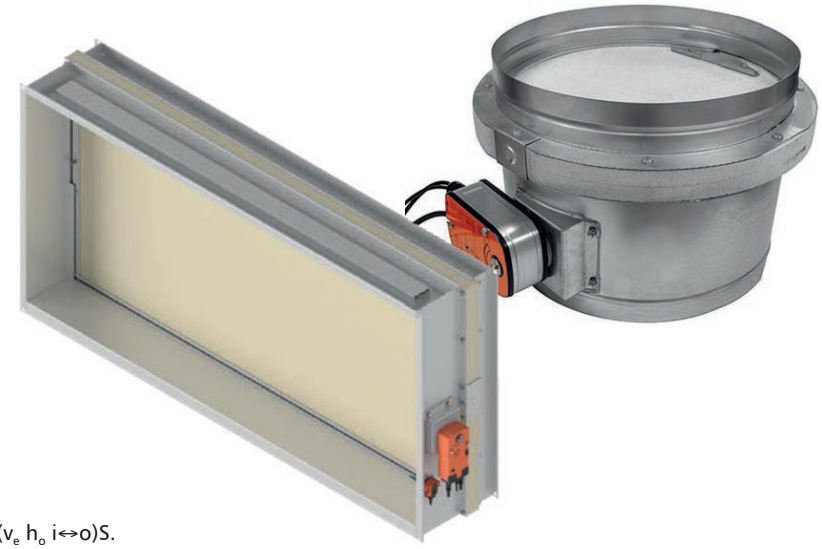
mercor®

FIRE VENTILATION SYSTEMS

FIRE DAMPERS AND FIRE VALVES

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

downloadable models
on the website
under the designer zone tab



1396-CPR-0103
1488-CPR-0422/W

HYGIENIC CERTIFICATE

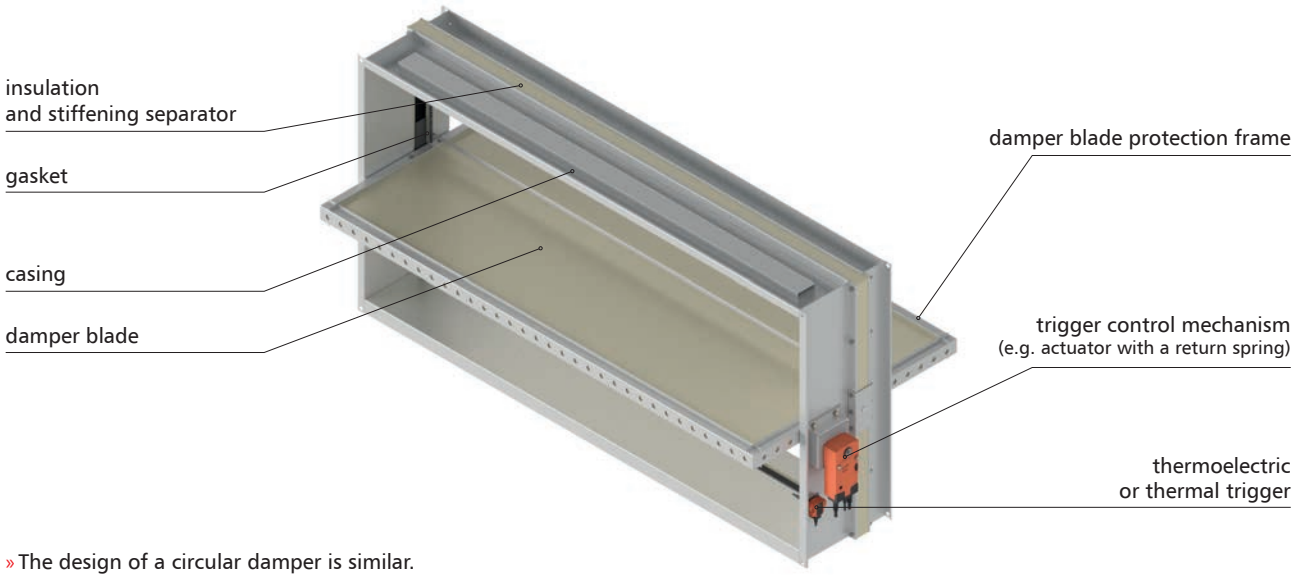
PRODUCT CERTIFICATION

» **EIS120**
» Fire resistance class: EI120 (v_e h_o i↔o)S.
» Certificate of constancy of performance 1488-CPR-0422/W and 1396-CPR-0103.
» Dampers certified for compliance with EN 15650.
» Dampers qualified under EN 13501-3 and tested under EN 1366-2.
» Cut-off dampers with a fire resistance rating independent of the airflow direction and installation side.
» Dampers for rectangular and circular ventilation ducts
» Certified installation of dampers in close proximity.
» Certified installation of dampers at a distance from construction partitions.
» Certified modular installation.
» Admitted operation of a damper with a horizontal and vertical rotation axis.
» Pressure difference range: 2000 Pa.
» KTB ATEX 2014/34/UE

3.1| Application

mcr FID S/S p/P, mcr FID S/S p/O cut-off dampers are designed for installation in general ventilation systems at installation passages through construction partitions.
During a fire, they preserve the fire resistance rating of the construction partition that the ventilation and air conditioning ducts are routed through. Furthermore, they prevent the spreading of fire, smoke and fire gasses to the remaining part of the building which is not on fire. During normal system operation, the damper blade is open. In case of fire, the damper blade closes. Admissible flow velocity in the connected duct is 12 m/s.
In the version designed for explosion hazard zones (EX version), the dampers can be operated in gas explosion hazard zone 1 inside and outside ventilation ducts and in dust explosion hazard zone 21 outside these ducts. The dampers have been certified in compliance with the ATEX directive 94/9/EC and meet the requirements of group II category 2G and 2D:
» II 2G Ex h IIC T6...T5 Gb
» II 2D Ex h IIIC T72...95°C Db
Ambient temperature: Ta: -20°... +50°C

3.2| Design



» The design of a circular damper is similar.

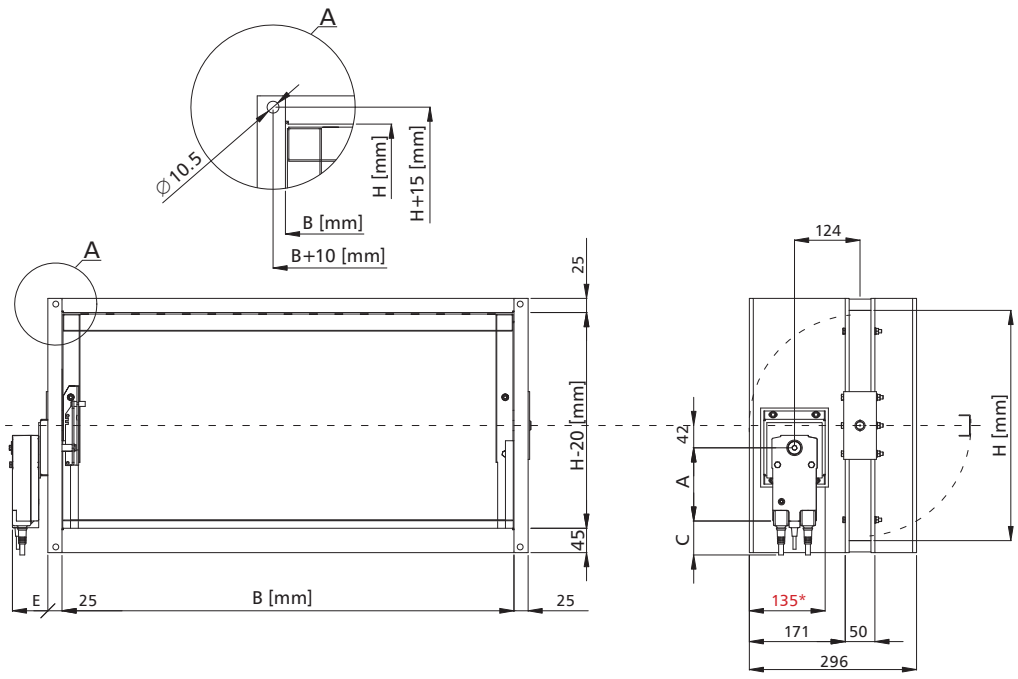
mcr FID S/S cut-off dampers consist of a casing with a rectangular (mcr FID S/S p/P) or circular (mcr FID S/S p/O) cross-section, made of two segments separated with a fire-proof panel with the cross-section of 20 x 40 mm, a moving damper blade and a trigger control mechanism, which is activated remotely or automatically by tripping a thermal or thermoelectric trigger. Standard damper casing is made of galvanized steel sheets. A special casing is used for chemically aggressive environments, which features steel elements made of 1.4404 (316L) acid-proof steel sheet, while other elements are impregnated. The casing total length is at least 296 mm. Dampers may be made with an extension element, in such a case the casing length is 400 mm.
The damper blade is made of a fire-proof panel with the total thickness of 40 mm, which is covered with a metal sheet reinforcement profile. The inner side of the fire damper casing is equipped with an intumescent gasket. Stop profiles are attached to the inner casing surface, limiting the rotating motion of the damper blade. Stop profiles are lined with a polyethylene ventilation gasket. In dampers with a rectangular cross-section, both ends of the casing are finished with flange connections, and in circular dampers they are finished with nipple or flange connections.

3.3 | Versions

3.3.1 | Damper closing and opening with an actuator

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

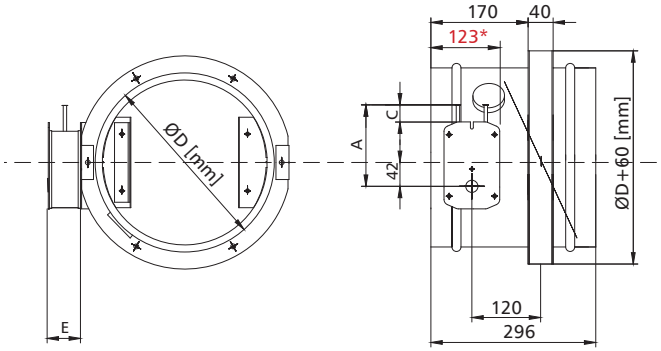
The mcr FID S/S dampers are equipped with a trigger control mechanism in the form of BF, BFL, BFN, BF-TL, EXBF, QT.Ex, MLF, MF series axial actuator with a return spring, supplied with 24 V AC/DC or 230 V AC, with a 72°C thermoelectric trigger (optionally it is possible to use triggers with the nominal tripping temperature of 95°C).
The actuators are equipped with limit switches used to monitor the blade position. Furthermore, a mechanical position indicator is placed on the actuator.
Thermoelectric triggers are equipped with a test switch.
Dampers with actuators close as a result of the thermoelectric trigger tripping or power supply cut-off as a result of the actuator return spring action. The dampers open when power supply voltage is applied to the actuator terminals. Dampers with those actuators may be opened manually using a key.



dimensions in [mm]

mechanism	A	C	E
BFN	157	30	62
BFL/MLF	138	30	58
BF24TL-ST	198	10	70
EXBF	225	55	175
QT.Ex	260	30	105
BF/MF	198	10	70

*embedding border



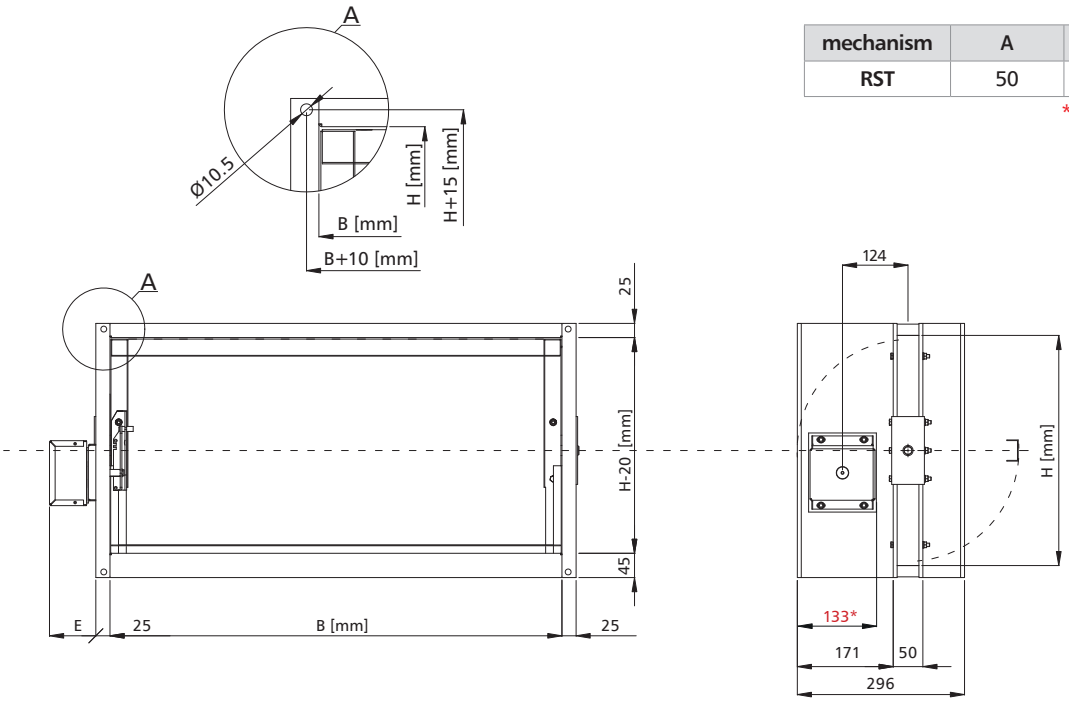
mechanism	A	C	E
BFN	157	30	42
BFL/MLF	138	30	38
BF24TL-ST	198	10	50
EXBF	225	55	160
QT.Ex	260	30	105
BF/MF	198	10	50

dimensions in [mm] *embedding border

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

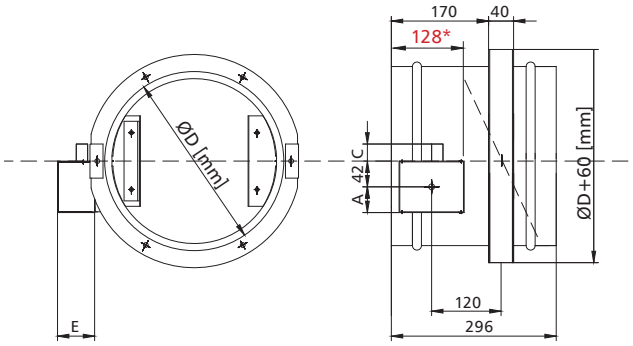
During normal operation, the fire damper blade remains open. In case of fire, the blade closes automatically.

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



mechanism	A	C	E
RST	50	30	75

*embedding border



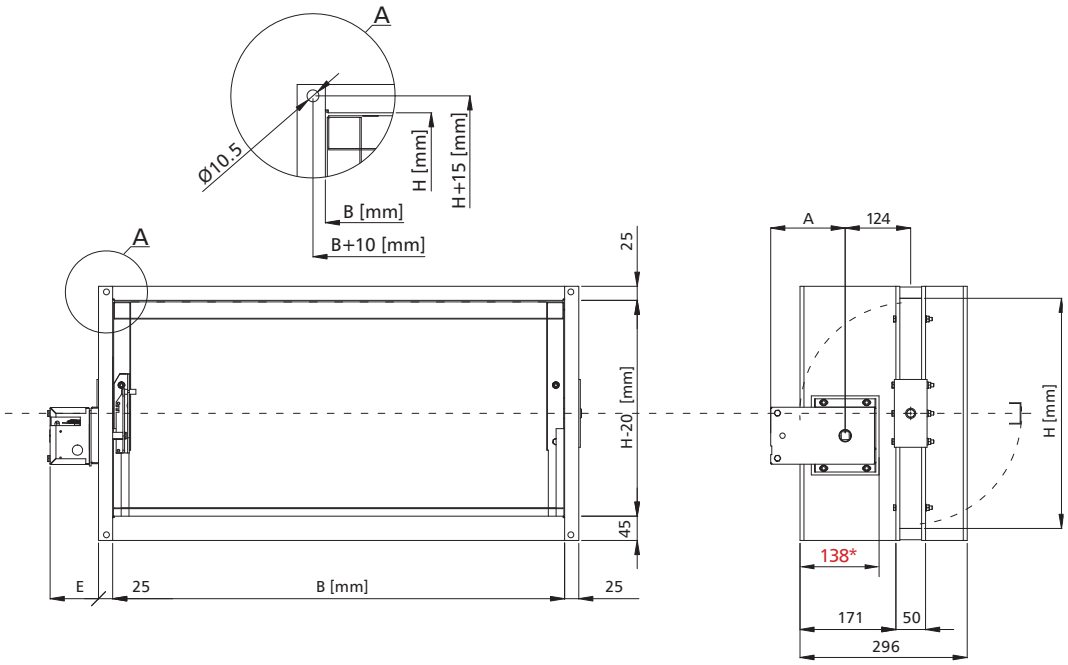
mechanism	A	C	E
RST	40	30	55

*embedding border

3.3.3 | mcr FID S/S – cut-off fire damper for ventilation ducts with a spring drive and an integrated thermal trigger, optionally equipped with an electromagnetic trigger and limit switches.

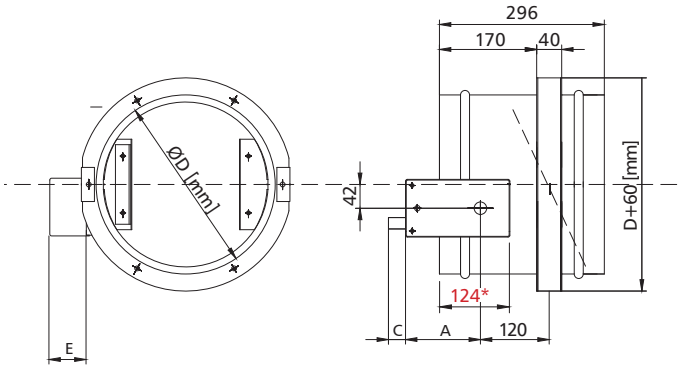
During normal operation, the fire damper blade remains open. In case of fire, the blade closes automatically or through the fire automation system in case of a damper with an electromagnetic trigger.

mcr FID S/S dampers are equipped with a KW1 trigger control mechanism with a drive spring and a cam-lever system. A 74°C thermal trigger (optionally 95°C) is integrated into the damper mechanism. Once the nominal temperature is exceeded, the thermal trigger is tripped and the blade closes. A mechanical blade position indicator is placed on the KW1 mechanism. It is possible to equip a trigger control mechanism with an electromagnetic trigger activated by the application („pulse") or removal („break") of the power supply voltage and with limit switches used to signal the blade position. The mechanism features a test and blade button-release functions. Blade re-opening is activated manually. It is not required to dismantle the system to replace the thermal trigger. The KW1 mechanism may be replaced with an electric actuator.



mechanism	A	C	E
KW1	130	30	85

*embedding border



dimensions in [mm]

mechanism	A	C	E
KW1	130	30	65

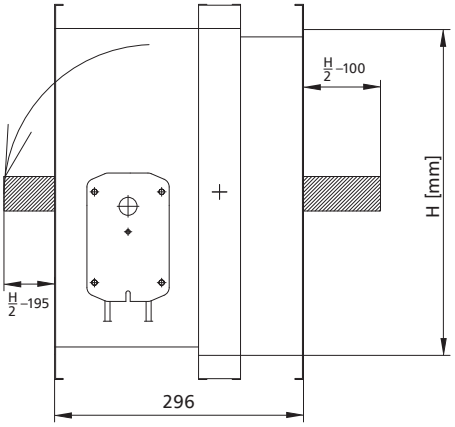
*embedding border

3.4 | Dimensions

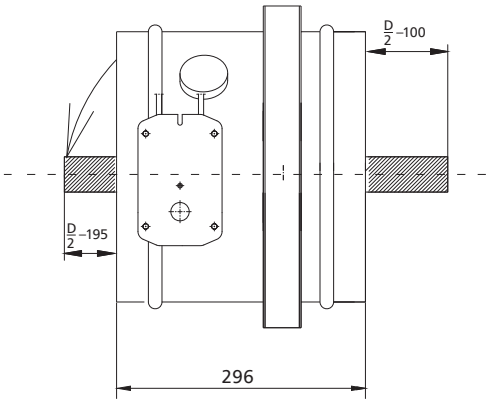
rectangular dampers:
» nominal width B: from 200 mm to 1500 mm
» nominal height H from 200 mm to 1500 mm
» maximum single damper cross-section surface up to 1.8 m²
Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 1 mm increments within the given ranges).

circular dampers:
» nominal diameter D from 250 mm to 630 mm
Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 1 mm increments within the given ranges).

» **mcr FID S/S p/P fire damper**



» **mcr FID S/S p/O fire damper**



dimensions in [mm]

3.5 | Installation

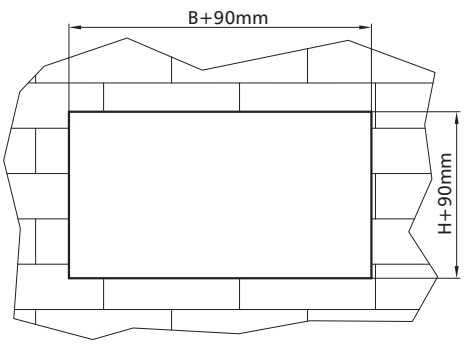
mcr FID S/S p/P rectangular dampers have been rated as EI120(v_e h_o i↔o)S class. These dampers may be installed in the following partitions:
» light walls/shafts made of gypsum boards with a min. thickness of 125 mm;
» rigid walls/shafts made of blocks or hollow bricks with a min. thickness of 120 mm;
» solid walls/shafts with a min. thickness of 120 mm;
» solid floor slabs with a min. thickness of 150 mm.
Dampers may be installed at a distance to the vertical construction partitions, using fire-proof boards providing a fire resistance rating no lesser that the fire resistance rating of the partition.
Dampers may be installed in vertical construction partitions with small distance between the dampers, equal to 60 mm.

mcr FID S/S p/O circular dampers have been rated as EI120(v_e h_o i↔o)S class. These dampers may be installed in the following partitions:
» light walls/shafts made of gypsum boards with a min. thickness of 125 mm;
» rigid walls/shafts made of blocks or hollow bricks with a min. thickness of 110 mm;
» solid walls/shafts with a min. thickness of 110 mm;
» solid floor slabs with a min. thickness of 150 mm.

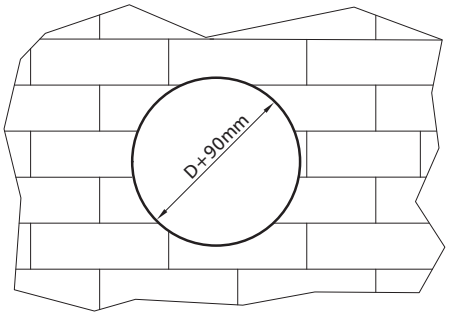
* The above mentioned installation must be clearly specified in the design documentation and communicated to the manufacturer when placing the order. The dimensions of the damper BxH (width x height), which is to be installed with a vertical rotation axis, should be provided as if for a damper with a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

3.5.1 | Preparation of installation openings

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

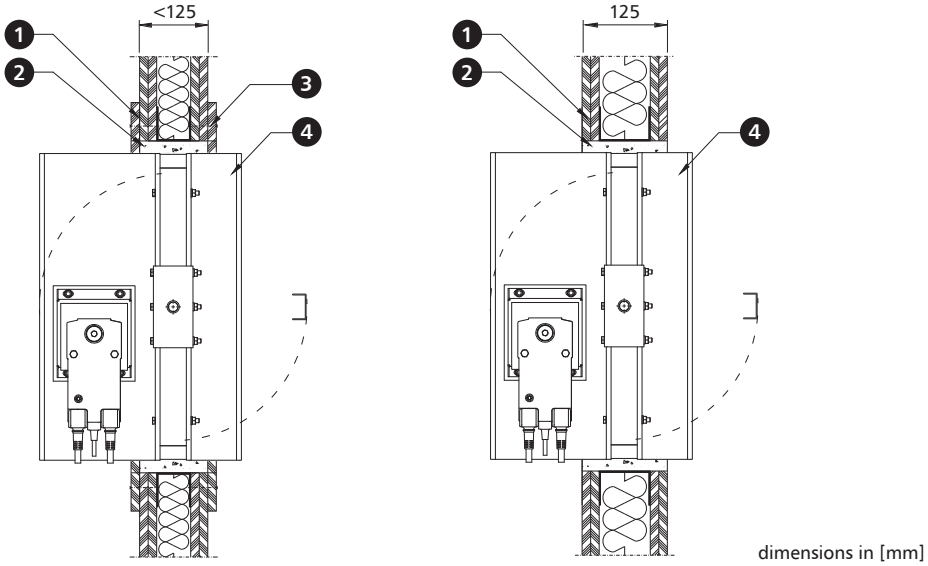


» **mcr FID S/S p/O fire damper – preferred opening**



3.5.2 | Sample installation in gypsum board light walls

» mcr FID S/S p/P fire damper



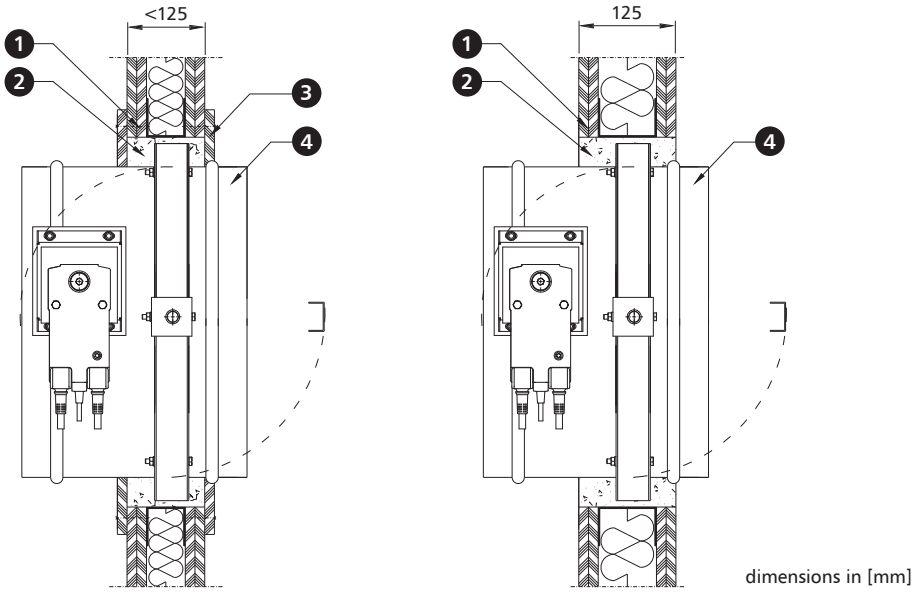
dimensions in [mm]

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

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

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

» mcr FID S/S p/O fire damper



dimensions in [mm]

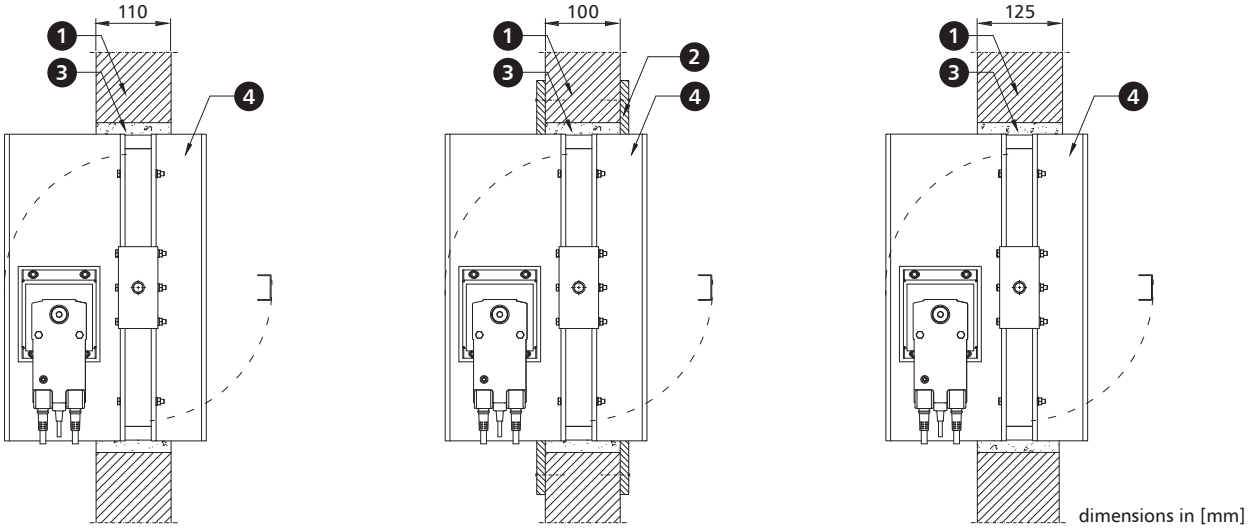
1. light wall
2. assembly mortar*
3. circumferential gypsum board trim
4. mcr FID S/S p/P fire damper

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

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

3.5.3 | Sample installation in concrete and brick walls

» mcr FID S/S p/P fire damper



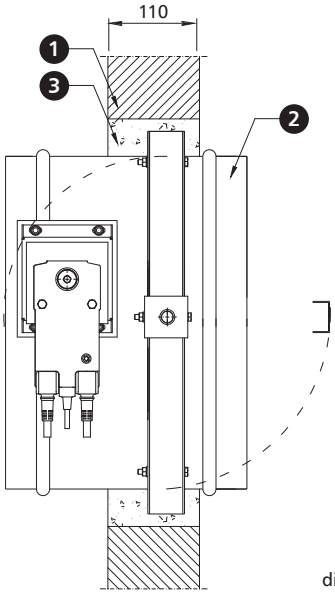
dimensions in [mm]

1. rigid wall - concrete, aerated concrete or bricks
2. circumferential gypsum board trim
3. assembly mortar*
4. mcr FID S/S p/P fire damper

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

NOTE: If the damper is installed in a wall with a thickness of less than 120 mm, the wall thickness should be increased along the damper circumference by installing a belt of panels or other construction elements to the required thickness.

» mcr FID S/S p/O fire damper



dimensions in [mm]

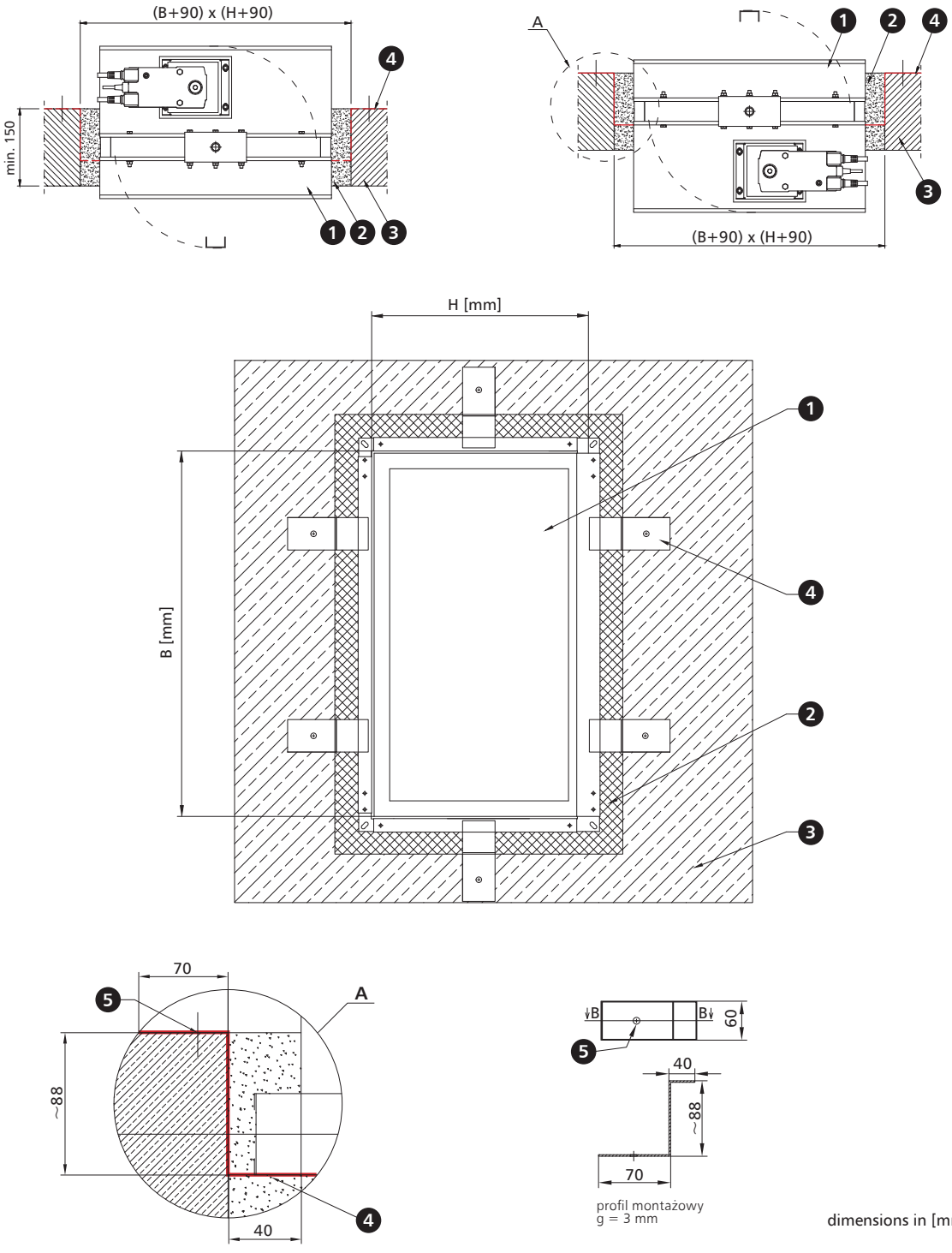
1. rigid wall - concrete, aerated concrete or bricks
2. mcr FID S/S p/O fire damper
3. assembly mortar*

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

NOTE: If the damper is installed in a wall with a thickness of less than 120 mm, the wall thickness should be increased along the damper circumference by installing a belt of panels or other construction elements to the required thickness.

3.5.4 | Sample installation in floor slabs

» **mcr FID S/S p/P fire damper**



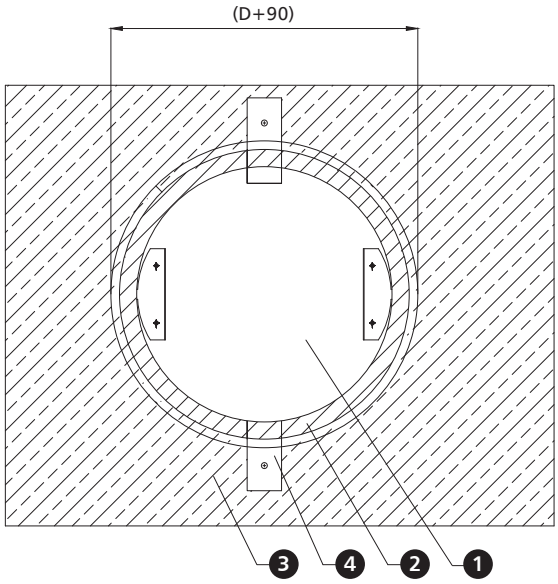
dimensions in [mm]

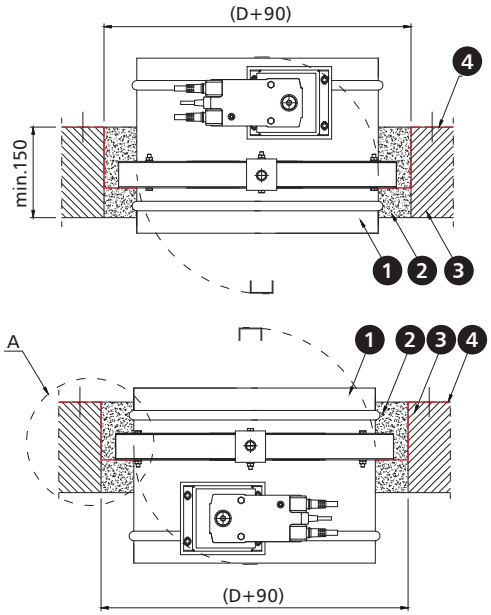
1. mcr FID S/S p/P fire damper
2. assembly mortar*
3. floor slab
4. installation profile g = 3 mm
5. steel expansion plug

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

NOTE: If the damper is installed in a floor slab with a thickness of less than 150 mm, the wall thickness should be increased along the damper circumference by installing a belt of panels or other construction elements to the required thickness.

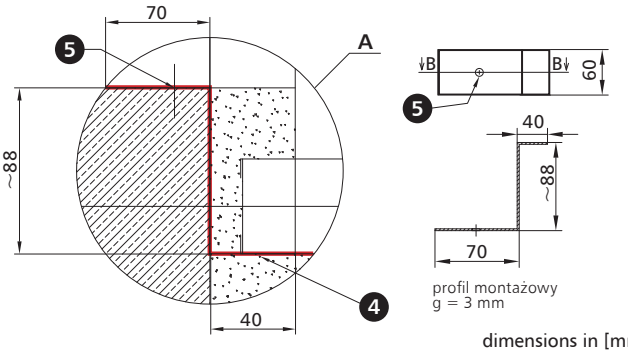
» mcr FID S/S p/O fire damper





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

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

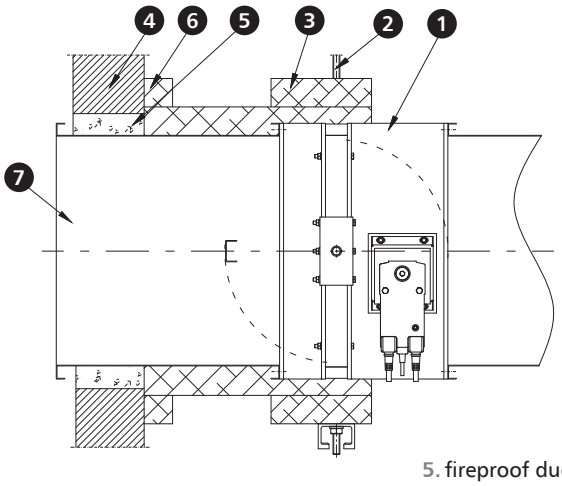


dimensions in [mm]

NOTE: If the damper is installed in a floor slab with a thickness of less than 150 mm, the wall thickness should be increased along the damper circumference by installing a belt of panels or other construction elements to the required thickness.

3.5.5 | Sample installation at a distance to the construction partition

» mcr FID S/S p/P fire damper

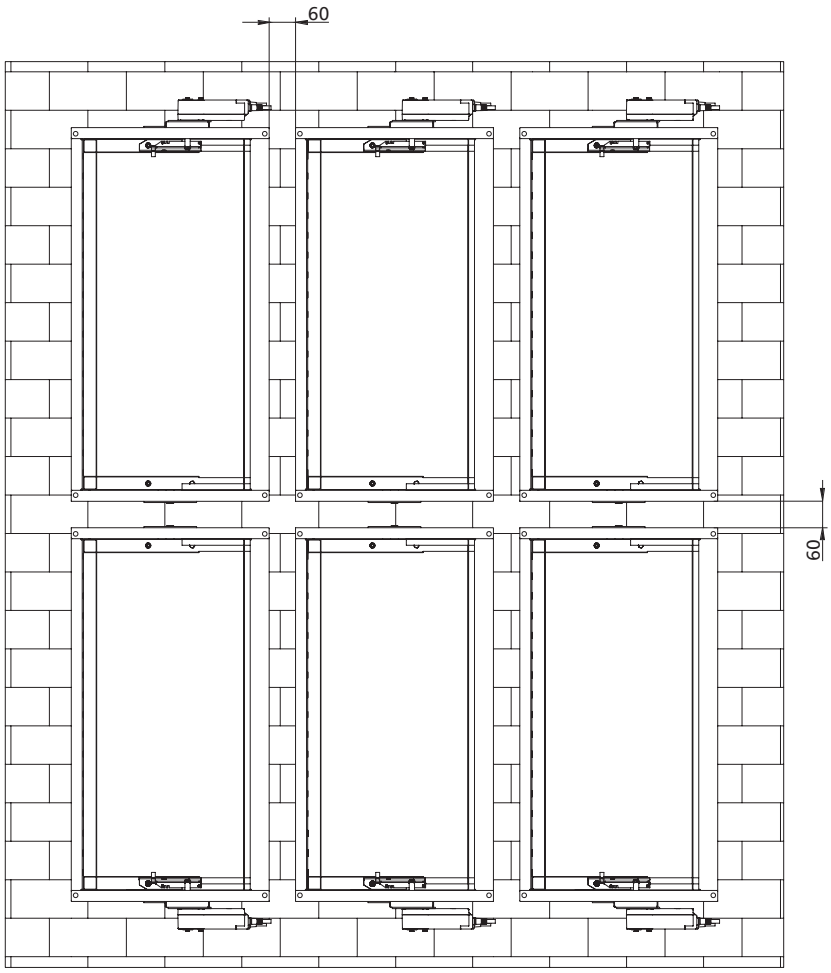


dimensions in [mm]

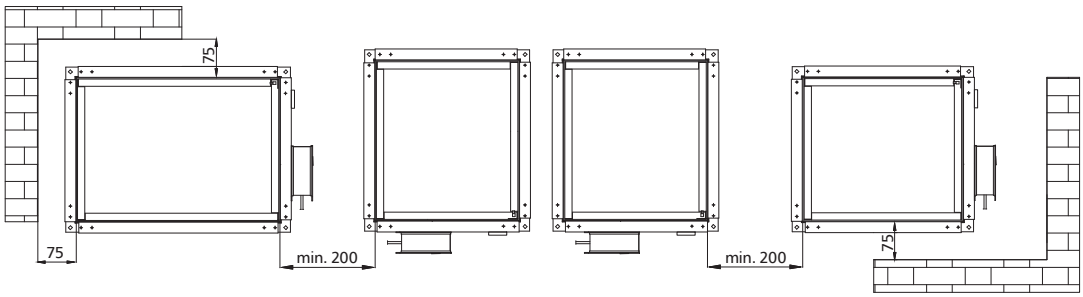
1. mcr FID S/S p/P fire damper
2. installation hangers system
3. duct and damper casing – e.g. made of fire-proof boards
4. wall
5. fireproof duct installation penetration system
6. a strip of fire-proof board along the entire length of the BxH side
7. steel ventilation duct

3.5.6 | Sample modular installation – close installation

» **mcr FID S/S p/P fire damper**



Minimum distance between systems and partitions



dimensions in [mm]

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

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

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

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

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

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

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

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

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

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

			height H [mm]														
			200					250					300				
		v [m/s]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]
width B [mm]	750	4	0.150	0.110	1 577	7	33	0.188	0.147	2 117	6	32	0.225	0.185	2 657	6	33
		6			2 365	17	44			3 175	15	44			3 985	14	44
		8			3 154	31	52			4 234	27	52			5 314	25	52
		10			3 942	48	58			5 292	43	58			6 642	39	57
	800	4	0.160	0.117	1 682	7	33	0.200	0.157	2 258	6	32	0.24	0.197	2 834	6	33
		6			2 523	17	45			3 387	15	44			4 251	13	43
		8			3 364	30	52			4 516	27	52			5 668	24	51
		10			4 205	47	58			5 645	42	58			7 085	38	57
	850	4	0.170	0.124	1 787	7	33	0.213	0.167	2 399	6	33	0.255	0.209	3 011	5	31
		6			2 681	16	44			3 599	14	44			4 517	13	44
		8			3 574	29	52			4 798	26	52			6 022	23	51
		10			4 468	46	58			5 998	41	58			7 528	37	57
	900	4	0.180	0.131	1 892	7	34	0.225	0.176	2 540	6	33	0.27	0.221	3 188	5	31
		6			2 838	16	44			3 810	14	44			4 782	13	44
		8			3 784	29	52			5 080	25	51			6 376	23	51
		10			4 730	45	58			6 350	40	58			7 970	36	57
	1000	4	0.200	0.146	2 102	7	34	0.250	0.196	2 822	6	33	0.3	0.246	3 542	5	32
		6			3 154	15	44			4 234	13	43			5 314	12	43
		8			4 205	28	52			5 645	24	51			7 085	22	51
		10			5 256	43	58			7 056	38	57			8 856	34	57
	1100	4	0.220	0.161	2 313	6	32	0.275	0.216	3 105	5	31	0.33	0.271	3 897	5	32
		6			3 469	15	44			4 657	13	44			5 845	11	43
		8			4 625	26	52			6 209	23	51			7 793	20	50
		10			5 782	41	57			7 762	36	57			9 742	32	56
	1200	4	0.240	0.175	2 523	6	33	0.300	0.235	3 387	5	32	0.36	0.295	4 251	4	30
		6			3 784	14	44			5 080	12	43			6 376	11	43
		8			5 046	25	51			6 774	22	51			8 502	19	50
		10			6 307	39	57			8 467	34	57			10 627	30	56
	1300	4	0.260	0.190	2 733	5	31	0.325	0.255	3 669	5	32	0.39	0.320	4 605	4	30
		6			4 100	13	43			5 504	11	42			6 908	10	42
		8			5 466	23	51			7 338	20	50			9 210	18	50
		10			6 833	37	57			9 173	32	56			11 513	28	55
	1400	4	0.280	0.204	2 943	5	31	0.350	0.274	3 951	4	29	0.42	0.344	4 959	4	30
		6			4 415	12	42			5 927	10	41			7 439	9	41
		8			5 887	22	50			7 903	19	50			9 919	17	49
		10			7 358	35	56			9 878	30	56			12 398	27	55
	1500	4	0.300	0.219	3 154	5	31	0.375	0.294	4 234	4	30	0.45	0.369	5 314	4	31
		6			4 730	12	43			6 350	10	42			7 970	9	41
		8			6 307	21	50			8 467	18	49			10 627	16	49
		10			7 884	33	56			10 584	28	55			13 284	25	55

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

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

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

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

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

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

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

			height H [mm]														
			350					400					450				
		v [m/s]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]
width B [mm]	750	4	0.263	0.222	3 197	5	31	0.3	0.260	3 737	5	32	0.338	0.297	4 277	5	33
		6			4 795	13	44			5 605	12	44			6 415	11	43
		8			6 394	23	51			7 474	21	51			8 554	20	51
		10			7 992	36	57			9 342	33	57			10 692	31	56
	800	4	0.280	0.237	3 410	5	32	0.32	0.277	3 986	5	32	0.360	0.317	4 562	4	29
		6			5 115	12	43			5 979	11	43			6 843	11	42
		8			6 820	22	51			7 972	21	51			9 124	19	49
		10			8 525	35	57			9 965	32	57			11 405	30	55
	850	4	0.298	0.252	3 623	5	32	0.34	0.294	4 235	5	33	0.383	0.337	4 847	4	29
		6			5 435	12	43			6 353	11	43			7 271	10	41
		8			7 246	22	51			8 470	20	51			9 694	19	49
		10			9 058	34	57			10 588	31	56			12 118	29	55
	900	4	0.315	0.266	3 836	5	32	0.360	0.311	4 484	4	30	0.405	0.356	5 132	4	29
		6			5 754	12	44			6 726	11	43			7 698	10	41
		8			7 672	21	51			8 968	19	50			10 264	18	49
		10			9 590	33	57			11 210	31	57			12 830	29	55
	1000	4	0.350	0.296	4 262	5	33	0.400	0.346	4 982	4	30	0.450	0.396	5 702	4	29
		6			6 394	11	43			7 474	10	42			8 554	9	40
		8			8 525	20	51			9 965	18	50			11 405	17	48
		10			10 656	31	56			12 456	29	56			14 256	27	54
	1100	4	0.385	0.326	4 689	4	30	0.440	0.381	5 481	4	31	0.495	0.436	6 273	4	29
		6			7 033	10	42			8 221	9	41			9 409	9	40
		8			9 377	19	50			10 961	17	50			12 545	16	47
		10			11 722	29	56			13 702	27	56			15 682	25	53
	1200	4	0.420	0.355	5 115	4	31	0.480	0.415	5 979	4	31	0.540	0.475	6 843	3	25
		6			7 672	10	43			8 968	9	42			10 264	8	38
		8			10 230	17	49			11 958	16	49			13 686	15	46
		10			12 787	27	55			14 947	25	55			17 107	23	52
	1300	4	0.455	0.385	5 541	4	31	0.520	0.450	6 477	3	28	0.585	0.515	7 413	3	25
		6			8 312	9	41			9 716	8	41			11 120	8	38
		8			11 082	16	49			12 954	15	49			14 826	14	45
		10			13 853	26	55			16 193	24	55			18 533	22	51
	1400	4	0.490	0.414	5 967	3	27	0.560	0.484	6 975	3	28	0.630	0.554	7 983	3	25
		6			8 951	8	40			10 463	8	41			11 975	7	36
		8			11 935	15	48			13 951	14	48			15 967	13	45
		10			14 918	24	55			17 438	22	54			19 958	20	50
	1500	4	0.525	0.444	6 394	3	28	0.600	0.519	7 474	3	28	0.675	0.594	8 554	3	25
		6			9 590	8	41			11 210	7	40			12 830	6	34
		8			12 787	14	48			14 947	13	48			17 107	12	43
		10			15 984	22	54			18 684	20	53			21 384	19	49

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

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

		height H [mm]														
		500					550					600				
	v [m/s]	S_k [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	0.1	0.089	1 284	5	27	0.110	0.099	1 428	5	28	0.120	0.109	1 572	5	28
	6			1 927	13	40			2 143	12	39			2 359	12	40
	8			2 569	23	47			2 857	22	47			3 145	21	47
	10			3 211	36	53			3 571	35	53			3 931	34	53
250	4	0.125	0.112	1 606	5	28	0.138	0.124	1 786	5	29	0.150	0.137	1 966	5	29
	6			2 408	13	41			2 678	12	40			2 948	12	41
	8			3 211	23	48			3 571	22	48			3 931	21	48
	10			4 014	36	54			4 464	35	54			4 914	33	54
300	4	0.15	0.134	1 927	5	29	0.165	0.149	2 143	5	30	0.180	0.164	2 359	5	30
	6			2 890	12	41			3 214	12	41			3 538	11	40
	8			3 853	23	49			4 285	22	49			4 717	21	49
	10			4 817	36	55			5 357	34	55			5 897	33	55
350	4	0.175	0.156	2 248	5	30	0.193	0.174	2 500	5	30	0.210	0.191	2 752	5	31
	6			3 372	12	41			3 750	12	42			4 128	11	41
	8			4 496	22	49			5 000	21	49			5 504	20	49
	10			5 620	35	55			6 250	34	55			6 880	32	55
400	4	0.2	0.178	2 569	5	30	0.220	0.198	2 857	5	31	0.240	0.218	3 145	5	31
	6			3 853	12	42			4 285	12	42			4 717	11	42
	8			5 138	22	50			5 714	21	50			6 290	20	49
	10			6 422	35	56			7 142	33	56			7 862	32	56
450	4	0.225	0.201	2 890	5	31	0.248	0.223	3 214	5	31	0.270	0.246	3 538	5	32
	6			4 335	12	42			4 821	11	42			5 307	11	42
	8			5 780	22	50			6 428	21	50			7 076	20	50
	10			7 225	34	56			8 035	32	56			8 845	31	56
500	4	0.250	0.223	3 211	5	31	0.275	0.248	3 571	5	32	0.300	0.273	3 931	4	29
	6			4 817	12	43			5 357	11	42			5 897	11	43
	8			6 422	21	50			7 142	20	50			7 862	19	50
	10			8 028	33	56			8 928	32	56			9 828	30	56
550	4	0.275	0.245	3 853	5	32	0.303	0.273	4 285	5	32	0.330	0.300	4 717	4	30
	6			5 780	11	42			6 428	11	43			7 076	10	42
	8			7 707	21	51			8 571	20	50			9 435	19	50
	10			9 634	33	56			10 714	31	56			11 794	30	56
600	4	0.3	0.268	3 853	5	32	0.330	0.298	4 285	4	30	0.360	0.328	4 717	4	30
	6			5 780	11	43			6 428	11	43			7 076	10	42
	8			7 707	20	50			8 571	19	50			9 435	18	50
	10			9 634	32	56			10 714	30	56			11 794	29	56
650	4	0.325	0.290	4 175	5	33	0.358	0.322	4 643	4	30	0.390	0.355	5 111	4	31
	6			6 262	11	43			6 964	10	42			7 666	10	43
	8			8 349	20	51			9 285	19	50			10 221	18	50
	10			10 436	31	56			11 606	30	56			12 776	28	56
700	4	0.350	0.312	4 496	4	30	0.385	0.347	5 000	4	30	0.420	0.382	5 504	4	31
	6			6 744	11	43			7 500	10	42			8 256	10	43
	8			8 991	19	50			9 999	18	50			11 007	17	50
	10			11 239	30	56			12 499	29	56			13 759	27	56

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

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

			height H [mm]														
			500					550					600				
		v [m/s]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]
width B [mm]	750	4	0.375	0.335	4 817	4	30	0.413	0.372	5 357	4	31	0.450	0.410	5 897	4	31
		6			7 225	10	42			8 035	10	43			8 845	9	42
		8			9 634	19	51			10 714	18	50			11 794	17	50
		10			12 042	29	56			13 392	28	56			14 742	27	56
	800	4	0.4	0.357	5 138	4	30	0.440	0.397	5 714	4	31	0.480	0.437	6 290	4	31
		6			7 707	10	42			8 571	9	42			9 435	9	42
		8			10 276	18	50			11 428	17	50			12 580	16	50
		10			12 845	29	56			14 285	27	56			15 725	26	56
	850	4	0.425	0.379	5 459	4	30	0.468	0.422	6 071	4	31	0.510	0.464	6 683	4	32
		6			8 189	10	42			9 107	9	42			10 025	9	42
		8			10 918	18	50			12 142	17	50			13 366	16	50
		10			13 648	28	56			15 178	26	56			16 708	25	56
	900	4	0.45	0.401	5 780	4	30	0.495	0.446	6 428	4	32	0.540	0.491	7 076	3	28
		6			8 670	9	41			9 642	9	42			10 614	8	39
		8			11 560	17	49			12 856	16	50			14 152	15	47
		10			14 450	27	55			16 070	25	55			17 690	24	52
	1000	4	0.5	0.446	6 422	4	30	0.550	0.496	6 428	3	28	0.600	0.546	7 862	3	29
		6			9 634	9	41			9 642	8	41			11 794	8	41
		8			12 845	16	48			12 856	15	49			15 725	14	49
		10			16 056	25	54			16 070	24	55			19 656	23	55
	1100	4	0.55	0.491	7 065	3	27	0.605	0.546	7 857	3	29	0.660	0.601	8 649	3	29
		6			10 597	8	39			11 785	8	41			12 973	7	40
		8			14 129	15	48			15 713	14	49			17 297	13	48
		10			17 662	24	54			19 642	22	55			21 622	21	54
	1200	4	0.6	0.535	7 707	3	27	0.660	0.595	8 571	3	29	0.720	0.655	9 435	3	29
		6			11 560	8	39			12 856	7	40			14 152	7	41
		8			15 414	14	47			17 142	13	48			18 870	12	48
		10			19 267	22	53			21 427	21	54			23 587	20	54
	1300	4	0.65	0.580	8 349	3	27	0.715	0.645	9 285	3	29	0.780	0.710	10 221	2	25
		6			12 524	7	38			13 928	7	40			15 332	6	39
		8			16 698	13	46			18 570	12	47			20 442	11	47
		10			20 873	20	51			23 213	19	53			25 553	18	53
	1400	4	0.7	0.624	8 991	3	27	0.770	0.694	9 999	2	24	0.840	0.764	11 007	2	25
		6			13 487	6	36			14 999	6	39			16 511	6	39
		8			17 983	12	45			19 999	11	47			22 015	10	46
		10			22 478	19	51			24 998	18	53			27 518	17	53
	1500	4	0.75	0.669	9 634	2	21	0.825	0.744	10 714	2	25	0.900	0.819	11 794	2	25
		6			14 450	6	36			16 070	6	39			17 690	5	37
		8			19 267	11	43			21 427	10	46			23 587	10	46
		10			24 084	17	49			26 784	16	52			29 484	15	51

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

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

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

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

			height H [mm]														
			800					850					900				
		v [m/s]	S_k [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	0.149	2 148	4	27	0.170	0.159	2 292	4	27	0.180	0.169	2 436	4	27
		6			3 223	10	39			3 439	10	39			3 655	10	39
		8			4 297	19	47			4 585	18	47			4 873	18	47
		10			5 371	30	53			5 731	29	53			6 091	28	53
	250	4	0.200	0.187	2 686	4	28	0.213	0.199	2 866	4	28	0.225	0.212	3 046	4	28
		6			4 028	10	40			4 298	10	40			4 568	10	40
		8			5 371	19	48			5 731	18	48			6 091	18	48
		10			6 714	29	54			7 164	29	54			7 614	28	54
	300	4	0.240	0.224	3 223	4	29	0.255	0.239	3 439	4	29	0.270	0.254	3 655	4	29
		6			4 834	10	40			5 158	10	41			5 482	10	41
		8			6 445	18	48			6 877	18	48			7 309	17	48
		10			8 057	29	54			8 597	28	54			9 137	27	54
	350	4	0.280	0.261	3 760	4	29	0.298	0.279	4 012	4	30	0.315	0.296	4 264	4	30
		6			5 640	10	41			6 018	10	41			6 396	9	40
		8			7 520	18	49			8 024	17	48			8 528	17	49
		10			9 400	28	55			10 030	28	55			10 660	27	55
	400	4	0.320	0.298	4 297	4	30	0.340	0.318	4 585	4	30	0.360	0.338	4 873	4	30
		6			6 445	10	42			6 877	9	41			7 309	9	41
		8			8 594	18	49			9 170	17	49			9 746	17	49
		10			10 742	28	55			11 462	27	55			12 182	26	55
	450	4	0.360	0.336	4 834	4	30	0.383	0.358	5 158	4	31	0.405	0.381	5 482	4	31
		6			7 251	9	41			7 737	9	41			8 223	9	41
		8			9 668	17	49			10 316	17	49			10 964	16	49
		10			12 085	27	55			12 895	26	55			13 705	26	55
	500	4	0.400	0.373	5 371	4	31	0.425	0.398	5 731	4	31	0.450	0.423	6 091	4	31
		6			8 057	9	41			8 597	9	42			9 137	9	42
		8			10 742	17	50			11 462	16	49			12 182	16	49
		10			13 428	26	55			14 328	26	55			15 228	25	55
	550	4	0.440	0.410	5 908	4	31	0.468	0.438	6 304	4	31	0.495	0.465	6 700	3	28
		6			8 862	9	42			9 456	9	42			10 050	8	41
		8			11 817	16	49			12 609	16	50			13 401	15	49
		10			14 771	26	56			15 761	25	55			16 751	24	55
	600	4	0.480	0.448	6 445	4	32	0.510	0.478	6 877	3	28	0.540	0.508	7 309	3	28
		6			9 668	9	42			10 316	8	41			10 964	8	41
		8			12 891	16	50			13 755	15	49			14 619	15	49
		10			16 114	25	55			17 194	24	55			18 274	24	55
	650	4	0.520	0.485	6 983	3	28	0.553	0.517	7 451	3	28	0.585	0.550	7 919	3	29
		6			10 474	8	41			11 176	8	41			11 878	8	41
		8			13 965	15	49			14 901	15	49			15 837	14	49
		10			17 456	24	55			18 626	24	56			19 796	23	55
	700	4	0.560	0.522	7 520	3	28	0.595	0.557	8 024	3	29	0.630	0.592	8 528	3	29
		6			11 280	8	41			12 036	8	42			12 792	8	42
		8			15 039	15	49			16 047	14	49			17 055	14	49
		10			18 799	24	56			20 059	23	55			21 319	22	55

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S_e – damper active cross-section [m²]

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

			height H [mm]														
			800					850					900				
		v [m/s]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]
width B [mm]	750	4	0.600	0.560	**8 057**	**3**	**29**	0.638	0.597	8 597	3	29	0.675	0.635	9 137	3	29
		6			**12 085**	**8**	**42**			12 895	8	42			13 705	7	40
		8			**16 114**	**14**	**49**			17 194	14	49			18 274	14	49
		10			**20 142**	**23**	**55**			21 492	22	55			22 842	21	55
	800	4	0.640	0.597	**8 594**	**3**	**29**	0.680	0.637	9 170	3	29	0.720	0.677	9 746	3	30
		6			**12 891**	**8**	**42**			13 755	7	40			14 619	7	41
		8			**17 188**	**14**	**49**			18 340	13	48			19 492	13	49
		10			**21 485**	**22**	**55**			22 925	21	55			24 365	21	55
	850	4	0.680	0.634	**9 131**	**3**	**29**	0.723	0.677	9 743	3	30	0.765	0.719	10 355	3	30
		6			**13 697**	**7**	**40**			14 615	7	41			15 533	7	41
		8			**18 262**	**13**	**48**			19 486	13	49			20 710	13	49
		10			**22 828**	**21**	**55**			24 358	21	55			25 888	20	55
	900	4	0.720	0.671	**9 668**	**3**	**30**	0.765	0.716	10 316	3	30	0.810	0.761	10 964	3	30
		6			**14 502**	**7**	**41**			15 474	7	41			16 446	7	41
		8			**19 336**	**13**	**49**			20 632	13	49			21 928	12	48
		10			**24 170**	**21**	**55**			25 790	20	55			27 410	19	54
	1000	4	0.800	0.746	**10 742**	**3**	**30**	0.850	0.796	11 462	3	30	0.900	0.846	12 182	2	25
		6			**16 114**	**7**	**41**			17 194	6	39			18 274	6	40
		8			**21 485**	**12**	**48**			22 925	12	48			24 365	11	48
		10			**26 856**	**19**	**54**			28 656	18	54			30 456	18	54
	1100	4	0.880	0.821	**11 817**	**2**	**25**	0.935	0.876	12 609	2	25	0.990	0.931	13 401	2	26
		6			**17 725**	**6**	**39**			18 913	6	40			20 101	6	40
		8			**23 633**	**11**	**47**			25 217	11	48			26 801	10	47
		10			**29 542**	**18**	**54**			31 522	17	53			33 502	16	53
	1200	4	0.960	0.895	**12 891**	**2**	**26**	1.020	0.955	13 755	2	26	1.080	1.015	14 619	2	26
		6			**19 336**	**6**	**40**			20 632	5	38			21 928	5	38
		8			**25 782**	**10**	**47**			27 510	10	47			29 238	9	46
		10			**32 227**	**16**	**53**			34 387	16	53			36 547	15	52
	1300	4	1.040	0.970	**13 965**	**2**	**26**	1.105	1.035	14 901	2	26	1.170	1.100	15 837	2	26
		6			**20 948**	**5**	**38**			22 352	5	38			23 756	5	38
		8			**27 930**	**9**	**45**			29 802	9	46			31 674	9	46
		10			**34 913**	**15**	**52**			37 253	14	52			39 593	14	52
	1400	4	1.120	1.044	**15 039**	**2**	**26**	1.190	1.114	16 047	2	27	1.260	1.184	17 055	2	27
		6			**22 559**	**5**	**38**			24 071	4	36			25 583	4	36
		8			**30 079**	**9**	**46**			32 095	8	45			34 111	8	45
		10			**37 598**	**14**	**52**			40 118	13	51			42 638	13	51
	1500	4	1.200	1.119	**16 114**	**2**	**27**	1.275	1.194	17 194	1	18	1.350	1.269	18 274	1	18
		6			**24 170**	**4**	**36**			25 790	4	36			27 410	4	36
		8			**32 227**	**8**	**45**			34 387	7	43			36 547	7	43
		10			**40 284**	**12**	**50**			42 984	12	50			45 684	11	49

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

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

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

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

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

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

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

			height H [mm]														
			1000					1100					1200				
		v [m/s]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]
width B [mm]	750	4	0.750	0.710	10 217	3	30	0.825	0.785	11 297	3	30	0.900	0.860	12 377	3	31
		6			15 325	7	41			16 945	7	41			18 565	6	40
		8			20 434	13	49			22 594	12	48			24 754	12	49
		10			25 542	20	55			28 242	19	54			30 942	18	54
	800	4	0.800	0.757	10 898	3	30	0.880	0.837	12 050	3	31	0.960	0.917	13 202	2	26
		6			16 347	7	41			18 075	6	40			19 803	6	40
		8			21 796	12	48			24 100	12	49			26 404	11	48
		10			27 245	20	55			30 125	19	55			33 005	18	54
	850	4	0.850	0.804	11 579	3	30	0.935	0.889	12 803	2	26	1.020	0.974	14 027	2	26
		6			17 369	6	39			19 205	6	40			21 041	6	40
		8			23 158	12	48			25 606	11	48			28 054	11	48
		10			28 948	19	54			32 008	18	54			35 068	17	54
	900	4	0.900	0.851	12 260	2	25	0.990	0.941	13 556	2	26	1.080	1.031	14 852	2	26
		6			18 390	6	40			20 334	6	40			22 278	6	40
		8			24 520	11	48			27 112	11	48			29 704	10	47
		10			30 650	18	54			33 890	17	54			37 130	16	53
	1000	4	1.000	0.946	13 622	2	26	1.100	1.046	15 062	2	26	1.200	1.146	16 502	2	27
		6			20 434	6	40			22 594	5	38			24 754	5	39
		8			27 245	11	48			30 125	10	47			33 005	9	46
		10			34 056	17	54			37 656	16	53			41 256	15	53
	1100	4	1.100	1.041	14 985	2	26	1.210	1.151	16 569	2	27	1.320	1.261	18 153	2	27
		6			22 477	5	38			24 853	5	39			27 229	5	39
		8			29 969	10	47			33 137	9	46			36 305	9	47
		10			37 462	15	52			41 422	14	52			45 382	14	52
	1200	4	1.200	1.135	16 347	2	27	1.320	1.255	18 075	2	27	1.440	1.375	19 803	2	27
		6			24 520	5	39			27 112	4	36			29 704	4	36
		8			32 694	9	46			36 150	8	45			39 606	8	45
		10			40 867	14	52			45 187	13	51			49 507	13	52
	1300	4	1.300	1.230	17 709	2	27	1.430	1.360	19 581	2	27	1.560	1.490	21 453	1	19
		6			26 564	4	36			29 372	4	36			32 180	4	37
		8			35 418	8	45			39 162	8	45			42 906	7	44
		10			44 273	13	51			48 953	12	51			53 633	11	50
	1400	4	1.400	1.324	19 071	1	18	1.540	1.464	21 087	1	19	1.680	1.604	23 103	1	19
		6			28 607	4	36			31 631	4	37			34 655	3	33
		8			38 143	7	44			42 175	7	44			46 207	6	42
		10			47 678	12	51			52 718	11	50			57 758	10	49
	1500	4	1.500	1.419	20 434	1	19	1.650	1.569	22 594	1	19	1.800	1.719	24 754	1	19
		6			30 650	4	37			33 890	3	33			37 130	3	34
		8			40 867	7	44			45 187	6	42			49 507	6	43
		10			51 084	11	50			56 484	10	49			61 884	9	48

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

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

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

		height H [mm]														
		1300					1400					1500				
	v [m/s]	S_k [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	0.260	0.249	3 588	3	25	0.280	0.269	3 876	3	26	0.300	0.289	4 164	3	26
	6			5 383	8	38			5 815	8	38			6 247	8	39
	8			7 177	15	46			7 753	15	47			8 329	14	46
	10			8 971	24	52			9 691	23	52			10 411	23	52
250	4	0.325	0.312	4 486	3	26	0.350	0.337	4 846	3	27	0.375	0.362	4 164	3	27
	6			6 728	8	39			7 268	8	39			6 247	8	40
	8			8 971	15	47			9 691	14	47			8 329	14	47
	10			11 214	24	53			12 114	23	53			10 411	22	53
300	4	0.390	0.374	5 383	3	27	0.420	0.404	5 815	3	27	0.450	0.434	6 247	3	28
	6			8 074	8	40			8 722	8	40			9 370	8	40
	8			10 765	15	48			11 629	14	47			12 493	14	48
	10			13 457	23	54			14 537	22	53			15 617	22	54
350	4	0.455	0.436	6 280	3	28	0.490	0.471	6 784	3	28	0.525	0.506	7 288	3	28
	6			9 420	8	40			10 176	8	41			10 932	7	39
	8			12 560	14	48			13 568	14	48			14 576	13	47
	10			15 700	23	54			16 960	22	54			18 220	21	54
400	4	0.520	0.498	7 177	3	28	0.560	0.538	7 753	3	29	0.600	0.578	8 329	3	29
	6			10 765	8	41			11 629	7	40			12 493	7	40
	8			14 354	14	48			15 506	13	48			16 658	13	48
	10			17 942	22	54			19 382	21	54			20 822	21	54
450	4	0.585	0.561	8 074	3	29	0.630	0.606	8 722	3	29	0.675	0.651	9 370	3	29
	6			12 111	7	40			13 083	7	40			14 055	7	40
	8			16 148	14	49			17 444	13	48			18 740	13	49
	10			20 185	21	54			21 805	21	54			23 425	20	54
500	4	0.650	0.623	8 971	3	29	0.700	0.673	9 691	3	30	0.750	0.723	10 411	3	30
	6			13 457	7	40			14 537	7	41			15 617	7	41
	8			17 942	13	48			19 382	13	49			20 822	12	48
	10			22 428	21	55			24 228	20	54			26 028	19	54
550	4	0.715	0.685	9 868	3	30	0.770	0.740	10 660	3	30	0.825	0.795	11 452	3	30
	6			14 802	7	41			15 990	7	41			17 178	6	39
	8			19 737	13	49			21 321	12	48			22 905	12	48
	10			24 671	20	54			26 651	19	54			28 631	19	54
600	4	0.780	0.748	10 765	3	30	0.840	0.808	11 629	3	30	0.900	0.868	12 493	2	25
	6			16 148	7	41			17 444	6	39			18 740	6	40
	8			21 531	12	48			23 259	12	48			24 987	11	48
	10			26 914	20	55			29 074	19	54			31 234	18	54
650	4	0.845	0.810	11 663	3	30	0.910	0.875	12 599	2	25	0.975	0.940	13 535	2	26
	6			17 494	6	39			18 898	6	40			20 302	6	40
	8			23 325	12	48			25 197	11	48			27 069	11	48
	10			29 156	19	54			31 496	18	54			33 836	18	54
700	4	0.910	0.872	12 560	2	25	0.980	0.942	13 568	2	26	1.050	1.012	14 576	2	26
	6			18 840	6	40			20 352	6	40			21 864	6	40
	8			25 119	11	48			27 135	11	48			29 151	11	48
	10			31 399	18	54			33 919	17	54			36 439	17	54

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

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

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

		height H [mm]														
		1300					1400					1500				
	v [m/s]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]
width B [mm] 750	4	0.975	0.935	13 457	2	26	1.050	1.010	14 537	2	26	1.125	1.085	15 617	3	31
	6			20 185	6	40			21 805	6	40			23 425	6	40
	8			26 914	11	48			29 074	11	48			31 234	12	49
	10			33 642	18	54			36 342	17	54			39 042	18	54
800	4	1.040	0.997	14 354	2	26	1.120	1.077	15 506	2	26	1.200	1.157	16 658	2	26
	6			21 531	6	40			23 259	6	41			24 987	6	40
	8			28 708	11	48			31 012	10	47			33 316	11	48
	10			35 885	17	54			38 765	16	53			41 645	18	54
850	4	1.105	1.059	15 251	2	26	1.190	1.144	16 475	2	27	1.275	1.229	17 699	2	26
	6			22 877	6	41			24 713	5	39			26 549	6	40
	8			30 502	10	47			32 950	10	48			35 398	11	48
	10			38 128	16	53			41 188	16	54			44 248	17	54
900	4	1.170	1.121	16 148	2	27	1.260	1.211	17 444	2	27	1.350	1.301	18 740	2	26
	6			24 222	5	38			26 166	5	39			28 110	6	40
	8			32 296	10	47			34 888	9	46			37 480	10	47
	10			40 370	16	54			43 610	15	53			46 850	16	53
1000	4	1.300	1.246	17 942	2	27	1.400	1.346	19 382	2	27	1.500	1.446	20 822	2	27
	6			26 914	5	39			29 074	5	39			31 234	5	39
	8			35 885	9	47			38 765	9	47			41 645	9	46
	10			44 856	14	52			48 456	14	53			52 056	15	53
1100	4	1.430	1.371	19 737	2	27	1.540	1.481	21 321	2	28	1.650	1.591	22 905	2	27
	6			29 605	4	36			31 981	4	37			34 357	5	39
	8			39 473	8	45			42 641	8	46			45 809	9	47
	10			49 342	13	52			53 302	12	51			57 262	14	52
1200	4	1.560	1.495	21 531	1	19	1.680	1.615	23 259	1	19	1.800	1.735	24 987	2	27
	6			32 296	4	37			34 888	4	37			37 480	4	36
	8			32 694	9	46			36 150	8	45			39 606	8	45
	10			40 867	14	52			45 187	13	51			49 507	13	52

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

D – nominal diameter [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]

D	v [m/s]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]
250	4	0.0491	0.0401	577	1	15
	6			866	4	24
	8			1154	8	28
	10			1443	11	33
315	4	0.0779	0.0664	956	1	18
	6			1434	4	24
	8			1912	8	30
	10			2390	16	35
355	4	0.0990	0.0859	1237	1	17
	6			1855	5	24
	8			2474	11	34
	10			3092	20	40
400	4	0.1257	0.1108	1596	1	17
	6			2394	5	25
	8			3192	11	34
	10			3990	19	41

D	v [m/s]	S_k [m²]	S_e [m²]	Q [m³/h]	d_p [PA]	L_{WA} [dB]
450	4	0.1590	0.1423	2049	1	16
	6			3073	4	25
	8			4097	10	35
	10			5122	18	41
500	4	0.1963	0.1776	2558	1	18
	6			3837	4	24
	8			5116	8	33
	10			6395	15	40
560	4	0.2463	0.2253	3244	1	16
	6			4865	3	24
	8			6487	7	33
	10			8109	13	39
630	4	0.3117	0.2880	4147	1	20
	6			6220	2	22
	8			8293	5	33
	10			10366	9	40

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

height H [mm] \ width B [mm]	200	250	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
200	9.5	9.7	10	10	15	17	17.5	19	22	25	28	30	33	39	45
250	9.5	10	11	11	16	17.5	18	21	24	27	29	32	34	45	48
300	10	11	11	12	17	20	21	23	26	28	31	34	38	50	51
350	11	11	11	16	18	20.5	23	26	28	29	33	35	36	52	53
400	10	11	12	18	19	21	25	29	30	33	35	36	39	54	55
500	15	16	17	19	20	23	27	32	33	35	38	40	44	55	56
600	17	17.5	20	21	30	26	30	35	37	39	43	48	52	56	58
700	17.5	18	21	23	30	35	35	40	42	44	47	52	54	57	65
800	20	21	22	24	29	35	37	41	43	49	52	57	60	62	78
900	22	25	25	28	33	35	39	43	47	53	56	60	62	64	82
1000	23	29	28	33	36	42	43	49	53	56	59	65	67	69	98
1100	26	30	31	35	38	42	47	56	59	62	63	69	71	73	101
1200	32	33	35	36	40	49	53	56	61	71	72	73	85	86	105
1300	35	36	38	39	44	52	57	59	78	79	80	81	92		
1400	37	39	41	44	48	56	63	65	80	82	85	87			
1500	40	41	44	48	52	58	68	71	82	98	115	120			

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

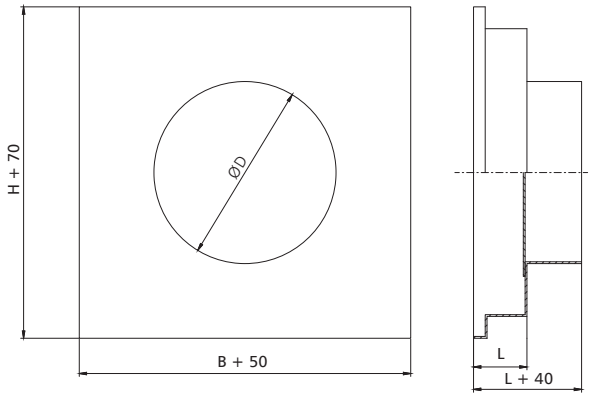
diameter D [mm]	RST, KW1	actuator
250	7	8
315	9	10
355	12	13
400	14	15
450	15	16
500	16	17
560	18	19
630	20	21

3.8 | Accessories

3.8.1 | mcr KRP connection stub

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

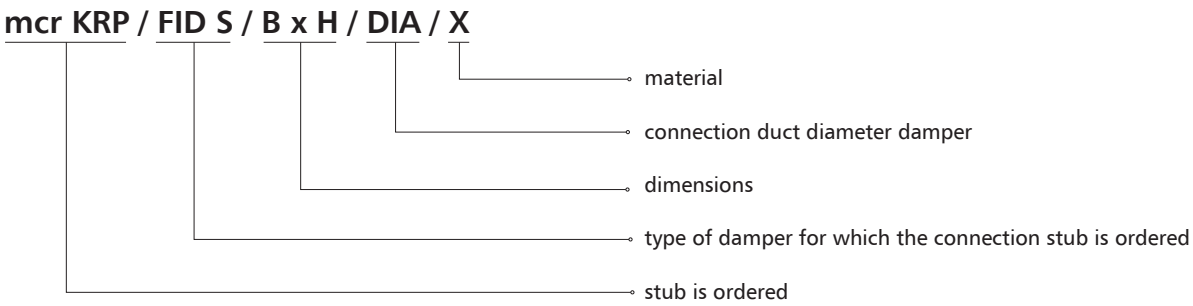
NOTE: due to the asymmetrical position of the fire blade in the damper casing, the connection stubs are of different lengths L, depending on the side of the damper on which they are to be used. Stubs are supplied for both sides of the damper.



dimensions in [mm]

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

Marking:

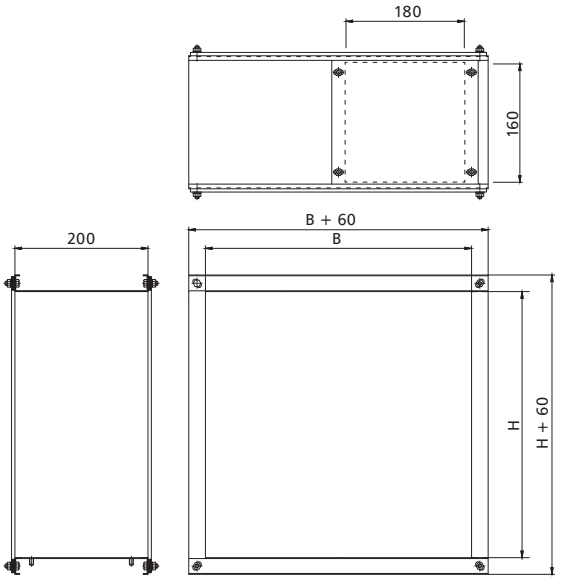


X – material
[no symbol] – galvanized steel, Zn 275 g/m2 coating[2]
KN – stainless steel
KK – 1.4404 acid-proof steel

3.8.2 | Casing module with KRW-type inspection access

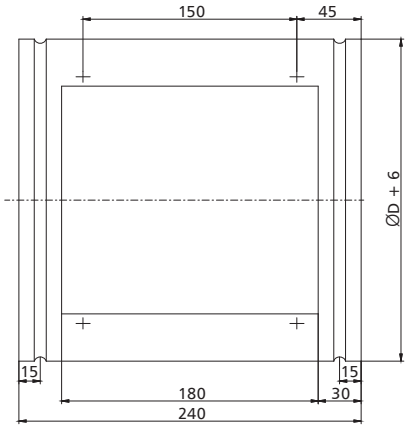
The casing modules with a KRW-type inspection access are made of sheet metal and equipped with connection flanges. The casing features an inspection access opening with a cover. The module enables to access the damper blade or a drive train quickly without having to dismantle the damper or the duct on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

» KRW P module for rectangular damper



dimensions in [mm]

» KRW OM module
» round muff module for nipple damper



dimensions in [mm]

Marking:

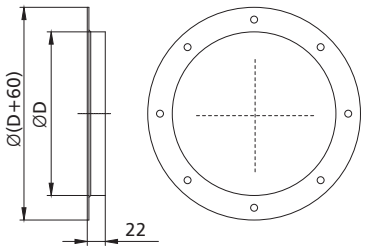
mcr KRW OM / FID S / B x H / X

- material
- dimensions
- type of damper for which the module is ordered
- rectangular module - mcr KRW P
  round muff module - mcr KRW OM

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

3.8.3 | KP type connection flange

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



dimensions in [mm]

3.9 | Marking

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

- additional parameters
- material
- control
- width x height (nominal)
- damper type

1 - control:

» **RST trigger control mechanism**
RST – thermal trigger
RST/WK1 – thermal trigger + limit switch (closed blade signal)
RST/WK2 – thermal trigger + limit switch (open/closed blade signal)

» **RST-KW1 trigger control mechanism**
KW1/S – thermal trigger
KW1/S/WK2 – thermal trigger + limit switch (open/closed blade signal)
KW1/24I/WK2 – thermal trigger + "pulse" electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
KW1/24P/WK2 – thermal trigger + "break" electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade) signal)
KW1/24I/WK2(+MP230/24) – thermal trigger + "pulse" electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
KW1/24P/WK2(+MP230/24) – thermal trigger + "break" electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)

» **trigger and control mechanism, axial actuator**
BF 24-T/BF 24-SR-T – actuator with a return spring, U = 24 V AC/DC
BF230-T – actuator with a return spring, U = 230 V AC
BF24TL-T-ST (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control
EXBF24-T – explosion proof actuator with a return spring in the Ex version, U = 24 V AC/DC
EXBF230-T – explosion proof actuator with a return spring in the Ex version, U = 230 V AC
BF24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
BFL 24-T/BFL 24-SR-T – actuator with a return spring, U = 24 V AC/DC
BFL230-T/MLF230T1 – actuator with a return spring, U = 230 V AC
BFL24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
BFN 24-T/BFN 24-SR-T– actuator with a return spring, U = 24 V AC/DC
BFN230-T – actuator with a return spring, U = 230 V AC
BFN24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
MLF24T1 – actuator with a return spring, U = 24 V AC/DC
MLF230T1 – actuator with a return spring, U = 230 V AC
MF24T1 – actuator with a return spring, U = 24 V AC/DC
MF230T1 – 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/m^2 coating
KN – stainless steel
KK – 1.4404 acid-proof steel
KKM – special damper design - damper and its components made of stainless steel, damper partition sleeves additionally secured
KOM – special damper design - damper and its components made of galvanized steel, damper partition sleeves additionally secured

3 - additional parameters

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

» **Control mechanism position**
[no symbol] – perpendicular to the damper rotation axis*
WOK – along the damper rotation axis

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

» **Design standard**
[no symbol] – right damper
KL – left damper (excl. round dampers)
KO – inverted damper (excl. round dampers)

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

» **Connection flange** (round dampers only)
[no symbol] – damper without a flange – for the "bare end" connection
KP – damper with a connection flange

» **Mounting runner**s (round dampers only)
WM – mounting runners (set)
Perimeter gaskets (round dampers only)
UKW – external perimeter gaskets

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

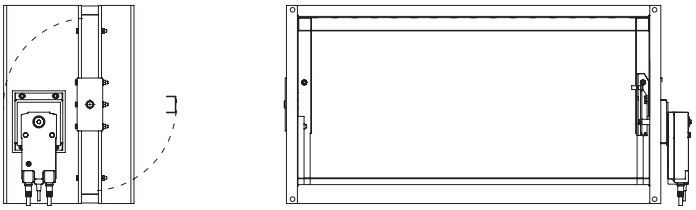
NOTE: separate additional parameters entered with the "/" sign
example marking:

mcr FID S/S p/P 400 x 400 BFL24-T
EI120 cut-off fire damper with a 24 V actuator with limit switches.

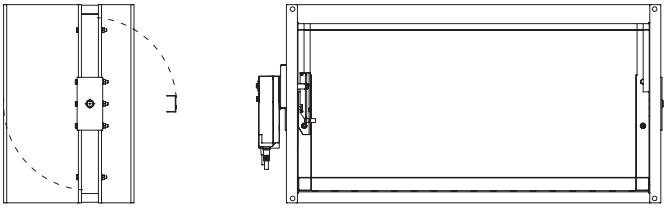
mcr FID S/S p/O Ø400 RST / WK2
EI120 cut-off fire damper with a 72°C thermal trigger and damper blade opening and closing limit switch.

3.9.1 | Design standard

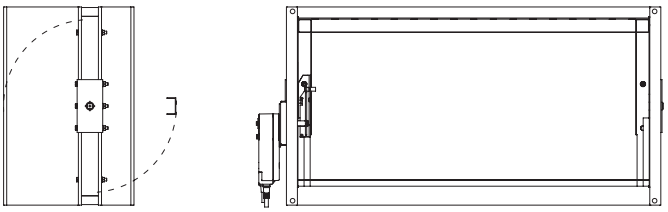
» right damper - standard



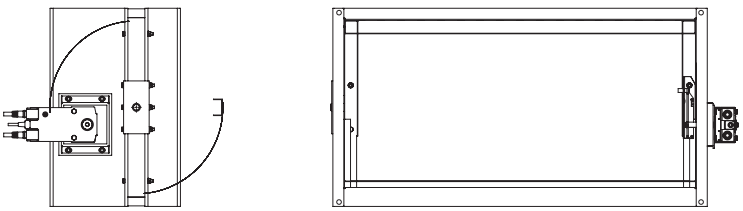
» inverted damper - (ducts facing downwards)



» left damper



» along the damper axis



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

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