19	1.680	1.604	23 103	1	19
				28 607	4	36			31 631	4	37			34 655	3	33
				38 143	7	44			42 175	7	44			46 207	6	42
				47 678	12	51			52 718	11	50			57 758	10	49
	1500	1.500	1.419	20 434	1	19	1.650	1.569	22 594	1	19	1.800	1.719	24 754	1	19
				30 650	4	37			33 890	3	33			37 130	3	34
				40 867	7	44			45 187	6	42			49 507	6	43
				51 084	11	50			56 484	10	49			61 884	9	48

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1300					1400					1500				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.260	0.249	3 588	3	0.280	0.269	3 876	3	26	0.300	0.289	4 164	3	26
		6			5 383	8			5 815	8	38			6 247	8	39
		8			7 177	15			7 753	15	47			8 329	14	46
		10			8 971	24			9 691	23	52			10 411	23	52
	250	4	0.325	0.312	4 486	3	0.350	0.337	4 846	3	27	0.375	0.362	4 164	3	27
		6			6 728	8			7 268	8	39			6 247	8	40
		8			8 971	15			9 691	14	47			8 329	14	47
		10			11 214	24			12 114	23	53			10 411	22	53
	300	4	0.390	0.374	5 383	3	0.420	0.404	5 815	3	27	0.450	0.434	6 247	3	28
		6			8 074	8			8 722	8	40			9 370	8	40
		8			10 765	15			11 629	14	47			12 493	14	48
		10			13 457	23			14 537	22	53			15 617	22	54
	350	4	0.455	0.436	6 280	3	0.490	0.471	6 784	3	28	0.525	0.506	7 288	3	28
		6			9 420	8			10 176	8	41			10 932	7	39
		8			12 560	14			13 568	14	48			14 576	13	47
		10			15 700	23			16 960	22	54			18 220	21	54
	400	4	0.520	0.498	7 177	3	0.560	0.538	7 753	3	29	0.600	0.578	8 329	3	29
		6			10 765	8			11 629	7	40			12 493	7	40
		8			14 354	14			15 506	13	48			16 658	13	48
		10			17 942	22			19 382	21	54			20 822	21	54
	450	4	0.585	0.561	8 074	3	0.630	0.606	8 722	3	29	0.675	0.651	9 370	3	29
		6			12 111	7			13 083	7	40			14 055	7	40
		8			16 148	14			17 444	13	48			18 740	13	49
		10			20 185	21			21 805	21	54			23 425	20	54
	500	4	0.650	0.623	8 971	3	0.700	0.673	9 691	3	30	0.750	0.723	10 411	3	30
		6			13 457	7			14 537	7	41			15 617	7	41
		8			17 942	13			19 382	13	49			20 822	12	48
		10			22 428	21			24 228	20	54			26 028	19	54
	550	4	0.715	0.685	9 868	3	0.770	0.740	10 660	3	30	0.825	0.795	11 452	3	30
		6			14 802	7			15 990	7	41			17 178	6	39
		8			19 737	13			21 321	12	48			22 905	12	48
		10			24 671	20			26 651	19	54			28 631	19	54
	600	4	0.780	0.748	10 765	3	0.840	0.808	11 629	3	30	0.900	0.868	12 493	2	25
		6			16 148	7			17 444	6	39			18 740	6	40
		8			21 531	12			23 259	12	48			24 987	11	48
		10			26 914	20			29 074	19	54			31 234	18	54
	650	4	0.845	0.810	11 663	3	0.910	0.875	12 599	2	25	0.975	0.940	13 535	2	26
		6			17 494	6			18 898	6	40			20 302	6	40
		8			23 325	12			25 197	11	48			27 069	11	48
		10			29 156	19			31 496	18	54			33 836	18	54
	700	4	0.910	0.872	12 560	2	0.980	0.942	13 568	2	26	1.050	1.012	14 576	2	26
		6			18 840	6			20 352	6	40			21 864	6	40
		8			25 119	11			27 135	11	48			29 151	11	48
		10			31 399	18			33 919	17	54			36 439	17	54

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers **for comfort ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1300					1400					1500				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	4	0.975	0.935	13 457	2	1.050	1.010	14 537	2	26	1.125	1.085	15 617	3	31
		6			20 185	6			21 805	6	40			23 425	6	40
		8			26 914	11			29 074	11	48			31 234	12	49
		10			33 642	18			36 342	17	54			39 042	18	54
	800	4	1.040	0.997	14 354	2	1.120	1.077	15 506	2	26	1.200	1.157	16 658	2	26
		6			21 531	6			23 259	6	41			24 987	6	40
		8			28 708	11			31 012	10	47			33 316	11	48
		10			35 885	17			38 765	16	53			41 645	18	54
	850	4	1.105	1.059	15 251	2	1.190	1.144	16 475	2	27	1.275	1.229	17 699	2	26
		6			22 877	6			24 713	5	39			26 549	6	40
		8			30 502	10			32 950	10	48			35 398	11	48
		10			38 128	16			41 188	16	54			44 248	17	54
	900	4	1.170	1.121	16 148	2	1.260	1.211	17 444	2	27	1.350	1.301	18 740	2	26
		6			24 222	5			26 166	5	39			28 110	6	40
		8			32 296	10			34 888	9	46			37 480	10	47
		10			40 370	16			43 610	15	53			46 850	16	53
	1000	4	1.300	1.246	17 942	2	1.400	1.346	19 382	2	27	1.500	1.446	20 822	2	27
		6			26 914	5			29 074	5	39			31 234	5	39
		8			35 885	9			38 765	9	47			41 645	9	46
		10			44 856	14			48 456	14	53			52 056	15	53
	1100	4	1.430	1.371	19 737	2	1.540	1.481	21 321	2	28	1.650	1.591	22 905	2	27
		6			29 605	4			31 981	4	37			34 357	5	39
		8			39 473	8			42 641	8	46			45 809	9	47
		10			49 342	13			53 302	12	51			57 262	14	52
	1200	4	1.560	1.495	21 531	1	1.680	1.615	23 259	1	19	1.800	1.735	24 987	2	27
		6			32 296	4			34 888	4	37			37 480	4	36
		8			32 694	9			36 150	8	45			39 606	8	45
		10			40 867	14			45 187	13	51			49 507	13	52

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

3.6.2 | mcr FID S/S p/O circular dampers technical parameters

D – nominal diameter [mm]

v – velocity [m/s]

Q – flow [m³/h]

S_k – duct cross-section [m²]

d_p – pressure drop [Pa]

S_e – damper active cross-section [m²]

L_{WA} – damper noise level [dB]

	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
250	4	0.0491	0.0392	281	1	15
	6			560	4	24
	8			890	8	28
	10			1130	11	33
315	4	0.0779	0.0653	478	1	18
	6			949	4	24
	8			1400	8	30
	10			1880	16	35
355	4	0.0989	0.0847	610	1	17
	6			1 220	5	24
	8			1 830	11	34
	10			2 440	20	40
400	4	0.1256	0.1096	789	1	17
	6			1 578	5	25
	8			2 367	11	34
	10			3 156	10	41

	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
450	4	0,1590	0,1410	1 015	1	16
	6			2 030	4	25
	8			3 045	10	35
	10			4 060	18	41
500	4	0,1963	0,1763	1 269	1	18
	6			2 538	4	24
	8			3 807	8	33
	10			5 076	15	40
560	4	0,2462	0,2238	1 611	1	16
	6			3 222	3	24
	8			4 834	7	33
	10			6 445	13	39
630	4	0,3116	0,2864	2 062	1	20
	6			4 124	2	22
	8			6 186	5	33
	10			8 247	9	40

3.7.1 | 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	35	36	38	39	44	52	57	59	78	79	80	81	92		
	1400	37	39	41	44	48	56	63	65	80	82	85	87			
	1500	40	41	44	48	52	58	68	71	82	98	115	120			

3.7.2 | Estimated weights of mcr FID S/S p/O dampers for circular ventilation ducts [kg]

diameter D [mm]	RST, KW1	actuator
250	7	8
315	9	10
355	12	13
400	14	15
450	15	16
500	16	17
560	18	19
630	20	21

3.8 | Accessories

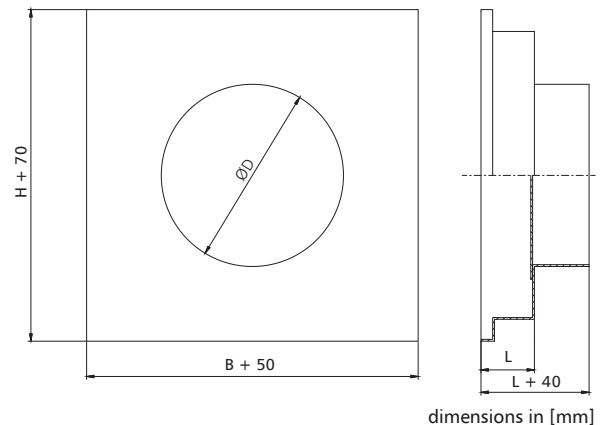
3.8.1 | mcr KRP connection stub

mcr KRP connection stubs are used to connect a circular ventilation duct to a rectangular damper. The connection is a „bare end“ pipe. The diameter of the stub pipe is 2 mm smaller than the diameter of the ventilation duct.

NOTE: due to the asymmetrical position of the fire blade in the damper casing, the connection stubs are of different lengths L, depending on the side of the damper on which they are to be used. Stubs are supplied for both sides of the damper.

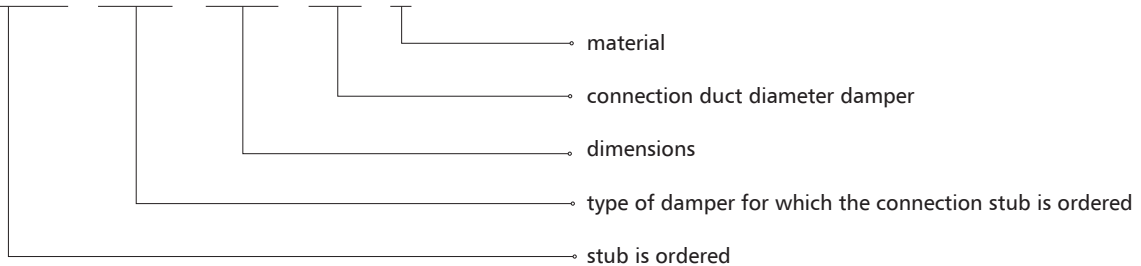
Dimensions:

- » BxH - damper dimensions [mm]
- » ØD - diameter of the connection duct [mm]
- » L - length [mm] calculated from the formula: $H/2-50$ for one connection side and $H/2-150$ for the other connection side



Marking:

mcr KRP / FID S / B x H / DIA / X



X – material

[no symbol] – galvanized steel, Zn 275 g/m2 coating²

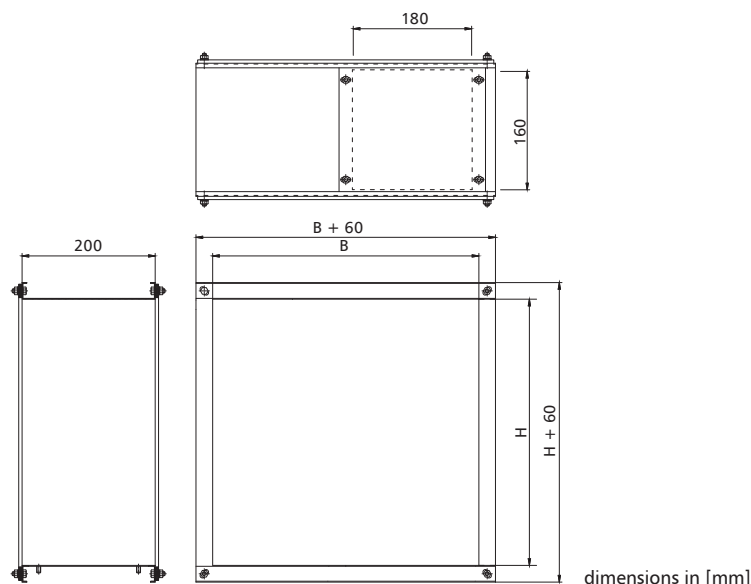
KN – stainless steel

KK – 1.4404 acid-proof steel

3.8.2 | Casing module with KRW-type inspection access

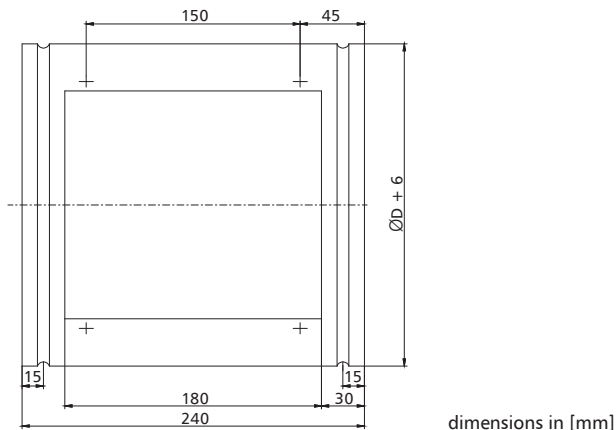
The casing modules with a KRW-type inspection access are made of sheet metal and equipped with connection flanges. The casing features an inspection access opening with a cover. The module enables to access the damper blade or a drive train quickly without having to dismantle the damper or the duct on which it is installed.

» KRW P module for rectangular damper



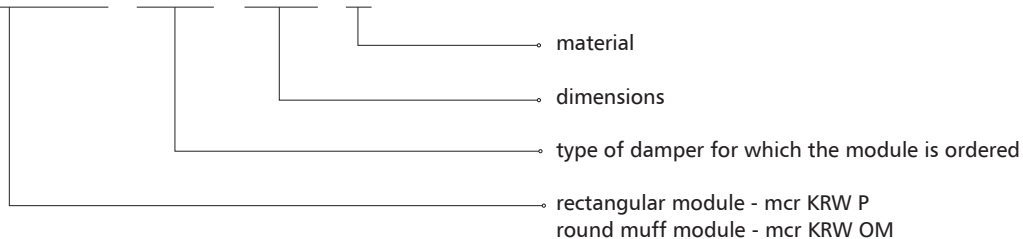
mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

- » KRW OM module
- » round muff module for nipple damper



Marking:

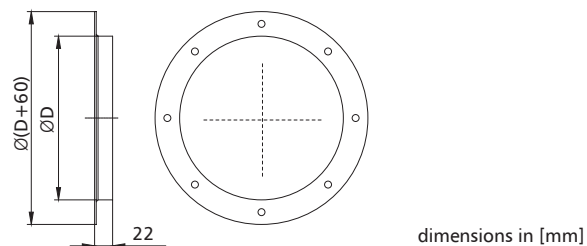
mcr KRW OM / FID S / B x H / X



X – material
 [no symbol] – galvanized steel, Zn 275 g/m² coating²
 KN – stainless steel
 KK – 1.4404 acid-proof steel

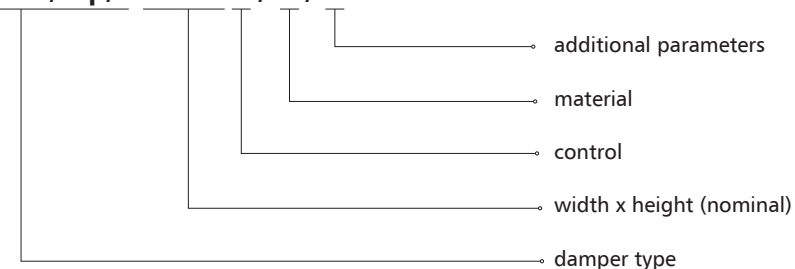
3.8.3 | KP type connection flange

The KP type connection flange is used to connect a round fire damper to a duct with a connection made in accordance with PN-EN 12220.



3.9 | Marking

mcr FID S/S p/P B x H 1 / 2 / 3



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

- KW1/S – thermal trigger
- KW1/S/WK2 – thermal trigger + limit switch (open/closed blade signal)
- KW1/24I/WK2 – thermal trigger + “pulse” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
- KW1/24P/WK2 – thermal trigger + “break” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade) signal)
- KW1/24I/WK2(+MP230/24) – thermal trigger + “pulse” electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
- KW1/24P/WK2(+MP230/24) – thermal trigger + “break” electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)

» trigger and control mechanism, axial actuator

- BF 24-T/BF 24-SR-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
- BFL 24-T/BFL 24-SR-T – actuator with a return spring, U = 24 V AC/DC
- BFL230-T/MLF230T – 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
- BFN 24-T/BFN 24-SR-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
- MLF24T – actuator with a return spring, U = 24 V AC/DC
- MLF230T – actuator with a return spring, U = 230 V AC
- MF24T – actuator with a return spring, U = 24 V AC/DC
- MF230T – actuator with a return spring, U = 230 V AC
- QT.Ex 24-FT.Ex – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC
- QT.Ex 230-FT.Ex – explosion proof actuator with a return spring in the Ex version, U = 230 V AC/DC

2 - material

- [no symbol] – galvanized steel, Zn 275 g/m² coating
- KN – stainless steel
- KK – 1.4404 acid-proof steel
- KKM – special design of the damper – damper and its elements made of stainless steel, additionally sleeves and their painted elements

3 - additional parameters

» Thermoelectric and thermal triggers

- [no symbol] – 72°C trigger
- ZBAT95 – thermoelectric trigger for 95°C
- T93-95 – thermal trigger for 95°C
- T2-95 (MLF/MF) – thermoelectric trigger for 95°C
- FT.Ex-72 – thermoelectric trigger for 72°C
- FT.Ex-95 – thermoelectric trigger for 95°C

» Control mechanism position

- [no symbol] – perpendicular to the damper rotation axis*
- WOK – along the damper rotation axis

» Damper axis of rotation

- [no symbol] – horizontal axis of rotation
- PP_D – vertical axis of rotation – mechanism at the bottom of the damper
- P_G – vertical axis of rotation – mechanism at the top of the damper

» Design standard

- [no symbol] – right damper
- KL – left damper (excl. round dampers)
- KO – inverted damper (excl. round dampers)

» Damper casing

- [no symbol] – standard casing length
- 400 – casing with a length of 400 mm
- BU – earth pin

» Connection flange (round dampers only)

- [no symbol] – damper without a flange – for the “bare end” connection
- KP – damper with a connection flange

» Mounting runners (round dampers only)

- WM – mounting runners (set)
- Perimeter gaskets (round dampers only)
- UKW – external perimeter gaskets

* for a round damper with a RST, RST-KW1 mechanism and a BF actuator, the trigger control mechanism is installed along the axis of rotation as standard – exception

mcr FID S/S p/P, mcr FID S/S p/O | Single-blade cut-off fire dampers for comfort ventilation systems

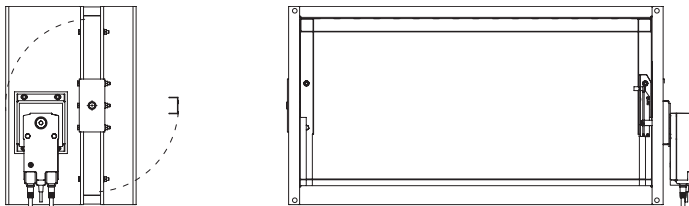
NOTE: separate additional parameters entered with the "/" sign
example marking:

mcr FID S/S p/P 400 x 400 BFL24-T
E120 cut-off fire damper with a 24 V actuator with limit switches.

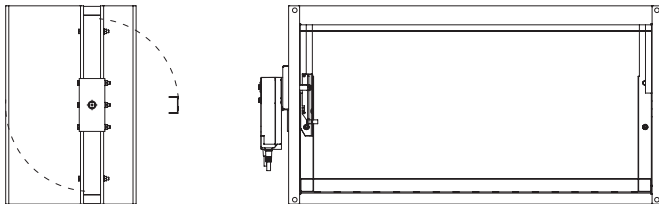
mcr FID S/S p/O Ø400 RST / WK2
E120 cut-off fire damper with a 72°C thermal trigger and damper blade opening and closing limit switch.

3.9.1 | Design standard

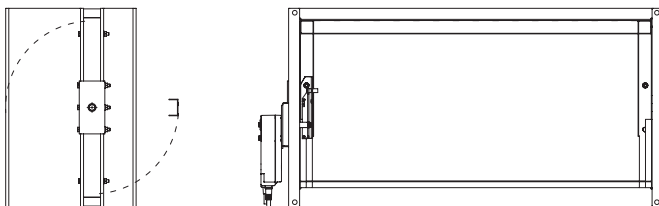
» right damper - standard



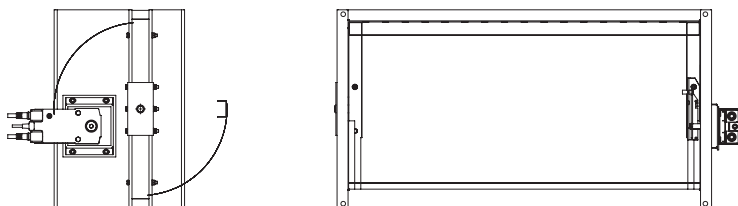
» inverted damper - (ducts facing downwards)



» left damper



» along the damper axis

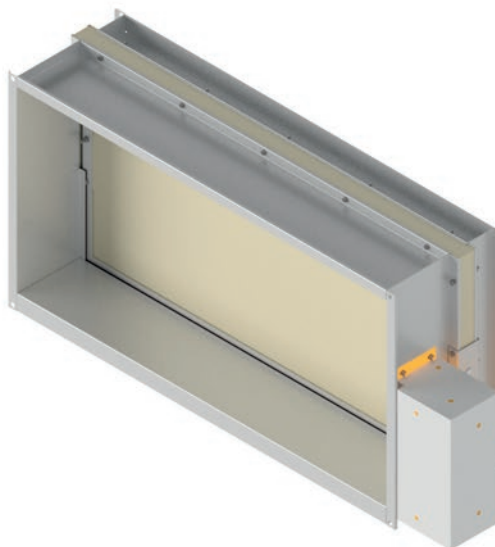


Chapter 19 - power supply and control (p. 350) contains the following information:
- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems



downloadable models
on the website
under the designer zone tab



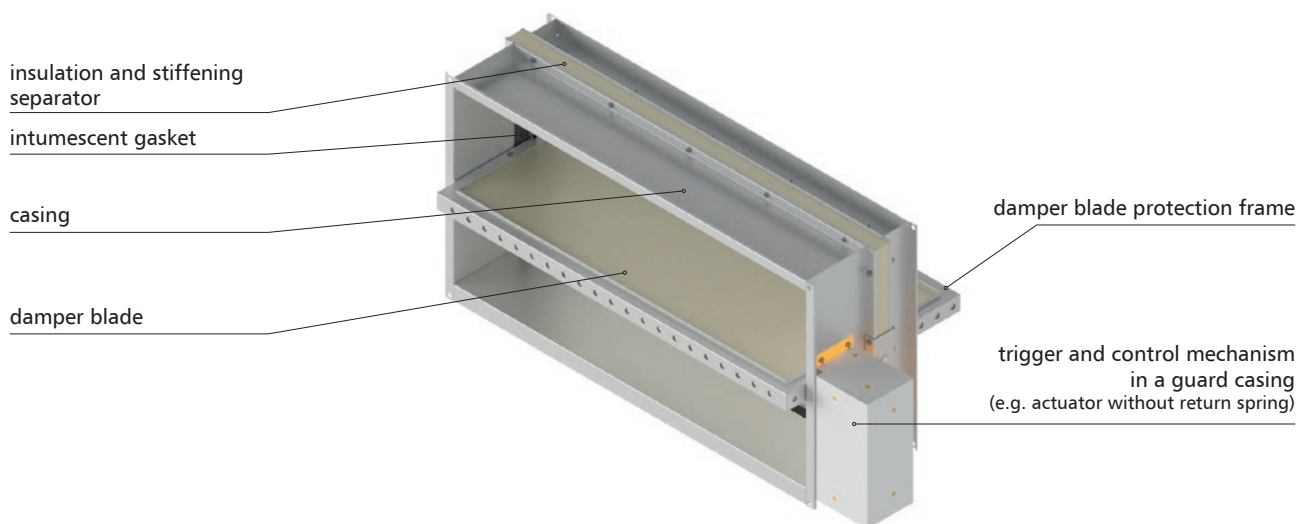
» EIS120, E₆₀₀ 120

- » Fire resistance class: EI120(v_{ed} h_{od} i↔o) S1000C₁₀₀₀₀ AAmulti, EI120 (v_{ew} i↔o) S1500C₁₀₀₀₀ AAmulti, EI120 (v_{edw} i↔o) S1000C₁₀₀₀₀ AAmulti.
- » Certificate of constancy of performance 1488-CPR-0448/W, 2434-CPR-0029.
- » Dampers certified for compliance with EN 12101-8.
- » Dampers rated under EN 13501-4 and tested under EN 1366-10.
- » Cut-off dampers resistance independent of airflow direction and installation side.
- » Dampers certified for modular installation (batteries).
- » Certified installation on smoke ventilation ducts.
- » Certified AA (Automatic Activation) feature.

4.1 | Application

mcr FID S/V p/P, mcr FID S/V-M p/P smoke control dampers are intended for installation in automatically operated fire ventilation systems. mcr FID S/V p/P dampers are used in fire ventilation systems and the dampers marked mcr FID S/V-M p/P are used in mixed, fire and comfort ventilation systems. When installed, these devices prevent the propagation of fire, smoke and fire gases to adjacent areas. During normal operation, the fire damper blade is in the open or closed position, depending on its function. The fire damper blade in the fire compartment is opened, whereas in other areas the blades remain closed. Admissible flow velocity in the connected duct is 12 m/s.

4.2 | Design



mcr FID S/V p/P, mcr FID S/V-M p/P smoke control dampers consist of a casing with a rectangular cross-section, made of two segments separated with a fire-proof panel with a cross-section of 20 x 40 mm, a moving damper blade and a remotely activated actuator. Standard damper casing is made of galvanized steel sheets. A special casing is used for chemically aggressive environments, which features steel elements 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 a 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 metal sheet reinforcement profile. The inner side of the fire damper casing is equipped with an intumescent gasket. Stop profiles are attached to the inner casing surface, limiting the rotating motion of the damper blade. Stop profiles are lined with a polyethylene ventilation gasket.

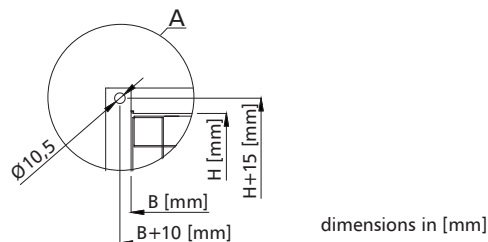
mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.3 | Versions

4.3.1 | Damper closing and opening with an actuator

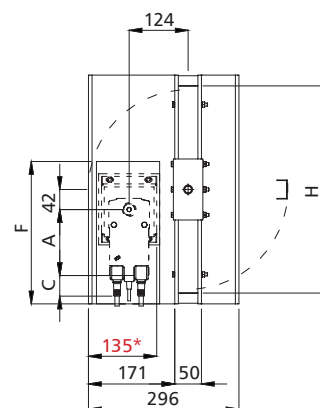
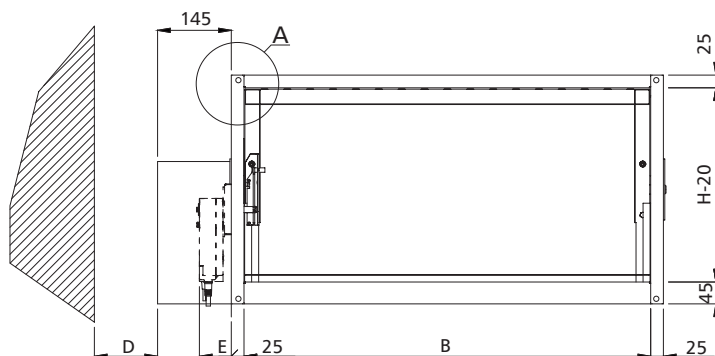
During normal operation, the damper blade of the fire damper remains open or closed. In the case of fire, the damper blade in the compartment where the fire occurs opens and the damper blades in the remaining compartments are closed – the blades are operated remotely by supplying power.

The mcr FID S/V p/P, mcr FID S/V-M p/P dampers are equipped with a trigger and control mechanism in the form of BE, BEE, BEN, MLE or ME series axial actuator, supplied with 24 V AC/DC or 230 V AC. Actuators are equipped with limit switches used to monitor the position of the damper blade. Dampers with BE, BEE, BEN, MLE or ME actuators can be opened/closed by supplying voltage to the actuator terminals.



mechanism	A	C	D	E	F
BE	198	10	75	70	345
BEE	140	28	75	52	305
BEN	130	20	75	48	305
ME	198	10	75	57	345
MLE	126	10	75	59	305

*embedding border



mechanism
BE
BEE
BEN

4.4 | Dimensions

damper installation in a construction partition:

- » nominal width B: from 200 mm to 1500 mm
- » nominal height H from 200 mm to 1500 mm
- » maximum single damper cross-section surface up to
 - 1.5 m² for FID S/V p/P dampers
 - 1.25 m² for FID S/V-M p/P dampers

damper installation on a fireproof duct:

- » nominal width B: from 200 mm to 1500 mm
- » nominal height H from 200 mm to 1000 mm
- » maximum single damper cross-section surface up to 1.5 m²

installation of dampers in a battery (set)

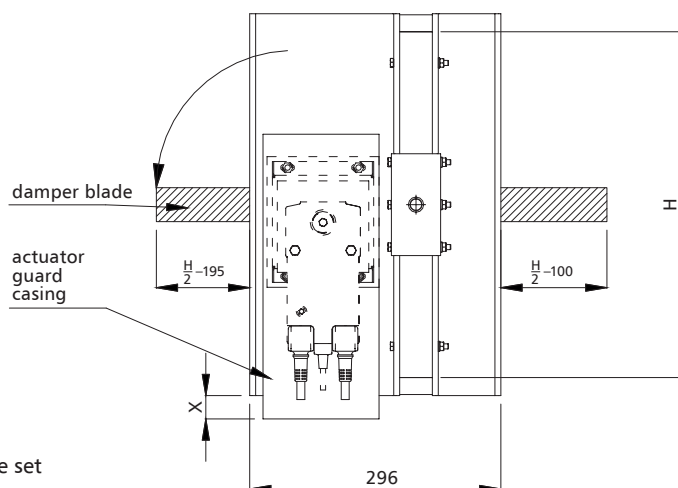
made up of 2 or 3 dampers:

- » dimensions 200 x 200 to 1500 x 710 mm
- » vertical rotation axis, mechanism on the top or bottom of the set

modular installation – one damper next to another

(only vertical rotation axes):

- » maximum width: n x 710 mm
- » maximum height: 2 x 1500 mm



Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 1 mm increments within the given ranges). For dampers with a $H < 500$ mm side, the actuator guard casing protrudes outside the damper body by the value X, calculated from the following formula $X = 250 - \frac{H}{2}$

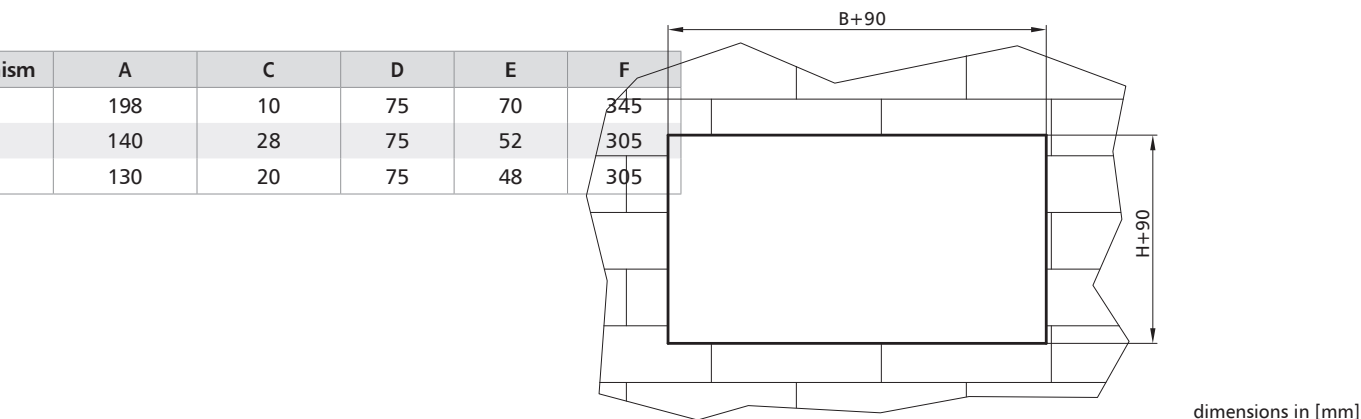
mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.5 | Installation

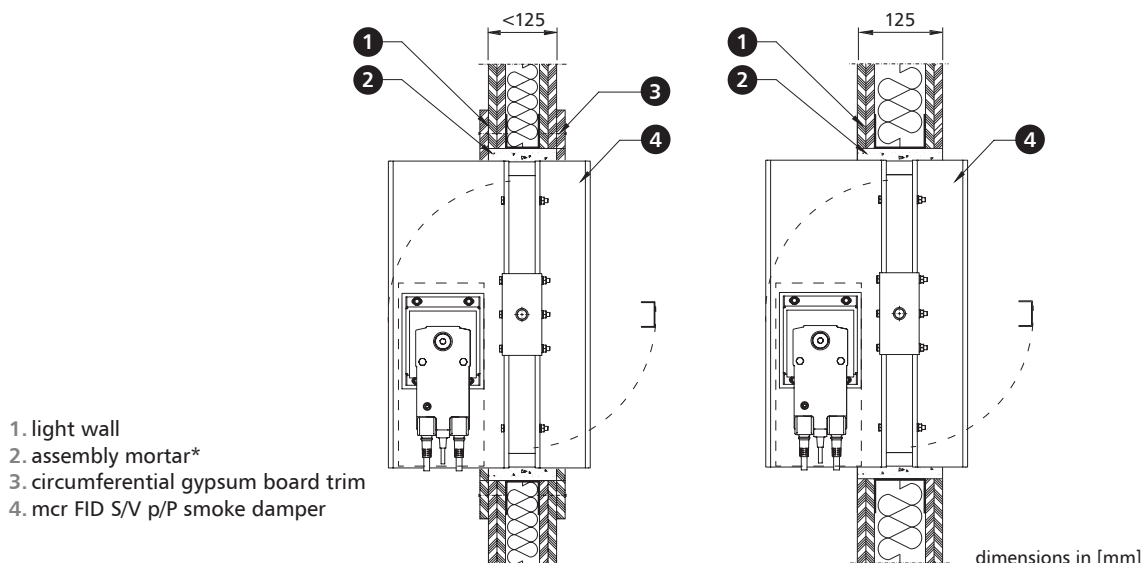
- » mcr FID S/V p/P rectangular dampers are rated EI120($v_{ew} i \leftrightarrow o$)S1000C₃₀₀AAmulti if installed in wall/shaft partitions made of concrete, bricks, hollow bricks, masonry or prefabricated slabs with a min. thickness of 110 mm.
- » mcr FID S/V p/P rectangular dampers are rated EI120($v_{ew} i \leftrightarrow o$)S1500C₁₀₀₀₀AAmulti if installed in wall/shaft partitions made of concrete, bricks, hollow bricks, masonry or prefabricated slabs with a min. thickness of 120 mm, in light walls made of gypsum boards on a steel framework with a min. thickness of 125 mm and a resistance rating no lesser than EI120.
- » mcr FID S/V-M p/P rectangular dampers are rated EI120($v_{ew} i \leftrightarrow o$)S1500C₁₀₀₀₀AAmulti if installed in wall/shaft partitions made of concrete, bricks, hollow bricks, masonry or prefabricated slabs with a min. thickness of 125 mm, in light walls made of gypsum boards on a steel framework with a min. thickness of 125 mm and a resistance rating no lesser than EI120.
- » mcr FID S/V p/P rectangular dampers are rated EI120($v_{ed} h_{od} i \leftrightarrow o$)S1000C₁₀₀₀₀AAmulti if installed in a fireproof duct compliant with EN 1366-8 or EN 1366-9, with fire resistance ratings equal to or lesser than the fire resistance rating of the damper.
- » mcr FID S/V-M p/P rectangular dampers are rated EI120($v_{edw} i \leftrightarrow o$)S1000C₁₀₀₀₀AAmulti if installed in solid building shafts, masonry of blocks, hollow bricks with s min. thickness 120 mm and a resistance rating no lesser than EI120.
- » A rectangular damper battery (set) is rated EI120($v_{ew} i \leftrightarrow o$)S1000C₁₀₀₀₀AAmulti and EI60($v_{ew} i \leftrightarrow o$)S1500C₁₀₀₀₀AAmulti if installed in partitions made of concrete, bricks, hollow bricks, masonry or prefabricated slabs with a min. thickness of 120 mm. Damper batteries can be combined together into modules.
- » mcr FID S/V p/P rectangular dampers are rated E₆₀₀ 120 ($v_{ed} i \leftrightarrow o$) S1000 C₁₀₀₀₀ AA single in single-zone fire ventilation systems.

4.5.1 | Preparation of installation openings

- » preferred opening



4.5.2 | Sample installation in gypsum board light walls

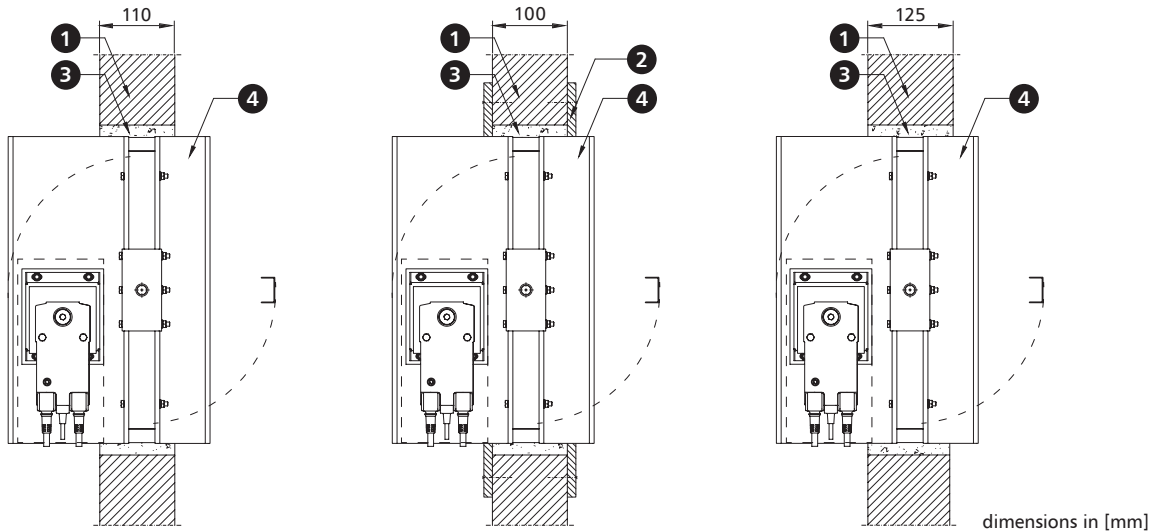


* The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

NOTE: If the damper is installed in a wall with a thickness of less than 125 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.

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.5.3 | Sample installation in concrete and brick walls



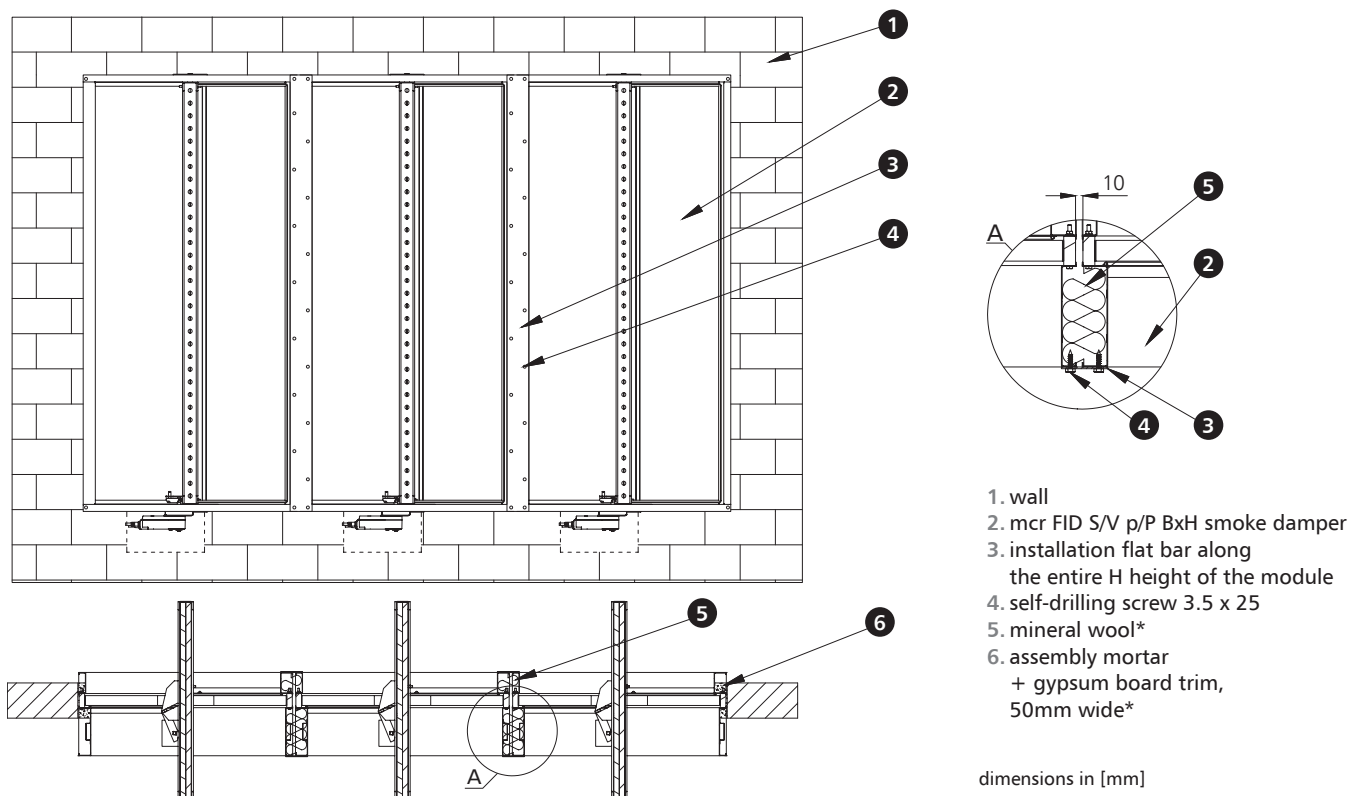
- 1. rigid wall - concrete, aerated concrete or bricks
- 2. circumferential gypsum board trim

- 3. assembly mortar*
- 4. mcr FID S/V p/P smoke damper

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the method applied

NOTE: If the damper is installed in a wall with a thickness of less than 110 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.

4.5.4 | Sample battery installation



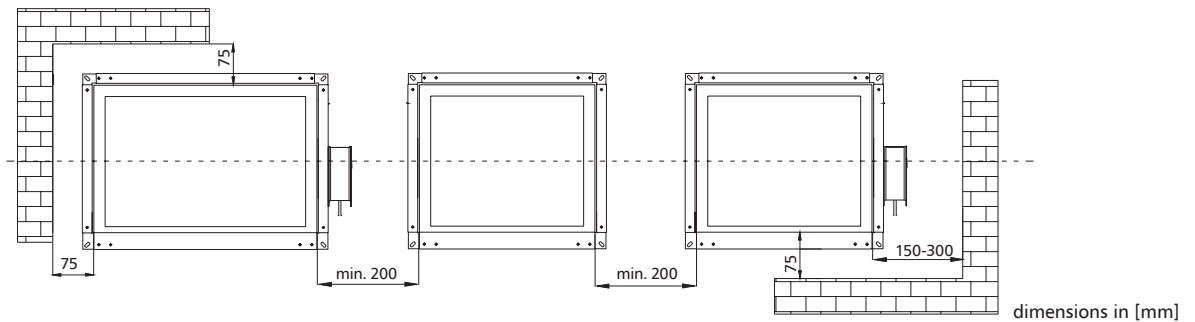
- 1. wall
- 2. mcr FID S/V p/P BxH smoke damper
- 3. installation flat bar along the entire H height of the module
- 4. self-drilling screw 3.5 x 25
- 5. mineral wool*
- 6. assembly mortar + gypsum board trim, 50mm wide*

dimensions in [mm]

* Recommended filling of spaces between the dampers is based on wool with a min. density of 100 kg/m³ and fire resistance class A1. Recommended damper installation to the wall is based on assembly mortar on the basis of gypsum or cement.

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

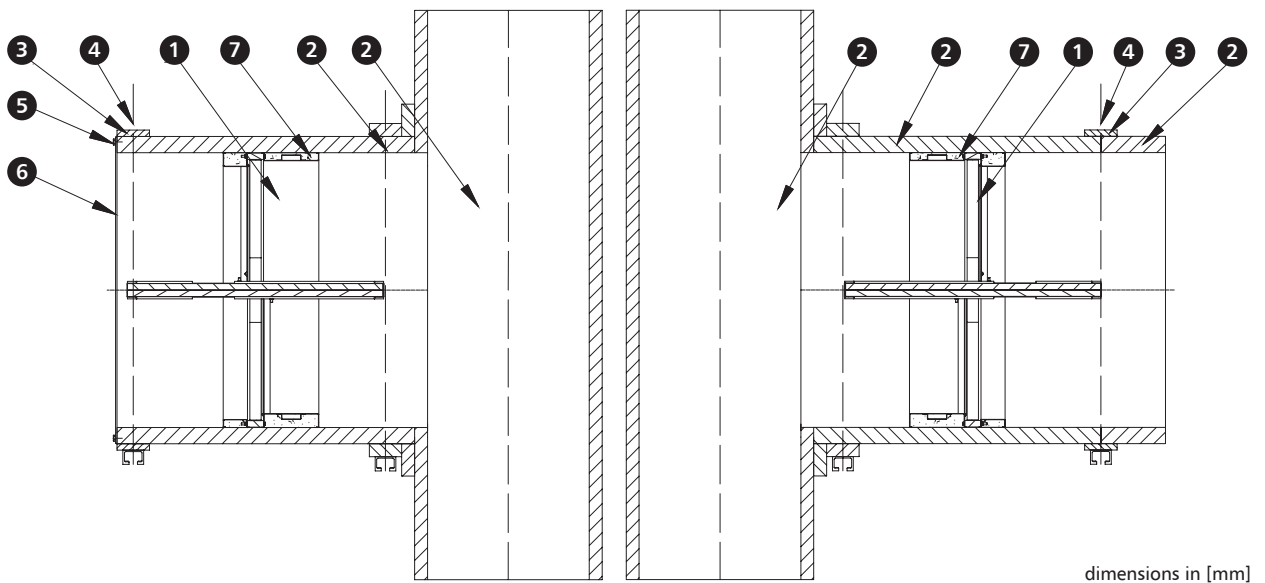
Minimum distance between the individual systems and partitions



Damper installation with a vertical axis of rotation

Such installation must be clearly stated in the draft documentation and reported to the damper's manufacturer in the order. BxH damper dimensions should be provided in a manner similar to the damper with a horizontal rotation axis (actuator installed on the dimension provided as the second one, e.g. 1000 x 200(s) or 200 x 1000(s) PP).

4.5.5 | Damper installation on horizontal ducts



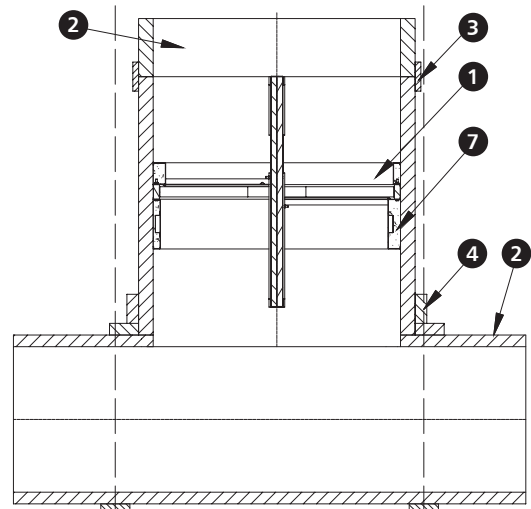
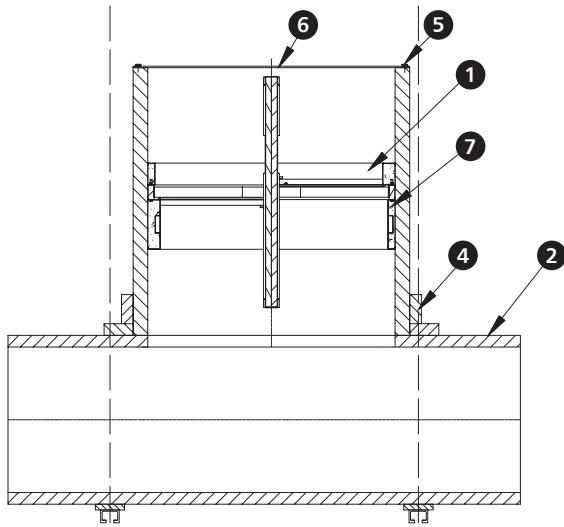
1. mcr FID S/V p/P BxH smoke damper
2. multi-zone smoke extract duct – e.g. made of fire-proof boards
3. a strip of fire-proof board along the entire length of the BxH side
4. installation hangers system

5. M10 x 20 bolt
6. MWB system grille (optional)
7. sealing

Smoke extraction ducts should be made in accordance with the ducts manufacturer's guidelines. The ducts must have an adequate fire resistance rating in accordance with the fire resistance rating provided for the entire solution. Seal all connections between the damper and the ducts with the appropriate grout/glue/gaskets, ensuring that the fire resistance rating is maintained. The shut-off damper in vertical fire ventilation systems may be installed across the horizontal smoke extract duct or on the sides of the horizontal smoke extract duct or on the surface of any side of the vertical smoke extract duct. A masking grille may terminate the system.

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.5.6 | Damper installation on vertical ducts



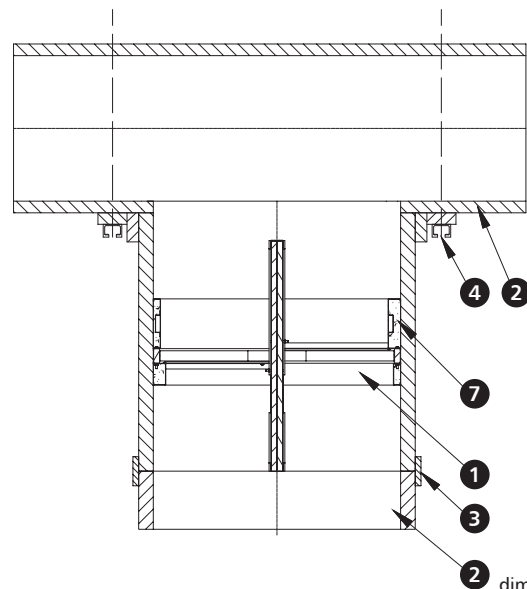
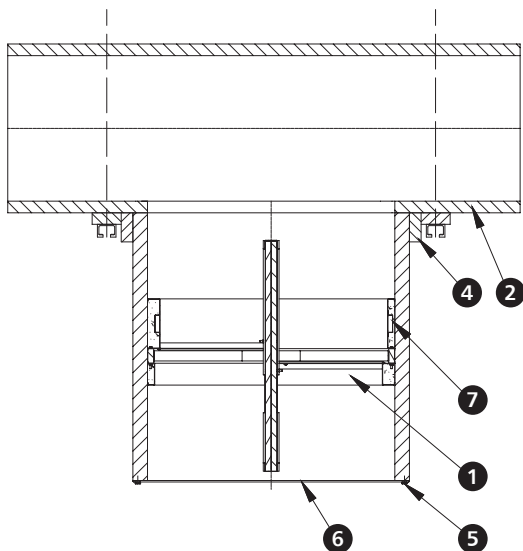
dimensions in [mm]

1. mcr FID S/V p/P BxH smoke damper
2. multi-zone smoke extract duct – e.g. made of fire-proof boards
3. a strip of fire-proof board along the entire length of the BxH side
4. installation hangers system

5. M10 x 20 bolt
6. MWB system grille (optional)
7. sealing

Smoke extraction ducts should be made in accordance with the ducts manufacturer's guidelines. The ducts must have an adequate fire resistance rating in accordance with the fire resistance rating provided for the entire solution. Seal all connections between the damper and the ducts with the appropriate grout/glue/gaskets, ensuring that the fire resistance rating is maintained. The shut-off damper in vertical fire ventilation systems may be installed across the horizontal smoke extract duct or on the sides of the horizontal smoke extract duct or on the surface of any side of the vertical smoke extract duct. A masking grille may terminate the system.

4.5.7 | Damper installation on vertical ducts



dimensions in [mm]

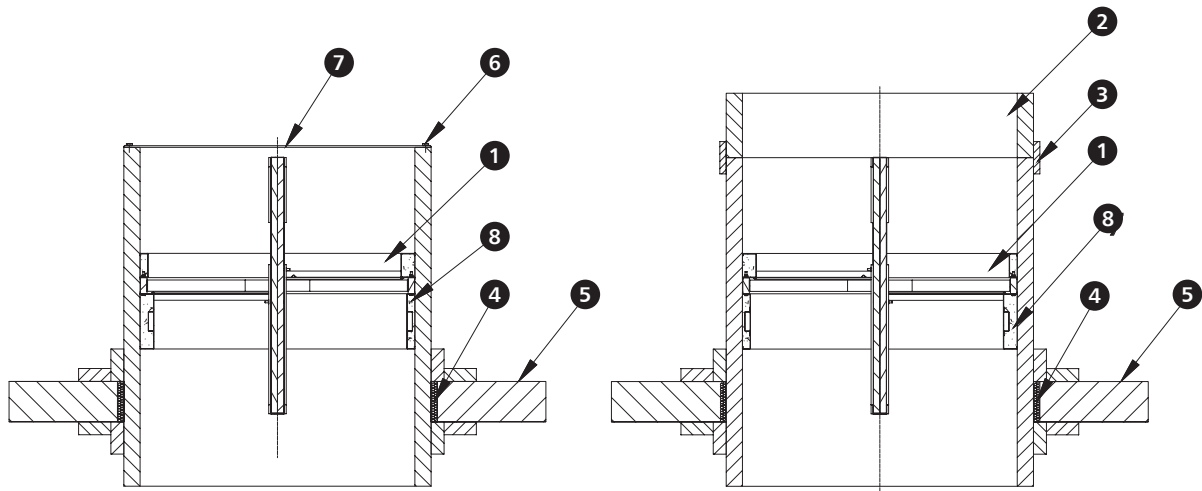
1. mcr FID S/V p/P BxH smoke damper
2. multi-zone smoke extract duct – e.g. made of fire-proof boards
3. a strip of fire-proof board along the entire length of the BxH side
4. installation hangers system

5. M10 x 20 bolt
6. MWB system grille (optional)
7. sealing

Smoke extraction ducts should be made in accordance with the ducts manufacturer's guidelines. The ducts must have an adequate fire resistance rating in accordance with the fire resistance rating provided for the entire solution. Seal all connections between the damper and the ducts with the appropriate grout/glue/gaskets, ensuring that the fire resistance rating is maintained. The shut-off damper in vertical fire ventilation systems may be installed across the horizontal smoke extract duct or on the sides of the horizontal smoke extract duct or on the surface of any side of the vertical smoke extract duct. A masking grille may terminate the system.

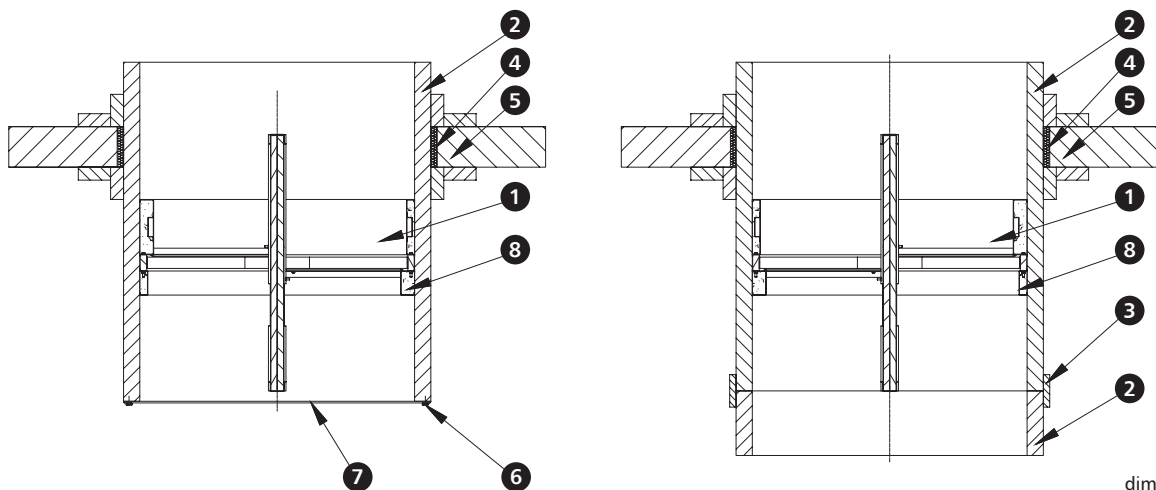
mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.5.8 | Damper installation on vertical ducts



- 1. mcr FID S/V p/P BxH smoke damper
- 2. multi-zone smoke extract duct – e.g. made of fire-proof boards
- 3. a strip of fire-proof board along the entire length of the BxH side
- 4. Fireproof duct installation penetration system

- 5. Floor slab
- 6. M10 x 20 bolt
- 7. MWB system grille (optional)
- 8. sealing



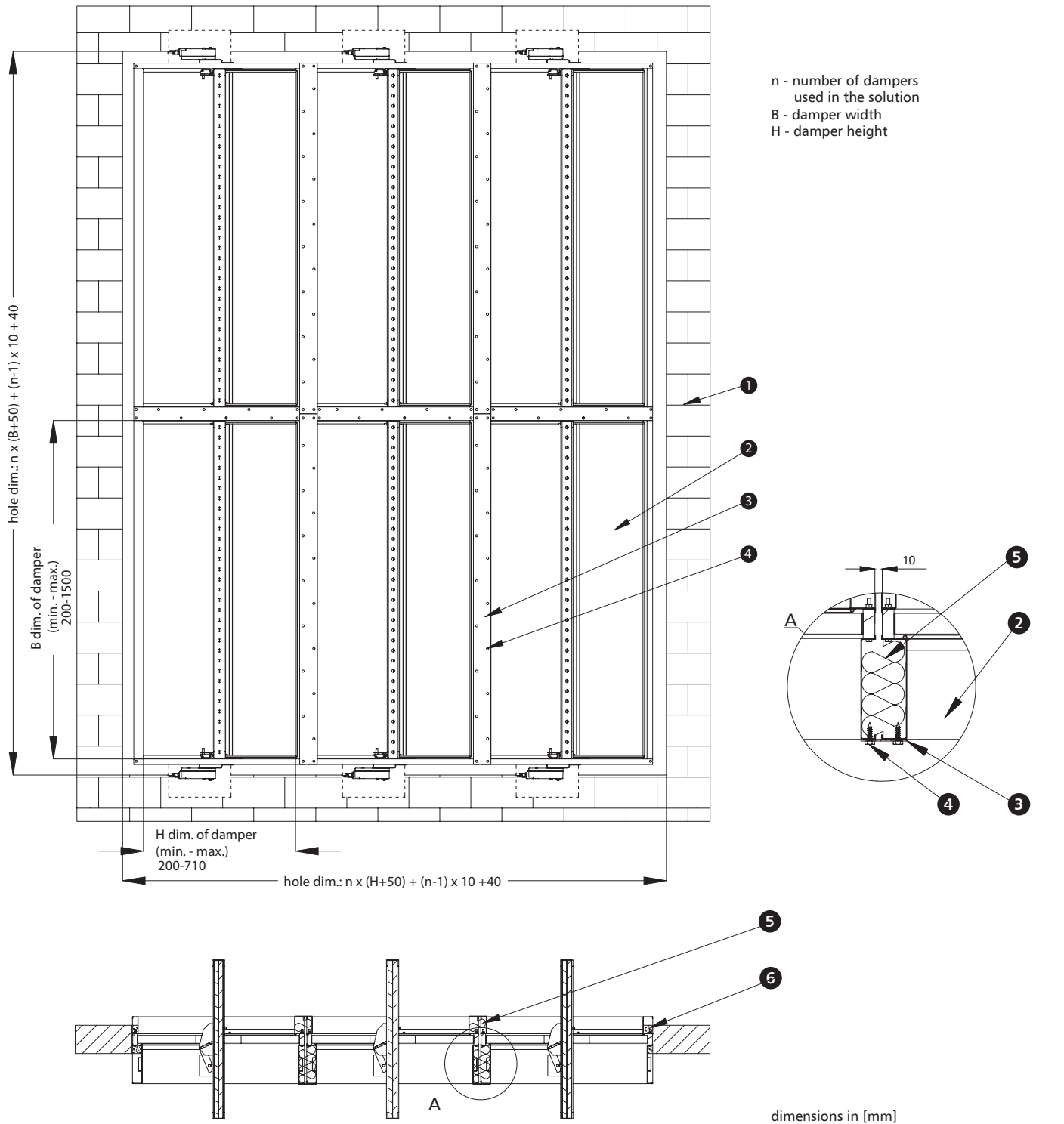
- 1. mcr FID S/V p/P BxH smoke damper
- 2. multi-zone smoke extract duct – e.g. made of fire-proof boards
- 3. a strip of fire-proof board along the entire length of the BxH side
- 4. Fireproof duct installation penetration system

- 5. Floor slab
- 6. M10 x 20 bolt
- 7. MWB system grille (optional)
- 8. sealing

dimensions in [mm]

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.5.9 | Sample damper battery (module) installation



1. wall
2. mcr FID S/V p/P BxH smoke damper
3. installation flat bar along the entire H height of the module

4. self-drilling screw 3.5 x 25
5. mineral wool*
6. assembly mortar + gypsum board trim, 50mm wide*

* Recommended filling of spaces between the dampers is based on wool with a min. density of 100 kg/m³ and fire resistance class A1. Recommended damper installation to the wall is based on assembly mortar on the basis of gypsum or cement.

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.6 | mcr FID S/V p/P, mcr FID S/V-M p/P rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		200					250					300					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]
width B [mm]	200	4	0.040	0.029	420	8	29	0.050	0.039	564	7	28	0.06	0.049	708	7	29
		6			631	19	40			847	17	40			1 063	16	40
		8			841	34	48			1 129	31	48			1 417	29	48
		10			1 051	54	54			1 411	49	54			1 771	45	54
	250	4	0.050	0.037	526	8	30	0.063	0.049	706	7	29	0.075	0.062	886	7	30
		6			788	19	41			1 058	17	41			1 328	16	41
		8			1 051	34	49			1 411	31	49			1 771	29	49
		10			1 314	54	55			1 764	49	55			2 214	45	54
	300	4	0.060	0.044	631	8	31	0.075	0.059	847	7	30	0.09	0.074	1 063	7	31
		6			946	19	42			1 270	17	42			1 594	16	42
		8			1 261	34	49			1 693	31	49			2 125	28	49
		10			1 577	54	55			2 117	48	55			2 657	45	55
	350	4	0.070	0.051	736	8	31	0.088	0.069	988	7	31	0.105	0.086	1 240	7	32
		6			1 104	19	42			1 482	17	42			1 860	16	42
		8			1 472	34	50			1 976	31	50			2 480	28	50
		10			1 840	53	56			2 470	48	56			3 100	44	56
	400	4	0.080	0.058	841	8	32	0.100	0.078	1 129	7	31	0.12	0.098	1 417	7	32
		6			1 261	19	43			1 693	17	43			2 125	15	42
		8			1 682	34	51			2 258	30	50			2 834	28	50
		10			2 102	53	56			2 822	48	56			3 542	44	56
	450	4	0.090	0.066	946	8	32	0.113	0.088	1 270	7	32	0.135	0.111	1 594	7	33
		6			1 419	19	44			1 905	17	43			2 391	15	43
		8			1 892	33	51			2 540	30	51			3 188	28	51
		10			2 365	53	57			3 175	47	57			3 985	43	56
	500	4	0.100	0.073	1 051	8	33	0.125	0.098	1 411	7	32	0.15	0.123	1 771	6	31
		6			1 577	18	43			2 117	16	43			2 657	15	43
		8			2 102	33	51			2 822	30	51			3 542	27	51
		10			2 628	52	57			3 528	47	57			4 428	43	57
550	4	0.110	0.080	1 156	8	33	0.138	0.108	1 552	7	33	0.165	0.135	1 948	6	32	
	6			1 734	18	44			2 328	16	43			2 922	15	44	
	8			2 313	33	52			3 105	29	51			3 897	27	51	
	10			2 891	51	57			3 881	46	57			4 871	42	57	
600	4	0.120	0.088	1 261	8	34	0.150	0.118	1 693	7	33	0.18	0.148	2 125	6	32	
	6			1 892	18	44			2 540	16	44			3 188	15	44	
	8			2 523	32	52			3 387	29	52			4 251	26	51	
	10			3 154	51	58			4 234	45	57			5 314	41	57	
650	4	0.130	0.095	1 367	8	34	0.163	0.127	1 835	7	33	0.195	0.160	2 303	6	32	
	6			2 050	18	44			2 752	16	44			3 454	14	43	
	8			2 733	32	52			3 669	28	51			4 605	26	51	
	10			3 416	50	58			4 586	44	57			5 756	40	57	
700	4	0.140	0.102	1 472	7	32	0.175	0.137	1 976	7	34	0.21	0.172	2 480	6	33	
	6			2 208	17	44			2 964	15	44			3 720	14	44	
	8			2 943	31	52			3 951	28	52			4 959	25	51	
	10			3 679	49	58			4 939	44	58			6 199	40	57	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		200					250					300				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	4	0.150	0.110	1 577	7	0.188	0.147	2 117	6	32	0.225	0.185	2 657	6	33
		6			2 365	17			3 175	15				3 985	14	
		8			3 154	31			4 234	27				5 314	25	
		10			3 942	48			5 292	43				6 642	39	
	800	4	0.160	0.117	1 682	7	0.200	0.157	2 258	6	32	0.24	0.197	2 834	6	33
		6			2 523	17			3 387	15				4 251	13	
		8			3 364	30			4 516	27				5 668	24	
		10			4 205	47			5 645	42				7 085	38	
	850	4	0.170	0.124	1 787	7	0.213	0.167	2 399	6	33	0.255	0.209	3 011	5	31
		6			2 681	16			3 599	14				4 517	13	
		8			3 574	29			4 798	26				6 022	23	
		10			4 468	46			5 998	41				7 528	37	
	900	4	0.180	0.131	1 892	7	0.225	0.176	2 540	6	33	0.27	0.221	3 188	5	31
		6			2 838	16			3 810	14				4 782	13	
		8			3 784	29			5 080	25				6 376	23	
		10			4 730	45			6 350	40				7 970	36	
	1000	4	0.200	0.146	2 102	7	0.250	0.196	2 822	6	33	0.3	0.246	3 542	5	32
		6			3 154	15			4 234	13				5 314	12	
		8			4 205	28			5 645	24				7 085	22	
		10			5 256	43			7 056	38				8 856	34	
	1100	4	0.220	0.161	2 313	6	0.275	0.216	3 105	5	31	0.33	0.271	3 897	5	32
		6			3 469	15			4 657	13				5 845	11	
		8			4 625	26			6 209	23				7 793	20	
		10			5 782	41			7 762	36				9 742	32	
	1200	4	0.240	0.175	2 523	6	0.300	0.235	3 387	5	32	0.36	0.295	4 251	4	30
		6			3 784	14			5 080	12				6 376	11	
		8			5 046	25			6 774	22				8 502	19	
		10			6 307	39			8 467	34				10 627	30	
	1300	4	0.260	0.190	2 733	5	0.325	0.255	3 669	5	32	0.39	0.320	4 605	4	30
		6			4 100	13			5 504	11				6 908	10	
		8			5 466	23			7 338	20				9 210	18	
		10			6 833	37			9 173	32				11 513	28	
	1400	4	0.280	0.204	2 943	5	0.350	0.274	3 951	4	29	0.42	0.344	4 959	4	30
		6			4 415	12			5 927	10				7 439	9	
		8			5 887	22			7 903	19				9 919	17	
		10			7 358	35			9 878	30				12 398	27	
	1500	4	0.300	0.219	3 154	5	0.375	0.294	4 234	4	30	0.45	0.369	5 314	4	31
		6			4 730	12			6 350	10				7 970	9	
		8			6 307	21			8 467	18				10 627	16	
		10			7 884	33			10 584	28				13 284	25	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			350						400					450				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]
width B [mm]	200	4	0.070	0.059	852	6	28	0.080	0.069	996	6	29	0.090	0.079	1 140	6	29	
		6			1 279	15	40			1 495	14	40			1 711	13	39	
		8			1 705	27	48			1 993	25	47			2 281	24	47	
		10			2 131	42	53			2 491	40	53			2 851	38	53	
	250	4	0.088	0.074	1 066	6	29	0.100	0.087	1 246	6	30	0.113	0.099	1 426	6	30	
		6			1 598	15	41			1 868	14	41			2 138	13	40	
		8			2 131	27	49			2 491	25	48			2 851	24	48	
		10			2 664	42	54			3 114	40	54			3 564	38	54	
	300	4	0.105	0.089	1 279	6	30	0.120	0.104	1 495	6	31	0.135	0.119	1 711	6	31	
		6			1 918	15	42			2 242	14	42			2 566	13	41	
		8			2 557	27	49			2 989	25	49			3 421	24	49	
		10			3 197	42	55			3 737	39	55			4 277	37	55	
	350	4	0.123	0.104	1 492	6	30	0.140	0.121	1 744	6	31	0.158	0.139	1 996	5	29	
		6			2 238	15	42			2 616	14	42			2 994	13	42	
		8			2 984	26	50			3 488	25	50			3 992	23	49	
		10			3 730	41	56			4 360	39	56			4 990	37	55	
	400	4	0.140	0.118	1 705	6	31	0.160	0.138	1 993	6	32	0.180	0.158	2 281	5	30	
		6			2 557	14	42			2 989	13	42			3 421	13	42	
		8			3 410	26	50			3 986	24	50			4 562	23	50	
		10			4 262	41	56			4 982	38	56			5 702	36	56	
	450	4	0.158	0.133	1 918	6	32	0.180	0.156	2 242	6	32	0.203	0.178	2 566	5	30	
		6			2 877	14	43			3 363	13	42			3 849	13	43	
		8			3 836	26	51			4 484	24	50			5 132	23	50	
		10			4 795	40	56			5 605	38	56			6 415	36	56	
	500	4	0.175	0.148	2 131	6	32	0.200	0.173	2 491	6	33	0.225	0.198	2 851	5	31	
		6			3 197	14	43			3 737	13	43			4 277	12	42	
		8			4 262	25	51			4 982	24	51			5 702	22	50	
		10			5 328	40	57			6 228	37	56			7 128	35	56	
550	4	0.193	0.163	2 557	6	32	0.220	0.190	2 740	5	31	0.248	0.218	3 136	5	31		
	6			3 836	14	44			4 110	13	43			4 704	12	43		
	8			5 115	25	51			5 481	23	51			6 273	22	51		
	10			6 394	39	57			6 851	36	56			7 841	34	56		
600	4	0.210	0.178	2 557	6	33	0.240	0.208	2 989	5	31	0.270	0.238	3 421	5	32		
	6			3 836	13	43			4 484	13	44			5 132	12	43		
	8			5 115	24	51			5 979	23	51			6 843	21	50		
	10			6 394	38	57			7 474	36	57			8 554	34	57		
650	4	0.228	0.192	2 771	6	33	0.260	0.225	3 239	5	31	0.293	0.257	3 707	5	32		
	6			4 156	13	43			4 858	12	43			5 560	11	42		
	8			5 541	24	51			6 477	22	51			7 413	21	51		
	10			6 926	37	57			8 096	35	57			9 266	33	57		
700	4	0.245	0.207	2 984	5	31	0.28	0.242	3 488	5	32	0.315	0.277	3 992	5	32		
	6			4 476	13	44			5 232	12	43			5 988	11	43		
	8			5 967	23	51			6 975	22	51			7 983	20	50		
	10			7 459	37	57			8 719	34	57			9 979	32	57		

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		350					400					450				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	4	0.263	0.222	3 197	5	0.3	0.260	3 737	5	32	0.338	0.297	4 277	5	33
		6			4 795	13			5 605	12	44			6 415	11	43
		8			6 394	23			7 474	21	51			8 554	20	51
		10			7 992	36			9 342	33	57			10 692	31	56
	800	4	0.280	0.237	3 410	5	0.32	0.277	3 986	5	32	0.360	0.317	4 562	4	29
		6			5 115	12			5 979	11	43			6 843	11	42
		8			6 820	22			7 972	21	51			9 124	19	49
		10			8 525	35			9 965	32	57			11 405	30	55
	850	4	0.298	0.252	3 623	5	0.34	0.294	4 235	5	33	0.383	0.337	4 847	4	29
		6			5 435	12			6 353	11	43			7 271	10	41
		8			7 246	22			8 470	20	51			9 694	19	49
		10			9 058	34			10 588	31	56			12 118	29	55
	900	4	0.315	0.266	3 836	5	0.360	0.311	4 484	4	30	0.405	0.356	5 132	4	29
		6			5 754	12			6 726	11	43			7 698	10	41
		8			7 672	21			8 968	19	50			10 264	18	49
		10			9 590	33			11 210	31	57			12 830	29	55
	1000	4	0.350	0.296	4 262	5	0.400	0.346	4 982	4	30	0.450	0.396	5 702	4	29
		6			6 394	11			7 474	10	42			8 554	9	40
		8			8 525	20			9 965	18	50			11 405	17	48
		10			10 656	31			12 456	29	56			14 256	27	54
	1100	4	0.385	0.326	4 689	4	0.440	0.381	5 481	4	31	0.495	0.436	6 273	4	29
		6			7 033	10			8 221	9	41			9 409	9	40
		8			9 377	19			10 961	17	50			12 545	16	47
		10			11 722	29			13 702	27	56			15 682	25	53
	1200	4	0.420	0.355	5 115	4	0.480	0.415	5 979	4	31	0.540	0.475	6 843	3	25
		6			7 672	10			8 968	9	42			10 264	8	38
		8			10 230	17			11 958	16	49			13 686	15	46
		10			12 787	27			14 947	25	55			17 107	23	52
	1300	4	0.455	0.385	5 541	4	0.520	0.450	6 477	3	28	0.585	0.515	7 413	3	25
		6			8 312	9			9 716	8	41			11 120	8	38
		8			11 082	16			12 954	15	49			14 826	14	45
		10			13 853	26			16 193	24	55			18 533	22	51
	1400	4	0.490	0.414	5 967	3	0.560	0.484	6 975	3	28	0.630	0.554	7 983	3	25
		6			8 951	8			10 463	8	41			11 975	7	36
		8			11 935	15			13 951	14	48			15 967	13	45
		10			14 918	24			17 438	22	54			19 958	20	50
	1500	4	0.525	0.444	6 394	3	0.600	0.519	7 474	3	28	0.675	0.594	8 554	3	25
		6			9 590	8			11 210	7	40			12 830	6	34
		8			12 787	14			14 947	13	48			17 107	12	43
		10			15 984	22			18 684	20	53			21 384	19	49

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		500					550					600				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.1	0.089	1 284	5	0.110	0.099	1 428	5	28	0.120	0.109	1 572	5	28
		6			1 927	13			2 143	12	39			2 359	12	40
		8			2 569	23			2 857	22	47			3 145	21	47
		10			3 211	36			3 571	35	53			3 931	34	53
	250	4	0.125	0.112	1 606	5	0.138	0.124	1 786	5	29	0.150	0.137	1 966	5	29
		6			2 408	13			2 678	12	40			2 948	12	41
		8			3 211	23			3 571	22	48			3 931	21	48
		10			4 014	36			4 464	35	54			4 914	33	54
	300	4	0.15	0.134	1 927	5	0.165	0.149	2 143	5	30	0.180	0.164	2 359	5	30
		6			2 890	12			3 214	12	41			3 538	11	40
		8			3 853	23			4 285	22	49			4 717	21	49
		10			4 817	36			5 357	34	55			5 897	33	55
	350	4	0.175	0.156	2 248	5	0.193	0.174	2 500	5	30	0.210	0.191	2 752	5	31
		6			3 372	12			3 750	12	42			4 128	11	41
		8			4 496	22			5 000	21	49			5 504	20	49
		10			5 620	35			6 250	34	55			6 880	32	55
	400	4	0.2	0.178	2 569	5	0.220	0.198	2 857	5	31	0.240	0.218	3 145	5	31
		6			3 853	12			4 285	12	42			4 717	11	42
		8			5 138	22			5 714	21	50			6 290	20	49
		10			6 422	35			7 142	33	56			7 862	32	56
	450	4	0.225	0.201	2 890	5	0.248	0.223	3 214	5	31	0.270	0.246	3 538	5	32
		6			4 335	12			4 821	11	42			5 307	11	42
		8			5 780	22			6 428	21	50			7 076	20	50
		10			7 225	34			8 035	32	56			8 845	31	56
	500	4	0.250	0.223	3 211	5	0.275	0.248	3 571	5	32	0.300	0.273	3 931	4	29
		6			4 817	12			5 357	11	42			5 897	11	43
		8			6 422	21			7 142	20	50			7 862	19	50
		10			8 028	33			8 928	32	56			9 828	30	56
	550	4	0.275	0.245	3 853	5	0.303	0.273	4 285	5	32	0.330	0.300	4 717	4	30
		6			5 780	11			6 428	11	43			7 076	10	42
		8			7 707	21			8 571	20	50			9 435	19	50
		10			9 634	33			10 714	31	56			11 794	30	56
	600	4	0.3	0.268	3 853	5	0.330	0.298	4 285	4	30	0.360	0.328	4 717	4	30
		6			5 780	11			6 428	11	43			7 076	10	42
		8			7 707	20			8 571	19	50			9 435	18	50
		10			9 634	32			10 714	30	56			11 794	29	56
	650	4	0.325	0.290	4 175	5	0.358	0.322	4 643	4	30	0.390	0.355	5 111	4	31
		6			6 262	11			6 964	10	42			7 666	10	43
		8			8 349	20			9 285	19	50			10 221	18	50
		10			10 436	31			11 606	30	56			12 776	28	56
	700	4	0.350	0.312	4 496	4	0.385	0.347	5 000	4	30	0.420	0.382	5 504	4	31
		6			6 744	11			7 500	10	42			8 256	10	43
		8			8 991	19			9 999	18	50			11 007	17	50
		10			11 239	30			12 499	29	56			13 759	27	56

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

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S_e – damper active cross-section [m²]

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

		height H [mm]														
		500					550					600				
	v	S _k	S _e	Q	d _p	L _{WA}	S _k	S _e	Q	d _p	L _{WA}	S _k	S _e	Q	d _p	L _{WA}
width B [mm]	750	4	0.375	0.335	4 817	4	0.413	0.372	5 357	4	0.450	0.410	5 897	4	31	31
	6	7 225			10	42			8 035	10				8 845	9	
	8	9 634			19	51			10 714	18				11 794	17	
	10	12 042			29	56			13 392	28				14 742	27	
800	4	5 138	0.4	0.357	4	30	0.440	0.397	5 714	4	0.480	0.437	6 290	4	31	31
	6	7 707			10	42			8 571	9				9 435	9	
	8	10 276			18	50			11 428	17				12 580	16	
	10	12 845			29	56			14 285	27				15 725	26	
850	4	5 459	0.425	0.379	4	30	0.468	0.422	6 071	4	0.510	0.464	6 683	4	32	32
	6	8 189			10	42			9 107	9				10 025	9	
	8	10 918			18	50			12 142	17				13 366	16	
	10	13 648			28	56			15 178	26				16 708	25	
900	4	5 780	0.45	0.401	4	30	0.495	0.446	6 428	4	0.540	0.491	7 076	3	28	28
	6	8 670			9	41			9 642	9				10 614	8	
	8	11 560			17	49			12 856	16				14 152	15	
	10	14 450			27	55			16 070	25				17 690	24	
1000	4	6 422	0.5	0.446	4	30	0.550	0.496	6 428	3	0.600	0.546	7 862	3	29	29
	6	9 634			9	41			9 642	8				11 794	8	
	8	12 845			16	48			12 856	15				15 725	14	
	10	16 056			25	54			16 070	24				19 656	23	
1100	4	7 065	0.55	0.491	3	27	0.605	0.546	7 857	3	0.660	0.601	8 649	3	29	29
	6	10 597			8	39			11 785	8				12 973	7	
	8	14 129			15	48			15 713	14				17 297	13	
	10	17 662			24	54			19 642	22				21 622	21	
1200	4	7 707	0.6	0.535	3	27	0.660	0.595	8 571	3	0.720	0.655	9 435	3	29	29
	6	11 560			8	39			12 856	7				14 152	7	
	8	15 414			14	47			17 142	13				18 870	12	
	10	19 267			22	53			21 427	21				23 587	20	
1300	4	8 349	0.65	0.580	3	27	0.715	0.645	9 285	3	0.780	0.710	10 221	2	25	25
	6	12 524			7	38			13 928	7				15 332	6	
	8	16 698			13	46			18 570	12				20 442	11	
	10	20 873			20	51			23 213	19				25 553	18	
1400	4	8 991	0.7	0.624	3	27	0.770	0.694	9 999	2	0.840	0.764	11 007	2	25	25
	6	13 487			6	36			14 999	6				16 511	6	
	8	17 983			12	45			19 999	11				22 015	10	
	10	22 478			19	51			24 998	18				27 518	17	
1500	4	9 634	0.75	0.669	2	21	0.825	0.744	10 714	2	0.900	0.819	11 794	2	25	25
	6	14 450			6	36			16 070	6				17 690	5	
	8	19 267			11	43			21 427	10				23 587	10	
	10	24 084			17	49			26 784	16				29 484	15	

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers **for multi-compartment fire ventilation systems**

B – nominal width [mm]
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S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		650						700					750				
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.130	0.119	1 716	5	29	0.140	0.129	1 860	5	29	0.150	0.139	2 004	4	26
		6			2 575	11	39			2 791	11	39			3 007	11	40
		8			3 433	21	47			3 721	20	47			4 009	19	47
		10			4 291	32	53			4 651	31	53			5 011	31	53
	250	4	0.163	0.149	2 146	5	30	0.175	0.162	2 326	5	30	0.188	0.174	2 506	4	27
		6			3 218	11	40			3 488	11	40			3 758	11	41
		8			4 291	20	48			4 651	20	48			5 011	19	48
		10			5 364	32	54			5 814	31	54			6 264	30	54
	300	4	0.195	0.179	2 575	5	30	0.210	0.194	2 791	4	28	0.225	0.209	3 007	4	28
		6			3 862	11	41			4 186	11	41			4 510	10	40
		8			5 149	20	49			5 581	19	48			6 013	19	49
		10			6 437	32	55			6 977	31	55			7 517	30	55
	350	4	0.228	0.209	3 004	5	31	0.245	0.226	3 256	4	29	0.263	0.244	3 508	4	29
		6			4 506	11	41			4 884	11	42			5 262	10	41
		8			6 008	20	49			6 512	19	49			7 016	18	49
		10			7 510	31	55			8 140	30	55			8 770	29	55
	400	4	0.260	0.238	3 433	4	29	0.280	0.258	3 721	4	29	0.300	0.278	4 009	4	30
		6			5 149	11	42			5 581	10	41			6 013	10	41
		8			6 866	19	49			7 442	19	49			8 018	18	49
		10			8 582	31	56			9 302	30	55			10 022	29	55
	450	4	0.293	0.268	3 862	4	29	0.315	0.291	4 186	4	30	0.338	0.313	4 510	4	30
		6			5 793	10	41			6 279	10	42			6 765	10	42
		8			7 724	19	50			8 372	18	49			9 020	18	50
		10			9 655	30	56			10 465	29	56			11 275	28	55
	500	4	0.325	0.298	4 291	4	30	0.350	0.323	4 651	4	30	0.375	0.348	5 011	4	30
		6			6 437	10	42			6 977	10	42			7 517	10	42
		8			8 582	19	50			9 302	18	50			10 022	17	49
		10			10 728	29	56			11 628	28	56			12 528	27	55
550	4	0.358	0.328	5 149	4	30	0.385	0.355	5 116	4	31	0.413	0.383	5 512	4	31	
	6			7 724	10	42			7 674	10	43			8 268	9	41	
	8			10 299	18	50			10 233	17	49			11 025	17	50	
	10			12 874	29	56			12 791	28	56			13 781	27	56	
600	4	0.390	0.358	5 149	4	31	0.420	0.388	5 581	4	31	0.450	0.418	6 013	4	31	
	6			7 724	10	43			8 372	9	42			9 020	9	42	
	8			10 299	18	50			11 163	17	50			12 027	16	49	
	10			12 874	28	56			13 954	27	56			15 034	26	56	
650	4	0.423	0.387	5 579	4	31	0.455	0.420	6 047	4	31	0.488	0.452	6 515	4	32	
	6			8 368	9	42			9 070	9	42			9 772	9	42	
	8			11 157	17	50			12 093	17	50			13 029	16	50	
	10			13 946	27	56			15 116	26	56			16 286	25	55	
700	4	0.455	0.417	6 008	4	31	0.490	0.452	6 512	4	32	0.525	0.487	7 016	3	28	
	6			9 012	9	42			9 768	9	42			10 524	8	41	
	8			12 015	17	50			13 023	16	50			14 031	15	49	
	10			15 019	26	56			16 279	25	55			17 539	24	55	

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d_p – pressure drop [Pa]
L_{WA} – damper noise level [dB]

		height H [mm]															
		650						700					750				
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]
width B [mm]	750	4	0.488	0.447	6 437	4	32	0.525	0.485	6 977	4	32	0.563	0.522	7 517	3	28
		6			9 655	9	42			10 465	9	42			11 275	8	41
		8			12 874	16	50			13 954	16	50			15 034	15	49
		10			16 092	26	56			17 442	25	56			18 792	24	56
	800	4	0.520	0.477	6 866	4	32	0.560	0.517	7 442	3	26	0.600	0.557	8 018	3	29
		6			10 299	9	42			11 163	8	39			12 027	8	42
		8			13 732	16	50			14 884	15	47			16 036	14	49
		10			17 165	25	55			18 605	24	52			20 045	23	55
	850	4	0.553	0.507	7 295	3	28	0.595	0.549	7 907	3	29	0.638	0.592	8 519	3	29
		6			10 943	8	41			11 861	8	41			12 779	8	42
		8			14 590	15	49			15 814	15	50			17 038	14	49
		10			18 238	24	55			19 768	23	55			21 298	22	55
	900	4	0.585	0.536	7 724	3	28	0.630	0.581	8 372	3	29	0.675	0.626	9 020	3	29
		6			11 586	8	41			12 558	8	42			13 530	7	40
		8			15 448	15	49			16 744	14	49			18 040	13	48
		10			19 310	23	54			20 930	22	55			22 550	21	55
	1000	4	0.650	0.596	8 582	3	28	0.700	0.646	9 302	3	29	0.750	0.696	10 022	3	30
		6			12 874	7	39			13 954	7	40			15 034	7	41
		8			17 165	14	48			18 605	13	49			20 045	13	49
		10			21 456	22	54			23 256	21	55			25 056	20	54
1100	4	0.715	0.656	9 441	3	28	0.770	0.711	10 233	3	30	0.825	0.766	11 025	3	30	
	6			14 161	7	39			15 349	7	41			16 537	6	39	
	8			18 881	13	47			20 465	12	48			22 049	12	48	
	10			23 602	20	53			25 582	19	54			27 562	18	53	
1200	4	0.780	0.715	10 299	3	28	0.840	0.775	11 163	2	25	0.900	0.835	12 027	2	25	
	6			15 448	6	37			16 744	6	39			18 040	6	40	
	8			20 598	12	46			22 326	11	47			24 054	11	47	
	10			25 747	19	52			27 907	18	54			30 067	17	53	
1300	4	0.845	0.775	11 157	2	23	0.910	0.840	12 093	2	25	0.975	0.905	13 029	2	26	
	6			16 736	6	37			18 140	6	40			19 544	5	38	
	8			22 314	11	45			24 186	10	46			26 058	10	47	
	10			27 893	17	50			30 233	16	52			32 573	16	53	
1400	4	0.910	0.834	12 015	2	23	0.980	0.904	13 023	2	26	1.050	0.974	14 031	2	26	
	6			18 023	5	34			19 535	5	38			21 047	5	38	
	8			24 031	10	44			26 047	9	45			28 063	9	46	
	10			30 038	16	50			32 558	15	52			35 078	14	51	
1500	4	0.975	0.894	12 874	2	23	1.050	0.969	13 954	2	26	1.125	1.044	15 034	2	26	
	6			19 310	5	34			20 930	5	38			22 550	4	35	
	8			25 747	9	42			27 907	9	45			30 067	8	44	
	10			32 184	14	48			34 884	14	51			37 584	13	51	

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

B – nominal width [mm]
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S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		800					850					900				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.160	0.149	2 148	4	0.170	0.159	2 292	4	0.180	0.169	2 436	4	0.225	0.212
		6			3 223	10			3 439	10			3 655	10		
		8			4 297	19			4 585	18			4 873	18		
		10			5 371	30			5 731	29			6 091	28		
	250	4	0.200	0.187	2 686	4	0.213	0.199	2 866	4	0.225	0.212	3 046	4	0.270	0.254
		6			4 028	10			4 298	10			4 568	10		
		8			5 371	19			5 731	18			6 091	18		
		10			6 714	29			7 164	29			7 614	28		
	300	4	0.240	0.224	3 223	4	0.255	0.239	3 439	4	0.270	0.254	3 655	4	0.315	0.296
		6			4 834	10			5 158	10			5 482	10		
		8			6 445	18			6 877	18			7 309	17		
		10			8 057	29			8 597	28			9 137	27		
	350	4	0.280	0.261	3 760	4	0.298	0.279	4 012	4	0.315	0.296	4 264	4	0.360	0.338
		6			5 640	10			6 018	10			6 396	9		
		8			7 520	18			8 024	17			8 528	17		
		10			9 400	28			10 030	28			10 660	27		
	400	4	0.320	0.298	4 297	4	0.340	0.318	4 585	4	0.360	0.338	4 873	4	0.405	0.381
		6			6 445	10			6 877	9			7 309	9		
		8			8 594	18			9 170	17			9 746	17		
		10			10 742	28			11 462	27			12 182	26		
	450	4	0.360	0.336	4 834	4	0.383	0.358	5 158	4	0.405	0.381	5 482	4	0.425	0.398
		6			7 251	9			7 737	9			8 223	9		
		8			9 668	17			10 316	17			10 964	16		
		10			12 085	27			12 895	26			13 705	26		
	500	4	0.400	0.373	5 371	4	0.425	0.398	5 731	4	0.450	0.423	6 091	4	0.468	0.438
		6			8 057	9			8 597	9			9 137	9		
		8			10 742	17			11 462	16			12 182	16		
		10			13 428	26			14 328	26			15 228	25		
	550	4	0.440	0.410	5 908	4	0.468	0.438	6 304	4	0.495	0.465	6 700	3	0.510	0.478
		6			8 862	9			9 456	9			10 050	8		
		8			11 817	16			12 609	16			13 401	15		
		10			14 771	26			15 761	25			16 751	24		
	600	4	0.480	0.448	6 445	4	0.510	0.478	6 877	3	0.540	0.508	7 309	3	0.553	0.517
		6			9 668	9			10 316	8			10 964	8		
		8			12 891	16			13 755	15			14 619	15		
		10			16 114	25			17 194	24			18 274	24		
	650	4	0.520	0.485	6 983	3	0.553	0.517	7 451	3	0.585	0.550	7 919	3	0.595	0.557
		6			10 474	8			11 176	8			11 878	8		
		8			13 965	15			14 901	15			15 837	14		
		10			17 456	24			18 626	24			19 796	23		
	700	4	0.560	0.522	7 520	3	0.595	0.557	8 024	3	0.630	0.592	8 528	3		
		6			11 280	8			12 036	8			12 792	8		
		8			15 039	15			16 047	14			17 055	14		
		10			18 799	24			20 059	23			21 319	22		

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		800					850					900				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	0.600	0.560	8 057	3	29	0.638	0.597	8 597	3	29	0.675	0.635	9 137	3	29
				12 085	8	42			12 895	8	42			13 705	7	40
				16 114	14	49			17 194	14	49			18 274	14	49
				20 142	23	55			21 492	22	55			22 842	21	55
	800	0.640	0.597	8 594	3	29	0.680	0.637	9 170	3	29	0.720	0.677	9 746	3	30
				12 891	8	42			13 755	7	40			14 619	7	41
				17 188	14	49			18 340	13	48			19 492	13	49
				21 485	22	55			22 925	21	55			24 365	21	55
	850	0.680	0.634	9 131	3	29	0.723	0.677	9 743	3	30	0.765	0.719	10 355	3	30
				13 697	7	40			14 615	7	41			15 533	7	41
				18 262	13	48			19 486	13	49			20 710	13	49
				22 828	21	55			24 358	21	55			25 888	20	55
	900	0.720	0.671	9 668	3	30	0.765	0.716	10 316	3	30	0.810	0.761	10 964	3	30
				14 502	7	41			15 474	7	41			16 446	7	41
				19 336	13	49			20 632	13	49			21 928	12	48
				24 170	21	55			25 790	20	55			27 410	19	54
	1000	0.800	0.746	10 742	3	30	0.850	0.796	11 462	3	30	0.900	0.846	12 182	2	25
				16 114	7	41			17 194	6	39			18 274	6	40
				21 485	12	48			22 925	12	48			24 365	11	48
				26 856	19	54			28 656	18	54			30 456	18	54
	1100	0.880	0.821	11 817	2	25	0.935	0.876	12 609	2	25	0.990	0.931	13 401	2	26
				17 725	6	39			18 913	6	40			20 101	6	40
				23 633	11	47			25 217	11	48			26 801	10	47
				29 542	18	54			31 522	17	53			33 502	16	53
	1200	0.960	0.895	12 891	2	26	1.020	0.955	13 755	2	26	1.080	1.015	14 619	2	26
				19 336	6	40			20 632	5	38			21 928	5	38
				25 782	10	47			27 510	10	47			29 238	9	46
				32 227	16	53			34 387	16	53			36 547	15	52
	1300	1.040	0.970	13 965	2	26	1.105	1.035	14 901	2	26	1.170	1.100	15 837	2	26
				20 948	5	38			22 352	5	38			23 756	5	38
				27 930	9	45			29 802	9	46			31 674	9	46
				34 913	15	52			37 253	14	52			39 593	14	52
	1400	1.120	1.044	15 039	2	26	1.190	1.114	16 047	2	27	1.260	1.184	17 055	2	27
				22 559	5	38			24 071	4	36			25 583	4	36
				30 079	9	46			32 095	8	45			34 111	8	45
				37 598	14	52			40 118	13	51			42 638	13	51
	1500	1.200	1.119	16 114	2	27	1.275	1.194	17 194	1	18	1.350	1.269	18 274	1	18
				24 170	4	36			25 790	4	36			27 410	4	36
				32 227	8	45			34 387	7	43			36 547	7	43
				40 284	12	50			42 984	12	50			45 684	11	49

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1000					1100					1200				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	0.200	0.189	2 724	4	28	0.220	0.209	3 012	4	28	0.240	0.229	3 300	4	29
				4 087	9	38			4 519	9	39			4 951	9	39
				5 449	17	47			6 025	16	46			6 601	16	47
				6 811	27	53			7 531	26	53			8 251	25	53
	250	0.250	0.237	3 406	4	29	0.275	0.262	3 766	4	29	0.300	0.287	4 126	4	30
				5 108	9	39			5 648	9	40			6 188	9	40
				6 811	17	48			7 531	16	47			8 251	16	48
				8 514	27	54			9 414	25	53			10 314	25	54
	300	0.300	0.284	4 087	4	30	0.330	0.314	4 519	4	30	0.360	0.344	4 951	3	27
				6 130	9	40			6 778	9	41			7 426	8	39
				8 173	17	48			9 037	16	48			9 901	15	48
				10 217	26	54			11 297	25	54			12 377	24	54
	350	0.350	0.331	4 768	4	30	0.385	0.366	5 272	3	27	0.420	0.401	5 776	3	27
				7 152	9	41			7 908	8	40			8 664	8	40
				9 536	16	48			10 544	15	48			11 552	15	48
				11 920	26	55			13 180	24	54			14 440	24	54
	400	0.400	0.378	5 449	4	31	0.440	0.418	6 025	3	28	0.480	0.458	6 601	3	28
				8 173	9	41			9 037	8	40			9 901	8	41
				10 898	16	49			12 050	15	48			13 202	14	48
				13 622	25	55			15 062	24	55			16 502	23	54
	450	0.450	0.426	6 130	3	28	0.495	0.471	6 778	3	28	0.540	0.516	7 426	3	28
				9 195	8	40			10 167	8	41			11 139	8	41
				12 260	15	49			13 556	15	49			14 852	14	49
				15 325	24	55			16 945	23	55			18 565	22	54
	500	0.500	0.473	6 811	3	28	0.550	0.523	7 531	3	28	0.600	0.573	8 251	3	29
				10 217	8	41			11 297	8	41			12 377	7	40
				13 622	15	49			15 062	14	49			16 502	14	49
				17 028	24	55			18 828	23	55			20 628	22	55
	550	0.550	0.520	7 492	3	28	0.605	0.575	8 284	3	29	0.660	0.630	9 076	3	29
				11 238	8	41			12 426	8	42			13 614	7	40
				14 985	15	49			16 569	14	49			18 153	13	48
				18 731	23	55			20 711	22	55			22 691	21	55
	600	0.600	0.568	8 173	3	29	0.660	0.628	9 037	3	29	0.720	0.688	9 901	3	30
				12 260	8	42			13 556	7	40			14 852	7	41
				16 347	14	49			18 075	13	48			19 803	13	49
				20 434	22	55			22 594	21	55			24 754	20	54
	650	0.650	0.615	8 855	3	29	0.715	0.680	9 791	3	30	0.780	0.745	10 727	3	30
				13 282	7	40			14 686	7	41			16 090	7	41
				17 709	14	49			19 581	13	49			21 453	12	48
				22 136	22	55			24 476	21	55			26 816	20	55
	700	0.700	0.662	9 536	3	30	0.770	0.732	10 544	3	30	0.840	0.802	11 552	3	30
				14 304	7	41			15 816	7	41			17 328	7	41
				19 071	13	49			21 087	13	49			23 103	12	48
				23 839	21	55			26 359	20	55			28 879	19	54

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

B – nominal width [mm]
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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]																	
			1000						1100					1200						
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]		
width B [mm]	750	4	0.750	0.710	10 217	3	30	0.825	0.785	11 297	3	30	0.900	0.860	12 377	3	31			
		6			15 325	7	41			16 945	7	41			18 565	6	40			
		8			20 434	13	49			22 594	12	48			24 754	12	49			
		10			25 542	20	55			28 242	19	54			30 942	18	54			
	800	4	0.800	0.757	10 898	3	30	0.880	0.837	12 050	3	31	0.960	0.917	13 202	2	26			
		6			16 347	7	41			18 075	6	40			19 803	6	40			
		8			21 796	12	48			24 100	12	49			26 404	11	48			
		10			27 245	20	55			30 125	19	55			33 005	18	54			
	850	4	0.850	0.804	11 579	3	30	0.935	0.889	12 803	2	26	1.020	0.974	14 027	2	26			
		6			17 369	6	39			19 205	6	40			21 041	6	40			
		8			23 158	12	48			25 606	11	48			28 054	11	48			
		10			28 948	19	54			32 008	18	54			35 068	17	54			
	900	4	0.900	0.851	12 260	2	25	0.990	0.941	13 556	2	26	1.080	1.031	14 852	2	26			
		6			18 390	6	40			20 334	6	40			22 278	6	40			
		8			24 520	11	48			27 112	11	48			29 704	10	47			
		10			30 650	18	54			33 890	17	54			37 130	16	53			
	1000	4	1.000	0.946	13 622	2	26	1.100	1.046	15 062	2	26	1.200	1.146	16 502	2	27			
		6			20 434	6	40			22 594	5	38			24 754	5	39			
		8			27 245	11	48			30 125	10	47			33 005	9	46			
		10			34 056	17	54			37 656	16	53			41 256	15	53			
	1100	4	1.100	1.041	14 985	2	26	1.210	1.151	16 569	2	27	1.320	1.261	18 153	2	27			
		6			22 477	5	38			24 853	5	39			27 229	5	39			
		8			29 969	10	47			33 137	9	46			36 305	9	47			
		10			37 462	15	52			41 422	14	52			45 382	14	52			
	1200	4	1.200	1.135	16 347	2	27	1.320	1.255	18 075	2	27	1.440	1.375	19 803	2	27			
		6			24 520	5	39			27 112	4	36			29 704	4	36			
		8			32 694	9	46			36 150	8	45			39 606	8	45			
		10			40 867	14	52			45 187	13	51			49 507	13	52			
1300	4	1.300	1.230	17 709	2	27	1.430	1.360	19 581	2	27									
	6			26 564	4	36			29 372	4	36									
	8			35 418	8	45			39 162	8	45									
	10			44 273	13	51			48 953	12	51									
1400	4	1.400	1.324	19 071	1	18														
	6			28 607	4	36														
	8			38 143	7	44														
	10			47 678	12	51														
1500	4	1.500	1.419	20 434	1	19														
	6			30 650	4	37														
	8			40 867	7	44														
	10			51 084	11	50														

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers **for multi-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1300					1400					1500				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.260	0.249	3 588	3	0.280	0.269	3 876	3	26	0.300	0.289	4 164	3	26
		6			5 383	8			5 815	8	38			6 247	8	39
		8			7 177	15			7 753	15	47			8 329	14	46
		10			8 971	24			9 691	23	52			10 411	23	52
	250	4	0.325	0.312	4 486	3	0.350	0.337	4 846	3	27	0.375	0.362	4 164	3	27
		6			6 728	8			7 268	8	39			6 247	8	40
		8			8 971	15			9 691	14	47			8 329	14	47
		10			11 214	24			12 114	23	53			10 411	22	53
	300	4	0.390	0.374	5 383	3	0.420	0.404	5 815	3	27	0.450	0.434	6 247	3	28
		6			8 074	8			8 722	8	40			9 370	8	40
		8			10 765	15			11 629	14	47			12 493	14	48
		10			13 457	23			14 537	22	53			15 617	22	54
	350	4	0.455	0.436	6 280	3	0.490	0.471	6 784	3	28	0.525	0.506	7 288	3	28
		6			9 420	8			10 176	8	41			10 932	7	39
		8			12 560	14			13 568	14	48			14 576	13	47
		10			15 700	23			16 960	22	54			18 220	21	54
	400	4	0.520	0.498	7 177	3	0.560	0.538	7 753	3	29	0.600	0.578	8 329	3	29
		6			10 765	8			11 629	7	40			12 493	7	40
		8			14 354	14			15 506	13	48			16 658	13	48
		10			17 942	22			19 382	21	54			20 822	21	54
	450	4	0.585	0.561	8 074	3	0.630	0.606	8 722	3	29	0.675	0.651	9 370	3	29
		6			12 111	7			13 083	7	40			14 055	7	40
		8			16 148	14			17 444	13	48			18 740	13	49
		10			20 185	21			21 805	21	54			23 425	20	54
	500	4	0.650	0.623	8 971	3	0.700	0.673	9 691	3	30	0.750	0.723	10 411	3	30
		6			13 457	7			14 537	7	41			15 617	7	41
		8			17 942	13			19 382	13	49			20 822	12	48
		10			22 428	21			24 228	20	54			26 028	19	54
	550	4	0.715	0.685	9 868	3	0.770	0.740	10 660	3	30	0.825	0.795	11 452	3	30
		6			14 802	7			15 990	7	41			17 178	6	39
		8			19 737	13			21 321	12	48			22 905	12	48
		10			24 671	20			26 651	19	54			28 631	19	54
	600	4	0.780	0.748	10 765	3	0.840	0.808	11 629	3	30	0.900	0.868	12 493	2	25
		6			16 148	7			17 444	6	39			18 740	6	40
		8			21 531	12			23 259	12	48			24 987	11	48
		10			26 914	20			29 074	19	54			31 234	18	54
	650	4	0.845	0.810	11 663	3	0.910	0.875	12 599	2	25	0.975	0.940	13 535	2	26
		6			17 494	6			18 898	6	40			20 302	6	40
		8			23 325	12			25 197	11	48			27 069	11	48
		10			29 156	19			31 496	18	54			33 836	18	54
	700	4	0.910	0.872	12 560	2	0.980	0.942	13 568	2	26	1.050	1.012	14 576	2	26
		6			18 840	6			20 352	6	40			21 864	6	40
		8			25 119	11			27 135	11	48			29 151	11	48
		10			31 399	18			33 919	17	54			36 439	17	54

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1300					1400					1500				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	4	0.975	0.935	13 457	2	1.050	1.010	14 537	2	26	1.125	1.085	15 617	2	26
		6			20 185	6			21 805	6				23 425	6	
		8			26 914	11			29 074	11				31 234	10	
		10			33 642	18			36 342	17				39 042	16	
	800	4	1.040	0.997	14 354	2	1.120	1.077	15 506	2	26	1.200	1.157	16 658	2	27
		6			21 531	6			23 259	6				24 987	5	
		8			28 708	11			31 012	10				33 316	10	
		10			35 885	17			38 765	16				41 645	16	
	850	4	1.105	1.059	15 251	2	1.190	1.144	16 475	2	27	1.275	1.229	17 699	2	27
		6			22 877	6			24 713	5				26 549	5	
		8			30 502	10			32 950	10				35 398	9	
		10			38 128	16			41 188	16				44 248	15	
	900	4	1.170	1.121	16 148	2	1.260	1.211	17 444	2	27	1.350	1.301	18 740	2	27
		6			24 222	5			26 166	5				28 110	5	
		8			32 296	10			34 888	9				37 480	9	
		10			40 370	16			43 610	15				46 850	14	
	1000	4	1.300	1.246	17 942	2	1.400	1.346	19 382	2	27	1.500	1.446	20 822	2	28
		6			26 914	5			29 074	5				31 234	4	
		8			35 885	9			38 765	9				41 645	8	
		10			44 856	14			48 456	14				52 056	13	
	1100	4	1.430	1.371	19 737	2										
		6			29 605	4										
		8			39 473	8										
		10			49 342	13										

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.7 | Estimated weight of the 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					

4.8 | Accessories

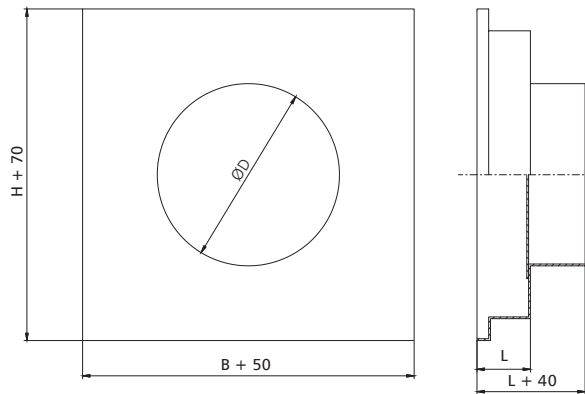
4.8.1 | mcr KRP connection stub

mcr KRP connection stubs are used to connect a circular ventilation duct to a rectangular damper. The connection is a „bare end“ pipe. The diameter of the stub pipe is 2 mm smaller than the diameter of the ventilation duct.

NOTE: due to the asymmetrical position of the fire blade in the damper casing, the connection stubs are of different lengths L, depending on the side of the damper on which they are to be used. Stubs are supplied for both sides of the damper.

Dimensions:

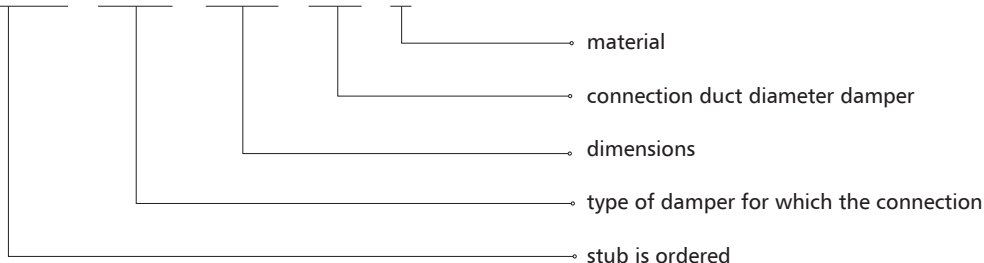
- » BxH - damper dimensions [mm]
- » ØD - diameter of the connection duct [mm]
- » L - length [mm] calculated from the formula: H/2-50 for one connection side and H/2-150 for the other connection side



dimensions in [mm]

Marking:

mcr KRP / FID S / B x H / DIA / X

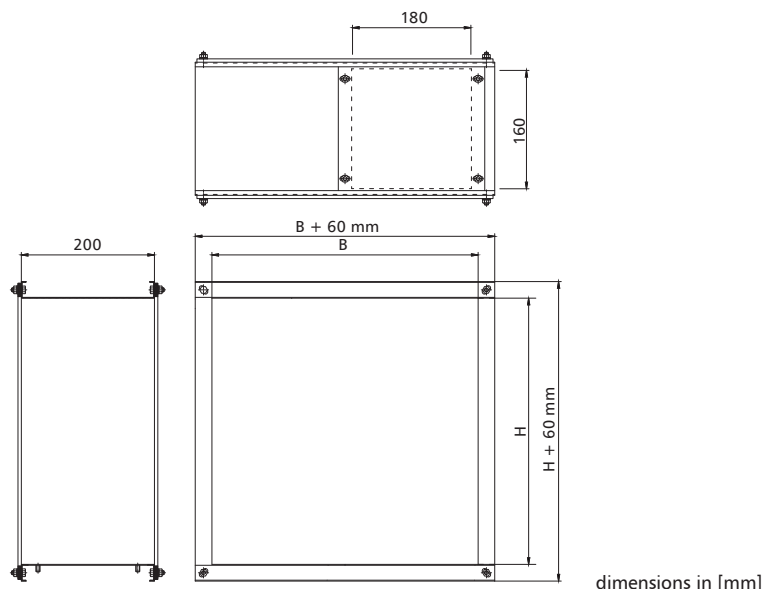


X – material
 [no symbol] – galvanized steel, Zn 275 g/m² coating
 KN – stainless steel
 KK – 1.4404 acid-proof steel

> mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

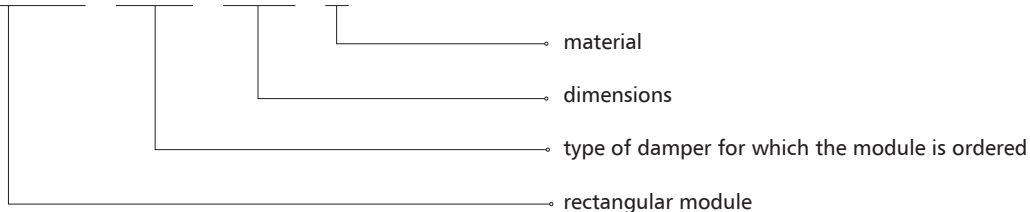
4.8.2 | Casing module with KRW-type inspection access

The casing modules with a KRW-type inspection access are made of sheet metal and equipped with connection flanges. The casing features an inspection access opening with a cover. The module enables to access the damper blade or a drive train quickly without having to dismantle the damper or the duct on which it is installed.



Marking:

mcr KRW P / FID S / B x H / X

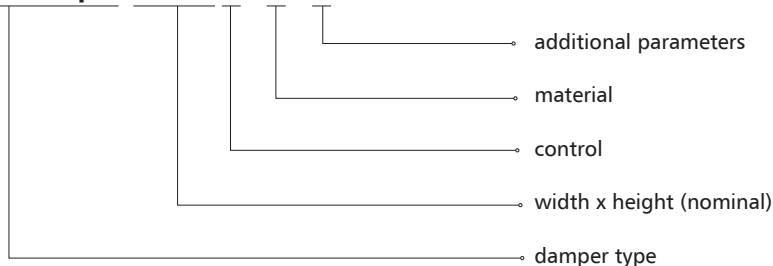


X – material
 [no symbol] – galvanized steel, Zn 275 g/m² coating
 KN – stainless steel
 KK – 1.4404 acid-proof steel

mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.9 | Marking

mcr FID S/V p/P B x H 1 / 2 / 3



1 - control:

» trigger and control mechanism, axial actuator

- BE24 – actuator without a return spring, U = 24 V AC/DC
- BEN24 – actuator without a return spring, U = 24 V AC/DC
- BEE24 – actuator without a return spring, U = 24 V AC/DC
- BE230 – actuator without a return spring, U = 230 V AC
- BEN230 – actuator without a return spring, U = 230 V AC
- BEE230 – actuator without a return spring, U = 230 V AC
- MLE24 – actuator without a return spring, U = 24 V AC/DC
- MLE230 – actuator without a return spring, U = 230 V AC
- ME24 – actuator without a return spring, U = 24 V AC/DC
- ME230 – actuator without a return spring, U = 230 V AC

2 - material

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

KN – stainless steel

KK – 1.4404 acid-proof steel

KKM – special design of the damper – damper and its elements made of stainless steel, additionally sleeves and their painted elements

3 - additional parameters

» Control mechanism position

[no symbol] – perpendicular to the damper rotation axis

WOK – along the damper rotation axis

» Damper axis of rotation

[no symbol] – horizontal axis of rotation

PP_D – vertical axis of rotation – mechanism at the bottom of the damper

PP_G – vertical axis of rotation - mechanism at the top of the damper

» Design standard

[no symbol] – right damper

KL – left damper

KO – inverted damper

» Damper casing

[no symbol] – standard casing length

400 – casing with a length of 400 mm

BU – earth pin

NOTE: separate additional parameters entered with the “/” sign

example marking:

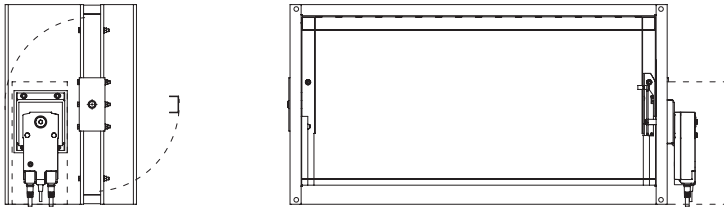
mcr FID S/V p/P 400 x 400 BEN24

Smoke control damper for fire ventilation systems with a 24 V actuator with limit switches.

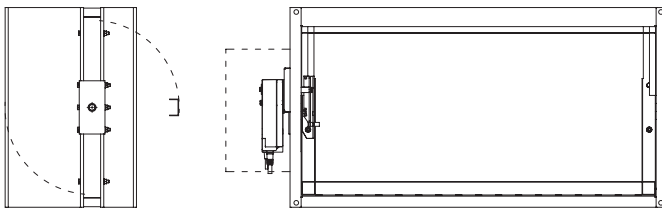
mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.9.1 | Design standard

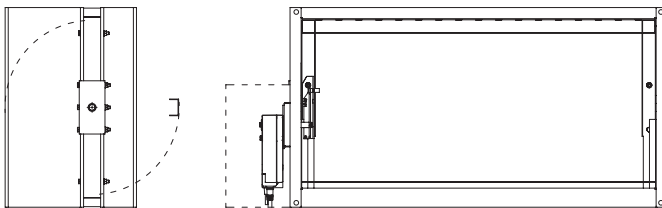
» right damper - standard



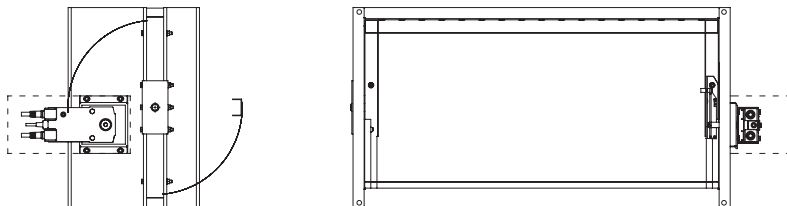
» inverted damper - (ducts facing downwards)



» left damper



» along the damper axis



Chapter 19 - power supply and control (p. 350) contains the following information:
- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.

mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems



downloadable models
on the website
under the designer zone tab



HYGIENIC CERTIFICATE



» EIS120

- » Fire resistance class: EI60 ($v_e h_o i \leftrightarrow o$)S, EI90 ($v_e i \leftrightarrow o$)S, EI120 ($v_e o \rightarrow i$)S, EI120 ($v_e h_o i \leftrightarrow o$)S, EI180 ($h_o i \leftrightarrow o$)S.
- » Certificate of constancy of performance 2434-CPR-0009.
- » Dampers certified for compliance with EN 15650.
- » Dampers qualified under EN 13501-3 and tested under EN 1366-2.
- » Cut-off dampers with a fire resistance rating independent of the airflow direction and installation side.
- » Lower acoustic noise and hydraulic resistance in the system achieved through a reduction of damper blade thickness.
- » Certified installation of dampers in close proximity.
- » Certified installation of dampers at a distance from construction partitions.
- » Certified damper dry installation in mineral wool.
- » Pressure difference range: 2000 Pa.

5.1 | Application

mcr FID PRO low-resistance cut-off dampers are designed for installation in comfort ventilation systems at installation passages through vertical and horizontal construction partitions. They are installed for example in systems with higher acoustic parameters requirements. During a fire, they preserve the fire resistance rating of the construction partition that the ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and fire gasses 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. Admissible flow velocity in the connected duct is 12 m/s for dampers with actuators and 10 m/s for fusible link dampers.

The dampers cannot be operated in systems exposed to dust, unless included in a special, individually developed service and technical inspections programme.

In the version designed for explosion hazard zones (EX version), the dampers can be operated in gas explosion hazard zone 1 inside and outside ventilation ducts and in dust explosion hazard zone 21 outside these ducts. The dampers have been certified in compliance with the ATEX directive 94/9/EC and meet the requirements of group II category 2G and -/2D:

- » II 2G Ex h IIC T6 Gb
- » II -/2D Ex h IIIC T72° -/Db

Ambient temperature: T_a : -20°... +50°C

5.2 | Design



mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

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 galvanized metal sheets. A special casing is used for chemically aggressive environments, which features steel elements made of 1.4404 acid-proof steel sheet, while other elements are impregnated. In the middle part, where the damper blade is placed, the casing is perforated along a width that depends on the blade diameter and thickness. On the damper circumference, around the closed damper blade, there is an intumescent gasket.

The blade is covered on both sides with metal sheets to ensure mechanical reinforcement and reduction of friction resistance. A ventilation gasket is installed on the perimeter of the blade, ensuring tightness of the dampers at ambient temperature. Both ends of the casing are terminated with a nipple (standard) or muff connection. Nipple dampers are made without external rubber perimeter gaskets as a standard. Upon the customer's request, dampers may be supplied with a perimeter lip gasket.

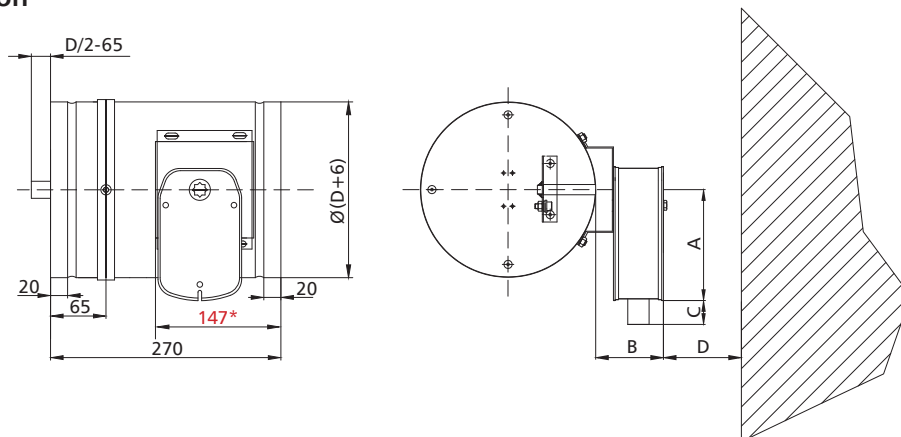
5.3 | Versions

5.3.1 | Damper closing and opening with an actuator

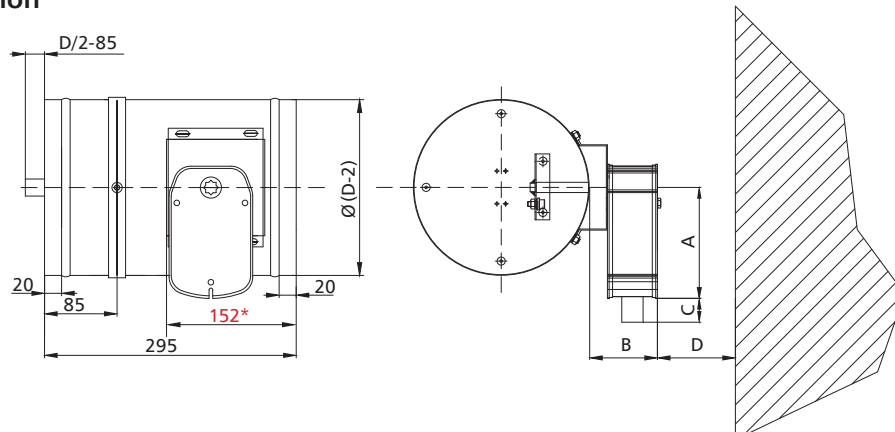
During normal operation, the fire damper blade remains open. In case of fire, the blade closes automatically or remotely when the power supply is cut off.

mcr FID PRO dampers are equipped with a trigger control mechanism in the form of BFL, MLF, EXBF, QT.Ex or BF-TL series axial actuator with a return spring, supplied with 24 V AC/DC or 230 V AC, with a 72°C thermoelectric trigger (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, a mechanical position indicator is placed on the actuator. Thermoelectric triggers are equipped with a test switch. Dampers with analog actuators close as a result of the thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when power supply voltage is applied to the actuator terminals. Dampers with those actuators may be opened manually using a key.

» muff version



» nipple version

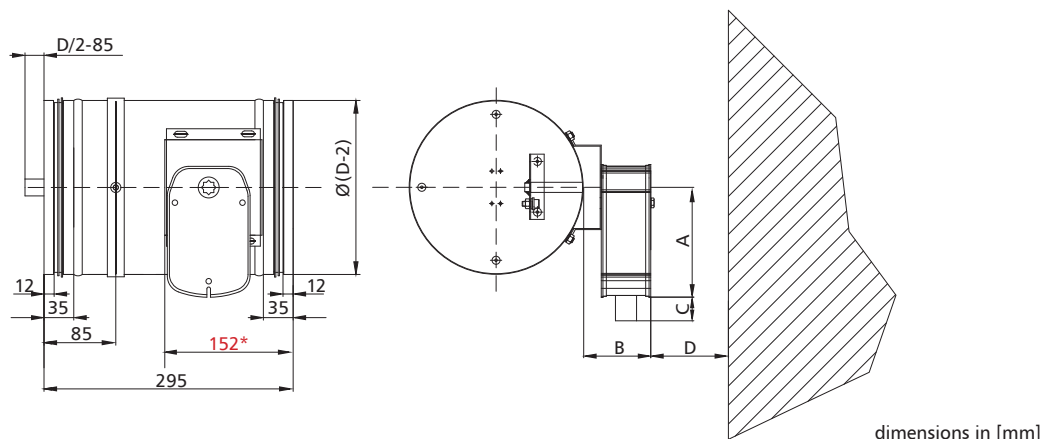


dimensions in [mm]

*embedding border

mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

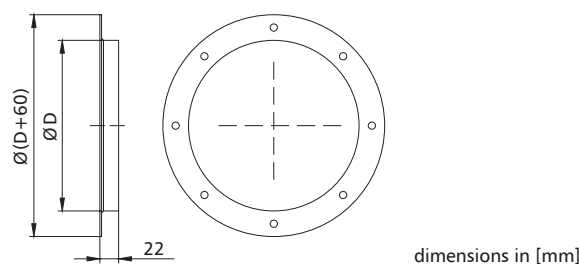
» version with UKW perimeter gasket



mechanism	A	B	C	D
BFL, MLF	138	74	30	75
BF24TL-ST	198	85	10	75
EXBF	225	190	55	100
QT.Ex	255	115	30	75

*embedding border

» connection flange



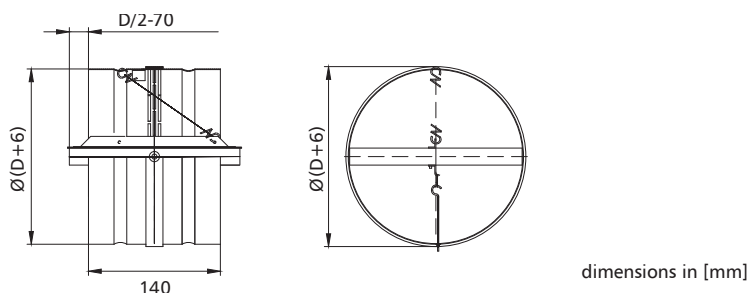
Spacing and number of openings according to EN 12220 (dimensions of circular flanges for general ventilation).

5.3.2 | **mcr FID PRO – cut-off fire damper for ventilation ducts with a spring drive and thermal trigger**

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

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 74°C thermal trigger (optionally 95°C) is installed outside the damper mechanism, on the damper blade itself. Once the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. It is possible to equip the damper with WK1 or WK2 limit switches used to signal the blade position.

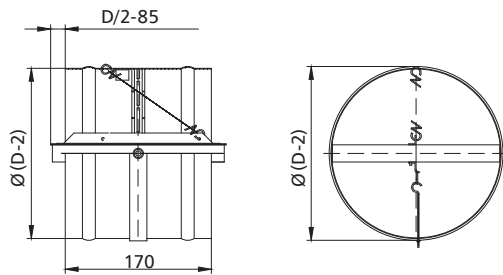
» muff version



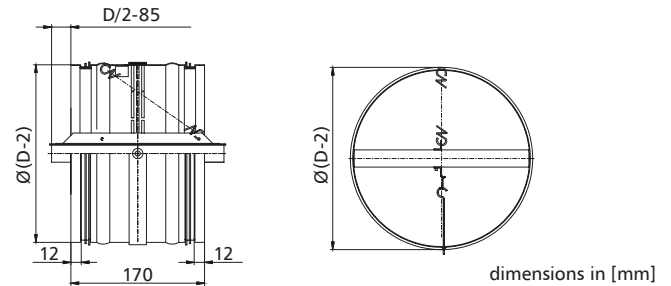
insert symmetrically against the wall axis

mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

» nipple version

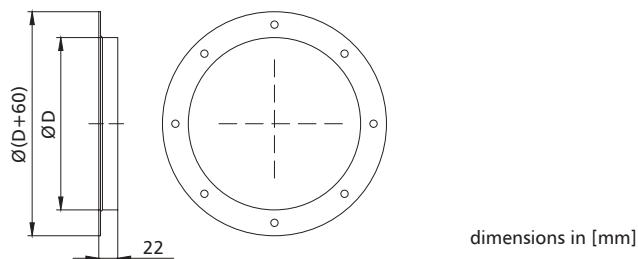


» version with an UKW perimeter gasket



insert symmetrically against the wall axis

» connection flange



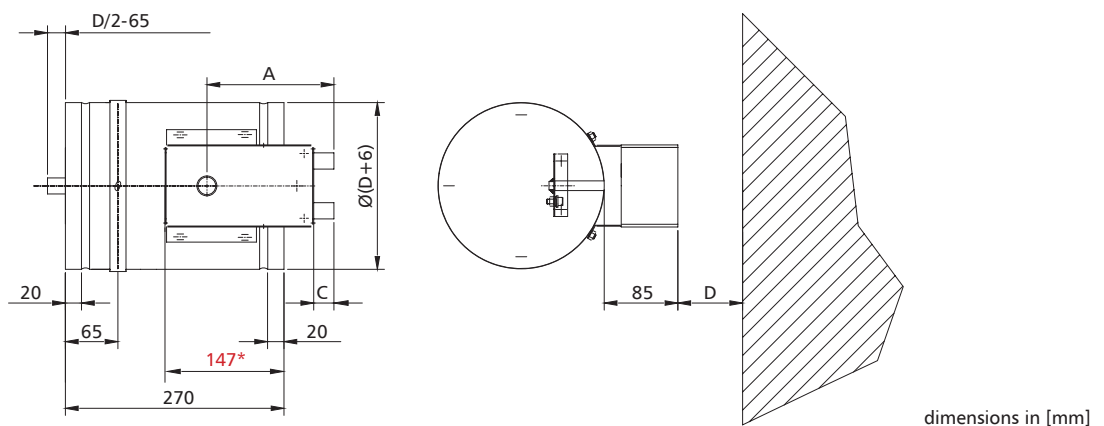
Spacing and number of openings according to EN 12220 (dimensions of circular flanges for general ventilation).

5.3.3 | mcr FID PRO – 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 fire damper blade remains open. In case of fire, the blade closes automatically or through the fire automation system in case of a damper with an electromagnetic trigger.

mcr FID PRO dampers are equipped with a KW1 trigger control mechanism with a drive spring and a cam-lever system. A 74°C thermal trigger (optionally 95°C) is integrated into the damper mechanism. Once the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. A mechanical blade position indicator is placed on the KW1 mechanism. 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. The mechanism features a test and blade button-release functions. Blade re-opening is activated manually using a key. It is not required to dismantle the system to replace the thermal trigger. The KW1 mechanism may be replaced with an electric actuator.

» muff version



*embedding border

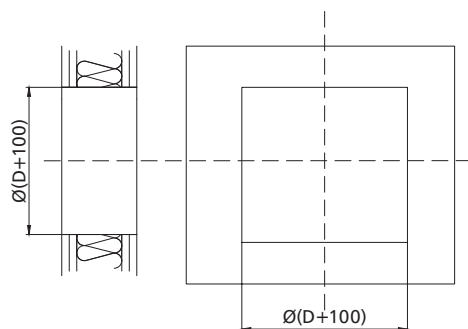
mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

5.5 | Installation

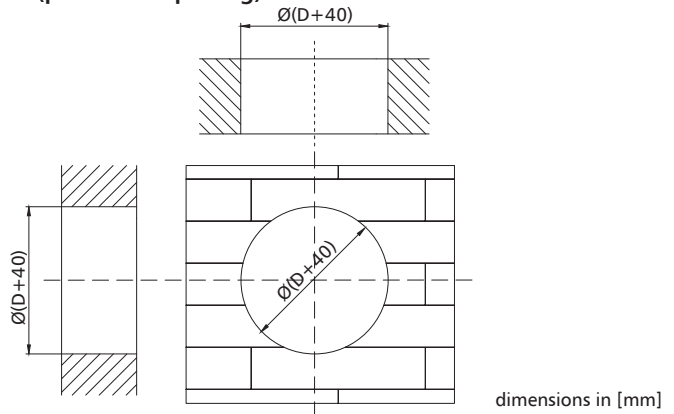
mcr FID PRO round dampers are rated EI120(v_e h_o $i \leftrightarrow o$)S and EI90S(v_e h_o $i \leftrightarrow o$)S if installed in concrete partitions, partitions made of full bricks or aerated concrete blocks with a thickness of at least or 125 mm, with mortar or mineral wool, or 120 mm with mortar for EIS120 class, in light walls/shafts made of gypsum boards with a min. thickness of 125 mm and concrete floors with a min. thickness of 150 mm. Additionally, mcr FID PRO dampers with diameters from 201 to 315 mm installed in concrete floor slabs are EI180(h_o $i \leftrightarrow o$)S rated. Dampers may also be installed away from walls/shafts, provided that the ventilation duct section between the damper and the wall meets the criteria of EIS120 fire resistance rating. The dampers can also be installed in flexible walls of the RIGIPS 3.50.11 system and have been classified as EI90 S with permitted dry installation for dampers D100 to D200, and EI120 S with permitted wet and dry installation for D100 dampers.

5.5.1 | Preparation of installation openings

» in light gypsum board walls – dry installation (preferred opening)



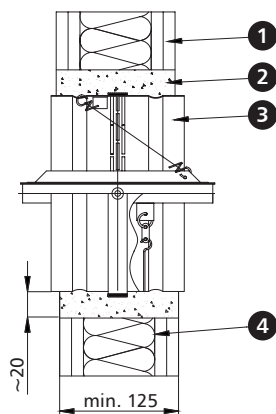
» in rigid walls and floor slabs - wet installation (preferred opening)



5.5.2 | Sample installation in gypsum board light walls

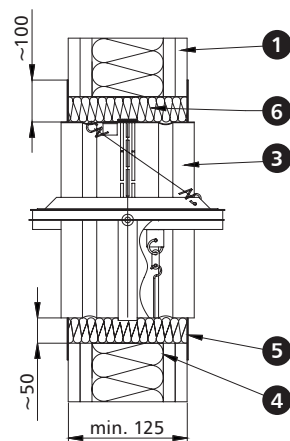
» mcr FID PRO damper with an RST mechanism

» WET installation



1. light wall
2. assembly mortar*
3. mcr FID PRO fire damper

» DRY installation



4. structural profile
5. elastic fire protection grout/mass*
6. mineral wool

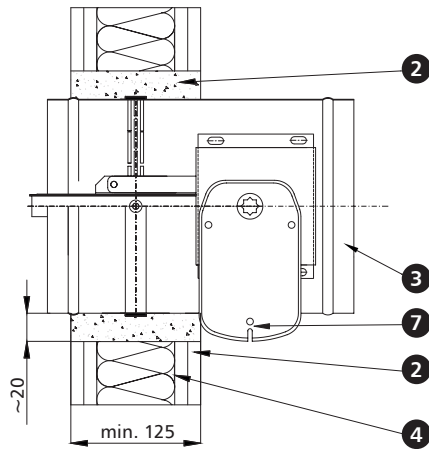
* Recommended damper installation in a dry system is based on wool with a min. density of 150 kg/m³ and a fire resistance class A1, as well as on securing the contact portion between the damper and the wall and the wall itself with the elastic fire protection mass mcr Polyac Elastic with a thickness of 1 mm, as per the drawing above. Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

NOTE: If the damper is installed in a wall with a thickness of less than 125 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.

mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

» mcr FID PRO damper with a BFL, MLF, KW1 mechanism

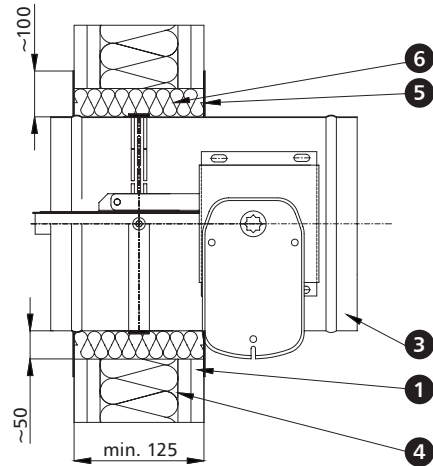
» WET installation



- 1. light wall
- 2. assembly mortar*
- 3. mcr FID PRO fire damper

- 4. structural profile
- 5. elastic fire protection grout/mass*

» DRY installation



- 6. mineral wool*
- 7. trigger control mechanism

dimensions in [mm]

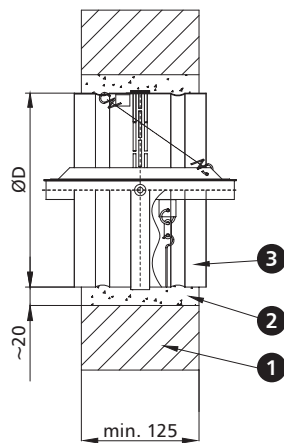
* Recommended damper installation in a dry system is based on wool with a min. density of 150 kg/m³ and a fire resistance class A1, as well as on securing the contact portion between the damper and the wall and the wall itself with the elastic fire protection mass mcr Polyloc Elastic with a thickness of 1 mm, as per the drawing above. Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

NOTE: If the damper is installed in a wall with a thickness of less than 125 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.

5.5.3 | Sample installation in concrete and brick walls

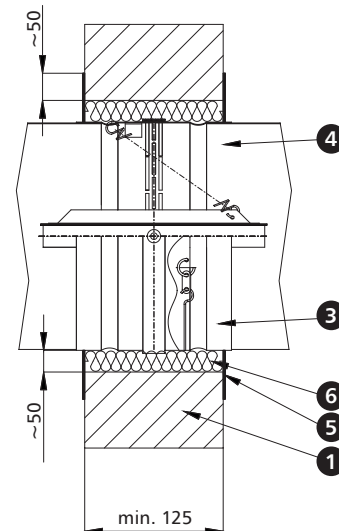
» mcr FID PRO damper with an RST mechanism

» WET installation



- 1. rigid wall
- 2. assembly mortar*
- 3. mcr FID PRO fire damper

» DRY installation



- 4. ventilation duct
- 5. elastic fire protection grout/mass*
- 6. mineral wool*

dimensions in [mm]

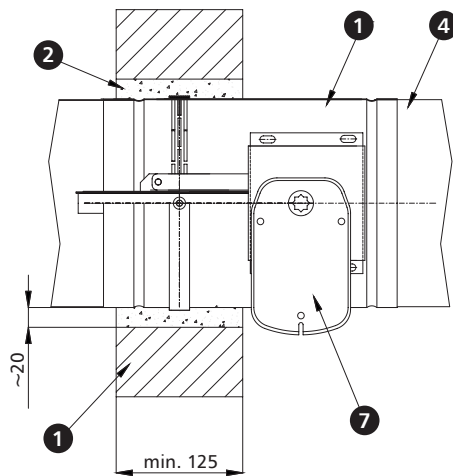
* Recommended damper installation in a dry system is based on wool with a min. density of 150 kg/m³ and a fire resistance class A1, as well as on securing the contact portion between the damper and the wall and the wall itself with the elastic fire protection mass mcr Polyloc Elastic with a thickness of 1 mm, as per the drawing above. Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

NOTE: If the damper is installed in a wall with a thickness of less than 125 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.

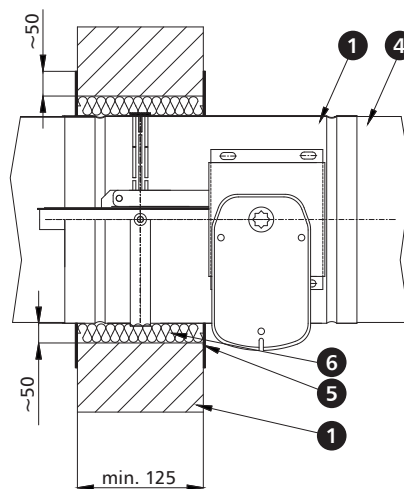
mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

» mcr FID PRO damper with a BFL, MLF, KW1 mechanism

» WET installation



» DRY installation



dimensions in [mm]

1. rigid wall
2. assembly mortar*
3. mcr FID PRO fire damper

4. ventilation duct
5. elastic fire protection grout/mass*

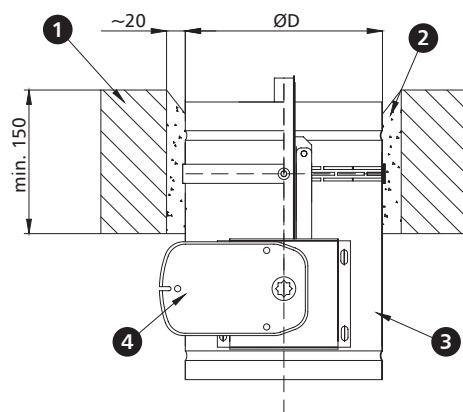
6. mineral wool*
7. trigger control mechanism

* Recommended damper installation in a dry system is based on wool with a min. density of 150 kg/m³ and a fire resistance class A1, as well as on securing the contact portion between the damper and the wall and the wall itself with the elastic fire protection mass mcr Polylac Elastic with a thickness of 1 mm, as per the drawing above. Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

NOTE: If the damper is installed in a wall with a thickness of less than 125 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.

5.5.4 | Sample installation in floor slabs

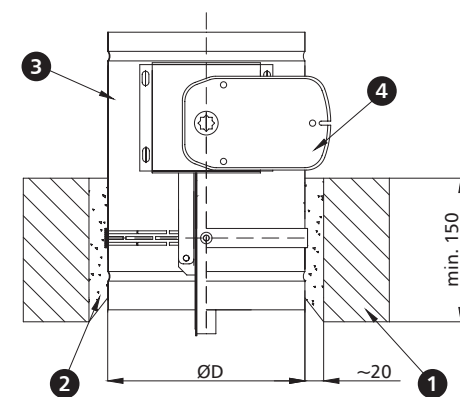
» mcr FID PRO damper
» with a BFL, MLF, KW1 mechanism



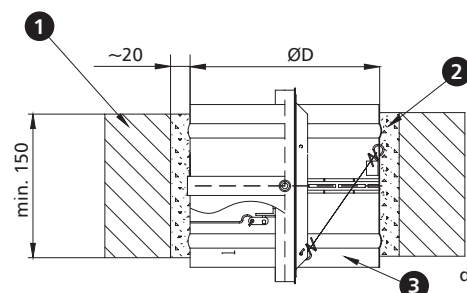
1. floor slab
2. assembly mortar*
3. mcr FID PRO fire damper
4. trigger control mechanism

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the method applied

» mcr FID PRO damper
» with a BFL, MLF, KW1 mechanism



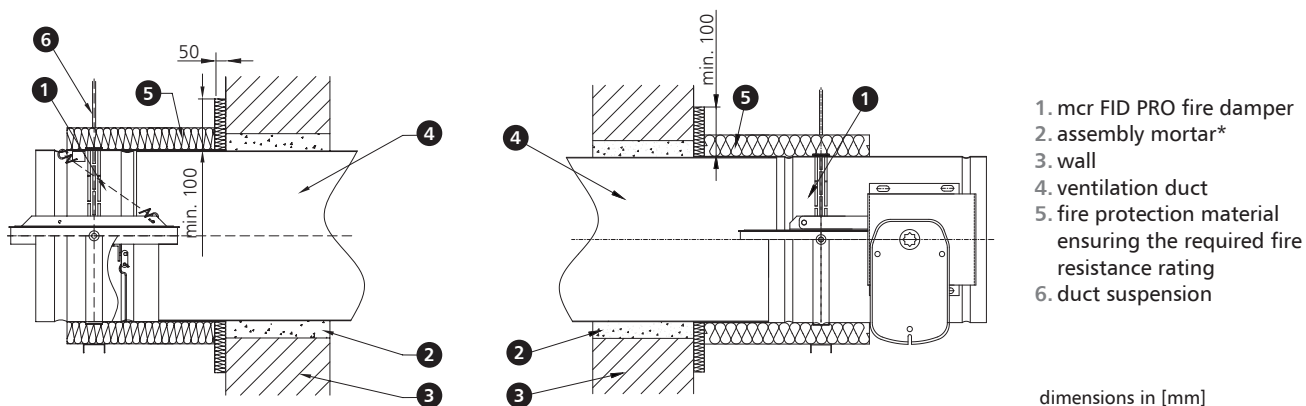
» mcr FID PRO damper with an RST mechanism



dimensions in [mm]

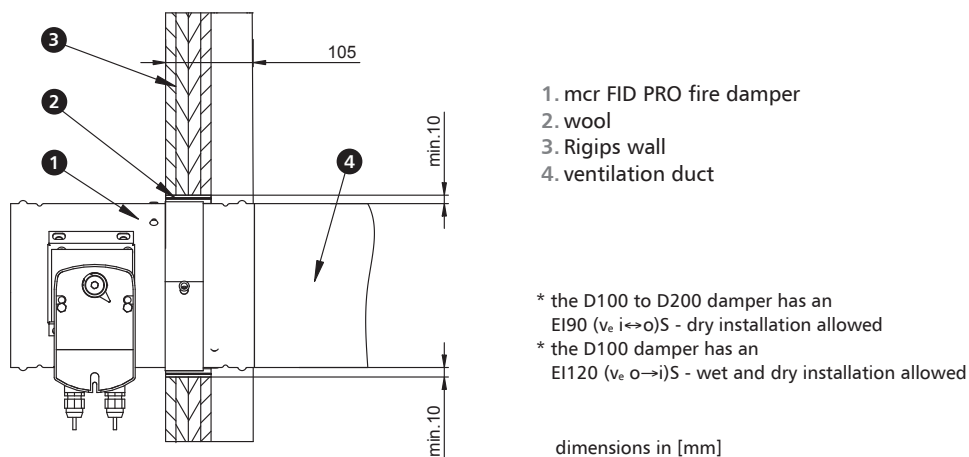
mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

5.5.5 | Sample installation outside of a fire partition

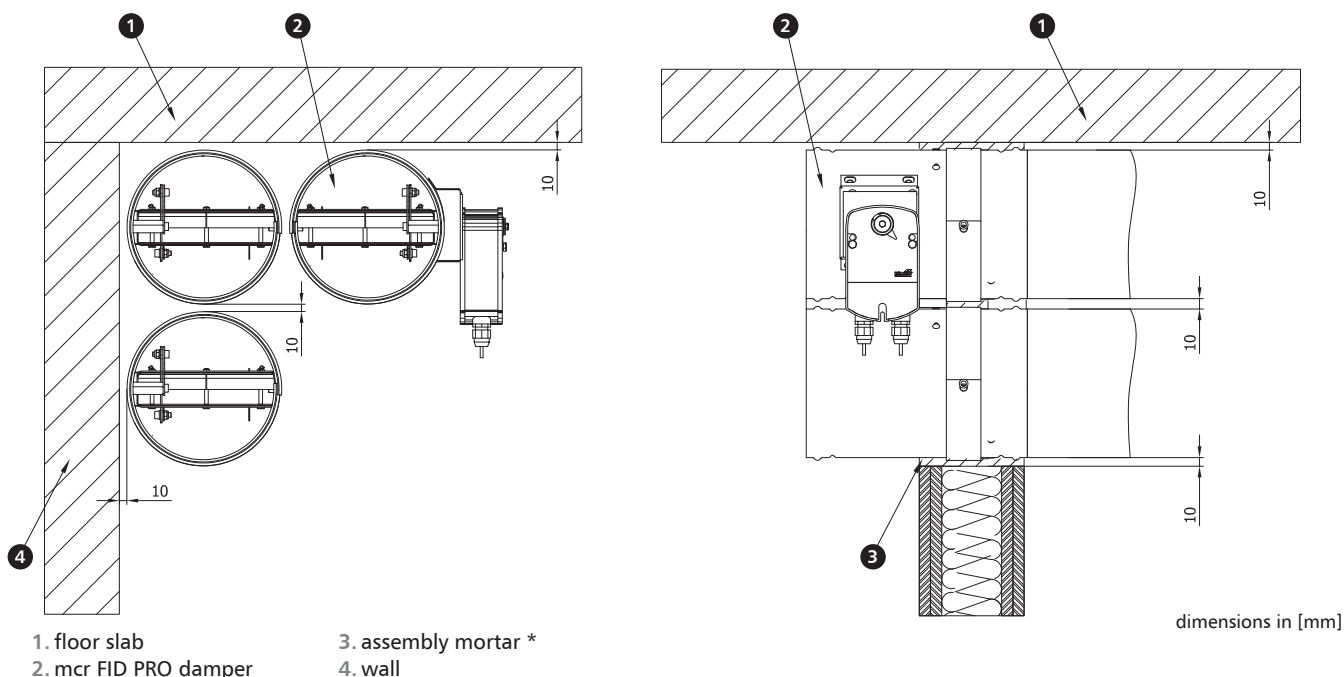


* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the method applied. The maximum distance of the damper from the building partition is 1000 mm.

5.5.6 | Sample installation in RIGIPS 3.50.11 walls*



Minimum distance between systems and partitions



* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the method applied.

mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

5.6 | mcr FID PRO rectangular dampers technical parameters

D – nominal diameter [mm]

v – velocity [m/s]

Q – flow [m³/h]

S_k – duct cross-section [m²]

d_p – pressure drop [Pa]

S_e – damper active cross-section [m²]

L_{WA} – damper noise level [dB]

» mcr FID PRO EIS 60

» mcr FID PRO 100

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
100	2	0.0079	0.0064	46	3	16
	4			91	11	25
	6			137	20	33
	8			183	32	40

» mcr FID PRO 125

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
125	2	0.0123	0.0104	75	2	14
	4			150	8	23
	6			224	15	32
	8			299	25	39

» mcr FID PRO 160

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
160	2	0.0201	0.0177	127	1	11
	4			255	3	14
	6			382	7	24
	8			510	12	32

» mcr FID PRO 200

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
200	2	0.0314	0.0284	204	1	12
	4			409	3	17
	6			613	8	29
	8			818	15	37

» mcr FID PRO 250

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
250	2	0.0491	0.0453	326	1	3
	4			653	2	8
	6			979	2	15
	8			1305	4	20

» mcr FID PRO 315

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
315	2	0.0779	0.0732	527	1	4
	4			1054	2	10
	6			1580	3	18
	8			2107	5	26

mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

D – nominal diameter [mm]

v – velocity [m/s]

Q – flow [m³/h]

S_k – duct cross-section [m²]

d_p – pressure drop [Pa]

S_e – damper active cross-section [m²]

L_{WA} – damper noise level [dB]

» mcr FID PRO EIS 120

» mcr FID PRO 100

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
100	2	0.0079	0.0059	42	4.5	21
	4			84	14	29
	6			126	26	37
	8			168	42	43

» mcr FID PRO 125

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
125	2	0.0123	0.0098	70	3	19
	4			141	10	27
	6			211	20	36
	8			281	33	42

» mcr FID PRO 160

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
160	2	0.0201	0.0169	122	1	16
	4			243	4	17
	6			365	9	28
	8			487	16	35

» mcr FID PRO 200

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
200	2	0.0314	0.0274	197	1	16
	4			395	5	21
	6			592	11	33
	8			789	20	40

» mcr FID PRO 250

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
250	2	0.0491	0.0391	281	2	17
	4			563	4	21
	6			844	7	27
	8			1125	10	33

» mcr FID PRO 315

D [m/s]	v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
315	2	0.0779	0.0653	470	2	18
	4			940	4	23
	6			1410	7	31
	8			1880	13	39

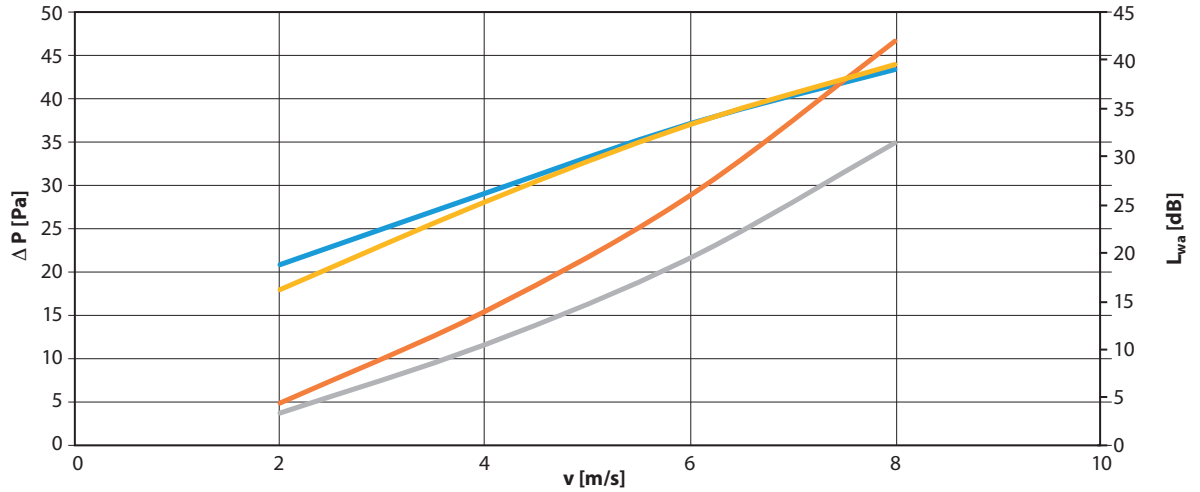
The mcr FID PRO fire damper selection program is available at www.mercor.com.pl, in the Designer Zone.

mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

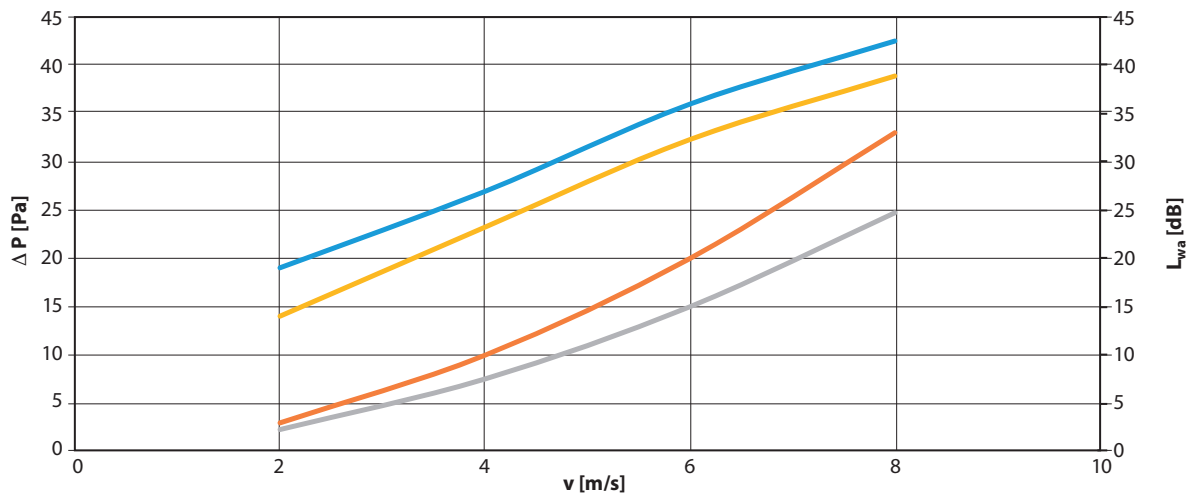
5.6.1 | Flow characteristics for mcr FID PRO circular dampers



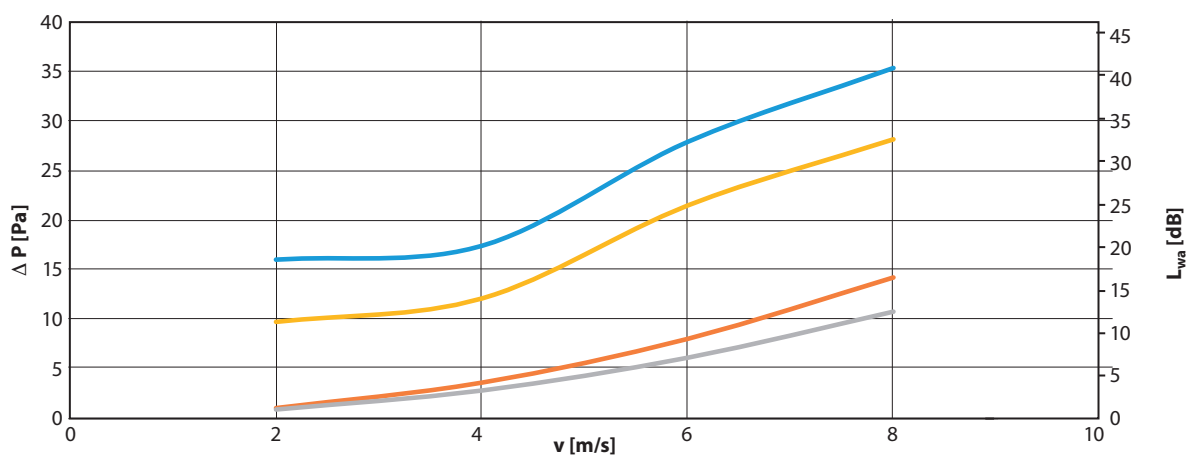
» mcr FID PRO 100



» mcr FID PRO 125



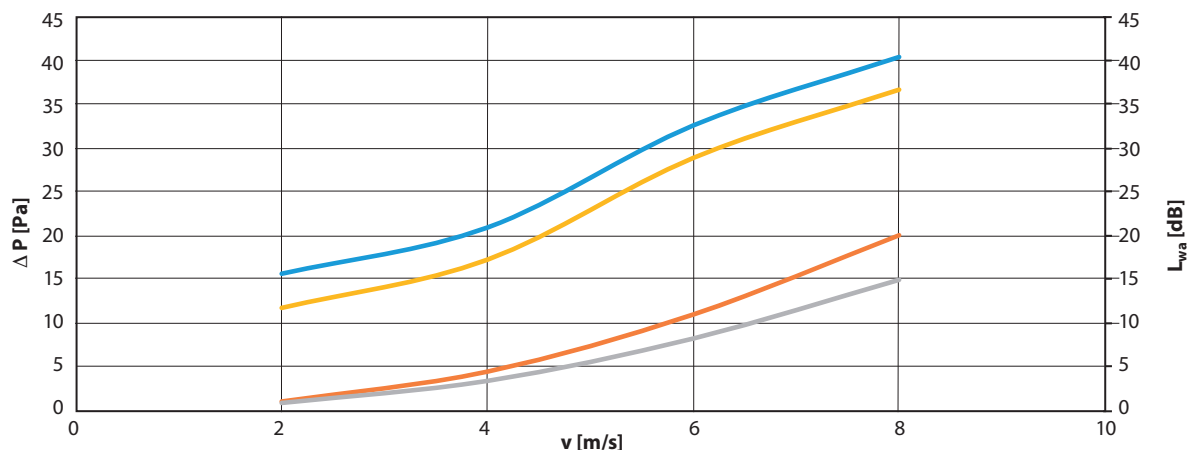
» mcr FID PRO 160



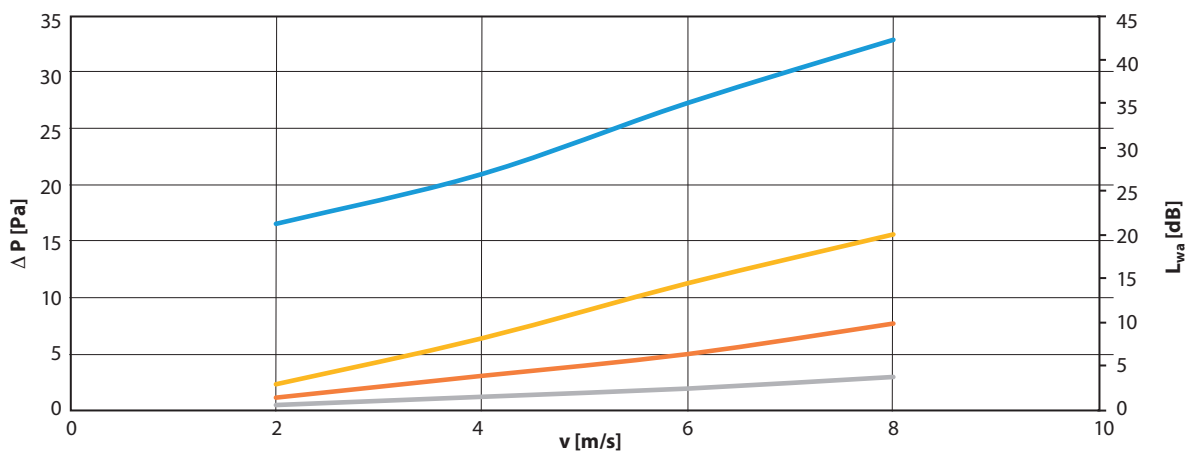
mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers
for comfort ventilation systems

EIS120 damper noise emission level
EIS120 pressure drop on a damper
EIS60 pressure drop on a damper
EIS60 damper noise emission level

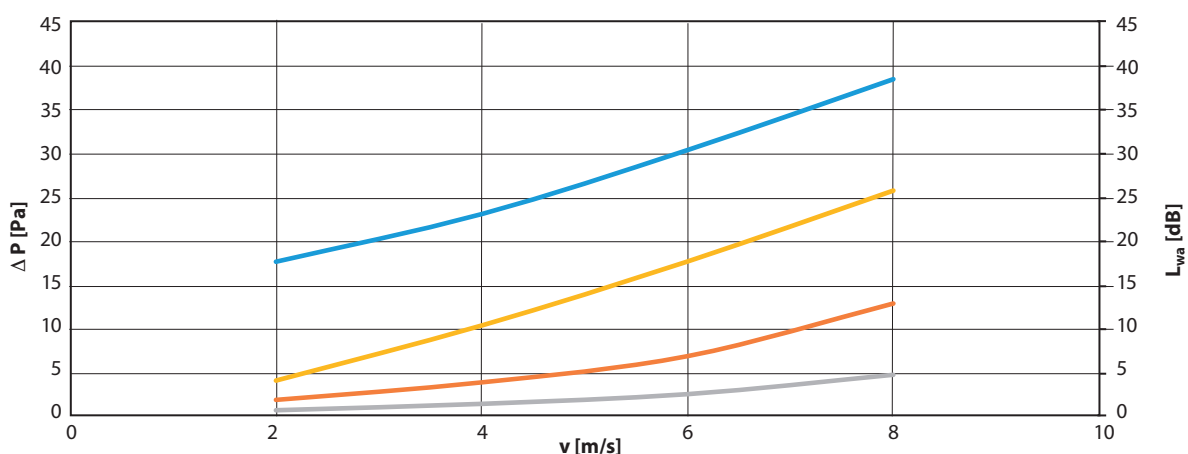
» mcr FID PRO 200



» mcr FID PRO 250



» mcr FID PRO 315



mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

5.7 | Estimated weights of mcr FID PRO dampers for circular ventilation ducts [kg]

diameter D [mm]	RST	actuator/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

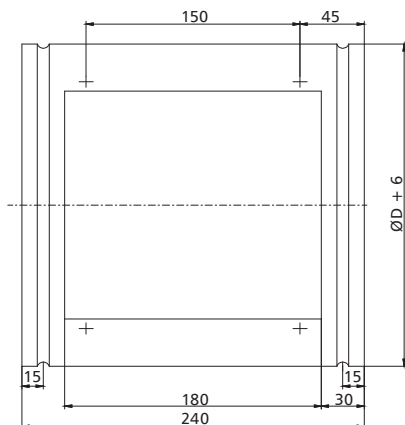
5.8 | Accessories

5.8.1 | Casing module with KRW-type inspection access

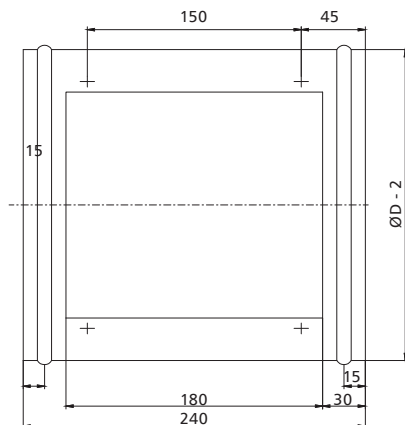
The casing modules with a KRW-type inspection access are made of sheet metal and equipped with connection flanges. The casing features an inspection access opening with a cover. The module enables to access the damper blade or a drive train quickly without having to dismantle the damper or the duct on which it is installed.

Versions:

- » KRW OM module
- » round muff module for nipple damper



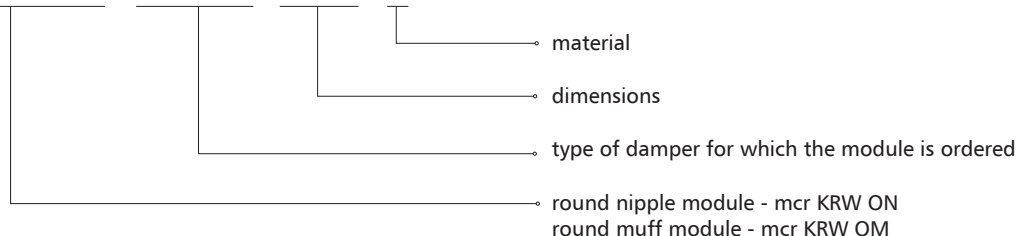
- » KRW ON module
- » round nipple module for muff damper



dimensions in [mm]

Marking

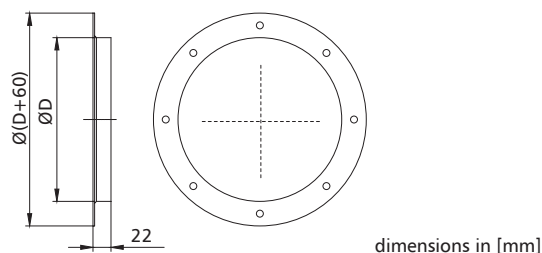
mcr KRW ON / FID PRO / B x H / X



X – material
 [no symbol] – galvanized steel, Zn 275 g/m² coating
 KN – stainless steel
 KK – 1.4404 acid-proof steel

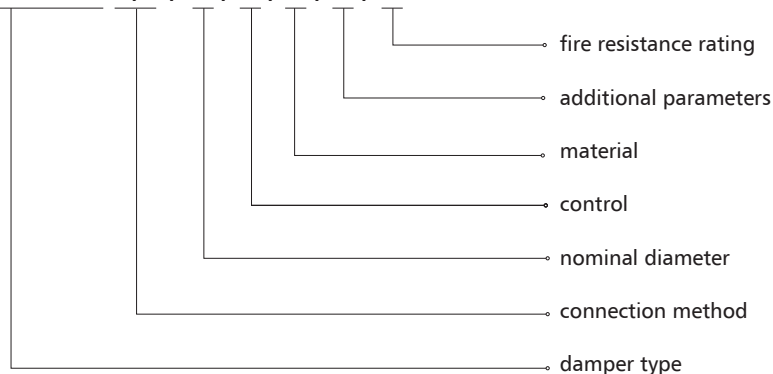
5.8.2 | Connection flange

The connection flange is used to connect a round fire damper to a duct with a connection made in accordance with PN-EN 12220.



5.9 | Marking

mcr FID PRO S/1 / Ø / 2 / 3 / 4 / 5



1 - connection method

N or [no symbol] – nipple
M – muff
K – flange

2 - control:

» RST trigger control mechanism

RST – thermal trigger

RST/WK1 – thermal trigger + “pulse” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)

RST/WK2 – thermal trigger + “break” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade)

» RST trigger control mechanism-KW1

KW1/S – thermal trigger

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

KW1/24I/WK2 – thermal trigger + “pulse” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)

KW1/24P/WK2 – thermal trigger + “break” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade) signal)

KW1/24I/WK2(+MP230/24) – thermal trigger + “pulse” electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)

KW1/24P/WK2(+MP230/24) – thermal trigger + “break” electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)

» trigger and control mechanism, axial actuator

BF24TL-TN-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-SR-T – actuator with a return spring, U = 24 V AC/DC

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

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

MLF24T – actuator with a return spring, U = 24 V AC/DC

MLF230T – actuator with a return spring, U = 230 V AC

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

QT.Ex 230-FT.Ex – explosion proof actuator with a return spring in the Ex version, U = 230 V AC/DC

mcr FID PRO | Low-resistance circular single-blade cut-off fire dampers for comfort ventilation systems

3 - material

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

KN – stainless steel

KK – 1.4404 acid-proof steel

KKM – special design of the damper – damper and its elements made of stainless steel, additionally sleeves and their painted elements

4 - additional parameters

» Thermoelectric and thermal triggers

[no symbol] – 72°C trigger

ZBAT95 – thermoelectric trigger for 95°C

T93-95 – thermal trigger for 95°C

T2-95 (MLF) – thermal trigger for 95°C

FT.Ex-72 – thermoelectric trigger for 72°C

FT.Ex-95 – thermoelectric trigger for 95°C

» Control mechanism position

[no symbol] – perpendicular to the damper rotation axis*

WOK – along the damper axis

» Damper casing

[no symbol] – standard casing length

400 – casing with a length of 400 mm

BU – earth pin

» Extended damper casing

[no symbol] – design without gaskets

UKW – version with external gaskets

5 - fire resistance rating

[no symbol] – fire resistance rating EI120

EI60 – fire resistance rating EI60

* – for dampers with the KW1 mechanism, the trigger control mechanism is installed along the axis of rotation as standard – exception

NOTE: separate additional parameters entered with the “/” sign

example marking:

mcr FID PRO Ø125 BFL24-T

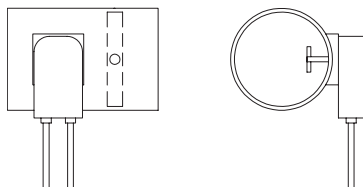
EI120 low-resistance cut-off damper with a 24 V actuator with a thermoelectric trigger and limit switches.

mcr FID PRO Ø125 RST/WK1

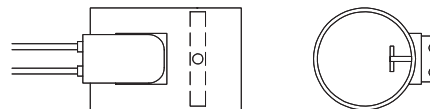
EI120 low-resistance cut-off damper with a 74°C thermal trigger and damper blade opening limit switch.

5.9.1 | Design standard

» right damper - standard



» actuator along the damper axis



standard for BFL24-TN-ST

Chapter 19 - power supply and control (p. 350) contains the following information:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.



downloadable models
on the website
under the designer zone tab



1812-CPR-1916
1812-CPR-1917
1812-CPR-1918
1812-CPR-1919

Efectis



HYGIENIC CERTIFICATE

» EIS120

- » Fire resistance class: EI120 ($v_e h_o i \leftrightarrow o$)S, EI60 ($v_e h_o i \leftrightarrow o$)S.
- » Certificate of constancy of performance 1812-CPR-1916, 1812-CPR-1917, 1812-CPR-1918, 1812-CPR-1919.
- » Dampers certified for compliance with EN 15650.
- » Dampers qualified under EN 13501-3 and tested under EN 1366-2.
- » Cut-off dampers resistance independent of airflow direction and installation side.
- » Certified installation in ductwork or with anemostat at system termination.
- » Certified installation with both horizontal and vertical axis of rotation.

6.1 | Application

mcr FID WING cut-off dampers are designed for installation in general ventilation systems at installation passages through vertical and horizontal construction partitions. During a fire, they preserve the fire resistance rating of the construction partition that the ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and fire gasses 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, unless included in a special, individually developed service and technical inspections programme.

6.2 | Design



mcr FID WING cut-off fire dampers consist of a casing with a circular cross-section, a moving damper blade and a trigger and control mechanism, which is activated when the thermal trigger is tripped. The damper casing is made of galvanized steel sheets. There is an intumescent gasket and ventilation gasket on its outer part. The damper blade is made of a fireproof material.

mcr FID WING fire dampers remain open during normal operation. Dampers are switched over into safety state (closed) automatically when the thermal trigger (RST-type actuation and control mechanism) trips.

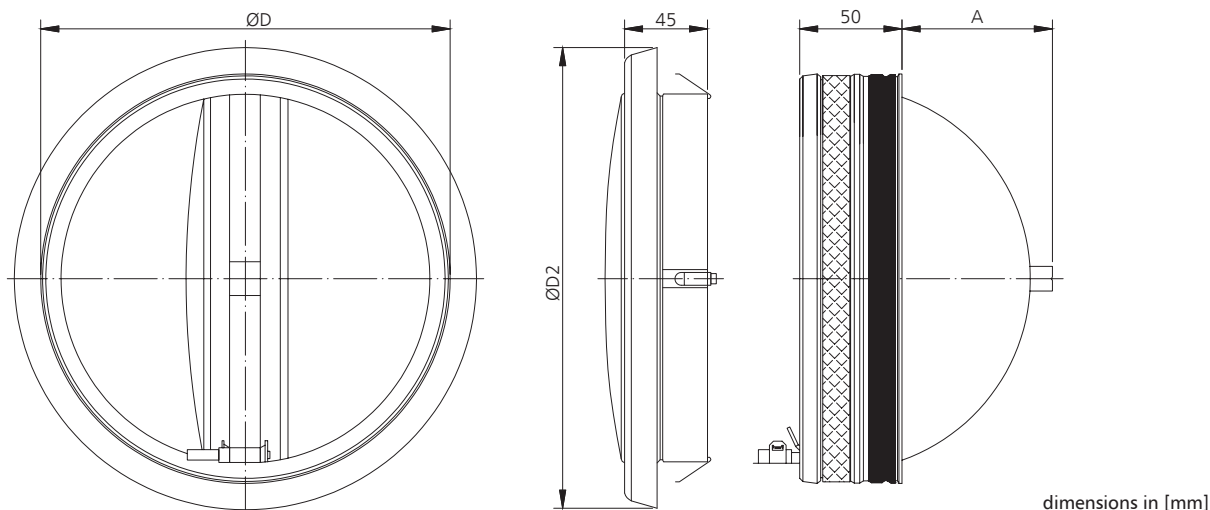
Fire dampers may be equipped with an adjustable air anemostat, the performance (active surface area) of which is adjusted by turning its disc. Anemostats are supplied in RAL 9010.

6.3 | Versions

During normal operation, the fire damper blade remains open. In case of fire, the blade closes automatically. mcr FID WING fire dampers are equipped with an RST trigger and control mechanism with a 74°C thermal trigger (it is possible to use a thermal trigger with the nominal tripping temperature of 95°C as an option) and driving spring. Once 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.

6.4 | Dimensions

» circular dampers:



nominal diameter $\varnothing D$ [mm]	anemostat external diameter $\varnothing D2$ [mm]	length A [mm]	weight [kg]
100	149	21	0,2
125	169	34	0,3
160	195	51	0,4
200	240	72	0,6

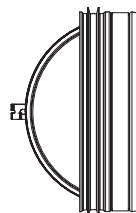
» mcr FID WING Ø100



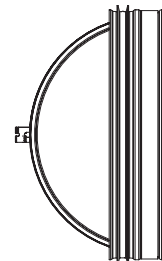
» mcr FID WING Ø125



» mcr FID WING Ø160



» mcr FID WING Ø200



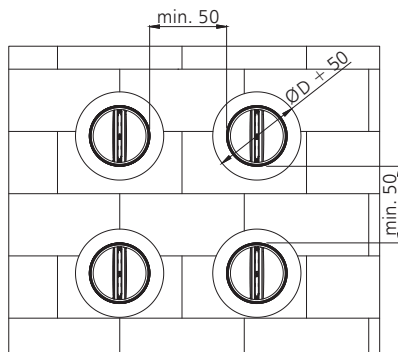
6.5 | Installation

mcr FID WING circular dampers are rated EI 120 ($v_e h_o i \leftrightarrow o$) S and EI 60 ($v_e h_o i \leftrightarrow o$) S if installed in concrete, solid brickwork or aerated concrete blockwork partitions with min. thickness of 100 mm, in light walls made of gypsum boards on a steel framework with a min. thickness of 100 mm and a fire resistance rating equal to the expected fire resistance rating of the fire damper in question and in concrete floor slabs with a min. thickness of 100 mm for EIS60 and 150 mm for EIS120.

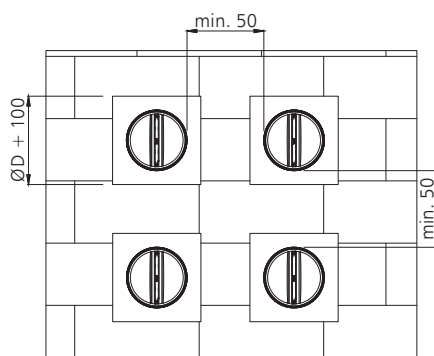
6.5.1 | Preparation of installation openings

» walls - preferred opening

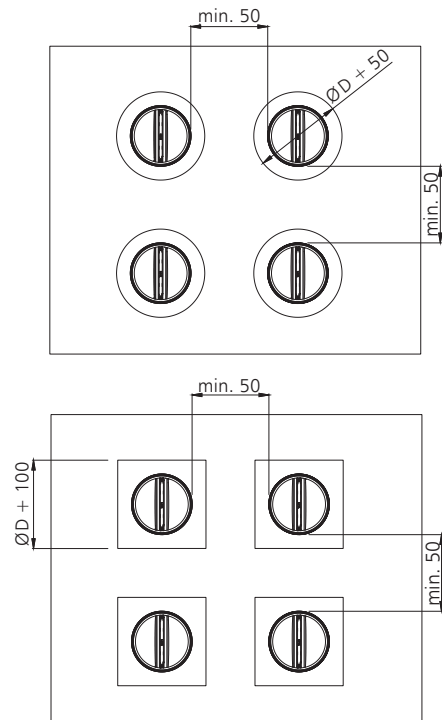
» wet installation



» dry installation



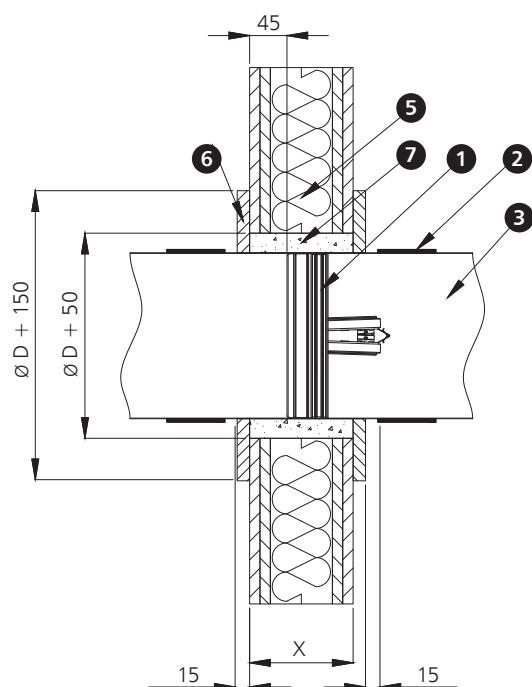
» floor slabs - preferred opening



dimensions in [mm]

6.5.2 | mcr FID WING damper installation in plasterboard walls for EI60

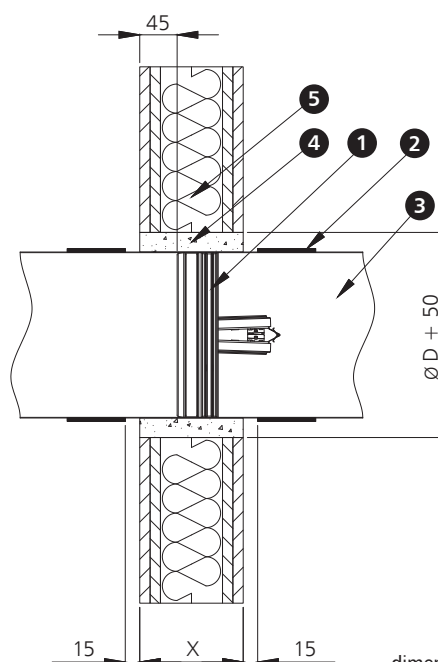
» opening



1. mcr FID WING fire damper
2. insulating wrap
3. ventilation duct

4. assembly mortar*
5. plasterboard wall
6. gypsum board trim 12.5 mm

» opening

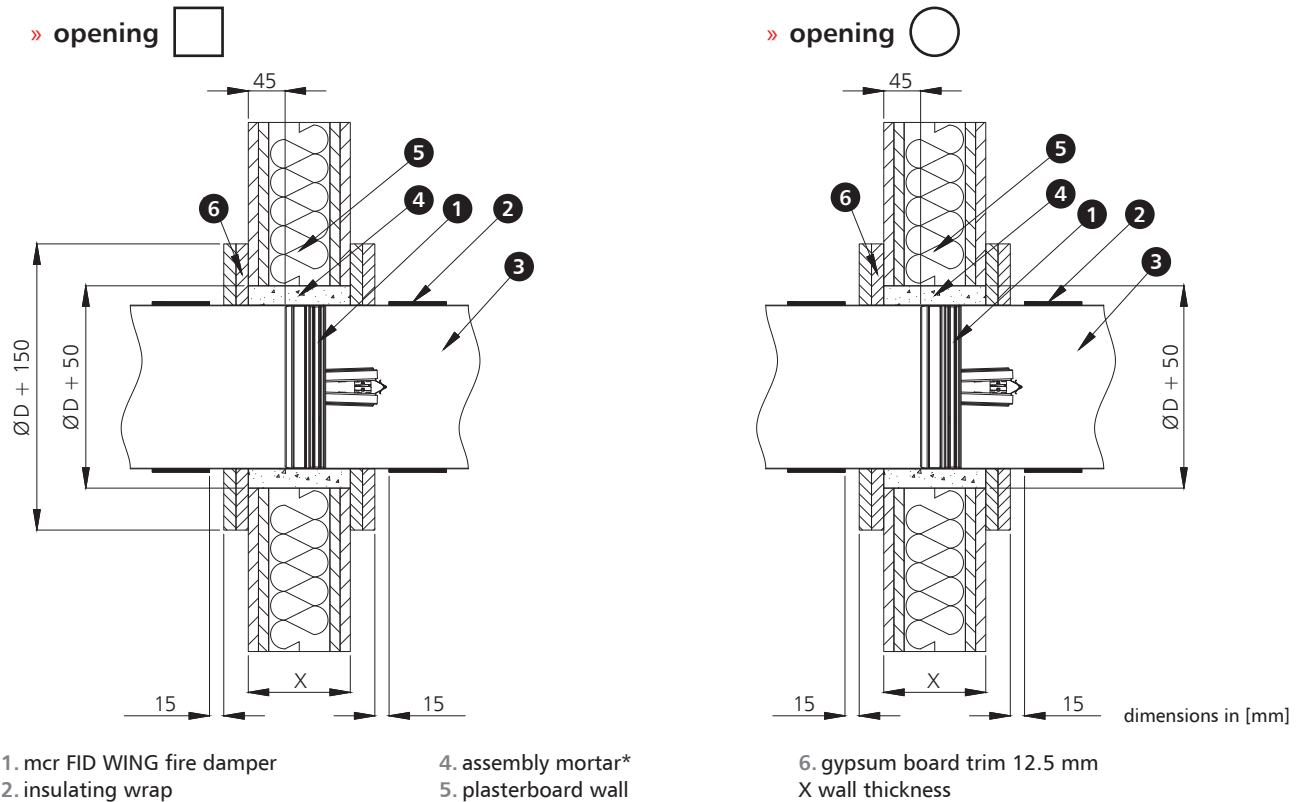


7. assembly mortar or mineral wool *
- X wall thickness

dimensions in [mm]

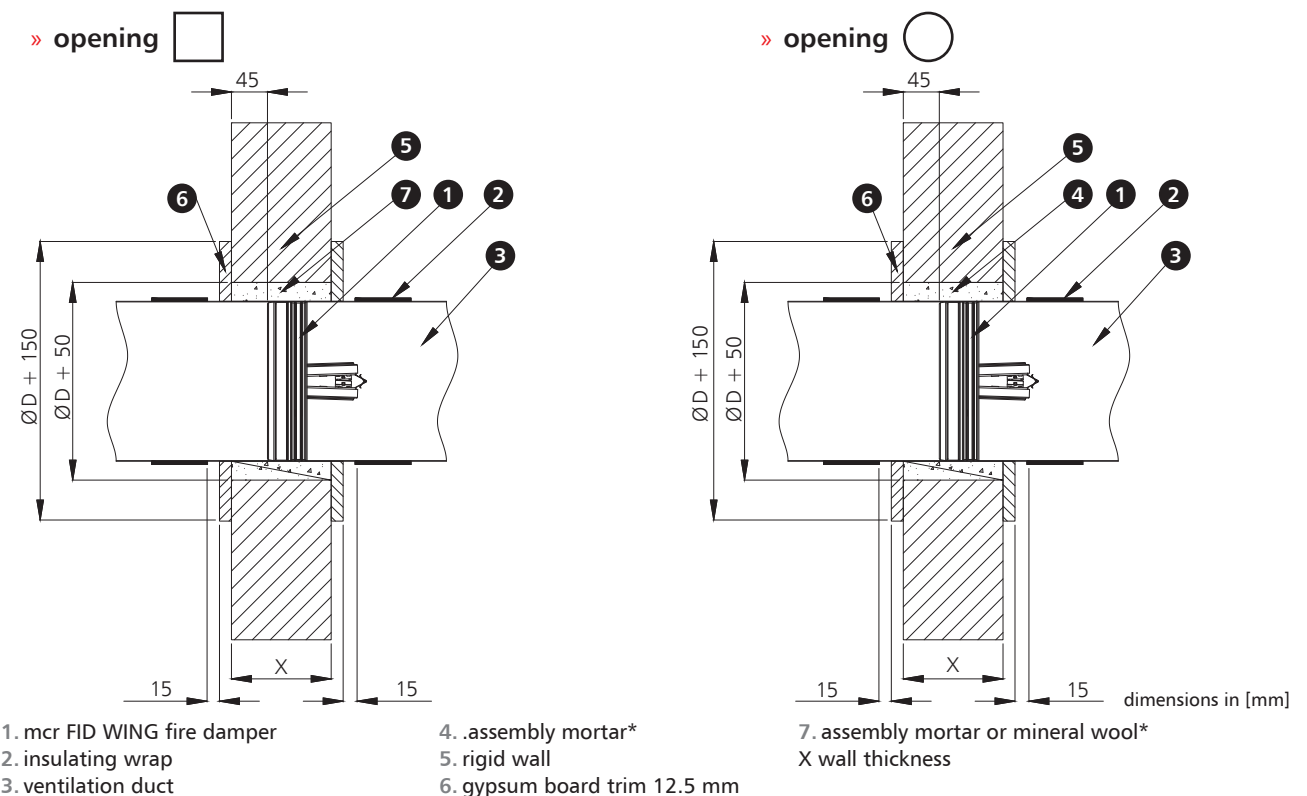
* Recommended installation of the damper in a dry system is based on wool of min. 40 kg / m³ with A1 nonflammability class. The recommended installation of the damper in a wet system is based on a plaster or cementbased mortar. The manufacturer allows the use of other materials with parameters that confirm and ensure the appropriate class of fire resistance for the applied method of assembly.

6.5.3 | mcr FID WING damper installation in plasterboard walls for EI60



* Recommended installation of the damper in a dry system is based on wool of min. 100 kg / m³ with A1 nonflammability class. The recommended installation of the damper in a wet system is based on a plaster or cementbased mortar. The manufacturer allows the use of other materials with parameters that confirm and ensure the appropriate class of fire resistance for the applied method of assembly.

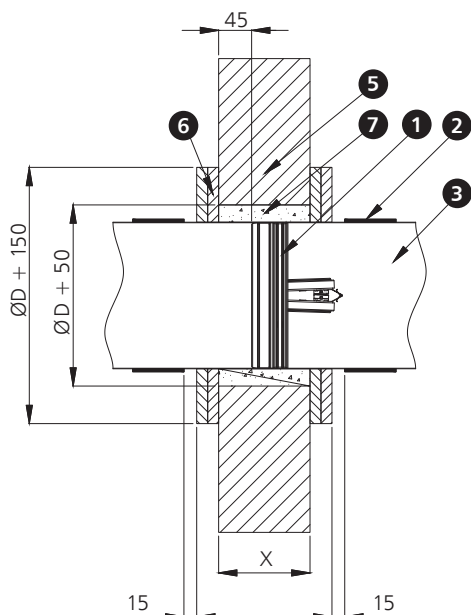
6.5.4 | mcr FID WING damper installation in rigid walls for EI60



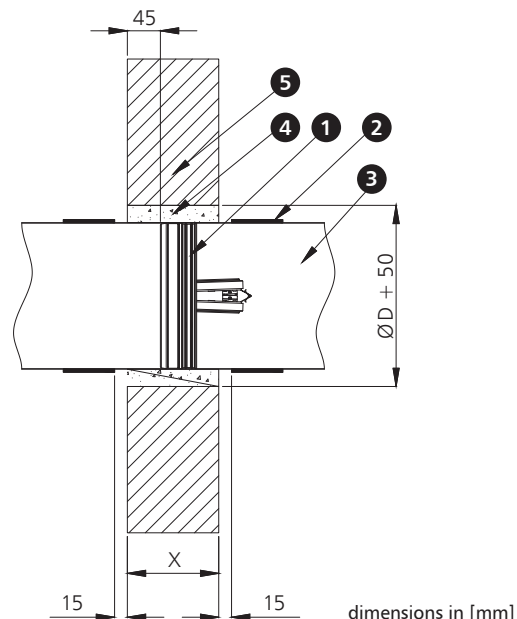
* Recommended installation of the damper in a dry system is based on wool of min. 100 kg / m³ with A1 nonflammability class. The recommended installation of the damper in a wet system is based on a plaster or cementbased mortar. The manufacturer allows the use of other materials with parameters that confirm and ensure the appropriate class of fire resistance for the applied method of assembly.

6.5.5 | mcr FID WING damper installation in rigid walls for EIS120

» opening 



» opening 



- 1. mcr FID WING fire damper
- 2. insulating wrap
- 3. ventilation duct

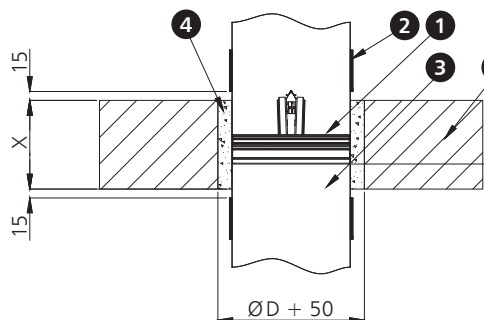
- 4. assembly mortar*
- 5. rigid wall
- 6. gypsum board trim 12.5 mm

- 7. assembly mortar or mineral wool* X wall thickness*

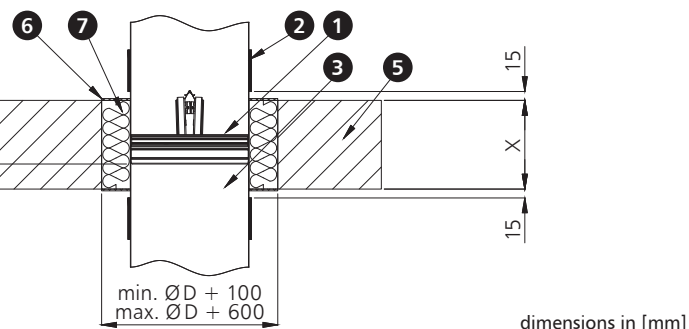
* Recommended installation of the damper in a dry system is based on wool of min. 100 kg / m³ with A1 nonflammability class. The recommended installation of the damper in a wet system is based on a plaster or cementbased mortar. The manufacturer allows the use of other materials with parameters that confirm and ensure the appropriate class of fire resistance for the applied method of assembly.

6.5.6 | mcr FID WING damper installation in floor slabs

» opening 



» opening 



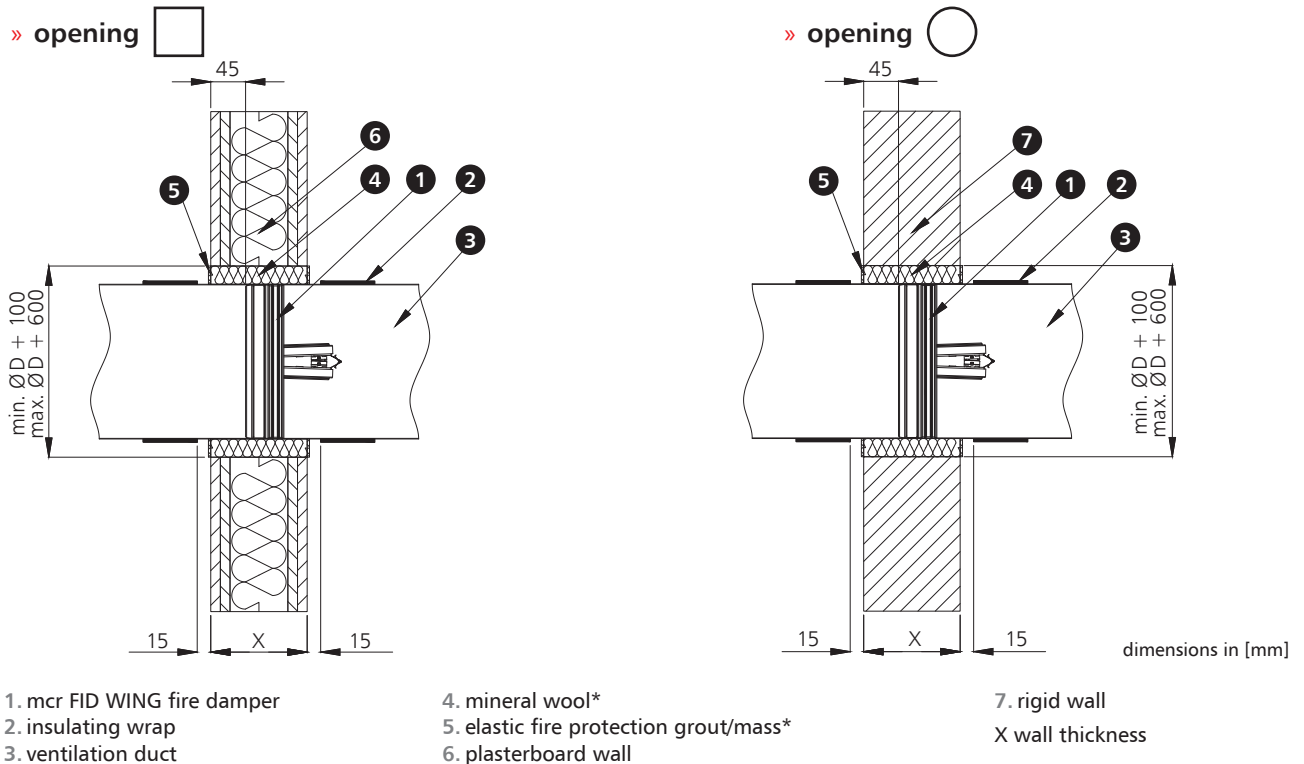
- 1. mcr FID WING fire damper
- 2. insulating wrap
- 3. ventilation duct

- 4. assembly mortar*
- 5. floor slab
- 6. elastic fire protection grout/mass*

- 7. .mineral wool*
- X wall thickness
- Y 75 mm for EIS120, 45 mm for EIS60

* Recommended installation of the damper in a dry system is based on wool of min. 140 kg / m³ with non-flammability class A1, thickness min. 50mm and securing the joint between the wool and the wall with PROMASTOP E PASTE or HILTI CFS-CT paint and wool with the fire-retardant PROMASTOP E PASTE or HILTI CFS-S ACR paint, as shown in the above drawing. The recommended installation of the damper in a wet system is based on plaster or cement mortar. The manufacturer allows the use of other materials with parameters that confirm and ensure the appropriate class of fire resistance for the applied method of assembly.

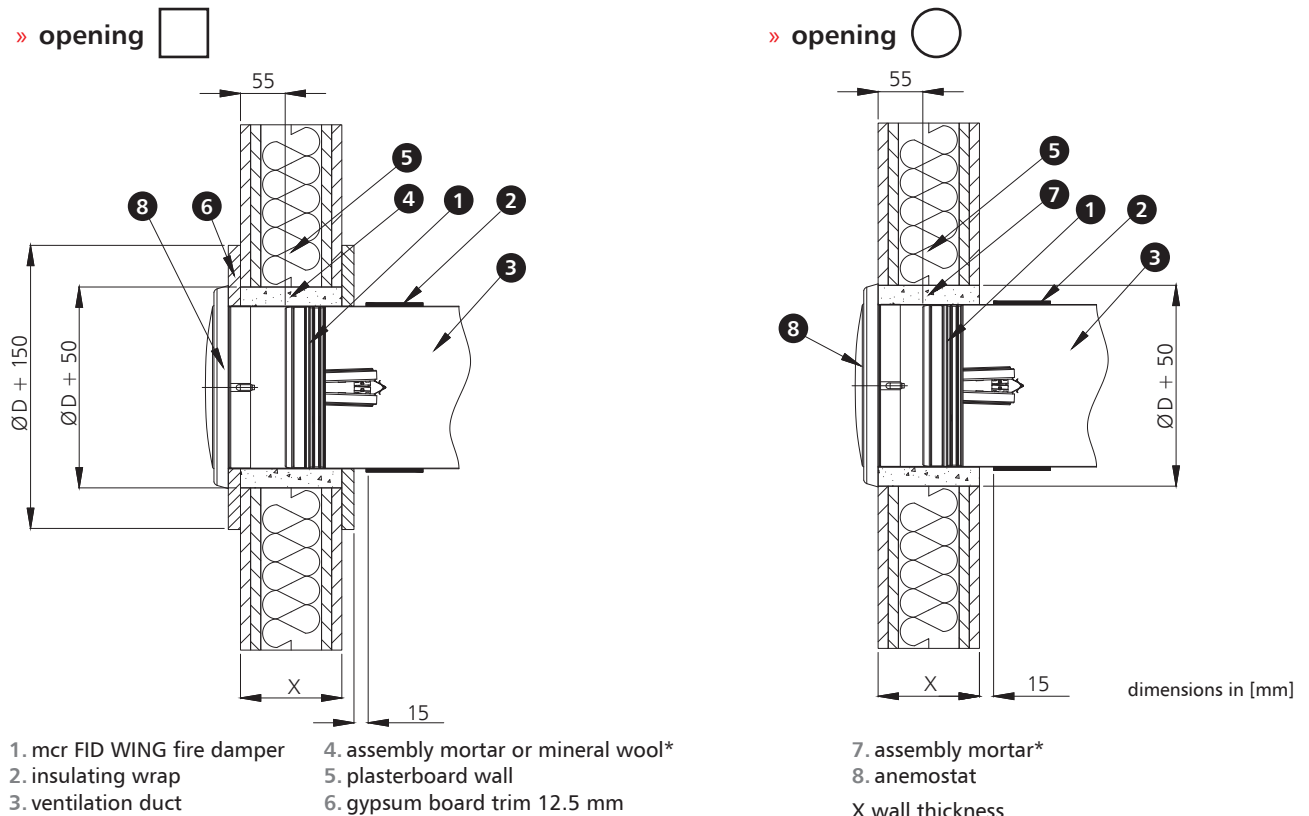
6.5.7 | mcr FID WING damper installation in dry systems



* Recommended damper installation in a dry system is based on wool with a min. density of 140 kg/m³ and fire resistance class A1 and a thickness of at least 50 mm, as well as on securing the contact portion between the wool and the wall with PROMASTOP E PASTE or HILTI CFS-CT elastic mass and wool with the PROMASTOP E PASTE or HILTI CFS-S ACR fire protection elastic mass, as per the drawing above.

The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

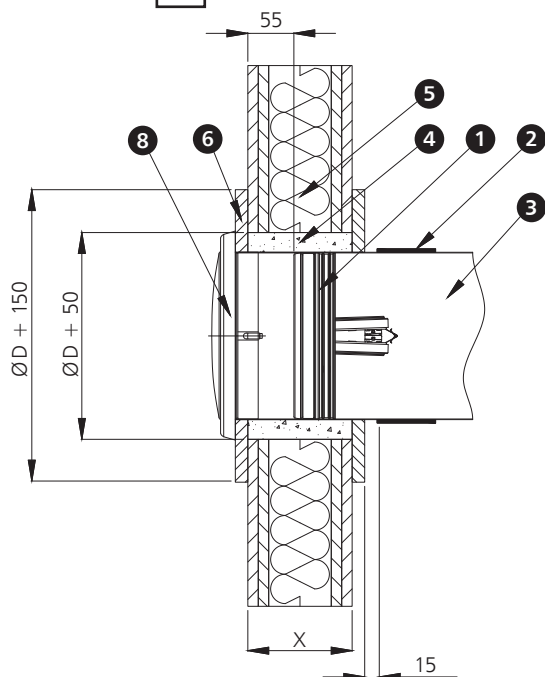
6.5.8 | mcr FID WING damper installation in plasterboard walls for EIS60



* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

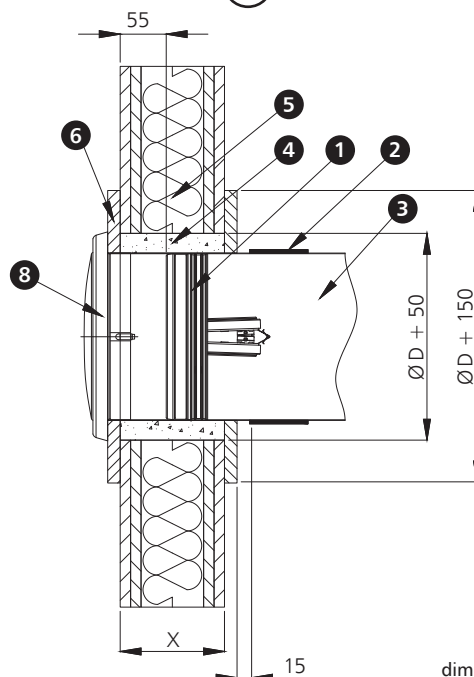
6.5.9 | mcr FID WING damper installation in plasterboard walls for EIS120

» opening 



- | | |
|-----------------------------|-------------------------------------|
| 1. mcr FID WING fire damper | 4. assembly mortar or mineral wool* |
| 2. insulating wrap | 5. plasterboard wall |
| 3. ventilation duct | 6. gypsum board trim 12.5 mm |

» opening 



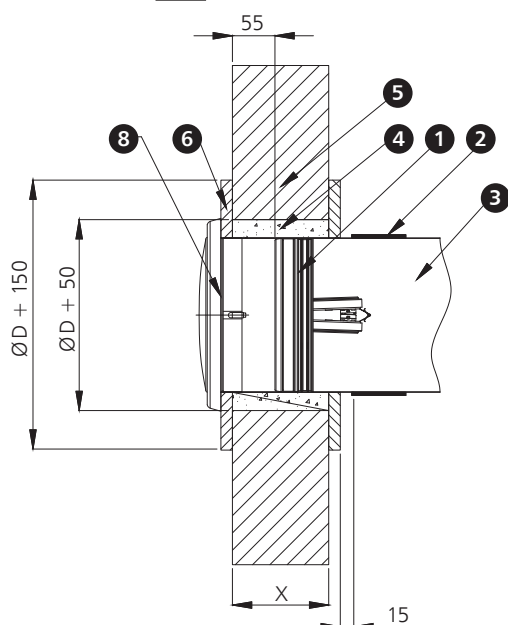
- | |
|------------------|
| 7. anemostat |
| X wall thickness |

dimensions in [mm]

* Recommended damper installation in a dry system is based on wool with a min. density of 40 kg/m³ and fire resistance class A1, as well as on securing the contact portion of the damper. Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

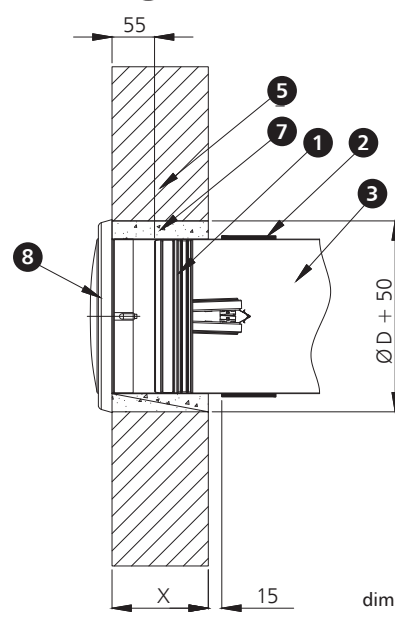
6.5.10 | mcr FID WING damper installation in rigid walls for EIS120 and EIS60

» opening 



- | | |
|-----------------------------|-------------------------------------|
| 1. mcr FID WING fire damper | 4. assembly mortar or mineral wool* |
| 2. insulating wrap | 5. rigid wall |
| 3. ventilation duct | 6. gypsum board trim 12.5 mm |

» opening 

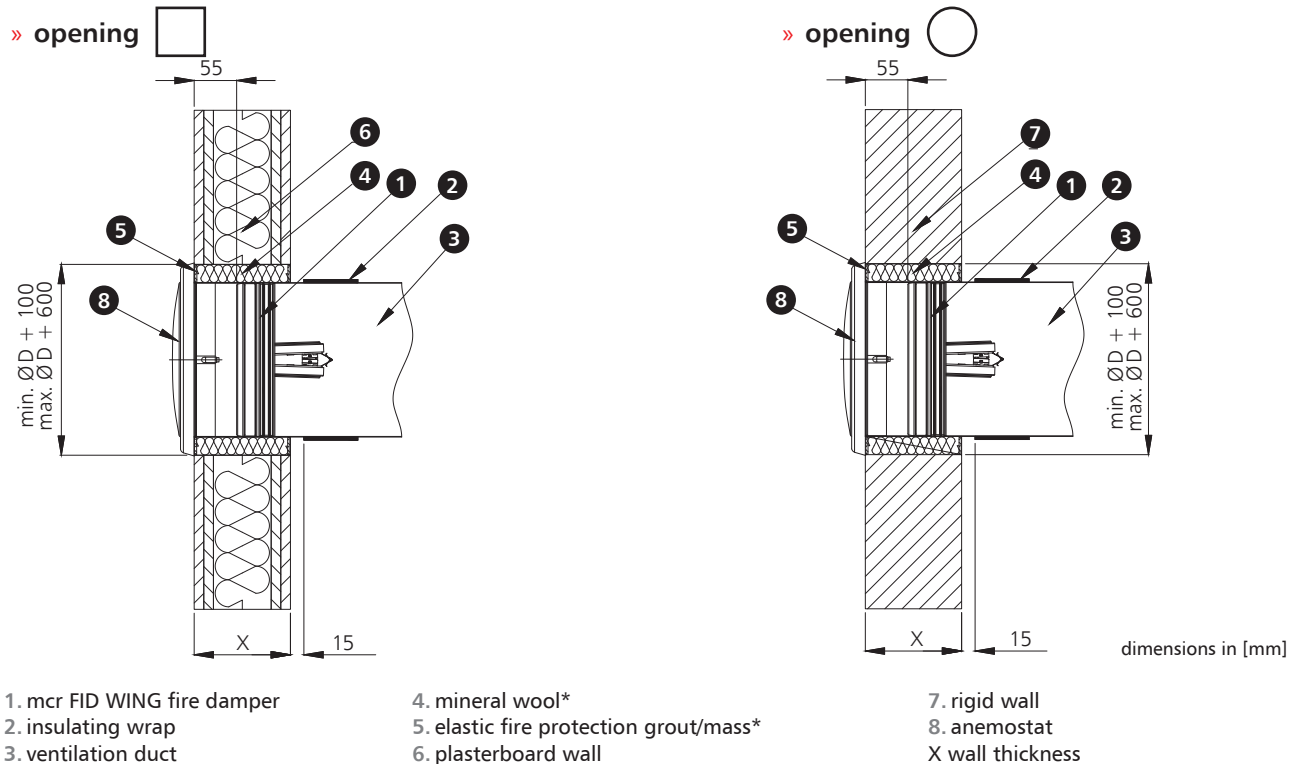


- | |
|---------------------|
| 7. assembly mortar* |
| 8. anemostat |
| X wall thickness |

dimensions in [mm]

* Recommended damper installation in a dry system is based on wool with a min. density of 40 kg/m³ and fire resistance class A1, as well as on securing the contact portion of the damper. Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement.

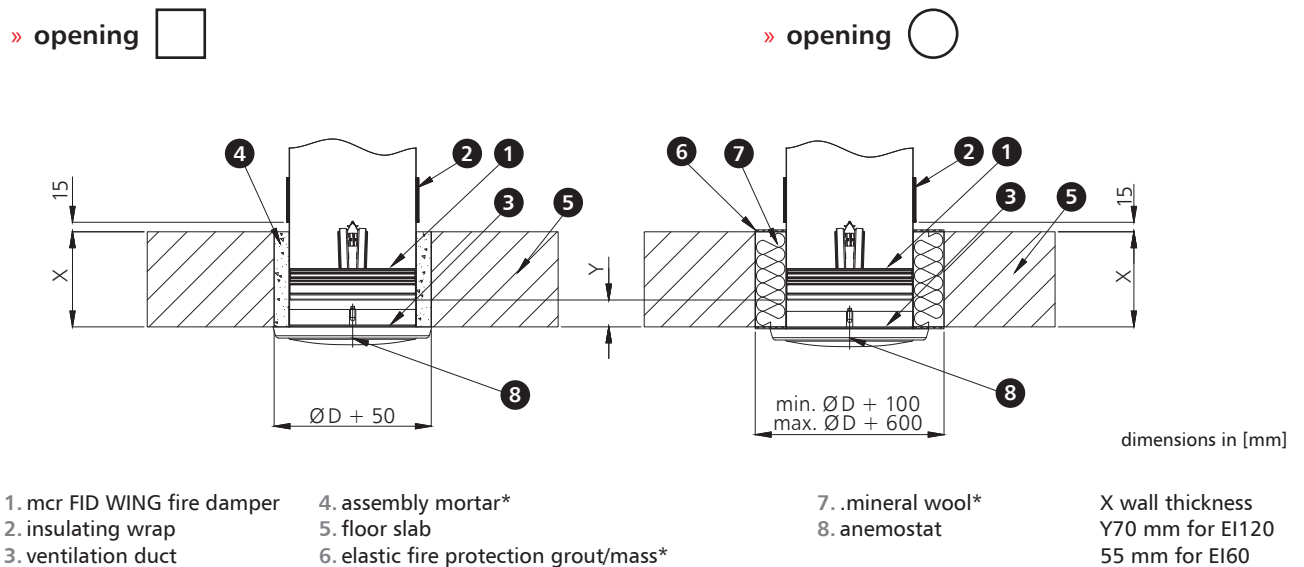
6.5.11 | mcr FID WING damper installation in dry systems



* Recommended damper installation in a dry system is based on wool with a min. density of 140 kg/m³ and fire resistance class A1 and a thickness of at least 50 mm, as well as on securing the contact portion between the wool and the wall with PROMASTOP E PASTE or HILTI CFS-CT elastic mass and wool with the PROMASTOP E PASTE or HILTI CFS-S ACR fire protection elastic mass, as per the drawing above.

The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

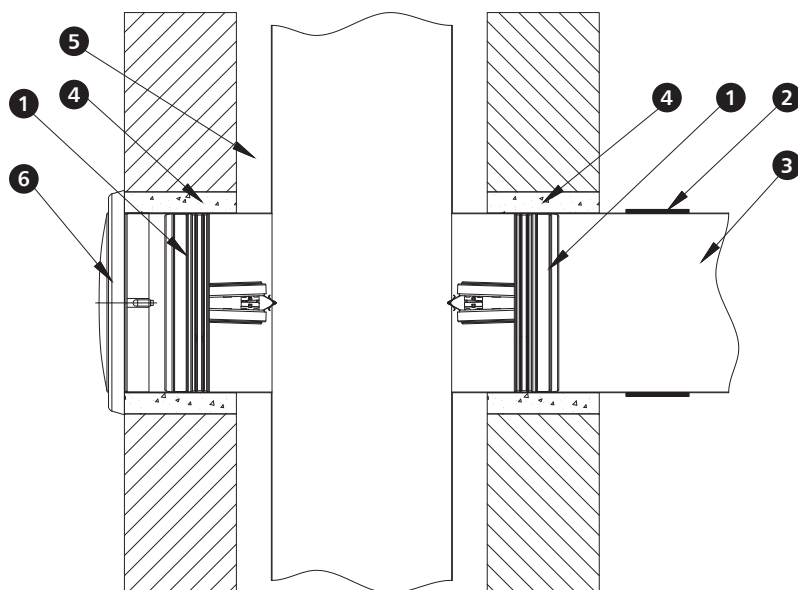
6.5.12 | mcr FID WING damper installation in floor slabs



* Recommended damper installation in a dry system is based on wool with a min. density of 140 kg/m³ and fire resistance class A1 and a thickness of at least 50 mm, as well as on securing the contact portion between the wool and the wall with PROMASTOP E PASTE or HILTI CFS-CT elastic mass and wool with the PROMASTOP E PASTE or HILTI CFS-S ACR fire protection elastic mass, as per the drawing above. Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement.

The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

6.5.13 | mcr FID WING damper installation in service shaft openings for EIS120 and EIS60



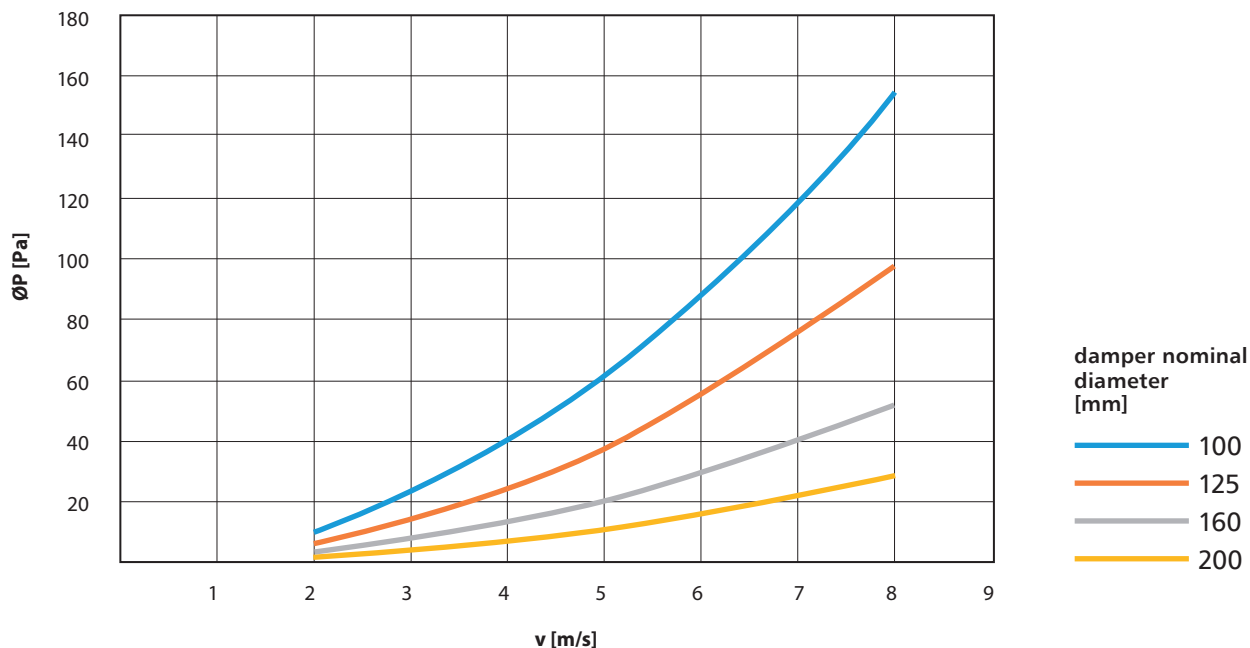
- | | |
|-----------------------------|------------------------------------|
| 1. mcr FID WING fire damper | 4. installation clearance filling* |
| 2. insulating wrap | 5. service shaft |
| 3. ventilation duct | 6. anemostat |

* The method of filling the installation clearance is based on the fire resistance rating of the solution and the assembly method as shown in the drawings above. When the damper is installed in the service shaft openings (in technical shafts that are not designed for continuous presence or stay of people), it is not necessary to use the insulating wrap supplied with the damper. The fire damper should be placed at the duct side inside the shaft. Fire resistance rating of the shaft walls should be equal to or higher than that of the fire damper.

6.6 | mcr FID WING circular dampers technical parameters

product	D [mm]	S_k [m ²]	S_e [m ²]	v [m/s]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]
mcr FID WING	100	0.008	0.002	2	58	11	27
				4	29	40	44
				6	43	88	54
				8	58	154	61
	125	0.012	0.004	2	29	6	24
				4	58	25	40
				6	86	55	49
				8	115	98	55
	160	0.02	0.01	2	72	3	17
				4	144	13	34
				6	216	30	44
				8	288	53	52
	200	0.031	0.017	2	122	2	16
				4	245	7	32
				6	367	16	41
				8	490	29	48

» pressure drop – mcr FID WING damper



6.7 | mcr FID WING circular fire dampers estimated weights

nominal diameter ØD [mm]	weight [kg]
100	0.3
125	0.4
160	0.5
200	0.9

6.8 | Accessories

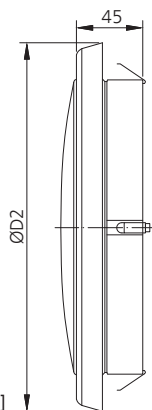
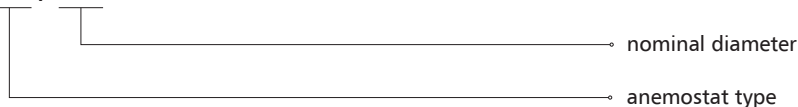
» anemostat



System AN anemostats are designed to fulfill either supply or exhaust function. They are made of plastic. They allow for an aesthetic system termination. They are equipped with a movable disc, allowing adjustment of the airflow supplied by the system. The body of the anemostat is attached to the ventilation duct with the connection collar supplied in the kit. The anemostat is fixed in the connection collar using strutting elements on the anemostat's perimeter. Such a solution allows for installing the product even in the most visually-demanding applications. Anemostats are supplied in RAL 9010 as a standard.

Marking

AN / ØD



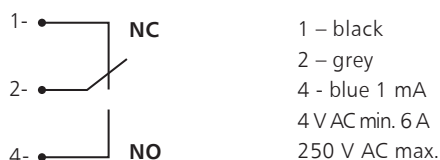
dimensions in [mm]

nominal diameter ØD [mm]	external diameter ØD2 [mm]
100	149
125	169
160	195
200	240

Trigger control mechanisms – specifications and connections diagram

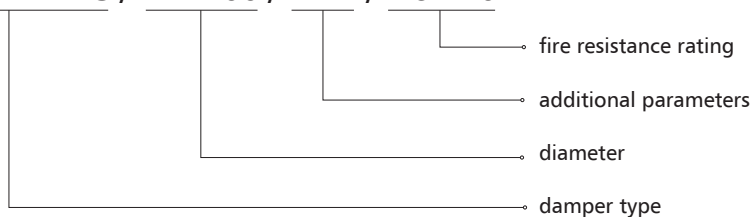
execution type	RST	RST + WK1
thermal trigger	+	+
limit switch	–	250 V AC / 6A

Electrical connections diagram for the mcr FID WING +WK1 damper



6.9 | Marking

mcr FID WING / DIA 200 / WK1 / EIS 120



additional parameters

WK1 – limit switch – closed damper blade signal
AN – anemostat

NOTE: separate additional parameters entered with the “/” sign

example marking:

mcr FID WING / DIA 200 / AN / EIS120

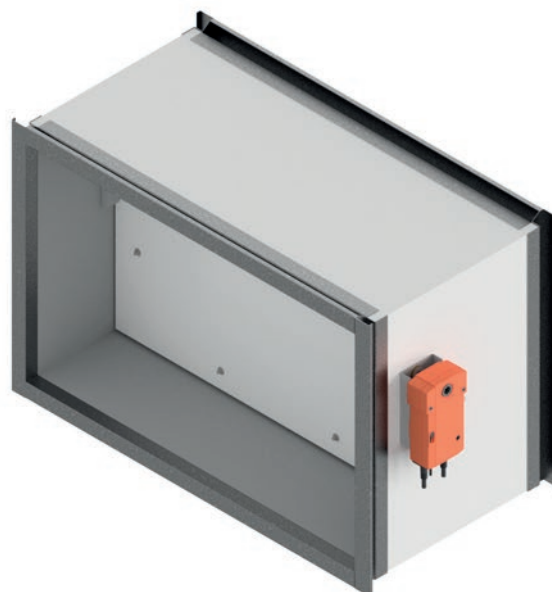
EIS120 cut-off damper with a 74°C thermal trigger, equipped with an anemostat.

Chapter 19 - power supply and control (p. 350) contains the following information:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.



downloadable models
on the website
under the designer zone tab

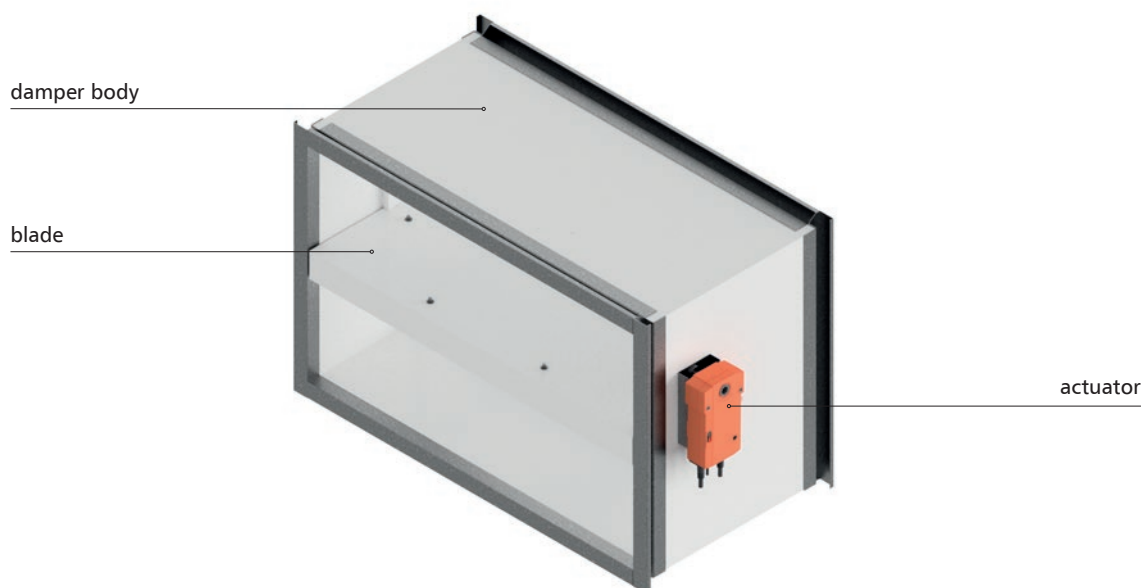


- » **EIS240**
- » Fire resistance class: EI240 ($v_e i \leftrightarrow o$)S.
- » Certificate of constancy of performance 1391-CPR-2021/0123.
- » Dampers certified for compliance with EN 15650.
- » Dampers qualified under EN 13501-3 and tested under EN 1366-2.
- » Cut-off dampers resistance independent of airflow direction and installation side.
- » Certified installation in a dry system.

7.1 | Application

mcr FID 240 cut-off dampers are designed for installation in general ventilation systems at installation passages through vertical construction partitions. During a fire, they preserve the fire resistance rating of the construction partition that the ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and fire gasses 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, unless included in a special, individually developed service and technical inspections programme.

7.2 | Design



mcr FID 240 cut-off fire dampers consist of a casing with a rectangular cross-section composed of fire-proof boards, a moving damper blade and an actuator, which is activated remotely or automatically when the thermoelectric trigger is tripped. The total length of the casing is 310–460 mm, depending on the damper height dimension. The damper blade is made of a fire-proof panel. The inner side of the fire damper casing is equipped with a sealing system. Stop profiles are attached to the inner casing surface, limiting the rotating motion of the damper blade. As a standard, the damper is equipped with steel flanges allowing for the installation of masking grilles and connection of steel ventilation ducts.

7.3 | Versions

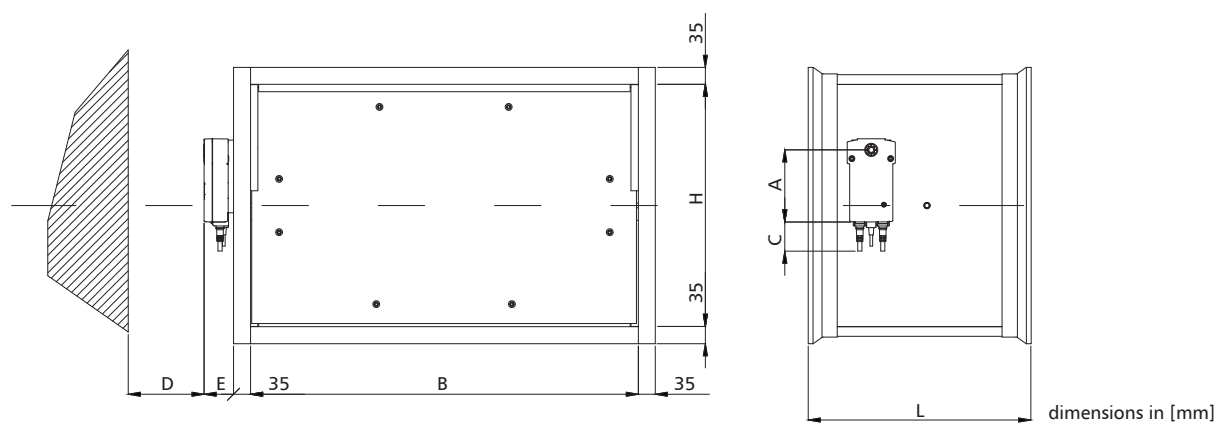
7.3.1 | Damper closing and opening with an actuator

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

The mcr FID 240 dampers are equipped with a trigger control mechanism in the form of BFL, BFN, BF-TL series axial actuator with a return spring, supplied with 24 V AC/DC or 230 V AC, with a 72°C thermoelectric trigger (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, a mechanical position indicator is placed on the actuator.

Thermoelectric triggers are equipped with a test switch.

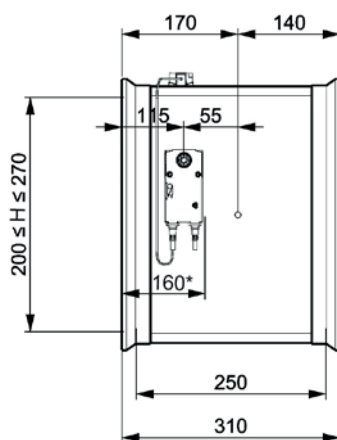
Dampers with analog BFL, BFN and digital BF-TL actuators close as a result of the thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when power supply voltage is applied to the actuator terminals. Dampers with those actuators may be opened manually using a key. In the case of fire, the damper blade in the compartment where the fire occurs opens and the damper blades in the remaining compartments are closed – the blades are operated remotely by supplying power.



mechanism	A	C	D	E	H	L
BF	198	10	75	80	$H > 300$	460
BFN	157	30	75	72	$270 < H \leq 300$	360
BFL	138	30	75	68	$200 \leq H \leq 270$	310

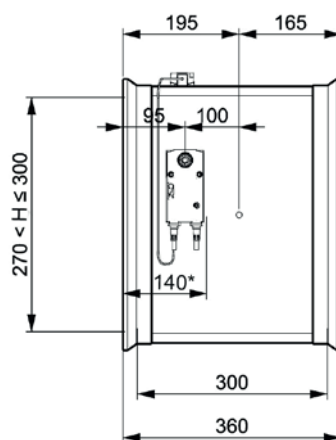
7.4 | Dimensions

» $200 \leq H \leq 270$

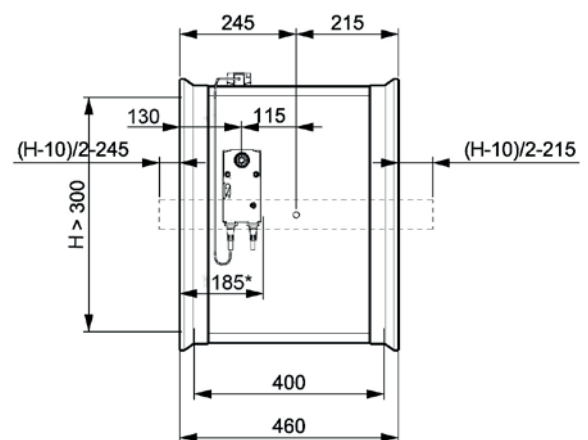


*embedding border

» $270 < H \leq 300$



» $H > 300$



dimensions in [mm]

Rectangular dampers

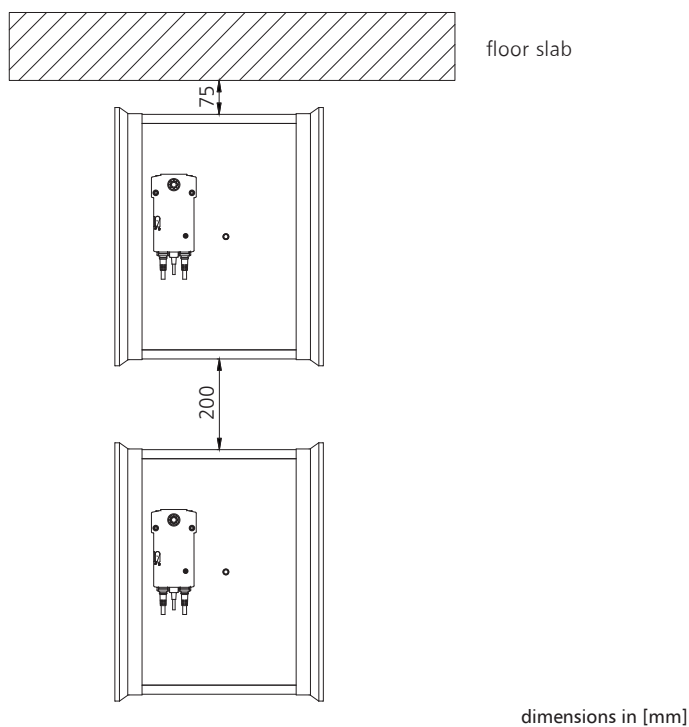
» nominal width B: from 200 mm to 1000 mm

» nominal height H: from 200 mm to 800 mm

» maximum single damper cross-section surface up to 0.73 m²

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

7.4.1 | Minimum distance between systems and partitions

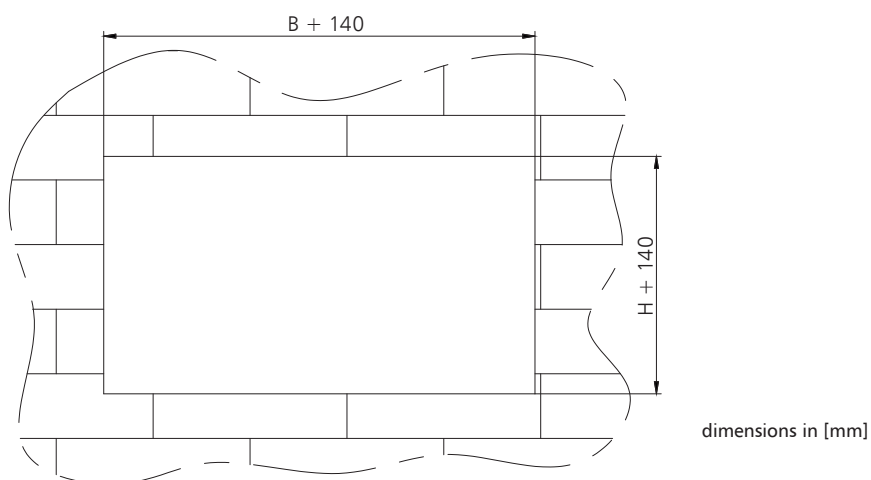


7.5 | Installation

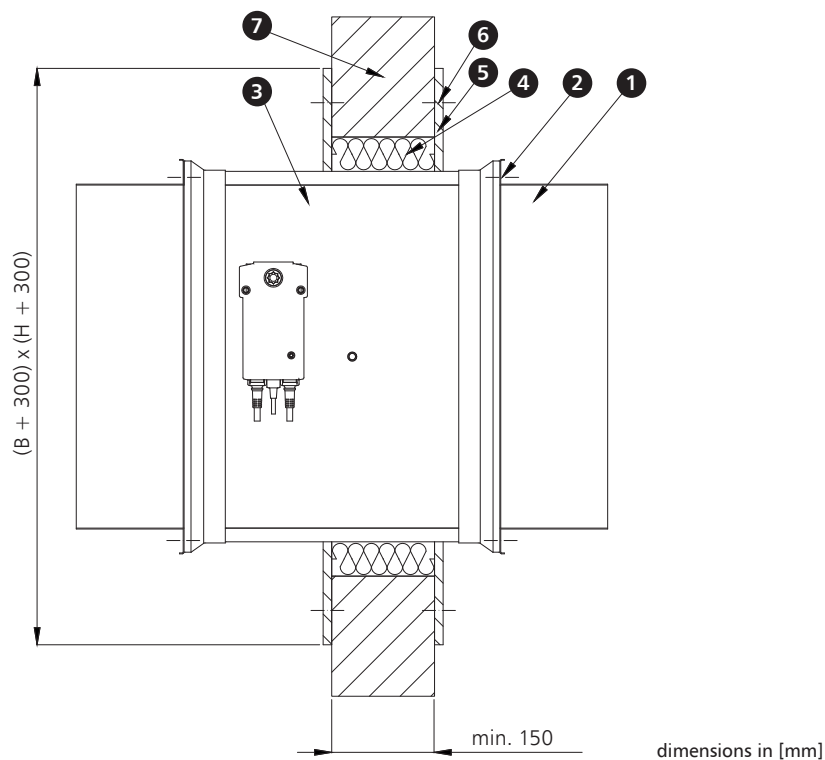
mcr FID 240 rectangular dampers are rated EI240(v_e i $\leftrightarrow$ o)S. Dampers may be installed in concrete partitions with thickness of at least 150 mm, partitions made of full bricks or aerated concrete blocks with a thickness of at least 150 mm and the resistance rating no lesser than EI240.

7.5.1 | Installation damper mcr FID 240

» preferred opening



7.5.2 | Sample installation in brick and concrete walls



- 1. ventilation duct
- 2. ST4.2 x 16 sheet metal screw
- 3. mcr FID 240 BxH fire damper
- 4. Sealing – mineral wool*

- 5. Gypsum board trim along the entire length of the BxH side
- 6. Installation anchor
- 7. Wall

* The recommended installation of the damper in a dry system is based on wool of min. 140 kg / m³ and a thickness of 50 mm with A1 non-flammability class. The manufacturer allows the use of other materials with parameters that confirm and ensure the appropriate class of fire resistance for the applied method of assembly.

7.6 | mcr FID 240 rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		200					250					300				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.040	0.022	317	11	0.050	0.031	450	9	31	0.06	0.041	583	8	31
		6			475	24			675	21	41			875	19	41
		8			634	43			900	37	49			1 166	33	49
		10			792	67			1 125	58	55			1 458	52	54
	250	4	0.050	0.028	407	11	0.063	0.040	576	9	32	0.075	0.052	745	8	32
		6			610	24			864	21	43			1 118	19	42
		8			814	42			1 152	37	50			1 490	33	50
		10			1 017	66			1 440	58	56			1 863	52	56
	300	4	0.060	0.035	497	11	0.000	0.049	702	9	33	0.09	0.063	907	8	33
		6			745	24			1 053	21	43			1 361	19	43
		8			994	42			1 404	37	51			1 814	33	51
		10			1 242	66			1 755	58	57			2 268	52	56
	350	4	0.070	0.041	587	10	0.088	0.058	828	9	34	0.105	0.074	1 069	8	32
		6			880	23			1 242	21	44			1 604	17	43
		8			1 174	41			1 656	37	52			2 138	31	50
		10			1 467	64			2 070	58	57			2 673	48	56
	400	4	0.080	0.047	677	10	0.100	0.066	954	8	33	0.12	0.086	1 231	8	33
		6			1 015	22			1 431	19	44			1 847	17	44
		8			1 354	40			1 908	34	51			2 462	31	51
		10			1 692	62			2 385	53	57			3 078	48	57
	450	4	0.090	0.053	767	10	0.113	0.075	1 080	8	34	0.135	0.097	1 393	8	34
		6			1 150	22			1 620	19	44			2 090	17	44
		8			1 534	40			2 160	34	52			2 786	31	52
		10			1 917	62			2 700	53	57			3 483	48	57
	500	4	0.100	0.060	857	11	0.125	0.084	1 206	8	34	0.15	0.108	1 555	8	34
		6			1 285	26			1 809	18	44			2 333	17	45
		8			1 714	46			2 412	32	52			3 110	31	52
		10			2 142	71			3 015	51	57			3 888	48	58
	550	4	0.110	0.066	947	10	0.138	0.093	1 332	7	33	0.165	0.119	1 717	7	34
		6			1 420	22			1 998	17	43			2 576	17	44
		8			1 894	40			2 664	29	51			3 434	29	52
		10			2 367	62			3 330	46	57			4 293	46	58
	600	4	0.120	0.072	1 037	10	0.150	0.101	1 458	7	33	0.18	0.131	1 879	6	32
		6			1 555	22			2 187	17	44			2 819	15	43
		8			2 074	40			2 916	29	51			3 758	26	51
		10			2 592	62			3 645	46	57			4 698	40	56
	650	4	0.130	0.078	1 127	10	0.163	0.110	1 584	7	33	0.195	0.142	2 041	7	35
		6			1 690	22			2 376	17	44			3 062	17	45
		8			2 254	40			3 168	29	52			4 082	29	53
		10			2 817	62			3 960	46	57			5 103	46	58
	700	4	0.140	0.085	1 217	10	0.175	0.119	1 710	7	34	0.21	0.153	2 203	7	35
		6			1 825	22			2 565	17	44			3 305	17	45
		8			2 434	38			3 420	29	52			4 406	29	53
		10			3 042	60			4 275	46	58			5 508	46	59

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

v – velocity [m/s]
 S_k – duct cross-section [m²]
 S_e – damper active cross-section [m²]

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

			height H [mm]															
			200						250					300				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	750	4	0.150	0.091	1 307	10	36	0.188	0.128	1 836	7	34	0.225	0.164	2 365	7	35	
		6			1 960	22	47			2 754	17	45			3 548	17	46	
		8			2 614	38	54			3 672	29	52			4 730	29	53	
		10			3 267	60	60			4 590	46	58			5 913	46	59	
	800	4	0.160	0.097	1 397	9	36	0.200	0.136	1 962	7	34	0.24	0.176	2 527	7	35	
		6			2 095	21	46			2 943	17	45			3 791	17	46	
		8			2 794	37	54			3 924	29	52			5 054	29	54	
		10			3 492	58	60			4 905	46	58			6 318	46	59	
	850	4	0.170	0.103	1 487	8	35	0.213	0.145	2 088	6	32	0.255	0.187	2 689	6	32	
		6			2 230	19	45			3 132	14	43			4 034	13	43	
		8			2 974	33	53			4 176	24	50			5 378	23	50	
		10			3 717	52	59			5 220	38	56			6 723	36	56	
	900	4	0.180	0.110	1 577	8	35	0.225	0.154	2 214	6	32	0.27	0.198	2 851	6	33	
		6			2 365	19	46			3 321	14	43			4 277	13	44	
		8			3 154	33	53			4 428	24	50			5 702	24	51	
		10			3 942	52	59			5 535	38	56			7 128	37	57	
	960	4	0.192	0.117	1 685	8	35	0.240	0.164	2 365	6	33	0.288	0.212	3 046	6	33	
		6			2 527	19	46			3 548	14	43			4 568	13	44	
		8			3 370	33	53			4 730	24	51			6 091	24	51	
		10			4 212	52	59			5 913	38	57			7 614	37	57	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		350					400					450				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	0.070	0.050	716	8	30	0.080	0.059	850	6	29	0.090	0.068	983	7	31
				1 075	17	41			1 274	15	40			1 474	17	42
				1 433	30	48			1 699	26	47			1 966	30	50
				1 791	47	54			2 124	40	53			2 457	46	55
	250	0.088	0.064	914	7	30	0.100	0.075	1 084	6	30	0.113	0.087	1 253	7	33
				1 372	15	40			1 625	15	41			1 879	17	43
				1 829	27	48			2 167	26	48			2 506	30	51
				2 286	41	54			2 709	40	54			3 132	46	56
	300	0.105	0.077	1 112	7	31	0.120	0.092	1 318	6	31	0.135	0.106	1 523	7	33
				1 669	15	41			1 976	15	41			2 284	16	44
				2 225	27	49			2 635	26	49			3 046	29	51
				2 781	41	54			3 294	40	55			3 807	45	57
	350	0.123	0.091	1 310	7	31	0.140	0.108	1 552	6	32	0.158	0.125	1 793	7	33
				1 966	15	42			2 327	15	42			2 689	16	44
				2 621	27	49			3 103	26	50			3 586	28	51
				3 276	41	55			3 879	40	55			4 482	44	57
	400	0.140	0.105	1 508	6	30	0.160	0.124	1 786	6	31	0.180	0.143	2 063	7	34
				2 263	13	41			2 678	13	42			3 094	15	44
				3 017	24	48			3 571	24	49			4 126	27	52
				3 771	37	54			4 464	37	55			5 157	42	57
	450	0.158	0.119	1 706	7	33	0.180	0.140	2 020	6	32	0.203	0.162	2 333	6	32
				2 560	15	43			3 029	13	42			3 499	13	43
				3 413	27	51			4 039	24	50			4 666	24	50
				4 266	43	57			5 049	37	55			5 832	37	56
	500	0.175	0.132	1 904	6	33	0.200	0.157	2 254	6	31	0.225	0.181	2 603	6	32
				2 857	15	43			3 380	12	42			3 904	12	42
				3 809	26	51			4 507	22	49			5 206	22	50
				4 761	40	56			5 634	35	55			6 507	34	56
	550	0.193	0.146	2 300	6	33	0.220	0.173	2 488	5	30	0.248	0.200	2 873	6	32
				3 451	15	44			3 731	11	40			4 309	12	43
				4 601	26	51			4 975	19	48			5 746	22	50
				5 751	40	57			6 219	30	54			7 182	34	56
	600	0.210	0.160	2 300	5	31	0.240	0.189	2 722	5	30	0.270	0.218	3 143	6	33
				3 451	12	41			4 082	9	39			4 714	12	43
				4 601	21	49			5 443	16	46			6 286	22	51
				5 751	33	55			6 804	25	52			7 857	34	56
	650	0.228	0.174	2 498	5	31	0.260	0.205	2 956	4	28	0.293	0.237	3 413	5	31
				3 748	12	42			4 433	9	39			5 119	10	41
				4 997	21	49			5 911	16	46			6 826	19	49
				6 246	33	55			7 389	25	52			8 532	29	55
	700	0.245	0.187	2 696	5	32	0.28	0.222	3 190	4	29	0.315	0.256	3 683	5	31
				4 045	12	42			4 784	9	39			5 524	10	42
				5 393	21	50			6 379	16	47			7 366	19	49
				6 741	33	55			7 974	25	53			9 207	29	55

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			350					400					450				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	750	4	0.263	0.201	2 894	5	31	0.3	0.238	3 424	4	29	0.338	0.275	3 953	5	31
		6			4 342	12	42			5 135	9	40			5 929	10	42
		8			5 789	21	49			6 847	16	47			7 906	19	50
		10			7 236	32	55			8 559	25	53			9 882	29	55
	800	4	0.280	0.215	3 092	5	32	0.32	0.254	3 658	4	29	0.360	0.293	4 223	5	31
		6			4 639	12	42			5 486	9	40			6 334	10	41
		8			6 185	21	50			7 315	16	47			8 446	19	49
		10			7 731	32	56			9 144	25	53			10 557	29	55
	850	4	0.298	0.229	3 290	5	32	0.34	0.270	3 892	5	32	0.383	0.312	4 493	5	31
		6			4 936	12	43			5 837	11	42			6 739	10	41
		8			6 581	21	50			7 783	19	50			8 986	19	49
		10			8 226	32	56			9 729	30	56			11 232	29	55
	900	4	0.315	0.242	3 488	6	34	0.360	0.287	4 126	7	37	0.405	0.331	4 763	5	31
		6			5 233	14	45			6 188	14	46			7 144	10	41
		8			6 977	24	52			8 251	30	56			9 526	19	49
		10			8 721	38	58			10 314	38	59			11 907	29	55
	1000	4	0.336	0.259	3 726	5	32	0.384	0.306	4 406	5	32	0.432	0.353	5 087	5	31
		6			5 589	11	42			6 610	11	43			7 630	10	41
		8			7 452	19	50			8 813	19	50			10 174	19	49
		10			9 315	30	55			11 016	30	56			12 717	29	55

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		500					550					600				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.1	0.078	1 116	6	0.110	0.087	1 249	6	0.120	0.096	1 382	6	0.120	0.096
		6			1 674	15			1 874	14			2 074	13		
		8			2 232	26			2 498	24			2 765	24		
		10			2 790	40			3 123	38			3 456	37		
	250	4	0.125	0.099	1 422	6	0.138	0.111	1 591	6	0.150	0.122	1 760	6	0.150	0.122
		6			2 133	15			2 387	14			2 641	13		
		8			2 844	26			3 182	24			3 521	24		
		10			3 555	40			3 978	38			4 401	37		
	300	4	0.15	0.120	1 728	6	0.165	0.134	1 933	6	0.180	0.149	2 138	6	0.180	0.149
		6			2 592	14			2 900	13			3 208	12		
		8			3 456	24			3 866	24			4 277	22		
		10			4 320	38			4 833	37			5 346	35		
	350	4	0.175	0.141	2 034	6	0.193	0.158	2 275	6	0.210	0.175	2 516	5	0.210	0.175
		6			3 051	13			3 413	13			3 775	12		
		8			4 068	24			4 550	24			5 033	21		
		10			5 085	37			5 688	37			6 291	33		
	400	4	0.2	0.163	2 340	6	0.220	0.182	2 617	5	0.240	0.201	2 894	5	0.240	0.201
		6			3 510	12			3 926	12			4 342	12		
		8			4 680	22			5 234	21			5 789	21		
		10			5 850	35			6 543	33			7 236	32		
	450	4	0.225	0.184	2 646	5	0.248	0.206	2 959	5	0.270	0.227	3 272	5	0.270	0.227
		6			3 969	11			4 439	11			4 909	11		
		8			5 292	19			5 918	19			6 545	19		
		10			6 615	30			7 398	30			8 181	30		
	500	4	0.250	0.205	2 952	4	0.275	0.229	3 301	4	0.300	0.254	3 650	4	0.300	0.254
		6			4 428	9			4 952	10			5 476	10		
		8			5 904	16			6 602	18			7 301	18		
		10			7 380	23			8 253	28			9 126	28		
	550	4	0.275	0.226	3 564	4	0.303	0.253	3 985	4	0.330	0.280	4 406	4	0.330	0.280
		6			5 346	9			5 978	9			6 610	9		
		8			7 128	15			7 970	16			8 813	16		
		10			8 910	24			9 963	25			11 016	25		
	600	4	0.3	0.248	3 564	4	0.330	0.277	3 985	4	0.360	0.306	4 406	4	0.360	0.306
		6			5 346	9			5 978	9			6 610	9		
		8			7 128	15			7 970	15			8 813	15		
		10			8 910	24			9 963	24			11 016	24		
	650	4	0.325	0.269	3 870	5	0.358	0.301	4 327	4	0.390	0.332	4 784	4	0.390	0.332
		6			5 805	10			6 491	9			7 177	9		
		8			7 740	19			8 654	15			9 569	15		
		10			9 675	24			10 818	24			11 961	24		
	700	4	0.350	0.290	4 176	4	0.385	0.324	4 669	4	0.420	0.359	5 162	4	0.420	0.359
		6			6 264	9			7 004	9			7 744	9		
		8			8 352	15			9 338	15			10 325	15		
		10			10 440	24			11 673	24			12 906	24		

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

v – velocity [m/s]
 S_k – duct cross-section [m²]
 S_e – damper active cross-section [m²]

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

			height H [mm]														
			500						550					600			
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	750	4	0.375	0.311	4 482	4	30	0.413	0.348	5 011	4	29	0.450	0.385	5 540	4	30
		6			6 723	9	40			7 517	8	40			8 311	8	40
		8			8 964	15	48			10 022	15	47			11 081	15	48
		10			11 205	24	53			12 528	23	53			13 851	23	54
	800	4	0.4	0.333	4 788	4	30	0.440	0.372	5 353	4	30	0.480	0.411	5 918	3	29
		6			7 182	9	40			8 030	8	40			8 878	7	39
		8			9 576	15	48			10 706	15	48			11 837	13	47
		10			11 970	24	53			13 383	23	54			14 796	21	53
	850	4	0.425	0.354	5 094	46	62	0.468	0.396	5 695	4	29	0.510	0.437	6 296	3	28
		6			7 641	104	72			8 543	8	40			9 445	7	39
		8			10 188	185	80			11 390	14	47			12 593	13	46
		10			12 735	289	86			14 238	22	53			15 741	20	52
	900	4	0.45	0.375	5 400	4	30	0.495	0.419	6 037	3	29	0.540	0.464	6 674	3	29
		6			8 100	9	40			9 056	7	39			10 012	7	36
		8			10 800	15	48			12 074	13	47			13 349	13	44
		10			13 500	24	53			15 093	21	53			16 686	20	49
	1000	4	0.48	0.401	5 767	4	29	0.528	0.448	6 037	3	28	0.576	0.495	7 128	3	28
		6			8 651	8	39			9 056	7	38			10 692	7	39
		8			11 534	15	47			12 074	12	46			14 256	12	46
		10			14 418	23	53			15 093	18	51			17 820	18	52

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		650					700					800				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.130	0.105	1 516	6	0.140	0.115	1 649	6	0.152	0.145	2 081	6	0.152	0.145
		6			2 273	13			2 473	13			3 121	13		
		8			3 031	23			3 298	23			4 162	23		
		10			3 789	36			4 122	36			5 202	36		
	250	4	0.163	0.134	1 930	6	0.175	0.146	2 099	6	0.190	0.181	2 601	6	0.190	0.181
		6			2 894	13			3 148	13			3 902	13		
		8			3 859	23			4 198	23			5 202	23		
		10			4 824	36			5 247	36			6 503	36		
	300	4	0.195	0.163	2 344	5	0.210	0.177	2 549	5	0.228	0.217	3 121	5	0.228	0.217
		6			3 515	12			3 823	12			4 682	12		
		8			4 687	21			5 098	21			6 242	21		
		10			5 859	33			6 372	32			7 803	32		
	350	4	0.228	0.192	2 758	5	0.245	0.208	2 999	5	0.266	0.253	3 641	5	0.266	0.253
		6			4 136	12			4 498	11			5 462	11		
		8			5 515	21			5 998	20			7 283	20		
		10			6 894	32			7 497	31			9 104	31		
	400	4	0.260	0.220	3 172	5	0.280	0.240	3 449	5	0.304	0.289	4 162	5	0.304	0.289
		6			4 757	12			5 173	11			6 242	11		
		8			6 343	21			6 898	20			8 323	20		
		10			7 929	32			8 622	31			10 404	31		
	450	4	0.293	0.249	3 586	5	0.315	0.271	3 899	4	0.342	0.325	4 682	4	0.342	0.325
		6			5 378	11			5 848	10			7 023	10		
		8			7 171	19			7 798	18			9 364	18		
		10			8 964	30			9 747	28			11 705	28		
	500	4	0.325	0.278	4 000	4	0.350	0.302	4 349	4	0.380	0.361	5 202	4	0.380	0.361
		6			5 999	10			6 523	10			7 803	10		
		8			7 999	18			8 698	17			10 404	17		
		10			9 999	28			10 872	26			13 005	26		
	550	4	0.358	0.307	4 828	4	0.385	0.333	4 799	4	0.418	0.397	5 722	4	0.418	0.397
		6			7 241	9			7 198	9			8 583	9		
		8			9 655	16			9 598	16			11 444	16		
		10			12 069	25			11 997	25			14 306	25		
	600	4	0.390	0.335	4 828	4	0.420	0.365	5 249	4	0.456	0.434	6 242	4	0.456	0.434
		6			7 241	9			7 873	9			9 364	9		
		8			9 655	15			10 498	15			12 485	15		
		10			12 069	24			13 122	24			15 606	24		
	650	4	0.423	0.364	5 242	4	0.455	0.396	5 699	4	0.494	0.470	6 763	4	0.494	0.470
		6			7 862	8			8 548	8			10 144	8		
		8			10 483	15			11 398	15			13 525	14		
		10			13 104	23			14 247	23			16 907	22		
	700	4	0.455	0.393	5 656	4	0.490	0.427	6 149	4	0.532	0.506	7 283	4	0.532	0.506
		6			8 483	8			9 223	8			10 924	8		
		8			11 311	15			12 298	15			14 566	14		
		10			14 139	23			15 372	23			18 207	22		

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

v – velocity [m/s]
 S_k – duct cross-section [m²]
 S_e – damper active cross-section [m²]

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

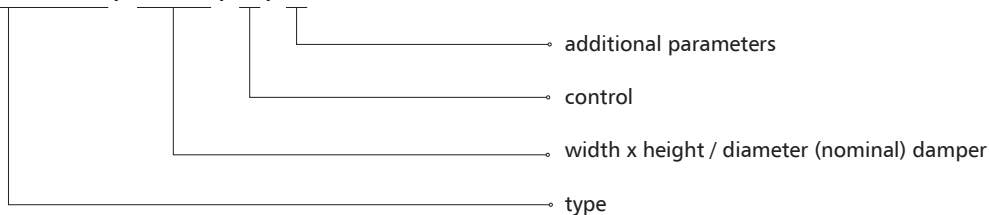
		height H [mm]														
		650					700					800				
width B [mm]	v [m/s]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]
750	4	0.488	0.422	6 070	4	30	0.525	0.458	6 599	4	31	0.570	0.542	7 803	4	31
	6			9 104	8	41			9 898	8	41			11 705	8	41
	8			12 139	15	48			13 198	15	49			15 606	14	49
	10			15 174	23	54			16 497	23	54			19 508	22	55
	4	0.520	0.450	6 484	3	29	0.560	0.490	7 049	5	31	0.608	0.578	8 323	3	30
	6			9 725	7	39			10 573	8	38			12 485	7	41
	8			12 967	13	47			14 098	13	44			16 646	13	48
	10			16 209	21	53			17 622	18	48			20 808	21	54
	4	0.553	0.479	6 898	3	27	0.595	0.521	7 499	3	28	0.646	0.614	8 843	3	29
	6			10 346	7	38			11 248	7	39			13 265	7	40
	8			13 795	12	45			14 998	12	46			17 687	12	47
	10			17 244	18	51			18 747	18	52			22 109	18	53
	4	0.585	0.508	7 312	3	27	0.630	0.552	7 949	3	29	0.684	0.650	9 364	3	29
	6			10 967	7	38			11 923	7	39			14 045	7	40
	8			14 623	12	45			15 898	12	47			18 727	12	47
	10			18 279	18	51			19 872	18	52			23 409	18	53
	4	0.624	0.542	7 808	3	27	0.672	0.590	8 489	3	29	0.730	0.694	9 988	3	30
	6			11 713	7	38			12 733	7	39			14 982	7	40
	8			15 617	12	45			16 978	12	47			19 976	12	48
	10			19 521	18	51			21 222	18	53			24 970	18	53

7.7 | Estimated weight of the mcr FID 240 rectangular dampers [kg]

		width B [mm]														
		200	250	300	350	400	450	500	550	600	650	700	750	800	850	900
height H [mm]	200	10	11	12	13	14	15	16	17	18	20	21	22	23	24	25
	250	11	12	13	15	16	17	18	19	20	22	23	24	25	26	27
	300	12	13	15	16	17	19	20	21	22	24	25	26	27	29	30
	350	13	15	16	17	19	20	22	23	24	26	27	28	30	31	33
	400	14	16	17	19	20	22	23	25	26	28	29	31	32	34	35
	450	15	17	19	20	22	23	25	27	28	30	31	33	35	36	38
	500	16	18	20	22	23	25	27	28	30	32	34	35	37	39	41
	550	17	19	21	23	25	27	28	30	32	34	36	38	39	41	43
	600	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46
	650	20	22	24	26	28	30	32	34	36	38	40	42	44	46	48
700	700	21	23	25	27	29	31	34	36	38	40	42	45	47	49	51
	800	22	24	26	29	31	33	36	38	40	43	45	47	50	52	54

7.8 | Marking

mcr FID 240 / B x H / 1 / 2



1 - control:

» trigger and control mechanism, axial actuator

BF 24-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

BFL 24-T / BFL 24-SR-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

BFN 24-T / BFN 24-SR-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 - additional parameters :

» Thermoelectric and thermal triggers

[no symbol] – 72°C trigger

ZBAT95 – thermoelectric trigger for 95°C

NOTE: separate additional parameters entered with the “/” sign

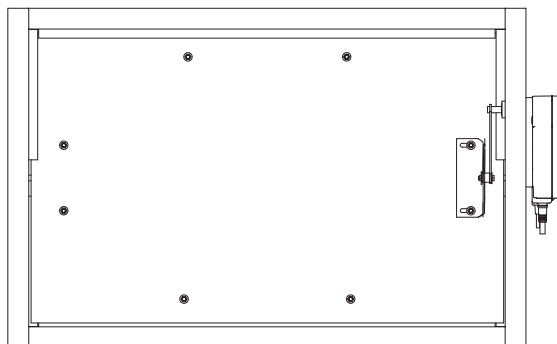
example marking:

mcr FID 240/S /500 x 600 /BFL 24-T

EIS240 cut-off damper with a 24 V actuator with limit switches.

7.8.1 | Design standard

» right damper - standard



Chapter 19 - power supply and control (p. 350) contains the following information:
 - technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.



downloadable models
on the website
under the designer zone tab



» **EIS120**

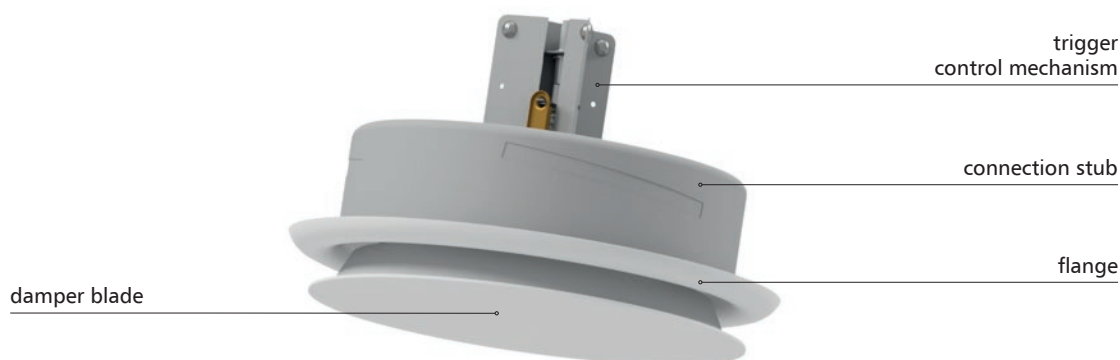
- » Fire resistance class: EI120 ($v_e h_o o \rightarrow i$)S, EI120 ($v_e i \rightarrow o$), EI180 ($v_e o \rightarrow i$)S.
- » Certificate of constancy of performance 1396-CPR-0092.
- » Valves certified for compliance with EN 15650.
- » Valves qualified under EN 13501-3 and tested under EN 1366-2.
- » Airflow adjustment function and cut-off damper in one device

8.1 | Application

The mcr ZIPP cut-off fire valves are designed for installation at the terminal points of general ventilation systems, where those systems pass through construction partitions. They are used to separate a 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, 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 egress routes from smoke, in which case they remain open during the fire and ensure a supply of fresh air to egress 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.

8.2 | Design



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

The connection stub is made of galvanized steel sheet. The valve flange is made of powder-painted steel sheets. The insulation blade of the valve is made of a material that provides fire protection, coated on the outside with powder-painted steel sheets. The blade is placed on a threaded, 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 means of thermal trigger tripping (RST trigger control mechanism),
- » remotely, by means of electromagnetic and thermal trigger tripping (RST+EK trigger control mechanism). As a standard, the valves are painted in RAL 9010.

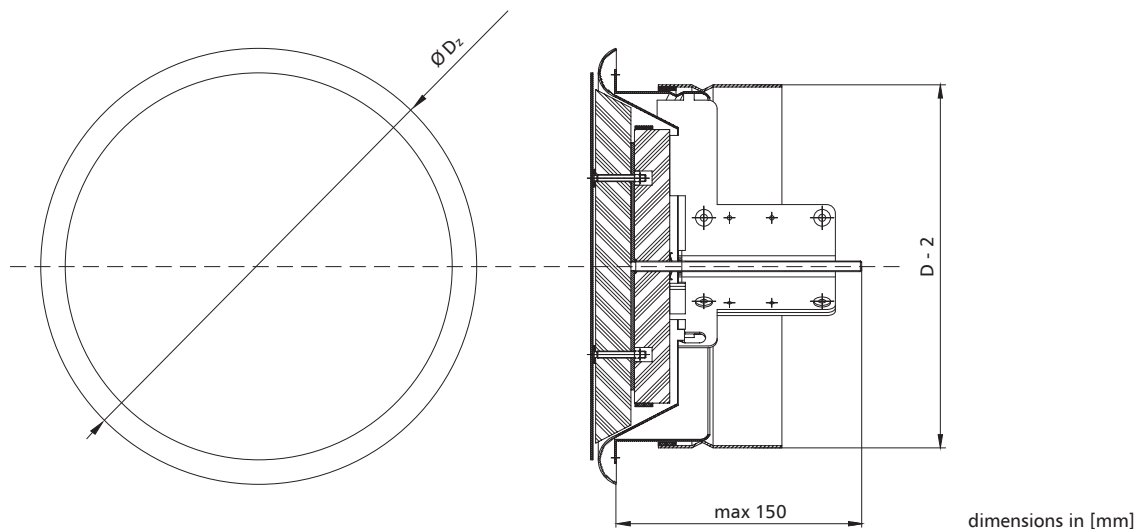
8.3 | Versions

8.3.1 | mcr ZIPP RST – 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.

mcr ZIPP RST valves are equipped with an RST trigger and control mechanism with a 74°C thermal trigger (it is possible to use a thermal trigger with the nominal tripping temperature of 95°C as an option) and drive spring. Once 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.

» closed valve blade

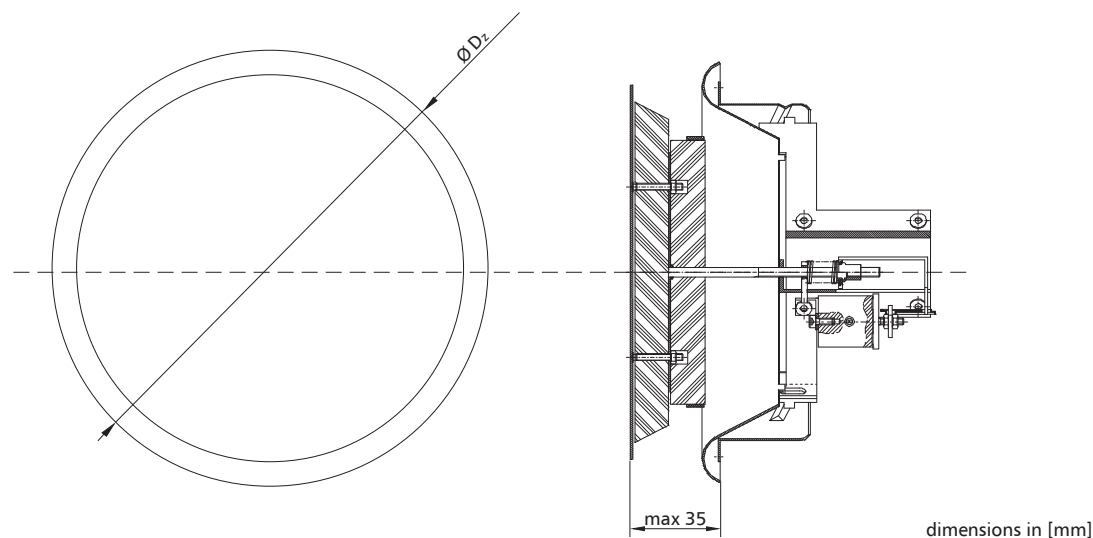


8.3.2 | mcr ZIPP RST+EK – cut-off fire valve for ventilation ducts with an electromagnetic and thermal trigger

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

mcr ZIPP RST+EK valves are equipped with a trigger control mechanism with a 74°C thermal trigger (optionally 95°C), a spring drive and an electromagnetic trigger tripped by the power supply application ("pulse") or removal ("break").

» open valve blade



8.4 | Dimensions

» Circular valves:

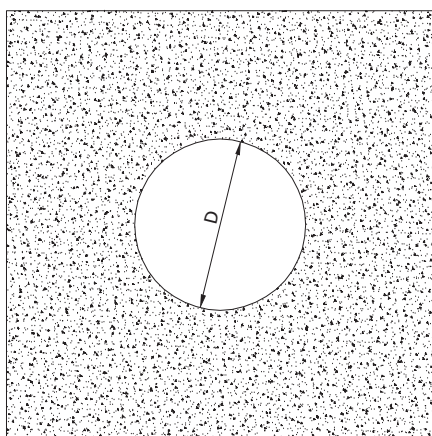
nominal diameter D: 100 mm, 125 mm, 160 mm, 200 mm.

8.5 | Installation

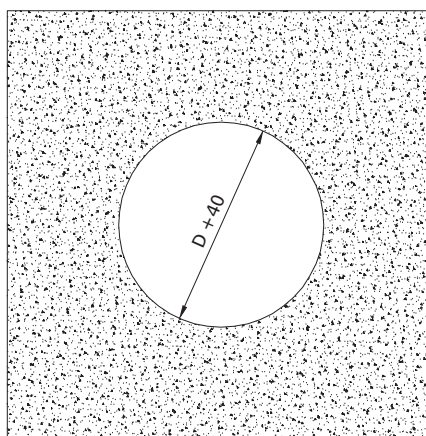
mcr ZIPP valves are rated EI120(v_e h_o o→i)S if installed in concrete partitions, partitions made of full bricks or aerated concrete blocks with a thickness of at least 110 mm, gypsum board light walls on a steel framework with a thickness of min. 125 mm and EI120 or higher fire rating, as well as concrete floor slabs with a thickness of at least 150 mm.

8.5.1 | Preparation of installation openings

» in light gypsum board walls – preferred opening



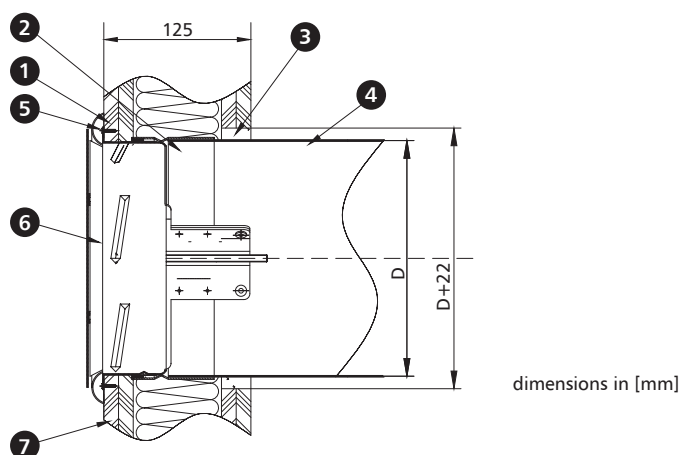
» in rigid walls and floor slabs – preferred opening



dimensions in [mm]

8.5.2 | Sample installation in gypsum board light walls on a steel framework

» duct installation



dimensions in [mm]

- 1. gypsum board
- 2. extension stub
- 3. assembly mortar*
- 4. ventilation duct

- 5. gypsum board screw
- 6. mcr ZIPP valve
- 7. gypsum board light wall

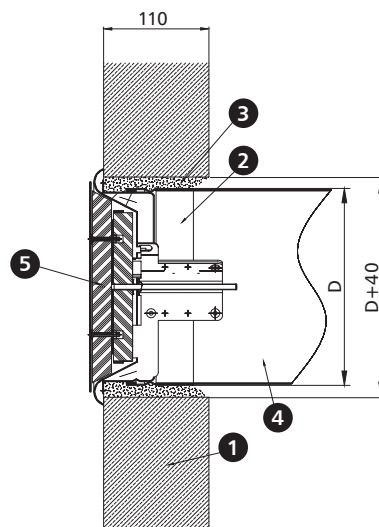
*it is possible to use a different filling that ensures the required fire resistance

8.5.3 | Sample installation in brick and concrete walls

» duct installation

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

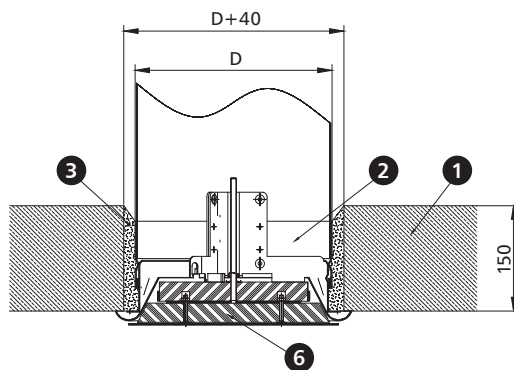
*it is possible to use a different filling that ensures the required fire resistance



dimensions in [mm]

8.5.4 | Sample installation in floor slabs

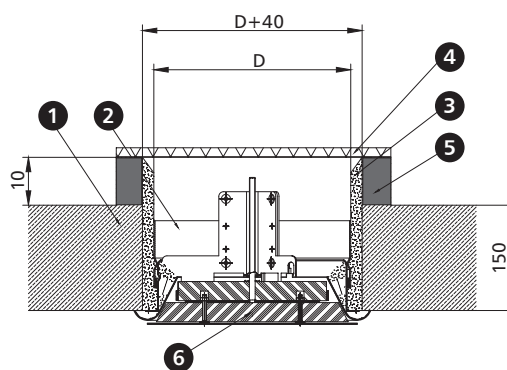
» duct installation



1. floor slab
2. extension stub
3. sealing - plaster or cement mortar*
4. masking grille (not included)
6. mcr ZIPP valve

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

» ductless installation



dimensions in [mm]

1. floor slab
2. extension stub
3. sealing - plaster or cement mortar*
4. masking grille (not included)
5. circumferential trim or masking grille with suitable height
6. mcr ZIPP valve

8.6 | mcr ZIPP valves technical parameters

S_e – valve active cross-section [m²]
 S_k – duct cross-section [m²]
 D – nominal diameter [mm]

diameter D [mm]	100	125	160	200
S_e	0,0027	0,0055	0,0111	0,0191
S_k	0,0079	0,0123	0,0201	0,0314

» Flow characteristics

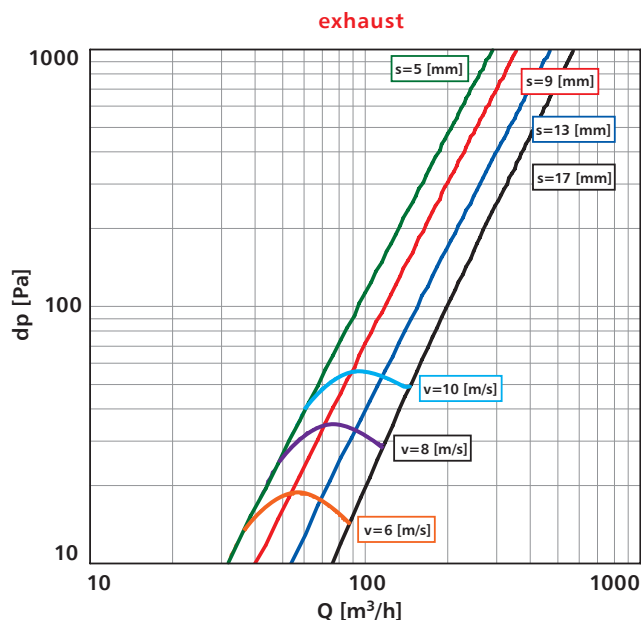
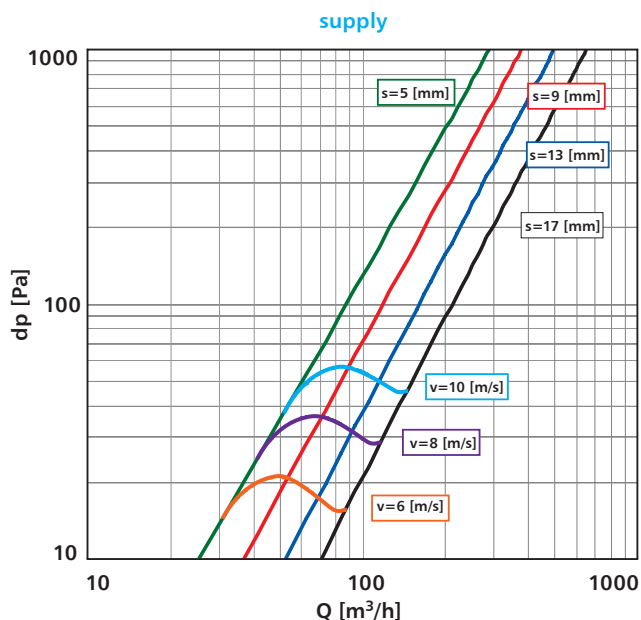
d_p – pressure drop [Pa]

s – valve opening [mm]

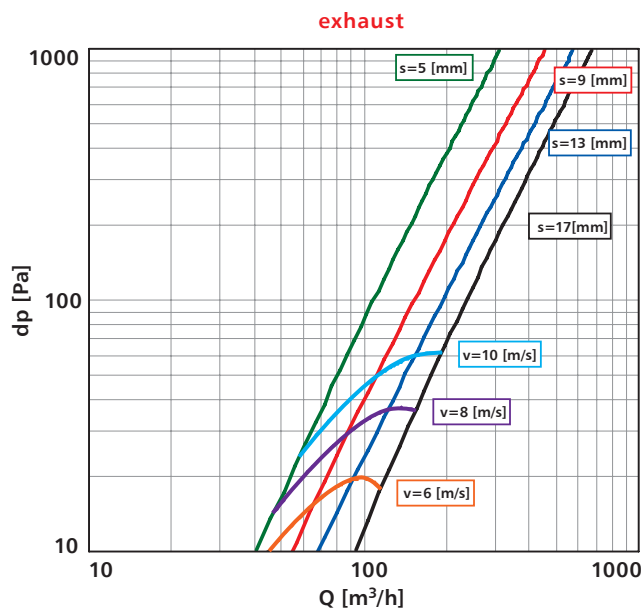
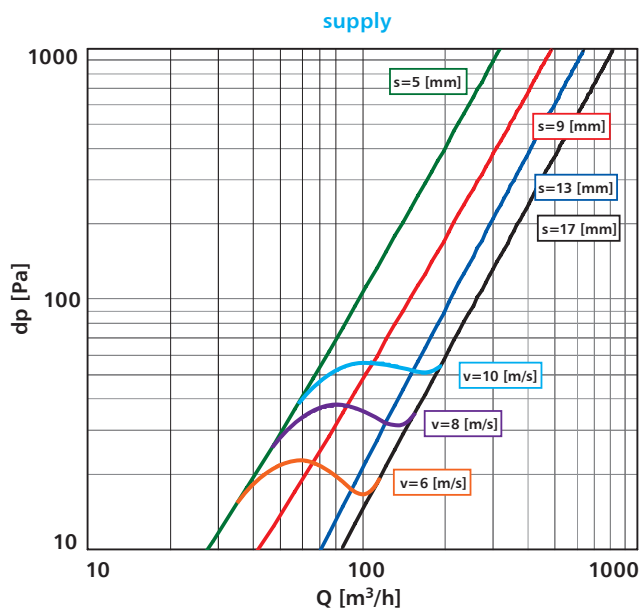
v – velocity [m/s]

Q – flow [m³/h]

» mcr ZIPP 100 flow characteristics



» mcr ZIPP 125 flow characteristics



» Flow characteristics

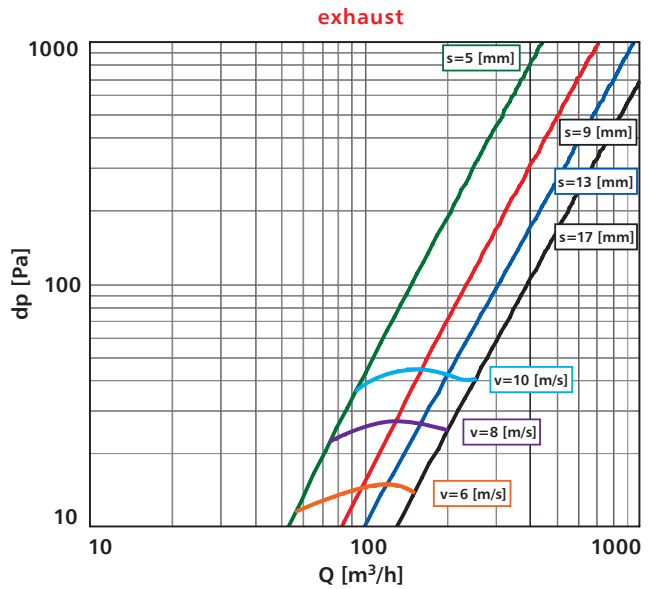
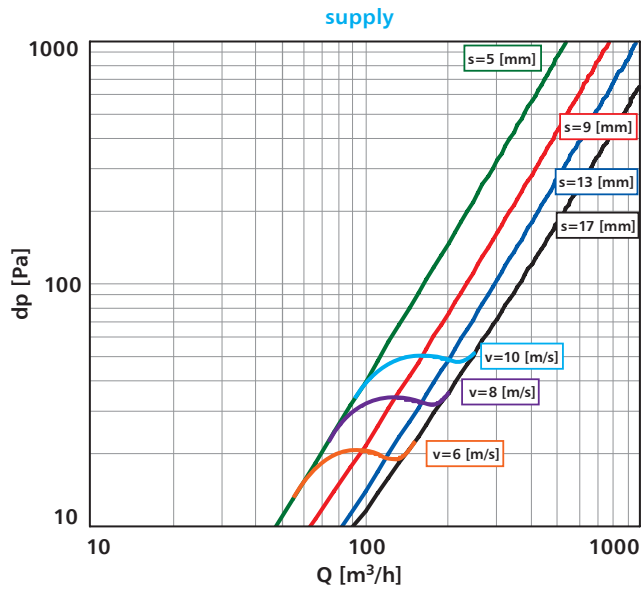
d_p – pressure drop [Pa]

s – valve opening [mm]

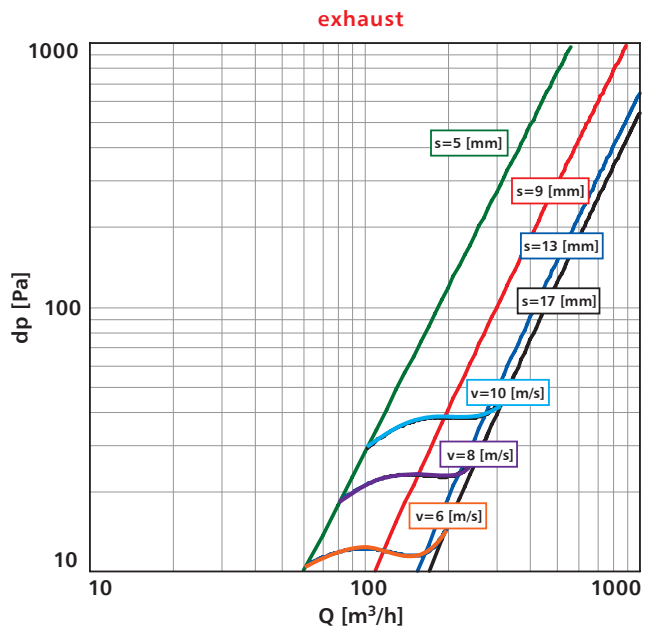
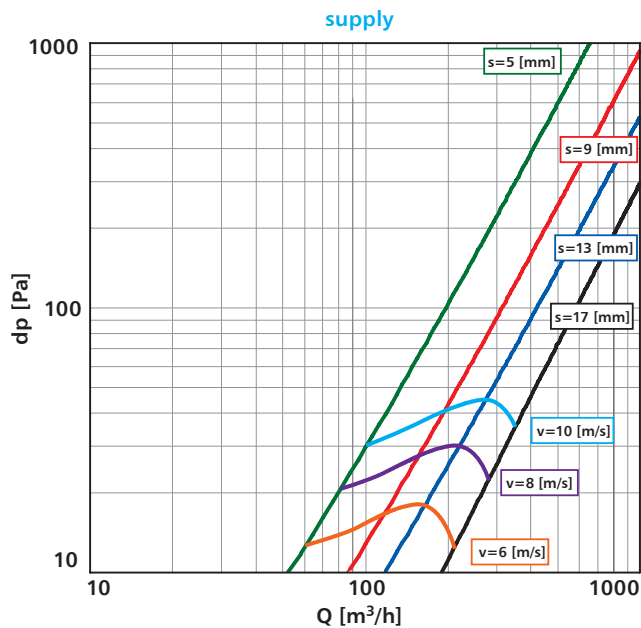
v – velocity [m/s]

Q – flow [m³/h]

» mcr ZIPP 160 flow characteristics



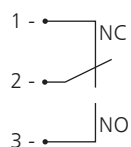
» mcr ZIPP 200 flow characteristics



8.7 | Trigger control mechanisms – specifications and connections diagram

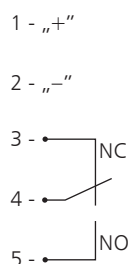
execution type	RST	RST+WK1	RST+EKI24+WK1	RST+EKI230+WK1	RST+EKP24+WK1	RST+EKP240+WK1
thermal trigger	+	+	+	+	+	+
limit switch	-	250 V AC / 5A	250 V AC / 5A	250 V AC / 5A	250 V AC / 5A	250 V AC / 5A
rated voltage	-	-	24 V DC / pulse	230V AC / pulse	24 V DC / break	230V AC / break
power consumption	-	-	3.5 W	3.5 W	1.8 W	1.8 W

» electrical connections diagram for the mcr ZIPP RST+WK1 valve



» electrical connections diagram for the mcr ZIPP RST+EKI valve or RST+EKP+WK1

»



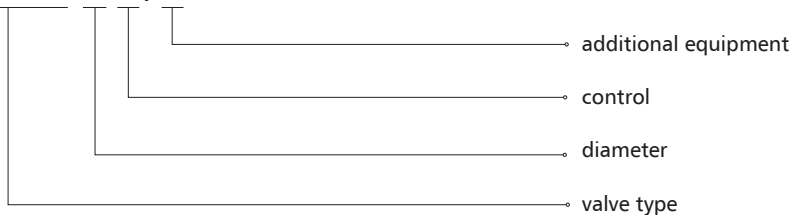
NOTE: the position of limit switch in standby (valve open)

8.8 | 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

8.9 | Marking

mcr ZIPP Ø 1 / 2



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

RST+EKI230 – thermal trigger + “pulse” electromagnetic trigger, U = 230 V AC

RST+EKP24 – thermal trigger + “break” electromagnetic trigger, U = 24 V DC

RST+EKP230 – thermal trigger + “break” electromagnetic trigger, U = 230 V AC

2 - additional equipment:

WK1 – limit switch (closed blade signal)

RMK – extension stub

T95 – thermal trigger for 95°C

NOTE: separate additional equipment entered with the “/” sign

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 + WK1

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.

Chapter 19 - power supply and control (p. 350) contains the following information:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.



downloadable models
on the website
under the designer zone tab



HYGIENIC CERTIFICATE



» **EIS60, ES120**

- » Fire resistance class: EI60 ($v_e i \leftrightarrow o$)S, E120 ($v_e i \leftrightarrow o$)S.
- » Certificate of constancy of performance 1396-CPR-0097.
- » Dampers certified for compliance with EN 15650.
- » Dampers qualified under EN 13501-3 and tested under EN 1366-2.
- » Narrow louvered cut-off dampers.

9.1 | Application

mcr WIP/S multi-blade cut-off dampers are designed for use in general ventilation systems, where those systems pass through construction partitions mcr WIP/S fire dampers are intended for use especially in systems, where the components such as a silencer, bend or supply and extract grille are installed downstream of the fire damper, as the partition does not protrude beyond the damper casing.

During a fire, they preserve the fire resistance rating of the construction partition that the ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and fire gasses to the remaining part of the building which is not on fire. During normal system operation, the louvers are open. In case of fire, the louver closes. Admissible flow velocity in the connected duct is 12 m/s.

In the version designed for explosion hazard zones (EX version), the dampers can be operated in gas explosion hazard zone 1 inside and outside ventilation ducts and in dust explosion hazard zone 21 outside these ducts. The dampers have been certified in compliance with the ATEX directive 94/9/EC and meet the requirements of group II category 2G and -/2D:

- » II 2G Ex h IIC T6 Gb
- » II -/2D Ex h IIIC T72° -/Db

Ambient temperature: T_a : -20° ... +50°C

9.2 | Design

casing

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

casing made
of non-flammable panels

louvers (damper blade)



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

The louver surface is covered with galvanized or stainless steel sheets. Each louver with a thickness of 15 mm is filled with a plaster board with fire protection properties. The damper blades revolve on their own axes, which consist of two steel pins.

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 a square with a circular "bare end" connection.

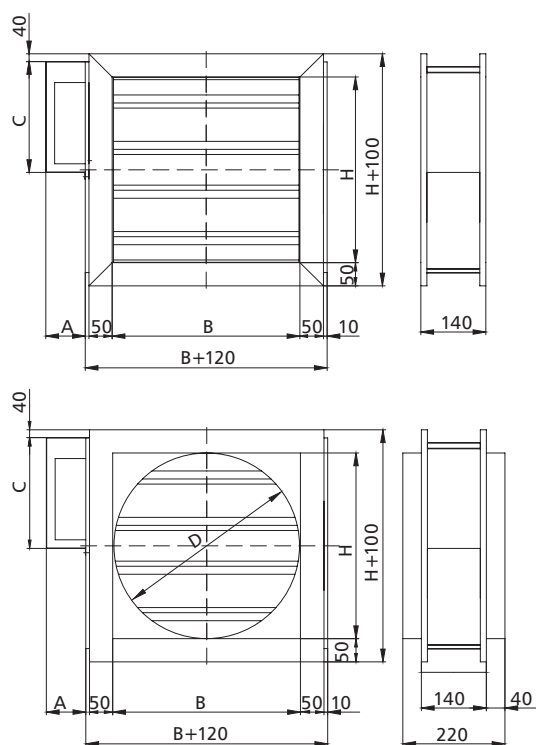
9.3 | Versions

9.3.1 | Damper closing and opening with an actuator

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

The mcr WIP/S dampers are equipped with a trigger control mechanism in the form of BFL, BFN, BF, BF-TL, QT.Ex, MLF, MF series axial actuator with a return spring, supplied with 24 V AC/DC or 230 V AC, with a 72°C thermoelectric trigger (optionally it is possible to use triggers with the nominal tripping temperature of 95°C). Actuators are equipped with limit switches used to monitor the position of the louver.

Dampers with actuators: analog BFL, BFN, BF, MLF, MF, digital BF-TL, QT.Ex explosion-proof actuators close as a result of the thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when power supply voltage is applied to the actuator terminals.



dimensions in [mm]

insert symmetrically against the wall axis

mechanism	A	C
BFN/MLF	125	325
BFL	125	275
BF/MF	125	325
BF24TL-ST	125	275
QT.Ex	125	400

9.4 | Dimensions

Rectangular dampers:

- » nominal width B: from 120 mm to 1000 mm
- » nominal height H from 160 mm to 1000 mm
- » maximum single damper cross-section surface up to 1 m².

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 1 mm increments within the given ranges). The exception are dampers whose height value falls within the 36-54 ranges, e.g. 136-154, 236-254... Square dampers may also be additionally equipped with round connection collars allowing for so called "bare end" connection to round ducts.

9.5 | Installation

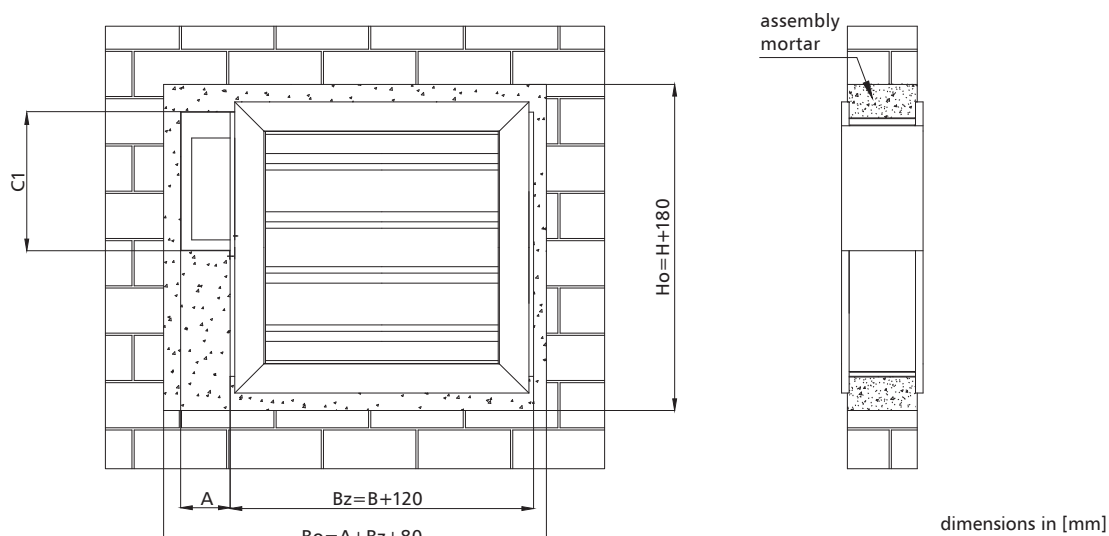
mcr WIP/S rectangular dampers are rated EI60(v_e i↔o)S and EI120(v_e i↔o)S if installed in concrete partitions with a thickness of at least 120 mm, partitions made of full bricks or aerated concrete blocks with a thickness of at least 120 mm.

9.5.1 | Preparation of installation openings

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

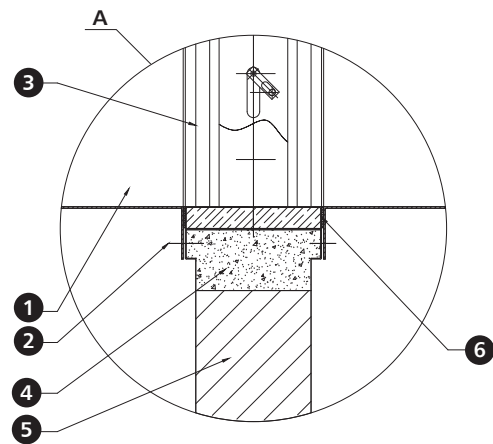
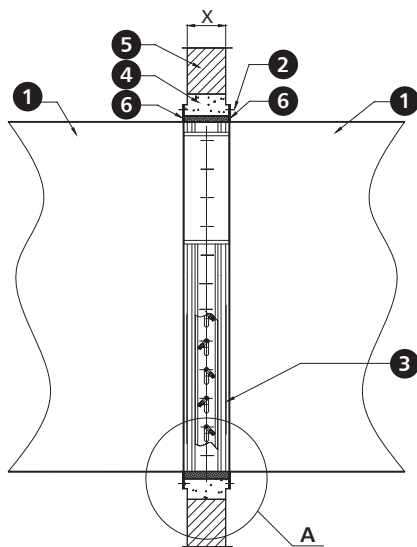
$$B_o = (A + B_z + 80) \text{ mm}$$

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



mechanism	BF	BFL	BFN	MF	MLF	QT.Ex
C1 [mm]	325	335	325	325	325	400
A [mm]	125	125	125	125	125	125

9.5.2 | Sample installation in concrete or masonry walls



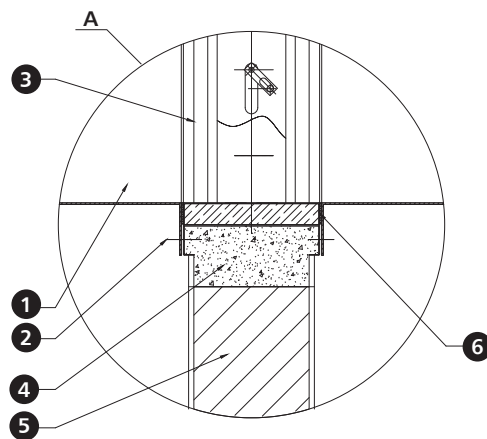
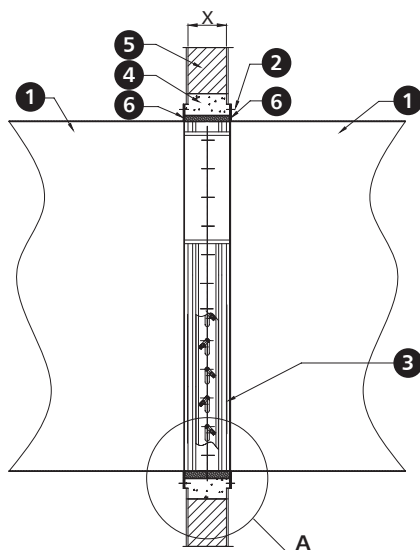
dimensions in [mm]

- 1. ventilation duct
- 2. ST4.2 x 16 sheet metal screw
- 3. mcr WIP/S fire damper
- 4. assembly mortar*
- 5. masonry wall

- 6. heat resistant gasket
- X. wall thickness

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

9.5.3 | Sample installation in concrete block or full brick walls



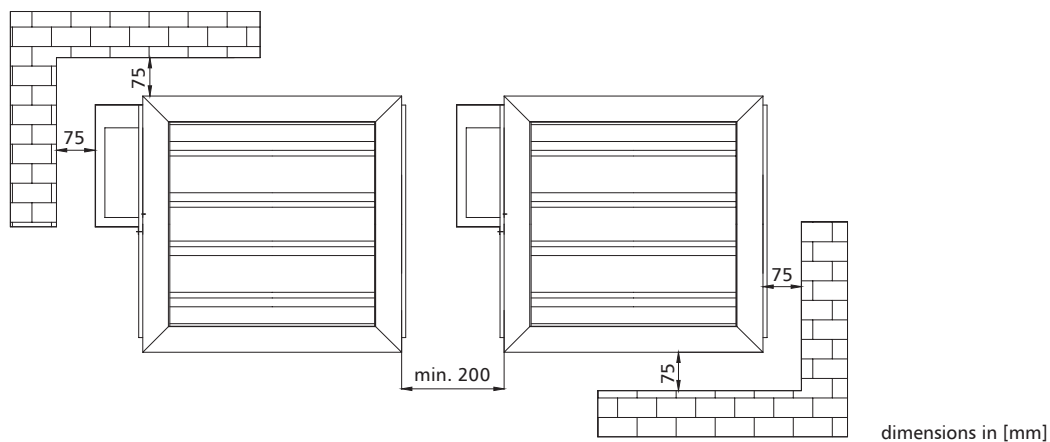
dimensions in [mm]

- 1. ventilation duct
- 2. ST4.2 x 16 sheet metal screw
- 3. mcr WIP/S fire damper
- 4. assembly mortar*
- 5. wall of concrete blocks or full bricks

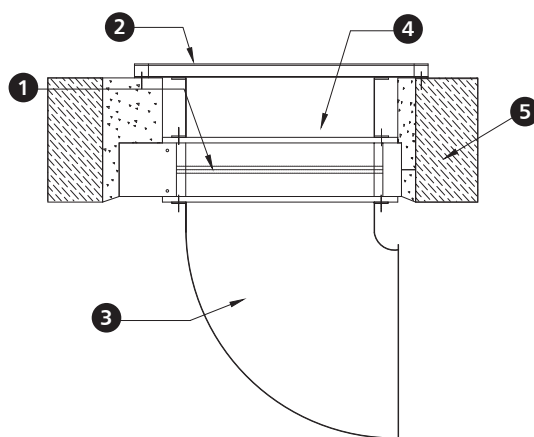
- 6. heat resistant gasket
- X. wall thickness

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

» Minimum distance between systems and partitions



» Example applications - installation with a masking element



- 1. mcr WIP/S fire damper
- 2. masking element
- 3. ventilation duct

- 4. duct - ventilation straight connection piece
- 5. wall, floor slab

If a mcr WIP/S damper is used, the application of louvers (no single-blade design) it is possible to use the space in front of and behind the damper for such system elements as a masking grille or a silencer with additional attenuation barrier or to route a duct along the wall using a duct bend or reduction.

9.6 | mcr WIP/S rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			200						250					300				
			S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	
width B [mm]	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	6	29	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		

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		350					400					450				
		S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]
width B [mm]	v [m/s]															
	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
	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
	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
	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
	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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	
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	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			500						550					600				
			S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	
width B [mm]	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		

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		650					700					750					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	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	

mcr WIP/S | Multi-blade cut-off fire dampers for comfort ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]																			
		800					850					900					1000				
	v	S _k	S _e	Q	d _p	L _{WA}	S _k	S _e	Q	d _p	L _{WA}	S _k	S _e	Q	d _p	L _{WA}	S _k	S _e	Q	d _p	L _{WA}
width B [mm]	[m/s]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]
200	4			1 958	5	29			2 081	5	29			2 203	5	29			2 448	5	29
	6			2 938	11	39			3 121	11	40			3 305	10	39			3 672	10	40
	8	0.160	0.136	3 917	19	47	0.170	0.145	4 162	19	47	0.180	0.153	4 406	19	47	0.200	0.170	4 896	19	47
	10			4 896	30	53			5 202	30	53			5 508	29	53			6 120	29	53
250	4			2 448	5	30			2 601	5	30			2 754	5	30			3 060	5	30
	6	0.200	0.170	3 672	11	40	0.213	0.181	3 902	11	41	0.225	0.191	4 131	10	40	0.250	0.213	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			2 938	5	31			3 121	5	31			3 305	5	31			3 672	5	31
	6	0.240	0.204	4 406	11	41	0.255	0.217	4 682	11	41	0.270	0.230	4 957	10	41	0.300	0.255	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			3 427	5	31			3 641	5	31			3 856	4	31			4 284	4	31
	6	0.280	0.238	5 141	10	41	0.298	0.253	5 462	10	42	0.315	0.268	5 783	10	41	0.350	0.298	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			3 917	5	31			4 162	5	32			4 406	4	31			4 896	4	32
	6	0.320	0.272	5 875	10	42	0.340	0.289	6 242	10	42	0.360	0.306	6 610	10	42	0.400	0.340	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			4 406	5	32			4 682	4	32			4 957	4	31			5 508	4	32
	6	0.360	0.306	6 610	10	42	0.383	0.325	7 023	10	42	0.405	0.344	7 436	10	42	0.450	0.383	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			4 896	5	32			5 202	4	32			5 508	4	32			6 120	4	32
	6	0.400	0.340	7 344	10	43	0.425	0.361	7 803	10	43	0.450	0.383	8 262	10	42	0.500	0.425	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			5 386	5	33			5 722	4	33			6 059	4	32			6 732	4	33
	6	0.440	0.374	8 078	10	43	0.468	0.397	8 583	10	43	0.495	0.421	9 088	10	43	0.550	0.468	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			5 875	5	33			6 242	4	33			6 610	4	33			7 344	4	33
	6	0.480	0.408	8 813	10	44	0.510	0.434	9 364	10	43	0.540	0.459	9 914	10	43	0.600	0.510	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			6 365	5	33			6 763	4	33			7 160	4	33			7 956	4	34
	6	0.520	0.442	9 547	10	44	0.553	0.470	10 144	10	44	0.585	0.497	10 741	10	44	0.650	0.553	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			6 854	4	33			7 283	4	33			7 711	4	33			8 568	4	33
	6	0.560	0.476	10 282	10	44	0.595	0.506	10 924	10	44	0.630	0.536	11 567	9	43	0.700	0.595	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			7 344	4	34			7 803	4	33			8 262	4	33			9 180	4	34
	6	0.600	0.510	11 016	10	44	0.638	0.542	11 705	10	44	0.675	0.574	12 393	9	44	0.750	0.638	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			7 834	4	34			8 323	4	34			8 813	4	33			9 792	4	34
	6	0.640	0.544	11 750	10	44	0.680	0.578	12 485	10	44	0.720	0.612	13 219	9	44	0.800	0.680	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			8 323	4	34			8 843	4	33			9 364	4	34			10 404	4	34
	6	0.680	0.578	12 485	10	44	0.723	0.614	13 265	9	44	0.765	0.650	14 045	9	44	0.850	0.723	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			8 813	4	34			9 364	4	34			9 914	4	34			11 016	4	34
	6	0.720	0.612	13 219	10	45	0.765	0.650	14 045	9	44	0.810	0.689	14 872	9	45	0.900	0.765	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			9 792	4	34			10 404	4	34			11 016	4	33			12 240	4	34
	6	0.800	0.680	14 688	9	44	0.850	0.723	15 606	9	44	0.900	0.765	16 524	9	44	1.000	0.850	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/S fire damper selection program is available at www.mercor.com.pl, in the Designer Zone.

9.7 | Estimated weights of mcr WIP/S dampers for rectangular ventilation 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

9.8 | Accessories

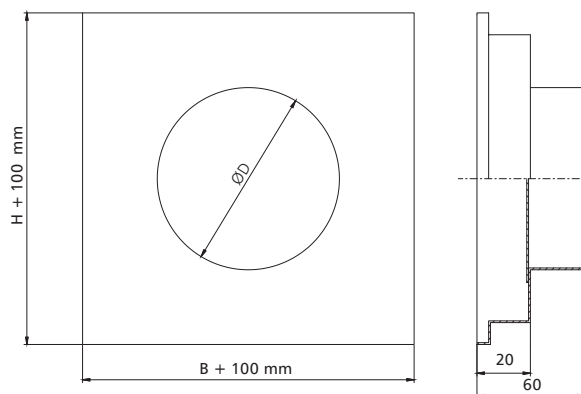
9.8.1 | mcr KRP connection stub

mcr KRP connection stubs are used to connect a circular ventilation duct to a rectangular damper. The connection is a „bare end“ pipe. The diameter of the stub pipe is 2 mm smaller than the diameter of the ventilation duct.

Dimensions:

BxH - damper dimensions [mm]

ØD - diameter of the connection duct [mm]



9.9 | Marking

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



1 - control:

» trigger and control mechanism – BF24-TN axial

BF24-TN – actuator with a return spring, U = 24 V AC/DC

BF230-TN – actuator with a return spring, U = 230 V AC

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

BF24-TN-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

MF24T – actuator with a return spring, U = 24 V AC/DC

MF230T – actuator with a return spring, U = 230 V AC

MLF24T – actuator with a return spring, U = 24 V AC/DC

MLF230T – actuator with a return spring, U = 230 V AC

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

QT.Ex 230-FT.Ex – explosion proof actuator with a return spring in the Ex version, U = 230 V AC/DC

2 - material

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

3 - additional parameters

» Thermoelectric and thermal triggers

[no symbol] – 72°C trigger
 ZBAT95 – thermoelectric trigger for 95°C
 T93-95 – thermal trigger for 95°C
 T2-95 (MLF/MF) – thermal trigger for 95°C
 FT.Ex-72 – thermoelectric trigger for 72°C
 FT.Ex-95 – thermoelectric trigger for 95°C

» Damper axis of rotation

[no symbol] – horizontal axis of rotation
 PP_D – vertical axis of rotation – mechanism at the bottom of the damper
 PP_G – vertical axis of rotation – mechanism at the top of the damper

» Design standard

[no symbol] – left damper
 KP – right damper

» Damper casing

BU – earth pin

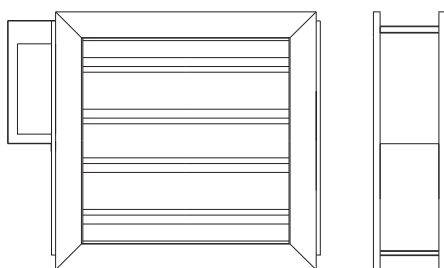
NOTE: separate additional parameters entered with the "/" sign

example marking:

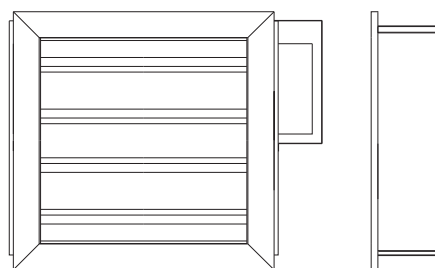
mcr WIP/S 400 x 400 BFL24-T
 EIS60 louvered cut-off damper with a 24 V actuator with limit switches.

9.9.1 | Design standard

» left damper standard



» right damper



reverse installation possible

Chapter 19 - power supply and control (p. 350) contains the following information:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.



downloadable models
on the website
under the designer zone tab



» **EI120, E120**

- » Fire resistance class: EI120 ($v_e i \leftrightarrow o$), E120 ($v_e i \leftrightarrow o$).
- » Certificate of constancy of performance 1396-CPR-0097.
- » Dampers qualified under EN 13501-2, EN 13501-3 and tested under EN 1366-2.
- » Louvered transfer damper.
- » Installation with a horizontal and vertical rotation axis.

10.1 | Application

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

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

In the version designed for explosion hazard zones (EX version), the dampers can be operated in gas explosion hazard zone 1 inside and outside ventilation ducts and in dust explosion hazard zone 21 outside these ducts. The dampers have been certified in compliance with the ATEX directive 94/9/EC and meet the requirements of group II category 2G and -/2D:

- » II 2G Ex h IIC T6 Gb
- » II -/2D Ex h IIIC T72° -/Db

Ambient temperature: T_a : -20° ... +50°C

10.2 | Design

casing

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

casing made
of non-flammable panels

louvers (damper blade)



mcr WIP/T transfer dampers consist of a casing with a rectangular cross section, a moving insulation blade in the form of multiple blades - louvers rotating on their axes and a trigger control mechanism which is tripped remotely or automatically by tripping a thermal trigger. The damper casing is made of galvanized steel sheets or stainless steel sheets. Its integral part is a flange made of boards with a fire resistance rating. The inner side of the fire damper casing is equipped with an intumescent gasket. The casing total length is 140 mm.

The louver surface is covered with galvanized or stainless steel sheets. Each louver with a thickness of 15 mm is filled with a plaster board. The damper blades revolve on their own axes, which consist of two steel pins. Transfer dampers must be protected with masking grilles.

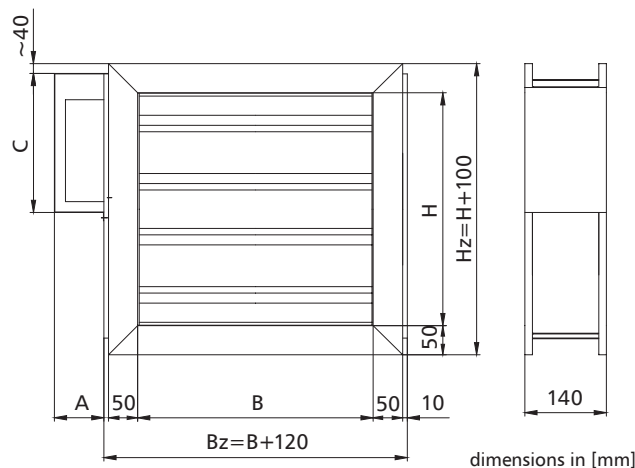
10.3 | Versions

10.3.1 | Damper closing and opening with an actuator

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

The mcr WIP/T dampers are equipped with a trigger control mechanism in the form of BFL, BFN, BF, BF-TL, QT.Ex, MF, MLF series axial actuator with a return spring, supplied with 24 V AC/DC or 230 V AC, with a 72°C thermoelectric trigger (optionally it is possible to use triggers with the nominal tripping temperature of 95°C).

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



mechanism	A	C
MF	125	325
MLF	125	325
BFN	125	325
BFL	125	275
BF	125	325
BF24TL-ST	125	325
QT.Ex	125	400

insert symmetrically against the wall axis

10.4 | Dimensions

» Rectangular dampers:

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

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 1 mm increments within the given ranges). The exception are dampers whose height value falls within the 36-54 ranges, e.g. 136-154, 236-254...

10.5 | Installation

mcr WIP/T rectangular dampers are rated EI120(v_e i↔o) / E120(v_e i↔o) if installed in concrete or reinforced concrete partitions with a thickness of at least 120 mm, partitions made of full bricks or concrete blocks with a thickness of at least 120 mm, masonry partitions made of perforated bricks or aerated concrete blocks with a thickness of at least 120 mm.

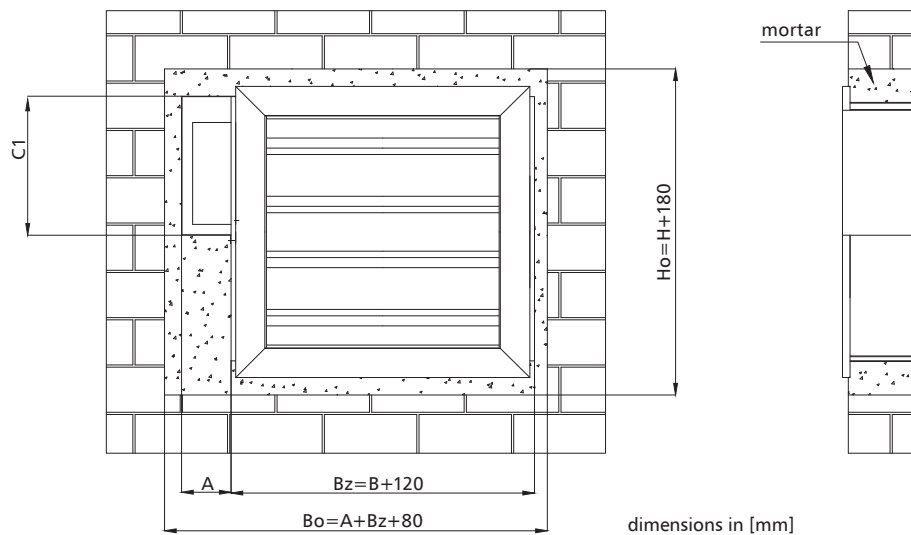
10.5.1 | Preparation of installation openings

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

Preferred

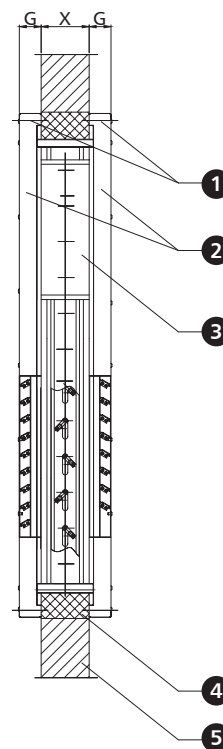
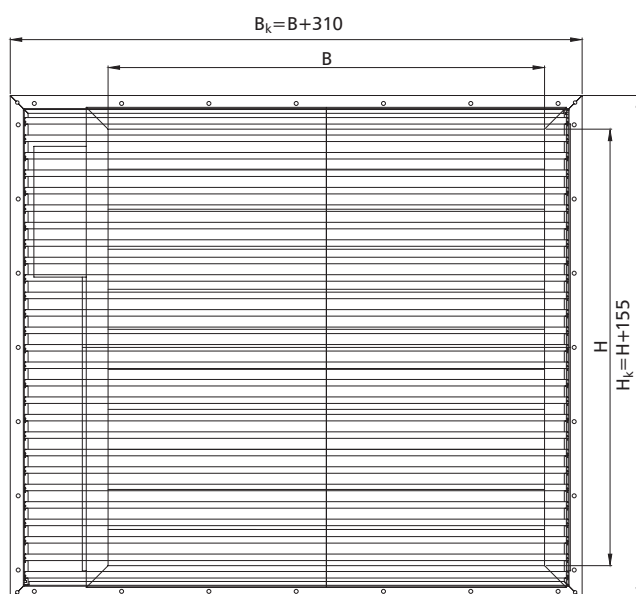
$$B_o = (A + B_z + 80) \text{ mm}$$

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



	BF	MF	MLF	BFL	BFN	QT.Ex
C1 [mm]	325	325	325	335	325	400
A [mm]	125	125	125	125	125	125

10.5.2 | Sample installation in concrete block or full brick walls



1. mounting pin
2. MST masking element
3. mcr WIP/T fire damper

4. assembly mortar*
5. e.g. masonry wall

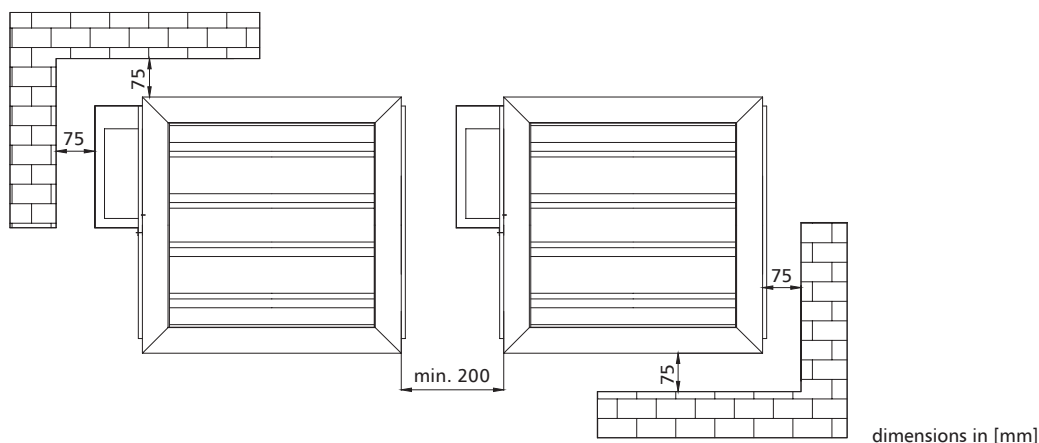
dimensions in [mm]

The thickness of the masking grille "G" is 50 mm for wall thickness up to 120 mm. For walls thicker than 120 mm the manufacturer allows masking grilles with a thickness of below 50 mm. For walls wider than the dampers' thickness, 30 mm masking grilles may be used. The system masking grille may be made of galvanized or stainless steel and painted in any RAL color (RAL 9010 as a standard).

» **Damper installation with a vertical louver rotation axis**

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

» **Minimum distance between systems and partitions**



10.5.3 | MST system masking grilles



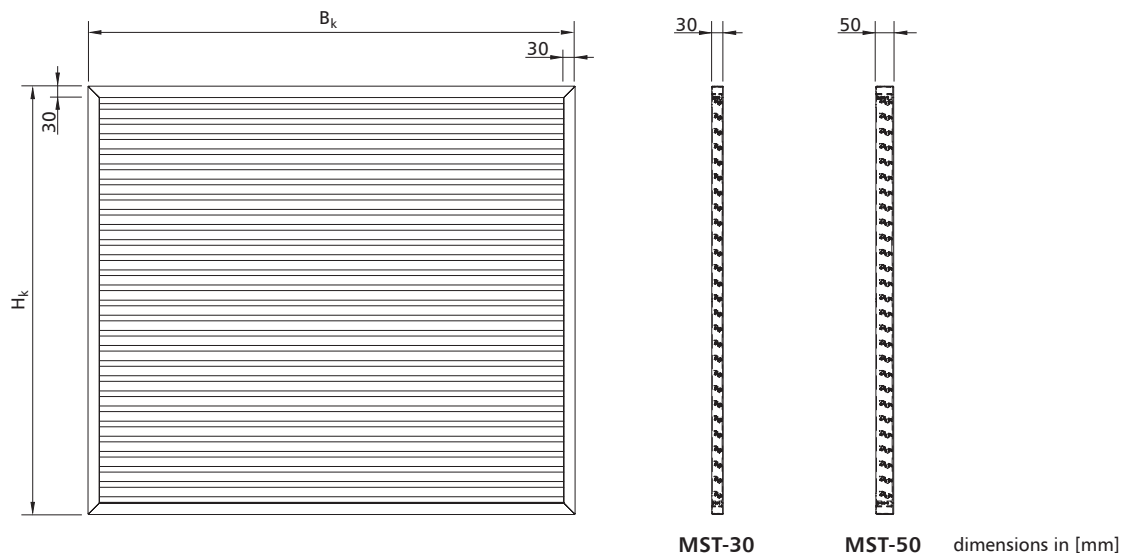
MST system masking grilles are designed to fulfill either supply or exhaust function. They enable the transfer of air through construction partitions. They come with fixed steel louvers with a 40 mm span, obscuring damper visibility.

Bolts embedded in the body are used to attach the masking grille body. After installation, an outer frame is mounted on the masking grille body so that the holes and bolts cannot be seen from the outside. Such a solution allows for installing the product even in the most visually-demanding applications. The masking grilles are painted in RAL 9010 as a standard (available in any colour from the RAL range on request).

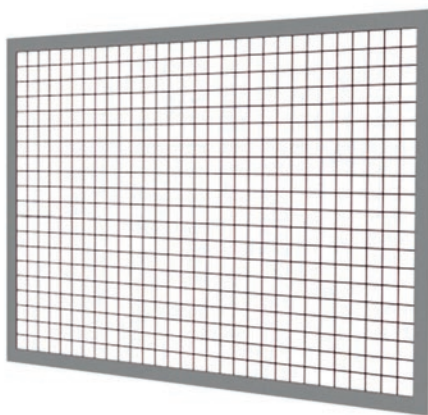
dimensions:

- » nominal width B_k : from 200 mm to 1500 mm
- » nominal height H_k from 200 mm to 1500 mm
- » nominal thickness G 30 and 50 mm

Apart from the standard dimensions, masking grilles may be manufactured with intermediate dimensions.



10.5.4 | MWP mesh cover

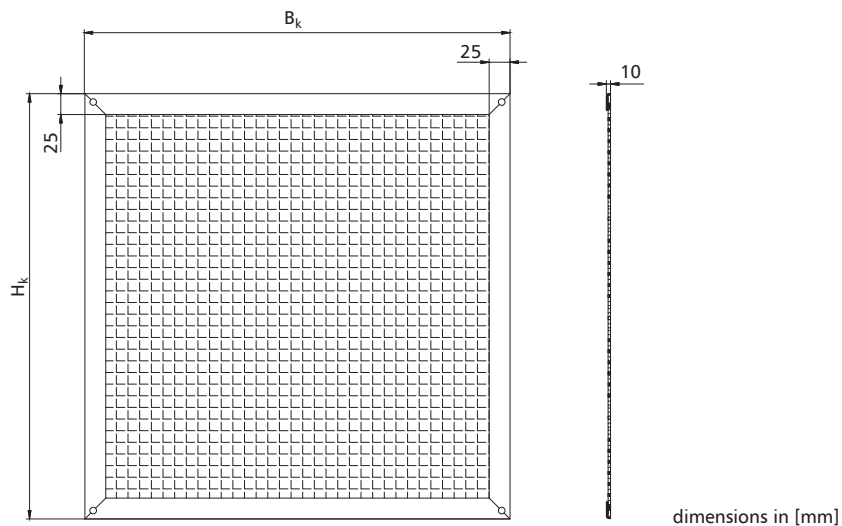


The MWP mesh cover may be supplied together with the damper by the damper manufacturer. System masking grilles, dedicated especially for commercial premises with high architectural and service requirements allows for covering the damper with any additional masking grille while fulfilling the fire rating requirements of the mcr WIP damper. With a wall thickness greater than 200 mm, system and non-system grilles can be applied directly to the wall.

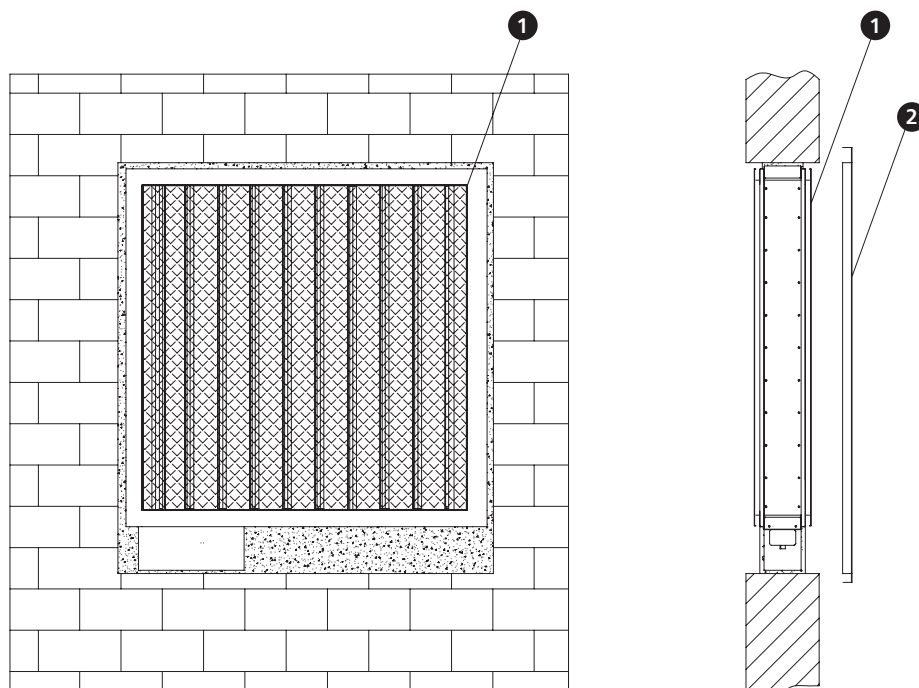
dimensions:

- » nominal width B_k : from 200 mm to 1100 mm
- » nominal height H_k from 200 mm to 1100 mm
- » nominal thickness 10 mm

Apart from the standard dimensions, masking grilles may be manufactured with intermediate dimensions.



» sample installation



1. MWP mesh cover
2. decorative grille (any, e.g. as indicated by the architect)

10.5.5 | MST masking grille technical parameters

B_k – nominal width [mm]
H_k – nominal height [mm]

v – velocity [m/s]
S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
d_p – pressure drop [Pa]

		height H _k [mm]												
		200			300			400			500			
		S _e [m²]	Q [m³/h]	d _p [Pa]	S _e [m²]	Q [m³/h]	d _p [Pa]	S _e [m²]	Q [m³/h]	d _p [Pa]	S _e [m²]	Q [m³/h]	d _p [Pa]	
width B _k [mm]	v [m/s]													
	200	4	0.015	210	12	0.028	403	10	0.041	596	9	0.055	789	9
		6		315	27		605	23		894	21		1 184	20
		8		420	49		806	41		1 192	37		1 578	35
		10		526	76		1 008	64		1 490	58		1 973	54
	300	4	0.028	402	10	0.051	734	8	0.074	1 067	7	0.097	1 400	7
		6		603	23		1 102	19		1 601	17		2 100	15
		8		804	41		1 469	33		2 134	29		2 799	27
		10		1 004	64		1 836	52		2 668	46		3 499	42
	400	4	0.041	593	9	0.074	1 066	7	0.107	1 538	6	0.140	2 010	6
		6		890	21		1 598	17		2 307	14		3 015	13
		8		1 187	37		2 131	29		3 076	26		4 020	23
		10		1 483	58		2 664	46		3 845	40		5 026	36
	500	4	0.055	785	9	0.097	1 397	7	0.140	2 009	6	0.182	2 621	5
		6		1 177	20		2 095	15		3 013	13		3 931	12
		8		1 570	35		2 794	27		4 018	23		5 242	21
		10		1 962	55		3 492	42		5 022	36		6 552	33
	600	4	0.068	976	8	0.120	1 728	6	0.172	2 480	5	0.224	3 231	5
		6		1 464	19		2 592	14		3 720	12		4 847	11
8		1 953		33	3 456		26	4 959		22	6 463		19	
10		2 441		52	4 320		40	6 199		34	8 078		30	
700	4	0.081	1 168	8	0.143	2 059	6	0.205	2 951	5	0.267	3 842	5	
	6		1 752	18		3 089	14		4 426	12		5 763	10	
	8		2 336	32		4 118	25		5 901	21		7 684	18	
	10		2 920	50		5 148	38		7 376	32		9 605	29	
800	4	0.094	1 359	8	0.166	2 390	6	0.238	3 421	5	0.309	4 452	4	
	6		2 039	18		3 586	13		5 132	11		6 679	10	
	8		2 719	31		4 781	24		6 843	20		8 905	17	
	10		3 398	49		5 976	37		8 554	31		11 131	27	
900	4	0.108	1 551	8	0.189	2 722	6	0.270	3 892	5	0.352	5 063	4	
	6		2 326	17		4 082	13		5 838	11		7 595	9	
	8		3 102	31		5 443	23		7 785	19		10 126	17	
	10		3 877	48		6 804	36		9 731	30		12 658	26	
1000	4	0.121	1 742	8	0.212	3 053	6	0.303	4 363	5	0.394	5 674	4	
	6		2 614	17		4 579	13		6 545	10		8 510	9	
	8		3 485	30		6 106	23		8 726	19		11 347	16	
	10		4 356	47		7 632	35		10 908	29		14 184	25	
1100	4	0.134	1 934	7	0.235	3 384	6	0.336	4 834	5	0.436	6 284	4	
	6		2 901	17		5 076	12		7 251	10		9 426	9	
	8		3 868	30		6 768	22		9 668	18		12 568	16	
	10		4 835	47		8 460	35		12 085	28		15 710	25	
1200	4	0.148	2 125	7	0.258	3 715	5	0.368	5 305	4	0.479	6 895	4	
	6		3 188	17		5 573	12		7 957	10		10 342	9	
	8		4 251	30		7 430	22		10 610	18		13 789	16	
	10		5 314	46		9 288	34		13 262	28		17 237	24	
1300	4	0.161	2 317	7	0.281	4 046	5	0.401	5 776	4	0.521	7 505	4	
	6		3 475	16		6 070	12		8 664	10		11 258	9	
	8		4 634	29		8 093	21		11 552	18		15 011	15	
	10		5 792	46		10 116	34		14 440	27		18 763	24	
1400	4	0.174	2 508	7	0.304	4 378	5	0.434	6 247	4	0.564	8 116	4	
	6		3 763	16		6 566	12		9 370	10		12 174	8	
	8		5 017	29		8 755	21		12 493	17		16 232	15	
	10		6 271	45		10 944	33		15 617	27		20 290	23	
1500	4	0.188	2 700	7	0.327	4 709	5	0.467	6 718	4	0.606	8 726	4	
	6		4 050	16		7 063	12		10 076	10		13 090	8	
	8		5 400	29		9 418	21		13 435	17		17 453	15	
	10		6 750	45		11 772	33		16 794	27		21 816	23	

B_k – nominal width [mm]
H_k – nominal height [mm]

v – velocity [m/s]
S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
d_p – pressure drop [Pa]

			height H _k [mm]											
			600			700			800			900		
			S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]
width B _k [mm]	200	4	982	8	0.082	1 175	8	0.095	1 368	8	0.108	1 558	8	
		6	1 473	19		1 763	18		2 052	18		2 337	17	
		8	1 964	33		2 350	32		2 736	31		3 116	31	
		10	2 455	52		2 938	50		3 420	49		3 895	48	
	300	4	1 732	6	0.143	2 065	6	0.167	2 398	6	0.189	2 726	6	
		6	2 598	14		3 097	14		3 596	13		4 089	13	
		8	3 465	25		4 130	24		4 795	24		5 452	23	
		10	4 331	40		5 162	38		5 994	37		6 815	36	
	400	4	2 483	5	0.205	2 955	5	0.238	3 427	5	0.270	3 894	5	
		6	3 724	12		4 432	12		5 141	11		5 841	11	
		8	4 965	22		5 910	21		6 854	20		7 788	19	
		10	6 206	34		7 387	32		8 568	31		9 734	30	
	500	4	3 233	5	0.267	3 845	5	0.310	4 457	4	0.352	5 062	4	
		6	4 849	11		5 767	10		6 685	10		7 592	9	
		8	6 466	19		7 690	18		8 914	17		10 123	17	
		10	8 082	30		9 612	28		11 142	27		12 654	26	
	600	4	3 983	4	0.329	4 735	4	0.381	5 486	4	0.433	6 229	4	
		6	5 975	10		7 102	9		8 230	9		9 344	9	
		8	7 966	18		9 469	17		10 973	16		12 459	15	
		10	9 958	28		11 837	26		13 716	25		15 574	24	
700	4	4 733	4	0.391	5 625	4	0.453	6 516	4	0.514	7 397	4		
	6	7 100	9		8 437	9		9 774	8		11 096	8		
	8	9 467	17		11 249	16		13 032	15		14 795	14		
	10	11 833	26		14 062	24		16 290	23		18 493	22		
800	4	5 484	4	0.452	6 515	4	0.524	7 546	3	0.595	8 565	3		
	6	8 225	9		9 772	8		11 318	8		12 848	8		
	8	10 967	16		13 029	15		15 091	14		17 130	13		
	10	13 709	25		16 286	23		18 864	22		21 413	21		
900	4	6 234	4	0.514	7 404	4	0.596	8 575	3	0.676	9 733	3		
	6	9 351	9		11 107	8		12 863	7		14 599	7		
	8	12 468	15		14 809	14		17 150	13		19 466	13		
	10	15 584	24		18 511	22		21 438	21		24 332	20		
1000	4	6 984	4	0.576	8 294	3	0.667	9 605	3	0.757	10 901	3		
	6	10 476	8		12 442	8		14 407	7		16 351	7		
	8	13 968	15		16 589	14		19 210	13		21 802	12		
	10	17 460	23		20 736	21		24 012	20		27 252	19		
1100	4	7 734	4	0.638	9 184	3	0.739	10 634	3	0.838	12 069	3		
	6	11 601	8		13 776	7		15 952	7		18 103	7		
	8	15 468	14		18 369	13		21 269	12		24 137	12		
	10	19 336	22		22 961	21		26 586	19		30 172	18		
1200	4	8 484	3	0.700	10 074	3	0.810	11 664	3	0.919	13 236	3		
	6	12 727	8		15 111	7		17 496	7		19 855	6		
	8	16 969	14		20 148	13		23 328	12		26 473	11		
	10	21 211	22		25 186	20		29 160	19		33 091	18		
1300	4	9 235	3	0.761	10 964	3	0.882	12 694	3	1.000	14 404	3		
	6	13 852	8		16 446	7		19 040	7		21 606	6		
	8	18 469	14		21 928	13		25 387	12		28 809	11		
	10	23 087	21		27 410	20		31 734	18		36 011	17		
1400	4	9 985	3	0.823	11 854	3	0.953	13 723	3	1.081	15 572	3		
	6	14 977	8		17 781	7		20 585	6		23 358	6		
	8	19 970	13		23 708	12		27 446	11		31 144	11		
	10	24 962	21		29 635	19		34 308	18		38 930	17		
1500	4	10 735	3	0.885	12 744	3	1.025	14 753	3	1.163	16 740	3		
	6	16 103	7		19 116	7		22 129	6		25 110	6		
	8	21 470	13		25 488	12		29 506	11		33 480	11		
	10	26 838	21		31 860	19		36 882	18		41 850	17		

B_k – nominal width [mm]
H_k – nominal height [mm]

v – velocity [m/s]
S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
d_p – pressure drop [Pa]

		height H _k [mm]											
		1000			1100			1200			1300		
		S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]
width B _k [mm]	200	4	1 751	8	0.135	1 944	7	0.148	2 137	7	0.162	2 330	7
		6	2 627	17		2 916	17		3 205	16		3 495	16
		8	3 502	30		3 888	30		4 274	29		4 660	29
		10	4 378	47		4 860	46		5 342	46		5 825	45
	300	4	3 059	6	0.236	3 391	5	0.259	3 724	5	0.282	4 056	5
		6	4 588	13		5 087	12		5 586	12		6 085	12
		8	6 117	22		6 782	22		7 448	22		8 113	21
		10	7 646	35		8 478	34		9 310	34		10 141	33
	400	4	4 366	5	0.336	4 838	5	0.369	5 311	4	0.402	5 783	4
		6	6 549	10		7 258	10		7 966	10		8 675	10
		8	8 732	19		9 677	18		10 621	18		11 566	17
		10	10 915	29		12 096	28		13 277	28		14 458	27
	500	4	5 674	4	0.437	6 286	4	0.479	6 898	4	0.522	7 510	4
		6	8 510	9		9 428	9		10 346	9		11 264	9
		8	11 347	16		12 571	16		13 795	15		15 019	15
		10	14 184	25		15 714	25		17 244	24		18 774	24
	600	4	6 981	4	0.537	7 733	4	0.589	8 484	3	0.641	9 236	3
		6	10 472	8		11 599	8		12 727	8		13 854	8
		8	13 962	15		15 466	14		16 969	14		18 472	14
		10	17 453	23		19 332	22		21 211	22		23 090	21
	700	4	8 289	3	0.638	9 180	3	0.699	10 071	3	0.761	10 963	3
		6	12 433	8		13 770	7		15 107	7		16 444	7
		8	16 577	14		18 360	13		20 143	13		21 925	13
		10	20 722	21		22 950	21		25 178	20		27 407	20
	800	4	9 596	3	0.738	10 627	3	0.810	11 658	3	0.881	12 689	3
		6	14 394	7		15 941	7		17 487	7		19 034	7
		8	19 192	13		21 254	12		23 316	12		25 379	12
		10	23 990	20		26 568	19		29 146	19		31 723	18
900	4	10 904	3	0.839	12 074	3	0.920	13 245	3	1.001	14 416	3	
	6	16 356	7		18 112	7		19 868	6		21 624	6	
	8	21 807	12		24 149	12		26 490	11		28 832	11	
	10	27 259	19		30 186	18		33 113	18		36 040	17	
1000	4	12 211	3	0.939	13 522	3	1.030	14 832	3	1.121	16 142	3	
	6	18 317	7		20 282	6		22 248	6		24 214	6	
	8	24 422	12		27 043	11		29 664	11		32 285	11	
	10	30 528	18		33 804	18		37 080	17		40 356	17	
1100	4	13 519	3	1.040	14 969	3	1.140	16 419	3	1.241	17 869	3	
	6	20 278	6		22 453	6		24 628	6		26 803	6	
	8	27 037	11		29 938	11		32 838	10		35 738	10	
	10	33 797	18		37 422	17		41 047	16		44 672	16	
1200	4	14 826	3	1.140	16 416	3	1.250	18 006	3	1.361	19 596	2	
	6	22 239	6		24 624	6		27 009	6		29 393	6	
	8	29 652	11		32 832	10		36 012	10		39 191	10	
	10	37 066	17		41 040	16		45 014	16		48 989	15	
1300	4	16 134	3	1.241	17 863	3	1.361	19 593	2	1.481	21 322	2	
	6	24 201	6		26 795	6		29 389	6		31 983	5	
	8	32 268	11		35 726	10		39 185	10		42 644	10	
	10	40 334	17		44 658	16		48 982	15		53 305	15	
1400	4	17 441	3	1.341	19 310	2	1.471	21 180	2	1.601	23 049	2	
	6	26 162	6		28 966	6		31 769	5		34 573	5	
	8	34 883	10		38 621	10		42 359	10		46 097	9	
	10	43 603	16		48 276	16		52 949	15		57 622	14	
1500	4	18 749	3	1.442	20 758	2	1.581	22 766	2	1.721	24 775	2	
	6	28 123	6		31 136	5		34 150	5		37 163	5	
	8	37 498	10		41 515	10		45 533	9		49 550	9	
	10	46 872	16		51 894	15		56 916	15		61 938	14	

B_k – nominal width [mm]
 H_k – nominal height [mm]

v – velocity [m/s]
 S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
 d_p – pressure drop [Pa]

		height H_k [mm]					
		1400			1500		
	v [m/s]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]
width B_k [mm]	200	4	2 523	7	0.175	2 716	7
		6	3 784	16		4 074	16
		8	5 046	29		5 432	29
		10	6 307	45		6 790	45
	300	4	4 389	5	0.305	4 722	5
		6	6 584	12		7 083	12
		8	8 778	21		9 444	21
		10	10 973	33		11 804	33
	400	4	6 255	4	0.434	6 728	4
		6	9 383	10		10 092	10
		8	12 511	17		13 455	17
		10	15 638	27		16 819	27
	500	4	8 122	4	0.564	8 734	4
		6	12 182	8		13 100	8
		8	16 243	15		17 467	15
		10	20 304	23		21 834	23
	600	4	9 988	3	0.694	10 740	3
		6	14 982	8		16 109	7
		8	19 976	13		21 479	13
		10	24 970	21		26 849	21
	700	4	11 854	3	0.823	12 745	3
		6	17 781	7		19 118	7
		8	23 708	12		25 491	12
		10	29 635	19		31 864	19
	800	4	13 720	3	0.953	14 751	3
		6	20 580	6		22 127	6
		8	27 441	11		29 503	11
		10	34 301	18		36 878	18
	900	4	15 587	3	1.082	16 757	3
		6	23 380	6		25 136	6
		8	31 173	11		33 515	11
		10	38 966	17		41 893	17
	1000	4	17 453	3	1.212	18 763	3
		6	26 179	6		28 145	6
		8	34 906	10		37 526	10
		10	43 632	16		46 908	16
	1100	4	19 319	2	1.342	20 769	2
		6	28 979	6		31 154	5
		8	38 638	10		41 538	10
		10	48 298	15		51 923	15
	1200	4	21 185	2	1.471	22 775	2
		6	31 778	5		34 163	5
		8	42 371	10		45 550	9
		10	52 963	15		56 938	15
	1300	4	23 052	2	1.601	24 781	2
		6	34 577	5		37 171	5
		8	46 103	9		49 562	9
		10	57 629	14		61 952	14
	1400	4	24 918	2	1.730	26 787	2
		6	37 377	5		40 180	5
		8	49 836	9		53 574	9
		10	62 294	14		66 967	14
	1500	4	26 784	2	1.860	28 793	2
		6	40 176	5		43 189	5
		8	53 568	9		57 586	9
		10	66 960	14		71 982	13

10.6 | mcr WIP/T rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		200					250					300					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	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	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		350					400					450					
		S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	
width B [mm]	v [m/s]	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	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			500					550					600				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	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	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		650					700					750					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	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	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

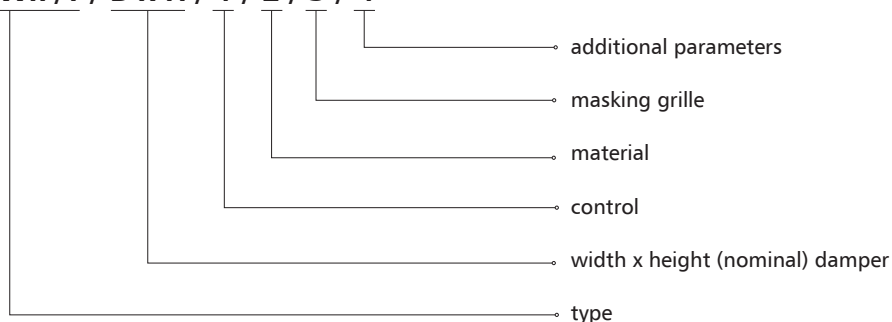
		height H [mm]																						
		800					850					900					1000							
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]		
width B [mm]	200	4	0.160	0.136	1 958	5	0.170	0.145	2 081	5	0.180	0.153	2 203	5	0.200	0.170	2 448	5	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	0.213	0.181	2 601	5	0.225	0.191	2 754	5	0.250	0.213	3 060	5	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	0.255	0.217	3 121	5	0.270	0.230	3 305	5	0.300	0.255	3 672	5	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	0.298	0.253	3 641	5	0.315	0.268	3 856	4	0.350	0.298	4 284	4	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	0.340	0.289	4 162	5	0.360	0.306	4 406	4	0.400	0.340	4 896	4	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	0.383	0.325	4 682	4	0.405	0.344	4 957	4	0.450	0.383	5 508	4	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	0.425	0.361	5 202	4	0.450	0.383	5 508	4	0.500	0.425	6 120	4	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	0.468	0.397	5 722	4	0.495	0.421	6 059	4	0.550	0.468	6 732	4	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	0.510	0.434	6 242	4	0.540	0.459	6 610	4	0.600	0.510	7 344	4	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	0.553	0.470	6 763	4	0.585	0.497	7 160	4	0.650	0.553	7 956	4	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	0.595	0.506	7 283	4	0.630	0.536	7 711	4	0.700	0.595	8 568	4	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	0.638	0.542	7 803	4	0.675	0.574	8 262	4	0.750	0.638	9 180	4	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	0.680	0.578	8 323	4	0.720	0.612	8 813	4	0.800	0.680	9 792	4	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	0.723	0.614	8 843	4	0.765	0.650	9 364	4	0.850	0.723	10 404	4	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	0.765	0.650	9 364	4	0.810	0.689	9 914	4	0.900	0.765	11 016	4	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	0.850	0.723	10 404	4	0.900	0.765	11 016	4	1.000	0.850	12 240	4	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	

10.7 | Estimated weights of mcr WIP/T 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

10.8 | Marking

mcr WIP/T / B x H / 1 / 2 / 3 / 4



1 - control:

» trigger control mechanism

- BF24-TN – actuator with a return spring, U = 24 V AC/DC
- BF230-TN – actuator with a return spring, U = 230 V AC
- BF24TL-TN-ST (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control
- BF24-TN-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
- MF24T – actuator with a return spring, U = 24 V AC/DC
- MF230T – actuator with a return spring, U = 230 V AC
- MLF24T – actuator with a return spring, U = 24 V AC/DC
- MLF230T – actuator with a return spring, U = 230 V AC
- QT.Ex 24-FT.Ex – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC
- QT.Ex 230-FT.Ex – explosion proof actuator with a return spring in the Ex version, U = 230 V AC/DC

2 - material:

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

3 - masking element:

- MSTx1 – single masking grille
- MSTx2 – two masking grilles
- MWPx1 – single mesh cover
- MWPx2 – two mesh cover

4 - additional parameters :

» Thermoelectric and thermal triggers

[no symbol] – 72°C trigger

ZBAT95 – thermoelectric trigger for 95°C

T93-95 – thermal trigger for 95°C

T2-95 (MLF / MF) – thermal trigger for 95°C

FT.Ex-72 – thermoelectric trigger for 72°C

FT.Ex-95 – thermoelectric trigger for 95°C

» Damper axis of rotation

[no symbol] – horizontal axis of rotation

PP_D – vertical axis of rotation – mechanism at the bottom of the damper

PP_G – vertical axis of rotation - mechanism at the top of the damper

» Design standard

[no symbol] – left damper

KO – inverted damper

» Damper casing

BU - earth pin

NOTE: separate additional parameters entered with the “/” sign

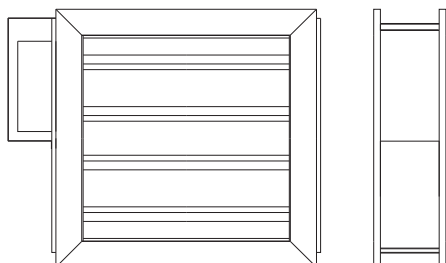
example marking:

mcr WIP/T 400 x 400 BFL24-T

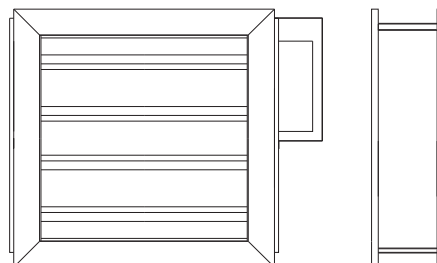
E1120 louvered transfer damper with a 24 V actuator with limit switches.

10.8.1 | Design standard

» left damper standard



» right damper



Chapter 19 - power supply and control (p. 350) contains the following information:
- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.

> mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper for multi-compartment fire ventilation systems



downloadable models
on the website
under the designer zone tab



» EI120

- » Fire resistance class: EI120 ($v_{ew} i \leftrightarrow o$)1000C₁₀₀₀₀AAmulti, E₆₀₀120 ($v_e i \leftrightarrow o$)1000C₁₀₀₀₀AAsingle.
- » Certificate of constancy of performance 1396-CPR-0117.
- » Dampers certified for compliance with EN 12101-8.
- » Dampers rated under EN 13501-4 and tested under EN 1366-10.
- » Narrow louvered smoke control dampers for fire ventilation systems.

11.1 | Application

mcr WIP/V, mcr WIP/V-M multi-blade smoke control dampers are intended for installation in automatically operated fire ventilation systems. mcr WIP/V dampers are used in fire ventilation systems, while dampers marked as mcr WIP/V-M are used in mixed, fire and comfort ventilation systems. When installed, these devices prevent the propagation of fire, smoke and fire gases to adjacent areas. During normal operation, the fire damper blade is in the open or closed position, depending on its function. The fire damper blade in the fire compartment is opened, whereas in other areas the blades are closed. Admissible flow velocity in the connected duct is 15 m/s. Due to their design, mcr WIP/V, mcr WIP/V-M smoke control dampers are intended for use in systems, where the components such as a silencer, bend or supply and extraction grille are installed downstream of the smoke control damper.

11.2 | Design

casing

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

casing made
of non-flammable panels

louvers (damper blade)



mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper for multi-compartment fire ventilation systems

mcr WIP/V, mcr WIP/V-M smoke control dampers consist of a casing with a rectangular cross-section, multiple moving damper blades – louvers rotating around their own axes – and a remotely activated trigger and control mechanism. The damper casing is made of galvanized steel sheets or stainless steel sheets. Its integral part is a flange made of boards with a fire resistance rating. The inner side of the fire damper casing is equipped with an intumescent gasket and ventilation gaskets to ensure air tightness. The damper casing total length is 140 mm.

The louver surface (blades) is covered with galvanized or stainless steel sheets. Each louver with a thickness of 15 mm is filled with a plaster board with fire protection properties. The damper blades revolve on their own 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 a square with a circular “bare end” connection.

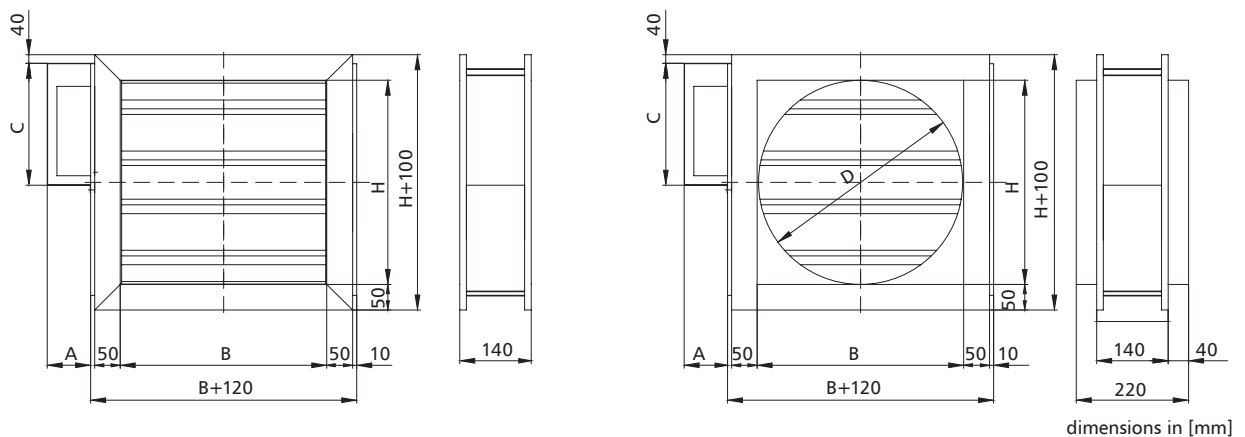
11.3 | Versions

11.3.1 | Damper closing and opening with an actuator

During normal operation, the smoke control dampers are opened or closed. In case of fire, the fire damper louvers are opened in the fire compartment 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 trigger control mechanism in the form of a BE, BEE, BEN, MLE or ME axial actuator without the return spring (24 V AC/DC or 230 V AC). The BE, BEE, BEN, MLE or ME series actuators are equipped with limit switches used to monitor the damper blade position. Furthermore, a mechanical position indicator is placed on the actuator.

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



mechanism	A	C
BEN	125	275
BEE	125	325
BE	125	325
ME	125	325
MLE	125	325

insert symmetrically against the wall axis

11.4 | Dimensions

» Rectangular dampers:

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

Apart from the standard dimensions, smoke control damper may be manufactured with intermediate dimensions (at 1 mm increments within the given ranges). The exception are dampers whose height value falls within the 36-54 ranges, e.g. 136-154, 236-254...

Square dampers may also be additionally equipped with round connection collars allowing for so called “bare end” connection to round ducts.

mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper for multi-compartment fire ventilation systems

11.5 | Installation

The mcr WIP/V and mcr WIP/V-M rectangular dampers are EI120($v_{ew} \leftrightarrow o$)1000C₁₀₀₀AA multi rated if installed in concrete partitions with a min. thickness of 110 mm, partitions made of full bricks or aerated concrete blocks with a thickness of at least 115 mm.

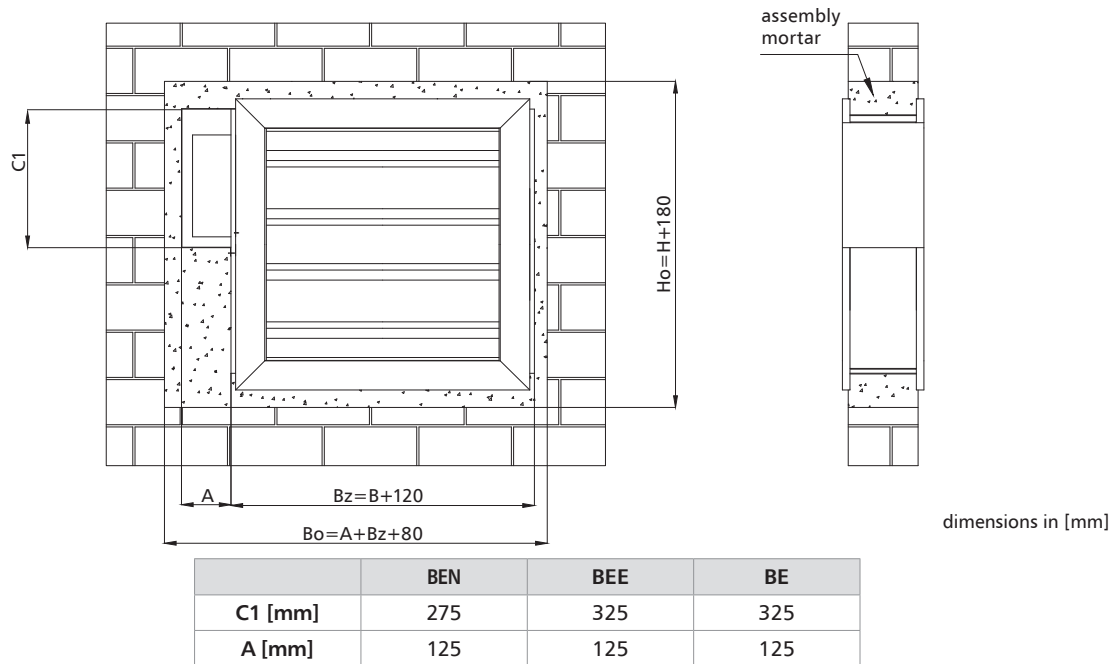
11.5.1 | Preparation of installation openings

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

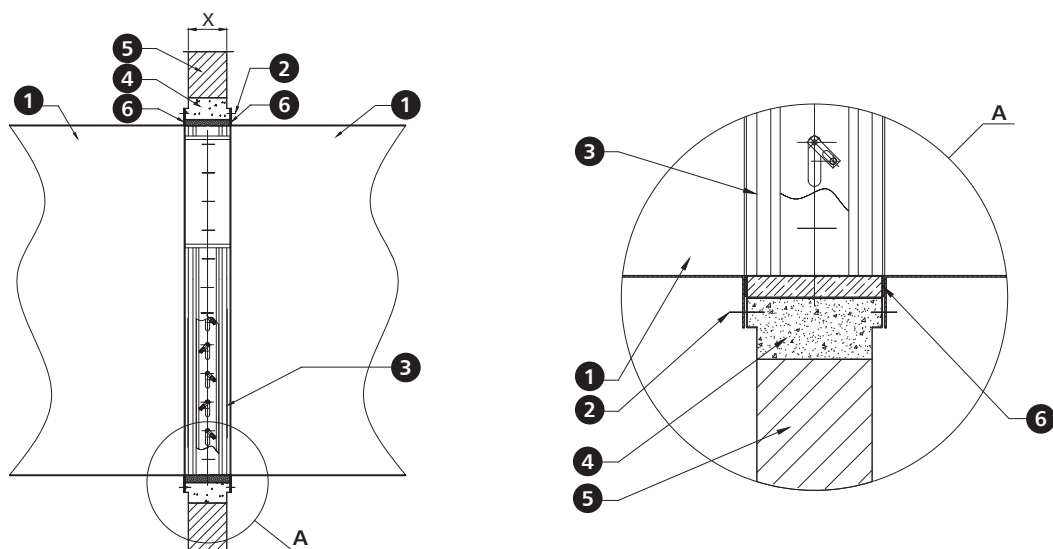
Preferred

$$Bo = (A + Bz + 80) \text{ mm}$$

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



11.5.2 | Sample installation in concrete or masonry walls



1. smoke ventilation duct

2. ST4.2 x 16 sheet metal screw

3. mcr WIP/V fire damper

4. assembly mortar*

5. masonry wall

6. heat resistant gasket

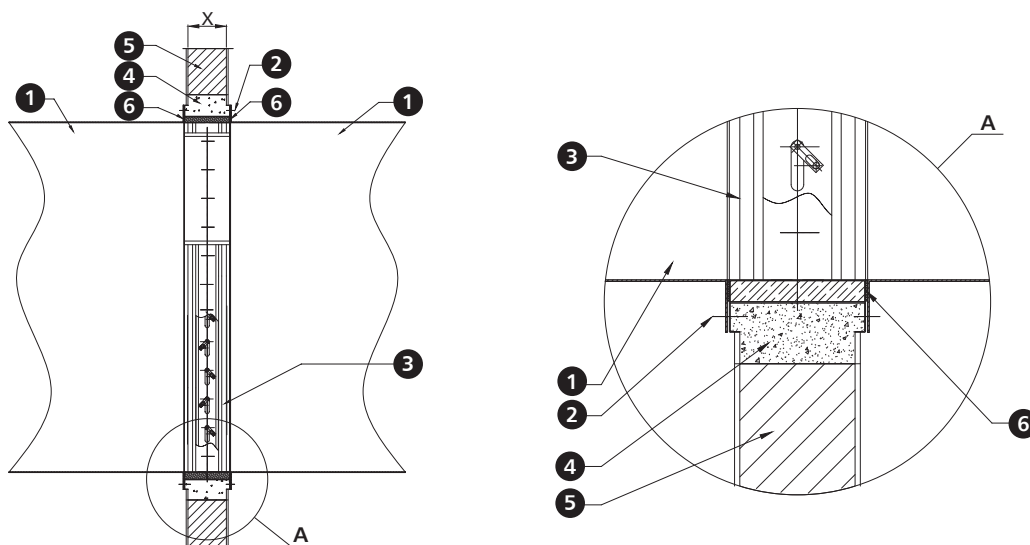
X. wall thickness

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement.

The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper for multi-compartment fire ventilation systems

11.5.3 | Sample installation in concrete block or full brick walls



- | | | |
|-----------------------------------|---|--------------------------|
| 1. smoke ventilation duct | 4. assembly mortar* | 6. heat resistant gasket |
| 2. ST4.2 x 16 sheet metal screw | 5. wall of concrete blocks or full bricks | X wall thickness |
| 3. mcr WIP/V smoke control damper | | |

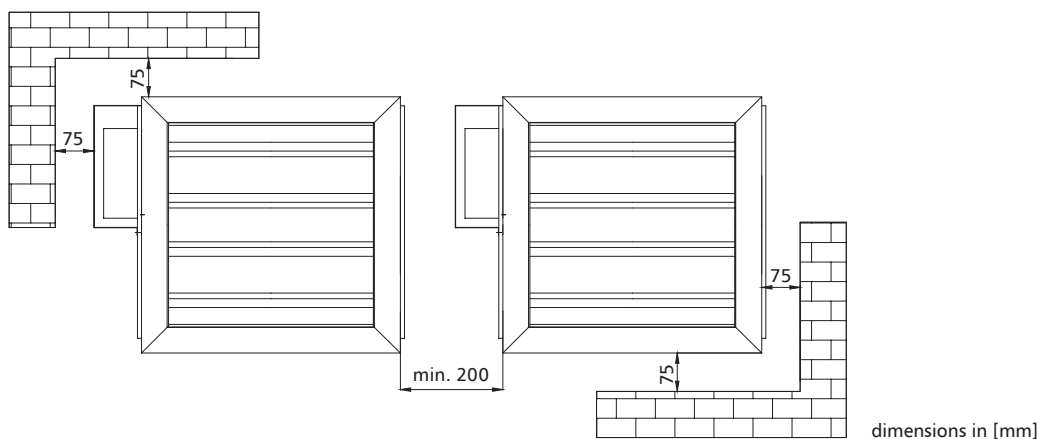
* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement.

The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

» Damper installation with a vertical louver rotation axis

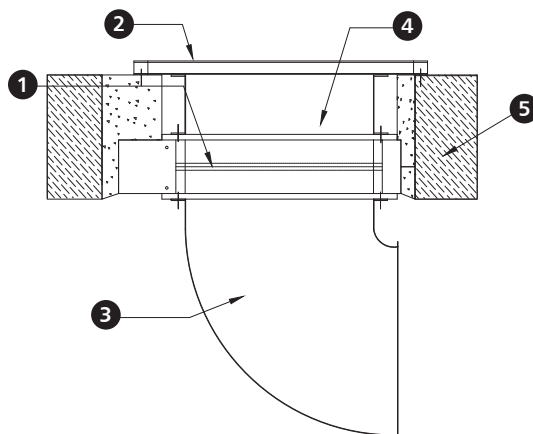
The damper can operate with a vertical louver rotation axis with a top or bottom-mounted mechanism.

» Minimum distance between systems and partitions



mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper for multi-compartment fire ventilation systems

» Example applications - installation with a masking element



- 1. mcr WIP/V fire damper
- 2. masking element
- 3. smoke extract or air supply duct

- 4. duct - ventilation straight connection piece
- 5. wall, floor slab

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

11.5.4 | **MST system masking grilles**



MST system masking grilles are designed to fulfill either supply or exhaust function. They enable the transfer of air through construction partitions. They come with fixed steel louvers with a 40 mm span, obscuring damper visibility.

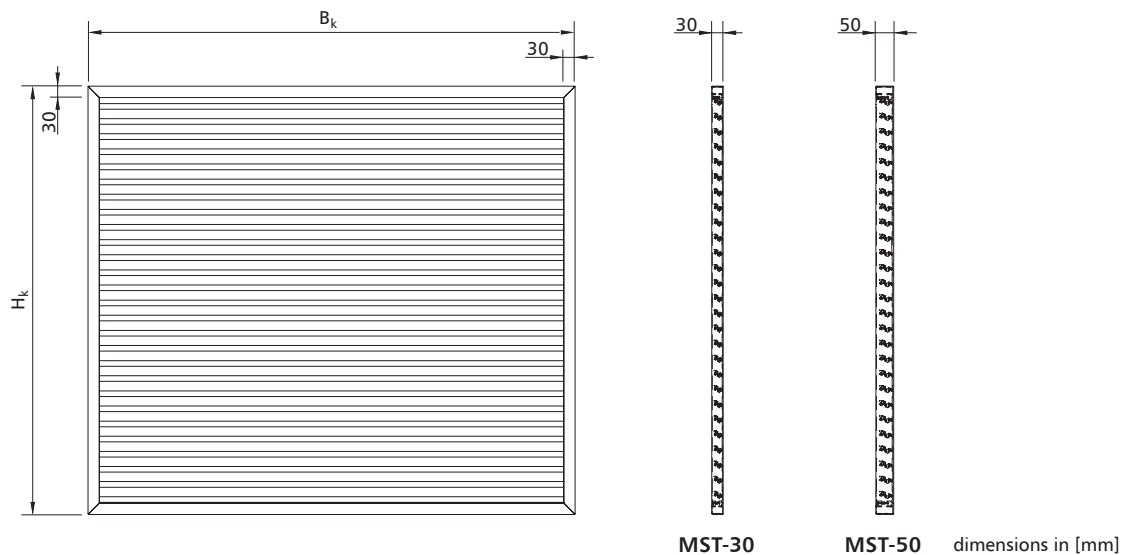
Bolts embedded in the body are used to attach the masking grille body. After installation, an outer frame is mounted on the masking grille body so that the holes and bolts cannot be seen from the outside. Such a solution allows for installing the product even in the most visually-demanding applications. The masking grilles are painted in RAL 9010 as a standard (available in any colour from the RAL range on request).

mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper for multi-compartment fire ventilation systems

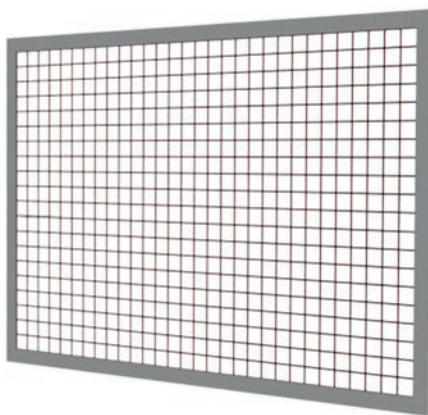
dimensions:

- » nominal width B_k : from 200 mm to 1500 mm
- » nominal height H_k from 200 mm to 1500 mm
- » nominal thickness G 30 and 50 mm

Apart from the standard dimensions, masking grilles may be manufactured with intermediate dimensions.



10.5.5 | MWP mesh cover



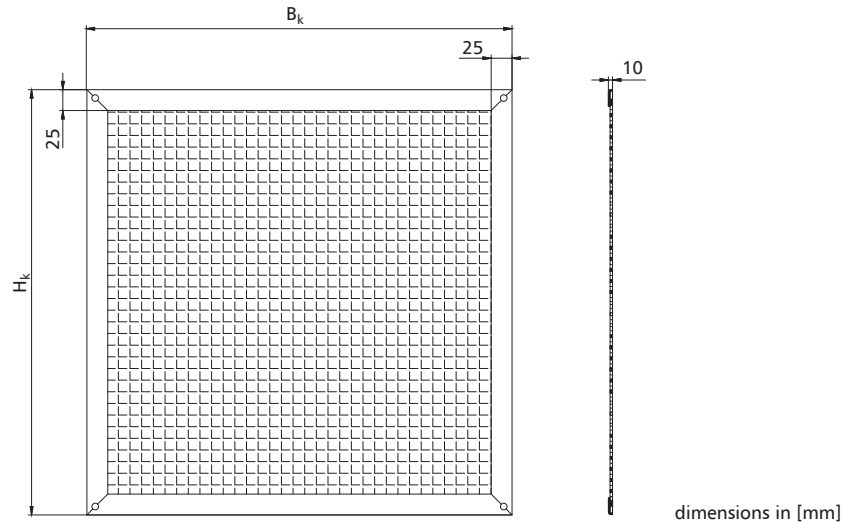
The MWP mesh cover may be supplied together with the damper by the damper manufacturer. System masking grilles, dedicated especially for commercial premises with high architectural and service requirements allows for covering the damper with any additional masking grille while fulfilling the fire rating requirements of the mcr WIP damper. With a wall thickness greater than 200 mm, system and non-system grilles can be applied directly to the wall.

> mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper for multi-compartment fire ventilation systems

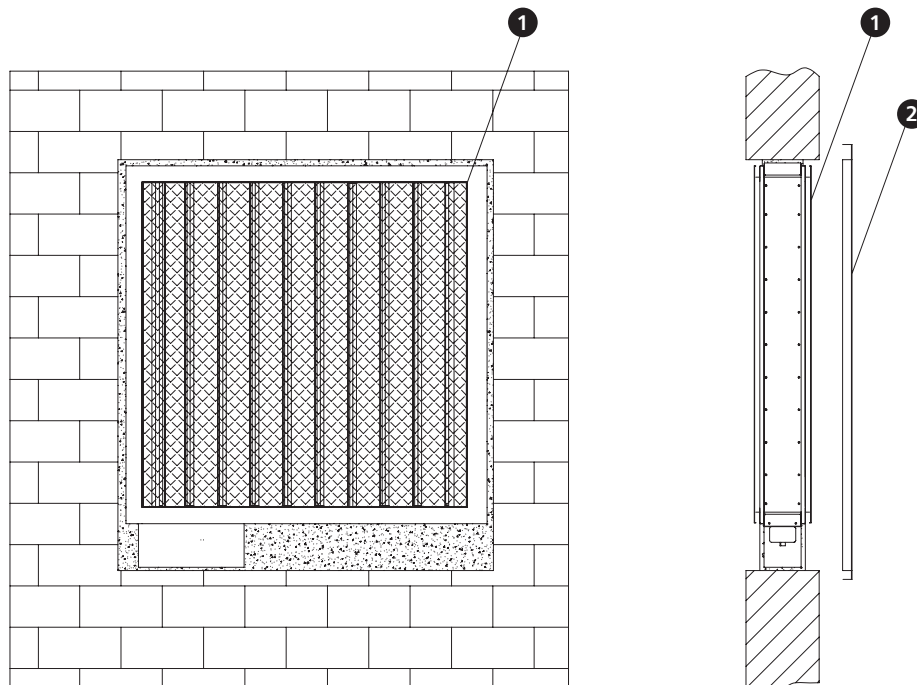
dimensions:

- » nominal width B_k : from 200 mm to 1100 mm
- » nominal height H_k from 200 mm to 1100 mm
- » nominal thickness 10 mm

Apart from the standard dimensions, masking grilles may be manufactured with intermediate dimensions.



» sample installation



1. MWP mesh cover
2. decorative grille (any, e.g. as indicated by the architect)

mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper for multi-compartment fire ventilation systems

11.6 | mcr WIP/V, mcr WIP/V-M rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		v [m/s]	height H [mm]														
			200				250					300					
		S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	
width B [mm]	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

mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper **for multi-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		350					400					450					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	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	0.280	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	0.300	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	0.320	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	0.340	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

mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper for multi-compartment fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			500					550					600				
			S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]
width B [mm]	200	4	0.100	0.085	1 224	5	0.110	0.094	1 346	5	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	0.138	0.117	1 683	5	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	0.165	0.140	2 020	5	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	0.193	0.164	2 356	5	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	0.220	0.187	2 693	5	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	0.248	0.210	3 029	5	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	0.275	0.234	3 366	5	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	0.303	0.257	4 039	5	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	0.330	0.281	4 039	5	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	0.358	0.304	4 376	5	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	0.385	0.327	4 712	5	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	0.413	0.351	5 049	5	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	0.440	0.374	5 386	5	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	0.468	0.397	5 722	5	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	0.495	0.421	6 059	5	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	0.550	0.468	6 059	5	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	

mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper **for multi-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			650					700					750				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	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

mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper **for multi-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]																							
		800						850						900						1000					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]			
width B [mm]	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/V fire damper selection program is available at www.mercor.com.pl, in the Designer Zone.

mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper for multi-compartment fire ventilation systems

11.7 | 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

11.8 | Accessories

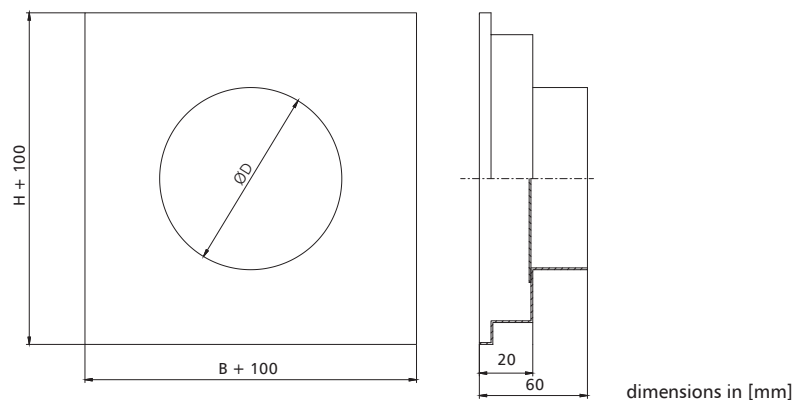
11.8.1 | mcr KRP connection stub

Mcr KRP connection stubs are used to connect a circular ventilation duct to a rectangular damper. The connection is a „bare end“ pipe. The diameter of the stub pipe is 2 mm smaller than the diameter of the ventilation duct.

Dimensions:

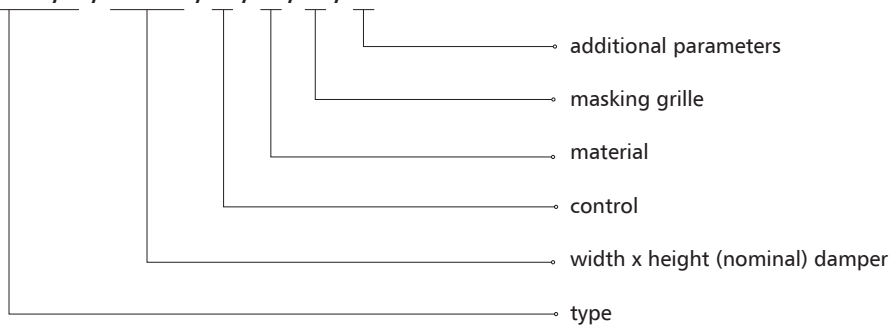
BxH - damper dimensions [mm]

ØD - diameter of the connection duct [mm]



11.9 | Marking

mcr WIP/V / B x H / 1 / 2 / 3 / 4



mcr WIP/V, mcr WIP/V-M | Multi-blade smoke control damper for multi-compartment fire ventilation systems

1 - control:

» trigger control mechanism

BE24 – actuator without a return spring, U = 24 V AC/DC
BE230 – actuator without a return spring, U = 230 V AC/DC
BEE24 – actuator without a return spring, U = 24 V AC/DC
BEN24 – actuator without a return spring, U = 24 V AC/DC
BEE230 – actuator without a return spring, U = 230 V AC/DC
BEN230 – actuator without a return spring, U = 230 V AC/DC
MLE24 – actuator without a return spring, U = 24 V AC/DC
MLE230 – actuator without a return spring, U = 230 V AC
ME24 – actuator without a return spring, U = 24 V AC/DC
ME230 – actuator without a return spring, U = 230 V AC

2 - material:

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

3 - masking element:

MSTx1 – single masking grille
MSTx2 – two masking grilles
MWPx1 – single mesh cover
MWPx2 – two mesh cover

4 - additional parameters :

» Damper axis of rotation

[no symbol] – horizontal axis of rotation
PP_D – vertical axis of rotation – mechanism at the bottom of the damper
PP_G – vertical axis of rotation – mechanism at the top of the damper

» Design standard

[no symbol] – left damper
KP – right damper

» Damper casing

BU – earth pin

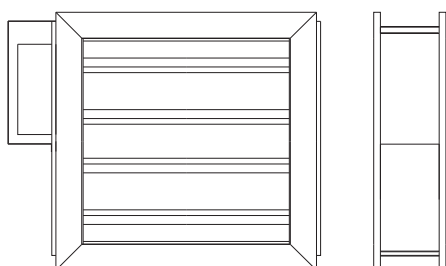
NOTE: separate additional parameters entered with the “/” sign

example marking:

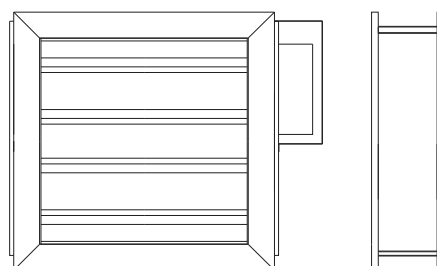
mcr WIP/V 400 x 400 BLE24
Louvered smoke control damper with a 24 V actuator with limit switches.

11.9.1 | Design standard

» left damper standard



» right damper



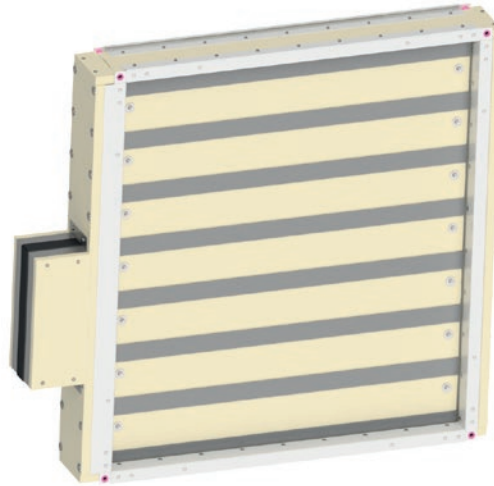
reverse installation possible

Chapter 19 - power supply and control (p. 350) contains the following information:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.



downloadable models
on the website
under the designer zone tab



- » **EI120S, EI90S, EI180**
- » Fire resistance class: EI120 ($v_e i \leftrightarrow o$)S, EI90 ($h_o i \leftrightarrow o$)S, E120 ($h_o i \leftrightarrow o$)S, EI180 ($v_e i \leftrightarrow o$).
- » Certificate of constancy of performance 2434-CPR-0031.
- » Dampers certified for compliance with EN 15650.
- » Dampers qualified under EN 13501-3 and tested under EN 1366-2.
- » Narrow louvered cut-off dampers.

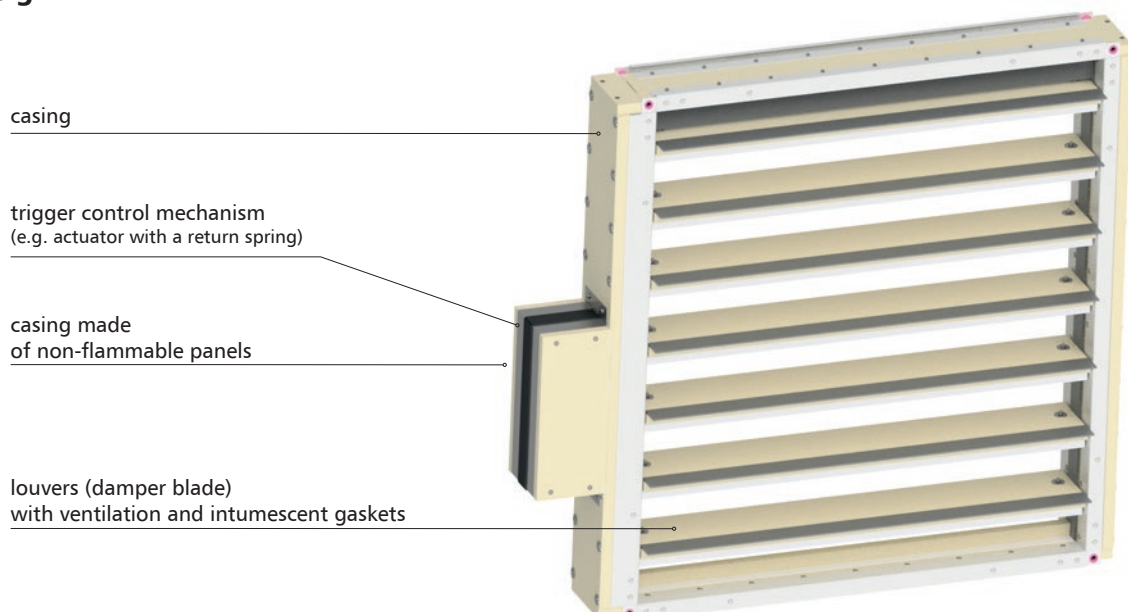
12.1 | Application

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 fire dampers are intended for use in systems, where the components such as a silencer, bend or supply and extraction grille are installed downstream of the fire damper.

During a fire, they preserve the fire resistance rating of the construction partition that the ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and fire gasses to the remaining part of the building which is not on fire. During normal system operation, the damper louvers are open. In case of fire, the louver closes. Admissible flow velocity in the connected duct is 12 m/s. In the version designed for explosion hazard zones (EX version), the dampers can be operated in gas explosion hazard zone 1 inside and outside ventilation ducts and in dust explosion hazard zone 21 outside these ducts. The dampers have been certified in compliance with the ATEX directive 94/9/EC and meet the requirements of group II category 2G and -/2D:

- » II 2G Ex h IIC T6 Gb
 - » II -/2D Ex h IIC T72° -/Db
- Ambient temperature: Ta: -20° ... +50°C

12.2 | Design



The multi-blade mcr WIP PRO/S damper consists of a rectangular casing made of two steel sections connected with a non-combustible plate using rivets and galvanized steel sheet fasteners, a set of movable blades rotating around their axes and a trigger control mechanism. The damper casing is made of fire resistant panels and galvanized "C" shape metal sheet profiles. The device is reinforced on both sides with steel flat bar corners. Intumescent and ventilation gaskets are installed on the inside of the damper. Each damper blade is made of two fire resistant panels, which are displaced against each other. An intumescent gasket and ventilation gasket are attached with staples along the entire blade length. The damper blades revolve on their own axes, which consist of two steel pins. Each pin is mounted in a sleeve installed on the vertical side H of the fire damper casing.

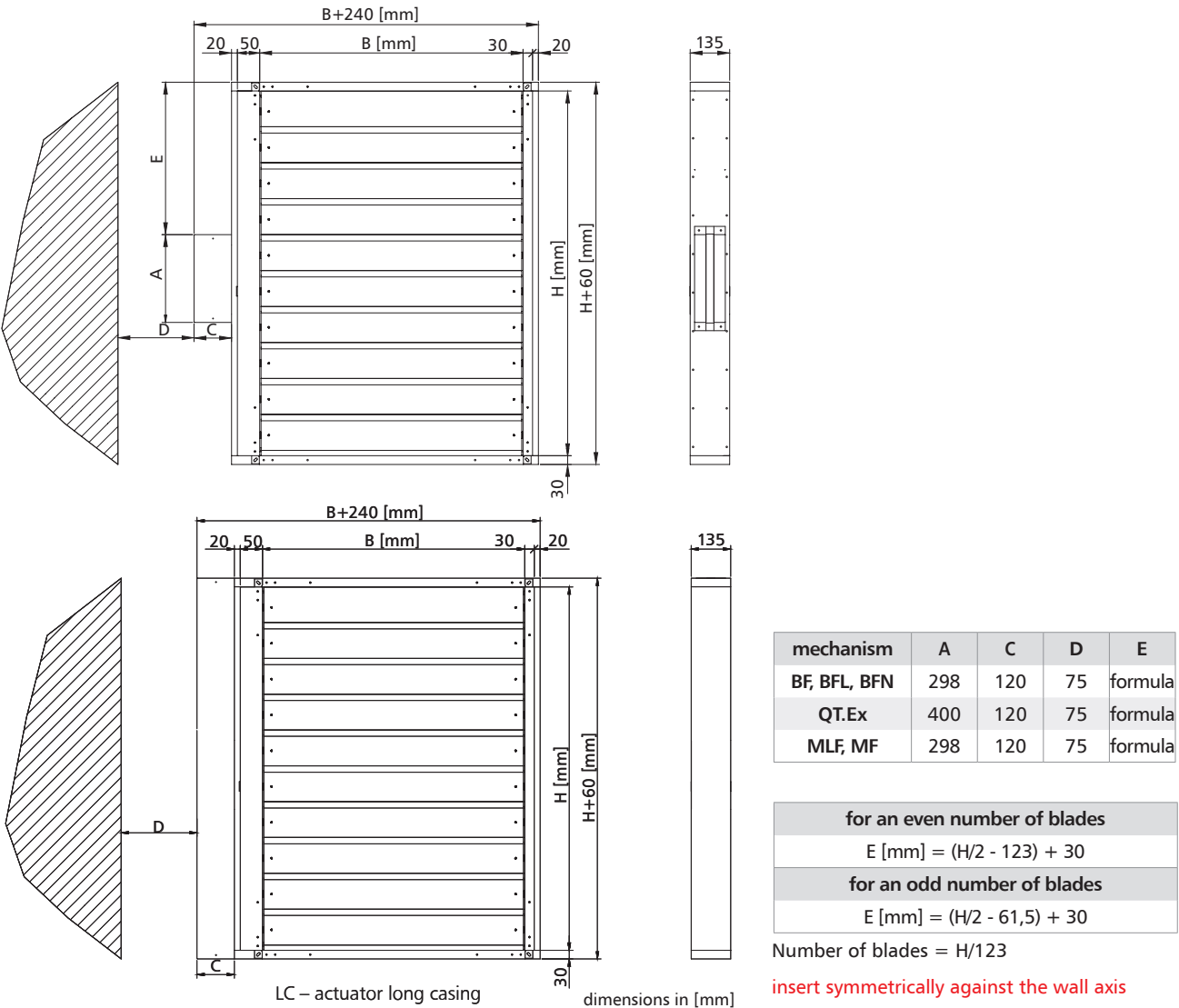
12.3 | Versions

12.3.1 | Damper closing and opening with an actuator

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

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

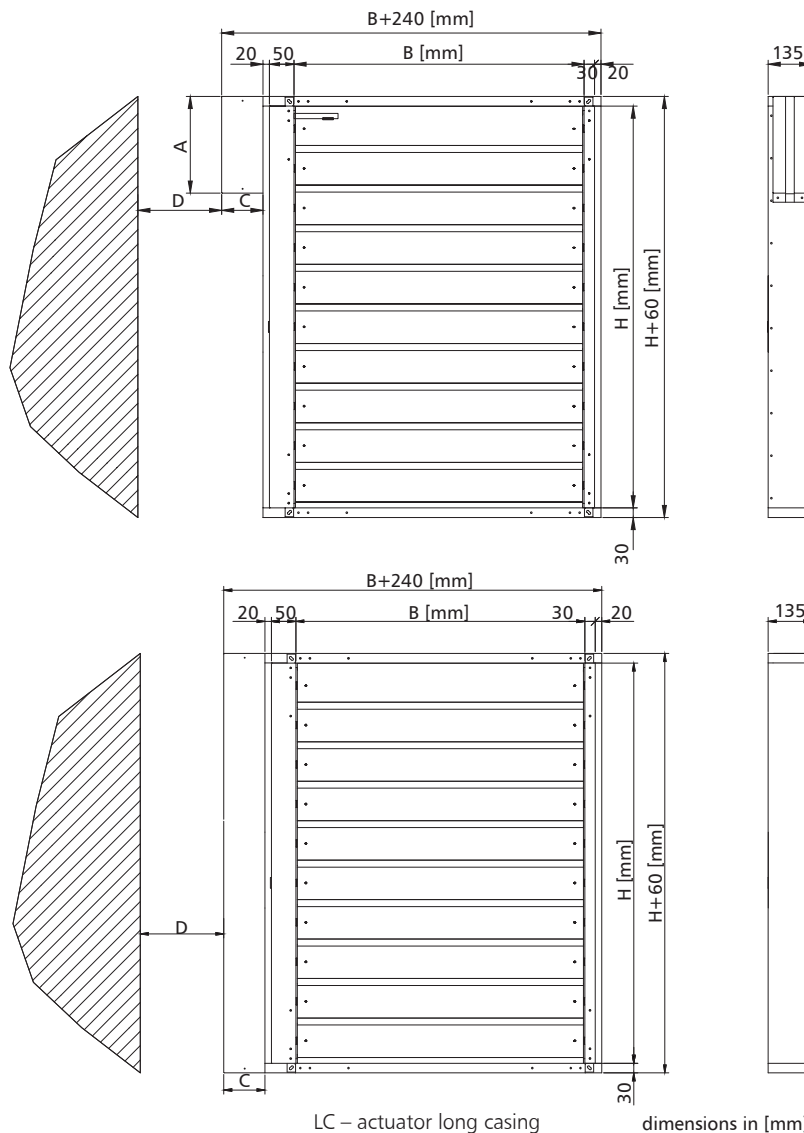
Dampers with analog BFL, BFN, BF, MLF, MF digital BF-TL, QT.Ex actuators close as a result of the thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when power supply voltage is applied to the actuator terminals. Dampers with those actuators may be opened manually using a key.



12.3.2 | mcr WIP PRO/S - 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 louvers of the fire damper remain open. In case of fire, the louvers close automatically or through the fire automation system in case of a damper with an electromagnetic trigger.

mcr WIP PRO/S dampers are equipped with a KW1 trigger control mechanism with a drive spring and a cam-lever system. A 74°C thermal trigger (optionally 95°C) is integrated into the damper mechanism. Once the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. A mechanical blade position indicator is placed on the KW1 mechanism. 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. The mechanism features a test and blade button-release functions. Blade re-opening is activated manually.



mechanism	A	C	D
KW1	298	120	75

insert symmetrically against the wall axis

12.4 | Dimensions

» Rectangular dampers:

- » nominal width B: from 110 mm to 900 mm
- » nominal height H from 270 mm to 1250 mm
- » maximum single damper cross-section surface up to 1.125 m²

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 10 mm increments within the given ranges).

Square dampers may also be additionally equipped with round connection collars allowing for so called "bare end" connection to round ducts.

12.5 | Installation

Rectangular mcr WIP PRO/S fire dampers are class EI120(v_e i $\leftrightarrow$ o)S rated if installed in concrete partitions with a min. thickness of 120 mm, partitions made of full bricks or aerated concrete blocks with a min. thickness of 120 mm, light walls with EI120 or higher fire rating, and EI90(h_o i $\leftrightarrow$ o)S / EI120(h_o i $\leftrightarrow$ o)S rated when installed in floor slabs with a min. thickness of 150 mm.

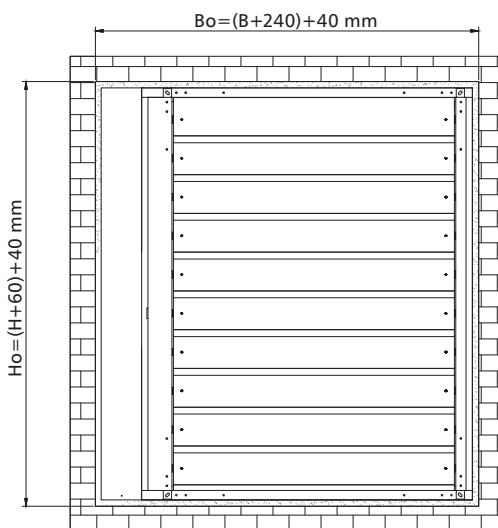
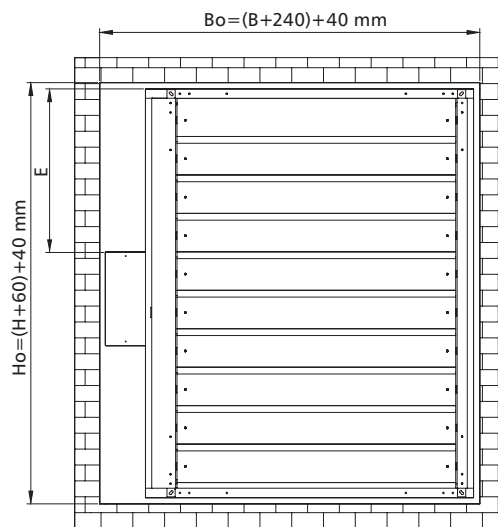
12.5.1 | Preparation of installation openings

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

Preferred

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

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



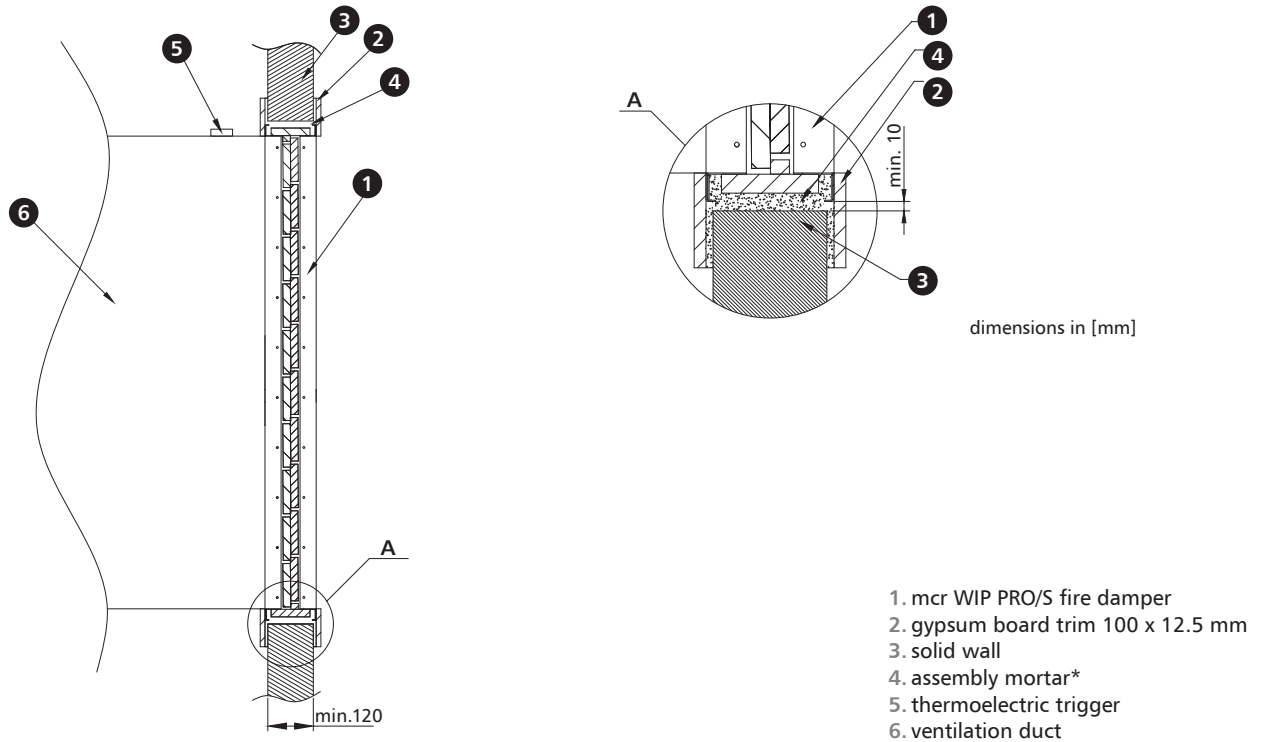
LC – actuator long casing

dimensions in [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:

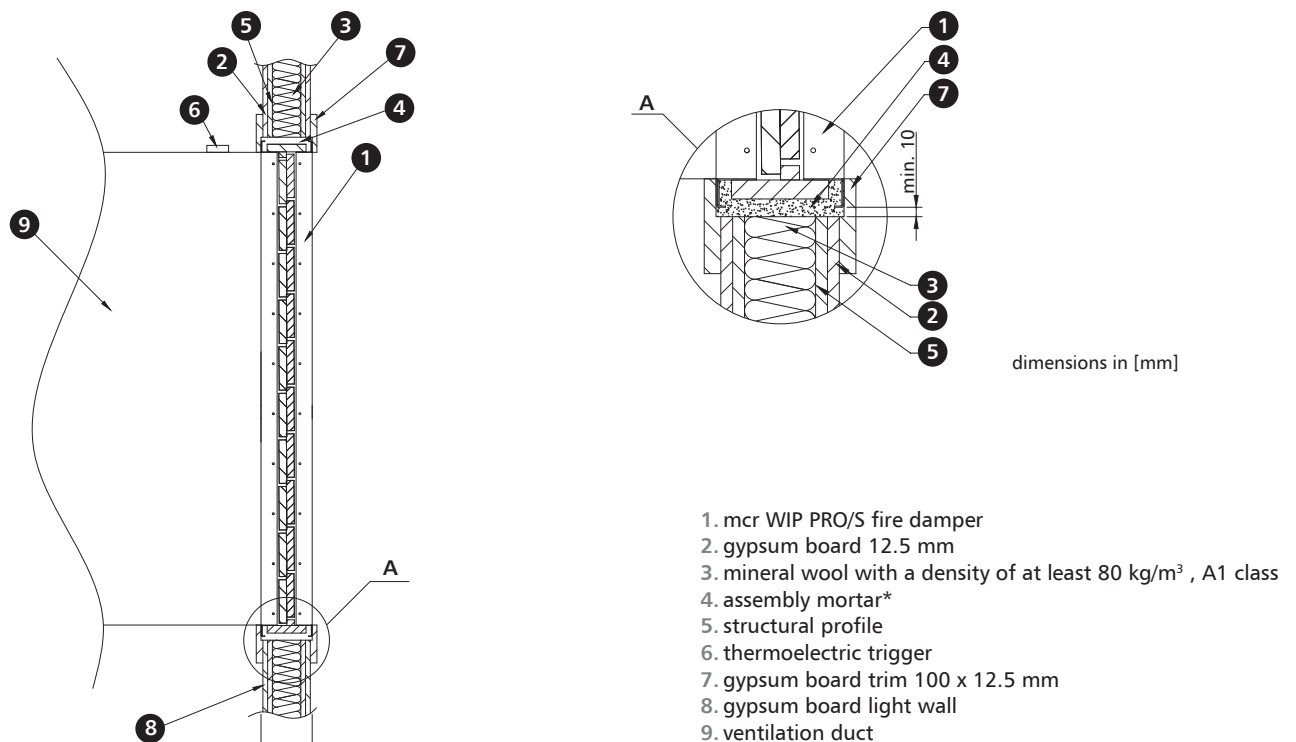
mechanism	for an even number of blades	for an odd number of blades
BF, BLF, BFN, MF, MLF, QT.Ex	$E \text{ [mm]} = (H/2 - 123) + 30$	$E \text{ [mm]} = (H/2 - 61,5) + 30$
KW1	$E \text{ [mm]} = 0$	$E \text{ [mm]} = 0$

12.5.2 | Sample installation in concrete block or full brick walls



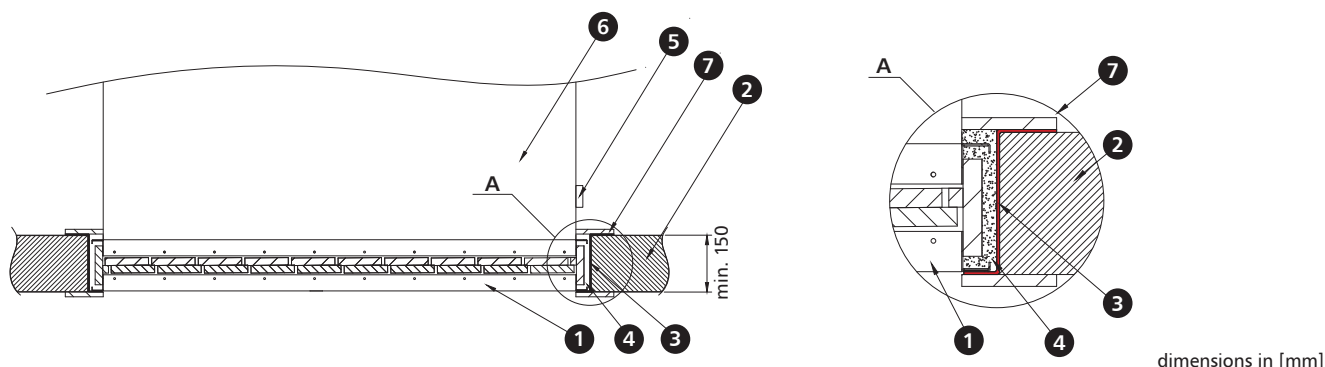
* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

12.5.3 | Sample installation in light walls



* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

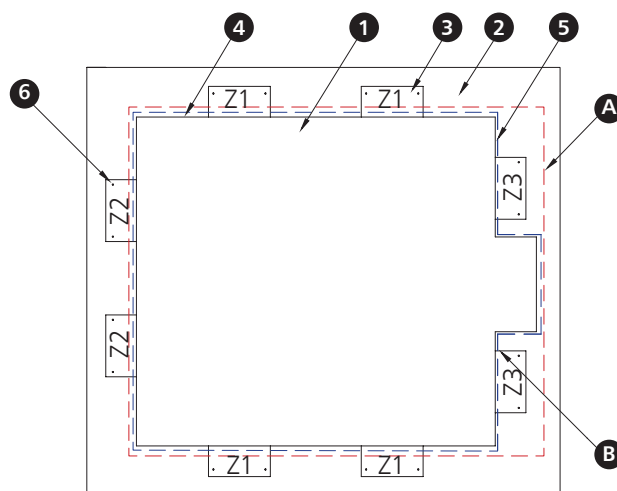
12.5.4 | Sample installation in floor slabs



- | | |
|------------------------------|-------------------------------------|
| 1. mcr WIP PRO/S fire damper | 5. thermoelectric trigger |
| 2. concrete floor slab | 6. ventilation duct |
| 3. Z-shape installation bars | 7. gypsum board trims 100 x 12.5 mm |
| 4. assembly mortar* | |

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement.

The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.



- | | |
|------------------------------|--------------------------------|
| 1. mcr WIP PRO/S fire damper | 4. assembly mortar* |
| 2. concrete floor slab | 5. installation opening A or B |
| 3. Z-shape installation bars | 6. anchor plug M8 x 80 mm |

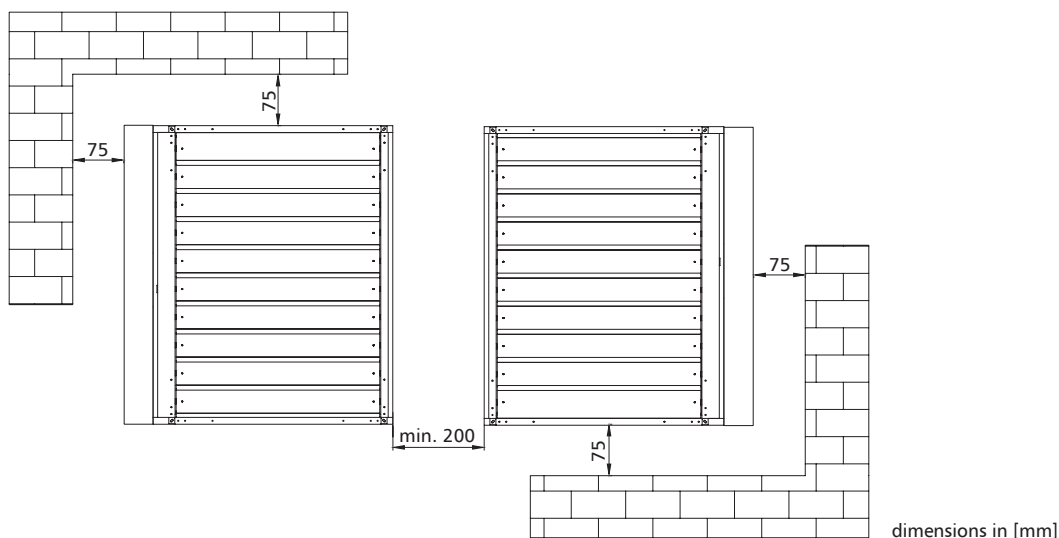
* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

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

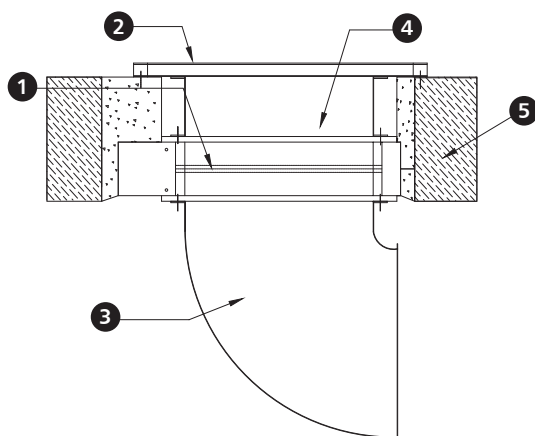
For construction openings with a cut-out for the trigger control mechanism box B, use standard Z3 fasteners.

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

» Minimum distance between systems and partitions



» Example applications - installation with a masking element



- 1. mcr WIP PRO/S fire damper
- 2. masking element
- 3. ventilation duct

- 4. duct - ventilation straight connection piece
- 5. wall, floor slab

If a mcr WIP PRO/S damper is used, the application of louvers (no single-blade design) it is possible to use the space in front of and behind the damper for such system elements as a masking grille or a silencer with additional attenuation barrier or to route a duct along the wall using a duct bend or reduction.

12.6 | mcr WIP PRO/S rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]
Q – flow [m³/h]
d_p – pressure drop [Pa]
L_{WA} – damper noise level [dB]

			height H [mm]														
			270					300					350				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]
width B [mm]	110	4	0.030	0.019	269	13	33	0.033	0.019	269	14	34	0.039	0.019	269	16	36
		6			404	30	44			404	30	44			404	36	46
		8			539	53	51			539	54	52			539	63	54
		10			673	82	57			673	85	58			673	99	60
	150	4	0.041	0.026	367	13	35	0.045	0.026	367	14	35	0.053	0.026	367	16	37
		6			551	30	45			551	30	46			551	36	48
		8			734	53	53			734	54	53			734	63	55
		10			918	82	59			918	85	59			918	99	61
	200	4	0.054	0.034	490	13	36	0.060	0.034	490	14	36	0.070	0.034	490	16	38
		6			734	30	46			734	30	47			734	36	49
		8			979	53	54			979	54	54			979	63	56
		10			1 224	82	60			1 224	84	60			1 224	99	62
	250	4	0.068	0.043	612	13	37	0.075	0.043	612	14	37	0.088	0.043	612	16	39
		6			918	30	47			918	30	48			918	36	50
		8			1 224	53	55			1 224	54	55			1 224	63	57
		10			1 530	82	61			1 530	85	61			1 530	99	63
	300	4	0.081	0.051	734	13	38	0.090	0.051	734	14	38	0.105	0.051	734	16	40
		6			1 102	30	48			1 102	30	49			1 102	36	51
		8			1 469	53	56			1 469	54	56			1 469	63	58
		10			1 836	82	62			1 836	85	62			1 836	99	64
	350	4	0.095	0.060	857	13	38	0.105	0.060	857	14	39	0.123	0.060	857	16	41
		6			1 285	30	49			1 285	30	49			1 285	36	51
		8			1 714	53	56			1 714	54	57			1 714	63	59
		10			2 142	82	62			2 142	85	63			2 142	99	65
	400	4	0.108	0.068	979	13	39	0.120	0.068	979	14	39	0.140	0.068	979	16	41
		6			1 469	30	49			1 469	30	50			1 469	36	52
		8			1 958	53	57			1 958	54	57			1 958	63	59
		10			2 448	82	63			2 448	84	63			2 448	99	65
	450	4	0.122	0.077	1 102	13	39	0.135	0.077	1 102	14	40	0.158	0.077	1 102	16	42
		6			1 652	30	50			1 652	30	50			1 652	36	52
		8			2 203	53	57			2 203	54	58			2 203	63	60
		10			2 754	82	63			2 754	84	64			2 754	99	66
	500	4	0.135	0.085	1 224	13	40	0.150	0.085	1 224	14	40	0.175	0.085	1 224	16	42
		6			1 836	30	50			1 836	30	51			1 836	36	53
		8			2 448	53	58			2 448	54	58			2 448	63	60
		10			3 060	82	64			3 060	85	64			3 060	99	66
	550	4	0.149	0.094	1 346	2	13	0.165	0.094	1 346	14	41	0.193	0.094	1 346	16	43
		6			2 020	4	24			2 020	30	51			2 020	36	53
		8			2 693	7	31			2 693	54	59			2 693	63	61
		10			3 366	10	37			3 366	84	65			3 366	99	67
	600	4	0.162	0.102	1 469	13	41	0.180	0.102	1 469	14	41	0.210	0.102	1 469	16	43
		6			2 203	30	51			2 203	30	52			2 203	36	54
		8			2 938	53	59			2 938	54	59			2 938	63	61
		10			3 672	82	65			3 672	85	65			3 672	99	67
	650	4	0.176	0.111	1 591	13	41	0.195	0.111	1 591	14	41	0.228	0.111	1 591	16	43
		6			2 387	30	52			2 387	30	52			2 387	36	54
		8			3 182	53	59			3 182	54	59			3 182	63	62
		10			3 978	82	65			3 978	85	65			3 978	99	67
700	4	0.189	0.119	1 714	13	41	0.210	0.119	1 714	14	42	0.245	0.119	1 714	16	44	
	6			2 570	30	52			2 570	30	52			2 570	36	54	
	8			3 427	53	59			3 427	54	60			3 427	63	62	
	10			4 284	82	65			4 284	85	66			4 284	99	68	
750	4	0.203	0.128	1 836	13	42	0.225	0.128	1 836	14	42	0.263	0.128	1 836	16	44	
	6			2 754	30	52			2 754	30	53			2 754	36	55	
	8			3 672	53	60			3 672	54	60			3 672	63	62	
	10			4 590	82	66			4 590	85	66			4 590	99	68	
800	4	0.216	0.136	1 958	13	42	0.240	0.136	1 958	14	42	0.280	0.136	1 958	16	44	
	6			2 938	30	52			2 938	30	53			2 938	36	55	
	8			3 917	53	60			3 917	54	60			3 917	63	62	
	10			4 896	82	66			4 896	84	66			4 896	99	68	
850	4	0.230	0.145	2 081	13	42	0.255	0.145	2 081	14	43	0.298	0.145	2 081	16	45	
	6			3 121	30	53			3 121	30	53			3 121	36	55	
	8			4 162	53	60			4 162	54	61			4 162	63	63	
	10			5 202	82	66			5 202	84	66			5 202	99	68	
900	4	0.243	0.153	2 203	13	42	0.270	0.153	2 203	14	43	0.315	0.153	2 203	16	45	
	6			3 305	30	53			3 305	30	53			3 305	36	55	
	8			4 406	53	60			4 406	54	61			4 406	63	63	
	10			5 508	82	66			5 508	84	67			5 508	99	69	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		390					450					520					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0.043	0.028	401	12	34	0.050	0.028	401	14	36	0.057	0.037	532	12	35
		6			601	27	44			601	31	46			798	27	46
		8			802	47	52			802	55	54			1 064	48	53
		10			1 002	74	58			1 002	86	60			1 331	75	59
	150	4	0.059	0.038	546	12	35	0.068	0.038	546	14	37	0.078	0.050	726	12	36
		6			820	27	46			820	31	48			1 089	27	47
		8			1 093	47	53			1 093	55	55			1 452	48	54
		10			1 366	74	59			1 366	86	61			1 814	75	60
	200	4	0.078	0.051	729	12	36	0.090	0.051	729	14	38	0.104	0.067	968	12	38
		6			1 093	27	47			1 093	31	49			1 452	27	48
		8			1 457	47	54			1 457	55	56			1 935	48	56
		10			1 822	74	60			1 822	86	62			2 419	75	62
	250	4	0.098	0.063	911	12	37	0.113	0.063	911	14	39	0.130	0.084	1 210	12	39
		6			1 366	27	48			1 366	31	50			1 814	27	49
		8			1 822	47	55			1 822	55	57			2 419	48	57
		10			2 277	74	61			2 277	86	63			3 024	75	63
	300	4	0.117	0.076	1 093	12	38	0.135	0.076	1 093	14	40	0.156	0.101	1 452	12	39
		6			1 639	27	49			1 639	31	51			2 177	27	50
		8			2 186	47	56			2 186	55	58			2 903	48	57
		10			2 732	74	62			2 732	86	64			3 629	75	63
350	4	0.137	0.089	1 275	12	39	0.158	0.089	1 275	14	41	0.182	0.118	1 693	12	40	
	6			1 913	27	49			1 913	31	51			2 540	27	51	
	8			2 550	47	57			2 550	55	59			3 387	48	58	
	10			3 188	74	63			3 188	86	65			4 234	75	64	
400	4	0.156	0.101	1 457	12	39	0.180	0.101	1 457	14	41	0.208	0.134	1 935	12	41	
	6			2 186	27	50			2 186	31	52			2 903	27	51	
	8			2 915	47	57			2 915	55	59			3 871	48	59	
	10			3 643	74	63			3 643	86	65			4 838	75	65	
450	4	0.176	0.114	1 639	12	40	0.203	0.114	1 639	14	42	0.234	0.151	2 177	12	41	
	6			2 459	27	50			2 459	31	52			3 266	27	52	
	8			3 279	47	58			3 279	55	60			4 355	48	59	
	10			4 099	74	64			4 099	86	66			5 443	75	65	
500	4	0.195	0.127	1 822	12	40	0.225	0.127	1 822	14	42	0.260	0.168	2 419	12	42	
	6			2 732	27	51			2 732	31	53			3 629	27	52	
	8			3 643	47	58			3 643	55	60			4 838	48	60	
	10			4 554	74	64			4 554	86	66			6 048	75	66	
550	4	0.215	0.139	2 004	12	41	0.248	0.139	2 004	14	43	0.286	0.185	2 661	12	42	
	6			3 006	27	51			3 006	31	53			3 992	27	53	
	8			4 008	47	59			4 008	55	61			5 322	48	60	
	10			5 009	74	65			5 009	86	67			6 653	75	66	
600	4	0.234	0.152	2 186	12	41	0.270	0.152	2 186	14	43	0.312	0.202	2 903	12	42	
	6			3 279	27	52			3 279	31	54			4 355	27	53	
	8			4 372	47	59			4 372	55	61			5 806	48	61	
	10			5 465	74	65			5 465	86	67			7 258	75	66	
650	4	0.254	0.164	2 368	12	41	0.293	0.164	2 368	14	43	0.338	0.218	3 145	12	43	
	6			3 552	27	52			3 552	31	54			4 717	27	53	
	8			4 736	47	59			4 736	55	61			6 290	48	61	
	10			5 920	74	65			5 920	86	67			7 862	75	67	
700	4	0.273	0.177	2 550	12	42	0.315	0.177	2 550	14	44	0.364	0.235	3 387	12	43	
	6			3 825	27	52			3 825	31	54			5 080	27	54	
	8			5 100	47	60			5 100	55	62			6 774	48	61	
	10			6 376	74	66			6 376	86	68			8 467	75	67	
750	4	0.293	0.190	2 732	12	42	0.338	0.190	2 732	14	44	0.390	0.252	3 629	12	43	
	6			4 099	27	53			4 099	31	55			5 443	27	54	
	8			5 465	47	60			5 465	55	62			7 258	48	61	
	10			6 831	74	66			6 831	86	68			9 072	75	67	
800	4	0.312	0.202	2 915	12	42	0.360	0.202	2 915	14	43	0.416	0.269	3 871	12	43	
	6			4 372	27	53			4 372	31	54			5 806	27	54	
	8			5 829	47	60			5 829	55	61			7 741	48	61	
	10			7 286	74	66			7 286	86	67			9 677	75	67	
850	4	0.332	0.215	3 097	12	43	0.383	0.215	3 097	14	43	0.442	0.286	4 113	12	43	
	6			4 645	27	53			4 645	31	54			6 169	27	54	
	8			6 193	47	61			6 193	55	61			8 225	48	61	
	10			7 742	74	66			7 742	86	67			10 282	75	67	
900	4	0.351	0.228	3 279	12	43	0.405	0.228	3 279	14	43	0.468	0.302	4 355	12	43	
	6			4 918	27	53			4 918	31	54			6 532	27	54	
	8			6 558	47	61			6 558	55	61			8 709	48	61	
	10			8 197	74	67			8 197	86	67			10 886	75	67	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			550					640					650				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	110	4	0.061	0.037	532	13	36	0.070	0.046	664	11	35	0.072	0.046	664	12	36
		6			798	29	46			996	26	46			996	27	47
		8			1 064	51	54			1 327	46	53			1 327	48	54
		10			1 331	79	60			1 659	72	59			1 659	76	60
	150	4	0.083	0.050	726	13	37	0.096	0.063	905	11	37	0.098	0.063	905	12	37
		6			1 089	29	48			1 358	26	47			1 358	27	48
		8			1 452	51	55			1 810	46	55			1 810	48	56
		10			1 814	79	61			2 263	72	61			2 263	76	61
	200	4	0.110	0.067	968	13	38	0.128	0.084	1 207	11	38	0.130	0.084	1 207	12	39
		6			1 452	29	49			1 810	26	49			1 810	27	49
		8			1 935	51	56			2 413	46	56			2 413	48	57
		10			2 419	79	62			3 017	72	62			3 017	76	63
	250	4	0.138	0.084	1 210	13	39	0.160	0.105	1 508	11	39	0.163	0.105	1 508	12	40
		6			1 814	29	50			2 263	26	50			2 263	27	50
		8			2 419	51	57			3 017	46	57			3 017	48	58
		10			3 024	79	63			3 771	72	63			3 771	76	64
	300	4	0.165	0.101	1 452	13	40	0.192	0.126	1 810	11	40	0.195	0.126	1 810	12	41
		6			2 177	29	51			2 715	26	50			2 715	27	51
		8			2 903	51	58			3 620	46	58			3 620	48	59
		10			3 629	79	64			4 525	72	64			4 525	76	64
	350	4	0.193	0.118	1 693	13	41	0.224	0.147	2 112	11	40	0.228	0.147	2 112	12	41
		6			2 540	29	51			3 168	26	51			3 168	27	52
		8			3 387	51	59			4 224	46	58			4 224	48	59
		10			4 234	79	65			5 279	72	64			5 279	76	65
	400	4	0.220	0.134	1 935	13	41	0.256	0.168	2 413	11	41	0.260	0.168	2 413	12	42
		6			2 903	29	52			3 620	26	52			3 620	27	52
		8			3 871	51	59			4 827	46	59			4 827	48	60
		10			4 838	79	65			6 034	72	65			6 034	76	66
	450	4	0.248	0.151	2 177	13	42	0.288	0.189	2 715	11	42	0.293	0.189	2 715	12	42
		6			3 266	29	52			4 073	26	52			4 073	27	53
		8			4 355	51	60			5 430	46	60			5 430	48	60
		10			5 443	79	66			6 788	72	65			6 788	76	66
	500	4	0.275	0.168	2 419	13	42	0.320	0.210	3 017	11	42	0.325	0.210	3 017	12	43
		6			3 629	29	53			4 525	26	53			4 525	27	53
		8			4 838	51	60			6 034	46	60			6 034	48	61
		10			6 048	79	66			7 542	72	66			7 542	76	67
	550	4	0.303	0.185	2 661	13	43	0.352	0.230	3 318	11	42	0.358	0.230	3 318	12	43
		6			3 992	29	53			4 978	26	53			4 978	27	54
		8			5 322	51	61			6 637	46	60			6 637	48	61
		10			6 653	79	67			8 296	72	66			8 296	76	67
	600	4	0.330	0.202	2 903	13	43	0.384	0.251	3 620	11	43	0.390	0.251	3 620	12	44
		6			4 355	29	54			5 430	26	53			5 430	27	54
		8			5 806	51	61			7 240	46	61			7 240	48	62
		10			7 258	79	67			9 050	72	67			9 050	76	67
	650	4	0.358	0.218	3 145	13	44	0.416	0.272	3 922	11	43	0.423	0.272	3 922	12	44
		6			4 717	29	54			5 883	26	54			5 883	27	54
		8			6 290	51	62			7 844	46	61			7 844	48	62
		10			7 862	79	67			9 805	72	67			9 805	76	68
700	4	0.385	0.235	3 387	13	44	0.448	0.293	4 224	11	43	0.455	0.293	4 224	12	44	
	6			5 080	29	54			6 335	26	54			6 335	27	55	
	8			6 774	51	62			8 447	46	61			8 447	48	62	
	10			8 467	79	68			10 559	72	67			10 559	76	68	
750	4	0.413	0.252	3 629	13	44	0.480	0.314	4 525	11	44	0.488	0.314	4 525	12	44	
	6			5 443	29	55			6 788	26	54			6 788	27	55	
	8			7 258	51	62			9 050	46	62			9 050	48	63	
	10			9 072	79	68			11 313	72	68			11 313	76	68	
800	4	0.440	0.269	3 871	13	44	0.512	0.335	4 827	11	44	0.520	0.335	4 827	12	44	
	6			5 806	29	55			7 240	26	55			7 240	27	55	
	8			7 741	51	62			9 654	46	62			9 654	48	63	
	10			9 677	79	68			12 067	72	68			12 067	76	68	
850	4	0.468	0.286	4 113	13	45	0.544	0.356	5 129	11	44	0.553	0.356	5 129	12	44	
	6			6 169	29	55			7 693	26	55			7 693	27	55	
	8			8 225	51	63			10 257	46	62			10 257	48	63	
	10			10 282	79	69			12 821	72	68			12 821	76	68	
900	4	0.495	0.302	4 355	13	45	0.576	0.377	5 430	11	45	0.585	0.377	5 430	12	44	
	6			6 532	29	56			8 145	26	52			8 145	27	55	
	8			8 709	51	63			10 860	46	60			10 860	48	63	
	10			10 886	79	69			13 576	72	65			13 576	76	68	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			700					760					800				
			S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]
width B [mm]	110	v [m/s]	0.077	0.046	664	14	38	0.084	0.055	795	12	37	0.088	0.055	795	10	34
		996			30	48	1 193			28	48	1 193			22	45	
		1 327			54	56	1 590			50	55	1 590			40	52	
		1 659			85	61	1 988			78	61	1 988			62	58	
	150	v [m/s]	0.105	0.063	905	14	39	0.114	0.075	1 084	12	39	0.120	0.075	1 084	10	36
		1 358			30	49	1 626			28	49	1 626			22	46	
		1 810			54	57	2 169			50	57	2 169			40	54	
		2 263			85	63	2 711			78	62	2 711			62	60	
	200	v [m/s]	0.140	0.084	1 207	14	40	0.152	0.100	1 446	12	40	0.160	0.100	1 446	10	37
		1 810			30	51	2 169			28	50	2 169			22	48	
		2 413			54	58	2 892			50	58	2 892			40	55	
		3 017			85	64	3 614			78	64	3 614			62	61	
	250	v [m/s]	0.175	0.105	1 508	14	41	0.190	0.126	1 807	12	41	0.200	0.126	1 807	10	38
		2 263			30	52	2 711			28	51	2 711			22	49	
		3 017			54	59	3 614			50	59	3 614			40	56	
		3 771			85	65	4 518			78	65	4 518			62	62	
	300	v [m/s]	0.210	0.126	1 810	14	42	0.228	0.151	2 169	12	42	0.240	0.151	2 169	10	39
		2 715			30	53	3 253			28	52	3 253			22	49	
		3 620			54	60	4 337			50	60	4 337			40	57	
		4 525			85	66	5 422			78	66	5 422			62	63	
350	v [m/s]	0.245	0.147	2 112	14	43	0.266	0.176	2 530	12	42	0.280	0.176	2 530	10	39	
	3 168			30	53	3 795			28	53	3 795			22	50		
	4 224			54	61	5 060			50	60	5 060			40	57		
	5 279			85	66	6 325			78	66	6 325			62	63		
400	v [m/s]	0.280	0.168	2 413	14	43	0.304	0.201	2 892	12	43	0.320	0.201	2 892	10	40	
	3 620			30	54	4 337			28	53	4 337			22	51		
	4 827			54	61	5 783			50	61	5 783			40	58		
	6 034			85	67	7 229			78	67	7 229			62	64		
450	v [m/s]	0.315	0.189	2 715	14	44	0.342	0.226	3 253	12	43	0.360	0.226	3 253	10	41	
	4 073			30	54	4 879			28	54	4 879			22	51		
	5 430			54	62	6 506			50	61	6 506			40	59		
	6 788			85	68	8 132			78	67	8 132			62	64		
500	v [m/s]	0.350	0.210	3 017	14	44	0.380	0.251	3 614	12	44	0.400	0.251	3 614	10	41	
	4 525			30	55	5 422			28	54	5 422			22	52		
	6 034			54	62	7 229			50	62	7 229			40	59		
	7 542			85	68	9 036			78	68	9 036			62	65		
550	v [m/s]	0.385	0.230	3 318	14	45	0.418	0.276	3 976	12	44	0.440	0.276	3 976	10	41	
	4 978			30	55	5 964			28	55	5 964			22	52		
	6 637			54	63	7 952			50	62	7 952			40	59		
	8 296			85	68	9 940			78	68	9 940			62	65		
600	v [m/s]	0.420	0.251	3 620	14	45	0.456	0.301	4 337	12	45	0.480	0.301	4 337	10	42	
	5 430			30	56	6 506			28	55	6 506			22	52		
	7 240			54	63	8 675			50	63	8 675			40	60		
	9 050			85	69	10 843			78	69	10 843			62	66		
650	v [m/s]	0.455	0.272	3 922	14	45	0.494	0.326	4 699	12	45	0.520	0.326	4 699	10	42	
	5 883			30	56	7 048			28	56	7 048			22	53		
	7 844			54	63	9 397			50	63	9 397			40	60		
	9 805			85	69	11 747			78	69	11 747			62	66		
700	v [m/s]	0.490	0.293	4 224	14	46	0.532	0.351	5 060	12	45	0.560	0.351	5 060	10	42	
	6 335			30	56	7 590			28	56	7 590			22	53		
	8 447			54	64	10 120			50	63	10 120			40	61		
	10 559			85	69	12 650			78	69	12 650			62	66		
750	v [m/s]	0.525	0.314	4 525	14	46	0.570	0.377	5 422	12	46	0.600	0.377	5 422	10	43	
	6 788			30	56	8 132			28	56	8 132			22	53		
	9 050			54	64	10 843			50	64	10 843			40	61		
	11 313			85	70	13 554			78	69	13 554			62	67		
800	v [m/s]	0.560	0.335	4 827	14	44	0.608	0.402	5 783	12	46	0.640	0.402	5 783	10	43	
	7 240			30	55	8 675			28	56	8 675			22	54		
	9 654			54	62	11 566			50	64	11 566			40	61		
	12 067			85	67	14 458			78	70	14 458			62	67		
850	v [m/s]	0.595	0.356	5 129	14	46	0.646	0.427	6 144	12	46	0.680	0.427	6 144	10	43	
	7 693			30	57	9 217			28	57	9 217			22	54		
	10 257			54	65	12 289			50	64	12 289			40	61		
	12 821			85	70	15 361			78	70	15 361			62	67		
900	v [m/s]	0.630	0.377	5 430	14	47	0.684	0.452	6 506	12	46	0.720	0.452	6 506	10	44	
	8 145			30	57	9 759			28	57	9 759			22	54		
	10 860			54	65	13 012			50	64	13 012			40	62		

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			890					900					950				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	110	4	0,098	0,064	927	13	38	0,099	0,064	927	13	39	0,105	0,064	927	14	40
		6			1 390	29	49			1 390	30	49			1 390	32	50
		8			1 853	51	56			1 853	53	57			1 853	57	58
		10			2 317	79	62			2 317	83	63			2 317	89	64
	150	4	0,134	0,088	1 264	13	40	0,135	0,088	1 264	13	40	0,143	0,088	1 264	14	41
		6			1 895	29	50			1 895	30	51			1 895	32	52
		8			2 527	51	58			2 527	53	58			2 527	57	59
		10			3 159	79	63			3 159	83	64			3 159	89	65
	200	4	0,178	0,117	1 685	13	41	0,180	0,117	1 685	13	41	0,190	0,117	1 685	14	42
		6			2 527	29	51			2 527	30	52			2 527	32	53
		8			3 370	51	59			3 370	53	59			3 370	57	60
		10			4 212	79	65			4 212	83	65			4 212	89	66
	250	4	0,223	0,146	2 106	13	42	0,225	0,146	2 106	13	42	0,238	0,146	2 106	14	43
		6			3 159	29	52			3 159	30	53			3 159	32	54
		8			4 212	51	60			4 212	53	60			4 212	57	61
		10			5 265	79	66			5 265	83	66			5 265	89	67
	300	4	0,267	0,176	2 527	13	43	0,270	0,176	2 527	13	43	0,285	0,176	2 527	14	44
		6			3 791	29	53			3 791	30	54			3 791	32	55
		8			5 054	51	61			5 054	53	61			5 054	57	62
		10			6 318	79	66			6 318	83	67			6 318	89	68
	350	4	0,312	0,205	2 948	13	43	0,315	0,205	2 948	13	44	0,333	0,205	2 948	14	45
		6			4 423	29	54			4 423	30	54			4 423	32	55
		8			5 897	51	61			5 897	53	62			5 897	57	63
		10			7 371	79	67			7 371	83	68			7 371	89	69
400	4	0,356	0,234	3 370	13	44	0,360	0,234	3 370	13	44	0,380	0,234	3 370	14	45	
	6			5 054	29	54			5 054	30	55			5 054	32	56	
	8			6 739	51	62			6 739	53	62			6 739	57	63	
	10			8 424	79	68			8 424	83	68			8 424	89	69	
450	4	0,401	0,263	3 791	13	44	0,405	0,263	3 791	13	45	0,428	0,263	3 791	14	46	
	6			5 686	29	55			5 686	30	55			5 686	32	56	
	8			7 582	51	62			7 582	53	63			7 582	57	64	
	10			9 477	79	68			9 477	83	69			9 477	89	70	
500	4	0,445	0,293	4 212	13	45	0,450	0,293	4 212	13	45	0,475	0,293	4 212	14	46	
	6			6 318	29	55			6 318	30	56			6 318	32	57	
	8			8 424	51	63			8 424	53	63			8 424	57	64	
	10			10 530	79	69			10 530	83	69			10 530	89	70	
550	4	0,490	0,322	4 633	13	45	0,495	0,322	4 633	13	46	0,523	0,322	4 633	14	47	
	6			6 950	29	56			6 950	30	56			6 950	32	57	
	8			9 266	51	63			9 266	53	64			9 266	57	65	
	10			11 583	79	69			11 583	83	70			11 583	89	70	
600	4	0,534	0,351	5 054	13	46	0,540	0,351	5 054	13	46	0,570	0,351	5 054	14	47	
	6			7 582	29	56			7 582	30	57			7 582	32	58	
	8			10 109	51	64			10 109	53	64			10 109	57	65	
	10			12 636	79	69			12 636	83	70			12 636	89	71	
650	4	0,579	0,380	5 476	13	46	0,585	0,380	5 476	13	46	0,618	0,380	5 476	14	47	
	6			8 213	29	56			8 213	30	57			8 213	32	58	
	8			10 951	51	64			10 951	53	65			10 951	57	65	
	10			13 689	79	70			13 689	83	70			13 689	89	71	
700	4	0,623	0,410	5 897	13	46	0,630	0,410	5 897	13	47	0,665	0,410	5 897	14	48	
	6			8 845	29	57			8 845	30	57			8 845	32	58	
	8			11 794	51	64			11 794	53	65			11 794	57	66	
	10			14 742	79	70			14 742	83	71			14 742	89	72	
750	4	0,668	0,439	6 318	13	47	0,675	0,439	6 318	13	47	0,713	0,439	6 318	14	48	
	6			9 477	29	57			9 477	30	58			9 477	32	59	
	8			12 636	51	65			12 636	53	65			12 636	57	66	
	10			15 795	79	70			15 795	83	71			15 795	89	72	
800	4	0,712	0,468	6 739	13	47	0,720	0,468	6 739	13	47	0,760	0,468	6 739	14	48	
	6			10 109	29	57			10 109	30	58			10 109	32	59	
	8			13 478	51	65			13 478	53	65			13 478	57	66	
	10			16 848	79	71			16 848	83	71			16 848	89	72	
850	4	0,757	0,497	7 160	13	47	0,765	0,497	7 160	13	48	0,808	0,497	7 160	14	49	
	6			10 741	29	58			10 741	30	58			10 741	32	59	
	8			14 321	51	65			14 321	53	66			14 321	57	67	
	10			17 901	79	71			17 901	83	71			17 901	89	72	
900	4	0,801	0,527	7 582	13	47	0,810	0,527	7 582	13	48	0,855	0,527	7 582	14	49	
	6			11 372	29	58			11 372	30	58			11 372	32	59	
	8			15 163	51	65			15 163	53	66			15 163	57	67	
	10			18 954	79	71			18 954	83	72			18 954	89	73	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			1010					1050					1100				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	110	4	0,111	0,073	1 058	12	38	0,116	0,073	1 058	13	39	0,121	0,073	1 058	15	41
		6			1 587	28	49			1 587	29	49			1 587	33	51
		8			2 116	50	57			2 116	51	57			2 116	59	59
		10			2 645	77	62			2 645	79	63			2 645	93	65
	150	4	0,152	0,100	1 443	12	40	0,158	0,100	1 443	13	40	0,165	0,100	1 443	15	42
		6			2 164	28	50			2 164	29	51			2 164	33	53
		8			2 886	50	58			2 886	51	58			2 886	59	60
		10			3 607	77	64			3 607	79	64			3 607	93	66
	200	4	0,202	0,134	1 924	12	41	0,210	0,134	1 924	13	41	0,220	0,134	1 924	15	43
		6			2 886	28	52			2 886	29	52			2 886	33	54
		8			3 848	50	59			3 848	51	59			3 848	59	61
		10			4 810	77	65			4 810	79	65			4 810	93	67
	250	4	0,253	0,167	2 405	12	42	0,263	0,167	2 405	13	42	0,275	0,167	2 405	15	44
		6			3 607	28	53			3 607	29	53			3 607	33	55
		8			4 810	50	60			4 810	51	60			4 810	59	62
		10			6 012	77	66			6 012	79	66			6 012	93	68
	300	4	0,303	0,200	2 886	12	43	0,315	0,200	2 886	13	43	0,330	0,200	2 886	15	45
		6			4 329	28	53			4 329	29	54			4 329	33	56
		8			5 772	50	61			5 772	51	61			5 772	59	63
		10			7 214	77	67			7 214	79	67			7 214	93	69
	350	4	0,354	0,234	3 367	12	43	0,368	0,234	3 367	13	44	0,385	0,234	3 367	15	46
		6			5 050	28	54			5 050	29	54			5 050	33	56
		8			6 733	50	62			6 733	51	62			6 733	59	64
		10			8 417	77	67			8 417	79	68			8 417	93	70
400	4	0,404	0,267	3 848	12	44	0,420	0,267	3 848	13	44	0,440	0,267	3 848	15	46	
	6			5 772	28	55			5 772	29	55			5 772	33	57	
	8			7 695	50	62			7 695	51	62			7 695	59	64	
	10			9 619	77	68			9 619	79	68			9 619	93	70	
450	4	0,455	0,301	4 329	12	45	0,473	0,301	4 329	13	45	0,495	0,301	4 329	15	47	
	6			6 493	28	55			6 493	29	55			6 493	33	57	
	8			8 657	50	63			8 657	51	63			8 657	59	65	
	10			10 822	77	68			10 822	79	69			10 822	93	71	
500	4	0,505	0,334	4 810	12	45	0,525	0,334	4 810	13	45	0,550	0,334	4 810	15	47	
	6			7 214	28	56			7 214	29	56			7 214	33	58	
	8			9 619	50	63			9 619	51	63			9 619	59	65	
	10			12 024	77	69			12 024	79	69			12 024	93	71	
550	4	0,556	0,367	5 291	12	45	0,578	0,367	5 291	13	46	0,605	0,367	5 291	15	48	
	6			7 936	28	56			7 936	29	56			7 936	33	58	
	8			10 581	50	63			10 581	51	64			10 581	59	66	
	10			13 226	77	69			13 226	79	70			13 226	93	72	
600	4	0,606	0,401	5 772	12	46	0,630	0,401	5 772	13	46	0,660	0,401	5 772	15	48	
	6			8 657	28	56			8 657	29	57			8 657	33	59	
	8			11 543	50	64			11 543	51	64			11 543	59	66	
	10			14 429	77	70			14 429	79	70			14 429	93	72	
650	4	0,657	0,434	6 252	12	46	0,683	0,434	6 252	13	46	0,715	0,434	6 252	15	48	
	6			9 379	28	57			9 379	29	57			9 379	33	59	
	8			12 505	50	64			12 505	51	65			12 505	59	67	
	10			15 631	77	70			15 631	79	70			15 631	93	72	
700	4	0,707	0,468	6 733	12	46	0,735	0,468	6 733	13	47	0,770	0,468	6 733	15	49	
	6			10 100	28	57			10 100	29	57			10 100	33	59	
	8			13 467	50	65			13 467	51	65			13 467	59	67	
	10			16 834	77	70			16 834	79	71			16 834	93	73	
750	4	0,758	0,501	7 214	12	47	0,788	0,501	7 214	13	47	0,825	0,501	7 214	15	49	
	6			10 822	28	57			10 822	29	58			10 822	33	60	
	8			14 429	50	65			14 429	51	65			14 429	59	67	
	10			18 036	77	71			18 036	79	71			18 036	93	73	
800	4	0,808	0,534	7 695	12	47	0,840	0,534	7 695	13	47	0,880	0,534	7 695	15	49	
	6			11 543	28	58			11 543	29	58			11 543	33	60	
	8			15 391	50	65			15 391	51	65			15 391	59	67	
	10			19 238	77	71			19 238	79	71			19 238	93	73	
850	4	0,859	0,568	8 176	12	47	0,893	0,568	8 176	13	48	0,935	0,568	8 176	15	50	
	6			12 264	28	58			12 264	29	58			12 264	33	60	
	8			16 353	50	65			16 353	51	66			16 353	59	68	
	10			20 441	77	71			20 441	79	72			20 441	93	74	
900	4	0,909	0,601	8 657	12	48	0,945	0,601	8 657	13	48	0,990	0,601	8 657	15	50	
	6			12 986	28	58			12 986	29	58			12 986	33	60	
	8			17 315	50	66			17 315	51	66			17 315	59	68	
	10			21 643	77	71			21 643	79	72			21 643	93	74	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]
Q – flow [m³/h]
d_p – pressure drop [Pa]
L_{WA} – damper noise level [dB]

		height H [mm]														
		1130					1200					1250				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	4	0.124	0.083	1 190	12	39	0.132	0.083	1 190	13	40	0.138	0.092	1 321	11	37
	6			1 784	27	49			1 784	30	51			1 982	24	48
	8			2 379	49	57			2 379	54	58			2 642	43	55
	10			2 974	76	63			2 974	84	64			3 303	66	61
	4	0.170	0.113	1 622	12	40	0.180	0.113	1 622	13	41	0.188	0.125	1 801	11	39
	6			2 433	27	51			2 433	30	52			2 702	24	49
	8			3 244	49	58			3 244	54	59			3 603	43	57
	10			4 055	76	64			4 055	84	65			4 504	66	63
	4	0.226	0.150	2 163	12	41	0.240	0.150	2 163	13	42	0.250	0.167	2 402	11	39
	6			3 244	27	51			3 244	30	53			3 603	24	50
	8			4 326	49	59			4 326	54	60			4 804	43	57
	10			5 407	76	65			5 407	84	66			6 005	66	63
	4	0.283	0.188	2 704	12	42	0.300	0.188	2 704	13	43	0.313	0.209	3 002	11	40
	6			4 055	27	52			4 055	30	54			4 504	24	51
	8			5 407	49	60			5 407	54	61			6 005	43	58
	10			6 759	76	66			6 759	84	67			7 506	66	64
	4	0.339	0.225	3 244	12	43	0.360	0.225	3 244	13	44	0.375	0.250	3 603	11	41
	6			4 866	27	53			4 866	30	54			5 404	24	51
	8			6 489	49	61			6 489	54	62			7 206	43	59
	10			8 111	76	66			8 111	84	68			9 007	66	65
	4	0.396	0.263	3 785	12	43	0.420	0.263	3 785	13	45	0.438	0.292	4 203	11	41
	6			5 678	27	54			5 678	30	55			6 305	24	52
	8			7 570	49	61			7 570	54	63			8 407	43	60
	10			9 463	76	67			9 463	84	68			10 508	66	65
	4	0.452	0.300	4 326	12	44	0.480	0.300	4 326	13	45	0.500	0.334	4 804	11	42
	6			6 489	27	54			6 489	30	56			7 206	24	53
	8			8 652	49	62			8 652	54	63			9 608	43	60
	10			10 814	76	68			10 814	84	69			12 010	66	66
	4	0.509	0.338	4 866	12	44	0.540	0.338	4 866	13	46	0.563	0.375	5 404	11	43
	6			7 300	27	55			7 300	30	56			8 106	24	53
	8			9 733	49	62			9 733	54	64			10 809	43	61
	10			12 166	76	68			12 166	84	70			13 511	66	66
	4	0.565	0.376	5 407	12	45	0.600	0.376	5 407	13	46	0.625	0.417	6 005	11	43
	6			8 111	27	55			8 111	30	57			9 007	24	54
	8			10 814	49	63			10 814	54	64			12 010	43	61
	10			13 518	76	69			13 518	84	70			15 012	66	67
	4	0.622	0.413	5 948	12	45	0.660	0.413	5 948	13	47	0.688	0.459	6 605	11	43
	6			8 922	27	56			8 922	30	57			9 908	24	54
	8			11 896	49	63			11 896	54	65			13 211	43	62
	10			14 870	76	69			14 870	84	70			16 513	66	67
	4	0.678	0.451	6 489	12	46	0.720	0.451	6 489	13	47	0.750	0.500	7 206	11	44
	6			9 733	27	56			9 733	30	57			10 809	24	54
	8			12 977	49	64			12 977	54	65			14 412	43	62
	10			16 222	76	69			16 222	84	71			18 014	66	68
	4	0.735	0.488	7 029	12	46	0.780	0.488	7 029	13	47	0.813	0.542	7 806	11	44
	6			10 544	27	56			10 544	30	58			11 709	24	55
	8			14 059	49	64			14 059	54	65			15 612	43	62
	10			17 573	76	70			17 573	84	71			19 516	66	68
	4	0.791	0.526	7 570	12	46	0.840	0.526	7 570	13	48	0.875	0.584	8 407	11	44
	6			11 355	27	57			11 355	30	58			12 610	24	55
	8			15 140	49	64			15 140	54	66			16 813	43	63
	10			18 925	76	70			18 925	84	71			21 017	66	68
	4	0.848	0.563	8 111	12	47	0.900	0.563	8 111	13	48	0.938	0.626	9 007	11	45
	6			12 166	27	57			12 166	30	58			13 511	24	55
	8			16 222	49	65			16 222	54	66			18 014	43	63
	10			20 277	76	70			20 277	84	72			22 518	66	69
	4	0.904	0.601	8 652	12	47	0.960	0.601	8 652	13	48	1.000	0.667	9 608	11	45
	6			12 977	27	57			12 977	30	59			14 412	24	56
	8			17 303	49	65			17 303	54	66			19 215	43	63
	10			21 629	76	71			21 629	84	72			24 019	66	69
	4	0.961	0.638	9 192	12	47	1.020	0.638	9 192	13	48	1.063	0.709	10 208	11	45
	6			13 788	27	58			13 788	30	59			15 312	24	56
	8			18 384	49	65			18 384	54	66			20 416	43	63
	10			22 981	76	71			22 981	84	72			25 520	66	69
	4	1.017	0.676	9 733	12	47	1.080	0.676	9 733	13	49	1.125	0.751	10 809	11	46
	6			14 599	27	58			14 599	30	59			16 213	24	56
	8			19 466	49	65			19 466	54	67			21 617	43	64
	10			24 332	76	71			24 332	84	73			27 022	66	69

The mcr WIP PRO/S fire damper selection program is available at www.mercor.com.pl, in the Designer Zone.

12.7 | Estimated weights of mcr WIP PRO/S dampers for rectangular ventilation ducts [kg]

		width B [mm]											
		110	150	200	250	300	350	400	500	600	700	800	900
height H [mm]	270	3	4	5	7	8	9	11	14	16	19	22	25
	300	3	4	6	8	9	11	12	16	19	22	25	29
	400	4	6	8	12	12	15	17	21	25	30	34	38
	500	5	8	10	13	16	18	21	27	32	37	43	48
	600	7	9	12	16	19	22	25	32	38	45	51	58
	700	8	11	15	18	22	26	30	37	45	52	60	68
	800	9	12	17	21	25	30	34	43	51	60	69	77
	900	10	14	19	24	29	34	38	48	58	68	77	87
	1000	11	16	21	27	32	37	43	54	64	75	86	97
	1100	13	17	23	29	35	41	47	59	71	83	95	106
	1250	14	20	27	33	40	47	54	67	81	94	108	128

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

12.8 | Accessories

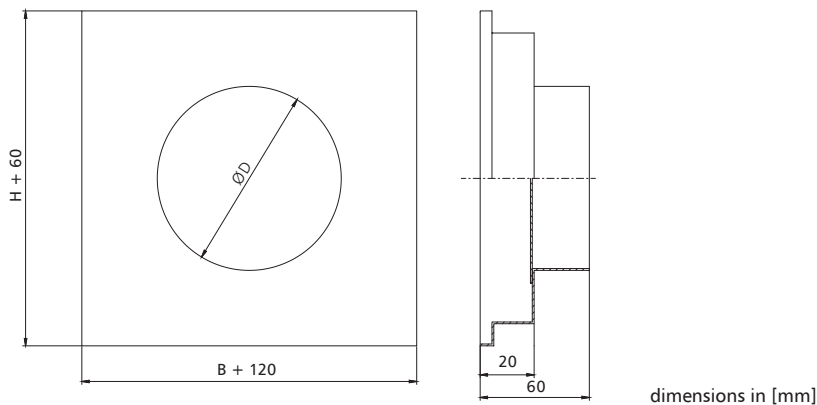
12.8.1 | mcr KRP connection stub

Mcr KRP connection stubs are used to connect a circular ventilation duct to a rectangular damper. The connection is a „bare end“ pipe. The diameter of the stub pipe is 2 mm smaller than the diameter of the ventilation duct.

Dimensions:

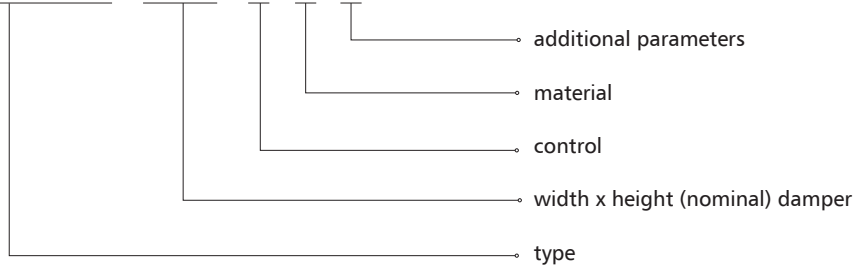
BxH - damper dimensions [mm]

ØD - diameter of the connection duct [mm]



12.9 | Marking

mcr WIP PRO/S / B x H / 1 / 2 / 3



1 - control:

» KW1 trigger control mechanism

KW1/S – thermal trigger

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

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

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

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

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

» trigger control mechanism

BF24-T, BF24-TN – actuator with a return spring, U = 24 V AC/DC

BF230-T, BF230-TN – actuator with a return spring, U = 230 V AC

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

BF24-T-ST, BF24-TN-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

MF24T – thermal trigger

MF230T – thermal trigger + limit switch (open/closed blade signal)

MLF24T – thermal trigger

MLF230T – thermal trigger + limit switch (open/closed blade signal)

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

QT.Ex 230-FT.Ex – explosion proof actuator with a return spring in the Ex version, U = 230 V AC/DC

2 - material:

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

KN – stainless steel

KK – 1.4404 acid-proof steel

3 - additional parameters :

» Thermoelectric and thermal triggers

[no symbol] – 72°C trigger

ZBAT95 – thermoelectric trigger for 95°C

T93-95 – thermal trigger for 95°C

T2-95 (MLF / MF) – thermal trigger for 95°C

FT.Ex-72 – thermoelectric trigger for 72°C

FT.Ex-95 – thermoelectric trigger for 95°C

» Damper axis of rotation

[no symbol] – horizontal axis of rotation

PP_D – vertical axis of rotation – mechanism at the bottom of the damper

PP_G – vertical axis of rotation - mechanism at the top of the damper

» Design standard

[no symbol] – left damper

KP – right damper

LC - actuator long casing

» Damper casing

BU - earth pin

NOTE: separate additional parameters entered with the “/” sign example marking:

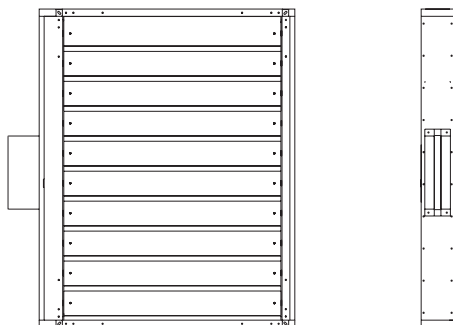
mcr WIP PRO/S 400 x 400 BFL24-T

E120 louvered cut-off damper with a 24 V actuator with limit switches.

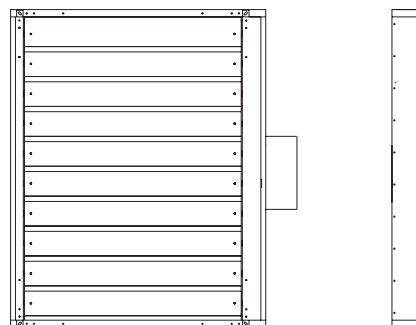
12.9.1 | Design standard

» mcr WIP PRO/S damper with actuator

» left damper standard



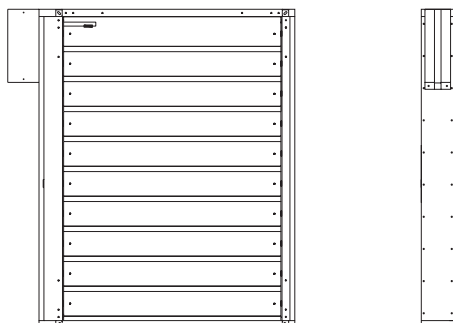
» right damper



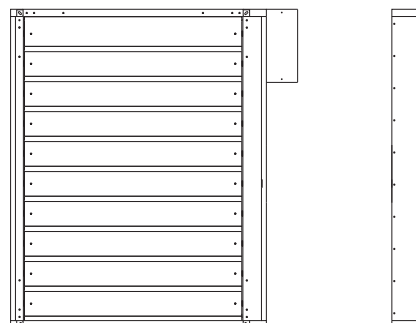
installation in reversed horizontal and vertical position possible

» mcr WIP PRO/S damper with KW1 mechanism

» left damper standard



» right damper

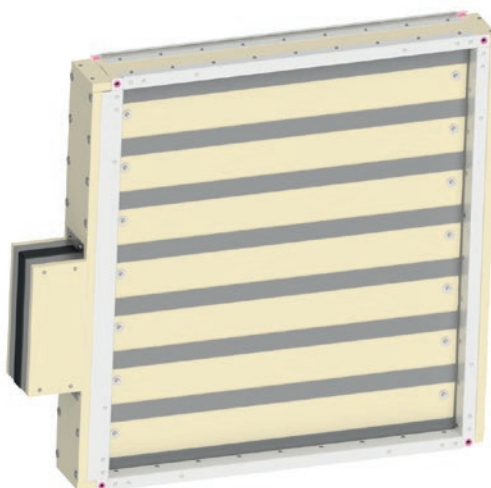


installation in reversed horizontal and vertical position possible

Chapter 19 - power supply and control (p. 350) contains the following information:
- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.



downloadable models
on the website
under the designer zone tab



» **EI120, EI180**

- » Fire resistance class: EI120 ($v_e \leftrightarrow o$)S, EI90 ($h_o \leftrightarrow o$)S
- » Certificate of constancy of performance 2434-CPR-0031.
- » Dampers qualified under EN 15650-3 and tested under EN 1366-2.
- » Narrow louvered transfer damper.

13.1| Application

mcr WIP PRO/T transfer dampers are intended for installation in fire ventilation systems. They are installed in fire partitions without connecting ventilation ducts and retain their fire resistance rating during the fire. During normal operation, damper blades are open, which enables the supply of fresh air to egress routes, protecting them from smoke, or to the space where air exchange or supply through vertical construction partitions is required. It is possible to use a closed transfer damper, in which the louvers open to transfer compensation air upon the receipt of an alarm signal from the fire signaling centre.

In the version designed for explosion hazard zones (EX version), the dampers can be operated in gas explosion hazard zone 1 inside and outside ventilation ducts and in dust explosion hazard zone 21 outside these ducts. The dampers have been certified in compliance with the ATEX directive 94/9/EC and meet the requirements of group II category 2G and -/2D:

- » II 2G Ex h IIC T6 Gb
 - » II -/2D Ex h IIIC T72° -/Db
- Ambient temperature: Ta: -20° ... +50° C

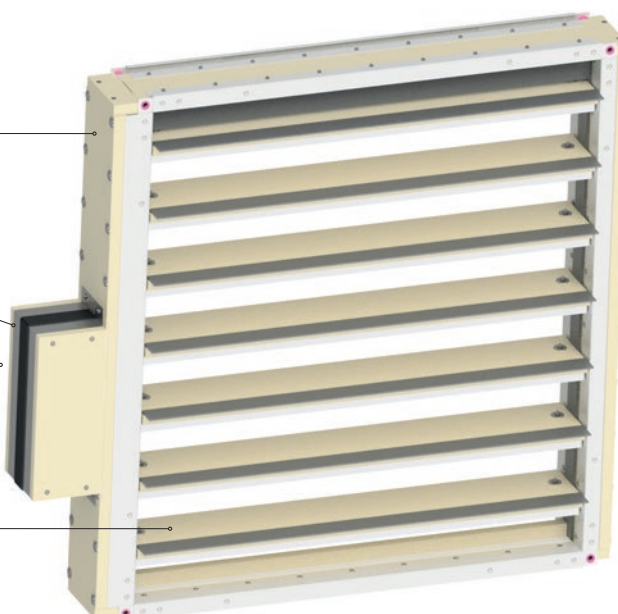
13.2| Design

casing

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

casing made
of non-flammable panels

louvers (damper blade)
with ventilation and intumescent gaskets



The mcr WIP PRO/T transfer damper consists of a rectangular casing made of two steel sections connected with a non-combustible plate using rivets and galvanized steel sheet fasteners, a set of movable blades rotating around their axes and a trigger control mechanism. The damper casing is made of fire resistant panels and galvanized "C" shape metal sheet profiles. The device is reinforced on both sides with steel flat bar corners. Intumescent and ventilation gaskets are installed on the inside of the damper. Each damper blade is made of two fire resistant panel, which are displaced against each other. An intumescent gasket and ventilation gasket are attached with staples along the entire blade length. The damper blades revolve on their own axes, which consist of two steel pins. Each pin is mounted in a brass sleeve installed on the vertical side H of the fire damper casing.

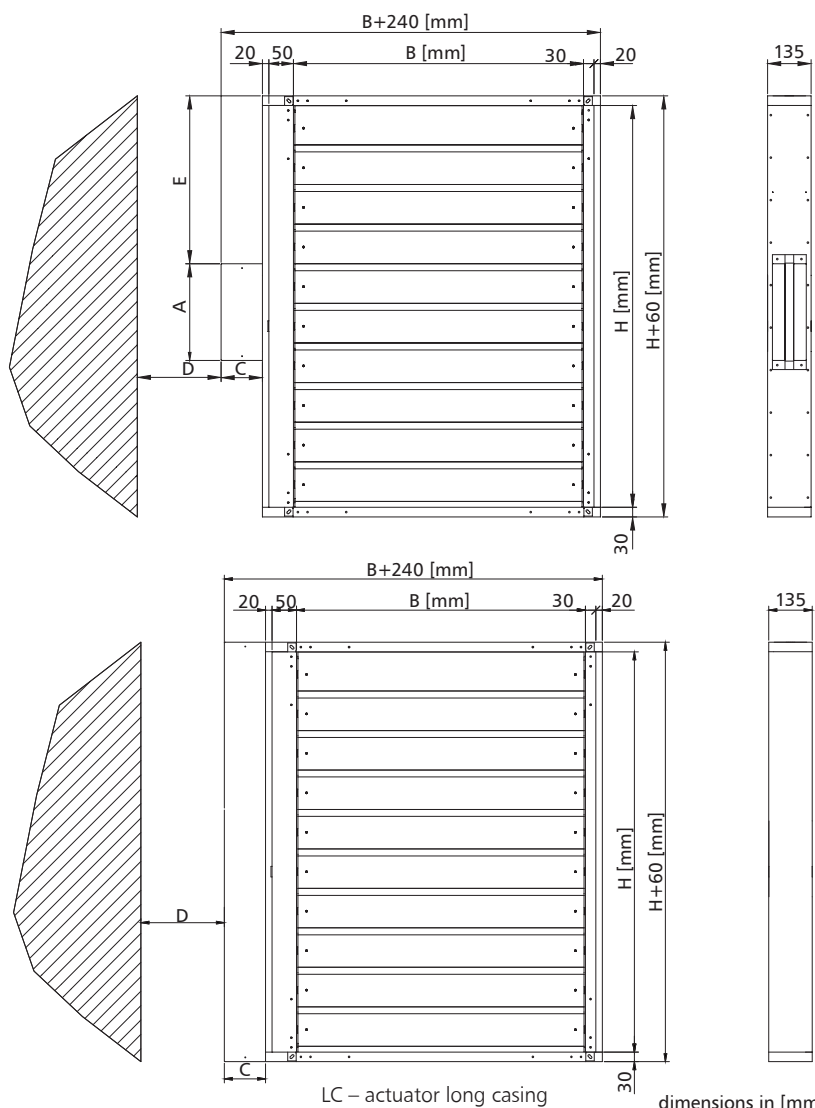
13.3 | Versions

13.3.1 | Damper closing and opening with an actuator

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

The mcr WIP PRO/T dampers are equipped with a trigger control mechanism in the form of BFL, BFN, BF, BF-TL, QT.Ex, MLF, MF series axial actuator with a return spring, supplied with 24 V AC/DC or 230 V AC, with a 72°C thermoelectric trigger (optionally it is possible to use triggers with the nominal tripping temperature of 95°C). The BFL, BFN, BF, MLF, MF, QT.Ex series actuators are equipped with limit switches used to monitor the damper blade position. Furthermore, a mechanical position indicator is placed on the actuator.

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



mechanism	A	C	D	E
BF, BFL, BFN	298	120	75	formula
QT.Ex	400	120	75	formula
MLF, MF	298	120	75	formula

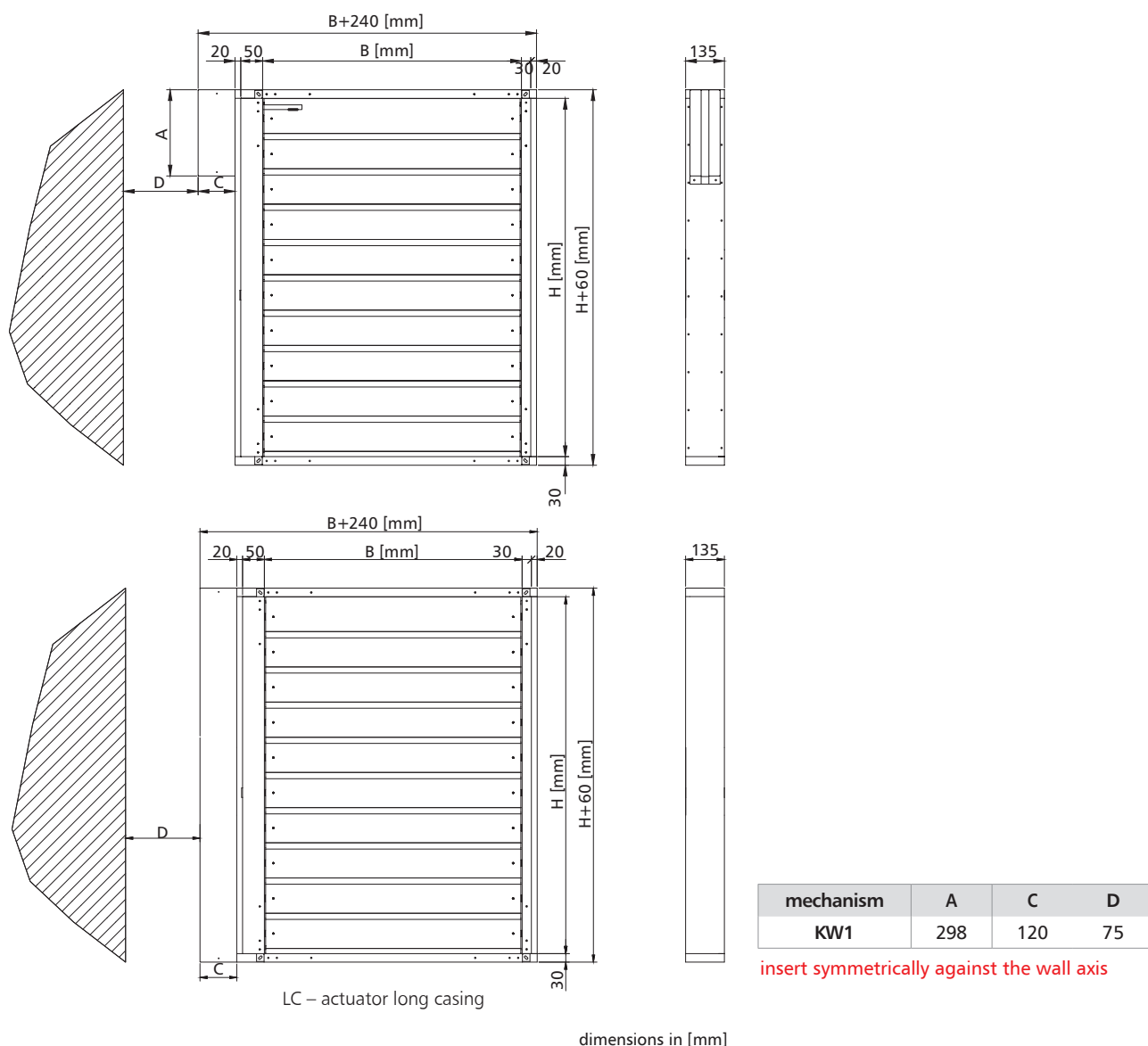
for an even number of blades
$E [mm] = (H/2 - 123) + 30$
for an odd number of blades
$E [mm] = (H/2 - 61,5) + 30$
Number of blades = $H/123$

insert symmetrically against the wall axis

13.3.2 | The transfer fire damper with a spring drive and an integrated thermal trigger, optionally equipped with an electromagnetic trigger and limit switches.

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

mcr WIP PRO/T dampers are equipped with a KW1 trigger control mechanism with a drive spring and a cam-lever system. A 74°C thermal trigger (optionally 95°C) is integrated into the damper mechanism. Once the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. A mechanical blade position indicator is placed on the KW1 mechanism. 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. The mechanism features a test and blade button-release functions. Blade re-opening is activated manually.



13.4 | Dimensions

» Rectangular dampers:

- » nominal width B: from 110 mm to 900 mm
 - » nominal height H from 270 mm to 1250 mm
 - » maximum single damper cross-section surface up to 1.125 m²
- Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 10 mm increments within the given ranges).

Square dampers may also be additionally equipped with round connection collars allowing for so called “bare end” connection to round ducts.

13.5 | Installation

Rectangular mcr WIP PRO/T fire dampers are class EI180($v_e \leftrightarrow o$) rated if installed in concrete partitions with a min. thickness of 120 mm, partitions made of full bricks or aerated concrete blocks with a min. thickness of 120 mm or light walls with EI120 or higher fire resistance rating.

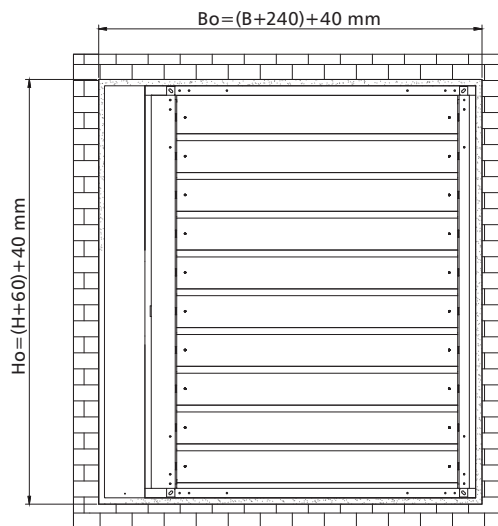
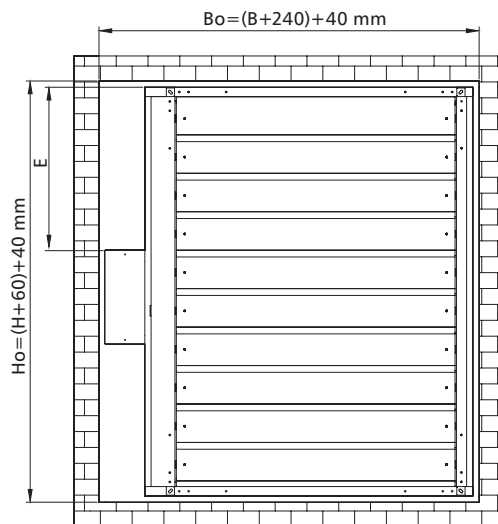
13.5.1 | Preparation of installation openings

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

Preferred

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

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



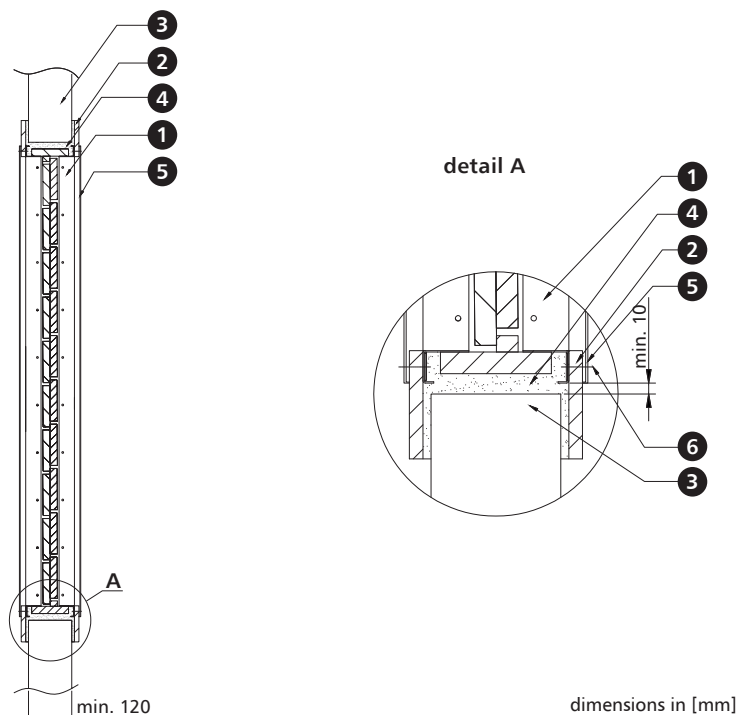
LC – actuator long casing

dimensions in [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 an even number of blades	for an odd number of blades
BF, BFL, BFN, MLF, MF, QT.Ex	$E \text{ [mm]} = (H/2 - 123) + 30$	$E \text{ [mm]} = (H/2 - 61,5) + 30$
KW1	$E \text{ [mm]} = 0$	$E \text{ [mm]} = 0$

13.5.2 | Sample installation in concrete block or full brick walls

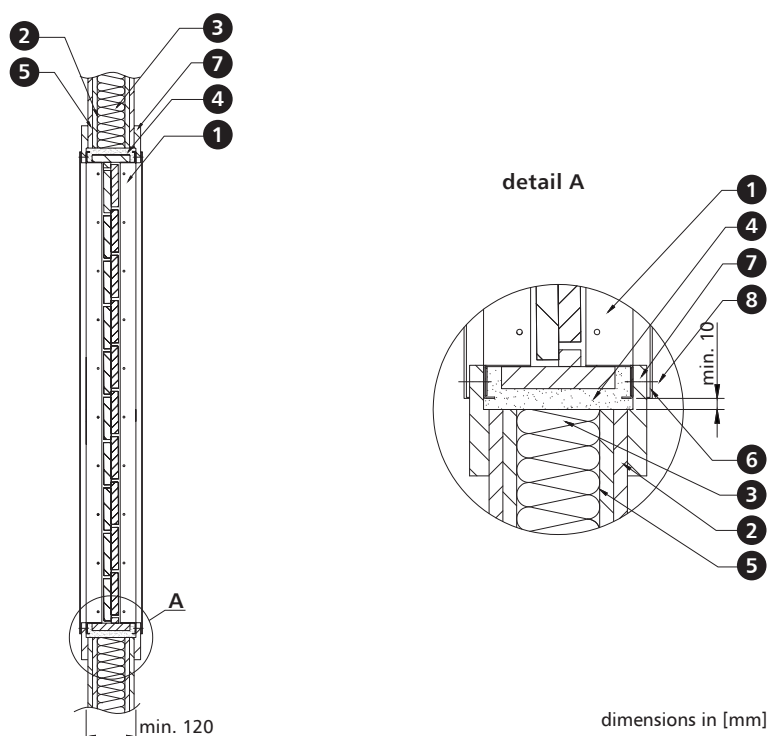


- 1. mcr WIP PRO/T fire damper
- 2. gypsum board trim 100 x 12.5 mm
- 3. solid wall, min. 120 mm
- 4. assembly mortar*
- 5. masking element
- 6. M8 bolt

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

The system masking grille has the thickness of 5 mm. The masking grille may be made of galvanized or stainless steel and painted in any RAL color (RAL 9010 as a standard).

13.5.3 | Sample installation in light walls



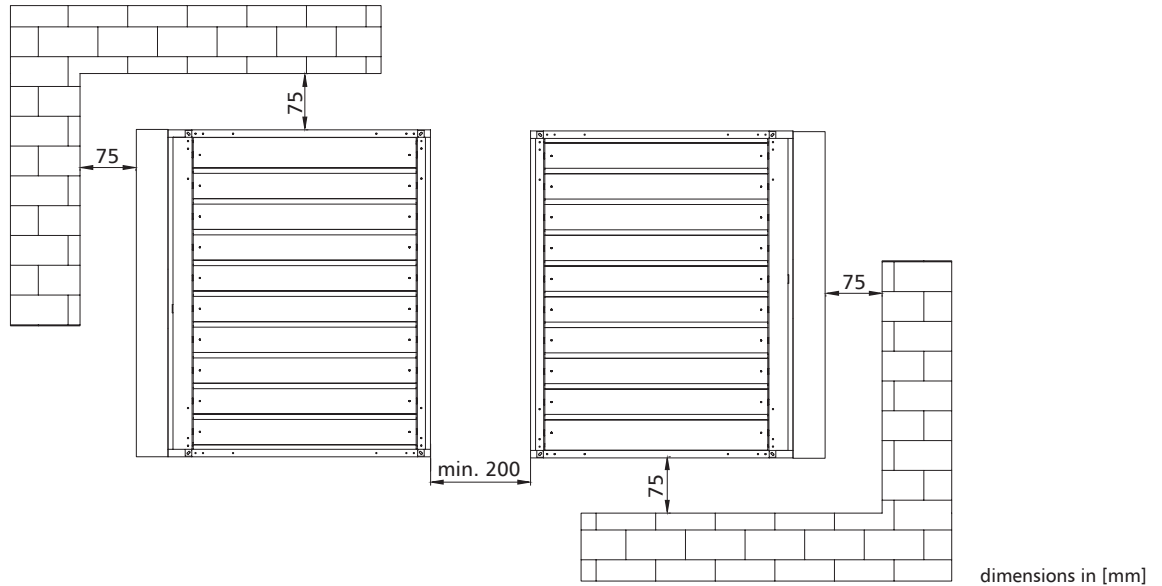
- 1. mcr WIP PRO/T fire damper
- 2. gypsum board 12.5 mm
- 3. mineral wool
- 4. assembly mortar*
- 5. structural profile
- 6. masking element
- 7. gypsum board trim 100 x 12.5 mm
- 8. M8 bolt

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

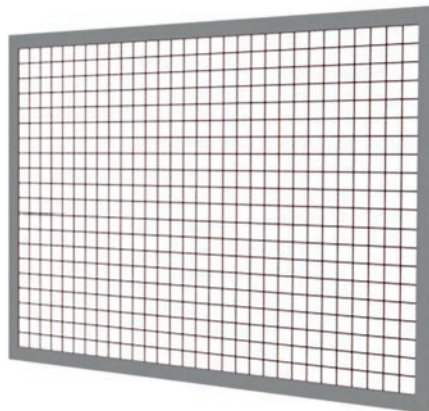
» Damper installation with a vertical louver rotation axis

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

» Minimum distance between systems and partitions



13.5.4 | MWP system masking grilles



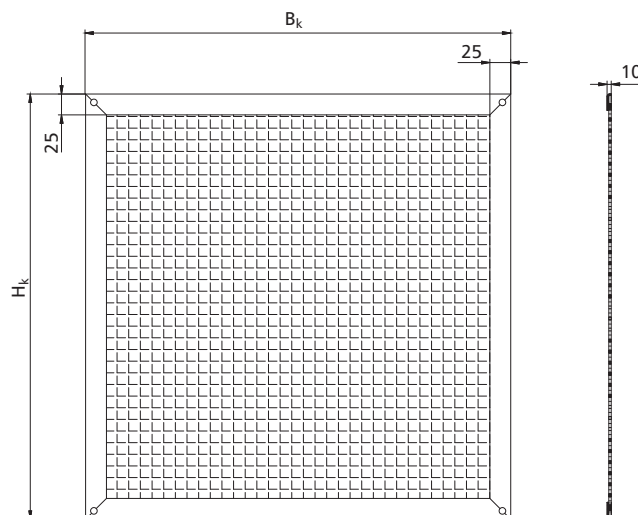
MWP masking grilles are designed to fulfill either supply or exhaust function. They enable the transfer of air through construction partitions. They come with a fixed steel mesh that covers the damper, reducing its visibility.

Bolts are used to attach the masking grille body to the damper. Such a solution allows for installing the product even in the most visually-demanding applications. The masking grilles are painted in RAL 9010 as a standard (available in any colour from the RAL range on request).

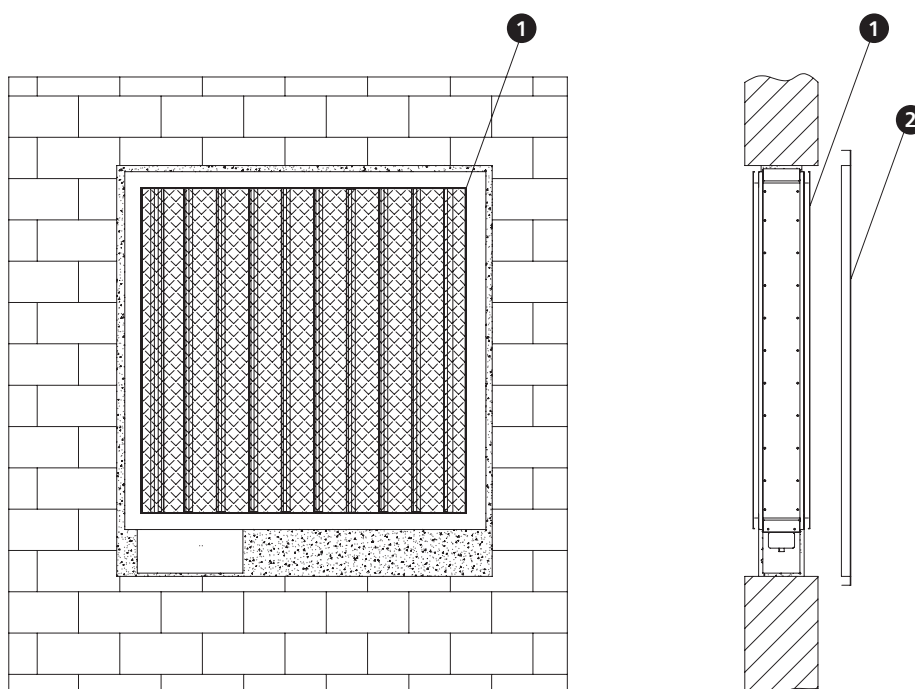
dimensions:

- » nominal width B_k : from 200 mm to 950 mm
- » nominal height H_k from 200 mm to 1300 mm
- » nominal thickness 10 mm

Apart from the standard dimensions, masking grilles may be manufactured with intermediate dimensions.



» sample installation



1. MWP mesh cover
2. decorative grille (any, e.g. as indicated by the architect)

13.5.5 | MWP masking grilles technical parameters

B_k – nominal width [mm]
 H_k – nominal height [mm]
 v – velocity [m/s]

S_e – masking grille active cross-section [m²]
 S_k – duct cross-section [m²]

Q – flow [m³/h]
 d_p – pressure drop [Pa]

		height H_k [mm]															
		200				300				400				500			
	v [m/s]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]
width B_k [mm]	200	4	0.040	0.028	409	0.060	0.043	613	8	0.080	0.057	818	8	0.100	0.071	1 022	8
		6			613			920	17			1 227	17			1 534	17
		8			818			1 227	31			1 636	31			2 045	31
		10			1 022			1 534	48			2 045	48			2 556	48
	300	4	0.060	0.043	613	0.090	0.064	920	8	0.120	0.085	1 227	8	0.150	0.107	1 534	8
		6			920			1 380	17			1 840	17			2 300	17
		8			1 227			1 840	31			2 454	31			3 067	31
		10			1 534			2 300	48			3 067	48			3 834	48
	400	4	0.080	0.057	818	0.120	0.085	1 227	8	0.160	0.114	1 636	8	0.200	0.142	2 045	8
		6			1 227			1 840	17			2 454	17			3 067	17
		8			1 636			2 454	31			3 272	31			4 090	31
		10			2 045			3 067	48			4 090	48			5 112	48
	500	4	0.100	0.071	1 022	0.150	0.107	1 534	8	0.200	0.142	2 045	8	0.250	0.178	2 556	8
		6			1 534			2 300	17			3 067	17			3 834	17
		8			2 045			3 067	31			4 090	31			5 112	31
		10			2 556			3 834	48			5 112	48			6 390	48
	600	4	0.120	0.085	1 227	0.180	0.128	1 840	8	0.240	0.170	2 454	8	0.300	0.213	3 067	8
		6			1 840			2 760	17			3 681	17			4 601	17
		8			2 454			3 681	31			4 908	31			6 134	31
		10			3 067			4 601	48			6 134	48			7 668	48
	700	4	0.140	0.099	1 431	0.210	0.149	2 147	8	0.280	0.199	2 863	8	0.350	0.249	3 578	8
		6			2 147			3 221	17			4 294	17			5 368	17
		8			2 863			4 294	31			5 725	31			7 157	31
		10			3 578			5 368	48			7 157	48			8 946	48
	800	4	0.160	0.114	1 636	0.240	0.170	2 454	8	0.320	0.227	3 272	8	0.400	0.284	4 090	8
		6			2 454			3 681	17			4 908	17			6 134	17
		8			3 272			4 908	31			6 543	31			8 179	31
		10			4 090			6 134	48			8 179	48			10 224	48
	900	4	0.180	0.128	1 840	0.270	0.192	2 760	8	0.360	0.256	3 681	8	0.450	0.320	4 601	8
		6			2 760			4 141	17			5 521	17			6 901	17
		8			3 681			5 521	31			7 361	31			9 202	31
		10			4 601			6 901	48			9 202	48			11 502	48

B_k – nominal width [mm]
 H_k – nominal height [mm]
 v – velocity [m/s]

S_e – masking grille active cross-section [m²]
 S_k – duct cross-section [m²]

Q – flow [m³/h]
 d_p – pressure drop [Pa]

		height H_k [mm]															
		600				700				800				900			
	v [m/s]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]
width B_k [mm]	200	4	0.120	0.085	1 227	0.140	0.099	1 431	8	0.160	0.114	1 636	8	0.180	0.128	1 840	8
		6			1 840			2 147	17			2 454	17			2 760	17
		8			2 454			2 863	31			3 272	31			3 681	31
		10			3 067			3 578	48			4 090	48			4 601	48
	300	4	0.180	0.128	1 840	0.210	0.149	2 147	8	0.240	0.170	2 454	8	0.270	0.192	2 760	8
		6			2 760			3 221	17			3 681	17			4 141	17
		8			3 681			4 294	31			4 908	31			5 521	31
		10			4 601			5 368	48			6 134	48			6 901	48
	400	4	0.240	0.170	2 454	0.280	0.199	2 863	8	0.320	0.227	3 272	8	0.360	0.256	3 681	8
		6			3 681			4 294	17			4 908	17			5 521	17
		8			4 908			5 725	31			6 543	31			7 361	31
		10			6 134			7 157	48			8 179	48			9 202	48
	500	4	0.300	0.213	3 067	0.350	0.249	3 578	8	0.400	0.284	4 090	8	0.450	0.320	4 601	8
		6			4 601			5 368	17			6 134	17			6 901	17
		8			6 134			7 157	31			8 179	31			9 202	31
		10			7 668			8 946	48			10 224	48			11 502	48
	600	4	0.360	0.256	3 681	0.420	0.298	4 294	8	0.480	0.341	4 908	8	0.540	0.383	5 521	8
		6			5 521			6 441	17			7 361	17			8 281	17
		8			7 361			8 588	31			9 815	31			11 042	31
		10			9 202			10 735	48			12 269	48			13 802	48
	700	4	0.420	0.298	4 294	0.490	0.348	5 010	8	0.560	0.398	5 725	8	0.630	0.447	6 441	8
		6			6 441			7 515	17			8 588	17			9 662	17
		8			8 588			10 020	31			11 451	31			12 882	31
		10			10 735			12 524	48			14 314	48			16 103	48
	800	4	0.480	0.341	4 908	0.560	0.398	5 725	8	0.640	0.454	6 543	8	0.720	0.511	7 361	8
		6			7 361			8 588	17			9 815	17			11 042	17
		8			9 815			11 451	31			13 087	31			14 723	31
		10			12 269			14 314	48			16 358	48			18 403	48
	900	4	0.540	0.383	5 521	0.630	0.447	6 441	8	0.720	0.511	7 361	8	0.810	0.575	8 281	8
		6			8 281			9 662	17			11 042	17			12 422	17
		8			11 042			12 882	31			14 723	31			16 563	31
		10			13 802			16 103	48			18 403	48			20 704	48

B_k – nominal width [mm]
 H_k – nominal height [mm]
 v – velocity [m/s]

S_e – masking grille active cross-section [m²]
 S_k – duct cross-section [m²]

Q – flow [m³/h]
 d_p – pressure drop [Pa]

			height H _k [mm]											
			1000				1100				1250			
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	S _k [m²]	S _e [m²]	Q [m³/h]
width B _k [mm]	200	4	0.200	0.142	2 045	8	0.220	0.156	2 249	8	0.250	0.178	2 556	8
		6			3 067	17			3 374	17			3 834	17
		8			4 090	31			4 499	31			5 112	31
		10			5 112	48			5 623	48			6 390	48
	300	4	0.300	0.213	3 067	8	0.330	0.234	3 374	8	0.375	0.266	3 834	8
		6			4 601	17			5 061	17			5 751	17
		8			6 134	31			6 748	31			7 668	31
		10			7 668	48			8 435	48			9 585	48
	400	4	0.400	0.284	4 090	8	0.440	0.312	4 499	8	0.500	0.355	5 112	8
		6			6 134	17			6 748	17			7 668	17
		8			8 179	31			8 997	31			10 224	31
		10			10 224	48			11 246	48			12 780	48
	500	4	0.500	0.355	5 112	8	0.550	0.391	5 623	8	0.625	0.444	6 390	8
		6			7 668	17			8 435	17			9 585	17
		8			10 224	31			11 246	31			12 780	31
		10			12 780	48			14 058	48			15 975	48
	600	4	0.600	0.426	6 134	8	0.660	0.469	6 748	8	0.750	0.533	7 668	8
		6			9 202	17			10 122	17			11 502	17
		8			12 269	31			13 496	31			15 336	31
		10			15 336	48			16 870	48			19 170	48
	700	4	0.700	0.497	7 157	8	0.770	0.547	7 872	8	0.875	0.621	8 946	8
		6			10 735	17			11 809	17			13 419	17
		8			14 314	31			15 745	31			17 892	31
		10			17 892	48			19 681	48			22 365	48
	800	4	0.800	0.568	8 179	8	0.880	0.625	8 997	8	1.000	0.710	10 224	8
		6			12 269	17			13 496	17			15 336	17
		8			16 358	31			17 994	31			20 448	31
		10			20 448	48			22 493	48			25 560	48
	900	4	0.900	0.639	9 202	8	0.990	0.703	10 122	8	1.125	0.799	11 502	8
		6			13 802	17			15 183	17			17 253	17
		8			18 403	31			20 244	31			23 004	31
		10			23 004	48			25 304	48			28 755	48

13.5.6 | MST system masking grilles



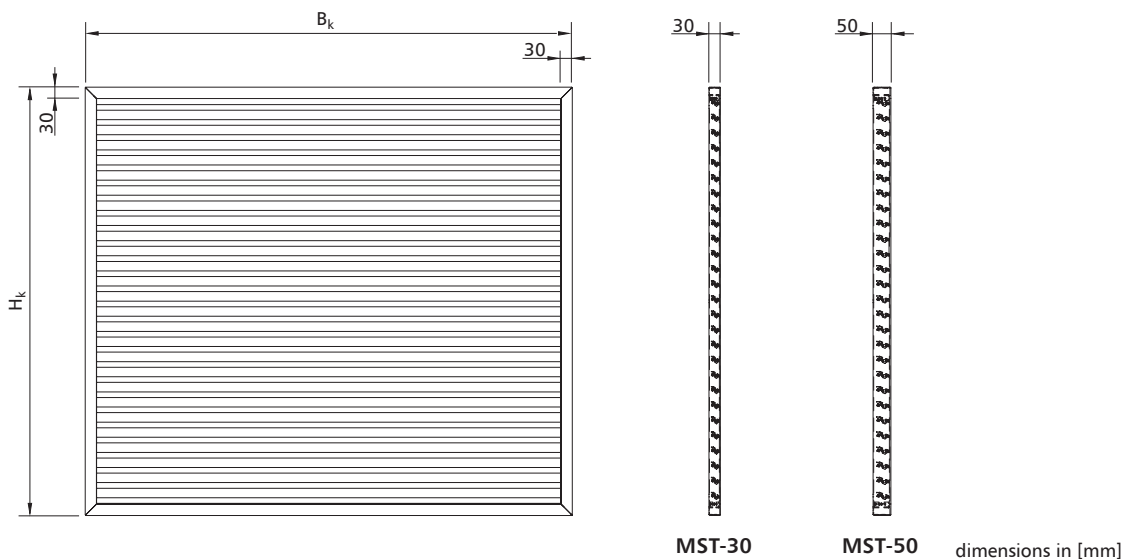
MST system masking grilles are designed to fulfill either supply or exhaust function. They enable the transfer of air through construction partitions. They come with fixed steel louvers with a 40 mm span, obscuring damper visibility.

Bolts embedded in the body are used to attach the masking grille body. After installation, an outer frame is mounted on the masking grille body so that the holes and bolts cannot be seen from the outside. Such a solution allows for installing the product even in the most visually-demanding applications. The masking grilles are painted in RAL 9010 as a standard (available in any colour from the RAL range on request).

dimensions:

- » nominal width B_k : from 200 mm to 1500 mm
- » nominal height H_k from 200 mm to 1500 mm
- » nominal thickness G 30 and 50 mm

Apart from the standard dimensions, masking grilles may be manufactured with intermediate dimensions.



13.5.7 | MST masking grille technical parameters

B_k – nominal width [mm]
 H_k – nominal height [mm]

v – velocity [m/s]
 S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
 d_p – pressure drop [Pa]

			height H_k [mm]												
			200				300			400			500		
			S_e [m²]	Q [m³/h]	d_p [PA]		S_e [m²]	Q [m³/h]	d_p [PA]		S_e [m²]	Q [m³/h]	d_p [PA]		S_e [m²]
width B_k [mm]	200	v [m/s]	0.015	210	12	0.028	403	10	0.041	596	9	0.055	789	9	
		6		315	27		605	23		894	21		1 184	20	
		8		420	49		806	41		1 192	37		1 578	35	
		10		526	76		1 008	64		1 490	58		1 973	54	
	300	4	0.028	402	10	0.051	734	8	0.074	1 067	7	0.097	1 400	7	
		6		603	23		1 102	19		1 601	17		2 100	15	
		8		804	41		1 469	33		2 134	29		2 799	27	
		10		1 004	64		1 836	52		2 668	46		3 499	42	
	400	4	0.041	593	9	0.074	1 066	7	0.107	1 538	6	0.140	2 010	6	
		6		890	21		1 598	17		2 307	14		3 015	13	
		8		1 187	37		2 131	29		3 076	26		4 020	23	
		10		1 483	58		2 664	46		3 845	40		5 026	36	
	500	4	0.055	785	9	0.097	1 397	7	0.140	2 009	6	0.182	2 621	5	
		6		1 177	20		2 095	15		3 013	13		3 931	12	
		8		1 570	35		2 794	27		4 018	23		5 242	21	
		10		1 962	55		3 492	42		5 022	36		6 552	33	
	600	4	0.068	976	8	0.120	1 728	6	0.172	2 480	5	0.224	3 231	5	
		6		1 464	19		2 592	14		3 720	12		4 847	11	
		8		1 953	33		3 456	26		4 959	22		6 463	19	
		10		2 441	52		4 320	40		6 199	34		8 078	30	
700	4	0.081	1 168	8	0.143	2 059	6	0.205	2 951	5	0.267	3 842	5		
	6		1 752	18		3 089	14		4 426	12		5 763	10		
	8		2 336	32		4 118	25		5 901	21		7 684	18		
	10		2 920	50		5 148	38		7 376	32		9 605	29		
800	4	0.094	1 359	8	0.166	2 390	6	0.238	3 421	5	0.309	4 452	4		
	6		2 039	18		3 586	13		5 132	11		6 679	10		
	8		2 719	31		4 781	24		6 843	20		8 905	17		
	10		3 398	49		5 976	37		8 554	31		11 131	27		
900	4	0.108	1 551	8	0.189	2 722	6	0.270	3 892	5	0.352	5 063	4		
	6		2 326	17		4 082	13		5 838	11		7 595	9		
	8		3 102	31		5 443	23		7 785	19		10 126	17		
	10		3 877	48		6 804	36		9 731	30		12 658	26		
1000	4	0.121	1 742	8	0.212	3 053	6	0.303	4 363	5	0.394	5 674	4		
	6		2 614	17		4 579	13		6 545	10		8 510	9		
	8		3 485	30		6 106	23		8 726	19		11 347	16		
	10		4 356	47		7 632	35		10 908	29		14 184	25		
1100	4	0.134	1 934	7	0.235	3 384	6	0.336	4 834	5	0.436	6 284	4		
	6		2 901	17		5 076	12		7 251	10		9 426	9		
	8		3 868	30		6 768	22		9 668	18		12 568	16		
	10		4 835	47		8 460	35		12 085	28		15 710	25		
1200	4	0.148	2 125	7	0.258	3 715	5	0.368	5 305	4	0.479	6 895	4		
	6		3 188	17		5 573	12		7 957	10		10 342	9		
	8		4 251	30		7 430	22		10 610	18		13 789	16		
	10		5 314	46		9 288	34		13 262	28		17 237	24		
1300	4	0.161	2 317	7	0.281	4 046	5	0.401	5 776	4	0.521	7 505	4		
	6		3 475	16		6 070	12		8 664	10		11 258	9		
	8		4 634	29		8 093	21		11 552	18		15 011	15		
	10		5 792	46		10 116	34		14 440	27		18 763	24		
1400	4	0.174	2 508	7	0.304	4 378	5	0.434	6 247	4	0.564	8 116	4		
	6		3 763	16		6 566	12		9 370	10		12 174	8		
	8		5 017	29		8 755	21		12 493	17		16 232	15		
	10		6 271	45		10 944	33		15 617	27		20 290	23		
1500	4	0.188	2 700	7	0.327	4 709	5	0.467	6 718	4	0.606	8 726	4		
	6		4 050	16		7 063	12		10 076	10		13 090	8		
	8		5 400	29		9 418	21		13 435	17		17 453	15		
	10		6 750	45		11 772	33		16 794	27		21 816	23		

B_k – nominal width [mm]
 H_k – nominal height [mm]

v – velocity [m/s]
 S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
 d_p – pressure drop [Pa]

			height H_k [mm]											
			600			700			800			900		
			S_e [m ²]	Q [m ³ /h]	d_p [Pa]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]
width B_k [mm]	v [m/s]													
	200	4	0.068	982	8	0.082	1 175	8	0.095	1 368	8	0.108	1 558	8
		6		1 473	19		1 763	18		2 052	18		2 337	17
		8		1 964	33		2 350	32		2 736	31		3 116	31
		10		2 455	52		2 938	50		3 420	49		3 895	48
	300	4	0.120	1 732	6	0.143	2 065	6	0.167	2 398	6	0.189	2 726	6
		6		2 598	14		3 097	14		3 596	13		4 089	13
		8		3 465	25		4 130	24		4 795	24		5 452	23
		10		4 331	40		5 162	38		5 994	37		6 815	36
	400	4	0.172	2 483	5	0.205	2 955	5	0.238	3 427	5	0.270	3 894	5
		6		3 724	12		4 432	12		5 141	11		5 841	11
		8		4 965	22		5 910	21		6 854	20		7 788	19
		10		6 206	34		7 387	32		8 568	31		9 734	30
	500	4	0.225	3 233	5	0.267	3 845	5	0.310	4 457	4	0.352	5 062	4
		6		4 849	11		5 767	10		6 685	10		7 592	9
		8		6 466	19		7 690	18		8 914	17		10 123	17
		10		8 082	30		9 612	28		11 142	27		12 654	26
	600	4	0.277	3 983	4	0.329	4 735	4	0.381	5 486	4	0.433	6 229	4
		6		5 975	10		7 102	9		8 230	9		9 344	9
		8		7 966	18		9 469	17		10 973	16		12 459	15
		10		9 958	28		11 837	26		13 716	25		15 574	24
	700	4	0.329	4 733	4	0.391	5 625	4	0.453	6 516	4	0.514	7 397	4
		6		7 100	9		8 437	9		9 774	8		11 096	8
		8		9 467	17		11 249	16		13 032	15		14 795	14
		10		11 833	26		14 062	24		16 290	23		18 493	22
	800	4	0.381	5 484	4	0.452	6 515	4	0.524	7 546	3	0.595	8 565	3
		6		8 225	9		9 772	8		11 318	8		12 848	8
8		10 967		16	13 029		15	15 091		14	17 130		13	
10		13 709		25	16 286		23	18 864		22	21 413		21	
900	4	0.433	6 234	4	0.514	7 404	4	0.596	8 575	3	0.676	9 733	3	
	6		9 351	9		11 107	8		12 863	7		14 599	7	
	8		12 468	15		14 809	14		17 150	13		19 466	13	
	10		15 584	24		18 511	22		21 438	21		24 332	20	
1000	4	0.485	6 984	4	0.576	8 294	3	0.667	9 605	3	0.757	10 901	3	
	6		10 476	8		12 442	8		14 407	7		16 351	7	
	8		13 968	15		16 589	14		19 210	13		21 802	12	
	10		17 460	23		20 736	21		24 012	20		27 252	19	
1100	4	0.537	7 734	4	0.638	9 184	3	0.739	10 634	3	0.838	12 069	3	
	6		11 601	8		13 776	7		15 952	7		18 103	7	
	8		15 468	14		18 369	13		21 269	12		24 137	12	
	10		19 336	22		22 961	21		26 586	19		30 172	18	
1200	4	0.589	8 484	3	0.700	10 074	3	0.810	11 664	3	0.919	13 236	3	
	6		12 727	8		15 111	7		17 496	7		19 855	6	
	8		16 969	14		20 148	13		23 328	12		26 473	11	
	10		21 211	22		25 186	20		29 160	19		33 091	18	
1300	4	0.641	9 235	3	0.761	10 964	3	0.882	12 694	3	1.000	14 404	3	
	6		13 852	8		16 446	7		19 040	7		21 606	6	
	8		18 469	14		21 928	13		25 387	12		28 809	11	
	10		23 087	21		27 410	20		31 734	18		36 011	17	
1400	4	0.693	9 985	3	0.823	11 854	3	0.953	13 723	3	1.081	15 572	3	
	6		14 977	8		17 781	7		20 585	6		23 358	6	
	8		19 970	13		23 708	12		27 446	11		31 144	11	
	10		24 962	21		29 635	19		34 308	18		38 930	17	
1500	4	0.746	10 735	3	0.885	12 744	3	1.025	14 753	3	1.163	16 740	3	
	6		16 103	7		19 116	7		22 129	6		25 110	6	
	8		21 470	13		25 488	12		29 506	11		33 480	11	
	10		26 838	21		31 860	19		36 882	18		41 850	17	

B_k – nominal width [mm]
 H_k – nominal height [mm]

v – velocity [m/s]
 S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
 d_p – pressure drop [Pa]

			height H_k [mm]											
			1000			1100			1200			1300		
			S_e [m ²]	Q [m ³ /h]	d_p [PA]	S_e [m ²]	Q [m ³ /h]	d_p [PA]	S_e [m ²]	Q [m ³ /h]	d_p [PA]	S_e [m ²]	Q [m ³ /h]	d_p [PA]
width B_k [mm]	200	4	0.122	1 751	8	0.135	1 944	7	0.148	2 137	7	0.162	2 330	7
		6		2 627	17		2 916	17		3 205	16		3 495	16
		8		3 502	30		3 888	30		4 274	29		4 660	29
		10		4 378	47		4 860	46		5 342	46		5 825	45
	300	4	0.212	3 059	6	0.236	3 391	5	0.259	3 724	5	0.282	4 056	5
		6		4 588	13		5 087	12		5 586	12		6 085	12
		8		6 117	22		6 782	22		7 448	22		8 113	21
		10		7 646	35		8 478	34		9 310	34		10 141	33
	400	4	0.303	4 366	5	0.336	4 838	5	0.369	5 311	4	0.402	5 783	4
		6		6 549	10		7 258	10		7 966	10		8 675	10
		8		8 732	19		9 677	18		10 621	18		11 566	17
		10		10 915	29		12 096	28		13 277	28		14 458	27
	500	4	0.394	5 674	4	0.437	6 286	4	0.479	6 898	4	0.522	7 510	4
		6		8 510	9		9 428	9		10 346	9		11 264	9
		8		11 347	16		12 571	16		13 795	15		15 019	15
		10		14 184	25		15 714	25		17 244	24		18 774	24
	600	4	0.485	6 981	4	0.537	7 733	4	0.589	8 484	3	0.641	9 236	3
		6		10 472	8		11 599	8		12 727	8		13 854	8
		8		13 962	15		15 466	14		16 969	14		18 472	14
		10		17 453	23		19 332	22		21 211	22		23 090	21
	700	4	0.576	8 289	3	0.638	9 180	3	0.699	10 071	3	0.761	10 963	3
		6		12 433	8		13 770	7		15 107	7		16 444	7
		8		16 577	14		18 360	13		20 143	13		21 925	13
		10		20 722	21		22 950	21		25 178	20		27 407	20
	800	4	0.666	9 596	3	0.738	10 627	3	0.810	11 658	3	0.881	12 689	3
		6		14 394	7		15 941	7		17 487	7		19 034	7
		8		19 192	13		21 254	12		23 316	12		25 379	12
		10		23 990	20		26 568	19		29 146	19		31 723	18
900	4	0.757	10 904	3	0.839	12 074	3	0.920	13 245	3	1.001	14 416	3	
	6		16 356	7		18 112	7		19 868	6		21 624	6	
	8		21 807	12		24 149	12		26 490	11		28 832	11	
	10		27 259	19		30 186	18		33 113	18		36 040	17	
1000	4	0.848	12 211	3	0.939	13 522	3	1.030	14 832	3	1.121	16 142	3	
	6		18 317	7		20 282	6		22 248	6		24 214	6	
	8		24 422	12		27 043	11		29 664	11		32 285	11	
	10		30 528	18		33 804	18		37 080	17		40 356	17	
1100	4	0.939	13 519	3	1.040	14 969	3	1.140	16 419	3	1.241	17 869	3	
	6		20 278	6		22 453	6		24 628	6		26 803	6	
	8		27 037	11		29 938	11		32 838	10		35 738	10	
	10		33 797	18		37 422	17		41 047	16		44 672	16	
1200	4	1.030	14 826	3	1.140	16 416	3	1.250	18 006	3	1.361	19 596	2	
	6		22 239	6		24 624	6		27 009	6		29 393	6	
	8		29 652	11		32 832	10		36 012	10		39 191	10	
	10		37 066	17		41 040	16		45 014	16		48 989	15	
1300	4	1.120	16 134	3	1.241	17 863	3	1.361	19 593	2	1.481	21 322	2	
	6		24 201	6		26 795	6		29 389	6		31 983	5	
	8		32 268	11		35 726	10		39 185	10		42 644	10	
	10		40 334	17		44 658	16		48 982	15		53 305	15	
1400	4	1.211	17 441	3	1.341	19 310	2	1.471	21 180	2	1.601	23 049	2	
	6		26 162	6		28 966	6		31 769	5		34 573	5	
	8		34 883	10		38 621	10		42 359	10		46 097	9	
	10		43 603	16		48 276	16		52 949	15		57 622	14	
1500	4	1.302	18 749	3	1.442	20 758	2	1.581	22 766	2	1.721	24 775	2	
	6		28 123	6		31 136	5		34 150	5		37 163	5	
	8		37 498	10		41 515	10		45 533	9		49 550	9	
	10		46 872	16		51 894	15		56 916	15		61 938	14	

B_k – nominal width [mm]
 H_k – nominal height [mm]

v – velocity [m/s]
 S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
 d_p – pressure drop [Pa]

		height H_k [mm]					
		1400			1500		
	v [m/s]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]
width B_k [mm]	200	4	2 523	7		2 716	7
		6	3 784	16		4 074	16
		8	5 046	29	0.189	5 432	29
		10	6 307	45		6 790	45
	300	4	4 389	5		4 722	5
		6	6 584	12		7 083	12
		8	8 778	21	0.328	9 444	21
		10	10 973	33		11 804	33
	400	4	6 255	4		6 728	4
		6	9 383	10		10 092	10
		8	12 511	17	0.467	13 455	17
		10	15 638	27		16 819	27
	500	4	8 122	4		8 734	4
		6	12 182	8		13 100	8
		8	16 243	15	0.607	17 467	15
		10	20 304	23		21 834	23
	600	4	9 988	3		10 740	3
		6	14 982	8		16 109	7
		8	19 976	13	0.746	21 479	13
		10	24 970	21		26 849	21
	700	4	11 854	3		12 745	3
		6	17 781	7		19 118	7
		8	23 708	12	0.885	25 491	12
		10	29 635	19		31 864	19
	800	4	13 720	3		14 751	3
		6	20 580	6		22 127	6
		8	27 441	11	1.024	29 503	11
		10	34 301	18		36 878	18
	900	4	15 587	3		16 757	3
		6	23 380	6		25 136	6
		8	31 173	11	1.164	33 515	11
		10	38 966	17		41 893	17
	1000	4	17 453	3		18 763	3
		6	26 179	6		28 145	6
		8	34 906	10	1.303	37 526	10
		10	43 632	16		46 908	16
	1100	4	19 319	2		20 769	2
		6	28 979	6		31 154	5
		8	38 638	10	1.442	41 538	10
		10	48 298	15		51 923	15
	1200	4	21 185	2		22 775	2
		6	31 778	5		34 163	5
		8	42 371	10	1.582	45 550	9
		10	52 963	15		56 938	15
	1300	4	23 052	2		24 781	2
		6	34 577	5		37 171	5
		8	46 103	9	1.721	49 562	9
		10	57 629	14		61 952	14
	1400	4	24 918	2		26 787	2
		6	37 377	5		40 180	5
		8	49 836	9	1.860	53 574	9
		10	62 294	14		66 967	14
	1500	4	26 784	2		28 793	2
		6	40 176	5		43 189	5
		8	53 568	9	2.000	57 586	9
		10	66 960	14		71 982	13

13.6 | mcr WIP PRO/T rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]																	
			270						300						350					
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]		
width B [mm]	110	4	0.030	0.019	269	13	33	0.033	0.019	269	14	34	0.039	0.019	269	16	36			
		6			404	30	44			404	30	44			404	36	46			
		8			539	53	51			539	54	52			539	63	54			
		10			673	82	57			673	85	58			673	99	60			
	150	4	0.041	0.026	367	13	35	0.045	0.026	367	14	35	0.053	0.026	367	16	37			
		6			551	30	45			551	30	46			551	36	48			
		8			734	53	53			734	54	53			734	63	55			
		10			918	82	59			918	85	59			918	99	61			
	200	4	0.054	0.034	490	13	36	0.060	0.034	490	14	36	0.070	0.034	490	16	38			
		6			734	30	46			734	30	47			734	36	49			
		8			979	53	54			979	54	54			979	63	56			
		10			1 224	82	60			1 224	84	60			1 224	99	62			
	250	4	0.068	0.043	612	13	37	0.075	0.043	612	14	37	0.088	0.043	612	16	39			
		6			918	30	47			918	30	48			918	36	50			
		8			1 224	53	55			1 224	54	55			1 224	63	57			
		10			1 530	82	61			1 530	85	61			1 530	99	63			
	300	4	0.081	0.051	734	13	38	0.090	0.051	734	14	38	0.105	0.051	734	16	40			
		6			1 102	30	48			1 102	30	49			1 102	36	51			
		8			1 469	53	56			1 469	54	56			1 469	63	58			
		10			1 836	82	62			1 836	85	62			1 836	99	64			
	350	4	0.095	0.060	857	13	38	0.105	0.060	857	14	39	0.123	0.060	857	16	41			
		6			1 285	30	49			1 285	30	49			1 285	36	51			
		8			1 714	53	56			1 714	54	57			1 714	63	59			
		10			2 142	82	62			2 142	85	63			2 142	99	65			
	400	4	0.108	0.068	979	13	39	0.120	0.068	979	14	39	0.140	0.068	979	16	41			
		6			1 469	30	49			1 469	30	50			1 469	36	52			
		8			1 958	53	57			1 958	54	57			1 958	63	59			
		10			2 448	82	63			2 448	84	63			2 448	99	65			
	450	4	0.122	0.077	1 102	13	39	0.135	0.077	1 102	14	40	0.158	0.077	1 102	16	42			
		6			1 652	30	50			1 652	30	50			1 652	36	52			
		8			2 203	53	57			2 203	54	58			2 203	63	60			
		10			2 754	82	63			2 754	84	64			2 754	99	66			
	500	4	0.135	0.085	1 224	13	40	0.150	0.085	1 224	14	40	0.175	0.085	1 224	16	42			
		6			1 836	30	50			1 836	30	51			1 836	36	53			
		8			2 448	53	58			2 448	54	58			2 448	63	60			
		10			3 060	82	64			3 060	85	64			3 060	99	66			
	550	4	0.149	0.094	1 346	2	13	0.165	0.094	1 346	14	41	0.193	0.094	1 346	16	43			
		6			2 020	4	24			2 020	30	51			2 020	36	53			
		8			2 693	7	31			2 693	54	59			2 693	63	61			
		10			3 366	10	37			3 366	84	65			3 366	99	67			
	600	4	0.162	0.102	1 469	13	41	0.180	0.102	1 469	14	41	0.210	0.102	1 469	16	43			
		6			2 203	30	51			2 203	30	52			2 203	36	54			
		8			2 938	53	59			2 938	54	59			2 938	63	61			
		10			3 672	82	65			3 672	85	65			3 672	99	67			
	650	4	0.176	0.111	1 591	13	41	0.195	0.111	1 591	14	41	0.228	0.111	1 591	16	43			
		6			2 387	30	52			2 387	30	52			2 387	36	54			
		8			3 182	53	59			3 182	54	59			3 182	63	62			
		10			3 978	82	65			3 978	85	65			3 978	99	67			
700	4	0.189	0.119	1 714	13	41	0.210	0.119	1 714	14	42	0.245	0.119	1 714	16	44				
	6			2 570	30	52			2 570	30	52			2 570	36	54				
	8			3 427	53	59			3 427	54	60			3 427	63	62				
	10			4 284	82	65			4 284	85	66			4 284	99	68				
750	4	0.203	0.128	1 836	13	42	0.225	0.128	1 836	14	42	0.263	0.128	1 836	16	44				
	6			2 754	30	52			2 754	30	53			2 754	36	55				
	8			3 672	53	60			3 672	54	60			3 672	63	62				
	10			4 590	82	66			4 590	85	66			4 590	99	68				
800	4	0.216	0.136	1 958	13	42	0.240	0.136	1 958	14	42	0.280	0.136	1 958	16	44				
	6			2 938	30	52			2 938	30	53			2 938	36	55				
	8			3 917	53	60			3 917	54	60			3 917	63	62				
	10			4 896	82	66			4 896	84	66			4 896	99	68				
850	4	0.230	0.145	2 081	13	42	0.255	0.145	2 081	14	43	0.298	0.145	2 081	16	45				
	6			3 121	30	53			3 121	30	53			3 121	36	55				
	8			4 162	53	60			4 162	54	61			4 162	63	63				
	10			5 202	82	66			5 202	84	66			5 202	99	68				
900	4	0.243	0.153	2 203	13	42	0.270	0.153	2 203	14	43	0.315	0.153	2 203	16	45				
	6			3 305	30	53			3 305	30	53			3 305	36	55				
	8			4 406	53	60			4 406	54	61			4 406	63	63				
	10			5 508	82	66			5 508	84	67			5 508	99	69				

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			390					450					520				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]
width B [mm]	110	4	0.043	0.028	401	12	34	0.050	0.028	401	14	36	0.057	0.037	532	12	35
		6			601	27	44			601	31	46			798	27	46
		8			802	47	52			802	55	54			1 064	48	53
		10			1 002	74	58			1 002	86	60			1 331	75	59
	150	4	0.059	0.038	546	12	35	0.068	0.038	546	14	37	0.078	0.050	726	12	36
		6			820	27	46			820	31	48			1 089	27	47
		8			1 093	47	53			1 093	55	55			1 452	48	54
		10			1 366	74	59			1 366	86	61			1 814	75	60
	200	4	0.078	0.051	729	12	36	0.090	0.051	729	14	38	0.104	0.067	968	12	38
		6			1 093	27	47			1 093	31	49			1 452	27	48
		8			1 457	47	54			1 457	55	56			1 935	48	56
		10			1 822	74	60			1 822	86	62			2 419	75	62
	250	4	0.098	0.063	911	12	37	0.113	0.063	911	14	39	0.130	0.084	1 210	12	39
		6			1 366	27	48			1 366	31	50			1 814	27	49
		8			1 822	47	55			1 822	55	57			2 419	48	57
		10			2 277	74	61			2 277	86	63			3 024	75	63
	300	4	0.117	0.076	1 093	12	38	0.135	0.076	1 093	14	40	0.156	0.101	1 452	12	39
		6			1 639	27	49			1 639	31	51			2 177	27	50
		8			2 186	47	56			2 186	55	58			2 903	48	57
		10			2 732	74	62			2 732	86	64			3 629	75	63
	350	4	0.137	0.089	1 275	12	39	0.158	0.089	1 275	14	41	0.182	0.118	1 693	12	40
		6			1 913	27	49			1 913	31	51			2 540	27	51
		8			2 550	47	57			2 550	55	59			3 387	48	58
		10			3 188	74	63			3 188	86	65			4 234	75	64
	400	4	0.156	0.101	1 457	12	39	0.180	0.101	1 457	14	41	0.208	0.134	1 935	12	41
		6			2 186	27	50			2 186	31	52			2 903	27	51
		8			2 915	47	57			2 915	55	59			3 871	48	59
		10			3 643	74	63			3 643	86	65			4 838	75	65
	450	4	0.176	0.114	1 639	12	40	0.203	0.114	1 639	14	42	0.234	0.151	2 177	12	41
		6			2 459	27	50			2 459	31	52			3 266	27	52
		8			3 279	47	58			3 279	55	60			4 355	48	59
		10			4 099	74	64			4 099	86	66			5 443	75	65
	500	4	0.195	0.127	1 822	12	40	0.225	0.127	1 822	14	42	0.260	0.168	2 419	12	42
		6			2 732	27	51			2 732	31	53			3 629	27	52
		8			3 643	47	58			3 643	55	60			4 838	48	60
		10			4 554	74	64			4 554	86	66			6 048	75	66
	550	4	0.215	0.139	2 004	12	41	0.248	0.139	2 004	14	43	0.286	0.185	2 661	12	42
		6			3 006	27	51			3 006	31	53			3 992	27	53
		8			4 008	47	59			4 008	55	61			5 322	48	60
		10			5 009	74	65			5 009	86	67			6 653	75	66
	600	4	0.234	0.152	2 186	12	41	0.270	0.152	2 186	14	43	0.312	0.202	2 903	12	42
		6			3 279	27	52			3 279	31	54			4 355	27	53
		8			4 372	47	59			4 372	55	61			5 806	48	61
		10			5 465	74	65			5 465	86	67			7 258	75	66
	650	4	0.254	0.164	2 368	12	41	0.293	0.164	2 368	14	43	0.338	0.218	3 145	12	43
		6			3 552	27	52			3 552	31	54			4 717	27	53
		8			4 736	47	59			4 736	55	61			6 290	48	61
		10			5 920	74	65			5 920	86	67			7 862	75	67
700	4	0.273	0.177	2 550	12	42	0.315	0.177	2 550	14	44	0.364	0.235	3 387	12	43	
	6			3 825	27	52			3 825	31	54			5 080	27	54	
	8			5 100	47	60			5 100	55	62			6 774	48	61	
	10			6 376	74	66			6 376	86	68			8 467	75	67	
750	4	0.293	0.190	2 732	12	42	0.338	0.190	2 732	14	44	0.390	0.252	3 629	12	43	
	6			4 099	27	53			4 099	31	55			5 443	27	54	
	8			5 465	47	60			5 465	55	62			7 258	48	61	
	10			6 831	74	66			6 831	86	68			9 072	75	67	
800	4	0.312	0.202	2 915	12	42	0.360	0.202	2 915	14	43	0.416	0.269	3 871	12	43	
	6			4 372	27	53			4 372	31	54			5 806	27	54	
	8			5 829	47	60			5 829	55	61			7 741	48	61	
	10			7 286	74	66			7 286	86	67			9 677	75	67	
850	4	0.332	0.215	3 097	12	43	0.383	0.215	3 097	14	43	0.442	0.286	4 113	12	43	
	6			4 645	27	53			4 645	31	54			6 169	27	54	
	8			6 193	47	61			6 193	55	61			8 225	48	61	
	10			7 742	74	66			7 742	86	67			10 282	75	67	
900	4	0.351	0.228	3 279	12	43	0.405	0.228	3 279	14	43	0.468	0.302	4 355	12	43	
	6			4 918	27	53			4 918	31	54			6 532	27	54	
	8			6 558	47	61			6 558	55	61			8 709	48	61	
	10			8 197	74	67			8 197	86	67			10 886	75	67	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			550					640					650				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	110	4	0.061	0.037	532	13	36	0.070	0.046	664	11	35	0.072	0.046	664	12	36
		6			798	29	46			996	26	46			996	27	47
		8			1 064	51	54			1 327	46	53			1 327	48	54
		10			1 331	79	60			1 659	72	59			1 659	76	60
	150	4	0.083	0.050	726	13	37	0.096	0.063	905	11	37	0.098	0.063	905	12	37
		6			1 089	29	48			1 358	26	47			1 358	27	48
		8			1 452	51	55			1 810	46	55			1 810	48	56
		10			1 814	79	61			2 263	72	61			2 263	76	61
	200	4	0.110	0.067	968	13	38	0.128	0.084	1 207	11	38	0.130	0.084	1 207	12	39
		6			1 452	29	49			1 810	26	49			1 810	27	49
		8			1 935	51	56			2 413	46	56			2 413	48	57
		10			2 419	79	62			3 017	72	62			3 017	76	63
	250	4	0.138	0.084	1 210	13	39	0.160	0.105	1 508	11	39	0.163	0.105	1 508	12	40
		6			1 814	29	50			2 263	26	50			2 263	27	50
		8			2 419	51	57			3 017	46	57			3 017	48	58
		10			3 024	79	63			3 771	72	63			3 771	76	64
	300	4	0.165	0.101	1 452	13	40	0.192	0.126	1 810	11	40	0.195	0.126	1 810	12	41
		6			2 177	29	51			2 715	26	50			2 715	27	51
		8			2 903	51	58			3 620	46	58			3 620	48	59
		10			3 629	79	64			4 525	72	64			4 525	76	64
	350	4	0.193	0.118	1 693	13	41	0.224	0.147	2 112	11	40	0.228	0.147	2 112	12	41
		6			2 540	29	51			3 168	26	51			3 168	27	52
		8			3 387	51	59			4 224	46	58			4 224	48	59
		10			4 234	79	65			5 279	72	64			5 279	76	65
	400	4	0.220	0.134	1 935	13	41	0.256	0.168	2 413	11	41	0.260	0.168	2 413	12	42
		6			2 903	29	52			3 620	26	52			3 620	27	52
		8			3 871	51	59			4 827	46	59			4 827	48	60
		10			4 838	79	65			6 034	72	65			6 034	76	66
	450	4	0.248	0.151	2 177	13	42	0.288	0.189	2 715	11	42	0.293	0.189	2 715	12	42
		6			3 266	29	52			4 073	26	52			4 073	27	53
		8			4 355	51	60			5 430	46	60			5 430	48	60
		10			5 443	79	66			6 788	72	65			6 788	76	66
	500	4	0.275	0.168	2 419	13	42	0.320	0.210	3 017	11	42	0.325	0.210	3 017	12	43
		6			3 629	29	53			4 525	26	53			4 525	27	53
		8			4 838	51	60			6 034	46	60			6 034	48	61
		10			6 048	79	66			7 542	72	66			7 542	76	67
	550	4	0.303	0.185	2 661	13	43	0.352	0.230	3 318	11	42	0.358	0.230	3 318	12	43
		6			3 992	29	53			4 978	26	53			4 978	27	54
		8			5 322	51	61			6 637	46	60			6 637	48	61
		10			6 653	79	67			8 296	72	66			8 296	76	67
	600	4	0.330	0.202	2 903	13	43	0.384	0.251	3 620	11	43	0.390	0.251	3 620	12	44
		6			4 355	29	54			5 430	26	53			5 430	27	54
		8			5 806	51	61			7 240	46	61			7 240	48	62
		10			7 258	79	67			9 050	72	67			9 050	76	67
	650	4	0.358	0.218	3 145	13	44	0.416	0.272	3 922	11	43	0.423	0.272	3 922	12	44
		6			4 717	29	54			5 883	26	54			5 883	27	54
		8			6 290	51	62			7 844	46	61			7 844	48	62
		10			7 862	79	67			9 805	72	67			9 805	76	68
700	4	0.385	0.235	3 387	13	44	0.448	0.293	4 224	11	43	0.455	0.293	4 224	12	44	
	6			5 080	29	54			6 335	26	54			6 335	27	55	
	8			6 774	51	62			8 447	46	61			8 447	48	62	
	10			8 467	79	68			10 559	72	67			10 559	76	68	
750	4	0.413	0.252	3 629	13	44	0.480	0.314	4 525	11	44	0.488	0.314	4 525	12	44	
	6			5 443	29	55			6 788	26	54			6 788	27	55	
	8			7 258	51	62			9 050	46	62			9 050	48	63	
	10			9 072	79	68			11 313	72	68			11 313	76	68	
800	4	0.440	0.269	3 871	13	44	0.512	0.335	4 827	11	44	0.520	0.335	4 827	12	44	
	6			5 806	29	55			7 240	26	55			7 240	27	55	
	8			7 741	51	62			9 654	46	62			9 654	48	63	
	10			9 677	79	68			12 067	72	68			12 067	76	68	
850	4	0.468	0.286	4 113	13	45	0.544	0.356	5 129	11	44	0.553	0.356	5 129	12	44	
	6			6 169	29	55			7 693	26	55			7 693	27	55	
	8			8 225	51	63			10 257	46	62			10 257	48	63	
	10			10 282	79	69			12 821	72	68			12 821	76	68	
900	4	0.495	0.302	4 355	13	45	0.576	0.377	5 430	11	45	0.585	0.377	5 430	12	44	
	6			6 532	29	56			8 145	26	52			8 145	27	55	
	8			8 709	51	63			10 860	46	60			10 860	48	63	
	10			10 886	79	69			13 576	72	65			13 576	76	68	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			700					760					800				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	110	4	0.077	0.046	664	14	38	0.084	0.055	795	12	37	0.088	0.055	795	10	34
		6			996	30	48			1 193	28	48			1 193	22	45
		8			1 327	54	56			1 590	50	55			1 590	40	52
		10			1 659	85	61			1 988	78	61			1 988	62	58
	150	4	0.105	0.063	905	14	39	0.114	0.075	1 084	12	39	0.120	0.075	1 084	10	36
		6			1 358	30	49			1 626	28	49			1 626	22	46
		8			1 810	54	57			2 169	50	57			2 169	40	54
		10			2 263	85	63			2 711	78	62			2 711	62	60
	200	4	0.140	0.084	1 207	14	40	0.152	0.100	1 446	12	40	0.160	0.100	1 446	10	37
		6			1 810	30	51			2 169	28	50			2 169	22	48
		8			2 413	54	58			2 892	50	58			2 892	40	55
		10			3 017	85	64			3 614	78	64			3 614	62	61
	250	4	0.175	0.105	1 508	14	41	0.190	0.126	1 807	12	41	0.200	0.126	1 807	10	38
		6			2 263	30	52			2 711	28	51			2 711	22	49
		8			3 017	54	59			3 614	50	59			3 614	40	56
		10			3 771	85	65			4 518	78	65			4 518	62	62
	300	4	0.210	0.126	1 810	14	42	0.228	0.151	2 169	12	42	0.240	0.151	2 169	10	39
		6			2 715	30	53			3 253	28	52			3 253	22	49
		8			3 620	54	60			4 337	50	60			4 337	40	57
		10			4 525	85	66			5 422	78	66			5 422	62	63
	350	4	0.245	0.147	2 112	14	43	0.266	0.176	2 530	12	42	0.280	0.176	2 530	10	39
		6			3 168	30	53			3 795	28	53			3 795	22	50
		8			4 224	54	61			5 060	50	60			5 060	40	57
		10			5 279	85	66			6 325	78	66			6 325	62	63
400	4	0.280	0.168	2 413	14	43	0.304	0.201	2 892	12	43	0.320	0.201	2 892	10	40	
	6			3 620	30	54			4 337	28	53			4 337	22	51	
	8			4 827	54	61			5 783	50	61			5 783	40	58	
	10			6 034	85	67			7 229	78	67			7 229	62	64	
450	4	0.315	0.189	2 715	14	44	0.342	0.226	3 253	12	43	0.360	0.226	3 253	10	41	
	6			4 073	30	54			4 879	28	54			4 879	22	51	
	8			5 430	54	62			6 506	50	61			6 506	40	59	
	10			6 788	85	68			8 132	78	67			8 132	62	64	
500	4	0.350	0.210	3 017	14	44	0.380	0.251	3 614	12	44	0.400	0.251	3 614	10	41	
	6			4 525	30	55			5 422	28	54			5 422	22	52	
	8			6 034	54	62			7 229	50	62			7 229	40	59	
	10			7 542	85	68			9 036	78	68			9 036	62	65	
550	4	0.385	0.230	3 318	14	45	0.418	0.276	3 976	12	44	0.440	0.276	3 976	10	41	
	6			4 978	30	55			5 964	28	55			5 964	22	52	
	8			6 637	54	63			7 952	50	62			7 952	40	59	
	10			8 296	85	68			9 940	78	68			9 940	62	65	
600	4	0.420	0.251	3 620	14	45	0.456	0.301	4 337	12	45	0.480	0.301	4 337	10	42	
	6			5 430	30	56			6 506	28	55			6 506	22	52	
	8			7 240	54	63			8 675	50	63			8 675	40	60	
	10			9 050	85	69			10 843	78	69			10 843	62	66	
650	4	0.455	0.272	3 922	14	45	0.494	0.326	4 699	12	45	0.520	0.326	4 699	10	42	
	6			5 883	30	56			7 048	28	56			7 048	22	53	
	8			7 844	54	63			9 397	50	63			9 397	40	60	
	10			9 805	85	69			11 747	78	69			11 747	62	66	
700	4	0.490	0.293	4 224	14	46	0.532	0.351	5 060	12	45	0.560	0.351	5 060	10	42	
	6			6 335	30	56			7 590	28	56			7 590	22	53	
	8			8 447	54	64			10 120	50	63			10 120	40	61	
	10			10 559	85	69			12 650	78	69			12 650	62	66	
750	4	0.525	0.314	4 525	14	46	0.570	0.377	5 422	12	46	0.600	0.377	5 422	10	43	
	6			6 788	30	56			8 132	28	56			8 132	22	53	
	8			9 050	54	64			10 843	50	64			10 843	40	61	
	10			11 313	85	70			13 554	78	69			13 554	62	67	
800	4	0.560	0.335	4 827	14	44	0.608	0.402	5 783	12	46	0.640	0.402	5 783	10	43	
	6			7 240	30	55			8 675	28	56			8 675	22	54	
	8			9 654	54	62			11 566	50	64			11 566	40	61	
	10			12 067	85	67			14 458	78	70			14 458	62	67	
850	4	0.595	0.356	5 129	14	46	0.646	0.427	6 144	12	46	0.680	0.427	6 144	10	43	
	6			7 693	30	57			9 217	28	57			9 217	22	54	
	8			10 257	54	65			12 289	50	64			12 289	40	61	
	10			12 821	85	70			15 361	78	70			15 361	62	67	
900	4	0.630	0.377	5 430	14	47	0.684	0.452	6 506	12	46	0.720	0.452	6 506	10	44	
	6			8 145	30	57			9 759	28	57			9 759	22	54	
	8			10 860	54	65			13 012	50	64			13 012	40	62	
	10			13 576	85	71			16 265	78	70			16 265	62	67	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			890					900					950				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	110	4	0.098	0.064	927	13	38	0.099	0.064	927	13	39	0.105	0.064	927	14	40
		6			1 390	29	49			1 390	30	49			1 390	32	50
		8			1 853	51	56			1 853	53	57			1 853	57	58
		10			2 317	79	62			2 317	83	63			2 317	89	64
	150	4	0.134	0.088	1 264	13	40	0.135	0.088	1 264	13	40	0.143	0.088	1 264	14	41
		6			1 895	29	50			1 895	30	51			1 895	32	52
		8			2 527	51	58			2 527	53	58			2 527	57	59
		10			3 159	79	63			3 159	83	64			3 159	89	65
	200	4	0.178	0.117	1 685	13	41	0.180	0.117	1 685	13	41	0.190	0.117	1 685	14	42
		6			2 527	29	51			2 527	30	52			2 527	32	53
		8			3 370	51	59			3 370	53	59			3 370	57	60
		10			4 212	79	65			4 212	83	65			4 212	89	66
	250	4	0.223	0.146	2 106	13	42	0.225	0.146	2 106	13	42	0.238	0.146	2 106	14	43
		6			3 159	29	52			3 159	30	53			3 159	32	54
		8			4 212	51	60			4 212	53	60			4 212	57	61
		10			5 265	79	66			5 265	83	66			5 265	89	67
	300	4	0.267	0.176	2 527	13	43	0.270	0.176	2 527	13	43	0.285	0.176	2 527	14	44
		6			3 791	29	53			3 791	30	54			3 791	32	55
		8			5 054	51	61			5 054	53	61			5 054	57	62
		10			6 318	79	66			6 318	83	67			6 318	89	68
	350	4	0.312	0.205	2 948	13	43	0.315	0.205	2 948	13	44	0.333	0.205	2 948	14	45
		6			4 423	29	54			4 423	30	54			4 423	32	55
		8			5 897	51	61			5 897	53	62			5 897	57	63
		10			7 371	79	67			7 371	83	68			7 371	89	69
	400	4	0.356	0.234	3 370	13	44	0.360	0.234	3 370	13	44	0.380	0.234	3 370	14	45
		6			5 054	29	54			5 054	30	55			5 054	32	56
		8			6 739	51	62			6 739	53	62			6 739	57	63
		10			8 424	79	68			8 424	83	68			8 424	89	69
	450	4	0.401	0.263	3 791	13	44	0.405	0.263	3 791	13	45	0.428	0.263	3 791	14	46
		6			5 686	29	55			5 686	30	55			5 686	32	56
		8			7 582	51	62			7 582	53	63			7 582	57	64
		10			9 477	79	68			9 477	83	69			9 477	89	70
	500	4	0.445	0.293	4 212	13	45	0.450	0.293	4 212	13	45	0.475	0.293	4 212	14	46
		6			6 318	29	55			6 318	30	56			6 318	32	57
		8			8 424	51	63			8 424	53	63			8 424	57	64
		10			10 530	79	69			10 530	83	69			10 530	89	70
	550	4	0.490	0.322	4 633	13	45	0.495	0.322	4 633	13	46	0.523	0.322	4 633	14	47
		6			6 950	29	56			6 950	30	56			6 950	32	57
		8			9 266	51	63			9 266	53	64			9 266	57	65
		10			11 583	79	69			11 583	83	70			11 583	89	70
	600	4	0.534	0.351	5 054	13	46	0.540	0.351	5 054	13	46	0.570	0.351	5 054	14	47
		6			7 582	29	56			7 582	30	57			7 582	32	58
		8			10 109	51	64			10 109	53	64			10 109	57	65
		10			12 636	79	69			12 636	83	70			12 636	89	71
	650	4	0.579	0.380	5 476	13	46	0.585	0.380	5 476	13	46	0.618	0.380	5 476	14	47
		6			8 213	29	56			8 213	30	57			8 213	32	58
		8			10 951	51	64			10 951	53	65			10 951	57	65
		10			13 689	79	70			13 689	83	70			13 689	89	71
700	4	0.623	0.410	5 897	13	46	0.630	0.410	5 897	13	47	0.665	0.410	5 897	14	48	
	6			8 845	29	57			8 845	30	57			8 845	32	58	
	8			11 794	51	64			11 794	53	65			11 794	57	66	
	10			14 742	79	70			14 742	83	71			14 742	89	72	
750	4	0.668	0.439	6 318	13	47	0.675	0.439	6 318	13	47	0.713	0.439	6 318	14	48	
	6			9 477	29	57			9 477	30	58			9 477	32	59	
	8			12 636	51	65			12 636	53	65			12 636	57	66	
	10			15 795	79	70			15 795	83	71			15 795	89	72	
800	4	0.712	0.468	6 739	13	47	0.720	0.468	6 739	13	47	0.760	0.468	6 739	14	48	
	6			10 109	29	57			10 109	30	58			10 109	32	59	
	8			13 478	51	65			13 478	53	65			13 478	57	66	
	10			16 848	79	71			16 848	83	71			16 848	89	72	
850	4	0.757	0.497	7 160	13	47	0.765	0.497	7 160	13	48	0.808	0.497	7 160	14	49	
	6			10 741	29	58			10 741	30	58			10 741	32	59	
	8			14 321	51	65			14 321	53	66			14 321	57	67	
	10			17 901	79	71			17 901	83	71			17 901	89	72	
900	4	0.801	0.527	7 582	13	47	0.810	0.527	7 582	13	48	0.855	0.527	7 582	14	49	
	6			11 372	29	58			11 372	30	58			11 372	32	59	
	8			15 163	51	65			15 163	53	66			15 163	57	67	
	10			18 954	79	71			18 954	83	72			18 954	89	73	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			1010					1050					1100				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	110	4	0.111	0.073	1 058	12	38	0.116	0.073	1 058	13	39	0.121	0.073	1 058	15	41
		6			1 587	28	49			1 587	29	49			1 587	33	51
		8			2 116	50	57			2 116	51	57			2 116	59	59
		10			2 645	77	62			2 645	79	63			2 645	93	65
	150	4	0.152	0.100	1 443	12	40	0.158	0.100	1 443	13	40	0.165	0.100	1 443	15	42
		6			2 164	28	50			2 164	29	51			2 164	33	53
		8			2 886	50	58			2 886	51	58			2 886	59	60
		10			3 607	77	64			3 607	79	64			3 607	93	66
	200	4	0.202	0.134	1 924	12	41	0.210	0.134	1 924	13	41	0.220	0.134	1 924	15	43
		6			2 886	28	52			2 886	29	52			2 886	33	54
		8			3 848	50	59			3 848	51	59			3 848	59	61
		10			4 810	77	65			4 810	79	65			4 810	93	67
	250	4	0.253	0.167	2 405	12	42	0.263	0.167	2 405	13	42	0.275	0.167	2 405	15	44
		6			3 607	28	53			3 607	29	53			3 607	33	55
		8			4 810	50	60			4 810	51	60			4 810	59	62
		10			6 012	77	66			6 012	79	66			6 012	93	68
	300	4	0.303	0.200	2 886	12	43	0.315	0.200	2 886	13	43	0.330	0.200	2 886	15	45
		6			4 329	28	53			4 329	29	54			4 329	33	56
		8			5 772	50	61			5 772	51	61			5 772	59	63
		10			7 214	77	67			7 214	79	67			7 214	93	69
	350	4	0.354	0.234	3 367	12	43	0.368	0.234	3 367	13	44	0.385	0.234	3 367	15	46
		6			5 050	28	54			5 050	29	54			5 050	33	56
		8			6 733	50	62			6 733	51	62			6 733	59	64
		10			8 417	77	67			8 417	79	68			8 417	93	70
	400	4	0.404	0.267	3 848	12	44	0.420	0.267	3 848	13	44	0.440	0.267	3 848	15	46
		6			5 772	28	55			5 772	29	55			5 772	33	57
		8			7 695	50	62			7 695	51	62			7 695	59	64
		10			9 619	77	68			9 619	79	68			9 619	93	70
	450	4	0.455	0.301	4 329	12	45	0.473	0.301	4 329	13	45	0.495	0.301	4 329	15	47
		6			6 493	28	55			6 493	29	55			6 493	33	57
		8			8 657	50	63			8 657	51	63			8 657	59	65
		10			10 822	77	68			10 822	79	69			10 822	93	71
	500	4	0.505	0.334	4 810	12	45	0.525	0.334	4 810	13	45	0.550	0.334	4 810	15	47
		6			7 214	28	56			7 214	29	56			7 214	33	58
		8			9 619	50	63			9 619	51	63			9 619	59	65
		10			12 024	77	69			12 024	79	69			12 024	93	71
	550	4	0.556	0.367	5 291	12	45	0.578	0.367	5 291	13	46	0.605	0.367	5 291	15	48
		6			7 936	28	56			7 936	29	56			7 936	33	58
		8			10 581	50	63			10 581	51	64			10 581	59	66
		10			13 226	77	69			13 226	79	70			13 226	93	72
	600	4	0.606	0.401	5 772	12	46	0.630	0.401	5 772	13	46	0.660	0.401	5 772	15	48
		6			8 657	28	56			8 657	29	57			8 657	33	59
		8			11 543	50	64			11 543	51	64			11 543	59	66
		10			14 429	77	70			14 429	79	70			14 429	93	72
	650	4	0.657	0.434	6 252	12	46	0.683	0.434	6 252	13	46	0.715	0.434	6 252	15	48
		6			9 379	28	57			9 379	29	57			9 379	33	59
		8			12 505	50	64			12 505	51	65			12 505	59	67
		10			15 631	77	70			15 631	79	70			15 631	93	72
700	4	0.707	0.468	6 733	12	46	0.735	0.468	6 733	13	47	0.770	0.468	6 733	15	49	
	6			10 100	28	57			10 100	29	57			10 100	33	59	
	8			13 467	50	65			13 467	51	65			13 467	59	67	
	10			16 834	77	70			16 834	79	71			16 834	93	73	
750	4	0.758	0.501	7 214	12	47	0.788	0.501	7 214	13	47	0.825	0.501	7 214	15	49	
	6			10 822	28	57			10 822	29	58			10 822	33	60	
	8			14 429	50	65			14 429	51	65			14 429	59	67	
	10			18 036	77	71			18 036	79	71			18 036	93	73	
800	4	0.808	0.534	7 695	12	47	0.840	0.534	7 695	13	47	0.880	0.534	7 695	15	49	
	6			11 543	28	58			11 543	29	58			11 543	33	60	
	8			15 391	50	65			15 391	51	65			15 391	59	67	
	10			19 238	77	71			19 238	79	71			19 238	93	73	
850	4	0.859	0.568	8 176	12	47	0.893	0.568	8 176	13	48	0.935	0.568	8 176	15	50	
	6			12 264	28	58			12 264	29	58			12 264	33	60	
	8			16 353	50	65			16 353	51	66			16 353	59	68	
	10			20 441	77	71			20 441	79	72			20 441	93	74	
900	4	0.909	0.601	8 657	12	48	0.945	0.601	8 657	13	48	0.990	0.601	8 657	15	50	
	6			12 986	28	58			12 986	29	58			12 986	33	60	
	8			17 315	50	66			17 315	51	66			17 315	59	68	
	10			21 643	77	71			21 643	79	72			21 643	93	74	

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			1130					1200					1250				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]
width B [mm]	110	4	0.124	0.083	1 190	12	39	0.132	0.083	1 190	13	40	0.138	0.092	1 321	11	37
		6			1 784	27	49			1 784	30	51			1 982	24	48
		8			2 379	49	57			2 379	54	58			2 642	43	55
		10			2 974	76	63			2 974	84	64			3 303	66	61
	150	4	0.170	0.113	1 622	12	40	0.180	0.113	1 622	13	41	0.188	0.125	1 801	11	39
		6			2 433	27	51			2 433	30	52			2 702	24	49
		8			3 244	49	58			3 244	54	59			3 603	43	57
		10			4 055	76	64			4 055	84	65			4 504	66	63
	200	4	0.226	0.150	2 163	12	41	0.240	0.150	2 163	13	42	0.250	0.167	2 402	11	39
		6			3 244	27	51			3 244	30	53			3 603	24	50
		8			4 326	49	59			4 326	54	60			4 804	43	57
		10			5 407	76	65			5 407	84	66			6 005	66	63
	250	4	0.283	0.188	2 704	12	42	0.300	0.188	2 704	13	43	0.313	0.209	3 002	11	40
		6			4 055	27	52			4 055	30	54			4 504	24	51
		8			5 407	49	60			5 407	54	61			6 005	43	58
		10			6 759	76	66			6 759	84	67			7 506	66	64
	300	4	0.339	0.225	3 244	12	43	0.360	0.225	3 244	13	44	0.375	0.250	3 603	11	41
		6			4 866	27	53			4 866	30	54			5 404	24	51
		8			6 489	49	61			6 489	54	62			7 206	43	59
		10			8 111	76	66			8 111	84	68			9 007	66	65
	350	4	0.396	0.263	3 785	12	43	0.420	0.263	3 785	13	45	0.438	0.292	4 203	11	41
		6			5 678	27	54			5 678	30	55			6 305	24	52
		8			7 570	49	61			7 570	54	63			8 407	43	60
		10			9 463	76	67			9 463	84	68			10 508	66	65
	400	4	0.452	0.300	4 326	12	44	0.480	0.300	4 326	13	45	0.500	0.334	4 804	11	42
		6			6 489	27	54			6 489	30	56			7 206	24	53
		8			8 652	49	62			8 652	54	63			9 608	43	60
		10			10 814	76	68			10 814	84	69			12 010	66	66
	450	4	0.509	0.338	4 866	12	44	0.540	0.338	4 866	13	46	0.563	0.375	5 404	11	43
		6			7 300	27	55			7 300	30	56			8 106	24	53
		8			9 733	49	62			9 733	54	64			10 809	43	61
		10			12 166	76	68			12 166	84	70			13 511	66	66
	500	4	0.565	0.376	5 407	12	45	0.600	0.376	5 407	13	46	0.625	0.417	6 005	11	43
		6			8 111	27	55			8 111	30	57			9 007	24	54
		8			10 814	49	63			10 814	54	64			12 010	43	61
		10			13 518	76	69			13 518	84	70			15 012	66	67
	550	4	0.622	0.413	5 948	12	45	0.660	0.413	5 948	13	47	0.688	0.459	6 605	11	43
		6			8 922	27	56			8 922	30	57			9 908	24	54
		8			11 896	49	63			11 896	54	65			13 211	43	62
		10			14 870	76	69			14 870	84	70			16 513	66	67
	600	4	0.678	0.451	6 489	12	46	0.720	0.451	6 489	13	47	0.750	0.500	7 206	11	44
		6			9 733	27	56			9 733	30	57			10 809	24	54
		8			12 977	49	64			12 977	54	65			14 412	43	62
		10			16 222	76	69			16 222	84	71			18 014	66	68
	650	4	0.735	0.488	7 029	12	46	0.780	0.488	7 029	13	47	0.813	0.542	7 806	11	44
		6			10 544	27	56			10 544	30	58			11 709	24	55
		8			14 059	49	64			14 059	54	65			15 612	43	62
		10			17 573	76	70			17 573	84	71			19 516	66	68
700	4	0.791	0.526	7 570	12	46	0.840	0.526	7 570	13	48	0.875	0.584	8 407	11	44	
	6			11 355	27	57			11 355	30	58			12 610	24	55	
	8			15 140	49	64			15 140	54	66			16 813	43	63	
	10			18 925	76	70			18 925	84	71			21 017	66	68	
750	4	0.848	0.563	8 111	12	47	0.900	0.563	8 111	13	48	0.938	0.626	9 007	11	45	
	6			12 166	27	57			12 166	30	58			13 511	24	55	
	8			16 222	49	65			16 222	54	66			18 014	43	63	
	10			20 277	76	70			20 277	84	72			22 518	66	69	
800	4	0.904	0.601	8 652	12	47	0.960	0.601	8 652	13	48	1.000	0.667	9 608	11	45	
	6			12 977	27	57			12 977	30	59			14 412	24	56	
	8			17 303	49	65			17 303	54	66			19 215	43	63	
	10			21 629	76	71			21 629	84	72			24 019	66	69	
850	4	0.961	0.638	9 192	12	47	1.020	0.638	9 192	13	48	1.063	0.709	10 208	11	45	
	6			13 788	27	58			13 788	30	59			15 312	24	56	
	8			18 384	49	65			18 384	54	66			20 416	43	63	
	10			22 981	76	71			22 981	84	72			25 520	66	69	
900	4	1.017	0.676	9 733	12	47	1.080	0.676	9 733	13	49	1.125	0.751	10 809	11	46	
	6			14 599	27	58			14 599	30	59			16 213	24	56	
	8			19 466	49	65			19 466	54	67			21 617	43	64	
	10			24 332	76	71			24 332	84	73			27 022	66	69	

The mcr WIP PRO/T fire damper selection program is available at www.mercor.com.pl, in the Designer Zone.

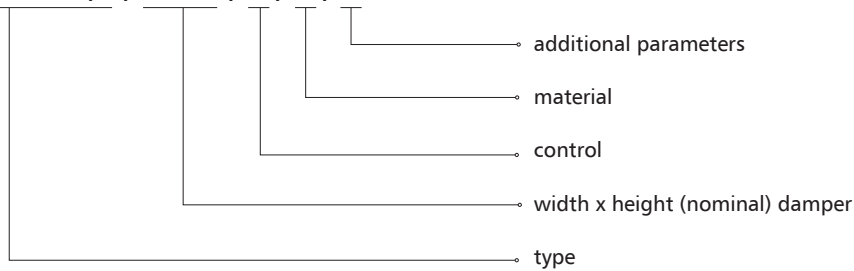
13.7 | Estimated weights of mcr WIP PRO/T dampers [kg]

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

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

13.8 | Marking

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



1 - control:

» KW1 trigger control mechanism

KW1/S – thermal trigger

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

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

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

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

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

» trigger control mechanism

BF24-T, BF24-TN – actuator with a return spring, U = 24 V AC/DC

BF230-T, BF230-TN – actuator with a return spring, U = 230 V AC

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

BF24-T-ST, BF24-TN-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

MF24T – thermal trigger

MF230T – thermal trigger + limit switch (open/closed blade signal)

MLF24T – thermal trigger

MF230T – thermal trigger + limit switch (open/closed blade signal)

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

QT.Ex 230-FT.Ex – explosion proof actuator with a return spring in the Ex version, U = 230 V AC/DC

2 - material:

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

KN – stainless steel

KK – 1.4404 acid-proof steel

3 - additional parameters :

» Thermoelectric and thermal triggers

[no symbol] – 72°C trigger

ZBAT95 – thermoelectric trigger for 95°C

T93-95 – thermal trigger for 95°C

T2-95 (MLF/ MF) – thermal trigger for 95°C

FT.Ex-72 – thermoelectric trigger for 72°C

FT.Ex-95 – thermoelectric trigger for 95°C

» Damper axis of rotation

[no symbol] – horizontal axis of rotation

PP_D – vertical axis of rotation – mechanism at the bottom of the damper

PP_G – vertical axis of rotation - mechanism at the top of the damper

» Design standard

[no symbol] – left damper

KP – right damper

LC - actuator long casing

» Damper casing

BU - earth pin

NOTE: separate additional parameters entered with the “/” sign example marking:

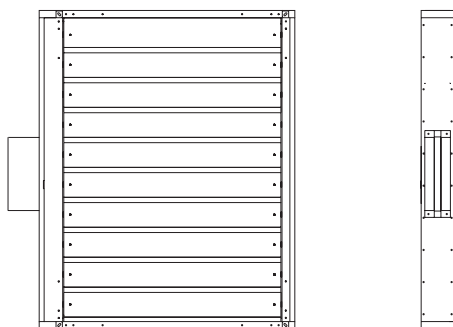
mcr WIP PRO/T 400 x 400 BFL24-T

E120 louvered cut-off damper with a 24 V actuator with limit switches.

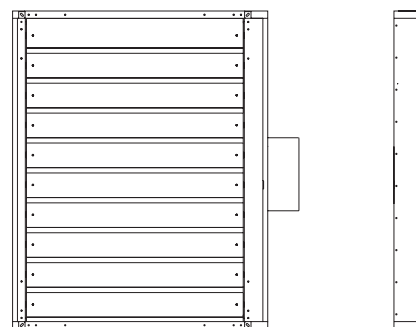
13.8.1 | Design standard

» mcr WIP PRO/T damper with actuator

» left damper standard



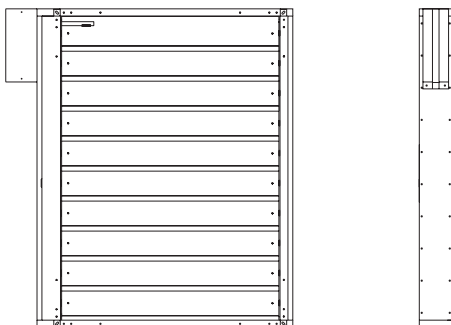
» right damper



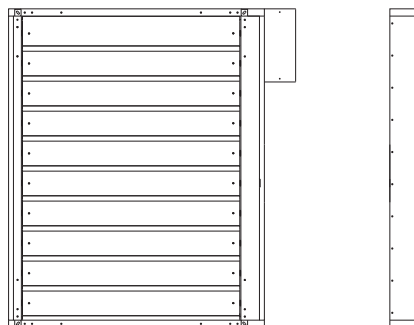
installation in reversed horizontal and vertical position possible

» mcr WIP PRO/T damper with KW1 mechanism

» left damper standard



» right damper



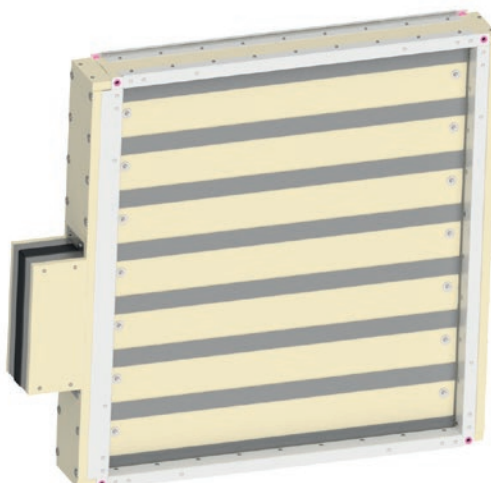
installation in reversed horizontal and vertical position possible

Chapter 19 - power supply and control (p. 350) contains the following information:
- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers for multi-compartment fire ventilation systems



downloadable models
on the website
under the designer zone tab



» EIS120, E₆₀₀ 120

- » Fire resistance class: EI120 (v_{ew} i↔o)S1000C₁₀₀₀₀AAmulti, EI120 (v_{ed} h_{od} i↔o)S1000C₁₀₀₀₀AAmulti, EI120(v_{edw} i↔o)S1000C₁₀₀₀₀AAmulti.
- » Certificate of constancy of performance 2434-CPR-0031.
- » Dampers certified for compliance with EN 12101-8.
- » Dampers rated under EN 13501-4 and tested under EN 1366-10.
- » Narrow louvered smoke control dampers for fire ventilation systems.
- » Certified installation on smoke ventilation ducts.
- » Dampers certified for installation in batteries.

14.1 | Application

mcr WIP PRO/V, mcr WIP PRO/V-M multi-blade smoke control dampers are intended for installation in automatically operated fire ventilation systems. mcr WIP PRO/V dampers are used in fire ventilation systems, while dampers marked as mcr WIP PRO/V-M are used in mixed, fire and comfort ventilation systems. When installed, these devices prevent the propagation of fire, smoke and fire gases to adjacent areas. During normal operation, the fire damper blade is in the open or closed position, depending on its function. The fire damper blade in the fire compartment is opened, whereas in other areas the blades are closed. Admissible flow velocity in the connected duct is 12 m/s. Due to their design, mcr WIP PRO/V, mcr WIP PRO/V-M fire dampers are intended for use in systems, where the components such as a silencer, bend or supply and extraction grille are installed downstream of the smoke control damper. Dampers may be installed in smoke extract ducts, shafts and at system ends.

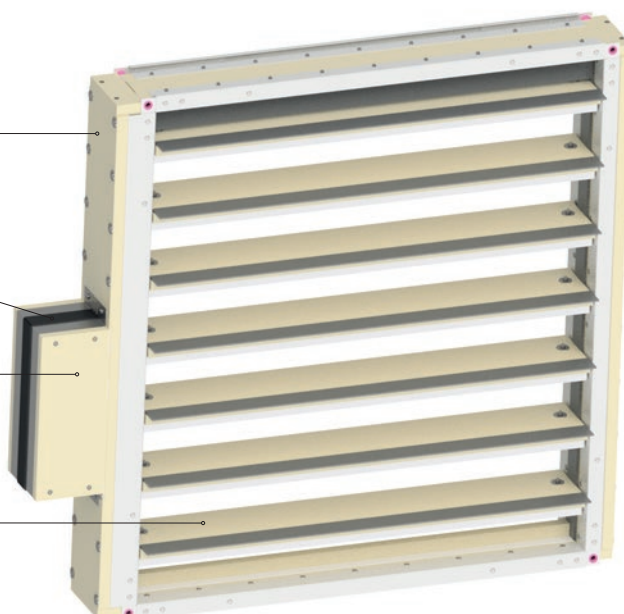
14.2 | Design

casing

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

casing made
of non-flammable panels

louvers (damper blade)
with ventilation and intumescent gaskets



mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers for multi-compartment fire ventilation systems

The multi-blade mcr WIP PRO/V, mcr WIP PRO/V-M damper consists of a rectangular casing made of two steel sections connected with a non-combustible plate using rivets and galvanized steel sheet fasteners, a set of movable blades rotating around their axes and a trigger control mechanism. The damper casing is made of fire resistant panels and galvanized "C" shape metal sheet profiles. The device is reinforced on both sides with steel flat bar corners. Intumescent and ventilation gaskets are installed on the inside of the damper. Each damper blade is made of two fire resistant panels, which are displaced against each other. An intumescent gasket and ventilation gasket are attached with staples along the entire blade length. The damper blades revolve on their own axes, which consist of two steel pins. Each pin is mounted in a sleeve installed on the vertical side H of the fire damper casing.

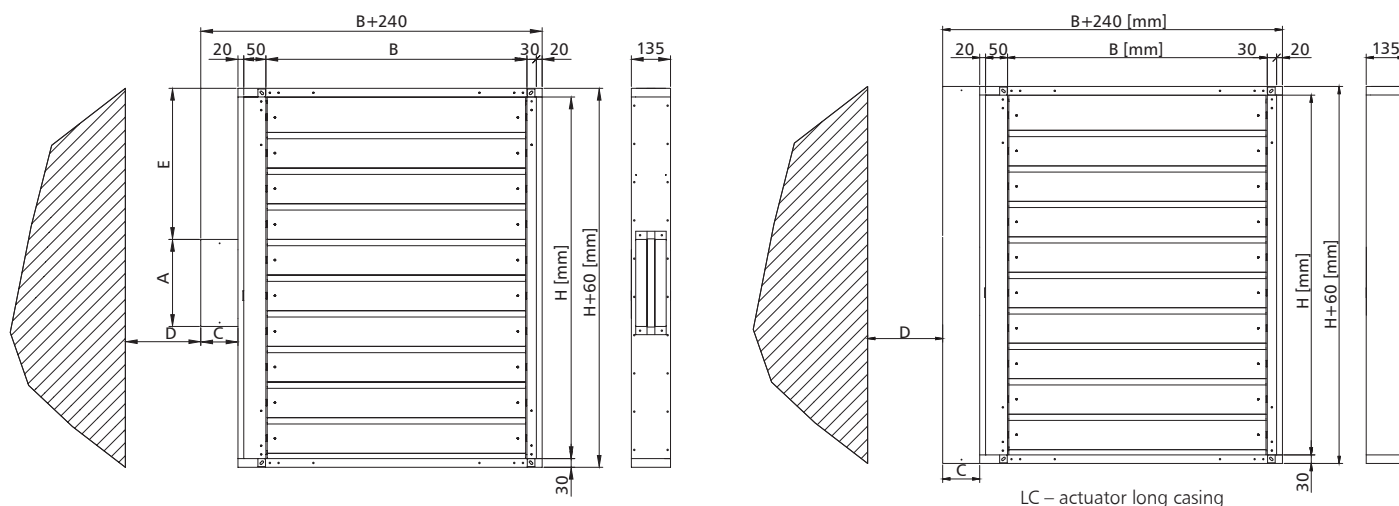
14.3 | Versions

14.3.1 | Damper closing and opening with an actuator

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

mcr WIP PRO/V, mcr WIP PRO/V-M smoke control damper are equipped with a trigger control mechanism in the form of a BE, BEE, BEN, MLE or ME axial actuator without the return spring (24 V AC/DC or 230 V AC). The BE, BEE, BEN, MLE or ME series actuators are equipped with limit switches used to monitor the damper blade position. Furthermore, a mechanical position indicator is placed on the actuator.

mcr WIP PRO/V, mcr WIP PRO/V-M smoke control dampers with BE, BEE, BEN, MLE or ME actuators can be opened/closed by supplying voltage to the actuator terminals. Dampers with those actuators may be opened/closed manually using a key.



insert symmetrically against the wall axis

dimensions in [mm]

mechanism	A	C	D	E
BE, BEE, BEN, ME, MLE	298	120	75	formula

for an even number of blades
$E [mm] = (H/2 - 123) + 30$
for an odd number of blades
$E [mm] = (H/2 - 61,5) + 30$

Number of blades = $H/123$

14.4 | Dimensions

» Rectangular dampers:

- » nominal width B: from 110 mm to 1250 mm
- » nominal height H from 270 mm to 1250 mm
- » maximum single damper cross-section surface up to 1.5625 m²

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 10 mm increments within the given ranges).

Square dampers may also be additionally equipped with round connection collars allowing for so called "bare end" connection to round ducts.

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers for multi-compartment fire ventilation systems

14.5 | Installation

mcr WIP PRO/V rectangular dampers are rated EI120(v_{ew} $i \leftrightarrow o$)S1000C₁₀₀₀AAmulti if installed in wall/shaft partitions made of concrete, bricks, hollow bricks, masonry or prefabricated slabs with a min. thickness of 125 mm. The mcr WIP PRO/V rectangular dampers are rated EI120(v_{ew} $i \leftrightarrow o$)S1000C₁₀₀₀AAmulti if installed in yielding wall/shaft partitions made from gypsum board panels with the thickness of at least 125 mm.

mcr WIP PRO/V rectangular dampers are rated EI120(v_{ed} h_{od} $i \leftrightarrow o$)S1000C₁₀₀₀AAmulti if installed in a fireproof duct compliant with EN 1366-8 or EN 1366-9, with fire resistances equal to or lesser than the fire resistance of the damper.

Rectangular dampers mcr WIP PRO/V have been classified in the EI120(v_{edw} $i \leftrightarrow o$)S1000C₁₀₀₀AAmulti class when installed in solid building shafts, masonry shafts made of blocks, bricks, or hollow blocks, and flexible walls/shafts made of plasterboard with a minimum thickness of 125 mm and a fire resistance of the damper rating of at least EI120. The battery (set) composed of up to 4 rectangular dampers is rated EI120(v_{ew} $i \rightarrow o$)S1500C₁₀₀₀AAmulti if installed in solid partitions, partitions made of concrete, bricks or hollow bricks. mcr WIP PRO/V rectangular dampers are rated E₆₀₀ 120 (v_{ed} $i \leftrightarrow o$) S1000C₁₀₀₀AA single in single-zone fire ventilation systems.

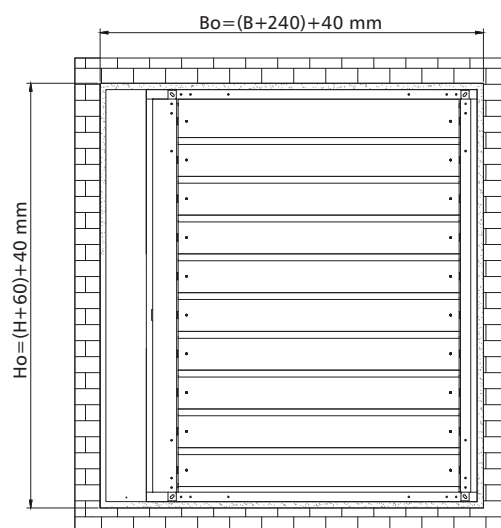
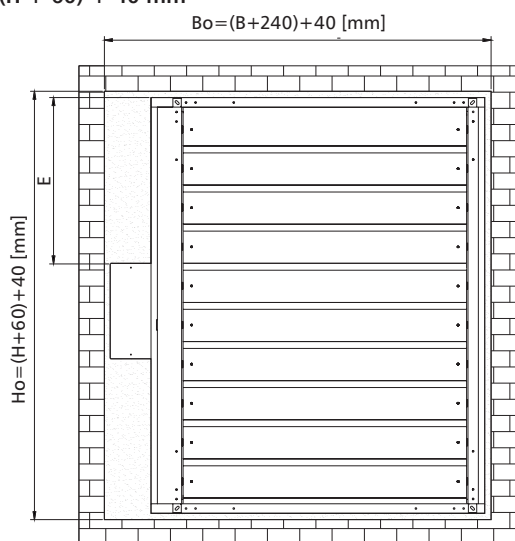
14.5.1 | Preparation of installation openings

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

Preferred

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

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

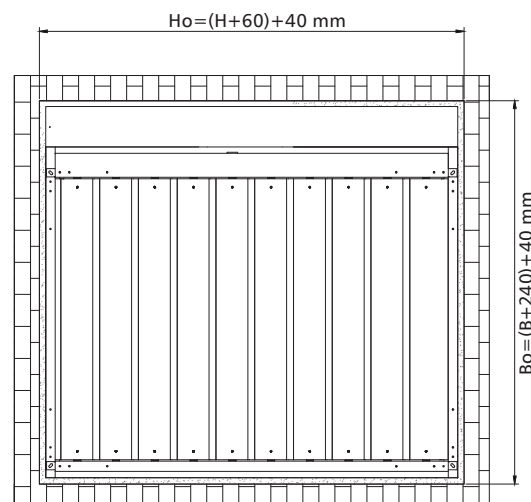
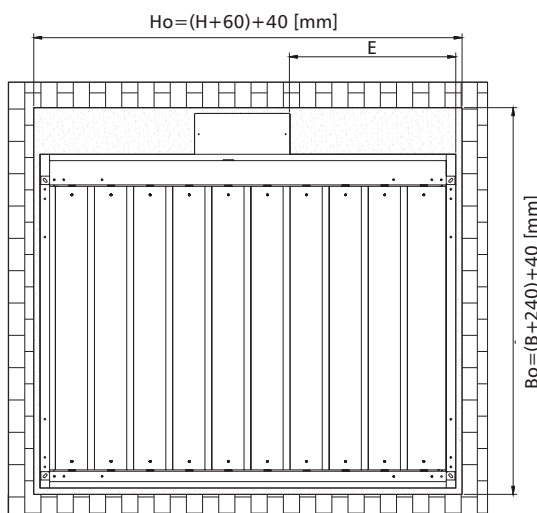


LC – actuator long casing

v_{ew} damper with a horizontal rotation axis: 110 x 270 to 900 x 1250 [mm], also applicable for versions with LC casing

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 an even number of blades	for an odd number of blades
BE, BEE, BEN	$E \text{ [mm]} = (H/2 - 123) + 30$	$E \text{ [mm]} = (H/2 - 61,5) + 30$

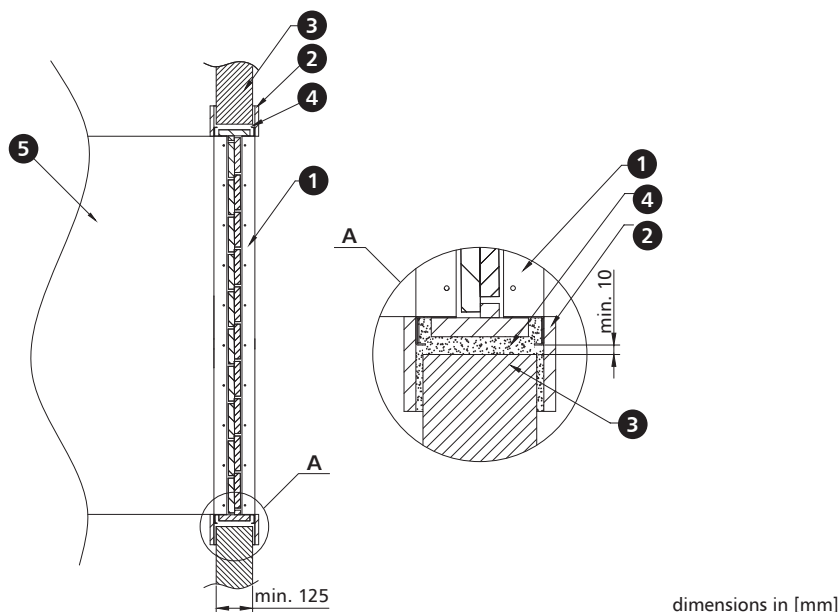


LC – actuator long casing

v_{ew} damper with a vertical rotation axis: 110 x 270 to 1250 x 1250 [mm], also applicable for versions with LC casing

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers for multi-compartment fire ventilation systems

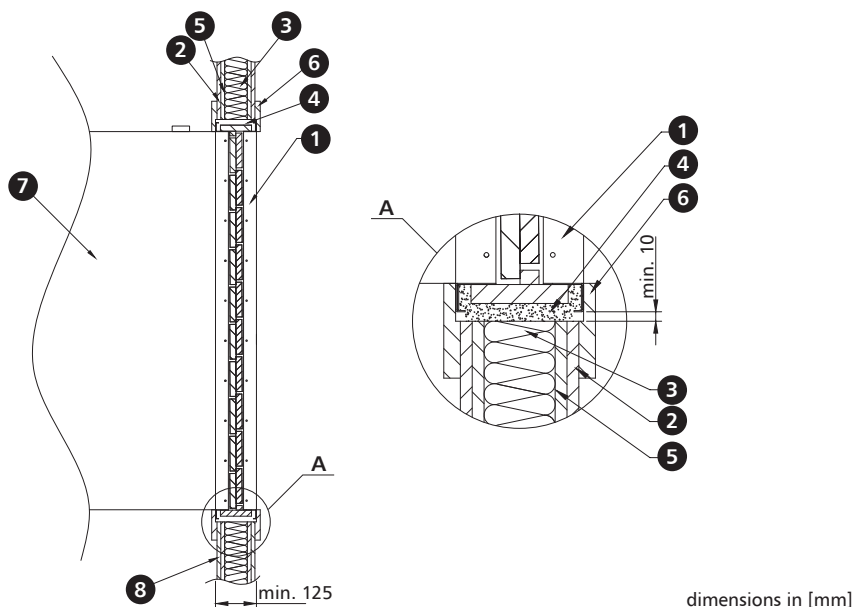
14.5.2 | Sample installation in concrete block or full brick walls



- | | |
|--|---------------------------|
| 1. mcr WIP PRO/V or mcr WIP PRO/V-M smoke control damper | 4. assembly mortar* |
| 2. gypsum board trim 100 x 12.5 mm | 5. smoke ventilation duct |
| 3. solid wall | |

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

14.5.3 | Sample installation in light walls

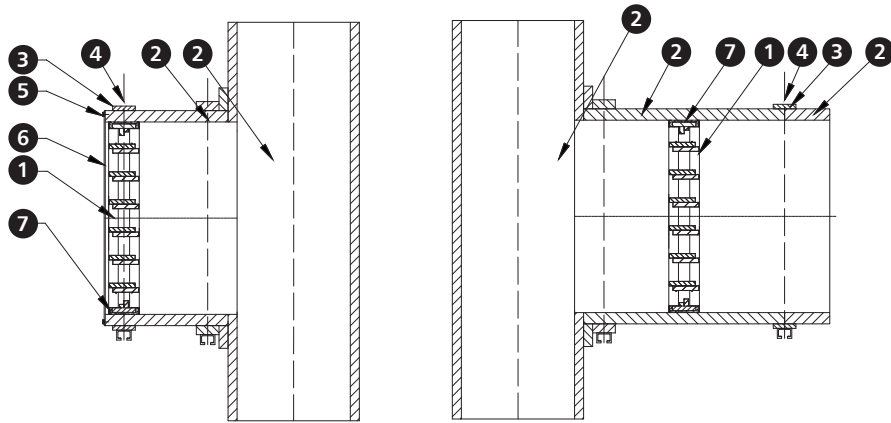


- | | | |
|--|------------------------------------|----------------------------|
| 1. mcr WIP PRO/V or mcr WIP PRO/V-M smoke control damper | 4. installation grout* | 7. smoke ventilation duct |
| 2. gypsum board 12.5 mm | 5. structural profile | 8. gypsum board light wall |
| 3. mineral wool with a density of at least 80 kg/m ³ , A1 class | 6. gypsum board trim 100 x 12.5 mm | |

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

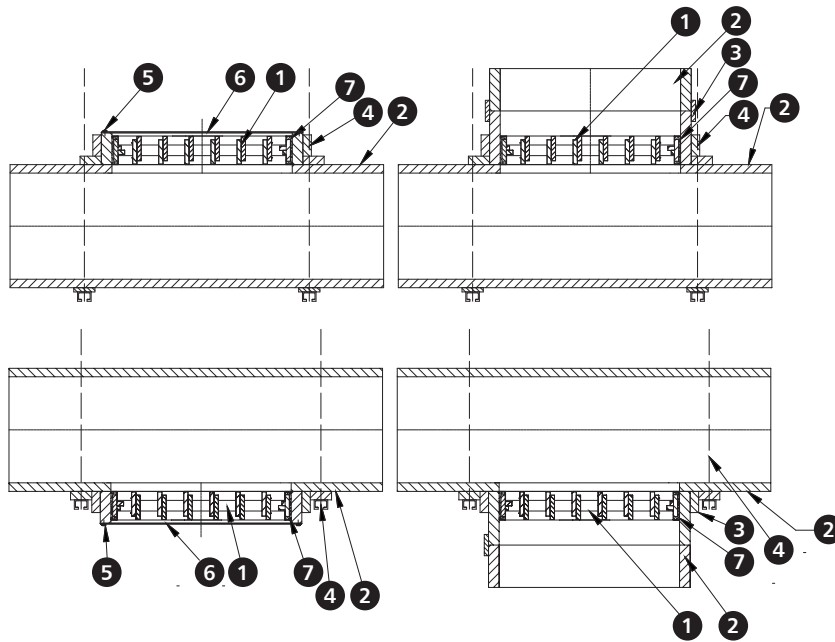
mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers for multi-compartment fire ventilation systems

14.5.4.1 | Sample installation in fire ventilation system ducts



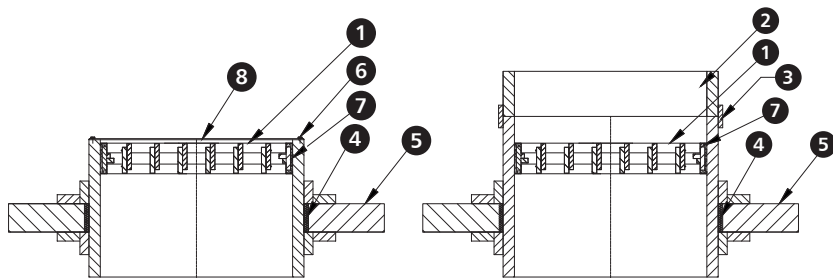
1. mcr WIP PRO/V or mcr WIP PRO/V-M BxH smoke control damper
2. Multi-zone smoke extract duct – e.g. made of fire-proof boards
3. A strip of fire-proof board along the entire length of the BxH side
4. Installation hangers system

5. M10 x 20 bolt
6. MWB system grille (optional)
7. System duct sealing



1. mcr WIP PRO/V or mcr WIP PRO/V-M BxH smoke control damper
2. Multi-zone smoke extract duct – e.g. made of fire-proof boards
3. A strip of fire-proof board along the entire length of the BxH side
4. Installation hangers system

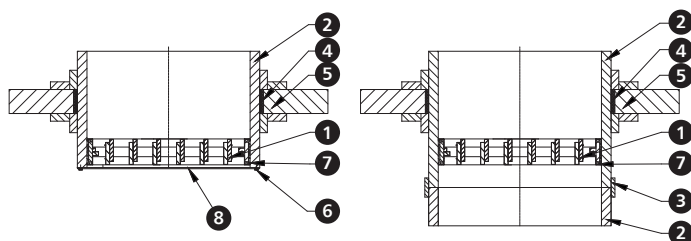
5. M10 x 20 bolt
6. MWB system grille (optional)
7. System duct sealing



1. mcr WIP PRO/V or mcr WIP PRO/V-M BxH smoke control damper
2. Multi-zone smoke extract duct – e.g. made of fire-proof boards
3. A strip of fire-proof board along the entire length of the BxH side
4. Installation hangers system

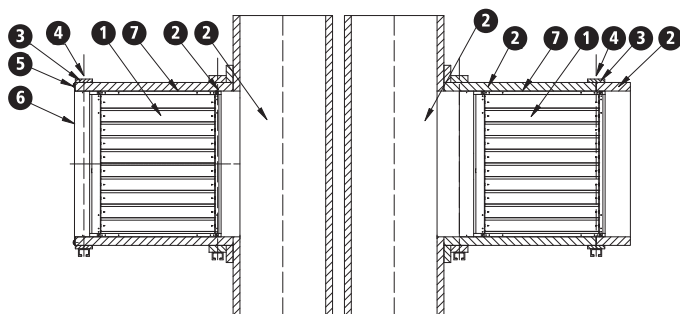
5. Floor slab
6. M10 x 20 bolt
7. System duct sealing
8. MWB system grille (optional)

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers for multi-compartment fire ventilation systems

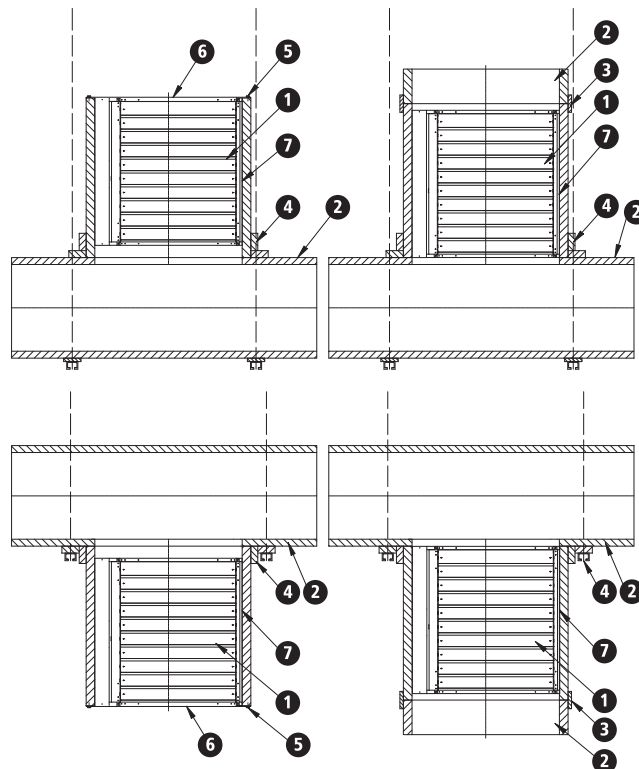


1. mcr WIP PRO/V or mcr WIP PRO/V-M BxH smoke control damper
2. Multi-zone smoke extract duct – e.g. made of fire-proof boards
3. A strip of fire-proof board along the entire length of the BxH side
4. Fireproof duct installation penetration system.
5. Floor slab
6. M10 x 20 bolt
7. System duct sealing
8. MWB system grille (optional)

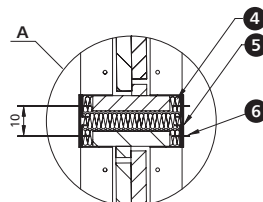
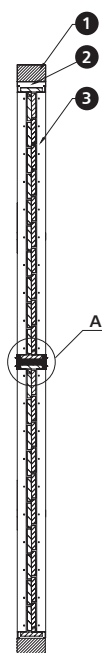
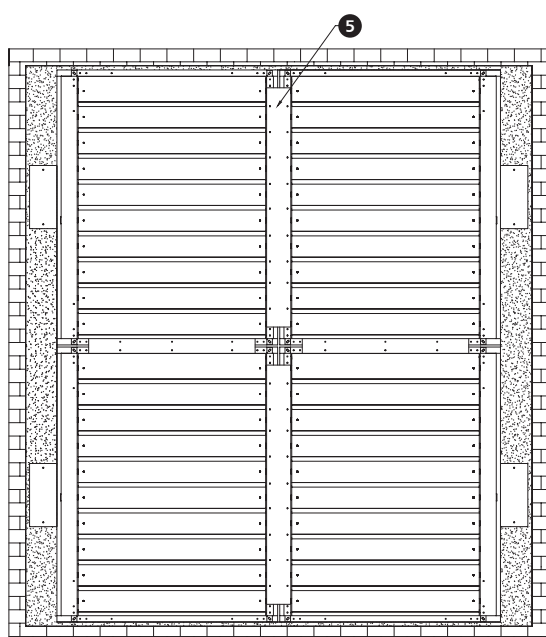
14.5.4.2 | Sample installation in fire ventilation system ducts with LC casing



1. mcr WIP PRO/V or mcr WIP PRO/V-M BxH smoke control damper with LC casing
2. multi-zone smoke extract duct – e.g. made of fire-proof boards
3. a strip of fire-proof board along the entire length of the BxH side
4. installation hangers system
5. M10 x 20 bolt
6. MWB system grille
7. system duct sealing



14.5.5 | Sample modular installation

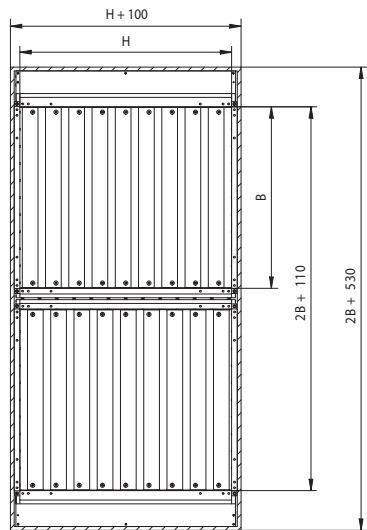


1. e.g. masonry wall
2. assembly mortar*
3. mcr WIP PRO/V or mcr WIP PRO/V-M damper module
4. mineral wool with a density of at least 80 kg/m³, A1 class
5. steel installation element
6. ST8 x 16 screw

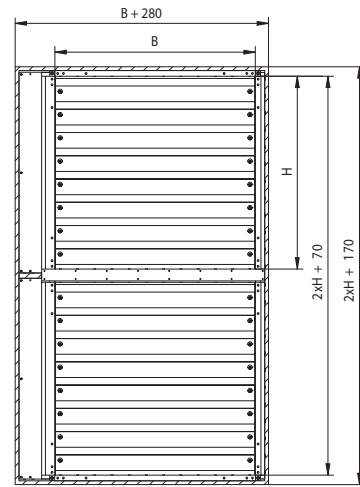
dimensions in [mm]

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied. Also applicable for versions with LC casing

14.5.5.1 | Modular installation – 1x2



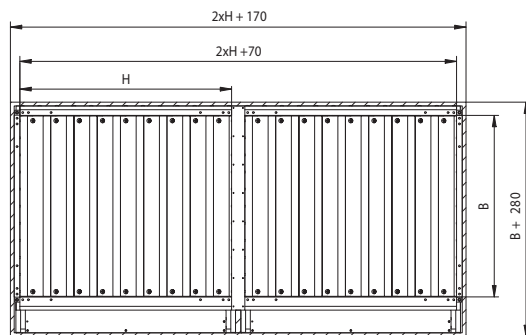
» vertical



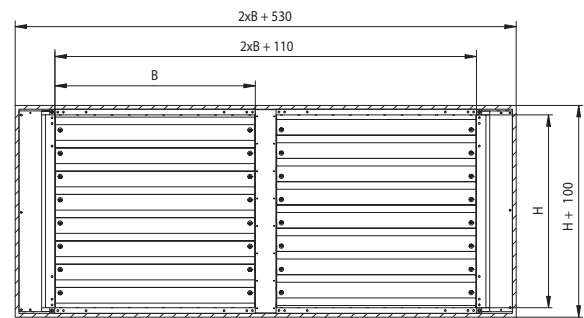
dimensions in [mm]

» horizontal

14.5.5.2 | Modular installation – 2x1



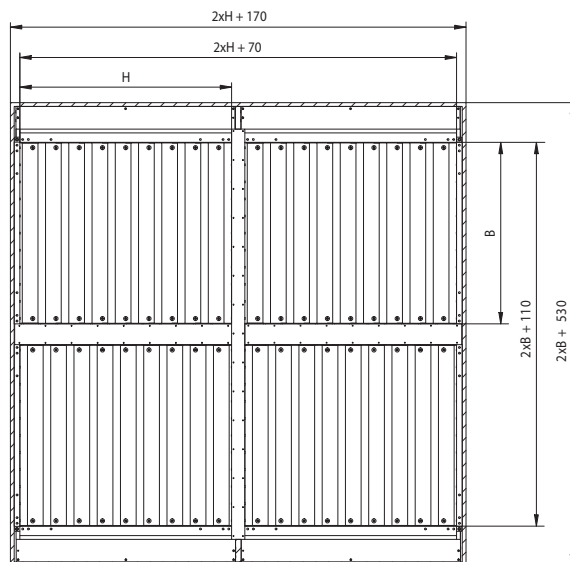
» vertical



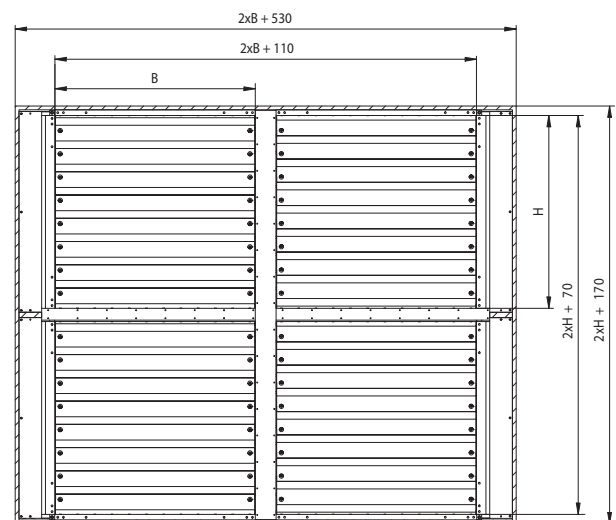
dimensions in [mm]

» horizontal

14.5.5.3 | Modular installation – 2x2



» vertical

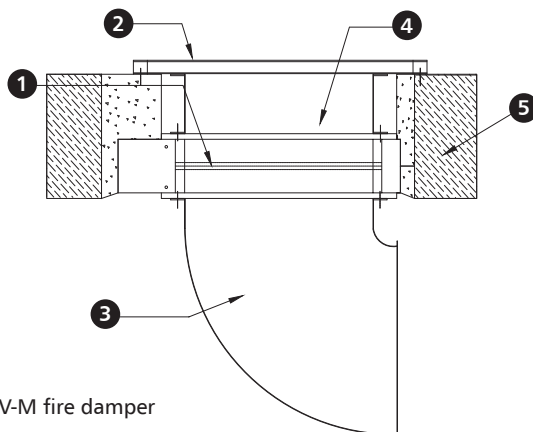


dimensions in [mm]

» horizontal

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» Example applications - installation with a masking element



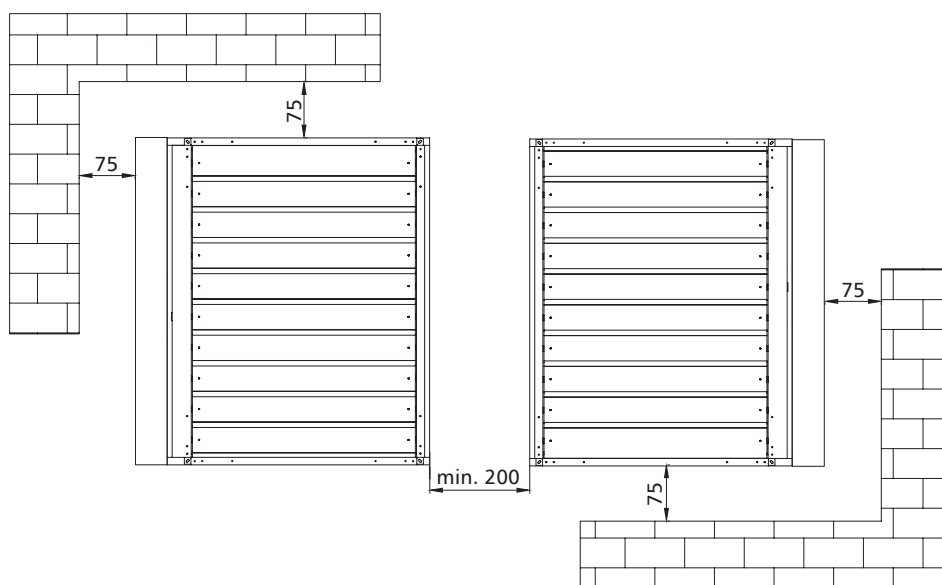
1. mcr WIP PRO/V or mcr WIP PRO/V-M fire damper
2. masking element
3. smoke ventilation duct
4. duct - ventilation straight connection piece
5. wall, floor slab

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

» Damper installation with a vertical louver rotation axis

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

» Minimum distance between systems and partitions



dimensions in [mm]

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14.5.6 | MST system masking grilles



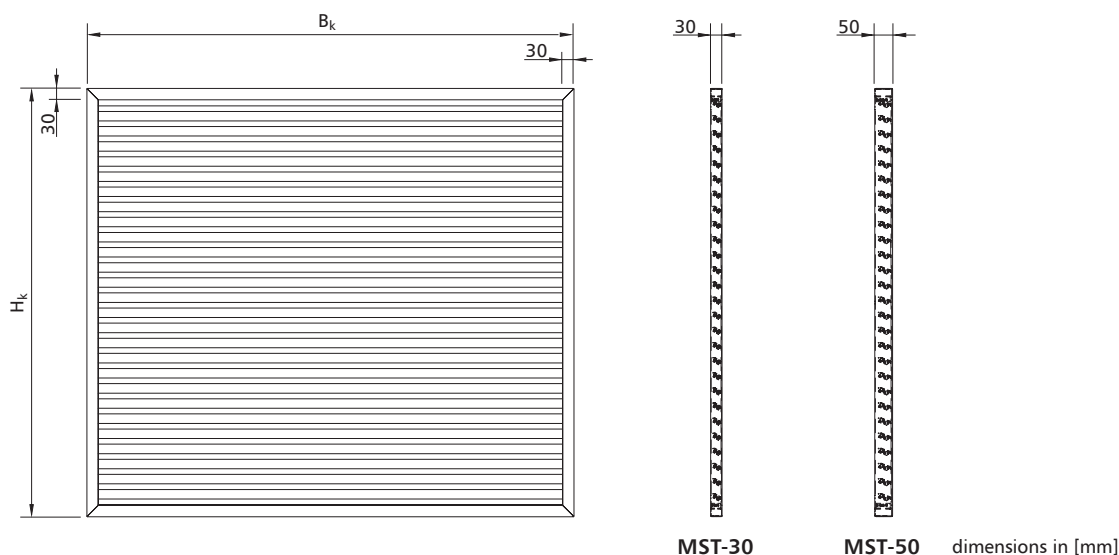
MST system masking grilles are designed to fulfill either supply or exhaust function. They enable the transfer of air through construction partitions. They come with fixed steel louvers with a 40 mm span, obscuring damper visibility.

Bolts embedded in the body are used to attach the masking grille body. After installation, an outer frame is mounted on the masking grille body so that the holes and bolts cannot be seen from the outside. Such a solution allows for installing the product even in the most visually-demanding applications. The masking grilles are painted in RAL 9010 as a standard (available in any colour from the RAL range on request).

dimensions:

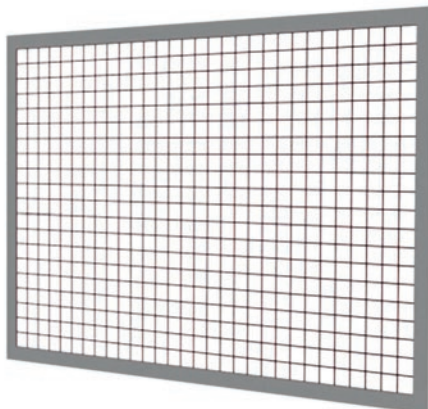
- » nominal width B_k : from 200 mm to 1500 mm
- » nominal height H_k from 200 mm to 1500 mm
- » nominal thickness G 30 and 50 mm

Apart from the standard dimensions, masking grilles may be manufactured with intermediate dimensions.



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14.5.7 | MWP mesh cover

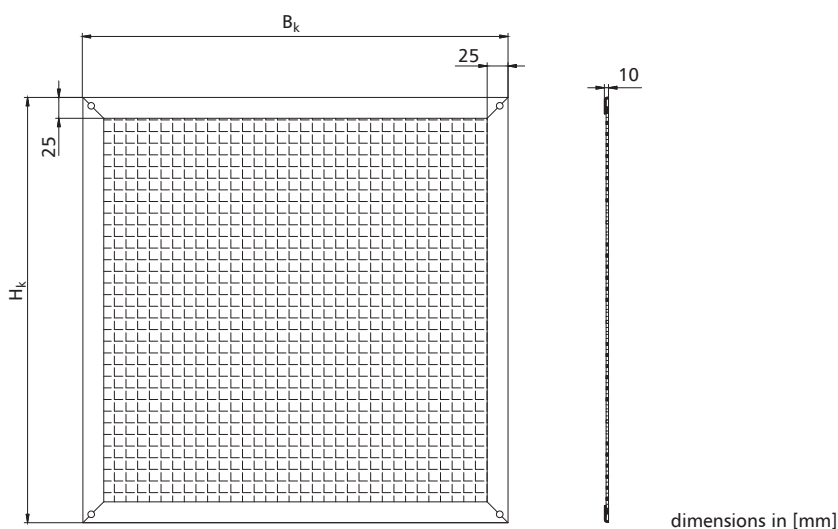


The MWP mesh cover may be supplied together with the damper by the damper manufacturer. System masking grilles, dedicated especially for commercial premises with high architectonical and service requirements allows for covering the damper with any additional masking grille while fulfilling the fire rating requirements of the mcr WIP damper. With a wall thickness greater than 200 mm, system and non-system grilles can be applied directly to the wall.

dimensions:

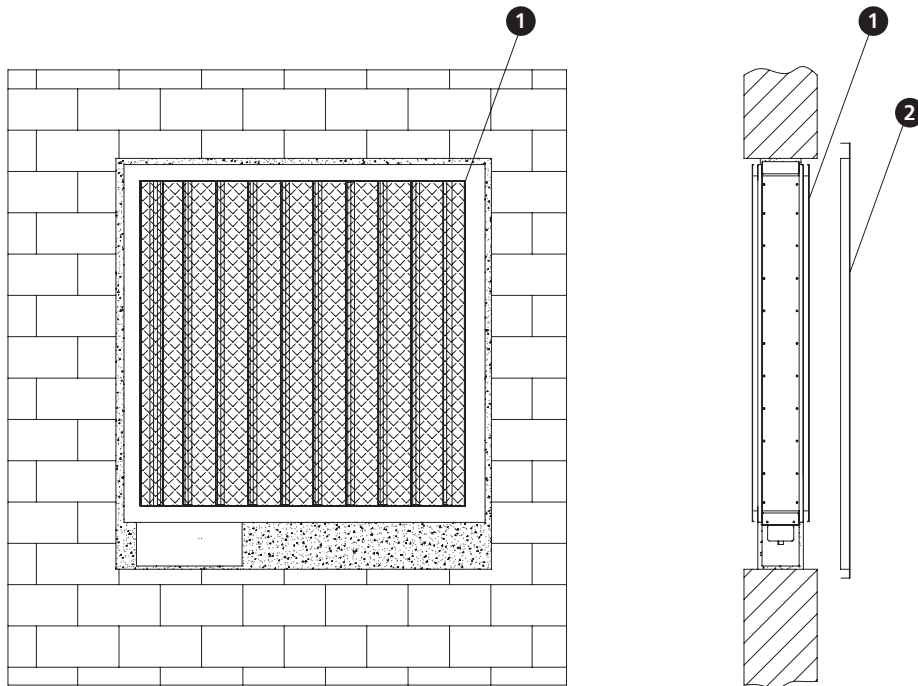
- » nominal width B_k : from 200 mm to 1100 mm
- » nominal height H_k from 200 mm to 1100 mm
- » nominal thickness 10 mm

Apart from the standard dimensions, masking grilles may be manufactured with intermediate dimensions.



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» sample installation



- 1. MWP mesh cover
- 2. decorative grille (any, e.g. as indicated by the architect)

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers for multi-compartment fire ventilation systems

14.6 | mcr WIP PRO/V, mcr WIP PRO/V-M rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		270					300					350				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0.030	0.019	269	13	0.033	0.019	269	14	34	0.039	0.019	269	16	36
		6			404	30			404	30	44			404	36	46
		8			539	53			539	54	52			539	63	54
		10			673	82			673	85	58			673	99	60
	150	4	0.041	0.026	367	13	0.045	0.026	367	14	35	0.053	0.026	367	16	37
		6			551	30			551	30	46			551	36	48
		8			734	53			734	54	53			734	63	55
		10			918	82			918	85	59			918	99	61
	200	4	0.054	0.034	490	13	0.060	0.034	490	14	36	0.070	0.034	490	16	38
		6			734	30			734	30	47			734	36	49
		8			979	53			979	54	54			979	63	56
		10			1 224	82			1 224	84	60			1 224	99	62
	250	4	0.068	0.043	612	13	0.075	0.043	612	14	37	0.088	0.043	612	16	39
		6			918	30			918	30	48			918	36	50
		8			1 224	53			1 224	54	55			1 224	63	57
		10			1 530	82			1 530	85	61			1 530	99	63
	300	4	0.081	0.051	734	13	0.090	0.051	734	14	38	0.105	0.051	734	16	40
		6			1 102	30			1 102	30	49			1 102	36	51
		8			1 469	53			1 469	54	56			1 469	63	58
		10			1 836	82			1 836	85	62			1 836	99	64
	350	4	0.095	0.060	857	13	0.105	0.060	857	14	39	0.123	0.060	857	16	41
		6			1 285	30			1 285	30	49			1 285	36	51
		8			1 714	53			1 714	54	57			1 714	63	59
		10			2 142	82			2 142	85	63			2 142	99	65
	400	4	0.108	0.068	979	13	0.120	0.068	979	14	39	0.140	0.068	979	16	41
		6			1 469	30			1 469	30	50			1 469	36	52
		8			1 958	53			1 958	54	57			1 958	63	59
		10			2 448	82			2 448	84	63			2 448	99	65
	450	4	0.122	0.077	1 102	13	0.135	0.077	1 102	14	40	0.158	0.077	1 102	16	42
		6			1 652	30			1 652	30	50			1 652	36	52
		8			2 203	53			2 203	54	58			2 203	63	60
		10			2 754	82			2 754	84	64			2 754	99	66
	500	4	0.135	0.085	1 224	13	0.150	0.085	1 224	14	40	0.175	0.085	1 224	16	42
		6			1 836	30			1 836	30	51			1 836	36	53
		8			2 448	53			2 448	54	58			2 448	63	60
		10			3 060	82			3 060	85	64			3 060	99	66
	550	4	0.149	0.094	1 346	2	0.165	0.094	1 346	14	41	0.193	0.094	1 346	16	43
		6			2 020	4			2 020	30	51			2 020	36	53
		8			2 693	7			2 693	54	59			2 693	63	61
		10			3 366	10			3 366	84	65			3 366	99	67
	600	4	0.162	0.102	1 469	13	0.180	0.102	1 469	14	41	0.210	0.102	1 469	16	43
		6			2 203	30			2 203	30	52			2 203	36	54
		8			2 938	53			2 938	54	59			2 938	63	61
		10			3 672	82			3 672	85	65			3 672	99	67
	650	4	0.176	0.111	1 591	13	0.195	0.111	1 591	14	41	0.228	0.111	1 591	16	43
		6			2 387	30			2 387	30	52			2 387	36	54
		8			3 182	53			3 182	54	59			3 182	63	62
		10			3 978	82			3 978	85	65			3 978	99	67

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers **for multi-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			270						300					350				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	0.189	0.119	1 714	13	41	0.210	0.119	1 714	14	42	0.245	0.119	1 714	16	44	
		6			2 570	30	52			2 570	30	52			2 570	36	54	
		8			3 427	53	59			3 427	54	60			3 427	63	62	
		10			4 284	82	65			4 284	85	66			4 284	99	68	
	750	4	0.203	0.128	1 836	13	42	0.225	0.128	1 836	14	42	0.263	0.128	1 836	16	44	
		6			2 754	30	52			2 754	30	53			2 754	36	55	
		8			3 672	53	60			3 672	54	60			3 672	63	62	
		10			4 590	82	66			4 590	85	66			4 590	99	68	
	800	4	0.216	0.136	1 958	13	42	0.240	0.136	1 958	14	42	0.280	0.136	1 958	16	44	
		6			2 938	30	52			2 938	30	53			2 938	36	55	
		8			3 917	53	60			3 917	54	60			3 917	63	62	
		10			4 896	82	66			4 896	84	66			4 896	99	68	
	850	4	0.230	0.145	2 081	13	42	0.255	0.145	2 081	14	43	0.298	0.145	2 081	16	45	
		6			3 121	30	53			3 121	30	53			3 121	36	55	
		8			4 162	53	60			4 162	54	61			4 162	63	63	
		10			5 202	82	66			5 202	84	66			5 202	99	68	
	900	4	0.243	0.153	2 203	13	42	0.270	0.153	2 203	14	43	0.315	0.153	2 203	16	45	
		6			3 305	30	53			3 305	30	53			3 305	36	55	
		8			4 406	53	60			4 406	54	61			4 406	63	63	
		10			5 508	82	66			5 508	84	67			5 508	99	69	
	950	4	0.257	0.162	2 326	13	43	0.285	0.162	2 326	18	47	0.333	0.162	2 326	25	51	
		6			3 488	30	53			3 488	41	57			3 488	57	62	
		8			4 651	53	61			4 651	72	65			4 651	102	69	
		10			5 814	82	67			5 814	113	71			5 814	159	75	
	1000	4	0.270	0.170	2 448	13	43	0.300	0.170	2 448	18	47	0.350	0.170	2 448	25	51	
		6			3 672	30	53			3 672	41	58			3 672	57	62	
		8			4 896	53	61			4 896	72	65			4 896	102	70	
		10			6 120	82	67			6 120	113	71			6 120	159	75	
	1050	4	0.284	0.179	2 570	13	43	0.315	0.179	2 570	18	47	0.368	0.179	2 570	25	52	
		6			3 856	30	54			3 856	41	58			3 856	57	62	
		8			5 141	53	61			5 141	72	65			5 141	102	70	
		10			6 426	82	67			6 426	113	71			6 426	159	76	
	1100	4	0.297	0.187	2 693	13	43	0.330	0.187	2 693	18	47	0.385	0.187	2 693	25	52	
		6			4 039	30	54			4 039	41	58			4 039	57	62	
		8			5 386	53	61			5 386	72	65			5 386	102	70	
		10			6 732	82	67			6 732	113	71			6 732	159	76	
	1150	4	0.311	0.196	2 815	13	43	0.345	0.196	2 815	18	48	0.403	0.196	2 815	25	52	
		6			4 223	30	54			4 223	41	58			4 223	57	63	
		8			5 630	53	62			5 630	72	66			5 630	102	70	
		10			7 038	82	67			7 038	113	71			7 038	159	76	
	1200	4	0.324	0.204	2 938	13	44	0.360	0.204	2 938	18	48	0.420	0.204	2 938	25	52	
		6			4 406	30	54			4 406	41	58			4 406	57	63	
		8			5 875	53	62			5 875	72	66			5 875	102	70	
		10			7 344	82	68			7 344	113	72			7 344	159	76	
	1250	4	0.338	0.213	3 060	13	44	0.375	0.213	3 060	18	48	0.438	0.213	3 060	25	52	
		6			4 590	30	54			4 590	41	59			4 590	57	63	
		8			6 120	53	62			6 120	72	66			6 120	102	70	
		10			7 650	82	68			7 650	113	72			7 650	159	76	

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers **for multi-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]																	
			400						450						520					
			S_k [m ²]	S_e [m ²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]			
width B [mm]	v [m/s]																			
	4	0.044	0.024	348	12	34	0.050	0.028	401	14	36	0.057	0.037	532	12	35				
	6			523	26	44			601	31	46			798	27	46				
	8			697	48	52			802	55	54			1 064	48	53				
	10			871	74	58			1 002	86	60			1 331	75	59				
	4	0.060	0.033	475	12	35	0.068	0.038	546	14	37	0.078	0.050	726	12	36				
	6			713	26	46			820	31	48			1 089	27	47				
	8			950	48	53			1 093	55	55			1 452	48	54				
	10			1 188	74	59			1 366	86	61			1 814	75	60				
	4	0.080	0.044	634	12	36	0.090	0.051	729	14	38	0.104	0.067	968	12	38				
	6			950	26	47			1 093	31	49			1 452	27	48				
	8			1 267	48	54			1 457	55	56			1 935	48	56				
	10			1 584	74	60			1 822	86	62			2 419	75	62				
	4	0.100	0.055	792	12	37	0.113	0.063	911	14	39	0.130	0.084	1 210	12	39				
	6			1 188	26	48			1 366	31	50			1 814	27	49				
	8			1 584	48	55			1 822	55	57			2 419	48	57				
	10			1 980	74	61			2 277	86	63			3 024	75	63				
	4	0.120	0.066	950	12	38	0.135	0.076	1 093	14	40	0.156	0.101	1 452	12	39				
	6			1 426	26	49			1 639	31	51			2 177	27	50				
	8			1 901	48	56			2 186	55	58			2 903	48	57				
	10			2 376	74	62			2 732	86	64			3 629	75	63				
	4	0.140	0.077	1 109	12	39	0.158	0.089	1 275	14	41	0.182	0.118	1 693	12	40				
	6			1 663	26	49			1 913	31	51			2 540	27	51				
	8			2 218	48	57			2 550	55	59			3 387	48	58				
	10			2 772	74	63			3 188	86	65			4 234	75	64				
	4	0.160	0.088	1 267	12	39	0.180	0.101	1 457	14	41	0.208	0.134	1 935	12	41				
	6			1 901	26	50			2 186	31	52			2 903	27	51				
	8			2 534	48	57			2 915	55	59			3 871	48	59				
10	3 168			74	63	3 643			86	65	4 838			75	65					
4	0.180	0.099	1 426	12	40	0.203	0.114	1 639	14	42	0.234	0.151	2 177	12	41					
6			2 138	26	50			2 459	31	52			3 266	27	52					
8			2 851	48	58			3 279	55	60			4 355	48	59					
10			3 564	74	64			4 099	86	66			5 443	75	65					
4	0.200	0.110	1 584	12	40	0.225	0.127	1 822	14	42	0.260	0.168	2 419	12	42					
6			2 376	26	51			2 732	31	53			3 629	27	52					
8			3 168	48	58			3 643	55	60			4 838	48	60					
10			3 960	74	64			4 554	86	66			6 048	75	66					
4	0.220	0.121	1 742	12	41	0.248	0.139	2 004	14	43	0.286	0.185	2 661	12	42					
6			2 614	26	51			3 006	31	53			3 992	27	53					
8			3 485	48	59			4 008	55	61			5 322	48	60					
10			4 356	74	65			5 009	86	67			6 653	75	66					
4	0.240	0.132	1 901	12	41	0.270	0.152	2 186	14	43	0.312	0.202	2 903	12	42					
6			2 851	26	52			3 279	31	54			4 355	27	53					
8			3 802	48	59			4 372	55	61			5 806	48	61					
10			4 752	74	65			5 465	86	67			7 258	75	66					
4	0.260	0.143	2 059	12	41	0.293	0.164	2 368	14	43	0.338	0.218	3 145	12	43					
6			3 089	26	52			3 552	31	54			4 717	27	53					
8			4 118	48	59			4 736	55	61			6 290	48	61					
10			5 148	74	65			5 920	86	67			7 862	75	67					

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers **for multi-compartment fire ventilation systems**

B – nominal width [mm]
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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		400					450					520				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	0.280	0.154	2 218	12	0.315	0.177	2 550	14	44	0.364	0.235	3 387	12	43
		6			3 326	26			3 825	31	54			5 080	27	54
		8			4 435	48			5 100	55	62			6 774	48	61
		10			5 544	74			6 376	86	68			8 467	75	67
	750	4	0.300	0.165	2 376	12	0.338	0.190	2 732	14	44	0.390	0.252	3 629	12	43
		6			3 564	26			4 099	31	55			5 443	27	54
		8			4 752	48			5 465	55	62			7 258	48	61
		10			5 940	74			6 831	86	68			9 072	75	67
	800	4	0.320	0.176	2 534	12	0.360	0.202	2 915	14	43	0.416	0.269	3 871	12	43
		6			3 802	26			4 372	31	54			5 806	27	54
		8			5 069	48			5 829	55	61			7 741	48	61
		10			6 336	74			7 286	86	67			9 677	75	67
	850	4	0.340	0.187	2 693	12	0.383	0.215	3 097	14	43	0.442	0.286	4 113	12	43
		6			4 039	26			4 645	31	54			6 169	27	54
		8			5 386	48			6 193	55	61			8 225	48	61
		10			6 732	74			7 742	86	67			10 282	75	67
	900	4	0.360	0.198	2 851	12	0.405	0.228	3 279	14	43	0.468	0.302	4 355	12	43
		6			4 277	26			4 918	31	54			6 532	27	54
		8			5 702	48			6 558	55	61			8 709	48	61
		10			7 128	74			8 197	86	67			10 886	75	67
	950	4	0.380	0.209	3 010	12	0.428	0.240	3 461	18	49	0.494	0.319	4 596	12	44
		6			4 514	26			5 192	41	59			6 895	27	55
		8			6 019	48			6 922	74	67			9 193	48	62
		10			7 524	74			8 653	115	73			11 491	75	68
	1000	4	0.400	0.220	3 168	12	0.450	0.253	3 643	18	49	0.520	0.336	4 838	12	45
		6			4 752	26			5 465	41	60			7 258	27	55
		8			6 336	48			7 286	74	67			9 677	48	63
		10			7 920	74			9 108	115	73			12 096	75	69
	1050	4	0.420	0.231	3 326	12	0.473	0.266	3 825	18	49	0.546	0.353	5 080	12	45
		6			4 990	26			5 738	41	60			7 620	27	55
		8			6 653	48			7 651	74	67			10 161	48	63
		10			8 316	74			9 563	115	73			12 701	75	69
	1100	4	0.440	0.242	3 485	12	0.495	0.278	4 008	18	49	0.572	0.370	5 322	12	45
		6			5 227	26			6 011	41	60			7 983	27	56
		8			6 970	48			8 015	74	67			10 644	48	63
		10			8 712	74			10 019	115	73			13 306	75	69
	1150	4	0.460	0.253	3 643	12	0.518	0.291	4 190	18	50	0.598	0.386	5 564	12	45
		6			5 465	26			6 285	41	60			8 346	27	56
		8			7 286	48			8 379	74	68			11 128	48	63
		10			9 108	74			10 474	115	73			13 910	75	69
	1200	4	0.480	0.264	3 802	12	0.540	0.304	4 372	18	50	0.624	0.403	5 806	12	45
		6			5 702	26			6 558	41	60			8 709	27	56
		8			7 603	48			8 744	74	68			11 612	48	64
		10			9 504	74			10 930	115	74			14 515	75	69
	1250	4	0.500	0.275	3 960	12	0.563	0.316	4 554	18	50	0.650	0.420	6 048	12	46
		6			5 940	26			6 831	41	61			9 072	27	56
		8			7 920	48			9 108	74	68			12 096	48	64
		10			9 900	74			11 385	115	74			15 120	75	70

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers **for multi-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		550					600					650				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0.061	0.037	532	13	0.066	0.034	494	13	35	0.072	0.046	664	12	36
		6			798	29			741	30	46			996	27	47
		8			1 064	51			988	51	53			1 327	48	54
		10			1 331	79			1 236	81	59			1 659	76	60
	150	4	0.083	0.050	726	13	0.090	0.047	674	13	37	0.098	0.063	905	12	37
		6			1 089	29			1 011	30	47			1 358	27	48
		8			1 452	51			1 348	51	55			1 810	48	56
		10			1 814	79			1 685	81	61			2 263	76	61
	200	4	0.110	0.067	968	13	0.120	0.062	899	13	38	0.130	0.084	1 207	12	39
		6			1 452	29			1 348	30	49			1 810	27	49
		8			1 935	51			1 797	51	56			2 413	48	57
		10			2 419	79			2 246	81	62			3 017	76	63
	250	4	0.138	0.084	1 210	13	0.150	0.078	1 123	13	39	0.163	0.105	1 508	12	40
		6			1 814	29			1 685	30	50			2 263	27	50
		8			2 419	51			2 246	51	57			3 017	48	58
		10			3 024	79			2 808	81	63			3 771	76	64
	300	4	0.165	0.101	1 452	13	0.180	0.094	1 348	13	40	0.195	0.126	1 810	12	41
		6			2 177	29			2 022	30	50			2 715	27	51
		8			2 903	51			2 696	51	58			3 620	48	59
		10			3 629	79			3 370	81	64			4 525	76	64
	350	4	0.193	0.118	1 693	13	0.210	0.109	1 572	13	40	0.228	0.147	2 112	12	41
		6			2 540	29			2 359	30	51			3 168	27	52
		8			3 387	51			3 145	51	58			4 224	48	59
		10			4 234	79			3 931	81	64			5 279	76	65
	400	4	0.220	0.134	1 935	13	0.240	0.125	1 797	13	41	0.260	0.168	2 413	12	42
		6			2 903	29			2 696	30	52			3 620	27	52
		8			3 871	51			3 594	51	59			4 827	48	60
		10			4 838	79			4 493	81	65			6 034	76	66
	450	4	0.248	0.151	2 177	13	0.270	0.140	2 022	13	42	0.293	0.189	2 715	12	42
		6			3 266	29			3 033	30	52			4 073	27	53
		8			4 355	51			4 044	51	60			5 430	48	60
		10			5 443	79			5 054	81	65			6 788	76	66
	500	4	0.275	0.168	2 419	13	0.300	0.156	2 246	13	42	0.325	0.210	3 017	12	43
		6			3 629	29			3 370	30	53			4 525	27	53
		8			4 838	51			4 493	51	60			6 034	48	61
		10			6 048	79			5 616	81	66			7 542	76	67
	550	4	0.303	0.185	2 661	13	0.330	0.172	2 471	13	42	0.358	0.230	3 318	12	43
		6			3 992	29			3 707	30	53			4 978	27	54
		8			5 322	51			4 942	51	60			6 637	48	61
		10			6 653	79			6 178	81	66			8 296	76	67
	600	4	0.330	0.202	2 903	13	0.360	0.187	2 696	13	43	0.390	0.251	3 620	12	44
		6			4 355	29			4 044	30	53			5 430	27	54
		8			5 806	51			5 391	51	61			7 240	48	62
		10			7 258	79			6 739	81	67			9 050	76	67
	650	4	0.358	0.218	3 145	13	0.390	0.203	2 920	13	43	0.423	0.272	3 922	12	44
		6			4 717	29			4 380	30	54			5 883	27	54
		8			6 290	51			5 841	51	61			7 844	48	62
		10			7 862	79			7 301	81	67			9 805	76	68

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers **for multi-compartment fire ventilation systems**

B – nominal width [mm]
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S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		550					600					650				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	0.385	0.235	3 387	13	0.420	0.218	3 145	13	43	0.455	0.293	4 224	12	44
		6			5 080	29			4 717	30	54			6 335	27	55
		8			6 774	51			6 290	51	61			8 447	48	62
		10			8 467	79			7 862	81	67			10 559	76	68
	750	4	0.413	0.252	3 629	13	0.450	0.234	3 370	13	44	0.488	0.314	4 525	12	44
		6			5 443	29			5 054	30	54			6 788	27	55
		8			7 258	51			6 739	51	62			9 050	48	63
		10			9 072	79			8 424	81	68			11 313	76	68
	800	4	0.440	0.269	3 871	13	0.480	0.250	3 594	13	44	0.520	0.335	4 827	12	44
		6			5 806	29			5 391	30	55			7 240	27	55
		8			7 741	51			7 188	51	62			9 654	48	63
		10			9 677	79			8 986	81	68			12 067	76	68
	850	4	0.468	0.286	4 113	13	0.510	0.265	3 819	13	44	0.553	0.356	5 129	12	44
		6			6 169	29			5 728	30	55			7 693	27	55
		8			8 225	51			7 638	51	62			10 257	48	63
		10			10 282	79			9 547	81	68			12 821	76	68
	900	4	0.495	0.302	4 355	13	0.540	0.281	4 044	13	45	0.585	0.377	5 430	12	44
		6			6 532	29			6 065	30	52			8 145	27	55
		8			8 709	51			8 087	51	60			10 860	48	63
		10			10 886	79			10 109	81	65			13 576	76	68
	950	4	0.523	0.319	4 596	15	0.570	0.296	4 268	13	45	0.618	0.398	5 732	12	46
		6			6 895	33			6 402	30	55			8 598	27	56
		8			9 193	58			8 536	51	63			11 464	48	64
		10			11 491	91			10 670	81	69			14 330	76	69
	1000	4	0.550	0.336	4 838	15	0.600	0.312	4 493	13	45	0.650	0.419	6 034	12	46
		6			7 258	33			6 739	30	56			9 050	27	56
		8			9 677	58			8 986	51	63			12 067	48	64
		10			12 096	91			11 232	81	69			15 084	76	70
	1050	4	0.578	0.353	5 080	15	0.630	0.328	4 717	13	45	0.683	0.440	6 335	12	46
		6			7 620	33			7 076	30	56			9 503	27	57
		8			10 161	58			9 435	51	63			12 671	48	64
		10			12 701	91			11 794	81	69			15 838	76	70
	1100	4	0.605	0.370	5 322	15	0.660	0.343	4 942	13	45	0.715	0.461	6 637	12	46
		6			7 983	33			7 413	30	56			9 955	27	57
		8			10 644	58			9 884	51	63			13 274	48	64
		10			13 306	91			12 355	81	69			16 592	76	70
	1150	4	0.633	0.386	5 564	15	0.690	0.359	5 167	13	46	0.748	0.482	6 939	12	46
		6			8 346	33			7 750	30	56			10 408	27	57
		8			11 128	58			10 333	51	64			13 877	48	64
		10			13 910	91			12 917	81	69			17 347	76	70
	1200	4	0.660	0.403	5 806	15	0.720	0.374	5 391	13	46	0.780	0.503	7 240	12	47
		6			8 709	33			8 087	30	56			10 860	27	57
		8			11 612	58			10 783	51	64			14 481	48	65
		10			14 515	91			13 478	81	70			18 101	76	70
	1250	4	0.688	0.420	6 048	15	0.750	0.390	5 616	13	46	0.813	0.524	7 542	12	47
		6			9 072	33			8 424	30	57			11 313	27	57
		8			12 096	58			11 232	51	64			15 084	48	65
		10			15 120	91			14 040	81	70			18 855	76	71

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers **for multi-compartment fire ventilation systems**

B – nominal width [mm]
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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		700					750					800				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0.077	0.046	664	14	0.083	0.068	979	12	34	0.088	0.055	795	10	34
		6			996	30			1 468	26	44			1 193	22	45
		8			1 327	54			1 958	48	52			1 590	40	52
		10			1 659	85			2 447	74	58			1 988	62	58
	150	4	0.105	0.063	905	14	0.113	0.093	1 335	12	39	0.120	0.075	1 084	10	36
		6			1 358	30			2 002	26	49			1 626	22	46
		8			1 810	54			2 670	48	57			2 169	40	54
		10			2 263	85			3 337	74	62			2 711	62	60
	200	4	0.140	0.084	1 207	14	0.150	0.124	1 780	12	40	0.160	0.100	1 446	10	37
		6			1 810	30			2 670	26	50			2 169	22	48
		8			2 413	54			3 560	48	58			2 892	40	55
		10			3 017	85			4 450	74	64			3 614	62	61
	250	4	0.175	0.105	1 508	14	0.188	0.155	2 225	12	41	0.200	0.126	1 807	10	38
		6			2 263	30			3 337	26	51			2 711	22	49
		8			3 017	54			4 450	48	59			3 614	40	56
		10			3 771	85			5 562	74	65			4 518	62	62
	300	4	0.210	0.126	1 810	14	0.225	0.185	2 670	12	42	0.240	0.151	2 169	10	39
		6			2 715	30			4 005	26	52			3 253	22	49
		8			3 620	54			5 340	48	60			4 337	40	57
		10			4 525	85			6 674	74	66			5 422	62	63
	350	4	0.245	0.147	2 112	14	0.263	0.216	3 115	12	42	0.280	0.176	2 530	10	39
		6			3 168	30			4 672	26	53			3 795	22	50
		8			4 224	54			6 229	48	60			5 060	40	57
		10			5 279	85			7 787	74	66			6 325	62	63
	400	4	0.280	0.168	2 413	14	0.300	0.247	3 560	12	43	0.320	0.201	2 892	10	40
		6			3 620	30			5 340	26	53			4 337	22	51
		8			4 827	54			7 119	48	61			5 783	40	58
		10			6 034	85			8 899	74	67			7 229	62	64
	450	4	0.315	0.189	2 715	14	0.338	0.278	4 005	12	43	0.360	0.226	3 253	10	41
		6			4 073	30			6 007	26	54			4 879	22	51
		8			5 430	54			8 009	48	61			6 506	40	59
		10			6 788	85			10 012	74	67			8 132	62	64
	500	4	0.350	0.210	3 017	14	0.375	0.309	4 450	12	44	0.400	0.251	3 614	10	41
		6			4 525	30			6 674	26	54			5 422	22	52
		8			6 034	54			8 899	48	62			7 229	40	59
		10			7 542	85			11 124	74	68			9 036	62	65
	550	4	0.385	0.230	3 318	14	0.413	0.340	4 895	12	44	0.440	0.276	3 976	10	41
		6			4 978	30			7 342	26	55			5 964	22	52
		8			6 637	54			9 789	48	62			7 952	40	59
		10			8 296	85			12 236	74	68			9 940	62	65
	600	4	0.420	0.251	3 620	14	0.450	0.371	5 340	12	45	0.480	0.301	4 337	10	42
		6			5 430	30			8 009	26	55			6 506	22	52
		8			7 240	54			10 679	48	63			8 675	40	60
		10			9 050	85			13 349	74	69			10 843	62	66
	650	4	0.455	0.272	3 922	14	0.488	0.402	5 784	12	45	0.520	0.326	4 699	10	42
		6			5 883	30			8 677	26	56			7 048	22	53
		8			7 844	54			11 569	48	63			9 397	40	60
		10			9 805	85			14 461	74	69			11 747	62	66

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			700					750					800				
			S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]
width B [mm]	700	v [m/s]	0.490	0.293	4 224	14	46	0.525	0.433	6 229	12	45	0.560	0.351	5 060	10	42
		6			6 335	30	56			9 344	26	56			7 590	22	53
		8			8 447	54	64			12 459	48	63			10 120	40	61
		10			10 559	85	69			15 574	74	69			12 650	62	66
	750	v [m/s]	0.525	0.314	4 525	14	46	0.563	0.464	6 674	12	46	0.600	0.377	5 422	10	43
		6			6 788	30	56			10 012	26	56			8 132	22	53
		8			9 050	54	64			13 349	48	64			10 843	40	61
		10			11 313	85	70			16 686	74	69			13 554	62	67
	800	v [m/s]	0.560	0.335	4 827	14	44	0.600	0.494	7 119	12	46	0.640	0.402	5 783	10	43
		6			7 240	30	55			10 679	26	56			8 675	22	54
		8			9 654	54	62			14 239	48	64			11 566	40	61
		10			12 067	85	67			17 798	74	70			14 458	62	67
	850	v [m/s]	0.595	0.356	5 129	14	46	0.638	0.525	7 564	12	46	0.680	0.427	6 144	10	43
		6			7 693	30	57			11 346	26	57			9 217	22	54
		8			10 257	54	65			15 129	48	64			12 289	40	61
		10			12 821	85	70			18 911	74	70			15 361	62	67
	900	v [m/s]	0.630	0.377	5 430	14	47	0.675	0.556	8 009	12	46	0.720	0.452	6 506	10	44
		6			8 145	30	57			12 014	26	57			9 759	22	54
		8			10 860	54	65			16 019	48	64			13 012	40	62
		10			13 576	85	71			20 023	74	70			16 265	62	67
950	v [m/s]	0.665	0.398	5 732	15	49	0.713	0.587	8 454	12	45	0.760	0.477	6 867	13	48	
	6			8 598	35	59			12 681	26	56			10 301	30	58	
	8			11 464	62	67			16 908	48	63			13 735	53	66	
	10			14 330	97	73			21 136	74	69			17 168	83	71	
1000	v [m/s]	0.700	0.419	6 034	15	49	0.750	0.618	8 899	12	45	0.800	0.502	7 229	13	48	
	6			9 050	35	59			13 349	26	56			10 843	30	58	
	8			12 067	62	67			17 798	48	63			14 458	53	66	
	10			15 084	97	73			22 248	74	69			18 072	83	72	
1050	v [m/s]	0.735	0.440	6 335	15	49	0.788	0.649	9 344	12	46	0.840	0.527	7 590	13	48	
	6			9 503	35	60			14 016	26	56			11 385	30	59	
	8			12 671	62	67			18 688	48	64			15 180	53	66	
	10			15 838	97	73			23 360	74	69			18 976	83	72	
1100	v [m/s]	0.770	0.461	6 637	15	49	0.825	0.680	9 789	12	46	0.880	0.552	7 952	13	48	
	6			9 955	35	60			14 684	26	56			11 928	30	59	
	8			13 274	62	67			19 578	48	64			15 903	53	66	
	10			16 592	97	73			24 473	74	70			19 879	83	72	
1150	v [m/s]	0.805	0.482	6 939	15	50	0.863	0.711	10 234	12	46	0.920	0.577	8 313	13	48	
	6			10 408	35	60			15 351	26	56			12 470	30	59	
	8			13 877	62	68			20 468	48	64			16 626	53	66	
	10			17 347	97	73			25 585	74	70			20 783	83	72	
1200	v [m/s]	0.840	0.503	7 240	15	50	0.900	0.742	10 679	12	46	0.960	0.602	8 675	13	49	
	6			10 860	35	60			16 019	26	57			13 012	30	59	
	8			14 481	62	68			21 358	48	64			17 349	53	67	
	10			18 101	97	74			26 698	74	70			21 686	83	72	
1250	v [m/s]	0.875	0.524	7 542	15	50	0.938	0.773	11 124	12	46	1.000	0.628	9 036	13	49	
	6			11 313	35	60			16 686	26	57			13 554	30	59	
	8			15 084	62	68			22 248	48	64			18 072	53	67	
	10			18 855	97	74			27 810	74	70			22 590	83	73	

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers **for multi-compartment fire ventilation systems**

B – nominal width [mm]
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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		850					900					950				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0.094	0.054	776	14	0.099	0.064	927	13	39	0.105	0.064	927	14	40
		6			1 164	32			1 390	30	49			1 390	32	50
		8			1 552	58			1 853	53	57			1 853	57	58
		10			1 940	90			2 317	83	63			2 317	89	64
	150	4	0.128	0.074	1 058	14	0.135	0.088	1 264	13	40	0.143	0.088	1 264	14	41
		6			1 588	32			1 895	30	51			1 895	32	52
		8			2 117	58			2 527	53	58			2 527	57	59
		10			2 646	90			3 159	83	64			3 159	89	65
	200	4	0.170	0.098	1 411	14	0.180	0.117	1 685	13	41	0.190	0.117	1 685	14	42
		6			2 117	32			2 527	30	52			2 527	32	53
		8			2 822	58			3 370	53	59			3 370	57	60
		10			3 528	90			4 212	83	65			4 212	89	66
	250	4	0.213	0.123	1 764	14	0.225	0.146	2 106	13	42	0.238	0.146	2 106	14	43
		6			2 646	32			3 159	30	53			3 159	32	54
		8			3 528	58			4 212	53	60			4 212	57	61
		10			4 410	90			5 265	83	66			5 265	89	67
	300	4	0.255	0.147	2 117	14	0.270	0.176	2 527	13	43	0.285	0.176	2 527	14	44
		6			3 175	32			3 791	30	54			3 791	32	55
		8			4 234	58			5 054	53	61			5 054	57	62
		10			5 292	90			6 318	83	67			6 318	89	68
	350	4	0.298	0.172	2 470	14	0.315	0.205	2 948	13	44	0.333	0.205	2 948	14	45
		6			3 704	32			4 423	30	54			4 423	32	55
		8			4 939	58			5 897	53	62			5 897	57	63
		10			6 174	90			7 371	83	68			7 371	89	69
	400	4	0.340	0.196	2 822	14	0.360	0.234	3 370	13	44	0.380	0.234	3 370	14	45
		6			4 234	32			5 054	30	55			5 054	32	56
		8			5 645	58			6 739	53	62			6 739	57	63
		10			7 056	90			8 424	83	68			8 424	89	69
	450	4	0.383	0.221	3 175	14	0.405	0.263	3 791	13	45	0.428	0.263	3 791	14	46
		6			4 763	32			5 686	30	55			5 686	32	56
		8			6 350	58			7 582	53	63			7 582	57	64
		10			7 938	90			9 477	83	69			9 477	89	70
	500	4	0.425	0.245	3 528	14	0.450	0.293	4 212	13	45	0.475	0.293	4 212	14	46
		6			5 292	32			6 318	30	56			6 318	32	57
		8			7 056	58			8 424	53	63			8 424	57	64
		10			8 820	90			10 530	83	69			10 530	89	70
	550	4	0.468	0.270	3 881	14	0.495	0.322	4 633	13	46	0.523	0.322	4 633	14	47
		6			5 821	32			6 950	30	56			6 950	32	57
		8			7 762	58			9 266	53	64			9 266	57	65
		10			9 702	90			11 583	83	70			11 583	89	70
	600	4	0.510	0.294	4 234	14	0.540	0.351	5 054	13	46	0.570	0.351	5 054	14	47
		6			6 350	32			7 582	30	57			7 582	32	58
		8			8 467	58			10 109	53	64			10 109	57	65
		10			10 584	90			12 636	83	70			12 636	89	71
	650	4	0.553	0.319	4 586	14	0.585	0.380	5 476	13	46	0.618	0.380	5 476	14	47
		6			6 880	32			8 213	30	57			8 213	32	58
		8			9 173	58			10 951	53	65			10 951	57	65
		10			11 466	90			13 689	83	70			13 689	89	71

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers **for multi-compartment fire ventilation systems**

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S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			850					900					950				
			S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]
width B [mm]		v [m/s]															
	700	4	0.595	0.343	4 939	14	46	0.630	0.410	5 897	13	47	0.665	0.410	5 897	14	48
		6			7 409	32	57			8 845	30	57			8 845	32	58
		8			9 878	58	65			11 794	53	65			11 794	57	66
		10			12 348	90	70			14 742	83	71			14 742	89	72
	750	4	0.638	0.368	5 292	14	47	0.675	0.439	6 318	13	47	0.713	0.439	6 318	14	48
		6			7 938	32	57			9 477	30	58			9 477	32	59
		8			10 584	58	65			12 636	53	65			12 636	57	66
		10			13 230	90	71			15 795	83	71			15 795	89	72
	800	4	0.680	0.392	5 645	14	47	0.720	0.468	6 739	13	47	0.760	0.468	6 739	14	48
		6			8 467	32	58			10 109	30	58			10 109	32	59
		8			11 290	58	65			13 478	53	65			13 478	57	66
		10			14 112	90	71			16 848	83	71			16 848	89	72
	850	4	0.723	0.417	5 998	14	47	0.765	0.497	7 160	13	48	0.808	0.497	7 160	14	49
		6			8 996	32	58			10 741	30	58			10 741	32	59
		8			11 995	58	65			14 321	53	66			14 321	57	67
		10			14 994	90	71			17 901	83	71			17 901	89	72
	900	4	0.765	0.441	6 350	14	48	0.810	0.527	7 582	13	48	0.855	0.527	7 582	14	49
		6			9 526	32	58			11 372	30	58			11 372	32	59
8		12 701			58	66	15 163			53	66	15 163			57	67	
10		15 876			90	71	18 954			83	72	18 954			89	73	
950	4	0.808	0.466	6 703	14	46	0.855	0.556	8 003	12	47	0.903	0.556	8 003	14	49	
	6			10 055	32	57			12 004	26	57			12 004	32	60	
	8			13 406	58	64			16 006	47	65			16 006	57	67	
	10			16 758	90	70			20 007	74	70			20 007	89	73	
1000	4	0.850	0.490	7 056	14	46	0.900	0.585	8 424	12	47	0.950	0.585	8 424	14	49	
	6			10 584	32	57			12 636	26	57			12 636	32	60	
	8			14 112	58	65			16 848	47	65			16 848	57	67	
	10			17 640	90	70			21 060	74	71			21 060	89	73	
1050	4	0.893	0.515	7 409	14	47	0.945	0.614	8 845	12	47	0.998	0.614	8 845	14	49	
	6			11 113	32	57			13 268	26	58			13 268	32	60	
	8			14 818	58	65			17 690	47	65			17 690	57	67	
	10			18 522	90	71			22 113	74	71			22 113	89	73	
1100	4	0.935	0.539	7 762	14	47	0.990	0.644	9 266	12	47	1.045	0.644	9 266	14	50	
	6			11 642	32	57			13 900	26	58			13 900	32	60	
	8			15 523	58	65			18 533	47	65			18 533	57	68	
	10			19 404	90	71			23 166	73	71			23 166	89	74	
1150	4	0.978	0.564	8 114	14	47	1.035	0.673	9 688	12	47	1.093	0.673	9 688	14	50	
	6			12 172	32	58			14 531	26	58			14 531	32	60	
	8			16 229	58	65			19 375	47	65			19 375	57	68	
	10			20 286	90	71			24 219	74	71			24 219	89	74	
1200	4	1.020	0.588	8 467	14	47	1.080	0.702	10 109	12	48	1.140	0.702	10 109	14	50	
	6			12 701	32	58			15 163	26	58			15 163	32	61	
	8			16 934	58	65			20 218	47	66			20 218	57	68	
	10			21 168	90	71			25 272	74	71			25 272	89	74	
1250	4	1.063	0.613	8 820	14	47	1.125	0.731	10 530	12	48	1.188	0.731	10 530	14	50	
	6			13 230	32	58			15 795	26	58			15 795	32	61	
	8			17 640	58	66			21 060	47	66			21 060	57	68	
	10			22 050	90	71			26 325	74	72			26 325	89	74	

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers **for multi-compartment fire ventilation systems**

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S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1000					1050					1100				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0.111	0.073	1 058	12	0.116	0.073	1 058	13	39	0.121	0.073	1 058	15	41
		6			1 587	28			1 587	29	49			1 587	33	51
		8			2 116	50			2 116	51	57			2 116	59	59
		10			2 645	77			2 645	79	63			2 645	93	65
	150	4	0.152	0.100	1 443	12	0.158	0.100	1 443	13	40	0.165	0.100	1 443	15	42
		6			2 164	28			2 164	29	51			2 164	33	53
		8			2 886	50			2 886	51	58			2 886	59	60
		10			3 607	77			3 607	79	64			3 607	93	66
	200	4	0.202	0.134	1 924	12	0.210	0.134	1 924	13	41	0.220	0.134	1 924	15	43
		6			2 886	28			2 886	29	52			2 886	33	54
		8			3 848	50			3 848	51	59			3 848	59	61
		10			4 810	77			4 810	79	65			4 810	93	67
	250	4	0.253	0.167	2 405	12	0.263	0.167	2 405	13	42	0.275	0.167	2 405	15	44
		6			3 607	28			3 607	29	53			3 607	33	55
		8			4 810	50			4 810	51	60			4 810	59	62
		10			6 012	77			6 012	79	66			6 012	93	68
	300	4	0.303	0.200	2 886	12	0.315	0.200	2 886	13	43	0.330	0.200	2 886	15	45
		6			4 329	28			4 329	29	54			4 329	33	56
		8			5 772	50			5 772	51	61			5 772	59	63
		10			7 214	77			7 214	79	67			7 214	93	69
	350	4	0.354	0.234	3 367	12	0.368	0.234	3 367	13	44	0.385	0.234	3 367	15	46
		6			5 050	28			5 050	29	54			5 050	33	56
		8			6 733	50			6 733	51	62			6 733	59	64
		10			8 417	77			8 417	79	68			8 417	93	70
	400	4	0.404	0.267	3 848	12	0.420	0.267	3 848	13	44	0.440	0.267	3 848	15	46
		6			5 772	28			5 772	29	55			5 772	33	57
		8			7 695	50			7 695	51	62			7 695	59	64
		10			9 619	77			9 619	79	68			9 619	93	70
	450	4	0.455	0.301	4 329	12	0.473	0.301	4 329	13	45	0.495	0.301	4 329	15	47
		6			6 493	28			6 493	29	55			6 493	33	57
		8			8 657	50			8 657	51	63			8 657	59	65
		10			10 822	77			10 822	79	69			10 822	93	71
	500	4	0.505	0.334	4 810	12	0.525	0.334	4 810	13	45	0.550	0.334	4 810	15	47
		6			7 214	28			7 214	29	56			7 214	33	58
		8			9 619	50			9 619	51	63			9 619	59	65
		10			12 024	77			12 024	79	69			12 024	93	71
	550	4	0.556	0.367	5 291	12	0.578	0.367	5 291	13	46	0.605	0.367	5 291	15	48
		6			7 936	28			7 936	29	56			7 936	33	58
		8			10 581	50			10 581	51	64			10 581	59	66
		10			13 226	77			13 226	79	70			13 226	93	72
	600	4	0.606	0.401	5 772	12	0.630	0.401	5 772	13	46	0.660	0.401	5 772	15	48
		6			8 657	28			8 657	29	57			8 657	33	59
		8			11 543	50			11 543	51	64			11 543	59	66
		10			14 429	77			14 429	79	70			14 429	93	72
	650	4	0.657	0.434	6 252	12	0.683	0.434	6 252	13	46	0.715	0.434	6 252	15	48
		6			9 379	28			9 379	29	57			9 379	33	59
		8			12 505	50			12 505	51	65			12 505	59	67
		10			15 631	77			15 631	79	70			15 631	93	72

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S_k – duct cross-section [m²]
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Q – flow [m³/h]
d_p – pressure drop [Pa]
L_{WA} – damper noise level [dB]

		height H [mm]														
		1000					1050					1100				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	0.707	0.468	6 733	12	0.735	0.468	6 733	13	47	0.770	0.468	6 733	15	49
		6			10 100	28			10 100	29	57			10 100	33	59
		8			13 467	50			13 467	51	65			13 467	59	67
		10			16 834	77			16 834	79	71			16 834	93	73
	750	4	0.758	0.501	7 214	12	0.788	0.501	7 214	13	47	0.825	0.501	7 214	15	49
		6			10 822	28			10 822	29	58			10 822	33	60
		8			14 429	50			14 429	51	65			14 429	59	67
		10			18 036	77			18 036	79	71			18 036	93	73
	800	4	0.808	0.534	7 695	12	0.840	0.534	7 695	13	47	0.880	0.534	7 695	15	49
		6			11 543	28			11 543	29	58			11 543	33	60
		8			15 391	50			15 391	51	65			15 391	59	67
		10			19 238	77			19 238	79	71			19 238	93	73
	850	4	0.859	0.568	8 176	12	0.893	0.568	8 176	13	48	0.935	0.568	8 176	15	50
		6			12 264	28			12 264	29	58			12 264	33	60
		8			16 353	50			16 353	51	66			16 353	59	68
		10			20 441	77			20 441	79	72			20 441	93	74
	900	4	0.909	0.601	8 657	12	0.945	0.601	8 657	13	48	0.990	0.601	8 657	15	50
		6			12 986	28			12 986	29	58			12 986	33	60
		8			17 315	50			17 315	51	66			17 315	59	68
		10			21 643	77			21 643	79	72			21 643	93	74
	950	4	0.960	0.635	9 138	11	0.998	0.635	9 138	13	48	1.045	0.635	9 138	15	50
		6			13 707	25			13 707	29	59			13 707	33	61
		8			18 276	44			18 276	51	66			18 276	59	68
		10			22 846	69			22 846	79	72			22 846	93	74
	1000	4	1.010	0.668	9 619	11	1.050	0.668	9 619	13	48	1.100	0.668	9 619	15	50
		6			14 429	25			14 429	29	59			14 429	33	61
		8			19 238	44			19 238	51	66			19 238	59	68
		10			24 048	69			24 048	79	72			24 048	93	74
	1050	4	1.061	0.701	10 100	11	1.103	0.701	10 100	13	49	1.155	0.701	10 100	15	51
		6			15 150	25			15 150	29	59			15 150	33	61
		8			20 200	44			20 200	51	67			20 200	59	69
		10			25 250	69			25 250	79	72			25 250	93	74
	1100	4	1.111	0.735	10 581	11	1.155	0.735	10 581	13	49	1.210	0.735	10 581	15	51
		6			15 872	25			15 872	29	59			15 872	33	61
		8			21 162	44			21 162	51	67			21 162	59	69
		10			26 453	69			26 453	79	73			26 453	93	75
	1150	4	1.162	0.768	11 062	11	1.208	0.768	11 062	13	49	1.265	0.768	11 062	15	51
		6			16 593	25			16 593	29	60			16 593	33	62
		8			22 124	44			22 124	51	67			22 124	59	69
		10			27 655	69			27 655	79	73			27 655	93	75
	1200	4	1.212	0.802	11 543	11	1.260	0.802	11 543	13	49	1.320	0.802	11 543	15	51
		6			17 315	25			17 315	29	60			17 315	33	62
		8			23 086	44			23 086	51	67			23 086	59	69
		10			28 858	69			28 858	79	73			28 858	93	75
	1250	4	1.263	0.835	12 024	11	1.313	0.835	12 024	13	49	1.375	0.835	12 024	15	51
		6			18 036	25			18 036	29	60			18 036	33	62
		8			24 048	44			24 048	51	67			24 048	59	69
		10			30 060	69			30 060	79	73			30 060	93	75

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers **for multi-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1150					1200					1250				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0.127	0.092	1 318	11	0.132	0.083	1 190	13	40	0.138	0.092	1 321	11	37
		6			1 977	23			1 784	30	51			1 982	24	48
		8			2 636	39			2 379	54	58			2 642	43	55
		10			3 295	59			2 974	84	64			3 303	66	61
	150	4	0.173	0.125	1 797	11	0.180	0.113	1 622	13	41	0.188	0.125	1 801	11	39
		6			2 696	23			2 433	30	52			2 702	24	49
		8			3 594	39			3 244	54	59			3 603	43	57
		10			4 493	59			4 055	84	65			4 504	66	63
	200	4	0.230	0.166	2 396	11	0.240	0.150	2 163	13	42	0.250	0.167	2 402	11	39
		6			3 594	23			3 244	30	53			3 603	24	50
		8			4 792	39			4 326	54	60			4 804	43	57
		10			5 990	59			5 407	84	66			6 005	66	63
	250	4	0.288	0.208	2 995	11	0.300	0.188	2 704	13	43	0.313	0.209	3 002	11	40
		6			4 493	23			4 055	30	54			4 504	24	51
		8			5 990	39			5 407	54	61			6 005	43	58
		10			7 488	59			6 759	84	67			7 506	66	64
	300	4	0.345	0.250	3 594	11	0.360	0.225	3 244	13	44	0.375	0.250	3 603	11	41
		6			5 391	23			4 866	30	54			5 404	24	51
		8			7 188	39			6 489	54	62			7 206	43	59
		10			8 986	59			8 111	84	68			9 007	66	65
	350	4	0.403	0.291	4 193	11	0.420	0.263	3 785	13	45	0.438	0.292	4 203	11	41
		6			6 290	23			5 678	30	55			6 305	24	52
		8			8 387	39			7 570	54	63			8 407	43	60
		10			10 483	59			9 463	84	68			10 508	66	65
	400	4	0.460	0.333	4 792	11	0.480	0.300	4 326	13	45	0.500	0.334	4 804	11	42
		6			7 188	23			6 489	30	56			7 206	24	53
		8			9 585	39			8 652	54	63			9 608	43	60
		10			11 981	59			10 814	84	69			12 010	66	66
	450	4	0.518	0.374	5 391	11	0.540	0.338	4 866	13	46	0.563	0.375	5 404	11	43
		6			8 087	23			7 300	30	56			8 106	24	53
		8			10 783	39			9 733	54	64			10 809	43	61
		10			13 478	59			12 166	84	70			13 511	66	66
	500	4	0.575	0.416	5 990	11	0.600	0.376	5 407	13	46	0.625	0.417	6 005	11	43
		6			8 986	23			8 111	30	57			9 007	24	54
		8			11 981	39			10 814	54	64			12 010	43	61
		10			14 976	59			13 518	84	70			15 012	66	67
	550	4	0.633	0.458	6 589	11	0.660	0.413	5 948	13	47	0.688	0.459	6 605	11	43
		6			9 884	23			8 922	30	57			9 908	24	54
		8			13 179	39			11 896	54	65			13 211	43	62
		10			16 474	59			14 870	84	70			16 513	66	67
	600	4	0.690	0.499	7 188	11	0.720	0.451	6 489	13	47	0.750	0.500	7 206	11	44
		6			10 783	23			9 733	30	57			10 809	24	54
		8			14 377	39			12 977	54	65			14 412	43	62
		10			17 971	59			16 222	84	71			18 014	66	68
	650	4	0.748	0.541	7 788	11	0.780	0.488	7 029	13	47	0.813	0.542	7 806	11	44
		6			11 681	23			10 544	30	58			11 709	24	55
		8			15 575	39			14 059	54	65			15 612	43	62
		10			19 469	59			17 573	84	71			19 516	66	68

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers **for multi-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1150					1200					1250				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	0.805	0.582	8 387	11	0.840	0.526	7 570	13	48	0.875	0.584	8 407	11	44
		6			12 580	23			11 355	30				12 610	24	
		8			16 773	39			15 140	54				16 813	43	
		10			20 966	59			18 925	84				21 017	66	
	750	4	0.863	0.624	8 986	11	0.900	0.563	8 111	13	48	0.938	0.626	9 007	11	45
		6			13 478	23			12 166	30				13 511	24	
		8			17 971	39			16 222	54				18 014	43	
		10			22 464	59			20 277	84				22 518	66	
	800	4	0.920	0.666	9 585	11	0.960	0.601	8 652	13	48	1.000	0.667	9 608	11	45
		6			14 377	23			12 977	30				14 412	24	
		8			19 169	39			17 303	54				19 215	43	
		10			23 962	59			21 629	84				24 019	66	
	850	4	0.978	0.707	10 184	11	1.020	0.638	9 192	13	48	1.063	0.709	10 208	11	45
		6			15 276	23			13 788	30				15 312	24	
		8			20 367	39			18 384	54				20 416	43	
		10			25 459	59			22 981	84				25 520	66	
	900	4	1.035	0.749	10 783	11	1.080	0.676	9 733	13	49	1.125	0.751	10 809	11	46
		6			16 174	23			14 599	30				16 213	24	
		8			21 565	39			19 466	54				21 617	43	
		10			26 957	59			24 332	84				27 022	66	
	950	4	1.093	0.790	11 382	11	1.140	0.713	10 274	13	49	1.188	0.792	11 409	11	47
		6			17 073	23			15 411	30				17 114	24	
		8			22 764	39			20 547	54				22 818	43	
		10			28 454	59			25 684	84				28 523	66	
	1000	4	1.150	0.832	11 981	11	1.200	0.751	10 814	13	50	1.250	0.834	12 010	11	47
		6			17 971	23			16 222	30				18 014	24	
		8			23 962	39			21 629	54				24 019	43	
		10			29 952	59			27 036	84				30 024	66	
	1050	4	1.208	0.874	12 580	11	1.260	0.789	11 355	13	50	1.313	0.876	12 610	11	47
		6			18 870	23			17 033	30				18 915	24	
		8			25 160	39			22 710	54				25 220	43	
		10			31 450	59			28 388	84				31 525	66	
	1100	4	1.265	0.915	13 179	11	1.320	0.826	11 896	13	50	1.375	0.917	13 211	11	47
		6			19 768	23			17 844	30				19 816	24	
		8			26 358	39			23 792	54				26 421	43	
		10			32 947	59			29 740	84				33 026	66	
	1150	4	1.323	0.957	13 778	11	1.380	0.864	12 437	13	50	1.438	0.959	13 811	11	48
		6			20 667	23			18 655	30				20 717	24	
		8			27 556	39			24 873	54				27 622	43	
		10			34 445	59			31 091	84				34 528	66	
	1200	4	1.380	0.998	14 377	11	1.440	0.901	12 977	13	50	1.500	1.001	14 412	11	48
		6			21 565	23			19 466	30				21 617	24	
		8			28 754	39			25 955	54				28 823	43	
		10			35 942	59			32 443	84				36 029	66	
	1250	4	1.438	1.040	14 976	11	1.500	0.939	13 518	13	51	1.563	1.043	15 012	11	48
		6			22 464	23			20 277	30				22 518	24	
		8			29 952	39			27 036	54				30 024	43	
		10			37 440	59			33 795	84				37 530	66	

The WIP PRO/V fire damper selection program is available at www.mercor.com.pl, in the Designer Zone.

mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers for multi-compartment fire ventilation systems

14.7 | Estimated weights of mcr WIP PRO/V, mcr WIP PRO/V-M dampers [kg]

		width B [mm]														
		110	150	200	250	300	350	400	500	600	700	800	900	1000	1100	1250
height H [mm]	263	3	4	5	7	8	9	11	14	16	19	22	25	28	31	34
	300	3	4	6	8	9	11	12	16	19	22	25	29	33	37	41
	400	4	6	8	12	12	15	17	21	25	30	34	38	42	46	50
	500	5	8	10	13	16	18	21	27	32	37	43	48	53	58	63
	600	7	9	12	16	19	22	25	32	38	45	51	58	65	72	79
	700	8	11	15	18	22	26	30	37	45	52	60	68	76	84	92
	800	9	12	17	21	25	30	34	43	51	60	69	77	85	93	101
	900	10	14	19	24	29	34	38	48	58	68	77	87	97	107	117
	1000	11	16	21	27	32	37	43	54	64	75	86	97	108	119	130
	1100	13	17	23	29	35	41	47	59	71	83	95	106	117	128	139
	1250	14	20	27	33	40	47	54	67	81	94	108	122	136	150	164

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

14.8 | Accessories

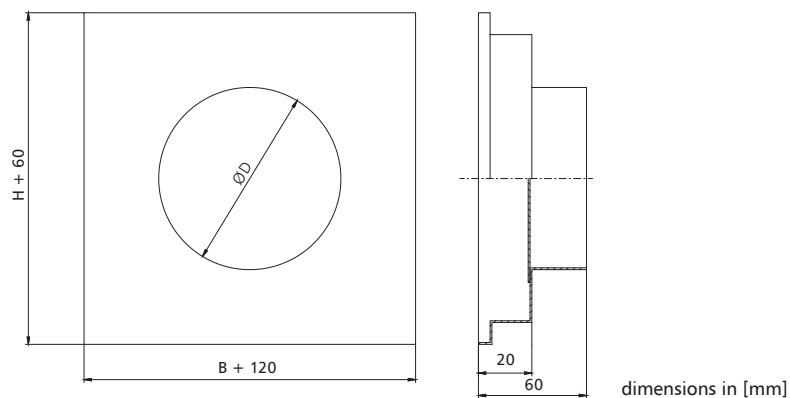
14.8.1 | mcr KRP connection stub

mcr KRP connection stubs are used to connect a circular ventilation duct to a rectangular damper. The connection is a „bare end“ pipe. The diameter of the stub pipe is 2 mm smaller than the diameter of the ventilation duct.

Dimensions:

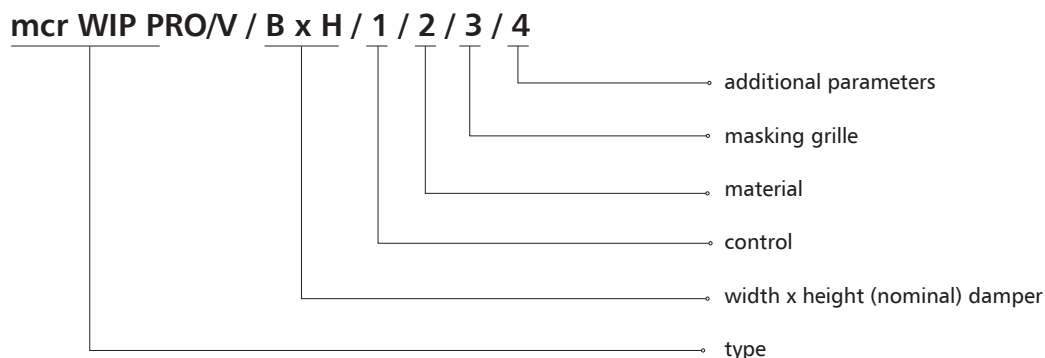
BxH - damper dimensions [mm]

ØD - diameter of the connection duct [mm]



mcr WIP PRO/V, mcr WIP PRO/V-M | Multi-blade smoke control dampers for multi-compartment fire ventilation systems

14.9 | Marking



1 - control:

» trigger and control mechanism, axial actuator

- BE24 – actuator without a return spring, U = 24 V AC/DC
- BE230 – actuator without a return spring, U = 230 V AC/DC
- BEE24 – actuator without a return spring, U = 24 V AC/DC
- BEE230 – actuator without a return spring, U = 230 V AC/DC
- BEN24 – actuator without a return spring, U = 24 V AC/DC
- BEN230 – actuator without a return spring, U = 230 V AC/DC
- MLE24 – actuator without a return spring, U = 24 V AC/DC
- MLE230 – actuator without a return spring, U = 230 V AC
- ME24 – actuator without a return spring, U = 24 V AC/DC
- ME230 – actuator without a return spring, U = 230 V AC

2 - material:

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

3 - masking element:

- MSTx1 – single masking grille
- MSTx2 – two masking grilles
- MWPx1 – single mesh cover
- MWPx2 – two mesh cover

4 - additional parameters :

» Damper axis of rotation

- [no symbol] – horizontal axis of rotation
- PP_D – vertical axis of rotation – mechanism at the bottom of the damper
- PP_G – vertical axis of rotation - mechanism at the top of the damper

» Design standard

- [no symbol] – left damper
- KP – right damper
- LC – actuator long casing

» Damper casing

- BU - earth pin

NOTE: separate additional parameters entered with the “/” sign example marking:

mcr WIP PRO/V 400 x 400 BLE24

EIS120 louvered smoke ventilation damper with a 24 V actuator with limit switches.

Chapter 19 - power supply and control (p. 350) contains the following information:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems



downloadable models
on the website
under the designer zone tab



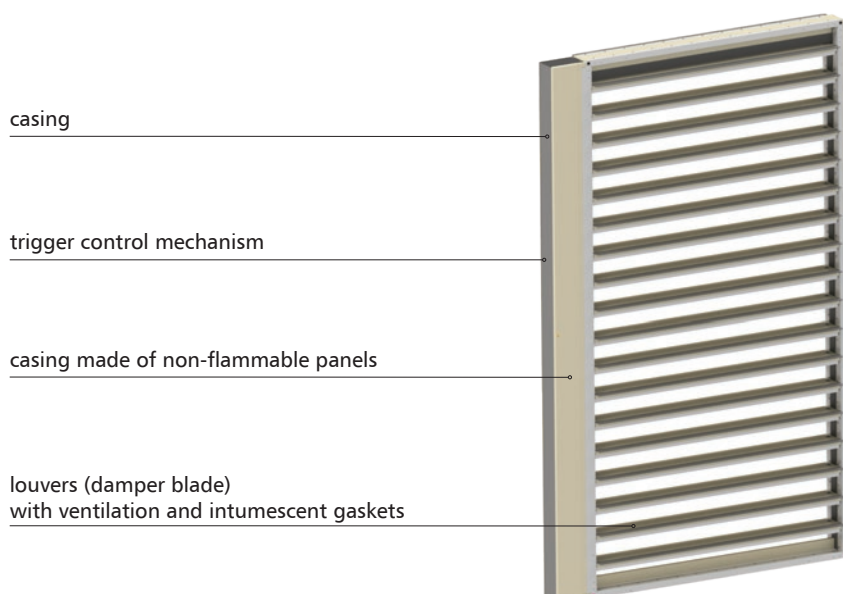
» EIS120, EIS90, EIS60 E₆₀₀ 120

- » Fire resistance class: EI120 ($v_{ed} i \leftrightarrow o$)S1000C₁₀₀₀₀AAmulti, EI90 ($v_{ed} i \leftrightarrow o$)S1000C₁₀₀₀₀AAmulti, EI60 ($v_{ed} i \leftrightarrow o$)S1000C₁₀₀₀₀AAmulti.
- » Certificate of constancy of performance 2434-CPR-0374/VV
- » Dampers certified for compliance with EN 12101-8.
- » Dampers rated under EN 13501-4 and tested under EN 1366-10.
- » Narrow louvered smoke control dampers for fire ventilation systems.
- » Certified installation on/in multi-compartment and single-compartment fire ventilation system ducts.
- » Certified installation including a masking grille.
- » Option of mounting dampers in modules (damper next to damper, damper above damper).

15.1 | Application

mcr WIP PROV/V, mcr WIP PROV/V-M multi-blade smoke control dampers are intended for installation in automatically operated fire ventilation systems. mcr WIP PROV/V dampers are used in fire ventilation systems, while dampers marked as mcr WIP PROV/V-M are used in mixed, fire and comfort ventilation systems. When installed, these devices prevent the propagation of fire, smoke and fire gases to adjacent areas. During normal operation, the fire damper blade is in the open or closed position, depending on its function. The fire damper blade in the fire compartment is opened, whereas in other areas the blades are closed. Admissible flow velocity in the connected duct is 12 m/s. Due to their design, mcr WIP PROV/V, mcr WIP PROV/V-M fire dampers are intended for use in systems, where the components such as a silencer, bend or supply and extraction grille are installed downstream of the smoke control damper. Dampers may be installed in smoke extract ducts, shafts and at system ends.

15.2 | Design



mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

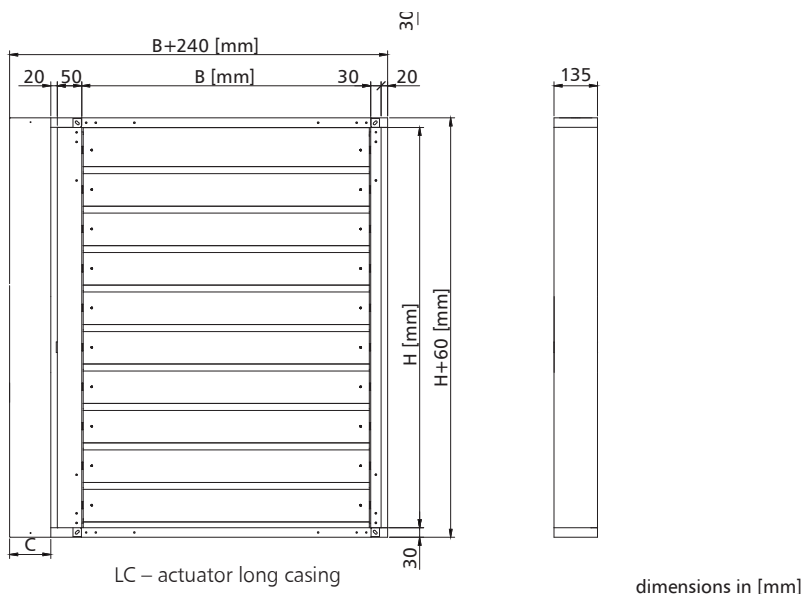
The multi-blade mcr WIP PROV/V damper consists of a rectangular casing made of two steel sections connected with a non-combustible plate using rivets and galvanized steel sheet fasteners, a set of movable blades rotating around their axes and a trigger control mechanism. The damper casing is made of fire resistant panels and galvanized "C" shape metal sheet profiles. The device is reinforced on both sides with steel flat bar corners. On the vertical side H, intumescent and ventilation gaskets are installed on the inside. The vertical edge with the actuator is protected by a fire resistant panel. The actuator cover is mounted on the side H of the damper. Each damper blade is made of two fire resistant panels, which are displaced against each other. An intumescent gasket and ventilation gasket are attached with staples on both sides, along the entire blade length. The damper blades revolve on their own axes, which consist of two steel pins. Each pin is mounted in a brass sleeve installed on the vertical side H of the fire damper casing.

15.3 | Versions

15.3.1 | Damper closing and opening with an actuator

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

mcr WIP PROV/V, mcr WIP PROV/V-M smoke control damper are equipped with a trigger control mechanism in the form of a BE, BEE, BEN, MLE, ME axial actuator without the return spring (24 V AC/DC or 230 V AC). The BE, BEE, BEN, MLE, ME series actuators are equipped with limit switches used to monitor the damper blade position. Furthermore, a mechanical position indicator is placed on the actuator. mcr WIP PROV/V, mcr WIP PROV/V-M smoke control dampers with BE, BEE, BEN, MLE, ME actuators can be opened/closed by supplying voltage to the actuator terminals. Dampers with those actuators may also be opened/closed manually using a key.



mechanism	C
BE, BEE, BEN, MLE, ME	120

15.4 | Dimensions

» Rectangular dampers::

- » nominal width B: from 110 mm to 1200 mm
- » nominal height H: from 270 mm to 2300 mm
- » maximum single damper cross-section surface up to 2.76 m²

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 10 mm increments within the given ranges).

Square dampers may also be additionally equipped with round connection collars allowing for so called "bare end" connection to round ducts.

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

15.5 | Installation

mcr WIP PROV/V rectangular dampers (with grille) are rated EI120($v_{ed} i \leftrightarrow o$)S1000C₁₀₀₀AAmulti if installed in/on building shafts made of blocks, bricks, hollow bricks, slabs or solid materials.

mcr WIP PROV/V rectangular dampers are rated EI120($v_{ed} i \leftrightarrow o$)S1000C₁₀₀₀AAmulti if installed in/on vertical/horizontal smoke exhaust ducts in accordance with EN 1366-8 or EN 1366-9, with a min. wall thickness of 50 mm.

mcr WIP PROV/V damper modules (damper next to damper, damper above damper) are rated EI120($v_{ed} i \leftrightarrow o$)S1000C₁₀₀₀AAmulti if installed in/on building shafts made of blocks, bricks, hollow bricks, slabs or solid materials.

mcr WIP PROV/V damper modules (damper next to damper, damper above damper) are rated EI120($v_{ed} i \leftrightarrow o$)S1000C₁₀₀₀AAmulti when installed on vertical smoke exhaust ducts in accordance with EN 1366-8 or EN 1366-9, with a min. wall thickness of 50 mm.

mcr WIP PROV/V rectangular dampers are rated E600I20($v_{ed} i \leftrightarrow o$)S1000C₁₀₀₀AAsingle in single-zone fire ventilation systems.

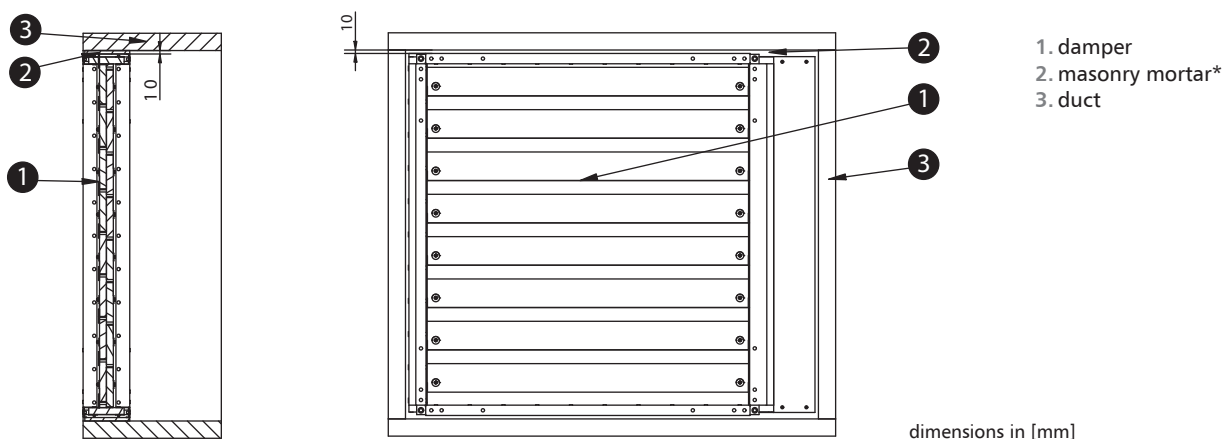
15.5.1 | Preparation of installation openings

The recommended size of the opening enabling correct installation of the mcr WIP PROV/V damper depends on the method and location of installation.

For a damper mounted on a horizontal section of a duct made of fire resistant panels, a gap of at least 10 mm should be left in its clearance on each side of the damper and filled around its perimeter with masonry mortar.

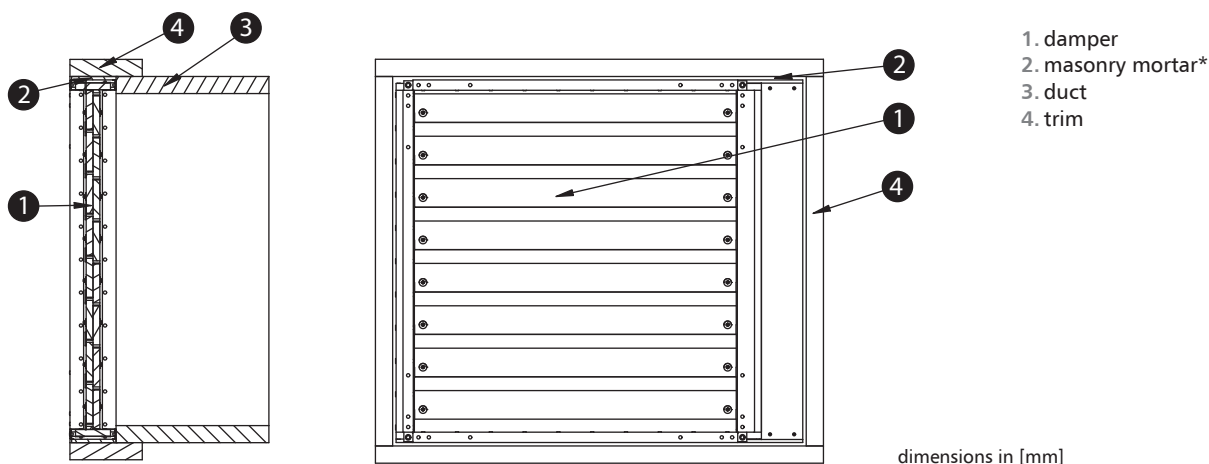
For a damper mounted on a horizontal section of a duct made of fire resistant panels "butt-on" to the duct wall, the damper should be sealed at the point of contact between the collar and the wall, and enclosed around the perimeter with board trims and sealed with assembly mortar.

» installation in the opening clearance



* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

» "butt-on" installation

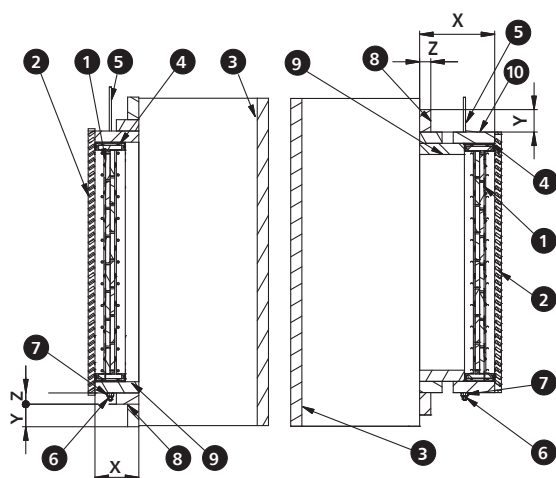


* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

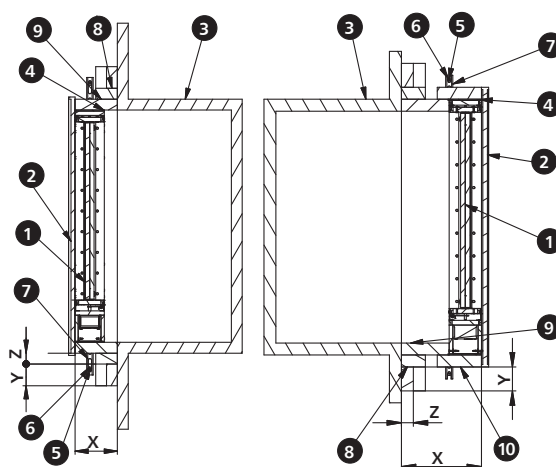
mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

15.5.2 | Example installation on a vertical, solid or brick building shaft

» vertical section



» top view

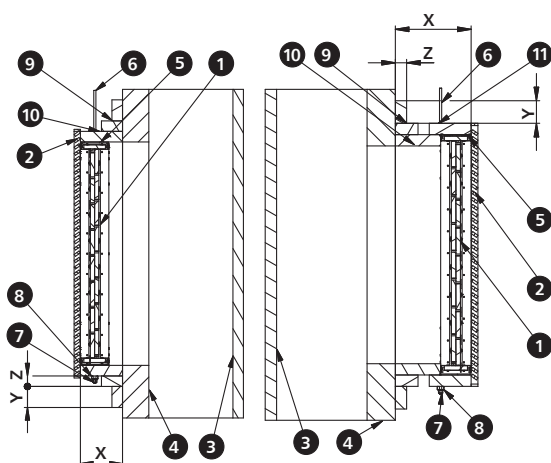


X - min. 135 mm
Y - min. 40mm - board trim
Z - min. 40mm - board trim

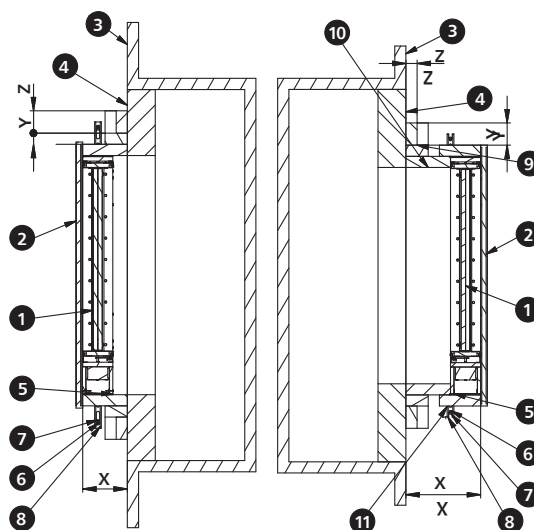
- | | | |
|------------------------|--|---|
| 1. mcr WIP PROV damper | 5. suspension system - rod | 8. fire resistant panel elements |
| 2. masking grille | 6. suspension system, fastening according to EN 1366-8 | 9. horizontal section of the duct made of fire resistant panels |
| 3. construction shaft | 7. suspension system - horizontal element | 10. fire resistant panel trim |
| 4. masonry mortar* | | |

* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

» vertical section



» top view



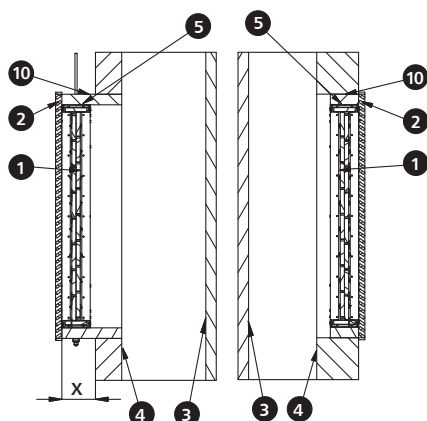
X - min. 135 mm
Y - min. 40mm - board trim
Z - min. 40mm - board trim

- | | | |
|------------------------------|---|--|
| 1. mcr WIP PROV damper | 5. masonry mortar* | 9. fire resistant panel elements |
| 2. masking grille | 6. suspension system, fastening | 10. horizontal section of the duct made of fire resistant panels acc. to EN 1366-8 |
| 3. construction shaft | 7. suspension system - horizontal element | 11. fire resistant panel trim |
| 4. closing wall of the shaft | 8. suspension system, fastening | |

* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

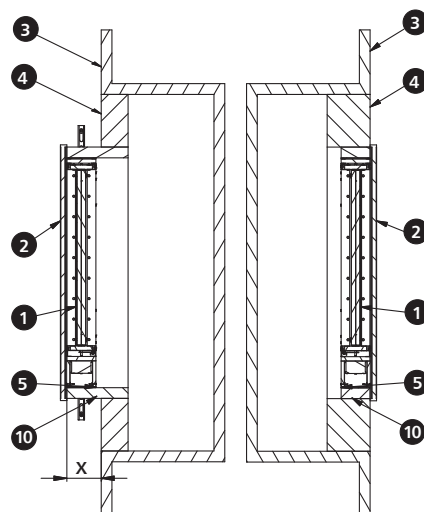
» vertical section



- 1. mcr WIP PROV/V damper
- 2. masking grille
- 3. construction shaft

- 4. closing wall of the shaft
- 5. masonry mortar*
- 10. horizontal section of the duct made of fire resistant panels acc. to EN 1366-8

» top view

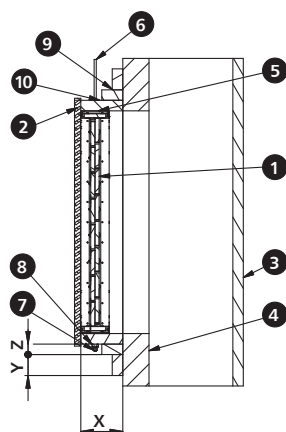


X – min. 135mm

* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

15.5.3 | Sample installation on a vertical building shaft made of boards

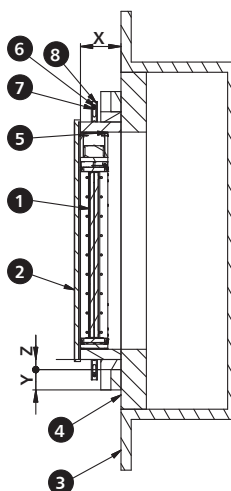
» vertical section



- 1. mcr WIP PROV damper
- 2. masking grille
- 3. construction shaft
- 4. closing wall of the shaft

- 5. masonry mortar*
- 6. suspension system, fastening
- 7. suspension system - horizontal element
- 8. suspension system, fastening

» top view



X - min. 135 mm
Y - min. 40mm - board trim
Z - min. 40mm - board trim

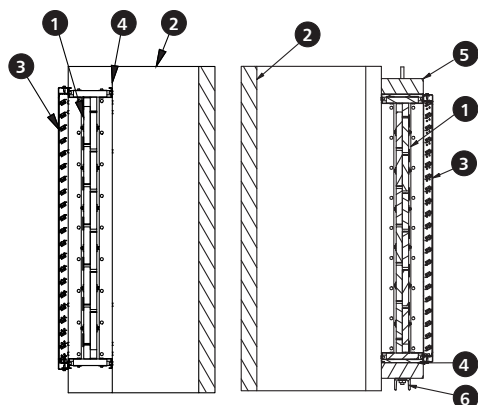
- 9. fire resistant panel elements
- 10. horizontal section of the duct made of fire resistant panels acc. to EN 1366-8

* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

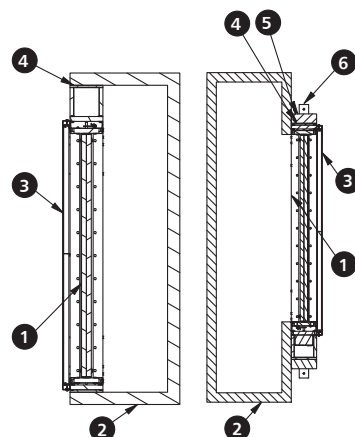
mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

15.5.4 | Sample installation in/on a vertical fire ventilation duct or in/on an air supply duct

» vertical section



» top view

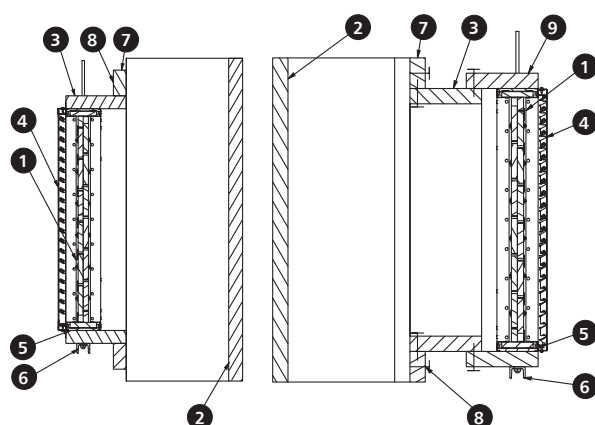


- | | |
|--------------------------------|------------------------|
| 1. mcr WIP PROV damper | 4. masonry mortar* |
| 2. self-supporting, board duct | 5. board mounting trim |
| 3. masking grille | 6. suspension system |

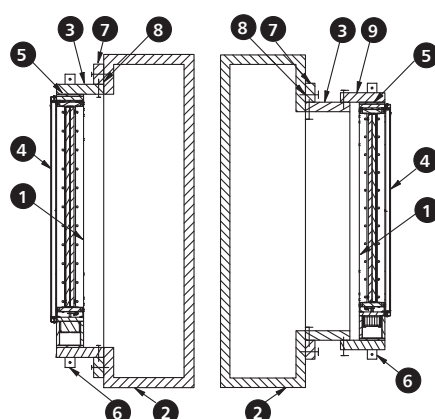
* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

15.5.5 | Sample installation in/on a horizontal branch/section from a vertical fire ventilation duct or on an air supply duct

» vertical section



» top view

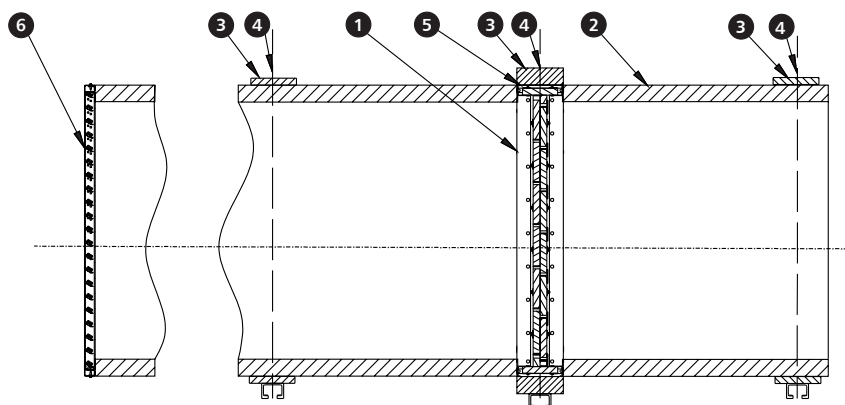


- | | | |
|--------------------------------|----------------------|---|
| 1. mcr WIP PROV damper | 4. masking grille | 7. additional mounting trim |
| 2. self-supporting, board duct | 5. masonry mortar* | 8. connectors - e.g. screws |
| 3. duct horizontal section | 6. suspension system | 9. trim around the damper circumference |

* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

15.5.6 | Sample installation in a horizontal section of a fire ventilation duct or an air supply duct

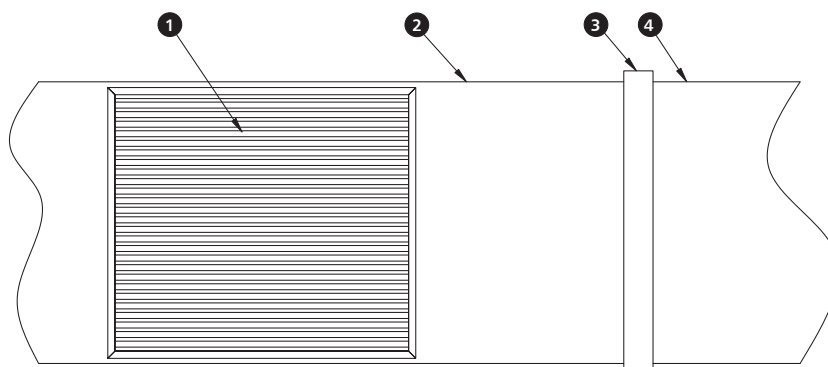


- | | |
|---|---|
| 1. mcr WIP PROV damper | 4. suspension system |
| 2. self-supporting duct | 5. masonry mortar* |
| 3. system trims of duct section or trim for damper casing | 6. masking grille at the damper or at the end of the installation |

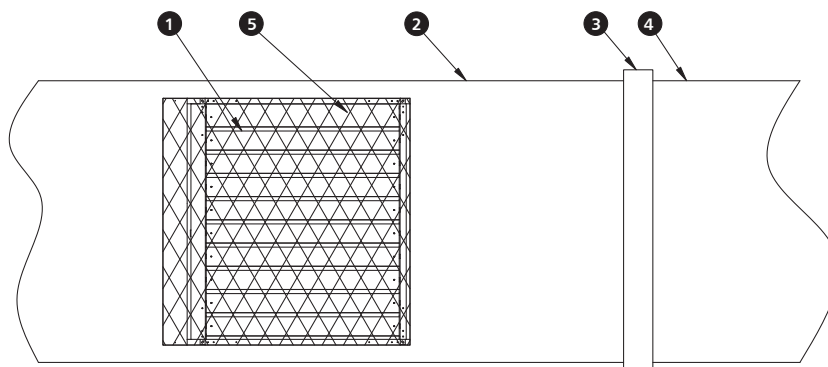
* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

15.5.7 | Sample installation in the side wall of a horizontal section of a fire ventilation duct or an air supply duct

» with a lamella masking grille type MST



» with a mesh masking grille type MWP

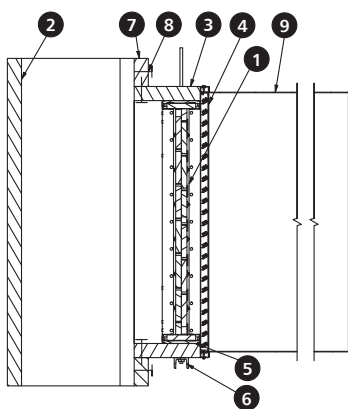


- | | |
|-------------------------------------|----------------------------|
| 1. masking grille | 4. duct horizontal section |
| 2. duct horizontal section | 5. mcr WIP PROV damper |
| 3. trims - connecting duct sections | |

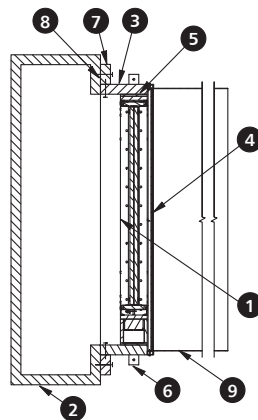
mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

15.5.8 | Sample installation on a horizontal branch/section from a vertical fire ventilation duct - connection to a steel duct

» vertical section



» top view



- 1. mcr WIP PROV damper
- 2. self-supporting duct
- 3. horizontal section of the duct (damper casing)

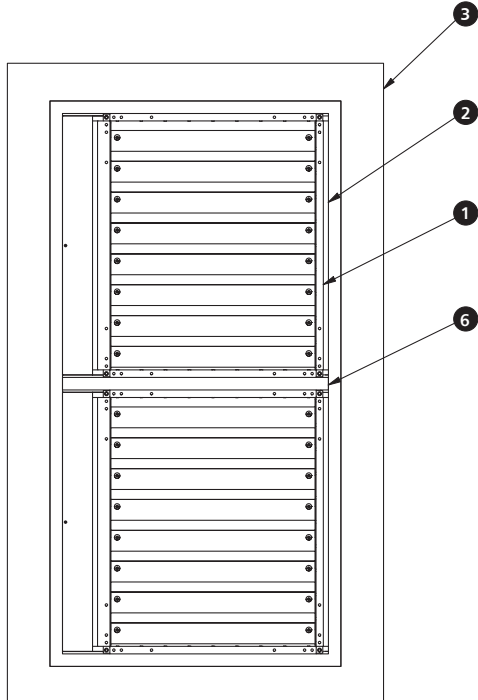
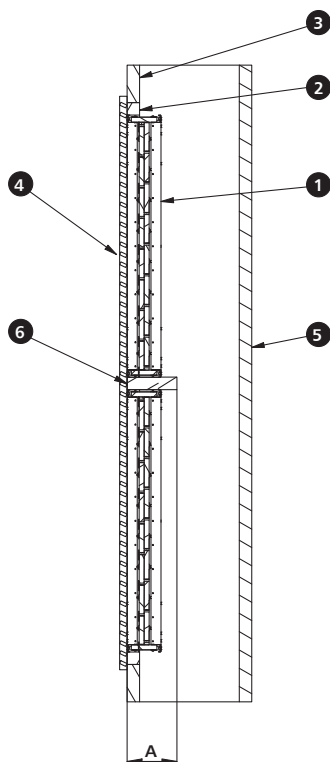
- 4. masking grille
- 5. masonry mortar*
- 6. suspension system

- 7. additional mounting trim
- 8. connectors - e.g. screws
- 9. horizontal steel duct

* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

15.5.9 | Sample installation on/in the wall of a vertical fire ventilation duct or an air supply duct - damper above damper

» in the duct clearance



- 1. mcr WIP PROV damper
- 2. masonry mortar*
- 3. duct or shaft wall

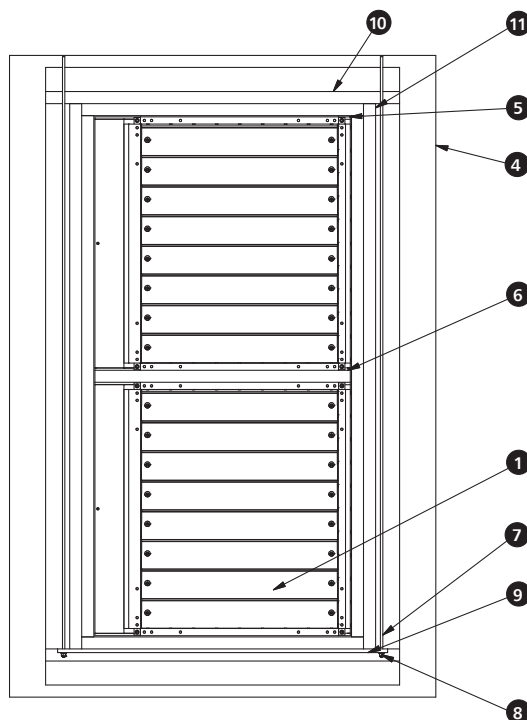
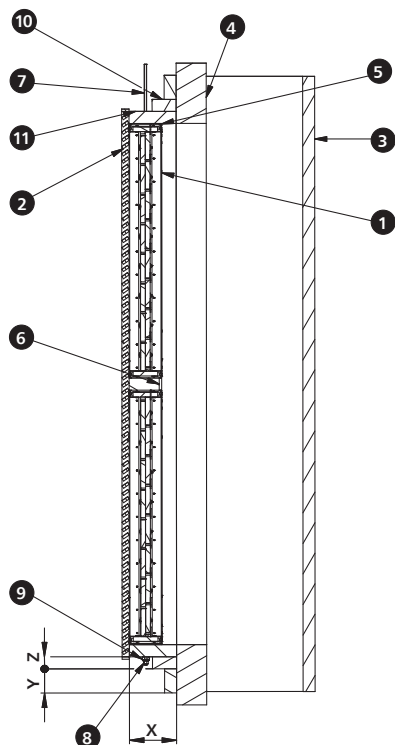
- 4. masking grille
- 5. vertical duct or shaft

- 6. fire board strip, min. 50mm thick, width A, min. 135mm, placed between the dampers, sealed with masonry mortar

* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

» on the shaft



X - min. 135mm
Y - min. 40 mm
- board trim
Z - min. 40 mm
- board trim

1. mcr WIP PROV damper
2. masking grille
3. shaft wall
4. shaft wall
5. masonry mortar*

6. fire board strip, min. 50mm thick, width A, min. 135mm, placed between the dampers, sealed with masonry mortar
7. suspension system
8. suspension system

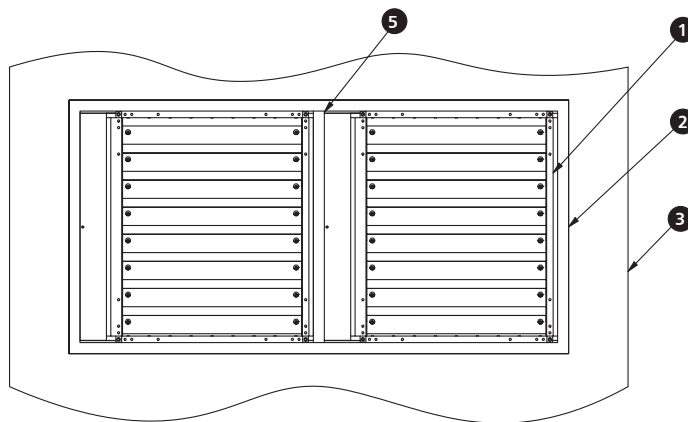
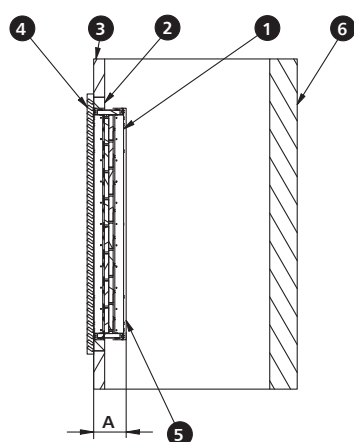
9. suspension system
10. board trims
11. section of the duct made of panels acc. to EN 1366-8

* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

15.5.10 | Sample installation in the side wall of a horizontal section of a fire ventilation duct or an air supply duct

» in the duct clearance

The dampers can be mounted in the following configuration: left - left damper, left - right damper or right - left damper.



1. mcr WIP PROV damper
2. masonry mortar*
3. duct wall
4. masking grille

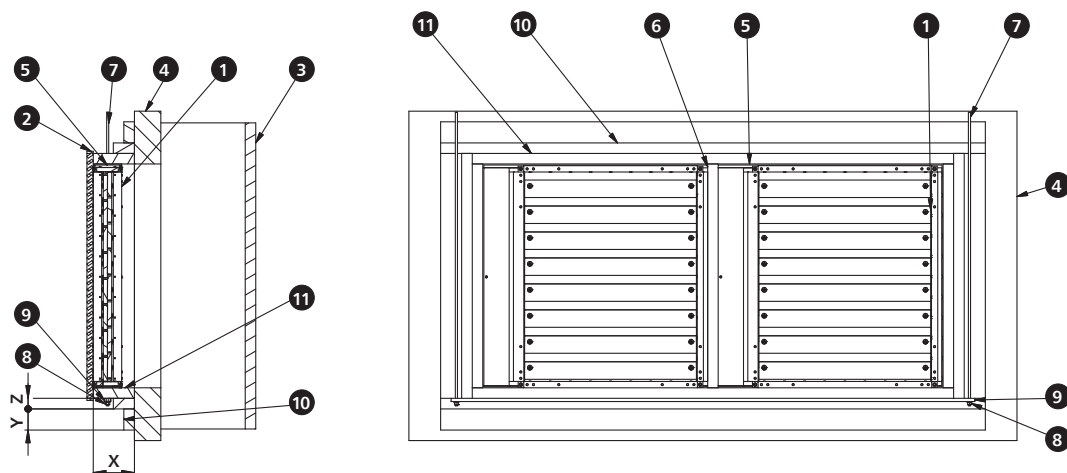
5. fire board strip, min. 50mm thick, width A, min. 135mm, placed between the dampers, sealed with masonry mortar
6. duct wall

* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

» on the shaft

The dampers can be mounted in the following configuration: left - left damper, left - right damper or right - left damper.

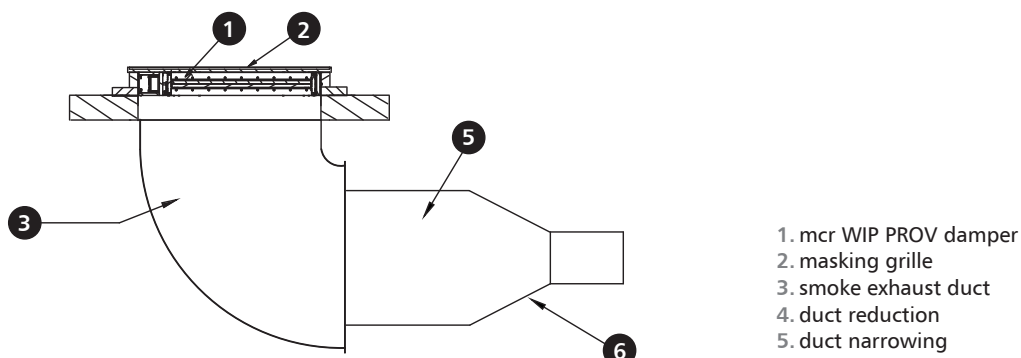


X - min. 135 mm
Y - min. 40mm - board trim
Z - min. 40mm - board trim

- | | | |
|------------------------|---|--|
| 1. mcr WIP PROV damper | 6. fire board strip, min. 50mm thick, width A, min. 135mm, placed between the dampers, sealed with masonry mortar | 9. suspension system |
| 2. masking grille | 7. suspension system | 10. board trims |
| 3. shaft wall | 8. suspension system | 11. section of the duct made of panels |
| 4. shaft wall | | |
| 5. masonry mortar* | | |

* Recommended damper installation in a wet system is based on masonry mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters no worse than the recommended solutions and with appropriate approval documents confirming the appropriate fire resistance class.

» Sample installation for non-standard applications

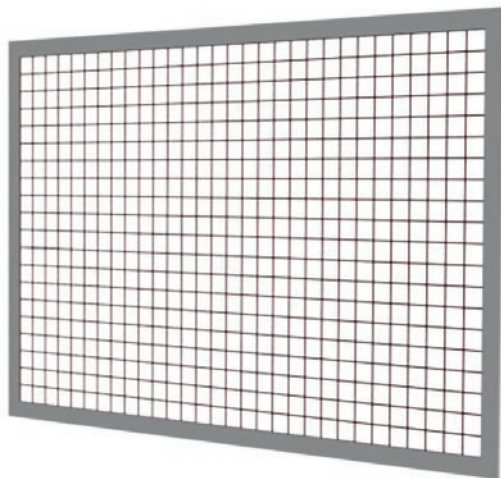


- | |
|------------------------|
| 1. mcr WIP PROV damper |
| 2. masking grille |
| 3. smoke exhaust duct |
| 4. duct reduction |
| 5. duct narrowing |

mcr WIP PROV/V, mcr WIP PROV/V-M multi-blade smoke control damper, thanks to its design, is adapted for installation in places where non-standard solutions are used. Installation can be performed in places where such elements as a bend, duct narrowing or reduction will be downstream of the smoke control damper. This allows for optimal use of space and ensures adequate airflow, and the damper itself allows for flexible adjustment to various ventilation system configurations.

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

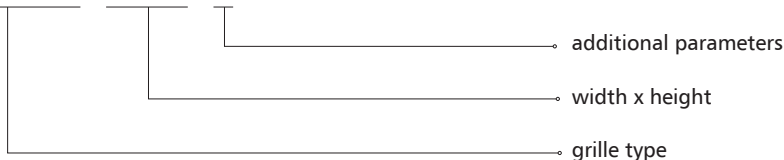
15.5.11 | MWP mesh masking grille



The MWP mesh masking grille is supplied together with the mcr WIP PROV damper by the damper manufacturer. The grille and its installation at the damper or at the end of the installation where the damper is installed is required for the damper to obtain the EIS120 class. In the absence of a masking grille, the damper has a resistance of EIS60 or EIS 90. In the event of additional architectural requirements, the design of the system masking grilles allows the damper and grille to be covered with additional masking grilles, or the system MWP grille to be replaced with any steel masking grille.

Legend:

mcr MWP / B x H / X

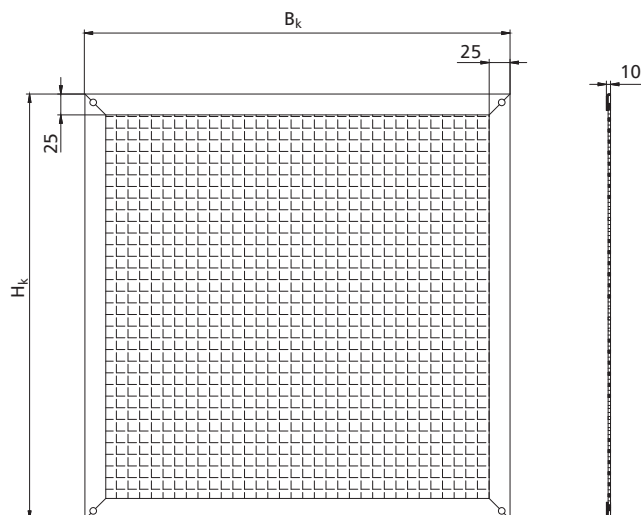


X - colour code

[no symbol] - RAL9010

RALXXXX - selected colour code from the RAL palette

NONE - masking grille not painted



dimensions in [mm]

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

15.5.12 | MST lamella masking grille

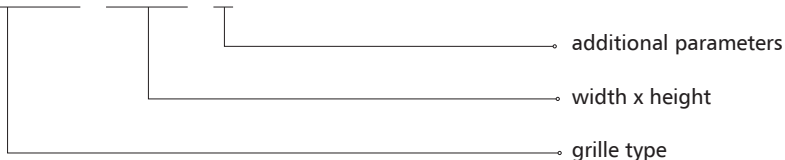


An alternative solution to the MWP mesh masking grid is the MST lamella masking grid. The grille is available in two versions: MST-30 and MST-50.

The grille consists of an internal body, which is attached to the wall with screws, and an external masking frame, which is put on the body after its assembly. The solution makes the mounting screws invisible, which guarantees a highly aesthetic solution. The cover grille is painted in RAL 9010 as standard. It can be painted in any RAL colour upon request or left unpainted.

Legend:

mcr MST / B x H / X

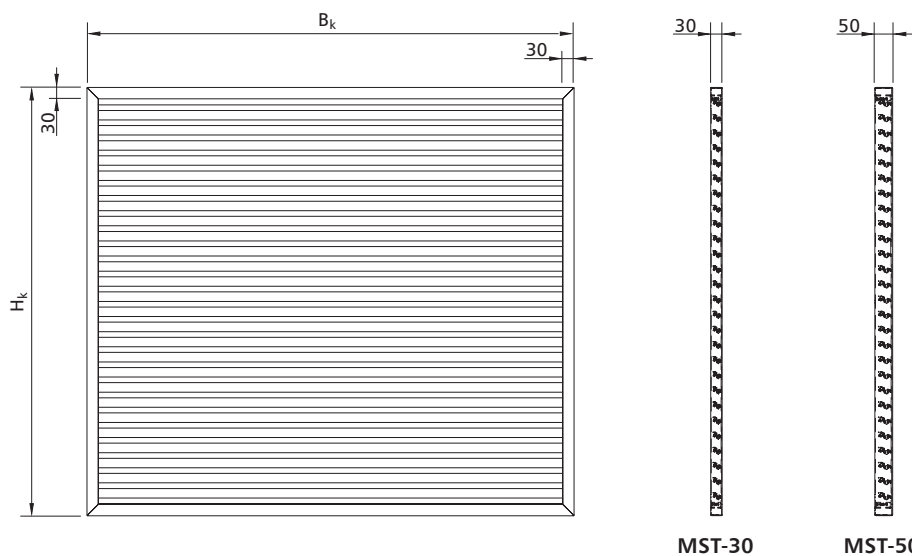


X - colour code

[no symbol] - RAL9010

RALXXXX - selected colour code from the RAL palette

NONE - masking grille not painted



dimensions in [mm]

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

15.6 | mcr WIP PROV/V, mcr WIP PROV/V-M rectangular damper technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			270					300					350				
			S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [Pa]	L_{WA} [dB]
width B [mm]	v [m/s]	4	0,030	0,019	269	13	33	0,033	0,019	269	14	34	0,039	0,019	269	16	36
		6 <td>404</td> <td>30</td> <td>44</td> <td>404</td> <td>30</td> <td>44</td> <td>404</td> <td>36</td> <td>46</td>			404	30	44			404	30	44			404	36	46
	8 <td>539</td> <td>53</td> <td>51</td> <td>539</td> <td>54</td> <td>52</td> <td>539</td> <td>63</td> <td>54</td>	539			53	51	539			54	52	539			63	54	
	10 <td>673</td> <td>82</td> <td>57</td> <td>673</td> <td>85</td> <td>58</td> <td>673</td> <td>99</td> <td>60</td>	673			82	57	673			85	58	673			99	60	
	150	4 <td rowspan="4">0,041</td> <td rowspan="4">0,026</td> <td>367</td> <td>13</td> <td>35</td> <td rowspan="4">0,045</td> <td rowspan="4">0,026</td> <td>367</td> <td>14</td> <td>35</td> <td rowspan="4">0,053</td> <td rowspan="4">0,026</td> <td>367</td> <td>16</td> <td>37</td>	0,041	0,026	367	13	35	0,045	0,026	367	14	35	0,053	0,026	367	16	37
		6 <td>551</td> <td>30</td> <td>45</td> <td>551</td> <td>30</td> <td>46</td> <td>551</td> <td>36</td> <td>48</td>			551	30	45			551	30	46			551	36	48
		8 <td>734</td> <td>53</td> <td>53</td> <td>734</td> <td>54</td> <td>53</td> <td>734</td> <td>63</td> <td>55</td>			734	53	53			734	54	53			734	63	55
		10 <td>918</td> <td>82</td> <td>59</td> <td>918</td> <td>85</td> <td>59</td> <td>918</td> <td>99</td> <td>61</td>			918	82	59			918	85	59			918	99	61
	200	4 <td rowspan="4">0,054</td> <td rowspan="4">0,034</td> <td>490</td> <td>13</td> <td>36</td> <td rowspan="4">0,060</td> <td rowspan="4">0,034</td> <td>490</td> <td>14</td> <td>36</td> <td rowspan="4">0,070</td> <td rowspan="4">0,034</td> <td>490</td> <td>16</td> <td>38</td>	0,054	0,034	490	13	36	0,060	0,034	490	14	36	0,070	0,034	490	16	38
		6 <td>734</td> <td>30</td> <td>46</td> <td>734</td> <td>30</td> <td>47</td> <td>734</td> <td>36</td> <td>49</td>			734	30	46			734	30	47			734	36	49
		8 <td>979</td> <td>53</td> <td>54</td> <td>979</td> <td>54</td> <td>54</td> <td>979</td> <td>63</td> <td>56</td>			979	53	54			979	54	54			979	63	56
		10 <td>1 224</td> <td>82</td> <td>60</td> <td>1 224</td> <td>84</td> <td>60</td> <td>1 224</td> <td>99</td> <td>62</td>			1 224	82	60			1 224	84	60			1 224	99	62
	250	4 <td rowspan="4">0,068</td> <td rowspan="4">0,043</td> <td>612</td> <td>13</td> <td>37</td> <td rowspan="4">0,075</td> <td rowspan="4">0,043</td> <td>612</td> <td>14</td> <td>37</td> <td rowspan="4">0,088</td> <td rowspan="4">0,043</td> <td>612</td> <td>16</td> <td>39</td>	0,068	0,043	612	13	37	0,075	0,043	612	14	37	0,088	0,043	612	16	39
		6 <td>918</td> <td>30</td> <td>47</td> <td>918</td> <td>30</td> <td>48</td> <td>918</td> <td>36</td> <td>50</td>			918	30	47			918	30	48			918	36	50
		8 <td>1 224</td> <td>53</td> <td>55</td> <td>1 224</td> <td>54</td> <td>55</td> <td>1 224</td> <td>63</td> <td>57</td>			1 224	53	55			1 224	54	55			1 224	63	57
		10 <td>1 530</td> <td>82</td> <td>61</td> <td>1 530</td> <td>85</td> <td>61</td> <td>1 530</td> <td>99</td> <td>63</td>			1 530	82	61			1 530	85	61			1 530	99	63
	300	4 <td rowspan="4">0,081</td> <td rowspan="4">0,051</td> <td>734</td> <td>13</td> <td>38</td> <td rowspan="4">0,090</td> <td rowspan="4">0,051</td> <td>734</td> <td>14</td> <td>38</td> <td rowspan="4">0,105</td> <td rowspan="4">0,051</td> <td>734</td> <td>16</td> <td>40</td>	0,081	0,051	734	13	38	0,090	0,051	734	14	38	0,105	0,051	734	16	40
		6 <td>1 102</td> <td>30</td> <td>48</td> <td>1 102</td> <td>30</td> <td>49</td> <td>1 102</td> <td>36</td> <td>51</td>			1 102	30	48			1 102	30	49			1 102	36	51
		8 <td>1 469</td> <td>53</td> <td>56</td> <td>1 469</td> <td>54</td> <td>56</td> <td>1 469</td> <td>63</td> <td>58</td>			1 469	53	56			1 469	54	56			1 469	63	58
		10 <td>1 836</td> <td>82</td> <td>62</td> <td>1 836</td> <td>85</td> <td>62</td> <td>1 836</td> <td>99</td> <td>64</td>			1 836	82	62			1 836	85	62			1 836	99	64
350	4 <td rowspan="4">0,095</td> <td rowspan="4">0,060</td> <td>857</td> <td>13</td> <td>38</td> <td rowspan="4">0,105</td> <td rowspan="4">0,060</td> <td>857</td> <td>14</td> <td>39</td> <td rowspan="4">0,123</td> <td rowspan="4">0,060</td> <td>857</td> <td>16</td> <td>41</td>	0,095	0,060	857	13	38	0,105	0,060	857	14	39	0,123	0,060	857	16	41	
	6 <td>1 285</td> <td>30</td> <td>49</td> <td>1 285</td> <td>30</td> <td>49</td> <td>1 285</td> <td>36</td> <td>51</td>			1 285	30	49			1 285	30	49			1 285	36	51	
	8 <td>1 714</td> <td>53</td> <td>56</td> <td>1 714</td> <td>54</td> <td>57</td> <td>1 714</td> <td>63</td> <td>59</td>			1 714	53	56			1 714	54	57			1 714	63	59	
	10 <td>2 142</td> <td>82</td> <td>62</td> <td>2 142</td> <td>85</td> <td>63</td> <td>2 142</td> <td>99</td> <td>65</td>			2 142	82	62			2 142	85	63			2 142	99	65	
400	4 <td rowspan="4">0,108</td> <td rowspan="4">0,068</td> <td>979</td> <td>13</td> <td>39</td> <td rowspan="4">0,120</td> <td rowspan="4">0,068</td> <td>979</td> <td>14</td> <td>39</td> <td rowspan="4">0,140</td> <td rowspan="4">0,068</td> <td>979</td> <td>16</td> <td>41</td>	0,108	0,068	979	13	39	0,120	0,068	979	14	39	0,140	0,068	979	16	41	
	6 <td>1 469</td> <td>30</td> <td>49</td> <td>1 469</td> <td>30</td> <td>50</td> <td>1 469</td> <td>36</td> <td>52</td>			1 469	30	49			1 469	30	50			1 469	36	52	
	8 <td>1 958</td> <td>53</td> <td>57</td> <td>1 958</td> <td>54</td> <td>57</td> <td>1 958</td> <td>63</td> <td>59</td>			1 958	53	57			1 958	54	57			1 958	63	59	
	10 <td>2 448</td> <td>82</td> <td>63</td> <td>2 448</td> <td>84</td> <td>63</td> <td>2 448</td> <td>99</td> <td>65</td>			2 448	82	63			2 448	84	63			2 448	99	65	
450	4 <td rowspan="4">0,122</td> <td rowspan="4">0,077</td> <td>1 102</td> <td>13</td> <td>39</td> <td rowspan="4">0,135</td> <td rowspan="4">0,077</td> <td>1 102</td> <td>14</td> <td>40</td> <td rowspan="4">0,158</td> <td rowspan="4">0,077</td> <td>1 102</td> <td>16</td> <td>42</td>	0,122	0,077	1 102	13	39	0,135	0,077	1 102	14	40	0,158	0,077	1 102	16	42	
	6 <td>1 652</td> <td>30</td> <td>50</td> <td>1 652</td> <td>30</td> <td>50</td> <td>1 652</td> <td>36</td> <td>52</td>			1 652	30	50			1 652	30	50			1 652	36	52	
	8 <td>2 203</td> <td>53</td> <td>57</td> <td>2 203</td> <td>54</td> <td>58</td> <td>2 203</td> <td>63</td> <td>60</td>			2 203	53	57			2 203	54	58			2 203	63	60	
	10 <td>2 754</td> <td>82</td> <td>63</td> <td>2 754</td> <td>84</td> <td>64</td> <td>2 754</td> <td>99</td> <td>66</td>			2 754	82	63			2 754	84	64			2 754	99	66	
500	4 <td rowspan="4">0,135</td> <td rowspan="4">0,085</td> <td>1 224</td> <td>13</td> <td>40</td> <td rowspan="4">0,150</td> <td rowspan="4">0,085</td> <td>1 224</td> <td>14</td> <td>40</td> <td rowspan="4">0,175</td> <td rowspan="4">0,085</td> <td>1 224</td> <td>16</td> <td>42</td>	0,135	0,085	1 224	13	40	0,150	0,085	1 224	14	40	0,175	0,085	1 224	16	42	
	6 <td>1 836</td> <td>30</td> <td>50</td> <td>1 836</td> <td>30</td> <td>51</td> <td>1 836</td> <td>36</td> <td>53</td>			1 836	30	50			1 836	30	51			1 836	36	53	
	8 <td>2 448</td> <td>53</td> <td>58</td> <td>2 448</td> <td>54</td> <td>58</td> <td>2 448</td> <td>63</td> <td>60</td>			2 448	53	58			2 448	54	58			2 448	63	60	
	10 <td>3 060</td> <td>82</td> <td>64</td> <td>3 060</td> <td>85</td> <td>64</td> <td>3 060</td> <td>99</td> <td>66</td>			3 060	82	64			3 060	85	64			3 060	99	66	
550	4 <td rowspan="4">0,149</td> <td rowspan="4">0,094</td> <td>1 346</td> <td>2</td> <td>13</td> <td rowspan="4">0,165</td> <td rowspan="4">0,094</td> <td>1 346</td> <td>14</td> <td>41</td> <td rowspan="4">0,193</td> <td rowspan="4">0,094</td> <td>1 346</td> <td>16</td> <td>43</td>	0,149	0,094	1 346	2	13	0,165	0,094	1 346	14	41	0,193	0,094	1 346	16	43	
	6 <td>2 020</td> <td>4</td> <td>24</td> <td>2 020</td> <td>30</td> <td>51</td> <td>2 020</td> <td>36</td> <td>53</td>			2 020	4	24			2 020	30	51			2 020	36	53	
	8 <td>2 693</td> <td>7</td> <td>31</td> <td>2 693</td> <td>54</td> <td>59</td> <td>2 693</td> <td>63</td> <td>61</td>			2 693	7	31			2 693	54	59			2 693	63	61	
	10 <td>3 366</td> <td>10</td> <td>37</td> <td>3 366</td> <td>84</td> <td>65</td> <td>3 366</td> <td>99</td> <td>67</td>			3 366	10	37			3 366	84	65			3 366	99	67	
600	4 <td rowspan="4">0,162</td> <td rowspan="4">0,102</td> <td>1 469</td> <td>13</td> <td>41</td> <td rowspan="4">0,180</td> <td rowspan="4">0,102</td> <td>1 469</td> <td>14</td> <td>41</td> <td rowspan="4">0,210</td> <td rowspan="4">0,102</td> <td>1 469</td> <td>16</td> <td>43</td>	0,162	0,102	1 469	13	41	0,180	0,102	1 469	14	41	0,210	0,102	1 469	16	43	
	6 <td>2 203</td> <td>30</td> <td>51</td> <td>2 203</td> <td>30</td> <td>52</td> <td>2 203</td> <td>36</td> <td>54</td>			2 203	30	51			2 203	30	52			2 203	36	54	
	8 <td>2 938</td> <td>53</td> <td>59</td> <td>2 938</td> <td>54</td> <td>59</td> <td>2 938</td> <td>63</td> <td>61</td>			2 938	53	59			2 938	54	59			2 938	63	61	
	10 <td>3 672</td> <td>82</td> <td>65</td> <td>3 672</td> <td>85</td> <td>65</td> <td>3 672</td> <td>99</td> <td>67</td>			3 672	82	65			3 672	85	65			3 672	99	67	
650	4 <td rowspan="4">0,176</td> <td rowspan="4">0,111</td> <td>1 591</td> <td>13</td> <td>41</td> <td rowspan="4">0,195</td> <td rowspan="4">0,111</td> <td>1 591</td> <td>14</td> <td>41</td> <td rowspan="4">0,228</td> <td rowspan="4">0,111</td> <td>1 591</td> <td>16</td> <td>43</td>	0,176	0,111	1 591	13	41	0,195	0,111	1 591	14	41	0,228	0,111	1 591	16	43	
	6 <td>2 387</td> <td>30</td> <td>52</td> <td>2 387</td> <td>30</td> <td>52</td> <td>2 387</td> <td>36</td> <td>54</td>			2 387	30	52			2 387	30	52			2 387	36	54	
	8 <td>3 182</td> <td>53</td> <td>59</td> <td>3 182</td> <td>54</td> <td>59</td> <td>3 182</td> <td>63</td> <td>62</td>			3 182	53	59			3 182	54	59			3 182	63	62	
	10 <td>3 978</td> <td>82</td> <td>65</td> <td>3 978</td> <td>85</td> <td>65</td> <td>3 978</td> <td>99</td> <td>67</td>			3 978	82	65			3 978	85	65			3 978	99	67	

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			270						300					350				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	0,189	0,119	1 714	13	41	0,210	0,119	1 714	14	42	0,245	0,119	1 714	16	44	
		6			2 570	30	52			2 570	30	52			2 570	36	54	
		8			3 427	53	59			3 427	54	60			3 427	63	62	
		10			4 284	82	65			4 284	85	66			4 284	99	68	
	750	4	0,203	0,128	1 836	13	42	0,225	0,128	1 836	14	42	0,263	0,128	1 836	16	44	
		6			2 754	30	52			2 754	30	53			2 754	36	55	
		8			3 672	53	60			3 672	54	60			3 672	63	62	
		10			4 590	82	66			4 590	85	66			4 590	99	68	
	800	4	0,216	0,136	1 958	13	42	0,240	0,136	1 958	14	42	0,280	0,136	1 958	16	44	
		6			2 938	30	52			2 938	30	53			2 938	36	55	
		8			3 917	53	60			3 917	54	60			3 917	63	62	
		10			4 896	82	66			4 896	84	66			4 896	99	68	
	850	4	0,230	0,145	2 081	13	42	0,255	0,145	2 081	14	43	0,298	0,145	2 081	16	45	
		6			3 121	30	53			3 121	30	53			3 121	36	55	
		8			4 162	53	60			4 162	54	61			4 162	63	63	
		10			5 202	82	66			5 202	84	66			5 202	99	68	
	900	4	0,243	0,153	2 203	13	42	0,270	0,153	2 203	14	43	0,315	0,153	2 203	16	45	
		6			3 305	30	53			3 305	30	53			3 305	36	55	
		8			4 406	53	60			4 406	54	61			4 406	63	63	
		10			5 508	82	66			5 508	84	67			5 508	99	69	
950	4	0,257	0,162	2 326	13	43	0,285	0,162	2 326	18	47	0,333	0,162	2 326	25	51		
	6			3 488	30	53			3 488	41	57			3 488	57	62		
	8			4 651	53	61			4 651	72	65			4 651	102	69		
	10			5 814	82	67			5 814	113	71			5 814	159	75		
1000	4	0,270	0,170	2 448	13	43	0,300	0,170	2 448	18	47	0,350	0,170	2 448	25	51		
	6			3 672	30	53			3 672	41	58			3 672	57	62		
	8			4 896	53	61			4 896	72	65			4 896	102	70		
	10			6 120	82	67			6 120	113	71			6 120	159	75		
1050	4	0,284	0,179	2 570	13	43	0,315	0,179	2 570	18	47	0,368	0,179	2 570	25	52		
	6			3 856	30	54			3 856	41	58			3 856	57	62		
	8			5 141	53	61			5 141	72	65			5 141	102	70		
	10			6 426	82	67			6 426	113	71			6 426	159	76		
1100	4	0,297	0,187	2 693	13	43	0,330	0,187	2 693	18	47	0,385	0,187	2 693	25	52		
	6			4 039	30	54			4 039	41	58			4 039	57	62		
	8			5 386	53	61			5 386	72	65			5 386	102	70		
	10			6 732	82	67			6 732	113	71			6 732	159	76		
1150	4	0,311	0,196	2 815	13	43	0,345	0,196	2 815	18	48	0,403	0,196	2 815	25	52		
	6			4 223	30	54			4 223	41	58			4 223	57	63		
	8			5 630	53	62			5 630	72	66			5 630	102	70		
	10			7 038	82	67			7 038	113	71			7 038	159	76		
1200	4	0,324	0,204	2 938	13	44	0,360	0,204	2 938	18	48	0,420	0,204	2 938	25	52		
	6			4 406	30	54			4 406	41	58			4 406	57	63		
	8			5 875	53	62			5 875	72	66			5 875	102	70		
	10			7 344	82	68			7 344	113	72			7 344	159	76		
1250	4	0,338	0,213	3 060	13	44	0,375	0,213	3 060	18	48	0,438	0,213	3 060	25	52		
	6			4 590	30	54			4 590	41	59			4 590	57	63		
	8			6 120	53	62			6 120	72	66			6 120	102	70		
	10			7 650	82	68			7 650	113	72			7 650	159	76		

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B – nominal width [mm]
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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		400						450					500				
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0,044	0,024	348	12	34	0,050	0,028	401	14	36	0,055	0,035	507	12	35
		6			523	26	44			26	44	46			760	26	46
		8			697	48	52			48	52	54			1 014	47	53
		10			871	74	58			74	58	60			1 267	73	59
	150	4	0,060	0,033	475	12	35	0,068	0,038	546	14	37	0,075	0,048	691	12	36
		6			713	26	46			26	46	48			1 037	26	47
		8			950	48	53			48	53	55			1 382	47	54
		10			1 188	74	59			74	59	61			1 728	73	60
	200	4	0,080	0,044	634	12	36	0,090	0,051	729	14	38	0,100	0,064	922	12	38
		6			950	26	47			26	47	49			1 382	26	48
		8			1 267	48	54			48	54	56			1 843	47	56
		10			1 584	74	60			74	60	62			2 304	73	62
	250	4	0,100	0,055	792	12	37	0,113	0,063	911	14	39	0,125	0,080	1 152	12	39
		6			1 188	26	48			26	48	50			1 728	26	49
		8			1 584	48	55			48	55	57			2 304	47	57
		10			1 980	74	61			74	61	63			2 880	73	63
	300	4	0,120	0,066	950	12	38	0,135	0,076	1 093	14	40	0,150	0,096	1 382	12	39
		6			1 426	26	49			26	49	51			2 074	26	50
		8			1 901	48	56			48	56	58			2 765	47	57
		10			2 376	74	62			74	62	64			3 456	73	63
350	4	0,140	0,077	1 109	12	39	0,158	0,089	1 275	14	41	0,175	0,112	1 613	12	40	
	6			1 663	26	49			26	49	51			2 419	26	51	
	8			2 218	48	57			48	57	59			3 226	47	58	
	10			2 772	74	63			74	63	65			4 032	73	64	
400	4	0,160	0,088	1 267	12	39	0,180	0,101	1 457	14	41	0,200	0,128	1 843	12	41	
	6			1 901	26	50			26	50	52			2 765	26	51	
	8			2 534	48	57			48	57	59			3 686	47	59	
	10			3 168	74	63			74	63	65			4 608	73	65	
450	4	0,180	0,099	1 426	12	40	0,203	0,114	1 639	14	42	0,225	0,144	2 074	12	41	
	6			2 138	26	50			26	50	52			3 110	26	52	
	8			2 851	48	58			48	58	60			4 147	47	59	
	10			3 564	74	64			74	64	66			5 184	73	65	
500	4	0,200	0,110	1 584	12	40	0,225	0,127	1 822	14	42	0,250	0,160	2 304	12	42	
	6			2 376	26	51			26	51	53			3 456	26	52	
	8			3 168	48	58			48	58	60			4 608	47	60	
	10			3 960	74	64			74	64	66			5 760	73	66	
550	4	0,220	0,121	1 742	12	41	0,248	0,139	2 004	14	43	0,275	0,176	2 534	12	42	
	6			2 614	26	51			26	51	53			3 802	26	53	
	8			3 485	48	59			48	59	61			5 069	47	60	
	10			4 356	74	65			74	65	67			6 336	73	66	
600	4	0,240	0,132	1 901	12	41	0,270	0,152	2 186	14	43	0,300	0,192	2 765	12	42	
	6			2 851	26	52			26	52	54			4 147	26	53	
	8			3 802	48	59			48	59	61			5 530	47	61	
	10			4 752	74	65			74	65	67			6 912	73	66	
650	4	0,260	0,143	2 059	12	41	0,293	0,164	2 368	14	43	0,325	0,208	2 995	12	43	
	6			3 089	26	52			26	52	54			4 493	26	53	
	8			4 118	48	59			48	59	61			5 990	47	61	
	10			5 148	74	65			74	65	67			7 488	73	67	

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		400						450					500				
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	0,280	0,154	2 218	12	42	0,315	0,177	2 550	14	44	0,350	0,224	3 226	12	43
		6			3 326	26	52			3 825	31	54			4 838	26	54
		8			4 435	48	60			5 100	55	62			6 451	47	61
		10			5 544	74	66			6 376	86	68			8 064	73	67
	750	4	0,300	0,165	2 376	12	42	0,338	0,190	2 732	14	44	0,375	0,240	3 456	12	43
		6			3 564	26	53			4 099	31	55			5 184	26	54
		8			4 752	48	60			5 465	55	62			6 912	47	61
		10			5 940	74	66			6 831	86	68			8 640	73	67
	800	4	0,320	0,176	2 534	12	42	0,360	0,202	2 915	14	43	0,400	0,256	3 686	12	43
		6			3 802	26	53			4 372	31	54			5 530	26	54
		8			5 069	48	60			5 829	55	61			7 373	47	61
		10			6 336	74	66			7 286	86	67			9 216	73	67
	850	4	0,340	0,187	2 693	12	43	0,383	0,215	3 097	14	43	0,425	0,272	3 917	12	43
		6			4 039	26	53			4 645	31	54			5 875	26	54
		8			5 386	48	61			6 193	55	61			7 834	47	61
		10			6 732	74	66			7 742	86	67			9 792	73	67
	900	4	0,360	0,198	2 851	12	43	0,405	0,228	3 279	14	43	0,450	0,288	4 147	12	43
		6			4 277	26	53			4 918	31	54			6 221	26	54
		8			5 702	48	61			6 558	55	61			8 294	47	61
		10			7 128	74	67			8 197	86	67			10 368	73	67
950	4	0,380	0,209	3 010	12	43	0,428	0,240	3 461	18	49	0,475	0,304	4 378	12	44	
	6			4 514	26	54			5 192	41	59			6 566	26	55	
	8			6 019	48	61			6 922	74	67			8 755	47	62	
	10			7 524	74	67			8 653	115	73			10 944	73	68	
1000	4	0,400	0,220	3 168	12	43	0,450	0,253	3 643	18	49	0,500	0,320	4 608	12	45	
	6			4 752	26	54			5 465	41	60			6 912	26	55	
	8			6 336	48	61			7 286	74	67			9 216	47	63	
	10			7 920	74	67			9 108	115	73			11 520	73	69	
1050	4	0,420	0,231	3 326	12	43	0,473	0,266	3 825	18	49	0,525	0,336	4 838	12	45	
	6			4 990	26	54			5 738	41	60			7 258	26	55	
	8			6 653	48	62			7 651	74	67			9 677	47	63	
	10			8 316	74	67			9 563	115	73			12 096	73	69	
1100	4	0,440	0,242	3 485	12	44	0,495	0,278	4 008	18	49	0,550	0,352	5 069	12	45	
	6			5 227	26	54			6 011	41	60			7 603	26	56	
	8			6 970	48	62			8 015	74	67			10 138	47	63	
	10			8 712	74	68			10 019	115	73			12 672	73	69	
1150	4	0,460	0,253	3 643	12	44	0,518	0,291	4 190	18	50	0,575	0,368	5 299	12	45	
	6			5 465	26	54			6 285	41	60			7 949	26	56	
	8			7 286	48	62			8 379	74	68			10 598	47	63	
	10			9 108	74	68			10 474	115	73			13 248	73	69	
1200	4	0,480	0,264	3 802	12	44	0,540	0,304	4 372	18	50	0,600	0,384	5 530	12	45	
	6			5 702	26	55			6 558	41	60			8 294	26	56	
	8			7 603	48	62			8 744	74	68			11 059	47	64	
	10			9 504	74	68			10 930	115	74			13 824	73	69	
1250	4	0,500	0,275	3 960	12	44	0,563	0,316	4 554	18	50	0,625	0,400	5 760	12	46	
	6			5 940	26	55			6 831	41	61			8 640	26	56	
	8			7 920	48	62			9 108	74	68			11 520	47	64	
	10			9 900	74	68			11 385	115	74			14 400	73	70	

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			550						600					650				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0,061	0,037	532	13	36	0,066	0,034	494	13	35	0,072	0,046	664	12	36	
		6			798	29	46			741	30	46			996	27	47	
		8			1 064	51	54			988	51	53			1 327	48	54	
		10			1 331	79	60			1 236	81	59			1 659	76	60	
	150	4	0,083	0,050	726	13	37	0,090	0,047	674	13	37	0,098	0,063	905	12	37	
		6			1 089	29	48			1 011	30	47			1 358	27	48	
		8			1 452	51	55			1 348	51	55			1 810	48	56	
		10			1 814	79	61			1 685	81	61			2 263	76	61	
	200	4	0,110	0,067	968	13	38	0,120	0,062	899	13	38	0,130	0,084	1 207	12	39	
		6			1 452	29	49			1 348	30	49			1 810	27	49	
		8			1 935	51	56			1 797	51	56			2 413	48	57	
		10			2 419	79	62			2 246	81	62			3 017	76	63	
	250	4	0,138	0,084	1 210	13	39	0,150	0,078	1 123	13	39	0,163	0,105	1 508	12	40	
		6			1 814	29	50			1 685	30	50			2 263	27	50	
		8			2 419	51	57			2 246	51	57			3 017	48	58	
		10			3 024	79	63			2 808	81	63			3 771	76	64	
	300	4	0,165	0,101	1 452	13	40	0,180	0,094	1 348	13	40	0,195	0,126	1 810	12	41	
		6			2 177	29	51			2 022	30	50			2 715	27	51	
		8			2 903	51	58			2 696	51	58			3 620	48	59	
		10			3 629	79	64			3 370	81	64			4 525	76	64	
	350	4	0,193	0,118	1 693	13	41	0,210	0,109	1 572	13	40	0,228	0,147	2 112	12	41	
		6			2 540	29	51			2 359	30	51			3 168	27	52	
		8			3 387	51	59			3 145	51	58			4 224	48	59	
		10			4 234	79	65			3 931	81	64			5 279	76	65	
	400	4	0,220	0,134	1 935	13	41	0,240	0,125	1 797	13	41	0,260	0,168	2 413	12	42	
		6			2 903	29	52			2 696	30	52			3 620	27	52	
		8			3 871	51	59			3 594	51	59			4 827	48	60	
		10			4 838	79	65			4 493	81	65			6 034	76	66	
450	4	0,248	0,151	2 177	13	42	0,270	0,140	2 022	13	42	0,293	0,189	2 715	12	42		
	6			3 266	29	52			3 033	30	52			4 073	27	53		
	8			4 355	51	60			4 044	51	60			5 430	48	60		
	10			5 443	79	66			5 054	81	65			6 788	76	66		
500	4	0,275	0,168	2 419	13	42	0,300	0,156	2 246	13	42	0,325	0,210	3 017	12	43		
	6			3 629	29	53			3 370	30	53			4 525	27	53		
	8			4 838	51	60			4 493	51	60			6 034	48	61		
	10			6 048	79	66			5 616	81	66			7 542	76	67		
550	4	0,303	0,185	2 661	13	43	0,330	0,172	2 471	13	42	0,358	0,230	3 318	12	43		
	6			3 992	29	53			3 707	30	53			4 978	27	54		
	8			5 322	51	61			4 942	51	60			6 637	48	61		
	10			6 653	79	67			6 178	81	66			8 296	76	67		
600	4	0,330	0,202	2 903	13	43	0,360	0,187	2 696	13	43	0,390	0,251	3 620	12	44		
	6			4 355	29	54			4 044	30	53			5 430	27	54		
	8			5 806	51	61			5 391	51	61			7 240	48	62		
	10			7 258	79	67			6 739	81	67			9 050	76	67		
650	4	0,358	0,218	3 145	13	44	0,390	0,203	2 920	13	43	0,423	0,272	3 922	12	44		
	6			4 717	29	54			4 380	30	54			5 883	27	54		
	8			6 290	51	62			5 841	51	61			7 844	48	62		
	10			7 862	79	67			7 301	81	67			9 805	76	68		

B – nominal width [mm]
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S_e – damper active cross-section [m²]

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

		height H [mm]														
		550					600					650				
	v	S _k	S _e	Q	d _p	L _{WA}	S _k	S _e	Q	d _p	L _{WA}	S _k	S _e	Q	d _p	L _{WA}
	[m/s]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]
width B [mm]	700	4	0,385	0,235	3 387	13	0,420	0,218	3 145	13	43	0,455	0,293	4 224	12	44
		6			5 080	29			4 717	30	54			6 335	27	55
		8			6 774	51			6 290	51	61			8 447	48	62
		10			8 467	79			7 862	81	67			10 559	76	68
	750	4	0,413	0,252	3 629	13	0,450	0,234	3 370	13	44	0,488	0,314	4 525	12	44
		6			5 443	29			5 054	30	54			6 788	27	55
		8			7 258	51			6 739	51	62			9 050	48	63
		10			9 072	79			8 424	81	68			11 313	76	68
	800	4	0,440	0,269	3 871	13	0,480	0,250	3 594	13	44	0,520	0,335	4 827	12	44
		6			5 806	29			5 391	30	55			7 240	27	55
		8			7 741	51			7 188	51	62			9 654	48	63
		10			9 677	79			8 986	81	68			12 067	76	68
	850	4	0,468	0,286	4 113	13	0,510	0,265	3 819	13	44	0,553	0,356	5 129	12	44
		6			6 169	29			5 728	30	55			7 693	27	55
		8			8 225	51			7 638	51	62			10 257	48	63
		10			10 282	79			9 547	81	68			12 821	76	68
	900	4	0,495	0,302	4 355	13	0,540	0,281	4 044	13	45	0,585	0,377	5 430	12	44
		6			6 532	29			6 065	30	52			8 145	27	55
		8			8 709	51			8 087	51	60			10 860	48	63
		10			10 886	79			10 109	81	65			13 576	76	68
	950	4	0,523	0,319	4 596	15	0,570	0,296	4 268	13	45	0,618	0,398	5 732	12	46
		6			6 895	33			6 402	30	55			8 598	27	56
		8			9 193	58			8 536	51	63			11 464	48	64
		10			11 491	91			10 670	81	69			14 330	76	69
	1000	4	0,550	0,336	4 838	15	0,600	0,312	4 493	13	45	0,650	0,419	6 034	12	46
		6			7 258	33			6 739	30	56			9 050	27	56
		8			9 677	58			8 986	51	63			12 067	48	64
		10			12 096	91			11 232	81	69			15 084	76	70
	1050	4	0,578	0,353	5 080	15	0,630	0,328	4 717	13	45	0,683	0,440	6 335	12	46
		6			7 620	33			7 076	30	56			9 503	27	57
		8			10 161	58			9 435	51	63			12 671	48	64
		10			12 701	91			11 794	81	69			15 838	76	70
	1100	4	0,605	0,370	5 322	15	0,660	0,343	4 942	13	45	0,715	0,461	6 637	12	46
		6			7 983	33			7 413	30	56			9 955	27	57
		8			10 644	58			9 884	51	63			13 274	48	64
		10			13 306	91			12 355	81	69			16 592	76	70
	1150	4	0,633	0,386	5 564	15	0,690	0,359	5 167	13	46	0,748	0,482	6 939	12	46
		6			8 346	33			7 750	30	56			10 408	27	57
		8			11 128	58			10 333	51	64			13 877	48	64
		10			13 910	91			12 917	81	69			17 347	76	70
	1200	4	0,660	0,403	5 806	15	0,720	0,374	5 391	13	46	0,780	0,503	7 240	12	47
		6			8 709	33			8 087	30	56			10 860	27	57
		8			11 612	58			10 783	51	64			14 481	48	65
		10			14 515	91			13 478	81	70			18 101	76	70
	1250	4	0,688	0,420	6 048	15	0,750	0,390	5 616	13	46	0,813	0,524	7 542	12	47
		6			9 072	33			8 424	30	57			11 313	27	57
		8			12 096	58			11 232	51	64			15 084	48	65
		10			15 120	91			14 040	81	70			18 855	76	71

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			700						750					800				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0,077	0,046	664	14	38	0,083	0,068	979	12	34	0,088	0,055	795	10	34	
		6			996	30	48			1 468	26	44			1 193	22	45	
		8			1 327	54	56			1 958	48	52			1 590	40	52	
		10			1 659	85	61			2 447	74	58			1 988	62	58	
	150	4	0,105	0,063	905	14	39	0,113	0,093	1 335	12	39	0,120	0,075	1 084	10	36	
		6			1 358	30	49			2 002	26	49			1 626	22	46	
		8			1 810	54	57			2 670	48	57			2 169	40	54	
		10			2 263	85	63			3 337	74	62			2 711	62	60	
	200	4	0,140	0,084	1 207	14	40	0,150	0,124	1 780	12	40	0,160	0,100	1 446	10	37	
		6			1 810	30	51			2 670	26	50			2 169	22	48	
		8			2 413	54	58			3 560	48	58			2 892	40	55	
		10			3 017	85	64			4 450	74	64			3 614	62	61	
	250	4	0,175	0,105	1 508	14	41	0,188	0,155	2 225	12	41	0,200	0,126	1 807	10	38	
		6			2 263	30	52			3 337	26	51			2 711	22	49	
		8			3 017	54	59			4 450	48	59			3 614	40	56	
		10			3 771	85	65			5 562	74	65			4 518	62	62	
	300	4	0,210	0,126	1 810	14	42	0,225	0,185	2 670	12	42	0,240	0,151	2 169	10	39	
		6			2 715	30	53			4 005	26	52			3 253	22	49	
		8			3 620	54	60			5 340	48	60			4 337	40	57	
		10			4 525	85	66			6 674	74	66			5 422	62	63	
	350	4	0,245	0,147	2 112	14	43	0,263	0,216	3 115	12	42	0,280	0,176	2 530	10	39	
		6			3 168	30	53			4 672	26	53			3 795	22	50	
		8			4 224	54	61			6 229	48	60			5 060	40	57	
		10			5 279	85	66			7 787	74	66			6 325	62	63	
	400	4	0,280	0,168	2 413	14	43	0,300	0,247	3 560	12	43	0,320	0,201	2 892	10	40	
		6			3 620	30	54			5 340	26	53			4 337	22	51	
		8			4 827	54	61			7 119	48	61			5 783	40	58	
		10			6 034	85	67			8 899	74	67			7 229	62	64	
450	4	0,315	0,189	2 715	14	44	0,338	0,278	4 005	12	43	0,360	0,226	3 253	10	41		
	6			4 073	30	54			6 007	26	54			4 879	22	51		
	8			5 430	54	62			8 009	48	61			6 506	40	59		
	10			6 788	85	68			10 012	74	67			8 132	62	64		
500	4	0,350	0,210	3 017	14	44	0,375	0,309	4 450	12	44	0,400	0,251	3 614	10	41		
	6			4 525	30	55			6 674	26	54			5 422	22	52		
	8			6 034	54	62			8 899	48	62			7 229	40	59		
	10			7 542	85	68			11 124	74	68			9 036	62	65		
550	4	0,385	0,230	3 318	14	45	0,413	0,340	4 895	12	44	0,440	0,276	3 976	10	41		
	6			4 978	30	55			7 342	26	55			5 964	22	52		
	8			6 637	54	63			9 789	48	62			7 952	40	59		
	10			8 296	85	68			12 236	74	68			9 940	62	65		
600	4	0,420	0,251	3 620	14	45	0,450	0,371	5 340	12	45	0,480	0,301	4 337	10	42		
	6			5 430	30	56			8 009	26	55			6 506	22	52		
	8			7 240	54	63			10 679	48	63			8 675	40	60		
	10			9 050	85	69			13 349	74	69			10 843	62	66		
650	4	0,455	0,272	3 922	14	45	0,488	0,402	5 784	12	45	0,520	0,326	4 699	10	42		
	6			5 883	30	56			8 677	26	56			7 048	22	53		
	8			7 844	54	63			11 569	48	63			9 397	40	60		
	10			9 805	85	69			14 461	74	69			11 747	62	66		

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		700					750					800				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	0,490	0,293	4 224	14	0,525	0,433	6 229	12	45	0,560	0,351	5 060	10	42
		6			6 335	30			9 344	26				7 590	22	
		8			8 447	54			12 459	48				10 120	40	
		10			10 559	85			15 574	74				12 650	62	
	750	4	0,525	0,314	4 525	14	0,563	0,464	6 674	12	46	0,600	0,377	5 422	10	43
		6			6 788	30			10 012	26				8 132	22	
		8			9 050	54			13 349	48				10 843	40	
		10			11 313	85			16 686	74				13 554	62	
	800	4	0,560	0,335	4 827	14	0,600	0,494	7 119	12	46	0,640	0,402	5 783	10	43
		6			7 240	30			10 679	26				8 675	22	
		8			9 654	54			14 239	48				11 566	40	
		10			12 067	85			17 798	74				14 458	62	
	850	4	0,595	0,356	5 129	14	0,638	0,525	7 564	12	46	0,680	0,427	6 144	10	43
		6			7 693	30			11 346	26				9 217	22	
		8			10 257	54			15 129	48				12 289	40	
		10			12 821	85			18 911	74				15 361	62	
	900	4	0,630	0,377	5 430	14	0,675	0,556	8 009	12	46	0,720	0,452	6 506	10	44
		6			8 145	30			12 014	26				9 759	22	
		8			10 860	54			16 019	48				13 012	40	
		10			13 576	85			20 023	74				16 265	62	
	950	4	0,665	0,398	5 732	15	0,713	0,587	8 454	12	45	0,760	0,477	6 867	13	48
		6			8 598	35			12 681	26				10 301	30	
		8			11 464	62			16 908	48				13 735	53	
		10			14 330	97			21 136	74				17 168	83	
	1000	4	0,700	0,419	6 034	15	0,750	0,618	8 899	12	45	0,800	0,502	7 229	13	48
		6			9 050	35			13 349	26				10 843	30	
		8			12 067	62			17 798	48				14 458	53	
		10			15 084	97			22 248	74				18 072	83	
	1050	4	0,735	0,440	6 335	15	0,788	0,649	9 344	12	46	0,840	0,527	7 590	13	48
		6			9 503	35			14 016	26				11 385	30	
		8			12 671	62			18 688	48				15 180	53	
		10			15 838	97			23 360	74				18 976	83	
	1100	4	0,770	0,461	6 637	15	0,825	0,680	9 789	12	46	0,880	0,552	7 952	13	48
		6			9 955	35			14 684	26				11 928	30	
		8			13 274	62			19 578	48				15 903	53	
		10			16 592	97			24 473	74				19 879	83	
	1150	4	0,805	0,482	6 939	15	0,863	0,711	10 234	12	46	0,920	0,577	8 313	13	48
		6			10 408	35			15 351	26				12 470	30	
		8			13 877	62			20 468	48				16 626	53	
		10			17 347	97			25 585	74				20 783	83	
	1200	4	0,840	0,503	7 240	15	0,900	0,742	10 679	12	46	0,960	0,602	8 675	13	49
		6			10 860	35			16 019	26				13 012	30	
		8			14 481	62			21 358	48				17 349	53	
		10			18 101	97			26 698	74				21 686	83	
	1250	4	0,875	0,524	7 542	15	0,938	0,773	11 124	12	46	1,000	0,628	9 036	13	49
		6			11 313	35			16 686	26				13 554	30	
		8			15 084	62			22 248	48				18 072	53	
		10			18 855	97			27 810	74				22 590	83	

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		850						900					950				
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0,094	0,054	776	14	38	0,099	0,064	927	13	39	0,105	0,064	927	14	40
		6			1 164	32	49			1 390	30	49			1 390	32	50
		8			1 552	58	57			1 853	53	57			1 853	57	58
		10			1 940	90	62			2 317	83	63			2 317	89	64
	150	4	0,128	0,074	1 058	14	40	0,135	0,088	1 264	13	40	0,143	0,088	1 264	14	41
		6			1 588	32	50			1 895	30	51			1 895	32	52
		8			2 117	58	58			2 527	53	58			2 527	57	59
		10			2 646	90	64			3 159	83	64			3 159	89	65
	200	4	0,170	0,098	1 411	14	41	0,180	0,117	1 685	13	41	0,190	0,117	1 685	14	42
		6			2 117	32	52			2 527	30	52			2 527	32	53
		8			2 822	58	59			3 370	53	59			3 370	57	60
		10			3 528	90	65			4 212	83	65			4 212	89	66
	250	4	0,213	0,123	1 764	14	42	0,225	0,146	2 106	13	42	0,238	0,146	2 106	14	43
		6			2 646	32	53			3 159	30	53			3 159	32	54
		8			3 528	58	60			4 212	53	60			4 212	57	61
		10			4 410	90	66			5 265	83	66			5 265	89	67
	300	4	0,255	0,147	2 117	14	43	0,270	0,176	2 527	13	43	0,285	0,176	2 527	14	44
		6			3 175	32	53			3 791	30	54			3 791	32	55
		8			4 234	58	61			5 054	53	61			5 054	57	62
		10			5 292	90	67			6 318	83	67			6 318	89	68
	350	4	0,298	0,172	2 470	14	43	0,315	0,205	2 948	13	44	0,333	0,205	2 948	14	45
		6			3 704	32	54			4 423	30	54			4 423	32	55
		8			4 939	58	62			5 897	53	62			5 897	57	63
		10			6 174	90	67			7 371	83	68			7 371	89	69
	400	4	0,340	0,196	2 822	14	44	0,360	0,234	3 370	13	44	0,380	0,234	3 370	14	45
		6			4 234	32	55			5 054	30	55			5 054	32	56
		8			5 645	58	62			6 739	53	62			6 739	57	63
		10			7 056	90	68			8 424	83	68			8 424	89	69
450	4	0,383	0,221	3 175	14	45	0,405	0,263	3 791	13	45	0,428	0,263	3 791	14	46	
	6			4 763	32	55			5 686	30	55			5 686	32	56	
	8			6 350	58	63			7 582	53	63			7 582	57	64	
	10			7 938	90	68			9 477	83	69			9 477	89	70	
500	4	0,425	0,245	3 528	14	45	0,450	0,293	4 212	13	45	0,475	0,293	4 212	14	46	
	6			5 292	32	56			6 318	30	56			6 318	32	57	
	8			7 056	58	63			8 424	53	63			8 424	57	64	
	10			8 820	90	69			10 530	83	69			10 530	89	70	
550	4	0,468	0,270	3 881	14	45	0,495	0,322	4 633	13	46	0,523	0,322	4 633	14	47	
	6			5 821	32	56			6 950	30	56			6 950	32	57	
	8			7 762	58	63			9 266	53	64			9 266	57	65	
	10			9 702	90	69			11 583	83	70			11 583	89	70	
600	4	0,510	0,294	4 234	14	46	0,540	0,351	5 054	13	46	0,570	0,351	5 054	14	47	
	6			6 350	32	56			7 582	30	57			7 582	32	58	
	8			8 467	58	64			10 109	53	64			10 109	57	65	
	10			10 584	90	70			12 636	83	70			12 636	89	71	
650	4	0,553	0,319	4 586	14	46	0,585	0,380	5 476	13	46	0,618	0,380	5 476	14	47	
	6			6 880	32	57			8 213	30	57			8 213	32	58	
	8			9 173	58	64			10 951	53	65			10 951	57	65	
	10			11 466	90	70			13 689	83	70			13 689	89	71	

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		850					900					950				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	0,595	0,343	4 939	14	0,630	0,410	5 897	13	47	0,665	0,410	5 897	14	48
		6			7 409	32			8 845	30	57			8 845	32	58
		8			9 878	58			11 794	53	65			11 794	57	66
		10			12 348	90			14 742	83	71			14 742	89	72
	750	4	0,638	0,368	5 292	14	0,675	0,439	6 318	13	47	0,713	0,439	6 318	14	48
		6			7 938	32			9 477	30	58			9 477	32	59
		8			10 584	58			12 636	53	65			12 636	57	66
		10			13 230	90			15 795	83	71			15 795	89	72
	800	4	0,680	0,392	5 645	14	0,720	0,468	6 739	13	47	0,760	0,468	6 739	14	48
		6			8 467	32			10 109	30	58			10 109	32	59
		8			11 290	58			13 478	53	65			13 478	57	66
		10			14 112	90			16 848	83	71			16 848	89	72
	850	4	0,723	0,417	5 998	14	0,765	0,497	7 160	13	48	0,808	0,497	7 160	14	49
		6			8 996	32			10 741	30	58			10 741	32	59
		8			11 995	58			14 321	53	66			14 321	57	67
		10			14 994	90			17 901	83	71			17 901	89	72
	900	4	0,765	0,441	6 350	14	0,810	0,527	7 582	13	48	0,855	0,527	7 582	14	49
		6			9 526	32			11 372	30	58			11 372	32	59
		8			12 701	58			15 163	53	66			15 163	57	67
		10			15 876	90			18 954	83	72			18 954	89	73
	950	4	0,808	0,466	6 703	14	0,855	0,556	8 003	12	47	0,903	0,556	8 003	14	49
		6			10 055	32			12 004	26	57			12 004	32	60
		8			13 406	58			16 006	47	65			16 006	57	67
		10			16 758	90			20 007	74	70			20 007	89	73
	1000	4	0,850	0,490	7 056	14	0,900	0,585	8 424	12	47	0,950	0,585	8 424	14	49
		6			10 584	32			12 636	26	57			12 636	32	60
		8			14 112	58			16 848	47	65			16 848	57	67
		10			17 640	90			21 060	74	71			21 060	89	73
	1050	4	0,893	0,515	7 409	14	0,945	0,614	8 845	12	47	0,998	0,614	8 845	14	49
		6			11 113	32			13 268	26	58			13 268	32	60
		8			14 818	58			17 690	47	65			17 690	57	67
		10			18 522	90			22 113	74	71			22 113	89	73
	1100	4	0,935	0,539	7 762	14	0,990	0,644	9 266	12	47	1,045	0,644	9 266	14	50
		6			11 642	32			13 900	26	58			13 900	32	60
		8			15 523	58			18 533	47	65			18 533	57	68
		10			19 404	90			23 166	73	71			23 166	89	74
	1150	4	0,978	0,564	8 114	14	1,035	0,673	9 688	12	47	1,093	0,673	9 688	14	50
		6			12 172	32			14 531	26	58			14 531	32	60
		8			16 229	58			19 375	47	65			19 375	57	68
		10			20 286	90			24 219	74	71			24 219	89	74
	1200	4	1,020	0,588	8 467	14	1,080	0,702	10 109	12	48	1,140	0,702	10 109	14	50
		6			12 701	32			15 163	26	58			15 163	32	61
		8			16 934	58			20 218	47	66			20 218	57	68
		10			21 168	90			25 272	74	71			25 272	89	74
	1250	4	1,063	0,613	8 820	14	1,125	0,731	10 530	12	48	1,188	0,731	10 530	14	50
		6			13 230	32			15 795	26	58			15 795	32	61
		8			17 640	58			21 060	47	66			21 060	57	68
		10			22 050	90			26 325	74	72			26 325	89	74

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			1000						1050					1100				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0,111	0,073	1 058	12	38	0,116	0,073	1 058	13	39	0,121	0,073	1 058	15	41	
		6			1 587	28	49			1 587	29	49			1 587	33	51	
		8			2 116	50	57			2 116	51	57			2 116	59	59	
		10			2 645	77	62			2 645	79	63			2 645	93	65	
	150	4	0,152	0,100	1 443	12	40	0,158	0,100	1 443	13	40	0,165	0,100	1 443	15	42	
		6			2 164	28	50			2 164	29	51			2 164	33	53	
		8			2 886	50	58			2 886	51	58			2 886	59	60	
		10			3 607	77	64			3 607	79	64			3 607	93	66	
	200	4	0,202	0,134	1 924	12	41	0,210	0,134	1 924	13	41	0,220	0,134	1 924	15	43	
		6			2 886	28	52			2 886	29	52			2 886	33	54	
		8			3 848	50	59			3 848	51	59			3 848	59	61	
		10			4 810	77	65			4 810	79	65			4 810	93	67	
	250	4	0,253	0,167	2 405	12	42	0,263	0,167	2 405	13	42	0,275	0,167	2 405	15	44	
		6			3 607	28	53			3 607	29	53			3 607	33	55	
		8			4 810	50	60			4 810	51	60			4 810	59	62	
		10			6 012	77	66			6 012	79	66			6 012	93	68	
	300	4	0,303	0,200	2 886	12	43	0,315	0,200	2 886	13	43	0,330	0,200	2 886	15	45	
		6			4 329	28	53			4 329	29	54			4 329	33	56	
		8			5 772	50	61			5 772	51	61			5 772	59	63	
		10			7 214	77	67			7 214	79	67			7 214	93	69	
350	4	0,354	0,234	3 367	12	43	0,368	0,234	3 367	13	44	0,385	0,234	3 367	15	46		
	6			5 050	28	54			5 050	29	54			5 050	33	56		
	8			6 733	50	62			6 733	51	62			6 733	59	64		
	10			8 417	77	67			8 417	79	68			8 417	93	70		
400	4	0,404	0,267	3 848	12	44	0,420	0,267	3 848	13	44	0,440	0,267	3 848	15	46		
	6			5 772	28	55			5 772	29	55			5 772	33	57		
	8			7 695	50	62			7 695	51	62			7 695	59	64		
	10			9 619	77	68			9 619	79	68			9 619	93	70		
450	4	0,455	0,301	4 329	12	45	0,473	0,301	4 329	13	45	0,495	0,301	4 329	15	47		
	6			6 493	28	55			6 493	29	55			6 493	33	57		
	8			8 657	50	63			8 657	51	63			8 657	59	65		
	10			10 822	77	68			10 822	79	69			10 822	93	71		
500	4	0,505	0,334	4 810	12	45	0,525	0,334	4 810	13	45	0,550	0,334	4 810	15	47		
	6			7 214	28	56			7 214	29	56			7 214	33	58		
	8			9 619	50	63			9 619	51	63			9 619	59	65		
	10			12 024	77	69			12 024	79	69			12 024	93	71		
550	4	0,556	0,367	5 291	12	45	0,578	0,367	5 291	13	46	0,605	0,367	5 291	15	48		
	6			7 936	28	56			7 936	29	56			7 936	33	58		
	8			10 581	50	63			10 581	51	64			10 581	59	66		
	10			13 226	77	69			13 226	79	70			13 226	93	72		
600	4	0,606	0,401	5 772	12	46	0,630	0,401	5 772	13	46	0,660	0,401	5 772	15	48		
	6			8 657	28	56			8 657	29	57			8 657	33	59		
	8			11 543	50	64			11 543	51	64			11 543	59	66		
	10			14 429	77	70			14 429	79	70			14 429	93	72		
650	4	0,657	0,434	6 252	12	46	0,683	0,434	6 252	13	46	0,715	0,434	6 252	15	48		
	6			9 379	28	57			9 379	29	57			9 379	33	59		
	8			12 505	50	64			12 505	51	65			12 505	59	67		
	10			15 631	77	70			15 631	79	70			15 631	93	72		

B – nominal width [mm]
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S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1000					1050					1100				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	0,707	0,468	6 733	12	0,735	0,468	6 733	13	47	0,770	0,468	6 733	15	49
		6			10 100	28			10 100	29	57			10 100	33	59
		8			13 467	50			13 467	51	65			13 467	59	67
		10			16 834	77			16 834	79	71			16 834	93	73
	750	4	0,758	0,501	7 214	12	0,788	0,501	7 214	13	47	0,825	0,501	7 214	15	49
		6			10 822	28			10 822	29	58			10 822	33	60
		8			14 429	50			14 429	51	65			14 429	59	67
		10			18 036	77			18 036	79	71			18 036	93	73
	800	4	0,808	0,534	7 695	12	0,840	0,534	7 695	13	47	0,880	0,534	7 695	15	49
		6			11 543	28			11 543	29	58			11 543	33	60
		8			15 391	50			15 391	51	65			15 391	59	67
		10			19 238	77			19 238	79	71			19 238	93	73
	850	4	0,859	0,568	8 176	12	0,893	0,568	8 176	13	48	0,935	0,568	8 176	15	50
		6			12 264	28			12 264	29	58			12 264	33	60
		8			16 353	50			16 353	51	66			16 353	59	68
		10			20 441	77			20 441	79	72			20 441	93	74
	900	4	0,909	0,601	8 657	12	0,945	0,601	8 657	13	48	0,990	0,601	8 657	15	50
		6			12 986	28			12 986	29	58			12 986	33	60
		8			17 315	50			17 315	51	66			17 315	59	68
		10			21 643	77			21 643	79	72			21 643	93	74
	950	4	0,960	0,635	9 138	11	0,998	0,635	9 138	13	48	1,045	0,635	9 138	15	50
		6			13 707	25			13 707	29	59			13 707	33	61
		8			18 276	44			18 276	51	66			18 276	59	68
		10			22 846	69			22 846	79	72			22 846	93	74
	1000	4	1,010	0,668	9 619	11	1,050	0,668	9 619	13	48	1,100	0,668	9 619	15	50
		6			14 429	25			14 429	29	59			14 429	33	61
		8			19 238	44			19 238	51	66			19 238	59	68
		10			24 048	69			24 048	79	72			24 048	93	74
	1050	4	1,061	0,701	10 100	11	1,103	0,701	10 100	13	49	1,155	0,701	10 100	15	51
		6			15 150	25			15 150	29	59			15 150	33	61
		8			20 200	44			20 200	51	67			20 200	59	69
		10			25 250	69			25 250	79	72			25 250	93	74
	1100	4	1,111	0,735	10 581	11	1,155	0,735	10 581	13	49	1,210	0,735	10 581	15	51
		6			15 872	25			15 872	29	59			15 872	33	61
		8			21 162	44			21 162	51	67			21 162	59	69
		10			26 453	69			26 453	79	73			26 453	93	75
	1150	4	1,162	0,768	11 062	11	1,208	0,768	11 062	13	49	1,265	0,768	11 062	15	51
		6			16 593	25			16 593	29	60			16 593	33	62
		8			22 124	44			22 124	51	67			22 124	59	69
		10			27 655	69			27 655	79	73			27 655	93	75
	1200	4	1,212	0,802	11 543	11	1,260	0,802	11 543	13	49	1,320	0,802	11 543	15	51
		6			17 315	25			17 315	29	60			17 315	33	62
		8			23 086	44			23 086	51	67			23 086	59	69
		10			28 858	69			28 858	79	73			28 858	93	75
	1250	4	1,263	0,835	12 024	11	1,313	0,835	12 024	13	49	1,375	0,835	12 024	15	51
		6			18 036	25			18 036	29	60			18 036	33	62
		8			24 048	44			24 048	51	67			24 048	59	69
		10			30 060	69			30 060	79	73			30 060	93	75

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

B – nominal width [mm]
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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			1150						1200					1250				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0,127	0,092	1 318	11	39	0,132	0,083	1 190	13	40	0,138	0,092	1 321	11	37	
		6			1 977	23	49			1 784	30	51			1 982	24	48	
		8			2 636	39	57			2 379	54	58			2 642	43	55	
		10			3 295	59	63			2 974	84	64			3 303	66	61	
	150	4	0,173	0,125	1 797	11	40	0,180	0,113	1 622	13	41	0,188	0,125	1 801	11	39	
		6			2 696	23	51			2 433	30	52			2 702	24	49	
		8			3 594	39	58			3 244	54	59			3 603	43	57	
		10			4 493	59	64			4 055	84	65			4 504	66	63	
	200	4	0,230	0,166	2 396	11	41	0,240	0,150	2 163	13	42	0,250	0,167	2 402	11	39	
		6			3 594	23	52			3 244	30	53			3 603	24	50	
		8			4 792	39	59			4 326	54	60			4 804	43	57	
		10			5 990	59	65			5 407	84	66			6 005	66	63	
	250	4	0,288	0,208	2 995	11	42	0,300	0,188	2 704	13	43	0,313	0,209	3 002	11	40	
		6			4 493	23	53			4 055	30	54			4 504	24	51	
		8			5 990	39	60			5 407	54	61			6 005	43	58	
		10			7 488	59	66			6 759	84	67			7 506	66	64	
	300	4	0,345	0,250	3 594	11	43	0,360	0,225	3 244	13	44	0,375	0,250	3 603	11	41	
		6			5 391	23	54			4 866	30	54			5 404	24	51	
		8			7 188	39	61			6 489	54	62			7 206	43	59	
		10			8 986	59	67			8 111	84	68			9 007	66	65	
350	4	0,403	0,291	4 193	11	44	0,420	0,263	3 785	13	45	0,438	0,292	4 203	11	41		
	6			6 290	23	54			5 678	30	55			6 305	24	52		
	8			8 387	39	62			7 570	54	63			8 407	43	60		
	10			10 483	59	68			9 463	84	68			10 508	66	65		
400	4	0,460	0,333	4 792	11	44	0,480	0,300	4 326	13	45	0,500	0,334	4 804	11	42		
	6			7 188	23	55			6 489	30	56			7 206	24	53		
	8			9 585	39	62			8 652	54	63			9 608	43	60		
	10			11 981	59	68			10 814	84	69			12 010	66	66		
450	4	0,518	0,374	5 391	11	45	0,540	0,338	4 866	13	46	0,563	0,375	5 404	11	43		
	6			8 087	23	55			7 300	30	56			8 106	24	53		
	8			10 783	39	63			9 733	54	64			10 809	43	61		
	10			13 478	59	69			12 166	84	70			13 511	66	66		
500	4	0,575	0,416	5 990	11	45	0,600	0,376	5 407	13	46	0,625	0,417	6 005	11	43		
	6			8 986	23	56			8 111	30	57			9 007	24	54		
	8			11 981	39	63			10 814	54	64			12 010	43	61		
	10			14 976	59	69			13 518	84	70			15 012	66	67		
550	4	0,633	0,458	6 589	11	46	0,660	0,413	5 948	13	47	0,688	0,459	6 605	11	43		
	6			9 884	23	56			8 922	30	57			9 908	24	54		
	8			13 179	39	64			11 896	54	65			13 211	43	62		
	10			16 474	59	70			14 870	84	70			16 513	66	67		
600	4	0,690	0,499	7 188	11	46	0,720	0,451	6 489	13	47	0,750	0,500	7 206	11	44		
	6			10 783	23	57			9 733	30	57			10 809	24	54		
	8			14 377	39	64			12 977	54	65			14 412	43	62		
	10			17 971	59	70			16 222	84	71			18 014	66	68		
650	4	0,748	0,541	7 788	11	46	0,780	0,488	7 029	13	47	0,813	0,542	7 806	11	44		
	6			11 681	23	57			10 544	30	58			11 709	24	55		
	8			15 575	39	65			14 059	54	65			15 612	43	62		
	10			19 469	59	70			17 573	84	71			19 516	66	68		

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

B – nominal width [mm]
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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		1150						1200					1250				
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	0,805	0,582	8 387	11	47	0,840	0,526	7 570	13	48	0,875	0,584	8 407	11	44
		6			12 580	23	57			11 355	30	58			12 610	24	55
		8			16 773	39	65			15 140	54	66			16 813	43	63
		10			20 966	59	71			18 925	84	71			21 017	66	68
	750	4	0,863	0,624	8 986	11	47	0,900	0,563	8 111	13	48	0,938	0,626	9 007	11	45
		6			13 478	23	58			12 166	30	58			13 511	24	55
		8			17 971	39	65			16 222	54	66			18 014	43	63
		10			22 464	59	71			20 277	84	72			22 518	66	69
	800	4	0,920	0,666	9 585	11	47	0,960	0,601	8 652	13	48	1,000	0,667	9 608	11	45
		6			14 377	23	58			12 977	30	59			14 412	24	56
		8			19 169	39	65			17 303	54	66			19 215	43	63
		10			23 962	59	71			21 629	84	72			24 019	66	69
	850	4	0,978	0,707	10 184	11	48	1,020	0,638	9 192	13	48	1,063	0,709	10 208	11	45
		6			15 276	23	58			13 788	30	59			15 312	24	56
		8			20 367	39	66			18 384	54	66			20 416	43	63
		10			25 459	59	72			22 981	84	72			25 520	66	69
	900	4	1,035	0,749	10 783	11	48	1,080	0,676	9 733	13	49	1,125	0,751	10 809	11	46
		6			16 174	23	58			14 599	30	59			16 213	24	56
		8			21 565	39	66			19 466	54	67			21 617	43	64
		10			26 957	59	72			24 332	84	73			27 022	66	69
950	4	1,093	0,790	11 382	11	48	1,140	0,713	10 274	13	49	1,188	0,792	11 409	11	47	
	6			17 073	23	59			15 411	30	60			17 114	24	57	
	8			22 764	39	66			20 547	54	67			22 818	43	65	
	10			28 454	59	72			25 684	84	73			28 523	66	71	
1000	4	1,150	0,832	11 981	11	48	1,200	0,751	10 814	13	50	1,250	0,834	12 010	11	47	
	6			17 971	23	59			16 222	30	60			18 014	24	58	
	8			23 962	39	66			21 629	54	68			24 019	43	65	
	10			29 952	59	72			27 036	84	73			30 024	66	71	
1050	4	1,208	0,874	12 580	11	49	1,260	0,789	11 355	13	50	1,313	0,876	12 610	11	47	
	6			18 870	23	59			17 033	30	60			18 915	24	58	
	8			25 160	39	67			22 710	54	68			25 220	43	65	
	10			31 450	59	72			28 388	84	74			31 525	66	71	
1100	4	1,265	0,915	13 179	11	49	1,320	0,826	11 896	13	50	1,375	0,917	13 211	11	47	
	6			19 768	23	59			17 844	30	61			19 816	24	58	
	8			26 358	39	67			23 792	54	68			26 421	43	65	
	10			32 947	59	73			29 740	84	74			33 026	66	71	
1150	4	1,323	0,957	13 778	11	49	1,380	0,864	12 437	13	50	1,438	0,959	13 811	11	48	
	6			20 667	23	60			18 655	30	61			20 717	24	58	
	8			27 556	39	67			24 873	54	68			27 622	43	66	
	10			34 445	59	73			31 091	84	74			34 528	66	71	
1200	4	1,380	0,998	14 377	11	49	1,440	0,901	12 977	13	50	1,500	1,001	14 412	11	48	
	6			21 565	23	60			19 466	30	61			21 617	24	58	
	8			28 754	39	67			25 955	54	68			28 823	43	66	
	10			35 942	59	73			32 443	84	74			36 029	66	72	
1250	4	1,438	1,040	14 976	11	49	1,500	0,939	13 518	13	51	1,563	1,043	15 012	11	48	
	6			22 464	23	60			20 277	30	61			22 518	24	59	
	8			29 952	39	67			27 036	54	69			30 024	43	66	
	10			37 440	59	73			33 795	84	74			37 530	66	72	

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1300					1350					1400				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0,143	0,090	1 299	12	0,149	0,092	1 323	13	40	0,154	0,099	1 430	12	41
		6			1 948	27			1 984	28				2 146	26	
		8			2 598	48			2 645	50				2 861	46	
		10			3 247	75			3 307	78				3 576	72	
	150	4	0,195	0,123	1 771	12	0,203	0,125	1 804	13	41	0,210	0,135	1 950	12	41
		6			2 657	27			2 705	28				2 926	26	
		8			3 542	48			3 607	50				3 901	46	
		10			4 428	75			4 509	78				4 876	72	
	200	4	0,260	0,164	2 362	12	0,270	0,167	2 405	13	42	0,280	0,181	2 601	12	42
		6			3 542	27			3 607	28				3 901	26	
		8			4 723	48			4 810	50				5 201	46	
		10			5 904	75			6 012	78				6 502	72	
	250	4	0,325	0,205	2 952	12	0,338	0,209	3 006	13	42	0,350	0,226	3 251	12	43
		6			4 428	27			4 509	28				4 876	26	
		8			5 904	48			6 012	50				6 502	46	
		10			7 380	75			7 515	78				8 127	72	
	300	4	0,390	0,246	3 542	12	0,405	0,251	3 607	13	43	0,420	0,271	3 901	12	43
		6			5 314	27			5 411	28				5 851	26	
		8			7 085	48			7 214	50				7 802	46	
		10			8 856	75			9 018	78				9 752	72	
	350	4	0,455	0,287	4 133	12	0,473	0,292	4 208	13	43	0,490	0,316	4 551	12	44
		6			6 199	27			6 313	28				6 827	26	
		8			8 266	48			8 417	50				9 102	46	
		10			10 332	75			10 521	78				11 378	72	
	400	4	0,520	0,328	4 723	12	0,540	0,334	4 810	13	44	0,560	0,361	5 201	12	44
		6			7 085	27			7 214	28				7 802	26	
		8			9 446	48			9 619	50				10 403	46	
		10			11 808	75			12 024	78				13 003	72	
	450	4	0,585	0,369	5 314	12	0,608	0,376	5 411	13	45	0,630	0,406	5 851	12	45
		6			7 970	27			8 116	28				8 777	26	
		8			10 627	48			10 822	50				11 703	46	
		10			13 284	75			13 527	78				14 629	72	
	500	4	0,650	0,410	5 904	12	0,675	0,418	6 012	13	45	0,700	0,452	6 502	12	46
		6			8 856	27			9 018	28				9 752	26	
		8			11 808	48			12 024	50				13 003	46	
		10			14 760	75			15 030	78				16 254	72	
	550	4	0,715	0,451	6 494	12	0,743	0,459	6 613	13	46	0,770	0,497	7 152	12	46
		6			9 742	27			9 920	28				10 728	26	
		8			12 989	48			13 226	50				14 304	46	
		10			16 236	75			16 533	78				17 879	72	
	600	4	0,780	0,492	7 085	12	0,810	0,501	7 214	13	46	0,840	0,542	7 802	12	47
		6			10 627	27			10 822	28				11 703	26	
		8			14 170	48			14 429	50				15 604	46	
		10			17 712	75			18 036	78				19 505	72	
	650	4	0,845	0,533	7 675	12	0,878	0,543	7 816	13	47	0,910	0,587	8 452	12	47
		6			11 513	27			11 723	28				12 678	26	
		8			15 350	48			15 631	50				16 904	46	
		10			19 188	75			19 539	78				21 130	72	

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		1300						1350					1400				
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]
width B [mm]	700	4	0,910	0,574	8 266	12	47	0,945	0,585	8 417	13	48	0,945	0,585	9 102	12	48
		6			12 398	27	58			12 625	28	58			13 653	26	58
		8			16 531	48	59			16 834	50	59			18 204	46	60
		10			20 664	75	71			21 042	78	71			22 756	72	72
	750	4	0,975	0,615	8 856	12	48	1,013	0,626	9 018	13	48	1,013	0,626	9 752	12	49
		6			13 284	27	58			13 527	28	59			14 629	26	59
		8			17 712	48	59			18 036	50	59			19 505	46	60
		10			22 140	75	72			22 545	78	72			24 381	72	72
	800	4	1,040	0,656	9 446	12	49	1,080	0,668	9 619	13	49	1,080	0,668	10 403	12	49
		6			14 170	27	59			14 429	28	59			15 604	26	60
		8			18 893	48	59			19 238	50	59			20 805	46	60
		10			23 616	75	72			24 048	78	73			26 006	72	73
	850	4	1,105	0,697	10 037	12	49	1,148	0,710	10 220	13	49	1,148	0,710	11 053	12	50
		6			15 055	27	60			15 331	28	60			16 579	26	60
		8			20 074	48	59			20 441	50	59			22 105	46	60
		10			25 092	75	73			25 551	78	73			27 632	72	74
	900	4	1,170	0,738	10 627	12	50	1,215	0,752	10 822	13	50	1,215	0,752	11 703	12	50
		6			15 941	27	60			16 232	28	60			17 554	26	61
		8			21 254	48	59			21 643	50	60			23 406	46	60
		10			26 568	75	74			27 054	78	74			29 257	72	74
	950	4	1,235	0,779	11 218	12	50	1,283	0,793	11 423	13	51	1,283	0,793	12 353	12	51
		6			16 826	27	61			17 134	28	61			18 530	26	61
		8			22 435	48	59			22 846	50	60			24 706	46	60
		10			28 044	75	74			28 557	78	74			30 883	72	75
	1000	4	1,300	0,820	11 808	12	51	1,350	0,835	12 024	13	51	1,350	0,835	13 003	12	52
		6			17 712	27	61			18 036	28	62			19 505	26	62
		8			23 616	48	59			24 048	50	60			26 006	46	60
		10			29 520	75	75			30 060	78	75			32 508	72	75
	1050	4	1,365	0,861	12 398	12	52	1,418	0,877	12 625	13	52	1,418	0,877	13 653	12	52
		6			18 598	27	62			18 938	28	62			20 480	26	63
		8			24 797	48	59			25 250	50	60			27 307	46	60
		10			30 996	75	75			31 563	78	76			34 133	72	76
	1100	4	1,430	0,902	12 989	12	52	1,485	0,919	13 226	13	52	1,485	0,919	14 304	12	53
		6			19 483	27	63			19 840	28	63			21 455	26	63
		8			25 978	48	59			26 453	50	60			28 607	46	60
		10			32 472	75	76			33 066	78	76			35 759	72	76
	1150	4	1,495	0,943	13 579	12	53	1,553	0,960	13 828	13	53	1,553	0,960	14 954	12	53
		6			20 369	27	63			20 741	28	63			22 431	26	64
		8			27 158	48	60			27 655	50	60			29 907	46	60
		10			33 948	75	76			34 569	78	77			37 384	72	77
	1200	4	1,560	0,984	14 170	12	53	1,620	1,002	14 429	13	54	1,620	1,002	15 604	12	54
		6			21 254	27	64			21 643	28	64			23 406	26	64
		8			28 339	48	60			28 858	50	60			31 208	46	60
		10			35 424	75	77			36 072	78	77			39 010	72	78
	1250	4	1,625	1,025	14 760	12	54	1,688	1,044	15 030	13	54	1,688	1,044	16 254	12	55
		6			22 140	27	64			22 545	28	65			24 381	26	65
		8			29 520	48	60			30 060	50	60			32 508	46	60
		10			36 900	75	78			37 575	78	78			40 635	72	78

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1450					1500					1550				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0,160	0,099	1 430	12	0,165	0,108	1 562	11	41	0,171	0,108	1 562	12	42
		6			2 146	28			2 343	25	52			2 343	27	52
		8			2 861	50			3 124	44	59			3 124	47	60
		10			3 576	77			3 905	69	65			3 905	74	66
	150	4	0,218	0,135	1 950	12	0,225	0,148	2 130	11	42	0,233	0,148	2 130	12	42
		6			2 926	28			3 195	25	53			3 195	27	53
		8			3 901	50			4 260	44	60			4 260	47	60
		10			4 876	77			5 324	69	66			5 324	74	66
	200	4	0,290	0,181	2 601	12	0,300	0,197	2 840	11	43	0,310	0,197	2 840	12	43
		6			3 901	28			4 260	25	53			4 260	27	53
		8			5 201	50			5 679	44	60			5 679	47	60
		10			6 502	77			7 099	69	66			7 099	74	67
	250	4	0,363	0,226	3 251	12	0,375	0,247	3 550	11	43	0,388	0,247	3 550	12	43
		6			4 876	28			5 324	25	54			5 324	27	54
		8			6 502	50			7 099	44	60			7 099	47	60
		10			8 127	77			8 874	69	67			8 874	74	67
	300	4	0,435	0,271	3 901	12	0,450	0,296	4 260	11	44	0,465	0,296	4 260	12	44
		6			5 851	28			6 389	25	54			6 389	27	55
		8			7 802	50			8 519	44	60			8 519	47	60
		10			9 752	77			10 649	69	68			10 649	74	68
	350	4	0,508	0,316	4 551	12	0,525	0,345	4 969	11	44	0,543	0,345	4 969	12	45
		6			6 827	28			7 454	25	55			7 454	27	55
		8			9 102	50			9 939	44	60			9 939	47	60
		10			11 378	77			12 424	69	68			12 424	74	69
	400	4	0,580	0,361	5 201	12	0,600	0,394	5 679	11	45	0,620	0,394	5 679	12	45
		6			7 802	28			8 519	25	56			8 519	27	56
		8			10 403	50			11 359	44	60			11 359	47	60
		10			13 003	77			14 198	69	69			14 198	74	69
	450	4	0,653	0,406	5 851	12	0,675	0,444	6 389	11	46	0,698	0,444	6 389	12	46
		6			8 777	28			9 584	25	56			9 584	27	56
		8			11 703	50			12 779	44	60			12 779	47	60
		10			14 629	77			15 973	69	69			15 973	74	70
	500	4	0,725	0,452	6 502	12	0,750	0,493	7 099	11	46	0,775	0,493	7 099	12	46
		6			9 752	28			10 649	25	57			10 649	27	57
		8			13 003	50			14 198	44	60			14 198	47	60
		10			16 254	77			17 748	69	70			17 748	74	70
	550	4	0,798	0,497	7 152	12	0,825	0,542	7 809	11	47	0,853	0,542	7 809	12	47
		6			10 728	28			11 714	25	57			11 714	27	58
		8			14 304	50			15 618	44	60			15 618	47	60
		10			17 879	77			19 523	69	71			19 523	74	71
	600	4	0,870	0,542	7 802	12	0,900	0,592	8 519	11	47	0,930	0,592	8 519	12	48
		6			11 703	28			12 779	25	58			12 779	27	58
		8			15 604	50			17 038	44	60			17 038	47	60
		10			19 505	77			21 298	69	71			21 298	74	71
	650	4	0,943	0,587	8 452	12	0,975	0,641	9 229	11	48	1,008	0,641	9 229	12	48
		6			12 678	28			13 843	25	58			13 843	27	59
		8			16 904	50			18 458	44	60			18 458	47	60
		10			21 130	77			23 072	69	72			23 072	74	72

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1450					1500					1550				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	1,015	0,632	9 102	12	1,050	0,690	9 939	11	49	1,085	0,690	9 939	12	49
		6			13 653	28			14 908	25	59			14 908	27	59
		8			18 204	50			19 878	44	60			19 878	47	61
		10			22 756	77			24 847	69	72			24 847	74	73
	750	4	1,088	0,677	9 752	12	1,125	0,740	10 649	11	49	1,163	0,740	10 649	12	49
		6			14 629	28			15 973	25	60			15 973	27	60
		8			19 505	50			21 298	44	60			21 298	47	61
		10			24 381	77			26 622	69	73			26 622	74	73
	800	4	1,160	0,722	10 403	12	1,200	0,789	11 359	11	50	1,240	0,789	11 359	12	50
		6			15 604	28			17 038	25	60			17 038	27	61
		8			20 805	50			22 717	44	60			22 717	47	61
		10			26 006	77			28 397	69	74			28 397	74	74
	850	4	1,233	0,768	11 053	12	1,275	0,838	12 069	11	50	1,318	0,838	12 069	12	51
		6			16 579	28			18 103	25	61			18 103	27	61
		8			22 105	50			24 137	44	60			24 137	47	61
		10			27 632	77			30 172	69	74			30 172	74	74
	900	4	1,305	0,813	11 703	12	1,350	0,887	12 779	11	51	1,395	0,887	12 779	12	51
		6			17 554	28			19 168	25	61			19 168	27	62
		8			23 406	50			25 557	44	60			25 557	47	61
		10			29 257	77			31 946	69	75			31 946	74	75
	950	4	1,378	0,858	12 353	12	1,425	0,937	13 488	11	52	1,473	0,937	13 488	12	52
		6			18 530	28			20 233	25	62			20 233	27	62
		8			24 706	50			26 977	44	61			26 977	47	61
		10			30 883	77			33 721	69	75			33 721	74	76
	1000	4	1,450	0,903	13 003	12	1,500	0,986	14 198	11	52	1,550	0,986	14 198	12	52
		6			19 505	28			21 298	25	63			21 298	27	63
		8			26 006	50			28 397	44	61			28 397	47	61
		10			32 508	77			35 496	69	76			35 496	74	76
	1050	4	1,523	0,948	13 653	12	1,575	1,035	14 908	11	53	1,628	1,035	14 908	12	53
		6			20 480	28			22 362	25	63			22 362	27	63
		8			27 307	50			29 817	44	61			29 817	47	61
		10			34 133	77			37 271	69	76			37 271	74	77
	1100	4	1,595	0,993	14 304	12	1,650	1,085	15 618	11	53	1,705	1,085	15 618	12	54
		6			21 455	28			23 427	25	64			23 427	27	64
		8			28 607	50			31 236	44	61			31 236	47	61
		10			35 759	77			39 046	69	77			39 046	74	77
	1150	4	1,668	1,038	14 954	12	1,725	1,134	16 328	11	54	1,783	1,134	16 328	12	54
		6			22 431	28			24 492	25	64			24 492	27	65
		8			29 907	50			32 656	44	61			32 656	47	61
		10			37 384	77			40 820	69	78			40 820	74	78
	1200	4	1,740	1,084	15 604	12	1,800	1,183	17 038	11	55	1,860	1,183	17 038	12	55
		6			23 406	28			25 557	25	65			25 557	27	65
		8			31 208	50			34 076	44	61			34 076	47	61
		10			39 010	77			42 595	69	78			42 595	74	79
	1250	4	1,813	1,129	16 254	12	1,875	1,233	17 748	11	55	1,938	1,233	17 748	12	55
		6			24 381	28			26 622	25	66				27	66
		8			32 508	50			35 496	44	61			35 496	47	61
		10			40 635	77			44 370	69	79			44 370	74	79

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			1600						1650					1700				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0,176	0,106	1 522	13	42	0,182	0,118	1 693	11	42	0,187	0,118	1 693	12	43	
		6			2 283	30	53			2 540	26	53			2 540	27	53	
		8			3 044	53	60			3 387	46	60			3 387	49	61	
		10			3 806	83	66			4 233	71	66			4 233	76	67	
	150	4	0,240	0,144	2 076	13	43	0,248	0,160	2 309	11	43	0,255	0,160	2 309	12	43	
		6			3 114	30	53			3 464	26	53			3 464	27	54	
		8			4 152	53	60			4 618	46	60			4 618	49	61	
		10			5 189	83	67			5 773	71	67			5 773	76	67	
	200	4	0,320	0,192	2 768	13	43	0,330	0,214	3 079	11	43	0,340	0,214	3 079	12	44	
		6			4 152	30	54			4 618	26	54			4 618	27	54	
		8			5 535	53	60			6 157	46	61			6 157	49	61	
		10			6 919	83	67			7 697	71	67			7 697	76	68	
	250	4	0,400	0,240	3 460	13	44	0,413	0,267	3 848	11	44	0,425	0,267	3 848	12	44	
		6			5 189	30	54			5 773	26	55			5 773	27	55	
		8			6 919	53	60			7 697	46	61			7 697	49	61	
		10			8 649	83	68			9 621	71	68			9 621	76	68	
	300	4	0,480	0,288	4 152	13	44	0,495	0,321	4 618	11	45	0,510	0,321	4 618	12	45	
		6			6 227	30	55			6 927	26	55			6 927	27	56	
		8			8 303	53	60			9 236	46	61			9 236	49	61	
		10			10 379	83	68			11 545	71	69			11 545	76	69	
350	4	0,560	0,336	4 843	13	45	0,578	0,374	5 388	11	45	0,595	0,374	5 388	12	46		
	6			7 265	30	56			8 082	26	56			8 082	27	56		
	8			9 687	53	60			10 776	46	61			10 776	49	61		
	10			12 109	83	69			13 469	71	69			13 469	76	69		
400	4	0,640	0,384	5 535	13	46	0,660	0,428	6 157	11	46	0,680	0,428	6 157	12	46		
	6			8 303	30	56			9 236	26	56			9 236	27	57		
	8			11 071	53	60			12 315	46	61			12 315	49	61		
	10			13 838	83	69			15 394	71	70			15 394	76	70		
450	4	0,720	0,432	6 227	13	46	0,743	0,481	6 927	11	46	0,765	0,481	6 927	12	47		
	6			9 341	30	57			10 391	26	57			10 391	27	57		
	8			12 455	53	61			13 854	46	61			13 854	49	61		
	10			15 568	83	70			17 318	71	70			17 318	76	71		
500	4	0,800	0,481	6 919	13	47	0,825	0,535	7 697	11	47	0,850	0,535	7 697	12	47		
	6			10 379	30	57			11 545	26	58			11 545	27	58		
	8			13 838	53	61			15 394	46	61			15 394	49	61		
	10			17 298	83	71			19 242	71	71			19 242	76	71		
550	4	0,880	0,529	7 611	13	47	0,908	0,588	8 466	11	48	0,935	0,588	8 466	12	48		
	6			11 417	30	58			12 700	26	58			12 700	27	58		
	8			15 222	53	61			16 933	46	61			16 933	49	61		
	10			19 028	83	71			21 166	71	71			21 166	76	72		
600	4	0,960	0,577	8 303	13	48	0,990	0,641	9 236	11	48	1,020	0,641	9 236	12	49		
	6			12 455	30	58			13 854	26	59			13 854	27	59		
	8			16 606	53	61			18 472	46	61			18 472	49	61		
	10			20 758	83	72			23 090	71	72			23 090	76	72		
650	4	1,040	0,625	8 995	13	49	1,073	0,695	10 006	11	49	1,105	0,695	10 006	12	49		
	6			13 492	30	59			15 009	26	59			15 009	27	60		
	8			17 990	53	61			20 012	46	61			20 012	49	61		
	10			22 487	83	72			25 015	71	73			25 015	76	73		

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1600					1650					1700				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	1,120	0,673	9 687	13	1,155	0,748	10 776	11	49	1,190	0,748	10 776	12	50
		6			14 530	30			16 163	26	60			16 163	27	60
		8			19 374	53			21 551	46	61			21 551	49	61
		10			24 217	83			26 939	71	73			26 939	76	74
	750	4	1,200	0,721	10 379	13	1,238	0,802	11 545	11	50	1,275	0,802	11 545	12	50
		6			15 568	30			17 318	26	61			17 318	27	61
		8			20 758	53			23 090	46	61			23 090	49	61
		10			25 947	83			28 863	71	74			28 863	76	74
	800	4	1,280	0,769	11 071	13	1,320	0,855	12 315	11	51	1,360	0,855	12 315	12	51
		6			16 606	30			18 472	26	61			18 472	27	61
		8			22 141	53			24 630	46	61			24 630	49	62
		10			27 677	83			30 787	71	74			30 787	76	75
	850	4	1,360	0,817	11 763	13	1,403	0,909	13 085	11	51	1,445	0,909	13 085	12	52
		6			17 644	30			19 627	26	62			19 627	27	62
		8			23 525	53			26 169	46	61			26 169	49	62
		10			29 407	83			32 711	71	75			32 711	76	75
	900	4	1,440	0,865	12 455	13	1,485	0,962	13 854	11	52	1,530	0,962	13 854	12	52
		6			18 682	30			20 781	26	62			20 781	27	63
		8			24 909	53			27 708	46	61			27 708	49	62
		10			31 136	83			34 636	71	76			34 636	76	76
	950	4	1,520	0,913	13 146	13	1,568	1,016	14 624	11	52	1,615	1,016	14 624	12	53
		6			19 720	30			21 936	26	63			21 936	27	63
		8			26 293	53			29 248	46	61			29 248	49	62
		10			32 866	83			36 560	71	76			36 560	76	76
	1000	4	1,600	0,961	13 838	13	1,650	1,069	15 394	11	53	1,700	1,069	15 394	12	53
		6			20 758	30			23 090	26	64			23 090	27	64
		8			27 677	53			30 787	46	61			30 787	49	62
		10			34 596	83			38 484	71	77			38 484	76	77
	1050	4	1,680	1,009	14 530	13	1,733	1,122	16 163	11	54	1,785	1,122	16 163	12	54
		6			21 795	30			24 245	26	64			24 245	27	64
		8			29 061	53			32 327	46	62			32 327	49	62
		10			36 326	83			40 408	71	77			40 408	76	78
	1100	4	1,760	1,057	15 222	13	1,815	1,176	16 933	11	54	1,870	1,176	16 933	12	55
		6			22 833	30			25 399	26	65			25 399	27	65
		8			30 444	53			33 866	46	62			33 866	49	62
		10			38 056	83			42 332	71	78			42 332	76	78
	1150	4	1,840	1,105	15 914	13	1,898	1,229	17 703	11	55	1,955	1,229	17 703	12	55
		6			23 871	30			26 554	26	65			26 554	27	66
		8			31 828	53			35 405	46	62			35 405	49	62
		10			39 785	83			44 257	71	79			44 257	76	79
	1200	4	1,920	1,153	16 606	13	1,980	1,283	18 472	11	55	2,040	1,283	18 472	12	56
		6			24 909	30			27 708	26	66			27 708	27	66
		8			33 212	53			36 945	46	62			36 945	49	62
		10			41 515	83			46 181	71	79			46 181	76	79
	1250	4	2,000	1,201	17 298	13	2,063	1,336	19 242	11	56	2,125	1,336	19 242	12	56
		6			25 947	30			28 863	26	66			28 863	27	67
		8			34 596	53			38 484	46	62			38 484	49	62
		10			43 245	83			48 105	71	80			48 105	76	80

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		1750						1800					1850				
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0,193	0,127	1 823	11	43	0,198	0,127	1 825	12	43	0,204	0,136	1 956	11	43
		6			2 735	25	53			2 737	26	54			2 934	24	54
		8			3 646	44	61			3 650	47	61			3 912	43	62
		10			4 558	69	67			4 562	73	67			4 891	67	67
	150	4	0,263	0,173	2 486	11	43	0,270	0,173	2 488	12	44	0,278	0,185	2 668	11	44
		6			3 729	25	54			3 732	26	54			4 001	24	55
		8			4 972	44	61			4 977	47	61			5 335	43	62
		10			6 215	69	67			6 221	73	68			6 669	67	68
	200	4	0,350	0,230	3 315	11	44	0,360	0,230	3 318	12	44	0,370	0,247	3 557	11	45
		6			4 972	25	55			4 977	26	55			5 335	24	55
		8			6 630	44	61			6 636	47	61			7 114	43	62
		10			8 287	69	68			8 294	73	68			8 892	67	69
	250	4	0,438	0,288	4 144	11	45	0,450	0,288	4 147	12	45	0,463	0,309	4 446	11	45
		6			6 215	25	55			6 221	26	56			6 669	24	56
		8			8 287	44	61			8 294	47	61			8 892	43	62
		10			10 359	69	69			10 368	73	69			11 115	67	69
	300	4	0,525	0,345	4 972	11	45	0,540	0,346	4 977	12	46	0,555	0,371	5 335	11	46
		6			7 458	25	56			7 465	26	56			8 003	24	56
		8			9 945	44	61			9 953	47	62			10 670	43	62
		10			12 431	69	69			12 442	73	69			13 338	67	70
350	4	0,613	0,403	5 801	11	46	0,630	0,403	5 806	12	46	0,648	0,432	6 224	11	46	
	6			8 702	25	56			8 709	26	57			9 337	24	57	
	8			11 602	44	61			11 612	47	62			12 449	43	62	
	10			14 503	69	70			14 515	73	70			15 561	67	70	
400	4	0,700	0,460	6 630	11	46	0,720	0,461	6 636	12	47	0,740	0,494	7 114	11	47	
	6			9 945	25	57			9 953	26	57			10 670	24	58	
	8			13 260	44	61			13 271	47	62			14 227	43	62	
	10			16 574	69	70			16 589	73	71			17 784	67	71	
450	4	0,788	0,518	7 458	11	47	0,810	0,518	7 465	12	47	0,833	0,556	8 003	11	48	
	6			11 188	25	58			11 197	26	58			12 004	24	58	
	8			14 917	44	61			14 930	47	62			16 006	43	62	
	10			18 646	69	71			18 662	73	71			20 007	67	72	
500	4	0,875	0,576	8 287	11	48	0,900	0,576	8 294	12	48	0,925	0,618	8 892	11	48	
	6			12 431	25	58			12 442	26	59			13 338	24	59	
	8			16 574	44	61			16 589	47	62			17 784	43	62	
	10			20 718	69	72			20 736	73	72			22 230	67	72	
550	4	0,963	0,633	9 116	11	48	0,990	0,634	9 124	12	49	1,018	0,679	9 781	11	49	
	6			13 674	25	59			13 686	26	59			14 672	24	59	
	8			18 232	44	62			18 248	47	62			19 562	43	62	
	10			22 790	69	72			22 810	73	72			24 453	67	73	
600	4	1,050	0,691	9 945	11	49	1,080	0,691	9 953	12	49	1,110	0,741	10 670	11	49	
	6			14 917	25	59			14 930	26	60			16 006	24	60	
	8			19 889	44	62			19 907	47	62			21 341	43	62	
	10			24 862	69	73			24 883	73	73			26 676	67	73	
650	4	1,138	0,748	10 773	11	49	1,170	0,749	10 783	12	50	1,203	0,803	11 560	11	50	
	6			16 160	25	60			16 174	26	60			17 339	24	61	
	8			21 547	44	62			21 565	47	62			23 119	43	62	
	10			26 933	69	73			26 957	73	74			28 899	67	74	

B – nominal width [mm]
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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		1750					1800					1850				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	1,225	0,806	11 602	11	1,260	0,806	11 612	12	50	1,295	0,865	12 449	11	51
		6			17 403	25			17 418	26	61			18 673	24	61
		8			23 204	44			23 224	47	62			24 898	43	62
		10			29 005	69			29 030	73	74			31 122	67	74
	750	4	1,313	0,863	12 431	11	1,350	0,864	12 442	12	51	1,388	0,926	13 338	11	51
		6			18 646	25			18 662	26	61			20 007	24	62
		8			24 862	44			24 883	47	62			26 676	43	62
		10			31 077	69			31 104	73	75			33 345	67	75
	800	4	1,400	0,921	13 260	11	1,440	0,922	13 271	12	52	1,480	0,988	14 227	11	52
		6			19 889	25			19 907	26	62			21 341	24	62
		8			26 519	44			26 542	47	62			28 454	43	62
		10			33 149	69			33 178	73	75			35 568	67	76
	850	4	1,488	0,978	14 088	11	1,530	0,979	14 100	12	52	1,573	1,050	15 116	11	52
		6			21 132	25			21 151	26	63			22 675	24	63
		8			28 176	44			28 201	47	62			30 233	43	63
		10			35 221	69			35 251	73	76			37 791	67	76
	900	4	1,575	1,036	14 917	11	1,620	1,037	14 930	12	53	1,665	1,112	16 006	11	53
		6			22 375	25			22 395	26	63			24 008	24	64
		8			29 834	44			29 860	47	62			32 011	43	63
		10			37 292	69			37 325	73	77			40 014	67	77
	950	4	1,663	1,093	15 746	11	1,710	1,094	15 759	12	53	1,758	1,173	16 895	11	54
		6			23 619	25			23 639	26	64			25 342	24	64
		8			31 491	44			31 519	47	62			33 790	43	63
		10			39 364	69			39 398	73	77			42 237	67	77
	1000	4	1,750	1,151	16 574	11	1,800	1,152	16 589	12	54	1,850	1,235	17 784	11	54
		6			24 862	25			24 883	26	64			26 676	24	65
		8			33 149	44			33 178	47	62			35 568	43	63
		10			41 436	69			41 472	73	78			44 460	67	78
	1050	4	1,838	1,209	17 403	11	1,890	1,210	17 418	12	54	1,943	1,297	18 673	11	55
		6			26 105	25			26 127	26	65			28 010	24	65
		8			34 806	44			34 836	47	62			37 346	43	63
		10			43 508	69			43 546	73	78			46 683	67	79
	1100	4	1,925	1,266	18 232	11	1,980	1,267	18 248	12	55	2,035	1,359	19 562	11	55
		6			27 348	25			27 372	26	66			29 344	24	66
		8			36 464	44			36 495	47	63			39 125	43	63
		10			45 580	69			45 619	73	79			48 906	67	79
	1150	4	2,013	1,324	19 061	11	2,070	1,325	19 077	12	56	2,128	1,420	20 452	11	56
		6			28 591	25			28 616	26	66			30 677	24	67
		8			38 121	44			38 154	47	63			40 903	43	63
		10			47 651	69			47 693	73	79			51 129	67	80
	1200	4	2,100	1,381	19 889	11	2,160	1,382	19 907	12	56	2,220	1,482	21 341	11	57
		6			29 834	25			29 860	26	67			32 011	24	67
		8			39 779	44			39 813	47	63			42 682	43	63
		10			49 723	69			49 766	73	80			53 352	67	80
	1250	4	2,188	1,439	20 718	11	2,250	1,440	20 736	12	57	2,313	1,544	22 230	11	57
		6			31 077	25			31 104	26	67			33 345	24	68
		8			41 436	44			41 472	47	63			44 460	43	63
		10			51 795	69			51 840	73	81			55 575	67	81

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			1900						1950					2000				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [PA]	L _{WA} [dB]
width B [mm]	110	4	0,209	0,136	1 956	11	44	0,215	0,136	1 956	12	44	0,220	0,145	2 088	11	44	
		6			2 934	26	54			2 934	27	55			3 132	25	55	
		8			3 912	45	62			3 912	48	62			4 175	44	63	
		10			4 891	71	68			4 891	75	68			5 219	69	68	
	150	4	0,285	0,185	2 668	11	44	0,293	0,185	2 668	12	45	0,300	0,198	2 847	11	45	
		6			4 001	26	55			4 001	27	55			4 270	25	56	
		8			5 335	45	62			5 335	48	62			5 694	44	63	
		10			6 669	71	68			6 669	75	69			7 117	69	69	
	200	4	0,380	0,247	3 557	11	45	0,390	0,247	3 557	12	45	0,400	0,264	3 796	11	46	
		6			5 335	26	56			5 335	27	56			5 694	25	56	
		8			7 114	45	62			7 114	48	62			7 592	44	63	
		10			8 892	71	69			8 892	75	69			9 490	69	69	
	250	4	0,475	0,309	4 446	11	46	0,488	0,309	4 446	12	46	0,500	0,330	4 745	11	46	
		6			6 669	26	56			6 669	27	56			7 117	25	57	
		8			8 892	45	62			8 892	48	62			9 490	44	63	
		10			11 115	71	69			11 115	75	70			11 862	69	70	
	300	4	0,570	0,371	5 335	11	46	0,585	0,371	5 335	12	46	0,600	0,395	5 694	11	47	
		6			8 003	26	57			8 003	27	57			8 541	25	57	
		8			10 670	45	62			10 670	48	62			11 388	44	63	
		10			13 338	71	70			13 338	75	70			14 234	69	71	
350	4	0,665	0,432	6 224	11	47	0,683	0,432	6 224	12	47	0,700	0,461	6 643	11	47		
	6			9 337	26	57			9 337	27	58			9 964	25	58		
	8			12 449	45	62			12 449	48	63			13 285	44	63		
	10			15 561	71	71			15 561	75	71			16 607	69	71		
400	4	0,760	0,494	7 114	11	47	0,780	0,494	7 114	12	48	0,800	0,527	7 592	11	48		
	6			10 670	26	58			10 670	27	58			11 388	25	59		
	8			14 227	45	62			14 227	48	63			15 183	44	63		
	10			17 784	71	71			17 784	75	72			18 979	69	72		
450	4	0,855	0,556	8 003	11	48	0,878	0,556	8 003	12	48	0,900	0,593	8 541	11	48		
	6			12 004	26	59			12 004	27	59			12 811	25	59		
	8			16 006	45	62			16 006	48	63			17 081	44	63		
	10			20 007	71	72			20 007	75	72			21 352	69	72		
500	4	0,950	0,618	8 892	11	49	0,975	0,618	8 892	12	49	1,000	0,659	9 490	11	49		
	6			13 338	26	59			13 338	27	59			14 234	25	60		
	8			17 784	45	62			17 784	48	63			18 979	44	63		
	10			22 230	71	72			22 230	75	73			23 724	69	73		
550	4	1,045	0,679	9 781	11	49	1,073	0,679	9 781	12	49	1,100	0,725	10 439	11	50		
	6			14 672	26	60			14 672	27	60			15 658	25	60		
	8			19 562	45	62			19 562	48	63			20 877	44	63		
	10			24 453	71	73			24 453	75	73			26 096	69	74		
600	4	1,140	0,741	10 670	11	50	1,170	0,741	10 670	12	50	1,200	0,791	11 388	11	50		
	6			16 006	26	60			16 006	27	61			17 081	25	61		
	8			21 341	45	63			21 341	48	63			22 775	44	63		
	10			26 676	71	74			26 676	75	74			28 469	69	74		
650	4	1,235	0,803	11 560	11	50	1,268	0,803	11 560	12	51	1,300	0,857	12 336	11	51		
	6			17 339	26	61			17 339	27	61			18 505	25	62		
	8			23 119	45	63			23 119	48	63			24 673	44	63		
	10			28 899	71	74			28 899	75	74			30 841	69	75		

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			1900					1950					2000				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	700	4	1,330	0,865	12 449	11	51	1,365	0,865	12 449	12	51	1,400	0,923	13 285	11	51
		6			18 673	26	61			18 673	27	62			19 928	25	62
		8			24 898	45	63			24 898	48	63			26 571	44	63
		10			31 122	71	75			31 122	75	75			33 214	69	75
	750	4	1,425	0,926	13 338	11	51	1,463	0,926	13 338	12	52	1,500	0,989	14 234	11	52
		6			20 007	26	62			20 007	27	62			21 352	25	63
		8			26 676	45	63			26 676	48	63			28 469	44	63
		10			33 345	71	75			33 345	75	76			35 586	69	76
	800	4	1,520	0,988	14 227	11	52	1,560	0,988	14 227	12	52	1,600	1,054	15 183	11	53
		6			21 341	26	63			21 341	27	63			22 775	25	63
		8			28 454	45	63			28 454	48	63			30 367	44	63
		10			35 568	71	76			35 568	75	76			37 958	69	77
	850	4	1,615	1,050	15 116	11	53	1,658	1,050	15 116	12	53	1,700	1,120	16 132	11	53
		6			22 675	26	63			22 675	27	64			24 198	25	64
		8			30 233	45	63			30 233	48	63			32 265	44	63
		10			37 791	71	77			37 791	75	77			40 331	69	77
	900	4	1,710	1,112	16 006	11	53	1,755	1,112	16 006	12	54	1,800	1,186	17 081	11	54
		6			24 008	26	64			24 008	27	64			25 622	25	64
		8			32 011	45	63			32 011	48	63			34 163	44	63
		10			40 014	71	77			40 014	75	77			42 703	69	78
950	4	1,805	1,173	16 895	11	54	1,853	1,173	16 895	12	54	1,900	1,252	18 030	11	54	
	6			25 342	26	64			25 342	27	65			27 045	25	65	
	8			33 790	45	63			33 790	48	63			36 060	44	64	
	10			42 237	71	78			42 237	75	78			45 076	69	78	
1000	4	1,900	1,235	17 784	11	54	1,950	1,235	17 784	12	55	2,000	1,318	18 979	11	55	
	6			26 676	26	65			26 676	27	65			28 469	25	66	
	8			35 568	45	63			35 568	48	63			37 958	44	64	
	10			44 460	71	78			44 460	75	79			47 448	69	79	
1050	4	1,995	1,297	18 673	11	55	2,048	1,297	18 673	12	55	2,100	1,384	19 928	11	56	
	6			28 010	26	66			28 010	27	66			29 892	25	66	
	8			37 346	45	63			37 346	48	63			39 856	44	64	
	10			46 683	71	79			46 683	75	79			49 820	69	79	
1100	4	2,090	1,359	19 562	11	56	2,145	1,359	19 562	12	56	2,200	1,450	20 877	11	56	
	6			29 344	26	66			29 344	27	67			31 316	25	67	
	8			39 125	45	63			39 125	48	63			41 754	44	64	
	10			48 906	71	79			48 906	75	80			52 193	69	80	
1150	4	2,185	1,420	20 452	11	56	2,243	1,420	20 452	12	57	2,300	1,516	21 826	11	57	
	6			30 677	26	67			30 677	27	67			32 739	25	67	
	8			40 903	45	63			40 903	48	63			43 652	44	64	
	10			51 129	71	80			51 129	75	80			54 565	69	81	
1200	4	2,280	1,482	21 341	11	57	2,340	1,482	21 341	12	57	2,400	1,582	22 775	11	57	
	6			32 011	26	67			32 011	27	68			34 163	25	68	
	8			42 682	45	63			42 682	48	64			45 550	44	64	
	10			53 352	71	81			53 352	75	81			56 938	69	81	
1250	4	2,375	1,544	22 230	11	57	2,438	1,544	22 230	12	58	2,500	1,648	23 724	11	58	
	6			33 345	26	68			33 345	27	68			35 586	25	69	
	8			44 460	45	63			44 460	48	64			47 448	44	64	
	10			55 575	71	81			55 575	75	82			59 310	69	82	

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			2050						2100					2150				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0,226	0,153	2 202	10	45	0,231	0,154	2 219	11	45	0,237	0,154	2 219	11	45	
		6			3 303	23	55			3 329	24	56			3 329	25	56	
		8			4 404	42	63			4 438	43	63			4 438	45	63	
		10			5 504	65	69			5 548	67	69			5 548	71	69	
	150	4	0,308	0,209	3 002	10	45	0,315	0,210	3 026	11	45	0,323	0,210	3 026	11	46	
		6			4 504	23	56			4 539	24	56			4 539	25	57	
		8			6 005	42	63			6 052	43	63			6 052	45	63	
		10			7 506	65	69			7 565	67	69			7 565	71	70	
	200	4	0,410	0,278	4 003	10	46	0,420	0,280	4 035	11	46	0,430	0,280	4 035	11	46	
		6			6 005	23	56			6 052	24	57			6 052	25	57	
		8			8 006	42	63			8 070	43	63			8 070	45	64	
		10			10 008	65	70			10 087	67	70			10 087	71	70	
	250	4	0,513	0,348	5 004	10	46	0,525	0,350	5 044	11	47	0,538	0,350	5 044	11	47	
		6			7 506	23	57			7 565	24	57			7 565	25	58	
		8			10 008	42	63			10 087	43	63			10 087	45	64	
		10			12 510	65	70			12 609	67	71			12 609	71	71	
	300	4	0,615	0,417	6 005	10	47	0,630	0,420	6 052	11	47	0,645	0,420	6 052	11	48	
		6			9 007	23	58			9 078	24	58			9 078	25	58	
		8			12 010	42	63			12 105	43	63			12 105	45	64	
		10			15 012	65	71			15 131	67	71			15 131	71	72	
350	4	0,718	0,487	7 006	10	48	0,735	0,490	7 061	11	48	0,753	0,490	7 061	11	48		
	6			10 508	23	58			10 592	24	59			10 592	25	59		
	8			14 011	42	63			14 122	43	63			14 122	45	64		
	10			17 514	65	72			17 653	67	72			17 653	71	72		
400	4	0,820	0,556	8 006	10	48	0,840	0,560	8 070	11	48	0,860	0,560	8 070	11	49		
	6			12 010	23	59			12 105	24	59			12 105	25	59		
	8			16 013	42	63			16 140	43	63			16 140	45	64		
	10			20 016	65	72			20 174	67	72			20 174	71	73		
450	4	0,923	0,626	9 007	10	49	0,945	0,630	9 078	11	49	0,968	0,630	9 078	11	49		
	6			13 511	23	59			13 618	24	60			13 618	25	60		
	8			18 014	42	63			18 157	43	64			18 157	45	64		
	10			22 518	65	73			22 696	67	73			22 696	71	73		
500	4	1,025	0,695	10 008	10	49	1,050	0,701	10 087	11	50	1,075	0,701	10 087	11	50		
	6			15 012	23	60			15 131	24	60			15 131	25	61		
	8			20 016	42	63			20 174	43	64			20 174	45	64		
	10			25 020	65	73			25 218	67	74			25 218	71	74		
550	4	1,128	0,765	11 009	10	50	1,155	0,771	11 096	11	50	1,183	0,771	11 096	11	51		
	6			16 513	23	61			16 644	24	61			16 644	25	61		
	8			22 018	42	63			22 192	43	64			22 192	45	64		
	10			27 522	65	74			27 740	67	74			27 740	71	74		
600	4	1,230	0,834	12 010	10	51	1,260	0,841	12 105	11	51	1,290	0,841	12 105	11	51		
	6			18 014	23	61			18 157	24	62			18 157	25	62		
	8			24 019	42	63			24 209	43	64			24 209	45	64		
	10			30 024	65	74			30 262	67	75			30 262	71	75		
650	4	1,333	0,904	13 010	10	51	1,365	0,911	13 113	11	51	1,398	0,911	13 113	11	52		
	6			19 516	23	62			19 670	24	62			19 670	25	62		
	8			26 021	42	63			26 227	43	64			26 227	45	64		
	10			32 526	65	75			32 783	67	75			32 783	71	76		

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		2050						2100					2150				
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	1,435	0,973	14 011	10	52	1,470	0,981	14 122	11	52	1,505	0,981	14 122	11	52
		6			21 017	23	62			21 183	24	63			21 183	25	63
		8			28 022	42	64			28 244	43	64			28 244	45	64
		10			35 028	65	76			35 305	67	76			35 305	71	76
	750	4	1,538	1,043	15 012	10	52	1,575	1,051	15 131	11	53	1,613	1,051	15 131	11	53
		6			22 518	23	63			22 696	24	63			22 696	25	64
		8			30 024	42	64			30 262	43	64			30 262	45	64
		10			37 530	65	76			37 827	67	77			37 827	71	77
	800	4	1,640	1,112	16 013	10	53	1,680	1,121	16 140	11	53	1,720	1,121	16 140	11	54
		6			24 019	23	64			24 209	24	64			24 209	25	64
		8			32 026	42	64			32 279	43	64			32 279	45	64
		10			40 032	65	77			40 349	67	77			40 349	71	77
	850	4	1,743	1,182	17 014	10	54	1,785	1,191	17 148	11	54	1,828	1,191	17 148	11	54
		6			25 520	23	64			25 722	24	64			25 722	25	65
		8			34 027	42	64			34 296	43	64			34 296	45	64
		10			42 534	65	77			42 871	67	78			42 871	71	78
	900	4	1,845	1,251	18 014	10	54	1,890	1,261	18 157	11	54	1,935	1,261	18 157	11	55
		6			27 022	23	65			27 235	24	65			27 235	25	65
		8			36 029	42	64			36 314	43	64			36 314	45	64
		10			45 036	65	78			45 392	67	78			45 392	71	79
950	4	1,948	1,321	19 015	10	55	1,995	1,331	19 166	11	55	2,043	1,331	19 166	11	55	
	6			28 523	23	65			28 749	24	66			28 749	25	66	
	8			38 030	42	64			38 331	43	64			38 331	45	64	
	10			47 538	65	79			47 914	67	79			47 914	71	79	
1000	4	2,050	1,390	20 016	10	55	2,100	1,401	20 174	11	56	2,150	1,401	20 174	11	56	
	6			30 024	23	66			30 262	24	66			30 262	25	67	
	8			40 032	42	64			40 349	43	64			40 349	45	65	
	10			50 040	65	79			50 436	67	79			50 436	71	80	
1050	4	2,153	1,460	21 017	10	56	2,205	1,471	21 183	11	56	2,258	1,471	21 183	11	57	
	6			31 525	23	67			31 775	24	67			31 775	25	67	
	8			42 034	42	64			42 366	43	64			42 366	45	65	
	10			52 542	65	80			52 958	67	80			52 958	71	80	
1100	4	2,255	1,529	22 018	10	57	2,310	1,541	22 192	11	57	2,365	1,541	22 192	11	57	
	6			33 026	23	67			33 288	24	67			33 288	25	68	
	8			44 035	42	64			44 384	43	64			44 384	45	65	
	10			55 044	65	80			55 480	67	81			55 480	71	81	
1150	4	2,358	1,599	23 018	10	57	2,415	1,611	23 201	11	57	2,473	1,611	23 201	11	58	
	6			34 528	23	68			34 801	24	68			34 801	25	68	
	8			46 037	42	64			46 401	43	64			46 401	45	65	
	10			57 546	65	81			58 001	67	81			58 001	71	82	
1200	4	2,460	1,668	24 019	10	58	2,520	1,681	24 209	11	58	2,580	1,681	24 209	11	58	
	6			36 029	23	68			36 314	24	69			36 314	25	69	
	8			48 038	42	64			48 419	43	64			48 419	45	65	
	10			60 048	65	82			60 523	67	82			60 523	71	82	
1250	4	2,563	1,738	25 020	10	58	2,625	1,751	25 218	11	59	2,688	1,751	25 218	11	59	
	6			37 530	23	69			37 827	24	69			37 827	25	70	
	8			50 040	42	64			50 436	43	64			50 436	45	65	
	10			62 550	65	82			63 045	67	82			63 045	71	83	

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]														
		2200					2250					2300				
	v	S _k	S _e	Q	d _p	L _{WA}	S _k	S _e	Q	d _p	L _{WA}	S _k	S _e	Q	d _p	L _{WA}
	[m/s]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]
width B [mm]	110	4	0,242	0,154	2 219	12	0,248	0,163	2 351	11	46	0,253	0,163	2 351	12	46
		6			3 329	27			3 526	25	57			3 526	26	57
		8			4 438	47			4 701	44	64			4 701	46	64
		10			5 548	74			5 877	69	70			5 877	72	70
	150	4	0,330	0,210	3 026	12	0,338	0,223	3 205	11	46	0,345	0,223	3 205	12	47
		6			4 539	27			4 808	25	57			4 808	26	57
		8			6 052	47			6 411	44	64			6 411	46	64
		10			7 565	74			8 014	69	70			8 014	72	71
	200	4	0,440	0,280	4 035	12	0,450	0,297	4 274	11	47	0,460	0,297	4 274	12	47
		6			6 052	27			6 411	25	58			6 411	26	58
		8			8 070	47			8 548	44	64			8 548	46	64
		10			10 087	74			10 685	69	71			10 685	72	71
	250	4	0,550	0,350	5 044	12	0,563	0,371	5 342	11	48	0,575	0,371	5 342	12	48
		6			7 565	27			8 014	25	58			8 014	26	59
		8			10 087	47			10 685	44	64			10 685	46	65
		10			12 609	74			13 356	69	72			13 356	72	72
	300	4	0,660	0,420	6 052	12	0,675	0,445	6 411	11	48	0,690	0,445	6 411	12	48
		6			9 078	27			9 616	25	59			9 616	26	59
		8			12 105	47			12 822	44	64			12 822	46	65
		10			15 131	74			16 027	69	72			16 027	72	72
	350	4	0,770	0,490	7 061	12	0,788	0,519	7 479	11	49	0,805	0,519	7 479	12	49
		6			10 592	27			11 219	25	59			11 219	26	60
		8			14 122	47			14 959	44	64			14 959	46	65
		10			17 653	74			18 698	69	73			18 698	72	73
	400	4	0,880	0,560	8 070	12	0,900	0,594	8 548	11	49	0,920	0,594	8 548	12	50
		6			12 105	27			12 822	25	60			12 822	26	60
		8			16 140	47			17 096	44	64			17 096	46	65
		10			20 174	74			21 370	69	73			21 370	72	74
	450	4	0,990	0,630	9 078	12	1,013	0,668	9 616	11	50	1,035	0,668	9 616	12	50
		6			13 618	27			14 424	25	61			14 424	26	61
		8			18 157	47			19 233	44	64			19 233	46	65
		10			22 696	74			24 041	69	74			24 041	72	74
	500	4	1,100	0,701	10 087	12	1,125	0,742	10 685	11	51	1,150	0,742	10 685	12	51
		6			15 131	27			16 027	25	61			16 027	26	62
		8			20 174	47			21 370	44	65			21 370	46	65
		10			25 218	74			26 712	69	74			26 712	72	75
	550	4	1,210	0,771	11 096	12	1,238	0,816	11 753	11	51	1,265	0,816	11 753	12	51
		6			16 644	27			17 630	25	62			17 630	26	62
		8			22 192	47			23 507	44	65			23 507	46	65
		10			27 740	74			29 383	69	75			29 383	72	75
	600	4	1,320	0,841	12 105	12	1,350	0,890	12 822	11	52	1,380	0,890	12 822	12	52
		6			18 157	27			19 233	25	62			19 233	26	63
		8			24 209	47			25 644	44	65			25 644	46	65
		10			30 262	74			32 054	69	76			32 054	72	76
	650	4	1,430	0,911	13 113	12	1,463	0,965	13 890	11	52	1,495	0,965	13 890	12	53
		6			19 670	27			20 835	25	63			20 835	26	63
		8			26 227	47			27 780	44	65			27 780	46	65
		10			32 783	74			34 726	69	76			34 726	72	77

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers **for multi-compartment and single-compartment fire ventilation systems**

B – nominal width [mm]
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v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H [mm]															
		2050						2100					2150				
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	700	4	1,540	0,981	14 122	12	53	1,575	1,039	14 959	11	53	1,610	1,039	14 959	12	53
		6			21 183	27	63			22 438	25	64			22 438	26	64
		8			28 244	47	64			29 917	44	65			29 917	46	65
		10			35 305	74	77			37 397	69	77			37 397	72	77
	750	4	1,650	1,051	15 131	12	53	1,688	1,113	16 027	11	54	1,725	1,113	16 027	12	54
		6			22 696	27	64			24 041	25	64			24 041	26	65
		8			30 262	47	65			32 054	44	65			32 054	46	65
		10			37 827	74	77			40 068	69	77			40 068	72	78
	800	4	1,760	1,121	16 140	12	54	1,800	1,187	17 096	11	54	1,840	1,187	17 096	12	54
		6			24 209	27	65			25 644	25	65			25 644	26	65
		8			32 279	47	65			34 191	44	65			34 191	46	65
		10			40 349	74	78			42 739	69	78			42 739	72	78
	850	4	1,870	1,191	17 148	12	54	1,913	1,261	18 164	11	55	1,955	1,261	18 164	12	55
		6			25 722	27	65			27 246	25	65			27 246	26	66
		8			34 296	47	65			36 328	44	65			36 328	46	65
		10			42 871	74	78			45 410	69	79			45 410	72	79
	900	4	1,980	1,261	18 157	12	55	2,025	1,336	19 233	11	55	2,070	1,336	19 233	12	56
		6			27 235	27	66			28 849	25	66			28 849	26	66
		8			36 314	47	65			38 465	44	65			38 465	46	65
		10			45 392	74	79			48 082	69	79			48 082	72	79
950	4	2,090	1,331	19 166	12	56	2,138	1,410	20 301	11	56	2,185	1,410	20 301	12	56	
	6			28 749	27	66			30 452	25	67			30 452	26	67	
	8			38 331	47	65			40 602	44	65			40 602	46	65	
	10			47 914	74	79			50 753	69	80			50 753	72	80	
1000	4	2,200	1,401	20 174	12	56	2,250	1,484	21 370	11	57	2,300	1,484	21 370	12	57	
	6			30 262	27	67			32 054	25	67			32 054	26	67	
	8			40 349	47	65			42 739	44	65			42 739	46	65	
	10			50 436	74	80			53 424	69	80			53 424	72	81	
1050	4	2,310	1,471	21 183	12	57	2,363	1,558	22 438	11	57	2,415	1,558	22 438	12	57	
	6			31 775	27	67			33 657	25	68			33 657	26	68	
	8			42 366	47	65			44 876	44	65			44 876	46	65	
	10			52 958	74	81			56 095	69	81			56 095	72	81	
1100	4	2,420	1,541	22 192	12	57	2,475	1,632	23 507	11	58	2,530	1,632	23 507	12	58	
	6			33 288	27	68			35 260	25	68			35 260	26	69	
	8			44 384	47	65			47 013	44	65			47 013	46	66	
	10			55 480	74	81			58 766	69	82			58 766	72	82	
1150	4	2,530	1,611	23 201	12	58	2,588	1,707	24 575	11	58	2,645	1,707	24 575	12	59	
	6			34 801	27	69			36 863	25	69			36 863	26	69	
	8			46 401	47	65			49 150	44	65			49 150	46	66	
	10			58 001	74	82			61 438	69	82			61 438	72	82	
1200	4	2,640	1,681	24 209	12	59	2,700	1,781	25 644	11	59	2,760	1,781	25 644	12	59	
	6			36 314	27	69			38 465	25	70			38 465	26	70	
	8			48 419	47	65			51 287	44	65			51 287	46	66	
	10			60 523	74	82			64 109	69	83			64 109	72	83	
1250	4	2,750	1,751	25 218	12	59	2,813	1,855	26 712	11	60	2,875	1,855	26 712	12	60	
	6			37 827	27	70			40 068	25	70			40 068	26	70	
	8			50 436	47	65			53 424	44	65			53 424	46	66	
	10			63 045	74	83			66 780	69	83			66 780	72	84	

Program doboru klap przeciwpożarowych WIP PROV/V jest dostępny na stronie www.mercor.com.pl w Strefie Projektanta.

mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

15.7 | Estimated weights of mcr WIP PROV/V, mcr WIP PROV/V-M dampers [kg]

		width B [mm]																							
		110	150	200	250	300	350	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1150	1250	
height H [mm]	263	10	11	12	13	14	14	15	16	17	18	19	20	20	21	22	23	24	25	26	26	27	28	30	
	300	11	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	33	
	400	11	12	14	15	16	18	19	20	21	23	24	25	27	28	29	31	32	33	34	36	37	38	41	
	500	12	13	15	17	18	20	21	23	25	26	28	30	31	33	34	36	38	39	41	43	44	46	49	
	600	13	14	16	18	20	22	24	26	28	30	32	34	36	38	40	42	44	46	47	49	51	53	57	
	700	13	15	18	20	22	24	27	29	31	34	36	38	40	43	45	47	49	52	54	56	59	61	65	
	800	14	16	19	21	24	27	29	32	34	37	40	42	45	47	50	53	55	58	60	63	66	68	73	
	900	15	17	20	23	26	29	32	35	38	41	44	47	49	52	55	58	61	64	67	70	73	76	82	
	1000	16	18	21	25	28	31	34	38	41	44	47	51	54	57	60	64	67	70	73	77	80	83	90	
	1100	16	19	23	26	30	34	37	41	44	48	51	55	59	62	66	69	73	76	80	84	87	91	98	
	1200	17	20	24	28	32	36	40	44	47	51	55	59	63	67	71	75	79	83	86	90	94	98	106	
	1250	17	21	25	29	33	37	41	45	49	53	57	61	65	69	73	78	82	86	90	94	98	102	110	
	1300	18	21	25	30	34	38	42	47	51	55	59	63	68	72	76	80	85	89	93	97	101	106	114	
	1400	18	22	27	31	36	40	45	49	54	59	63	68	72	77	81	86	90	95	99	104	109	113	122	
	1500	19	23	28	33	38	43	47	52	57	62	67	72	77	82	86	91	96	101	106	111	116	121	130	
	1600	20	24	29	34	40	45	50	55	60	66	71	76	81	86	92	97	102	107	112	118	123	128	138	
	1700	21	25	31	36	42	47	53	58	64	69	75	80	86	91	97	102	108	113	119	125	130	136	147	
	1800	21	26	32	38	44	49	55	61	67	73	79	85	90	96	102	108	114	120	125	131	137	143	155	
	1900	22	27	33	39	46	52	58	64	70	76	83	89	95	101	107	113	120	126	132	138	144	151	163	
	2000	23	28	34	41	47	54	60	67	73	80	86	93	99	106	112	119	125	132	138	145	151	158	171	
	2100	23	29	36	43	49	56	63	70	77	84	90	97	104	111	118	125	131	138	145	152	159	165	179	
	2200	24	30	37	44	51	59	66	73	80	87	94	101	109	116	123	130	137	144	151	159	166	173	187	
	2300	25	31	38	46	53	61	68	76	83	91	98	106	113	121	128	136	143	151	158	165	173	180	195	

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

15.8 | Accessories

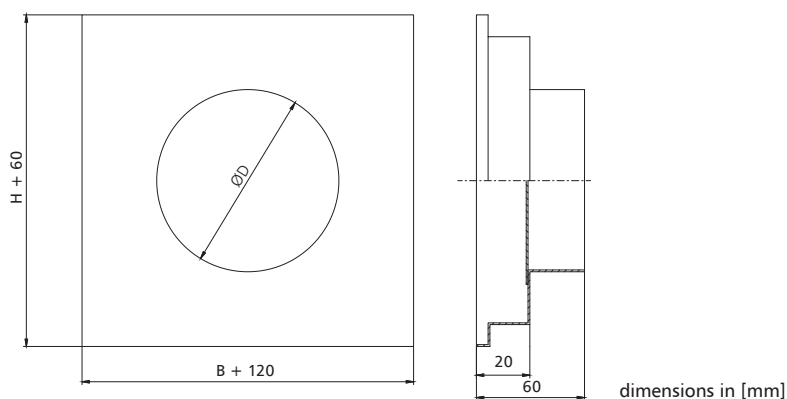
15.8.1 | mcr KRP connection stub

mcr KRP connection stubs are used to connect a circular ventilation duct to a rectangular damper. The connection is a „bare end“ pipe. The diameter of the stub pipe is 2 mm smaller than the diameter of the ventilation duct.

Dimensions:

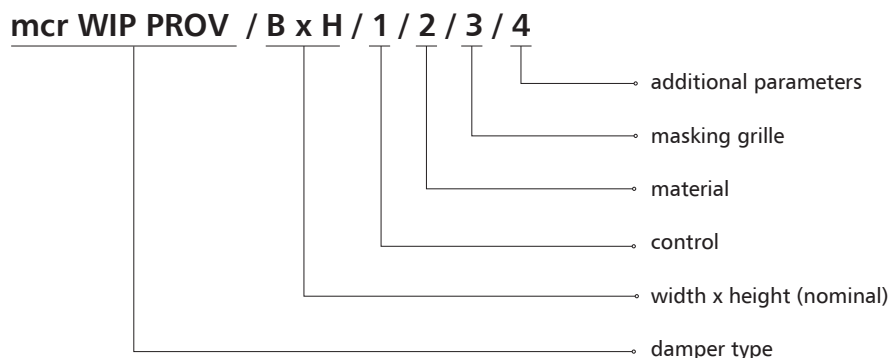
BxH - damper dimensions [mm]

ØD - diameter of the connection duct [mm]



mcr WIP PROV/V, mcr WIP PROV/V-M | Multi-blade smoke control dampers for multi-compartment and single-compartment fire ventilation systems

15.9 | Marking



1 - control:

» trigger and control mechanism, axial actuator

- BE24 – actuator without a return spring, U = 24 V AC/DC
- BE230 – actuator without a return spring, U = 230 V AC/DC
- BEE24 – actuator without a return spring, U = 24 V AC/DC
- BEE230 – actuator without a return spring, U = 230 V AC/DC
- BEN24 – actuator without a return spring, U = 24 V AC/DC
- BEN230 – actuator without a return spring, U = 230 V AC/DC
- MLE24 – actuator without a return spring, U = 24 V AC/DC
- MLE230 – actuator without a return spring, U = 230 V AC/DC
- ME24 – actuator without a return spring, U = 24 V AC/DC
- ME230 – actuator without a return spring, U = 230 V AC/DC

2 - material:

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

3 - masking grille:

- MSTx1 – masking grille
- MSTx2 – masking grille
- MWPx1 – mesh masking grille
- MWPx2 – two mesh masking grilles

4 - additional parameters:

» Damper axis of rotation

- [no symbol] – horizontal axis of rotation

» Damper casing

- BU – earth pin

Note: separate additional parameters entered with the “/” sign

example marking:

mcr WIP PROV/V 400 x 400 BLE24

EIS120 louvered smoke ventilation damper with a 24 V actuator with limit switches.

Chapter 19 - power supply and control (p. 350) contains the following information:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.



downloadable models
on the website
under the designer zone tab



- » **E120**
- » Fire resistance class: E120 ($v_e h_o i \leftrightarrow o$).
- » 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.

16.1 | 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 are opened. The dampers switch to safe mode (close):

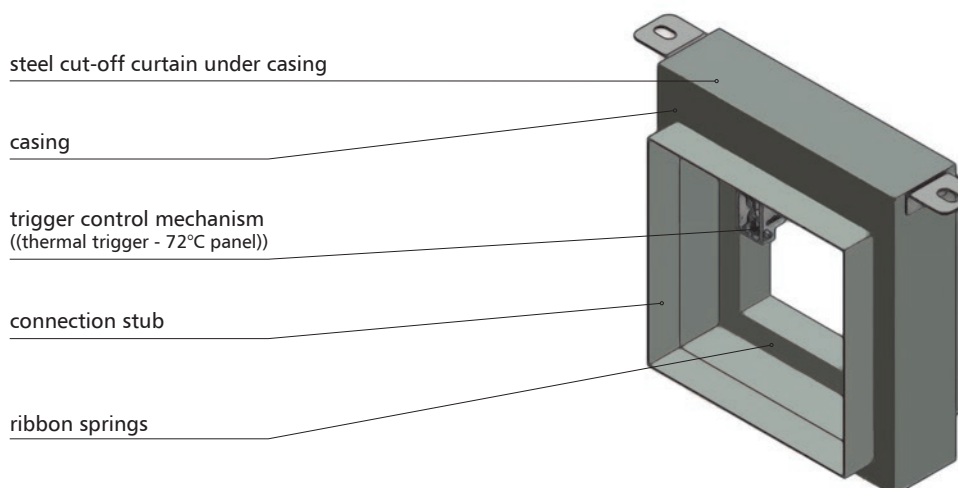
- » automatically, by means of thermal trigger tripping at 72°C,
- » manually (in test mode), by pressing the manual release button (trigger control mechanism),
- » remotely, by means of EM electromagnetic trigger tripping (optional).

Admissible flow velocity in the connected duct is 15 m/s. Dampers with EM electromagnetic triggers (optional) close as a result of cutting the power supply as a result of 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 drive spring action in the damper, activated by the triggering of the thermal trigger or manually, by pressing the dedicated button on the panel. Dampers are opened manually, by lifting the steel curtain and locking it in the trigger control mechanism clamps.

mcr FS dampers may also be used in the systems which are protecting egress routes from smoke, in which case they remain open during the fire and ensure a supply of fresh air to egress routes. If the fire develops further, the dampers are automatically closed as a result of thermal trigger tripping to prevent fire spreading.

16.2 | Design



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 galvanized steel sheets. 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 stub with the length of 38 mm for rectangular dampers and 60 mm for circular dampers. The damper blade is made of steel sheets. The steel flat bar on the casing exterior is installed to tighten the device after its activation.

The mechanism of 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.

16.3 | Versions

16.3.1 | mcr FS I/F – cut-off fire damper for E120(v_e h_o i↔o) rigid walls and floor slabs



insert symmetrically against the wall axis

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

The stainless steel cut-off curtain falls when 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.

16.3.2 | mcr FS DWFX-C – cut-off damper for E120(v_e i↔o) light walls



insert symmetrically against the wall axis

The mcr FS DWFX-C damper is suitable for installation in newly built light walls

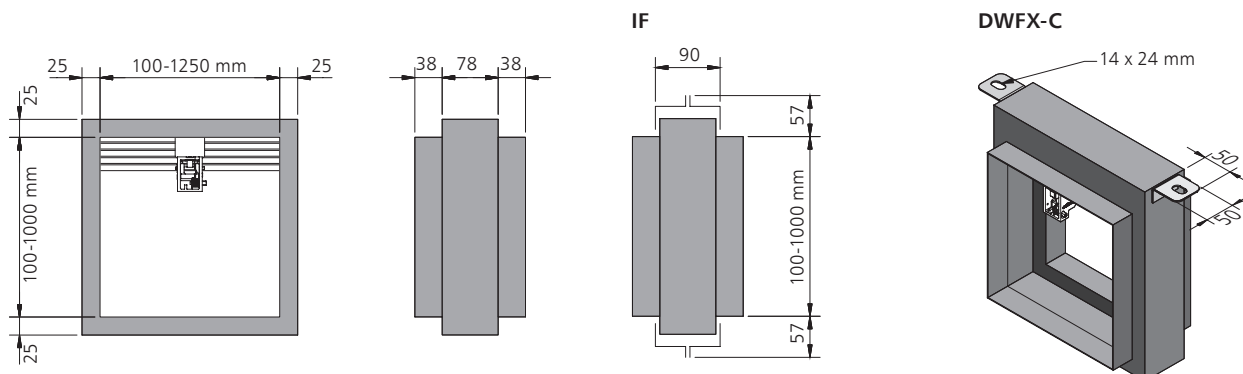
The stainless steel cut-off curtain falls when 72°C is exceeded or if the voltage is removed from the EM trigger control mechanism (optional).

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

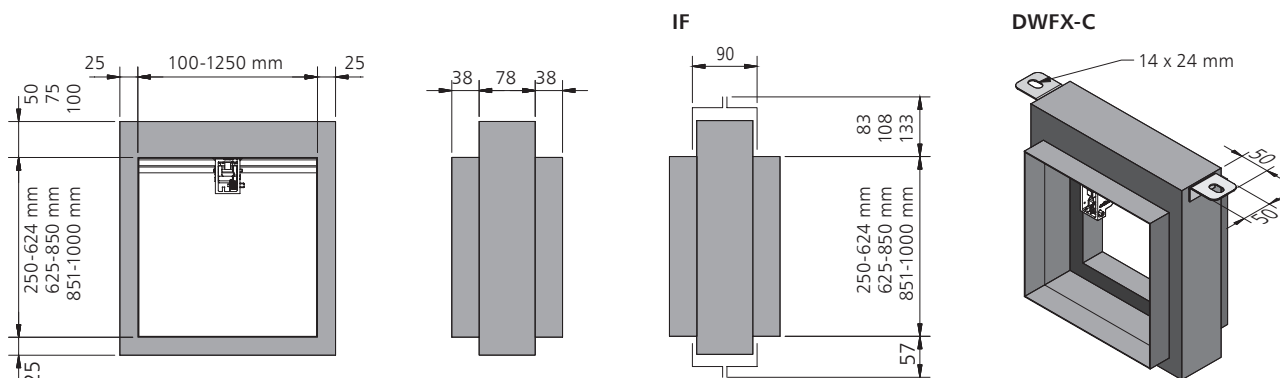
16.4 | Dimensions

mcr FS dampers are manufactured in three series:

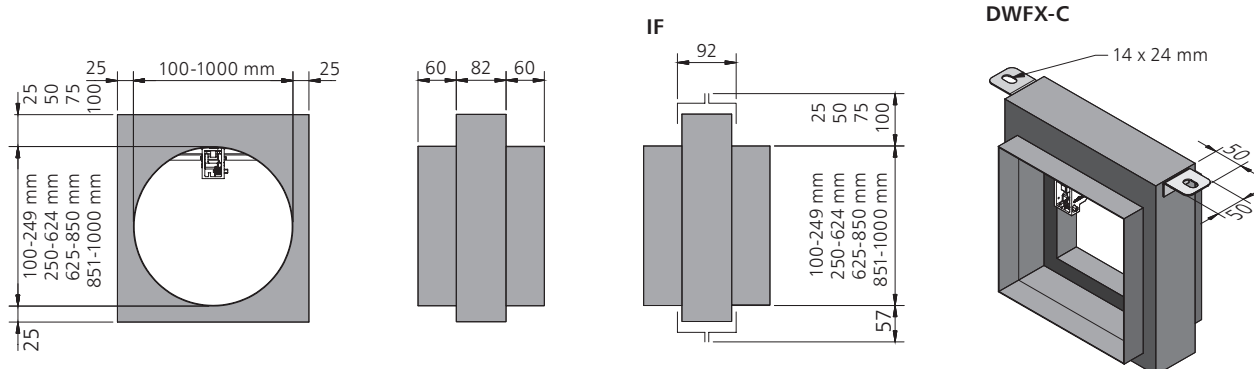
» **101 series** (rectangular dampers) with a curtain located partly in the air stream – from 100 x 100 mm to 1250 x 1000 mm.



» **201 series** (rectangular dampers) with a curtain located outside the air stream – from 100 x 250 mm to 1250 x 1000 mm.



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



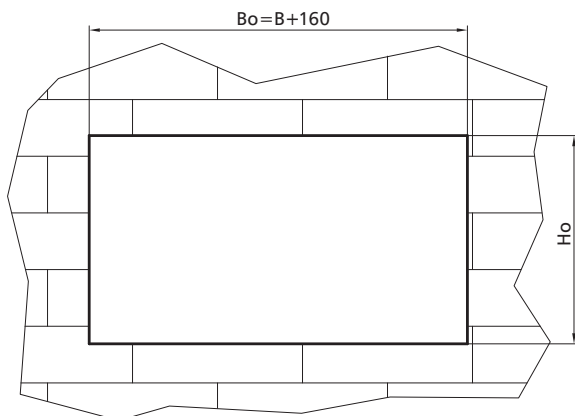
Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 1 mm increments within the given ranges).

16.5 | Installation

mcr FS I/F dampers are rated E120(v_e h_o $i \leftrightarrow o$) if installed in partitions made of concrete, full bricks or aerated concrete blocks with a thickness of at least 110 mm and concrete floor slabs with a thickness of at least 150 mm.
mcr FS DWFX-C dampers are rated E120(v_e $i \leftrightarrow o$) if installed in light walls with gypsum boards on a steel framework with the thickness of at least 125 mm.

16.5.1 | Preparation of installation openings

» mcr FS I/F version – preferred opening

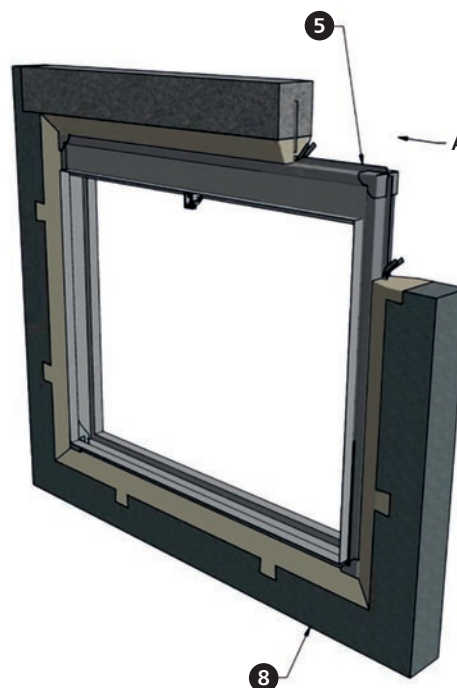
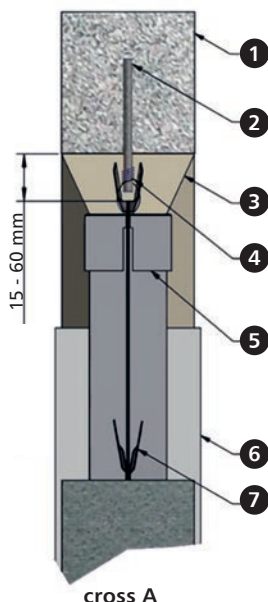


» mcr FS DWFX-C version

Dampers are installed during the construction of the gypsum board wall (the damper is embedded in the board wall).

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

16.5.2 | Sample installation of mcr FS I/F dampers

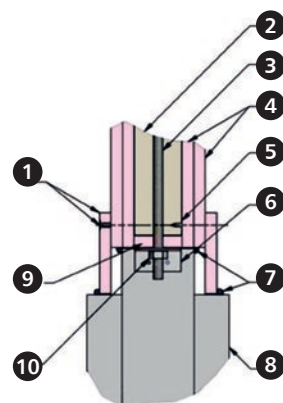
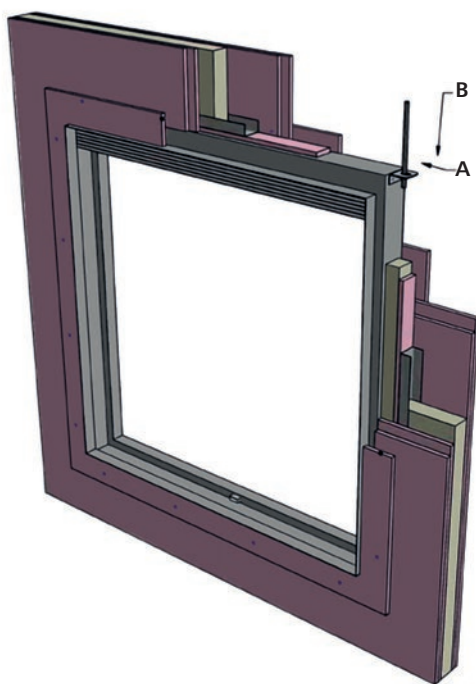


1. lintel
2. steel anchors $\varnothing$ min. 6.5 mm
3. assembly mortar*
4. steel wire $\varnothing$ 1.5 mm binding the anchors with frame runners

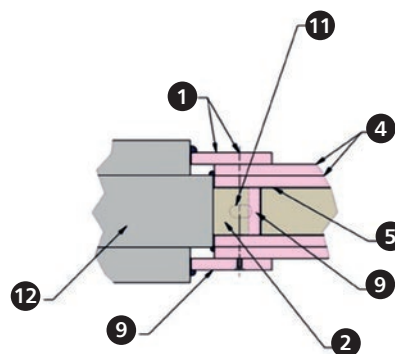
5. installation frame
6. mcr FS fire damper
7. frame runners - for bending sideways and downwards
8. rigid partition

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the method applied.

16.5.3 | Sample installation of mcr FS DWFX-C dampers



cross-section A



cross-section A

1. 12.5 x 100 mm circumferential gypsum board trim fixed to the gypsum board wall through a UD50 profile with 300 mm bolts
2. mineral wool 33 kg/m³
3. M10 rod (pin)
4. gypsum boards 2 x 12.5 mm
5. UD50 profile
6. angle profile welded to both ends of the casing

7. low-expansion intumescent compound around the damper, on both sides
8. damper casing
9. gypsum board trim 12.5 mm
10. M10 nut
11. angle profile with an opening
12. mcr FS fire damper

16.6 | mcr FS curtain dampers technical parameters

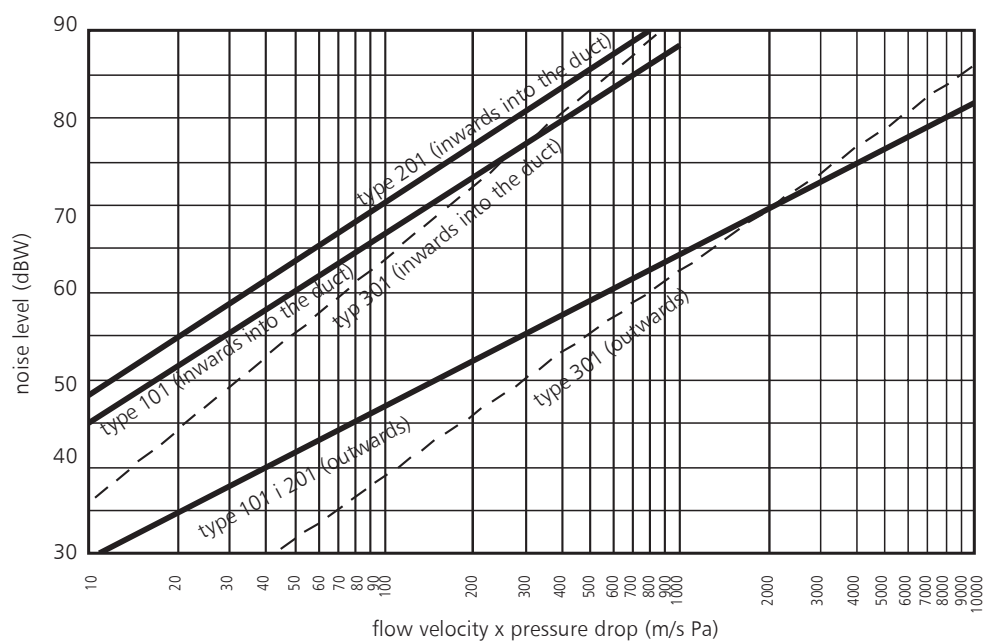
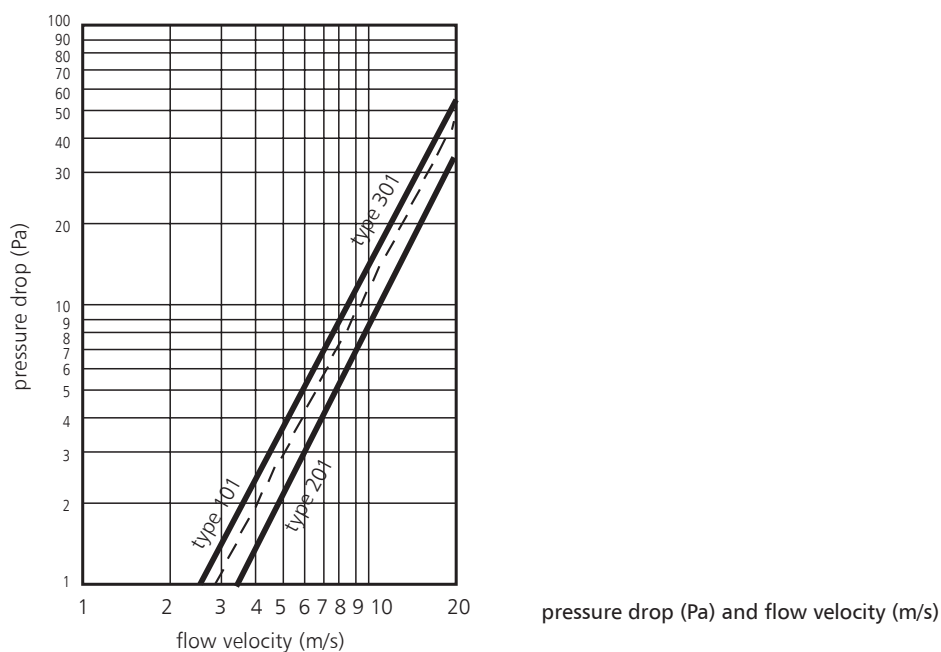
» damper active surface in relation to the B and H nominal and Bz and Hz total dimensions

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	100	200	300	400	500	600	700	800	900	1000
Hz	150	250	375	475	575	675	800	900	1025	1125
Bz	150	250	350	450	550	650	750	850	950	1050

16.6.1 | Flow characteristics



flow velocity (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
type 101	dB	10	7	3	9	13	20	30	33
type 201	dB	10	7	3	9	13	20	30	33
type 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
type 101	dB	4	12	16	18	22	20	32	38
type 201	dB	4	11	17	19	22	30	33	40
type 301	dB	4	10	16	18	21	24	30	38

16.7 | Weights of mcr FS curtain dampers

	approximate damper weights [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

16.8 | Options

16.8.1 | EM trigger control mechanism

» mechanism operation description:

The EM mechanism is designed to operate mcr FS transfer dampers. Once power supply voltage is removed, the mechanism lock is released, which causes 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 a 24 V AC/DC voltage – released by the removal of the power supply voltage

EM240 – mechanism supplied with a 230 V AC voltage – released by the removal of the power supply voltage

specifications

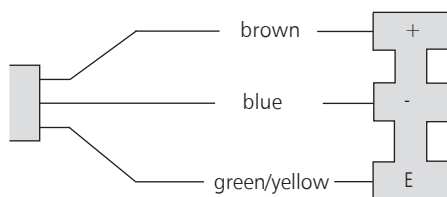
	EM24	EM240
power supply voltage	24 V AC / DC	230 V AC 50 Hz
rated current	120 m A	10 m A
electrical connection	wire 3 x 0.75 mm ²	
weight	1.6 kg	1.6 kg

» mechanism electrical diagram

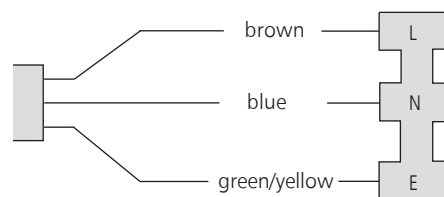
» power supply:

brown wire – “+” supply or “L” blue wire – mass “-” or “N” green-yellow wire – ground “E”

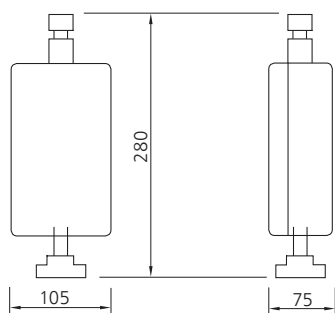
» 24 V AC/DC



» 230 V AC



» mechanism dimensions



16.8.2 | MSSP and MSDP independent limit switches

» mechanism operation description:

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

» versions:

MSSP – single switch – closed damper blade signaling.

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

specifications

service life	5 000 000 cycles
limit switch operating temperature	-25°C do +85°C
service life	5 000 000 cycles
voltage	300 V AC i 250 V DC
current	10 A
limit switch operating temperature	-25°C do +85°C
service life	5 000 000 cycles

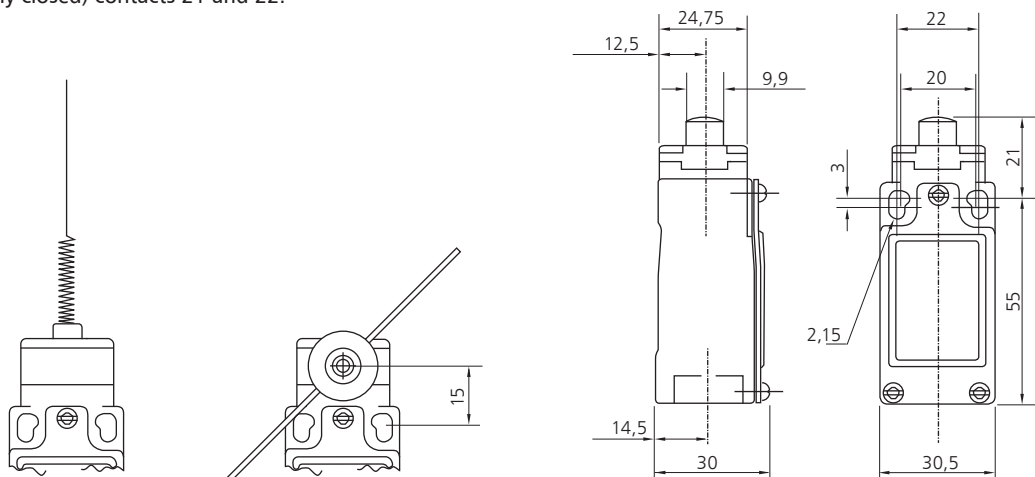
» mechanism electrical diagram:

MSSP – single limit switch, closed damper signaling:

MSDP – two limit switches:

» NO (normally open) contacts 13 and 14

» NC (normally closed) contacts 21 and 22.



16.9 | Marking

mcr FS 201 / IF / B x H / MSSP



type:

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

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

mcr FS 301 - circular damper with a curtain located 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)

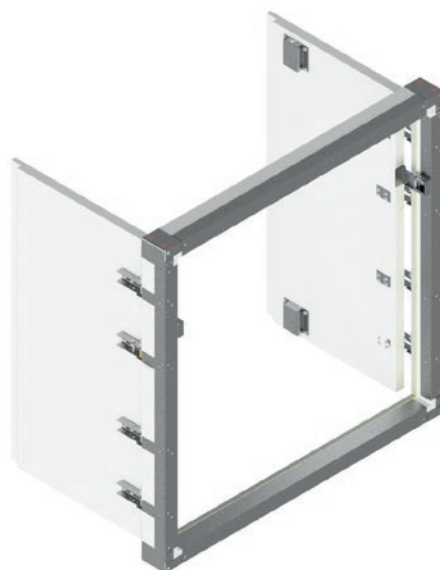
MSDP - two single limit switches (closed and open damper signaling)

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

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



downloadable models
on the website
under the designer zone tab



» **EIS180**

- » Fire resistance class: EI180 ($v_{ed} i \leftrightarrow o$)S1500C₃₀₀AAmulti.
- » Certificate of constancy of performance.
- » Dampers certified for compliance with EN 12101-8.
- » Dampers rated under EN 13501-4 and tested under EN 1366-10.
- » Smoke door dampers resistance independent of airflow direction and installation side.
- » Large active area, small resistances.
- » Certified installation with a system grille in set.

17.1 | Application

mcr DOR smoke door dampers are intended for installation in automatically operated fire ventilation systems. The devices are used in fire ventilation systems. The dampers prevent fire, smoke and fire gases from spreading to the adjacent zones. During normal system operation, the damper blade is closed. The fire damper blade in the fire compartment is opened, whereas in other areas the blades are closed. Admissible flow velocity in the connected duct is 15 m/s.

17.2 | Design

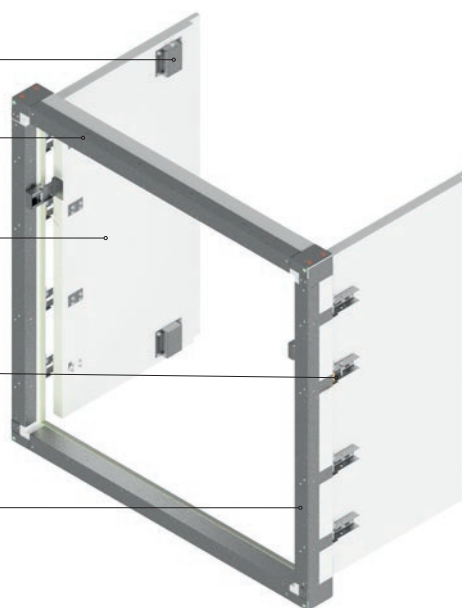
trigger control mechanism

casing

blade

hinge

steel reinforcement



mcr DOR smoke door dampers consist of a casing with a rectangular cross-section composed of fire-proof boards, a moving damper blade in the form of two wings and an automatically activated trigger and control mechanism. Special design casing with impregnated fire-proof boards are used in chemically aggressive environments. The damper casing total thickness is 110 mm. The damper blade is made of a fire-proof panel. At the corners and along the entire perimeter of the casing, there are steel reinforcements with a rivet nut system, enabling the installation of masking grilles and frames for connecting steel ventilation ducts.

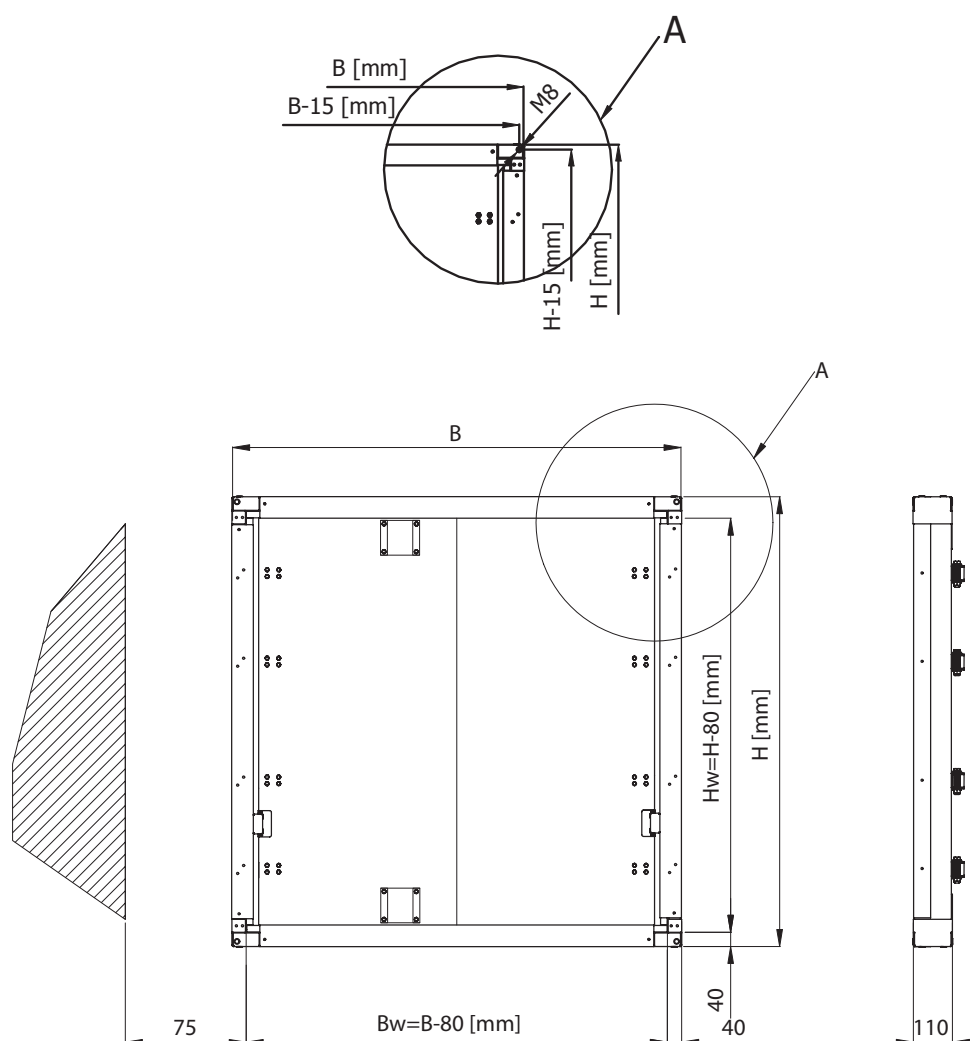
17.3 | Versions

17.3.1 | Opening with the trigger and control mechanism

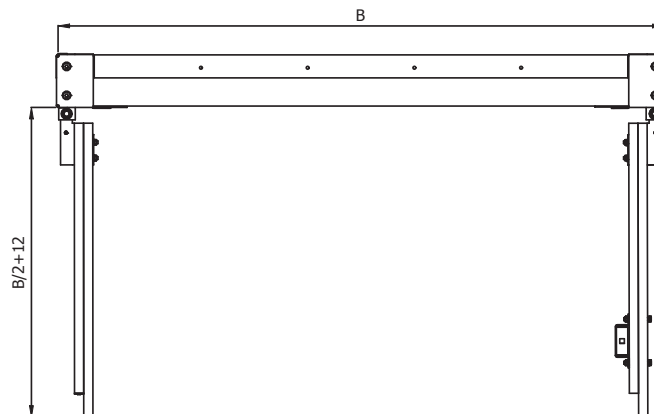
During normal operation, the fire damper blade remains closed. In the case of fire, the damper blade in the compartment where the fire occurs opens and the damper blades in the remaining compartments remain closed – the blades are operated remotely by supplying power.

mcr DOR dampers are equipped with a EM24D-type trigger and control mechanisms, supplied with 24 V AC/DC or 230 V AC. Dampers are equipped with limit switches used to monitor the position of the damper blade. The trigger and control mechanism is located inside the damper casing.

The dampers open as the result of power voltage supply to the trigger and control mechanism (current pulse of at least 5 s). Closing the damper blade after its tripping is possible manually, provided that there is no power supply to the trigger and control mechanism.



17.4 | Dimensions

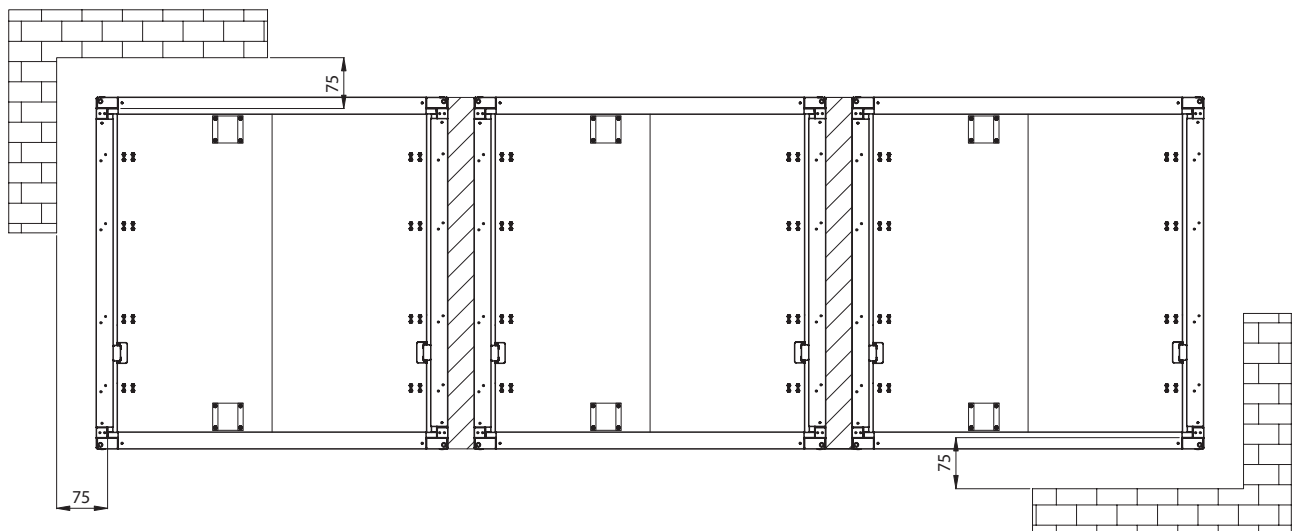


Rectangular dampers:

- » nominal width B: from 480 mm to 1330 mm (Bw from 400 mm to 1250 mm)
- » nominal height H: from 380 mm to 1330 mm (Hw from 300 mm to 1250 mm)
- » maximum cross-section surface of one damper up to 1.77 m²
- » the damper blade, regardless of the dimensions of the BxH damper, does not protrude beyond the device casing on one side
- » the open damper blade (wings) does not protrude outside the B dimension of the device casing

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

Minimum distance between systems and partitions



dimensions in [mm]

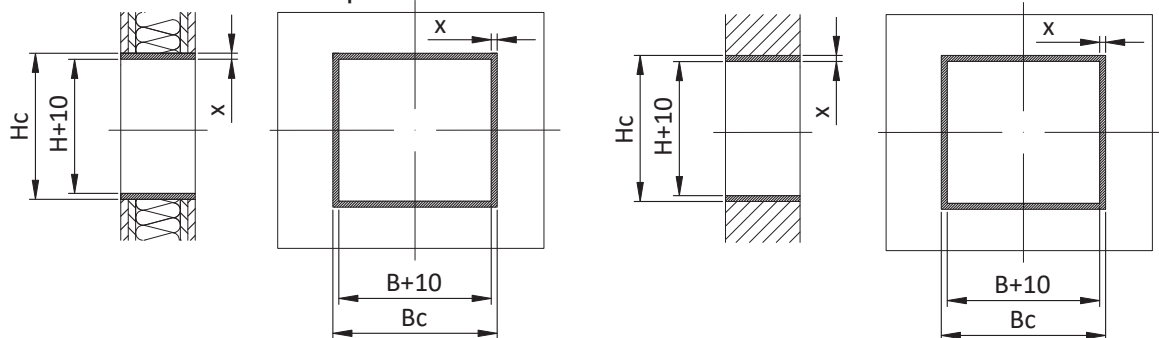
17.5 | Installation

mcr DOR door-type smoke exhaust dampers are rated EI180($v_{ed} i \leftrightarrow o$) S1500 C₃₀₀ AA multi multi if installed on fireproof ducts classified according to EN 1366-8 and EN 1366-9.

17.5.1 | Preparation of installation openings

Minimum dimensions of the installation opening that permits correct installation of the damper depending on division element installation manner:

» for installation in a wall of a shaft compliant with EN1366-8 and EN1366-9::



shaft wall thickness ≥ 110 mm

$$H_c = H + 10$$

$$B_c = B + 10$$

shaft wall thickness < 110 mm

$$H_c = H + 10 + 2X + L$$

$$B_c = B + 10 + 2X + L$$

where

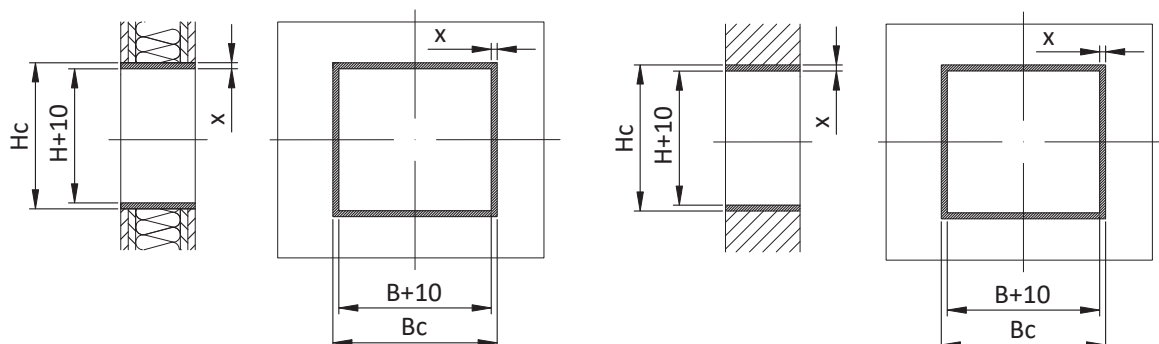
X = thickness of the fire-proof board trim used,

10 – installation clearance (5 mm per side) between the damper and the trim,

L – installation clearance between the trim and the wall/shaft, resulting from installation technology.

Thickness of the trim used depends on the resistance that needs to be obtained for the fire division (shaft wall),

» dinstallation in a wall of any shaft with a fire resistance or any fire dividing wall:



$$H_c = H + 10 + 2X + L$$

$$B_c = B + 10 + 2X + L$$

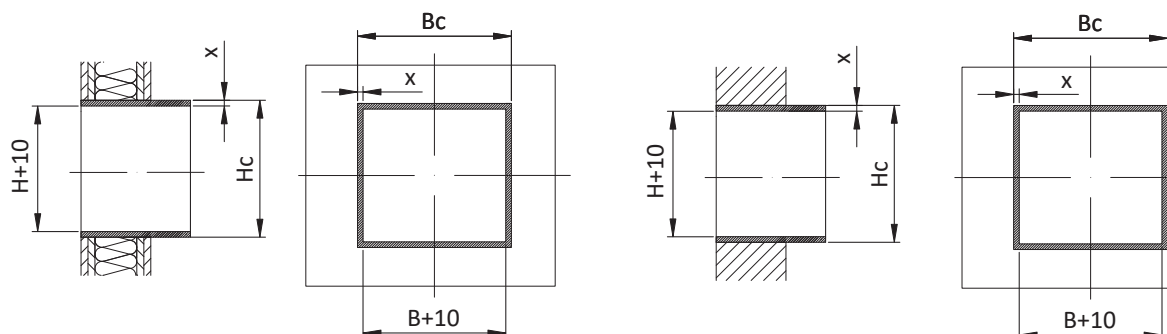
where

X = thickness of the fire-proof board trim used,
10 – installation clearance (5 mm per side) between the damper and the trim,

L – installation clearance between the trim and the wall/shaft, resulting from installation technology.

Thickness of the trim used depends on the resistance that needs to be obtained for the fire division (shaft wall),

» for installation in a fireproof duct compliant with EN1366-8 and EN1366-9, penetrating the wall:



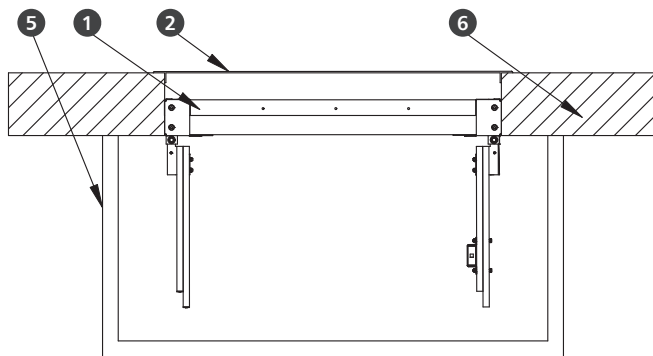
$$H_c = H + 10 + 2X$$

where

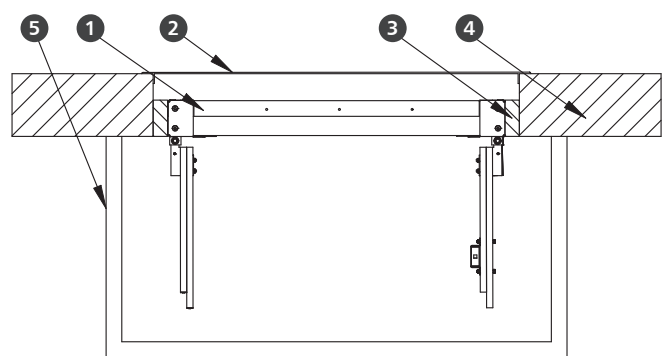
X = duct wall thickness, e.g. made of fire-proof boards

10 – installation clearance (5 mm per side) between the damper and the net dimension of the duct. Duct board thickness depends on the solution manufacturer.

17.5.2 | Damper installation in shaft walls >110 mm

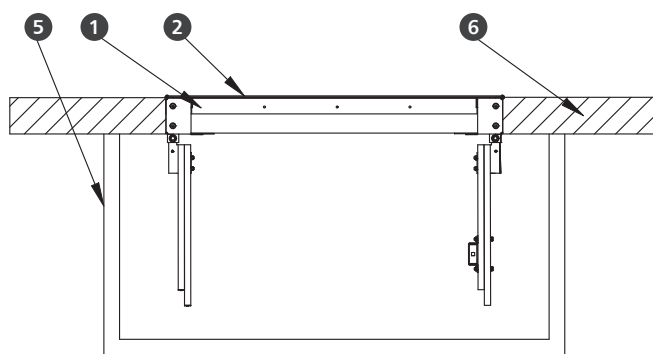


- 1. mcr DOR BxH smoke door damper
- 2. masking grille
- 3. a strip of fire-proof board along the entire length of the BxH side

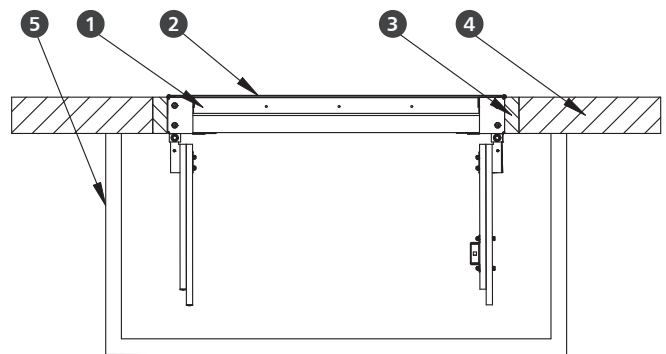


- 4. Shaft wall
- 5. Vertical fire ventilation shaft
- 6. Wall of a shaft compliant with EN1366-8 or EN1366-9

17.5.3 | Damper installation in shafts with a thickness of 110 mm

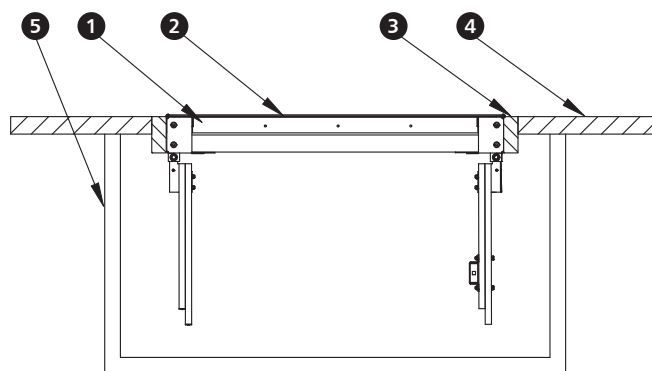


- 1. mcr DOR BxH smoke door damper
- 2. masking grille
- 3. a strip of fire-proof board along the entire length of the BxH side



- 4. Wall of a shaft compliant with EN1366-8 or EN1366-9
- 5. Vertical fire ventilation shaft

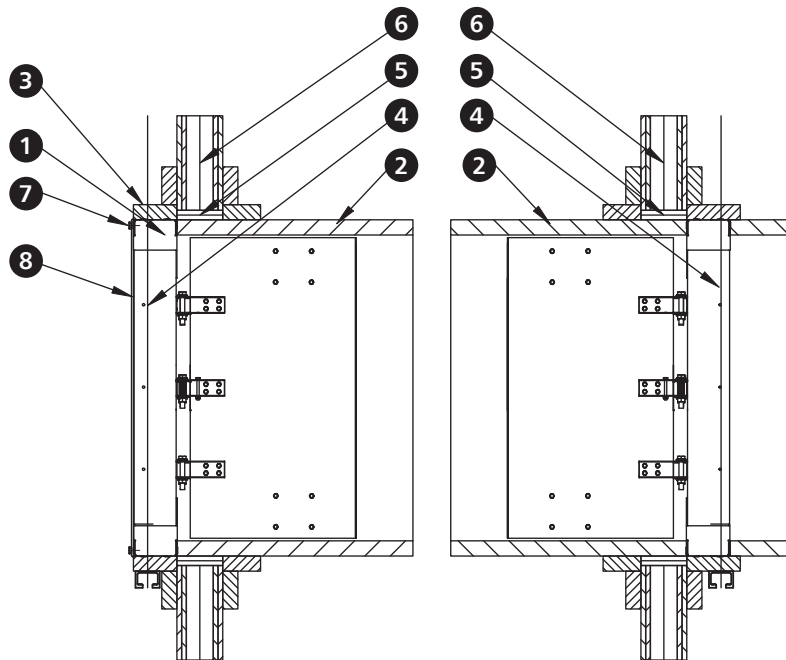
17.5.4 | Damper installation in shafts with a thickness <110 mm



- 1. mcr DOR BxH smoke door damper
- 2. masking grille
- 3. a strip of fire-proof board along the entire length of the BxH side

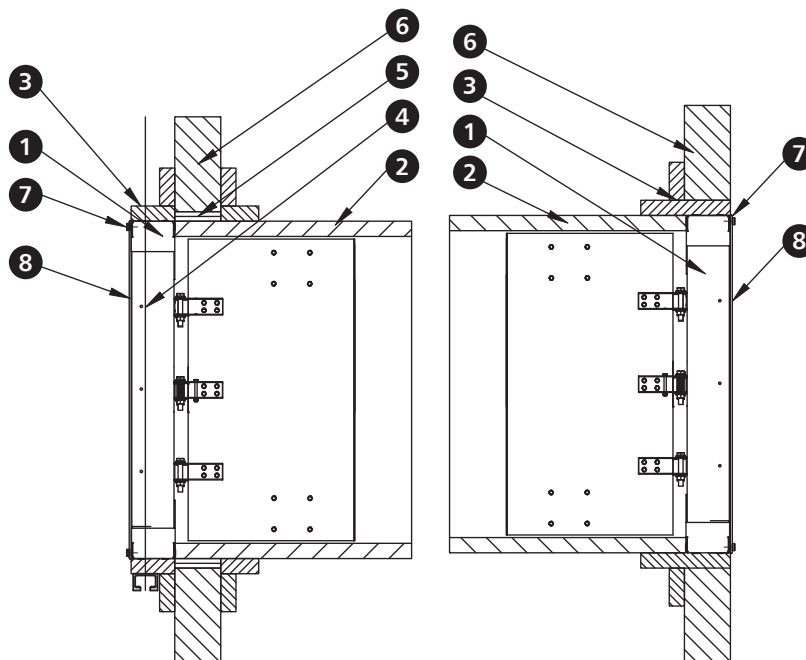
- 4. Wall of a shaft compliant with EN1366-8 or EN1366-9
- 5. Vertical fire ventilation shaft

17.5.5 | Damper installation in light walls (plasterboard)



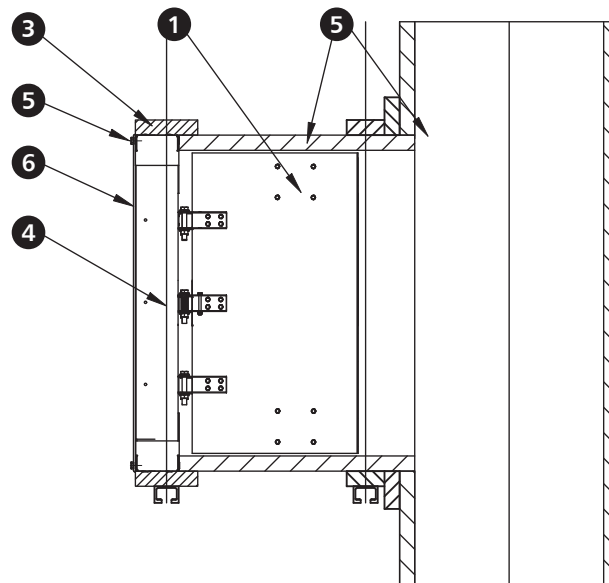
- | | |
|--|---|
| 1. mcr DOR BxH smoke door damper | 5. fireproof duct installation penetration system |
| 2. multi-compartment smoke extract duct – e.g. made of fire-proof boards | 6. plasterboard wall |
| 3. a strip of fire-proof board along the entire length of the BxH side | 7. M10 x 20 bolt |
| 4. system of installation hangers ensuring operational stability | 8. masking grille |

17.5.6 | Damper installation in solid walls



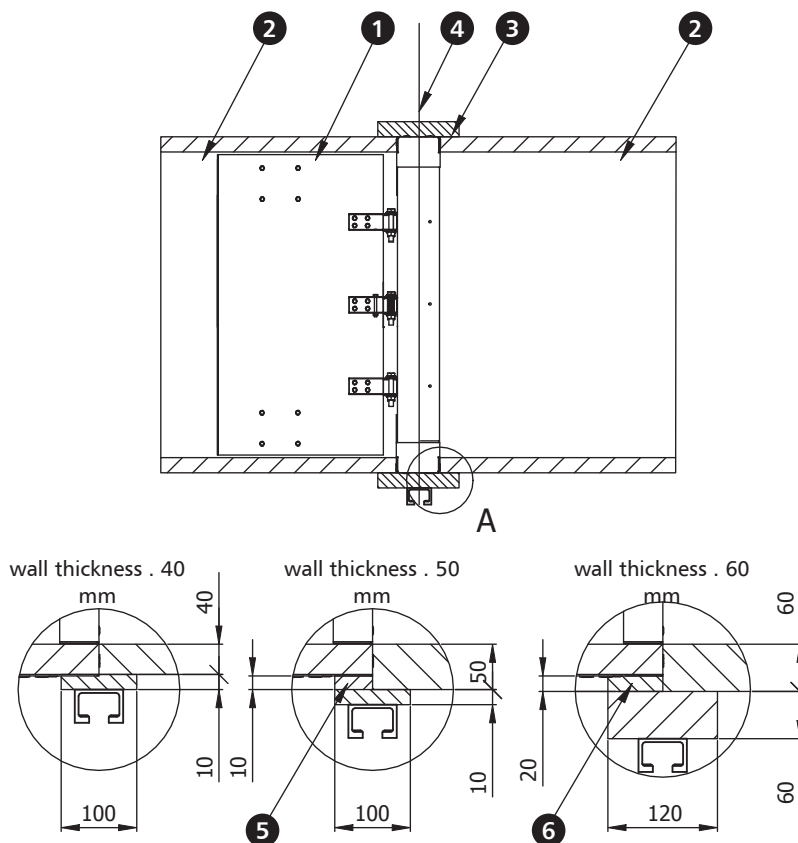
- | | |
|--|---|
| 1. mcr DOR BxH smoke door damper | 5. fireproof duct installation penetration system |
| 2. multi-compartment smoke extract duct – e.g. made of fire-proof boards | 6. solid wall |
| 3. a strip of fire-proof board along the entire length of the BxH side | 7. M10 x 20 bolt |
| 4. system of installation hangers ensuring operational stability | 8. masking grille |

17.5.7 | Damper installation on horizontal ducts



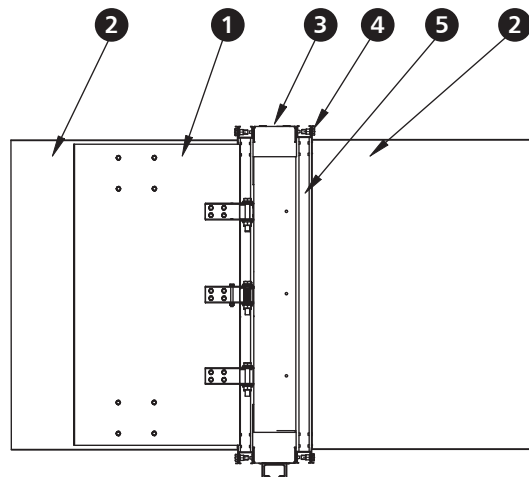
- 1. mcr DOR BxH smoke door damper
- 2. multi-compartment smoke extract duct – e.g. made of fire-proof boards
- 3. a strip of fire-proof board along the entire length of the BxH side
- 4. installation hangers system
- 5. M10 x 20 bolt
- 6. masking grille

17.5.8 | Damper connection with a multi-compartment duct, e.g. made of fire-proof boards with various wall thickness



- 1. mcr DOR BxH smoke door damper
- 2. multi-compartment smoke extract duct made of fire-proof boards
- 3. a strip of fire-proof board along the entire length of the BxH side
- 4. installation hangers system
- 5. a strip of fire-proof board along the entire length of the BxH side with the dimensions 10 x 50 mm
- 6. a strip of fire-proof board along the entire length of the BxH side with the dimensions 20 x 60 mm

17.5.9 | Damper connection with single-compartment duct, e.g. made of metal sheets



- 1. mcr DOR BxH smoke door damper
- 2. single-compartment smoke extract duct – metal sheets
- 3. installation hangers system

- 4. M10 x 20 bolt
- 5. RB mounting frame

Where a damper is installed in a duct connected on two sides, an inspection access allowing for the damper blade to be accessed freely for the purpose of closing it should be made from the side of the tripping and control mechanism.

Smoke extraction ducts should be made in accordance with the ducts manufacturer's guidelines. The ducts must have an adequate fire resistance rating in accordance with the fire resistance rating provided for the entire solution. Seal all connections between the damper and the ducts with the appropriate grout/glue/gaskets, ensuring that the fire resistance rating is maintained. The shut-off damper in vertical fire ventilation systems may be installed across the horizontal smoke extract duct or on the sides of the horizontal smoke extract duct or on the surface of any side of the vertical smoke extract duct. A masking grille may terminate the system.

17.6 | mcr DOR rectangular dampers technical parameters

B_w – nominal width [mm]
 H_w – nominal height [mm]

v – velocity [m/s]
 S_k – duct cross-section [m²]
 S_e – damper active cross-section [m²]

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

		height H_w [mm]									
		300					350				
	v [m/s]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]
width B_w [mm]	400	4	0.120	0.107	1 538	3	0.140	0.126	1 812	3	21
		6			2 307	4			2 717	3	24
		8			3 076	5			3 623	4	28
		10			3 845	6			4 529	6	31
	450	4	0.135	0.121	1 740	3	0.158	0.142	2 049	3	21
		6			2 609	3			3 074	3	24
		8			3 479	5			4 098	4	28
		10			4 349	6			5 123	6	31
	500	4	0.150	0.135	1 941	3	0.175	0.159	2 287	3	21
		6			2 912	3			3 430	3	25
		8			3 882	4			4 573	4	28
		10			4 853	6			5 717	6	31
	550	4	0.165	0.149	2 143	3	0.193	0.175	2 762	3	22
		6			3 214	3			4 143	3	25
		8			4 285	4			5 524	4	28
		10			5 357	6			6 905	5	32
	600	4	0.180	0.163	2 344	3	0.210	0.192	2 762	3	22
		6			3 516	3			4 143	3	25
		8			4 689	4			5 524	4	28
		10			5 861	6			6 905	5	32
	650	4	0.195	0.177	2 546	3	0.228	0.208	3 000	3	22
		6			3 819	3			4 499	3	25
		8			5 092	4			5 999	4	29
		10			6 365	6			7 499	5	32
	700	4	0.210	0.191	2 748	3	0.245	0.225	3 237	3	23
		6			4 121	3			4 856	3	26
		8			5 495	4			6 474	4	29
		10			6 869	6			8 093	5	32

B_w – nominal width [mm]
 H_w – nominal height [mm]

v – velocity [m/s]
 S_k – duct cross-section [m²]
 S_e – damper active cross-section [m²]

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

		height H_w [mm]									
		300					350				
	v [m/s]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]
width B_w [mm]	750	4	0.225	0.205	2 949	3	0.263	0.241	3 475	3	23
		6			4 424	3			5 212	3	26
		8			5 898	4			6 949	4	29
		10			7 373	6			8 687	5	32
	800	4	0.240	0.219	3 151	3	0.280	0.258	3 712	3	23
		6			4 726	3			5 568	3	26
		8			6 301	4			7 425	4	29
		10			7 877	5			9 281	5	33
	850	4	0.255	0.233	3 352	3	0.298	0.274	3 950	2	23
		6			5 028	3			5 925	3	26
		8			6 705	4			7 900	4	29
		10			8 381	5			9 875	5	33
	900	4	0.270	0.247	3 554	3	0.315	0.291	4 188	2	24
		6			5 331	3			6 281	3	26
		8			7 108	4			8 375	4	30
		10			8 885	5			10 469	5	33
	950	4	0.285	0.261	3 756	3	0.333	0.307	4 425	2	24
		6			5 633	3			6 638	3	27
		8			7 511	4			8 850	4	30
		10			9 389	5			11 063	5	33
	1000	4	0.300	0.275	3 957	3	0.350	0.324	3 237	2	24
		6			5 936	3			4 856	3	27
		8			7 914	4			6 474	4	30
		10			9 893	5			8 093	5	33
	1050	4	0.315	0.289	4 159	3	0.368	0.340	3 475	2	24
		6			6 238	3			5 212	3	27
		8			8 317	4			6 949	4	30
		10			10 397	5			8 687	5	33
	1100	4	0.330	0.303	4 360	3	0.385	0.357	3 712	2	24
		6			6 540	3			5 568	3	27
		8			8 721	4			7 425	4	30
		10			10 901	5			9 281	5	33
	1150	4	0.345	0.317	4 562	3	0.403	0.373	3 950	2	25
		6			6 843	3			5 925	3	27
		8			9 124	4			7 900	4	30
		10			11 405	5			9 875	5	34
	1200	4	0.360	0.331	4 764	3	0.420	0.390	4 188	2	25
		6			7 145	3			6 281	3	27
		8			9 527	4			8 375	4	31
		10			11 909	5			10 469	5	34
	1250	4	0.375	0.345	4 965	3	0.438	0.406	4 425	2	25
		6			7 448	3			6 638	3	28
		8			9 930	4			8 850	4	31
		10			12 413	5			11 063	5	34

B_w – nominal width [mm]
 H_w – nominal height [mm]

v – velocity [m/s]
 S_k – duct cross-section [m²]
 S_e – damper active cross-section [m²]

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

			height H_w [mm]																						
			400						450						500						550				
			v [m/s]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]		
width B_w [mm]	400		4	0.160	0.145	2 085	3	21	0.180	0.164	2 359	3	21	0.200	0.183	2 632	3	22	0.220	0.202	2 906	3	22		
			6			3 128	3	24			3 538	3	25			3 948	3	25			4 359	3	25		
			8			4 170	4	28			4 717	4	28			5 265	4	28			5 812	4	28		
			10			5 213	6	31			5 897	6	31			6 581	5	32			7 265	5	32		
	450		4	0.180	0.164	2 359	3	21	0.203	0.185	2 668	3	22	0.225	0.207	2 978	3	22	0.248	0.228	3 288	2	23		
			6			3 538	3	25			4 002	3	25			4 467	3	25			4 931	3	25		
			8			4 717	4	28			5 337	4	28			5 956	4	28			6 575	4	29		
			10			5 897	6	31			6 671	5	32			7 445	5	32			8 219	5	32		
	500		4	0.200	0.183	2 632	3	22	0.225	0.207	2 978	3	22	0.250	0.231	3 324	2	23	0.275	0.255	3 669	2	23		
			6			3 948	3	25			4 467	3	25			4 985	3	25			5 504	3	26		
			8			5 265	4	28			5 956	4	28			6 647	4	29			7 338	4	29		
			10			6 581	5	32			7 445	5	32			8 309	5	32			9 173	5	32		
	550		4	0.220	0.202	2 906	3	22	0.248	0.228	3 288	2	23	0.275	0.255	4 015	2	23	0.303	0.281	4 432	2	23		
			6			4 359	3	25			4 931	3	25			6 022	3	26			6 648	3	26		
			8			5 812	4	28			6 575	4	29			8 029	4	29			8 865	4	29		
			10			7 265	5	32			8 219	5	32			10 037	5	32			11 081	5	32		
	600		4	0.240	0.221	3 180	3	22	0.270	0.250	3 597	2	23	0.300	0.279	4 015	2	23	0.330	0.308	4 432	2	24		
			6			4 769	3	25			5 396	3	26			6 022	3	26			6 648	3	26		
			8			6 359	4	29			7 194	4	29			8 029	4	29			8 865	4	29		
			10			7 949	5	32			8 993	5	32			10 037	5	32			11 081	5	32		
650		4	0.260	0.240	3 453	2	23	0.293	0.271	3 907	2	23	0.325	0.303	4 360	2	23	0.358	0.334	4 814	2	24			
		6			5 180	3	26			5 860	3	26			6 540	3	26			7 221	3	26			
		8			6 906	4	29			7 813	4	29			8 721	4	29			9 628	4	29			
		10			8 633	5	32			9 767	5	32			10 901	5	32			12 035	5	32			
700		4	0.280	0.259	3 727	2	23	0.315	0.293	4 216	2	23	0.350	0.327	4 706	2	24	0.385	0.361	5 196	2	24			
		6			5 590	3	26			6 324	3	26			7 059	3	26			7 793	3	27			
		8			7 453	4	29			8 433	4	29			9 412	4	29			10 391	4	30			
		10			9 317	5	32			10 541	5	32			11 765	5	32			12 989	5	33			

B_w – nominal width [mm]
H_w – nominal height [mm]

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H _w [mm]																							
		400						450						500						550					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]			
width B _w [mm]	750	4	0.300	0.278	4 000	2	23	0.338	0.314	4 526	2	24	0.375	0.351	5 052	2	24	0.413	0.387	5 577	2	24			
		6			6 000	3	26			6 789	3	26			7 577	3	27			8 366	3	27			
		8			8 001	4	29			9 052	4	29			10 103	4	30			11 154	4	30			
		10			10 001	5	32			11 315	5	32			12 629	5	33			13 943	5	33			
	800	4	0.320	0.297	4 274	2	24	0.360	0.336	4 836	2	23	0.400	0.375	5 397	2	24	0.440	0.414	5 959	2	25			
		6			6 411	3	26			7 253	3	26			8 096	3	27			8 938	3	27			
		8			8 548	4	29			9 671	4	29			10 794	4	29			11 917	4	30			
		10			10 685	5	33			12 089	5	32			13 493	5	32			14 897	5	33			
	850	4	0.340	0.316	4 548	2	24	0.383	0.357	5 145	2	23	0.425	0.399	5 743	2	24	0.468	0.440	6 340	2	25			
		6			6 821	3	26			7 718	3	26			8 614	3	26			9 510	3	27			
		8			9 095	4	30			10 290	4	29			11 485	4	29			12 681	4	30			
		10			11 369	5	33			12 863	5	32			14 357	5	32			15 851	4	33			
	900	4	0.360	0.335	4 821	2	24	0.405	0.379	5 455	2	23	0.450	0.423	6 088	2	24	0.495	0.467	6 722	2	25			
		6			7 232	3	27			8 182	3	26			9 132	3	26			10 083	3	27			
		8			9 642	4	30			10 909	4	28			12 177	4	29			13 444	4	30			
		10			12 053	5	33			13 637	5	31			15 221	5	32			16 805	4	33			
	950	4	0.380	0.354	5 095	2	24	0.428	0.400	5 764	2	23	0.475	0.447	6 434	2	24	0.523	0.493	6 722	2	25			
		6			7 642	3	27			8 646	3	25			9 651	3	26			10 083	3	28			
		8			10 189	4	30			11 529	4	28			12 868	4	29			13 444	4	30			
		10			12 737	5	33			14 411	5	31			16 085	5	32			16 805	4	33			
1000	4	0.400	0.373	3 727	2	24	0.450	0.422	4 216	2	23	0.500	0.471	4 706	2	24	0.550	0.520	5 196	2	25				
	6			5 590	3	27			6 324	3	26			7 059	3	26			7 793	3	28				
	8			7 453	4	30			8 433	4	29			9 412	4	29			10 391	4	31				
	10			9 317	5	33			10 541	5	32			11 765	4	32			12 989	4	33				
1050	4	0.420	0.392	4 000	2	25	0.473	0.443	4 526	2	23	0.525	0.495	5 052	2	24	0.578	0.546	5 577	2	26				
	6			6 000	3	27			6 789	3	26			7 577	3	26			8 366	3	28				
	8			8 001	4	30			9 052	4	29			10 103	4	29			11 154	3	31				
	10			10 001	5	33			11 315	5	32			12 629	4	32			13 943	4	33				
1100	4	0.440	0.411	4 274	2	25	0.495	0.465	4 836	2	23	0.550	0.519	5 397	2	24	0.605	0.573	5 959	2	26				
	6			6 411	3	27			7 253	3	25			8 096	3	26			8 938	3	28				
	8			8 548	4	30			9 671	4	28			10 794	4	29			11 917	3	31				
	10			10 685	5	33			12 089	5	31			13 493	4	32			14 897	4	34				
1150	4	0.460	0.430	4 548	2	25	0.518	0.486	5 145	2	23	0.575	0.543	5 743	2	24	0.633	0.599	6 340	2	26				
	6			6 821	3	28			7 718	3	25			8 614	3	26			9 510	3	28				
	8			9 095	4	31			10 290	4	28			11 485	4	29			12 681	3	31				
	10			11 369	5	34			12 863	5	31			14 357	4	32			15 851	4	34				
1200	4	0.480	0.449	4 821	2	25	0.540	0.508	5 455	2	23	0.600	0.567	6 088	2	24	0.660	0.626	6 722	2	26				
	6			7 232	3	28			8 182	3	25			9 132	3	26			10 083	3	28				
	8			9 642	4	31			10 909	4	28			12 177	4	29			13 444	3	31				
	10			12 053	5	34			13 637	5	31			15 221	4	32			16 805	4	34				
1250	4	0.500	0.468	6 736	2	25	0.563	0.529	7 646	2	23	0.625	0.591	8 434	2	24	0.688	0.652	9 222	2	26				
	6			10 104	3	28			11 529	3	25			12 954	3	26			14 379	3	29				
	8			13 473	4	31			15 299	4	28			17 124	4	29			18 949	3	31				
	10			16 841	5	34			19 117	4	31			21 247	4	32			23 367	4	34				

B_w – nominal width [mm]
 H_w – nominal height [mm]

v – velocity [m/s]
 S_k – duct cross-section [m²]
 S_e – damper active cross-section [m²]

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

			height H _w [mm]																							
			600						650						700						750					
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]			
width B _w [mm]	400	4	0.240	0.221	3 180	3	22	0.260	0.240	3 453	2	23	0.280	0.259	3 727	2	23	0.300	0.278	4 000	2	23				
		6			4 769	3	25			5 180	3	26			5 590	3	26			6 000	3	26				
		8			6 359	4	29			6 906	4	29			7 453	4	29			8 001	4	29				
		10			7 949	5	32			8 633	5	32			9 317	5	32			10 001	5	32				
	450	4	0.270	0.250	3 597	2	23	0.293	0.271	3 907	2	23	0.315	0.293	4 216	2	23	0.338	0.314	4 526	2	24				
		6			5 396	3	26			5 860	3	26			6 324	3	26			6 789	3	26				
		8			7 194	4	29			7 813	4	29			8 433	4	29			9 052	4	29				
		10			8 993	5	32			9 767	5	32			10 541	5	32			11 315	5	32				
	500	4	0.300	0.279	4 015	2	23	0.325	0.303	4 360	2	23	0.350	0.327	4 706	2	24	0.375	0.351	5 052	2	24				
		6			6 022	3	26			6 540	3	26			7 059	3	26			7 577	3	27				
		8			8 029	4	29			8 721	4	29			9 412	4	29			10 103	4	30				
		10			10 037	5	32			10 901	5	32			11 765	5	32			12 629	5	33				
	550	4	0.330	0.308	4 850	2	24	0.358	0.334	5 268	2	24	0.385	0.361	5 196	2	24	0.413	0.387	5 577	2	24				
		6			7 275	3	26			7 901	3	26			7 793	3	27			8 366	3	27				
		8			9 700	4	29			10 535	4	29			10 391	4	30			11 154	4	30				
		10			12 125	5	32			13 169	5	32			12 989	5	33			13 943	5	33				
	600	4	0.360	0.337	4 850	2	24	0.390	0.366	5 268	2	24	0.420	0.395	5 685	2	24	0.450	0.424	6 103	2	25				
		6			7 275	3	26			7 901	3	27			8 528	3	27			9 154	3	27				
		8			9 700	4	29			10 535	4	30			11 370	4	30			12 205	4	30				
		10			12 125	5	32			13 169	5	33			14 213	5	33			15 257	4	33				
650	4	0.390	0.366	5 268	2	24	0.423	0.397	5 721	2	24	0.455	0.429	6 175	2	25	0.488	0.460	6 628	2	25					
	6			7 901	3	27			8 582	3	27			9 262	3	27			9 942	3	27					
	8			10 535	4	30			11 442	4	30			12 349	4	30			13 257	4	30					
	10			13 169	5	33			14 303	5	33			15 437	4	33			16 571	4	33					
700	4	0.420	0.395	5 685	2	24	0.455	0.429	6 175	2	25	0.490	0.463	6 664	2	25	0.525	0.497	7 154	2	25					
	6			8 528	3	27			9 262	3	27			9 996	3	27			10 731	3	28					
	8			11 370	4	30			12 349	4	30			13 329	4	30			14 308	3	30					
	10			14 213	5	33			15 437	4	33			16 661	4	33			17 885	4	33					

B_w – nominal width [mm]
H_w – nominal height [mm]

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H _w [mm]																			
		600					650					700					750				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B _w [mm]	750	4		6 103	2	25			6 628	2	25			7 154	2	25			7 680	2	25
		6	0,450	9 154	3	27	0,488	0,460	9 942	3	27	0,525	0,497	10 731	3	28	0,563	0,533	11 519	3	28
		8		12 205	4	30			13 257	4	30			14 308	3	30			15 359	3	30
		10		15 257	4	33			16 571	4	33			17 885	4	33			19 199	4	33
	800	4		6 520	2	25			7 082	2	25			7 644	2	23			8 205	2	26
		6	0,480	9 780	3	27	0,520	0,492	10 623	3	27	0,560	0,531	11 465	3	25	0,600	0,570	12 308	3	28
		8		13 041	4	30			14 164	3	30			15 287	3	28			16 410	3	31
		10		16 301	4	33			17 705	4	33			19 109	4	30			20 513	4	33
	850	4		6 938	2	25			7 536	2	25			8 133	2	26			8 731	2	26
		6	0,510	10 407	3	27	0,553	0,523	11 303	3	27	0,595	0,565	12 200	3	28	0,638	0,606	13 096	3	28
		8		13 876	4	30			15 071	3	30			16 266	3	31			17 461	3	31
		10		17 345	4	33			18 839	4	33			20 333	4	33			21 827	4	33
	900	4		7 356	2	25			7 989	2	25			8 623	2	26			9 256	2	26
		6	0,540	11 033	3	25	0,585	0,555	11 984	3	27	0,630	0,599	12 934	3	28	0,675	0,643	13 884	3	28
		8		14 711	3	28			15 978	3	30			17 245	3	31			18 513	3	31
		10		18 389	4	30			19 973	4	32			21 557	4	33			23 141	4	34
	950	4		7 773	2	26			8 443	2	25			9 112	2	26			9 782	2	26
		6	0,570	11 660	3	28	0,618	0,586	12 664	3	27	0,665	0,633	13 668	3	28	0,713	0,679	14 673	3	29
		8		15 546	3	31			16 885	3	30			18 225	3	31			19 564	3	31
		10		19 433	4	33			21 107	4	32			22 781	4	34			24 455	4	34
	1000	4		5 685	2	24			6 175	2	24			6 664	2	25			7 154	2	27
		6	0,600	8 528	3	26	0,650	0,618	9 262	3	27	0,700	0,667	9 996	3	27	0,750	0,716	10 731	3	29
		8		11 370	3	29			12 349	3	29			13 329	3	29			14 308	3	31
		10		14 213	4	32			15 437	4	32			16 661	4	32			17 885	4	34
width B _w [mm]	1050	4		6 103	2	24			6 628	2	25			7 154	2	25			7 680	2	27
		6	0,630	9 154	3	27	0,683	0,649	9 942	3	27	0,735	0,701	10 731	3	27	0,788	0,752	11 519	3	29
		8		12 205	3	29			13 257	3	29			14 308	3	30			15 359	3	31
		10		15 257	4	32			16 571	4	32			17 885	4	32			19 199	4	34
	1100	4		6 520	2	25			7 082	2	25			7 644	2	23			8 205	2	27
		6	0,660	9 780	3	27	0,715	0,681	10 623	3	27	0,770	0,735	11 465	3	25	0,825	0,789	12 308	3	29
		8		13 041	3	30			14 164	3	29			15 287	3	27			16 410	3	31
		10		16 301	4	32			17 705	4	32			19 109	4	29			20 513	4	34
	1150	4		6 938	2	25			7 536	2	25			8 133	2	26			8 731	2	26
		6	0,690	10 407	3	27	0,748	0,712	11 303	3	27	0,805	0,769	12 200	3	28	0,863	0,825	13 096	3	28
		8		13 876	3	30			15 071	3	29			16 266	3	30			17 461	3	30
		10		17 345	4	32			18 839	4	32			20 333	4	33			21 827	4	33
	1200	4		7 356	2	25			7 989	2	25			8 623	2	26			9 256	2	26
		6	0,720	11 033	3	25	0,780	0,744	11 984	3	27	0,840	0,803	12 934	3	28	0,900	0,862	13 884	3	28
		8		14 711	3	28			15 978	3	29			17 245	3	30			18 513	3	30
		10		18 389	4	30			19 973	4	32			21 557	4	33			23 141	4	33
	1250	4		7 773	2	25			8 443	2	25			9 112	2	26			9 782	2	26
		6	0,750	11 660	3	28	0,813	0,775	12 664	3	27	0,875	0,837	13 668	3	28	0,938	0,898	14 673	3	28
		8		15 546	3	30			16 885	3	29			18 225	3	30			19 564	3	31
		10		19 433	4	33			21 107	4	32			22 781	4	33			24 455	4	33

B_w – nominal width [mm]
H_w – nominal height [mm]

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H _w [mm]																							
			800						850						900						950					
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]			
width B _w [mm]	400	4	0,320	0,297	20 212	2	24	0,340	0,316	22 203	2	24	0,360	0,335	24 196	2	24	0,380	0,354	26 191	2	24				
		6			24 551	3	26			26 483	3	26			28 475	3	27			30 508	3	27				
		8			28 983	4	29			30 942	4	30			33 000	4	30			35 123	4	30				
		10			33 167	5	33			35 213	5	33			37 382	5	33			39 632	5	33				
	450	4	0,360	0,336	23 382	2	24	0,383	0,357	25 657	2	24	0,405	0,379	27 936	2	24	0,428	0,400	30 218	2	25				
		6			28 206	3	27			30 394	3	27			32 655	3	27			34 964	3	27				
		8			33 156	4	30			35 357	4	30			37 676	4	30			40 072	4	30				
		10			37 845	5	33			40 131	5	33			42 562	5	33			45 088	5	33				
	500	4	0,400	0,375	26 621	2	24	0,425	0,399	29 184	2	24	0,450	0,423	31 752	2	25	0,475	0,447	34 326	2	25				
		6			31 927	3	27			34 375	3	27			36 908	3	27			39 496	3	27				
		8			37 394	4	30			39 840	4	30			42 421	4	30			45 092	4	30				
		10			42 586	5	33			45 114	5	33			47 807	5	33			50 612	5	33				
	550	4	0,440	0,414	29 922	2	25	0,468	0,440	32 776	2	25	0,495	0,467	35 638	2	25	0,523	0,493	38 508	2	25				
		6			35 708	3	27			38 420	3	27			41 228	3	27			44 099	3	28				
		8			41 689	4	30			44 383	4	30			47 230	4	30			50 179	4	30				
		10			47 384	5	33			50 155	5	33			53 114	5	33			56 198	5	33				
	600	4	0,480	0,453	33 279	2	25	0,510	0,482	36 428	2	25	0,540	0,511	39 588	2	25	0,570	0,540	42 756	2	26				
		6			39 545	3	27			42 522	3	27			45 609	3	28			48 766	3	28				
		8			46 039	4	30			48 982	4	30			52 098	4	30			55 328	4	31				
		10			52 234	5	33			55 251	5	33			58 477	5	33			61 844	5	33				
650	4	0,520	0,492	34 338	2	25	0,553	0,523	35 303	2	25	0,585	0,555	36 170	2	25	0,618	0,586	36 951	2	25					
	6			40 650	3	27			41 059	3	27			41 522	3	27			41 997	3	27					
	8			47 208	3	30			47 177	3	30			47 308	3	30			47 524	3	30					
	10			53 474	4	33			53 126	4	33			53 010	4	32			53 028	4	32					
700	4	0,560	0,531	37 574	2	25	0,595	0,565	38 609	2	26	0,630	0,599	39 539	2	26	0,665	0,633	40 379	2	26					
	6			44 332	3	28			44 758	3	28			45 246	3	28			45 750	3	28					
	8			51 368	3	30			51 311	3	31			51 433	3	31			51 652	3	31					
	10			58 102	4	33			57 694	4	33			57 544	4	33			57 543	4	34					

B_w – nominal width [mm]
H_w – nominal height [mm]

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H _w [mm]																							
			800						850						900						950					
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]			
width B _w [mm]	750	4			40 850	2	26			41 955	2	26			42 949	2	26			43 848	2	26				
		6	0.600	0.570	48 055	3	28	0.638	0.606	48 498	3	28	0.675	0.643	49 011	3	28	0.713	0.679	49 544	3	29				
		8			55 568	3	31			55 484	3	31			55 598	3	31			55 818	3	31				
		10			62 769	4	33			62 301	4	33			62 116	4	34			62 096	4	34				
	800	4			44 166	2	26			45 340	2	26			46 398	2	26			47 355	2	27				
		6	0.640	0.609	51 816	3	28	0.680	0.648	52 275	3	28	0.720	0.687	52 813	3	29	0.760	0.726	53 375	3	29				
		8			59 806	3	31			59 695	3	31			59 800	3	31			60 022	3	31				
		10			67 474	4	33			66 945	4	34			66 724	4	34			66 684	4	34				
	850	4			47 517	2	26			48 761	2	26			49 883	2	26			50 898	2	26				
		6	0.680	0.648	55 612	3	28	0.723	0.689	56 088	3	28	0.765	0.731	56 651	3	28	0.808	0.772	57 242	3	28				
		8			64 080	3	31			63 940	3	30			64 036	3	30			64 260	3	30				
		10			72 213	4	33			71 624	4	33			71 367	4	33			71 306	4	33				
	900	4			50 903	2	26			52 217	2	26			53 402	2	26			54 476	2	26				
		6	0.720	0.687	59 443	3	28	0.765	0.731	59 935	3	28	0.810	0.775	60 523	3	28	0.855	0.819	61 142	3	28				
		8			68 387	3	31			68 219	3	31			68 306	3	31			68 531	3	30				
		10			76 986	4	33			76 335	4	33			76 042	4	33			75 960	4	33				
	950	4			54 320	2	26			55 704	2	26			56 953	2	26			58 085	2	26				
		6	0.760	0.726	63 305	3	28	0.808	0.772	63 814	3	28	0.855	0.819	64 426	3	28	0.903	0.865	65 073	3	28				
		8			72 725	3	31			72 529	3	31			72 606	3	31			72 832	3	31				
		10			81 789	4	33			81 076	4	33			80 747	4	33			80 645	4	33				
1000	4			40 094	2	27			41 103	2	27			42 014	2	27			42 840	2	27					
	6	0.800	0.765	46 638	3	29	0.850	0.814	47 003	3	29	0.900	0.863	47 445	3	29	0.950	0.912	47 914	3	29					
	8			53 506	3	31			53 351	3	31			53 397	3	32			53 555	3	32					
	10			60 120	4	34			59 582	4	34			59 328	4	34			59 243	4	34					
1050	4			43 417	2	27			44 496	2	27			45 472	2	27			46 357	2	28					
	6	0.840	0.804	50 415	3	29	0.893	0.855	50 799	3	29	0.945	0.907	51 268	3	29	0.998	0.958	51 767	3	30					
	8			57 768	3	31			57 588	3	32			57 629	3	32			57 791	3	32					
	10			64 853	4	34			64 259	4	34			63 973	4	34			63 871	4	34					
1100	4			46 773	2	27			47 923	2	27			48 964	2	28			49 908	2	28					
	6	0.880	0.843	54 226	3	29	0.935	0.897	54 628	3	29	0.990	0.951	55 124	3	30	1.045	1.005	55 653	3	30					
	8			62 061	3	32			61 857	3	32			61 892	3	32			62 057	3	32					
	10			69 616	4	34			68 966	4	34			68 648	4	34			68 528	4	34					
1150	4			50 162	2	26			51 383	2	26			52 488	2	26			53 491	2	26					
	6	0.920	0.882	58 067	3	28	0.978	0.938	58 488	3	28	1.035	0.995	59 010	3	28	1.093	1.051	59 569	3	28					
	8			66 385	3	30			66 157	3	30			66 184	3	30			66 353	3	30					
	10			74 410	4	33			73 703	4	32			73 351	4	32			73 214	4	32					
1200	4			53 582	2	26			54 874	2	26			56 043	2	26			57 104	2	26					
	6	0.960	0.921	61 939	3	28	1.020	0.980	62 378	3	28	1.080	1.039	62 926	3	28	1.140	1.098	63 514	3	28					
	8			70 738	3	30			70 485	3	30			70 505	3	30			70 676	3	30					
	10			79 232	4	33			78 467	4	33			78 083	4	33			77 926	4	32					
1250	4			57 031	2	26			58 393	2	26			59 627	2	26			60 747	2	26					
	6	1.000	0.960	65 839	3	28	1.063	1.021	66 296	3	28	1.125	1.083	66 871	3	28	1.188	1.144	67 488	3	28					
	8			75 119	3	30			74 840	3	30			74 853	3	30			75 027	3	30					
	10			84 082	4	33			83 258	4	33			82 840	4	33			82 665	4	33					

B_w – nominal width [mm]
 H_w – nominal height [mm]

v – velocity [m/s]
 S_k – duct cross-section [m²]
 S_e – damper active cross-section [m²]

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

			height H_w [mm]																							
			1000						1050						1100						1150					
			v [m/s]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]			
width B_w [mm]	400	4	0.400	0.373	28 190	2	24	0.420	0.392	30 194	2	25	0.440	0.411	32 203	2	25	0.460	0.430	34 220	2	25				
		6			32 569	3	27			34 653	3	27			36 756	3	27			38 876	3	28				
		8			37 293	4	30			39 498	4	30			41 732	4	30			43 989	4	31				
		10			41 939	5	33			44 291	5	33			46 677	5	33			49 092	5	34				
	450	4	0.450	0.422	32 506	2	25	0.473	0.443	34 799	2	25	0.495	0.465	37 100	2	25	0.518	0.486	39 409	2	25				
		6			37 307	3	27			39 677	3	27			42 069	3	28			44 481	3	28				
		8			42 523	4	30			45 015	4	30			47 542	4	31			50 097	4	31				
		10			47 682	5	33			50 329	5	33			53 016	5	33			55 738	5	34				
	500	4	0.500	0.471	36 907	2	25	0.525	0.495	39 495	2	25	0.550	0.519	42 091	2	25	0.575	0.543	44 697	2	26				
		6			42 125	3	28			44 785	3	28			47 470	3	28			50 179	3	28				
		8			47 827	4	30			50 611	4	31			53 433	4	31			56 288	4	31				
		10			53 495	4	33			56 438	4	33			59 429	4	34			62 459	4	34				
	550	4	0.550	0.520	41 385	2	25	0.578	0.546	44 271	2	26	0.605	0.573	47 167	2	26	0.633	0.599	50 074	2	26				
		6			47 016	3	28			49 969	3	28			52 952	3	28			55 960	3	28				
		8			53 201	4	31			56 278	3	31			59 399	3	31			62 556	3	31				
		10			59 372	4	33			62 615	4	33			65 911	4	34			69 251	4	34				
	600	4	0.600	0.569	45 934	2	26	0.630	0.598	49 122	2	26	0.660	0.627	52 321	2	26	0.690	0.656	55 531	2	26				
		6			51 976	3	28			55 225	3	28			58 507	3	28			61 818	3	29				
		8			58 639	3	31			62 011	3	31			65 434	3	31			68 897	3	31				
		10			65 311	4	33			68 854	4	34			72 458	4	34			76 111	4	34				
650	4	0.650	0.618	37 661	2	25	0.683	0.649	38 310	2	25	0.715	0.681	38 907	2	25	0.748	0.712	39 460	2	25					
	6			42 466	3	27			42 922	3	27			43 360	3	27			43 779	3	27					
	8			47 785	3	30			48 070	3	29			48 365	3	29			48 663	3	29					
	10			53 128	4	32			53 277	4	32			53 458	4	32			53 658	4	32					
700	4	0.700	0.667	41 142	2	26	0.735	0.701	41 840	2	26	0.770	0.735	42 483	2	27	0.805	0.769	43 078	2	27					
	6			46 250	3	28			46 736	3	29			47 204	3	29			47 652	3	29					
	8			51 922	3	31			52 219	3	31			52 529	3	31			52 843	3	31					
	10			57 633	4	34			57 780	4	34			57 963	4	34			58 169	4	34					

B_w – nominal width [mm]
H_w – nominal height [mm]

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H _w [mm]																			
		1000					1050					1100					1150				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B _w [mm]	750	4		44 664	2	27			45 412	2	27			46 100	2	27			46 738	2	27
		6	0.750	50 074	3	29	0.788	0.752	50 590	3	29	0.825	0.789	51 088	3	29	0.863	0.825	51 566	3	29
		8		56 097	3	31			56 406	3	31			56 731	3	31			57 062	3	32
		10		62 176	4	34			62 321	4	34			62 505	4	34			62 716	4	34
	800	4		48 225	2	27			47 122	2	27			49 166	2	27			50 435	2	27
		6	0.800	53 935	3	29	0.840	0.804	52 581	3	29	0.880	0.843	54 419	3	29	0.920	0.882	55 516	3	29
		8		60 308	3	31			58 730	3	31			60 380	3	32			61 316	3	32
		10		66 755	4	34			64 996	4	34			66 493	4	34			67 298	4	34
	850	4		51 822	2	26			50 058	2	26			52 232	2	26			54 169	2	26
		6	0.850	57 832	3	28	0.893	0.855	55 798	3	28	0.935	0.897	57 750	3	28	0.978	0.938	59 502	3	28
		8		64 554	3	30			62 278	3	30			64 026	3	30			65 605	3	30
		10		71 367	4	33			68 894	4	33			70 476	4	33			71 912	4	32
	900	4		55 453	2	26			52 993	2	26			55 296	2	26			57 937	2	26
		6	0.900	61 761	3	28	0.945	0.907	59 014	3	28	0.990	0.951	61 079	3	28	1.035	0.995	63 520	3	28
		8		68 833	3	30			65 823	3	30			67 670	3	30			69 925	3	30
		10		76 010	4	33			72 790	4	33			74 457	4	33			76 558	4	33
	950	4		59 116	2	26			55 929	2	26			58 361	2	26			61 737	2	26
		6	0.950	65 723	3	28	0.998	0.958	62 228	3	28	1.045	1.005	64 407	3	28	1.093	1.051	67 571	3	28
		8		73 142	3	30			69 368	3	30			71 312	3	30			74 276	3	30
		10		80 684	4	33			76 683	4	33			78 435	4	33			81 233	4	33
	1000	4		43 592	2	28			41 446	2	28			42 082	2	28			45 507	2	28
		6	1.000	48 385	3	30	1.050	1.010	46 012	3	30	1.100	1.059	46 461	3	30	1.150	1.108	49 729	3	30
		8		53 775	3	32			51 196	3	32			51 471	3	32			54 591	3	32
		10		59 263	4	34			56 515	4	34			56 647	4	35			59 644	4	35
	1050	4		47 163	2	28			45 035	2	28			45 716	2	28			49 215	2	28
		6	1.050	52 270	3	30	1.103	1.061	49 896	3	30	1.155	1.113	50 375	3	30	1.208	1.164	53 705	3	30
		8		58 021	3	32			55 423	3	32			55 714	3	32			58 883	3	32
		10		63 883	4	34			61 102	4	35			61 237	4	35			64 273	4	35
	1100	4		50 768	2	28			46 760	2	28			48 798	2	28			52 958	2	29
		6	1.100	56 186	3	30	1.155	1.113	51 915	3	30	1.210	1.167	53 735	3	30	1.265	1.221	57 713	3	30
		8		62 297	3	32			57 783	3	32			59 400	3	32			63 205	3	33
		10		68 533	4	35			63 821	4	35			65 270	4	35			68 930	4	35
	1150	4		54 405	2	26			49 711	2	26			51 878	2	26			56 733	2	25
		6	1.150	60 133	3	27	1.208	1.164	55 157	3	27	1.265	1.221	57 091	3	27	1.323	1.277	61 751	3	27
		8		66 602	3	30			61 366	3	30			63 082	3	30			67 556	3	29
		10		73 210	4	32			67 761	4	32			69 296	4	32			73 614	4	32
	1200	4		58 072	2	26			52 660	2	26			54 957	2	26			60 538	2	26
		6	1.200	64 110	3	28	1.260	1.216	58 396	3	28	1.320	1.275	60 445	3	28	1.380	1.334	65 818	3	28
		8		70 935	3	30			64 944	3	30			66 759	3	30			71 934	3	30
		10		77 914	4	32			71 695	4	32			73 317	4	32			78 324	4	32
	1250	4		61 769	2	26			55 607	2	26			58 034	2	26			64 371	2	26
		6	1.250	68 114	3	28	1.313	1.267	61 633	3	28	1.375	1.329	63 796	3	28	1.438	1.390	69 912	3	28
		8		75 295	3	30			68 518	3	30			70 433	3	30			76 338	3	30
		10		82 644	4	32			75 625	4	32			77 332	4	32			83 059	4	32

B_w – nominal width [mm]
H_w – nominal height [mm]

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

		height H _w [mm]									
		1200					1250				
	v	S _k	S _e	Q	d _p	L _{WA}	S _k	S _e	Q	d _p	L _{WA}
	[m/s]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]	[m ²]	[m ²]	[m ³ /h]	[Pa]	[dB]
width B _w [mm]	400	4	0.480	0.449	36 243	2	0.500	0.468	38 275	2	25
		6			41 010	3			43 158	3	28
		8			46 268	4			48 564	4	31
		10			51 532	5			53 993	5	34
	450	4	0.540	0.508	41 727	2	0.563	0.529	44 053	2	26
		6			46 911	3			49 356	3	28
		8			52 675	4			55 275	4	31
		10			58 488	5			61 263	4	34
	500	4	0.600	0.567	47 312	2	0.625	0.591	49 938	2	26
		6			52 907	3			55 653	3	28
		8			59 170	4			62 077	4	31
		10			65 522	4			68 613	4	34
	550	4	0.660	0.626	52 991	2	0.688	0.652	55 920	2	26
		6			58 990	3			62 040	3	29
		8			65 745	3			68 961	3	31
		10			72 629	4			76 039	4	34
	600	4	0.720	0.685	58 754	2	0.750	0.714	61 989	2	27
		6			65 153	3			68 511	3	29
		8			72 395	3			75 923	3	31
		10			79 806	4			83 537	4	34
	650	4	0.780	0.744	39 974	2	0.813	0.775	40 455	2	25
		6			44 180	3			44 563	3	27
		8			48 960	3			49 253	3	29
		10			53 869	4			54 088	4	32
	700	4	0.840	0.803	43 632	2	0.875	0.837	44 150	2	27
		6			48 082	3			48 492	3	29
		8			53 157	3			53 468	3	32
		10			58 388	4			58 616	4	34

B_w – nominal width [mm]
H_w – nominal height [mm]

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

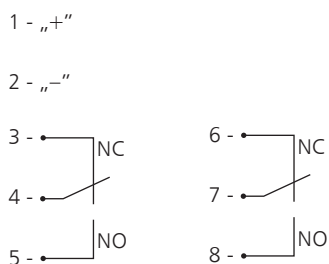
Q – flow [m³/h]
d_p – pressure drop [Pa]
L_{WA} – damper noise level [dB]

		height H _w [mm]										
		1200						1250				
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B _w [mm]	750	4	0.900	0.862	47 331	2	27	0.938	0.898	47 886	2	27
		6			52 023	3	29			52 461	3	29
		8			57 393	3	32			57 721	3	32
		10			62 943	4	34			63 179	4	34
	800	4	0.960	0.921	51 068	2	28	1.000	0.960	51 070	2	28
		6			56 002	3	30			55 878	3	30
		8			61 665	3	32			61 421	3	32
		10			67 532	4	34			67 188	4	34
	850	4	1.020	0.980	54 841	2	26	1.063	1.021	54 254	2	26
		6			60 016	3	28			59 292	3	28
		8			65 970	3	30			65 117	3	30
		10			72 153	4	32			71 191	4	32
	900	4	1.080	1.039	58 649	2	26	1.125	1.083	57 438	2	26
		6			58 606	3	28			62 706	3	28
		8			64 851	3	30			68 811	3	30
		10			69 972	4	33			75 192	4	32
	950	4	1.140	1.098	62 488	2	26	1.188	1.144	60 621	2	26
		6			68 141	3	28			66 118	3	28
		8			74 675	3	30			72 503	3	30
		10			81 487	4	33			79 189	4	33
	1000	4	1.200	1.157	43 219	2	28	1.250	1.206	43 732	2	29
		6			47 308	3	30			47 707	3	30
		8			52 043	3	32			52 331	3	33
		10			56 989	4	35			57 183	4	35
	1050	4	1.260	1.216	46 936	2	29	1.313	1.267	47 486	2	29
		6			51 281	3	30			51 707	3	31
		8			56 322	3	33			56 628	3	33
		10			61 594	4	35			61 798	4	35
1100	4	1.320	1.275	50 689	2	29	1.375	1.329	50 687	2	29	
	6			55 289	3	31			55 153	3	31	
	8			60 633	3	33			60 367	3	33	
	10			66 231	4	35			65 854	4	35	
1150	4	1.380	1.334	54 478	2	25	1.438	1.390	53 886	2	25	
	6			59 330	3	27			58 595	3	27	
	8			64 975	3	29			64 102	3	29	
	10			70 897	4	32			69 904	4	32	
1200	4	1.440	1.393	58 299	2	26	1.500	1.452	57 084	2	26	
	6			57 945	3	27			62 034	3	27	
	8			63 891	3	30			67 831	3	30	
	10			68 758	4	32			73 947	4	32	
1250	4	1.500	1.452	62 151	2	26	1.563	1.513	60 280	2	26	
	6			67 503	3	28			65 471	3	28	
	8			73 747	3	30			71 556	3	30	
	10			80 312	4	32			77 984	4	32	

17.7 | Trigger control mechanisms – specifications and connections diagram

execution type	EM24D + WK2
limit switch	250 V AC / 5A
rated voltage	24 V DC / pulse
power consumption	max 5 W

» electrical connections diagram for mcr DOR EM24D + WK2 damper



NOTE: the position of limit switches in standby

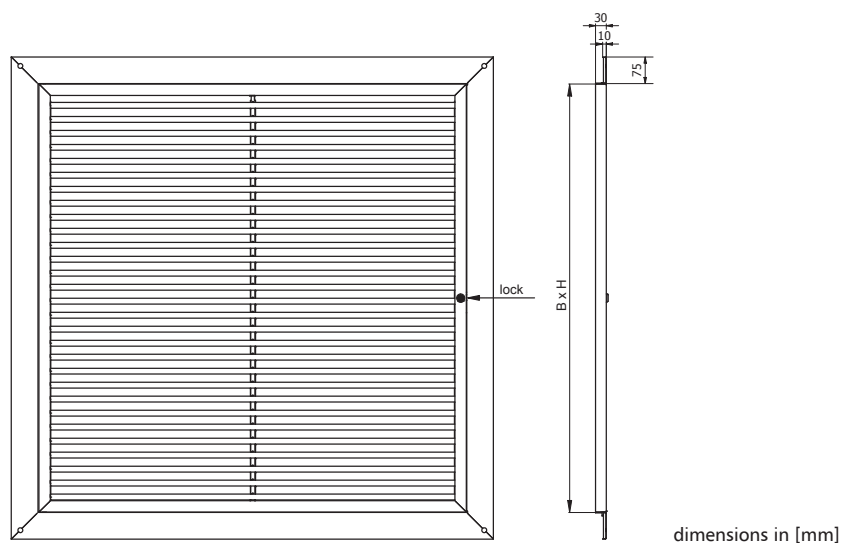
If the MP 230/24 element is used, the damper may be controlled (supplied) with 230 V AC voltage.

17.8 | Estimated weight of the mcr DOR rectangular dampers

		Width B [mm]															
		500	550	600	650	700	750	800	850	900	950	1 000	1050	1 100	1150	1 200	1250
Height H [mm]	400	8	9	9	10	11	11	12	12	13	14	14	15	16	16	17	17
	450	9	10	10	11	12	12	13	14	14	15	16	16	17	18	18	19
	500	10	10	11	12	12	13	14	15	15	16	17	18	18	19	20	21
	550	10	11	12	13	13	14	15	16	17	17	18	19	20	21	21	22
	600	11	12	13	14	14	15	16	17	18	19	19	20	21	22	23	24
	650	12	13	14	14	15	16	17	18	19	20	21	22	23	23	24	25
	700	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27
	750	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
	800	14	15	16	17	18	19	20	21	22	24	25	26	27	28	29	30
	850	15	16	17	18	19	20	21	23	24	25	26	27	28	29	30	31
	900	15	17	18	19	20	21	22	24	25	26	27	28	29	31	32	33
	950	16	17	19	20	21	22	24	25	26	27	28	30	31	32	33	35
	1000	17	18	19	21	22	23	25	26	27	28	30	31	32	34	35	36
	1050	18	19	20	22	23	24	26	27	28	30	31	32	34	35	36	38
	1100	18	20	21	23	24	25	27	28	29	31	32	34	35	36	38	39
	1150	19	21	22	23	25	26	28	29	31	32	34	35	36	38	39	41
	1200	20	21	23	24	26	27	29	30	32	33	35	36	38	39	41	42
	1250	21	22	24	25	27	28	30	31	33	35	36	38	39	41	42	44

17.9 | Accessories

17.9.1 | MWD grille



WD system masking grilles are designed to fulfill either supply or exhaust function. They allow for an aesthetic system termination. They come with adjustable louvers that cover the damper, reducing its visibility. The masking grille body is fixed to the damper using bolts or a latch system. Such a solution allows for installing the product even in the most visually-demanding applications. The masking grilles are painted in RAL 9010 as a standard (available in any colour from the RAL range on request).

dimensions:

- » nominal width B: from 200 to 1250 mm
- » nominal height H from 200 mm to 1250 mm
- » nominal thickness G 10 mm

Apart from the standard dimensions, masking grilles may be manufactured with intermediate dimensions.

Marking:

mcr MWD / B x H / 1

- additional parameters
- width x height
- grille type

17.9.2 | MWD grille technical parameters

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

v – velocity [m/s]
S_e – grille active cross-section [m²]

Q – flow [m³/h]
d_p – pressure drop [Pa]

		height H [mm]											
		200				300			400			500	
	v [m/s]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]
width B [mm]	200	4	210	12	0.015	403	10	0.041	596	9	0.055	789	9
		6	315	27		605	23		894	21		1 184	20
		8	420	49		806	41		1 192	37		1 578	35
		10	526	76		1 008	64		1 490	58		1 973	54
	300	4	402	10	0.028	734	8	0.074	1 067	7	0.097	1 400	7
		6	603	23		1 102	19		1 601	17		2 100	15
		8	804	41		1 469	33		2 134	29		2 799	27
		10	1 004	64		1 836	52		2 668	46		3 499	42
	400	4	593	9	0.041	1 066	7	0.107	1 538	6	0.140	2 010	6
		6	890	21		1 598	17		2 307	14		3 015	13
		8	1 187	37		2 131	29		3 076	26		4 020	23
		10	1 483	58		2 664	46		3 845	40		5 026	36
	500	4	785	9	0.055	1 397	7	0.140	2 009	6	0.182	2 621	5
		6	1 177	20		2 095	15		3 013	13		3 931	12
		8	1 570	35		2 794	27		4 018	23		5 242	21
		10	1 962	55		3 492	42		5 022	36		6 552	33
	600	4	976	8	0.068	1 728	6	0.172	2 480	5	0.224	3 231	5
		6	1 464	19		2 592	14		3 720	12		4 847	11
		8	1 953	33		3 456	26		4 959	22		6 463	19
		10	2 441	52		4 320	40		6 199	34		8 078	30
	700	4	1 168	8	0.081	2 059	6	0.205	2 951	5	0.267	3 842	5
		6	1 752	18		3 089	14		4 426	12		5 763	10
		8	2 336	32		4 118	25		5 901	21		7 684	18
		10	2 920	50		5 148	38		7 376	32		9 605	29
	800	4	1 359	8	0.094	2 390	6	0.238	3 421	5	0.309	4 452	4
		6	2 039	18		3 586	13		5 132	11		6 679	10
		8	2 719	31		4 781	24		6 843	20		8 905	17
		10	3 398	49		5 976	37		8 554	31		11 131	27
	900	4	1 551	8	0.108	2 722	6	0.270	3 892	5	0.352	5 063	4
		6	2 326	17		4 082	13		5 838	11		7 595	9
		8	3 102	31		5 443	23		7 785	19		10 126	17
		10	3 877	48		6 804	36		9 731	30		12 658	26
	1000	4	1 742	8	0.121	3 053	6	0.303	4 363	5	0.394	5 674	4
		6	2 614	17		4 579	13		6 545	10		8 510	9
		8	3 485	30		6 106	23		8 726	19		11 347	16
		10	4 356	47		7 632	35		10 908	29		14 184	25
	1100	4	1 934	7	0.134	3 384	6	0.336	4 834	5	0.436	6 284	4
		6	2 901	17		5 076	12		7 251	10		9 426	9
		8	3 868	30		6 768	22		9 668	18		12 568	16
		10	4 835	47		8 460	35		12 085	28		15 710	25
	1200	4	2 125	7	0.148	3 715	5	0.368	5 305	4	0.479	6 895	4
		6	3 188	17		5 573	12		7 957	10		10 342	9
		8	4 251	30		7 430	22		10 610	18		13 789	16
		10	5 314	46		9 288	34		13 262	28		17 237	24
	1300	4	2 317	7	0.161	4 046	5	0.401	5 776	4	0.521	7 505	4
		6	3 475	16		6 070	12		8 664	10		11 258	9
		8	4 634	29		8 093	21		11 552	18		15 011	15
		10	5 792	46		10 116	34		14 440	27		18 763	24
	1400	4	2 508	7	0.174	4 378	5	0.434	6 247	4	0.564	8 116	4
		6	3 763	16		6 566	12		9 370	10		12 174	8
		8	5 017	29		8 755	21		12 493	17		16 232	15
		10	6 271	45		10 944	33		15 617	27		20 290	23

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

v – velocity [m/s]
S_e – grille active cross-section [m²]

Q – flow [m³/h]
d_p – pressure drop [Pa]

		height H [mm]											
		600			700			800			900		
	v [m/s]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]
width B [mm]	200	4	982	8	0.082	1 175	8	0.095	1 368	8	0.108	1 558	8
		6	1 473	19		1 763	18		2 052	18		2 337	17
		8	1 964	33		2 350	32		2 736	31		3 116	31
		10	2 455	52		2 938	50		3 420	49		3 895	48
	300	4	1 732	6	0.143	2 065	6	0.167	2 398	6	0.189	2 726	6
		6	2 598	14		3 097	14		3 596	13		4 089	13
		8	3 465	25		4 130	24		4 795	24		5 452	23
		10	4 331	40		5 162	38		5 994	37		6 815	36
	400	4	2 483	5	0.205	2 955	5	0.238	3 427	5	0.270	3 894	5
		6	3 724	12		4 432	12		5 141	11		5 841	11
		8	4 965	22		5 910	21		6 854	20		7 788	19
		10	6 206	34		7 387	32		8 568	31		9 734	30
	500	4	3 233	5	0.267	3 845	5	0.310	4 457	4	0.352	5 062	4
		6	4 849	11		5 767	10		6 685	10		7 592	9
		8	6 466	19		7 690	18		8 914	17		10 123	17
		10	8 082	30		9 612	28		11 142	27		12 654	26
	600	4	3 983	4	0.329	4 735	4	0.381	5 486	4	0.433	6 229	4
		6	5 975	10		7 102	9		8 230	9		9 344	9
		8	7 966	18		9 469	17		10 973	16		12 459	15
		10	9 958	28		11 837	26		13 716	25		15 574	24
	700	4	4 733	4	0.391	5 625	4	0.453	6 516	4	0.514	7 397	4
		6	7 100	9		8 437	9		9 774	8		11 096	8
		8	9 467	17		11 249	16		13 032	15		14 795	14
		10	11 833	26		14 062	24		16 290	23		18 493	22
	800	4	5 484	4	0.452	6 515	4	0.524	7 546	3	0.595	8 565	3
		6	8 225	9		9 772	8		11 318	8		12 848	8
		8	10 967	16		13 029	15		15 091	14		17 130	13
		10	13 709	25		16 286	23		18 864	22		21 413	21
	900	4	6 234	4	0.514	7 404	4	0.596	8 575	3	0.676	9 733	3
		6	9 351	9		11 107	8		12 863	7		14 599	7
		8	12 468	15		14 809	14		17 150	13		19 466	13
		10	15 584	24		18 511	22		21 438	21		24 332	20
	1000	4	6 984	4	0.576	8 294	3	0.667	9 605	3	0.757	10 901	3
		6	10 476	8		12 442	8		14 407	7		16 351	7
		8	13 968	15		16 589	14		19 210	13		21 802	12
		10	17 460	23		20 736	21		24 012	20		27 252	19
	1100	4	7 734	4	0.638	9 184	3	0.739	10 634	3	0.838	12 069	3
		6	11 601	8		13 776	7		15 952	7		18 103	7
		8	15 468	14		18 369	13		21 269	12		24 137	12
		10	19 336	22		22 961	21		26 586	19		30 172	18
	1200	4	8 484	3	0.700	10 074	3	0.810	11 664	3	0.919	13 236	3
		6	12 727	8		15 111	7		17 496	7		19 855	6
		8	16 969	14		20 148	13		23 328	12		26 473	11
		10	21 211	22		25 186	20		29 160	19		33 091	18
	1300	4	9 235	3	0.761	10 964	3	0.882	12 694	3	1.000	14 404	3
		6	13 852	8		16 446	7		19 040	7		21 606	6
		8	18 469	14		21 928	13		25 387	12		28 809	11
		10	23 087	21		27 410	20		31 734	18		36 011	17
	1400	4	9 985	3	0.823	11 854	3	0.953	13 723	3	1.081	15 572	3
		6	14 977	8		17 781	7		20 585	6		23 358	6
		8	19 970	13		23 708	12		27 446	11		31 144	11
		10	24 962	21		29 635	19		34 308	18		38 930	17

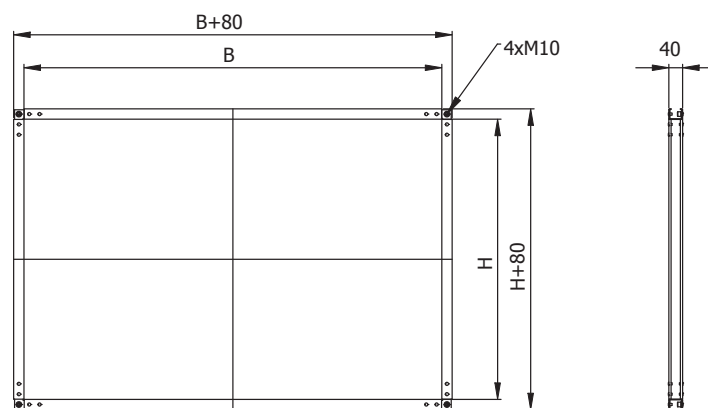
B – nominal width [mm]
H – nominal height [mm]

v – velocity [m/s]
S_e – grille active cross-section [m²]

Q – flow [m³/h]
d_p – pressure drop [Pa]

		v [m/s]	height H [mm]														
			1000			1100			1200			1300			1400		
			S _e [m ²]	Q [m³/h]	d _p [Pa]	S _e [m ²]	Q [m³/h]	d _p [Pa]	S _e [m ²]	Q [m³/h]	d _p [Pa]	S _e [m ²]	Q [m³/h]	d _p [Pa]	S _e [m ²]	Q [m³/h]	d _p [Pa]
width B [mm]	200	4	0.122	1 751	8	0.135	1 944	7	0.148	2 137	7	0.162	2 330	7	0.175	2 523	7
		6		2 627	17		2 916	17		3 205	16		3 495	16		3 784	16
		8		3 502	30		3 888	30		4 274	29		4 660	29		5 046	29
		10		4 378	47		4 860	46		5 342	46		5 825	45		6 307	45
	300	4	0.212	3 059	6	0.236	3 391	5	0.259	3 724	5	0.282	4 056	5	0.305	4 389	5
		6		4 588	13		5 087	12		5 586	12		6 085	12		6 584	12
		8		6 117	22		6 782	22		7 448	22		8 113	21		8 778	21
		10		7 646	35		8 478	34		9 310	34		10 141	33		10 973	33
	400	4	0.303	4 366	5	0.336	4 838	5	0.369	5 311	4	0.402	5 783	4	0.434	6 255	4
		6		6 549	10		7 258	10		7 966	10		8 675	10		9 383	10
		8		8 732	19		9 677	18		10 621	18		11 566	17		12 511	17
		10		10 915	29		12 096	28		13 277	28		14 458	27		15 638	27
	500	4	0.394	5 674	4	0.437	6 286	4	0.479	6 898	4	0.522	7 510	4	0.564	8 122	4
		6		8 510	9		9 428	9		10 346	9		11 264	9		12 182	8
		8		11 347	16		12 571	16		13 795	15		15 019	15		16 243	15
		10		14 184	25		15 714	25		17 244	24		18 774	24		20 304	23
	600	4	0.485	6 981	4	0.537	7 733	4	0.589	8 484	3	0.641	9 236	3	0.694	9 988	3
		6		10 472	8		11 599	8		12 727	8		13 854	8		14 982	8
		8		13 962	15		15 466	14		16 969	14		18 472	14		19 976	13
		10		17 453	23		19 332	22		21 211	22		23 090	21		24 970	21
	700	4	0.576	8 289	3	0.638	9 180	3	0.699	10 071	3	0.761	10 963	3	0.823	11 854	3
		6		12 433	8		13 770	7		15 107	7		16 444	7		17 781	7
		8		16 577	14		18 360	13		20 143	13		21 925	13		23 708	12
		10		20 722	21		22 950	21		25 178	20		27 407	20		29 635	19
	800	4	0.666	9 596	3	0.738	10 627	3	0.810	11 658	3	0.881	12 689	3	0.953	13 720	3
		6		14 394	7		15 941	7		17 487	7		19 034	7		20 580	6
		8		19 192	13		21 254	12		23 316	12		25 379	12		27 441	11
		10		23 990	20		26 568	19		29 146	19		31 723	18		34 301	18
	900	4	0.757	10 904	3	0.839	12 074	3	0.920	13 245	3	1.001	14 416	3	1.082	15 587	3
		6		16 356	7		18 112	7		19 868	6		21 624	6		23 380	6
		8		21 807	12		24 149	12		26 490	11		28 832	11		31 173	11
		10		27 259	19		30 186	18		33 113	18		36 040	17		38 966	17
	1000	4	0.848	12 211	3	0.939	13 522	3	1.030	14 832	3	1.121	16 142	3	1.212	17 453	3
		6		18 317	7		20 282	6		22 248	6		24 214	6		26 179	6
		8		24 422	12		27 043	11		29 664	11		32 285	11		34 906	10
		10		30 528	18		33 804	18		37 080	17		40 356	17		43 632	16
	1100	4	0.939	13 519	3	1.040	14 969	3	1.140	16 419	3	1.241	17 869	3	1.342	19 319	2
		6		20 278	6		22 453	6		24 628	6		26 803	6		28 979	6
		8		27 037	11		29 938	11		32 838	10		35 738	10		38 638	10
		10		33 797	18		37 422	17		41 047	16		44 672	16		48 298	15
	1200	4	1.030	14 826	3	1.140	16 416	3	1.250	18 006	3	1.361	19 596	2	1.471	21 185	2
		6		22 239	6		24 624	6		27 009	6		29 393	6		31 778	5
		8		29 652	11		32 832	10		36 012	10		39 191	10		42 371	10
		10		37 066	17		41 040	16		45 014	16		48 989	15		52 963	15
	1300	4	1.120	16 134	3	1.241	17 863	3	1.361	19 593	2	1.481	21 322	2	1.601	23 052	2
		6		24 201	6		26 795	6		29 389	6		31 983	5		34 577	5
		8		32 268	11		35 726	10		39 185	10		42 644	10		46 103	9
		10		40 334	17		44 658	16		48 982	15		53 305	15		57 629	14
	1400	4	1.211	17 441	3	1.341	19 310	2	1.471	21 180	2	1.601	23 049	2	1.730	24 918	2
		6		26 162	6		28 966	6		31 769	5		34 573	5		37 377	5
		8		34 883	10		38 621	10		42 359	10		46 097	9		49 836	9
		10		43 603	16		48 276	16		52 949	15		57 622	14		62 294	14

17.9.3 | RB connecting subframe



mcr RB connection frames are used to connect a steel ventilation duct to the damper. The connection may be made using bolts in the corners of the frame, as well as using latches/hasps for ventilation ducts or self-drilling screws.

Dimensions:

- » nominal width B: from 200 to 1200 mm
- » nominal height H from 200 mm to 800 mm
- » nominal thickness G 40 mm

Apart from the standard dimensions, masking grilles may be manufactured with intermediate dimensions.

Marking:

mcr RB / B x H / 1 / 2 / 3

- _____ grille type
- _____ width x height
- _____ additional parameters

17.10 | Marking

mcr DOR / B x H / 1 / 2 / 3 / 4

- _____ damper type
- _____ width x height / diameter (nominal)
- _____ control
- _____ material
- _____ masking grille
- _____ accessories

1 – control:

- » trigger control mechanism
- EM 24 D – electromagnetically powered and tripped trigger and control mechanism

2 – material

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

3 – masking grille

- MWDx1 – single masking grille
- MWDx2 – two masking grilles

4 – additional accessories

- MP230/24 – 230 V to 24 V transformation module
- WK2 – limit switch (closed blade signal)

5 – additional parameters

- » Damper casing
- BU – earth pin

NOTE: separate additional parameters entered with the “/” sign example marking:

mcr DOR 400 x 400 / EM 24 D / WK1

The mcr DOR smoke door damper for fire ventilation systems is equipped with a limit switch.

mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems



downloadable models
on the website
under the designer zone tab

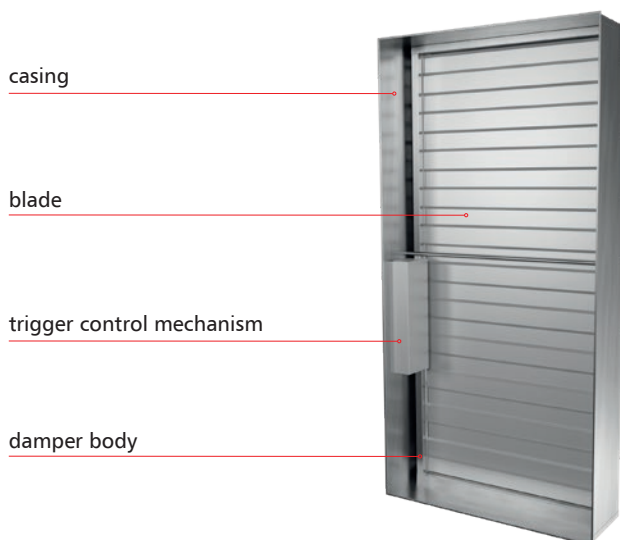


- » **EIS120, E600**
- » Fire resistance class: EI120 (v_{ew} i→o)S1000C₁₀₀₀₀AAmulti.
- » Certificate of constancy of performance 2434-CPR-0240
- » Dampers certified for compliance with EN 12101-8
- » Dampers rated under EN 13501-4 and tested under EN 1366-10
- » Dedicated for application in smoke removal and air supply shafts
- » Large active area, small resistances, quick installation
- » Certified installation with a system grille in set as per EN 12101-8

18.1 | Application

The mcr WIP LD smoke control dampers are intended for installation in manually or automatically operated fire ventilation systems. The devices are used in fire ventilation systems or in mixed fire and comfort ventilation systems (smoke evacuation or air supply systems). The dampers prevent fire, smoke and fire gases from spreading to the adjacent compartments. During normal system operation, the damper blades are closed. The smoke control dampers blades in the fire compartment are opened, whereas in other areas the blades are closed.

18.2 | Design



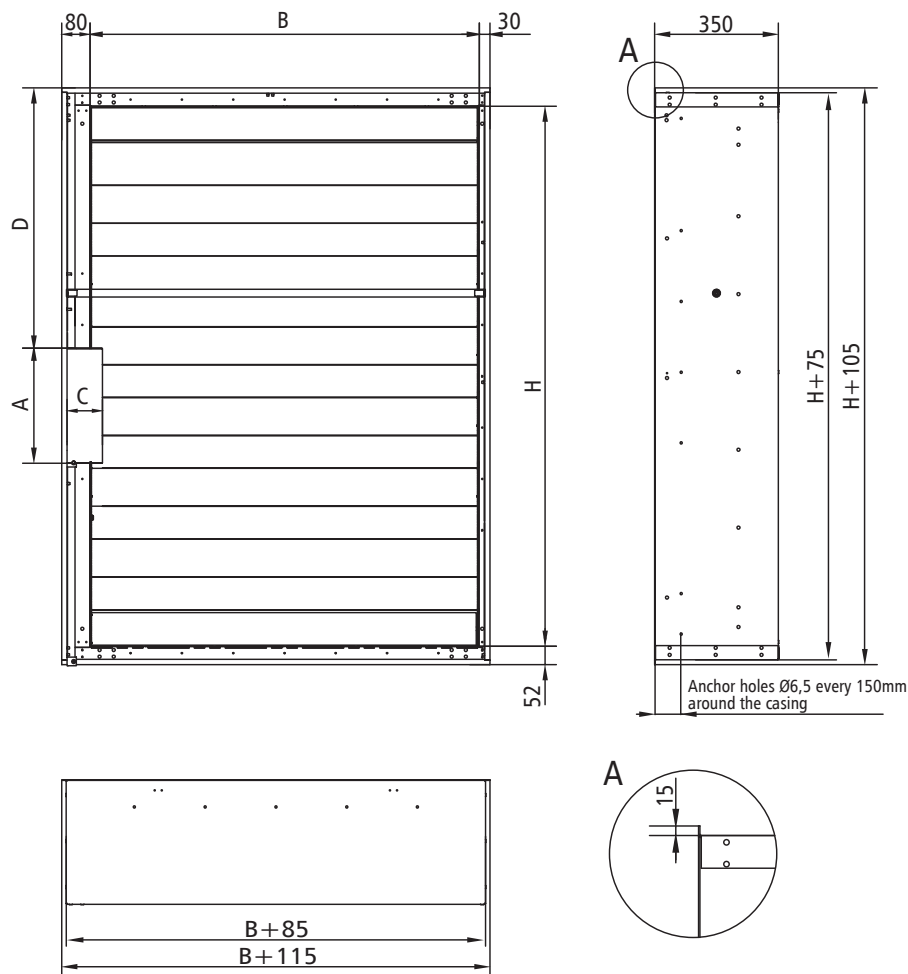
mcr WIP LD smoke control dampers consist of a casing with a rectangular cross-section, multiple moving damper blades – louvers rotating around their own axes – and a remotely activated trigger and control mechanism, which is installed inside the damper clearance. The damper casing is made of galvanized steel sheets or stainless steel sheets. The damper is also provided with a connection flange on one side. The other end is the so-called “bare-end”. The damper casing total length is 350 mm. Damper louvers are made of galvanized steel sheets or stainless steel. The damper blades revolve on their own axes, which consist of steel pins. A ventilation gasket is provided on the blades to ensure that the damper is “cold” sealed.

mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

18.3 | Versions

18.3.1 | Damper closing and opening with an actuator

During normal operation, the smoke control dampers are opened or closed. In case of fire, the smoke control dampers louvers are opened in the fire compartment area and closed in the other areas - the smoke control dampers is released remotely by feeding the supply voltage to the trigger control mechanism. mcr WIP LD smoke control dampers are equipped with a trigger control mechanism in the form of a BE, BEE, BEN, MLE or ME axial actuator without a return spring (24 V AC/DC or 230 V AC). The BE, BEE, BEN, MLE or ME series actuators are equipped with limit switches used to monitor the damper blade position. Furthermore, a mechanical position indicator is placed on the actuator. Smoke control dampers with BE, BEE, BEN, MLE or ME actuators can be opened/closed by supplying voltage to the actuator terminals. Dampers with those actuators may be opened/closed manually using a key.



mechanism	A	C	D
BE, BEE, BEN, ME, MLE	325	100	formula

for dimension $H < 599$	for dimension $H > 599$
$D \text{ [mm]} = H/2 - 168,75$	$D \text{ [mm]} = H/2 - 38,75$

18.4 | Dimensions

- » nominal width B: from 300 mm to 1100 mm
- » nominal height H from 600 mm to 2300 mm
- » maximum single damper cross-section surface up to 2.53 m²

Apart from the standard dimensions, smoke control dampers may be manufactured with intermediate dimensions (at 1 mm increments within the given ranges). The exception are dampers whose height value falls within the 36-54 ranges, e.g. 636-654...

18.5 | Installation

- » mcr WIP LD rectangular dampers are rated EI120(v_{ew} i→o)S 1000C₁₀₀₀₀AAmulti if installed in yielding wall/shaft partitions made from gypsum board panels with the thickness of at least 125 mm.
- » mcr WIP LD rectangular dampers are rated EI120(v_{ew} i→o)S 1000C₁₀₀₀₀AAmulti if installed in wall/shaft partitions made of concrete, bricks, hollow bricks, masonry or prefabricated slabs with a min. thickness of 125 mm.
- » mcr WIP LD rectangular dampers are rated E600(v_{ew} i→o)S 1000C₁₀₀₀₀AAmulti if installed in wall/shaft partitions made of concrete, bricks, hollow bricks, masonry or prefabricated slabs with a min. thickness of 125 mm.

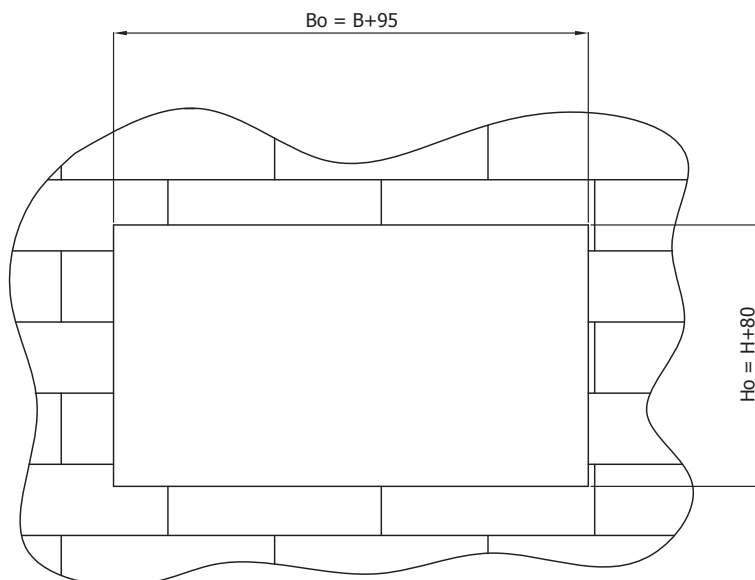
18.5.1 | Preparation of installation openings

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

Preferred

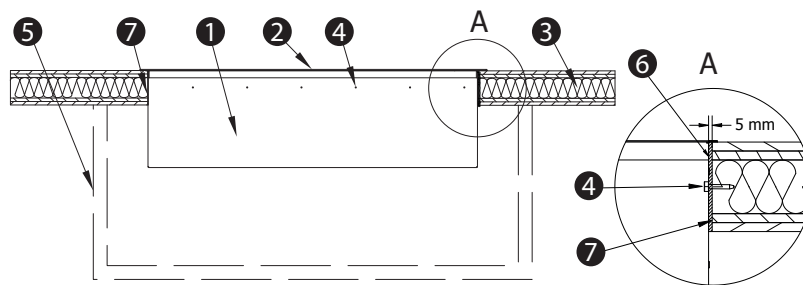
Bo = (B+95) mm

Ho = (H+85) mm



mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

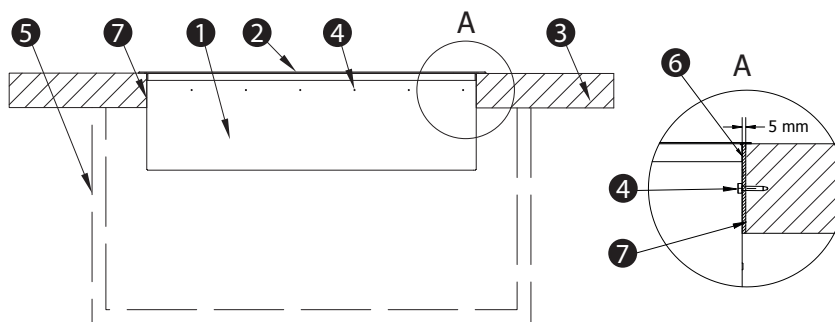
18.5.2 | Installation in light shaft walls



1. mcr WIP LD BxH smoke damper
2. MWS system grille (optional)
3. GK shaft wall
4. Installation anchors
5. Vertical fire ventilation shaft
6. Mounting gap*
7. Assembly mortar*

* The installation gap between the wall and the damper must be sealed with a material (installation mortar) that ensures the appropriate fire resistance rating.

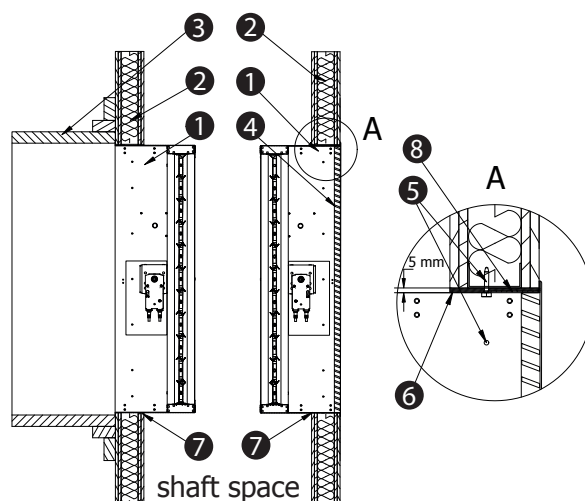
18.5.3 | Installation in shaft walls



1. mcr WIP LD BxH smoke damper
2. MWS system grille (optional)
3. GB shaft wall
4. Installation anchors
5. Vertical fire ventilation shaft
6. Mounting gap*
7. Assembly mortar*

* The installation gap between the wall and the damper must be sealed with a material (installation mortar) that ensures the appropriate fire resistance rating.

18.5.4 | Sample installation in light walls and with multi-compartment ducts or grilles



1. mcr WIP LD BxH smoke damper
2. Plasterboard wall
3. Multi-compartment smoke extract duct – e.g. made of fire-proof boards*
4. MWS system grille (optional)
5. Installation anchors
6. Mounting gap**
7. Sealing***
8. Assembly mortar**

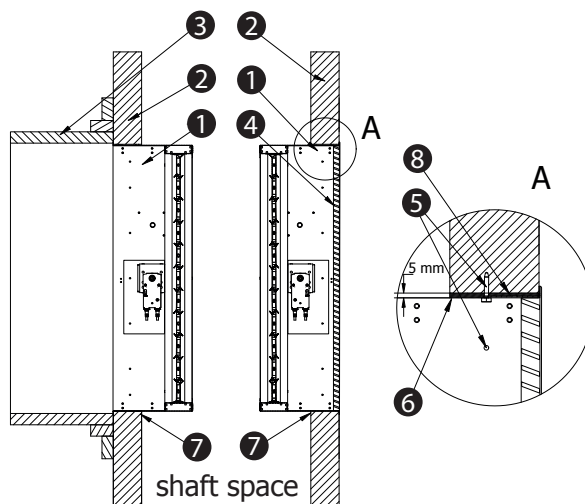
* Smoke extraction ducts should be made in accordance with the ducts manufacturer's guidelines. The ducts must have an adequate fire resistance rating in accordance with the fire resistance rating provided for the entire solution. Seal all connections between the damper, wall and the ducts with the appropriate grout/glue/gaskets, ensuring that the fire resistance rating is maintained. A masking grille may terminate the system.

** The installation gap between the wall and the damper must be sealed with a material (installation mortar) that ensures the appropriate fire resistance rating.

*** The seal between the lower edge of the damper and the wall must be made using a material (installation mortar) that ensures the appropriate fire resistance rating.

mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

18.5.5 | Installation in concrete walls and with multi-compartment ducts or grilles



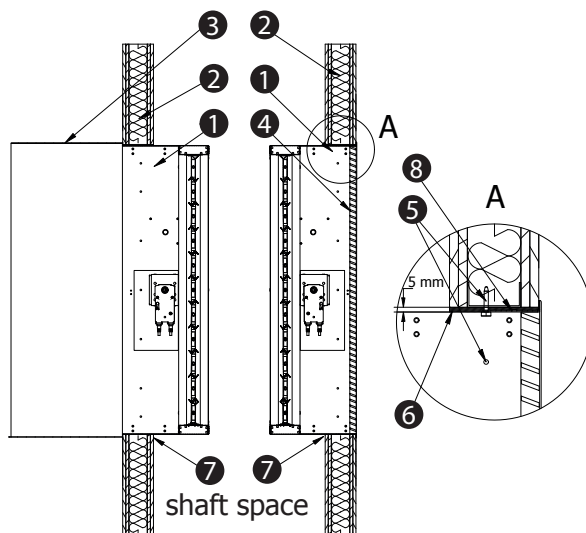
1. mcr WIP LD BxH smoke damper
2. Solid wall
3. Multi-compartment smoke extract duct
– e.g. made of fire-proof boards*
4. MWS system grille (optional)
5. Installation anchors
6. Mounting gap**
7. Sealing***
8. Assembly mortar**

* Smoke extraction ducts should be made in accordance with the ducts manufacturer's guidelines. The ducts must have an adequate fire resistance rating in accordance with the fire resistance rating provided for the entire solution. Seal all connections between the damper, wall and the ducts with the appropriate grout/glue/gaskets, ensuring that the fire resistance rating is maintained. A masking grille may terminate the system.

** The installation gap between the wall and the damper must be sealed with a material (installation mortar) that ensures the appropriate fire resistance rating.

*** The seal between the lower edge of the damper and the wall must be made using a material (installation mortar) that ensures the appropriate fire resistance rating.

18.5.6 | Sample installation in light walls and with single-compartment ducts or grilles



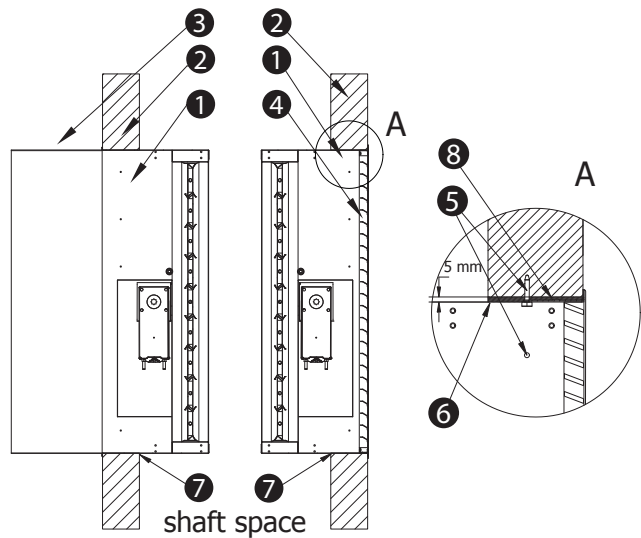
1. mcr WIP LD BxH smoke damper
2. Plasterboard wall
3. Single-compartment smoke extract duct
– e.g. made of metal sheets*
4. MWS system grille (optional)
5. Installation anchors
6. Mounting gap**
7. Sealing***
8. Assembly mortar**

* Smoke extraction ducts should be made in accordance with the ducts manufacturer's guidelines. The ducts must have an adequate fire resistance rating in accordance with the fire resistance rating provided for the entire solution. Seal all connections between the damper, wall and the ducts with the appropriate grout/glue/gaskets, ensuring that the fire resistance rating is maintained. A masking grille may terminate the system.

** The installation gap between the wall and the damper must be sealed with a material (installation mortar) that ensures the appropriate fire resistance rating.

*** The seal between the lower edge of the damper and the wall must be made using a material (installation mortar) that ensures the appropriate fire resistance rating.

18.5.7 | Sample installation in concrete or masonry walls and with single-compartment ducts or grilles



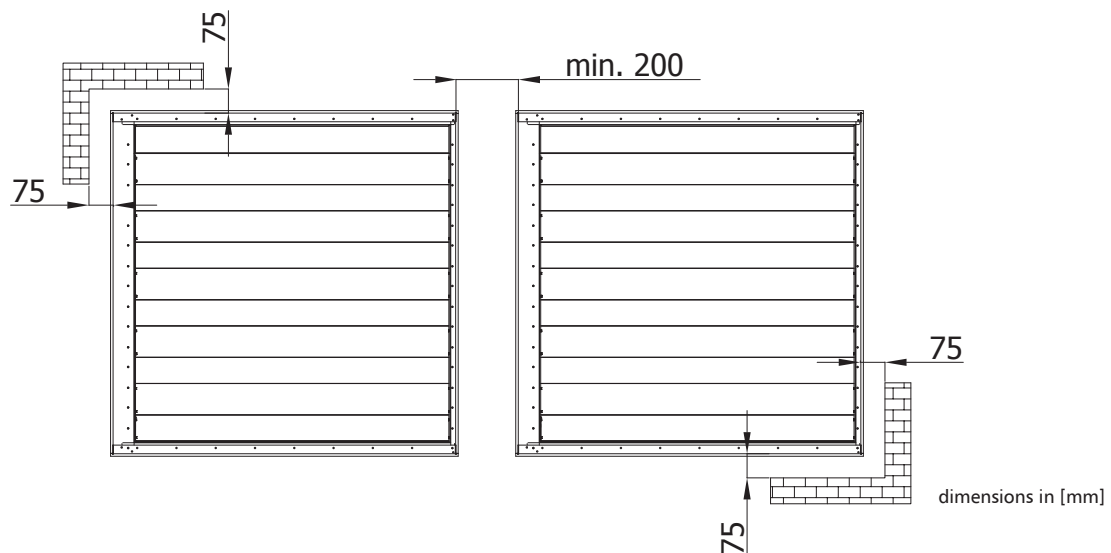
1. mcr WIP LD BxH smoke damper
2. Solid wall
3. Single-compartment smoke extract duct
– e.g. made of fire-proof boards*
4. MWS system grille (optional)
5. Installation anchors
6. Mounting gap**
7. Sealing***
8. Assembly mortar**

* Smoke extraction ducts should be made in accordance with the ducts manufacturer's guidelines. The ducts must have an adequate fire resistance rating in accordance with the fire resistance rating provided for the entire solution. Seal all connections between the damper, wall and the ducts with the appropriate grout/glue/gaskets, ensuring that the fire resistance rating is maintained. A masking grille may terminate the system.

** The installation gap between the wall and the damper must be sealed with a material (installation mortar) that ensures the appropriate fire resistance rating.

*** The seal between the lower edge of the damper and the wall must be made using a material (installation mortar) that ensures the appropriate fire resistance rating.

» Minimum distance between systems and partitions



18.6 | mcr WIP LD rectangular dampers technical parameters

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]															
			600						700					800				
			S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	S_k [m ²]	S_e [m ²]	Q [m ³ /h]	d_p [Pa]	L_{WA} [dB]	
width B [mm]	v [m/s]																	
	300	4	0,18	0,15	2 151	5	30	0,21	0,17	2 510	5	30	0,24	0,20	2 868	5	31	
		6			3 227	12	41			3 765	11	41			4 303	11	41	
		8			4 303	21	48			5 020	20	48			5 737	19	48	
		10			5 378	32	54			6 275	31	54			7 171	30	54	
	350	4	0,21	0,17	2 510	5	30	0,25	0,20	2 928	5	31	0,28	0,23	3 347	5	32	
		6			3 765	11	41			4 392	11	41			5 020	10	41	
		8			5 020	20	48			5 856	19	48			6 693	19	49	
		10			6 275	31	54			7 321	30	54			8 366	29	55	
	400	4	0,24	0,20	2 868	5	31	0,28	0,23	3 347	5	32	0,32	0,27	3 825	5	32	
		6			4 303	11	41			5 020	11	42			5 737	10	41	
		8			5 737	20	49			6 693	19	49			7 649	19	50	
		10			7 171	31	55			8 366	30	55			9 562	29	55	
	450	4	0,27	0,22	3 227	5	31	0,32	0,26	3 765	5	32	0,36	0,30	4 303	5	33	
		6			4 841	11	42			5 647	11	42			6 454	10	42	
		8			6 454	20	50			7 530	19	50			8 605	19	50	
		10			8 068	31	55			9 412	30	55			10 757	29	56	
	500	4	0,30	0,25	3 586	5	32	0,35	0,29	4 183	5	33	0,40	0,33	4 781	5	33	
		6			5 378	11	42			6 275	11	43			7 171	10	42	
		8			7 171	20	50			8 366	19	50			9 562	19	51	
		10			8 964	31	56			10 458	30	56			11 952	29	56	
	550	4	0,33	0,27	3 944	5	32	0,39	0,32	4 602	5	33	0,44	0,37	5 259	5	34	
		6			5 916	11	43			6 902	11	43			7 888	10	43	
8		7 888			20	50	9 203			19	50	10 518			19	51		
10		9 860			31	56	11 504			30	56	13 147			29	56		
600	4	0,36	0,30	4 303	5	33	0,42	0,35	5 020	5	33	0,48	0,40	5 737	5	34		
	6			6 454	11	43			7 530	11	44			8 605	10	43		
	8			8 605	19	50			10 040	19	51			11 474	19	51		
	10			10 757	30	56			12 550	30	57			14 342	29	57		
650	4	0,39	0,32	4 661	5	33	0,46	0,38	5 438	5	34	0,52	0,43	6 215	5	34		
	6			6 992	11	43			8 157	10	43			9 323	10	43		
	8			9 323	19	50			10 876	19	51			12 430	19	52		
	10			11 653	30	56			13 595	29	57			15 538	29	57		
700	4	0,42	0,35	5 020	5	33	0,49	0,41	5 856	5	34	0,56	0,46	6 693	4	32		
	6			7 530	11	44			8 785	10	43			10 040	10	44		
	8			10 040	19	51			11 713	19	51			13 386	18	51		
	10			12 550	30	57			14 641	29	57			16 733	28	57		
750	4	0,45	0,37	5 378	5	34	0,53	0,44	6 275	5	34	0,60	0,50	7 171	4	32		
	6			8 068	11	44			9 412	10	43			10 757	10	44		
	8			10 757	19	51			12 550	19	52			14 342	18	52		
	10			13 446	30	57			15 687	29	57			17 928	28	57		
800	4	0,48	0,40	5 737	5	34	0,56	0,46	6 693	4	32	0,64	0,53	7 649	4	32		
	6			8 605	10	43			10 040	7	39			11 474	10	44		
	8			11 474	19	51			13 386	11	45			15 299	18	52		
	10			14 342	29	57			16 733	28	57			19 123	28	58		
850	4	0,51	0,42	6 096	4	31	0,60	0,49	7 111	4	32	0,68	0,56	8 127	4	33		
	6			9 143	10	43			10 667	10	44			12 191	10	45		
	8			12 191	18	51			14 223	18	52			16 255	17	51		
	10			15 239	28	57			17 779	28	57			20 318	27	57		
900	4	0,54	0,45	6 454	4	32	0,63	0,52	7 530	4	32	0,72	0,60	8 605	4	33		
	6			9 681	10	44			11 295	10	44			12 908	10	45		
	8			12 908	18	51			15 060	17	51			17 211	17	52		
	10			16 135	28	57			18 824	27	57			21 514	27	58		
950	4	0,57	0,47	6 813	4	32	0,67	0,55	7 948	4	32	0,76	0,63	9 084	4	33		
	6			10 219	10	44			11 922	10	44			13 625	10	44		
	8			13 625	18	51			15 896	17	51			18 167	17	52		
	10			17 032	28	57			19 870	27	57			22 709	27	58		
1000	4	0,60	0,50	7 171	4	32	0,70	0,58	8 366	4	33	0,80	0,66	9 562	4	33		
	6			10 757	10	44			12 550	10	45			14 342	9	44		
	8			14 342	18	52			16 733	17	52			19 123	17	52		
	10			17 928	28	57			20 916	27	58			23 904	26	58		
1050	4	0,63	0,52	7 530	4	32	0,74	0,61	8 785	4	33	0,84	0,70	10 040	4	34		
	6			11 295	10	44			13 177	10	45			15 060	9	44		
	8			15 060	18	52			17 569	17	52			20 079	17	52		
	10			18 824	28	58			21 962	27	58			25 099	26	58		
1100	4	0,66	0,55	7 888	4	33	0,77	0,64	9 203	4	34	0,88	0,73	10 518	4	34		
	6			11 832	10	45			13 805	10	45			15 777	9	44		
	8			15 777	18	52			18 406	17	52			21 036	17	53		
	10			19 721	28	58			23 008	27	58			26 294	26	58		

mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			900					1000					1100				
			S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	300	4	0,27	0,22	3 227	5	31	0,30	0,25	3 586	5	32	0,33	0,27	3 944	6,25	35
		6			4 841	10	41			5 378	10	41			5 916	13	44
		8			6 454	19	49			7 171	19	49			7 888	24	53
		10			8 068	29	54			8 964	29	55			9 860	36	58
	350	4	0,32	0,26	3 765	4	29	0,35	0,29	4 183	4	30	0,39	0,32	4 602	5	33
		6			5 647	10	41			6 275	10	42			6 902	13	45
		8			7 530	18	49			8 366	18	49			9 203	23	53
		10			9 412	28	55			10 458	28	55			11 504	35	58
	400	4	0,36	0,30	4 303	4	30	0,40	0,33	4 781	4	30	0,44	0,37	5 259	5	34
		6			6 454	10	42			7 171	10	42			7 888	13	46
		8			8 605	18	49			9 562	18	50			10 518	23	53
		10			10 757	28	55			11 952	28	56			13 147	35	59
	450	4	0,41	0,34	4 841	4	30	0,45	0,37	5 378	4	31	0,50	0,41	5 916	5	34
		6			7 261	10	42			8 068	10	43			8 874	13	46
		8			9 681	17	49			10 757	17	50			11 832	21	53
		10			12 101	27	55			13 446	27	56			14 791	34	59
	500	4	0,45	0,37	5 378	4	31	0,50	0,42	5 976	4	31	0,55	0,46	6 574	5	35
		6			8 068	10	43			8 964	10	43			9 860	13	47
		8			10 757	17	50			11 952	17	50			13 147	21	53
		10			13 446	27	56			14 940	27	56			16 434	34	59
550	4	0,50	0,41	5 916	4	31	0,55	0,46	6 574	4	32	0,61	0,50	7 231	5	35	
	6			8 874	10	43			9 860	10	44			10 846	13	47	
	8			11 832	17	50			13 147	17	51			14 462	21	54	
	10			14 791	27	56			16 434	27	57			18 077	34	60	
600	4	0,54	0,45	6 454	4	32	0,60	0,50	7 171	4	32	0,66	0,55	7 888	5	35	
	6			9 681	10	44			10 757	10	44			11 832	13	47	
	8			12 908	17	50			14 342	17	51			15 777	21	54	
	10			16 135	27	56			17 928	27	57			19 721	34	60	
650	4	0,59	0,49	6 992	4	32	0,65	0,54	7 769	4	32	0,72	0,59	8 546	5	36	
	6			10 488	10	44			11 653	10	44			12 819	13	48	
	8			13 984	17	51			15 538	17	51			17 091	21	55	
	10			17 480	27	57			19 422	27	57			21 364	34	61	
700	4	0,63	0,52	7 530	4	32	0,70	0,58	8 366	4	33	0,77	0,64	9 203	5	36	
	6			11 295	9	43			12 550	9	43			13 805	11	47	
	8			15 060	17	51			16 733	17	52			18 406	21	55	
	10			18 824	26	57			20 916	26	57			23 008	33	60	
750	4	0,68	0,56	8 068	4	33	0,75	0,62	8 964	4	33	0,83	0,68	9 860	5	36	
	6			12 101	9	43			13 446	9	44			14 791	11	47	
	8			16 135	17	51			17 928	17	52			19 721	21	55	
	10			20 169	26	57			22 410	26	57			24 651	33	61	
800	4	0,72	0,60	8 605	4	33	0,80	0,66	9 562	4	33	0,88	0,73	10 518	5	37	
	6			12 908	9	43			14 342	9	44			15 777	11	47	
	8			17 211	17	52			19 123	17	52			21 036	21	55	
	10			21 514	26	57			23 904	26	58			26 294	33	61	
850	4	0,77	0,63	9 143	4	33	0,85	0,71	10 159	4	34	0,94	0,78	11 175	5	37	
	6			13 715	9	44			15 239	9	44			16 763	11	47	
	8			18 287	17	52			20 318	17	52			22 350	21	56	
	10			22 858	26	57			25 398	26	58			27 938	33	61	
900	4	0,81	0,67	9 681	4	33	0,90	0,75	10 757	4	34	0,99	0,82	11 832	5	37	
	6			14 522	9	44			16 135	9	44			17 749	11	48	
	8			19 362	17	52			21 514	16	52			23 665	20	55	
	10			24 203	26	58			26 892	25	58			29 581	31	61	
950	4	0,86	0,71	10 219	4	34	0,95	0,79	11 354	4	34	1,05	0,87	12 490	5	37	
	6			15 328	9	44			17 032	9	45			18 735	11	48	
	8			20 438	16	52			22 709	16	52			24 980	19	55	
	10			25 547	25	57			28 386	25	58			31 225	31	61	
1000	4	0,90	0,75	10 757	4	34	1,00	0,83	11 952	4	34	1,10	0,91	13 147	5	38	
	6			16 135	9	44			17 928	9	45			19 721	11	48	
	8			21 514	15	51			23 904	15	51			26 294	19	55	
	10			26 892	24	57			29 880	24	58			32 868	30	61	
1050	4	0,95	0,78	11 295	4	34	1,05	0,87	12 550	4	35	1,16	0,96	13 805	5	38	
	6			16 942	9	45			18 824	9	45			20 707	11	48	
	8			22 589	15	51			25 099	15	52			27 609	19	55	
	10			28 237	24	57			31 374	24	58			34 511	30	61	
1100	4	0,99	0,82	11 832	4	35	1,10	0,91	13 147	4	35	1,21	1,00	14 462	5	38	
	6			17 749	9	45			19 721	9	45			21 693	11	49	
	8			23 665	15	52			26 294	15	52			28 924	19	55	
	10			29 581	24	58			32 868	24	58			36 155	30	61	

mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]																										
			1200					1300					1400																
			S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]												
width B [mm]	v [m/s]																												
	300	4 6 8 10	0,36	0,30	4 303 6 454 8 605 10 757	5 9 18 28	33 40 49 55	0,39	0,32	4 661 6 992 9 323 11 653	5 9 18 27	33 40 49 55	0,42	0,35	5 020 7 530 10 040 12 550	5 8 17 26	33 40 49 55												
	350	4 6 8 10			0,42	0,35	5 020 7 530 10 040 12 550			3,5 10 17 27	29 42 49 55	0,46			0,38	5 438 8 157 10 876 13 595	3,25 9 17 26	28 42 49 55	0,49	0,41	5 856 8 785 11 713 14 641	3 9 16 25	27 42 49 55						
	400	4 6 8 10					0,48			0,40	5 737 8 605 11 474 14 342					3,5 10 17 27	29 42 50 56	0,52			0,43	6 215 9 323 12 430 15 538	3,25 9 17 26	29 42 50 56	0,56	0,46	6 693 10 040 13 386 16 733	3 9 16 25	28 42 50 56
	450	4 6 8 10									0,54					0,45	6 454 9 681 12 908 16 135					3,5 10 16 25	30 43 49 55	0,59			0,49	6 992 10 488 13 984 17 480	3,25 9 15 24
	500	4 6 8 10	0,60	0,50				7 171 10 757 14 342 17 928	3,5 10 16 25				30 43 50 56	0,65			0,54					7 769 11 653 15 538 19 422	3,25 9 15 24					30 43 49 56	0,70
	550	4 6 8 10			0,66	0,55		7 888 11 832 15 777 19 721	3,5 10 16 25			31 44 50 56	0,72		0,59				8 546 12 819 17 091 21 364	3,25 9 15 24		30 44 50 56	0,77					0,64	
	600	4 6 8 10					0,72	0,60	8 605 12 908 17 211 21 514	3,5 10 16 26		31 44 51 57						0,78	0,65	9 323 13 984 18 645 23 306	3,25 9 16 25	30 44 51 57			0,84	0,70			
	650	4 6 8 10							0,78	0,65	9 323 13 984 18 645 23 306	3,5 10 16 26				31 44 51 57				0,85	0,70	10 099 15 149 20 199 25 249		3,25 9 16 25			31 44 51 57		
	700	4 6 8 10	0,84	0,70							10 040 15 060 20 079 25 099	3,5 8 16 24		32 43 52 57		0,91	0,76					10 876 16 314 21 753 27 191		3,25 8 16 23			31 42 51 57		0,98
	750	4 6 8 10			0,90	0,75					10 757 16 135 21 514 26 892	3,5 8 16 24	32 43 52 57	0,98	0,81							11 653 17 480 23 306 29 133	3,25 8 16 23	31 42 52 57			1,05	0,87	
	800	4 6 8 10					0,96	0,80			11 474 17 211 22 948 28 685	3,5 9 16 25	32 44 52 58					1,04	0,86			12 430 18 645 24 860 31 075	3,25 8 16 24	32 44 52 58	1,12	0,93			
	850	4 6 8 10							1,02	0,85	12 191 18 287 24 382 30 478	4 9 17 25	34 44 53 58							1,11	0,92	13 207 19 810 26 414 33 017	4 8 16 25	35 44 53 58					
	900	4 6 8 10	1,08	0,90							12 908 19 362 25 816 32 270	4 9 15 24	35 44 52 58			1,17	0,97					13 984 20 976 27 968 34 960	4 8 15 23	35 44 52 58					1,26
	950	4 6 8 10			1,14	0,95					13 625 20 438 27 251 34 063	4 9 14 23	35 45 51 57	1,24	1,03							14 761 22 141 29 521 36 902	4 8 14 22	35 45 51 57			1,33	1,10	
	1000	4 6 8 10					1,20	1,00			14 342 21 514 28 685 35 856	4 9 14 22	35 45 51 57					1,30	1,08			15 538 23 306 31 075 38 844	4 8 13 21	35 45 50 57	1,40	1,16			
	1050	4 6 8 10							1,26	1,05	15 060 22 589 30 119 37 649	4 9 14 22	35 45 51 58							1,37	1,13	16 314 24 472 32 629 40 786	4 8 13 21	36 45 51 57					
	1100	4 6 8 10	1,32	1,10							15 777 23 665 31 553 39 442	4 9 14 22	36 45 51 58			1,43	1,19					17 091 25 637 34 183 42 728	4 8 13 21	36 45 51 57					1,54

mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			1500					1600					1700				
			v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]
width B [mm]	300	4	0,45	0,37	5 378	5	34	0,48	0,40	5 737	5	34	0,51	0,42	6 096	5	34
		6			8 068	8	39			8 605	7	38			9 143	7	38
		8			10 757	17	49			11 474	16	49			12 191	16	49
		10			13 446	25	55			14 342	25	55			15 239	24	55
	350	4	0,53	0,44	6 275	2,75	27	0,56	0,46	6 693	2,5	26	0,60	0,49	7 111	2,25	25
		6			9 412	9	42			10 040	9	42			10 667	8	41
		8			12 550	16	49			13 386	15	49			14 223	15	49
		10			15 687	24	55			16 733	24	55			17 779	23	55
	400	4	0,60	0,50	7 171	2,75	27	0,64	0,53	7 649	2,5	26	0,68	0,56	8 127	2,25	25
		6			10 757	9	42			11 474	9	42			12 191	8	42
		8			14 342	16	50			15 299	15	50			16 255	15	49
		10			17 928	24	56			19 123	24	55			20 318	23	55
	450	4	0,68	0,56	8 068	2,75	28	0,72	0,60	8 605	2,5	27	0,77	0,63	9 143	2,25	26
		6			12 101	9	43			12 908	9	43			13 715	8	43
		8			16 135	13	48			17 211	13	48			18 287	12	47
		10			20 169	22	55			21 514	21	54			22 858	20	54
	500	4	0,75	0,62	8 964	2,75	28	0,80	0,66	9 562	2,5	27	0,85	0,71	10 159	2,25	26
		6			13 446	9	43			14 342	9	43			15 239	8	43
		8			17 928	13	49			19 123	13	48			20 318	12	48
		10			22 410	22	55			23 904	21	55			25 398	20	55
	550	4	0,83	0,68	9 860	2,75	29	0,88	0,73	10 518	2,5	28	0,94	0,78	11 175	2,25	26
		6			14 791	9	44			15 777	9	44			16 763	8	43
		8			19 721	13	49			21 036	13	49			22 350	12	48
		10			24 651	22	56			26 294	21	55			27 938	20	55
600	4	0,90	0,75	10 757	2,75	29	0,96	0,80	11 474	2,5	28	1,02	0,85	12 191	2,25	27	
	6			16 135	9	44			17 211	9	44			18 287	8	44	
	8			21 514	15	51			22 948	14	50			24 382	14	50	
	10			26 892	23	57			28 685	23	57			30 478	22	56	
650	4	0,98	0,81	11 653	2,75	29	1,04	0,86	12 430	2,5	28	1,11	0,92	13 207	2,25	27	
	6			17 480	9	44			18 645	9	44			19 810	8	44	
	8			23 306	15	51			24 860	14	51			26 414	14	51	
	10			29 133	23	57			31 075	23	57			33 017	22	57	
700	4	1,05	0,87	12 550	2,75	30	1,12	0,93	13 386	2,5	29	1,19	0,99	14 223	2,25	28	
	6			18 824	7	41			20 079	6	40			21 334	6	39	
	8			25 099	15	51			26 772	14	51			28 446	14	51	
	10			31 374	21	56			33 466	20	56			35 557	19	55	
750	4	1,13	0,93	13 446	2,75	30	1,20	1,00	14 342	2,5	29	1,28	1,06	15 239	2,25	28	
	6			20 169	7	41			21 514	6	40			22 858	6	39	
	8			26 892	15	52			28 685	14	51			30 478	14	51	
	10			33 615	21	56			35 856	20	56			38 097	19	56	
800	4	1,20	1,00	14 342	2,75	30	1,28	1,06	15 299	2,5	29	1,36	1,13	16 255	2,25	28	
	6			21 514	8	44			22 948	8	44			24 382	7	43	
	8			28 685	15	52			30 597	14	52			32 509	14	51	
	10			35 856	22	57			38 246	22	57			40 637	21	57	
850	4	1,28	1,06	15 239	4	35	1,36	1,13	16 255	4	36	1,45	1,20	17 271	4	36	
	6			22 858	8	44			24 382	8	44			25 906	7	44	
	8			30 478	16	53			32 509	16	53			34 541	15	53	
	10			38 097	24	58			40 637	23	58			43 177	23	58	
900	4	1,35	1,12	16 135	4	36	1,44	1,20	17 211	4	36	1,53	1,27	18 287	4	36	
	6			24 203	8	44			25 816	8	44			27 430	7	44	
	8			32 270	14	51			34 422	13	51			36 573	13	51	
	10			40 338	21	57			43 027	21	57			45 716	20	57	
950	4	1,43	1,18	17 032	4	36	1,52	1,26	18 167	4	36	1,62	1,34	19 302	4	36	
	6			25 547	8	44			27 251	8	44			28 954	7	44	
	8			34 063	12	51			36 334	12	50			38 605	11	50	
	10			42 579	20	57			45 418	19	57			48 256	18	56	
1000	4	1,50	1,25	17 928	4	36	1,60	1,33	19 123	4	36	1,70	1,41	20 318	4	37	
	6			26 892	8	45			28 685	8	44			30 478	7	44	
	8			35 856	11	49			38 246	11	49			40 637	10	48	
	10			44 820	19	56			47 808	18	56			50 796	17	55	
1050	4	1,58	1,31	18 824	4	36	1,68	1,39	20 079	4	37	1,79	1,48	21 334	4	37	
	6			28 237	8	45			30 119	8	45			32 001	7	45	
	8			37 649	11	50			40 159	11	49			42 669	10	48	
	10			47 061	19	57			50 198	18	56			53 336	17	56	
1100	4	1,65	1,37	19 721	4	37	1,76	1,46	21 036	4	37	1,87	1,55	22 350	4	37	
	6			29 581	8	45			31 553	8	45			33 525	7	45	
	8			39 442	11	50			42 071	11	49			44 700	10	49	
	10			49 302	19	57			52 589	18	56			55 876	17	56	

mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			1800					1900					2000				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	300	4	0,54	0,45	6 454	5	34	0,57	0,47	6 813	5	35	0,60	0,50	7 171	5	35
		6			9 681	6	37			10 219	6	36			10 757	5	35
		8			12 908	15	49			13 625	15	49			14 342	14	48
		10			16 135	23	54			17 032	22	54			17 928	22	54
	350	4	0,63	0,52	7 530	2	23	0,67	0,55	7 948	1,75	22	0,70	0,58	8 366	1,5	20
		6			11 295	8	41			11 922	8	41			12 550	8	41
		8			15 060	14	49			15 896	14	48			16 733	13	48
		10			18 824	22	54			19 870	21	54			20 916	21	54
	400	4	0,72	0,60	8 605	2	24	0,76	0,63	9 084	1,75	22	0,80	0,66	9 562	1,5	21
		6			12 908	8	42			13 625	8	42			14 342	8	41
		8			17 211	14	49			18 167	14	49			19 123	13	49
		10			21 514	22	55			22 709	21	55			23 904	21	55
	450	4	0,81	0,67	9 681	2	24	0,86	0,71	10 219	1,75	23	0,90	0,75	10 757	1,5	21
		6			14 522	8	42			15 328	8	42			16 135	8	42
		8			19 362	11	47			20 438	10	46			21 514	10	45
		10			24 203	19	54			25 547	18	53			26 892	17	53
	500	4	0,90	0,75	10 757	2	25	0,95	0,79	11 354	1,75	23	1,00	0,83	11 952	1,5	21
		6			16 135	8	43			17 032	8	43			17 928	8	42
		8			21 514	11	47			22 709	10	46			23 904	10	46
		10			26 892	19	54			28 386	18	54			29 880	17	53
	550	4	0,99	0,82	11 832	2	25	1,05	0,87	12 490	1,75	24	1,10	0,91	13 147	1,5	22
		6			17 749	8	43			18 735	8	43			19 721	8	43
		8			23 665	11	47			24 980	10	47			26 294	10	46
		10			29 581	19	55			31 225	18	54			32 868	17	54
600	4	1,08	0,90	12 908	2	26	1,14	0,95	13 625	1,75	24	1,20	1,00	14 342	1,5	22	
	6			19 362	8	44			20 438	8	43			21 514	8	43	
	8			25 816	13	50			27 251	13	50			28 685	12	49	
	10			32 270	21	56			34 063	20	56			35 856	20	56	
650	4	1,17	0,97	13 984	2	26	1,24	1,03	14 761	1,75	24	1,30	1,08	15 538	1,5	23	
	6			20 976	8	44			22 141	8	44			23 306	8	44	
	8			27 968	13	50			29 521	13	50			31 075	12	50	
	10			34 960	21	57			36 902	20	56			38 844	20	56	
700	4	1,26	1,05	15 060	2	26	1,33	1,10	15 896	1,75	25	1,40	1,16	16 733	1,5	23	
	6			22 589	5	38			23 844	5	37			25 099	4	36	
	8			30 119	13	51			31 792	13	50			33 466	12	50	
	10			37 649	18	55			39 740	17	54			41 832	16	54	
750	4	1,35	1,12	16 135	2	27	1,43	1,18	17 032	1,75	25	1,50	1,25	17 928	1,5	23	
	6			24 203	5	38			25 547	5	37			26 892	4	36	
	8			32 270	13	51			34 063	13	51			35 856	12	50	
	10			40 338	18	55			42 579	17	55			44 820	16	54	
800	4	1,44	1,20	17 211	2	27	1,52	1,26	18 167	1,75	25	1,60	1,33	19 123	1,5	24	
	6			25 816	7	43			27 251	7	43			28 685	7	43	
	8			34 422	13	51			36 334	13	51			38 246	12	51	
	10			43 027	20	57			45 418	19	57			47 808	19	56	
850	4	1,53	1,27	18 287	4	36	1,62	1,34	19 302	4	36	1,70	1,41	20 318	4	37	
	6			27 430	7	43			28 954	7	43			30 478	7	43	
	8			36 573	15	53			38 605	15	53			40 637	15	53	
	10			45 716	22	58			48 256	22	58			50 796	21	58	
900	4	1,62	1,34	19 362	4	36	1,71	1,42	20 438	4	37	1,80	1,49	21 514	4	37	
	6			29 043	7	44			30 657	7	43			32 270	7	43	
	8			38 724	12	51			40 876	12	50			43 027	11	50	
	10			48 406	19	57			51 095	18	56			53 784	18	56	
950	4	1,71	1,42	20 438	4	37	1,81	1,50	21 573	4	37	1,90	1,58	22 709	4	37	
	6			30 657	7	44			32 360	7	44			34 063	7	43	
	8			40 876	11	49			43 147	10	49			45 418	9	48	
	10			51 095	18	56			53 933	17	55			56 772	16	55	
1000	4	1,80	1,49	21 514	4	37	1,90	1,58	22 709	4	37	2,00	1,66	23 904	4	37	
	6			32 270	7	44			34 063	7	44			35 856	7	44	
	8			43 027	9	47			45 418	8	46			47 808	8	45	
	10			53 784	16	55			56 772	15	54			59 760	14	54	
1050	4	1,89	1,57	22 589	4	37	2,00	1,66	23 844	4	37	2,10	1,74	25 099	4	38	
	6			33 884	7	44			35 766	7	44			37 649	7	44	
	8			45 179	9	48			47 688	8	47			50 198	8	46	
	10			56 473	16	55			59 611	15	55			62 748	14	54	
1100	4	1,98	1,64	23 665	4	38	2,09	1,73	24 980	4	38	2,20	1,83	26 294	4	38	
	6			35 497	7	45			37 470	7	45			39 442	7	44	
	8			47 330	9	48			49 959	8	47			52 589	8	46	
	10			59 162	16	55			62 449	15	55			65 736	14	54	

mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

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

v – velocity [m/s]
S_k – duct cross-section [m²]
S_e – damper active cross-section [m²]

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

			height H [mm]														
			2100					2200					2300				
			v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]
width B [mm]	300	4	0,63	0,52	7 530	5	35	0,66	0,55	7 888	5	35	0,69	0,57	8 247	5	36
		6			11 295	5	34			11 832	4	32			12 370	4	31
		8			15 060	14	48			15 777	13	48			16 494	13	47
		10			18 824	21	54			19 721	20	53			20 617	19	53
	350	4	0,74	0,61	8 785	1,25	18	0,77	0,64	9 203	1	15	0,81	0,67	9 621	0,75	12
		6			13 177	7	41			13 805	7	40			14 432	7	40
		8			17 569	13	48			18 406	12	47			19 243	12	47
		10			21 962	20	54			23 008	19	53			24 053	18	53
	400	4	0,84	0,70	10 040	1,25	18	0,88	0,73	10 518	1	16	0,92	0,76	10 996	0,75	12
		6			15 060	7	41			15 777	7	41			16 494	7	41
		8			20 079	13	48			21 036	12	48			21 992	12	48
		10			25 099	20	54			26 294	19	54			27 490	18	54
	450	4	0,95	0,78	11 295	1,25	19	0,99	0,82	11 832	1	16	1,04	0,86	12 370	0,75	13
		6			16 942	7	42			17 749	7	42			18 555	7	41
		8			22 589	9	44			23 665	8	43			24 741	7	42
		10			28 237	16	52			29 581	15	51			30 926	14	51
	500	4	1,05	0,87	12 550	1,25	19	1,10	0,91	13 147	1	17	1,15	0,95	13 745	0,75	13
		6			18 824	7	42			19 721	7	42			20 617	7	42
		8			25 099	9	45			26 294	8	44			27 490	7	43
		10			31 374	16	53			32 868	15	52			34 362	14	51
	550	4	1,16	0,96	13 805	1,25	20	1,21	1,00	14 462	1	17	1,27	1,05	15 119	0,75	13
		6			20 707	7	43			21 693	7	42			22 679	7	42
		8			27 609	9	45			28 924	8	44			30 239	7	43
		10			34 511	16	53			36 155	15	52			37 798	14	52
	600	4	1,26	1,05	15 060	1,25	20	1,32	1,10	15 777	1	17	1,38	1,15	16 494	0,75	14
		6			22 589	7	43			23 665	7	43			24 741	7	42
		8			30 119	12	49			31 553	11	49			32 988	11	48
		10			37 649	19	55			39 442	18	55			41 234	17	55
	650	4	1,37	1,13	16 314	1,25	20	1,43	1,19	17 091	1	18	1,50	1,24	17 868	0,75	14
		6			24 472	7	43			25 637	7	43			26 802	7	43
		8			32 629	12	49			34 183	11	49			35 736	11	49
		10			40 786	19	56			42 728	18	55			44 671	17	55
	700	4	1,47	1,22	17 569	1,25	21	1,54	1,28	18 406	1	18	1,61	1,34	19 243	0,75	15
		6			26 354	4	34			27 609	3	32			28 864	3	30
		8			35 139	12	50			36 812	11	49			38 485	11	49
		10			43 924	15	53			46 015	14	52			48 107	13	52
	750	4	1,58	1,31	18 824	1,25	21	1,65	1,37	19 721	1	18	1,73	1,43	20 617	0,75	15
		6			28 237	4	34			29 581	3	33			30 926	3	30
		8			37 649	12	50			39 442	11	50			41 234	11	49
		10			47 061	15	53			49 302	14	53			51 543	13	52
	800	4	1,68	1,39	20 079	1,25	21	1,76	1,46	21 036	1	19	1,84	1,53	21 992	0,75	15
		6			30 119	6	42			31 553	6	42			32 988	6	42
		8			40 159	12	50			42 071	11	50			43 983	11	49
		10			50 198	18	56			52 589	17	56			54 979	16	55
	850	4	1,79	1,48	21 334	4	37	1,87	1,55	22 350	4	37	1,96	1,62	23 366	4	37
		6			32 001	6	43			33 525	6	42			35 049	6	42
		8			42 669	14	53			44 700	14	53			46 732	14	53
		10			53 336	21	58			55 876	20	58			58 415	20	58
900	4	1,89	1,57	22 589	4	37	1,98	1,64	23 665	4	37	2,07	1,72	24 741	4	37	
	6			33 884	6	43			35 497	6	43			37 111	6	42	
	8			45 179	11	50			47 330	10	49			49 481	10	49	
	10			56 473	17	56			59 162	16	55			61 852	15	55	
950	4	2,00	1,66	23 844	4	37	2,09	1,73	24 980	4	37	2,19	1,81	26 115	4	38	
	6			35 766	6	43			37 470	6	43			39 173	6	42	
	8			47 688	9	47			49 959	8	46			52 230	7	46	
	10			59 611	15	54			62 449	14	54			65 288	13	53	
1000	4	2,10	1,74	25 099	4	37	2,20	1,83	26 294	4	38	2,30	1,91	27 490	4	38	
	6			37 649	6	43			39 442	6	43			41 234	6	43	
	8			50 198	7	44			52 589	6	43			54 979	5	41	
	10			62 748	13	53			65 736	12	52			68 724	11	51	
1050	4	2,21	1,83	26 354	4	38	2,31	1,92	27 609	4	38	2,42	2,00	28 864	4	38	
	6			39 531	6	44			41 414	6	43			43 296	6	43	
	8			52 708	7	45			55 218	6	43			57 728	5	42	
	10			65 885	13	53			69 023	12	52			72 160	11	51	
1100	4	2,31	1,92	27 609	4	38	2,42	2,01	28 924	4	39	2,53	2,10	30 239	4	39	
	6			41 414	6	44			43 386	6	44			45 358	6	43	
	8			55 218	7	45			57 848	6	44			60 477	5	42	
	10			69 023	13	53			72 310	12	53			75 596	11	52	

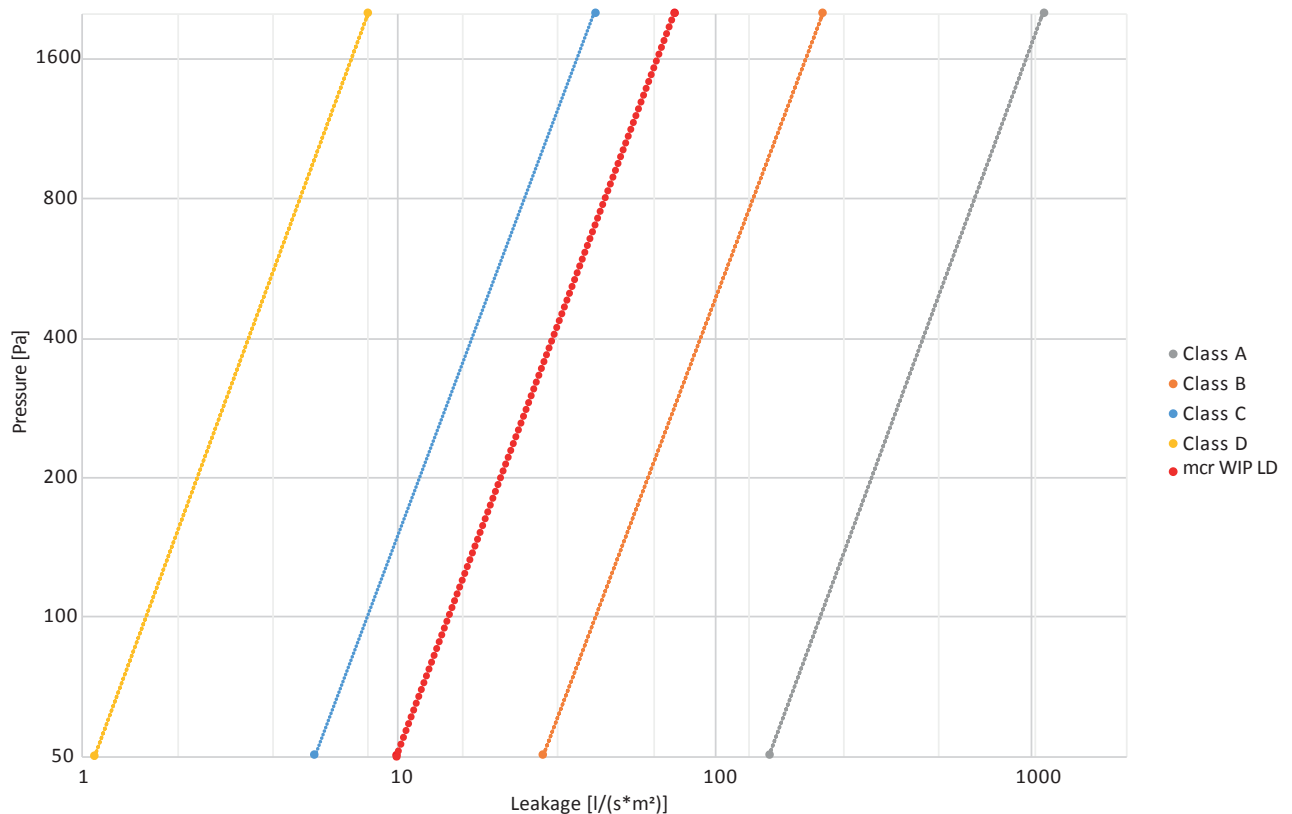
mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

18.7 | Damper active surface quick selection table [m2] (FREE AREA – APERTURE SIZES IN MM AND AREA IN MSQ)

Active surface a [m²]		Width Bo [mm]																
		395	400	450	500	550	600	650	700	750	800	850	900	950	1000	1050	1100	1195
Height Ho [mm]	685	0,10	0,12	0,14	0,16	0,18	0,20	0,22	0,24	0,26	0,28	0,30	0,32	0,34	0,36	0,38	0,40	0,44
	700	0,12	0,14	0,17	0,19	0,22	0,24	0,26	0,29	0,31	0,34	0,36	0,39	0,41	0,43	0,46	0,48	0,53
	800	0,14	0,17	0,20	0,22	0,25	0,28	0,31	0,34	0,37	0,40	0,42	0,45	0,48	0,51	0,54	0,57	0,62
	900	0,16	0,19	0,22	0,26	0,29	0,32	0,36	0,39	0,42	0,45	0,49	0,52	0,55	0,58	0,62	0,65	0,71
	1000	0,18	0,22	0,25	0,29	0,33	0,36	0,40	0,44	0,47	0,51	0,55	0,58	0,62	0,66	0,69	0,73	0,80
	1100	0,20	0,24	0,28	0,32	0,36	0,41	0,45	0,49	0,53	0,57	0,61	0,65	0,69	0,73	0,77	0,81	0,89
	1200	0,22	0,27	0,31	0,36	0,40	0,45	0,49	0,54	0,58	0,63	0,67	0,72	0,76	0,81	0,85	0,90	0,98
	1300	0,24	0,29	0,34	0,39	0,44	0,49	0,54	0,59	0,64	0,68	0,73	0,78	0,83	0,88	0,93	0,98	1,07
	1400	0,26	0,32	0,37	0,42	0,48	0,53	0,58	0,64	0,69	0,74	0,80	0,85	0,90	0,96	1,01	1,06	1,16
	1500	0,28	0,34	0,40	0,46	0,51	0,57	0,63	0,69	0,74	0,80	0,86	0,92	0,97	1,03	1,09	1,15	1,25
	1600	0,30	0,37	0,43	0,49	0,55	0,61	0,67	0,74	0,80	0,86	0,92	0,98	1,04	1,11	1,17	1,23	1,35
	1700	0,32	0,39	0,46	0,52	0,59	0,65	0,72	0,78	0,85	0,92	0,98	1,05	1,11	1,18	1,25	1,31	1,44
	1800	0,34	0,41	0,48	0,55	0,62	0,69	0,76	0,83	0,90	0,97	1,04	1,11	1,18	1,25	1,32	1,39	1,53
	1900	0,37	0,44	0,51	0,59	0,66	0,74	0,81	0,88	0,96	1,03	1,11	1,18	1,25	1,33	1,40	1,48	1,62
	2000	0,39	0,46	0,54	0,62	0,70	0,78	0,86	0,93	1,01	1,09	1,17	1,25	1,32	1,40	1,48	1,56	1,71
	2100	0,41	0,49	0,57	0,65	0,74	0,82	0,90	0,98	1,07	1,15	1,23	1,31	1,40	1,48	1,56	1,64	1,80
	2200	0,43	0,51	0,60	0,69	0,77	0,86	0,95	1,03	1,12	1,21	1,29	1,38	1,47	1,55	1,64	1,73	1,89
2300	0,45	0,54	0,63	0,72	0,81	0,90	0,99	1,08	1,17	1,26	1,35	1,45	1,54	1,63	1,72	1,81	1,98	
2385	0,47	0,56	0,66	0,75	0,85	0,94	1,04	1,13	1,23	1,32	1,42	1,51	1,61	1,70	1,80	1,89	2,07	

Bo - hole width
Ho - hole height

18.8 | Sealed damper blade tightness according to EN1751



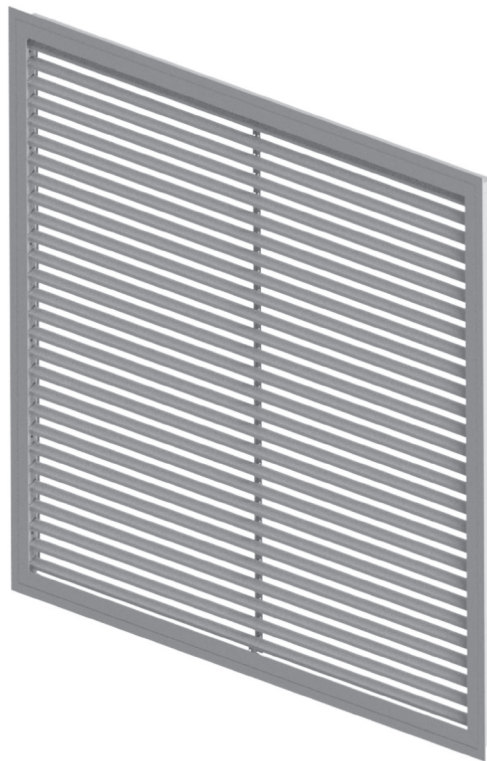
mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

18.9 | Estimated weight of the mcr WIP LD dampers [kg]

		Width B [mm]								
		300	400	500	600	700	800	900	1000	1100
Height H [mm]	600	20	21	23	26	30	35	37	39	41
	700	21	23	25	28	32	35	38	40	42
	800	22	24	29	35	37	41	43	49	55
	900	25	28	33	35	39	43	49	52	55
	1000	32	33	36	42	43	47	53	60	67
	1100	35	36	37	38	39	41	42	44	46
	1200	38	39	40	41	42	44	45	47	49
	1300	41	42	43	44	46	47	49	51	52
	1400	44	45	46	48	49	51	53	55	57
	1500	47	48	50	51	53	55	57	59	61
	1600	50	51	53	55	57	59	61	64	66
	1700	53	55	56	58	59	61	63	65	67
	1800	56	58	59	61	63	65	67	69	71
	1900	59	61	63	65	67	69	71	73	75
	2000	62	64	66	68	70	72	75	77	79
	2100	65	67	69	71	74	76	78	81	84
	2200	68	70	72	75	77	80	82	85	88
	2300	71	73	76	78	81	83	86	89	92

18.10 | Accessories

18.10.1 | mcr MWS system masking element

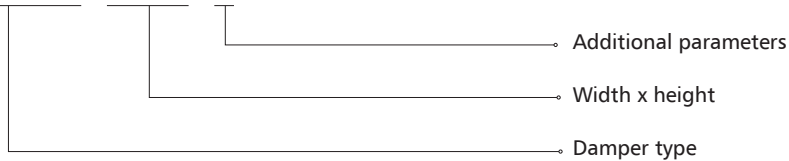


MWS system masking grilles are designed to fulfill either supply or exhaust function. They enable the transfer of air through construction partitions. They come with fixed steel louvers with a 40 mm span, obscuring damper visibility. Bolts embedded in the damper are used to attach the masking grille body. After installation, an outer frame is mounted on the masking grille body so that the holes and bolts cannot be seen from the outside. Such a solution allows for installing the product even in the most visually-demanding applications. The masking grilles are painted in RAL 9010 as a standard (available in any colour from the RAL range on request).

mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

Marking:

mcr MWS / B x H / X

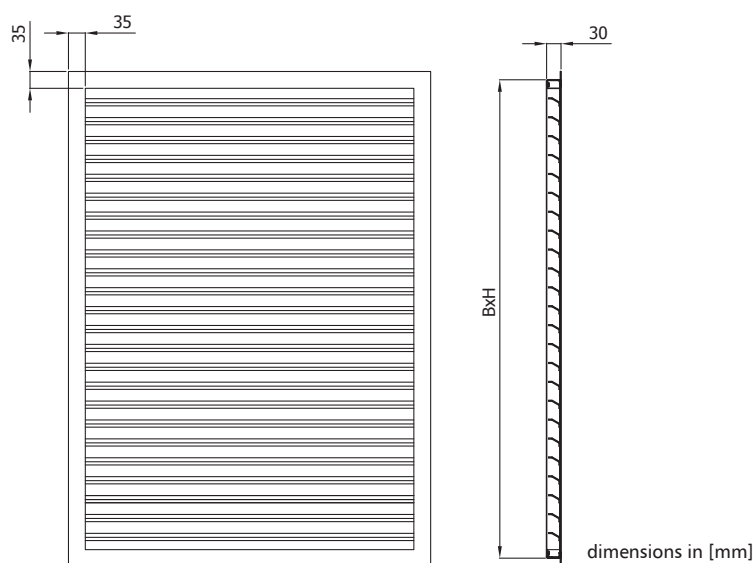


X – material

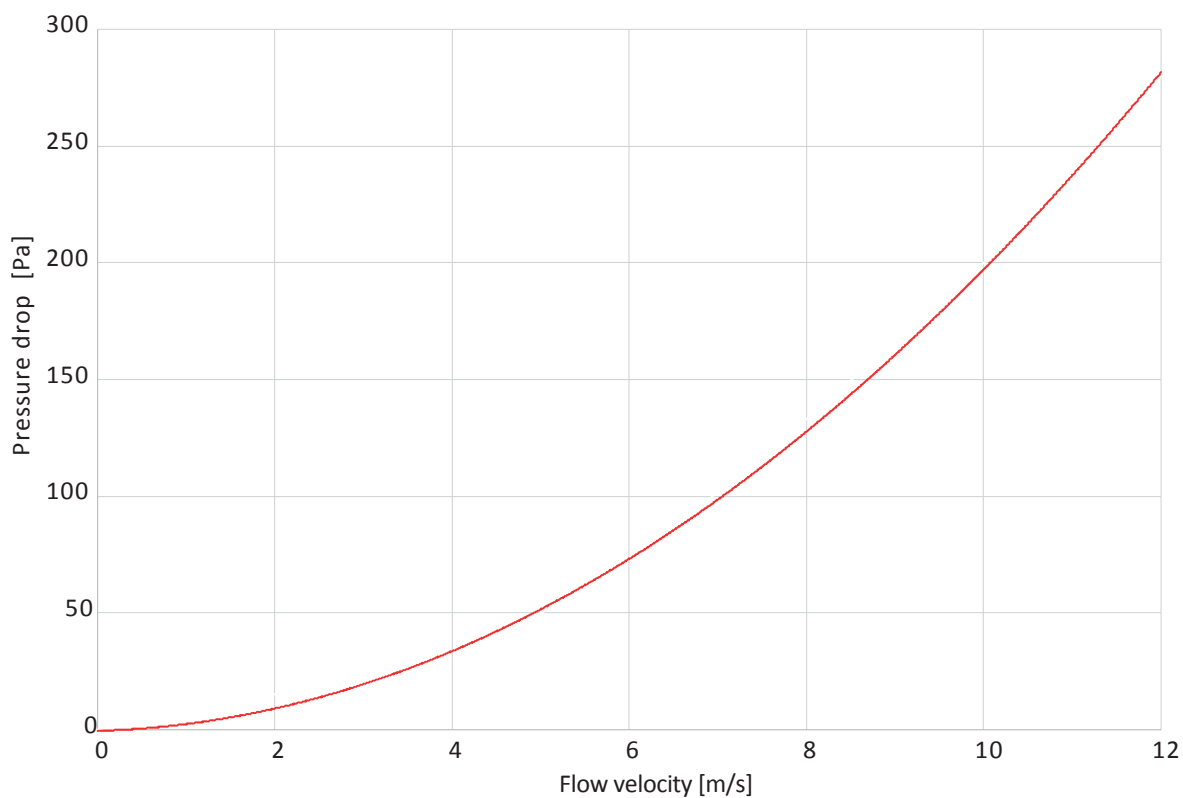
[no symbol] – RAL9010

RALXXXX – selected color code from the RAL palette

NONE – unpainted masking element

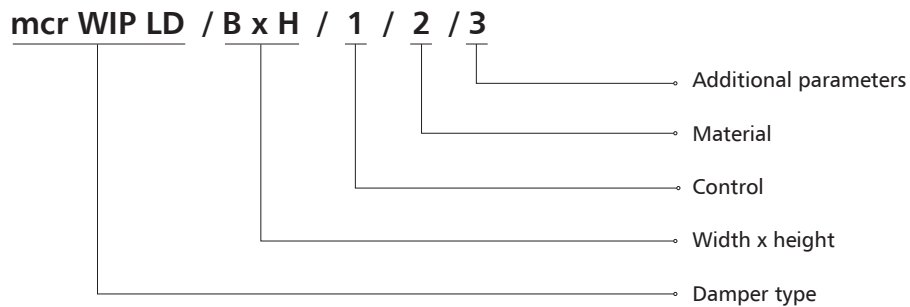


»Pressure drop on masking grilles



mcr WIP LD | Multi-blade smoke control damper for multi-zone fire ventilation systems

18.11 | Marking



1 – control

» trigger control mechanism

- BE24 – actuator without a return spring, U = 24 V AC/DC
- BE230 – actuator without a return spring, U = 230 V AC/DC
- BEE24 – actuator without a return spring, U = 24 V AC/DC
- BEN24 – actuator without a return spring, U = 24 V AC/DC
- BEE230 – actuator without a return spring, U = 230 V AC/DC
- BEN230 – actuator without a return spring, U = 230 V AC/DC
- MLE24 – actuator without a return spring, U = 24 V AC/DC
- MLE230 – actuator without a return spring, U = 230 V AC
- ME24 – actuator without a return spring, U = 24 V AC/DC
- ME230 – actuator without a return spring, U = 230 V AC

2 – material

- [no symbol] – galvanized steel, Zn 275 m² coating
- KN – stainless steel
- KK – 1.4404 acid-proof steel

3 – additional parameters

» Damper axis of rotation

- [no symbol] – horizontal axis of rotation
- [no symbol] – left damper
- [no symbol] – not painted
- RAL9005 – damper blades and internal casing from the side of the actuator are painted black

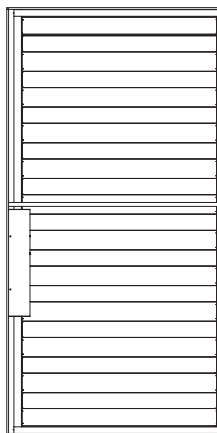
Note: separate additional parameters entered with the "/" sign

example marking: mcr WIP LD 400 x 600 BLE24

Multi-blade smoke control damper with a 24 V actuator with limit switches.

18.12 | Design standard

» Left damper



Chapter 19 - power supply and control (p. 350) contains the following information:

- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.

19.1 | Compatibility with smoke control dampers fire dampers – quick drive selection table

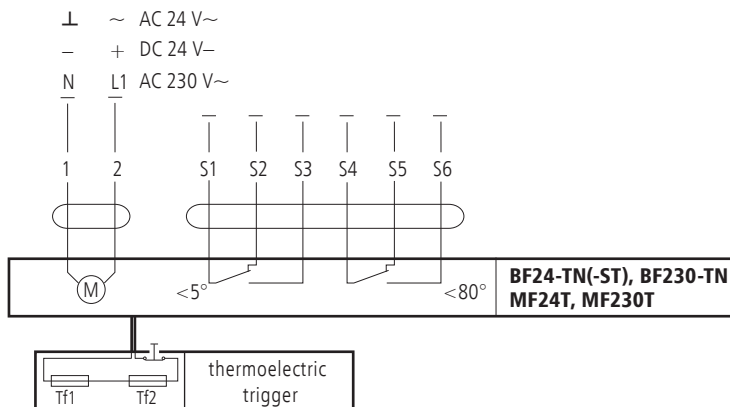
Smoke dampers fire dampers Trigger control mechanisms	mcr FID B	mcr FID S/S c/P	mcr FID S/S p/P mcr FID S/S p/O	mcr FID S/V p/P mcr FID S/V-M p/P	mcr FID PRO	mcr FID WING	mcr FID 240	mcr ZIPP	mcr WIP/S mcr WIP/T	mcr WIP/V mcr WIP/V-M	mcr WIP PRO/S mcr WIP PRO/T	mcr WIP PROV/M mcr WIP PROV	mcr DOR	mcr WIP LD
BFL24-T (-ST)		✓	✓		✓		✓		✓		✓			
BFL230-T		✓	✓		✓		✓		✓		✓			
BFN24-T (-ST)		✓	✓				✓		✓		✓			
BFN230-T		✓	✓				✓		✓		✓			
BE24	✓			✓						✓		✓		✓
BE230	✓			✓						✓		✓		✓
BEN24/BEE24	✓			✓						✓		✓		✓
BEN230/BEE230	✓			✓						✓		✓		✓
EXBF24-T		✓	✓		✓				✓		✓			
EXBF230-T		✓	✓		✓				✓		✓			
MF24T			✓				✓		✓		✓			
MF230T			✓				✓		✓		✓			
MLF24T		✓			✓									
MLF230T		✓			✓									
BF24TL-TN (-ST)		✓	✓		✓				✓		✓			
RST		✓	✓		✓	✓		✓						
RST/WK1		✓	✓		✓	✓		✓						
RST/WK2		✓	✓		✓									
RST-KW1/S		✓	✓		✓									
RST-KW1/S/WK2		✓	✓		✓						✓			
RST-KW1/24I		✓	✓		✓									
RST-KW1/24P		✓	✓		✓						✓			
RST-KW1/230I		✓	✓		✓									
RST-KW1/230P		✓	✓		✓						✓			
RST-EKI24								✓						
RST-EKP24								✓						
RST-EKI230								✓						
RST-EKP230								✓						
EM24D													✓	
MLE24	✓			✓						✓		✓		✓
MLE230	✓			✓						✓		✓		✓
QT.Ex24-FT.Ex		✓	✓		✓				✓		✓			
QT.Ex230-FT.Ex		✓	✓		✓				✓		✓			
ME24	✓			✓						✓		✓		✓
ME230	✓			✓						✓		✓		✓

19.2 | Actuators

19.2.1 | Electric actuators with a spring

Specifications	BF24-TN, MF24T	BF230-TN, MF230T
supply	AC 24 V 50/60 Hz DC 24 V	AC 220-240 V 50/60 Hz
power demand:		
– for spring tensioning	7 W	8 W
– for holding	2 W	3 W
sizing (apparent power)	10 VA	11 VA
protection class	III	II
ingress protection rating	IP 54	IP 54
auxiliary circuit breaker:	2 x EPU	2 x EPU
– activation point	3 (0,5) A 250 V 5°, 80°	3 (0,5) A 250 V~ 5°, 80°
torque:		
- motor	18 Nm	18 Nm
- return spring	12 Nm	12 Nm
cable connection:		
- motor (length: 0.9 m)	2 x 0,75 mm ²	2 x 0,75 mm ²
- auxiliary circuit breaker	6 x 0,75 mm ²	6 x 0,75 mm ²
operation time (0-90°):		
- motor	120 s	120 s
- return spring	~16 s	~16 s
operating temperature – range	-30 ... +50°C	-30 ... +50°C
noise level:		
- motor	max 45 dB (A)	max 45 dB (A)
- return spring	~63 dB (A)	~63 dB (A)

» electrical diagram for the BF...T, MF...T series actuator:



NOTE:

24 V connection through a safety transformer.

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

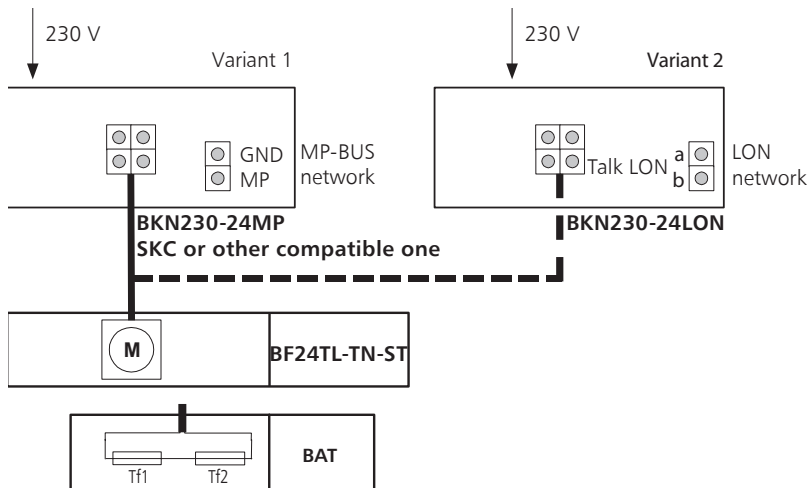
It is possible to connect further drives in parallel. Check the power consumption.

NOTE:

Actuator limit switches positions are provided for the voltage-free position.

Power supply and control | Trigger control mechanisms

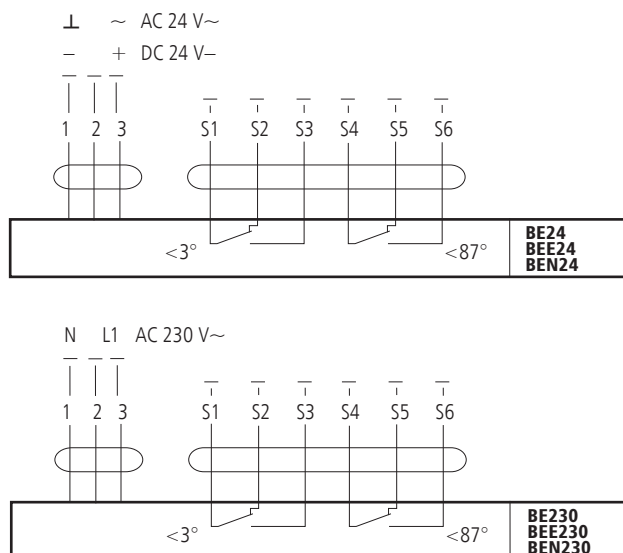
» electrical diagram for the BF24TL-T(-ST) and BF24TL(-ST) actuator:



19.2.2 | Electric actuators without return springs

Specifications	BE24	BE230	BEE24	BEE230	BEN24	BEN230	MLE 24	MLE 230	ME24	ME230
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	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	AC 24 V 50/60 Hz DC 24 V	AC 230 V 50/60 Hz
power demand: - for spring tensioning - for holding	12 W 0,5 W	8 W 0,5 W	5,5 W 0,1 W	3,5 W 0,4 W	3 W 0,1 W	4 W 0,4 W	8,2 W 3,5 W	5,2 W 3,5 W	6 W 1 W	6,5 W 1 W
sizing (apparent power)	18 VA	15 VA	5 VA	6 VA	6 V	7 V	10 VA	10 VA	10,5 VA	10,5 VA
protection class	III	II	III	II	III	II	II	II	III	II
ingress protection rating	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54
auxiliary circuit breaker: - activation point	2 x SPDT 6 (1,5) A AC 250 V 5°, 80°	2 x SPDT 6 (1,5) A AC 250 V 5°, 80°	2xSPDT 3A AC 250V 5°, 80°	2xSPDT 3A AC 250V 5°, 80°	2xSPDT 3A AC 250V 5°, 80°	2xSPDT 3A AC 250V 5°, 80°	2 x SPDT 3 (1,5) A AC 250 V 5°, 85°	2 x SPDT 3 (1,5) A AC 250 V 5°, 85°	2 x SPDT 3 (1,5) A AC 250 V 5°, 85°	2 x SPDT 3 (1,5) A AC 250 V 5°, 85°
torque - motor	40 Nm	40 Nm	25 Nm	25 Nm	15 Nm	15 Nm	18 Nm	18 Nm	40 Nm	40 Nm
cable connection: - motor (length: 0.9 m) - auxiliary circuit breaker	2 x 0,75 mm² 6 x 0,75 mm²	2 x 0,75 mm² 6 x 0,75 mm²	2 x 0,75 mm² 6 x 0,75 mm²	2 x 0,75 mm² 6 x 0,75 mm²	2 x 0,75 mm² 6 x 0,75 mm²	2 x 0,75 mm² 6 x 0,75 mm²	3 x 0,75 mm² 6 x 0,75 mm²	3 x 0,75 mm² 6 x 0,75 mm²	3 x 0,75 mm² 6 x 0,75 mm²	3 x 0,75 mm² 6 x 0,75 mm²
operation time (0-90°) - motor	< 60 s for 90°	< 60 s for 90°	60 s for 90°	60 s for 90°	30 s for 90°	30 s for 90°	< 30 s for 90°	< 30 s for 90°	60 s for 90°	60 s for 90°
operating temperature - range	-30 ... +50°C	-30 ... +50°C	-30 ... +55°C	-30 ... +55°C	-30 ... +55°C	-30 ... +55°C	-25 ... +55°C	-25 ... +55°C	-20... +50°C	-20... +50°C
noise level	~62 dB (A)	~62 dB (A)	~62 dB (A)	~62 dB (A)	~62 dB (A)	~62 dB (A)	~40 dB (A)	~40 dB (A)	~50 dB (A)	~50 dB (A)

» electrical diagram for the BE, BLE series actuator:



NOTE:

Engine operation control requires connection to a three-wire system.
The actuator rotation direction is changed by connecting supply voltage to the terminals no. 2 or no. 3, depending on the desired rotation direction.

NOTE: 24 V connection through a safety transformer.

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

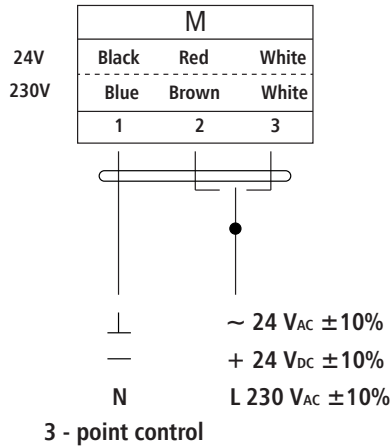
It is possible to connect further drives in parallel. Check the power consumption.

NOTE: Actuator limit switches positions are provided for the voltage-free position.

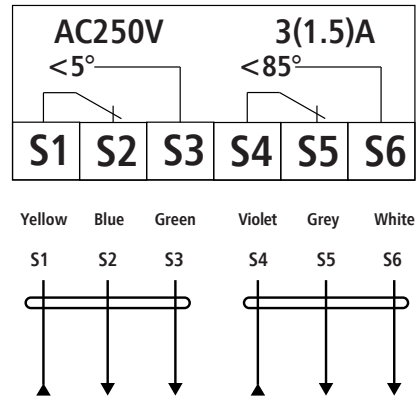
Power supply and control | Trigger control mechanisms

» electrical diagram MLE series actuator:

Supply control:

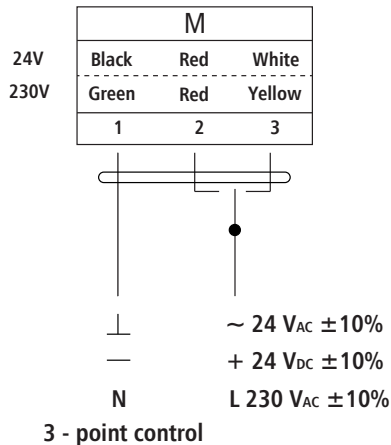


Aux switch:

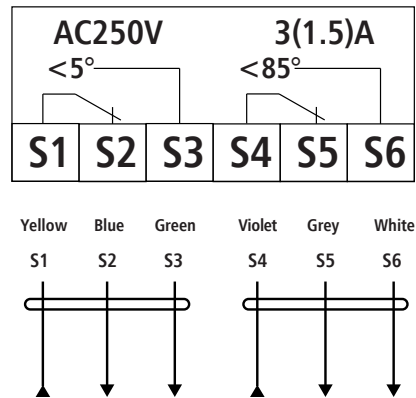


» electrical diagram ME series actuator::

Supply control:



Aux switch:



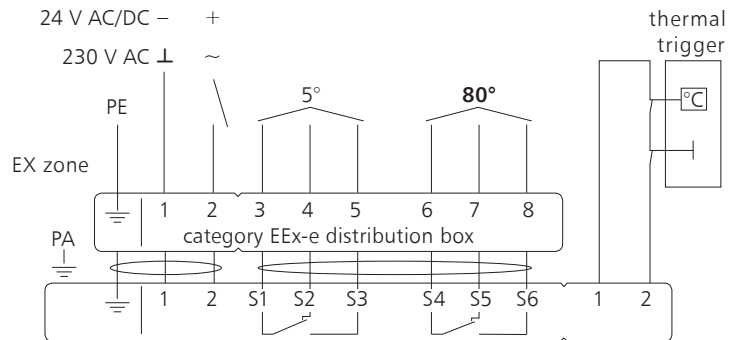
19.2.3 | Electric actuators without return springs

Specifications	EXBF B 001 2 ...0 N 000	EXBF A 001 2 ...0 N 000	QT.Ex24-FT.Ex	QT.Ex230-FT.Ex
zone	1, 2, 21, 22			
ATEX classification	II 2 GD EEx d IIC T6			
supply	24 V AC ±20% 50/60 Hz / 24 V DC -10/+20%	230 V AC ±14% 50/60 Hz	AC 24 V 50/60 Hz DC 24 V	AC 230 V 50/60 Hz
power demand:				
- for spring tensioning	7 W	8 W	20 W	20 W
- for holding	2 W	3 W	5 W	5 W
sizing (apparent power)	10 VA	11 VA	30 VA	30 VA
ingress protection rating	IP 66	IP 66	IP 66	IP 66
auxiliary circuit breaker:	2 x SPDT 6 A (3) max 250 V AC	2 x SPDT 6 A (3) max 250 V AC	2 x SPDT 3 (1,5) A AC 250 V	2 x SPDT 3 (1,5) A AC 250 V
- activation point	5°, 80°	5°, 80°	5°, 80°	5°, 80°
torque:				
- motor	18 Nm	18 Nm	18 Nm	18 Nm
- return spring	12 Nm	12 Nm	15 Nm	15 Nm
operation time (90°C):				
- motor	150 s	150 s	15 s	15 s
- return spring	~20 s	~20 s	3 s*/10 s	3 s*/10 s
ambient temperature	-30 ... +50°C	-30 ... +50°C	-40... +70°C	-40... +70°C

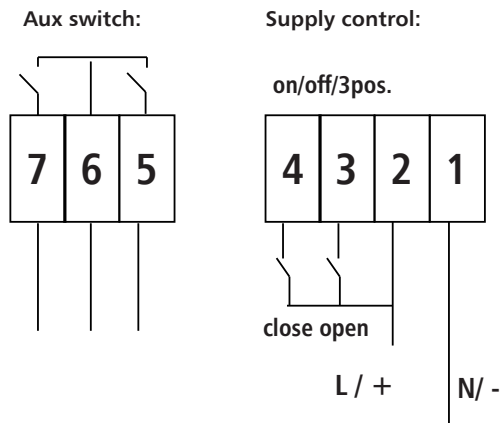
* time of 3s on request

> Power supply and control | Trigger control mechanisms

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



» connection diagram for the QT.Ex actuator:

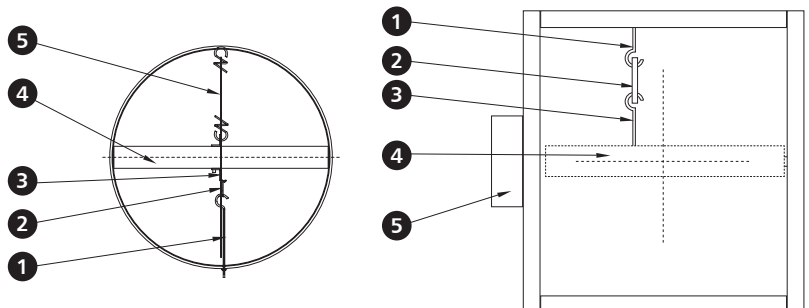


open bridge 2 to 3+ power on
close power off, actuator closes by spring return

19.3 | RST trigger and control mechanisms

In the RST version, the WK1 limit switches are installed inside the damper's casing as independent assemblies. The thermal trigger is located on the damper blade. A drive spring is installed on the damper blade or its casing in a protective box.

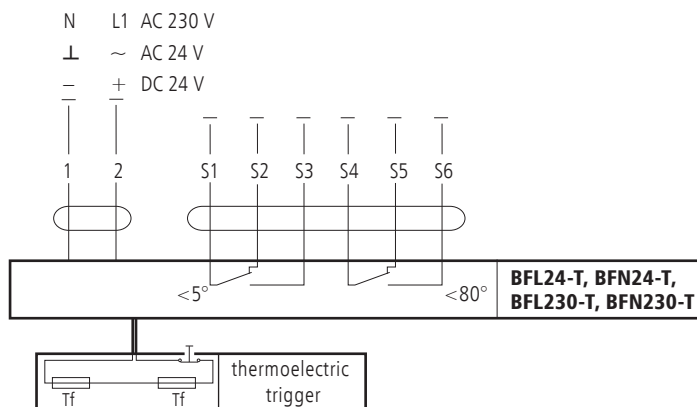
1. movable hook with nut
2. thermal trigger
3. thermal trigger
4. fixed hook on the damper blade
5. drive spring



Power supply and control | Trigger control mechanisms

Specifications	BFL24-T	BFL230-T	BFN24-T	BFN230-T	MLF24T	MLF230T
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	AC 24 V 50/60 Hz DC 24 V	AC 220-240 V 50/60 Hz
power demand:						
- for spring tensioning	2,5 W	3,5 W	4 W	5 W	5 W	5 W
- for holding	0,7 W	1,1 W	1,4 W	2,1 W	2,5 W	3 W
sizing (apparent power)	4 VA	6,5 VA	6 VA	10 VA	7 VA	7 VA
protection class	III	II	III	II	III	II
ingress protection rating	IP 54	IP 54	IP 54	IP 54	IP 54	IP 54
auxiliary circuit breaker:	2 x SPDT	2 x SPDT	2 x SPDT	2 x SPDT	2 x SPDT	2 x SPDT
- activation point	3 (0,5) A AC 250 V 5°, 80°	3 (0,5) A AC 250 V 5°, 80°	3 (0,5) A AC 250 V 5°, 80°	3 (0,5) A AC 250 V 5°, 80°	3 (0,5) A AC 250 V 5°, 80°	3 (0,5) A AC 250 V 5°, 80°
torque:						
- motor	4 Nm	4 Nm	9 Nm	9 Nm	4 Nm	4 Nm
- return spring	3 Nm	3 Nm	7 Nm	7 Nm	4 Nm	4 Nm
cable connection:						
- motor (length: 0.9 m)	2 x 0,75 mm ²	2 x 0,75 mm ²	2 x 0,75 mm ²	2 x 0,75 mm ²	2 x 0,75 mm ²	2 x 0,75 mm ²
- auxiliary circuit breaker	6 x 0,75 mm ²	6 x 0,75 mm ²	6 x 0,75 mm ²	6 x 0,75 mm ²	6 x 0,75 mm ²	6 x 0,75 mm ²
operation time (0-90°):						
- motor	< 60 s	< 60 s	< 60 s	< 60 s	40-75s	40-75s
- return spring	~20 s	~20 s	~20 s	~20 s	20s	20s
operating temperature – range	-30 ... +55°C	-30 ... +55°C	-30 ... +55°C	-30 ... +55°C	-30 ... +50°C	-30 ... +50°C
noise level:						
- motor	max 43 dB (A)	max 43 dB (A)	max 55 dB (A)	max 55 dB (A)	max 45 dB (A)	max 45 dB (A)
- return spring	~62 dB (A)	~62 dB (A)	~67 dB (A)	~67 dB (A)	~62 dB (A)	~62 dB (A)

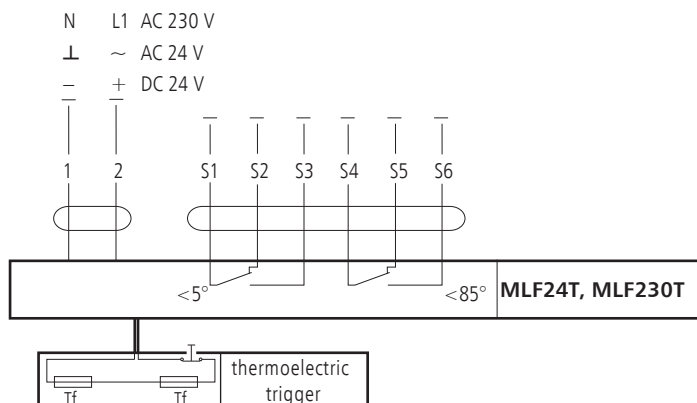
» electrical diagram for the BFL...-T, BFN...-T series actuator:



NOTE: 24 V connection through a safety transformer. To disconnect the 230 V actuator from the mains, a 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: actuator limit switches positions are provided for the voltage-free position.

» electrical diagram for the MLF24T, MLF230T series actuator:



NOTE: 24 V connection through a safety transformer. To disconnect the 230 V actuator from the mains, a 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: actuator limit switches positions are provided for the voltage-free position.

Power supply and control | Trigger control mechanisms

» Independent damper limit switches - for the RST version

WK1 – limit switch (closed blade signal)

WK2 – limit switch (open/closed blade signal)

» Switch technical data

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

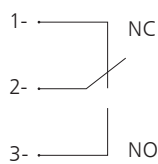
» Independent damper limit switches - for the RST version

WK1 – limit switch (closed blade signal)

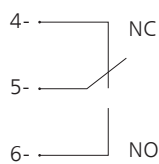
WK2 – limit switch (open/closed blade signal)

» electric diagram for the WK1 and WK2 limit switches

closing signalization



opening signalization



NOTE:

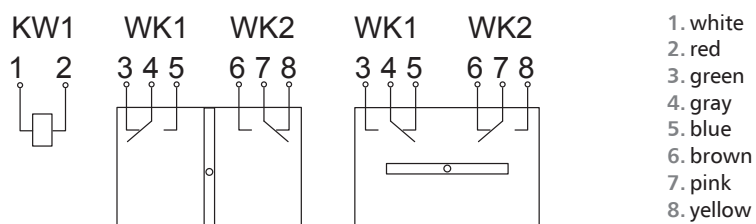
When closing the blade, the damper closing signalization switch is operated (terminal 2-3 is closed).

19.4 | RST-KW1 mechanisms

Specifications	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 - release switch	–	–	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				
operation time	max. 2 s					
mechanism operation control (closing)	-	-	voltage supply "impulse"	voltage disconnection "break"	voltage supply "impulse"	voltage disconnection "break"
mechanism operation control (opening)	manually	manually	manually	manually	manually	manually
impulse duration	max. 1 s					

» electrical collections description

KW1 mechanism power supply	WK1 limit switch	WK2 limit switch
Wire no. 1–2 white / red	Wire no. 3–4, NC type (normally closed) green / gray	Wire no. 6–7, NO type (normally open) brown / pink
	Wire no. 4–5, NO type (normally open) gray / blue	Wire no. 7–8, NC type (normally closed) pink / yellow





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