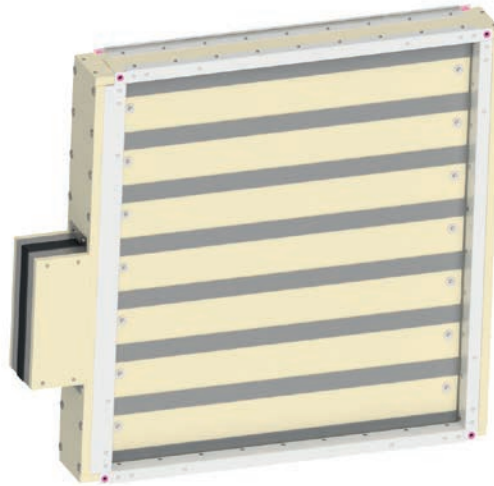


A large, stylized graphic element in the bottom left corner, consisting of a white 'L' shape with a red arrow pointing towards the bottom right, set against a red background.

FIRE VENTILATION SYSTEMS
FIRE DAMPERS AND FIRE VALVES



downloadable models
on the website
under the designer zone tab



- » **EI120S, EI90S, EI180**
- » Fire resistance class: EI120 ($v_e i \leftrightarrow o$)S, EI90 ($h_o i \leftrightarrow o$)S, E120 ($h_o i \leftrightarrow o$)S, EI180 ($v_e i \leftrightarrow o$).
- » Certificate of constancy of performance 2434-CPR-0031.
- » Dampers certified for compliance with EN 15650.
- » Dampers qualified under EN 13501-3 and tested under EN 1366-2.
- » Narrow louvered cut-off dampers.
- » KTB ATEX 2014/34/UE

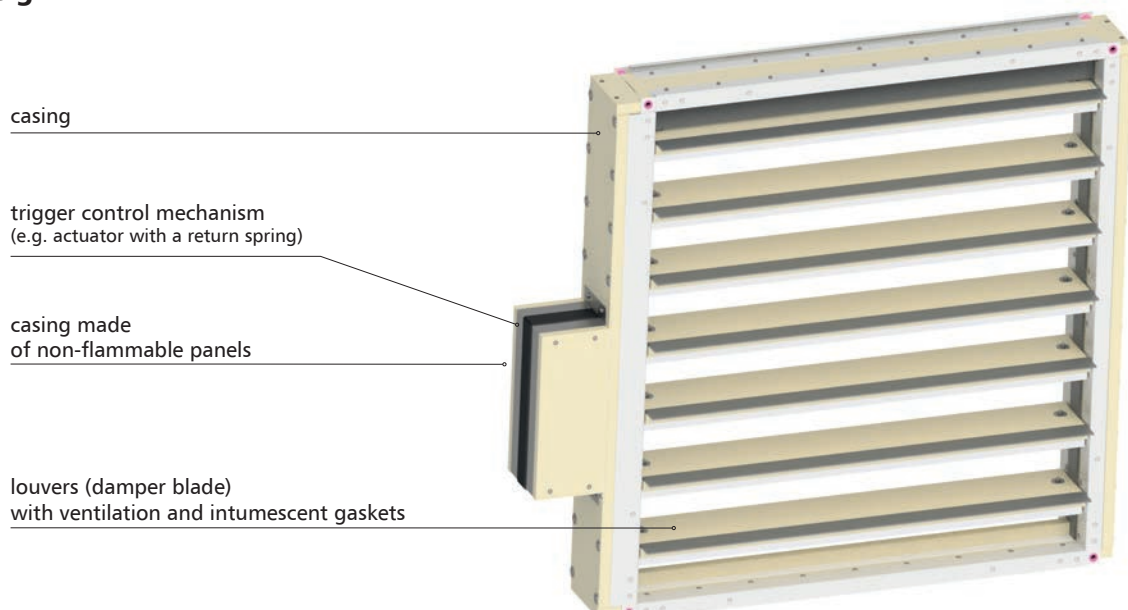
11.1| Application

mcr WIP PRO/S multi-blade cut-off dampers are designed for use in general ventilation systems, where those systems pass through construction partitions mcr WIP PRO/S fire dampers are intended for use in systems, where the components such as a silencer, bend or supply and extraction grille are installed downstream of the fire damper.

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 louvers are open. In case of fire, the louver 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

11.2| Design



The multi-blade mcr WIP PRO/S damper consists of a rectangular casing made of two steel sections connected with a non-combustible plate using rivets and galvanized steel sheet fasteners, a set of movable blades rotating around their axes and a trigger control mechanism. The damper casing is made of fire resistant panels and galvanized "C" shape metal sheet profiles. The device is reinforced on both sides with steel flat bar corners. Intumescent and ventilation gaskets are installed on the inside of the damper. Each damper blade is made of two fire resistant panels, which are displaced against each other. An intumescent gasket and ventilation gasket are attached with staples along the entire blade length. The damper blades revolve on their own axes, which consist of two steel pins. Each pin is mounted in a sleeve installed on the vertical side H of the fire damper casing.

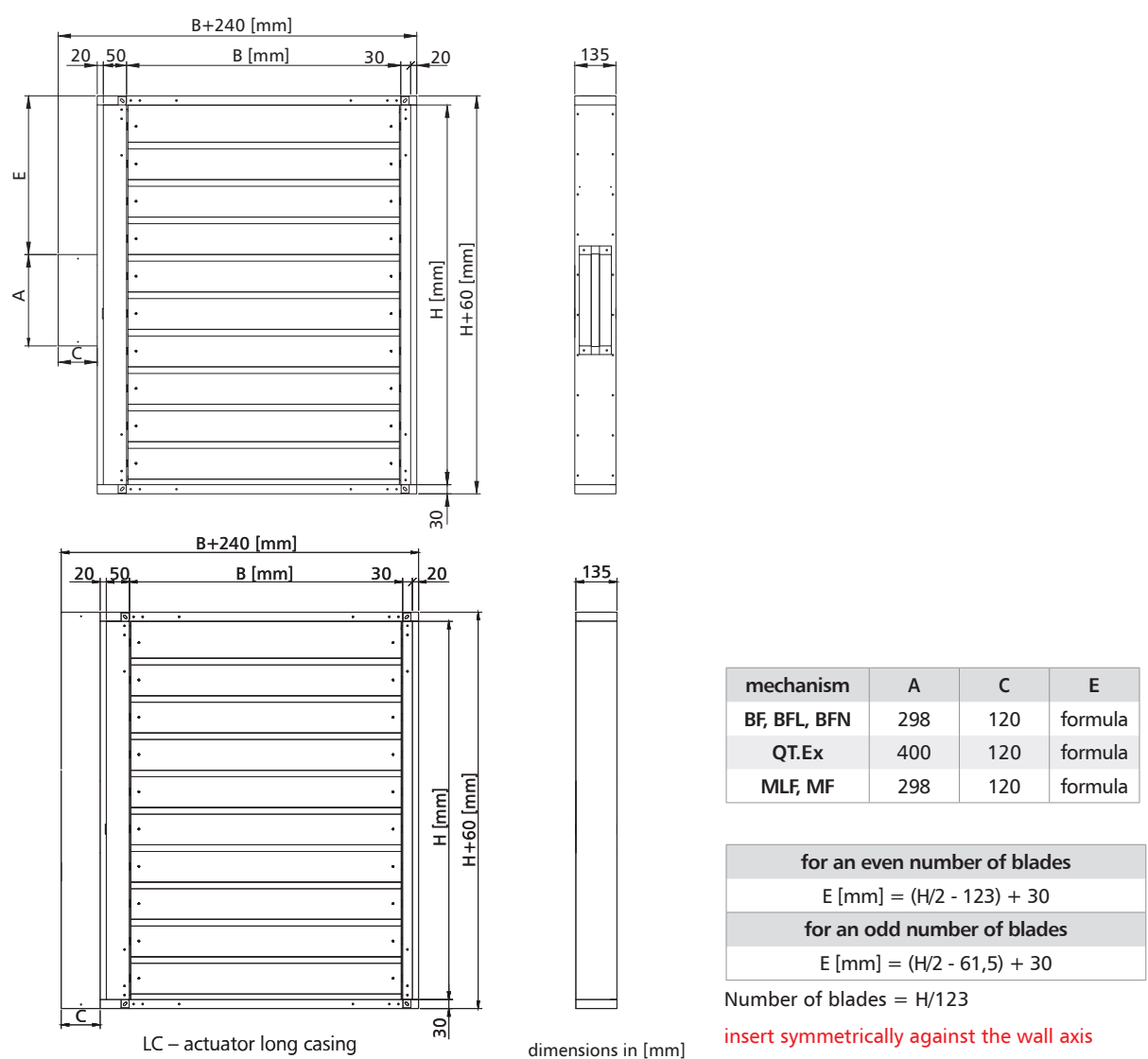
11.3 | Versions

11.3.1 | Damper closing and opening with an actuator

During normal operation, the cut-off louvers of the fire damper remain open. In case of fire, the louvers close automatically or remotely when the power supply is cut off.

The mcr WIP PRO/S dampers are equipped with a trigger control mechanism in the form of BFL, BFN, BF, BF-TL, QT.Ex, MF, MLF series axial actuator with a return spring, supplied with 24 V AC/DC or 230 V AC, with a 72°C thermoelectric trigger (optionally it is possible to use triggers with the nominal tripping temperature of 95°C). The BFL, BFN, BF, MLF, MF series actuators are equipped with limit switches used to monitor the damper blade position. Furthermore, a mechanical position indicator is placed on the actuator.

Dampers with analog BFL, BFN, BF, MLF, MF digital BF-TL, QT.Ex 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.

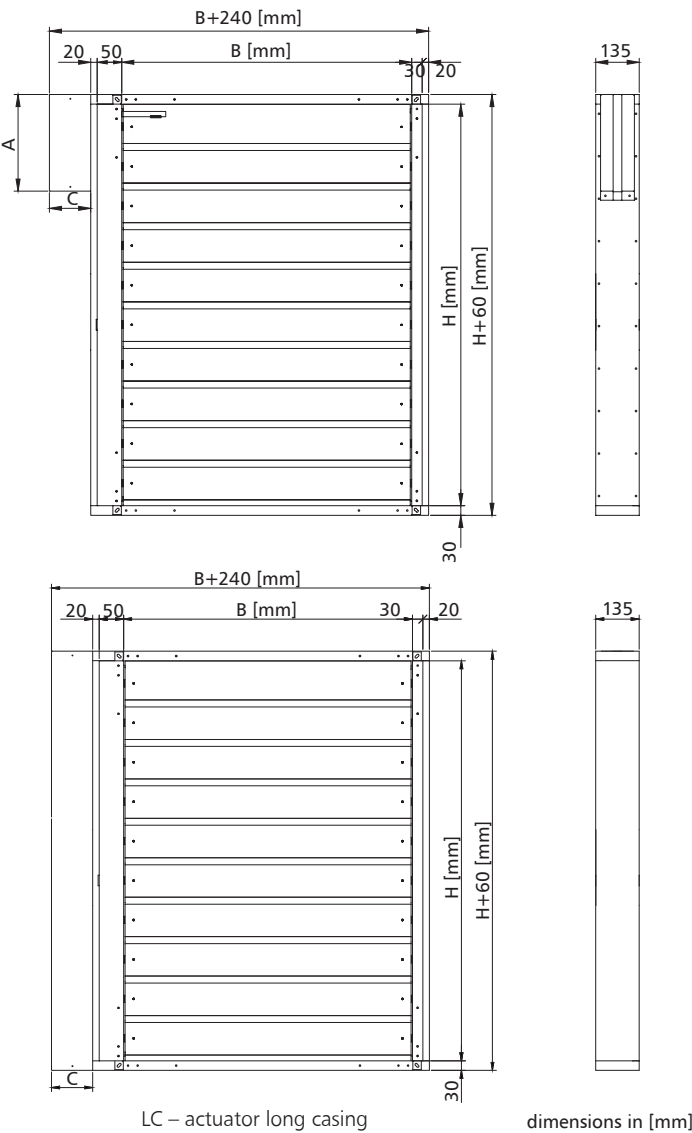


11.3.2

mcr WIP PRO/S - 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 cut-off louvers of the fire damper remain open. In case of fire, the louvers close automatically or through the fire automation system in case of a damper with an electromagnetic trigger.

mcr WIP PRO/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.



mechanism	A	C
KW1	298	120

insert symmetrically against the wall axis

11.4

Dimensions

» Rectangular dampers:

- » nominal width B: from 110 mm to 900 mm
- » nominal height H from 270 mm to 1250 mm
- » maximum single damper cross-section surface up to 1.125 m²

Apart from the standard dimensions, fire dampers may be manufactured with intermediate dimensions (at 10 mm increments within the given ranges).

Square dampers may also be additionally equipped with round connection collars allowing for so called “bare end” connection to round ducts.

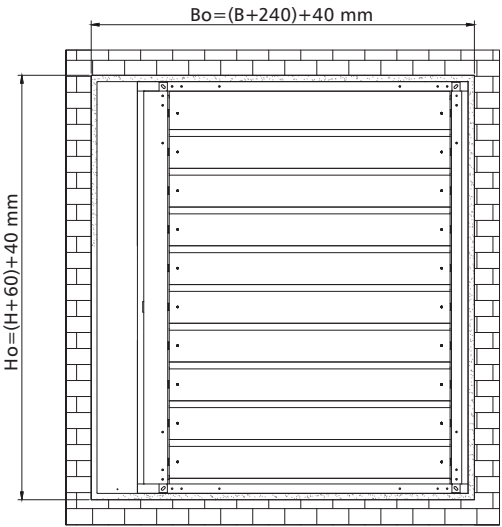
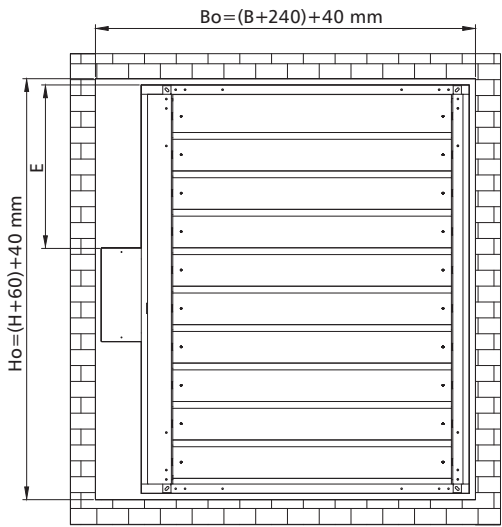
11.5 | Installation

Rectangular mcr WIP PRO/S fire dampers are class EI120(v_e $i \leftrightarrow o$)S rated if installed in concrete partitions with a min. thickness of 120 mm, partitions made of full bricks or aerated concrete blocks with a min. thickness of 120 mm, light walls with EI120 or higher fire rating, and EI90(h_o $i \leftrightarrow o$)S / EI20(h_o $i \leftrightarrow o$)S rated when installed in floor slabs with a min. thickness of 150 mm.

11.5.1 | Preparation of installation openings

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

Preferred
Bo = (B + 240) + 40 mm
Ho = (H + 60) + 40 mm

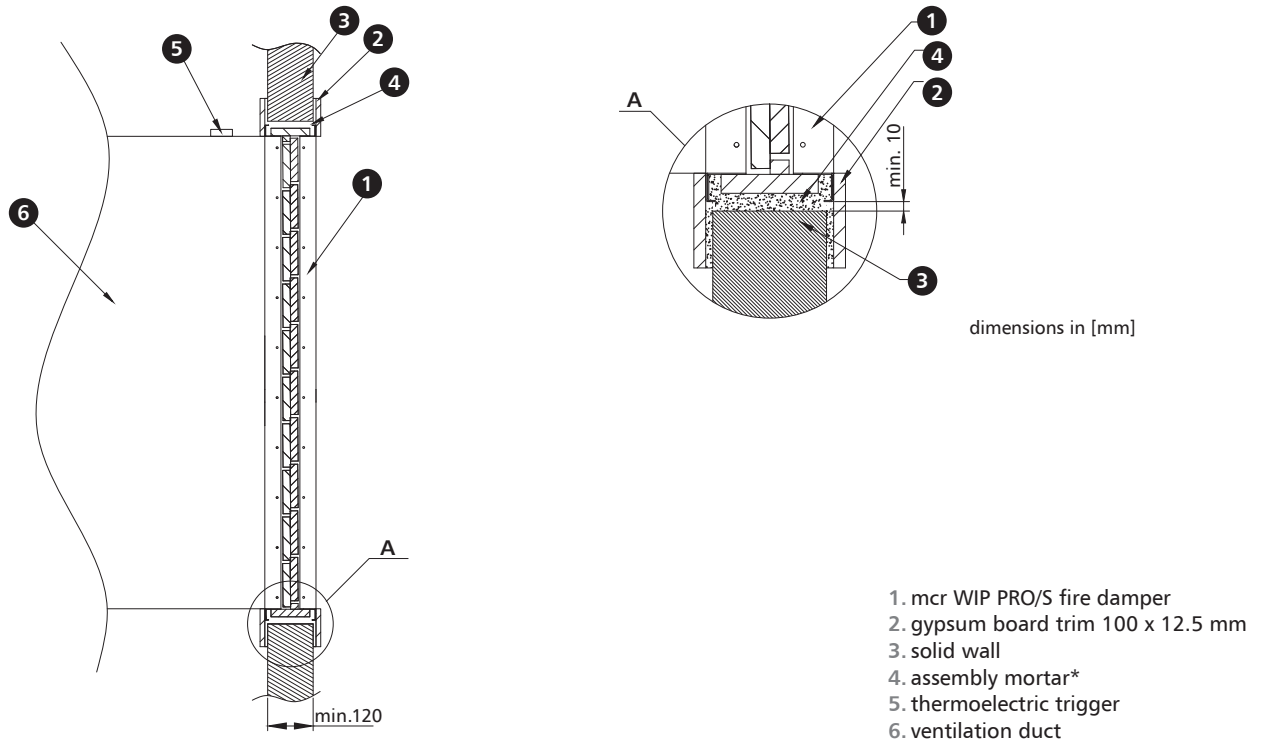


LC – actuator long casing dimensions in [mm]

Dimension E (distance from the top fire damper edge to the edge of the trigger control mechanism box) - depending on the dimension H and the trigger control mechanism used:

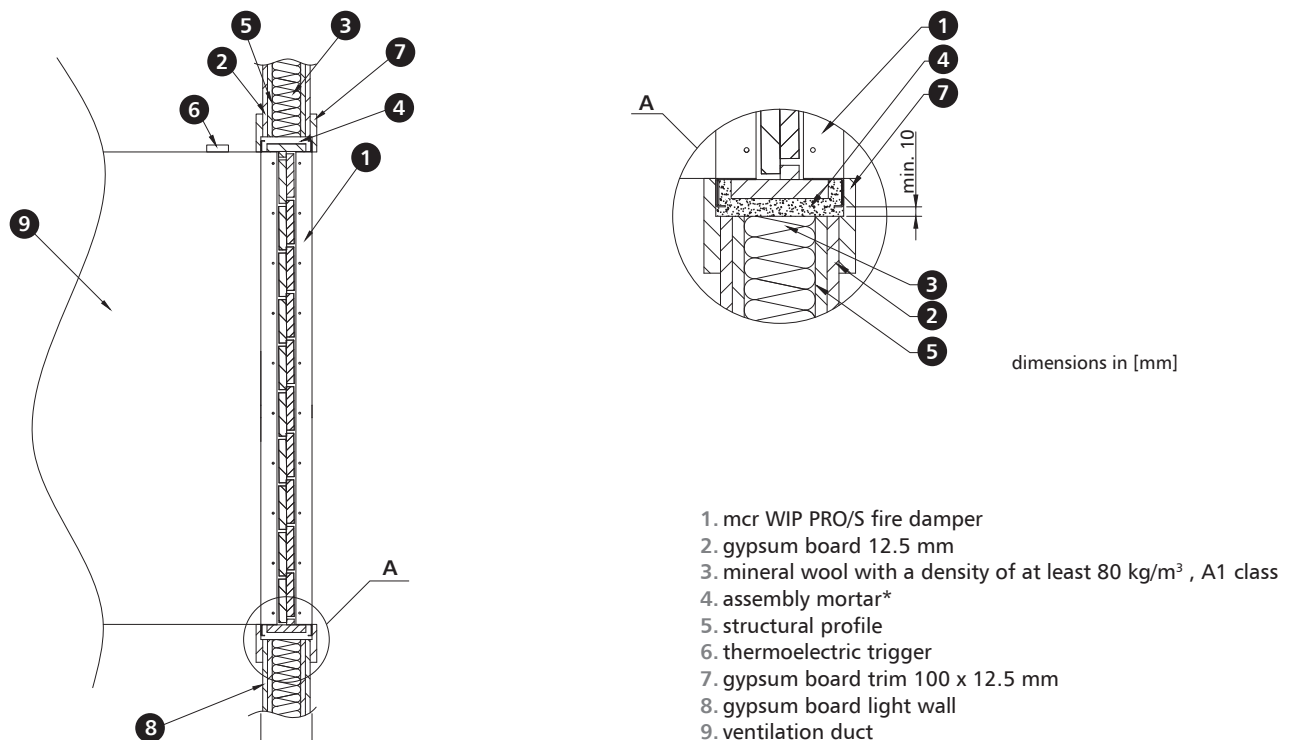
mechanism	for an even number of blades	for an odd number of blades
BF, BLF, BFN, MF, MLF, QT.Ex	$E \text{ [mm]} = (H/2 - 123) + 30$	$E \text{ [mm]} = (H/2 - 61,5) + 30$
KW1	$E \text{ [mm]} = 0$	$E \text{ [mm]} = 0$

11.5.2 | Sample installation in concrete block or full brick walls



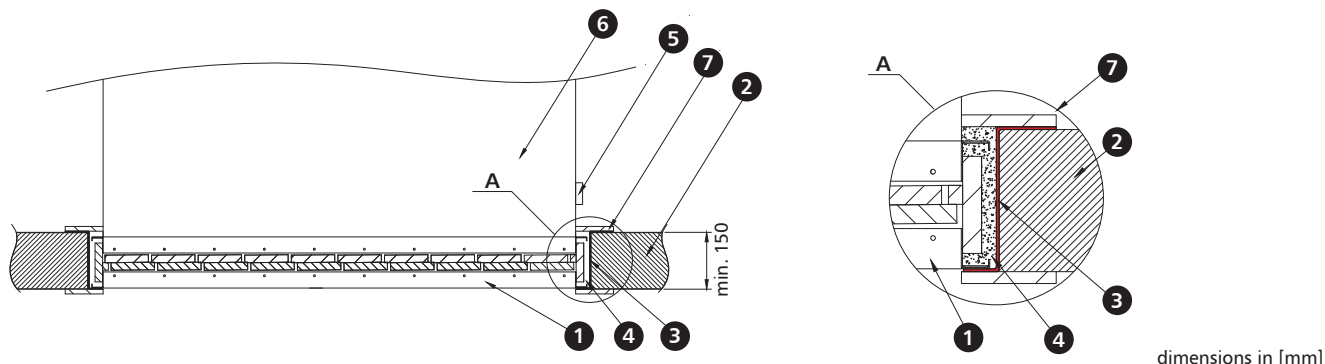
* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

11.5.3 | Sample installation in light walls



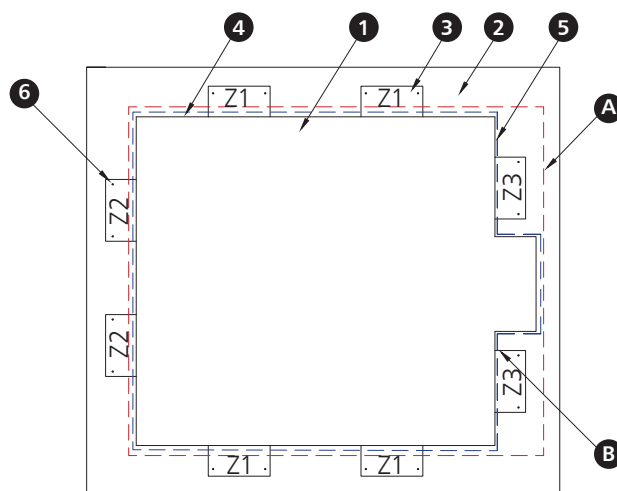
* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

11.5.4 | Sample installation in floor slabs



- | | |
|------------------------------|-------------------------------------|
| 1. mcr WIP PRO/S fire damper | 5. thermoelectric trigger |
| 2. concrete floor slab | 6. ventilation duct |
| 3. Z-shape installation bars | 7. gypsum board trims 100 x 12.5 mm |
| 4. assembly mortar* | |

* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.



- | | |
|------------------------------|--------------------------------|
| 1. mcr WIP PRO/S fire damper | 4. assembly mortar* |
| 2. concrete floor slab | 5. installation opening A or B |
| 3. Z-shape installation bars | 6. anchor plug M8 x 80 mm |

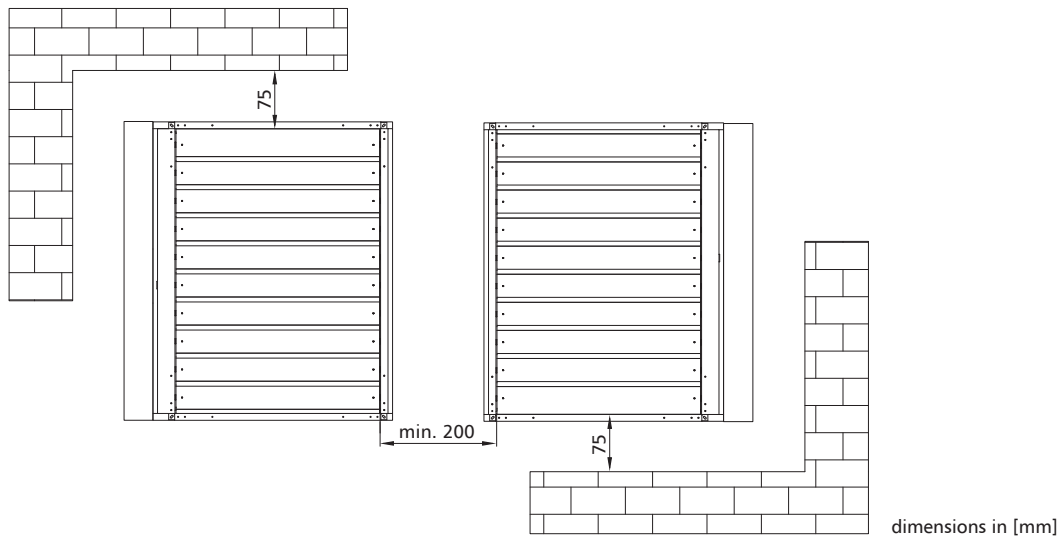
* Recommended damper installation in a wet system is based on assembly mortar on the basis of gypsum or cement. The manufacturer allows for using other materials with parameters that confirm and ensure the appropriate fire resistance rating for the installation method applied.

For mcr WIP PRO/S damper installation in the floor slab, use Z1/Z2/Z3 fasteners compatible with the width of the fire damper and construction opening "5" as per the guidelines in the operation and maintenance manual. Z1, Z2, Z3 fasteners are not included with the fire damper.

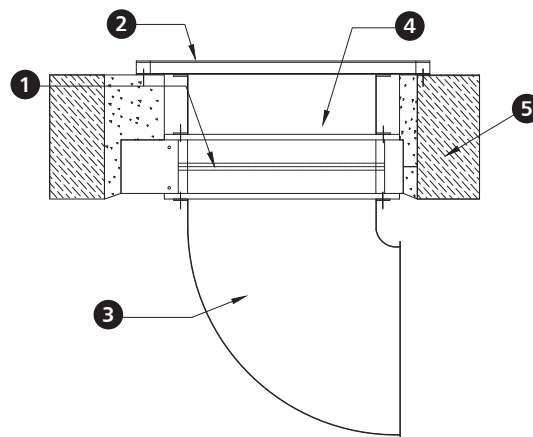
For construction openings with a cut-out for the trigger control mechanism box B, use standard Z3 fasteners.

For construction openings in form of a regular rectangular A, extend the Z3 fasteners by 120 mm.

» Minimum distance between systems and partitions



» Example applications - installation with a masking element



- 1. mcr WIP PRO/S fire damper
- 2. masking element
- 3. ventilation duct

- 4. duct - ventilation straight connection piece
- 5. wall, floor slab

If a mcr WIP PRO/S damper is used, the application of louvers (no single-blade design) it is possible to use the space in front of and behind the damper for such system elements as a masking grille or a silencer with additional attenuation barrier or to route a duct along the wall using a duct bend or reduction.

11.6 | mcr WIP PRO/S 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]														
		270					300					350				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	110	4	0.030	0.019	269	13	0.033	0.019	269	14	34	0.039	0.019	269	16	36
	6	404			30	44			404	30	44			404	36	46
	8	539			53	51			539	54	52			539	63	54
	10	673			82	57			673	85	58			673	99	60
	150	4	0.041	0.026	367	13	0.045	0.026	367	14	35	0.053	0.026	367	16	37
	6	551			30	45			551	30	46			551	36	48
	8	734			53	53			734	54	53			734	63	55
	10	918			82	59			918	85	59			918	99	61
	200	4	0.054	0.034	490	13	0.060	0.034	490	14	36	0.070	0.034	490	16	38
	6	734			30	46			734	30	47			734	36	49
	8	979			53	54			979	54	54			979	63	56
	10	1 224			82	60			1 224	84	60			1 224	99	62
	250	4	0.068	0.043	612	13	0.075	0.043	612	14	37	0.088	0.043	612	16	39
	6	918			30	47			918	30	48			918	36	50
	8	1 224			53	55			1 224	54	55			1 224	63	57
	10	1 530			82	61			1 530	85	61			1 530	99	63
	300	4	0.081	0.051	734	13	0.090	0.051	734	14	38	0.105	0.051	734	16	40
	6	1 102			30	48			1 102	30	49			1 102	36	51
	8	1 469			53	56			1 469	54	56			1 469	63	58
	10	1 836			82	62			1 836	85	62			1 836	99	64
	350	4	0.095	0.060	857	13	0.105	0.060	857	14	39	0.123	0.060	857	16	41
	6	1 285			30	49			1 285	30	49			1 285	36	51
	8	1 714			53	56			1 714	54	57			1 714	63	59
	10	2 142			82	62			2 142	85	63			2 142	99	65
	400	4	0.108	0.068	979	13	0.120	0.068	979	14	39	0.140	0.068	979	16	41
	6	1 469			30	49			1 469	30	50			1 469	36	52
	8	1 958			53	57			1 958	54	57			1 958	63	59
	10	2 448			82	63			2 448	84	63			2 448	99	65
	450	4	0.122	0.077	1 102	13	0.135	0.077	1 102	14	40	0.158	0.077	1 102	16	42
	6	1 652			30	50			1 652	30	50			1 652	36	52
	8	2 203			53	57			2 203	54	58			2 203	63	60
	10	2 754			82	63			2 754	84	64			2 754	99	66
	500	4	0.135	0.085	1 224	13	0.150	0.085	1 224	14	40	0.175	0.085	1 224	16	42
	6	1 836			30	50			1 836	30	51			1 836	36	53
	8	2 448			53	58			2 448	54	58			2 448	63	60
	10	3 060			82	64			3 060	85	64			3 060	99	66
	550	4	0.149	0.094	1 346	2	0.165	0.094	1 346	14	41	0.193	0.094	1 346	16	43
	6	2 020			4	24			2 020	30	51			2 020	36	53
	8	2 693			7	31			2 693	54	59			2 693	63	61
	10	3 366			10	37			3 366	84	65			3 366	99	67
	600	4	0.162	0.102	1 469	13	0.180	0.102	1 469	14	41	0.210	0.102	1 469	16	43
	6	2 203			30	51			2 203	30	52			2 203	36	54
	8	2 938			53	59			2 938	54	59			2 938	63	61
	10	3 672			82	65			3 672	85	65			3 672	99	67
	650	4	0.176	0.111	1 591	13	0.195	0.111	1 591	14	41	0.228	0.111	1 591	16	43
	6	2 387			30	52			2 387	30	52			2 387	36	54
	8	3 182			53	59			3 182	54	59			3 182	63	62
	10	3 978			82	65			3 978	85	65			3 978	99	67
	700	4	0.189	0.119	1 714	13	0.210	0.119	1 714	14	42	0.245	0.119	1 714	16	44
	6	2 570			30	52			2 570	30	52			2 570	36	54
	8	3 427			53	59			3 427	54	60			3 427	63	62
	10	4 284			82	65			4 284	85	66			4 284	99	68
	750	4	0.203	0.128	1 836	13	0.225	0.128	1 836	14	42	0.263	0.128	1 836	16	44
	6	2 754			30	52			2 754	30	53			2 754	36	55
	8	3 672			53	60			3 672	54	60			3 672	63	62
	10	4 590			82	66			4 590	85	66			4 590	99	68
	800	4	0.216	0.136	1 958	13	0.240	0.136	1 958	14	42	0.280	0.136	1 958	16	44
	6	2 938			30	52			2 938	30	53			2 938	36	55
	8	3 917			53	60			3 917	54	60			3 917	63	62
	10	4 896			82	66			4 896	84	66			4 896	99	68
	850	4	0.230	0.145	2 081	13	0.255	0.145	2 081	14	43	0.298	0.145	2 081	16	45
	6	3 121			30	53			3 121	30	53			3 121	36	55
	8	4 162			53	60			4 162	54	61			4 162	63	63
	10	5 202			82	66			5 202	84	66			5 202	99	68
	900	4	0.243	0.153	2 203	13	0.270	0.153	2 203	14	43	0.315	0.153	2 203	16	45
	6	3 305			30	53			3 305	30	53			3 305	36	55
	8	4 406			53	60			4 406	54	61			4 406	63	63
	10	5 508			82	66			5 508	84	67			5 508	99	69

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]														
			390					450					520				
			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]
width B [mm]	110	4	0.043	0.028	401	12	34	0.050	0.028	401	14	36	0.057	0.037	532	12	35
		6			601	27	44			601	31	46			798	27	46
		8			802	47	52			802	55	54			1 064	48	53
		10			1 002	74	58			1 002	86	60			1 331	75	59
	150	4	0.059	0.038	546	12	35	0.068	0.038	546	14	37	0.078	0.050	726	12	36
		6			820	27	46			820	31	48			1 089	27	47
		8			1 093	47	53			1 093	55	55			1 452	48	54
		10			1 366	74	59			1 366	86	61			1 814	75	60
	200	4	0.078	0.051	729	12	36	0.090	0.051	729	14	38	0.104	0.067	968	12	38
		6			1 093	27	47			1 093	31	49			1 452	27	48
		8			1 457	47	54			1 457	55	56			1 935	48	56
		10			1 822	74	60			1 822	86	62			2 419	75	62
	250	4	0.098	0.063	911	12	37	0.113	0.063	911	14	39	0.130	0.084	1 210	12	39
		6			1 366	27	48			1 366	31	50			1 814	27	49
		8			1 822	47	55			1 822	55	57			2 419	48	57
		10			2 277	74	61			2 277	86	63			3 024	75	63
	300	4	0.117	0.076	1 093	12	38	0.135	0.076	1 093	14	40	0.156	0.101	1 452	12	39
		6			1 639	27	49			1 639	31	51			2 177	27	50
		8			2 186	47	56			2 186	55	58			2 903	48	57
		10			2 732	74	62			2 732	86	64			3 629	75	63
	350	4	0.137	0.089	1 275	12	39	0.158	0.089	1 275	14	41	0.182	0.118	1 693	12	40
		6			1 913	27	49			1 913	31	51			2 540	27	51
		8			2 550	47	57			2 550	55	59			3 387	48	58
		10			3 188	74	63			3 188	86	65			4 234	75	64
400	4	0.156	0.101	1 457	12	39	0.180	0.101	1 457	14	41	0.208	0.134	1 935	12	41	
	6			2 186	27	50			2 186	31	52			2 903	27	51	
	8			2 915	47	57			2 915	55	59			3 871	48	59	
	10			3 643	74	63			3 643	86	65			4 838	75	65	
450	4	0.176	0.114	1 639	12	40	0.203	0.114	1 639	14	42	0.234	0.151	2 177	12	41	
	6			2 459	27	50			2 459	31	52			3 266	27	52	
	8			3 279	47	58			3 279	55	60			4 355	48	59	
	10			4 099	74	64			4 099	86	66			5 443	75	65	
500	4	0.195	0.127	1 822	12	40	0.225	0.127	1 822	14	42	0.260	0.168	2 419	12	42	
	6			2 732	27	51			2 732	31	53			3 629	27	52	
	8			3 643	47	58			3 643	55	60			4 838	48	60	
	10			4 554	74	64			4 554	86	66			6 048	75	66	
550	4	0.215	0.139	2 004	12	41	0.248	0.139	2 004	14	43	0.286	0.185	2 661	12	42	
	6			3 006	27	51			3 006	31	53			3 992	27	53	
	8			4 008	47	59			4 008	55	61			5 322	48	60	
	10			5 009	74	65			5 009	86	67			6 653	75	66	
600	4	0.234	0.152	2 186	12	41	0.270	0.152	2 186	14	43	0.312	0.202	2 903	12	42	
	6			3 279	27	52			3 279	31	54			4 355	27	53	
	8			4 372	47	59			4 372	55	61			5 806	48	61	
	10			5 465	74	65			5 465	86	67			7 258	75	66	
650	4	0.254	0.164	2 368	12	41	0.293	0.164	2 368	14	43	0.338	0.218	3 145	12	43	
	6			3 552	27	52			3 552	31	54			4 717	27	53	
	8			4 736	47	59			4 736	55	61			6 290	48	61	
	10			5 920	74	65			5 920	86	67			7 862	75	67	
700	4	0.273	0.177	2 550	12	42	0.315	0.177	2 550	14	44	0.364	0.235	3 387	12	43	
	6			3 825	27	52			3 825	31	54			5 080	27	54	
	8			5 100	47	60			5 100	55	62			6 774	48	61	
	10			6 376	74	66			6 376	86	68			8 467	75	67	
750	4	0.293	0.190	2 732	12	42	0.338	0.190	2 732	14	44	0.390	0.252	3 629	12	43	
	6			4 099	27	53			4 099	31	55			5 443	27	54	
	8			5 465	47	60			5 465	55	62			7 258	48	61	
	10			6 831	74	66			6 831	86	68			9 072	75	67	
800	4	0.312	0.202	2 915	12	42	0.360	0.202	2 915	14	43	0.416	0.269	3 871	12	43	
	6			4 372	27	53			4 372	31	54			5 806	27	54	
	8			5 829	47	60			5 829	55	61			7 741	48	61	
	10			7 286	74	66			7 286	86	67			9 677	75	67	
850	4	0.332	0.215	3 097	12	43	0.383	0.215	3 097	14	43	0.442	0.286	4 113	12	43	
	6			4 645	27	53			4 645	31	54			6 169	27	54	
	8			6 193	47	61			6 193	55	61			8 225	48	61	
	10			7 742	74	66			7 742	86	67			10 282	75	67	
900	4	0.351	0.228	3 279	12	43	0.405	0.228	3 279	14	43	0.468	0.302	4 355	12	43	
	6			4 918	27	53			4 918	31	54			6 532	27	54	
	8			6 558	47	61			6 558	55	61			8 709	48	61	
	10			8 197	74	67			8 197	86	67			10 886	75	67	

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]														
			550					640					650				
			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]
width B [mm]	110	4	0.061	0.037	532	13	36	0.070	0.046	664	11	35	0.072	0.046	664	12	36
		6			798	29	46			996	26	46			996	27	47
		8			1 064	51	54			1 327	46	53			1 327	48	54
		10			1 331	79	60			1 659	72	59			1 659	76	60
	150	4	0.083	0.050	726	13	37	0.096	0.063	905	11	37	0.098	0.063	905	12	37
		6			1 089	29	48			1 358	26	47			1 358	27	48
		8			1 452	51	55			1 810	46	55			1 810	48	56
		10			1 814	79	61			2 263	72	61			2 263	76	61
	200	4	0.110	0.067	968	13	38	0.128	0.084	1 207	11	38	0.130	0.084	1 207	12	39
		6			1 452	29	49			1 810	26	49			1 810	27	49
		8			1 935	51	56			2 413	46	56			2 413	48	57
		10			2 419	79	62			3 017	72	62			3 017	76	63
	250	4	0.138	0.084	1 210	13	39	0.160	0.105	1 508	11	39	0.163	0.105	1 508	12	40
		6			1 814	29	50			2 263	26	50			2 263	27	50
		8			2 419	51	57			3 017	46	57			3 017	48	58
		10			3 024	79	63			3 771	72	63			3 771	76	64
	300	4	0.165	0.101	1 452	13	40	0.192	0.126	1 810	11	40	0.195	0.126	1 810	12	41
		6			2 177	29	51			2 715	26	50			2 715	27	51
		8			2 903	51	58			3 620	46	58			3 620	48	59
		10			3 629	79	64			4 525	72	64			4 525	76	64
	350	4	0.193	0.118	1 693	13	41	0.224	0.147	2 112	11	40	0.228	0.147	2 112	12	41
		6			2 540	29	51			3 168	26	51			3 168	27	52
		8			3 387	51	59			4 224	46	58			4 224	48	59
		10			4 234	79	65			5 279	72	64			5 279	76	65
400	4	0.220	0.134	1 935	13	41	0.256	0.168	2 413	11	41	0.260	0.168	2 413	12	42	
	6			2 903	29	52			3 620	26	52			3 620	27	52	
	8			3 871	51	59			4 827	46	59			4 827	48	60	
	10			4 838	79	65			6 034	72	65			6 034	76	66	
450	4	0.248	0.151	2 177	13	42	0.288	0.189	2 715	11	42	0.293	0.189	2 715	12	42	
	6			3 266	29	52			4 073	26	52			4 073	27	53	
	8			4 355	51	60			5 430	46	60			5 430	48	60	
	10			5 443	79	66			6 788	72	65			6 788	76	66	
500	4	0.275	0.168	2 419	13	42	0.320	0.210	3 017	11	42	0.325	0.210	3 017	12	43	
	6			3 629	29	53			4 525	26	53			4 525	27	53	
	8			4 838	51	60			6 034	46	60			6 034	48	61	
	10			6 048	79	66			7 542	72	66			7 542	76	67	
550	4	0.303	0.185	2 661	13	43	0.352	0.230	3 318	11	42	0.358	0.230	3 318	12	43	
	6			3 992	29	53			4 978	26	53			4 978	27	54	
	8			5 322	51	61			6 637	46	60			6 637	48	61	
	10			6 653	79	67			8 296	72	66			8 296	76	67	
600	4	0.330	0.202	2 903	13	43	0.384	0.251	3 620	11	43	0.390	0.251	3 620	12	44	
	6			4 355	29	54			5 430	26	53			5 430	27	54	
	8			5 806	51	61			7 240	46	61			7 240	48	62	
	10			7 258	79	67			9 050	72	67			9 050	76	67	
650	4	0.358	0.218	3 145	13	44	0.416	0.272	3 922	11	43	0.423	0.272	3 922	12	44	
	6			4 717	29	54			5 883	26	54			5 883	27	54	
	8			6 290	51	62			7 844	46	61			7 844	48	62	
	10			7 862	79	67			9 805	72	67			9 805	76	68	
700	4	0.385	0.235	3 387	13	44	0.448	0.293	4 224	11	43	0.455	0.293	4 224	12	44	
	6			5 080	29	54			6 335	26	54			6 335	27	55	
	8			6 774	51	62			8 447	46	61			8 447	48	62	
	10			8 467	79	68			10 559	72	67			10 559	76	68	
750	4	0.413	0.252	3 629	13	44	0.480	0.314	4 525	11	44	0.488	0.314	4 525	12	44	
	6			5 443	29	55			6 788	26	54			6 788	27	55	
	8			7 258	51	62			9 050	46	62			9 050	48	63	
	10			9 072	79	68			11 313	72	68			11 313	76	68	
800	4	0.440	0.269	3 871	13	44	0.512	0.335	4 827	11	44	0.520	0.335	4 827	12	44	
	6			5 806	29	55			7 240	26	55			7 240	27	55	
	8			7 741	51	62			9 654	46	62			9 654	48	63	
	10			9 677	79	68			12 067	72	68			12 067	76	68	
850	4	0.468	0.286	4 113	13	45	0.544	0.356	5 129	11	44	0.553	0.356	5 129	12	44	
	6			6 169	29	55			7 693	26	55			7 693	27	55	
	8			8 225	51	63			10 257	46	62			10 257	48	63	
	10			10 282	79	69			12 821	72	68			12 821	76	68	
900	4	0.495	0.302	4 355	13	45	0.576	0.377	5 430	11	45	0.585	0.377	5 430	12	44	
	6			6 532	29	56			8 145	26	52			8 145	27	55	
	8			8 709	51	63			10 860	46	60			10 860	48	63	
	10			10 886	79	69			13 576	72	65			13 576	76	68	

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

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

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

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

			height H [mm]														
			700					760					800				
			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]		v [m/s]	0.077	0.046	664	14	38	0.084	0.055	795	12	37	0.088	0.055	795	10	34
	6	996			30	48	1 193			28	48	1 193			22	45	
	8	1 327			54	56	1 590			50	55	1 590			40	52	
	10	1 659			85	61	1 988			78	61	1 988			62	58	
	4	905	14	39	0.114	0.075	1 084	12	39	0.120	0.075	1 084	10	36			
	6	1 358	30	49			1 626	28	49			1 626	22	46			
	8	1 810	54	57			2 169	50	57			2 169	40	54			
	10	2 263	85	63			2 711	78	62			2 711	62	60			
	4	1 207	14	40	0.152	0.100	1 446	12	40	0.160	0.100	1 446	10	37			
	6	1 810	30	51			2 169	28	50			2 169	22	48			
	8	2 413	54	58			2 892	50	58			2 892	40	55			
	10	3 017	85	64			3 614	78	64			3 614	62	61			
	4	1 508	14	41	0.190	0.126	1 807	12	41	0.200	0.126	1 807	10	38			
	6	2 263	30	52			2 711	28	51			2 711	22	49			
	8	3 017	54	59			3 614	50	59			3 614	40	56			
	10	3 771	85	65			4 518	78	65			4 518	62	62			
	4	1 810	14	42	0.228	0.151	2 169	12	42	0.240	0.151	2 169	10	39			
	6	2 715	30	53			3 253	28	52			3 253	22	49			
	8	3 620	54	60			4 337	50	60			4 337	40	57			
	10	4 525	85	66			5 422	78	66			5 422	62	63			
	4	2 112	14	43	0.266	0.176	2 530	12	42	0.280	0.176	2 530	10	39			
	6	3 168	30	53			3 795	28	53			3 795	22	50			
	8	4 224	54	61			5 060	50	60			5 060	40	57			
	10	5 279	85	66			6 325	78	66			6 325	62	63			
	4	2 413	14	43	0.304	0.201	2 892	12	43	0.320	0.201	2 892	10	40			
	6	3 620	30	54			4 337	28	53			4 337	22	51			
	8	4 827	54	61			5 783	50	61			5 783	40	58			
	10	6 034	85	67			7 229	78	67			7 229	62	64			
4	2 715	14	44	0.342	0.226	3 253	12	43	0.360	0.226	3 253	10	41				
6	4 073	30	54			4 879	28	54			4 879	22	51				
8	5 430	54	62			6 506	50	61			6 506	40	59				
10	6 788	85	68			8 132	78	67			8 132	62	64				
4	3 017	14	44	0.380	0.251	3 614	12	44	0.400	0.251	3 614	10	41				
6	4 525	30	55			5 422	28	54			5 422	22	52				
8	6 034	54	62			7 229	50	62			7 229	40	59				
10	7 542	85	68			9 036	78	68			9 036	62	65				
4	3 318	14	45	0.418	0.276	3 976	12	44	0.440	0.276	3 976	10	41				
6	4 978	30	55			5 964	28	55			5 964	22	52				
8	6 637	54	63			7 952	50	62			7 952	40	59				
10	8 296	85	68			9 940	78	68			9 940	62	65				
4	3 620	14	45	0.456	0.301	4 337	12	45	0.480	0.301	4 337	10	42				
6	5 430	30	56			6 506	28	55			6 506	22	52				
8	7 240	54	63			8 675	50	63			8 675	40	60				
10	9 050	85	69			10 843	78	69			10 843	62	66				
4	3 922	14	45	0.494	0.326	4 699	12	45	0.520	0.326	4 699	10	42				
6	5 883	30	56			7 048	28	56			7 048	22	53				
8	7 844	54	63			9 397	50	63			9 397	40	60				
10	9 805	85	69			11 747	78	69			11 747	62	66				
4	4 224	14	46	0.532	0.351	5 060	12	45	0.560	0.351	5 060	10	42				
6	6 335	30	56			7 590	28	56			7 590	22	53				
8	8 447	54	64			10 120	50	63			10 120	40	61				
10	10 559	85	69			12 650	78	69			12 650	62	66				
4	4 525	14	46	0.570	0.377	5 422	12	46	0.600	0.377	5 422	10	43				
6	6 788	30	56			8 132	28	56			8 132	22	53				
8	9 050	54	64			10 843	50	64			10 843	40	61				
10	11 313	85	70			13 554	78	69			13 554	62	67				
4	4 827	14	44	0.608	0.402	5 783	12	46	0.640	0.402	5 783	10	43				
6	7 240	30	55			8 675	28	56			8 675	22	54				
8	9 654	54	62			11 566	50	64			11 566	40	61				
10	12 067	85	67			14 458	78	70			14 458	62	67				
4	5 129	14	46	0.646	0.427	6 144	12	46	0.680	0.427	6 144	10	43				
6	7 693	30	57			9 217	28	57			9 217	22	54				
8	10 257	54	65			12 289	50	64			12 289	40	61				
10	12 821	85	70			15 361	78	70			15 361	62	67				
4	5 430	14	47	0.684	0.452	6 506	12	46	0.720	0.452	6 506	10	44				
6	8 145	30	57			9 759	28	57			9 759	22	54				
8	10 860	54	65			13 012	50	64			13 012	40	62				
10	13 576	85	71			16 265	78	70			16 265	62	67				

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]														
			890					900					950				
			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]
width B [mm]	110	4	0,098	0,064	927	13	38	0,099	0,064	927	13	39	0,105	0,064	927	14	40
		6			1 390	29	49			1 390	30	49			1 390	32	50
		8			1 853	51	56			1 853	53	57			1 853	57	58
		10			2 317	79	62			2 317	83	63			2 317	89	64
	150	4	0,134	0,088	1 264	13	40	0,135	0,088	1 264	13	40	0,143	0,088	1 264	14	41
		6			1 895	29	50			1 895	30	51			1 895	32	52
		8			2 527	51	58			2 527	53	58			2 527	57	59
		10			3 159	79	63			3 159	83	64			3 159	89	65
	200	4	0,178	0,117	1 685	13	41	0,180	0,117	1 685	13	41	0,190	0,117	1 685	14	42
		6			2 527	29	51			2 527	30	52			2 527	32	53
		8			3 370	51	59			3 370	53	59			3 370	57	60
		10			4 212	79	65			4 212	83	65			4 212	89	66
	250	4	0,223	0,146	2 106	13	42	0,225	0,146	2 106	13	42	0,238	0,146	2 106	14	43
		6			3 159	29	52			3 159	30	53			3 159	32	54
		8			4 212	51	60			4 212	53	60			4 212	57	61
		10			5 265	79	66			5 265	83	66			5 265	89	67
	300	4	0,267	0,176	2 527	13	43	0,270	0,176	2 527	13	43	0,285	0,176	2 527	14	44
		6			3 791	29	53			3 791	30	54			3 791	32	55
		8			5 054	51	61			5 054	53	61			5 054	57	62
		10			6 318	79	66			6 318	83	67			6 318	89	68
	350	4	0,312	0,205	2 948	13	43	0,315	0,205	2 948	13	44	0,333	0,205	2 948	14	45
		6			4 423	29	54			4 423	30	54			4 423	32	55
		8			5 897	51	61			5 897	53	62			5 897	57	63
		10			7 371	79	67			7 371	83	68			7 371	89	69
400	4	0,356	0,234	3 370	13	44	0,360	0,234	3 370	13	44	0,380	0,234	3 370	14	45	
	6			5 054	29	54			5 054	30	55			5 054	32	56	
	8			6 739	51	62			6 739	53	62			6 739	57	63	
	10			8 424	79	68			8 424	83	68			8 424	89	69	
450	4	0,401	0,263	3 791	13	44	0,405	0,263	3 791	13	45	0,428	0,263	3 791	14	46	
	6			5 686	29	55			5 686	30	55			5 686	32	56	
	8			7 582	51	62			7 582	53	63			7 582	57	64	
	10			9 477	79	68			9 477	83	69			9 477	89	70	
500	4	0,445	0,293	4 212	13	45	0,450	0,293	4 212	13	45	0,475	0,293	4 212	14	46	
	6			6 318	29	55			6 318	30	56			6 318	32	57	
	8			8 424	51	63			8 424	53	63			8 424	57	64	
	10			10 530	79	69			10 530	83	69			10 530	89	70	
550	4	0,490	0,322	4 633	13	45	0,495	0,322	4 633	13	46	0,523	0,322	4 633	14	47	
	6			6 950	29	56			6 950	30	56			6 950	32	57	
	8			9 266	51	63			9 266	53	64			9 266	57	65	
	10			11 583	79	69			11 583	83	70			11 583	89	70	
600	4	0,534	0,351	5 054	13	46	0,540	0,351	5 054	13	46	0,570	0,351	5 054	14	47	
	6			7 582	29	56			7 582	30	57			7 582	32	58	
	8			10 109	51	64			10 109	53	64			10 109	57	65	
	10			12 636	79	69			12 636	83	70			12 636	89	71	
650	4	0,579	0,380	5 476	13	46	0,585	0,380	5 476	13	46	0,618	0,380	5 476	14	47	
	6			8 213	29	56			8 213	30	57			8 213	32	58	
	8			10 951	51	64			10 951	53	65			10 951	57	65	
	10			13 689	79	70			13 689	83	70			13 689	89	71	
700	4	0,623	0,410	5 897	13	46	0,630	0,410	5 897	13	47	0,665	0,410	5 897	14	48	
	6			8 845	29	57			8 845	30	57			8 845	32	58	
	8			11 794	51	64			11 794	53	65			11 794	57	66	
	10			14 742	79	70			14 742	83	71			14 742	89	72	
750	4	0,668	0,439	6 318	13	47	0,675	0,439	6 318	13	47	0,713	0,439	6 318	14	48	
	6			9 477	29	57			9 477	30	58			9 477	32	59	
	8			12 636	51	65			12 636	53	65			12 636	57	66	
	10			15 795	79	70			15 795	83	71			15 795	89	72	
800	4	0,712	0,468	6 739	13	47	0,720	0,468	6 739	13	47	0,760	0,468	6 739	14	48	
	6			10 109	29	57			10 109	30	58			10 109	32	59	
	8			13 478	51	65			13 478	53	65			13 478	57	66	
	10			16 848	79	71			16 848	83	71			16 848	89	72	
850	4	0,757	0,497	7 160	13	47	0,765	0,497	7 160	13	48	0,808	0,497	7 160	14	49	
	6			10 741	29	58			10 741	30	58			10 741	32	59	
	8			14 321	51	65			14 321	53	66			14 321	57	67	
	10			17 901	79	71			17 901	83	71			17 901	89	72	
900	4	0,801	0,527	7 582	13	47	0,810	0,527	7 582	13	48	0,855	0,527	7 582	14	49	
	6			11 372	29	58			11 372	30	58			11 372	32	59	
	8			15 163	51	65			15 163	53	66			15 163	57	67	
	10			18 954	79	71			18 954	83	72			18 954	89	73	

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]														
			1010					1050					1100				
			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]
width B [mm]	110	4	0,111	0,073	1 058	12	38	0,116	0,073	1 058	13	39	0,121	0,073	1 058	15	41
		6			1 587	28	49			1 587	29	49			1 587	33	51
		8			2 116	50	57			2 116	51	57			2 116	59	59
		10			2 645	77	62			2 645	79	63			2 645	93	65
	150	4	0,152	0,100	1 443	12	40	0,158	0,100	1 443	13	40	0,165	0,100	1 443	15	42
		6			2 164	28	50			2 164	29	51			2 164	33	53
		8			2 886	50	58			2 886	51	58			2 886	59	60
		10			3 607	77	64			3 607	79	64			3 607	93	66
	200	4	0,202	0,134	1 924	12	41	0,210	0,134	1 924	13	41	0,220	0,134	1 924	15	43
		6			2 886	28	52			2 886	29	52			2 886	33	54
		8			3 848	50	59			3 848	51	59			3 848	59	61
		10			4 810	77	65			4 810	79	65			4 810	93	67
	250	4	0,253	0,167	2 405	12	42	0,263	0,167	2 405	13	42	0,275	0,167	2 405	15	44
		6			3 607	28	53			3 607	29	53			3 607	33	55
		8			4 810	50	60			4 810	51	60			4 810	59	62
		10			6 012	77	66			6 012	79	66			6 012	93	68
	300	4	0,303	0,200	2 886	12	43	0,315	0,200	2 886	13	43	0,330	0,200	2 886	15	45
		6			4 329	28	53			4 329	29	54			4 329	33	56
		8			5 772	50	61			5 772	51	61			5 772	59	63
		10			7 214	77	67			7 214	79	67			7 214	93	69
	350	4	0,354	0,234	3 367	12	43	0,368	0,234	3 367	13	44	0,385	0,234	3 367	15	46
		6			5 050	28	54			5 050	29	54			5 050	33	56
		8			6 733	50	62			6 733	51	62			6 733	59	64
		10			8 417	77	67			8 417	79	68			8 417	93	70
	400	4	0,404	0,267	3 848	12	44	0,420	0,267	3 848	13	44	0,440	0,267	3 848	15	46
		6			5 772	28	55			5 772	29	55			5 772	33	57
		8			7 695	50	62			7 695	51	62			7 695	59	64
		10			9 619	77	68			9 619	79	68			9 619	93	70
	450	4	0,455	0,301	4 329	12	45	0,473	0,301	4 329	13	45	0,495	0,301	4 329	15	47
		6			6 493	28	55			6 493	29	55			6 493	33	57
		8			8 657	50	63			8 657	51	63			8 657	59	65
		10			10 822	77	68			10 822	79	69			10 822	93	71
	500	4	0,505	0,334	4 810	12	45	0,525	0,334	4 810	13	45	0,550	0,334	4 810	15	47
		6			7 214	28	56			7 214	29	56			7 214	33	58
		8			9 619	50	63			9 619	51	63			9 619	59	65
		10			12 024	77	69			12 024	79	69			12 024	93	71
	550	4	0,556	0,367	5 291	12	45	0,578	0,367	5 291	13	46	0,605	0,367	5 291	15	48
		6			7 936	28	56			7 936	29	56			7 936	33	58
		8			10 581	50	63			10 581	51	64			10 581	59	66
		10			13 226	77	69			13 226	79	70			13 226	93	72
	600	4	0,606	0,401	5 772	12	46	0,630	0,401	5 772	13	46	0,660	0,401	5 772	15	48
		6			8 657	28	56			8 657	29	57			8 657	33	59
		8			11 543	50	64			11 543	51	64			11 543	59	66
		10			14 429	77	70			14 429	79	70			14 429	93	72
	650	4	0,657	0,434	6 252	12	46	0,683	0,434	6 252	13	46	0,715	0,434	6 252	15	48
		6			9 379	28	57			9 379	29	57			9 379	33	59
		8			12 505	50	64			12 505	51	65			12 505	59	67
		10			15 631	77	70			15 631	79	70			15 631	93	72
700	4	0,707	0,468	6 733	12	46	0,735	0,468	6 733	13	47	0,770	0,468	6 733	15	49	
	6			10 100	28	57			10 100	29	57			10 100	33	59	
	8			13 467	50	65			13 467	51	65			13 467	59	67	
	10			16 834	77	70			16 834	79	71			16 834	93	73	
750	4	0,758	0,501	7 214	12	47	0,788	0,501	7 214	13	47	0,825	0,501	7 214	15	49	
	6			10 822	28	57			10 822	29	58			10 822	33	60	
	8			14 429	50	65			14 429	51	65			14 429	59	67	
	10			18 036	77	71			18 036	79	71			18 036	93	73	
800	4	0,808	0,534	7 695	12	47	0,840	0,534	7 695	13	47	0,880	0,534	7 695	15	49	
	6			11 543	28	58			11 543	29	58			11 543	33	60	
	8			15 391	50	65			15 391	51	65			15 391	59	67	
	10			19 238	77	71			19 238	79	71			19 238	93	73	
850	4	0,859	0,568	8 176	12	47	0,893	0,568	8 176	13	48	0,935	0,568	8 176	15	50	
	6			12 264	28	58			12 264	29	58			12 264	33	60	
	8			16 353	50	65			16 353	51	66			16 353	59	68	
	10			20 441	77	71			20 441	79	72			20 441	93	74	
900	4	0,909	0,601	8 657	12	48	0,945	0,601	8 657	13	48	0,990	0,601	8 657	15	50	
	6			12 986	28	58			12 986	29	58			12 986	33	60	
	8			17 315	50	66			17 315	51	66			17 315	59	68	
	10			21 643	77	71			21 643	79	72			21 643	93	74	

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]														
		1130					1200					1250				
	v [m/s]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]	S _k [m ²]	S _e [m ²]	Q [m ³ /h]	d _p [Pa]	L _{WA} [dB]
width B [mm]	4	0.124	0.083	1 190	12	39	0.132	0.083	1 190	13	40	0.138	0.092	1 321	11	37
	6			1 784	27	49			1 784	30	51			1 982	24	48
	8			2 379	49	57			2 379	54	58			2 642	43	55
	10			2 974	76	63			2 974	84	64			3 303	66	61
	4	0.170	0.113	1 622	12	40	0.180	0.113	1 622	13	41	0.188	0.125	1 801	11	39
	6			2 433	27	51			2 433	30	52			2 702	24	49
	8			3 244	49	58			3 244	54	59			3 603	43	57
	10			4 055	76	64			4 055	84	65			4 504	66	63
	4	0.226	0.150	2 163	12	41	0.240	0.150	2 163	13	42	0.250	0.167	2 402	11	39
	6			3 244	27	51			3 244	30	53			3 603	24	50
	8			4 326	49	59			4 326	54	60			4 804	43	57
	10			5 407	76	65			5 407	84	66			6 005	66	63
	4	0.283	0.188	2 704	12	42	0.300	0.188	2 704	13	43	0.313	0.209	3 002	11	40
	6			4 055	27	52			4 055	30	54			4 504	24	51
	8			5 407	49	60			5 407	54	61			6 005	43	58
	10			6 759	76	66			6 759	84	67			7 506	66	64
	4	0.339	0.225	3 244	12	43	0.360	0.225	3 244	13	44	0.375	0.250	3 603	11	41
	6			4 866	27	53			4 866	30	54			5 404	24	51
	8			6 489	49	61			6 489	54	62			7 206	43	59
	10			8 111	76	66			8 111	84	68			9 007	66	65
	4	0.396	0.263	3 785	12	43	0.420	0.263	3 785	13	45	0.438	0.292	4 203	11	41
	6			5 678	27	54			5 678	30	55			6 305	24	52
	8			7 570	49	61			7 570	54	63			8 407	43	60
	10			9 463	76	67			9 463	84	68			10 508	66	65
	4	0.452	0.300	4 326	12	44	0.480	0.300	4 326	13	45	0.500	0.334	4 804	11	42
	6			6 489	27	54			6 489	30	56			7 206	24	53
	8			8 652	49	62			8 652	54	63			9 608	43	60
	10			10 814	76	68			10 814	84	69			12 010	66	66
	4	0.509	0.338	4 866	12	44	0.540	0.338	4 866	13	46	0.563	0.375	5 404	11	43
	6			7 300	27	55			7 300	30	56			8 106	24	53
	8			9 733	49	62			9 733	54	64			10 809	43	61
	10			12 166	76	68			12 166	84	70			13 511	66	66
	4	0.565	0.376	5 407	12	45	0.600	0.376	5 407	13	46	0.625	0.417	6 005	11	43
	6			8 111	27	55			8 111	30	57			9 007	24	54
	8			10 814	49	63			10 814	54	64			12 010	43	61
	10			13 518	76	69			13 518	84	70			15 012	66	67
	4	0.622	0.413	5 948	12	45	0.660	0.413	5 948	13	47	0.688	0.459	6 605	11	43
	6			8 922	27	56			8 922	30	57			9 908	24	54
	8			11 896	49	63			11 896	54	65			13 211	43	62
	10			14 870	76	69			14 870	84	70			16 513	66	67
	4	0.678	0.451	6 489	12	46	0.720	0.451	6 489	13	47	0.750	0.500	7 206	11	44
	6			9 733	27	56			9 733	30	57			10 809	24	54
	8			12 977	49	64			12 977	54	65			14 412	43	62
	10			16 222	76	69			16 222	84	71			18 014	66	68
	4	0.735	0.488	7 029	12	46	0.780	0.488	7 029	13	47	0.813	0.542	7 806	11	44
	6			10 544	27	56			10 544	30	58			11 709	24	55
	8			14 059	49	64			14 059	54	65			15 612	43	62
	10			17 573	76	70			17 573	84	71			19 516	66	68
	4	0.791	0.526	7 570	12	46	0.840	0.526	7 570	13	48	0.875	0.584	8 407	11	44
	6			11 355	27	57			11 355	30	58			12 610	24	55
	8			15 140	49	64			15 140	54	66			16 813	43	63
	10			18 925	76	70			18 925	84	71			21 017	66	68
	4	0.848	0.563	8 111	12	47	0.900	0.563	8 111	13	48	0.938	0.626	9 007	11	45
	6			12 166	27	57			12 166	30	58			13 511	24	55
	8			16 222	49	65			16 222	54	66			18 014	43	63
	10			20 277	76	70			20 277	84	72			22 518	66	69
	4	0.904	0.601	8 652	12	47	0.960	0.601	8 652	13	48	1.000	0.667	9 608	11	45
	6			12 977	27	57			12 977	30	59			14 412	24	56
	8			17 303	49	65			17 303	54	66			19 215	43	63
	10			21 629	76	71			21 629	84	72			24 019	66	69
	4	0.961	0.638	9 192	12	47	1.020	0.638	9 192	13	48	1.063	0.709	10 208	11	45
	6			13 788	27	58			13 788	30	59			15 312	24	56
	8			18 384	49	65			18 384	54	66			20 416	43	63
	10			22 981	76	71			22 981	84	72			25 520	66	69
	4	1.017	0.676	9 733	12	47	1.080	0.676	9 733	13	49	1.125	0.751	10 809	11	46
	6			14 599	27	58			14 599	30	59			16 213	24	56
	8			19 466	49	65			19 466	54	67			21 617	43	64
	10			24 332	76	71			24 332	84	73			27 022	66	69

The mcr WIP PRO/S fire damper selection program is available at www.mercor.com.pl, in the Designer Zone.

11.7 | Estimated weights of mcr WIP PRO/S dampers for rectangular ventilation ducts [kg]

		width B [mm]											
		110	150	200	250	300	350	400	500	600	700	800	900
height H [mm]	270	3	4	5	7	8	9	11	14	16	19	22	25
	300	3	4	6	8	9	11	12	16	19	22	25	29
	400	4	6	8	12	12	15	17	21	25	30	34	38
	500	5	8	10	13	16	18	21	27	32	37	43	48
	600	7	9	12	16	19	22	25	32	38	45	51	58
	700	8	11	15	18	22	26	30	37	45	52	60	68
	800	9	12	17	21	25	30	34	43	51	60	69	77
	900	10	14	19	24	29	34	38	48	58	68	77	87
	1000	11	16	21	27	32	37	43	54	64	75	86	97
	1100	13	17	23	29	35	41	47	59	71	83	95	106
	1250	14	20	27	33	40	47	54	67	81	94	108	128

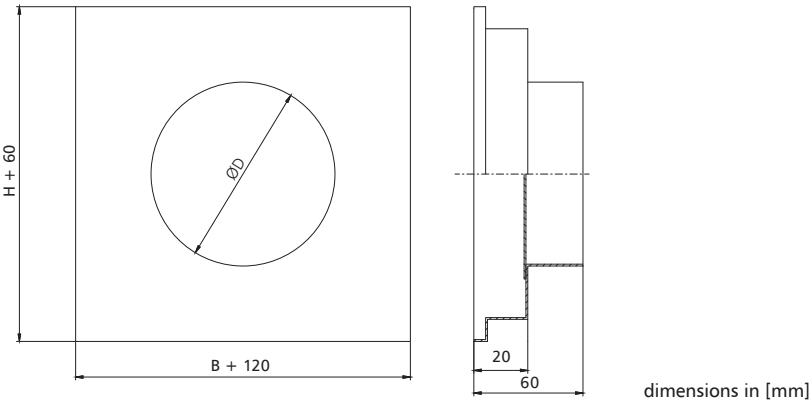
The table shows the weights of dampers with KW1 trigger control mechanisms or actuators.

11.8 | Accessories

11.8.1 | mcr KRP connection stub

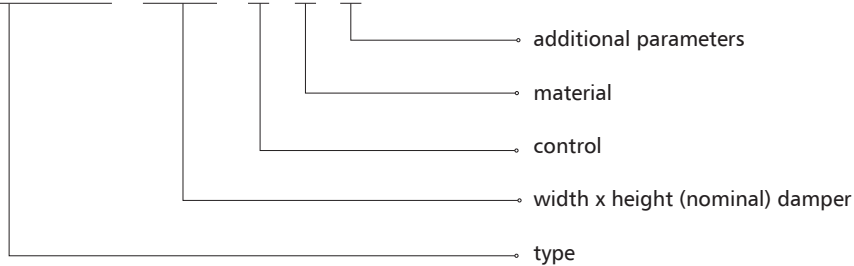
Mcr KRP connection stubs are used to connect a circular ventilation duct to a rectangular damper. The connection is a „bare end“ pipe. The diameter of the stub pipe is 2 mm smaller than the diameter of the ventilation duct.

Dimensions:
 BxH - damper dimensions [mm]
 ØD - diameter of the connection duct [mm]



11.9 | Marking

mcr WIP PRO/S / B x H / 1 / 2 / 3



1 - control:

» KW1 trigger control mechanism

- KW1/S – thermal trigger
- KW1/S/WK2 – thermal trigger + limit switch (open/closed blade signal)
- KW1/24I – thermal trigger + “pulse” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
- KW1/24P – thermal trigger + “break” electromagnetic trigger, U = 24 V DC + limit switch (open/closed blade signal)
- KW1/230I – thermal trigger + “pulse” electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)
- KW1/230P – thermal trigger + “break” electromagnetic trigger, U = 230 V AC + limit switch (open/closed blade signal)

» trigger control mechanism

- BF24-T, BF24-TN – actuator with a return spring, U = 24 V AC/DC
- BF230-T, BF230-TN – actuator with a return spring, U = 230 V AC
- BF24TL-T-ST, BF24TL-TN-ST (with the BKN230-24MP option) – actuator with a return spring, U = 24 V, MP Bus digital control
- BF24-T-ST, BF24-TN-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
- BFL24-T – actuator with a return spring, U = 24 V AC/DC
- BFL230-T – actuator with a return spring, U = 230 V AC
- BFL24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
- BFN24-T – actuator with a return spring, U = 24 V AC/DC
- BFN230-T – actuator with a return spring, U = 230 V AC
- BFN24-T-ST (with the BKN230-24 option) – actuator with a return spring, for the SBS Control system
- MF24T1 – thermal trigger
- MF230T1 – thermal trigger + limit switch (open/closed blade signal)
- MLF24T1 – thermal trigger
- MLF230T1 – thermal trigger + limit switch (open/closed blade signal)
- 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) – thermal trigger for 95°C
- FT.Ex-72 – thermoelectric trigger for 72°C
- FT.Ex-95 – thermoelectric trigger for 95°C

» Damper axis of rotation

- [no symbol] – horizontal axis of rotation
- PP_D – vertical axis of rotation – mechanism at the bottom of the damper
- PP_G – vertical axis of rotation - mechanism at the top of the damper

» Design standard

- [no symbol] – left damper
- KP – right damper
- LC - actuator long casing

» Damper casing

- BU - earth pin

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

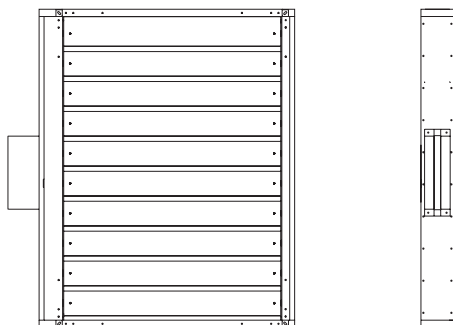
mcr WIP PRO/S 400 x 400 BFL24-T

E1120 louvered cut-off damper with a 24 V actuator with limit switches.

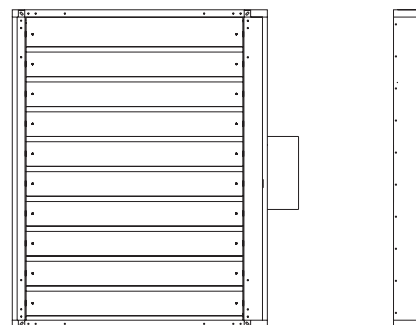
11.9.1 | Design standard

» mcr WIP PRO/S damper with actuator

» left damper standard



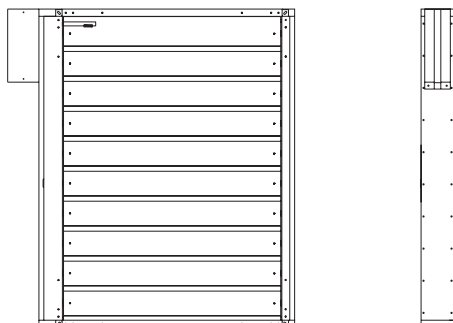
» right damper



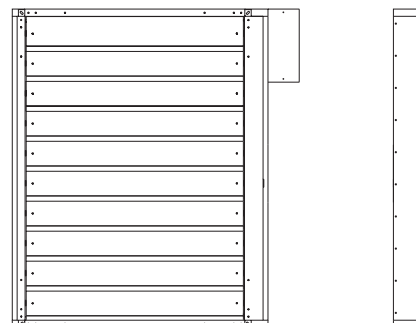
installation in reversed horizontal and vertical position possible

» mcr WIP PRO/S damper with KW1 mechanism

» left damper standard



» right damper



installation in reversed horizontal and vertical position possible

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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www.youtube.com/@mercorlv