mercor®

FIRE VENTILATION SYSTEMS

FIRE DAMPERS AND FIRE VALVES

mcr FID 240L | Single-blade cut-off fire dampers for comfort ventilation systems

downloadable models
on the website
under the designer zone tab

2434-CPR-0407

HYGIENIC CERTIFICATE

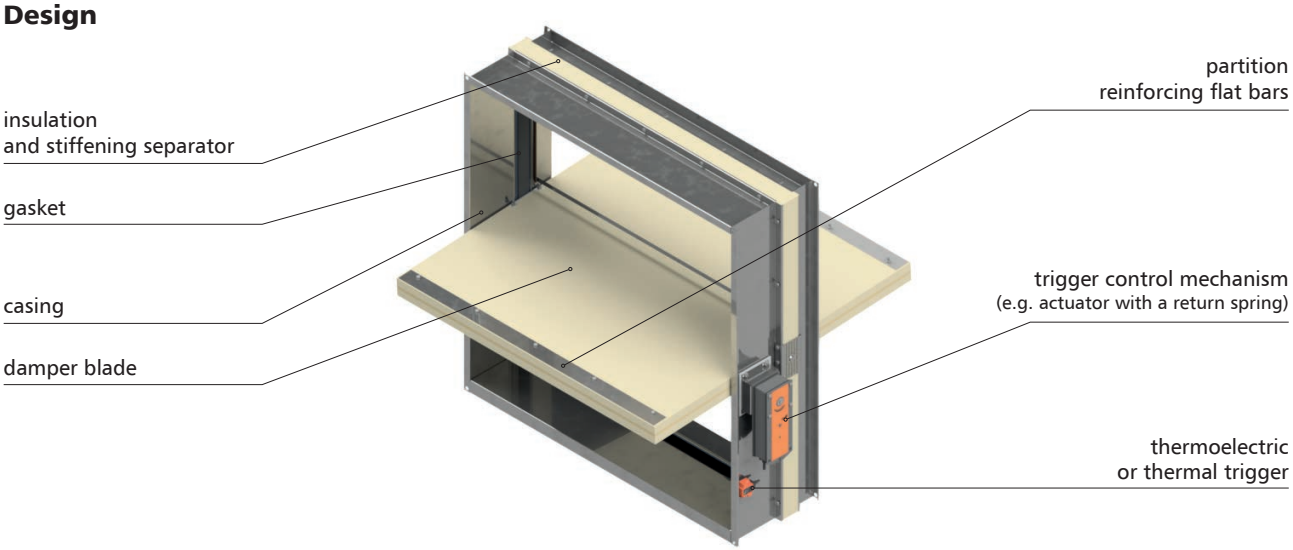
CTO S.A.

» **EIS240**
» Fire resistance class: EI240 (v_e i↔o)S.
» Certificate of constancy of performance 2434-CPR-0407.
» 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 ventilation ducts.
» KTB ATEX 2014/34/UE

7.1| Application

mcr FID 240L 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

7.2| Design



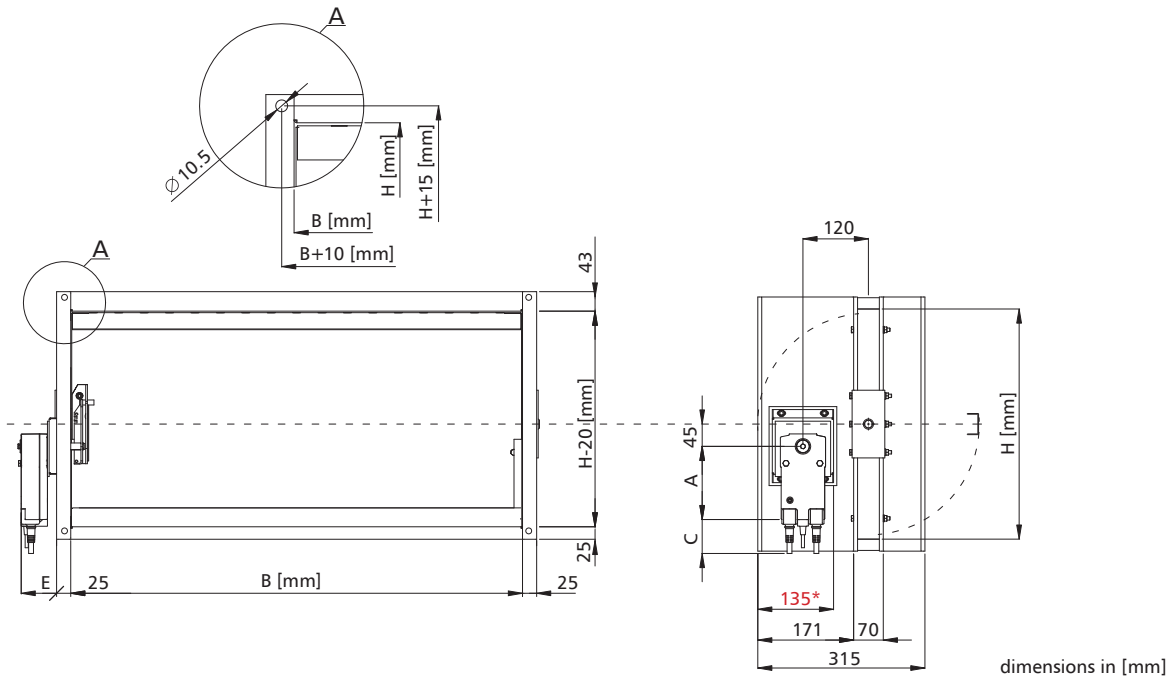
mcr FID 240L cut-off dampers consist of a casing with a rectangular, made of two segments separated by a fire-proof panel, a moving damper blade and a trigger control mechanism, which is activated remotely or automatically by tripping a thermal or thermoelectric trigger. Standard damper casing is made 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. The casing total length is at least 315 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, which is covered with a partition reinforcing flat bars. 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 both ends of the casing are finished with flange connections.

7.3 | Versions

7.3.1 | Damper closing and opening with an actuator

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

The mcr FID 240L 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, triggers with a nominal tripping temperature of 95°C may be used).
The actuators are equipped with limit switches used to monitor the blade position. Furthermore, a mechanical position indicator is placed on the actuator.
Dampers with actuators close either when the thermoelectric trigger trips or when the power supply is cut off, activating the actuator's return spring. 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]

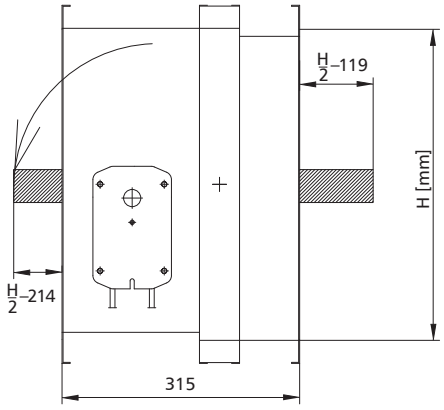
mechanism	A	C	E
BFN	157	30	62
BFL	138	30	58
BF24TL-ST	198	10	70
EXBF	225	55	175
QT.Ex	260	30	105
BF	198	10	70
MLF	114	30	67
MF	198	30	75

*embedding border

7.4 | Dimensions

rectangular dampers:
» nominal width B from 200 mm to 1050 mm
» nominal height H from 200 mm to 1000 mm
» maximum single damper cross-section surface up to 1.05 m²
Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 1 mm increments within the given ranges).

» **mcr FID 240L fire damper**



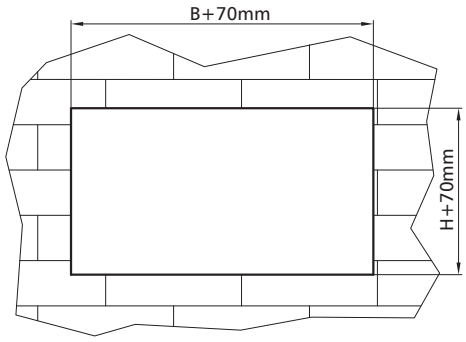
dimensions in [mm]

7.5 | Installation

mcr FID 240L rectangular dampers have been rated as EI240(v_e i↔o)S class. These dampers may be installed in the following partitions:
» rigid walls/shafts made of blocks or hollow bricks with a min. thickness of 150 mm;
» solid walls/shafts with a min. thickness of 150 mm;

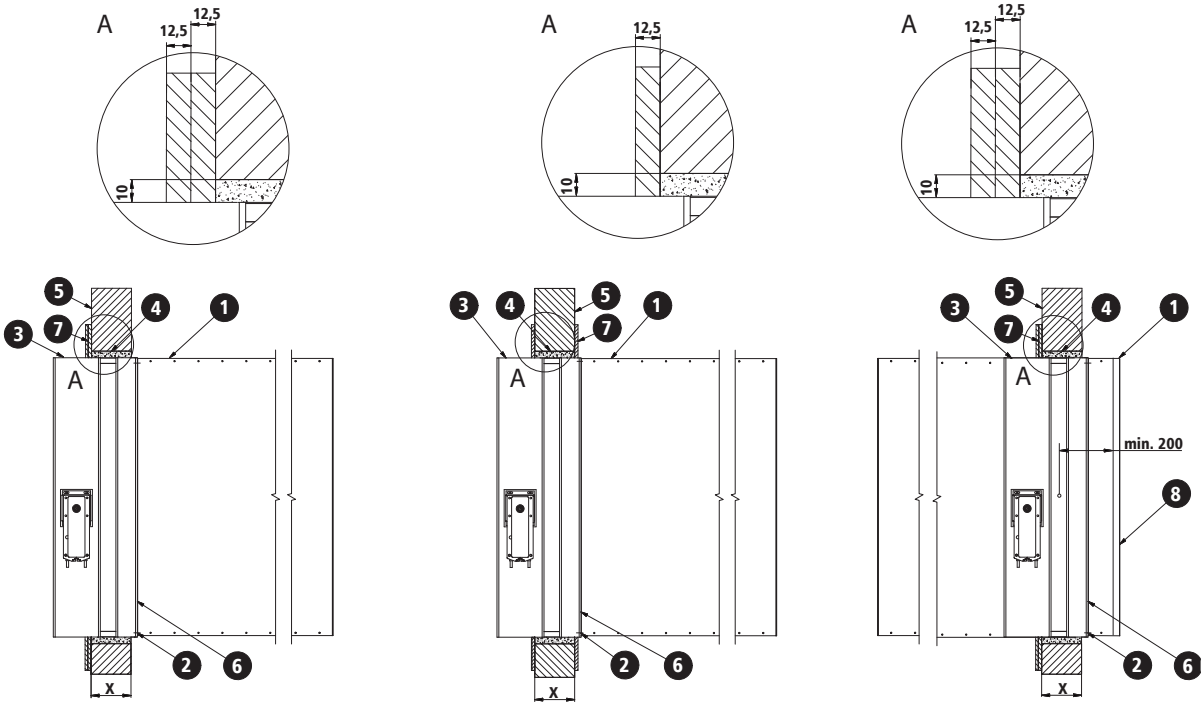
7.5.1 | Preparation of installation openings

» **mcr FID 240L fire damper – preferred opening**



7.5.2 | Sample installation in concrete and brick walls

» **mcr FID 240L fire damper**



dimensions in [mm]

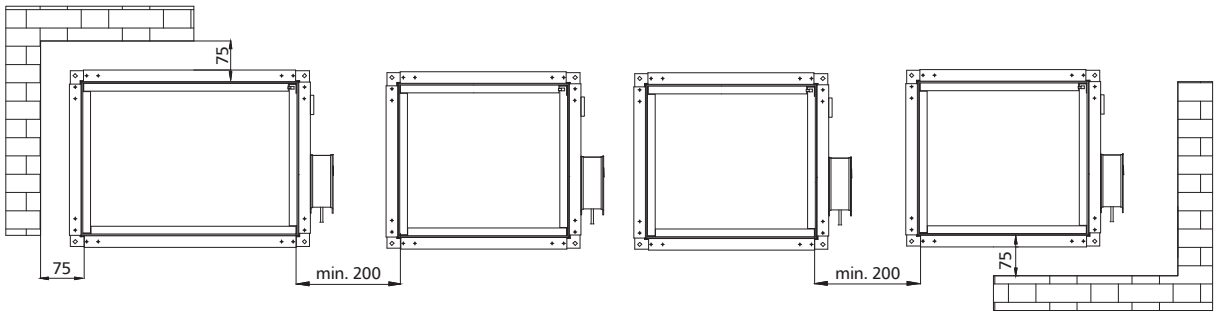
1. ventilation duct
2. self-tapping screw ST 4.2x16
3. mcr FID 240L fire damper
4. assembly mortar*
5. masonry wall
6. ventilation gasket
7. 12.5x100 mm plasterboard strip attached around the circumference of the damper
8. masking grille

X - min. 150mm

* 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 less than 120 mm thick, the thickness around the damper should be increased along the damper circumference by installing a belt of panels or other construction elements to the required thickness.

Minimum distance between systems and partitions



dimensions in [mm]

The minimum distance between the casings of two fire dampers in accordance with EN 1366-2 shall be ≥ 200 mm, and the minimum distance between the damper casing and a wall or ceiling shall be ≥ 75 mm.

7.6.1 | mcr FID 240L 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	0,04	0,024	348	9	24	0,05	0,034	492	9	25	0,06	0,044	636	8	26
		6			522	20	35			738	19	36			954	19	37
		8			696	35	42			984	34	43			1272	34	44
		10			869	55	48			1229	54	49			1589	53	50
	250	4	0,05	0,030	435	9	25	0,0625	0,043	615	8	26	0,075	0,055	795	8	27
		6			652	19	35			922	19	37			1192	19	37
		8			869	34	43			1229	34	44			1589	33	45
		10			1087	54	49			1537	53	50			1987	51	51
	300	4	0,06	0,036	522	8	25	0,075	0,051	738	8	27	0,09	0,066	954	8	27
		6			782	19	36			1106	19	37			1430	18	38
		8			1043	34	43			1475	33	45			1907	32	45
		10			1304	53	49			1844	51	50			2384	50	51
	350	4	0,07	0,042	609	8	26	0,0875	0,060	861	8	27	0,105	0,077	1113	8	28
		6			913	19	36			1291	18	37			1669	18	38
		8			1217	33	44			1721	32	45			2225	31	46
		10			1521	51	50			2151	50	51			2781	49	52
	400	4	0,08	0,048	696	8	26	0,1	0,068	984	8	27	0,12	0,088	1272	8	28
		6			1043	18	37			1475	18	38			1907	17	39
		8			1391	32	44			1967	31	45			2543	31	46
		10			1739	50	50			2459	49	51			3179	48	52
	450	4	0,09	0,054	782	8	26	0,1125	0,077	1106	8	27	0,135	0,099	1430	7	28
		6			1174	18	37			1660	17	38			2146	17	39
		8			1565	31	44			2213	31	45			2861	30	46
		10			1956	49	50			2766	48	51			3576	47	52
	500	4	0,1	0,060	869	8	26	0,125	0,085	1229	7	27	0,15	0,110	1589	7	28
		6			1304	17	37			1844	17	38			2384	16	39
		8			1739	31	44			2459	30	46			3179	29	46
		10			2174	48	50			3074	47	51			3974	45	52
	550	4	0,11	0,066	956	7	26	0,1375	0,094	1352	7	28	0,165	0,121	1748	7	28
		6			1435	17	37			2029	16	38			2623	16	39
		8			1913	30	44			2705	29	46			3497	28	46
		10			2391	47	50			3381	45	51			4371	44	52
	600	4	0,12	0,072	1043	7	26	0,15	0,102	1475	7	28	0,18	0,132	1907	7	28
		6			1565	16	37			2213	16	38			2861	15	39
		8			2087	29	44			2951	28	46			3815	27	46
		10			2608	45	50			3688	44	51			4768	43	52
	650	4	0,13	0,078	1130	7	26	0,1625	0,111	1598	7	28	0,195	0,143	2066	7	28
		6			1695	16	37			2397	15	38			3099	15	39
		8			2260	28	44			3196	27	46			4132	27	46
		10			2826	44	50			3996	43	51			5166	42	52
	700	4	0,14	0,085	1217	7	26	0,175	0,120	1721	7	27	0,21	0,155	2225	6	28
		6			1826	15	37			2582	15	38			3338	15	39
		8			2434	27	44			3442	27	46			4450	26	46
		10			3043	43	50			4303	42	51			5563	40	52
	750	4	0,15	0,091	1304	7	26	0,1875	0,128	1844	6	27	0,225	0,166	2384	6	28
		6			1956	15	37			2766	15	38			3576	14	39
		8			2608	27	44			3688	26	45			4768	25	46
		10			3260	42	50			4610	40	51			5960	39	52
	800	4	0,16	0,097	1391	6	26	0,2	0,137	1967	6	27	0,24	0,177	2543	6	28
		6			2087	15	37			2951	14	38			3815	14	39
		8			2782	26	44			3934	25	45			5086	24	46
		10			3478	40	50			4918	39	51			6358	38	52
	850	4	0,17	0,103	1478	6	26	0,2125	0,145	2090	6	27	0,255	0,188	2702	6	28
		6			2217	14	37			3135	14	38			4053	13	38
		8			2956	25	44			4180	24	45			5404	24	46
		10			3695	39	50			5225	38	51			6755	37	52
	900	4	0,18	0,109	1565	6	26	0,225	0,154	2213	6	27	0,27	0,199	2861	6	28
		6			2347	14	36			3319	13	38			4291	13	38
		8			3130	24	44			4426	24	45			5722	23	46
		10			3912	38	50			5532	37	51			7152	36	51
	950	4	0,19	0,115	1652	6	26	0,2375	0,162	2336	6	27	0,285	0,210	3020	5	27
		6			2478	13	36			3504	13	37			4530	12	38
		8			3304	24	44			4672	23	45			6040	22	45
		10			4130	37	50			5840	36	51			7550	34	51
	1000	4	0,2	0,121	1739	6	25	0,25	0,171	2459	5	27	0,3	0,221	3179	5	27
		6			2608	13	36			3688	12	37			4768	12	38
		8			3478	23	44			4918	22	45			6358	21	45
		10			4347	36	49			6147	34	50			7947	33	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]

width B [mm]	height H [mm]	v [m/s]	350 S_k [m²]	350 S_e [m²]	350 Q [m³/h]	350 d_p [PA]	350 L_{WA} [dB]	400 S_k [m²]	400 S_e [m²]	400 Q [m³/h]	400 d_p [PA]	400 L_{WA} [dB]	450 S_k [m²]	450 S_e [m²]	450 Q [m³/h]	450 d_p [PA]	450 L_{WA} [dB]
	200	4	0,07	0,054	780	8	27	0,08	0,064	924	8	27	0,09	0,074	1068	8	28
		6			1170	19	37			1386	18	38			1602	18	38
		8			1560	33	45			1848	32	45			2136	31	46
		10			1949	51	51			2309	50	51			2669	49	51
	250	4	0,0875	0,068	975	8	27	0,1	0,080	1155	8	28	0,1125	0,093	1335	8	28
		6			1462	18	38			1732	18	38			2002	17	39
		8			1949	32	46			2309	31	46			2669	31	46
		10			2437	50	51			2887	49	52			3337	48	52
	300	4	0,105	0,081	1170	8	28	0,12	0,096	1386	8	28	0,135	0,111	1602	7	29
		6			1754	18	38			2078	17	39			2402	17	39
		8			2339	31	46			2771	31	46			3203	30	47
		10			2924	49	52			3464	48	52			4004	47	52
	350	4	0,1225	0,095	1365	8	28	0,14	0,112	1617	7	29	0,1575	0,130	1869	7	29
		6			2047	17	39			2425	17	39			2803	16	40
		8			2729	31	46			3233	30	47			3737	29	47
		10			3411	48	52			4041	47	53			4671	45	53
	400	4	0,14	0,108	1560	7	29	0,16	0,128	1848	7	29	0,18	0,148	2136	7	29
		6			2339	17	39			2771	16	39			3203	16	40
		8			3119	30	47			3695	29	47			4271	28	47
		10			3899	47	52			4619	45	53			5339	44	53
	450	4	0,1575	0,122	1754	7	29	0,18	0,144	2078	7	29	0,2025	0,167	2402	7	29
		6			2632	16	39			3118	16	40			3604	15	40
		8			3509	29	47			4157	28	47			4805	27	47
		10			4386	45	53			5196	44	53			6006	43	53
	500	4	0,175	0,135	1949	7	29	0,2	0,160	2309	7	29	0,225	0,185	2669	7	29
		6			2924	16	39			3464	15	40			4004	15	40
		8			3899	28	47			4619	27	47			5339	27	47
		10			4874	44	53			5774	43	53			6674	42	53
	550	4	0,1925	0,149	2144	7	29	0,22	0,176	2540	7	29	0,2475	0,204	2936	6	29
		6			3217	15	39			3811	15	40			4405	15	40
		8			4289	27	47			5081	27	47			5873	26	47
		10			5361	43	53			6351	42	53			7341	40	53
	600	4	0,21	0,162	2339	7	29	0,24	0,192	2771	6	29	0,27	0,222	3203	6	29
		6			3509	15	39			4157	15	40			4805	14	40
		8			4679	27	47			5543	26	47			6407	25	47
		10			5848	42	53			6928	40	53			8008	39	53
	650	4	0,2275	0,176	2534	6	29	0,26	0,208	3002	6	29	0,2925	0,241	3470	6	29
		6			3801	15	39			4503	14	40			5205	14	40
		8			5068	26	47			6004	25	47			6940	24	47
		10			6336	40	53			7506	39	53			8676	38	53
	700	4	0,245	0,190	2729	6	29	0,28	0,225	3233	6	29	0,315	0,260	3737	6	29
		6			4094	14	39			4850	14	40			5606	13	40
		8			5458	25	47			6466	24	47			7474	24	47
		10			6823	39	53			8083	38	53			9343	37	53
	750	4	0,2625	0,203	2924	6	29	0,3	0,241	3464	6	29	0,3375	0,278	4004	6	29
		6			4386	14	39			5196	13	39			6006	13	40
		8			5848	24	47			6928	24	47			8008	23	47
		10			7310	38	52			8660	37	53			10010	36	53
	800	4	0,28	0,217	3119	6	28	0,32	0,257	3695	6	29	0,36	0,297	4271	5	29
		6			4679	13	39			5543	13	39			6407	12	39
		8			6238	24	46			7390	23	47			8542	22	47
		10			7798	37	52			9238	36	53			10678	34	53
	850	4	0,2975	0,230	3314	6	28	0,34	0,273	3926	5	29	0,3825	0,315	4538	5	29
		6			4971	13	39			5889	12	39			6807	12	39
		8			6628	23	46			7852	22	47			9076	21	47
		10			8285	36	52			9815	34	52			11345	33	53
	900	4	0,315	0,244	3509	5	28	0,36	0,289	4157	5	28	0,405	0,334	4805	5	28
		6			5263	12	39			6235	12	39			7207	11	39
		8			7018	22	46			8314	21	46			9610	20	47
		10			8772	34	52			10392	33	52			12012	32	52
	950	4	0,3325	0,257	3704	5	28	0,38	0,305	4388	5	28	0,4275	0,352	5072	5	28
		6			5556	12	38			6582	11	39			7608	11	39
		8			7408	21	46			8776	20	46			10144	20	46
		10			9260	33	52			10970	32	52			12680	31	52
	1000	4	0,35	0,271	3899	5	28	0,4	0,321	4619	5	28	0,45	0,371	5339	5	28
		6			5848	11	38			6928	11	38			8008	11	38
		8			7798	20	46			9238	20	46			10678	19	46
		10			9747	32	51			11547	31	52			13347	29	52

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

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

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

		height H [mm]															
		500					550					600					
width B [mm]		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]
	200	4	0,1	0,084	1212	8	28	0,11	0,094	1356	7	28	0,12	0,104	1500	7	28
		6			1818	17	38			2034	17	38			2250	16	39
		8			2424	31	46			2712	30	46			3000	29	46
		10			3029	48	52			3389	47	52			3749	45	52
	250	4	0,125	0,105	1515	7	28	0,1375	0,118	1695	7	29	0,15	0,130	1875	7	29
		6			2272	17	39			2542	16	39			2812	16	39
		8			3029	30	46			3389	29	47			3749	28	47
		10			3787	47	52			4237	45	52			4687	44	52
	300	4	0,15	0,126	1818	7	29	0,165	0,141	2034	7	29	0,18	0,156	2250	7	29
		6			2726	16	39			3050	16	40			3374	15	40
		8			3635	29	47			4067	28	47			4499	27	47
		10			4544	45	53			5084	44	53			5624	43	53
	350	4	0,175	0,147	2121	7	29	0,1925	0,165	2373	7	29	0,21	0,182	2625	7	29
		6			3181	16	40			3559	15	40			3937	15	40
		8			4241	28	47			4745	27	47			5249	27	47
		10			5301	44	53			5931	43	53			6561	42	53
	400	4	0,2	0,168	2424	7	29	0,22	0,188	2712	7	29	0,24	0,208	3000	6	30
		6			3635	15	40			4067	15	40			4499	15	40
		8			4847	27	47			5423	27	48			5999	26	48
		10			6059	43	53			6779	42	53			7499	40	53
	450	4	0,225	0,189	2726	7	29	0,2475	0,212	3050	6	30	0,27	0,234	3374	6	30
		6			4090	15	40			4576	15	40			5062	14	40
		8			5453	27	48			6101	26	48			6749	25	48
		10			6816	42	53			7626	40	53			8436	39	53
	500	4	0,25	0,210	3029	6	30	0,275	0,235	3389	6	30	0,3	0,260	3749	6	30
		6			4544	15	40			5084	14	40			5624	14	40
		8			6059	26	48			6779	25	48			7499	24	48
		10			7574	40	53			8474	39	54			9374	38	54
	550	4	0,275	0,231	3332	6	30	0,3025	0,259	3728	6	30	0,33	0,286	4124	6	30
		6			4999	14	40			5593	14	40			6187	13	40
		8			6665	25	48			7457	24	48			8249	24	48
		10			8331	39	53			9321	38	54			10311	37	54
	600	4	0,3	0,252	3635	6	30	0,33	0,282	4067	6	30	0,36	0,312	4499	6	30
		6			5453	14	40			6101	13	40			6749	13	40
		8			7271	24	48			8135	24	48			8999	23	48
		10			9088	38	53			10168	37	53			11248	36	53
	650	4	0,325	0,273	3938	6	29	0,3575	0,306	4406	6	29	0,39	0,338	4874	5	29
		6			5907	13	40			6609	13	40			7311	12	40
		8			7876	24	48			8812	23	48			9748	22	48
		10			9846	37	53			11016	36	53			12186	34	53
	700	4	0,35	0,295	4241	6	29	0,385	0,330	4745	5	29	0,42	0,365	5249	5	29
		6			6362	13	40			7118	12	40			7874	12	40
		8			8482	23	47			9490	22	47			10498	21	47
		10			10603	36	53			11863	34	53			13123	33	53
	750	4	0,375	0,316	4544	5	29	0,4125	0,353	5084	5	29	0,45	0,391	5624	5	29
		6			6816	12	40			7626	12	40			8436	11	40
		8			9088	22	47			10168	21	47			11248	20	47
		10			11360	34	53			12710	33	53			14060	32	53
	800	4	0,4	0,337	4847	5	29	0,44	0,377	5423	5	29	0,48	0,417	5999	5	29
		6			7271	12	40			8135	11	40			8999	11	39
		8			9694	21	47			10846	20	47			11998	20	47
		10			12118	33	53			13558	32	53			14998	31	53
	850	4	0,425	0,358	5150	5	29	0,4675	0,400	5762	5	29	0,51	0,443	6374	5	29
		6			7725	11	39			8643	11	39			9561	11	39
		8			10300	20	47			11524	20	47			12748	19	47
		10			12875	32	53			14405	31	53			15935	29	53
	900	4	0,45	0,379	5453	5	28	0,495	0,424	6101	5	28	0,54	0,469	6749	5	28
		6			8179	11	39			9151	11	39			10123	10	39
		8			10906	20	47			12202	19	47			13498	18	46
		10			13632	31	52			15252	29	52			16872	28	52
	950	4	0,475	0,400	5756	5	28	0,5225	0,447	6440	5	28	0,57	0,495	7124	4	28
		6			8634	11	39			9660	10	39			10686	10	39
		8			11512	19	46			12880	18	46			14248	17	46
		10			14390	29	52			16100	28	52			17810	27	52
	1000	4	0,5	0,421	6059	5	28	0,55	0,471	6779	4	28	0,6	0,521	7499	4	28
		6			9088	10	38			10168	10	38			11248	9	38
		8			12118	18	46			13558	17	46			14998	16	46
		10			15147	28	52			16947	27	52			18747	26	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]

width B [mm]	height H [mm]	v [m/s]	650 S_k [m²]	650 S_e [m²]	650 Q [m³/h]	650 d_p [PA]	650 L_{WA} [dB]	700 S_k [m²]	700 S_e [m²]	700 Q [m³/h]	700 d_p [PA]	700 L_{WA} [dB]	750 S_k [m²]	750 S_e [m²]	750 Q [m³/h]	750 d_p [PA]	750 L_{WA} [dB]
200		4	0,13	0,114	1644	7	28	0,14	0,124	1788	7	28	0,15	0,134	1932	7	28
		6			2466	16	39			2682	15	39			2898	15	39
		8			3288	28	46			3576	27	46			3864	27	46
		10			4109	44	52			4469	43	52			4829	42	52
250		4	0,1625	0,143	2055	7	29	0,175	0,155	2235	7	29	0,1875	0,168	2415	6	29
		6			3082	15	39			3352	15	39			3622	15	39
		8			4109	27	47			4469	27	47			4829	26	47
		10			5137	43	53			5587	42	52			6037	40	52
300		4	0,195	0,171	2466	7	29	0,21	0,186	2682	6	29	0,225	0,201	2898	6	29
		6			3698	15	40			4022	15	40			4346	14	40
		8			4931	27	47			5363	26	47			5795	25	47
		10			6164	42	53			6704	40	53			7244	39	53
350		4	0,2275	0,200	2877	6	29	0,245	0,217	3129	6	29	0,2625	0,235	3381	6	29
		6			4315	15	40			4693	14	40			5071	14	40
		8			5753	26	47			6257	25	47			6761	24	47
		10			7191	40	53			7821	39	53			8451	38	53
400		4	0,26	0,228	3288	6	30	0,28	0,248	3576	6	29	0,3	0,268	3864	6	29
		6			4931	14	40			5363	14	40			5795	13	40
		8			6575	25	48			7151	24	48			7727	24	47
		10			8219	39	53			8939	38	53			9659	37	53
450		4	0,2925	0,257	3698	6	30	0,315	0,279	4022	6	30	0,3375	0,302	4346	6	29
		6			5548	14	40			6034	13	40			6520	13	40
		8			7397	24	48			8045	24	48			8693	23	47
		10			9246	38	53			10056	37	53			10866	36	53
500		4	0,325	0,285	4109	6	30	0,35	0,310	4469	6	30	0,375	0,335	4829	5	29
		6			6164	13	40			6704	13	40			7244	12	40
		8			8219	24	48			8939	23	48			9659	22	47
		10			10274	37	54			11174	36	53			12074	34	53
550		4	0,3575	0,314	4520	6	30	0,385	0,341	4916	5	30	0,4125	0,369	5312	5	29
		6			6781	13	40			7375	12	40			7969	12	40
		8			9041	23	48			9833	22	48			10625	21	47
		10			11301	36	53			12291	34	53			13281	33	53
600		4	0,39	0,342	4931	5	30	0,42	0,372	5363	5	29	0,45	0,402	5795	5	29
		6			7397	12	40			8045	12	40			8693	11	40
		8			9863	22	48			10727	21	47			11591	20	47
		10			12328	34	53			13408	33	53			14488	32	53
650		4	0,4225	0,371	5342	5	29	0,455	0,403	5810	5	29	0,4875	0,436	6278	5	29
		6			8013	12	40			8715	11	40			9417	11	40
		8			10684	21	47			11620	20	47			12556	20	47
		10			13356	33	53			14526	32	53			15696	31	53
700		4	0,455	0,400	5753	5	29	0,49	0,435	6257	5	29	0,525	0,470	6761	5	29
		6			8630	11	40			9386	11	40			10142	11	39
		8			11506	20	47			12514	20	47			13522	19	47
		10			14383	32	53			15643	31	53			16903	29	53
750		4	0,4875	0,428	6164	5	29	0,525	0,466	6704	5	29	0,5625	0,503	7244	5	29
		6			9246	11	40			10056	11	39			10866	10	39
		8			12328	20	47			13408	19	47			14488	18	47
		10			15410	31	53			16760	29	53			18110	28	53
800		4	0,52	0,457	6575	5	29	0,56	0,497	7151	5	29	0,6	0,537	7727	4	28
		6			9863	11	39			10727	10	39			11591	10	39
		8			13150	19	47			14302	18	47			15454	17	46
		10			16438	29	53			17878	28	52			19318	27	52
850		4	0,5525	0,485	6986	5	28	0,595	0,528	7598	4	28	0,6375	0,570	8210	4	28
		6			10479	10	39			11397	10	39			12315	9	39
		8			13972	18	47			15196	17	46			16420	16	46
		10			17465	28	52			18995	27	52			20525	26	52
900		4	0,585	0,514	7397	4	28	0,63	0,559	8045	4	28	0,675	0,604	8693	4	28
		6			11095	10	39			12067	9	38			13039	9	38
		8			14794	17	46			16090	16	46			17386	16	46
		10			18492	27	52			20112	26	52			21732	25	51
950		4	0,6175	0,542	7808	4	28	0,665	0,590	8492	4	28	0,7125	0,637	9176	4	27
		6			11712	9	38			12738	9	38			13764	8	38
		8			15616	16	46			16984	16	46			18352	15	45
		10			19520	26	52			21230	25	51			22940	23	51
1000		4	0,65	0,571	8219	4	27	0,7	0,621	8939	4	27	0,75	0,671	9659	4	27
		6			12328	9	38			13408	8	38			14488	8	37
		8			16438	16	45			17878	15	45			19318	14	45
		10			20547	25	51			22347	23	51			24147	22	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]														
			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	0,16	0,144	2076	6	28	0,17	0,154	2220	6	28	0,18	0,164	2364	6	28
		6			3114	15	38			3330	14	38			3546	14	38
		8			4152	26	46			4440	25	46			4728	24	46
		10			5189	40	52			5549	39	52			5909	38	52
	250	4	0,2	0,180	2595	6	28	0,2125	0,193	2775	6	28	0,225	0,205	2955	6	28
		6			3892	14	39			4162	14	39			4432	13	39
		8			5189	25	47			5549	24	46			5909	24	46
		10			6487	39	52			6937	38	52			7387	37	52
	300	4	0,24	0,216	3114	6	29	0,255	0,231	3330	6	29	0,27	0,246	3546	6	29
		6			4670	14	39			4994	13	39			5318	13	39
		8			6227	24	47			6659	24	47			7091	23	47
		10			7784	38	53			8324	37	53			8864	36	52
	350	4	0,28	0,252	3633	6	29	0,2975	0,270	3885	6	29	0,315	0,287	4137	5	29
		6			5449	13	40			5827	13	40			6205	12	39
		8			7265	24	47			7769	23	47			8273	22	47
		10			9081	37	53			9711	36	53			10341	34	53
	400	4	0,32	0,288	4152	6	29	0,34	0,308	4440	5	29	0,36	0,328	4728	5	29
		6			6227	13	40			6659	12	40			7091	12	39
		8			8303	23	47			8879	22	47			9455	21	47
		10			10379	36	53			11099	34	53			11819	33	53
	450	4	0,36	0,324	4670	5	29	0,3825	0,347	4994	5	29	0,405	0,369	5318	5	29
		6			7006	12	40			7492	12	40			7978	11	39
		8			9341	22	47			9989	21	47			10637	20	47
		10			11676	34	53			12486	33	53			13296	32	53
	500	4	0,4	0,360	5189	5	29	0,425	0,385	5549	5	29	0,45	0,410	5909	5	29
		6			7784	12	40			8324	11	40			8864	11	39
		8			10379	21	47			11099	20	47			11819	20	47
		10			12974	33	53			13874	32	53			14774	31	53
	550	4	0,44	0,396	5708	5	29	0,4675	0,424	6104	5	29	0,495	0,451	6500	5	29
		6			8563	11	40			9157	11	40			9751	11	39
		8			11417	20	47			12209	20	47			13001	19	47
		10			14271	32	53			15261	31	53			16251	29	53
	600	4	0,48	0,432	6227	5	29	0,51	0,462	6659	5	29	0,54	0,492	7091	5	29
		6			9341	11	40			9989	11	39			10637	10	39
		8			12455	20	47			13319	19	47			14183	18	47
		10			15568	31	53			16648	29	53			17728	28	52
	650	4	0,52	0,468	6746	5	29	0,5525	0,501	7214	5	29	0,585	0,533	7682	4	28
		6			10119	11	39			10821	10	39			11523	10	39
		8			13492	19	47			14428	18	47			15364	17	46
		10			16866	29	53			18036	28	52			19206	27	52
	700	4	0,56	0,505	7265	5	29	0,595	0,540	7769	4	28	0,63	0,575	8273	4	28
		6			10898	10	39			11654	10	39			12410	9	39
		8			14530	18	47			15538	17	46			16546	16	46
		10			18163	28	53			19423	27	52			20683	26	52
	750	4	0,6	0,541	7784	4	28	0,6375	0,578	8324	4	28	0,675	0,616	8864	4	28
		6			11676	10	39			12486	9	39			13296	9	38
		8			15568	17	46			16648	16	46			17728	16	46
		10			19460	27	52			20810	26	52			22160	25	52
	800	4	0,64	0,577	8303	4	28	0,68	0,617	8879	4	28	0,72	0,657	9455	4	27
		6			12455	9	39			13319	9	38			14183	8	38
		8			16606	16	46			17758	16	46			18910	15	45
		10			20758	26	52			22198	25	52			23638	23	51
	850	4	0,68	0,613	8822	4	28	0,7225	0,655	9434	4	27	0,765	0,698	10046	4	27
		6			13233	9	38			14151	8	38			15069	8	37
		8			17644	16	46			18868	15	45			20092	14	45
		10			22055	25	52			23585	23	51			25115	22	51
	900	4	0,72	0,649	9341	4	27	0,765	0,694	9989	4	27	0,81	0,739	10637	3	26
		6			14011	8	38			14983	8	37			15955	7	37
		8			18682	15	45			19978	14	45			21274	13	44
		10			23352	23	51			24972	22	51			26592	21	50
	950	4	0,76	0,685	9860	4	27	0,8075	0,732	10544	3	26	0,855	0,780	11228	3	26
		6			14790	8	37			15816	7	37			16842	7	36
		8			19720	14	45			21088	13	44			22456	13	44
		10			24650	22	51			26360	21	50			28070	20	50
	1000	4	0,8	0,721	10379	3	26	0,85	0,771	11099	3	26	0,9	0,821	11819	3	25
		6			15568	7	37			16648	7	36			17728	7	36
		8			20758	13	44			22198	13	44			23638	12	43
		10			25947	21	50			27747	20	50			29547	18	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]

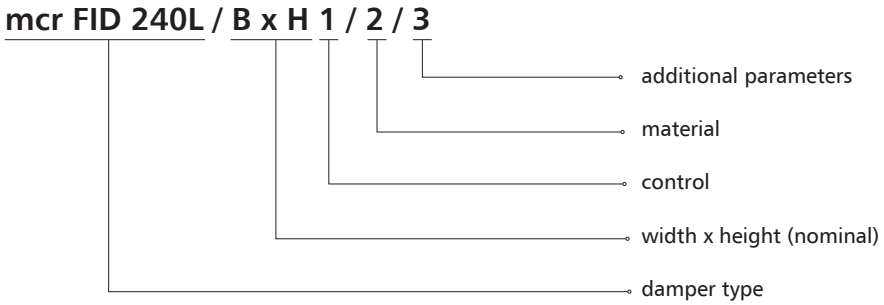
Q – flow [m³/h]
d_p – pressure drop [Pa]
L_{WA} – damper noise level [dB]

width B [mm]	height H [mm]	v [m/s]	950 S_k [m²]	950 S_e [m²]	950 Q [m³/h]	950 d_p [PA]	950 L_{WA} [dB]	1000 S_k [m²]	1000 S_e [m²]	1000 Q [m³/h]	1000 d_p [PA]	1000 L_{WA} [dB]	1050 S_k [m²]	1050 S_e [m²]	1050 Q [m³/h]	1050 d_p [PA]	1050 L_{WA} [dB]
	200	4	0,19	0,174	2508	6	27	0,2	0,184	2652	6	27	0,21	0,194	2796	5	27
		6			3762	13	38			3978	13	38			4194	12	38
		8			5016	24	46			5304	23	45			5592	22	45
		10			6269	37	51			6629	36	51			6989	34	51
	250	4	0,2375	0,218	3135	6	28	0,25	0,230	3315	5	28	0,2625	0,243	3495	5	28
		6			4702	13	39			4972	12	38			5242	12	38
		8			6269	23	46			6629	22	46			6989	21	46
		10			7837	36	52			8287	34	52			8737	33	51
	300	4	0,285	0,261	3762	5	28	0,3	0,276	3978	5	28	0,315	0,291	4194	5	28
		6			5642	12	39			5966	12	39			6290	11	38
		8			7523	22	46			7955	21	46			8387	20	46
		10			9404	34	52			9944	33	52			10484	32	52
	350	4	0,3325	0,305	4389	5	29	0,35	0,322	4641	5	28	0,3675	0,340	4893	5	28
		6			6583	12	39			6961	11	39			7339	11	39
		8			8777	21	47			9281	20	46			9785	20	46
		10			10971	33	52			11601	32	52			12231	31	52
	400	4	0,38	0,348	5016	5	29	0,4	0,368	5304	5	28	0,42	0,388	5592	5	28
		6			7523	11	39			7955	11	39			8387	11	39
		8			10031	20	47			10607	20	46			11183	19	46
		10			12539	32	53			13259	31	52			13979	29	52
	450	4	0,4275	0,392	5642	5	29	0,45	0,414	5966	5	28	0,4725	0,437	6290	5	28
		6			8464	11	39			8950	11	39			9436	10	39
		8			11285	20	47			11933	19	46			12581	18	46
		10			14106	31	53			14916	29	52			15726	28	52
	500	4	0,475	0,435	6269	5	29	0,5	0,460	6629	5	28	0,525	0,485	6989	4	28
		6			9404	11	39			9944	10	39			10484	10	38
		8			12539	19	47			13259	18	46			13979	17	46
		10			15674	29	52			16574	28	52			17474	27	52
	550	4	0,5225	0,479	6896	5	28	0,55	0,506	7292	4	28	0,5775	0,534	7688	4	28
		6			10345	10	39			10939	10	39			11533	9	38
		8			13793	18	46			14585	17	46			15377	16	46
		10			17241	28	52			18231	27	52			19221	26	52
	600	4	0,57	0,522	7523	4	28	0,6	0,552	7955	4	28	0,63	0,582	8387	4	27
		6			11285	10	39			11933	9	38			12581	9	38
		8			15047	17	46			15911	16	46			16775	16	46
		10			18808	27	52			19888	26	52			20968	25	51
	650	4	0,6175	0,566	8150	4	28	0,65	0,598	8618	4	28	0,6825	0,631	9086	4	27
		6			12225	9	39			12927	9	38			13629	8	38
		8			16300	16	46			17236	16	46			18172	15	45
		10			20376	26	52			21546	25	51			22716	23	51
	700	4	0,665	0,610	8777	4	28	0,7	0,645	9281	4	27	0,735	0,680	9785	4	27
		6			13166	9	38			13922	8	38			14678	8	37
		8			17554	16	46			18562	15	45			19570	14	45
		10			21943	25	52			23203	23	51			24463	22	51
	750	4	0,7125	0,653	9404	4	27	0,75	0,691	9944	4	27	0,7875	0,728	10484	3	26
		6			14106	8	38			14916	8	37			15726	7	37
		8			18808	15	45			19888	14	45			20968	13	44
		10			23510	23	51			24860	22	51			26210	21	50
	800	4	0,76	0,697	10031	4	27	0,8	0,737	10607	3	26	0,84	0,777	11183	3	26
		6			15047	8	37			15911	7	37			16775	7	36
		8			20062	14	45			21214	13	44			22366	13	44
		10			25078	22	51			26518	21	50			27958	20	50
	850	4	0,8075	0,740	10658	3	26	0,85	0,783	11270	3	26	0,8925	0,825	11882	3	25
		6			15987	7	37			16905	7	36			17823	7	36
		8			21316	13	44			22540	13	44			23764	12	43
		10			26645	21	50			28175	20	50			29705	18	49
	900	4	0,855	0,784	11285	3	26	0,9	0,829	11933	3	25	0,945	0,874	12581	3	25
		6			16927	7	36			17899	7	36			18871	6	35
		8			22570	13	44			23866	12	43			25162	11	43
		10			28212	20	50			29832	18	49			31452	17	48
	950	4	0,9025	0,827	11912	3	25	0,95	0,875	12596	3	25	0,9975	0,922	13280	3	24
		6			17868	7	36			18894	6	35			19920	6	34
		8			23824	12	43			25192	11	43			26560	10	42
		10			29780	18	49			31490	17	48			33200	16	48
	1000	4	0,95	0,871	12539	3	25	1	0,921	13259	3	24	1,05	0,971	13979	2	23
		6			18808	6	35			19888	6	34			20968	5	34
		8			25078	11	43			26518	10	42			27958	9	41
		10			31347	17	48			33147	16	48			34947	15	47

7.7.1 | Estimated weights of mcr FID 240L dampers for rectangular ventilation ducts [kg]

height H [mm] \ width B [mm]	200	250	300	400	500	600	700	800	900	1000	1050
200	10.5	11	11	11	17	19	20	21	25	28	30
250	10.5	11	12	12	18	20	20	24	27	30	31
300	11	12	12	13	19	22	24	26	29	31	33
350	12	12	12	18	20	23	26	29	31	32	35
400	11	12	13	20	21	24	28	32	34	37	38
500	17	18	19	21	22	26	30	36	37	39	41
600	19	20	22	24	34	29	34	39	41	44	46
700	20	20	24	26	34	39	39	45	47	49	51
800	22	24	25	27	32	39	41	46	48	55	57
900	25	28	28	31	37	39	44	48	53	59	61
1000	26	32	31	37	40	47	48	55	59	63	64

7.8 | Marking



1 - control:

» **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/m² coating
KN – stainless steel
KK – 1.4404 acid-proof steel
KKM – special damper design - damper and its components made of stainless steel, damper partition sleeves additionally secured
KOM – special damper design - damper and its components made of galvanized steel, damper partition sleeves additionally secured

3 - additional parameters

» **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

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

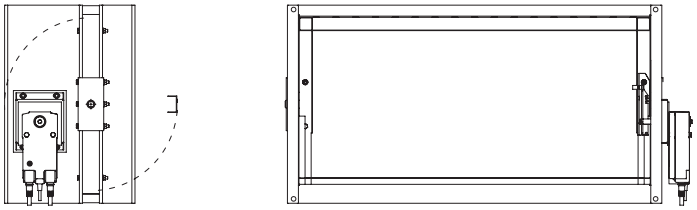
» **Damper casing**
[no symbol] – standard casing length
400 – casing with a length of 400 mm
BU – earth pin

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

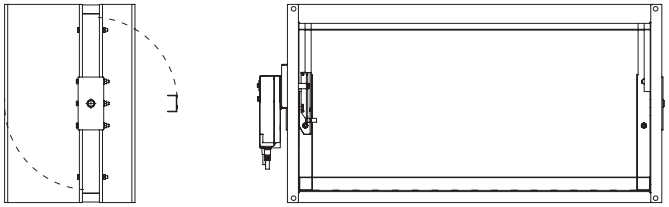
example marking:
mcr FID 240L /500 x 600 /BFL 24-T
EI240 cut-off fire damper with a 24 V actuator with limit switches.

7.9 | Design standard

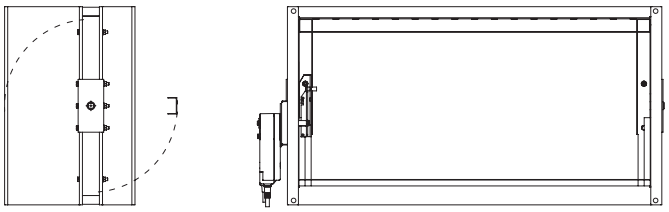
» right damper - standard



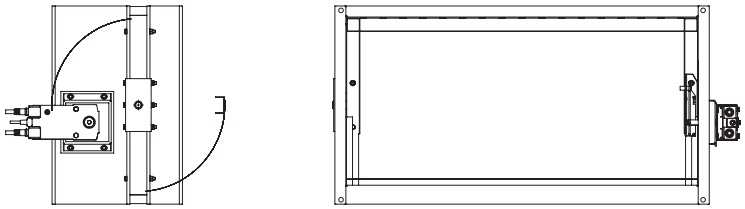
» inverted damper - (ducts facing downwards)



» 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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