

A large, stylized graphic element in the bottom left corner, consisting of a white 'L' shape with a red arrow pointing towards the bottom right, set against a red background.

FIRE VENTILATION SYSTEMS FIRE DAMPERS AND FIRE VALVES



downloadable models
on the website
under the designer zone tab



» **EI120, E120**

- » Fire resistance class: EI120 ($v_e i \leftrightarrow o$), E120 ($v_e i \leftrightarrow o$).
- » Certificate of constancy of performance 1396-CPR-0097.
- » Dampers qualified under EN 13501-2, EN 13501-3 and tested under EN 1366-2.
- » Louvered transfer damper.
- » Installation with a horizontal and vertical rotation axis.
- » KTB ATEX 2014/34/UE

10.1| Application

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

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

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

- » II 2G Ex h IIC T6...T5 Gb
 - » II 2D Ex h IIC T72...95°C Db
- Ambient temperature: T_a : -20° ... +50°C

10.2| Design

casing

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

casing made
of non-flammable panels

louvers (damper blade)



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

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

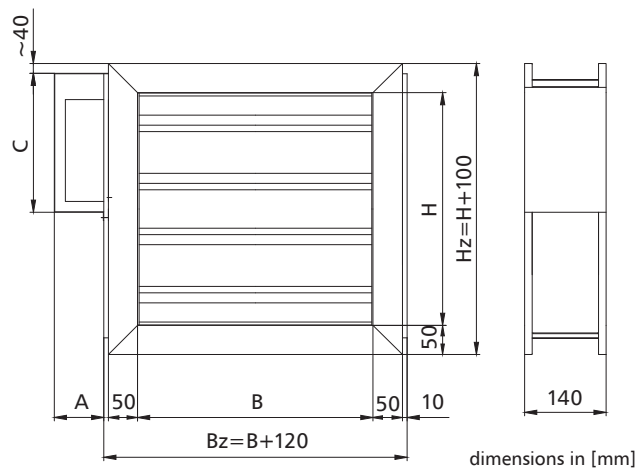
10.3 | Versions

10.3.1 | Damper closing and opening with an actuator

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

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

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



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

insert symmetrically against the wall axis

10.4 | Dimensions

» Rectangular dampers:

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

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

10.5 | Installation

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

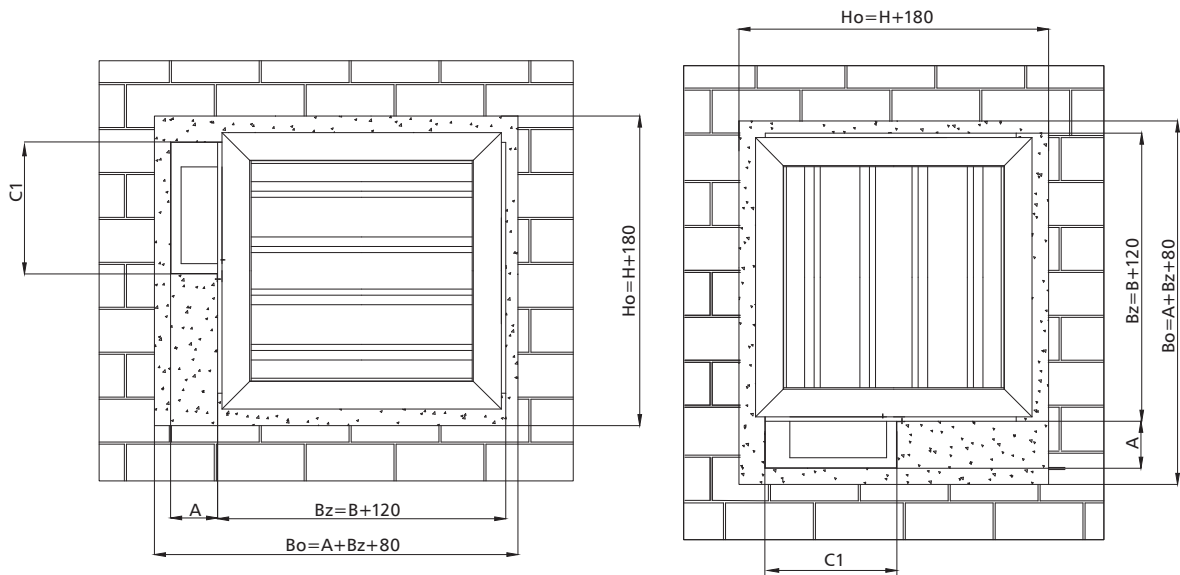
10.5.1 | Preparation of installation openings

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

Preferred

$$Bo = (A+Bz+80) \text{ mm}$$

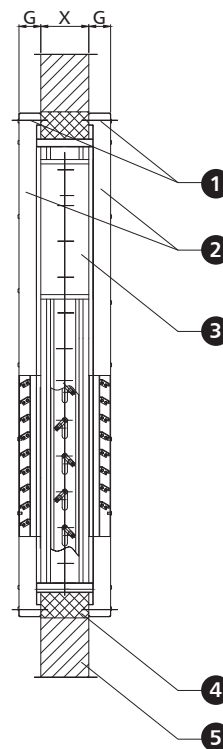
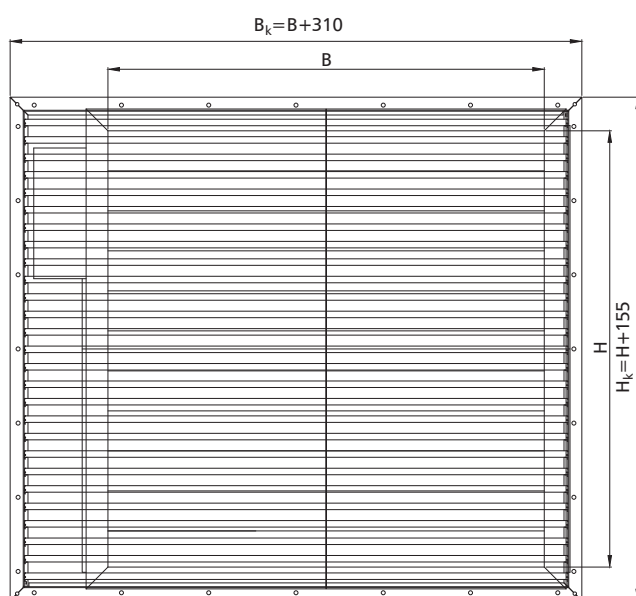
$$Ho = (H+180) \text{ mm}$$



dimensions in [mm]

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

10.5.2 | Sample installation in concrete block or full brick walls



1. mounting pin
2. MST masking element
3. mcr WIP/T fire damper

4. assembly mortar*
5. e.g. masonry wall

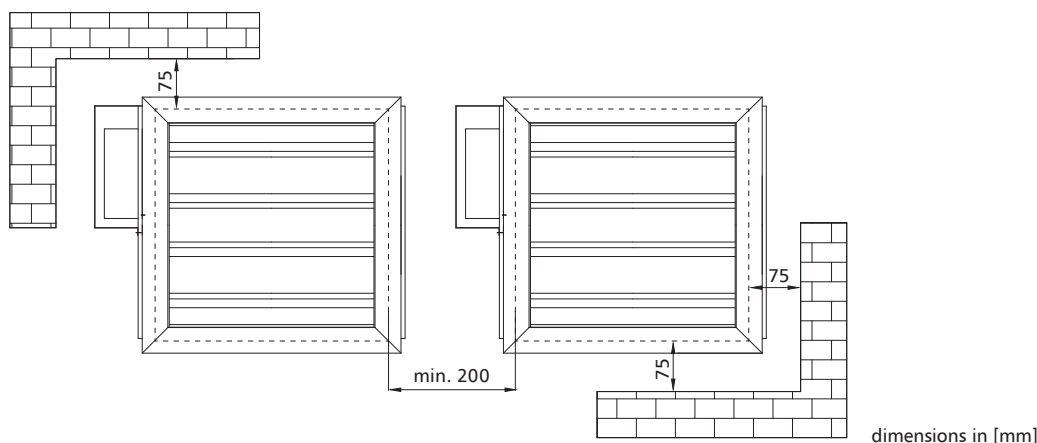
dimensions in [mm]

The thickness of the masking grille "G" is 50 mm for wall thickness up to 120 mm. For walls thicker than 120 mm the manufacturer allows masking grilles with a thickness of below 50 mm. For walls wider than the dampers' thickness, 30 mm masking grilles may be used. The system masking grille may be made of galvanized or stainless steel and painted in any RAL color (RAL 9010 as a standard).

» **Damper installation with a vertical louver rotation axis**

The damper can operate with a vertical louver rotation axis with a top or bottom-mounted mechanism.

» **Minimum distance between systems and partitions**



10.5.3 | MST system masking grilles



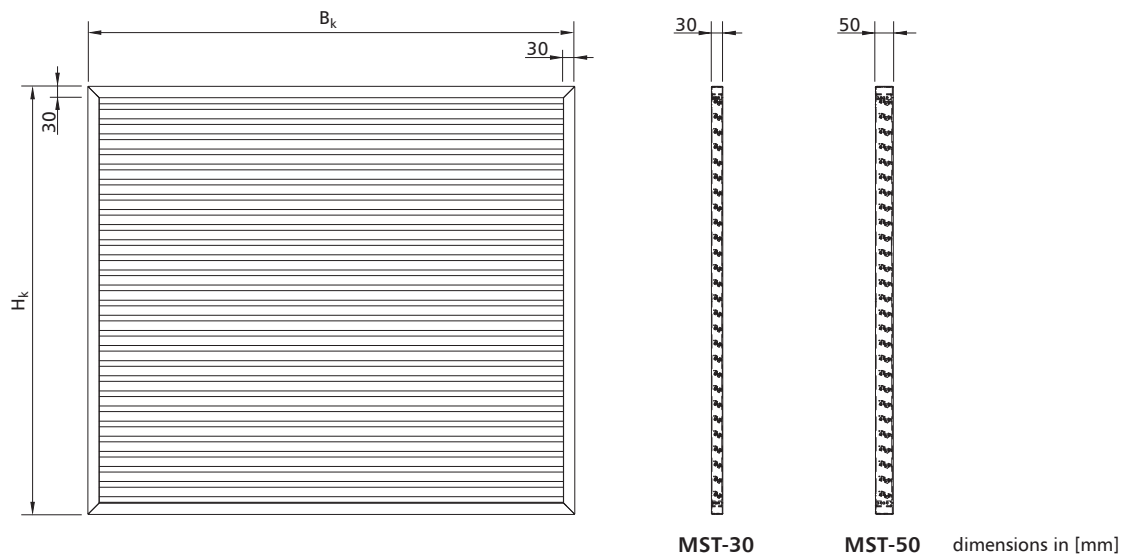
MST system masking grilles are designed to fulfill either supply or exhaust function. They enable the transfer of air through construction partitions. They come with fixed steel louvers with a 40 mm span, obscuring damper visibility.

Bolts embedded in the body are used to attach the masking grille body. After installation, an outer frame is mounted on the masking grille body so that the holes and bolts cannot be seen from the outside. Such a solution allows for installing the product even in the most visually-demanding applications. The masking grilles are painted in RAL 9010 as a standard (available in any colour from the RAL range on request).

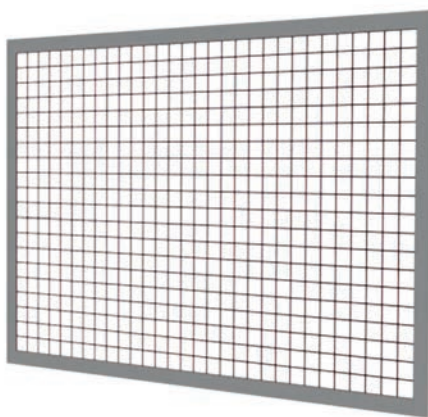
dimensions:

- » nominal width B_k : from 200 mm to 1500 mm
- » nominal height H_k from 200 mm to 1500 mm
- » nominal thickness G 30 and 50 mm

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



10.5.4 | MWP mesh cover

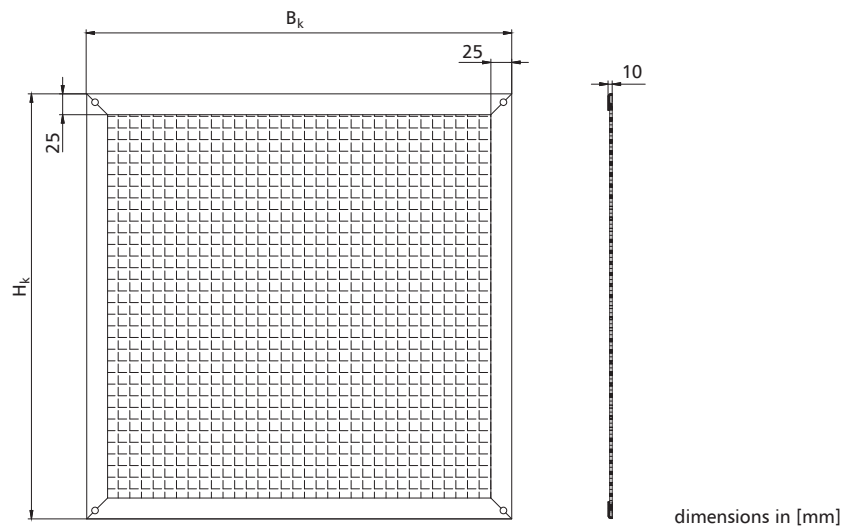


The MWP mesh cover may be supplied together with the damper by the damper manufacturer. System masking grilles, dedicated especially for commercial premises with high architectural and service requirements allows for covering the damper with any additional masking grille while fulfilling the fire rating requirements of the mcr WIP damper. With a wall thickness greater than 200 mm, system and non-system grilles can be applied directly to the wall.

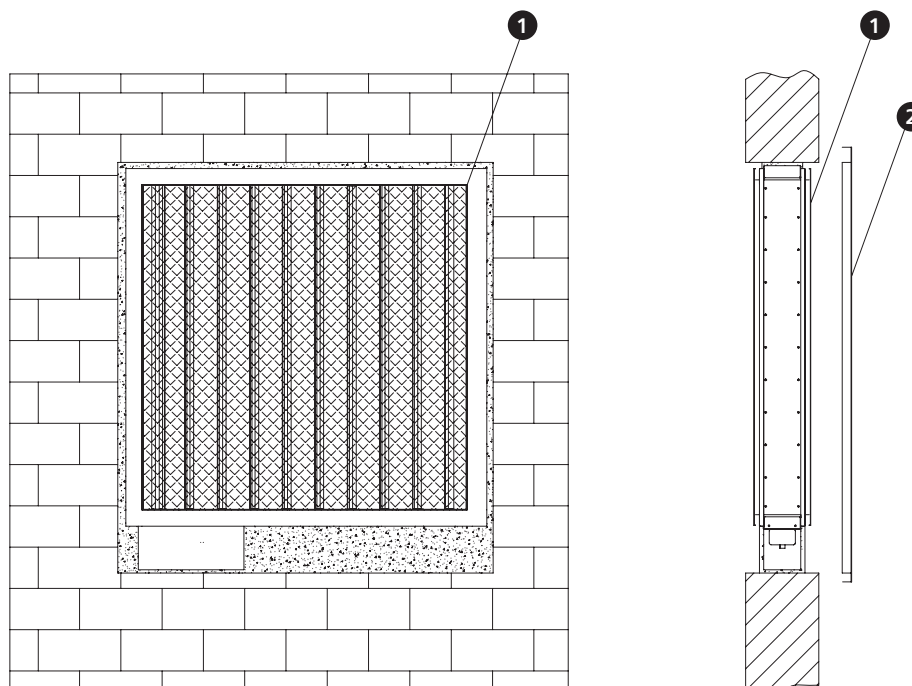
dimensions:

- » nominal width B_k : from 200 mm to 1100 mm
- » nominal height H_k from 200 mm to 1100 mm
- » nominal thickness 10 mm

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



» sample installation



1. MWP mesh cover
2. decorative grille (any, e.g. as indicated by the architect)

10.5.5 | MST masking grille technical parameters

B_k – nominal width [mm]
H_k – nominal height [mm]

v – velocity [m/s]
S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
d_p – pressure drop [Pa]

			height H _k [mm]											
			200			300			400			500		
			S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]
width B _k [mm]	200	4	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	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	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	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	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	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	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	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	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	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	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	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	2 508	7	0.304	4 378	5	0.434	6 247	4	0.564	8 116	4		
	6	3 763	16		6 566	12		9 370	10		12 174	8		
	8	5 017	29		8 755	21		12 493	17		16 232	15		
	10	6 271	45		10 944	33		15 617	27		20 290	23		
1500	4	2 700	7	0.327	4 709	5	0.467	6 718	4	0.606	8 726	4		
	6	4 050	16		7 063	12		10 076	10		13 090	8		
	8	5 400	29		9 418	21		13 435	17		17 453	15		
	10	6 750	45		11 772	33		16 794	27		21 816	23		

B_k – nominal width [mm]
H_k – nominal height [mm]

v – velocity [m/s]
S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
d_p – pressure drop [Pa]

			height H _k [mm]											
			600			700			800			900		
			S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]
width B _k [mm]	200	4	982	8	0.082	1 175	8	0.095	1 368	8	0.108	1 558	8	
		6	1 473	19		1 763	18		2 052	18		2 337	17	
		8	1 964	33		2 350	32		2 736	31		3 116	31	
		10	2 455	52		2 938	50		3 420	49		3 895	48	
	300	4	1 732	6	0.143	2 065	6	0.167	2 398	6	0.189	2 726	6	
		6	2 598	14		3 097	14		3 596	13		4 089	13	
		8	3 465	25		4 130	24		4 795	24		5 452	23	
		10	4 331	40		5 162	38		5 994	37		6 815	36	
	400	4	2 483	5	0.205	2 955	5	0.238	3 427	5	0.270	3 894	5	
		6	3 724	12		4 432	12		5 141	11		5 841	11	
		8	4 965	22		5 910	21		6 854	20		7 788	19	
		10	6 206	34		7 387	32		8 568	31		9 734	30	
	500	4	3 233	5	0.267	3 845	5	0.310	4 457	4	0.352	5 062	4	
		6	4 849	11		5 767	10		6 685	10		7 592	9	
		8	6 466	19		7 690	18		8 914	17		10 123	17	
		10	8 082	30		9 612	28		11 142	27		12 654	26	
	600	4	3 983	4	0.329	4 735	4	0.381	5 486	4	0.433	6 229	4	
		6	5 975	10		7 102	9		8 230	9		9 344	9	
		8	7 966	18		9 469	17		10 973	16		12 459	15	
		10	9 958	28		11 837	26		13 716	25		15 574	24	
	700	4	4 733	4	0.391	5 625	4	0.453	6 516	4	0.514	7 397	4	
		6	7 100	9		8 437	9		9 774	8		11 096	8	
		8	9 467	17		11 249	16		13 032	15		14 795	14	
		10	11 833	26		14 062	24		16 290	23		18 493	22	
	800	4	5 484	4	0.452	6 515	4	0.524	7 546	3	0.595	8 565	3	
		6	8 225	9		9 772	8		11 318	8		12 848	8	
		8	10 967	16		13 029	15		15 091	14		17 130	13	
		10	13 709	25		16 286	23		18 864	22		21 413	21	
900	4	6 234	4	0.514	7 404	4	0.596	8 575	3	0.676	9 733	3		
	6	9 351	9		11 107	8		12 863	7		14 599	7		
	8	12 468	15		14 809	14		17 150	13		19 466	13		
	10	15 584	24		18 511	22		21 438	21		24 332	20		
1000	4	6 984	4	0.576	8 294	3	0.667	9 605	3	0.757	10 901	3		
	6	10 476	8		12 442	8		14 407	7		16 351	7		
	8	13 968	15		16 589	14		19 210	13		21 802	12		
	10	17 460	23		20 736	21		24 012	20		27 252	19		
1100	4	7 734	4	0.638	9 184	3	0.739	10 634	3	0.838	12 069	3		
	6	11 601	8		13 776	7		15 952	7		18 103	7		
	8	15 468	14		18 369	13		21 269	12		24 137	12		
	10	19 336	22		22 961	21		26 586	19		30 172	18		
1200	4	8 484	3	0.700	10 074	3	0.810	11 664	3	0.919	13 236	3		
	6	12 727	8		15 111	7		17 496	7		19 855	6		
	8	16 969	14		20 148	13		23 328	12		26 473	11		
	10	21 211	22		25 186	20		29 160	19		33 091	18		
1300	4	9 235	3	0.761	10 964	3	0.882	12 694	3	1.000	14 404	3		
	6	13 852	8		16 446	7		19 040	7		21 606	6		
	8	18 469	14		21 928	13		25 387	12		28 809	11		
	10	23 087	21		27 410	20		31 734	18		36 011	17		
1400	4	9 985	3	0.823	11 854	3	0.953	13 723	3	1.081	15 572	3		
	6	14 977	8		17 781	7		20 585	6		23 358	6		
	8	19 970	13		23 708	12		27 446	11		31 144	11		
	10	24 962	21		29 635	19		34 308	18		38 930	17		
1500	4	10 735	3	0.885	12 744	3	1.025	14 753	3	1.163	16 740	3		
	6	16 103	7		19 116	7		22 129	6		25 110	6		
	8	21 470	13		25 488	12		29 506	11		33 480	11		
	10	26 838	21		31 860	19		36 882	18		41 850	17		

B_k – nominal width [mm]
H_k – nominal height [mm]

v – velocity [m/s]
S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
d_p – pressure drop [Pa]

			height H _k [mm]											
			1000			1100			1200			1300		
			S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]	S _e [m²]	Q [m³/h]	d _p [PA]
width B _k [mm]	v [m/s]													
	200	4	0.122	1 751	8	0.135	1 944	7	0.148	2 137	7	0.162	2 330	7
		6		2 627	17		2 916	17		3 205	16		3 495	16
		8		3 502	30		3 888	30		4 274	29		4 660	29
		10		4 378	47		4 860	46		5 342	46		5 825	45
	300	4	0.212	3 059	6	0.236	3 391	5	0.259	3 724	5	0.282	4 056	5
		6		4 588	13		5 087	12		5 586	12		6 085	12
		8		6 117	22		6 782	22		7 448	22		8 113	21
		10		7 646	35		8 478	34		9 310	34		10 141	33
	400	4	0.303	4 366	5	0.336	4 838	5	0.369	5 311	4	0.402	5 783	4
		6		6 549	10		7 258	10		7 966	10		8 675	10
		8		8 732	19		9 677	18		10 621	18		11 566	17
		10		10 915	29		12 096	28		13 277	28		14 458	27
	500	4	0.394	5 674	4	0.437	6 286	4	0.479	6 898	4	0.522	7 510	4
		6		8 510	9		9 428	9		10 346	9		11 264	9
		8		11 347	16		12 571	16		13 795	15		15 019	15
		10		14 184	25		15 714	25		17 244	24		18 774	24
	600	4	0.485	6 981	4	0.537	7 733	4	0.589	8 484	3	0.641	9 236	3
		6		10 472	8		11 599	8		12 727	8		13 854	8
		8		13 962	15		15 466	14		16 969	14		18 472	14
		10		17 453	23		19 332	22		21 211	22		23 090	21
	700	4	0.576	8 289	3	0.638	9 180	3	0.699	10 071	3	0.761	10 963	3
		6		12 433	8		13 770	7		15 107	7		16 444	7
		8		16 577	14		18 360	13		20 143	13		21 925	13
		10		20 722	21		22 950	21		25 178	20		27 407	20
	800	4	0.666	9 596	3	0.738	10 627	3	0.810	11 658	3	0.881	12 689	3
		6		14 394	7		15 941	7		17 487	7		19 034	7
8		19 192		13	21 254		12	23 316		12	25 379		12	
10		23 990		20	26 568		19	29 146		19	31 723		18	
900	4	0.757	10 904	3	0.839	12 074	3	0.920	13 245	3	1.001	14 416	3	
	6		16 356	7		18 112	7		19 868	6		21 624	6	
	8		21 807	12		24 149	12		26 490	11		28 832	11	
	10		27 259	19		30 186	18		33 113	18		36 040	17	
1000	4	0.848	12 211	3	0.939	13 522	3	1.030	14 832	3	1.121	16 142	3	
	6		18 317	7		20 282	6		22 248	6		24 214	6	
	8		24 422	12		27 043	11		29 664	11		32 285	11	
	10		30 528	18		33 804	18		37 080	17		40 356	17	
1100	4	0.939	13 519	3	1.040	14 969	3	1.140	16 419	3	1.241	17 869	3	
	6		20 278	6		22 453	6		24 628	6		26 803	6	
	8		27 037	11		29 938	11		32 838	10		35 738	10	
	10		33 797	18		37 422	17		41 047	16		44 672	16	
1200	4	1.030	14 826	3	1.140	16 416	3	1.250	18 006	3	1.361	19 596	2	
	6		22 239	6		24 624	6		27 009	6		29 393	6	
	8		29 652	11		32 832	10		36 012	10		39 191	10	
	10		37 066	17		41 040	16		45 014	16		48 989	15	
1300	4	1.120	16 134	3	1.241	17 863	3	1.361	19 593	2	1.481	21 322	2	
	6		24 201	6		26 795	6		29 389	6		31 983	5	
	8		32 268	11		35 726	10		39 185	10		42 644	10	
	10		40 334	17		44 658	16		48 982	15		53 305	15	
1400	4	1.211	17 441	3	1.341	19 310	2	1.471	21 180	2	1.601	23 049	2	
	6		26 162	6		28 966	6		31 769	5		34 573	5	
	8		34 883	10		38 621	10		42 359	10		46 097	9	
	10		43 603	16		48 276	16		52 949	15		57 622	14	
1500	4	1.302	18 749	3	1.442	20 758	2	1.581	22 766	2	1.721	24 775	2	
	6		28 123	6		31 136	5		34 150	5		37 163	5	
	8		37 498	10		41 515	10		45 533	9		49 550	9	
	10		46 872	16		51 894	15		56 916	15		61 938	14	

B_k – nominal width [mm]
 H_k – nominal height [mm]

v – velocity [m/s]
 S_e – masking grille active cross-section [m²]

Q – flow [m³/h]
 d_p – pressure drop [Pa]

			height H _k [mm]					
			1400			1500		
			v [m/s]	S _e [m²]	Q [m³/h]	d _p [Pa]	S _e [m²]	Q [m³/h]
width B _k [mm]	200	4	0.175	2 523	7	0.189	2 716	7
		6		3 784	16		4 074	16
		8		5 046	29		5 432	29
		10		6 307	45		6 790	45
	300	4	0.305	4 389	5	0.328	4 722	5
		6		6 584	12		7 083	12
		8		8 778	21		9 444	21
		10		10 973	33		11 804	33
	400	4	0.434	6 255	4	0.467	6 728	4
		6		9 383	10		10 092	10
		8		12 511	17		13 455	17
		10		15 638	27		16 819	27
	500	4	0.564	8 122	4	0.607	8 734	4
		6		12 182	8		13 100	8
		8		16 243	15		17 467	15
		10		20 304	23		21 834	23
	600	4	0.694	9 988	3	0.746	10 740	3
		6		14 982	8		16 109	7
		8		19 976	13		21 479	13
		10		24 970	21		26 849	21
	700	4	0.823	11 854	3	0.885	12 745	3
		6		17 781	7		19 118	7
		8		23 708	12		25 491	12
		10		29 635	19		31 864	19
	800	4	0.953	13 720	3	1.024	14 751	3
		6		20 580	6		22 127	6
		8		27 441	11		29 503	11
		10		34 301	18		36 878	18
	900	4	1.082	15 587	3	1.164	16 757	3
		6		23 380	6		25 136	6
		8		31 173	11		33 515	11
		10		38 966	17		41 893	17
	1000	4	1.212	17 453	3	1.303	18 763	3
		6		26 179	6		28 145	6
		8		34 906	10		37 526	10
		10		43 632	16		46 908	16
	1100	4	1.342	19 319	2	1.442	20 769	2
		6		28 979	6		31 154	5
		8		38 638	10		41 538	10
		10		48 298	15		51 923	15
	1200	4	1.471	21 185	2	1.582	22 775	2
		6		31 778	5		34 163	5
		8		42 371	10		45 550	9
		10		52 963	15		56 938	15
	1300	4	1.601	23 052	2	1.721	24 781	2
		6		34 577	5		37 171	5
		8		46 103	9		49 562	9
		10		57 629	14		61 952	14
	1400	4	1.730	24 918	2	1.860	26 787	2
		6		37 377	5		40 180	5
		8		49 836	9		53 574	9
		10		62 294	14		66 967	14
	1500	4	1.860	26 784	2	2.000	28 793	2
		6		40 176	5		43 189	5
		8		53 568	9		57 586	9
		10		66 960	14		71 982	13

10.6 | mcr WIP/T rectangular dampers technical parameters

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

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

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

		v [m/s]	height H [mm]														
			200					250					300				
			S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.040	0.034	490	6	26	0.050	0.043	612	6	26	0.06	0.051	734	6	27
		6			734	13	36			918	13	37			1 102	13	37
		8			979	24	44			1 224	23	44			1 469	22	45
		10			1 224	37	49			1 530	36	50			1 836	35	50
	250	4	0.050	0.043	612	6	26	0.063	0.053	765	6	27	0.075	0.064	918	6	28
		6			918	13	37			1 148	13	38			1 377	13	38
		8			1 224	23	44			1 530	23	45			1 836	22	46
		10			1 530	36	50			1 913	36	51			2 295	35	51
	300	4	0.060	0.051	734	6	27	0.075	0.064	918	6	28	0.09	0.077	1 102	6	28
		6			1 102	13	37			1 377	13	38			1 652	13	39
		8			1 469	23	45			1 836	23	46			2 203	22	46
		10			1 836	36	51			2 295	36	52			2 754	35	52
	350	4	0.070	0.060	857	6	27	0.088	0.074	1 071	36	52	0.105	0.089	1 285	5	29
		6			1 285	13	38			1 607	13	39			1 928	12	39
		8			1 714	22	45			2 142	22	46			2 570	22	47
		10			2 142	35	51			2 678	35	52			3 213	34	52
	400	4	0.080	0.068	979	6	28	0.100	0.085	1 224	6	29	0.12	0.102	1 469	5	29
		6			1 469	13	38			1 836	13	39			2 203	12	40
		8			1 958	22	46			2 448	22	47			2 938	22	47
		10			2 448	35	52			3 060	35	53			3 672	34	53
	450	4	0.090	0.077	1 102	6	28	0.113	0.096	1 377	6	29	0.135	0.115	1 652	5	30
		6			1 652	13	39			2 066	13	40			2 479	12	40
		8			2 203	22	46			2 754	22	47			3 305	22	48
		10			2 754	35	52			3 443	35	53			4 131	34	54
	500	4	0.100	0.085	1 224	5	28	0.125	0.106	1 530	5	29	0.15	0.128	1 836	5	30
		6			1 836	12	39			2 295	12	40			2 754	12	40
		8			2 448	22	46			3 060	22	47			3 672	21	48
		10			3 060	34	52			3 825	34	53			4 590	33	54
	550	4	0.110	0.094	1 346	5	29	0.138	0.117	1 683	5	30	0.165	0.140	2 020	5	31
		6			2 020	12	39			2 525	12	40			3 029	12	41
		8			2 693	22	47			3 366	22	48			4 039	22	49
		10			3 366	34	53			4 208	34	54			5 049	34	54
	600	4	0.120	0.102	1 469	5	29	0.150	0.128	1 836	5	30	0.18	0.153	2 203	5	31
		6			2 203	12	40			2 754	12	41			3 305	12	41
		8			2 938	22	47			3 672	22	48			4 406	21	49
		10			3 672	34	53			4 590	34	54			5 508	33	54
	650	4	0.130	0.111	1 591	5	30	0.163	0.138	1 989	5	30	0.195	0.166	2 387	5	31
		6			2 387	12	40			2 984	12	41			3 580	12	41
		8			3 182	22	48			3 978	22	49			4 774	21	49
		10			3 978	34	53			4 973	34	54			5 967	33	55
	700	4	0.140	0.119	1 714	5	30	0.175	0.149	2 142	5	31	0.21	0.179	2 570	5	31
		6			2 570	12	40			3 213	12	41			3 856	12	42
		8			3 427	22	48			4 284	22	49			5 141	21	49
		10			4 284	34	54			5 355	34	55			6 426	33	55
	750	4	0.150	0.128	1 836	5	30	0.188	0.159	2 295	5	31	0.225	0.191	2 754	5	31
		6			2 754	12	40			3 443	12	41			4 131	12	42
		8			3 672	21	48			4 590	21	49			5 508	21	49
		10			4 590	33	54			5 738	33	55			6 885	32	55
	800	4	0.160	0.136	1 958	5	30	0.200	0.170	2 448	5	31	0.24	0.204	2 938	5	31
		6			2 938	12	41			3 672	12	42			4 406	12	42
		8			3 917	21	48			4 896	21	49			5 875	21	49
		10			4 896	33	54			6 120	33	55			7 344	32	55
	850	4	0.170	0.145	2 081	5	30	0.213	0.181	2 601	5	31	0.255	0.217	3 121	5	31
		6			3 121	12	40			3 902	12	41			4 682	11	42
		8			4 162	21	48			5 202	21	49			6 242	20	49
		10			5 202	32	54			6 503	32	55			7 803	31	55
	900	4	0.180	0.153	2 203	5	30	0.225	0.191	2 754	5	31	0.27	0.230	3 305	5	31
		6			3 305	12	41			4 131	12	42			4 957	11	42
		8			4 406	21	48			5 508	21	49			6 610	20	50
		10			5 508	32	54			6 885	32	55			8 262	31	55
	1000	4	0.200	0.170	2 448	5	31	0.250	0.213	3 060	5	32	0.3	0.255	3 672	5	32
		6			3 672	12	41			4 590	12	42			5 508	11	43
		8			4 896	21	49			6 120	21	50			7 344	20	50
		10			6 120	32	54			7 650	32	55			9 180	31	56

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

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

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

		height H [mm]															
		350					400					450					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.070	0.060	857	6	27	0.080	0.068	979	5	27	0.090	0.077	1 102	5	28
		6			1 285	13	38			1 469	12	38			1 652	12	38
		8			1 714	22	45			1 958	22	45			2 203	22	46
		10			2 142	35	51			2 448	34	51			2 754	34	52
	250	4	0.088	0.074	1 071	6	28	0.100	0.085	1 224	5	28	0.113	0.096	1 377	5	29
		6			1 607	13	39			1 836	12	39			2 066	12	39
		8			2 142	22	46			2 448	22	46			2 754	22	47
		10			2 678	35	52			3 060	34	52			3 443	34	53
	300	4	0.105	0.089	1 285	6	29	0.120	0.102	1 469	5	29	0.135	0.115	1 652	5	30
		6			1 928	13	40			2 203	12	40			2 479	12	40
		8			2 570	22	47			2 938	22	47			3 305	22	48
		10			3 213	35	53			3 672	34	53			4 131	34	54
	350	4	0.123	0.104	1 499	5	29	0.140	0.119	1 714	5	29	0.158	0.134	1 928	5	30
		6			2 249	12	40			2 570	12	40			2 892	12	41
		8			2 999	22	47			3 427	21	48			3 856	21	48
		10			3 749	34	53			4 284	33	53			4 820	33	54
	400	4	0.140	0.119	1 714	5	30	0.160	0.136	1 958	5	30	0.180	0.153	2 203	5	31
		6			2 570	12	40			2 938	12	41			3 305	12	41
		8			3 427	22	48			3 917	21	48			4 406	21	49
		10			4 284	34	54			4 896	33	54			5 508	33	54
	450	4	0.158	0.134	1 928	5	30	0.180	0.153	2 203	5	31	0.203	0.172	2 479	5	31
		6			2 892	12	41			3 305	12	41			3 718	12	42
		8			3 856	22	48			4 406	21	49			4 957	21	49
		10			4 820	34	54			5 508	33	54			6 197	33	55
	500	4	0.175	0.149	2 142	5	30	0.200	0.170	2 448	5	31	0.225	0.191	2 754	5	32
		6			3 213	12	41			3 672	12	42			4 131	12	42
		8			4 284	21	48			4 896	21	49			5 508	21	50
		10			5 355	33	54			6 120	33	55			6 885	33	55
	550	4	0.193	0.164	2 570	5	31	0.220	0.187	2 693	5	31	0.248	0.210	3 029	5	32
		6			3 856	12	42			4 039	12	42			4 544	12	43
		8			5 141	22	49			5 386	21	49			6 059	21	50
		10			6 426	34	55			6 732	33	55			7 574	33	56
	600	4	0.210	0.179	2 570	5	31	0.240	0.204	2 938	4	28	0.270	0.230	3 305	5	32
		6			3 856	12	42			4 406	8	37			4 957	12	42
		8			5 141	21	49			5 875	14	44			6 610	21	50
		10			6 426	33	55			7 344	32	55			8 262	32	56
	650	4	0.228	0.193	2 785	5	32	0.260	0.221	3 182	5	32	0.293	0.249	3 580	5	32
		6			4 177	12	42			4 774	12	42			5 370	12	43
		8			5 569	21	50			6 365	21	50			7 160	21	50
		10			6 962	33	55			7 956	32	56			8 951	32	56
	700	4	0.245	0.208	2 999	5	32	0.28	0.238	3 427	5	32	0.315	0.268	3 856	5	33
		6			4 498	12	42			5 141	12	43			5 783	12	43
		8			5 998	21	50			6 854	21	50			7 711	21	51
		10			7 497	33	56			8 568	32	56			9 639	32	56
	750	4	0.263	0.223	3 213	5	32	0.3	0.255	3 672	5	32	0.338	0.287	4 131	5	33
		6			4 820	12	42			5 508	12	43			6 197	12	43
		8			6 426	21	50			7 344	21	50			8 262	21	51
		10			8 033	32	56			9 180	32	56			10 328	32	57
800	4	0.280	0.238	3 427	5	32	0.32	0.272	3 917	5	33	0.360	0.306	4 406	5	32	
	6			5 141	12	43			5 875	11	43			6 610	11	42	
	8			6 854	21	50			7 834	20	50			8 813	20	50	
	10			8 568	32	56			9 792	31	56			11 016	31	56	
850	4	0.298	0.253	3 641	5	32	0.34	0.289	4 162	5	32	0.383	0.325	4 682	5	31	
	6			5 462	11	42			6 242	11	43			7 023	11	42	
	8			7 283	20	50			8 323	19	50			9 364	19	49	
	10			9 104	31	56			10 404	30	56			11 705	30	55	
900	4	0.315	0.268	3 856	5	32	0.360	0.306	4 406	6	35	0.405	0.344	4 957	5	31	
	6			5 783	11	43			6 610	12	44			7 436	11	42	
	8			7 711	20	50			8 813	26	54			9 914	19	49	
	10			9 639	31	56			11 016	30	56			12 393	30	55	
1000	4	0.350	0.298	4 284	5	33	0.400	0.340	4 896	5	33	0.450	0.383	5 508	5	31	
	6			6 426	11	43			7 344	11	43			8 262	11	42	
	8			8 568	20	51			9 792	19	51			11 016	19	49	
	10			10 710	31	56			12 240	30	57			13 770	30	55	

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

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

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

		height H [mm]															
		500					550					600					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.100	0.085	1 224	5	28	0.110	0.094	1 346	5	28	0.120	0.102	1 469	5	28
		6			1 836	12	39			2 020	12	39			2 203	12	39
		8			2 448	21	46			2 693	21	46			2 938	21	46
		10			3 060	33	52			3 366	33	52			3 672	32	52
	250	4	0.125	0.106	1 530	5	29	0.138	0.117	1 683	5	29	0.150	0.128	1 836	5	29
		6			2 295	12	40			2 525	12	40			2 754	12	40
		8			3 060	21	47			3 366	21	47			3 672	21	47
		10			3 825	33	53			4 208	33	53			4 590	32	53
	300	4	0.150	0.128	1 836	5	30	0.165	0.140	2 020	5	30	0.180	0.153	2 203	5	30
		6			2 754	12	40			3 029	12	41			3 305	12	41
		8			3 672	21	48			4 039	21	48			4 406	21	48
		10			4 590	33	54			5 049	33	54			5 508	32	54
	350	4	0.175	0.149	2 142	5	30	0.193	0.164	2 356	5	30	0.210	0.179	2 570	5	30
		6			3 213	12	41			3 534	12	41			3 856	11	41
		8			4 284	21	48			4 712	21	49			5 141	20	48
		10			5 355	32	54			5 891	32	54			6 426	31	54
	400	4	0.200	0.170	2 448	5	31	0.220	0.187	2 693	5	31	0.240	0.204	2 938	5	31
		6			3 672	12	41			4 039	12	42			4 406	11	42
		8			4 896	21	49			5 386	21	49			5 875	20	49
		10			6 120	32	54			6 732	32	55			7 344	31	55
	450	4	0.225	0.191	2 754	5	31	0.248	0.210	3 029	5	32	0.270	0.230	3 305	5	31
		6			4 131	12	42			4 544	12	42			4 957	11	42
		8			5 508	21	49			6 059	21	50			6 610	20	50
		10			6 885	32	55			7 574	32	55			8 262	31	55
	500	4	0.250	0.213	3 060	5	31	0.275	0.234	3 366	5	32	0.300	0.255	3 672	5	32
		6			4 590	11	42			5 049	12	43			5 508	11	43
		8			6 120	22	51			6 732	21	50			7 344	20	50
		10			7 650	32	55			8 415	32	56			9 180	31	56
	550	4	0.275	0.234	3 672	5	32	0.303	0.257	4 039	5	32	0.330	0.281	4 406	5	32
		6			5 508	12	43			6 059	12	43			6 610	11	43
		8			7 344	21	50			8 078	21	50			8 813	20	50
		10			9 180	32	56			10 098	32	56			11 016	31	56
	600	4	0.300	0.255	3 672	5	32	0.330	0.281	4 039	5	32	0.360	0.306	4 406	5	32
		6			5 508	11	43			6 059	11	43			6 610	11	43
		8			7 344	20	50			8 078	20	50			8 813	19	50
		10			9 180	31	56			10 098	31	56			11 016	30	56
	650	4	0.325	0.276	3 978	5	33	0.358	0.304	4 376	5	33	0.390	0.332	4 774	5	33
		6			5 967	12	43			6 564	11	43			7 160	11	43
		8			7 956	21	51			8 752	20	51			9 547	19	51
		10			9 945	31	56			10 940	31	57			11 934	30	57
	700	4	0.350	0.298	4 284	5	33	0.385	0.327	4 712	5	33	0.420	0.357	5 141	5	33
		6			6 426	11	43			7 069	11	44			7 711	11	44
		8			8 568	20	51			9 425	20	51			10 282	19	51
		10			10 710	31	56			11 781	31	57			12 852	30	57
	750	4	0.375	0.319	4 590	5	33	0.413	0.351	5 049	5	33	0.450	0.383	5 508	5	33
		6			6 885	11	43			7 574	11	44			8 262	11	44
		8			9 180	20	51			10 098	20	51			11 016	19	51
		10			11 475	31	57			12 623	31	57			13 770	30	57
800	4	0.400	0.340	4 896	5	32	0.440	0.374	5 386	5	33	0.480	0.408	5 875	5	33	
	6			7 344	11	43			8 078	11	44			8 813	10	44	
	8			9 792	19	51			10 771	19	51			11 750	19	51	
	10			12 240	30	56			13 464	30	57			14 688	29	57	
850	4	0.425	0.361	5 202	5	32	0.468	0.397	5 722	5	33	0.510	0.434	6 242	4	33	
	6			7 803	10	43			8 583	10	44			9 364	10	43	
	8			10 404	19	50			11 444	19	51			12 485	18	51	
	10			13 005	29	56			14 306	29	57			15 606	28	57	
900	4	0.450	0.383	5 508	5	32	0.495	0.421	6 059	5	33	0.540	0.459	6 610	4	33	
	6			8 262	10	43			9 088	10	44			9 914	10	41	
	8			11 016	19	50			12 118	19	51			13 219	18	49	
	10			13 770	29	56			15 147	29	57			16 524	28	54	
1000	4	0.500	0.425	6 120	5	32	0.550	0.468	6 059	5	34	0.600	0.510	7 344	4	34	
	6			9 180	10	43			9 088	10	44			11 016	10	44	
	8			12 240	19	50			12 118	19	52			14 688	18	52	
	10			15 300	29	56			15 147	29	58			18 360	28	57	

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

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

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

		height H [mm]															
		650					700					750					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.130	0.111	1 591	5	29	0.140	0.119	1 714	5	29	0.150	0.128	1 836	5	29
		6			2 387	12	39			2 570	11	39			2 754	11	40
		8			3 182	21	47			3 427	20	47			3 672	20	47
		10			3 978	32	53			4 284	31	52			4 590	31	53
	250	4	0.163	0.138	1 989	5	30	0.175	0.149	2 142	5	30	0.188	0.159	2 295	5	30
		6			2 984	12	40			3 213	11	40			3 443	11	40
		8			3 978	21	48			4 284	20	48			4 590	20	48
		10			4 973	32	54			5 355	31	53			5 738	31	54
	300	4	0.195	0.166	2 387	5	30	0.210	0.179	2 570	5	30	0.225	0.191	2 754	5	31
		6			3 580	12	41			3 856	11	41			4 131	11	41
		8			4 774	21	49			5 141	20	48			5 508	20	49
		10			5 967	32	54			6 426	31	54			6 885	31	55
	350	4	0.228	0.193	2 785	5	31	0.245	0.208	2 999	5	31	0.263	0.223	3 213	5	31
		6			4 177	11	41			4 498	11	41			4 820	11	42
		8			5 569	20	49			5 998	19	49			6 426	19	49
		10			6 962	31	55			7 497	30	54			8 033	30	55
	400	4	0.260	0.221	3 182	5	31	0.280	0.238	3 427	5	31	0.300	0.255	3 672	5	32
		6			4 774	11	42			5 141	11	42			5 508	11	42
		8			6 365	20	49			6 854	19	49			7 344	19	50
		10			7 956	31	55			8 568	30	55			9 180	30	55
	450	4	0.293	0.249	3 580	5	32	0.315	0.268	3 856	5	32	0.338	0.287	4 131	5	32
		6			5 370	11	42			5 783	11	42			6 197	11	43
		8			7 160	20	50			7 711	19	50			8 262	19	50
		10			8 951	31	56			9 639	30	56			10 328	30	56
	500	4	0.325	0.276	3 978	5	32	0.350	0.298	4 284	5	32	0.375	0.319	4 590	5	32
		6			5 967	11	43			6 426	11	43			6 885	11	43
		8			7 956	20	50			8 568	19	50			9 180	19	51
		10			9 945	31	56			10 710	30	56			11 475	30	56
	550	4	0.358	0.304	4 774	5	33	0.385	0.327	4 712	5	33	0.413	0.351	5 049	5	33
		6			7 160	11	43			7 069	11	43			7 574	11	43
		8			9 547	20	51			9 425	19	51			10 098	19	51
		10			11 934	31	57			11 781	30	56			12 623	30	57
	600	4	0.390	0.332	4 774	5	33	0.420	0.357	5 141	5	33	0.450	0.383	5 508	5	33
		6			7 160	11	44			7 711	11	44			8 262	11	44
		8			9 547	20	51			10 282	19	51			11 016	19	51
		10			11 934	31	57			12 852	30	57			13 770	30	57
	650	4	0.423	0.359	5 171	5	33	0.455	0.387	5 569	5	33	0.488	0.414	5 967	5	33
		6			7 757	11	44			8 354	10	43			8 951	10	44
		8			10 343	19	51			11 138	19	51			11 934	19	51
		10			12 929	30	57			13 923	29	57			14 918	29	57
	700	4	0.455	0.387	5 569	5	33	0.490	0.417	5 998	5	33	0.525	0.446	6 426	5	34
		6			8 354	11	44			8 996	10	44			9 639	10	44
		8			11 138	19	51			11 995	19	51			12 852	19	52
		10			13 923	30	57			14 994	29	57			16 065	29	57
	750	4	0.488	0.414	5 967	5	34	0.525	0.446	6 426	5	34	0.563	0.478	6 885	5	34
		6			8 951	11	44			9 639	10	44			10 328	10	44
		8			11 934	19	52			12 852	19	52			13 770	19	52
		10			14 918	30	57			16 065	29	57			17 213	29	58
800	4	0.520	0.442	6 365	5	33	0.560	0.476	6 854	4	29	0.600	0.510	7 344	4	34	
	6			9 547	10	44			10 282	7	37			11 016	10	44	
	8			12 730	19	51			13 709	11	43			14 688	18	52	
	10			15 912	29	57			17 136	28	54			18 360	28	57	
850	4	0.553	0.470	6 763	4	33	0.595	0.506	7 283	4	34	0.638	0.542	7 803	4	34	
	6			10 144	10	43			10 924	10	44			11 705	10	44	
	8			13 525	18	51			14 566	18	52			15 606	18	52	
	10			16 907	28	57			18 207	28	57			19 508	28	58	
900	4	0.585	0.497	7 160	4	33	0.630	0.536	7 711	4	33	0.675	0.574	8 262	4	34	
	6			10 741	10	43			11 567	10	44			12 393	10	44	
	8			14 321	18	51			15 422	17	51			16 524	17	52	
	10			17 901	28	57			19 278	27	57			20 655	27	58	
1000	4	0.650	0.553	7 956	4	33	0.700	0.595	8 568	4	34	0.750	0.638	9 180	4	34	
	6			11 934	10	43			12 852	10	44			13 770	10	45	
	8			15 912	18	51			17 136	17	52			18 360	17	52	
	10			19 890	28	57			21 420	27	58			22 950	27	58	

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

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

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

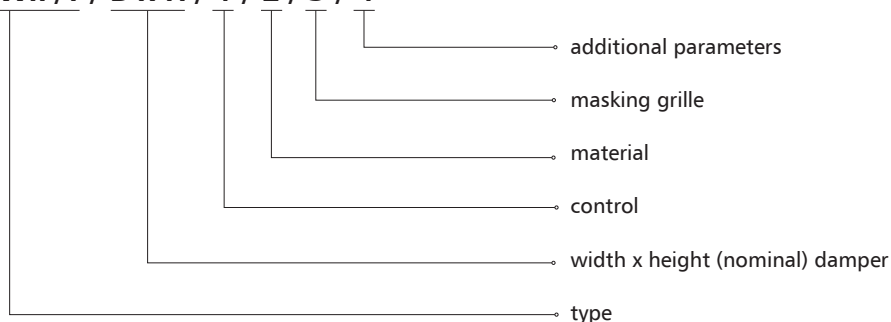
		height H [mm]																				
		800					850					900					1000					
		v [m/s]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]	S _k [m²]	S _e [m²]	Q [m³/h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	200	4	0.160	0.136	1 958	5	29	0.170	0.145	2 081	5	29	0.180	0.153	2 203	5	29	0.200	0.170	2 448	5	29
		6			2 938	11	39			3 121	11	40			3 305	10	39			3 672	10	40
		8			3 917	19	47			4 162	19	47			4 406	19	47			4 896	19	47
		10			4 896	30	53			5 202	30	53			5 508	29	53			6 120	29	53
	250	4	0.200	0.170	2 448	5	30	0.213	0.181	2 601	5	30	0.225	0.191	2 754	5	30	0.250	0.213	3 060	5	30
		6			3 672	11	40			3 902	11	41			4 131	10	40			4 590	10	41
		8			4 896	19	48			5 202	19	48			5 508	19	48			6 120	19	48
		10			6 120	30	54			6 503	30	54			6 885	29	54			7 650	29	54
	300	4	0.240	0.204	2 938	5	31	0.255	0.217	3 121	5	31	0.270	0.230	3 305	5	31	0.300	0.255	3 672	5	31
		6			4 406	11	41			4 682	11	41			4 957	10	41			5 508	10	42
		8			5 875	19	49			6 242	19	49			6 610	19	49			7 344	19	49
		10			7 344	30	54			7 803	30	55			8 262	29	54			9 180	29	55
	350	4	0.280	0.238	3 427	5	31	0.298	0.253	3 641	5	31	0.315	0.268	3 856	4	31	0.350	0.298	4 284	4	31
		6			5 141	10	41			5 462	10	42			5 783	10	41			6 426	10	42
		8			6 854	19	49			7 283	19	49			7 711	18	49			8 568	18	49
		10			8 568	29	55			9 104	29	55			9 639	28	55			10 710	28	55
	400	4	0.320	0.272	3 917	5	31	0.340	0.289	4 162	5	32	0.360	0.306	4 406	4	31	0.400	0.340	4 896	4	32
		6			5 875	10	42			6 242	10	42			6 610	10	42			7 344	10	42
		8			7 834	19	49			8 323	19	50			8 813	18	49			9 792	18	50
		10			9 792	29	55			10 404	29	55			11 016	28	55			12 240	28	56
	450	4	0.360	0.306	4 406	5	32	0.383	0.325	4 682	4	32	0.405	0.344	4 957	4	31	0.450	0.383	5 508	4	32
		6			6 610	10	42			7 023	10	42			7 436	10	42			8 262	10	42
		8			8 813	19	50			9 364	18	50			9 914	17	50			11 016	17	50
		10			11 016	29	56			11 705	28	56			12 393	27	55			13 770	27	56
	500	4	0.400	0.340	4 896	5	32	0.425	0.361	5 202	4	32	0.450	0.383	5 508	4	32	0.500	0.425	6 120	4	32
		6			7 344	10	43			7 803	10	43			8 262	10	42			9 180	10	43
		8			9 792	19	50			10 404	18	50			11 016	17	50			12 240	17	50
		10			12 240	29	56			13 005	28	56			13 770	27	56			15 300	27	56
	550	4	0.440	0.374	5 386	5	33	0.468	0.397	5 722	4	33	0.495	0.421	6 059	4	32	0.550	0.468	6 732	4	33
		6			8 078	10	43			8 583	10	43			9 088	10	43			10 098	10	43
		8			10 771	19	51			11 444	18	51			12 118	17	50			13 464	17	51
		10			13 464	29	57			14 306	28	56			15 147	27	56			16 830	27	57
	600	4	0.480	0.408	5 875	5	33	0.510	0.434	6 242	4	33	0.540	0.459	6 610	4	33	0.600	0.510	7 344	4	33
		6			8 813	10	44			9 364	10	43			9 914	10	43			11 016	10	44
		8			11 750	19	51			12 485	18	51			13 219	17	51			14 688	17	51
		10			14 688	29	57			15 606	28	57			16 524	27	57			18 360	27	57
	650	4	0.520	0.442	6 365	5	33	0.553	0.470	6 763	4	33	0.585	0.497	7 160	4	33	0.650	0.553	7 956	4	34
		6			9 547	10	44			10 144	10	44			10 741	10	44			11 934	10	44
		8			12 730	19	52			13 525	18	51			14 321	17	51			15 912	17	52
		10			15 912	29	57			16 907	28	57			17 901	27	57			19 890	27	57
	700	4	0.560	0.476	6 854	4	33	0.595	0.506	7 283	4	33	0.630	0.536	7 711	4	33	0.700	0.595	8 568	4	33
		6			10 282	10	44			10 924	10	44			11 567	9	43			12 852	9	44
		8			13 709	18	51			14 566	17	51			15 422	17	51			17 136	17	51
		10			17 136	28	57			18 207	27	57			19 278	26	57			21 420	26	57
	750	4	0.600	0.510	7 344	4	34	0.638	0.542	7 803	4	33	0.675	0.574	8 262	4	33	0.750	0.638	9 180	4	34
		6			11 016	10	44			11 705	10	44			12 393	9	44			13 770	9	44
		8			14 688	18	52			15 606	17	51			16 524	17	51			18 360	17	52
		10			18 360	28	57			19 508	27	57			20 655	26	57			22 950	26	57
800	4	0.640	0.544	7 834	4	34	0.680	0.578	8 323	4	34	0.720	0.612	8 813	4	33	0.800	0.680	9 792	4	34	
	6			11 750	10	44			12 485	10	44			13 219	9	44			14 688	9	44	
	8			15 667	18	52			16 646	17	52			17 626	17	52			19 584	17	52	
	10			19 584	28	58			20 808	27	58			22 032	26	57			24 480	26	58	
850	4	0.680	0.578	8 323	4	34	0.723	0.614	8 843	4	33	0.765	0.650	9 364	4	34	0.850	0.723	10 404	4	34	
	6			12 485	10	44			13 265	9	44			14 045	9	44			15 606	9	45	
	8			16 646	17	52			17 687	17	52			18 727	17	52			20 808	17	52	
	10			20 808	27	58			22 109	26	57			23 409	26	58			26 010	26	58	
900	4	0.720	0.612	8 813	4	34	0.765	0.650	9 364	4	34	0.810	0.689	9 914	4	34	0.900	0.765	11 016	4	34	
	6			13 219	10	45			14 045	9	44			14 872	9	45			16 524	9	44	
	8			17 626	17	52			18 727	17	52			19 829	17	52			22 032	16	52	
	10			22 032	27	58			23 409	26	58			24 786	26	58			27 540	25	58	
1000	4	0.800	0.680	9 792	4	34	0.850	0.723	10 404	4	34	0.900	0.765	11 016	4	33	1.000	0.850	12 240	4	34	
	6			14 688	9	44			15 606	9	44			16 524	9	44			18 360	9	44	
	8			19 584	17	52			20 808	16	52			22 032	15	51			24 480	15	52	
	10			24 480	26	58			26 010	25	58			27 540	24	57			30 600	24	58	

10.7 | Estimated weights of mcr WIP/T dampers [kg]

		width B [mm]									
		200	250	300	400	500	600	700	800	900	1000
height H [mm]	200	10	10	10	10	15	17	18	19	22	25
	250	10	10	11	11	16	18	18	21	24	27
	300	10	11	11	12	17	20	21	23	26	28
	350	11	11	11	16	18	21	23	26	28	30
	400	12	12	14	18	19	21	25	29	30	33
	500	15	16	17	19	20	23	27	32	33	35
	600	17	18	20	21	23	26	30	35	37	39
	700	18	18	21	23	25	28	32	35	38	40
	800	20	21	22	24	29	35	37	41	43	49
	900	22	25	25	28	33	35	39	43	49	52
	1000	23	29	32	33	36	42	43	47	53	60

10.8 | Marking

mcr WIP/T / B x H / 1 / 2 / 3 / 4



1 - control:

» trigger control mechanism

- BF24-TN – actuator with a return spring, U = 24 V AC/DC
- BF230-TN – actuator with a return spring, U = 230 V AC
- BF24TL-TN-ST (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control
- BF24-TN-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
- BFL24-T – actuator with a return spring, U = 24 V AC/DC
- BFL230-T – actuator with a return spring, U = 230 V AC
- BFL24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
- BFN24-T – actuator with a return spring, U = 24 V AC/DC
- BFN230-T – actuator with a return spring, U = 230 V AC
- BFN24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
- MF24T1 – actuator with a return spring, U = 24 V AC/DC
- MF230T1 – actuator with a return spring, U = 230 V AC
- MLF24T1 – actuator with a return spring, U = 24 V AC/DC
- MLF230T1 – actuator with a return spring, U = 230 V AC
- QT.Ex 24-FT.Ex – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC
- QT.Ex 230-FT.Ex – explosion proof actuator with a return spring in the Ex version, U = 230 V AC/DC

2 - material:

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

3 - masking element:

- MSTx1 – single masking grille
- MSTx2 – two masking grilles
- MWPx1 – single mesh cover
- MWPx2 – two mesh cover

4 - additional parameters :

» Thermoelectric and thermal triggers

[no symbol] – 72°C trigger

ZBAT95 – thermoelectric trigger for 95°C

T93-95 – thermal trigger for 95°C

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

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

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

» Damper axis of rotation

[no symbol] – horizontal axis of rotation

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

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

» Design standard

[no symbol] – left damper

KO – inverted damper

» Damper casing

BU - earth pin

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

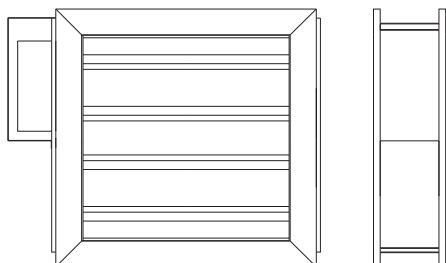
example marking:

mcr WIP/T 400 x 400 BFL24-T

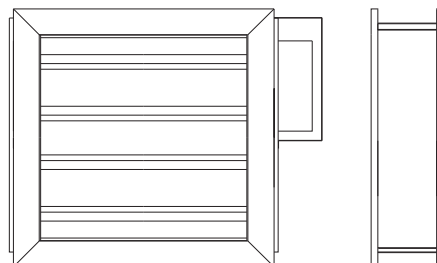
E1120 louvered transfer damper with a 24 V actuator with limit switches.

10.8.1 | Design standard

» left damper standard



» right damper



Chapter 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.



> **Mercor Light&Vent Sp. z o.o.**

📍 ul. Grzegorza z Sanoka 2
80-408 Gdańsk
☎ (+48) 58 341 42 45
✉ hw.export@mercor.com.pl

www.mercor.com.pl/en



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