

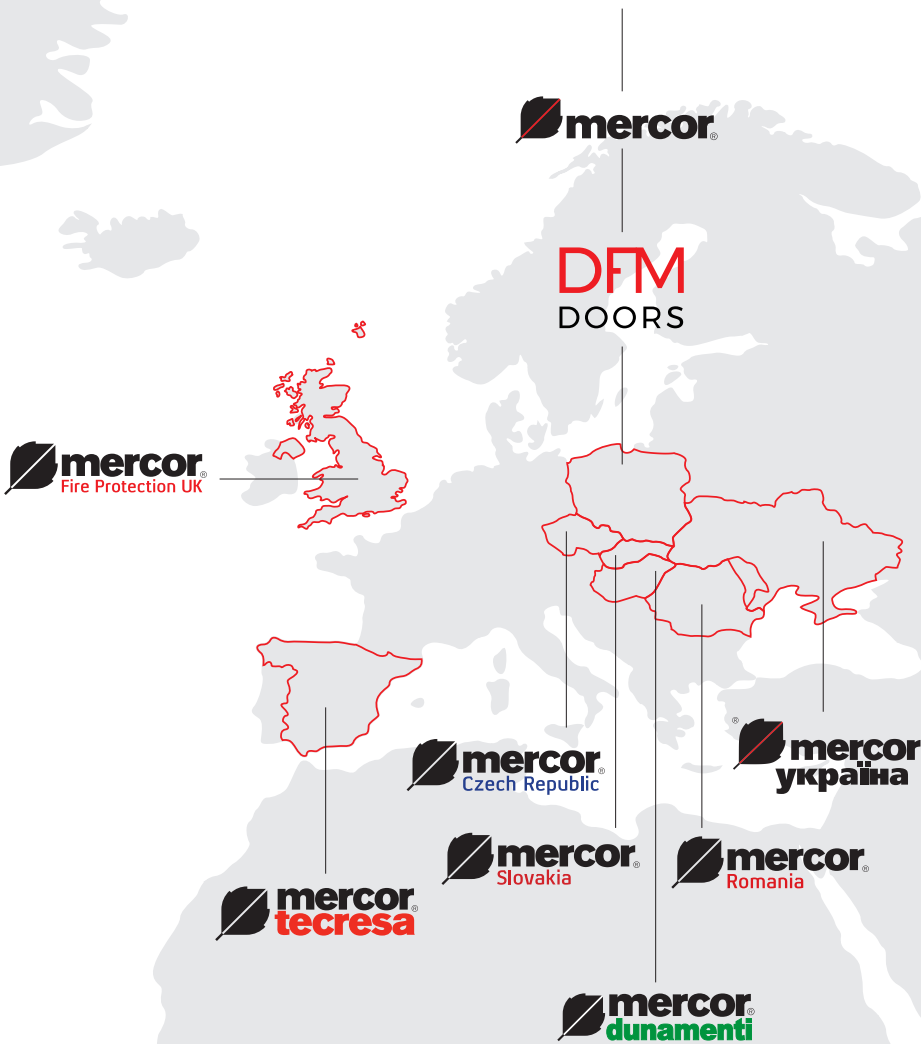


# PRODUCT BROCHURE

## **mcr DOR**




over **30 000 m<sup>2</sup>** of production space  
located on **16 ha** of plots housing **7** production facilities



over **750** people working  
for the Mercor Group

**Stable**  
technological advancement  
automation, software  
and production management  
intelligent solutions

A light gray silhouette of a world map serves as the background for the entire page, showing the outlines of continents and major islands.

**4** **product divisions:**

- » gravitational smoke exhaust
- » fire ventilation
- » building structure protections
- » fire partitions provided by DFM Doors company

**10** subsidiaries  
supplying over **50** markets  
worldwide

**production  
supported by  
IT systems**

i.e. ERP Vault and trademark  
Shop Floor Software



➤ **MERCOR GROUP  
FOR OVER 30 YEARS  
WE PROVIDE INFALLIBLE SOLUTIONS  
IN THE FIELD  
OF PASSIVE FIRE PROTECTION**

We are one of the biggest entities specializing in passive fire protection in Poland. Our international corporate group continues to be on the forefront of the specialized European market. We offer wide range of products: smoke and heat exhaust systems, rooflights, fire ventilation as well as fire-resistant forms of building protection. Our clients are provided with a full service care.

For over 30 years we've been dealing in safety. Our portfolio includes hundreds of projects, in Poland and abroad. Combining vast experience with innovative solutions we are able to confront the challenges posed by the modern standards in construction.

We are a public company. Since July 2007 "MERCOR" S.A. stocks are listed on the Warsaw Stock Exchange.

We strive for extensiveness of service and work in strict cooperation with designers and contractors. We can help you choose and design fire protection systems using our own products, provide transportation to the construction site, install as well as service them ensuring a long-time functionality.

Most of our products are custom made: every client can decide on suitable parameters within safety protocols and imposed regulations.

## TABLE OF CONTENTS

<b>FIRE DAMPERS</b>	<b>6</b>
<b>1 APPLICATION</b>	<b>9</b>
<b>2 DESIGN</b>	<b>9</b>
<b>3 VERSIONS</b>	<b>9</b>
3.1 Opening with the trigger and control mechanism	9
<b>4 DIMENSIONS</b>	<b>10</b>
<b>5 INSTALLATION</b>	<b>10</b>
5.1 Preparation of installation openings	10
5.2 Damper installation in shaft walls > 110 mm	11
5.3 Damper installation in shafts with a thickness of 110 mm	11
5.4 Damper installation in shafts with a thickness < 110 mm	12
5.5 Damper installation in light walls (plasterboard)	12
5.6 Damper installation in solid walls	12
5.7 Damper installation on horizontal ducts	13
5.8 Damper connection with a multi-compartment duct, e.g. made of fire-proof boards with various wall thickness	13
5.9 Damper connection with single-compartment duct, e.g. made of metal sheets	13
<b>6 MCR DOR RECTANGULAR DAMPERS TECHNICAL PARAMETERS</b>	<b>14</b>
<b>7 TRIGGER CONTROL MECHANISMS – SPECIFICATIONS AND CONNECTIONS DIAGRAM</b>	<b>24</b>
7.1 Trigger control mechanisms – specifications and connections diagram	24
7.2 Estimated weight of the mcr DOR rectangular dampers	24
<b>8 ACCESSORIES</b>	<b>25</b>
8.1 MWD grille	25
8.2 MWD grille technical parameters	26
8.2 RB connecting subframe	29
<b>9 MARKING</b>	<b>29</b>

## FIRE DAMPERS

Low-resistance circular single-blade cut-off fire damper

**mcr FID PRO**



class EN 15650  
fire-resistance EN 1366-2  
fire class EN 13501-3

Intended for installation in comfort ventilation systems

Single-blade cut-off fire circular damper for comfort ventilation systems

**mcr FID S/S p/O**



class EN 15650  
fire-resistance EN 1366-2  
fire class EN 13501-3

Intended for installation in general ventilation systems. Optional EX version.

Low-resistance single-blade fire damper for comfort ventilation systems

**mcr FID S/S c/P**



class EN 15650  
fire-resistance EN 1366-2  
fire class EN 13501-3

Intended for installation in general ventilation systems. Optional EX version.

Single-blade cut-off fire damper for comfort ventilation systems

**mcr FID S/S p/P**

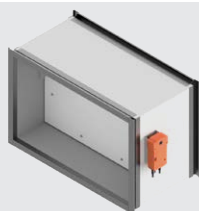


class EN 15650  
fire-resistance EN 1366-2  
fire class EN 13501-3

Intended for installation in general ventilation systems. Optional EX version.

Low-resistance single-blade fire damper

**mcr FID 240**



class EN 15650  
fire-resistance EN 1366-2  
fire class EN 13501-3

Intended for installation in general ventilation systems, in points of contact with vertical building partitions.

Multi-blade cut-off fire damper for comfort ventilation systems

**mcr WIP/S**



class EN 15650  
fire-resistance EN 1366-2  
fire class EN 13501-3

Intended for installation in general ventilation systems. Optional EX version.

Multi-blade cut-off fire damper for comfort ventilation systems

**mcr WIP PRO/S**



class EN 15650  
fire-resistance EN 1366-2  
fire class EN 13501-3

Intended for installation in general ventilation systems. Optional EX version.

Cut-off fire dampers for comfort ventilation systems

**mcr FID WING**



class EN 15650  
fire-resistance EN 1366-2  
fire class EN 13501-3

Intended for installation in general ventilation systems, in points of contact with vertical and horizontal building partitions.

Cut-off fire valve



**mcr ZIPP**

class EN 15650  
fire-resistance EN 1366-2  
fire class EN 13501-3

Used to separate danger zones from the rest of the building and transfer air through the building partitions.

Multi-blade transfer and relief fire damper

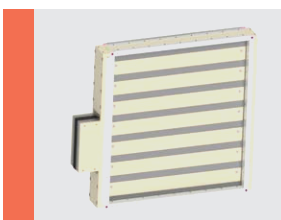


**mcr WIP/T**

class EN 15650  
fire-resistance EN 1366-2  
fire class EN 13501-3

Intended for installation in fire and comfort ventilation systems. Optional EX version.

Multi-blade transfer fire damper



**mcr WIP PRO/T**

class EN 15650  
fire-resistance EN 1366-2  
fire class EN 13501-3

Intended for installation in fire ventilation systems.

Single-bladesmoke control damper for multi-zone fire ventilation systems

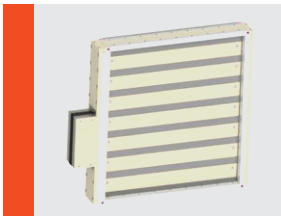


**mcr WIP/V**

class EN 12101-8  
fire-resistance EN 1366-10  
fire class EN-13501-4

Intended for installation in fire ventilation systems.

Multi-blade cut-off fire damper for multi-zone fire ventilation systems

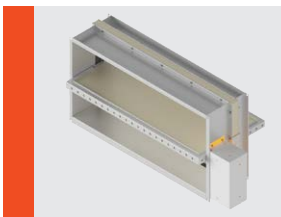


**mcr WIP PRO/V**

class EN 12101-8  
fire-resistance EN 1366-10  
fire class EN-13501-4

Intended for installation in fire ventilation systems.

Multi-blade smoke control damper for multi-zone fire ventilation systems

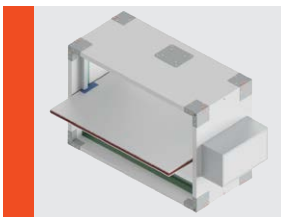


**mcr FID S/V p/P**

class EN 12101-8  
fire-resistance EN 1366-10  
fire class EN-13501-4

Intended for installation in fire ventilation systems.

Single-blade cut-off fire damper for multi-zone fire ventilation systems

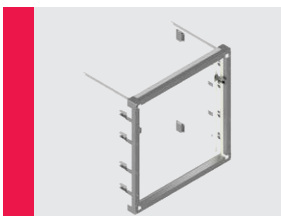


**mcr FID B**

class EN 12101-8  
fire-resistance EN 1366-10  
fire class EN-13501-4

Intended for installation in fire ventilation systems.

Door-type smoke and intake damper



**mcr DOR**

class EN 12101-8  
fire-resistance EN 1366-10  
fire class EN-13501-4

Intended for installation in supply and smoke exhaust ventilation systems.



Certificate  
of constancy  
of performance

Dampers certified  
for compliance with  
EN 12101-8

Classified  
qualified under  
EN 13501-4  
and tested under  
EN 1366-10

Smoke door dampers  
resistance independent  
of airflow direction  
and installation side



Wide active surface  
of up to  
**0,7 m<sup>2</sup>**



Installation in minimum  
**od 150mm**  
thick walls



**Certified**  
installation with  
**a system grille**  
in set



## 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.

## 2 DESIGN

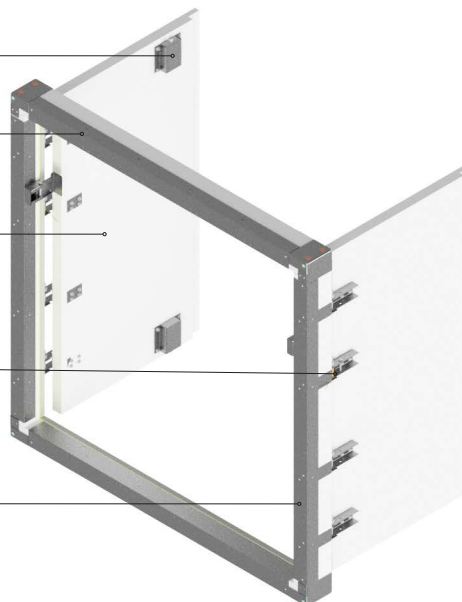
trigger control mechanism

casing

blade

hinge

steel reinforcement



models can be downloaded from the website in the designer zone tab

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 with the total thickness of 40 mm. 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.

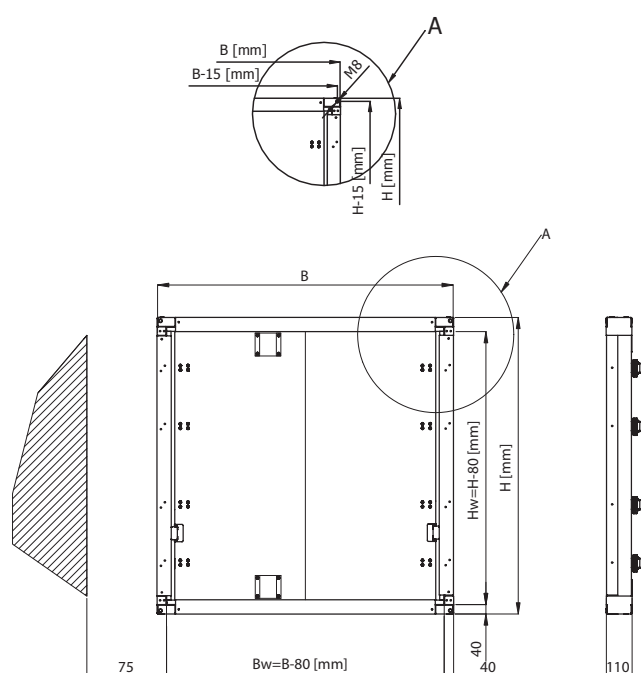
## 3 VERSIONS

### 3.1 Opening with the trigger and control mechanism

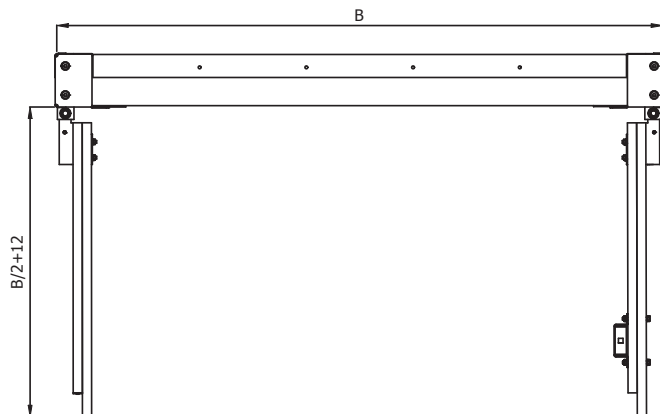
During normal operation, the fire damper blade remains closed. In the case of fire, the damper blade in the compartment where the fire occurs opens and the damper blades in the remaining compartments remain closed – the blades are operated remotely by supplying power.

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.



## 4 DIMENSIONS

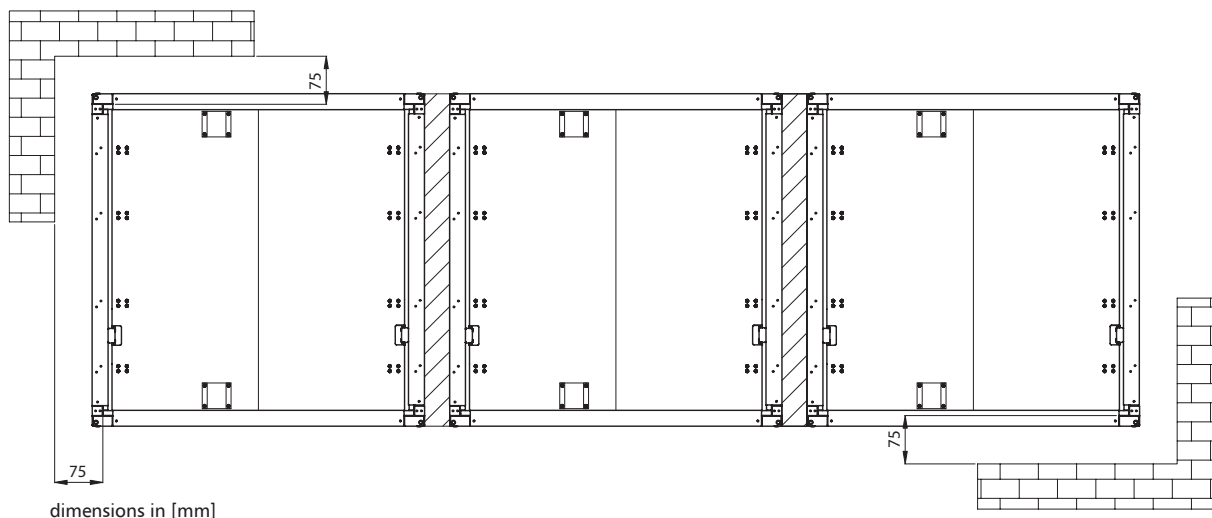


### Rectangular dampers:

- » 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 3w00 mm to 1250 mm)
- » maximum cross-section surface of one damper up to 1.77 m<sup>2</sup>
- » 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).

### Distance between systems and partitions

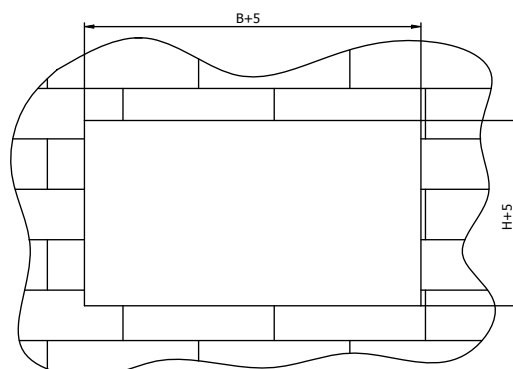


## 5 INSTALLATION

mcr DOR door-type smoke exhaust dampers are rated EI180( $v_{ed} i \leftrightarrow o$ ) S1500 C<sub>300</sub> AA multi if installed on fireproof ducts classified according to EN 1366-8 and EN 1366-9.

### 5.1 Preparation of installation openings

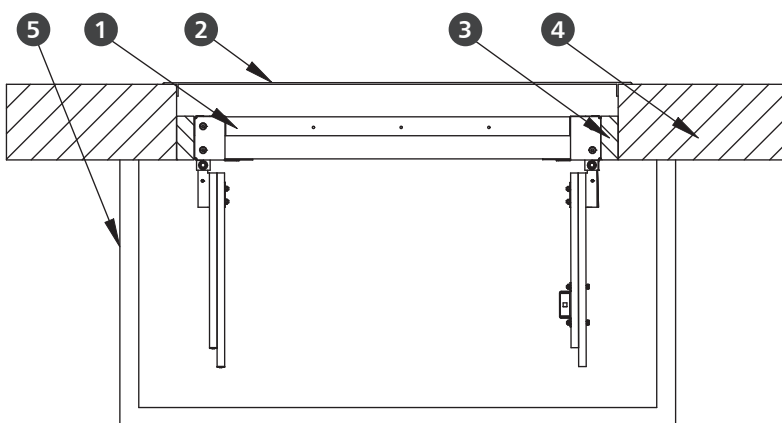
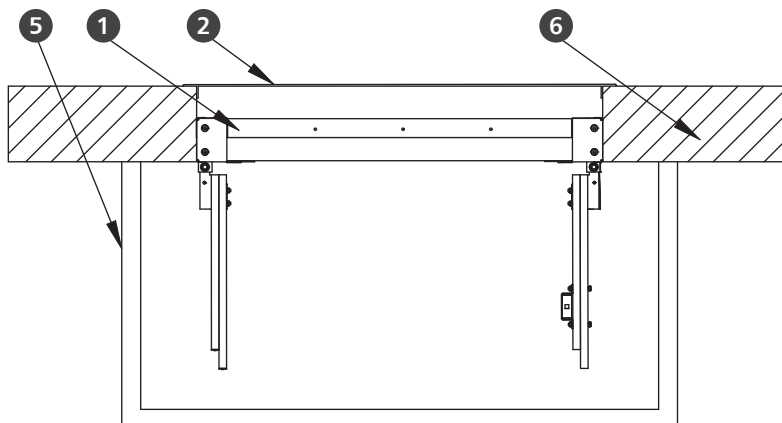
- » Preferred opening



dimensions in [mm]

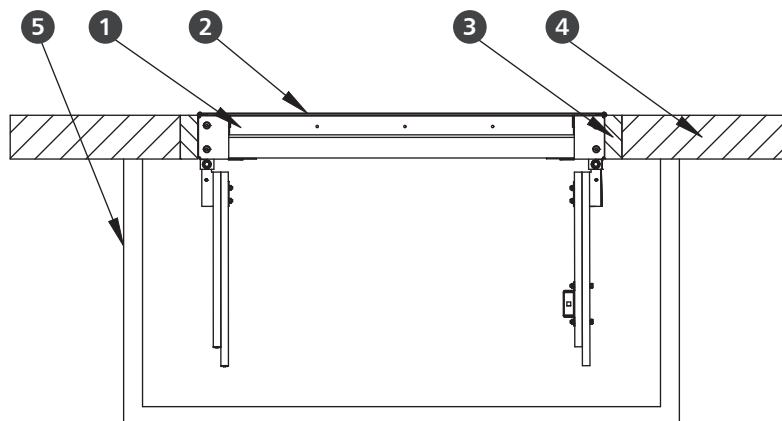
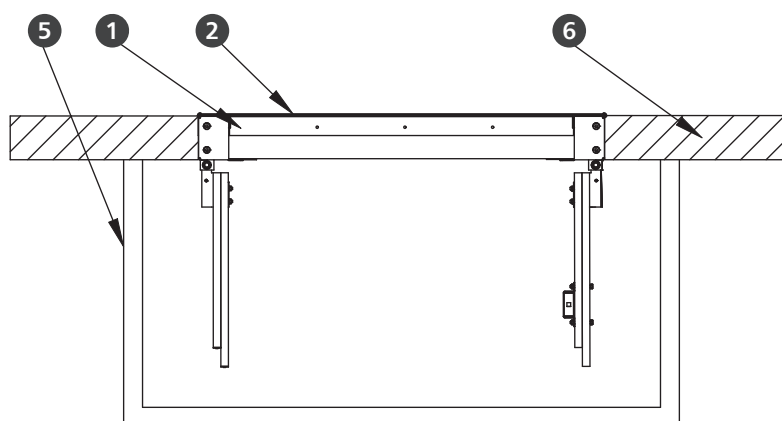
### 5.2 Damper installation in shaft walls >110 mm

- 1. mcr DOR BxH fire 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

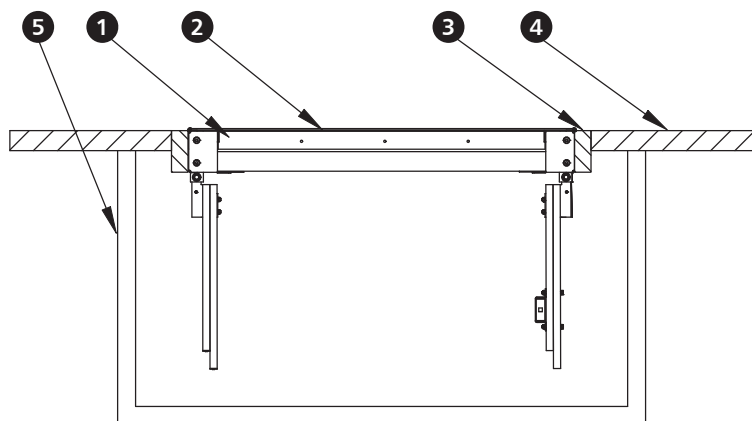


### 5.3 Damper installation in shafts with a thickness of 110 mm

- 1. mcr DOR BxH fire 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
- 6. Wall of a shaft compliant with EN1366-8 or EN1366-9

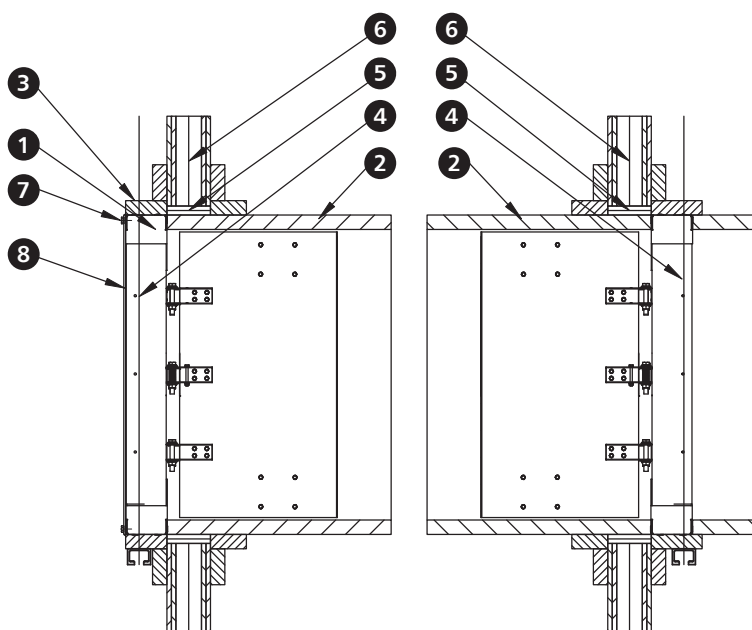


### 5.4 Damper installation in shafts with a thickness <110 mm



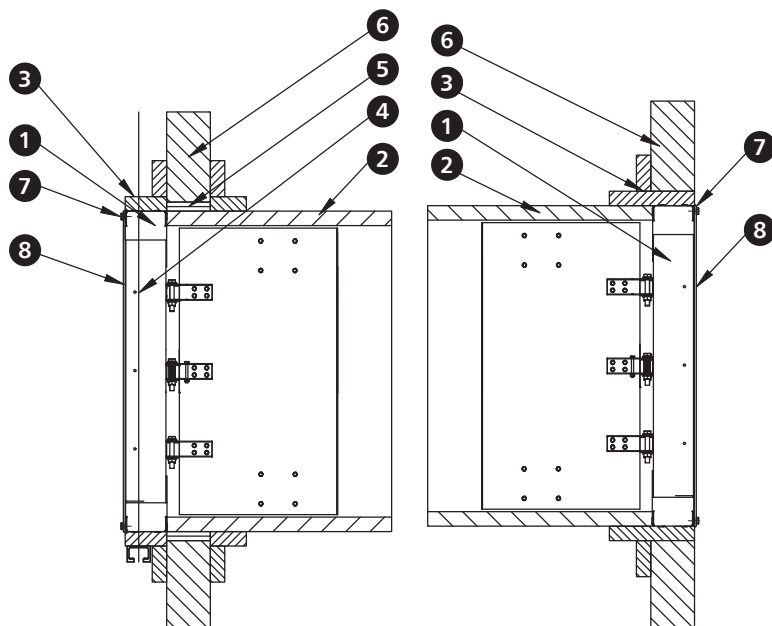
1. mcr DOR BxH fire damper
2. masking grille
3. a strip of fire-proof board along the entire length of the BxH side
4. Wall of a shaft compliant with EN1366-8 or EN1366-9
5. Vertical fire ventilation shaft

### 5.5 Damper installation in light walls (plasterboard)



1. mcr DOR BxH fire 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. M10x20 bolt
8. masking grille

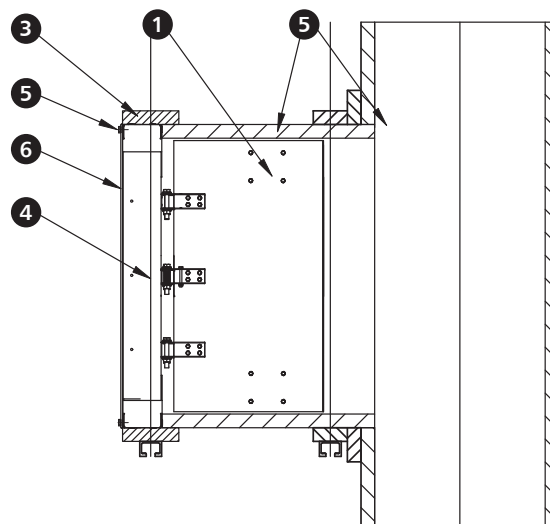
### 5.6 Damper installation in solid walls



1. mcr DOR BxH fire 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. M10x20 bolt
8. masking grille

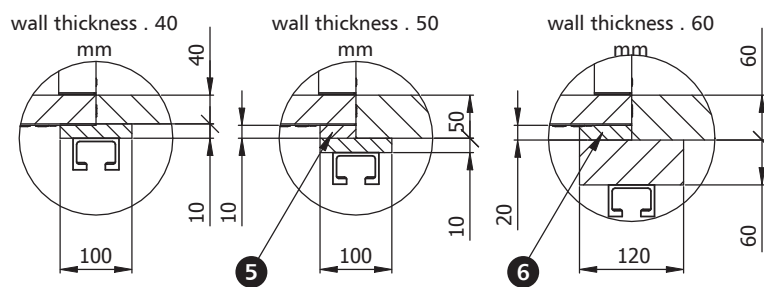
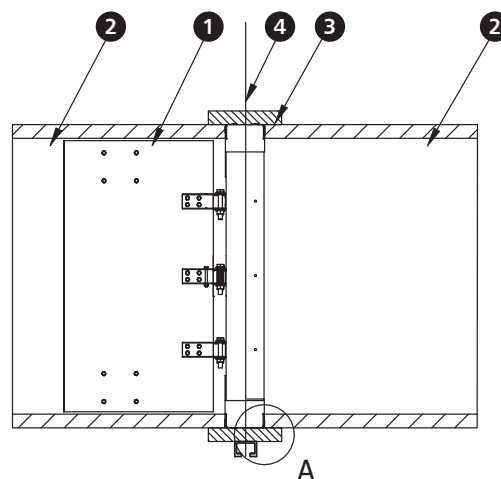
### 5.7 Damper installation on horizontal ducts

1. mcr DOR BxH fire 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. M10x20 bolt
6. masking grille



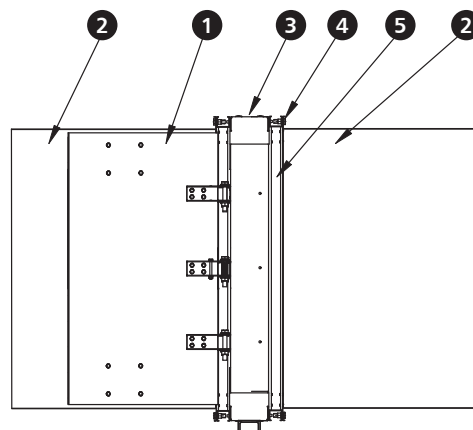
### 5.8 Damper connection with a multi-compartment duct, e.g. made of fire-proof boards with various wall thickness

1. mcr DOR BxH fire 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



### 5.9 Damper connection with single-compartment duct, e.g. made of metal sheets

1. mcr DOR BxH fire damper
2. single-compartment smoke extract duct – metal sheets
3. installation hangers system
4. M10x20 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.

## 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 [m<sup>2</sup>]  
 $S_e$  – damper active cross-section [m<sup>2</sup>]

$Q$  – flow [m<sup>3</sup>/h]  
 $d_p$  – pressure drop [Pa]  
 $L_{WA}$  – damper noise level [dB]

width $B_w$ [mm]	height $H_w$ [mm]																								
	300						350																		
	$v$ [m/s]	$S_k$ [m <sup>2</sup> ]	$S_e$ [m <sup>2</sup> ]	$Q$ [m <sup>3</sup> /s]	$d_p$ [Pa]	$L_{WA}$ [dB]	$S_k$ [m <sup>2</sup> ]	$S_e$ [m <sup>2</sup> ]	$Q$ [m <sup>3</sup> /s]	$d_p$ [Pa]	$L_{WA}$ [dB]														
400	4			1 538	3	20			1 812	3	21	850	4			3 352	3	23			3 950	2	23		
	6	0,120	0,107	2 307	4	24	0,140	0,126	2 717	3	24		6	0,255	0,233	5 028	3	26	0,298	0,274	5 925	3	26		
	8			3 076	5	27			3 623	4	28		8			6 705	4	29			7 900	4	29		
	10			3 845	6	31			4 529	6	31		10			8 381	5	33			9 875	5	33		
	450	4			1 740	3	20			2 049	3		21	900	4			3 554	3	23			4 188	2	24
		6	0,135	0,121	2 609	3	24	0,158	0,142	3 074	3		24		6	0,270	0,247	5 331	3	26	0,315	0,291	6 281	3	26
		8			3 479	5	28			4 098	4		28		8			7 108	4	30			8 375	4	30
		10			4 349	6	31			5 123	6		31		10			8 885	5	33			10 469	5	33
	500	4			1 941	3	21			2 287	3		21	950	4			3 756	3	23			4 425	2	24
		6	0,150	0,135	2 912	3	24	0,175	0,159	3 430	3		25		6	0,285	0,261	5 633	3	26	0,333	0,307	6 638	3	27
		8			3 882	4	28			4 573	4		28		8			7 511	4	30			8 850	4	30
		10			4 853	6	31			5 717	6		31		10			9 389	5	33			11 063	5	33
550	4			2 143	3	21			2 762	3	22	1000	4			3 957	3	23			3 237	2	24		
	6	0,165	0,149	3 214	3	25	0,193	0,175	4 143	3	25		6	0,300	0,275	5 936	3	27	0,350	0,324	4 856	3	27		
	8			4 285	4	28			5 524	4	28		8			7 914	4	30			6 474	4	30		
	10			5 357	6	32			6 905	5	32		10			9 893	5	33			8 093	5	33		
600	4			2 344	3	22			2 762	3	22	1050	4			4 159	3	24			3 475	2	24		
	6	0,180	0,163	3 516	3	25	0,210	0,192	4 143	3	25		6	0,315	0,289	6 238	3	27	0,368	0,340	5 212	3	27		
	8			4 689	4	28			5 524	4	28		8			8 317	4	30			6 949	4	30		
	10			5 861	6	32			6 905	5	32		10			10 397	5	33			8 687	5	33		
650	4			2 546	3	22			3 000	3	22	1100	4			4 360	3	24			3 712	2	24		
	6	0,195	0,177	3 819	3	25	0,228	0,208	4 499	3	25		6	0,330	0,303	6 540	3	27	0,385	0,357	5 568	3	27		
	8			5 092	4	29			5 999	4	29		8			8 721	4	30			7 425	4	30		
	10			6 365	6	32			7 499	5	32		10			10 901	5	33			9 281	5	33		
700	4			2 748	3	22			3 237	3	23	1150	4			4 562	3	24			3 950	2	25		
	6	0,210	0,191	4 121	3	25	0,245	0,225	4 856	3	26		6	0,345	0,317	6 843	3	27	0,403	0,373	5 925	3	27		
	8			5 495	4	29			6 474	4	29		8			9 124	4	30			7 900	4	30		
	10			6 869	6	32			8 093	5	32		10			11 405	5	34			9 875	5	34		
750	4			2 949	3	22			3 475	3	23	1200	4			4 764	3	24			4 188	2	25		
	6	0,225	0,205	4 424	3	26	0,263	0,241	5 212	3	26		6	0,360	0,331	7 145	3	27	0,420	0,390	6 281	3	27		
	8			5 898	4	29			6 949	4	29		8			9 527	4	30			8 375	4	31		
	10			7 373	6	32			8 687	5	32		10			11 909	5	34			10 469	5	34		
800	4			3 151	3	23			3 712	3	23	1250	4			4 965	3	24			4 425	2	25		
	6	0,240	0,219	4 726	3	26	0,280	0,258	5 568	3	26		6	0,375	0,345	7 448	3	27	0,438	0,406	6 638	3	28		
	8			6 301	4	29			7 425	4	29		8			9 930	4	31			8 850	4	31		
	10			7 877	5	33			9 281	5	33		10			12 413	5	34			11 063	5	34		

B<sub>w</sub> – nominal width [mm]  
H<sub>w</sub> – nominal height [mm]

v – velocity [m/s]  
S<sub>k</sub> – duct cross-section [m<sup>2</sup>]  
S<sub>e</sub> – damper active cross-section [m<sup>2</sup>]

Q – flow [m<sup>3</sup>/h]  
d<sub>p</sub> – pressure drop [Pa]  
L<sub>WA</sub> – damper noise level [dB]

		height H <sub>w</sub> [mm]																				
		400					450					500					550					
		v [m/s]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]
width B <sub>w</sub> [mm]	400	4			2 085	3	21			2 359	3	21			2 632	3	22			2 906	3	22
		6	0.160	0.145	3 128	3	24	0.180	0.164	3 538	3	25	0.200	0.183	3 948	3	25	0.220	0.202	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			2 359	3	21			2 668	3	22			2 978	3	22			3 288	2	23
		6	0.180	0.164	3 538	3	25	0.203	0.185	4 002	3	25	0.225	0.207	4 467	3	25	0.248	0.228	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			2 632	3	22			2 978	3	22			3 324	2	23			3 669	2	23
		6	0.200	0.183	3 948	3	25	0.225	0.207	4 467	3	25	0.250	0.231	4 985	3	25	0.275	0.255	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			2 906	3	22			3 288	2	23			4 015	2	23			4 432	2	23
		6	0.220	0.202	4 359	3	25	0.248	0.228	4 931	3	25	0.275	0.255	6 022	3	26	0.303	0.281	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			3 180	3	22			3 597	2	23			4 015	2	23			4 432	2	24
		6	0.240	0.221	4 769	3	25	0.270	0.250	5 396	3	26	0.300	0.279	6 022	3	26	0.330	0.308	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			3 453	2	23			3 907	2	23			4 360	2	23			4 814	2	24
		6	0.260	0.240	5 180	3	26	0.293	0.271	5 860	3	26	0.325	0.303	6 540	3	26	0.358	0.334	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			3 727	2	23			4 216	2	23			4 706	2	24			5 196	2	24
		6	0.280	0.259	5 590	3	26	0.315	0.293	6 324	3	26	0.350	0.327	7 059	3	26	0.385	0.361	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<sub>w</sub> – nominal width [mm]  
H<sub>w</sub> – nominal height [mm]

v – velocity [m/s]  
S<sub>k</sub> – duct cross-section [m<sup>2</sup>]  
S<sub>e</sub> – damper active cross-section [m<sup>2</sup>]

Q – flow [m<sup>3</sup>/h]  
d<sub>p</sub> – pressure drop [Pa]  
L<sub>WA</sub> – damper noise level [dB]

		height H <sub>w</sub> [mm]																				
		400					450					500					550					
		v [m/s]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]
width B <sub>w</sub> [mm]	750	4			4 000	2	23			4 526	2	24			5 052	2	24			5 577	2	24
		6	0.300	0.278	6 000	3	26	0.338	0.314	6 789	3	26	0.375	0.351	7 577	3	27	0.413	0.387	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			4 274	2	24			4 836	2	23			5 397	2	24			5 959	2	25
		6	0.320	0.297	6 411	3	26	0.360	0.336	7 253	3	26	0.400	0.375	8 096	3	27	0.440	0.414	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			4 548	2	24			5 145	2	23			5 743	2	24			6 340	2	25
		6	0.340	0.316	6 821	3	26	0.383	0.357	7 718	3	26	0.425	0.399	8 614	3	26	0.468	0.440	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			4 821	2	24			5 455	2	23			6 088	2	24			6 722	2	25	
	6	0.360	0.335	7 232	3	27	0.405	0.379	8 182	3	26	0.450	0.423	9 132	3	26	0.495	0.467	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			5 095	2	24			5 764	2	23			6 434	2	24			6 722	2	25	
	6	0.380	0.354	7 642	3	27	0.428	0.400	8 646	3	25	0.475	0.447	9 651	3	26	0.523	0.493	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			3 727	2	24			4 216	2	23			4 706	2	24			5 196	2	25	
	6	0.400	0.373	5 590	3	27	0.450	0.422	6 324	3	26	0.500	0.471	7 059	3	26	0.550	0.520	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			4 000	2	25			4 526	2	23			5 052	2	24			5 577	2	26	
	6	0.420	0.392	6 000	3	27	0.473	0.443	6 789	3	26	0.525	0.495	7 577	3	26	0.578	0.546	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			4 274	2	25			4 836	2	23			5 397	2	24			5 959	2	26	
	6	0.440	0.411	6 411	3	27	0.495	0.465	7 253	3	25	0.550	0.519	8 096	3	26	0.605	0.573	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			4 548	2	25			5 145	2	23			5 743	2	24			6 340	2	26	
	6	0.460	0.430	6 821	3	28	0.518	0.486	7 718	3	25	0.575	0.543	8 614	3	26	0.633	0.599	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			4 821	2	25			5 455	2	23			6 088	2	24			6 722	2	26	
	6	0.480	0.449	7 232	3	28	0.540	0.508	8 182	3	25	0.600	0.567	9 132	3	26	0.660	0.626	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			6 736	2	25			5 764	2	23			6 434	2	24			6 722	2	26	
	6	0.500	0.468	10 104	3	28	0.563	0.529	8 646	3	25	0.625	0.591	9 651	3	26	0.688	0.652	10 083	3	29	
	8			13 473	4	31			11 529	4	28			12 868	4	29			13 444	3	31	
	10			16 841	5	34			14 411	4	31			16 085	4	32			16 805	4	34	



**B<sub>w</sub>** – nominal width [mm]  
**H<sub>w</sub>** – nominal height [mm]

**v** – velocity [m/s]  
**S<sub>k</sub>** – duct cross-section [m<sup>2</sup>]  
**S<sub>e</sub>** – damper active cross-section [m<sup>2</sup>]

**Q** – flow [m<sup>3</sup>/h]  
**d<sub>p</sub>** – pressure drop [Pa]  
**L<sub>WA</sub>** – damper noise level [dB]

		height H <sub>w</sub> [mm]																				
		600					650					700					750					
		v [m/s]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]
width B <sub>w</sub> [mm]	400	4			3 180	3	22			3 453	2	23			3 727	2	23			4 000	2	23
		6	0.240	0.221	4 769	3	25	0.260	0.240	5 180	3	26	0.280	0.259	5 590	3	26	0.300	0.278	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			3 597	2	23			3 907	2	23			4 216	2	23			4 526	2	24
		6	0.270	0.250	5 396	3	26	0.293	0.271	5 860	3	26	0.315	0.293	6 324	3	26	0.338	0.314	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			4 015	2	23			4 360	2	23			4 706	2	24			5 052	2	24
		6	0.300	0.279	6 022	3	26	0.325	0.303	6 540	3	26	0.350	0.327	7 059	3	26	0.375	0.351	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			4 850	2	24			5 268	2	24			5 196	2	24			5 577	2	24
		6	0.330	0.308	7 275	3	26	0.358	0.334	7 901	3	26	0.385	0.361	7 793	3	27	0.413	0.387	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			4 850	2	24			5 268	2	24			5 685	2	24			6 103	2	25
		6	0.360	0.337	7 275	3	26	0.390	0.366	7 901	3	27	0.420	0.395	8 528	3	27	0.450	0.424	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			5 268	2	24			5 721	2	24			6 175	2	25			6 628	2	25
		6	0.390	0.366	7 901	3	27	0.423	0.397	8 582	3	27	0.455	0.429	9 262	3	27	0.488	0.460	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			5 685	2	24			6 175	2	25			6 664	2	25			7 154	2	25
		6	0.420	0.395	8 528	3	27	0.455	0.429	9 262	3	27	0.490	0.463	9 996	3	27	0.525	0.497	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<sub>w</sub> – nominal width [mm]  
H<sub>w</sub> – nominal height [mm]

v – velocity [m/s]  
S<sub>k</sub> – duct cross-section [m<sup>2</sup>]  
S<sub>e</sub> – damper active cross-section [m<sup>2</sup>]

Q – flow [m<sup>3</sup>/h]  
d<sub>p</sub> – pressure drop [Pa]  
L<sub>WA</sub> – damper noise level [dB]

		height H <sub>w</sub> [mm]																				
		600					650					700					750					
		v [m/s]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]
width B <sub>w</sub> [mm]	750	4			6 103	2	25			6 628	2	25			7 154	2	25			7 680	2	25
		6	0,450	0,424	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	0,453	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	0,482	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	0,511	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	0,540	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	0,569	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
	1050	4			6 103	2	24			6 628	2	25			7 154	2	25			7 680	2	27
		6	0,630	0,598	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	0,627	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	0,656	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	0,685	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	0,714	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<sub>w</sub> – nominal width [mm]  
H<sub>w</sub> – nominal height [mm]

v – velocity [m/s]  
S<sub>k</sub> – duct cross-section [m<sup>2</sup>]  
S<sub>e</sub> – damper active cross-section [m<sup>2</sup>]

Q – flow [m<sup>3</sup>/h]  
d<sub>p</sub> – pressure drop [Pa]  
L<sub>WA</sub> – damper noise level [dB]

		height H <sub>w</sub> [mm]																				
		800					850					900					950					
		v [m/s]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]
width B <sub>w</sub> [mm]	400	4			20 212	2	24			22 203	2	24			24 196	2	24			26 191	2	24
		6	0,320	0,297	24 551	3	26	0,340	0,316	26 483	3	26	0,360	0,335	28 475	3	27	0,380	0,354	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			23 382	2	24			25 657	2	24			27 936	2	24			30 218	2	25
		6	0,360	0,336	28 206	3	27	0,383	0,357	30 394	3	27	0,405	0,379	32 655	3	27	0,428	0,400	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			26 621	2	24			29 184	2	24			31 752	2	25			34 326	2	25
		6	0,400	0,375	31 927	3	27	0,425	0,399	34 375	3	27	0,450	0,423	36 908	3	27	0,475	0,447	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			29 922	2	25			32 776	2	25			35 638	2	25			38 508	2	25
		6	0,440	0,414	35 708	3	27	0,468	0,440	38 420	3	27	0,495	0,467	41 228	3	27	0,523	0,493	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	4	33			53 114	4	33			56 198	4	33
	600	4			33 279	2	25			36 428	2	25			39 588	2	25			42 756	2	26
		6	0,480	0,453	39 545	3	27	0,510	0,482	42 522	3	27	0,540	0,511	45 609	3	28	0,570	0,540	48 766	3	28
		8			46 039	4	30			48 982	4	30			52 098	3	30			55 328	3	31
		10			52 234	4	33			55 251	4	33			58 477	4	33			61 844	4	33
	650	4			34 338	2	25			35 303	2	25			36 170	2	25			36 951	2	25
		6	0,520	0,492	40 650	3	27	0,553	0,523	41 059	3	27	0,585	0,555	41 522	3	27	0,618	0,586	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			37 574	2	25			38 609	2	26			39 539	2	26			40 379	2	26
		6	0,560	0,531	44 332	3	28	0,595	0,565	44 758	3	28	0,630	0,599	45 246	3	28	0,665	0,633	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 [m<sup>2</sup>]  
 $S_e$  – damper active cross-section [m<sup>2</sup>]

$Q$  – flow [m<sup>3</sup>/h]  
 $d_p$  – pressure drop [Pa]  
 $L_{WA}$  – damper noise level [dB]

		height $H_w$ [mm]																				
		800					850					900					950					
		$v$ [m/s]	$S_k$ [m <sup>2</sup> ]	$S_e$ [m <sup>2</sup> ]	$Q$ [m <sup>3</sup> /s]	$d_p$ [Pa]	$L_{WA}$ [dB]	$S_k$ [m <sup>2</sup> ]	$S_e$ [m <sup>2</sup> ]	$Q$ [m <sup>3</sup> /s]	$d_p$ [Pa]	$L_{WA}$ [dB]	$S_k$ [m <sup>2</sup> ]	$S_e$ [m <sup>2</sup> ]	$Q$ [m <sup>3</sup> /s]	$d_p$ [Pa]	$L_{WA}$ [dB]	$S_k$ [m <sup>2</sup> ]	$S_e$ [m <sup>2</sup> ]	$Q$ [m <sup>3</sup> /s]	$d_p$ [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<sub>w</sub> – nominal width [mm]  
H<sub>w</sub> – nominal height [mm]

v – velocity [m/s]  
S<sub>k</sub> – duct cross-section [m<sup>2</sup>]  
S<sub>e</sub> – damper active cross-section [m<sup>2</sup>]

Q – flow [m<sup>3</sup>/h]  
d<sub>p</sub> – pressure drop [Pa]  
L<sub>WA</sub> – damper noise level [dB]

		height H <sub>w</sub> [mm]																				
		1000					1050					1100					1150					
		v [m/s]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]
width B <sub>w</sub> [mm]	400	4			28 190	2	24			30 194	2	25			32 203	2	25			34 220	2	25
		6	0.400	0.373	32 569	3	27	0.420	0.392	34 653	3	27	0.440	0.411	36 756	3	27	0.460	0.430	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			32 506	2	25			34 799	2	25			37 100	2	25			39 409	2	25
		6	0.450	0.422	37 307	3	27	0.473	0.443	39 677	3	27	0.495	0.465	42 069	3	28	0.518	0.486	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			36 907	2	25			39 495	2	25			42 091	2	25			44 697	2	26
		6	0.500	0.471	42 125	3	28	0.525	0.495	44 785	3	28	0.550	0.519	47 470	3	28	0.575	0.543	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			41 385	2	25			44 271	2	26			47 167	2	26			50 074	2	26
		6	0.550	0.520	47 016	3	28	0.578	0.546	49 969	3	28	0.605	0.573	52 952	3	28	0.633	0.599	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			45 934	2	26			49 122	2	26			52 321	2	26			55 531	2	26
		6	0.600	0.569	51 976	3	28	0.630	0.598	55 225	3	28	0.660	0.627	58 507	3	28	0.690	0.656	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			37 661	2	25			38 310	2	25			38 907	2	25			39 460	2	25
		6	0.650	0.618	42 466	3	27	0.683	0.649	42 922	3	27	0.715	0.681	43 360	3	27	0.748	0.712	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			41 142	2	26			41 840	2	26			42 483	2	27			43 078	2	27
		6	0.700	0.667	46 250	3	28	0.735	0.701	46 736	3	29	0.770	0.735	47 204	3	29	0.805	0.769	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<sub>w</sub> – nominal width [mm]  
H<sub>w</sub> – nominal height [mm]

v – velocity [m/s]  
S<sub>k</sub> – duct cross-section [m<sup>2</sup>]  
S<sub>e</sub> – damper active cross-section [m<sup>2</sup>]

Q – flow [m<sup>3</sup>/h]  
d<sub>p</sub> – pressure drop [Pa]  
L<sub>WA</sub> – damper noise level [dB]

		height H <sub>w</sub> [mm]																				
		1000					1050					1100					1150					
		v [m/s]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]
width B <sub>w</sub> [mm]	750	4			44 664	2	27			45 412	2	27			46 100	2	27			46 738	2	27
		6	0.750	0.716	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	0.765	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	0.814	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	0.863	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	0.912	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	0.961	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	1.010	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	1.059	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	1.108	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	1.157	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	1.206	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<sub>w</sub> – nominal width [mm]  
H<sub>w</sub> – nominal height [mm]

v – velocity [m/s]  
S<sub>k</sub> – duct cross-section [m<sup>2</sup>]  
S<sub>e</sub> – damper active cross-section [m<sup>2</sup>]

Q – flow [m<sup>3</sup>/h]  
d<sub>p</sub> – pressure drop [Pa]  
L<sub>WA</sub> – damper noise level [dB]

		height H <sub>w</sub> [mm]										
		1200					1250					
		v [m/s]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]
width B <sub>w</sub> [mm]	400	4			36 243	2 25			38 275	2 25		
		6	0.480	0.449	41 010	3 28	0.500	0.468	43 158	3 28		
		8			46 268	4 31			48 564	4 31		
		10			51 532	5 34			53 993	5 34		
	450	4			41 727	2 25			44 053	2 26		
		6	0.540	0.508	46 911	3 28	0.563	0.529	49 356	3 28		
		8			52 675	4 31			55 275	4 31		
		10			58 488	5 34			61 263	4 34		
	500	4			47 312	2 26			49 938	2 26		
		6	0.600	0.567	52 907	3 28	0.625	0.591	55 653	3 28		
		8			59 170	4 31			62 077	4 31		
		10			65 522	4 34			68 613	4 34		
550	4			52 991	2 26			55 920	2 26			
	6	0.660	0.626	58 990	3 28	0.688	0.652	62 040	3 29			
	8			65 745	3 31			68 961	3 31			
	10			72 629	4 34			76 039	4 34			
600	4			58 754	2 26			61 989	2 27			
	6	0.720	0.685	65 153	3 29	0.750	0.714	68 511	3 29			
	8			72 395	3 31			75 923	3 31			
	10			79 806	4 34			83 537	4 34			
650	4			39 974	2 25			40 455	2 25			
	6	0.780	0.744	44 180	3 27	0.813	0.775	44 563	3 27			
	8			48 960	3 29			49 253	3 29			
	10			53 869	4 32			54 088	4 32			
700	4			43 632	2 27			44 150	2 27			
	6	0.840	0.803	48 082	3 29	0.875	0.837	48 492	3 29			
	8			53 157	3 32			53 468	3 32			
	10			58 388	4 34			58 616	4 34			

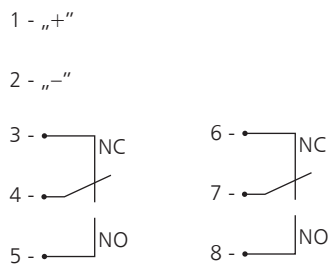
		height H <sub>w</sub> [mm]										
		1200					1250					
		v [m/s]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]	S <sub>k</sub> [m <sup>2</sup> ]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	L <sub>WA</sub> [dB]
width B <sub>w</sub> [mm]	750	4			47 331	2 27			47 886	2 27		
		6	0.900	0.862	52 023	3 29	0.938	0.898	52 461	3 29		
		8			57 393	3 32			57 721	3 32		
		10			62 943	4 34			63 179	4 34		
	800	4			51 068	2 28			51 070	2 28		
		6	0.960	0.921	56 002	3 30	1.000	0.960	55 878	3 30		
		8			61 665	3 32			61 421	3 32		
		10			67 532	4 34			67 188	4 34		
	850	4			54 841	2 26			54 254	2 26		
		6	1.020	0.980	60 016	3 28	1.063	1.021	59 292	3 28		
		8			65 970	3 30			65 117	3 30		
		10			72 153	4 32			71 191	4 32		
900	4			58 649	2 26			57 438	2 26			
	6	1.080	1.039	58 606	3 28	1.125	1.083	62 706	3 28			
	8			64 851	3 30			68 811	3 30			
	10			69 972	4 33			75 192	4 32			
950	4			62 488	2 26			60 621	2 26			
	6	1.140	1.098	68 141	3 28	1.188	1.144	66 118	3 28			
	8			74 675	3 30			72 503	3 30			
	10			81 487	4 33			79 189	4 33			
1000	4			43 219	2 28			43 732	2 29			
	6	1.200	1.157	47 308	3 30	1.250	1.206	47 707	3 30			
	8			52 043	3 32			52 331	3 33			
	10			56 989	4 35			57 183	4 35			
1050	4			46 936	2 29			47 486	2 29			
	6	1.260	1.216	51 281	3 30	1.313	1.267	51 707	3 31			
	8			56 322	3 33			56 628	3 33			
	10			61 594	4 35			61 798	4 35			
1100	4			50 689	2 29			50 687	2 29			
	6	1.320	1.275	55 289	3 31	1.375	1.329	55 153	3 31			
	8			60 633	3 33			60 367	3 33			
	10			66 231	4 35			65 854	4 35			
1150	4			54 478	2 25			53 886	2 25			
	6	1.380	1.334	59 330	3 27	1.438	1.390	58 595	3 27			
	8			64 975	3 29			64 102	3 29			
	10			70 897	4 32			69 904	4 32			
1200	4			58 299	2 26			57 084	2 26			
	6	1.440	1.393	57 945	3 27	1.500	1.452	62 034	3 27			
	8			63 891	3 30			67 831	3 30			
	10			68 758	4 32			73 947	4 32			
1250	4			62 151	2 26			60 280	2 26			
	6	1.500	1.452	67 503	3 28	1.563	1.513	65 471	3 28			
	8			73 747	3 30			71 556	3 30			
	10			80 312	4 32			77 984	4 32			

## 7 TRIGGER CONTROL MECHANISMS – SPECIFICATIONS AND CONNECTIONS DIAGRAM

### 7.1 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.

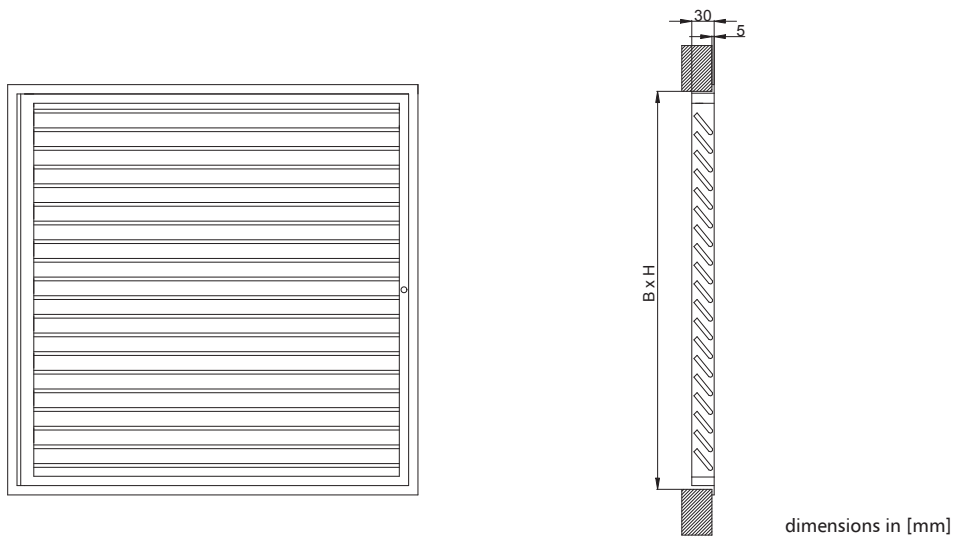
### 7.2 Estimated weight of the mcr DOR rectangular dampers

		Szerokość 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	13	14	15	16	16	17	18	18	19
	500	10	10	11	12	12	13	14	15	16	17	18	18	19	20	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	



## 8 ACCESSORIES

### 8.1 MWD grille



WD system masking elements 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. The masking element 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 elements are painted in RAL 9010 as a standard (available in any colour from the RAL range on request).

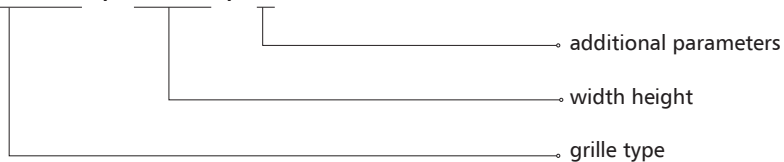
dimensions:

- » nominal width B: from 200 to 1250 mm
- » nominal height H from 200 mm to 1250 mm
- » nominal thickness G 5 mm

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

Marking:

**mcr MWD / B x H / 1**



## 8.2 MWD grille technical parameters

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

v – velocity [m/s]  
S<sub>e</sub> – grille active cross-section [m<sup>2</sup>]

Q – flow [m<sup>3</sup>/h]  
d<sub>p</sub> – pressure drop [Pa]

		height H [mm]												
		200			300			400			500			
		v [m/s]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [PA]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [PA]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [PA]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [PA]
width B [mm]	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	

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

v – velocity [m/s]  
S<sub>e</sub> – grille active cross-section [m<sup>2</sup>]

Q – flow [m<sup>3</sup>/h]  
d<sub>p</sub> – pressure drop [Pa]

		height H [mm]												
		600			700			800			900			
		v [m/s]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [PA]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [PA]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [PA]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [PA]
width B [mm]	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	

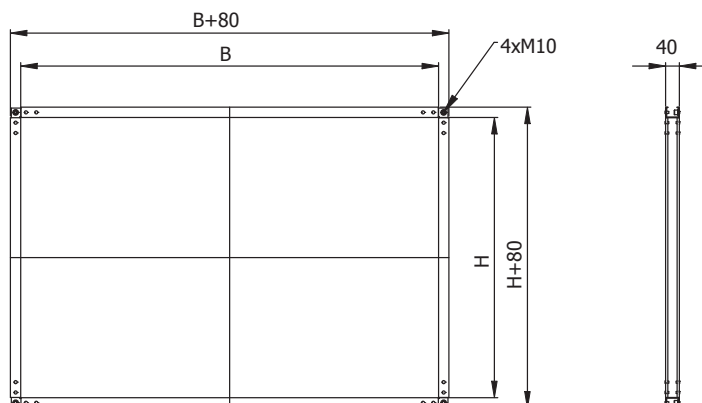
B – nominal width [mm]  
H – nominal height [mm]

v – velocity [m/s]  
S<sub>e</sub> – grille active cross-section [m<sup>2</sup>]

Q – flow [m<sup>3</sup>/h]  
d<sub>p</sub> – pressure drop [Pa]

		height H [mm]																		
		1000				1100				1200				1300			1400			
		v [m/s]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [Pa]	S <sub>e</sub> [m <sup>2</sup> ]	Q [m <sup>3</sup> /s]	d <sub>p</sub> [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				

### 8.3 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 elements may be manufactured with intermediate dimensions.

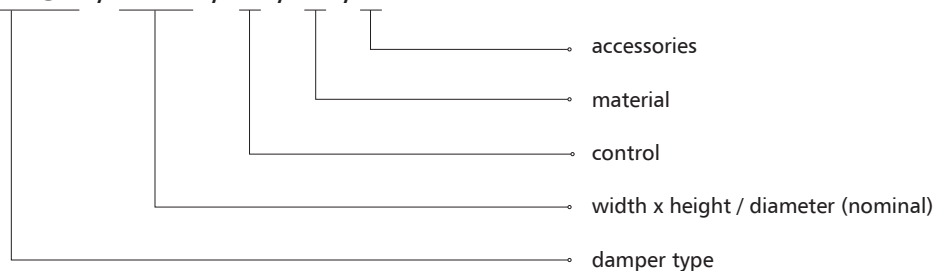
Marking:

**mcr RB / B x H / 1 / 2 / 3**



## 9 MARKING

**mcr DOR / B x H / 1 / 2 / 3**



#### 1 – control:

- » trigger control mechanism
- EM 24 D – electromagnetically powered and tripped trigger and control mechanism

#### 2 – material

- [no symbol] – galvanised steel, Zn 275 g/m<sup>2</sup> coating
- KN – stainless steel
- KK – 1.4404 acid-proof steel

#### 3 – additional accessories

- MP230/24 – 230 V to 24 V transformation module
- WK2 - limit switch (closed blade signal)

**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.



> HQ Gdansk

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