

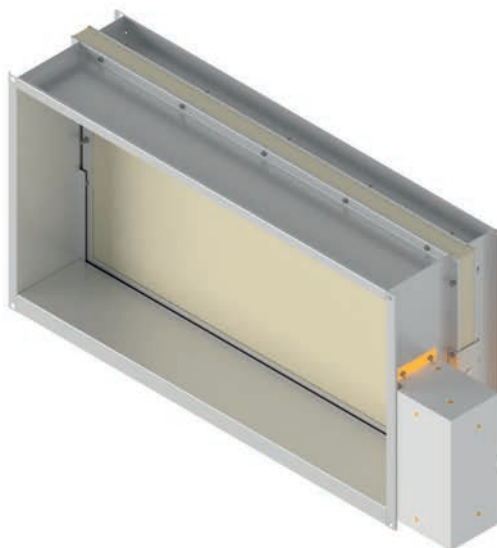


FIRE VENTILATION SYSTEMS
FIRE DAMPERS AND FIRE VALVES

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



ATEST HIGIENICZNY



CTO S.A.

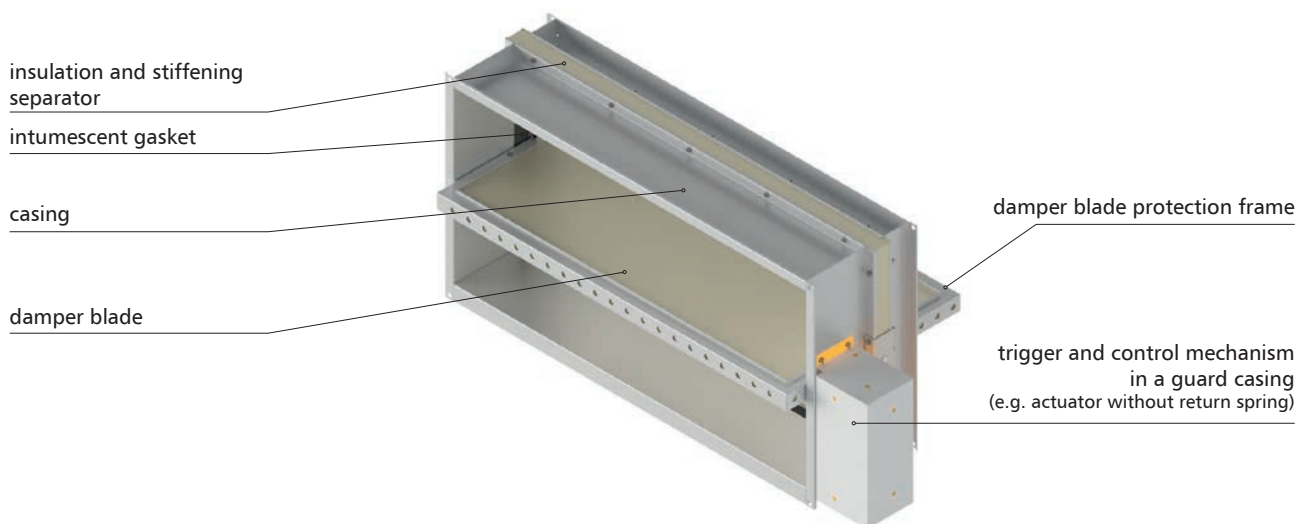
» EIS120, E₆₀₀ 120

- » 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.
- » Permitted operation with both vertical and horizontal axis of rotation.

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.

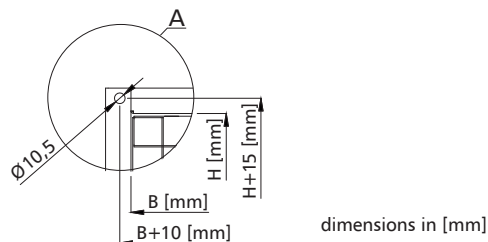
mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.3 | Versions

4.3.1 | Damper closing and opening with an actuator

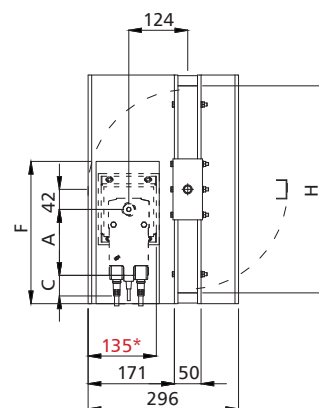
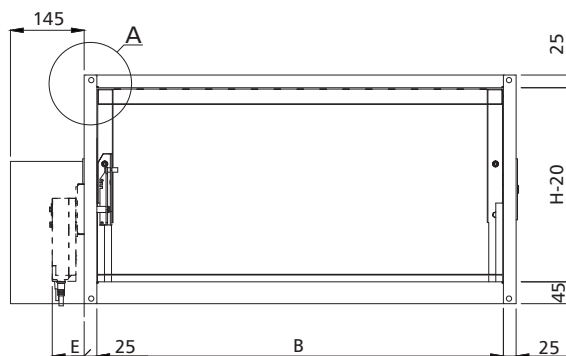
During normal operation, the damper blade of the fire damper remains open or closed. In the case of fire, the damper blade in the compartment where the fire occurs opens and the damper blades in the remaining compartments are closed – the blades are operated remotely by supplying power.

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

*embedding border



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)

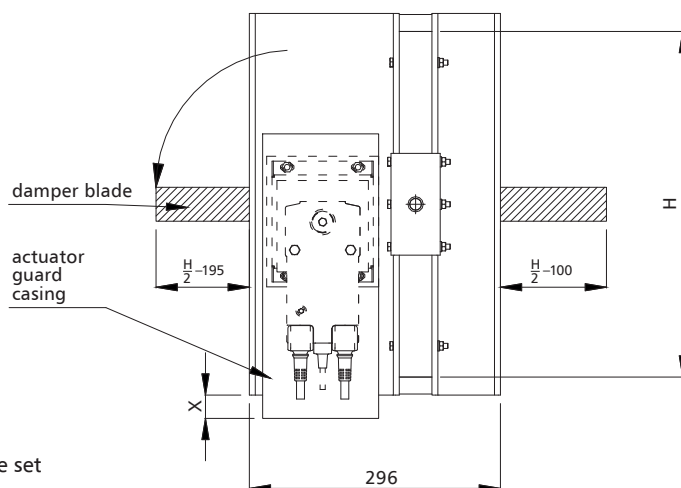
made up of 2 or 3 dampers:

- » 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

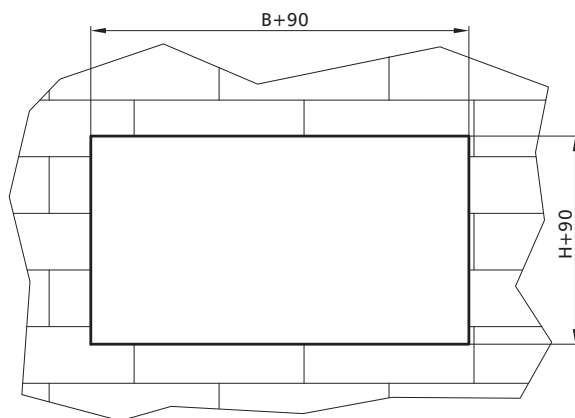
4.5 | Installation

- » 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.

* The above mentioned installation must be clearly specified in the design documentation and communicated to the manufacturer when placing the order. The dimensions of the damper BxH (width x height), which is to be installed with a vertical rotation axis, should be provided as if for a damper with a horizontal rotation axis (the power and control mechanism is mounted on the H dimension) with an indication of vertical axis installation.

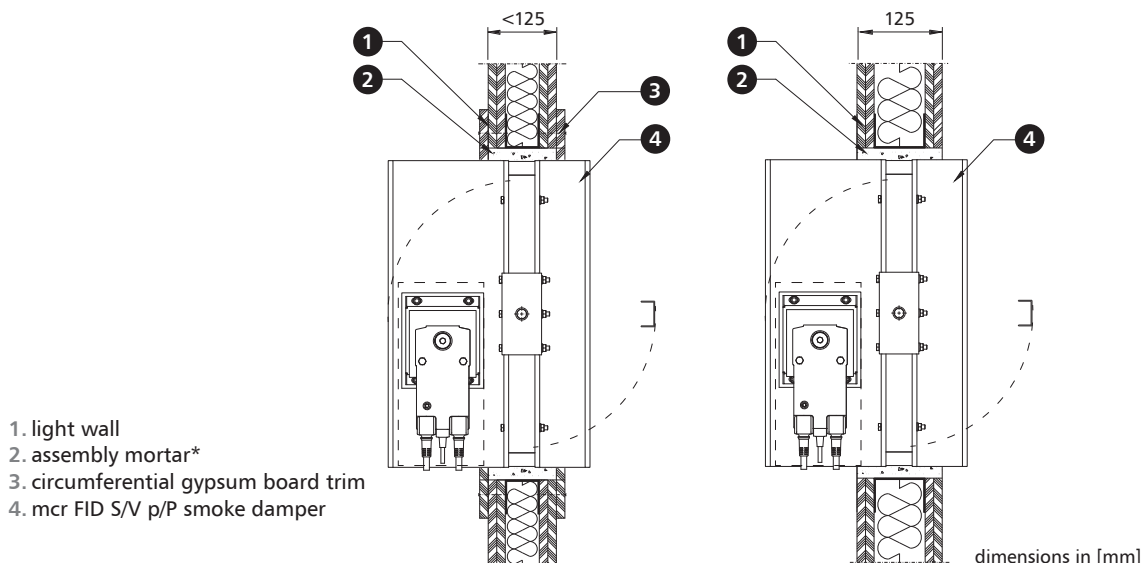
4.5.1 | Preparation of installation openings

- » preferred opening



dimensions in [mm]

4.5.2 | Sample installation in gypsum board light walls



1. light wall
2. assembly mortar*
3. circumferential gypsum board trim
4. mcr FID S/V p/P smoke damper

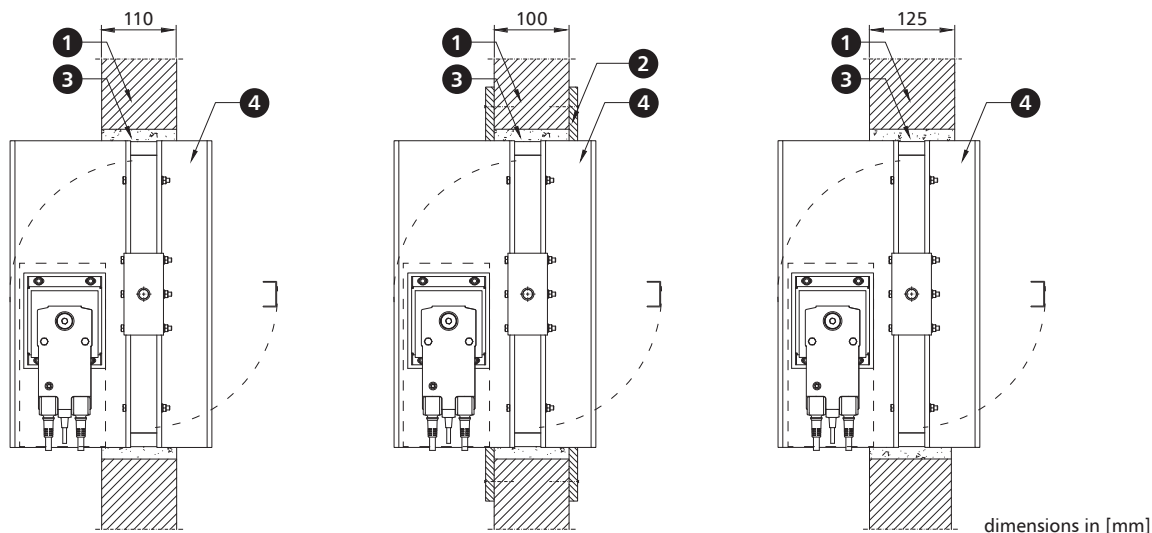
dimensions in [mm]

* 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.

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4.5.3 | Sample installation in concrete and brick walls



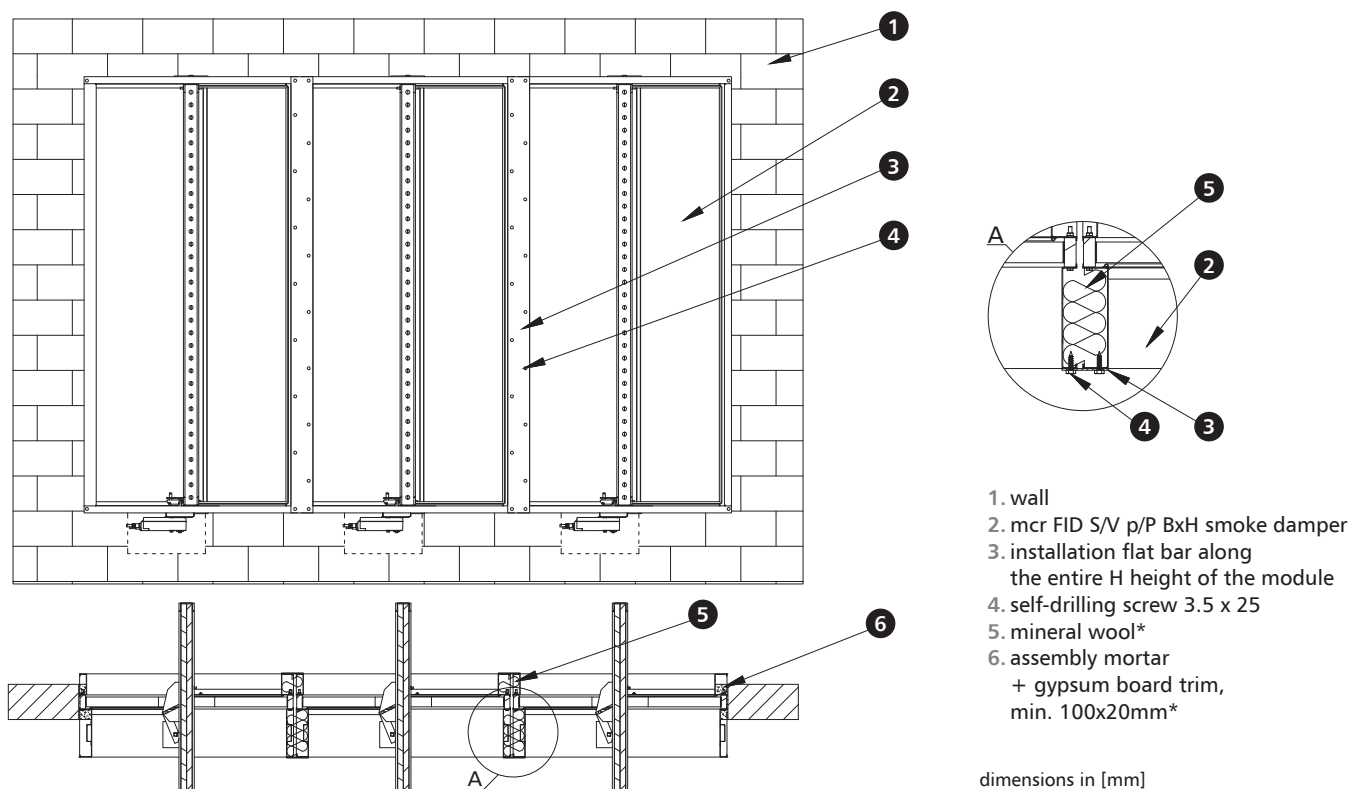
- 1. rigid wall - concrete, aerated concrete or bricks
- 2. circumferential gypsum board trim

- 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

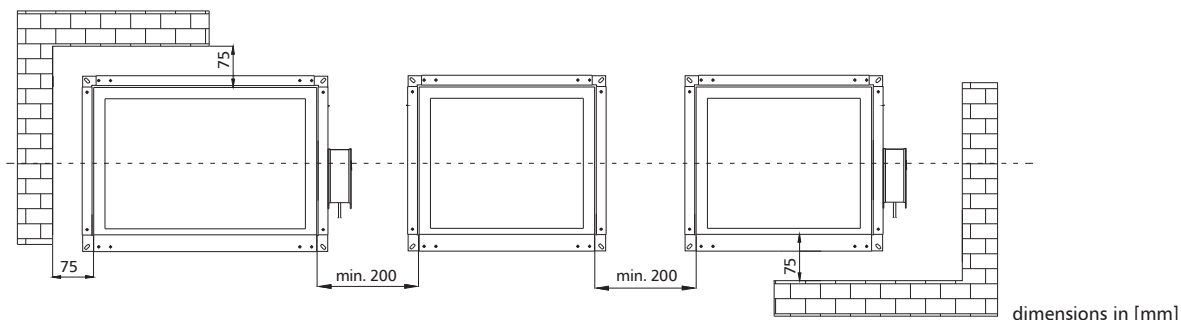


- 1. wall
- 2. mcr FID S/V p/P BxH smoke damper
- 3. installation flat bar along the entire H height of the module
- 4. self-drilling screw 3.5 x 25
- 5. mineral wool*
- 6. assembly mortar + gypsum board trim, min. 100x20mm*

* 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.

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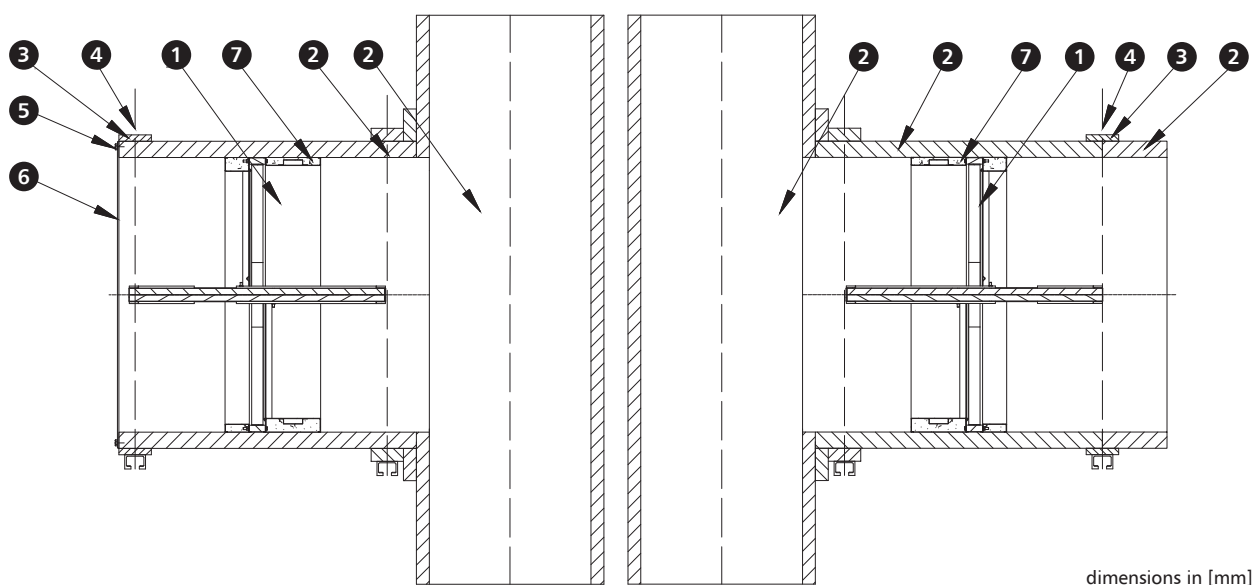
Minimum distance between the individual systems and partitions



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



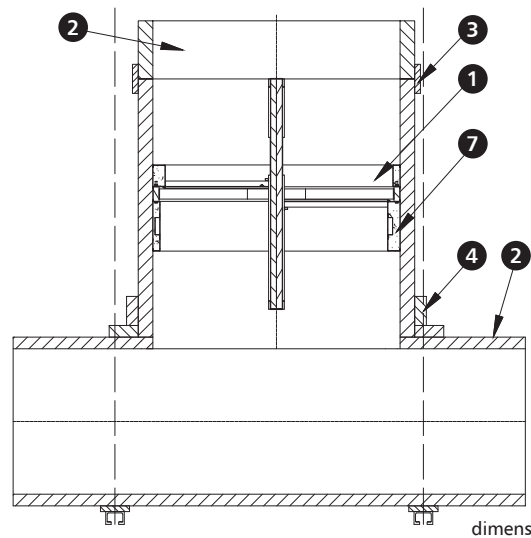
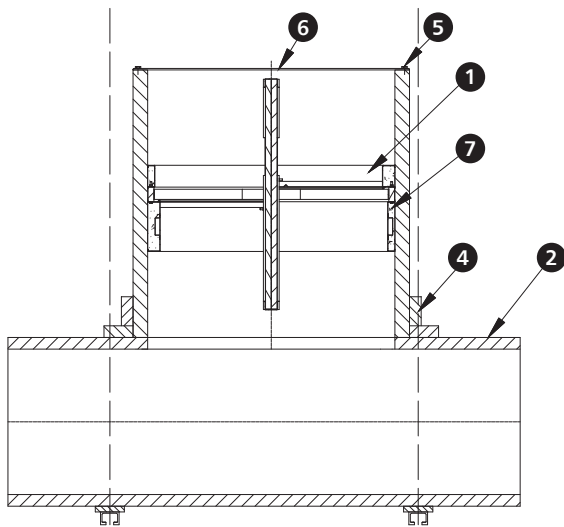
1. mcr FID S/V p/P BxH smoke damper
2. multi-zone smoke extract duct – e.g. made of fire-proof boards
3. a strip of fire-proof board along the entire length of the BxH side
4. installation hangers system

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.

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4.5.6 | Damper installation on vertical ducts



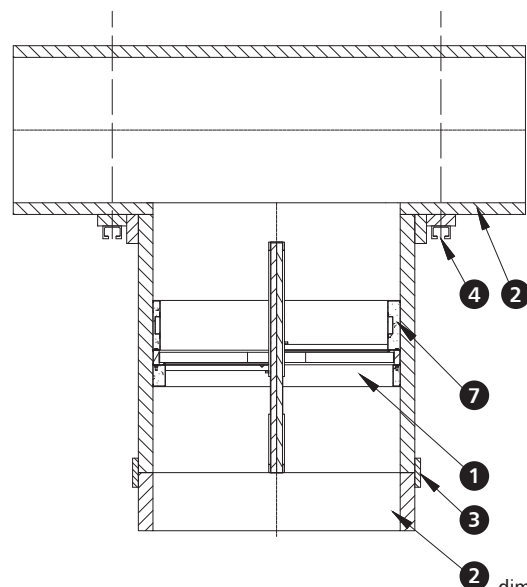
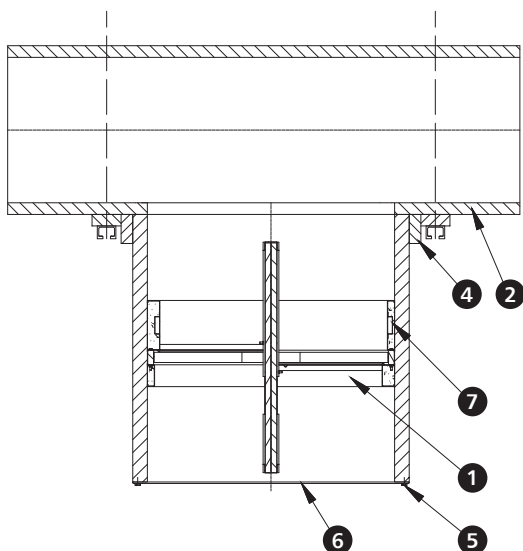
dimensions in [mm]

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]

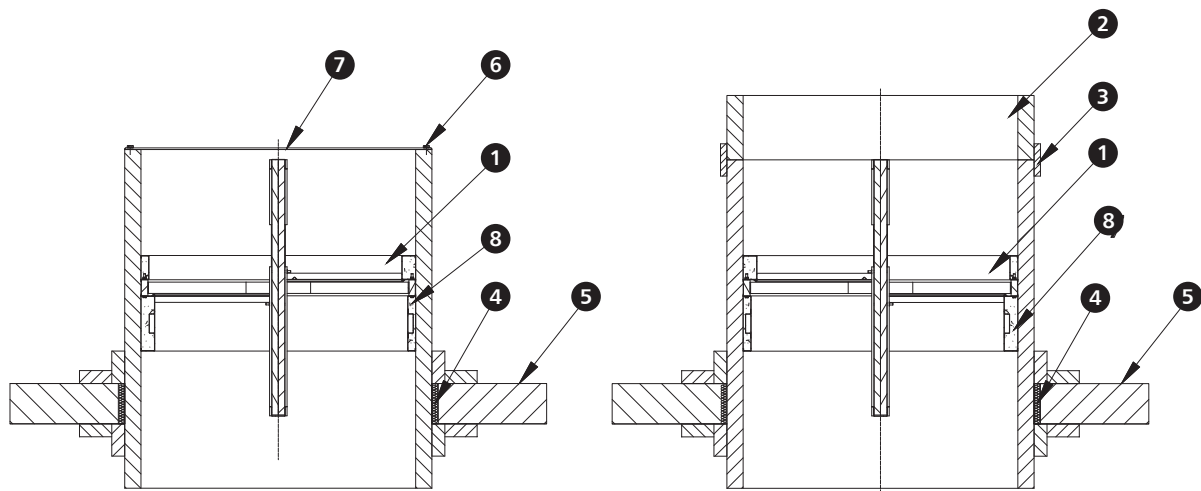
1. mcr FID S/V p/P BxH smoke damper
2. multi-zone smoke extract duct – e.g. made of fire-proof boards
3. a strip of fire-proof board along the entire length of the BxH side
4. installation hangers system

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.

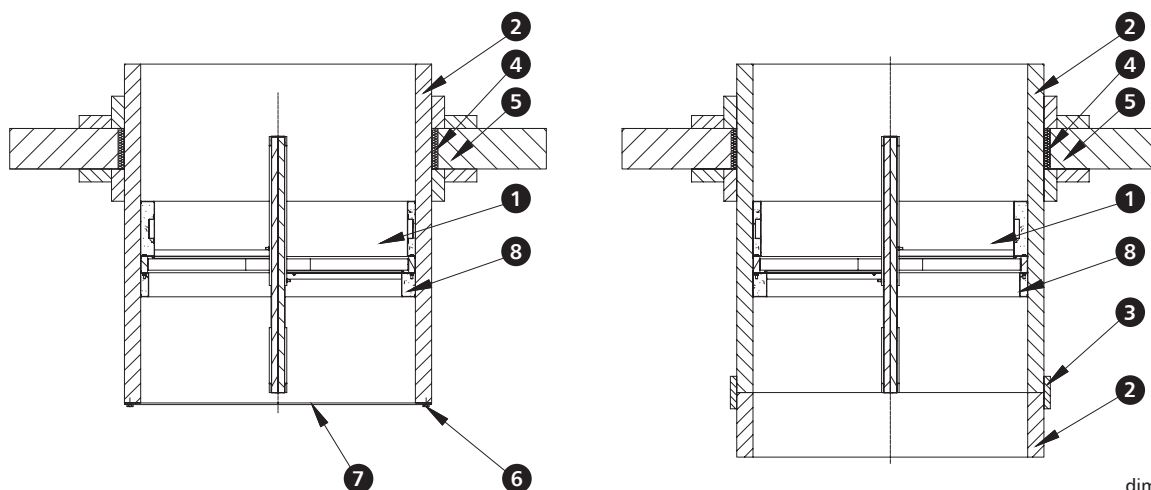
mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

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



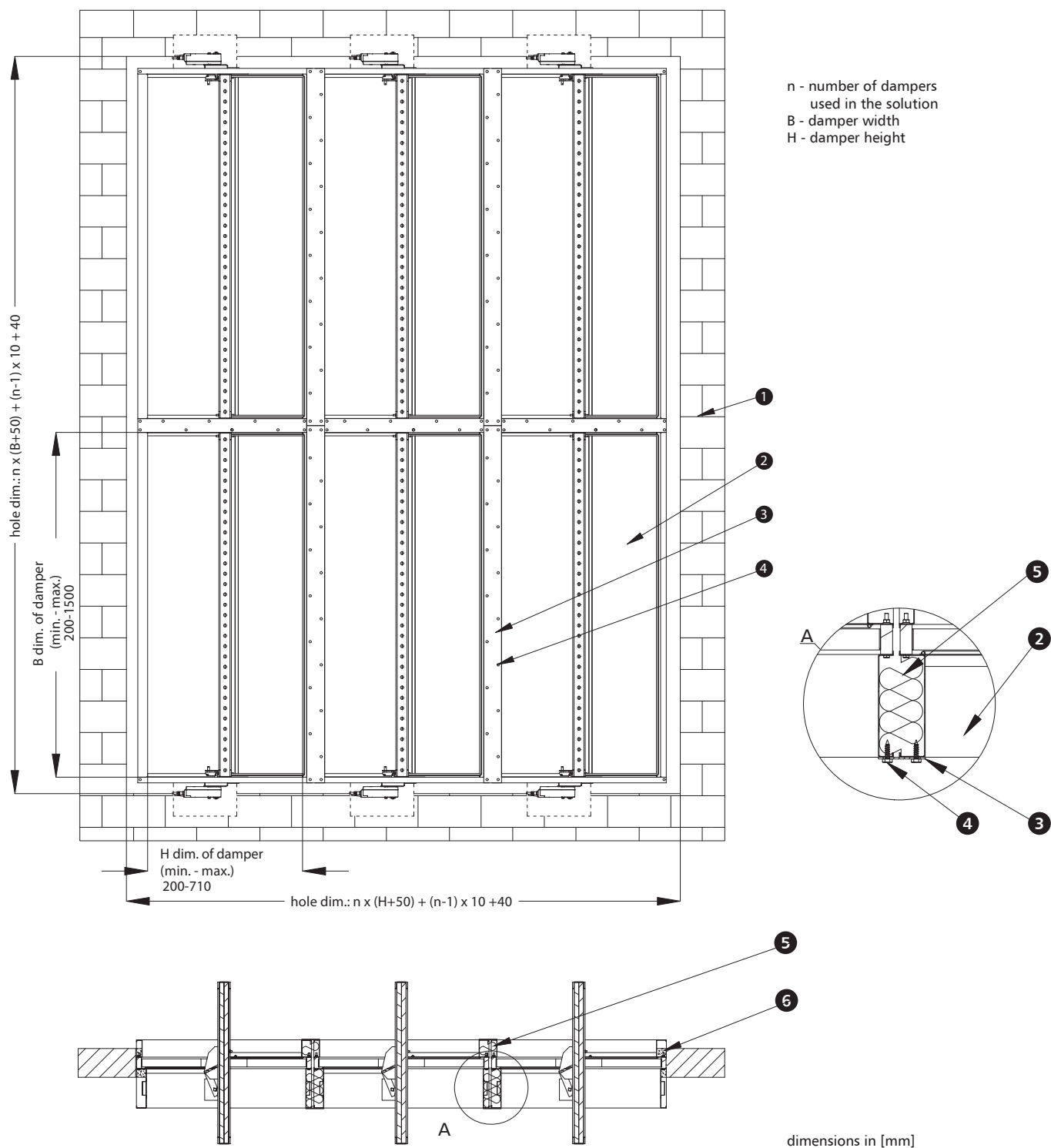
- 1. mcr FID S/V p/P BxH smoke damper
- 2. multi-zone smoke extract duct – e.g. made of fire-proof boards
- 3. a strip of fire-proof board along the entire length of the BxH side
- 4. Fireproof duct installation penetration system

- 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, min. 100x20mm*

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

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]														
		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	6	0.080	0.069	996	6	0.090	0.079	1 140	6	29	
		6			1 279	15			1 495	14						
		8			1 705	27			1 993	25						
		10			2 131	42			2 491	40						
	250	4	0.088	0.074	1 066	6	0.100	0.087	1 246	6	0.113	0.099	1 426	6	30	
		6			1 598	15			1 868	14						
		8			2 131	27			2 491	25						
		10			2 664	42			3 114	40						
	300	4	0.105	0.089	1 279	6	0.120	0.104	1 495	6	0.135	0.119	1 711	6	31	
		6			1 918	15			2 242	14						
		8			2 557	27			2 989	25						
		10			3 197	42			3 737	39						
	350	4	0.123	0.104	1 492	6	0.140	0.121	1 744	6	0.158	0.139	1 996	5	29	
		6			2 238	15			2 616	14						
		8			2 984	26			3 488	25						
		10			3 730	41			4 360	39						
	400	4	0.140	0.118	1 705	6	0.160	0.138	1 993	6	0.180	0.158	2 281	5	30	
		6			2 557	14			2 989	13						
		8			3 410	26			3 986	24						
		10			4 262	41			4 982	38						
	450	4	0.158	0.133	1 918	6	0.180	0.156	2 242	6	0.203	0.178	2 566	5	30	
		6			2 877	14			3 363	13						
		8			3 836	26			4 484	24						
		10			4 795	40			5 605	38						
	500	4	0.175	0.148	2 131	6	0.200	0.173	2 491	6	0.225	0.198	2 851	5	31	
		6			3 197	14			3 737	13						
		8			4 262	25			4 982	24						
		10			5 328	40			6 228	37						
	550	4	0.193	0.163	2 557	6	0.220	0.190	2 740	5	0.248	0.218	3 136	5	31	
		6			3 836	14			4 110	13						
		8			5 115	25			5 481	23						
		10			6 394	39			6 851	36						
	600	4	0.210	0.178	2 557	6	0.240	0.208	2 989	5	0.270	0.238	3 421	5	32	
		6			3 836	13			4 484	13						
		8			5 115	24			5 979	23						
		10			6 394	38			7 474	36						
	650	4	0.228	0.192	2 771	6	0.260	0.225	3 239	5	0.293	0.257	3 707	5	32	
		6			4 156	13			4 858	12						
		8			5 541	24			6 477	22						
		10			6 926	37			8 096	35						
	700	4	0.245	0.207	2 984	5	0.28	0.242	3 488	5	0.315	0.277	3 992	5	32	
		6			4 476	13			5 232	12						
		8			5 967	23			6 975	22						
		10			7 459	37			8 719	34						

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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]														
		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]
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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]														
		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/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]														
		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}
	[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]	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				8 845	9	
		8			9 634	19			10 714	18				11 794	17	
		10			12 042	29			13 392	28				14 742	27	
	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				9 435	9	
		8			10 276	18			11 428	17				12 580	16	
		10			12 845	29			14 285	27				15 725	26	
	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				10 025	9	
		8			10 918	18			12 142	17				13 366	16	
		10			13 648	28			15 178	26				16 708	25	
	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				10 614	8	
		8			11 560	17			12 856	16				14 152	15	
		10			14 450	27			16 070	25				17 690	24	
	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				11 794	8	
		8			12 845	16			12 856	15				15 725	14	
		10			16 056	25			16 070	24				19 656	23	
	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				12 973	7	
		8			14 129	15			15 713	14				17 297	13	
		10			17 662	24			19 642	22				21 622	21	
	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				14 152	7	
		8			15 414	14			17 142	13				18 870	12	
		10			19 267	22			21 427	21				23 587	20	
	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				15 332	6	
		8			16 698	13			18 570	12				20 442	11	
		10			20 873	20			23 213	19				25 553	18	
	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				16 511	6	
		8			17 983	12			19 999	11				22 015	10	
		10			22 478	19			24 998	18				27 518	17	
	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				17 690	5	
		8			19 267	11			21 427	10				23 587	10	
		10			24 084	17			26 784	16				29 484	15	

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S_k – duct cross-section [m²]
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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 [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	0.150	0.139	2 004	4	0.188	0.174
		6			2 575	11			2 791	11			3 007	11		
		8			3 433	21			3 721	20			4 009	19		
		10			4 291	32			4 651	31			5 011	31		
	250	4	0.163	0.149	2 146	5	0.175	0.162	2 326	5	0.188	0.174	2 506	4	0.225	0.209
		6			3 218	11			3 488	11			3 758	11		
		8			4 291	20			4 651	20			5 011	19		
		10			5 364	32			5 814	31			6 264	30		
	300	4	0.195	0.179	2 575	5	0.210	0.194	2 791	4	0.225	0.209	3 007	4	0.263	0.244
		6			3 862	11			4 186	11			4 510	10		
		8			5 149	20			5 581	19			6 013	19		
		10			6 437	32			6 977	31			7 517	30		
	350	4	0.228	0.209	3 004	5	0.245	0.226	3 256	4	0.263	0.244	3 508	4	0.300	0.278
		6			4 506	11			4 884	11			5 262	10		
		8			6 008	20			6 512	19			7 016	18		
		10			7 510	31			8 140	30			8 770	29		
	400	4	0.260	0.238	3 433	4	0.280	0.258	3 721	4	0.300	0.278	4 009	4	0.338	0.313
		6			5 149	11			5 581	10			6 013	10		
		8			6 866	19			7 442	19			8 018	18		
		10			8 582	31			9 302	30			10 022	29		
	450	4	0.293	0.268	3 862	4	0.315	0.291	4 186	4	0.338	0.313	4 510	4	0.375	0.348
		6			5 793	10			6 279	10			6 765	10		
		8			7 724	19			8 372	18			9 020	18		
		10			9 655	30			10 465	29			11 275	28		
	500	4	0.325	0.298	4 291	4	0.350	0.323	4 651	4	0.375	0.348	5 011	4	0.413	0.383
		6			6 437	10			6 977	10			7 517	10		
		8			8 582	19			9 302	18			10 022	17		
		10			10 728	29			11 628	28			12 528	27		
	550	4	0.358	0.328	5 149	4	0.385	0.355	5 116	4	0.413	0.383	5 512	4	0.450	0.418
		6			7 724	10			7 674	10			8 268	9		
		8			10 299	18			10 233	17			11 025	17		
		10			12 874	29			12 791	28			13 781	27		
	600	4	0.390	0.358	5 149	4	0.420	0.388	5 581	4	0.450	0.418	6 013	4	0.488	0.452
		6			7 724	10			8 372	9			9 020	9		
		8			10 299	18			11 163	17			12 027	16		
		10			12 874	28			13 954	27			15 034	26		
	650	4	0.423	0.387	5 579	4	0.455	0.420	6 047	4	0.488	0.452	6 515	4	0.525	0.487
		6			8 368	9			9 070	9			9 772	9		
		8			11 157	17			12 093	17			13 029	16		
		10			13 946	27			15 116	26			16 286	25		
	700	4	0.455	0.417	6 008	4	0.490	0.452	6 512	4	0.525	0.487	7 016	3		
		6			9 012	9			9 768	9			10 524	8		
		8			12 015	17			13 023	16			14 031	15		
		10			15 019	26			16 279	25			17 539	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]														
		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]	750	4	0.488	0.447	6 437	4	0.525	0.485	6 977	4	0.563	0.522	7 517	3	0.563	0.522
		6			9 655	9			10 465	9			11 275	8		
		8			12 874	16			13 954	16			15 034	15		
		10			16 092	26			17 442	25			18 792	24		
	800	4	0.520	0.477	6 866	4	0.560	0.517	7 442	3	0.600	0.557	8 018	3	0.600	0.557
		6			10 299	9			11 163	8			12 027	8		
		8			13 732	16			14 884	15			16 036	14		
		10			17 165	25			18 605	24			20 045	23		
	850	4	0.553	0.507	7 295	3	0.595	0.549	7 907	3	0.638	0.592	8 519	3	0.638	0.592
		6			10 943	8			11 861	8			12 779	8		
		8			14 590	15			15 814	15			17 038	14		
		10			18 238	24			19 768	23			21 298	22		
	900	4	0.585	0.536	7 724	3	0.630	0.581	8 372	3	0.675	0.626	9 020	3	0.675	0.626
		6			11 586	8			12 558	8			13 530	7		
		8			15 448	15			16 744	14			18 040	13		
		10			19 310	23			20 930	22			22 550	21		
	1000	4	0.650	0.596	8 582	3	0.700	0.646	9 302	3	0.750	0.696	10 022	3	0.750	0.696
		6			12 874	7			13 954	7			15 034	7		
		8			17 165	14			18 605	13			20 045	13		
		10			21 456	22			23 256	21			25 056	20		
	1100	4	0.715	0.656	9 441	3	0.770	0.711	10 233	3	0.825	0.766	11 025	3	0.825	0.766
		6			14 161	7			15 349	7			16 537	6		
		8			18 881	13			20 465	12			22 049	12		
		10			23 602	20			25 582	19			27 562	18		
	1200	4	0.780	0.715	10 299	3	0.840	0.775	11 163	2	0.900	0.835	12 027	2	0.900	0.835
		6			15 448	6			16 744	6			18 040	6		
		8			20 598	12			22 326	11			24 054	11		
		10			25 747	19			27 907	18			30 067	17		
	1300	4	0.845	0.775	11 157	2	0.910	0.840	12 093	2	0.975	0.905	13 029	2	0.975	0.905
		6			16 736	6			18 140	6			19 544	5		
		8			22 314	11			24 186	10			26 058	10		
		10			27 893	17			30 233	16			32 573	16		
	1400	4	0.910	0.834	12 015	2	0.980	0.904	13 023	2	1.050	0.974	14 031	2	1.050	0.974
		6			18 023	5			19 535	5			21 047	5		
		8			24 031	10			26 047	9			28 063	9		
		10			30 038	16			32 558	15			35 078	14		
	1500	4	0.975	0.894	12 874	2	1.050	0.969	13 954	2	1.125	1.044	15 034	2	1.125	1.044
		6			19 310	5			20 930	5			22 550	4		
		8			25 747	9			27 907	9			30 067	8		
		10			32 184	14			34 884	14			37 584	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**

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]	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		

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

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

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			21 177	2				22 617	2	
		6			29 605	4			31 605	4				33 605	4	
		8			39 473	8			42 473	8				45 473	8	
		10			49 342	13			52 342	13				55 342	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

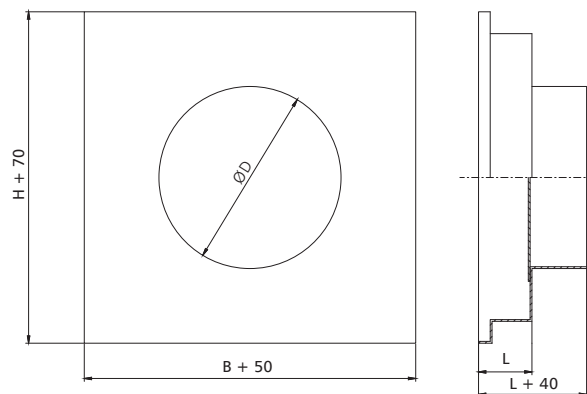
4.8.1 | mcr KRP connection stub

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:

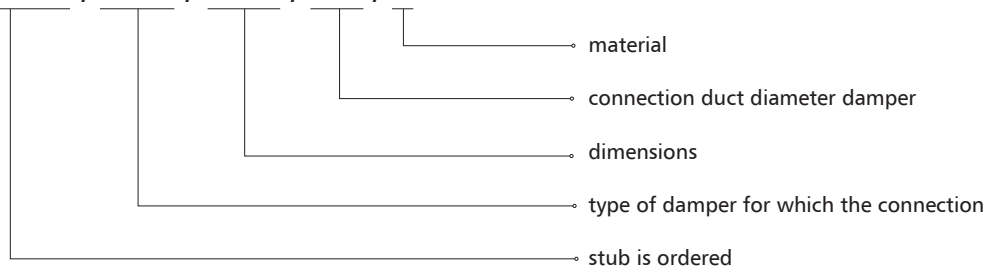
- » BxH - damper dimensions [mm]
- » ØD - diameter of the connection duct [mm]
- » L - length [mm] calculated from the formula: H/2-50 for one connection side and H/2-150 for the other connection side



dimensions in [mm]

Marking:

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



X – material

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

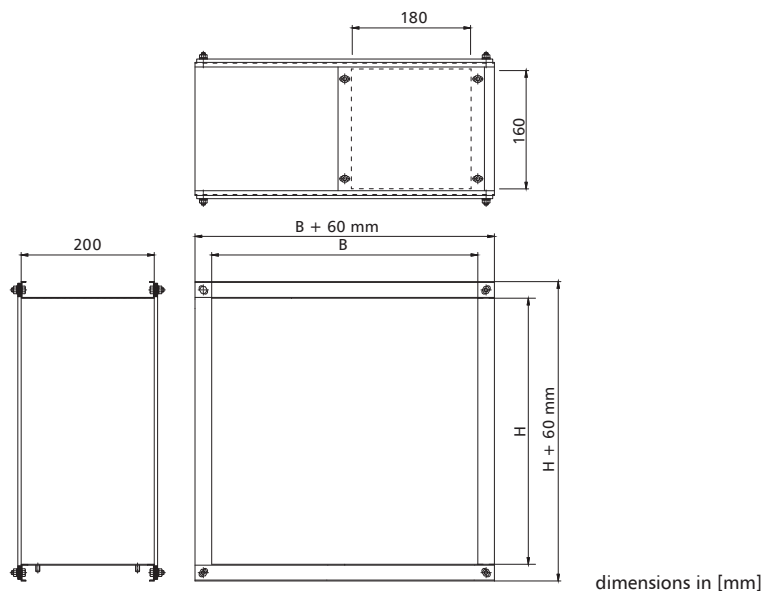
KN – stainless steel

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

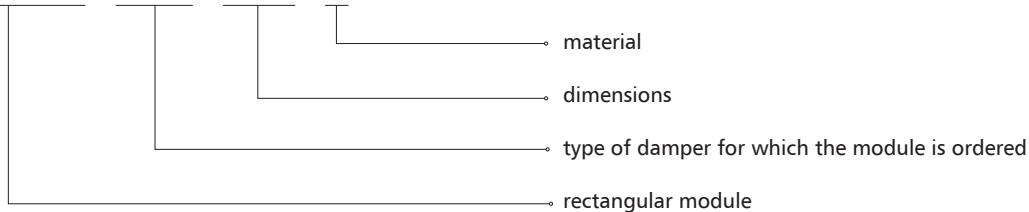
4.8.2 | Casing module with KRW-type inspection access

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

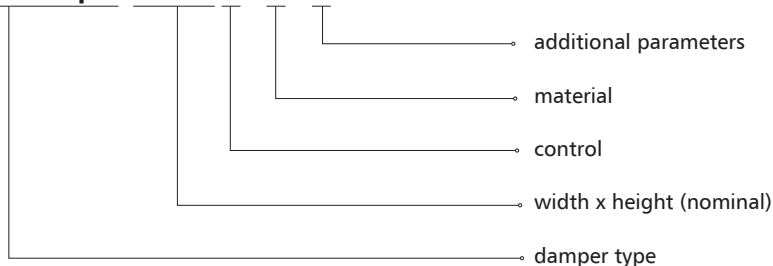


X – material
 [no symbol] – galvanized steel, Zn 275 g/m² coating
 KN – stainless steel
 KK – 1.4404 acid-proof steel

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 damper design - damper and its components made of stainless steel, damper partition sleeves additionally secured

KOM – special damper design - damper and its components made of galvanized steel, damper partition sleeves additionally secured

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:

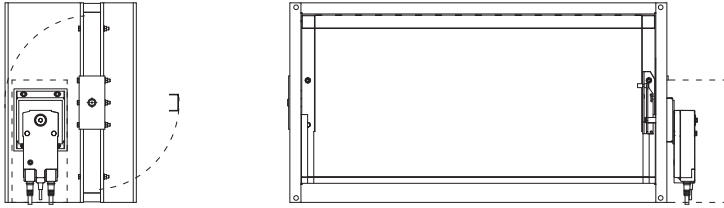
mcr FID S/V p/P 400 x 400 BEN24

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

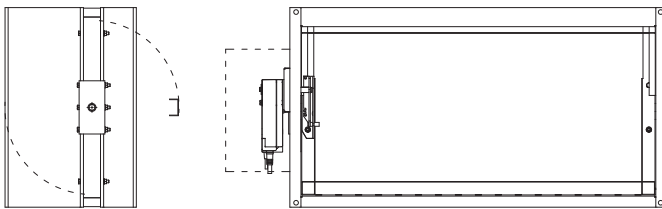
mcr FID S/V p/P, mcr FID S/V-M p/P | Single-blade smoke control dampers for multi-compartment fire ventilation systems

4.9.1 | Design standard

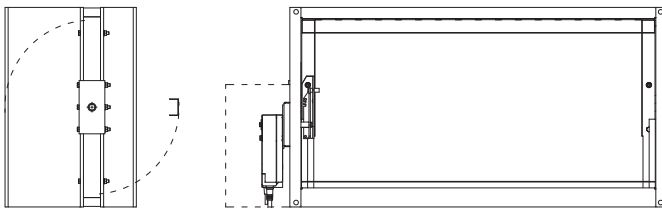
» right damper - standard



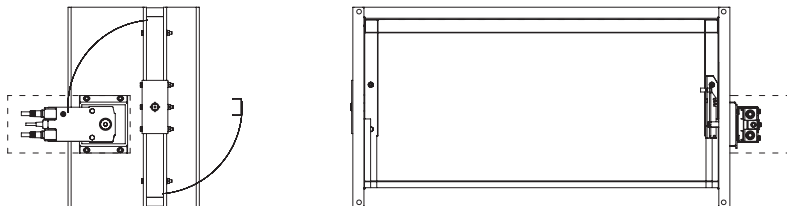
» inverted damper - (ducts facing downwards)



» left damper



» along the damper axis



Chapter 18 in Technical Catalogue - power supply and control (p. 350) contains the following information:
- technical specifications and connection diagrams for the trigger control mechanisms supporting the damper.



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