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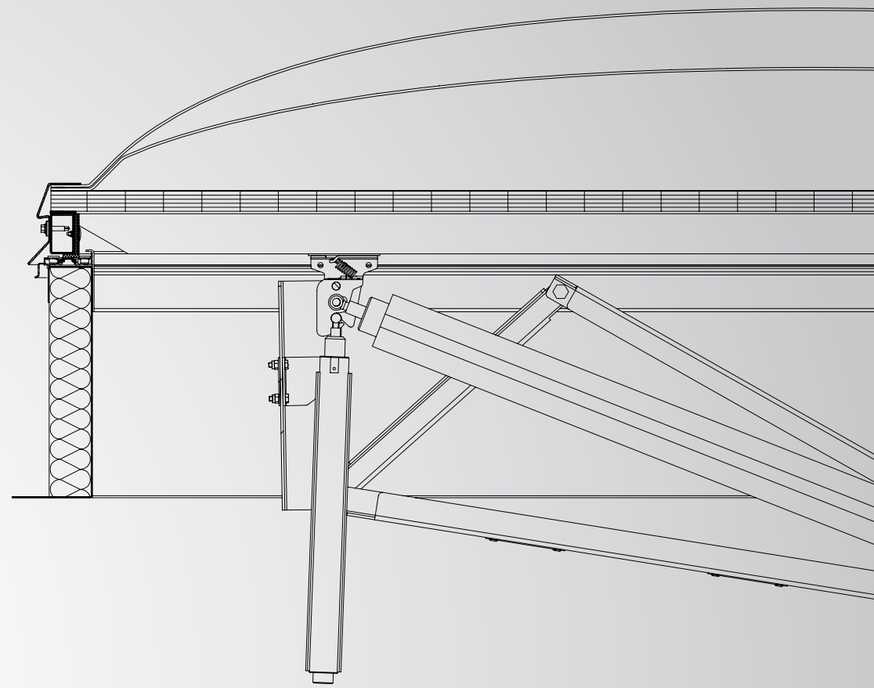

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TECHNICAL CATALOGUE

SMOKE EXHAUST

HEAT REMOVAL AND SKYLIGHT SYSTEMS

Technical Catalogue 2020

Dear Clients,
We are pleased to present to you our technical catalogue for smoke exhaust, heat removal and skylight systems. This publication presents in detail „MERCOR" S.A. products, starting from smoke vents and skylights, through smoke curtains, new generation roof hatches, all the way to the comprehensive review of our control systems. We believe the form in which we present our offer facilitates finding all the necessary information on the individual product series, their components, as well as detailed specifications for the elements of each product offered.

Every merchandise delivered from „MERCOR" S.A. to the Client is meticulously controlled in accordance with the highest quality assurance standards, and undergoes a number of approval tests. We take pride in providing safety through our business.

We invite you to see the full extent of our offer.

„MERCOR" S.A. - Export Department

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SMOKE EXHAUST, HEAT REMOVAL AND SKYLIGHT SYSTEMS

Smoke exhaust, heat removal and skylight systems
Technical Catalogue 2020

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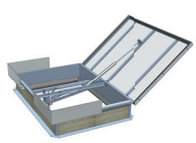
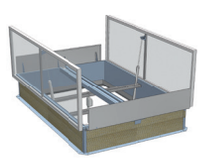
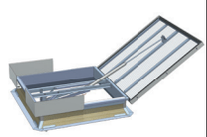
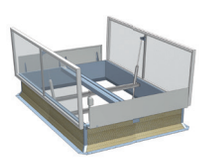
1. smoke vents

Smoke vents are the main element of any natural smoke exhaust system; their purpose is to extract smoke, fire fumes and heat energy from enclosed areas to the outside of the building. They allow to:

- maintain emergency routes in a state of moderate smoke level, permitting effective evacuation,
- carry out rescue operations by locating fire,
- reduce the risk of damaging or destroying the building structure by a sudden decrease in temperature.

	Parameters	C/ E vent	DVP vent	NG-A vent	DVPS vent
					
Type	mcr PROLIGHT	●	●	●	●
Product classification	Certificate of Conformity 1396-CPR-0040 as per EN 12101-2	• **Re300** lub **Re50** – operational reliability during 300/50 cycles of opening and closing to smoke exhaust position, and 10 000 cycles to ventilation position (double function vent), • **WL1500 or WL750** – operational certainty of vents under wind stress equivalent to 1500 Pa or 750 Pa (depending on type, size and accessories), • **T(-25) or T(00)** – resistance of vents to low temperature of -25°C or 0°C, • **B300 or B600** – resistance of vents to high temperature of 300°C or 600°C (depending on type and accessories), • **SL** – operational certainty of vents under snow load N/m²			
Control	pneumatic *(smoke exhaust)*	●	●	●	●
	electric 230V~ *(ventilation)*	●	●	●	●
	electric 24V- *(smoke exhaust + daily ventilation)*	●	●	●	●
	Pneumatic (gas springs) *(smoke exhaust and/or ventilation)*	●	●	-	-
Glazing	multi-chamber polycarbonate panel	●	●	●	●
	acrylic dome(*)	●	-	●	-
	solid polycarbonate dome(*)	●	-	●	-
	ALU sandwich panel(**)	●	●	●	●
	classification BROOF(t1) (***)	●	●	●	●
	multi-chamber polycarbonate panel and envelope cover(*)	●	●	●	●
	multi-chamber polycarbonate panel and single or double -layer acrylic dome or solid polycarbonate dome(*)	●	-	●	-

(*) Applies to selected vent sizes.

(**) ALU sandwich panel: aluminum - thermal insulation - aluminum

(***) BROOF(t1) glazing (multi-chamber polycarbonate of thickness ≥ 10 mm and polyester panel)

1.1. single-leaf smoke vents with straight base - C, E type

1.1.1. technical description of standard

- classification as per Certificate of Conformity in accordance with EN 12101-2 (CE Certificate),
- type C smoke vents (squared) and type E (rectangular) smoke vents for flat and pitched roofs covered with roofing paper or PVC membrane,
- dimensional range of smoke vents:
  - C type (squared): 100x100 cm ÷ 200x200 cm
  - E type (rectangular): 100x120 cm ÷ 200x250 cm
- straight base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness
- bottom part of the base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base has shape enabling water runoff,
- base standard: mcr Prolight: thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m^{2}K, circumferential strip in the upper part of base, made of galvanized steel sheet, used for fixing flashings,
- leaf glazing: multi-chamber polycarbonate panel, acrylic dome, solid polycarbonate dome, sandwich panel, multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome, multi-chamber polycarbonate panel with aluminum envelope cover and glazing of B_{ROOF} (t1) class (details in section 4),
- leaf opening angle ≥ 140°,
- hinges fixing the leaf to base installed at lengthwise side of vent,
- smoke exhaust control: pneumatic, electric 24V-, mechanic,
- ventilation control: electric 230V~,
- optional increased active smoke exhaust area (Aa) through the use of wind deflectors and/or inlet deflector

1.1.2. smoke vent design

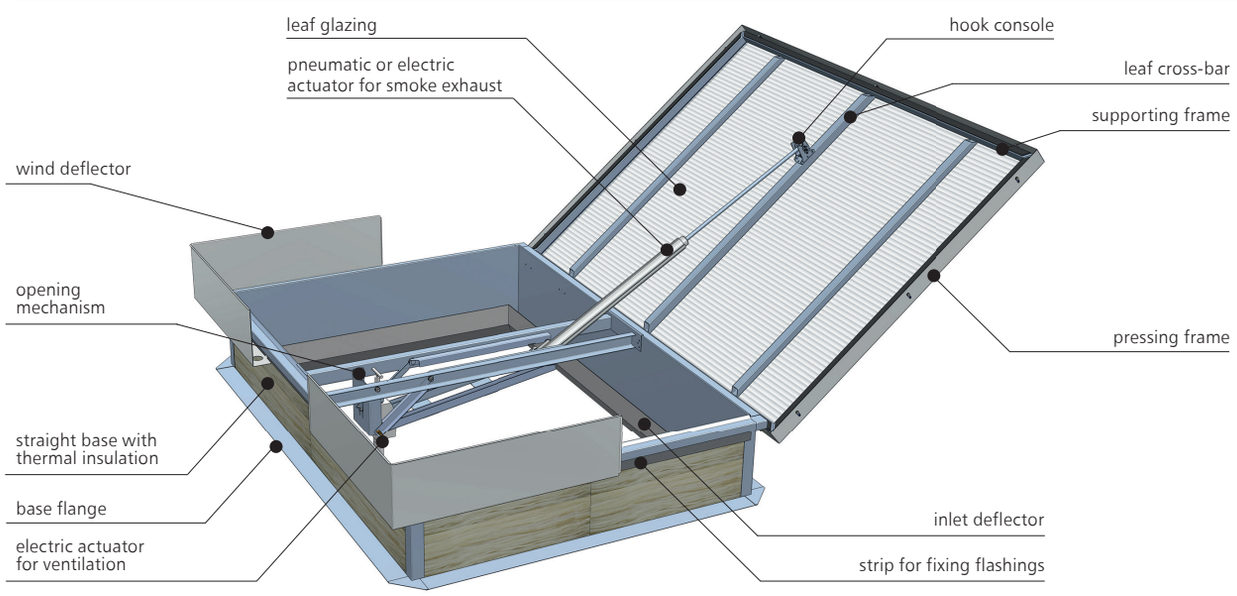


Fig. 1 – Design of mcr PROLIGHT E smoke vent equipped with wind deflectors and inlet deflector, with pneumatic actuator for smoke exhaust and electric actuator for ventilation

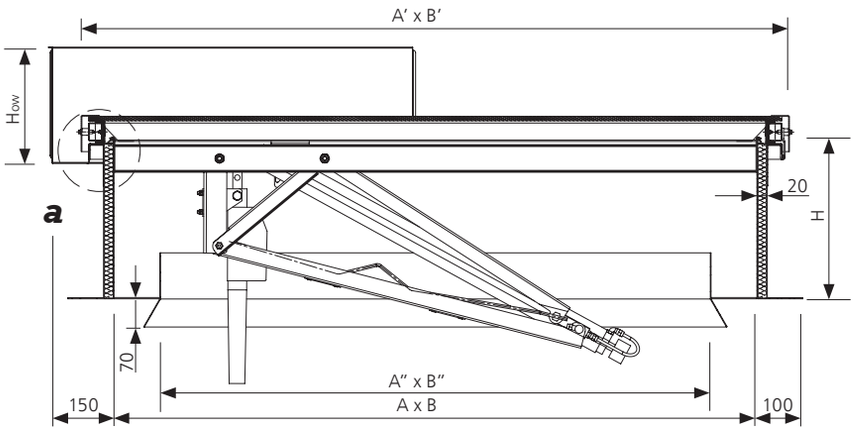
1.1.3. non-standard options

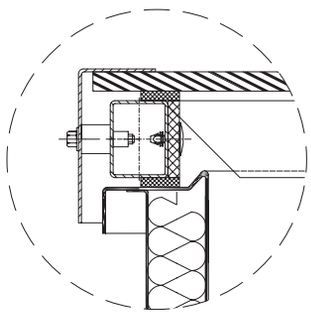
- vent elements painted to any RAL color - applies to wind deflectors, pressing frame, envelope cover, inlet deflector and base,
- thermal insulation of base: PIR panel of 30 mm thickness, heat transfer coefficient U=0.68 W/m^{2}K,
- base made of aluminium sheet of 2,00 mm thickness,
- custom dimensions of clear opening of vent base,
- custom base height within 200 mm(*) ÷ 700 mm,
- custom width of circumferential flange of base,
- circumferential strip for fixing roof flashings made of PVC coated metal sheet,
- base, inlet deflector and opening mechanism made of stainless steel,
- broad range of optional accessories,
- roof access option available.

(*) Base height below 300 mm available only if a plinth is designed for the vent, ensuring total height (vent+plinth) of min. 300 mm..

1.1.4. technical drawings

SMOKE VENT WITH WIND DEFLECTORS AND INLET DEFLECTOR, WITH PNEUMATIC CONTROL FOR SMOKE EXHAUST AND ELECTRIC ACTUATOR FOR VENTILATION





*Detail **a** – mcr PROLIGHT*

*Fig. 2 – Section **B-B** of mcr PROLIGHT C or E smoke vent in closed position, dimensions in [mm]*

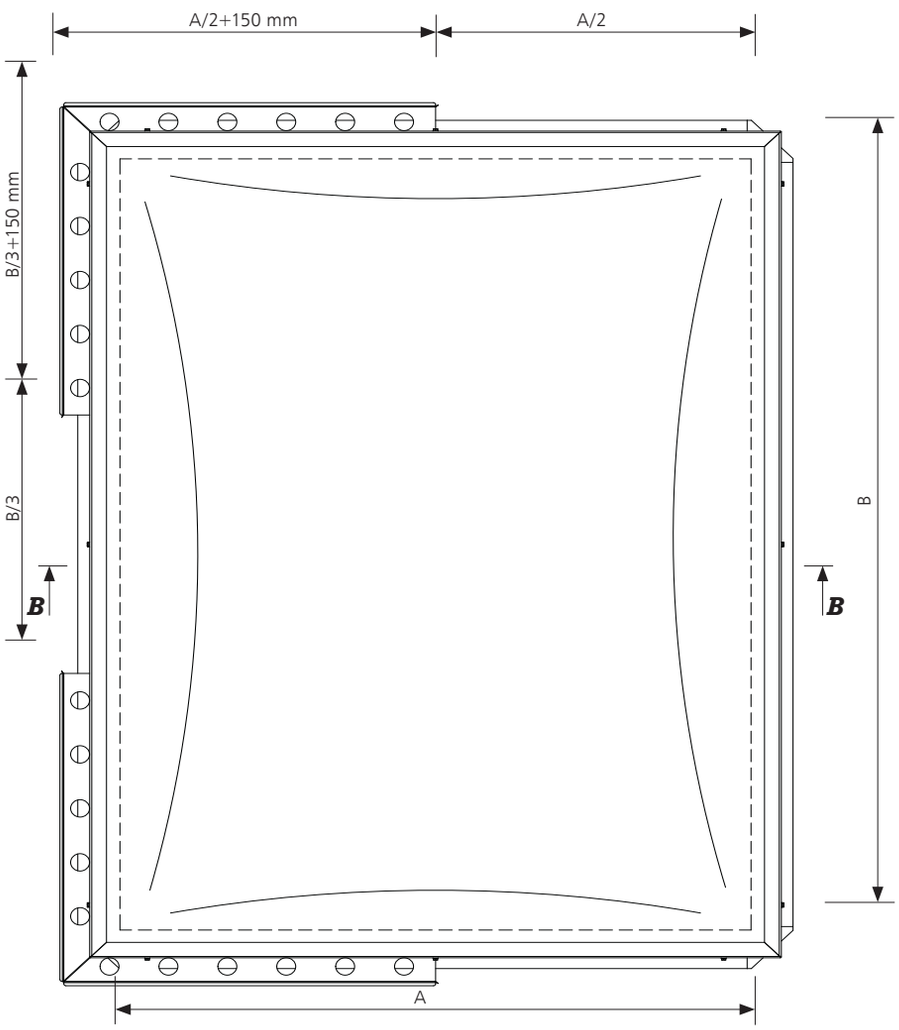


Fig. 3 – Top view of mcr PROLIGHT C or E smoke vent in closed position, dimensions in [mm]

A, B – nominal dimensions [mm], clear opening of smoke vent
A', B' – total dimensions of smoke vent leaf A'=A+135 mm, B'=B+135 mm
A", B" – clear opening of inlet deflector A"=A–200 mm, B"=B–200 mm
H – smoke vent base height [mm]
H_{ow} – wind deflector height 100 mm ≤ How ≤ 450 mm

1.1.5.1. technical details

VENT TYPE	NOMINAL DIMENSIONS(*)	BASE OF MIN. H=500 mm			BASE OF MIN. H=300 mm			ESTIMATED WEIGHT(**)
		ACTIVE AREA A_a [m^2]			ACTIVE AREA A_A [m^2]			
	A x B	STANDARD			STANDARD			
	[mm]	WITHOUT WIND DEFLECTORS AND INLET DEFLECTOR	WITH WIND DEFLECTORS	WITH WIND DEFLECTORS AND INLET DEFLECTOR	WITHOUT WIND DEFLECTORS AND INLET DEFLECTOR	WITH WIND DEFLECTORS	WITH WIND DEFLECTORS AND INLET DEFLECTOR	[kg]
C 100	1000 x 1000	0,72	0,71	0,79	0,64	0,67	0,75	76
C 110	1100 x 1100	0,85	0,85	0,96	0,74	0,80	0,92	82
C 115	1150 x 1150	0,91	0,93	1,04	0,79	0,87	1,01	85
C 120	1200 x 1200	0,98	1,01	1,14	0,85	0,95	1,09	88
C 125	1250 x 1250	1,05	1,09	1,25	0,91	1,03	1,19	91
C 130	1300 x 1300	1,13	1,17	1,35	0,96	1,12	1,28	94
C 135	1350 x 1350	1,20	1,26	1,46	1,04	1,20	1,40	102
C 140	1400 x 1400	1,27	1,35	1,57	1,10	1,27	1,51	105
C 150	1500 x 1500	1,44	1,55	1,80	1,22	1,46	1,73	117
C 155	1550 x 1550	1,51	1,63	1,92	1,30	1,56	1,85	120
C 160	1600 x 1600	1,61	1,74	2,05	1,36	1,66	1,97	124
C 170	1700 x 1700	1,76	1,97	2,34	1,50	1,88	2,23	140
C 180	1800 x 1800	1,94	2,20	2,62	1,65	2,11	2,49	147
C 190	1900 x 1900	2,13	2,45	2,92	1,81	2,35	2,82	154
C 195	1950 x 1950	2,24	2,55	3,08	1,86	2,43	2,97	157
C 200	2000 x 2000	2,32	2,68	3,24	1,96	2,56	3,12	161
E 100/120	1000 x 1200	0,85	0,84	0,95	0,74	0,79	0,91	82
E 100/130	1000 x 1300	0,92	0,91	1,03	0,79	0,86	0,99	85
E 100/140	1000 x 1400	0,98	0,98	1,11	0,85	0,92	1,06	88
E 100/150	1000 x 1500	1,04	1,05	1,19	0,90	0,99	1,14	95
E 100/160	1000 x 1600	1,10	1,12	1,26	0,94	1,06	1,22	98
E 100/180	1000 x 1800	1,22	1,24	1,44	1,03	1,19	1,37	104
E 100/190	1000 x 1900	1,27	1,31	1,52	1,08	1,25	1,44	107
E 100/200	1000 x 2000	1,34	1,38	1,60	1,12	1,32	1,54	110
E 100/210	1000 x 2100	1,40	1,45	1,68	1,16	1,39	1,62	113
E 100/220	1000 x 2200	1,45	1,52	1,76	1,19	1,45	1,69	116
E 100/230	1000 x 2300	1,50	1,59	1,84	1,22	1,50	1,77	119
E 100/240	1000 x 2400	1,56	1,66	1,92	1,27	1,56	1,85	122
E 100/250	1000 x 2500	1,63	1,73	2,00	1,30	1,63	1,93	125
E 110/200	1100 x 2000	1,45	1,52	1,76	1,21	1,43	1,69	114
E 115/200	1150 x 2000	1,50	1,59	1,84	1,24	1,50	1,77	116
E 120/140	1200 x 1400	1,13	1,16	1,34	0,97	1,11	1,28	94
E 120/150	1200 x 1500	1,21	1,24	1,44	1,03	1,19	1,39	102
E 120/170	1200 x 1700	1,35	1,41	1,63	1,14	1,33	1,57	108
E 120/180	1200 x 1800	1,43	1,49	1,73	1,19	1,40	1,66	111
E 120/200	1200 x 2000	1,56	1,66	1,92	1,30	1,56	1,85	117
E 120/210	1200 x 2100	1,63	1,71	2,02	1,34	1,64	1,94	120
E 120/220	1200 x 2200	1,69	1,80	2,11	1,40	1,72	2,03	123
E 120/240	1200 x 2400	1,81	1,96	2,30	1,47	1,87	2,22	130
E 120/250	1200 x 2500	1,89	2,04	2,40	1,53	1,95	2,31	133
E 125/250	1250 x 2500	1,94	2,13	2,50	1,56	2,03	2,41	134
E 130/150	1300 x 1500	1,29	1,35	1,56	1,09	1,27	1,50	105
E 130/160	1300 x 1600	1,35	1,44	1,66	1,16	1,35	1,60	108
E 130/180	1300 x 1800	1,52	1,61	1,87	1,26	1,52	1,80	180
E 130/190	1300 x 1900	1,58	1,68	1,98	1,33	1,61	1,90	117
E 130/200	1300 x 2000	1,66	1,77	2,08	1,38	1,69	2,00	121
E 130/220	1300 x 2200	1,80	1,94	2,29	1,49	1,86	2,20	127
E 130/230	1300 x 2300	1,88	2,03	2,39	1,52	1,94	2,30	130
E 130/250	1300 x 2500	2,02	2,21	2,60	1,63	2,11	2,50	136

1.1.5.1. technical details - mcr PROLIGHT

VENT TYPE	NOMINAL DIMENSIONS(*)	BASE OF MIN. H=500 mm			BASE OF MIN. H=300 mm			ESTIMATED WEIGHT(**)
		ACTIVE AREA A_a [m^2]			ACTIVE AREA A_a [m^2]			
	A x B	STANDARD			STANDARD			
	[mm]	WITHOUT WIND DEFLECTORS AND INLET DEFLECTOR	WITH WIND DEFLECTORS	WITH WIND DEFLECTORS AND INLET DEFLECTOR	WITHOUT WIND DEFLECTORS AND INLET DEFLECTOR	WITH WIND DEFLECTORS	WITH WIND DEFLECTORS AND INLET DEFLECTOR	[kg]
E 140/150	1400 x 1500	1,37	1,45	1,68	1,16	1,37	1,62	114
E 140/180	1400 x 1800	1,61	1,71	2,02	1,36	1,64	1,94	123
E 140/200	1400 x 2000	1,76	1,90	2,24	1,46	1,82	2,16	130
E 140/250	1400 x 2500	2,14	2,38	2,80	1,75	2,28	2,70	145
E 150/160	1500 x 1600	1,51	1,63	1,92	1,30	1,56	1,85	120
E 150/180	1500 x 1800	1,70	1,84	2,16	1,43	1,76	2,08	126
E 150/200	1500 x 2000	1,86	2,04	2,43	1,56	1,95	2,31	133
E 150/210	1500 x 2100	1,95	2,14	2,55	1,61	2,05	2,43	136
E 150/240	1500 x 2400	2,20	2,45	2,88	1,80	2,34	2,77	146
E 150/250	1500 x 2500	2,25	2,55	3,00	1,84	2,44	2,89	149
E 160/180	1600 x 1800	1,79	1,96	2,33	1,50	1,87	2,22	130
E 160/190	1600 x 1900	1,88	2,07	2,46	1,58	1,98	2,34	133
E 160/200	1600 x 2000	1,95	2,18	2,59	1,63	2,08	2,46	137
E 160/220	1600 x 2200	2,15	2,39	2,85	1,76	2,29	2,75	143
E 160/230	1600 x 2300	2,21	2,50	2,98	1,84	2,39	2,87	146
E 160/240	1600 x 2400	2,30	2,61	3,11	1,88	2,50	3,00	149
E 180/200	1800 x 2000	2,16	2,45	2,92	1,80	2,34	2,81	154
E 180/220	1800 x 2200	2,34	2,65	3,21	1,94	2,53	3,09	160
E 180/240	1800 x 2400	2,55	2,89	3,50	2,07	2,76	3,37	167
E 180/250	1800 x 2500	2,61	3,02	3,65	2,16	2,88	3,51	170
E 190/200	1900 x 2000	2,24	2,55	3,08	1,86	2,43	2,96	158
E 195/200	1950 x 2000	2,30	2,61	3,16	1,91	2,50	3,04	159
E 195/220	1950 x 2200	2,49	2,87	3,47	2,06	2,75	3,35	166
E 195/250	1950 x 2500	2,78	3,27	3,95	2,29	3,12	3,80	176
E 200/250	2000 x 2500	2,85	3,35	4,05	2,35	3,20	3,90	177

(*) Intermediate smoke vent dimensions between the values specified in the table are possible. The size of active smoke exhaust area for those dimensions is determined through linear interpolation method

(**) Estimated weight specified for smoke vent of base height 500 mm, of standard configuration with multi-chamber polycarbonate panel glazing of 16 mm thickness, with pneumatic control.

1.1.6. smoke vents control

For correct operation, smoke vents as well as smoke exhaust & ventilation vents require connecting to devices controlling their opening and closing. A set of such devices constitutes a system for smoke exhaust control or smoke exhaust and ventilation control.
Depending on the type of devices used, it may be designed as a:

- pneumatic smoke exhaust control system,
- 24V electric smoke exhaust control system with ventilation function,
- pneumatic and electric control system; the pneumatic part is responsible for smoke exhaust, while the 230V~ electric part - for ventilation.

Smoke exhaust control systems are activated as follows:

1) automatic – through a thermo switch installed in the vent (pneumatic system), or by optical smoke sensors (electric system),
2) manual – by a release of CO_2 cartridges in alarm box (pneumatic system), or by operation of RPO emergency pushbutton (electric system),
3) FAS signal – by external impulse from fire alarm system (FAS) sent to an electromagnet installed in the alarm box (pneumatic system), or directly to smoke exhaust control unit (electric system).

Control system elements are described in section 13.

1.1.6.1. smoke vents control

VENT TYPE	PNEUMATIC CONTROL(*)			ELECTRIC CONTROL(**)	
	PNEUMATIC ACTUATOR		MIN. CO_2 CARTRIDGE CAPACITY – SL 950 [g]	POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR FOR CLASS	
	STROKE [mm]	DIAMETER [mm]		SL 250	SL 550
C 100	550	50	24	1,6	2,6
C 110	550	50	24	1,6	2,6
C 115	550	50	24	1,6	4,0
C 120	550	50	40	2,0	4,0
C 125	550	50	40	2,0	4,0
C 130	550	50	40	2,6	4,0
C 135	750	50	40	2,6	6,0
C 140	750	50	40	2,6	6,0
C 150	750	50	55	4,0	6,0
C 155	750	50	55	4,0	6,0
C 160	750	50	55	6,0	-
C 170	1050	63	55	6,0	-
C 180	1050	63	120	6,0	-
C 190	1050	63	120	8,0	-
C 195	1050	63	120	8,0	-
C 200	1050	63	120	8,0	-
E 100/120	550	50	24	1,6	2,6
E 100/130	550	50	24	1,6	2,6
E 100/140	550	50	24	1,6	2,6
E 100/150	550	50	24	1,6	4,0
E 100/160	550	50	40	2,0	4,0
E 100/180	550	50	40	2,0	4,0
E 100/190	550	50	40	2,0	4,0
E 100/200	550	50	40	2,0	4,0
E 100/210	550	50	40	2,6	4,0
E 100/220	550	50	40	2,6	4,0
E 100/230	550	50	40	2,6	6,0
E 100/240	550	50	40	2,6	6,0
E 100/250	550	50	40	2,6	6,0

(*) Pneumatic control available in classes: SL 250, SL 550, SL 750, SL 1300, SL 1600 and SL 2000 at special request (applies to selected vent sizes).

(**) Electric control available in classes: SL 750, SL 950, SL 1300 and SL 1600 at special request (applies to selected vent sizes). Power consumption specified in the table applies to smoke vent with multi-chamber polycarbonate glazing.

1.1.6.1. smoke vents control

VENT TYPE	PNEUMATIC CONTROL(*)			ELECTRIC CONTROL(**)	
	PNEUMATIC ACTUATOR		MIN. CO_2 CARTRIDGE CAPACITY – SL 950 [g]	POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR FOR CLASS	
	STROKE [mm]	DIAMETER [mm]		SL 250	SL 550
E 115/200	550	50	40	2,6	6,0
E 120/140	550	50	40	2,0	4,0
E 120/150	550	50	40	2,6	4,0
E 120/170	550	50	40	2,6	6,0
E 120/180	550	50	40	2,6	6,0
E 120/200	550	50	40	2,6	6,0
E 120/210	550	50	55	4,0	6,0
E 120/220	550	50	55	4,0	6,0
E 120/240	550	50	55	4,0	6,0
E 120/250	550	50	55	4,0	6,0
E 125/250	550	50	55	4,0	8,0
E 130/150	550	50	40	2,6	6,0
E 130/160	550	50	40	2,6	6,0
E 130/180	550	50	55	4,0	6,0
E 130/190	550	50	55	4,0	6,0
E 130/200	550	50	55	4,0	6,0
E 130/220	550	50	55	4,0	6,0
E 130/230	550	50	55	4,0	8,0
E 130/250	550	50	80	4,0	8,0
E 140/150	750	50	40	2,6	6,0
E 140/180	750	50	55	4,0	6,0
E 140/200	750	50	55	4,0	8,0
E 140/250	750	50	80	6,0	8,0
E 150/160	750	50	55	4,0	8,0
E 150/180	750	50	55	4,0	8,0
E 150/200	750	50	80	6,0	8,0
E 150/210	750	50	80	6,0	8,0
E 150/240	750	50	80	6,0	8,0
E 150/250	750	50	80	6,0	-
E 160/180	750	50	80	6,0	-
E 160/190	750	50	80	6,0	-
E 160/200	750	50	80	6,0	-
E 160/220	750	50	80	6,0	-
E 160/230	750	50	80	6,0	-
E 160/240	750	50	80	6,0	-
E 180/200	1050	63	120	6,0	-
E 180/220	1050	63	120	8,0	-
E 180/240	1050	63	120	8,0	-
E 180/250	1050	63	120	8,0	-
E 190/200	1050	63	120	8,0	-
E 195/200	1050	63	120	8,0	-
E 195/220	1050	63	120	8,0	-
E 195/250	1050	63	120	-	-
E 200/250	1050	63	120	-	-

(*) Pneumatic control available in classes: SL 250, SL 550, SL 750, SL 1300, SL 1600 and SL 2000 at special request (applies to selected vent sizes).

(**) Electric control available in classes: SL 750, SL 950, SL 1300 and SL 1600 at special request (applies to selected vent sizes). Power consumption specified in the table applies to smoke vent with multi-chamber polycarbonate glazing.

1.2. double-leaf smoke vents with straight base - DVP type

1.2.1. technical description of standard

- classification as per Certificate of Conformity in accordance with EN 12101-2 (CE Certificate),
- type DVP smoke vents (double-leaf) for flat and pitched roofs covered with roofing paper or PVC membrane,
- dimensional range of smoke vents:
  - 120x250 cm ÷ 300x300 cm
- straight base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness
- bottom part of the base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base has shape enabling water runoff,
- thermal insulation of base and water trough made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41W/m^{2}K,
- circumferential strip in the upper part of base, made of galvanized steel sheet, used for fixing roof work,
- leaf glazing: multi-chamber polycarbonate panel, sandwich panel, multi-chamber polycarbonate panel with aluminum envelope cover and glazing with B_{ROOF} (t1) classification (details in section 4),
- leaf opening angle ≥ 90°,
- hinges fixing the leaf to base installed at lengthwise side of vent,
- smoke exhaust control: pneumatic, electric 24V-, oleoneumatic,
- ventilation control: electric 230V~,
- optional increased active smoke exhaust area (Aa) through the use of wind deflectors and/or inlet deflector.

1.2.2. smoke vent design

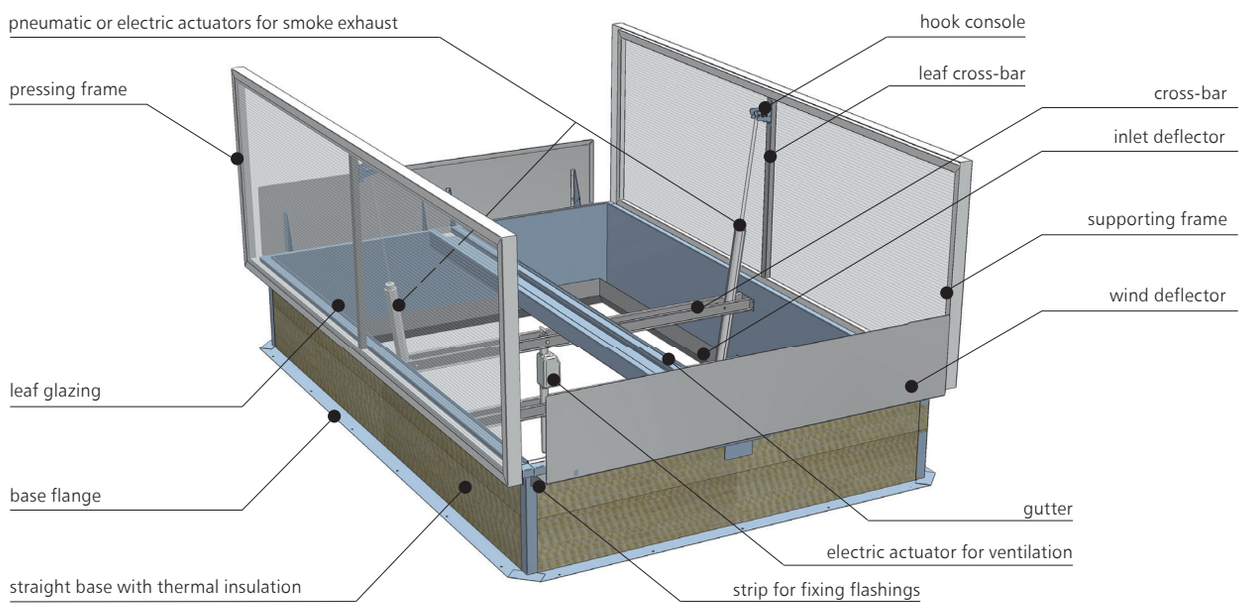


Fig. 4 – Design of mcr PROLIGHT DVP smoke vent equipped with wind deflectors and inlet deflector, with pneumatic actuators for smoke exhaust and electric actuator for ventilation

1.2.3. non-standard options

- vent elements painted to any RAL color - applies to wind deflectors, inlet deflector and base - powder coating up to 1800x3000 [mm] dimensions,
- thermal insulation of base made of PIR panel of 30 mm thickness, heat transfer coefficient U=0.68 W/m^{2}K,
- base made of aluminium sheet of 2,00 mm thickness,
- custom dimensions of clear opening of vent base,
- custom base height within 200 mm(*) ÷ 700 mm,
- custom width of circumferential flange of base,
- circumferential strip for fixing roof flashings made of PVC coated metal sheet,
- base, inlet deflector and cross-bar in stainless steel,
- broad range of optional accessories.

(*) Base height below 300 mm available only if a plinth is designed for the vent, ensuring total height (vent+plinth) of min. 300 mm.

1.2.4. technical drawings

SMOKE VENT WITH WIND DEFLECTORS AND INLET DEFLECTOR, WITH PNEUMATIC CONTROL(FOR SMOKE EXHAUST AND ELECTRIC ACTUATOR FOR VENTILATION

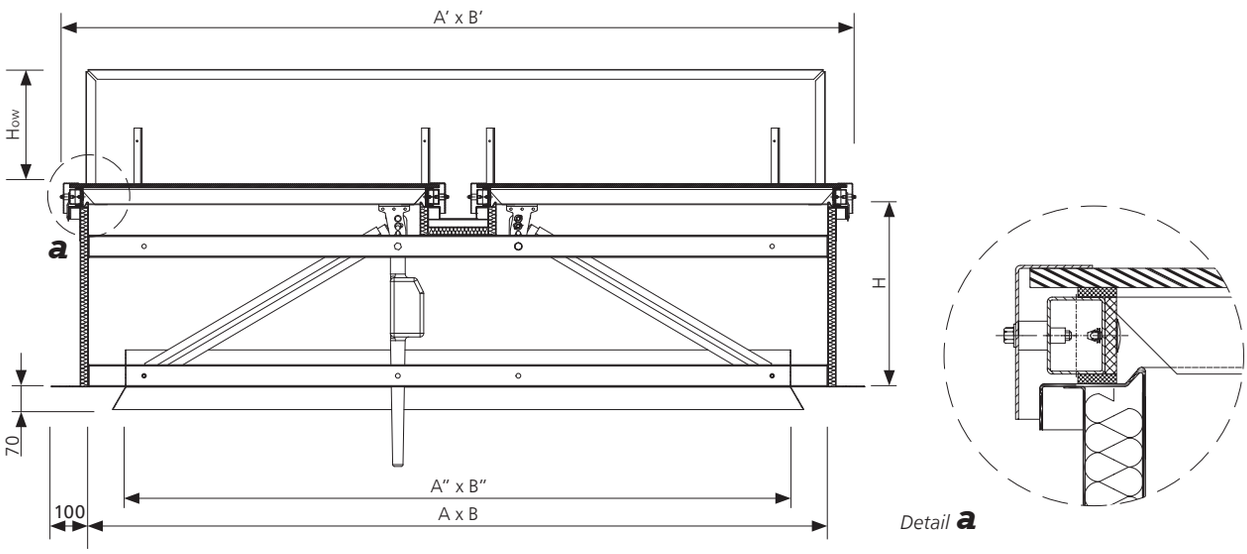


*Fig. 5 – Section **B-B** of mcr PROLIGHT DVP smoke vent in closed position, dimensions in [mm]*

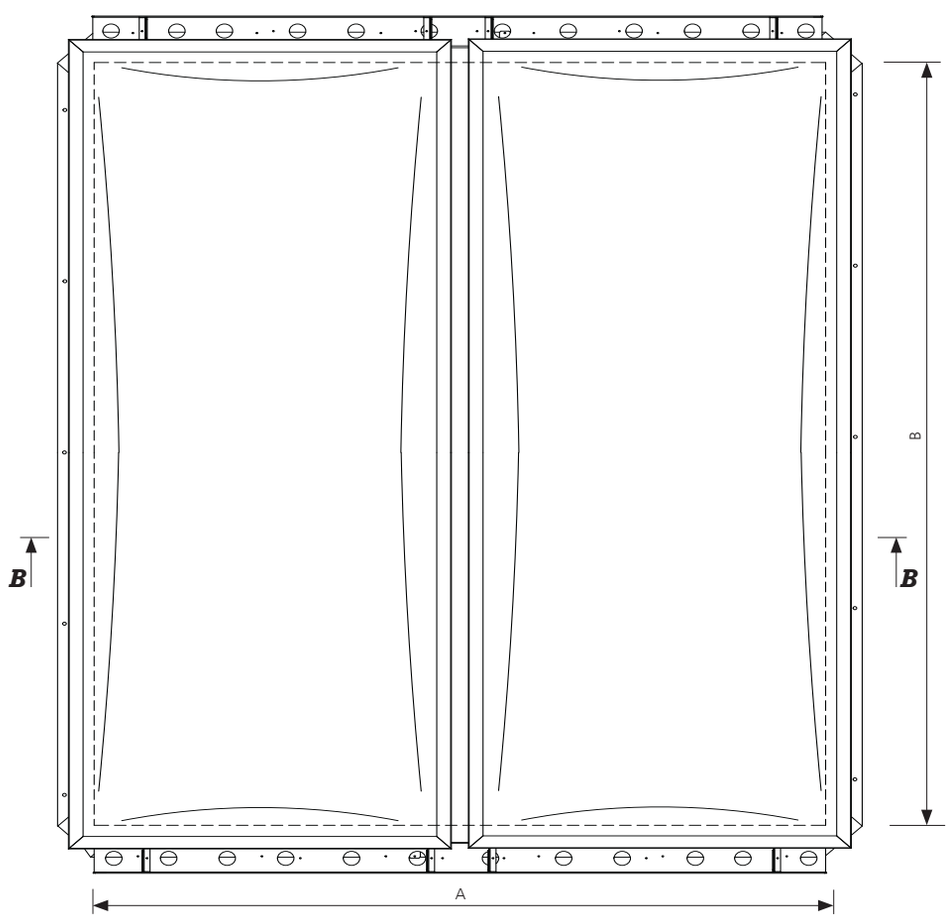


Fig. 6 – Top view of mcr PROLIGHT DVP smoke vent in closed position, dimensions in [mm]

A, B – nominal dimensions [mm], clear opening of smoke vent
A', B' – total dimensions of smoke vent leaf A'=A+135 mm, B'=B+135 mm
A", B" – clear opening of inlet deflector A"=A–100 mm, B"=B–100 mm
H – smoke vent base height [mm]
H_{ow} – wind deflector height 100 mm ≤ How ≤ 370 mm

1.2.5. technical details

VENT TYPE	NOMINAL DIMENSIONS(*)	BASE OF MIN. H=500 mm			BASE OF MIN. H=300 mm			ESTIMATED WEIGHT(**)
		ACTIVE AREA A_a [m^2]			ACTIVE AREA A_a [m^2]			
	A x B	STANDARD			STANDARD			
	[mm]	WITHOUT WIND DEFLECTORS AND INLET DEFLECTOR	WITH WIND DEFLEC-TORS	WITH WIND DEFLECTORS AND INLET DEFLECTOR	WITHOUT WIND DE-FLECTORS AND INLET DEFLECTOR	WITH WIND DEFLEC-TORS	WITH WIND DEFLECTORS AND INLET DEFLECTOR	[kg]
DVP 120/250	1200 x 2500	1,89	1,89	2,04	1,62	1,83	2,07	159
DVP 120/300	1200 x 3000	2,30	2,30	2,45	1,98	2,20	2,48	181
DVP 150/250	1500 x 2500	2,21	2,44	2,63	1,84	2,33	2,63	170
DVP 150/300	1500 x 3000	2,66	2,93	3,15	2,25	2,79	3,15	193
DVP 160/160	1600 x 1600	1,51	1,61	1,74	1,28	1,56	1,74	135
DVP 160/250	1600 x 2500	2,28	2,60	2,80	1,92	2,48	2,80	176
DVP 160/280	1600 x 2800	2,55	2,91	3,14	2,15	2,82	3,14	189
DVP 160/300	1600 x 3000	2,74	3,17	3,41	2,30	3,02	3,41	198
DVP 180/160	1800 x 1600	1,64	1,84	1,96	1,38	1,76	1,99	144
DVP 180/180	1800 x 1800	1,85	2,07	2,24	1,52	2,01	2,24	153
DVP 180/250	1800 x 2500	2,48	2,97	3,20	2,07	2,84	3,20	185
DVP 180/280	1800 x 2800	2,77	3,33	3,58	2,32	3,18	3,58	199
DVP 180/300	1800 x 3000	2,97	3,56	3,83	2,48	3,40	3,83	208
DVP 200/200	2000 x 2000	2,16	2,60	2,80	1,80	2,48	2,80	169
DVP 200/240	2000 x 2400	2,59	3,17	3,41	2,16	3,02	3,41	188
DVP 200/250	2000 x 2500	2,70	3,30	3,55	2,25	3,15	3,55	193
DVP 200/280	2000 x 2800	3,02	3,70	4,03	2,52	3,53	3,98	207
DVP 200/300	2000 x 3000	3,18	3,96	4,32	2,70	3,78	4,32	216
DVP 220/220	2200 x 2200	2,57	3,19	3,44	2,13	3,05	3,44	189
DVP 220/240	2200 x 2400	2,75	3,48	3,80	2,32	3,33	3,75	199
DVP 220/250	2200 x 2500	2,86	3,63	3,96	2,37	3,47	3,91	203
DVP 240/240	2400 x 2400	2,94	3,80	4,15	2,42	3,63	4,15	206
DVP 240/250	2400 x 2500	3,06	4,02	4,32	2,52	3,84	4,32	211
DVP 250/250	2500 x 2500	3,19	4,19	4,50	2,63	4,00	4,50	217
DVP 250/300	2500 x 3000	3,75	5,03	5,48	3,15	4,80	5,40	240
DVP 300/300	3000 x 3000	4,32	6,12	6,66	3,60	5,85	6,57	264

(*) Intermediate smoke vent dimensions between the values specified in the table are possible. The size of active smoke exhaust area for those dimensions is determined through linear interpolation method.

(**) Estimated weight specified for smoke vent of base height 500 mm, of standard configuration with multi-chamber polycarbonate panel glazing of 16 mm thickness, with pneumatic control.

1.2.6. smoke vents control

For correct operation, smoke vents as well as smoke exhaust & ventilation vents require connecting to devices controlling their opening and closing. A set of such devices constitutes a system for smoke exhaust control or smoke exhaust and ventilation control. Depending on the type of devices used, it may be designed as a:

- pneumatic smoke exhaust control system,
- 24V electric smoke exhaust control system with ventilation function,
- pneumatic and electric control system; the pneumatic part is responsible for smoke exhaust, while the 230V~ electric part - for ventilation.

Smoke exhaust control systems are activated as follows:

1) automatic – through a Thermo switch installed in the vent (pneumatic system), or by optical smoke sensors (electric system),
2) manual – by a release of CO_2 cartridges in alarm box (pneumatic system), or by operation of RPO emergency pushbutton (electric system),
3) FAS signal – by external impulse from fire alarm system (FAS) sent to an electromagnet installed in the alarm box (pneumatic system), or directly to smoke exhaust control unit (electric system).

Control system elements are described in section 13.

TYP KLAPY	PNEUMATIC CONTROL(*)			ELECTRIC CONTROL(**)	
	PNEUMATIC ACTUATOR		MIN. CO_2 CARTRIDGE CAPACITY – SL 950 [g]	POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR FOR CLASS	
	STROKE [mm]	DIAMETER [mm]		SL 250	SL 550
DVP 120/250	350	40	24	2 x 0,8	2 x 1,3
DVP 120/300	350	40	38	2 x 1,0	2 x 1,6
DVP 150/250	350	40	38	2 x 1,0	2 x 2,0
DVP 150/300	350	40	40	2 x 1,3	2 x 2,0
DVP 160/160	400	40	38	2 x 1,0	2 x 1,6
DVP 160/250	400	40	40	2 x 1,3	2 x 2,6
DVP 160/280	400	50/40	55	2 x 1,3	2 x 2,6
DVP 160/300	400	50/40	55	2 x 1,3	2 x 2,6
DVP 180/160	400	40	38	2 x 1,6	2 x 2,0
DVP 180/180	400	40	38	2 x 1,6	2 x 2,0
DVP 180/250	400	50/40	55	2 x 1,6	2 x 2,6
DVP 180/280	400	50/40	55	2 x 1,6	2 x 2,6
DVP 180/300	400	50	55	2 x 1,6	2 x 4,0
DVP 200/200	500	40	55	2 x 1,6	2 x 2,6
DVP 200/240	500	50/40	55	2 x 1,6	2 x 4,0
DVP 200/250	500	50/40	55	2 x 2,0	2 x 4,0
DVP 200/280	500	50/40	80	2 x 2,0	2 x 4,0
DVP 200/300	500	50/40	80	2 x 2,0	2 x 4,0
DVP 220/220	500	50	80	2 x 2,0	2 x 4,0
DVP 220/240	500	50	55	2 x 2,0	2 x 6,0
DVP 220/250	500	50	80	2 x 2,0	2 x 6,0
DVP 240/240	600	50	80	2 x 2,6	2 x 6,0
DVP 240/250	600	50	80	2 x 2,6	2 x 6,0
DVP 250/250	600	50	120	2 x 4,0	2 x 6,0
DVP 250/300	600	50	120	2 x 4,0	2 x 8,0
DVP 300/300	750	63/50	150	2 x 6,0	2 x 8,0

(*) Pneumatic control available in classes: SL 250, SL 550, SL 750, Sl 950 and SL 1300 at special request (applies to selected vent sizes).

(**) Selectric control available in classes: SL 750, SL 950, SL 1300, SL 1600 and SL 2000 at special request (applies to selected vent sizes). Power consumption specified in the table applies to smoke vent with multi-chamber polycarbonate glazing.

1.3. single-leaf smoke vents with skew base - NG-A type

1.3.1. technical description of standard

- classification as per Certificate of Conformity in accordance with EN 12101-2 (CE Certificate),
- NG-A type (squared and rectangular) smoke vents for flat and pitched roofs covered with roofing paper or PVC membrane,
- skew base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness
- bottom part of the base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base has shape enabling water runoff,
- base standard: mcr Prolight: thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m^{2}K, circumferential strip in the upper part of base, made of galvanized steel sheet, used for fixing flashings,
- leaf glazing: multi-chamber polycarbonate panel, acrylic dome, solid polycarbonate dome, sandwich panel, multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome, multi-chamber polycarbonate panel, envelope cover and glazing of B_{ROOF} (t1) class (details in section 4),
- leaf opening angle ≥ 140°,
- hinges fixing the leaf to base installed at lengthwise side of vent,
- smoke exhaust control: pneumatic, electric 24V-,
- ventilation control: electric 230V~,

1.3.2. smoke vent design

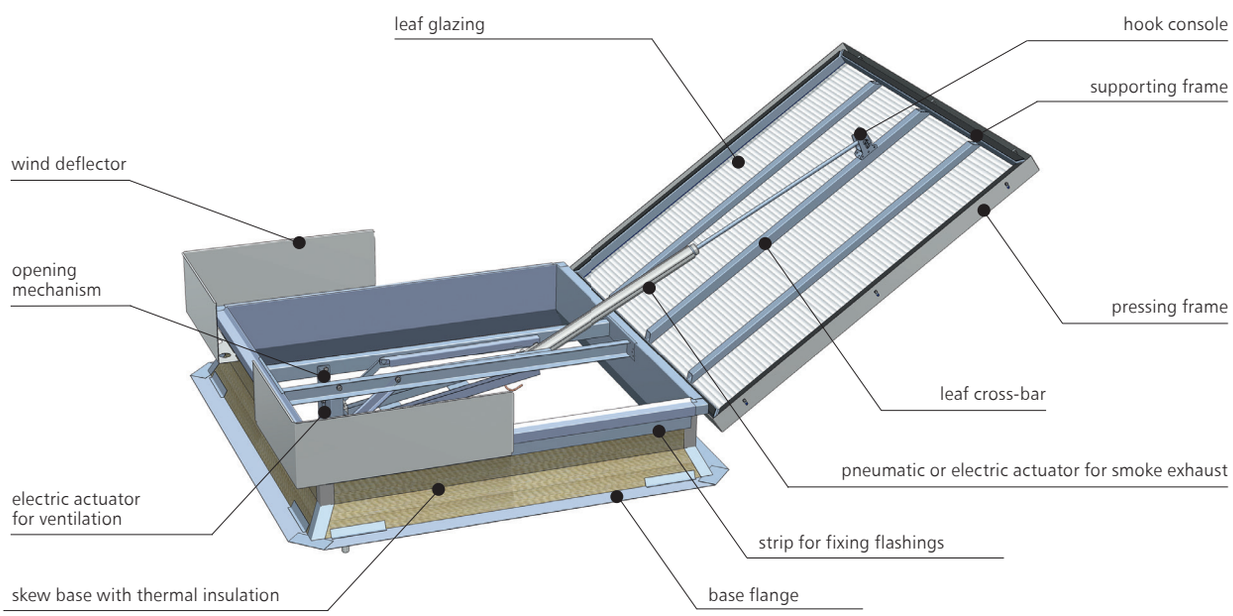


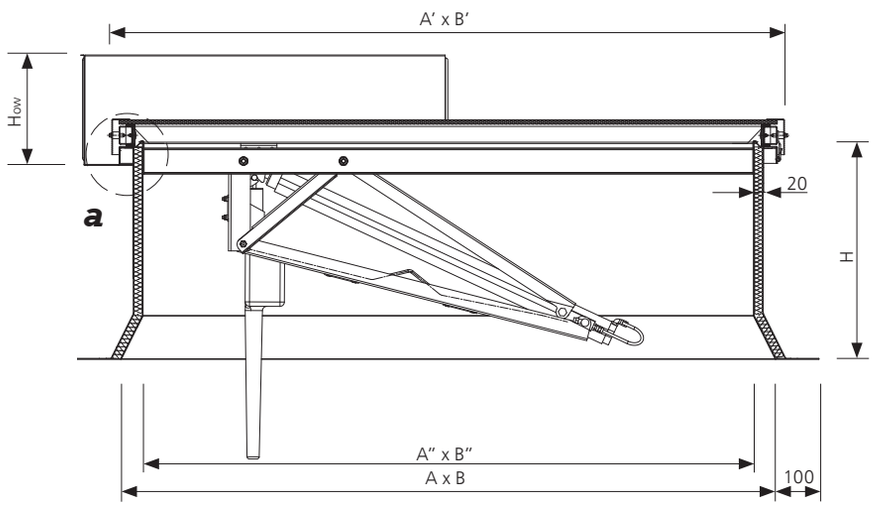
Fig. 7 – Design of mcr PROLIGHT NG-A smoke vent equipped with wind deflectors, with pneumatic actuator for smoke exhaust and electric actuator for ventilation

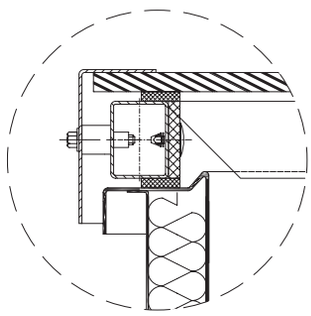
1.3.3. non-standard options

- vent elements painted to any RAL color - applies to base and wind deflectors,
- thermal insulation of base made of PIR panel of 30 mm thickness, heat transfer coefficient U=0.68 W/m^{2}K,
- base made of aluminium sheet of 2,00 mm thickness,
- custom dimensions of clear opening of vent base,
- custom base height within 300 mm ÷ 700 mm,
- custom width of circumferential flange of base,
- circumferential strip for fixing roof flashings made of PVC coated metal sheet,
- base and opening mechanism in stainless steel (on request),
- broad range of optional accessories.

1.3.4. technical drawings

SMOKE VENT WITH WIND DEFLECTORS, WITH PNEUMATIC CONTROL FOR SMOKE EXHAUST AND ELECTRIC ACTUATOR FOR VENTILATION





*Detail **a** – mcr PROLIGHT*

*Fig. 8 – Section **B-B** of mcr PROLIGHT NG-A smoke vent in closed position, dimensions in [mm]*

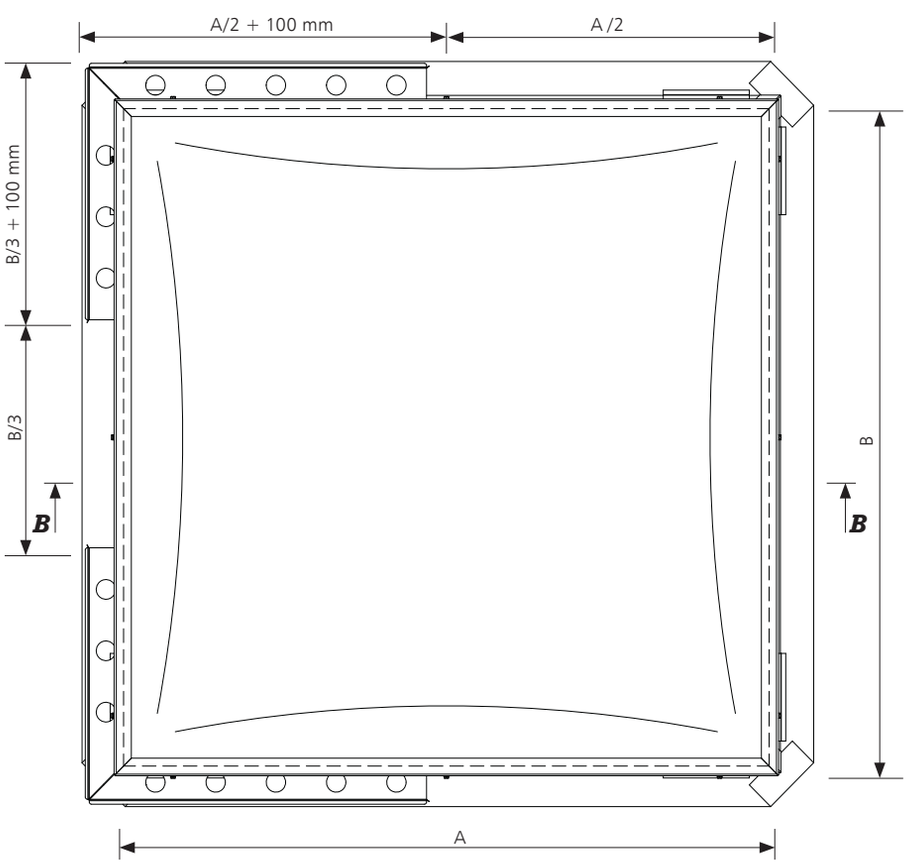


Fig. 9 – Top view of mcr PROLIGHT NG-A smoke vent in closed position, dimensions in [mm]

A, B – nominal dimensions [mm], clear opening of smoke vent
A', B' – total dimensions of smoke vent leaf A'=A+135 mm, B'=B+35 mm
A", B" – clear dimensions of smoke vent upper opening [mm], A"=A-100 mm, B"=B-100 mm
H – smoke vent base height [mm]
H_{ow} – wind deflector height 230 mm ≤ How ≤ 530 mm

1.3.5.1. technical details

VENT TYPE	NOMINAL DIMENSIONS(*) A x B [mm]	BASE OF MIN. H=500 mm ACTIVE AREA A_a [m^2] WITH WIND DEFLECTORS	BASE OF MIN. H=300 MM ACTIVE AREA A_a [m^2] WITH WIND DEFLECTORS	ESTIMATED WEIGHT(**) [kg]
NG-A 100x100	1000 x 1000	0,66	0,66	78
NG-A 100x110	1000 x 1100	0,74	0,73	81
NG-A 100x120	1000 x 1200	0,82	0,79	84
NG-A 100x130	1000 x 1300	0,88	0,87	87
NG-A 100x140	1000 x 1400	0,97	0,94	90
NG-A 100x150	1000 x 1500	1,04	1,01	96
NG-A 100x160	1000 x 1600	1,10	1,09	100
NG-A 100x170	1000 x 1700	1,17	1,16	103
NG-A 100x180	1000 x 1800	1,26	1,22	106
NG-A 100x190	1000 x 1900	1,33	1,29	110
NG-A 100x200	1000 x 2000	1,40	1,36	113
NG-A 100x210	1000 x 2100	1,47	1,45	116
NG-A 100x220	1000 x 2200	1,56	1,52	119
NG-A 100x230	1000 x 2300	1,63	1,59	122
NG-A 100x240	1000 x 2400	1,70	1,66	125
NG-A 100x250	1000 x 2500	1,78	1,73	129
NG-A 120x120	1200 x 1200	0,99	0,96	91
NG-A 120x130	1200 x 1300	1,08	1,06	94
NG-A 120x140	1200 x 1400	1,18	1,14	97
NG-A 120x150	1200 x 1500	1,26	1,22	104
NG-A 120x170	1200 x 1700	1,45	1,41	110
NG-A 120x180	1200 x 1800	1,53	1,49	114
NG-A 120x190	1200 x 1900	1,62	1,57	117
NG-A 120x200	1200 x 2000	1,73	1,66	120
NG-A 120x210	1200 x 2100	1,81	1,74	124
NG-A 120x220	1200 x 2200	1,90	1,85	127
NG-A 120x230	1200 x 2300	1,99	1,93	130
NG-A 120x240	1200 x 2400	2,07	2,02	133
NG-A 120x250	1200 x 2500	2,16	2,10	137
NG-A 125x125	1250 x 1250	1,08	1,06	94
NG-A 130x130	1300 x 1300	1,18	1,15	97
NG-A 130x140	1300 x 1400	1,27	1,24	100
NG-A 130x150	1300 x 1500	1,38	1,35	108
NG-A 130x160	1300 x 1600	1,48	1,44	111
NG-A 130x170	1300 x 1700	1,57	1,52	114
NG-A 130x180	1300 x 1800	1,68	1,61	118
NG-A 130x190	1300 x 1900	1,78	1,73	121
NG-A 130x200	1300 x 2000	1,87	1,82	124
NG-A 130x210	1300 x 2100	1,97	1,91	128
NG-A 130x220	1300 x 2200	2,06	2,00	131
NG-A 130x230	1300 x 2300	2,18	2,09	134
NG-A 130x240	1300 x 2400	2,28	2,18	138
NG-A 130x250	1300 x 2500	2,37	2,28	141
NG-A 140x140	1400 x 1400	1,39	1,35	104
NG-A 140x150	1400 x 1500	1,49	1,45	111
NG-A 140x160	1400 x 1600	1,59	1,55	115

1.3.5.1. technical details

VENT TYPE	NOMINAL DIMENSIONS(*) A x B [mm]	BASE OF MIN. H=500 mm ACTIVE AREA A_a [m^2] WITH WIND DEFLECTORS	BASE OF MIN. H=300 MM ACTIVE AREA A_a [m^2] WITH WIND DEFLECTORS	ESTIMATED WEIGHT(**) [kg]
NG-A 140x170	1400 x 1700	1,71	1,67	118
NG-A 140x180	1400 x 1800	1,81	1,76	122
NG-A 140x190	1400 x 1900	1,92	1,86	125
NG-A 140x200	1400 x 2000	2,02	1,96	128
NG-A 140x210	1400 x 2100	2,15	2,06	132
NG-A 140x220	1400 x 2200	2,25	2,16	135
NG-A 140x230	1400 x 2300	2,35	2,25	138
NG-A 140x240	1400 x 2400	2,45	2,39	142
NG-A 140x250	1400 x 2500	2,56	2,49	145
NG-A 150x150	1500 x 1500	1,62	1,55	120
NG-A 150x160	1500 x 1600	1,73	1,68	124
NG-A 150x170	1500 x 1700	1,84	1,79	127
NG-A 150x180	1500 x 1800	1,94	1,89	130
NG-A 150x190	1500 x 1900	2,08	2,00	134
NG-A 150x200	1500 x 2000	2,19	2,10	137
NG-A 150x210	1500 x 2100	2,30	2,21	141
NG-A 150x220	1500 x 2200	2,41	2,34	144
NG-A 150x230	1500 x 2300	2,52	2,45	148
NG-A 150x240	1500 x 2400	2,66	2,56	151
NG-A 150x250	1500 x 2500	2,78	2,66	154
NG-A 160x160	1600 x 1600	1,84	1,79	128
NG-A 160x170	1600 x 1700	1,96	1,90	131
NG-A 160x180	1600 x 1800	2,10	2,02	134
NG-A 160x190	1600 x 1900	2,22	2,13	138
NG-A 160x200	1600 x 2000	2,34	2,27	141
NG-A 160x210	1600 x 2100	2,45	2,39	145
NG-A 160x220	1600 x 2200	2,60	2,50	148
NG-A 160x230	1600 x 2300	2,72	2,61	151
NG-A 160x240	1600 x 2400	2,84	2,73	154
NG-A 160x250	1600 x 2500	2,96	2,84	158
NG-A 170x170	1700 x 1700	2,11	2,02	135
NG-A 170x180	1700 x 1800	2,23	2,14	138
NG-A 170x190	1700 x 1900	2,36	2,29	142
NG-A 170x200	1700 x 2000	2,48	2,41	145
NG-A 170x210	1700 x 2100	2,64	2,53	149
NG-A 170x220	1700 x 2200	2,77	2,66	152
NG-A 170x230	1700 x 2300	2,89	2,78	155
NG-A 170x240	1700 x 2400	3,02	2,90	159
NG-A 170x250	1700 x 2500	3,15	3,02	162
NG-A 180x180	1800 x 1800	2,37	2,30	152
NG-A 180x190	1800 x 1900	2,53	2,43	156
NG-A 180x200	1800 x 2000	2,66	2,56	159
NG-A 180x210	1800 x 2100	2,80	2,68	163
NG-A 180x220	1800 x 2200	2,93	2,81	166
NG-A 180x230	1800 x 2300	3,06	2,94	170
NG-A 180x240	1800 x 2400	3,20	3,07	173

1.3.5.1. technical details

VENT TYPE	NOMINAL DIMENSIONS(*) A x B [mm]	BASE OF MIN. H=500 mm ACTIVE AREA A_a [m2] WITH WIND DEFLECTORS	BASE OF MIN. H=300 MM ACTIVE AREA A_a [m^2] WITH WIND DEFLECTORS	ESTIMATED WEIGHT(**) [kg]
NG-A 180x250	1800 x 2500	3,38	3,24	176
NG-A 180x260	1800 x 2600	3,51	3,37	180
NG-A 180x270	1800 x 2700	3,65	3,50	183
NG-A 180x280	1800 x 2800	3,78	3,63	186
NG-A 180x290	1800 x 2900	3,92	3,76	189
NG-A 180x300	1800 x 3000	4,05	3,89	193
NG-A 190x190	1900 x 1900	2,67	2,56	160
NG-A 190x200	1900 x 2000	2,81	2,70	163
NG-A 190x210	1900 x 2100	2,95	2,83	167
NG-A 190x220	1900 x 2200	3,09	2,97	170
NG-A 190x230	1900 x 2300	3,28	3,15	174
NG-A 190x240	1900 x 2400	3,42	3,28	177
NG-A 190x250	1900 x 2500	3,56	3,42	180
NG-A 190x260	1900 x 2600	3,71	3,56	184
NG-A 190x270	1900 x 2700	3,85	3,69	187
NG-A 190x280	1900 x 2800	3,99	3,83	191
NG-A 190x290	1900 x 2900	4,13	3,97	194
NG-A 190x300	1900 x 3000	4,28	4,10	197
NG-A 200x200	2000 x 2000	2,96	2,84	167
NG-A 200x210	2000 x 2100	3,11	2,98	171
NG-A 200x220	2000 x 2200	3,30	3,17	174
NG-A 200x230	2000 x 2300	3,45	3,31	178
NG-A 200x240	2000 x 2400	3,60	3,46	181
NG-A 200x250	2000 x 2500	3,75	3,60	185
NG-A 200x260	2000 x 2600	3,90	3,74	188
NG-A 200x270	2000 x 2700	4,05	3,89	191
NG-A 200x280	2000 x 2800	4,20	4,03	195
NG-A 200x290	2000 x 2900	4,35	4,18	198
NG-A 200x300	2000 x 3000	4,56	4,32	202
NG-A 210x210	2100 x 2100	3,31	3,18	175

(*) Intermediate smoke vent dimensions between the values specified in the table are possible. The size of active smoke exhaust area for those dimensions is determined through linear interpolation method.

(**) Estimated weight specified for smoke vent of base height 500 mm with wind deflectors, of standard configuration with multi-chamber polycarbonate panel glazing of 16 mm thickness, with pneumatic control.

1.3.6. smoke vents control

For correct operation, smoke vents as well as smoke exhaust & ventilation vents require connecting to devices controlling their opening and closing. A set of such devices constitutes a system for smoke exhaust control or smoke exhaust and ventilation control. Depending on the type of devices used, it may be designed as a:

- pneumatic smoke exhaust control system,
- 24V electric smoke exhaust control system with ventilation function,
- pneumatic and electric control system; the pneumatic part is responsible for smoke exhaust, while the 230V~ electric part - for ventilation.

Smoke exhaust control systems are activated as follows:

1) automatic – through a thermal valve installed in the vent (pneumatic system), or by optical smoke sensors (electric system),
2) manual – by a release of CO_2 cartridges in alarm box (pneumatic system), or by operation of RPO emergency pushbutton (electric system),
3) FAS signal – by external impulse from fire alarm system (FAS) sent to an electromagnet installed in the alarm box (pneumatic system), or directly to smoke exhaust control unit (electric system).

Control system elements are described in section 13

1.3.6.1. smoke vents control

VENT TYPE	PNEUMATIC CONTROL(*)			ELECTRIC CONTROL(**)	
	PNEUMATIC ACTUATOR		MIN. CO_2 CARTRIDGE CAPACITY – SL 950 [g]	POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR FOR CLASS	
	STROKE [mm]	DIAMETER [mm]		SL 250	SL 550
NG-A 100/100	550	50	24	-	-
NG-A 100/110	550	50	24	-	-
NG-A 100/120	550	50	24	-	-
NG-A 100/130	550	50	24	-	-
NG-A 100/140	550	50	24	-	-
NG-A 100/150	550	50	24	-	-
NG-A 100/160	550	50	24	-	-
NG-A 100/170	550	50	40	-	-
NG-A 100/180	550	50	40	-	-
NG-A 100/190	550	50	40	-	-
NG-A 100/200	550	50	40	-	-
NG-A 100/210	550	50	40	-	-
NG-A 100/220	550	50	40	-	-
NG-A 100/230	550	50	40	-	-
NG-A 100/240	550	50	40	-	-
NG-A 100/250	550	50	40	-	-
NG-A 120/120	550	50	24	1,6	2,6
NG-A 120/130	550	50	40	1,6	2,6
NG-A 120/140	550	50	40	1,6	2,6
NG-A 120/150	550	50	40	1,6	4,0
NG-A 120/170	550	50	40	2,0	4,0
NG-A 120/180	550	50	40	2,6	4,0
NG-A 120/190	550	50	40	2,6	6,0
NG-A 120/200	550	50	40	2,6	6,0
NG-A 120/210	550	50	40	2,6	6,0
NG-A 120/220	550	50	55	4,0	6,0
NG-A 120/230	550	50	55	4,0	6,0
NG-A 120/240	550	50	55	4,0	6,0
NG-A 120/250	550	50	55	4,0	6,0
NG-A 125/125	550	50	24	1,6	4,0

1.3.6.1. smoke vents control

TYP KLAPY	PNEUMATIC CONTROL(*)			ELECTRIC CONTROL(**)	
	PNEUMATIC ACTUATOR		MIN. CO_2 CARTRIDGE CAPACITY – SL 950 [g]	POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR FOR CLASS	
	STROKE [mm]	DIAMETER [mm]		SL 250	SL 550
NG-A 130/130	550	50	40	2,0	4,0
NG-A 130/140	550	50	40	2,0	4,0
NG-A 130/150	550	50	40	2,0	4,0
NG-A 130/160	550	50	40	2,6	4,0
NG-A 130/170	550	50	40	2,6	6,0
NG-A 130/180	550	50	40	2,6	6,0
NG-A 130/190	550	50	40	2,6	6,0
NG-A 130/200	550	50	40	2,6	6,0
NG-A 130/210	550	50	40	2,6	6,0
NG-A 130/220	550	50	55	4,0	6,0
NG-A 130/230	550	50	55	4,0	6,0
NG-A 130/240	550	50	55	4,0	6,0
NG-A 130/250	550	50	55	4,0	6,0
NG-A 140/140	550	50	40	2,6	4,0
NG-A 140/150	550	50	40	2,6	6,0
NG-A 140/160	550	50	40	2,6	6,0
NG-A 140/170	550	50	40	2,6	6,0
NG-A 140/180	550	50	55	4,0	6,0
NG-A 140/190	550	50	55	4,0	6,0
NG-A 140/200	550	50	55	4,0	6,0
NG-A 140/210	550	50	55	4,0	6,0
NG-A 140/220	550	50	55	4,0	6,0
NG-A 140/230	550	50	55	4,0	6,0
NG-A 140/240	550	50	55	4,0	8,0
NG-A 140/250	550	50	80	4,0	8,0
NG-A 150/150	750	50	40	2,6	6,0
NG-A 150/160	750	50	40	2,6	6,0
NG-A 150/170	750	50	55	4,0	6,0
NG-A 150/180	750	50	55	4,0	6,0
NG-A 150/190	750	50	55	4,0	8,0
NG-A 150/200	750	50	55	4,0	8,0
NG-A 150/210	750	50	55	4,0	8,0
NG-A 150/220	750	50	80	4,0	8,0
NG-A 150/230	750	50	80	4,0	8,0
NG-A 150/240	750	50	80	4,0	8,0
NG-A 150/250	750	50	80	6,0	8,0
NG-A 160/160	750	50	55	4,0	6,0
NG-A 160/170	750	50	55	4,0	8,0
NG-A 160/180	750	50	55	4,0	8,0
NG-A 160/190	750	50	55	4,0	8,0
NG-A 160/200	750	50	80	6,0	8,0
NG-A 160/210	750	50	80	6,0	8,0
NG-A 160/220	750	50	80	6,0	8,0
NG-A 160/230	750	50	80	6,0	8,0
NG-A 160/240	750	50	80	6,0	8,0
NG-A 160/250	750	50	80	6,0	8,0
NG-A 170/170	750	50	55	6,0	-
NG-A 170/180	750	50	80	6,0	-
NG-A 170/190	750	50	80	6,0	-

1.3.6.1. smoke vents control

TYP KLAPY	PNEUMATIC CONTROL(*)			ELECTRIC CONTROL(**)	
	PNEUMATIC ACTUATOR		MIN. CO_2 CARTRIDGE CAPACITY – SL 950 [g]	POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR FOR CLASS	
	STROKE [mm]	DIAMETER [mm]		SL 250	SL 550
NG-A 170/200	750	50	80	6,0	-
NG-A 170/210	750	50	80	6,0	-
NG-A 170/220	750	50	80	6,0	-
NG-A 170/230	750	50	80	6,0	-
NG-A 170/240	750	50	80	6,0	-
NG-A 170/250	750	50	80	6,0	-
NG-A 180/180	1050	63	80	6,0	-
NG-A 180/190	1050	63	120	6,0	-
NG-A 180/200	1050	63	120	8,0	-
NG-A 180/210	1050	63	120	8,0	-
NG-A 180/220	1050	63	120	8,0	-
NG-A 180/230	1050	63	120	8,0	-
NG-A 180/240	1050	63	120	8,0	-
NG-A 180/250	1050	63	120	8,0	-
NG-A 180/260	1050	63	120	8,0	-
NG-A 180/270	1050	63	120	-	-
NG-A 180/280	1050	63	120	-	-
NG-A 180/290	1050	63	120	-	-
NG-A 180/300	1050	63	120	-	-
NG-A 190/190	1050	63	120	6,0	-
NG-A 190/200	1050	63	120	6,0	-
NG-A 190/210	1050	63	120	6,0	-
NG-A 190/220	1050	63	120	8,0	-
NG-A 190/230	1050	63	120	8,0	-
NG-A 190/240	1050	63	120	8,0	-
NG-A 190/250	1050	63	120	8,0	-
NG-A 190/260	1050	63	120	8,0	-
NG-A 190/270	1050	63	120	-	-
NG-A 190/280	1050	63	120	-	-
NG-A 190/290	1050	63	120	-	-
NG-A 190/300	1050	63	120	-	-
NG-A 200/200	1050	63	120	8,0	-
NG-A 200/210	1050	63	120	8,0	-
NG-A 200/220	1050	63	120	8,0	-
NG-A 200/230	1050	63	120	8,0	-
NG-A 200/240	1050	63	120	-	-
NG-A 200/250	1050	63	120	-	-
NG-A 200/260	1050	63	120	-	-
NG-A 200/270	1050	63	120	-	-
NG-A 200/280	1050	63	120	-	-
NG-A 200/290	1050	63	120	-	-
NG-A 200/300	1050	63	120***	-	-
NG-A 210/210	1050	63	120	8,0	-
NG-A 220/220	1050	63	120	-	-

(*) Pneumatic control available in classes: SL 250, SL 550, SL 750, SL 950, SL 1300, SL 1600 and SL 2000 at special request (applies to selected vent sizes).

(**) Electric control available in classes: SL 750, SL 950, SL 1300 and SL 1600 at special request (applies to selected vent sizes). Power consumption specified in the table applies to smoke vent with multi-chamber polycarbonate glazing.

(***) SL 900

1.4. double-leaf smoke vents with skew base - DVPS type

1.4.1. technical description of standard

- classification as per Certificate of Conformity in accordance with EN 12101-2 (CE Certificate),
- DVP type smoke vents (double-leaf) for flat and pitched roofs covered with roofing paper or PVC membrane,
- skew base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness
- bottom part of the base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base has shape enabling water runoff,
- thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m^{2}K
- circumferential strip of galvanized steel sheet for fixing roof flashing,
- wind deflectors made of aluminum or galvanized steel sheet,
- leaf glazing: multi-chamber polycarbonate panel, sandwich panel, multi-chamber polycarbonate panel with aluminum envelope cover and glazing with B_{ROOF} (t1) classification (details in section 4),
- leaf opening angle ≥ 90°,
- hinges fixing the leaf to base installed at lengthwise side of vent,
- smoke exhaust control: pneumatic, electric 24V-,
- ventilation control: electric 230V~

1.4.2. smoke vent design

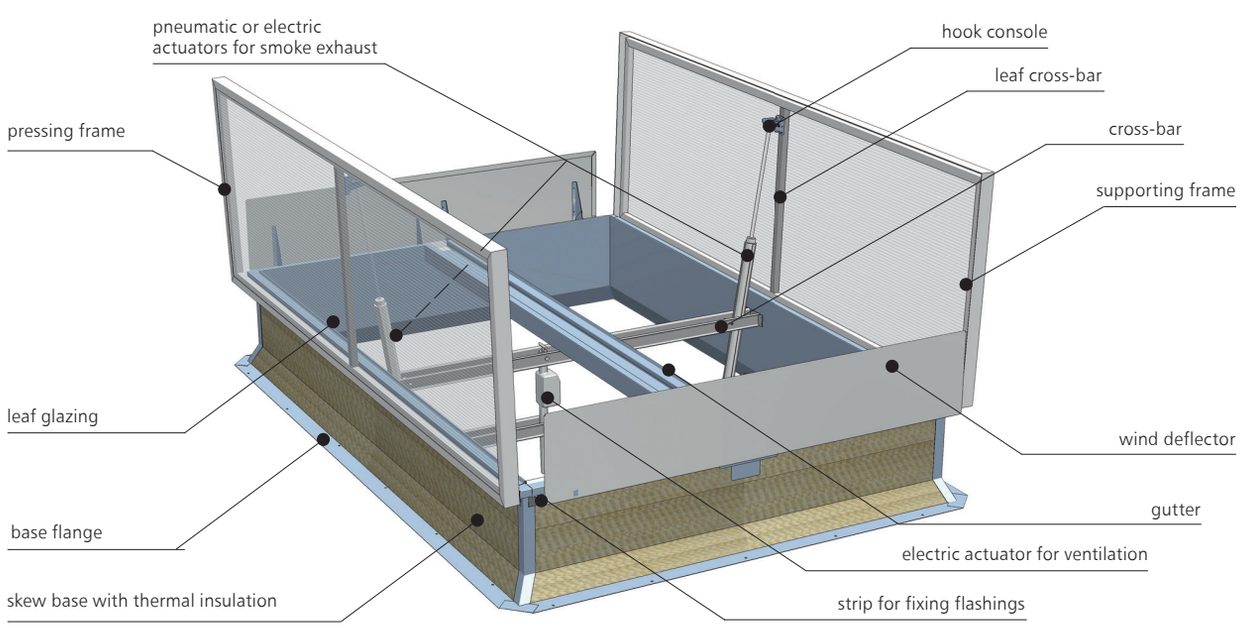


Fig. 10 – Design of mcr PROLIGHT DVPS smoke vent equipped with wind deflectors, with pneumatic actuators for smoke exhaust and electric actuator for ventilation

1.4.3. non-standard options

- vent elements painting to any RAL color - applies to wind deflectors and base - powder coating up to 1800x3000 [mm] dimensions,
- thermal insulation of base made of PIR panel of 30 mm thickness, heat transfer coefficient U=0.68 W/m^{2}K,
- base made of aluminium sheet of 2,00 mm thickness,
- custom dimensions of clear opening of vent base,
- custom base height within 300 mm ÷ 700 mm,
- custom width of circumferential flange of base,
- circumferential strip for fixing roof flashings made of PVC coated metal sheet,
- base and cross-bar in stainless steel,
- optional glazing in the form of Sunoptics prismatic dome (details and possible dimensions of vents in section 4, page 77),
- broad range of optional accessories.

1.4.4. smoke vent technical drawings

SMOKE VENT WITH WIND DEFLECTORS, WITH PNEUMATIC CONTROL FOR SMOKE EXHAUST AND ELECTRIC ACTUATOR FOR VENTILATION

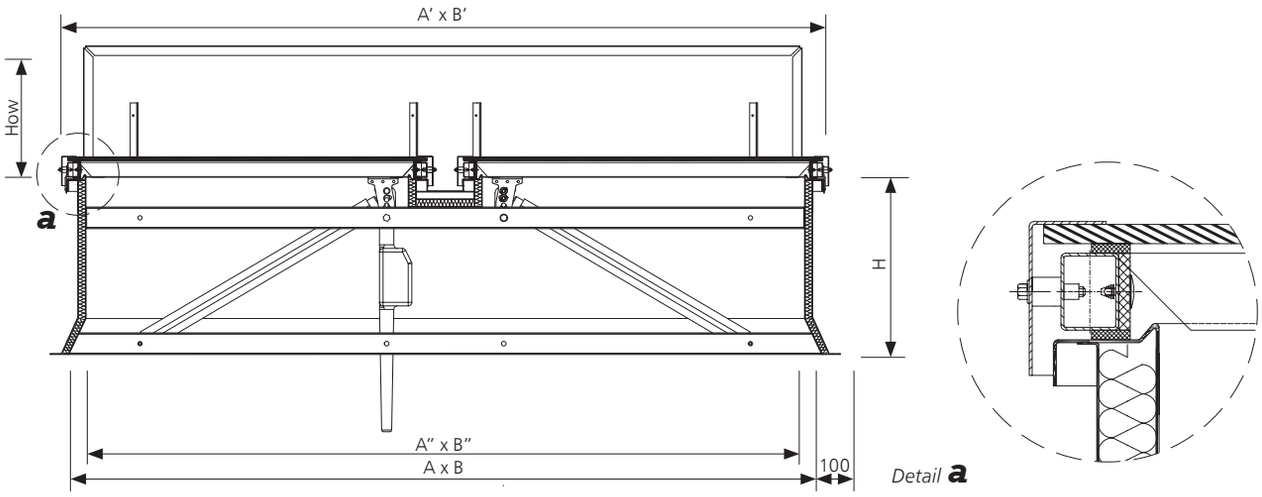


*Fig. 11 – Section **B-B** of mcr PROLIGHT DVPS smoke vent in closed position, dimensions in [mm]*

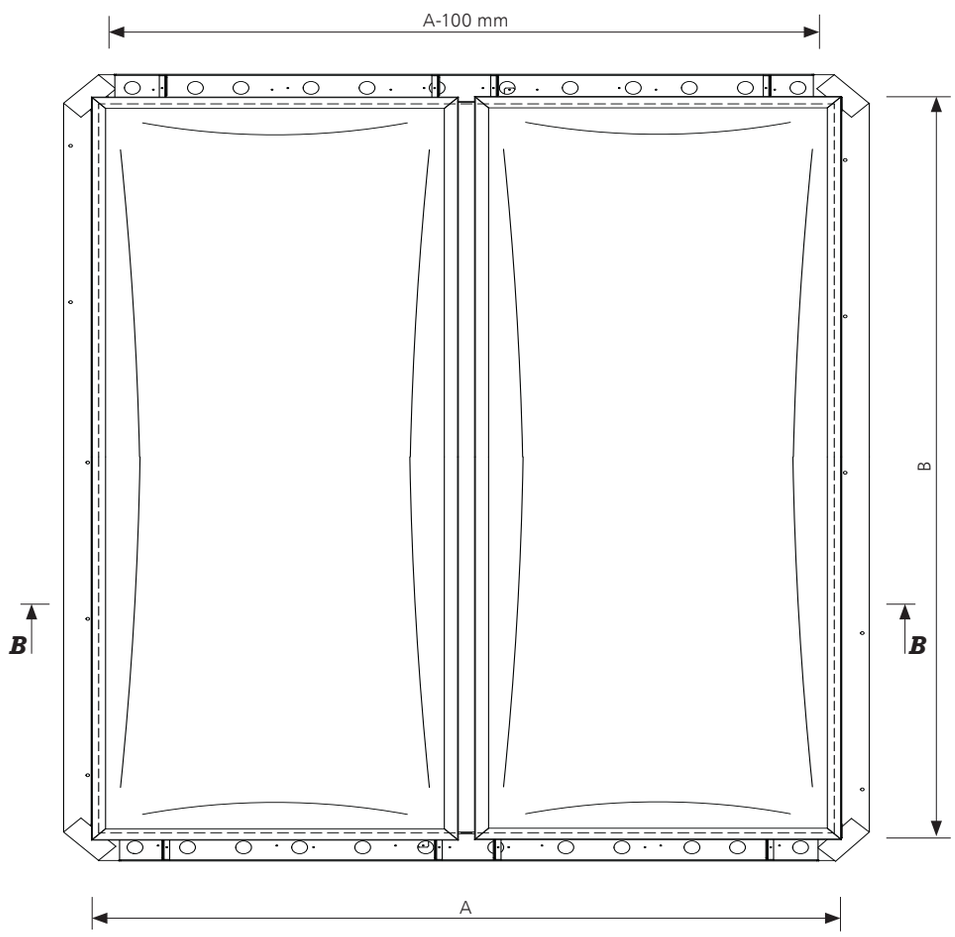


Fig. 12 – Top view of mcr PROLIGHT DVPS smoke vent in closed position, dimensions in [mm]

A, B – nominal dimensions [mm], clear opening of smoke vent
A', B' – total dimensions of smoke vent leaf A'=A+35 mm, B'=B+35 mm
A", B" – clear dimensions of smoke vent upper opening [mm], A"=A-100 mm, B"=B-100 mm
H – smoke vent base height [mm]
H_{ow} – wind deflector height 100 mm ≤ How ≤ 390 mm

1.4.5. technical details

VENT TYPE	NOMINAL DIMENSIONS(*)	BASE OF MIN. H=500 mm	BASE OF MIN. H=300 MM	ESTIMATED WEIGHT(**)
	A x B	ACTIVE AREA A_a [m^2]	ACTIVE AREA A_a [m^2]	
	[mm]	WITH WIND DEFLECTORS	WITH WIND DEFLECTORS	[kg]
DVPS 120/250	1200 x 2500	1,80	1,83	160
DVPS 120/300	1200 x 3000	2,20	2,20	183
DVPS 150/250	1500 x 2500	2,36	2,36	172
DVPS 150/300	1500 x 3000	2,93	2,84	195
DVPS 160/160	1600 x 1600	1,54	1,56	138
DVPS 160/250	1600 x 2500	2,56	2,52	178
DVPS 160/280	1600 x 2800	2,91	2,87	192
DVPS 160/300	1600 x 3000	3,12	3,07	201
DVPS 180/160	1800 x 1600	1,76	1,76	147
DVPS 180/180	1800 x 1800	2,04	2,01	156
DVPS 180/250	1800 x 2500	2,97	2,88	189
DVPS 180/280	1800 x 2800	3,33	3,23	203
DVPS 180/300	1800 x 3000	3,62	3,51	212
DVPS 200/200	2000 x 2000	2,60	2,52	173
DVPS 200/240	2000 x 2400	3,17	3,07	192
DVPS 200/250	2000 x 2500	3,35	3,25	197
DVPS 200/280	2000 x 2800	3,75	3,64	211
DVPS 200/300	2000 x 3000	4,08	3,90	221
DVPS 220/220	2200 x 2200	3,19	3,15	194
DVPS 220/240	2200 x 2400	3,54	3,43	204
DVPS 220/250	2200 x 2500	3,69	3,58	208
DVPS 240/240	2400 x 2400	3,92	3,74	212
DVPS 240/250	2400 x 2500	4,08	3,96	216
DVPS 250/250	2500 x 2500	4,31	4,13	223
DVPS 250/300	2500 x 3000	5,25	5,03	247
DVPS 300/300	3000 x 3000	6,39	6,03	272

(*) Intermediate smoke vent dimensions between the values specified in the table are possible. The size of active smoke exhaust area for those dimensions is determined through linear interpolation method.

(**) Estimated weight specified for smoke vent of base height 500 mm with wind deflectors, of standard configuration with multi-chamber polycarbonate panel glazing of 16 mm thickness, with pneumatic control.

1.4.6. smoke vents control

For correct operation, smoke vents as well as smoke exhaust & ventilation vents require connecting to devices controlling their opening and closing. A set of such devices constitutes a system for smoke exhaust control or smoke exhaust and ventilation control.
Depending on the type of devices used, it may be designed as a:

- pneumatic smoke exhaust control system,
- 24V electric smoke exhaust control system with ventilation function,
- pneumatic and electric control system; the pneumatic part is responsible for smoke exhaust, while the 230V~ electric part - for ventilation.

Smoke exhaust control systems are activated as follows:

1) automatic – through a thermo switch installed in the vent (pneumatic system), or by optical smoke sensors (electric system),
2) manual – by a release of CO_2 cartridges in alarm box (pneumatic system), or by operation of RPO emergency pushbutton (electric system),
3) FAS signal – by external impulse from fire alarm system (FAS) sent to an electromagnet installed in the alarm box (pneumatic system), or directly to smoke exhaust control unit (electric system).

Control system elements are described in section 13

TYP KLAPY	PNEUMATIC CONTROL(*)			ELECTRIC CONTROL(**)	
	PNEUMATIC ACTUATOR		MIN. CO_2 CARTRIDGE CAPACITY – SL 950 [g]	POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR FOR CLASS	
	STROKE mm]	DIAMETER [mm]		SL 250	SL 550
DVPS 120/250	350	40	24	2 x 0,8	2 x 1,3
DVPS 120/300	350	40	38	2 x 1,0	2 x 1,6
DVPS 150/250	350	40	38	2 x 1,0	2 x 2,0
DVPS 150/300	350	40	40	2 x 1,3	2 x 2,6
DVPS 160/160	350	40	25	2 x 0,8	2 x 1,3
DVPS 160/250	350	40	38	2 x 1,0	2 x 2,0
DVPS 160/280	350	40	38	2 x 1,0	2 x 2,0
DVPS 160/300	350	40	40	2 x 1,3	2 x 2,0
DVPS 180/160	400	40	38	2 x 1,0	2 x 2,0
DVPS 180/180	400	40	38	2 x 1,0	2 x 2,0
DVPS 180/250	400	50/40	55	2 x 1,3	2 x 2,6
DVPS 180/280	400	50/40	55	2 x 1,3	2 x 2,6
DVPS 180/300	400	50	55	2 x 1,6	2 x 2,6
DVPS 200/200	500	40	55	2 x 1,6	2 x 2,6
DVPS 200/240	500	50/40	55	2 x 1,6	2 x 4,0
DVPS 200/250	500	50/40	55	2 x 2,0	2 x 4,0
DVPS 200/280	500	50/40	80	2 x 2,0	2 x 4,0
DVPS 200/300	500	50/40	80	2 x 2,0	2 x 4,0
DVPS 220/220	500	50	80	2 x 2,0	2 x 4,0
DVPS 220/240	500	50	55	2 x 2,0	2 x 6,0
DVPS 220/250	500	50	80	2 x 2,0	2 x 6,0
DVPS 240/240	600	50	80	2 x 2,6	2 x 6,0
DVPS 240/250	600	50	80	2 x 2,6	2 x 6,0
DVPS 250/250	600	50	120	2 x 2,6	2 x 6,0
DVPS 250/300	600	50	120	2 x 2,6	2 x 6,0
DVPS 300/300	750	63/50	150	2 x 6,0	2 x 8,0

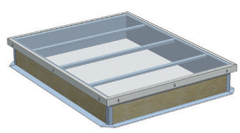
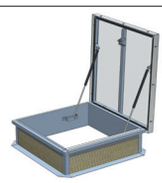
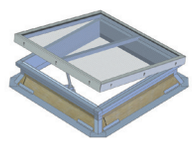
(*) Pneumatic control available in classes: SL 250, SL 550, SL 750 and SL 1300 at special request (applies to selected vent sizes).

(**) Electric control available in classes: SL 750, SL 950, SL 1300, SL 1600 and SL 2000 at special request (applies to selected vent sizes). Power consumption specified in the table applies to smoke vent with multi-chamber polycarbonate glazing.

Notes

2. fixed skylights, roof hatches, ventilation vents

The equipment series that includes mcr PROLIGHT fixed skylights, roof hatches and ventilation vents complements MERCOR natural smoke exhaust selection. Depending on the device chosen, they may serve the purpose of natural lighting, ventilating or increasing roof accessibility.

	Parameters	Fixed skylights (non-openable skylights)	Roof hatches (openable skylights)	Ventilation vents (openable skylights)
				
Type	mcr PROLIGHT	**C, E, NG-A, R type**	**C, E, NG-A type**	**C, E, NG-A type**
Classification	CE Declaration of Conformity *(as per EN 173-2009)(*****)*	• **Fire performance of available glazing** – $B_{ROOF}(t1)$ – B-s1-d0 – B-s2-d0 – E / NPD, • **Fire performance of weakest element** – E / NPD • **Resistance to effect of external fire** – $B_{ROOF}(t1)$ – F_{ROOF}, • **Impact resistance of skylights with multi-chamber polycarbonate** – SB1200 • **Heat transfer coefficient for entire device 1.3 W/m2K ≤ U ≤ 3.8 W/m2K (*),** dependent on: – type of glazing (see details in section 4) – type of device – dimensions of device – thermal insulation thickness – base type and height • **Direct acoustic resistance** – R_W = 18÷22 dB for multi-chamber polycarbonates – R_W = 20 dB for double-layer domes – R_W = 22 dB for double-layer domes		
Control	pneumatic *(ventilation)*	–	–	●
	electric 230V~ *(ventilation)*	–	–	●
	mechanic *(gas springs)*	–	●	–
Glazing	multi-chamber polycarbonate panel	●	●	●
	acrylic dome(****)	●	●	●
	solid polycarbonate dome(****)	●	●	●
	ALU sandwich panel(**), (****)	–	●	●
	classification $B_{ROOF}(t1)$(***)	●	●	●
	multi-chamber polycarbonate panel and envelope cover	–	●	●
	multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome(****)	●	●	●

(*) U heat transfer coefficient (thermal transmittance) available at client's request

(**) ALU sandwich panel (aluminum-thermal insulation-aluminum)

(***) $B_{ROOF}(t1)$ glazing (multi-chamber polycarbonate of thickness ≥ 10 mm and polyester panel)

(****) Selected sizes

(*****) Only for units with translucent glazing

2.1. fixed skylights with straight base - C, E type

2.1.1. technical description of standard

- classification in accordance with EN 1873+A1:2016-03 (ref. to units with tranclucent glazing),
- C type (squared) and type E (rectangular) fixed skylights for flat and pitched roofs covered with roofing paper or PVC membrane,
- dimensional range of fixed skylights:
  - C type fixed skylights (squared): 50x50 cm ÷ 200x200 cm
  - E type fixed skylights (rectangular): 50x50 cm ÷ 195x300 cm
- straight base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness
- bottom part of the base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base has shape enabling water runoff,
- thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m^{2}K
- circumferential strip in the upper part of base, made of galvanized steel sheet, used for fixing roof work,
- leaf glazing: multi-chamber polycarbonate panel, acrylic dome, solid polycarbonate dome, multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome, glazing of B_{ROOF} (t1) classification (see details in section 4).

2.1.2. fixed skylight design

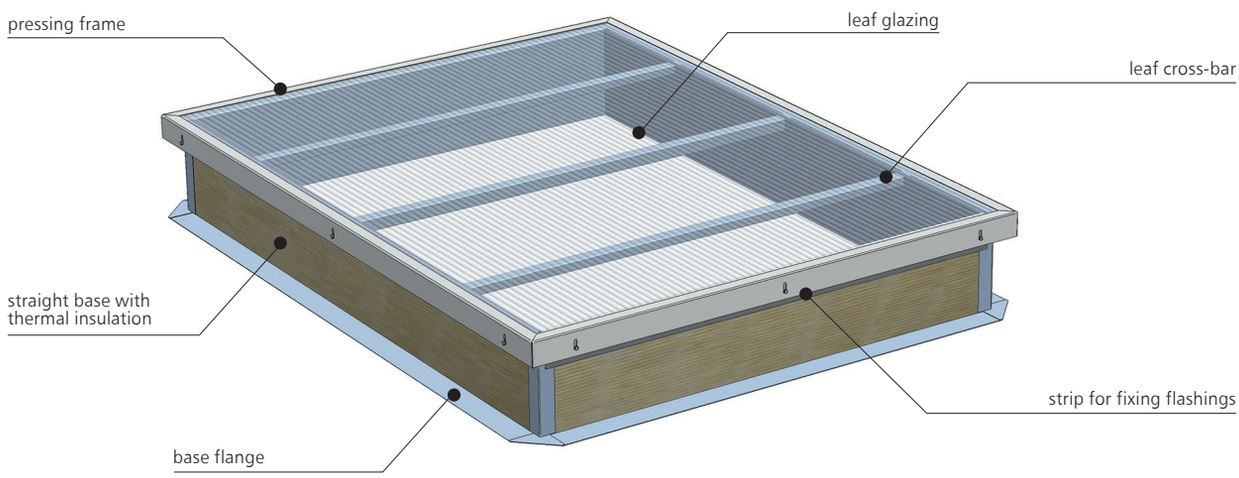


Fig. 13 – mcr PROLIGHT E fixed skylight design

2.1.3. non-standard options

- skylight elements painted to any RAL color,
- thermal insulation of base made of PIR panel of 30 mm thickness, heat transfer coefficient U=0.68 W/m^{2}K,
- custom base height 160 mm ÷ 750 mm,
- base made of aluminium sheet of 2,00 mm thickness,
- installation of additional protective elements in the form of anti-burglar grid or safety net,
- available in configuration with soft body impact resistance up to 1200 J,
- for roofs with roof membrane, optional PVC coated sheet strip for easier installation,
- optional glazing in the form of Sunoptics prismatic dome (see details in section 4),
- circumferential strip for fixing roof flashings made of PVC coated metal sheet.

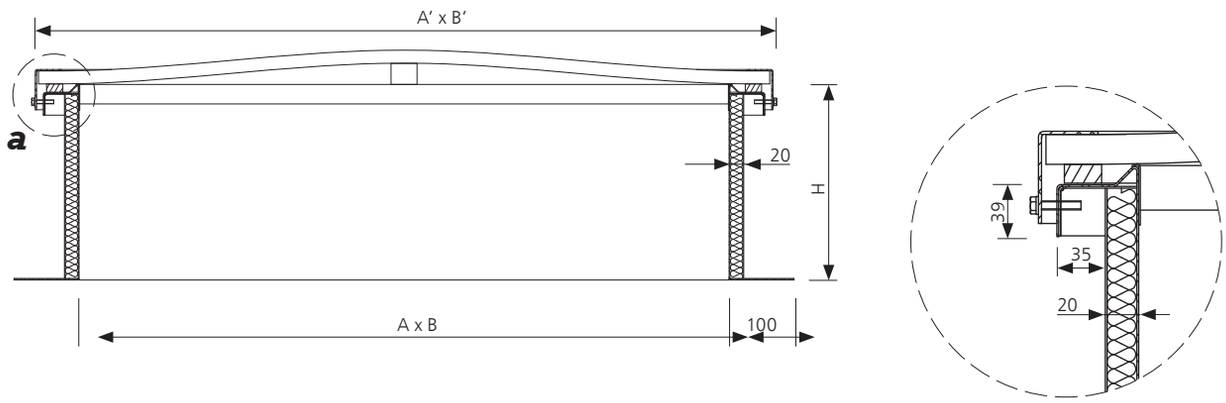


*Fig. 14 – Section **B-B** of mcr PROLIGHT C or E fixed skylight, dimensions in [mm]*

*Detail **a***

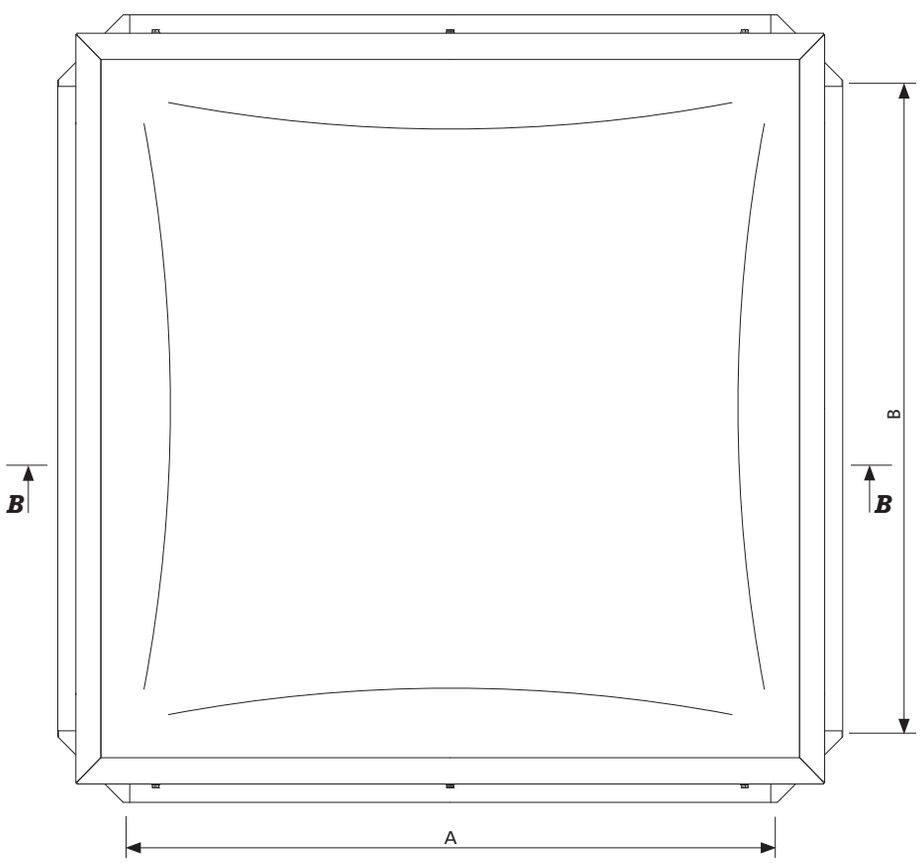


Fig. 15 – Top view of mcr PROLIGHT C or E fixed skylight, dimensions in [mm]

A, B – nominal dimensions [mm] of fixed skylight
A', B' – total dimensions of fixed skylight leaf A'=A+135 mm, B'=B+135 mm
H – fixed skylight base height [mm]

2.1.5. technical details

SKYLIGHT TYPE	NOMINAL DIMENSIONS(*)	ESTIMATED WEIGHT(**)
	A x B [mm]	[kg]
C 50	500 x 500	40
C 60	600 x 600	43
C 70	700 x 700	45
C 80	800 x 800	49
C 90	900 x 900	55
C 100	1000 x 1000	61
C 110	1100 x 1100	67
C 115	1150 x 1150	70
C 120	1200 x 1200	73
C 125	1250 x 1250	76
C 130	1300 x 1300	79
C 135	1350 x 1350	82
C 140	1400 x 1400	85
C 150	1500 x 1500	97
C 155	1550 x 1550	100
C 160	1600 x 1600	104
C 170	1700 x 1700	110
C 180	1800 x 1800	117
C 190	1900 x 1900	124
C 195	1950 x 1950	127
C 200	2000 x 2000	131
E 50/60	500 x 600	58
E 70/90	700 x 900	62
E 100/120	1000 x 1200	67
E 100/130	1000 x 1300	70
E 100/140	1000 x 1400	73
E 100/150	1000 x 1500	80
E 100/160	1000 x 1600	83
E 100/180	1000 x 1800	89
E 100/190	1000 x 1900	92
E 100/200	1000 x 2000	95
E 100/210	1000 x 2100	98
E 100/220	1000 x 2200	101
E 100/230	1000 x 2300	104
E 100/240	1000 x 2400	107
E 100/250	1000 x 2500	110
E 110/200	1100 x 2000	99
E 115/200	1150 x 2000	101
E 120/140	1200 x 1400	79
E 120/150	1200 x 1500	87
E 120/170	1200 x 1700	93
E 140/150	1400 x 1500	94
E 140/180	1400 x 1800	103
E 140/200	1400 x 2000	141
E 140/250	1400 x 2500	125
E 150/160	1500 x 1600	100
E 150/180	1500 x 1800	106
E 150/200	1500 x 2000	113
E 150/210	1500 x 2100	116
E 150/240	1500 x 2400	126
E 150/250	1500 x 2500	129

2.1.5. technical details

SKYLIGHT TYPE	NOMINAL DIMENSIONS(*)	ESTIMATED WEIGHT(**)
	A x B [mm]	[kg]
E 160/180	1600 x 1800	110
E 160/190	1600 x 1900	113
E 160/200	1600 x 2000	117
E 160/220	1600 x 2200	123
E 160/230	1600 x 2300	126
E 160/240	1600 x 2400	129
E 180/200	1800 x 2000	124
E 180/220	1800 x 2200	130
E 180/240	1800 x 2400	137
E 180/250	1800 x 2500	140
E 190/200	1900 x 2000	128
E 195/300	1950 x 3000	148

(*) Intermediate fixed skylight dimensions between the values specified in the table are possible.
(**) Estimated weight specified for fixed skylight of base height 500 mm, of standard configuration with multi-chamber polycarbonate panel glazing of 16 mm thickness.

2.2. fixed skylights with skew base - NG-A type

2.2.1. technical description of standard

- classification in accordance with EN 1873+A1:2016-03 (ref. to units with tranclucent glazing),
- NG-A type fixed skylights (squared and rectangular) smoke vents for flat and pitched roofs covered with roofing paper or PVC membrane,
- dimensional range of fixed skylights 60x60 cm ÷ 200x300 cm/ 210x210 cm
- skew base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness
- bottom part of the base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base has shape enabling water runoff,
- thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m^{2}K
- circumferential strip in the upper part of base, made of galvanized steel sheet, used for fixing roof work,
- leaf glazing: multi-chamber polycarbonate panel, acrylic dome, solid polycarbonate dome, multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome, glazing of B_{ROOF} (t1) classification (see details in section 4).

2.2.2. fixed skylight design

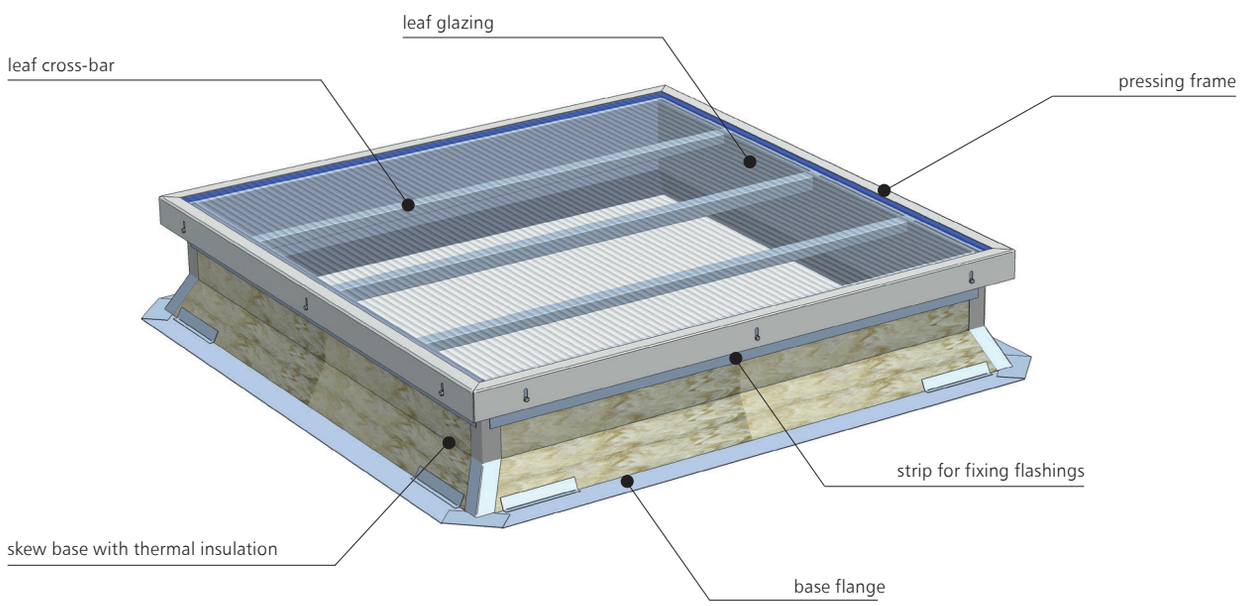


Fig. 16 – mcr PROLIGHT NG-A fixed skylight design

2.2.3. non-standard options

- skylight elements painted to any RAL color,
- thermal insulation of base made of PIR panel of 30 mm thickness, heat transfer coefficient U=0.68 W/m^{2}K,
- custom base height 160 mm ÷ 750 mm,
- base made of aluminium sheet of 2,00 mm thickness,
- installation of additional protective elements in the form of anti-burglar grid or safety net,
- available in configuration with soft body impact resistance up to 1200 J,
- for roofs with roof membrane, optional PVC coated sheet strip for easier installation,
- optional glazing in the form of Sunoptics prismatic dome (see details in section 4),
- circumferential strip for fixing roof flashings made of PVC coated metal sheet.

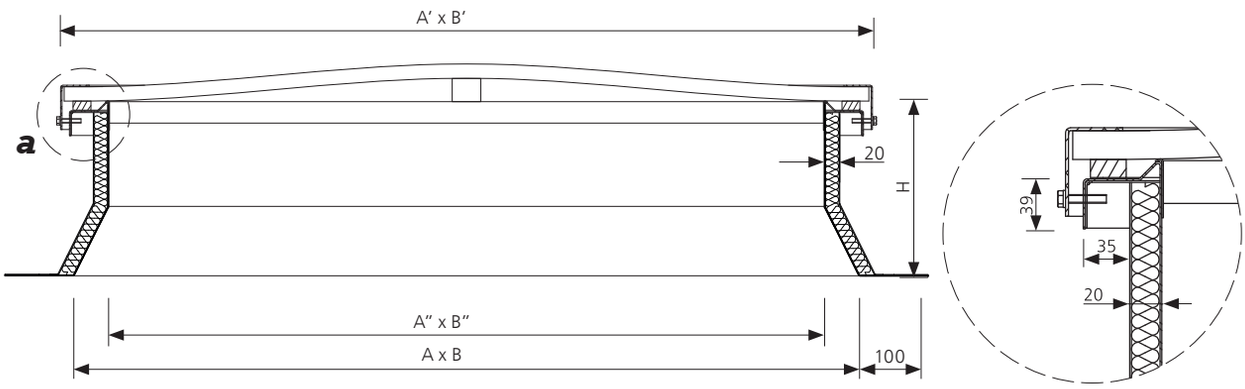


*Fig. 17 – Section **B-B** of mcr PROLIGHT NG-A fixed skylight, dimensions in [mm]*

*Detail **a***

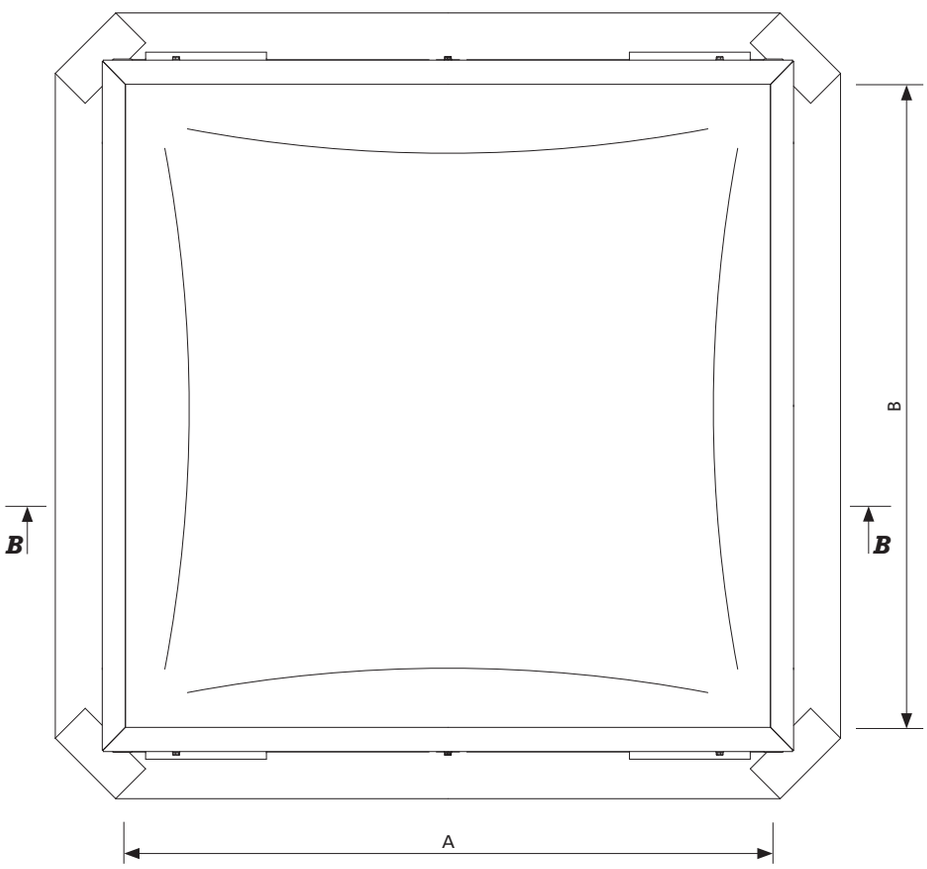


Fig. 18 – Top view of mcr PROLIGHT NG-A fixed skylight, dimensions in [mm]

A, B – nominal dimensions [mm] of fixed skylight
A', B' – total dimensions of fixed skylight leaf A'=A+135 mm, B'=B+135 mm
A", B" – clear dimensions of fixed skylight upper opening [mm], A"=A-100 mm, B"=B-100 mm
H – fixed skylight base height [mm]

2.2.5. technical details

SKYLIGHT TYPE	NOMINAL DIMENSIONS(*)	ESTIMATED WEIGHT(**)
	A x B [mm]	[kg]
NG-A 60/60	600 x 600	57
NG-A 80/100	800 x 1000	60
NG-A 100/100	1000 x 1000	63
NG-A 100/110	1000 x 1100	66
NG-A 100/120	1000 x 1200	69
NG-A 100/130	1000 x 1300	72
NG-A 100/140	1000 x 1400	75
NG-A 100/150	1000 x 1500	81
NG-A 100/160	1000 x 1600	85
NG-A 100/170	1000 x 1700	88
NG-A 100/180	1000 x 1800	91
NG-A 100/190	1000 x 1900	95
NG-A 100/200	1000 x 2000	98
NG-A 100/210	1000 x 2100	101
NG-A 100/220	1000 x 2200	104
NG-A 100/230	1000 x 2300	107
NG-A 100/240	1000 x 2400	110
NG-A 100/250	1000 x 2500	114
NG-A 120/120	1200 x 1200	76
NG-A 120/130	1200 x 1300	79
NG-A 120/140	1200 x 1400	82
NG-A 120/150	1200 x 1500	89
NG-A 120/170	1200 x 1700	95
NG-A 120/180	1200 x 1800	99
NG-A 120/190	1200 x 1900	102
NG-A 120/200	1200 x 2000	105
NG-A 120/210	1200 x 2100	109
NG-A 120/220	1200 x 2200	112
NG-A 120/230	1200 x 2300	115
NG-A 120/240	1200 x 2400	118
NG-A 120/250	1200 x 2500	122
NG-A 125/125	1250 x 1250	79
NG-A 130/130	1300 x 1300	82
NG-A 130/140	1300 x 1400	85
NG-A 130/150	1300 x 1500	93
NG-A 130/160	1300 x 1600	96
NG-A 130/170	1300 x 1700	99
NG-A 130/180	1300 x 1800	103
NG-A 130/190	1300 x 1900	106
NG-A 130/200	1300 x 2000	109
NG-A 130/210	1300 x 2100	113
NG-A 130/220	1300 x 2200	116
NG-A 130/230	1300 x 2300	119
NG-A 130/240	1300 x 2400	123
NG-A 130/250	1300 x 2500	126
NG-A 140/140	1400 x 1400	89
NG-A 140/150	1400 x 1500	96
NG-A 140/160	1400 x 1600	100
NG-A 140/170	1400 x 1700	103
NG-A 140/180	1400 x 1800	107
NG-A 140/190	1400 x 1900	110
NG-A 140/200	1400 x 2000	113

2.2.5. technical details

SKYLIGHT TYPE	NOMINAL DIMENSIONS(*)	ESTIMATED WEIGHT(**)
	A x B [mm]	[kg]
NG-A 140/210	1400 x 2100	117
NG-A 140/220	1400 x 2200	120
NG-A 140/230	1400 x 2300	123
NG-A 140/240	1400 x 2400	127
NG-A 140/250	1400 x 2500	130
NG-A 150/150	1500 x 1500	100
NG-A 150/160	1500 x 1600	104
NG-A 150/170	1500 x 1700	107
NG-A 150/180	1500 x 1800	110
NG-A 150/190	1500 x 1900	114
NG-A 150/200	1500 x 2000	117
NG-A 150/210	1500 x 2100	121
NG-A 150/220	1500 x 2200	124
NG-A 150/230	1500 x 2300	128
NG-A 150/240	1500 x 2400	131
NG-A 150/250	1500 x 2500	134
NG-A 160/160	1600 x 1600	108
NG-A 160/170	1600 x 1700	111
NG-A 160/180	1600 x 1800	114
NG-A 160/190	1600 x 1900	118
NG-A 160/200	1600 x 2000	121
NG-A 160/210	1600 x 2100	125
NG-A 160/220	1600 x 2200	128
NG-A 160/230	1600 x 2300	131
NG-A 160/240	1600 x 2400	134
NG-A 160/250	1600 x 2500	138
NG-A 170/170	1700 x 1700	115
NG-A 170/180	1700 x 1800	118
NG-A 170/190	1700 x 1900	122
NG-A 170/200	1700 x 2000	125
NG-A 170/210	1700 x 2100	129
NG-A 170/220	1700 x 2200	132
NG-A 170/230	1700 x 2300	135
NG-A 170/240	1700 x 2400	139
NG-A 170/250	1700 x 2500	142
NG-A 180/180	1800 x 1800	122
NG-A 180/190	1800 x 1900	126
NG-A 180/200	1800 x 2000	129
NG-A 180/210	1800 x 2100	133
NG-A 180/220	1800 x 2200	136
NG-A 180/230	1800 x 2300	140
NG-A 180/240	1800 x 2400	143
NG-A 180/250	1800 x 2500	146
NG-A 180/260	1800 x 2600	150
NG-A 180/270	1800 x 2700	153
NG-A 180/280	1800 x 2800	156
NG-A 180/290	1800 x 2900	159
NG-A 180/300	1800 x 3000	163
NG-A 190/190	1900 x 1900	130
NG-A 190/200	1900 x 2000	133

2.2.5. technical details

SKYLIGHT TYPE	NOMINAL DIMENSIONS(*)	ESTIMATED WEIGHT(**)
	A x B [mm]	[kg]
NG-A 190/210	1900 x 2100	137
NG-A 190/220	1900 x 2200	140
NG-A 190/230	1900 x 2300	144
NG-A 190/240	1900 x 2400	147
NG-A 190/250	1900 x 2500	150
NG-A 190/260	1900 x 2600	154
NG-A 190/270	1900 x 2700	157
NG-A 190/280	1900 x 2800	161
NG-A 190/290	1900 x 2900	164
NG-A 190/300	1900 x 3000	167
NG-A 200/200	2000 x 2000	137
NG-A 200/210	2000 x 2100	141
NG-A 200/220	2000 x 2200	144
NG-A 200/230	2000 x 2300	148
NG-A 200/240	2000 x 2400	151
NG-A 200/250	2000 x 2500	155
NG-A 200/260	2000 x 2600	158
NG-A 200/270	2000 x 2700	161
NG-A 200/280	2000 x 2800	165
NG-A 200/290	2000 x 2900	168
NG-A 200/300	2000 x 3000	172
NG-A 210/210	2100 x 2100	145

(*) Intermediate fixed skylight dimensions between the values specified in the table are possible.
(**) Estimated weight specified for fixed skylight of base height 500 mm, of standard configuration with multi-chamber polycarbonate panel glazing of 16 mm thickness.

2.3. fixed skylights with straight base - R type

2.3.1. technical description of standard

- classification in accordance with EN 1873+A1:2016-03 (ref. to units with tranclucent glazing),
- R type fixed skylights (circular) for flat and pitched roofs covered with roofing paper or PVC membrane,
- dimensional range of circular fixed skylights Ø80 cm ÷ Ø180 cm,
- straight base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness,
- bottom part of the base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base has shape enabling water runoff,
- thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m^{2}K,
- circumferential strip in the upper part of base, made of galvanized steel sheet, used for fixing roof work,
- leaf glazing: multi-chamber polycarbonate panel, acrylic dome, solid polycarbonate dome, multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome, glazing of B_{ROOF} (t1) classification (see details in section 4).

2.3.2. fixed skylight design

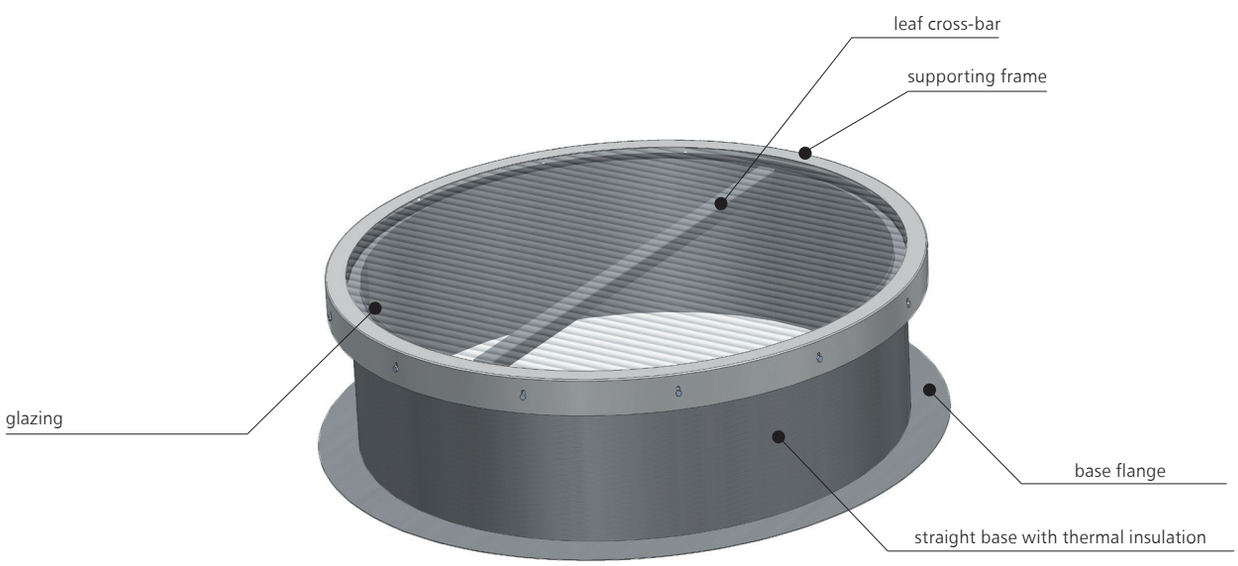


Fig. 19 – mcr PROLIGHT R fixed skylight design

2.3.3. non-standard options

- skylight elements painted to any RAL color,
- thermal insulation of base made of mineral wool of 40 mm thickness, heat transfer coefficient U=0.8 W/m^{2}K,
- custom base height 160 mm ÷ 750 mm,
- base made of aluminium sheet of 2,00 mm thickness,
- installation of additional protective elements in the form of anti-burglar grid or safety net,
- available in configuration with soft body impact resistance up to 1200 J,
- for roofs with roof membrane, optional PVC coated sheet strip for easier installation,

2.3.4. technical drawings

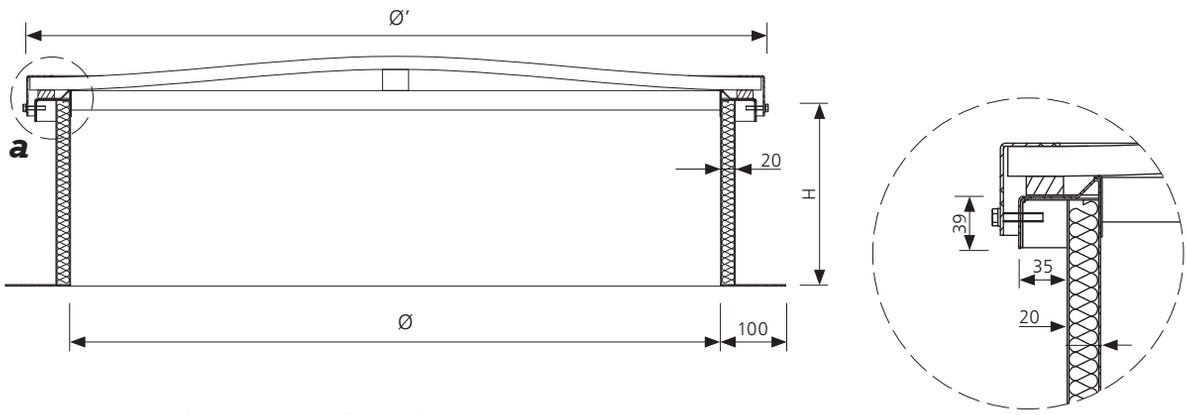


Fig. 20 – Cross section of mcr PROLIGHT R fixed skylight, dimensions in [mm]

Ø – nominal dimensions – diameter [mm] of fixed skylight
Ø – total dimensions of fixed skylight leaf Ø = Ø +135 mm
H – fixed skylight base height [mm]

2.3.5. technical details

SKYLIGHT TYPE	NOMINAL DIMENSIONS(*)	ESTIMATED WEIGHT(**)
	DIAMETER Ø [mm]	[kg]
R 80	800	48
R 90	900	55
R 100	1000	62
R 110	1100	69
R 120	1200	76
R 130	1300	83
R 140	1400	90
R 150	1500	103
R 160	1600	111
R 170	1700	119
R 180	1800	128

(*) Intermediate fixed skylight dimensions between the values specified in the table are possible.
(**) Estimated weight specified for fixed skylight of base height 300 mm, of standard configuration with multi-chamber polycarbonate panel glazing of 16 mm thickness.

2.4. roof hatches with straight base - C, E type

2.4.1. technical description of standard

- classification in accordance with EN 1873+A1:2016-03 (ref. to units with translucent glazing),
- C type roof hatches (squared) and E type (rectangular) for flat and pitched roofs covered with roofing paper or PVC membrane,
- dimensional range for roof hatches:
  - C type roof hatches (squared): 60x60 cm ÷ 140x140 cm,
  - E type roof hatches (rectangular): 80x90 cm ÷ 140x150 cm,
- straight base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness
- bottom part of base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base profiled to allow water run-off,
- thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m^{2}K,
- galvanized steel sheet circumferential strip in upper part of base allows fixing of roof flashing,
- hatch equipped in two gas springs for easy opening to 90° open position,
- leaf glazing: multi-chamber polycarbonate panel, acrylic dome, solid polycarbonate dome, multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome, glazing of B_{ROOF} (t1) classification (see details in section 4).

2.4.2. roof hatch design

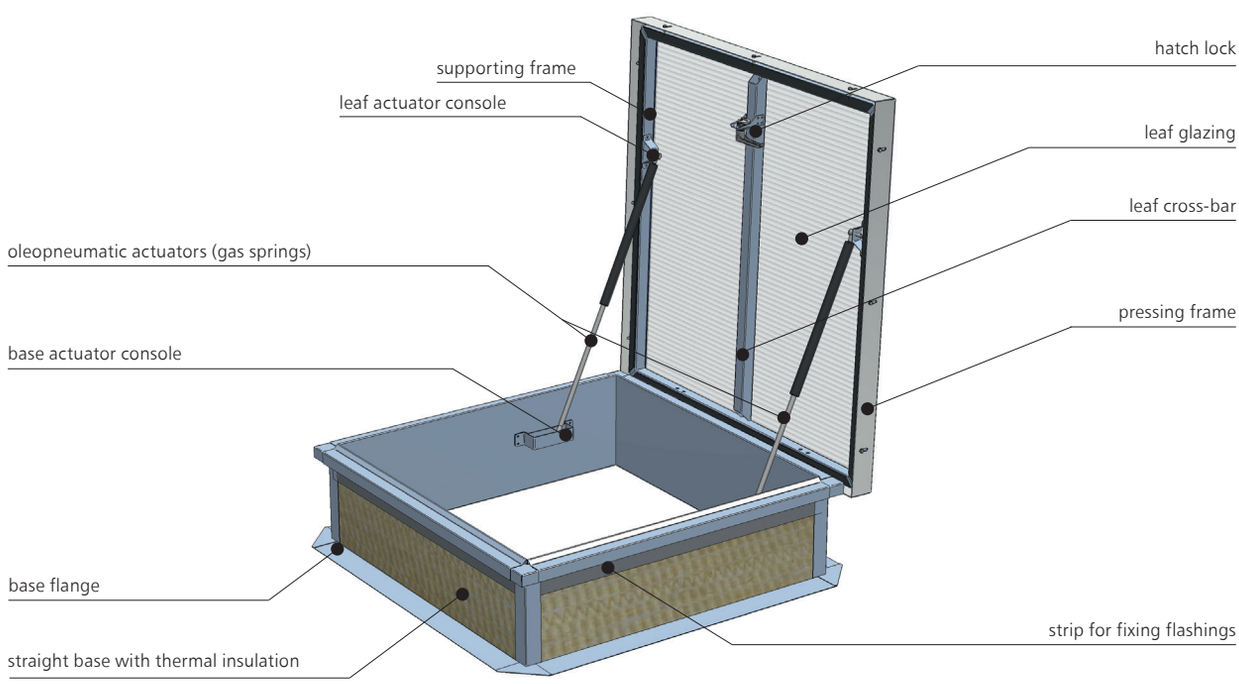


Fig. 21 – mcr PROLIGHT C roof hatch design

2.4.3. non-standard options

- hatch elements painted to any RAL color,
- thermal insulation of base made of PIR panel of 30 mm thickness, heat transfer coefficient U=0.68 W/m^{2}K,
- custom base height 160 mm ÷ 750 mm,
- base made of aluminium sheet of 2,00 mm thickness,
- installation of additional protective element in the form of anti-burglar grid or openable safety net.

2.4.4. technical drawings

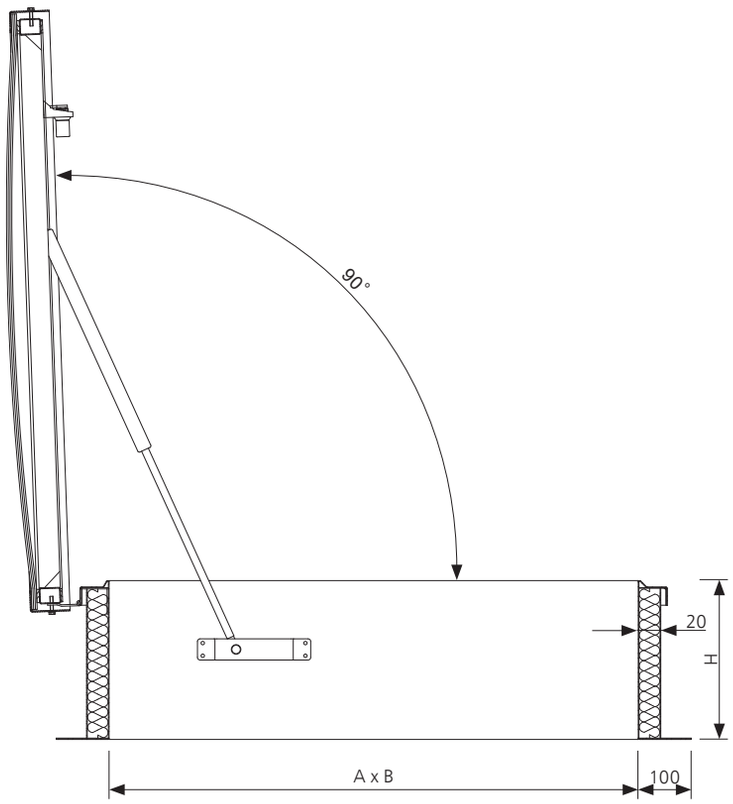


*Fig. 22 – Section **B-B** of mcr PROLIGHT C roof hatch in open position, dimensions in [mm]*

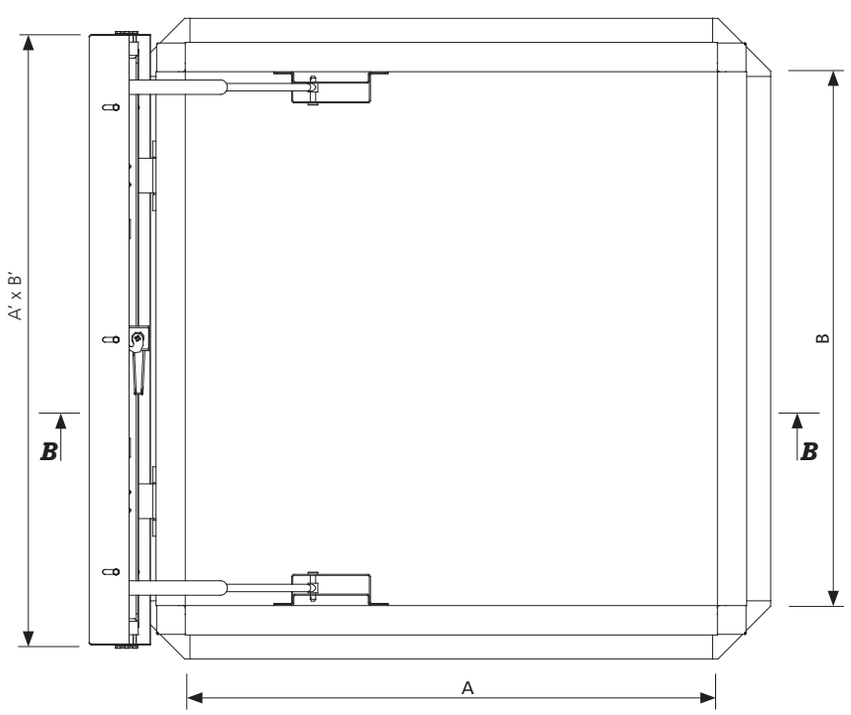


Fig. 23 – Top view of mcr PROLIGHT C roof hatch in open position, dimensions in [mm]

A, B – nominal dimensions [mm], clear opening of roof hatch
A', B' – total dimensions of roof hatch leaf [mm], A'=A+135 mm, B'=B+135 mm
H – roof hatch base height [mm]

2.4.5. technical details

ROOF HATCH TYPE	NOMINAL DIMENSIONS(*)	ESTIMATED WEIGHT(**)
	A x B [mm]	[kg]
C 60	600 x 600	45
C 70	700 x 700	47
C 80	800 x 800	51
C 90	900 x 900	57
C 100	1000 x 1000	63
C 110	1100 x 1100	69
C 120	1200 x 1200	72
C 125	1250 x 1250	75
C 130	1300 x 1300	81
C 135	1350 x 1350	84
C 140	1400 x 1400	87
E 50/60	500 x 600	49
E 70/90	700 x 900	51
E 80/90	800 x 900	54
E 80/100	800 x 1000	57
E 80/110	800 x 1100	59
E 80/120	800 x 1200	62
E 80/130	800 x 1300	64
E 80/140	800 x 1400	66
E 80/150	800 x 1500	69
E 90/100	900 x 1000	60
E 90/110	900 x 1100	63
E 90/120	900 x 1200	65
E 90/130	900 x 1300	68
E 90/140	900 x 1400	71
E 90/150	900 x 1500	73
E 100/110	1000 x 1100	66
E 100/120	1000 x 1200	69
E 100/130	1000 x 1300	72
E 100/140	1000 x 1400	75
E 100/150	1000 x 1500	82
E 110/120	1100 x 1200	72
E 110/130	1100 x 1300	75
E 110/140	1100 x 1400	78
E 110/150	1100 x 1500	81
E 120/130	1200 x 1300	79
E 120/140	1200 x 1400	81
E 120/150	1200 x 1500	89

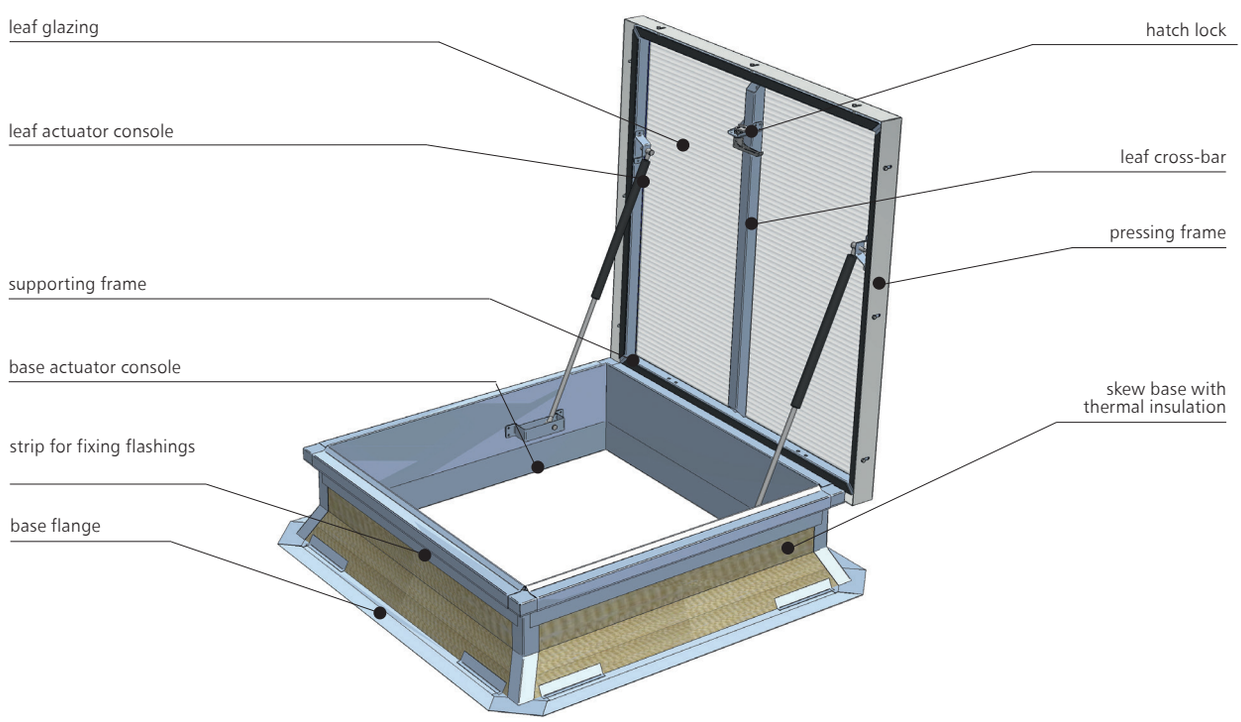
(*) Intermediate roof hatch dimensions between the values specified in the table are possible.
(**) Estimated weight specified for roof hatch of base height 500 mm, of standard configuration with multi-chamber polycarbonate panel glazing of 16 mm thickness.

2.5. roof hatches with skew base - NG-A type

2.5.1. technical description of standard

- classification in accordance with EN 1873+A1:2016-03 (ref. to units with translucent glazing),
- NG-A type roof hatches (squared and rectangular) smoke vents for flat and pitched roofs covered with roofing paper or PVC membrane,
- dimensional range for roof hatches: 70x70 cm ÷ 150x160 cm,
- skew base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness,
- bottom part of base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base profiled to allow water run-off,
- thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m^{2}K,
- galvanized steel sheet circumferential strip in upper part of base allows fixing of roof flashing,
- leaf glazing: multi-chamber polycarbonate panel, acrylic dome, solid polycarbonate dome, sandwich panel, multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome, multi-chamber polycarbonate panel with aluminum envelope cover and glazing of B_{ROOF} (t1) class (see details in section 4),
- hatch equipped in two gas springs for easy opening to 90° open position.

2.5.2. roof hatch design



Rys. 24 – mcr PROLIGHT NG-A roof hatch design

2.5.3. non-standard options

- hatch elements painted to any RAL color,
- thermal insulation of base – PIR panel of 30 mm thickness, heat transfer coefficient U=0.68 W/m^{2}K,
- custom base height 160 mm ÷ 750 mm,
- base made of aluminium sheet of 2,00 mm thickness,
- installation of additional protective element in the form of anti-burglar grid or openable safety net.

2.5.4. technical drawings

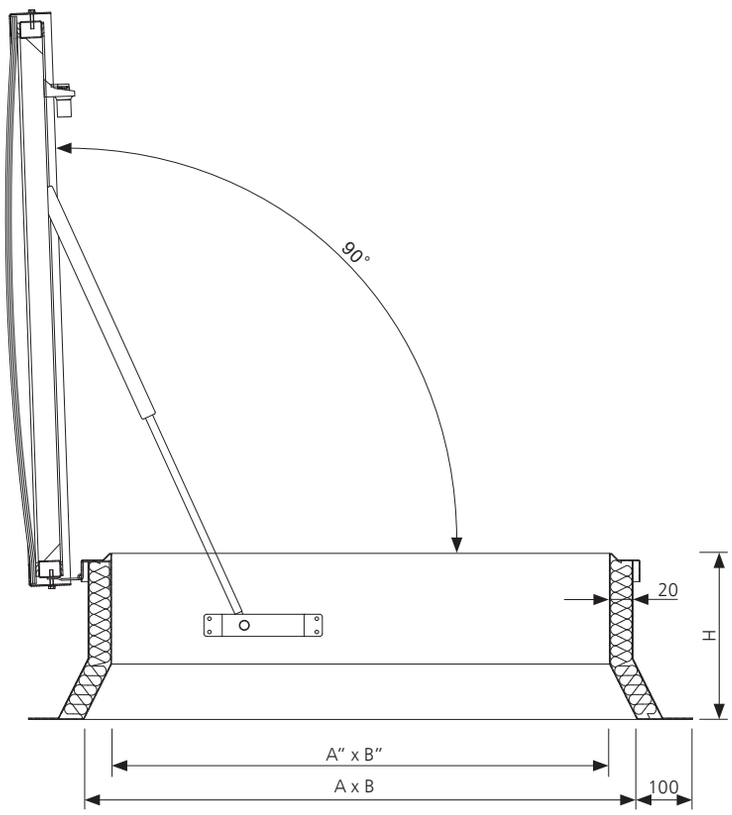


*Fig. 25 – Section **B-B** of mcr PROLIGHT NG-A roof hatch in open position, dimensions in [mm]*

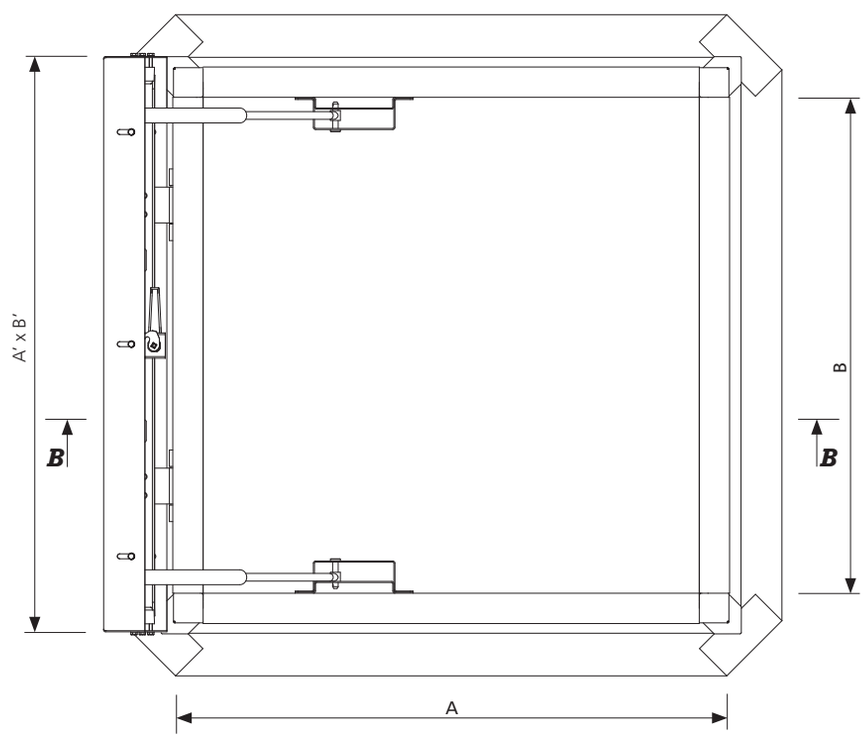


Fig. 26 – Top view of mcr PROLIGHT NG-A roof hatch in open position, dimensions in [mm]]

A, B – nominal dimensions [mm], clear opening of roof hatch
A', B' – total dimensions of roof hatch leaf [mm], A'=A+135 mm, B'=B+135 mm
A", B" – clear dimensions of roof hatch upper opening [mm], A"=A-100 mm, B"=B-100 mm
H – roof hatch base height [mm]

2.5.5. technical details

ROOF HATCH TYPE	NOMINAL DIMENSIONS(*)	ESTIMATED WEIGHT(**)
	A x B [mm]	[kg]
NG-A 70/70	700 x 700	75
NG-A 100/100	1000 x 1000	78
NG-A 100/110	1000 x 1100	81
NG-A 100/120	1000 x 1200	84
NG-A 100/130	1000 x 1300	87
NG-A 100/140	1000 x 1400	90
NG-A 100/150	1000 x 1500	96
NG-A 120/120	1200 x 1200	91
NG-A 120/130	1200 x 1300	94
NG-A 120/140	1200 x 1400	97
NG-A 120/150	1200 x 1500	104
NG-A 125/125	1250 x 1250	94
NG-A 130/130	1300 x 1300	97
NG-A 130/140	1300 x 1400	100
NG-A 130/150	1300 x 1500	108
NG-A 140/140	1400 x 1400	104
NG-A 140/150	1400 x 1500	111
NG-A 150/160	1500 x 1600	120

(*) Intermediate roof hatch dimensions between the values specified in the table are possible.
(**) Estimated weight specified for roof hatch of base height 500 mm, of standard configuration with multi-chamber polycarbonate panel glazing of 16 mm thickness.

2.6. ventilation vents with straight base - C, E type

2.6.1. technical description of standard

- classification in accordance with EN 1873+A1:2016-03 (ref. to units with tranclucent glazing),
- C type ventilation vents (squared) and E type (rectangular) for flat and pitched roofs covered with roofing paper or PVC membrane,
- dimensional range for ventilation vents:
  - C type squared vents: 880x90 ÷ 200x250 cm,
  - E type rectangular vents: 100x120 cm ÷ 195x300 cm,
- straight base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness
- bottom part of base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base profiled to allow water run-off,
- thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m^{2}K,
- galvanized steel sheet circumferential strip in upper part of base allows fixing of roof flashing,
- ventilation control 230V,
- leaf glazing: multi-chamber polycarbonate panel, acrylic dome, solid polycarbonate dome, sandwich panel, multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome, multi-chamber polycarbonate panel with aluminum envelope cover and glazing of BROOF (t1) class (see details in section 4).

2.6.2. ventilation vent design

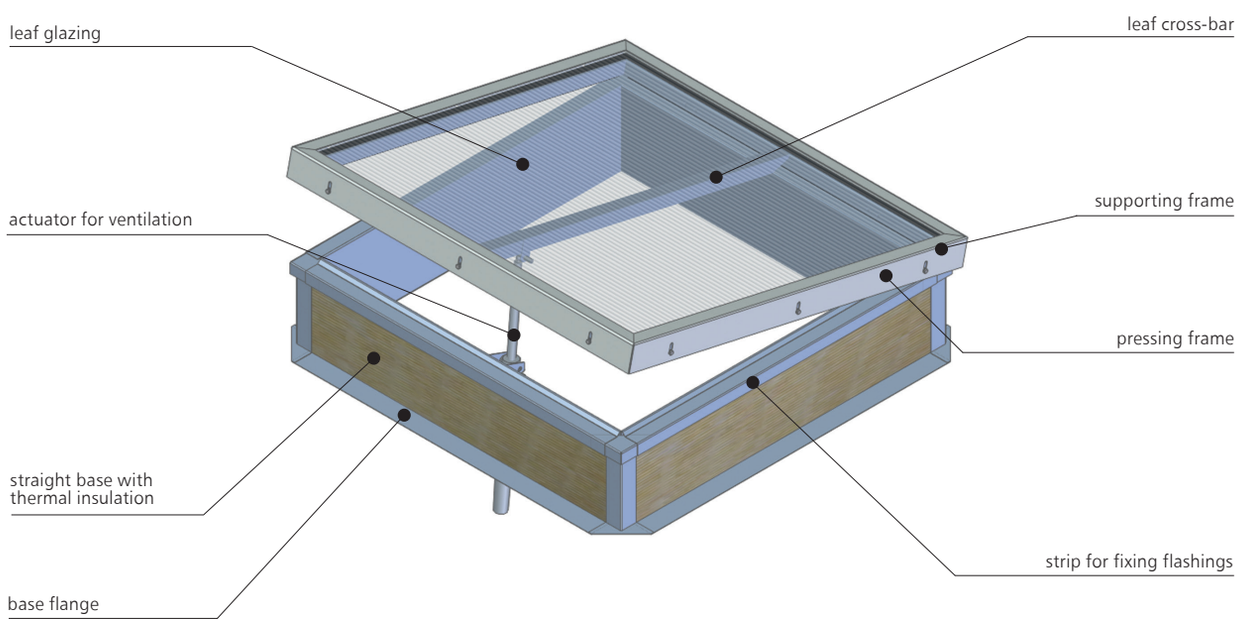


Fig. 27 – mcr PROLIGHT C ventilation vent design with electric actuator for ventilation

2.6.3. non-standard options

- vent elements painted to any RAL color,
- thermal insulation of base made of PIR panel of 30 mm thickness, heat transfer coefficient U=0.68 W/m^{2}K,
- custom dimensions of clear opening of vent base,
- custom base height within 160 mm ÷ 700 mm,
- custom width of circumferential flange of base,
- base made of aluminium sheet of 2,00 mm thickness,
- installation of additional protective elements in the form of anti-burglar grid or safety net,
- available in configuration with soft body impact resistance up to 1200 J,
- circumferential strip for fixing roof flashings made of PVC coated metal sheet,
- optional glazing in the form of Sunoptics prismatic dome (see details in section 4).

2.6.4. technical drawings

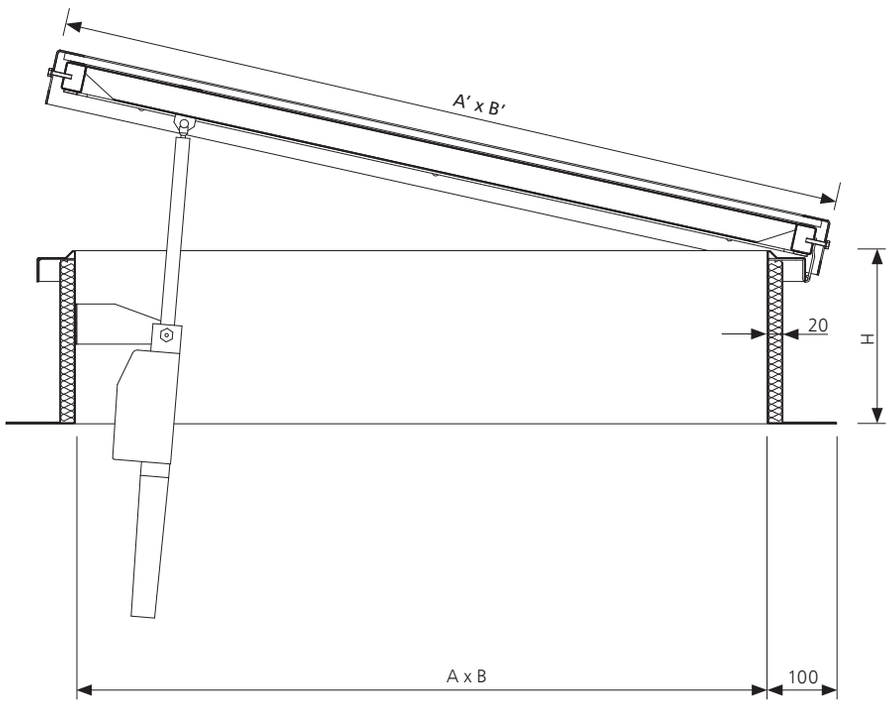


*Fig. 28 – Section **B-B** of mcr PROLIGHT E ventilation vent in open position, dimensions in [mm]*

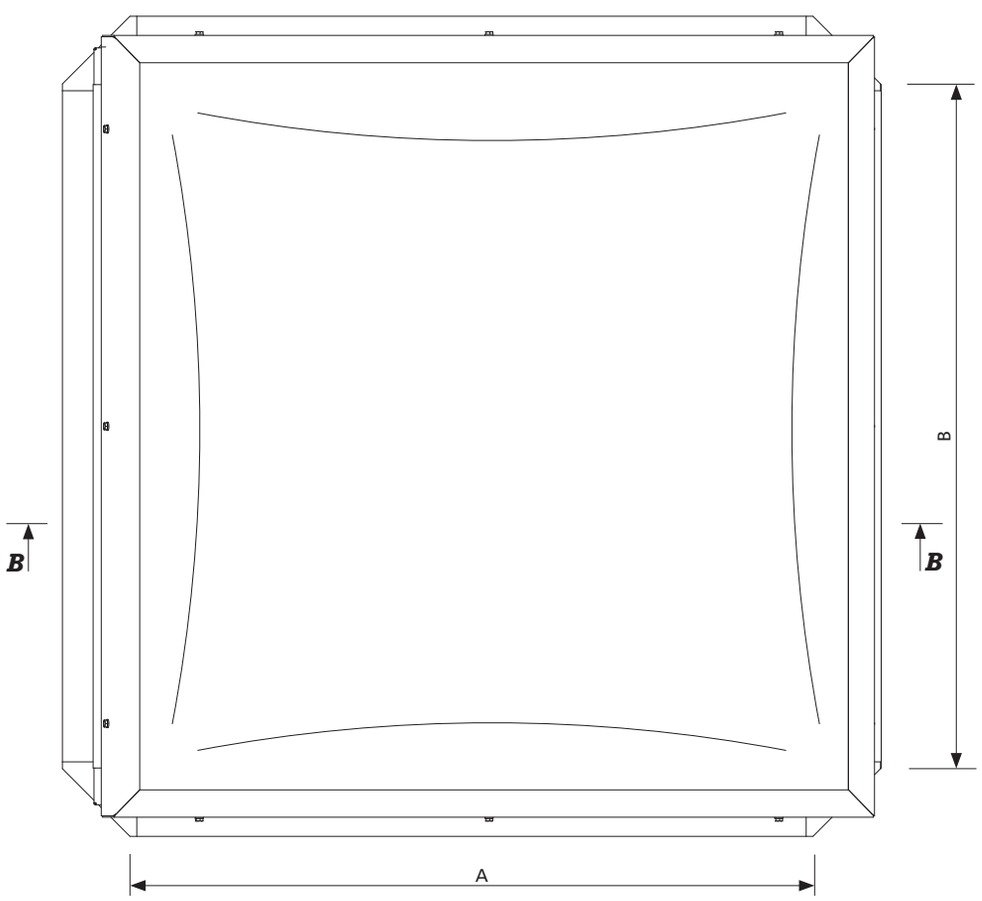


Fig. 29 – Top view of mcr PROLIGHT E ventilation vent in open position, dimensions in [mm]

A, B – nominal dimensions [mm] of ventilation vent
A', B' – total dimensions of ventilation vent A'=A+135 mm, B'=B+135 mm
H – ventilation vent base height [mm]

2.6.5. technical details

VENT TYPE	NOMINAL DIMENSIONS(*)	GEOMETRIC SURFACE	ESTIMATED WEIGHT(**)
	A x B [mm]	[m^2]	[kg]
C 80	800 x 800	0,64	49
C 90	900 x 900	0,81	54
C 100	1000 x 1000	1,00	60
C 110	1100 x 1100	1,21	70
C 115	1150 x 1150	1,32	73
C 120	1200 x 1200	1,44	76
C 125	1250 x 1250	1,56	79
C 130	1300 x 1300	1,69	82
C 135	1350 x 1350	1,82	85
C 140	1400 x 1400	1,96	88
C 150	1500 x 1500	2,25	103
C 155	1550 x 1550	2,40	106
C 160	1600 x 1600	2,56	110
C 170	1700 x 1700	2,89	116
C 180	1800 x 1800	3,24	123
C 190	1900 x 1900	3,61	130
C 195	1950 x 1950	3,80	133
C 200	2000 x 2000	4,00	137
E 80/90	800 x 900	0,72	65
E 100/120	1000 x 1200	1,20	70
E 100/130	1000 x 1300	1,30	73
E 100/140	1000 x 1400	1,40	76
E 100/150	1000 x 1500	1,50	83
E 100/160	1000 x 1600	1,60	86
E 100/180	1000 x 1800	1,80	92
E 100/190	1000 x 1900	1,90	95
E 100/200	1000 x 2000	2,00	101
E 100/210	1000 x 2100	2,10	104
E 100/220	1000 x 2200	2,20	107
E 100/230	1000 x 2300	2,30	110
E 100/240	1000 x 2400	2,40	113
E 100/250	1000 x 2500	2,50	116
E 110/200	1100 x 2000	2,20	105
E 115/200	1150 x 2000	2,30	107
E 120/140	1200 x 1400	1,68	82
E 120/150	1200 x 1500	1,80	90
E 120/170	1200 x 1700	2,04	99
E 140/150	1400 x 1500	2,10	100
E 140/180	1400 x 1800	2,52	109
E 140/200	1400 x 2000	2,80	116
E 140/250	1400 x 2500	3,50	131
E 150/160	1500 x 1600	2,40	106
E 150/180	1500 x 1800	2,70	112
E 150/200	1500 x 2000	3,00	119
E 150/210	1500 x 2100	3,15	122
E 150/240	1500 x 2400	3,60	132
E 150/250	1500 x 2500	3,75	135
E 160/180	1600 x 1800	2,88	116
E 160/190	1600 x 1900	3,04	119

2.6.5. technical details

VENT TYPE	NOMINAL DIMENSIONS(*)	GEOMETRIC AREA	ESTIMATED WEIGHT(**)
	A x B [mm]	[m^2]	[kg]
E 160/200	1600 x 2000	3,20	123
E 160/220	1600 x 2200	3,52	129
E 160/230	1600 x 2300	3,68	132
E 160/240	1600 x 2400	3,84	135
E 180/200	1800 x 2000	3,60	130
E 180/220	1800 x 2200	3,96	136
E 180/240	1800 x 2400	4,32	143
E 180/250	1800 x 2500	4,50	146
E 190/200	1900 x 2000	3,80	134
E 195/250	1950 x 2500	4,88	155

(*) Intermediate ventilation vent dimensions between the values specified in the table are possible.

(**) Estimated weight specified for ventilation vent of base height 500 mm, of standard configuration with multi-chamber polycarbonate panel glazing of 16 mm thickness, with electric control.

2.7. ventilation vents with skew base - NG-A type

2.7.1. technical description of standard

- classification in accordance with EN 1873+A1:2016-03 (ref. to units with tranclucent glazing),
- NG-A type (squared and rectangular) ventilation vents for flat and pitched roofs covered with roofing paper or PVC membrane,
- dimensional range for NG-A type ventilation vents: 90x90 ÷ 200x250 cm/ 210x210 cm,
- skew base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness,
- bottom part of base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base profiled to allow water run-off,
- thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m^{2}K,
- galvanized steel sheet circumferential strip in upper part of base allows fixing of roof flashing,
- leaf glazing: multi-chamber polycarbonate panel, acrylic dome, solid polycarbonate dome, sandwich panel, multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome, multi-chamber polycarbonate panel with aluminum envelope cover and glazing of B_{ROOF} (t1) class (see details in section 4),
- ventilation control: pneumatic or ~230V electric.

2.7.2. ventilation vent design

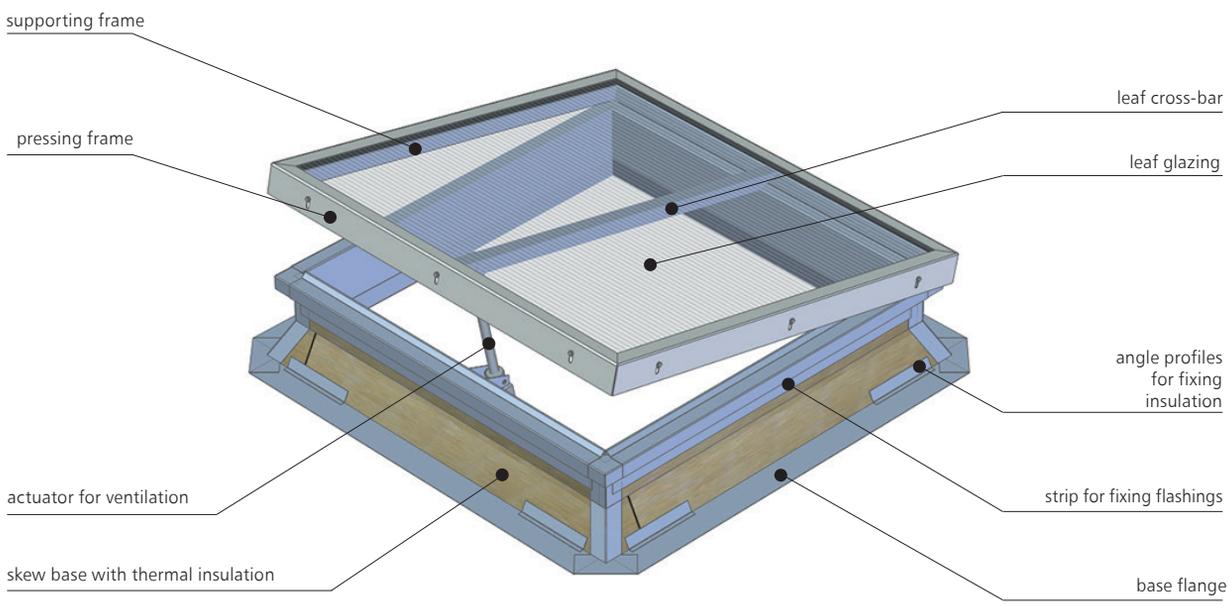


Fig. 30 – mcr PROLIGHT C ventilation vent design with electric actuator for ventilation

2.7.3. non-standard options

- vent elements painted to any RAL color,
- thermal insulation of base made of PIR panel of 30 mm thickness, heat transfer coefficient U=0.68 W/m^{2}K,
- custom base height 300 mm ÷ 700 mm,
- base made of aluminium sheet of 2,00 mm thickness,
- installation of additional protective elements in the form of anti-burglar grid or safety net,
- available in configuration with soft body impact resistance up to 1200 J
- circumferential strip for fixing roof flashings made of PVC coated metal sheet,
- optional glazing in the form of Sunoptics prismatic dome (see details in section 4).

2.7.4. technical drawings

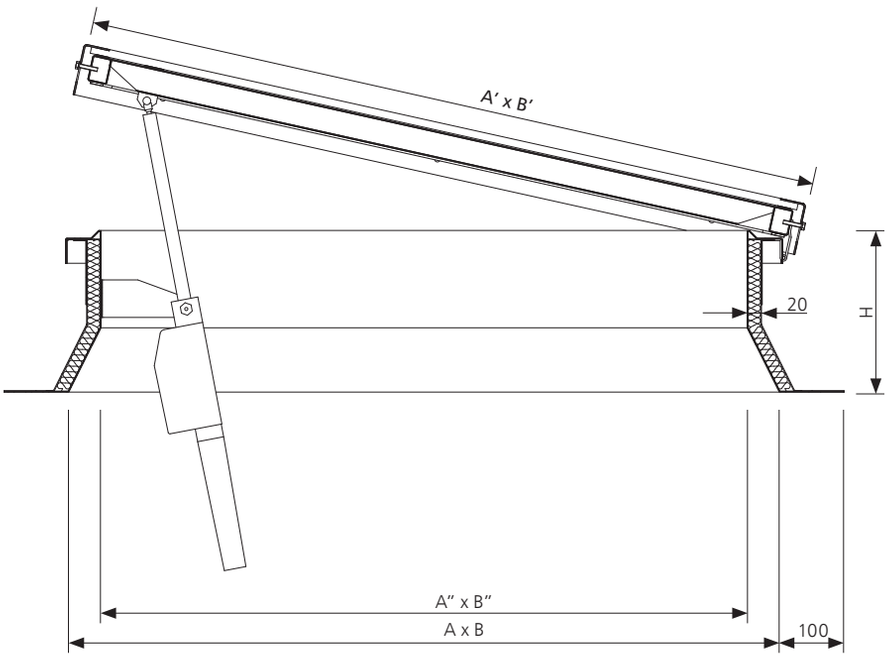


*Fig. 31 – Section **B-B** of mcr PROLIGHT NG-A ventilation vent with skew base in open position, dimensions in [mm]*

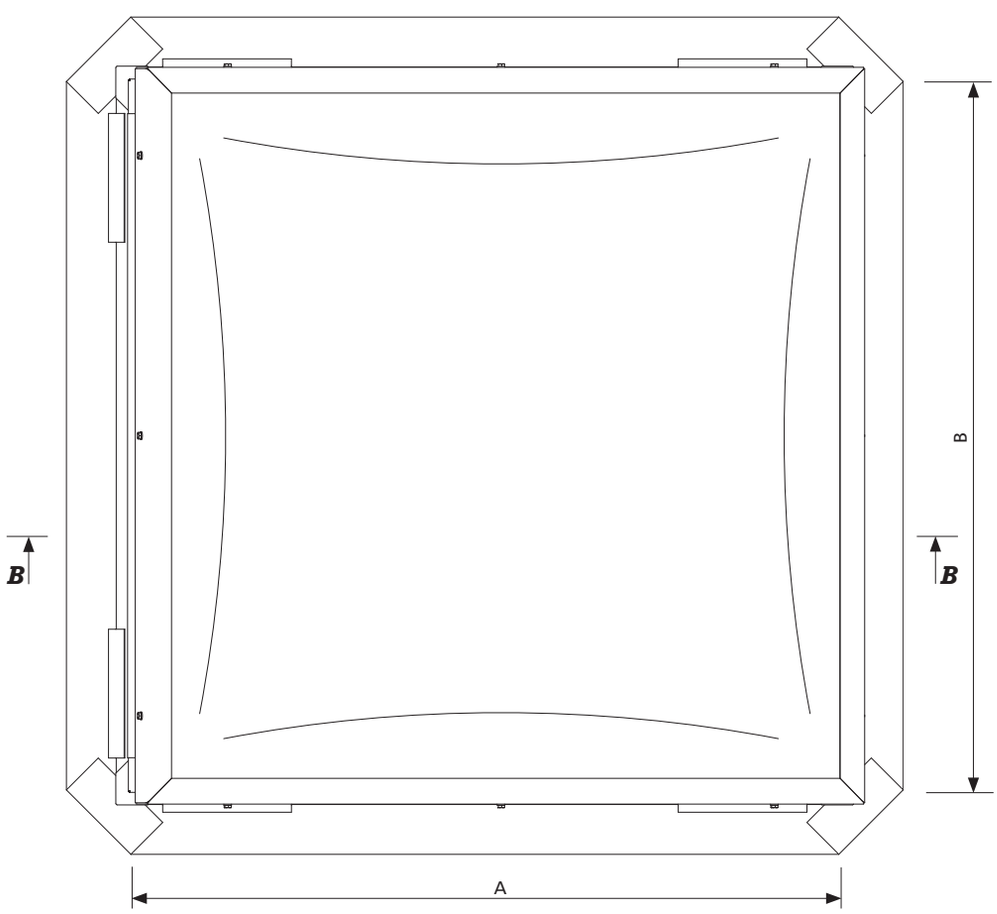


Fig. 32 – Top view of mcr PROLIGHT NG-A ventilation vent with skew base in open position, dimensions in [mm]

A, B – nominal dimensions [mm] of ventilation vent
A', B' – total dimensions of ventilation vent A'=A+135 mm, B'=B+135 mm
A", B" – clear dimensions of ventilation vent upper opening [mm], A"=A-100 mm, B"=B-100 mm
H – ventilation vent base height [mm]

2.7.5. technical details

VENT TYPE	NOMINAL DIMENSIONS(*)	GEOMETRIC AREA	ESTIMATED WEIGHT(**)
	A x B [mm]	[m^2]	[kg]
NG-A 90/90	900 x 900	0,64	53
NG-A 100/100	1000 x 1000	0,81	66
NG-A 100/110	1000 x 1100	0,90	69
NG-A 100/120	1000 x 1200	0,99	72
NG-A 100/130	1000 x 1300	1,08	75
NG-A 100/140	1000 x 1400	1,17	78
NG-A 100/150	1000 x 1500	1,26	84
NG-A 100/160	1000 x 1600	1,35	88
NG-A 100/170	1000 x 1700	1,44	91
NG-A 100/180	1000 x 1800	1,53	94
NG-A 100/190	1000 x 1900	1,62	98
NG-A 100/200	1000 x 2000	1,71	101
NG-A 100/210	1000 x 2100	1,80	104
NG-A 100/220	1000 x 2200	1,89	107
NG-A 100/230	1000 x 2300	1,98	110
NG-A 100/240	1000 x 2400	2,07	116
NG-A 100/250	1000 x 2500	2,16	120
NG-A 120/120	1200 x 1200	1,21	79
NG-A 120/130	1200 x 1300	1,32	82
NG-A 120/140	1200 x 1500	1,43	85
NG-A 120/150	1200 x 1600	1,54	92
NG-A 120/170	1200 x 1700	1,76	98
NG-A 120/180	1200 x 1800	1,87	102
NG-A 120/190	1200 x 1900	1,98	105
NG-A 120/200	1200 x 2000	2,09	111
NG-A 120/210	1200 x 2100	2,20	115
NG-A 120/220	1200 x 2200	2,31	118
NG-A 120/230	1200 x 2300	2,42	121
NG-A 120/240	1200 x 2400	2,53	124
NG-A 120/250	1200 x 2500	2,64	128
NG-A 125/125	1250 x 1250	1,32	82
NG-A 130/130	1300 x 1300	1,44	85
NG-A 130/140	1300 x 1400	1,56	88
NG-A 130/150	1300 x 1500	1,68	96
NG-A 130/160	1300 x 1600	1,80	99
NG-A 130/170	1300 x 1700	1,92	102
NG-A 130/180	1300 x 1800	2,04	109
NG-A 130/190	1300 x 1900	2,16	112
NG-A 130/200	1300 x 2000	2,28	115
NG-A 130/210	1300 x 2100	2,40	119
NG-A 130/220	1300 x 2200	2,52	122
NG-A 130/230	1300 x 2300	2,64	125
NG-A 130/240	1300 x 2400	2,76	129
NG-A 130/250	1300 x 2500	2,88	132
NG-A 140/140	1400 x 1400	1,69	92
NG-A 140/150	1400 x 1500	1,82	99
NG-A 140/160	1400 x 1600	1,95	103
NG-A 140/170	1400 x 1700	2,08	109
NG-A 140/180	1400 x 1800	2,21	113
NG-A 140/190	1400 x 1900	2,34	116
NG-A 140/200	1400 x 2000	2,47	119

2.7.5. technical details

VENT TYPE	NOMINAL DIMENSIONS(*)	GEOMETRIC AREA	ESTIMATED WEIGHT(**)
	A x B [mm]	[m^2]	[kg]
NG-A 140/210	1400 x 2100	2,60	123
NG-A 140/220	1400 x 2200	2,73	126
NG-A 140/230	1400 x 2300	2,86	129
NG-A 140/240	1400 x 2400	2,99	133
NG-A 140/250	1400 x 2500	3,12	136
NG-A 150/150	1500 x 1500	1,96	103
NG-A 150/160	1500 x 1600	2,10	110
NG-A 150/170	1500 x 1700	2,24	113
NG-A 150/180	1500 x 1800	2,38	116
NG-A 150/190	1500 x 1900	2,52	120
NG-A 150/200	1500 x 2000	2,66	123
NG-A 150/210	1500 x 2100	2,80	127
NG-A 150/220	1500 x 2200	2,94	130
NG-A 150/230	1500 x 2300	3,08	134
NG-A 150/240	1500 x 2400	3,22	137
NG-A 150/250	1500 x 2500	3,36	140
NG-A 160/160	1600 x 1600	2,25	114
NG-A 160/170	1600 x 1700	2,40	117
NG-A 160/180	1600 x 1800	2,55	120
NG-A 160/190	1600 x 1900	2,70	124
NG-A 160/200	1600 x 2000	2,85	127
NG-A 160/210	1600 x 2100	3,00	131
NG-A 160/220	1600 x 2200	3,15	134
NG-A 160/230	1600 x 2300	3,30	137
NG-A 160/240	1600 x 2400	3,45	140
NG-A 160/250	1600 x 2500	3,60	144
NG-A 170/170	1700 x 1700	2,56	121
NG-A 170/180	1700 x 1800	2,72	124
NG-A 170/190	1700 x 1900	2,88	128
NG-A 170/200	1700 x 2000	3,04	131
NG-A 170/210	1700 x 2100	3,20	135
NG-A 170/220	1700 x 2200	3,36	138
NG-A 170/230	1700 x 2300	3,52	141
NG-A 170/240	1700 x 2400	3,68	145
NG-A 170/250	1700 x 2500	3,84	148
NG-A 180/180	1800 x 1800	2,89	128
NG-A 180/190	1800 x 1900	3,06	132
NG-A 180/200	1800 x 2000	3,23	135
NG-A 180/210	1800 x 2100	3,23	139
NG-A 180/220	1800 x 2200	3,57	142
NG-A 180/230	1800 x 2300	3,74	146
NG-A 180/240	1800 x 2400	3,91	149
NG-A 180/250	1800 x 2500	4,08	152
NG-A 180/260	1800 x 2600	4,25	156
NG-A 180/270	1800 x 2700	4,42	159
NG-A 180/280	1800 x 2800	4,59	162
NG-A 180/290	1800 x 2900	4,76	165
NG-A 180/300	1800 x 3000	4,93	169
NG-A 190/190	1900 x 1900	3,24	136
NG-A 190/200	1900 x 2000	3,42	139

2.7.5. technical details

VENT TYPE	NOMINAL DIMENSIONS(*)	GEOMETRIC AREA	ESTIMATED WEIGHT(**)
	A x B [mm]	[m^2]	[kg]
NG-A 190/210	1900 x 2100	3,60	143
NG-A 190/220	1900 x 2200	3,78	146
NG-A 190/230	1900 x 2300	3,96	150
NG-A 190/240	1900 x 2400	4,14	153
NG-A 190/250	1900 x 2500	4,32	156
NG-A 190/260	1900 x 2600	4,50	160
NG-A 190/270	1900 x 2700	4,68	163
NG-A 190/280	1900 x 2800	4,86	167
NG-A 190/290	1900 x 2900	5,04	170
NG-A 190/300	1900 x 3000	5,22	173
NG-A 200/200	2000 x 2000	3,61	143
NG-A 200/210	2000 x 2100	3,80	147
NG-A 200/220	2000 x 2200	3,99	150
NG-A 200/230	2000 x 2300	4,18	154
NG-A 200/240	2000 x 2400	4,37	157
NG-A 200/250	2000 x 2500	4,56	161
NG-A 200/260	2000 x 2600	4,75	164
NG-A 210/210	2100 x 2100	4,00	151

(*) Intermediate ventilation vent dimensions between the values specified in the table are possible.
(**) Estimated weight specified for ventilation vent of base height 500 mm, of standard configuration with multi-chamber polycarbonate panel glazing of 16 mm thickness, with electric control.

2.7.6. ventilation vents control

For correct operation, ventilation vents require connecting to devices controlling their opening and closing. A set of such devices constitutes a complete ventilation control system. Depending on the type of devices used, it may be designed as a:

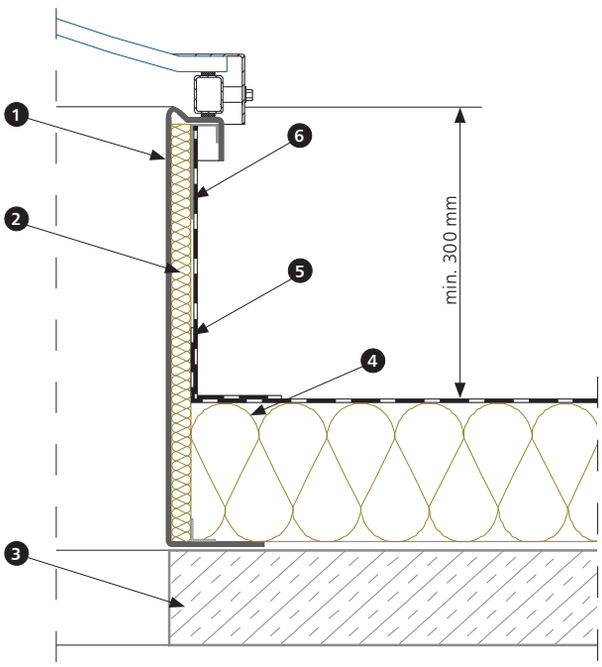
- electric ~230V ventilation control system,
- pneumatic ventilation control system.

Control system elements are described in section 13.

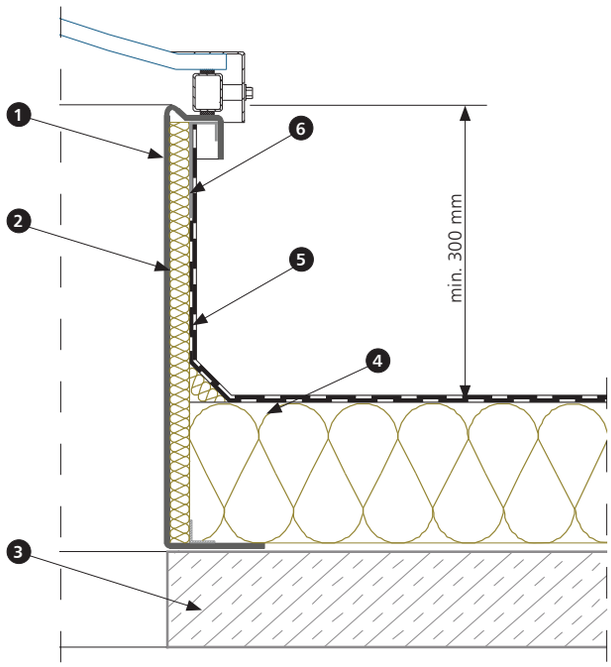
Notes

3. installation of smoke vents, ventilation vents, fixed skylights and roof hatches

3.1. smoke vent with steel straight base fixed onto reinforced concrete structure

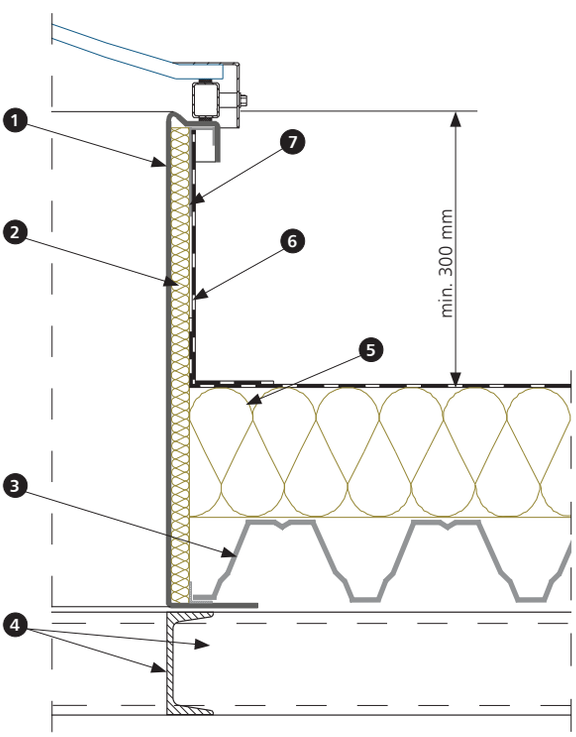


1 – smoke vent steel base
2 – thermal insulation of base
3 – ceiling, e.g. reinforced concrete slab
4 – thermal insulation of roof
5 – PVC membrane
6 – PVC coated sheet

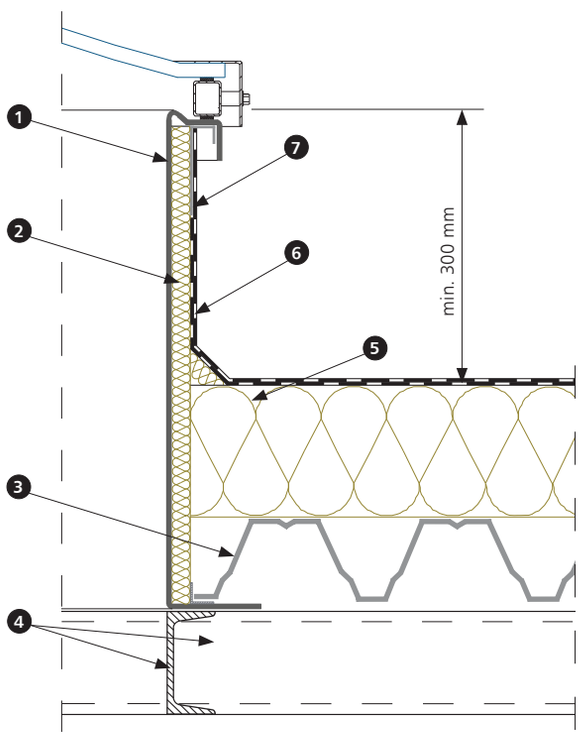


1 – smoke vent steel base
2 – thermal insulation of base
3 – ceiling, e.g. reinforced concrete slab
4 – thermal insulation of roof
5 – roofing paper
6 – galvanized steel shee

3.2. smoke vent with steel straight base fixed onto steel roof

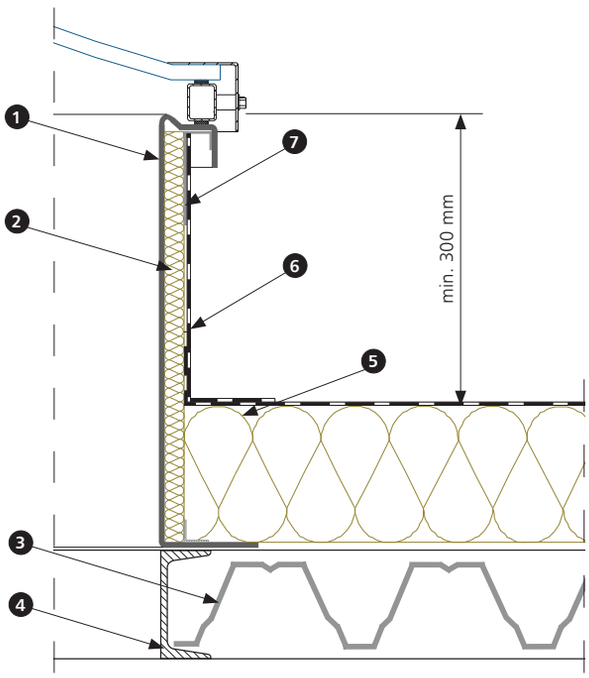


1 – smoke vent steel base
2 – thermal insulation of base
3 – trapezoidal metal sheet
4 – supporting steel profile
5 – thermal insulation of roof
6 – PVC membrane
7 – PVC coated sheet

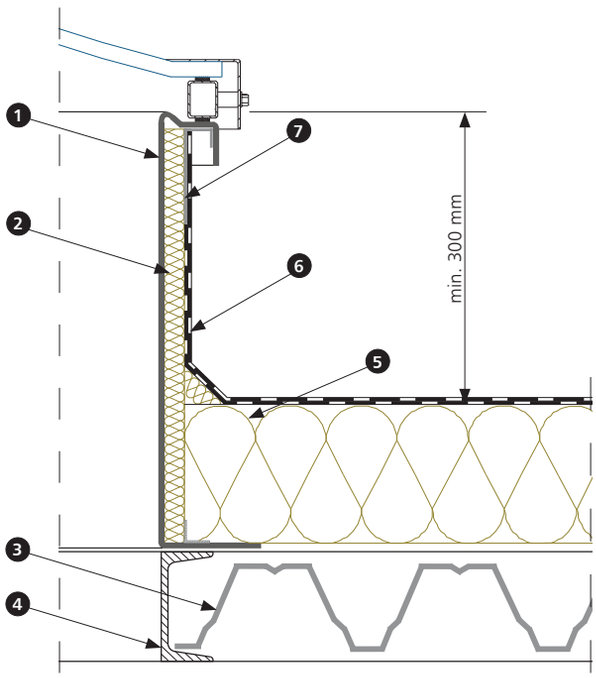


1 – smoke vent steel base
2 – thermal insulation of base
3 – trapezoidal metal sheet
4 – supporting steel profile
5 – thermal insulation of roof
6 – roofing paper
7 – galvanized steel sheet

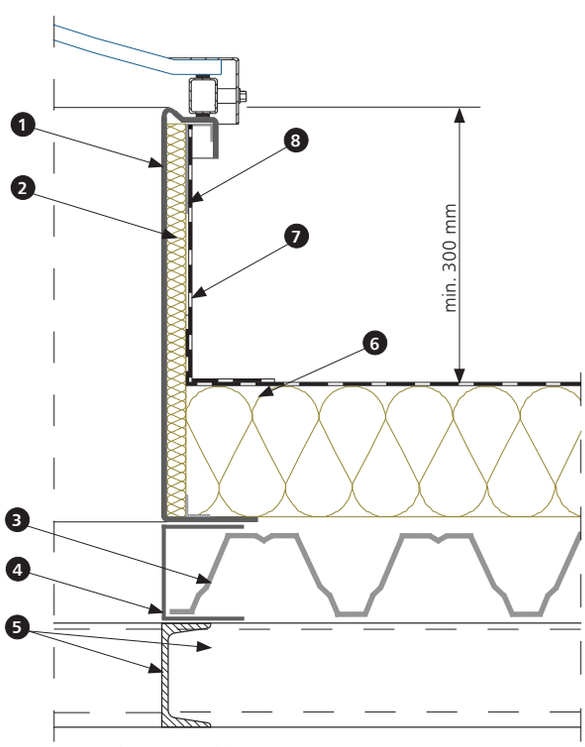
3.2. smoke vent with steel straight base fixed onto steel roof



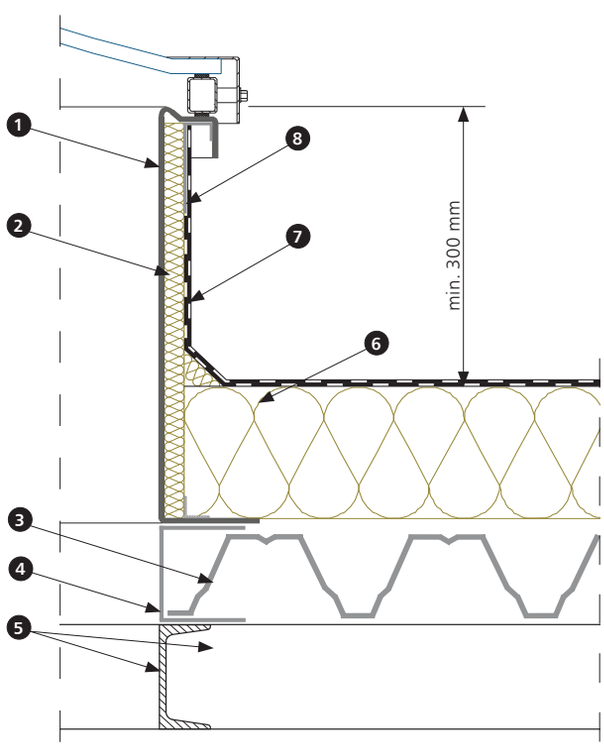
1 – smoke vent steel base
2 – thermal insulation of base
3 – trapezoidal metal sheet
4 – supporting steel profile
5 – thermal insulation of roof
6 – PVC membrane
7 – PVC coated sheet



1 – smoke vent steel base
2 – thermal insulation of base
3 – trapezoidal metal sheet
4 – supporting steel profile
5 – thermal insulation of roof
6 – roofing paper
7 – galvanized steel sheet

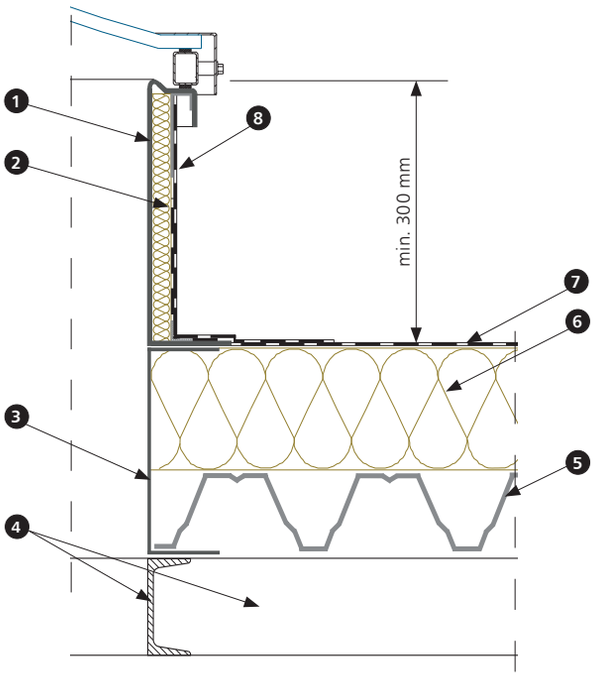


1 – smoke vent steel base
2 – thermal insulation of base
3 – trapezoidal metal sheet
4 – additional flashing
5 – supporting steel profile
6 – thermal insulation of roof
7 – PVC membrane
8 – PVC coated sheet



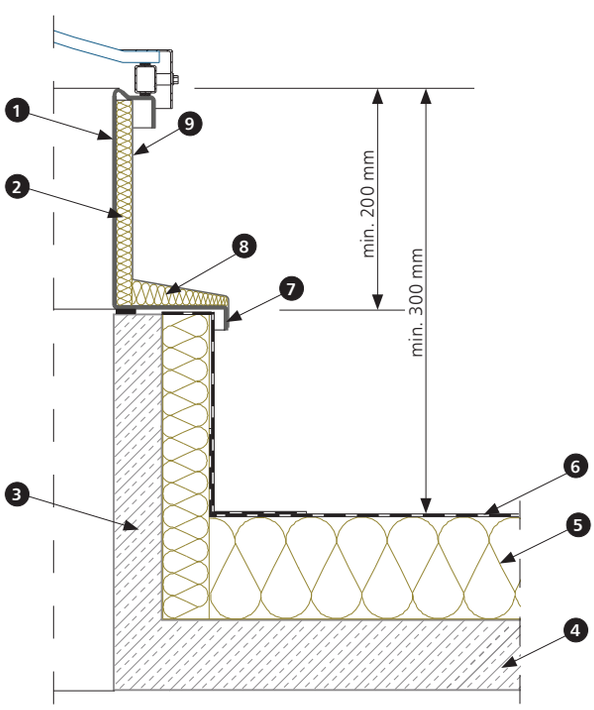
1 – smoke vent steel base
2 – thermal insulation of base
3 – trapezoidal metal sheet
4 – additional flashing
5 – supporting steel profile
6 – thermal insulation of roof
7 – roofing paper
8 – galvanized steel sheet

3.3. smoke vent with steel straight base fixed onto steel plinth



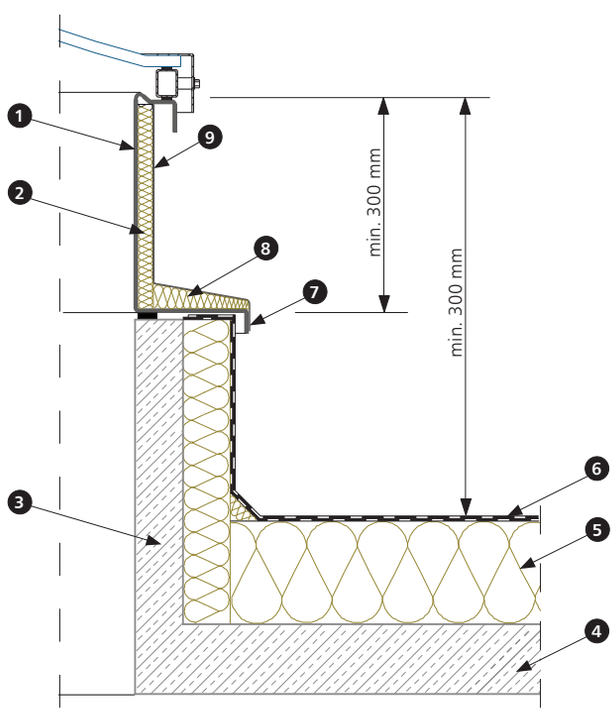
1 – smoke vent steel straight base 300 mm
2 – thermal insulation of base
3 – additional flashing
4 – supporting steel profile
5 – trapezoidal metal sheet
6 – thermal insulation of roof
7 – PVC membrane
8 – PVC coated sheet

3.4. smoke vent with plinth type straight base fixed onto steel plinth



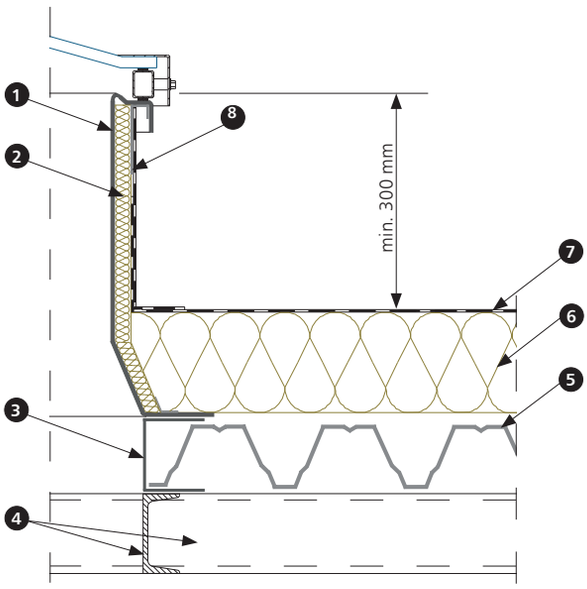
1 – smoke vent steel base
2 – thermal insulation of base
3 – reinforced concrete plinth (*)
4 – ceiling, e.g. reinforced concrete slab
5 – thermal insulation of roof
6 – PVC membrane
7 – drip cap
8 – thermal insulation of cover plate
9 – galvanized steel sheet

(*) optional placing of overlay base on wooden or steel plinth

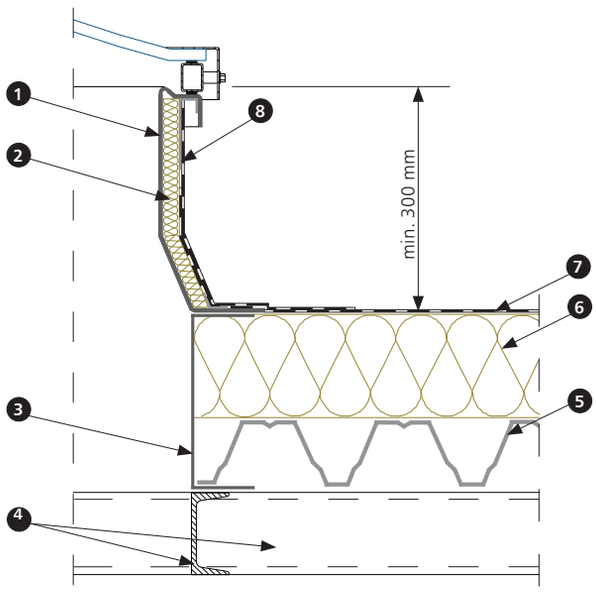


1 – smoke vent steel base
2 – thermal insulation of base
3 – reinforced concrete plinth(*)
4 – ceiling, e.g. reinforced concrete slab
5 – thermal insulation of roof
6 – roofing paper
7 – drip cap
8 – thermal insulation of cover plate
9 – galvanized steel sheet

3.5. smoke vent with steel skew base fixed onto steel structure



1 – smoke vent steel skew base
2 – thermal insulation of base
3 – additional flashing
4 – supporting steel profile
5 – trapezoidal metal sheet
6 – thermal insulation of roof
7 – PVC membrane
8 – PVC coated sheet

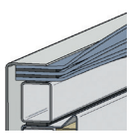
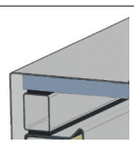
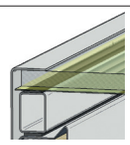
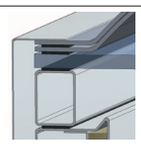


1 – smoke vent steel skew base 300 mm
2 – thermal insulation of base
3 – additional flashing
4 – supporting steel profile
5 – trapezoidal metal sheet
6 – thermal insulation of roof
7 – PVC membrane
8 – PVC coated sheet

4. smoke vents and ventilation vents, skylights and hatches glazing

A broad range of glazing options is available for vents, skylights and hatches used as sources of daylight. Choosing the right glazing will have impact on:

- sunlight intensity,
- thermal insulation of building, and
- operating safety.

Product type		Multi-chamber polycarbonate panel (PCA)	3x PMMA or PC dome	2x PMMA or PC dome	ALU sandwich panel(*)	Multi-chamber polycarbonate panel and ALU envelope cover (*)	B_{ROOF}(t1)(**)	2x PMMA or PC dome and PCA panel (***)
								
Smoke vents	C	●	●	●	●	●	●	●
	E	●	●	●	●	●	●	●
	NG-A	●	●	●	●	●	●	●
	DVP, DVPS	●	–	–	●	●	●	–
Fixed skylights	C, E	●	●	●	–	–	●	●
	NG-A	●	●	●	–	–	●	●
	R	●	●	●	–	–	●	●
Roof hatches	C, E	●	●	●	●	●	●	●
	NG-A	●	●	●	●	●	●	●
Ventilation vents	C, E	●	●	●	●	●	●	●
	NG-A	●	●	●	●	●	●	●

(*) Blind aluminum glazing in version:
- ALU sandwich panel (aluminum-thermal insulation-aluminum)
- Aluminum envelope cover with multi-chamber polycarbonate panel

(**) B_{ROOF}(t1) glazing (multi-chamber polycarbonate of thickness ≥ 10 mm and polyester panel)

(***) Applies to selected vent sizes

GLAZING SYMBOLS:
PCA - multi-chamber polycarbonate
PMMA - acrylate
PC - solid polycarbonate

4.1. multi-chamber polycarbonate panel (PCA)

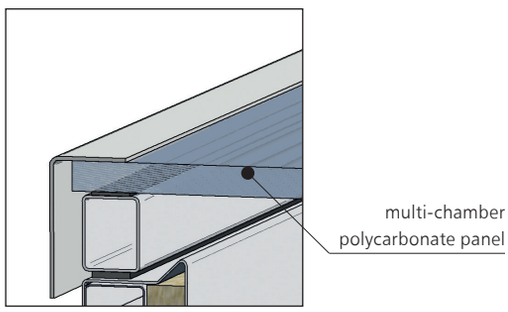


Fig. 33 – Vent glazing – multi-chamber polycarbonate panel

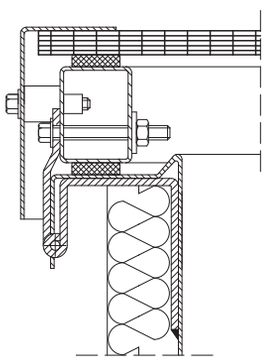


Fig. 34 – Vent section, glazing: multi-chamber polycarbonate panel

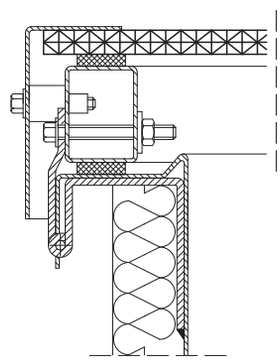


Fig. 35 – Vent section, glazing: structured multi-chamber polycarbonate panel

PARAMETERS	PCA 10 mm			PCA 16 mm		
	CLEAR	OPAL	BLACK	CLEAR	OPAL	BLACK
HEAT TRANSFER COEFFICIENT U	2,2÷2,5 W/m²K	2,2÷2,5 W/m²K	2,5 W/m²K	1,77÷2,0 W/m²K	1,77÷2,0 W/m²K	1,8 W/m²K
LIGHT TRANSMISION L_t	64÷65 %	44÷66 %	~0 %	54÷64 %	45÷47 %	~0 %
ACOUSTIC INSULATION R_w	18÷19 dB	18÷19 dB	18 dB	18÷19 dB	18÷19 dB	19 dB
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0	B-s1,d0	B-s1,d0	B-s1,d0 / B-s2,d0	B-s1,d0 / B-s2,d0	B-s2,d0

PARAMETERS	PCA 20 mm			PCA 25 mm		
	CLEAR	OPAL	BLACK	CLEAR	OPAL	BLACK
HEAT TRANSFER COEFFICIENT U	1,59÷1,6 W/m²K	1,59÷1,6 W/m²K	1,6 W/m²K	1,4 W/m²K	1,4 W/m²K	1,6 W/m²K
LIGHT TRANSMISION L_t	53÷62 %	45÷47 %	~0 %	51 %	44 %	~0 %
ACOUSTIC INSULATION R_w	21 dB	21 dB	21 dB	22 dB	22 dB	22 dB
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0 / B-s2,d0	B-s1,d0 / B-s2,d0	B-s2,d0	B-s2,d0	B-s2,d0	B-s2,d0

4.2. PMMA acrylic dome

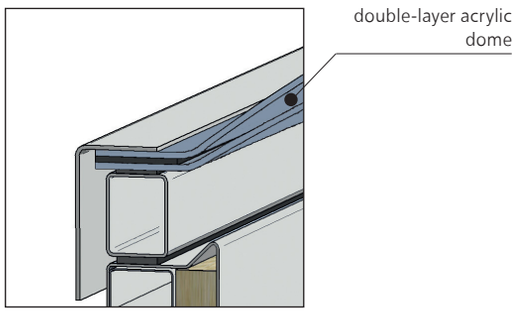


Fig. 36 – Vent glazing – double-layer acrylic dome

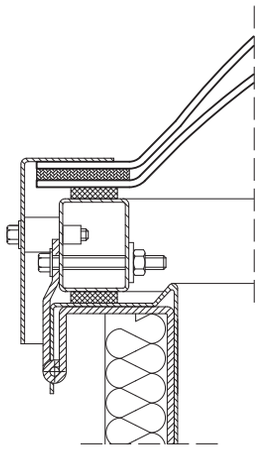


Fig. 37 – Vent section, glazing: double-layer acrylic dome

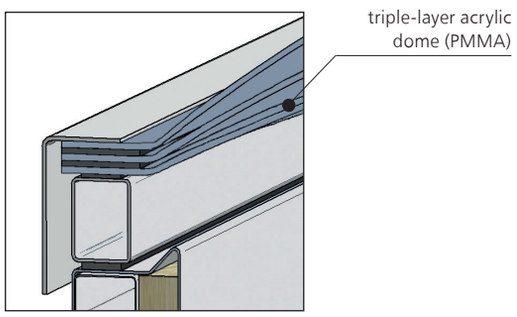


Fig. 38 – Vent glazing – triple-layer acrylic dome

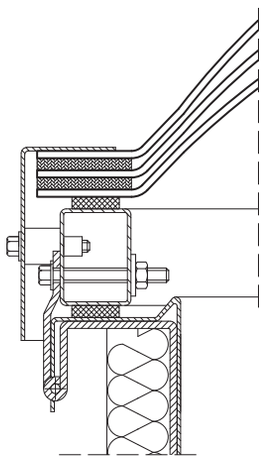


Fig. 39 – Vent section, glazing: triple-layer acrylic dome

PARAMETERS	DOUBLE-LAYER ACRYLIC DOME		TRIPLE-LAYER ACRYLIC DOME	
	CLEAR	OPAL	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	2,2 W/m²K	2,2 W/m²K	1,5 W/m²K	1,5 W/m²K
LIGHT TRANSMISION L_t	85 %	68 - 75 %	78 %	64 %
ACOUSTIC INSULATION R_W	20 dB	20 dB	22 dB	22 dB
FIRE PERFORMANCE (AS PER EN 13501-1)	NPD	NPD	NPD	NPD

4.3. PC solid polycarbonate dome

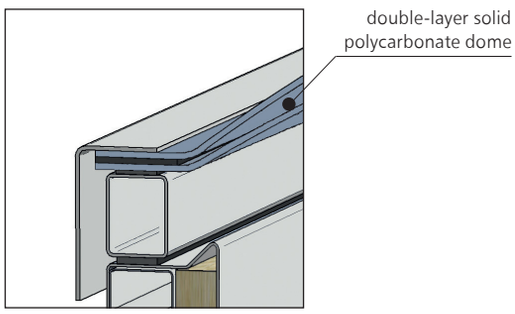


Fig. 40 – Vent glazing – double-layer solid polycarbonate dome

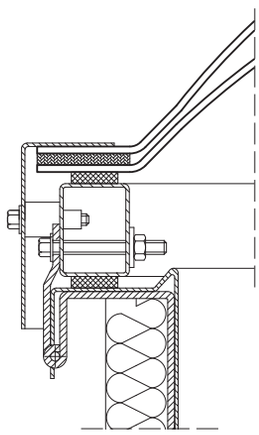


Fig. 41 – Vent section, glazing: double-layer solid polycarbonate dome

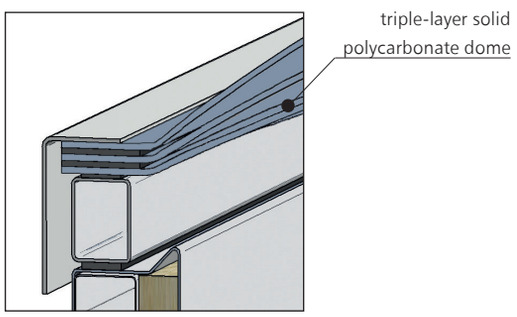


Fig. 42 – Vent glazing – triple-layer solid polycarbonate dome

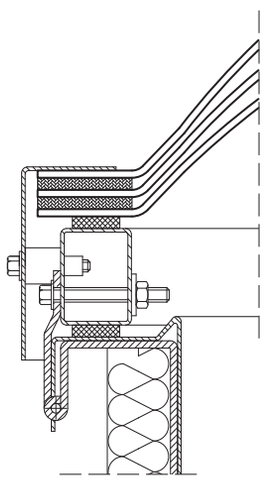


Fig. 43 – Vent section, glazing: triple-layer solid polycarbonate dome

PARAMETERS	DOUBLE-LAYER SOLID POLYCARBONATE DOME		TRIPLE-LAYER SOLID POLYCARBONATE DOME	
	CLEAR	OPAL	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	2,2 W/m²K	2,2 W/m²K	1,5 W/m²K	1,5 W/m²K
LIGHT TRANSMISION L_t	76÷79 %	26÷36 %	66÷70 %	23÷32 %
ACOUSTIC INSULATION R_W	20 dB	20 dB	22 dB	22 dB
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0 /B-s2,d0 / NPD	B-s1,d0 / B-s2,d0 / NPD	B-s1,d0 / B-s2,d0 / NPD	B-s1,d0 / B-s2,d0 / NPD

4.4. ALU sandwich panel

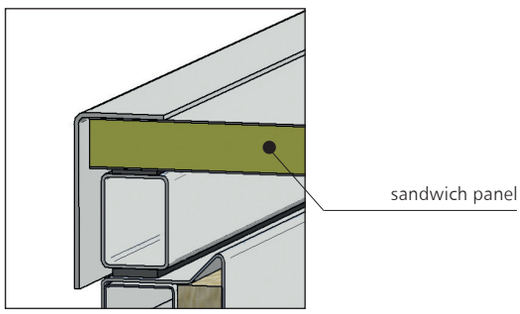


Fig. 44 – Vent glazing – ALU sandwich panel

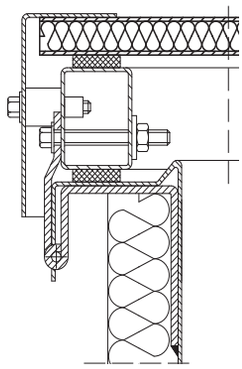


Fig. 45 – Vent section, glazing: ALU sandwich panel

PARAMETERS	ALU SANDWICH PANEL TH. 20 mm	ALU SANDWICH PANEL TH. 40 mm
HEAT TRANSFER COEFFICIENT U	1,4 W/m²K	0,78 W/m²K
LIGHT TRANSMISION L_t	blind	blind
FIRE PERFORMANCE (AS PER EN 13501-1)	E / NPD	E / NPD

4.5. ALU envelope cover with multi-chamber polycarbonate

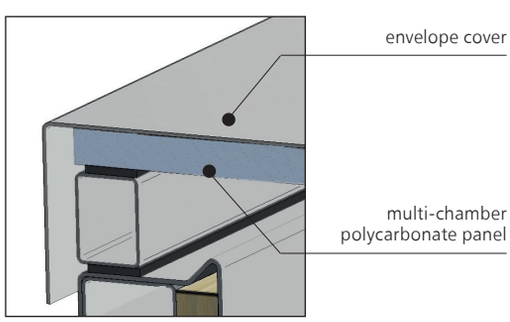


Fig. 46 – Vent glazing – ALU envelope cover with multi-chamber polycarbonate

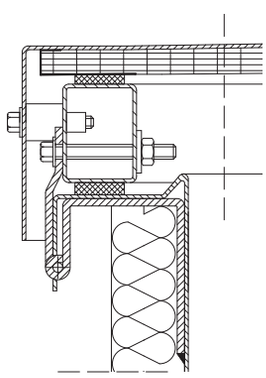


Fig. 47 – Vent section, glazing – ALU envelope cover with multi-chamber polycarbonate

PARAMETERS	10 mm	16 mm	20 mm	25 mm
HEAT TRANSFER COEFFICIENT U	2,2÷2,5 W/m²K	1,77÷2,0 W/m²K	1,59÷1,6 W/m²K	1,4 W/m²K
LIGHT TRANSMISION L_t	0 %	0%	0%	0%
ACOUSTIC INSULATION R_w	18÷19 dB	18÷19 dB	21 dB	22 dB
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0	B-s1,d0/ B-s2,d0	B-s1,d0/ B-s2,d0	B-s2,d0

4.6. single-layer acrylic dome (PMMA)/ solid polycarbonate (PC) dome and multi-chamber polycarbonate panel (PCA)

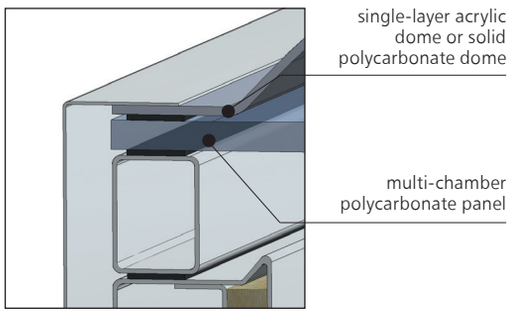


Fig. 48 – Vent filling – acrylic dome or solid polycarbonate dome and multi-chamber polycarbonate panel

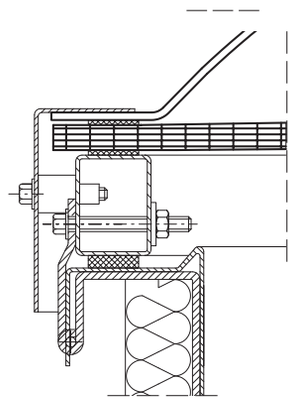


Fig. 49 – Vent section, glazing – acrylic dome or solid polycarbonate dome and multi-chamber polycarbonate panel

PARAMETERS	1xPMMA + PCA10	1xPC + PCA10	1xPMMA + PCA16	1xPC + PCA16
HEAT TRANSFER COEFFICIENT U	1,6 W/m²K	1,6 W/m²K	1,3 W/m²K	1,3 W/m²K
LIGHT TRANSMISION L_t (clear - clear)	59%	56÷57%	50÷59%	47÷57%
LIGHT TRANSMISION L_t (clear - opal)	51%	48÷49%	41÷43%	39÷42%
LIGHT TRANSMISION L_t (opal - opal)	45÷48%	35÷39%	37÷41%	29÷33%
ACOUSTIC INSULATION R_w	min. 19dB	min. 19dB	min. 21dB	min. 21dB
FIRE PERFORMANCE (as per EN 13501-1)	PMMA: NPD PCA10: B-s1,d0	PC: B-s1,d0 / B-s2,d0 /NPD PCA10: B-s1,d0	PMMA: NPD PCA16: B-s1,d0 / B-s2,d0	PC: B-s1,d0 / B-s2,d0 /NPD PCA10: B-s1,d0 / B-s2,d0

PARAMETERS	1xPMMA + PCA20	1xPC + PCA20	1xPMMA + PCA25	1xPC + PCA25
HEAT TRANSFER COEFFICIENT U	1,2 W/m²K	1,2 W/m²K	1,1 W/m²K	1,1 W/m²K
LIGHT TRANSMISION L_t (clear - clear)	49÷57%	46÷55%	47%	44÷45%
LIGHT TRANSMISION L_t (clear - opal)	41÷43%	39÷42%	40%	38÷39%
LIGHT TRANSMISION L_t (opal - opal)	37÷41%	29÷33%	36÷38%	28÷31%
ACOUSTIC INSULATION R_w	min. 21dB	min. 21dB	min. 22dB	min. 22dB
FIRE PERFORMANCE (as per EN 13501-1)	PMMA: NPD PCA20: B-s1,d0	PC: B-s1,d0 / B-s2,d0 /NPD PCA20: B-s1,d0	PMMA: NPD PCA25: B-s1,d0 / B-s2,d0	PC: B-s1,d0 / B-s2,d0 /NPD PCA25: B-s1, d0 / B-s2,d0

4.7. double-layer acrylic dome (PMMA)/ solid polycarbonate (PC) dome and multi-chamber polycarbonate panel (PCA)

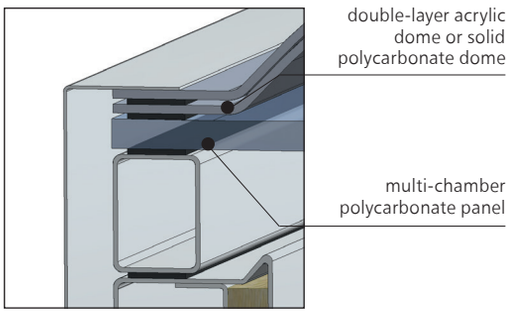


Fig. 50 – Vent filling – acrylic dome or solid polycarbonate dome and multi-chamber polycarbonate panel

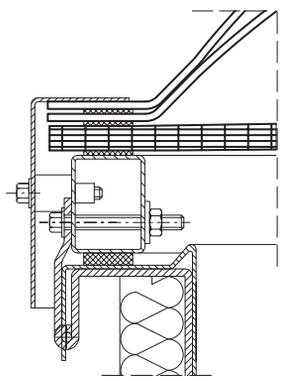


Fig. 51 – Vent section, glazing – acrylic dome or solid polycarbonate dome and multi-chamber polycarbonate panel

PARAMETERS	2xPMMA + PCA10	2xPC + PCA10	2xPMMA + PCA16	2xPC + PCA16
HEAT TRANSFER COEFFICIENT U	1,2 W/m²K	1,2 W/m²K	1,1 W/m²K	1,1 W/m²K
LIGHT TRANSMISION L_t (clear - clear)	54%	49÷51%	46÷54%	41÷51%
LIGHT TRANSMISION L_t (clear - opal)	47%	42÷43%	38÷40%	34÷37%
LIGHT TRANSMISION L_t (opal - opal)	37÷41%	14÷20%	31÷35%	12÷17%
ACOUSTIC INSULATION R_w	min. 19dB	min. 19dB	min. 21dB	min. 21dB
FIRE PERFORMANCE (as per EN 13501-1)	PMMA: NPD PCA10: B-s1,d0	PC: B-s1,d0 / B-s2,d0 /NPD PCA10: B-s1,d0	PMMA: NPD PCA16: B-s1,d0 / B-s2,d0	PC: B-s1,d0 / B-s2,d0 /NPD PCA10: B-s1,d0 / B-s2,d0

PARAMETERS	2xPMMA + PCA20	2xPC + PCA20	2xPMMA + PCA25	2xPC + PCA25
HEAT TRANSFER COEFFICIENT U	1,0 W/m²K	1,0 W/m²K	0,95 W/m²K	0,95 W/m²K
LIGHT TRANSMISION L_t (clear - clear)	45÷53%	40÷49%	43%	39÷40%
LIGHT TRANSMISION L_t (clear - opal)	38÷40%	34÷37%	37%	33÷35%
LIGHT TRANSMISION L_t (opal - opal)	31÷35%	12÷17%	30÷33%	11÷16%
ACOUSTIC INSULATION R_w	min. 21dB	min. 21dB	min. 22dB	min. 22dB
FIRE PERFORMANCE (as per EN 13501-1)	PMMA: NPD PCA20: B-s1,d0 / B-s2,d0	PC: B-s1,d0 / B-s2,d0 /NPD PCA20: B-s1,d0 / B-s2,d0	PMMA: NPD PCA25: B-s2,d0	PC: B-s1,d0 / B-s2,d0 /NPD PCA25: B-s2,d0

NOTE:

The above configurations apply only to selected vent dimensions.

4.8. $B_{ROOF}(t1)$ - multi-chamber polycarbonate panel + polyester panel

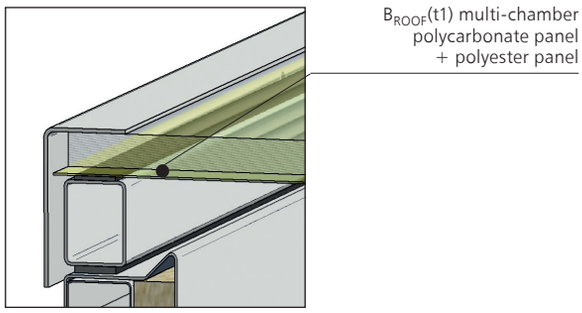


Fig. 52 – Vent glazing – multi-chamber polycarbonate panel + polyester panel

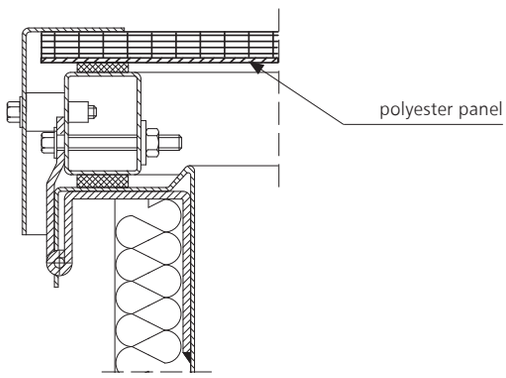


Fig. 53 – Vent section, glazing $B_{ROOF}(t1)$

PARAMETERS	$B_{ROOF}(t1)$ - MULTI-CHAMBER POLYCARBONATE PANEL TH. 16 MM(*) + POLYESTER PANEL		
	CLEAR	OPAL	BLACK
HEAT TRANSFER COEFFICIENT U	1,77÷2,0 W/m²K	1,77÷2,0 W/m²K	2,0 W/m²K
LIGHT TRANSMISION L_T	44÷59 %	24÷49 %	~0%
ACOUSTIC INSULATION R_W	19÷21 dB	19÷21dB	19 dB
FIRE PERFORMANCE (AS PER EN 13501-1)	B_{ROOF}(t1)	B_{ROOF}(t1)	B_{ROOF}(t1)

(*)$B_{ROOF}(t1)$ glazing also available with multi-chamber polycarbonate panel of thickness 10 mm, 20 mm and 25 mm.

4.9. Sunoptics glazing

Sunoptics glazing available in double and triple-layer dome version.

Range of dimensions of hatches, ventilation vents and skylights available with Sunoptics glazing:

VENT TYPE	NOMINAL DIMENSIONS A x B [mm]
C 117	1170 x 1170
C 147	1470 x 1470
C 169	1690 x1690
E 117/208	1170 x 2080
E 147/239	1470 x 2390
E 148/179	1480 x 1790
NG-A 127/127	1270 x 1270
NG-A 127/218	1270 x 2180
NG-A 157/157	1570 x 1570
NG-A 157/249	1570 x 2490
NG-A 158/189	1580 x 1890
NG-A 179/179	1790 x 1790
DVP 130/238	1300 x 2380
DVP 130/299	1300 x 2990
DVP 191/177	1910 x 1770
DVP 191/238	1910 x 2380
DVP 191/299	1910 x 2990
DVP 257/240	2570 x 2400
DVP 257/299	2570 x 2990
DVPS 140/248	1400 x 2480
DVPS 201/187	2010 x 1870
DVPS 201/248	2010 x 2480
DPVS 267/250	2670 x 2500

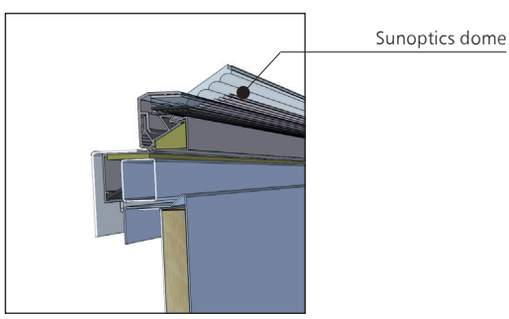


Fig. 54 – Vent glazing – Sunoptics dome

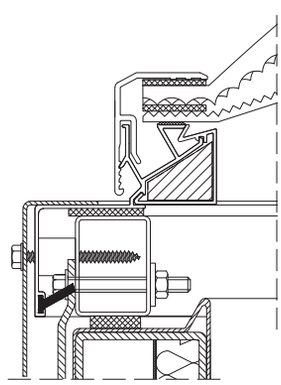
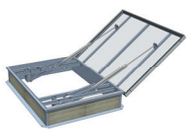
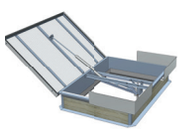
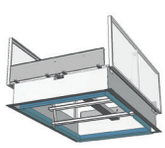
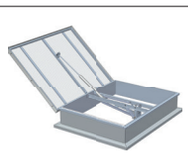


Fig. 55 – Vent section, Sunoptics dome glazing

PARAMETERS	SUNOPTICS
HEAT TRANSFER COEFFICIENT U	3,2÷3,9 W/m²K
LIGHT TRANSMISION L_t	58÷64 %
ACOUSTIC INSULATION R_W	20÷22 dB
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s2,d0

Notes

5. additional equipment for vents, skylights and hatches

Product type		Smoke vents	Fixed skylights	Roof hatches	Ventilation vents
Smoke vents with roof access option		●	–	●	–
Wind deflectors		●	–	–	–
Inlet deflector		●	–	–	–
Anti-burglar grid		●	●	●	●
Safety net		●	●	●	●
Overlay base N type		●	●(*)	●	●
Limit switch		●	–	–	●

(*) does not apply to round skylights

5.1. smoke vent with roof access option

5.1.1. technical description of standard

- smoke vents mcr Prolight C100 (100x100 mm), C110 (110x110 mm), E100/110 (100x110 mm) and NG-A 120/120 (120x120 mm) - classification according to Certificate of Conformity EN 12101-2,
- C, E type (squared and rectangular, single-leaf with straight base) smoke vents for flat and inclined roofs covered with roofing paper or PVC membrane,
- straight base of height 300 mm or 500 mm made of galvanized steel sheet of 1.25 mm thickness,
- bottom part of the base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base has shape enabling water runoff,
- thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m^{2}K
- circumferential strip in the upper part of base, made of galvanized steel sheet, used for fixing roof work,
- single-leaf vent leaf opening angle min. 140°,
- hinges fixing the leaf to base installed at lengthwise side of vent,
- leaf glazing: multi-chamber polycarbonate panel, acrylic dome, solid polycarbonate dome, sandwich panel, multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome, multi-chamber polycarbonate panel with aluminum envelope cover and glazing of B_{ROOF} (t1) class (details in section 4),
- smoke exhausting control: electric 24V, through single or double actuators installed at the sides, for use of vent as revision roof hatch (roof access function),
- attention: wind deflectors and inlet deflector are not recommened due to possible damage.

5.1.2. design of smoke vent with roof access function and single actuator - C100

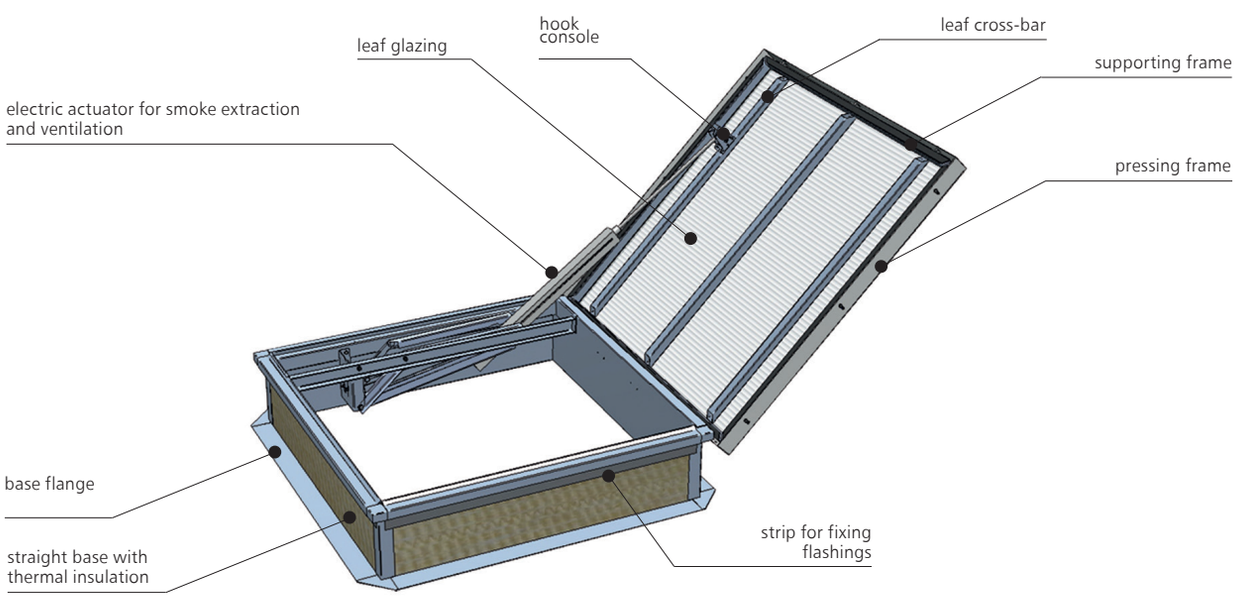


Fig. 56 – mcr PROLIGHT C100 smoke vent with roof access function and electric control for smoke extraction and ventilation

5.1.3. smoke vent with roof access option

- vent elements painted to any RAL color - applies to wind deflectors and base,
- thermal insulation of base – panel of 30 mm thickness, heat transfer coefficient U=0.68 W/m^{2}K,
- base made of aluminium sheet of 2,00 mm thickness,
- custom dimensions of clear opening of vent base,
- custom base height within 200 mm* ÷ 700 mm,
- custom width of circumferential flange of base,
- circumferential strip for fixing roof flashings made of PVC coated metal sheet,
- custom base design,
- broad range of optional accessories.

(*) Base height below 300 mm available only if a plinth is designed for the vent, ensuring total height (vent+plinth) of min. 300 mm.

5.1.4. available dimensions

VENT TYPE	NOMINAL DIMENSIONS	ACTIVE SMOKE EXHAUST AREA A_a [m^2]		ELECTRIC CONTROL	
	A x B	STANDARD (WITHOUT WIND DEFLECTOR AND INLET DEFLECTOR)		POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR FOR CLASS	
	[mm]	BASE MIN. H=500 MM	BASE MIN. H=300 MM	SL 250	SL 550
C 100	1000 x 1000	0,72	0,64	1 x 2,0	1 x 2,6
C 110	1100 x 1100	0,85	0,74	1 x 2,0	1 x 2,6
E 100/110	1000 x 1100	0,79	0,69	1 x 2,0	1 x 2,6
NG-A 120/120(*)	1200 x 1200	0,99	0,97	1 x 2,0	1 x 2,6

(*) mcr Prolight smoke exhaust vent NG-A 120/120 with skew base and wind deflectors.

5.1.5. technical drawings of smoke vent with roof access option and single actuator - C100

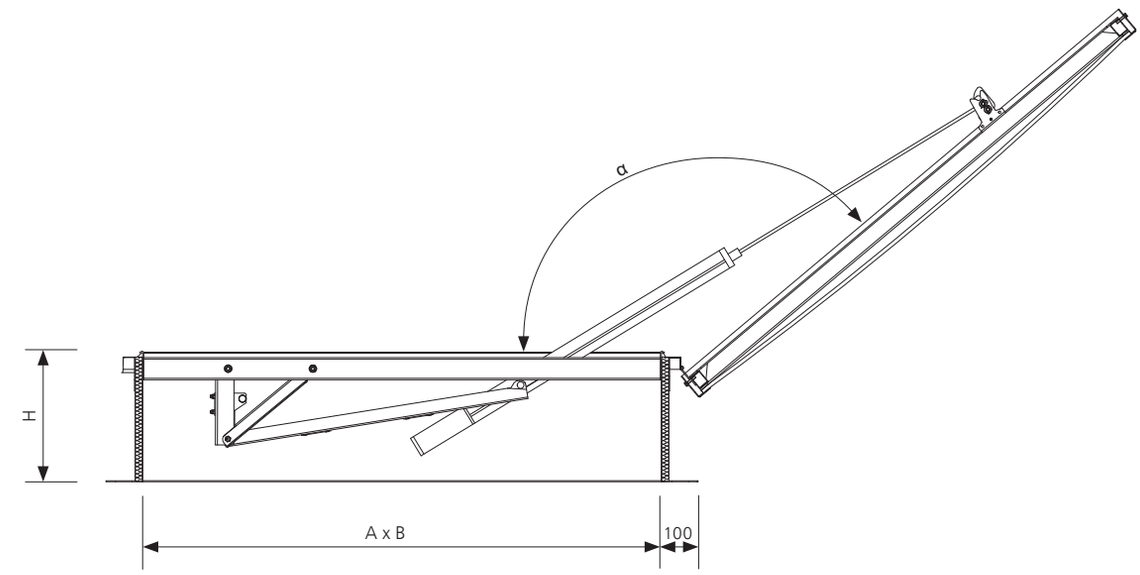


*Fig. 57 – Section **B-B** of mcr PROLIGHT C100 with roof access function in open position, dimensions in [mm]*

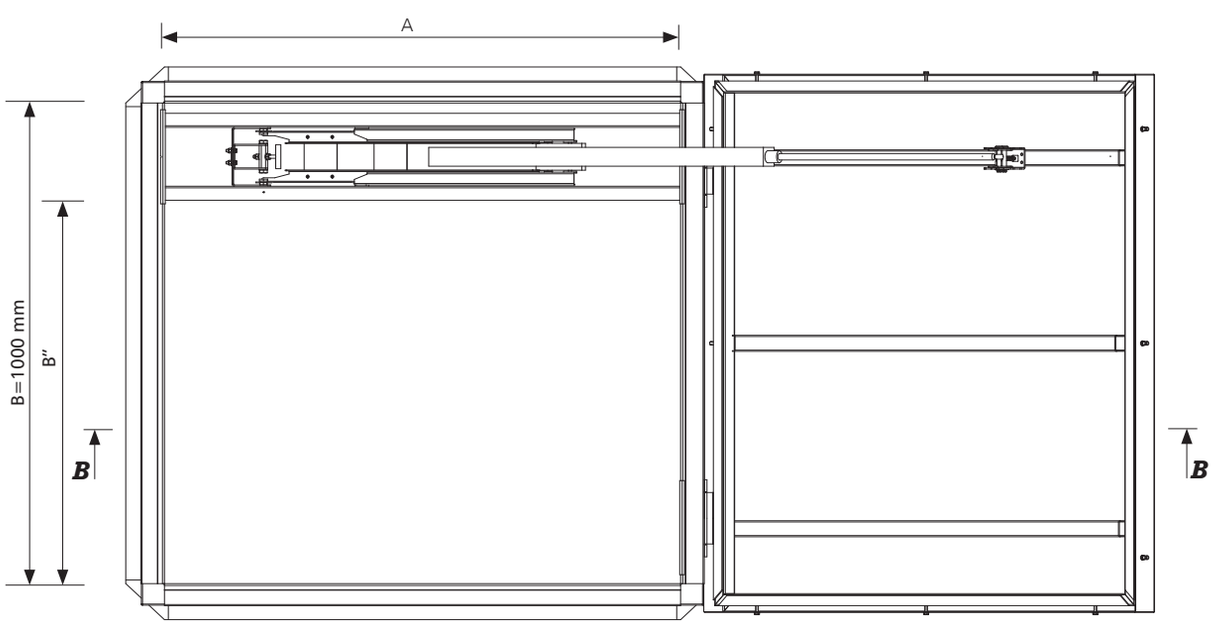


Fig. 58 – Top view of mcr PROLIGHT C100 with roof access function in open position, dimensions in [mm]

A, B – nominal dimensions [mm], clear opening of smoke vent
B''– clear opening, passage B''= B-195 mm
H – smoke vent base height [mm]
α – smoke vent opening angle ≥ 140°

5.2. wind deflectors

- a smoke vent element increasing its active area,
- wind deflectors are used in:
  - mcr PROLIGHT vents of C, E and DVP type as optional accessory,
  - mcr PROLIGHT NG-A type, mcr PROLIGHT DVPS type as standard accessory,
- consists of wind shield fixed to the base with mounting consoles,
- wind shields made of aluminum sheet; mounting consoles made of galvanized steel sheet,
- wind shields delivered as separate elements to be assembled on site (with previously installed mounting consoles),
- non-standard options:
  - powder coating of wind deflectors.

Wind deflectors are installed in smoke vents in pairs:
- at corners of the vent base, opposite to the hinges side (PROLIGHT C, E, NG-A type vents),
- along side walls of the base (mcr PROLIGHT DVP, DVPS type).

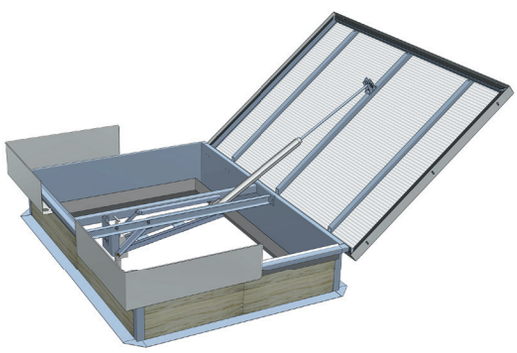


Fig. 59 – Wind deflectors in single-leaf smoke vents

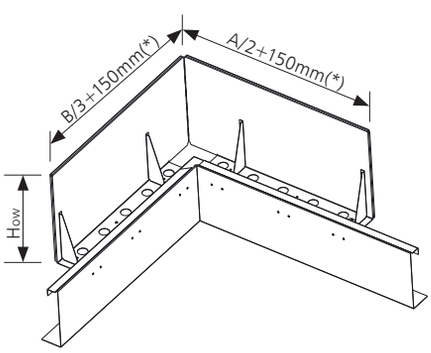


Fig. 60 – Wind deflectors inside view

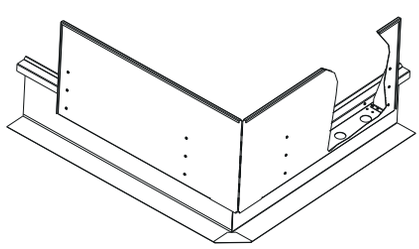


Fig. 61 –Wind deflectors outside view

A, B – nominal smoke vent dimensions [mm]
H_{ow} – wind deflector height [mm]
(*) – mcr PROLIGHT C and E type vents
mcr PROLIGHT DVP, DVPS type vents: A-100 mm
mcr NG-A type vents: A/2+100 mm

Wind deflector height depends on:
- smoke vent type,
- nominal dimensions of smoke vent,
- base height,
- inlet deflector applied as optional accessory.

Vent type	Wind deflector height
C i E	100 mm ÷ 450 mm
DVP	100 mm ÷ 370 mm
DVPS	100 mm ÷ 390 mm
NG-A	230 mm ÷ 530 mm

5.3. inlet deflector

- element of a smoke vent that increases its active area; always used alongside wind deflectors,
- inlet deflectors are used in:
  - mcr PROLIGHT C type, mcr PROLIGHT E type, mcr PROLIGHT DVP type vents as optional accessory,
- made of galvanized steel sheet,
- the application of inlet deflector determines wind deflectors height,
- the lower edge of inlet deflector protrudes 70 mm below the base,
- in case of fitting inlet deflector and anti-burglar grid or safety net together, the minimum vent base height should be:
  - 300 mm for mcr PROLIGHT C and E type vents,
  - 310 mm for mcr PROLIGHT DVP type vents,
- non-standard options:
  - powder coating of inlet deflector,
  - aluminum sheet or stainless steel making.

In order to avoid damage, inlet deflector is installed in the so-called transport position - above the lower base edge. After installing smoke vent on the roof, the inlet deflector should be lowered to working position.

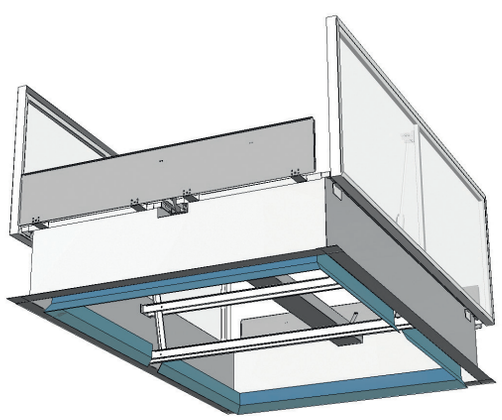


Fig. 62 – Inlet deflector installed in mcr PROLIGHT DVP type vent

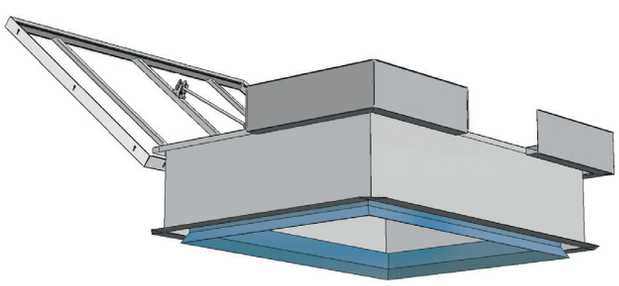


Fig. 63 – Inlet deflector installed in mcr PROLIGHT E type vent

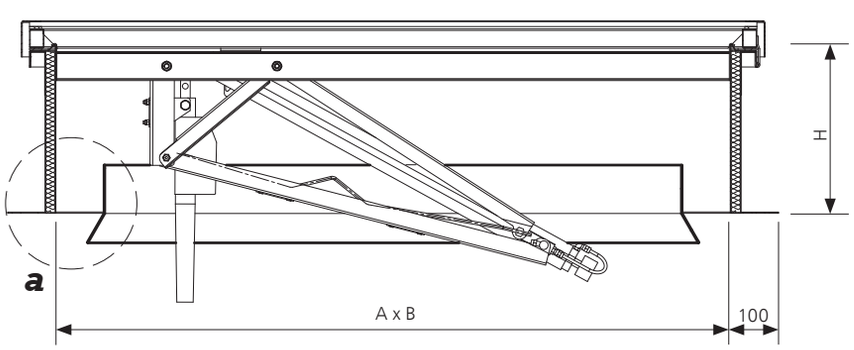
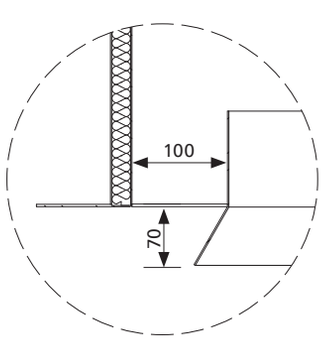


Fig. 64 – section of vent with inlet deflector installed



Detail a dimensions in [mm]

5.4. anti-burglar grid

- application in vents within the full dimensional range, and in skylight and hatches,
- prevents from access of unauthorized persons, and from falling inside,
- conforms to class 2 anti-burglar resistance as per ENV 1627:2009,
- resistant to impact of large, soft body, up to maximum energy of 1200J - corresponds to SB1200 class as per EN 1873:2009 standard,
- made of 21 mm galvanized steel rods fixed in steel sections; the pipes rotate, preventing from sawing off,
- rods additionally stringed with cross-bar,
- grid installed in the device base,
- maximum distance between rods of the grid - 180 mm,
- powder painted or galvanized grid.

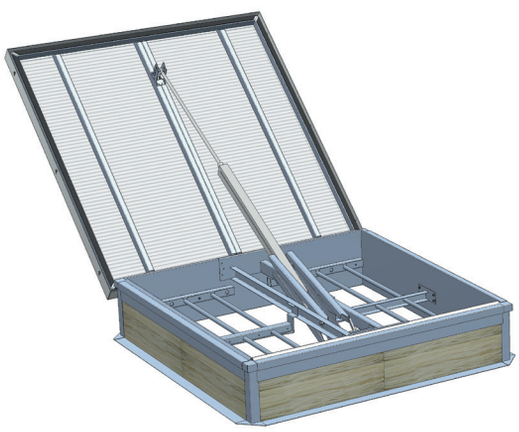


Fig. 65 – Anti-burglar grid installed in mcr PROLIGHT E type vent

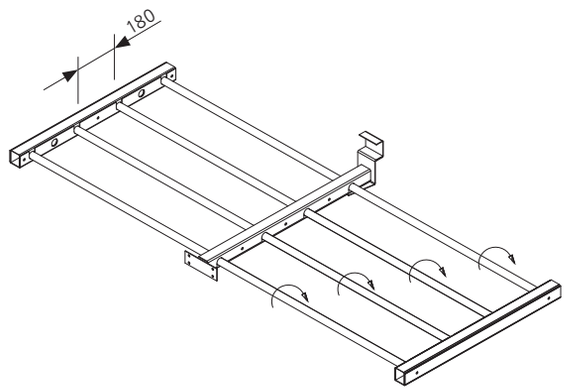


Fig. 66 – Anti-burglar grid for smoke vent

5.5. safety net

- application in vents within the full dimensional range,
- prevents from falling through,
- resistant to impact of large, soft body, up to maximum energy of 1200 J- corresponds to SB1200 class as per EN 1873:2009 standard,
- net installed in the device base,
- made of galvanized steel rods of 4÷8 mm diameter, with 100x100 mm mesh, or 150x170 mm to 150x500 mm mesh,
- net non-standard options:
  - powder coating,
  - openable net for mcr Prolight smoke vents with roof access function and hatches,
- optional safety (safeguard) net manufacturing, in accordance with EN 1263-1, providing fall protection. The net is made of polypropylene ropes and installed in the vent base.

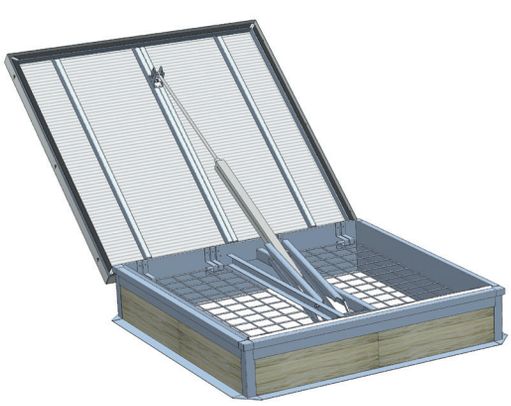


Fig. 67 – Safety net installed in mcr PROLIGHT E type vent

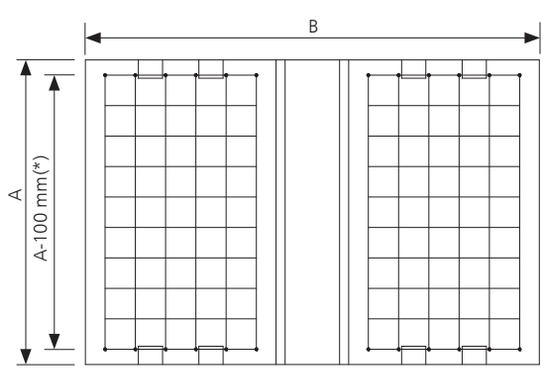


Fig. 68 – Top view of vent with safety net

A, B – nominal smoke vent dimensions [mm]

(*) – A-50 mm for vents of dimensions starting from 115 cm, in 10 cm increments (C115, C125, NG-A115120, E 115120 etc.)

5.6. overlay type base - N type

- possible to apply in mcr Prolight C, E, DVP type products,
- vents with N type base are designed for placement on reinforced concrete or steel plinths,
- flange allowing mounting on a plinth,
- the base flange dimensions are adapted to the size of existing plinth, according to client specifications,
- external flashing of the base with flange is made of galvanized steel sheet.

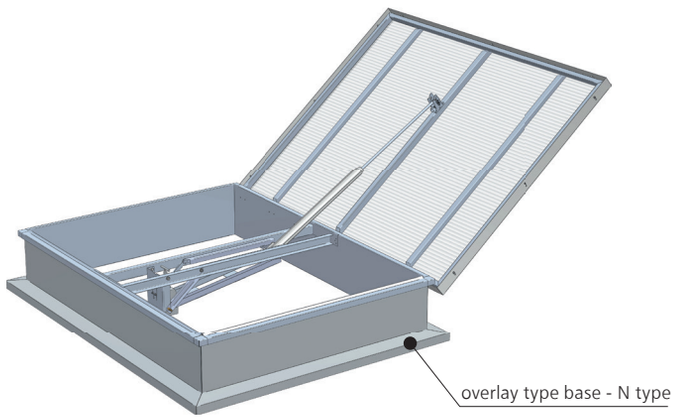


Fig. 69 – mcr PROLIGHT E type smoke vent with N type base

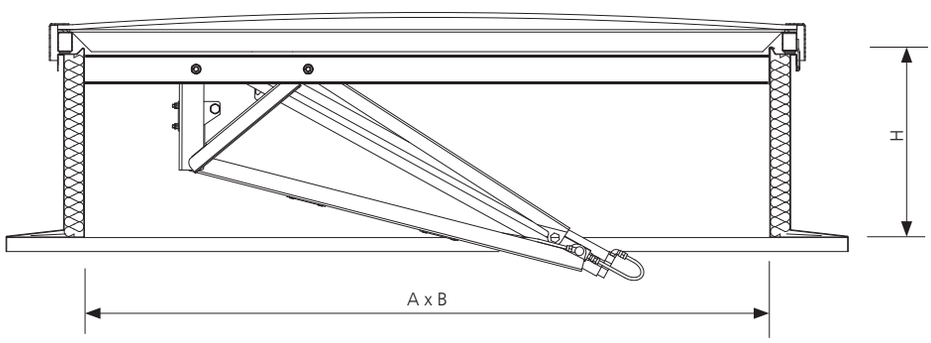
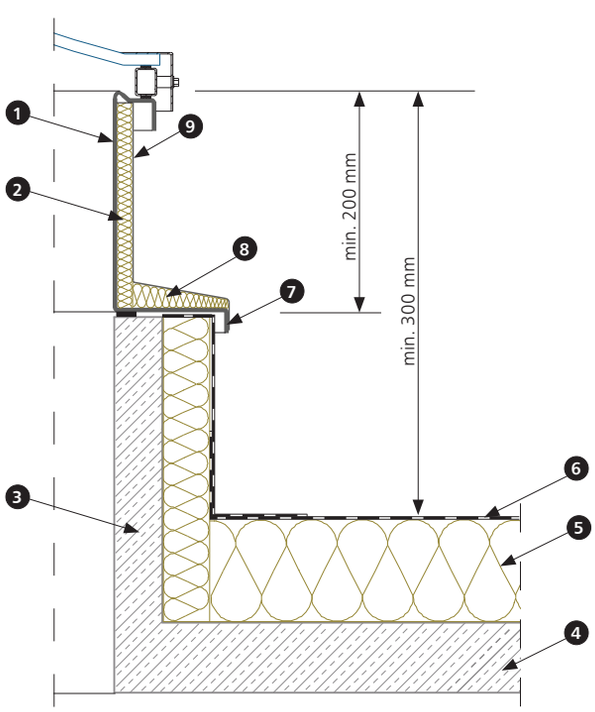
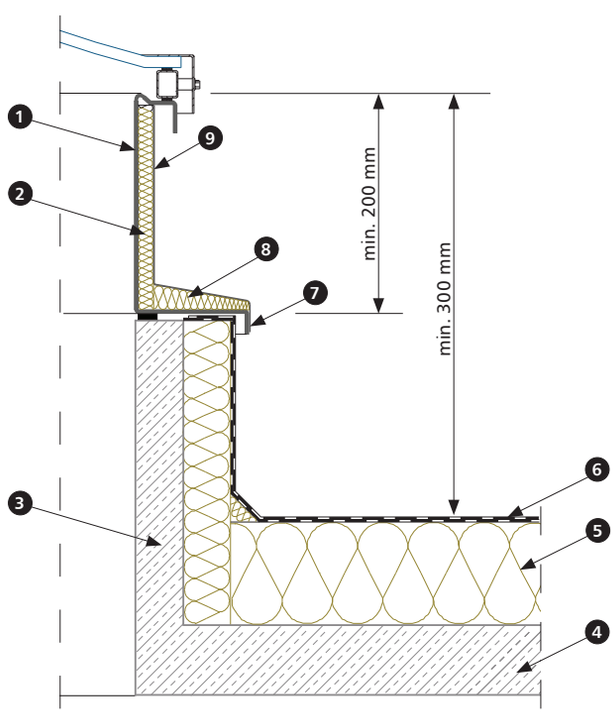


Fig. 70 – Section of mcr PROLIGHT E type vent with N plinth type base



1 – smoke vent steel base
2 – thermal insulation of base
3 – reinforced concrete plinth(*)
4 – ceiling, e.g. reinforced concrete slab
5 – thermal insulation of roof
6 – PVC membrane
7 – drip cap
8 – thermal insulation of flange
9 – galvanized steel sheet
(*) wooden or steel plinth



1 – smoke vent steel base
2 – thermal insulation of base
3 – reinforced concrete plinth(*)
4 – ceiling, e.g. reinforced concrete slab
5 – thermal insulation of roof
6 – roofing paper
7 – drip cap
8 – thermal insulation of cover plate
9 – galvanized steel sheet

5.7. limit switch

- indicates the position of smoke vent or ventilation vent leaf, displaying the position status on a control panel, or gives signal to fire signalling system,
- three position status indications are possible:
  - full closed position
  - full open position,
  - any open position,
- includes 1xNO and 1xNC voltage-free contacts,
- nominal voltage range up to 250 VDC or up to 400 VAC,
- maximum current-carrying capacity of contacts 10A (resistance load), dependent on load characteristics,
- switching frequency 3 600 cycles/hour,
- operating temperature range -25°C ÷ 70°C,
- switch casing protection rating IP65.

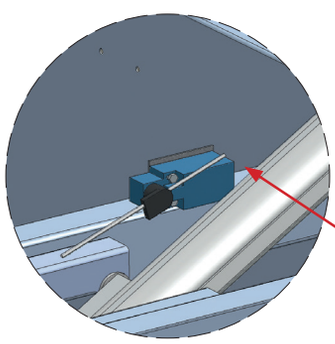


Fig. 71 – Limit switch in mcr PROLIGHT E type smoke vent

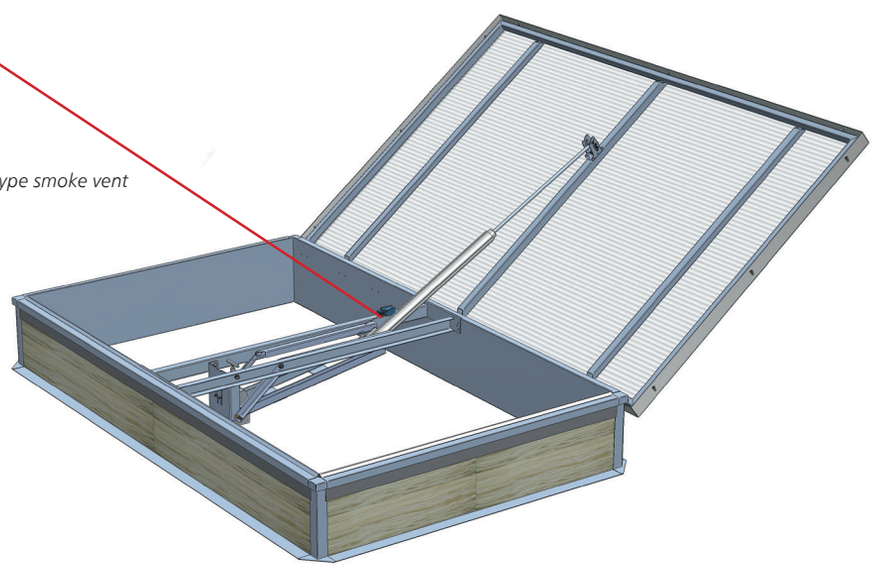


Fig. 72 – mcr PROLIGHT E type smoke vent with limit switch

5.8. mechanic opening system

Mechanic opening system relies on using gas springs (oleopneumatic actuators) in smoke exhaust vents. Actuation of smoke vents is effected by the energy of gas compressed in the gas spring. The vent is kept closed by a mechanical lock with thermal fuse. When the temperature rises above a certain level, the lock opens and the actuators expands, causing the opening of the vent. With adequate lock design (use of electromagnet), the system may be opened remotely by an electric signal (24 V–), which permits e.g. integration with central control panel for smoke exhaust and fire alarm signalling systems.

		Single leaf vent with gas springs		Double leaf vent with gas springs
Certificate of Conformity no. 1396-CPR-0040		●	●	●
Parameters in accordance with EN 12101-2		SL=350 WL= 750 Re=300 B=600 T=00(*)	SL=500 WL=1500 Re=100 B=600 T=00(*)	SL=480/ SL=750 WL=1500 Re=100 B=600 T=(-5)
Ventilation		Windlass	-	-
Glazing	multi-chamber polycarbonate panel	●	●	●
	acrylic dome	●	-	-
	solid polycarbonate dome	●	-	-
	ALU sandwich panel(**)	●	●	●
	classification $B_{ROOF(}t1)$	-	-	-
	multi-chamber polycarbonate panel and envelope cover(***)	●	●	●
	multi-chamber polycarbonate panel and single or double-layer acrylic dome or solid polycarbonate dome	-	-	-
Additional equipment	Pull cords for manual opening from inside and/or outside	●	●	●
Available sizes		C type – 800 ÷ 1200 mm (from 800x800 mm to 1200x1200 mm) E type – 800/1000 mm ÷ 1000/1200 mm (from 800x1000 mm to 1000x1200 mm) INTERMEDIATE SIZES ALLOWED	C type – 1000 ÷ 1000 mm (from 1000x1000 mm to 1400x1400 mm) E type – 1000/1100 mm ÷ 1000/2000 mm (from 1000x1100 mm to 1000x2000 mm) INTERMEDIATE SIZES ALLOWED	DVP 1000x1800 mm DVP 1000x2000 mm DVP 1200x1800 mm DVP 1200x2000 mm DVP 1200x2400 mm NO INTERMEDIATE SIZES ALLOWED

(*)T=(-5) available if SL reduced by 5%
(**) ALU sandwich panel: aluminum - thermal insulation - aluminum
(***) Applies to selected sizes

5.8. mechanic opening system

*Detail **a** – pull cord*

Fig. 73 – Design of mcr PROLIGHT Csmoke vent equipped in mechanic control system

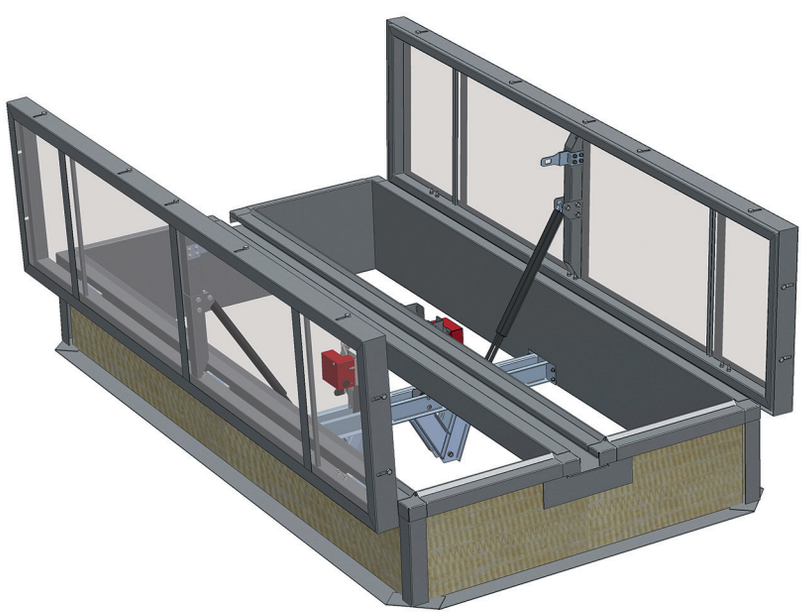
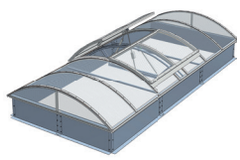
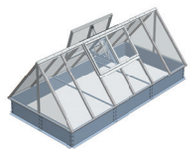
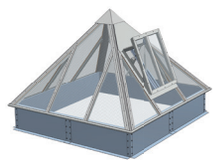
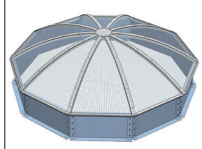


Fig. 74 – Design of mcr PROLIGHT DVP smoke ventequipped in mechanic control system

Notes

6. continuous rooflights with smoke vents and/or ventilation vents

Continuous rooflights are the most effective method of increasing natural light intensity in rooms. Their application in large-area single-storey buildings allows lighting even of the entire building area.

<table>
<tr><th>Parameters</th><th>Arch shaped rooflights</th><th>Triangular shaped rooflights</th><th>Pyramid skylights</th><th>Igloo skylights</th></tr>
<tr><td></td><td>  </td><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Classification</td><td colspan="4">Certificate of Conformity in accordance EN14963-2006:
• DL1000/ DL1125 / DL1500 / DL 2000/ DL 2050 / DL 2500 – resistance to downward loads as per EN 14963:2006, dependent on glazing thickness
• UL 1000/ UL 1500 – resistance to pull-off loads as per EN 14963:2006, dependent on glazing thickness
• Resistance of glazing to hard body impact as per EN 14963:2006
• Resistance of glazing to large soft body impact as per EN 14963:2006 for SB300 class
• Fire performance for external fire, class $\mathbf{B}_{ROOF}$(t1) as per EN 13501-5+A1:2010</td></tr>
<tr><td>Skylight span / diameter</td><td>1,2 ≤ S ≤ 6,0 m</td><td>1,2 ≤ S ≤ 5,0 m</td><td>1,2 ≤ S ≤ 5,0 m</td><td>1,2 ≤ D ≤ 6,0 m</td></tr>
<tr><td>Geometry</td><td>Skylight geometry is dependent on the thickness of polycarbonate (PCA):
<table><tr><th>glazing thickness (PCA)</th><th>bending radius [mm]</th><th>min. skylight span</th></tr><tr><td>g</td><td>R</td><td>S_{min}</td></tr><tr><td>10 mm</td><td>1750, 2050, 2800</td><td>1,2 m</td></tr><tr><td>16 mm</td><td>2800, 3250, 4500</td><td>1,5 m</td></tr><tr><td>20 mm</td><td>3600, 4500</td><td>2,0 m</td></tr><tr><td>25 mm</td><td>4500</td><td>2,5 m</td></tr></table></td><td colspan="2">Skylight inclination angle:
• 30° < α < 60°,
• optimum α = 45°</td><td>Dome base shape:
• regular polygon inscribed into a circle of diameter D</td></tr>
<tr><td>Module length</td><td colspan="4">m_1 = 710 mm lub m_2 = 1060 mm</td></tr>
<tr><td>Glazing</td><td colspan="4">• multi-chamber polycarbonate panel (PCA) of th. 10 mm, 16 mm, 20 mm, 25 mm
• B_{ROOF}(t1) classification – multi-chamber polycarbonate panel, as above + polyester panel
• multiple glazing with multi-chamber polycarbonate, see Section 8 for details</td></tr>
<tr><td>Smoke vents</td><td rowspan="2">• single-leaf vents 100x100 cm ÷ 200x250 cm
• double-leaf vents 100x100 cm ÷ 250x250 cm</td><td colspan="2">-</td><td rowspan="2">-</td></tr>
<tr><td>Ventilation vents</td><td>• single-leaf vents 100x100 cm ÷ 200x250 cm
• double-leaf vents 100x100 cm ÷ 250x250 cm</td><td>• single-leaf vents 100x100 cm ÷ 200x250 cm</td></tr>
<tr><td>Smoke vent classification</td><td>Certificate of Constancy of Performance 1396-CPR-0039 as per EN12101-2:2003 (EN12101-2:2005)
• WL750 or 1500 – operational certainty of vents under wind stress of 750 Pa or 1500 Pa
• T(-25) – resistance of vents to low temperature of - 25 °C
• B300 – resistance of vents to high temperature of 300°C,
• SL – operational certainty of vents under snow load N/m2
• Re50 – operational reliability of single leaf during 50 cycles of opening and closing to smoke exhaust position, and 10 000 cycles to ventilation position (double function vent),
• Re50 and Re300– operational reliability of double-leaf vent during 50 cycles of opening and closing to smoke exhaust position, and 10 000 cycles to ventilation position (double function vent),</td><td colspan="2">-</td><td>-</td></tr>
<tr><td>Vent control</td><td>• smoke exhaust - pneumatic, electric 24V-
• ventilation – electric ~230V, electric 24V-</td><td colspan="2">• ventilation – electric ~230V, electric 24V-</td><td>-</td></tr>
<tr><td>Non-standard options</td><td colspan="3">• alternative base sheet thickness of 2.5 mm – for self-supporting base of modular length up to 6.0 m
• skylight elements painted to any RAL color
• custom base height of h ≤ 300 mm
• custom width of circumferential flange of base,
• self-supporting base of modular length up to 6000 mm
• custom base design
• anti-burglar grid
• safety nets
• available in configuration with soft body impact resistance up to 1200 J</td><td>-</td></tr>
</table>

6.1. arch shaped continuous rooflights

6.1.1. technical description of standard

- continuous rooflights in accordance with EN 14963:2006,
- straight base of height 300 mm ÷ 700 mm made of galvanized steel sheet of thickness adequate to the skylight parameters (width, length, glazing thickness),
- dimensional range,
- bottom part of base has a circumferential flange of standard width 70 mm, for installing on the roof structure,
- skylight base stiffened with bracing at 1500 mm or 3000 mm,
- continuous rooflight base adapted for installing thermal insulation of min. thickness 50 mm,
- continuous rooflight structure made of aluminum profiles of shape ensuring water run-off,
- skylights glazing made of multi-chamber polycarbonate, available in various thicknesses and colors, glazing with $B_{ROOF}(t1)$ classification,
- continuous rooflights may be delivered with openable vents,
- smoke vents for exhausting smoke, heat and burning fumes,
- ventilation vents for daily ventilation.

6.1.2. arch shaped continuous rooflight design

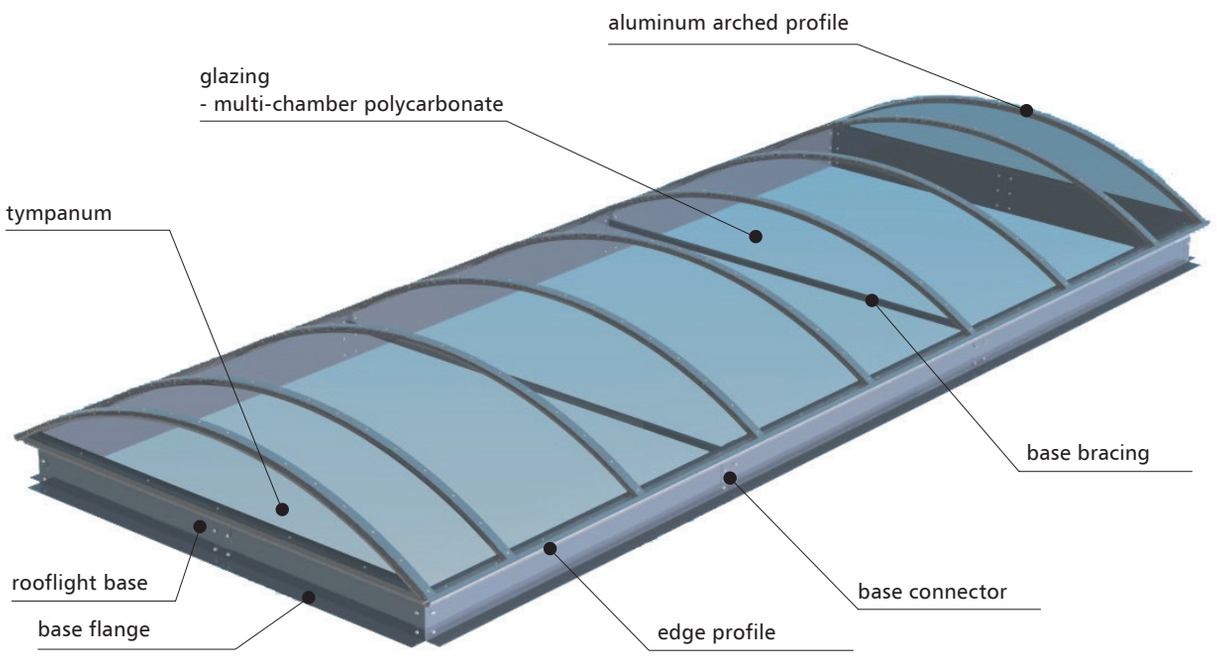


Fig. 75 – Design of mcr PROLIGHT arch shaped continuous rooflight

6.1.3 technical drawings of arch shaped continuous rooflight

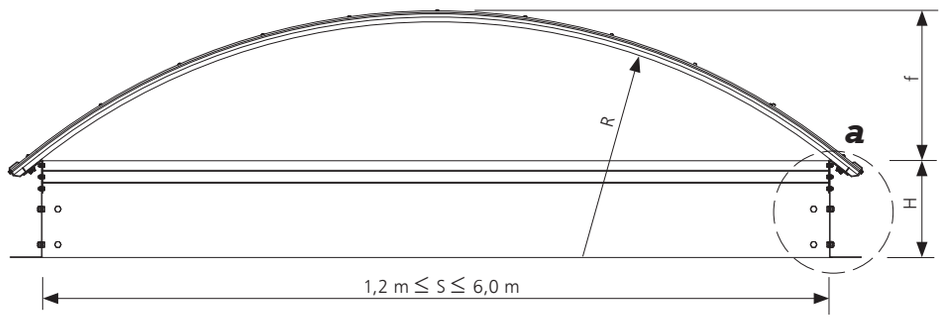
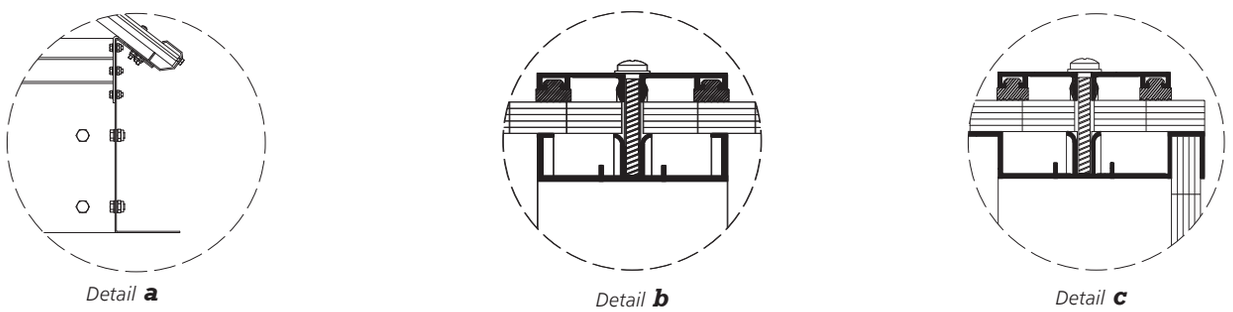


*Fig. 76 – Cross section **A-A** of mcr PROLIGHT arch shaped continuous rooflight*



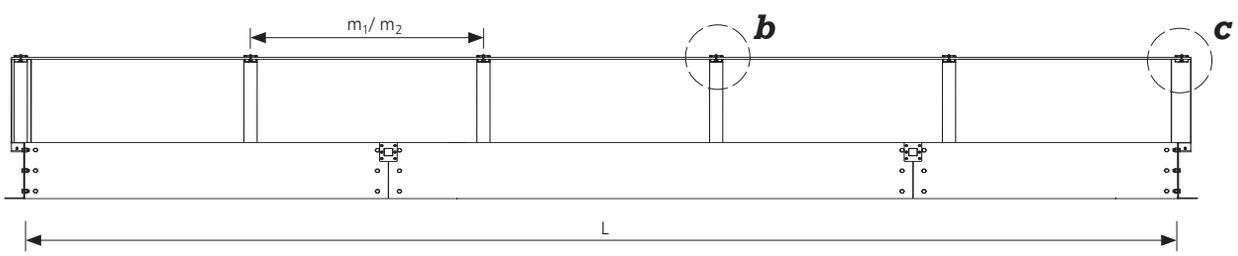


*Fig. 77 – Cross section **B-B** of mcr PROLIGHT arch shaped continuous rooflight*

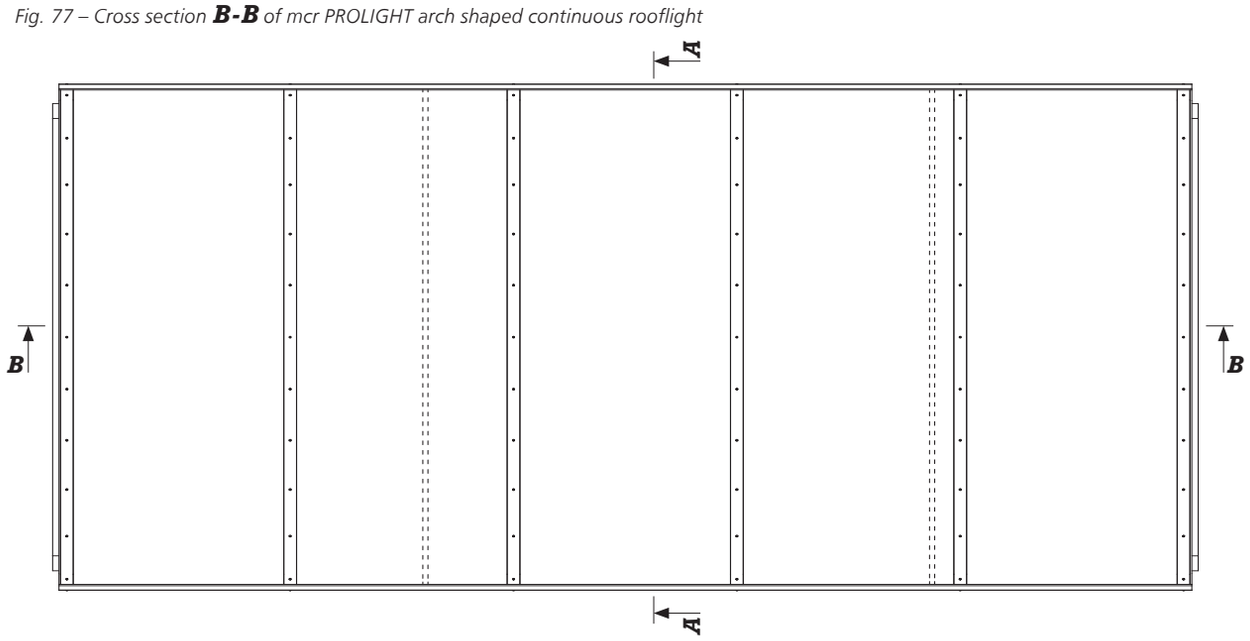


Fig. 78 – Top view of mcr PROLIGHT continuous rooflight

S – continuous rooflight span [m]
L – skylight length [m]
R – continuous rooflight radius [mm]
f – continuous rooflight rise [mm] – depends on glazing thickness, bending radius and rooflight span
H – continuous rooflight base height [mm]
m – modular spacing of bearing and pressing sections available in two sizes: 1060 mm or 710 mm

6.2. Smoke vents integrated in arch shaped continuous rooflights

6.2.1. technical description of standard

- continuous rooflights may be delivered with openable vents:
  - smoke vents for exhausting smoke, heat and burning fumes,
  - ventilation vents for daily ventilation
- smoke vent leaf opening angle:
  - ≥ 140° for single-leaf vent
  - ≥ 90° for double-leaf vent
- smoke exhaust control: pneumatic, electric 24V-,
- ventilation control: electric 230V~.

6.2.2. arch shaped continuous rooflight design with integrated smoke vents

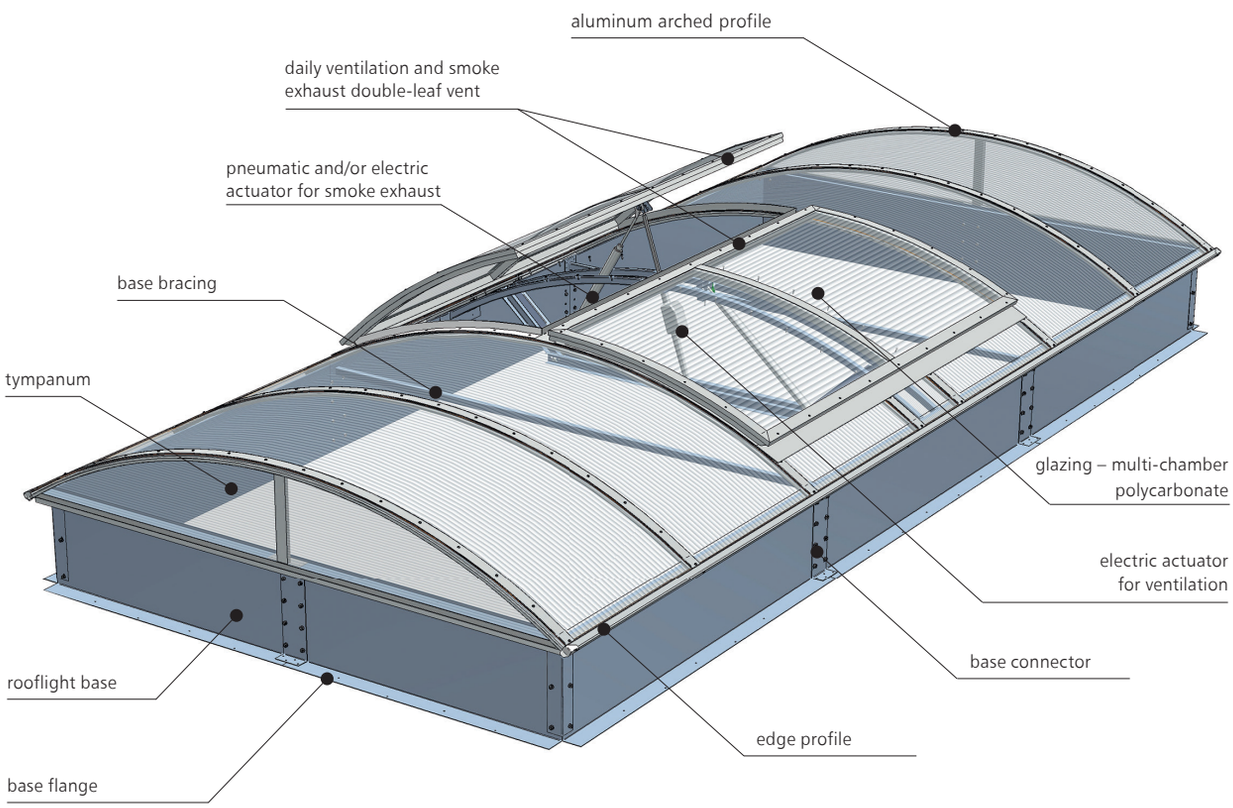


Fig. 79 – Design of mcr PROLIGHT arch shaped continuous rooflight with double-leaf smoke vent, with pneumatic actuator for smoke exhaust and electric actuator for daily ventilation

6.2.3 technical drawings of sample configurations of continuous rooflights with integrated smoke vents

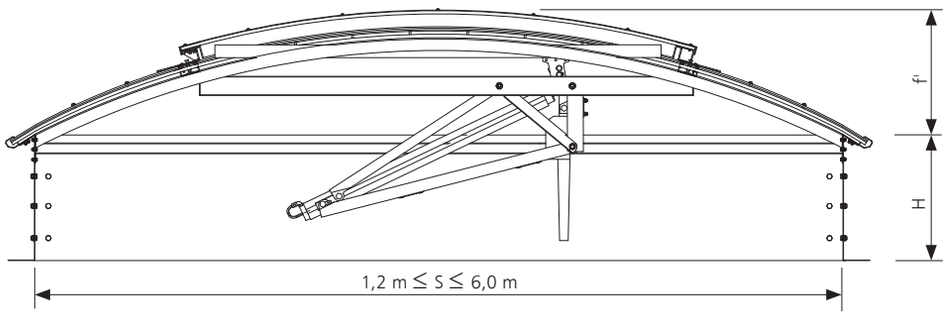


*Fig. 80 – Cross section **C-C** of mcr PROLIGHT arch shaped continuous rooflight with integrated smoke exhaust and daily ventilation single-leaf vent*

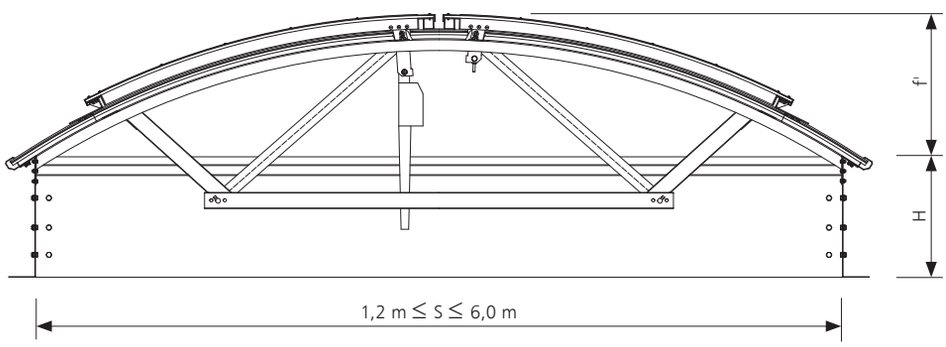


*Fig. 81 – Cross section **D-D** of mcr PROLIGHT arch shaped continuous rooflight with integrated smoke exhaust and daily ventilation double-leaf vent*

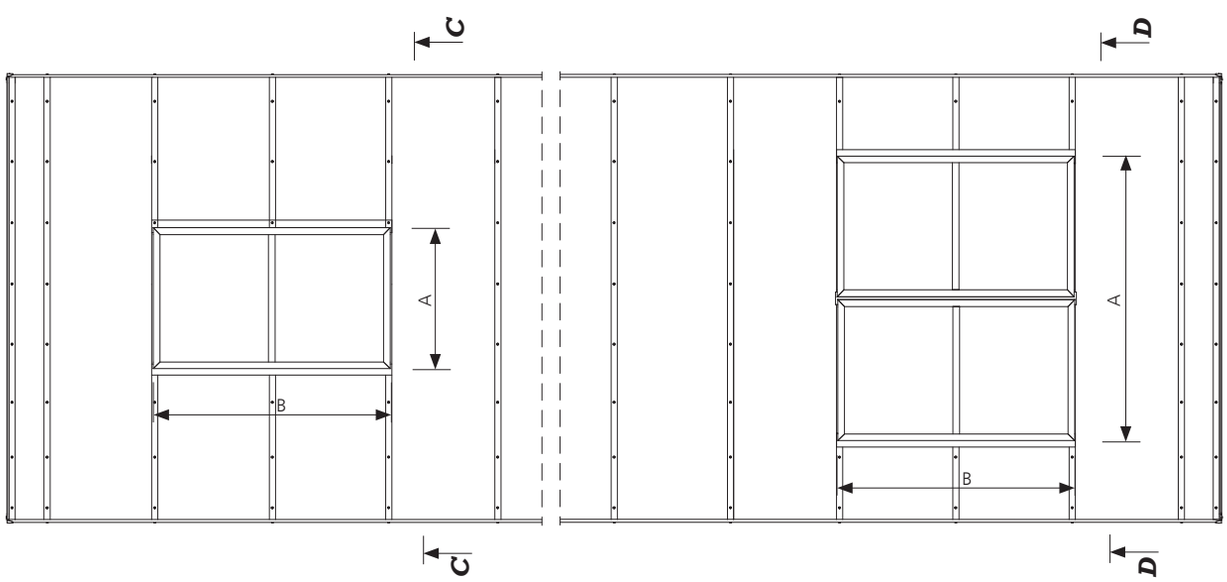


Fig. 82 – Top view of mcr PROLIGHT arch shaped continuous rooflight with integrated smoke exhaust and daily ventilation single and double-leaf vent

S – continuous rooflight span [m]
f – continuous rooflight rise [mm] – depends on glazing thickness, bending radius and rooflight span
H – continuous rooflight base height [mm]
A, B – nominal vent dimensions

6.2.4. available sizes table for smoke vents in arch shaped continuous rooflights as per CE 1396-CPR-0039

NOMINAL DIMENSIONS [A X B]	ACTIVE AREA A_a [m^2]			
	SINGLE-LEAF VENTS		DOUBLE-LEAF VENTS	
[mm]	WITHOUT WIND DEFLECTORS	WITH WIND DEFLECTORS	WITHOUT WIND DEFLECTORS	WITH WIND DEFLECTORS
1000 x 1000	0,44	0,72	0,42	0,65
1000 x 1100	0,47	0,79	0,46	0,72
1000 x 1200	0,48	0,88	0,5	0,8
1000 x 1300	0,51	0,95	0,54	0,87
1000 x 1400	0,52	1,02	0,58	0,95
1000 x 1500	0,52	1,1	0,62	1,02
1000 x 1600	0,54	1,17	0,67	1,09
1000 x 1700	0,56	1,24	0,71	1,17
1000 x 1800	0,56	1,31	0,76	1,24
1000 x 1900	0,57	1,39	0,8	1,32
1000 x 2000	0,57	1,46	0,85	1,39
1000 x 2100	0,60	1,53	0,9	1,46
1000 x 2200	0,60	1,61	0,95	1,54
1000 x 2300	0,61	1,68	1	1,61
1000 x 2400	0,61	1,75	1,05	1,69
1000 x 2500	0,60	1,83	1,1	1,76
1100 x 1000	0,65	0,79	0,45	0,72
1100 x 1100	0,63	0,88	0,49	0,81
1100 x 1200	0,66	0,96	0,53	0,89
1100 x 1300	0,65	1,04	0,57	0,97
1100 x 1400	0,66	1,12	0,62	1,05
1100 x 1500	0,63	1,2	0,66	1,14
1100 x 1600	0,69	1,28	0,71	1,22
1100 x 1700	0,67	1,37	0,76	1,3
1100 x 1800	0,70	1,45	0,8	1,38
1100 x 1900	0,69	1,53	0,85	1,46
1100 x 2000	0,71	1,61	0,9	1,55
1100 x 2100	0,70	1,69	0,95	1,63
1100 x 2200	0,66	1,77	1	1,71
1100 x 2300	0,73	1,85	1,05	1,79
1100 x 2400	0,70	1,93	1,11	1,88
1100 x 2500	0,75	2,01	1,16	1,96
1200 x 1000	0,68	0,88	0,48	0,8
1200 x 1100	0,73	0,96	0,52	0,89
1200 x 1200	0,76	1,05	0,56	0,98
1200 x 1300	0,77	1,14	0,61	1,07
1200 x 1400	0,75	1,23	0,66	1,16
1200 x 1500	0,76	1,31	0,7	1,25
1200 x 1600	0,73	1,4	0,75	1,34
1200 x 1700	0,79	1,49	0,8	1,43
1200 x 1800	0,71	1,58	0,85	1,52
1200 x 1900	0,81	1,66	0,9	1,61
1200 x 2000	0,77	1,75	0,95	1,7
1200 x 2100	0,81	1,84	1	1,79
1200 x 2200	0,79	1,95	1,06	1,88
1200 x 2300	0,81	2,04	1,11	1.96
1200 x 2400	0,81	2,13	1,17	2.04
1200 x 2500	0,76	2,22	1,22	2.16
1300 x 1000	0,84	0,95	0,51	0.88
1300 x 1100	0,73	1,04	0,55	0.97
1300 x 1200	0,85	1,14	0,6	1.08
1300 x 1300	0,80	1,23	0,65	1.17

6.2.5. available sizes table for smoke vents in arch shaped continuous rooflights as per CE 1396-CPR-0039

NOMINAL DIMENSIONS [A X B]	ACTIVE AREA A_a [m^2]			
	SINGLE-LEAF VENTS		DOUBLE-LEAF VENTS	
[mm]	WITHOUT WIND DEFLECTORS	WITH WIND DEFLECTORS	WITHOUT WIND DEFLECTORS	WITH WIND DEFLECTORS
1300 x 1400	0,86	1,33	0,69	1,27
1300 x 1500	0,83	1,42	0,74	1,37
1300 x 1600	0,86	1,52	0,79	1,47
1300 x 1700	0,79	1,61	0,84	1,56
1300 x 1800	0,88	1,71	0,9	1,66
1300 x 1900	0,75	1,8	0,95	1,76
1300 x 2000	0,85	1,92	1	1,86
1300 x 2100	0,86	2,02	1,06	1,96
1300 x 2200	0,84	2,12	1,11	2,06
1300 x 2300	0,90	2,21	1,17	2,16
1300 x 2400	0,77	2,31	1,23	2,26
1300 x 2500	0,82	2,41	1,29	2,35
1400 x 1000	0,92	1,02	0,54	0,95
1400 x 1100	0,93	1,12	0,58	1,05
1400 x 1200	0,87	1,23	0,63	1,16
1400 x 1300	0,92	1,33	0,68	1,27
1400 x 1400	0,90	1,43	0,73	1,37
1400 x 1500	0,92	1,53	0,78	1,48
1400 x 1600	0,92	1,64	0,84	1,59
1400 x 1700	0,87	1,74	0,89	1,7
1400 x 1800	0,95	1,86	0,94	1,8
1400 x 1900	0,79	1,97	1	1,91
1400 x 2000	0,84	2,07	1,05	2,02
1400 x 2100	0,91	2,18	1,11	2,12
1400 x 2200	0,97	2,28	1,17	2,23
1400 x 2300	0,94	2,38	1,23	2,34
1400 x 2400	0,98	2,49	1,29	2,45
1400 x 2500	0,81	2,59	1,35	2,55
1500 x 1000	0,90	1,1	0,57	1,02
1500 x 1100	0,97	1,2	0,62	1,14
1500 x 1200	0,98	1,31	0,67	1,25
1500 x 1300	1,00	1,42	0,72	1,37
1500 x 1400	0,87	1,53	0,77	1,48
1500 x 1500	0,95	1,64	0,82	1,6
1500 x 1600	1,02	1,75	0,88	1,71
1500 x 1700	0,83	1,89	0,93	1,83
1500 x 1800	0,93	2	0,99	1,94
1500 x 1900	0,99	2,11	1,05	2,06
1500 x 2000	1,03	2,22	1,11	2,17
1500 x 2100	0,89	2,33	1,16	2,29
1500 x 2200	1,01	2,44	1,22	2,4
1500 x 2300	1,04	2,55	1,29	2,52
1500 x 2400	1,03	2,66	1,35	2,64
1500 x 2500	0,98	2,78	1,41	2,75
1600 x 1000	1,07	1,17	0,6	1,09
1600 x 1100	0,91	1,28	0,65	1,22
1600 x 1200	0,96	1,4	0,7	1,34
1600 x 1300	1,03	1,52	0,75	1,47
1600 x 1400	1,09	1,64	0,81	1,59
1600 x 1500	1,06	1,75	0,86	1,71
1600 x 1600	1,10	1,89	0,92	1,84
1600 x 1700	1,08	2,01	0,98	1,96

6.2.5. available sizes table for smoke vents in arch shaped continuous rooflights as per CE 1396-CPR-0039

NOMINAL DIMENSIONS [A X B]	ACTIVE AREA A_a [m^2]			
	SINGLE-LEAF VENTS		DOUBLE-LEAF VENTS	
[mm]	WITHOUT WIND DEFLECTORS	WITH WIND DEFLECTORS	WITHOUT WIND DEFLECTORS	WITH WIND DEFLECTORS
1600 x 1800	1,10	2,13	1,04	2,08
1600 x 1900	1,02	2,25	1,1	2,21
1600 x 2000	0,93	2,37	1,16	2,33
1600 x 2100	0,99	2,49	1,22	2,45
1600 x 2200	1,07	2,6	1,28	2,58
1600 x 2300	1,15	2,72	1,34	2,7
1600 x 2400	1,11	2,84	1,41	2,83
1600 x 2500	1,16	2,96	1,47	2,95
1700 x 1000	1,05	1,24	0,62	1,17
1700 x 1100	1,01	1,37	0,68	1,3
1700 x 1200	1,13	1,49	0,73	1,43
1700 x 1300	1,16	1,61	0,79	1,56
1700 x 1400	1,15	1,74	0,85	1,7
1700 x 1500	1,11	1,89	0,9	1,83
1700 x 1600	1,08	2,01	0,96	1,96
1700 x 1700	1,04	2,14	1,02	2,09
1700 x 1800	1,15	2,26	1,08	2,22
1700 x 1900	1,22	2,39	1,15	2,36
1700 x 2000	1,18	2,52	1,21	2,49
1700 x 2100	1,22	2,64	1,27	2,62
1700 x 2200	1,21	2,77	1,34	2,75
1700 x 2300	1,22	2,89	1,4	2,88
1700 x 2400	1,14	3,02	1,47	3,02
1700 x 2500	1,11	3,15	1,53	3,15
1800 x 1000	1,19	1,31	0,65	1,24
1800 x 1100	1,23	1,45	0,71	1,38
1800 x 1200	1,29	1,58	0,77	1,52
1800 x 1300	1,18	1,71	0,83	1,66
1800 x 1400	1,26	1,86	0,89	1,8
1800 x 1500	1,29	2	0,95	1,94
1800 x 1600	1,28	2,13	1,01	2,08
1800 x 1700	1,14	2,26	1,07	2,22
1800 x 1800	1,23	2,4	1,13	2,36
1800 x 1900	1,21	2,53	1,19	2,5
1800 x 2000	1,28	2,66	1,26	2,64
1800 x 2100	1,31	2,8	1,32	2,78
1800 x 2200	1,36	2,93	1,39	2,92
1800 x 2300	1,34	3,06	1,46	3,07
1800 x 2400	1,35	3,2	1,53	3,21
1800 x 2500	1,27	3,33	1,6	3,35
1900 x 1000	1,25	1,39	0,68	1,32
1900 x 1100	1,32	1,53	0,74	1,46
1900 x 1200	1,36	1,66	0,8	1,61
1900 x 1300	1,31	1,8	0,86	1,76
1900 x 1400	1,39	1,97	0,92	1,91
1900 x 1500	1,42	2,11	0,99	2,06
1900 x 1600	1,41	2,25	1,05	2,21
1900 x 1700	1,37	2,39	1,11	2,36
1900 x 1800	1,41	2,53	1,18	2,5
1900 x 1900	1,35	2,67	1,24	2,65
1900 x 2000	1,45	2,81	1,31	2,8

6.2.5. available sizes table for smoke vents in arch shaped continuous rooflights as per CE 1396-CPR-0039

NOMINAL DIMENSIONS [A X B]	ACTIVE AREA A_a [m^2]			
	SINGLE-LEAF VENTS		DOUBLE-LEAF VENTS	
[mm]	WITHOUT WIND DEFLECTORS	WITH WIND DEFLECTORS	WITHOUT WIND DEFLECTORS	WITH WIND DEFLECTORS
1900 x 2100	1,47	2,95	1,38	2,95
1900 x 2200	1,49	3,09	1,45	3,1
1900 x 2300	1,41	3,23	1,52	3,25
1900 x 2400	1,46	3,37	1,59	3,4
1900 x 2500	1,50	3,52	1,66	3,54
2000 x 1000	1,53	1,46	0,71	1,39
2000 x 1100	1,45	1,61	0,77	1,55
2000 x 1200	1,55	1,75	0,84	1,7
2000 x 1300	1,51	1,92	0,9	1,86
2000 x 1400	1,55	2,07	0,96	2,02
2000 x 1500	1,59	2,22	1,03	2,17
2000 x 1600	1,62	2,37	1,09	2,33
2000 x 1700	1,55	2,52	1,16	2,49
2000 x 1800	1,60	2,66	1,22	2,64
2000 x 1900	1,65	2,81	1,29	2,8
2000 x 2000	1,68	2,96	1,36	2,96
2000 x 2100	1,65	3,11	1,43	3,11
2000 x 2200	1,70	3,26	1,5	3,27
2000 x 2300	1,74	3,4	1,57	3,43
2000 x 2400	1,75	3,55	1,65	3,59
2000 x 2500	1,80	3,7	1,72	3,74
2100 x 1000	1,85	–	0,74	1,46
2100 x 1100	–	–	0,81	1,63
2100 x 1200	–	–	0,87	1,79
2100 x 1300	–	–	0,93	1,96
2100 x 1400	–	–	1	2,12
2100 x 1500	–	–	1,07	2,29
2100 x 1600	–	–	1,13	2,45
2100 x 1700	–	–	1,2	2,62
2100 x 1800	–	–	1,27	2,78
2100 x 1900	–	–	1,34	2,95
2100 x 2000	–	–	1,41	3,11
2100 x 2100	–	–	1,49	3,28
2100 x 2200	–	–	1,56	3,44
2100 x 2300	–	–	1,63	3,61
2100 x 2400	–	–	1,71	3,78
2100 x 2500	–	–	1,78	3,94
2200 x 1000	0,93	1.61	0,77	1,54
2200 x 1100	–	–	0,84	1,71
2200 x 1200	–	–	0,9	1,88
2200 x 1300	–	–	0,97	2,06
2200 x 1400	–	–	1,04	2,23
2200 x 1500	–	–	1,11	2,4
2200 x 1600	–	–	1,18	2,58
2200 x 1700	–	–	1,25	2,75
2200 x 1800	–	–	1,32	2,92
2200 x 1900	–	–	1,39	3,1
2200 x 2000	–	–	1,46	3,27
2200 x 2100	–	–	1,54	3,44
2200 x 2200	–	–	1,61	3,62
2200 x 2300	–	–	1,69	3,79

6.2.5. available sizes table for smoke vents in arch shaped continuous rooflights as per CE 1396-CPR-0039

NOMINAL DIMENSIONS [A X B]	ACTIVE AREA A_a [m^2]			
	SINGLE-LEAF VENTS		DOUBLE-LEAF VENTS	
[mm]	WITHOUT WIND DEFLECTORS	WITH WIND DEFLECTORS	WITHOUT WIND DEFLECTORS	WITH WIND DEFLECTORS
2200 x 2400	–	–	1,77	3,97
2200 x 2500	–	–	1,84	4,14
2300 x 1000	–	–	0,8	1,61
2300 x 1100	–	–	0,87	1,79
2300 x 1200	–	–	0,94	1,98
2300 x 1300	–	–	1,01	2,16
2300 x 1400	–	–	1,08	2,34
2300 x 1500	–	–	1,15	2,52
2300 x 1600	–	–	1,22	2,7
2300 x 1700	–	–	1,29	2,88
2300 x 1800	–	–	1,37	3,07
2300 x 1900	–	–	1,44	3,25
2300 x 2000	–	–	1,52	3,43
2300 x 2100	–	–	1,59	3,61
2300 x 2200	–	–	1,67	3,79
2300 x 2300	–	–	1,75	3,97
2300 x 2400	–	–	1,83	4,15
2300 x 2500	–	–	1,91	4,34
2400 x 1000	–	–	0,83	1,69
2400 x 1100	–	–	0,9	1,88
2400 x 1200	–	–	0,97	2,07
2400 x 1300	–	–	1,04	2,26
2400 x 1400	–	–	1,11	2,45
2400 x 1500	–	–	1,19	2,64
2400 x 1600	–	–	1,26	2,83
2400 x 1700	–	–	1,34	3,02
2400 x 1800	–	–	1,41	3,21
2400 x 1900	–	–	1,49	3,4
2400 x 2000	–	–	1,57	3,59
2400 x 2100	–	–	1,65	3,78
2400 x 2200	–	–	1,72	3,97
2400 x 2300	–	–	1,81	4,15
2400 x 2400	–	–	1,89	4,34
2400 x 2500	–	–	1,97	4,53
2500 x 1000	–	–	0,86	1,76
2500 x 1100	–	–	0,93	1,96
2500 x 1200	–	–	1	2,16
2500 x 1300	–	–	1,08	2,35
2500 x 1400	–	–	1,15	2,55
2500 x 1500	–	–	1,23	2,75
2500 x 1600	–	–	1,3	2,95
2500 x 1700	–	–	1,38	3,15
2500 x 1800	–	–	1,46	3,35
2500 x 1900	–	–	1,54	3,54
2500 x 2000	–	–	1,62	3,74
2500 x 2100	–	–	1,7	3,94
2500 x 2200	–	–	1,78	4,14
2500 x 2300	–	–	1,86	4,34
2500 x 2400	–	–	1,95	4,53
2500 x 2500	–	–	2,03	4,73

6.2.6. smoke vents control in arch shaped continuous rooflights as per CE 1396-CPR-0039

For correct operation, smoke vents as well as smoke exhaust & ventilation vents require devices controlling their opening and closing. A set of such devices constitutes a system for smoke exhaust control or smoke exhaust and ventilation control. Depending on the type of devices used, it may be designed as a:

- pneumatic smoke exhaust control system,
- 24V- electric smoke exhaust control system with ventilation function,
- pneumatic and electric control system; the pneumatic part is responsible for smoke exhaust, while the 230V~ electric part - for ventilation.

Smoke exhaust control systems are activated as follows:

1) automatic – through a thermo switch installed in the vent (pneumatic system), or by optical smoke sensors (electric system),
2) manual – by a release of CO_2 cartridges in alarm box (pneumatic system), or by operation of RPO emergency pushbutton (electric system),
3) FAS signal – by external impulse from fire alarm system (FAS) sent to an electromagnet installed in the alarm box (pneumatic system), or directly to smoke exhaust control unit (electric system).

Control system elements are described in section 13.

SINGLE-LEAF VENTS IN ARCH SHAPED CONTINUOUS ROOFLIGHTS					
VENT DIMENSIONS (*)	PNEUMATIC CONTROL(***)			ELECTRIC CONTROL(***)	
	PNEUMATIC ACTUATOR		MIN. CAPACITY OF CO_2 – CARTRIDGE – SL 950 [g]	POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR FOR CLASS	
[mm]	STROKE [mm]	DIAMETER [mm]		SL 250	SL 550
1000 x 1000	550	50	40	1,6	2,0
1000 x 1200	550	50	40	1,6	2,6
1000 x 1400	550	50	40	1,6	2,6
1000 x 1600	550	50	40	2,0	4,0
1000 x 1800	550	50	40	2,0	4,0
1000 x 2000	550	50	40	2,0	4,0
1000 x 2200	550	50	40	2,6	4,0
1000 x 2500	550	50	40	2,6	6,0
1200 x 1000	550	50	40	2,0	4,0
1200 x 1200	550	50	40	2,0	4,0
1200 x 1600	550	50	40	2,6	6,0
1200 x 1800	550	50	40	2,6	6,0
1200 x 2100	550	50	55	4,0	6,0
1200 x 2500	550	50	55	4,0	6,0
1400 x 1000	750	50	40	2,6	4,0
1500 x 1500	750	50	55	4,0	6,0
1500 x 1800	750	50	55	4,0	8,0
1500 x 2100	750	50	80	6,0	8,0
1500 x 2500	750	50	80	6,0	-
1600 x 1000	750	50	40	2,6	6,0
1800 x 1000	1050	63	80	6,0	8,0
1800 x 1800	1050	63	120	6,0	-
1800 x 2100	1050	63	120	8,0	-
1800 x 2500	1050	63	120	8,0	-
2000 x 1000	1050	63	80	6,0	8,0
2000 x 2000	1050	63	120	8,0	-
2000 x 2100	1050	63	120	8,0	-
2000 x 2500	1050	63	120	-	-
2200 x 1000	1300	63	120(**)	-	-

(*) For different smoke vent dimensions than specified in the table control system should be selected for larger size of the vent.
(**) SL500
(***) For selected sizes there are different SL options available:
- For electric control: SL750, SL950, SL1300 and SL1600
- For pneumatic control: SL250, SL750, SL1300, SL1600 and SL2000

6.2.6. smoke vents control in arch shaped continuous rooflights as per CE 1396-CPR-0039

DOUBLE-LEAF VENTS IN ARCH SHAPED CONTINUOUS ROOFLIGHTS					
VENT DIMENSIONS (*)	PNEUMATIC CONTROL(*)			ELECTRIC CONTROL(**)	
	PNEUMATIC ACTUATOR		MIN. CAPACITY OF CO_2 – CARTRIDGE – SL 950 [g]	POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR FOR CLASS	
[mm]	STROKE [mm]	DIAMETER [mm]		SL 250	SL 550
1000 x 1500	400	40	24	2 x 0,8	2 x 0,8
1000 x 2500	400	40	40	2 x 0,8	2 x 1,3
1200 x 1200	400	40	24	2 x 0,8	2 x 1,0
1200 x 1500	400	40	24	2 x 0,8	2 x 1,0
1200 x 2100	400	40	24	2 x 0,8	2 x 1,3
1500 x 1500	400	40	24	2 x 1,6	2 x 2,0
1500 x 2100	400	40	40	2 x 1,6	2 x 2,6
1500 x 2500	400	40	40	2 x 1,6	2 x 2,6
1800 x 2100	550	40	55	2 x 1,6	2 x 4,0
2000 x 2100	600	40	55	2 x 2,0	2 x 4,0
2000 x 2500	600	40	80	2 x 2,0	2 x 4,0
2200 x 2500	700	40	80	2 x 4,0	2 x 6,0
2400 x 2500	750	40	120	2 x 4,0	2 x 6,0
2500 x 2500	850	40	120(**)	2 x 4,0	2 x 8,0

(*) For different smoke vent dimensions than specified in the table control system should be selected for larger size of the vent.
(**) SL500
(***) For selected sizes there are different SL options available:
- For electric control: SL750, SL950, SL1300 and SL1600
- For pneumatic control: SL250, SL750, SL1300, SL1600 and SL2000

6.3. triangular shaped continuous rooflights

6.3.1. technical description of standard

- continuous rooflights in accordance with EN14963:2006,
- width 1200 - 5000 mm,
- straight base of height 300 mm ÷ 700 mm made of galvanized steel sheet of thickness adequate to the rooflight parameters (width, length, glazing thickness),
- bottom part of base has a circumferential flange of standard width 70 mm, for installing on the roof structure,
- skylight base hardened using bracing spaced at 1500 mm or 3000 mm,
- continuous rooflight base adapted for installing thermal insulation of min. thickness 50 mm,
- continuous rooflight structure made of aluminum profiles of shape ensuring water run-off,
- continuous rooflights glazing made of multi-chamber polycarbonate, available in various thicknesses and colors,
- continuous rooflights may be delivered with openable vents:
  - ventilation vents for daily ventilation of facilities,
- ventilation control: electric ~230V/24V.

6.3.2. triangular shaped continuous rooflight design

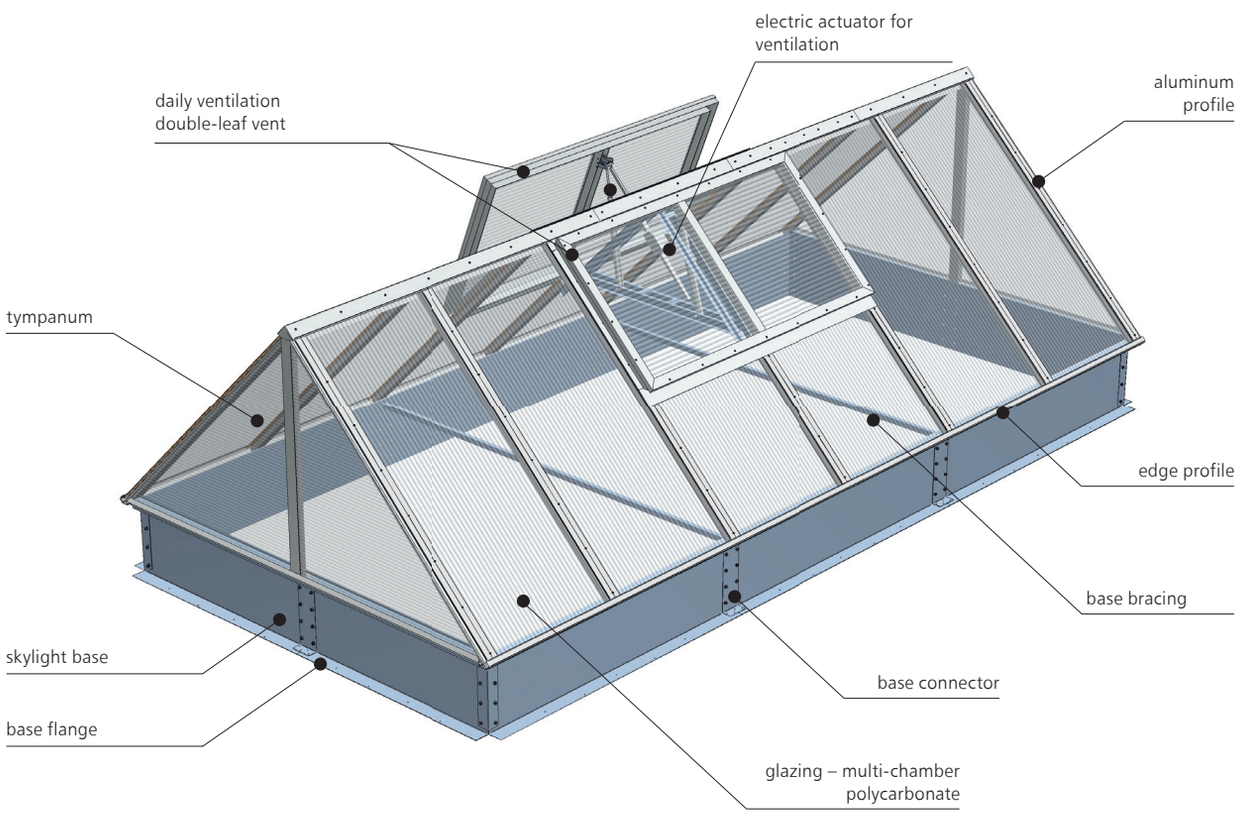


Fig. 83 – Design of mcr PROLIGHT triangular shaped continuous rooflight with double-leaf vent, with electric actuator for daily ventilation

6.3.3. technical drawings of triangular shaped continuous rooflight

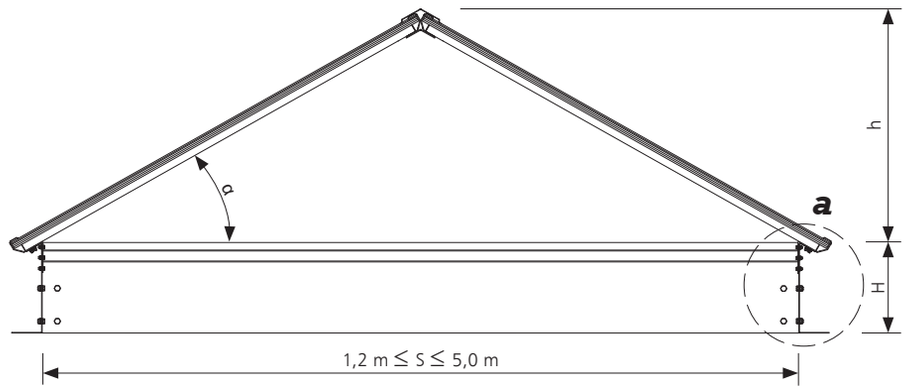


*Fig. 84 – Cross section **A-A** of mcr PROLIGHT triangular shaped continuous rooflight*

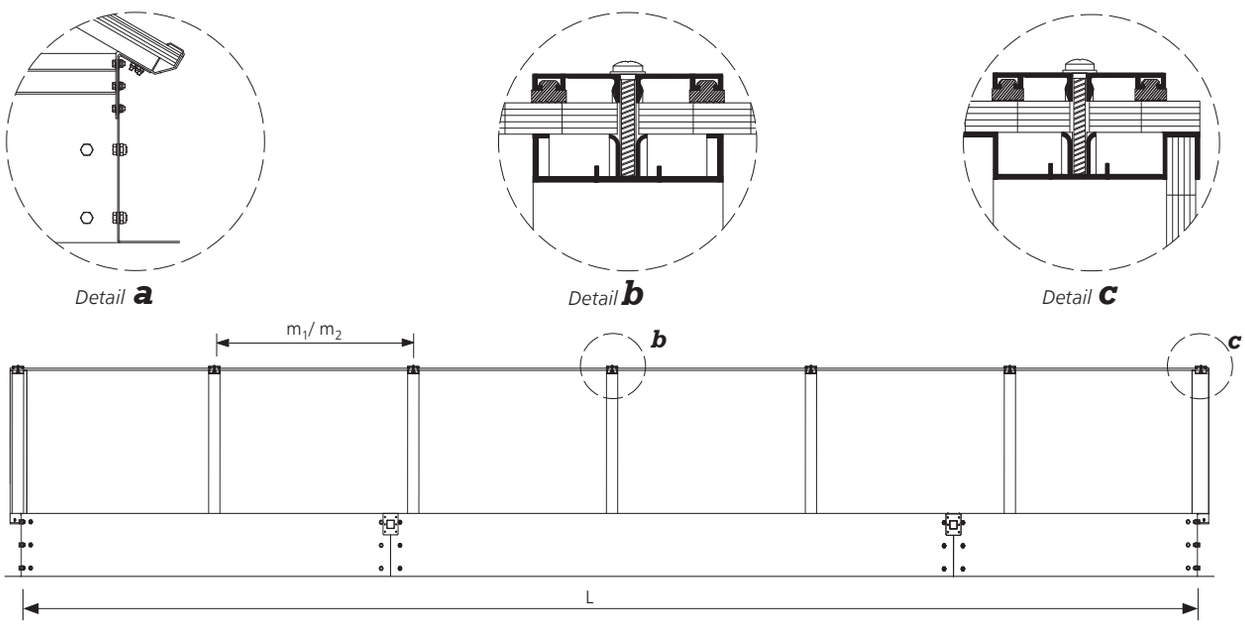


*Fig. 85 – Cross section **B-B** of mcr PROLIGHT triangular shaped continuous rooflight*

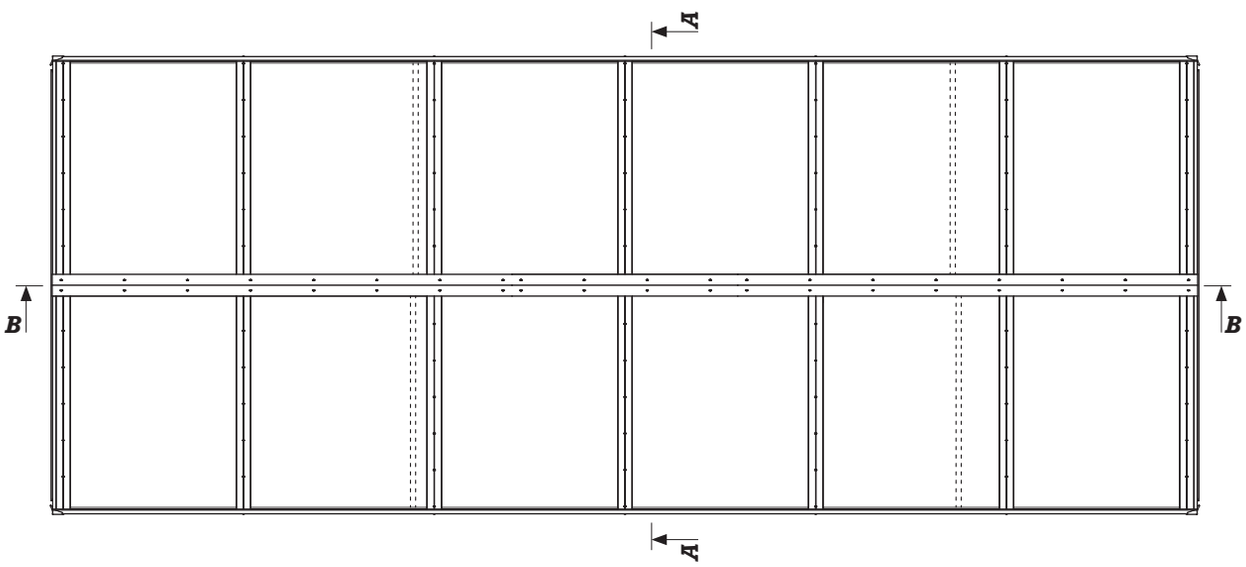


Fig. 86 – Top view of mcr PROLIGHT triangular shaped continuous rooflight

S – continuous rooflight span [m]
H – continuous rooflight base height [mm]
h – continuous rooflight height [mm], dependent on skylight angle of inclination and span

6.3.4. technical drawings of sample configurations of triangular shaped continuous rooflights with ventilation vents

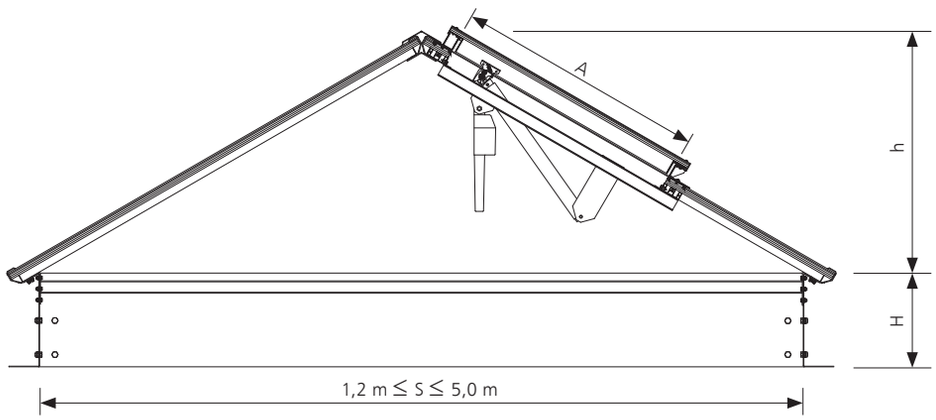


*Fig. 87 – Cross section **C-C** of mcr PROLIGHT triangular shaped continuous rooflight with daily ventilation single-leaf vent*

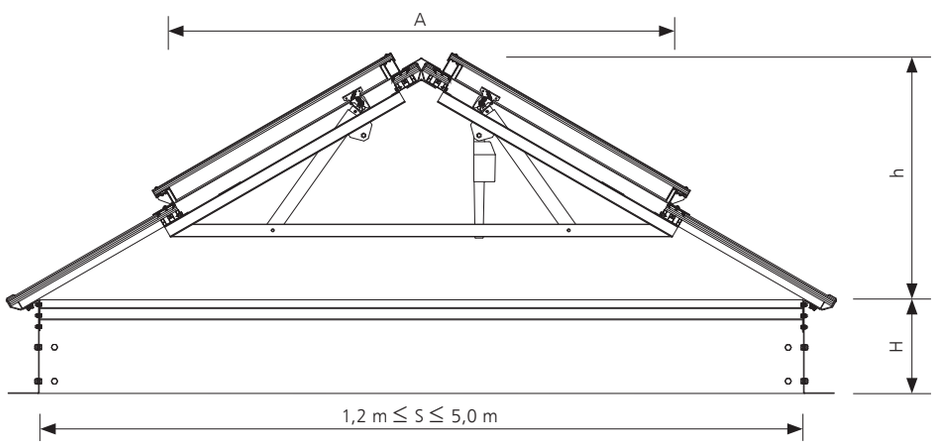


*Fig. 88 – Cross section **D-D** of mcr PROLIGHT triangular shaped continuous rooflight with daily ventilation double-leaf vent*

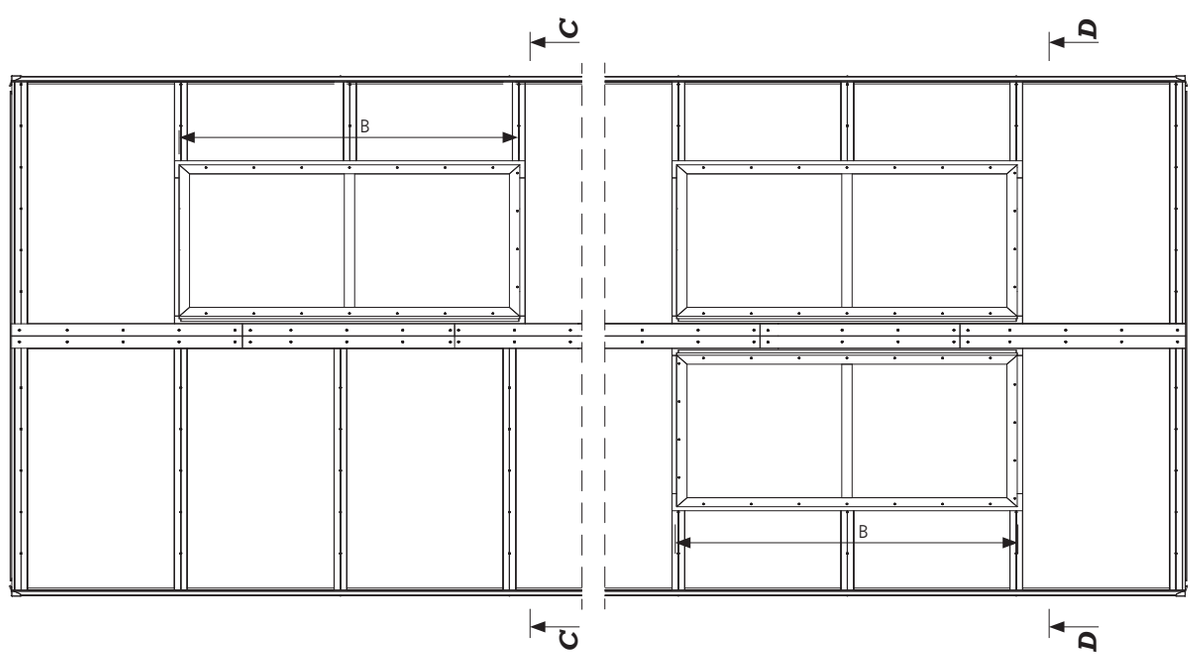


Fig. 89 – Top view of mcr PROLIGHT triangular shaped continuous rooflight with daily ventilation single-leaf and double-leaf vent

S – continuous rooflight span [m]
H – continuous rooflight base height [mm]
h – continuous rooflight height [mm], dependent on skylight angle of inclination and span
A, B – nominal vent dimensions

6.3.5. available sizes for ventilation vents in triangular shaped continuous rooflights

NOMINAL DIMENSIONS [A x B] [mm]	Notes (*)
630 x 650	Rooflights with module 710mm
1000 x 650	Rooflights with module 710mm
1200 x 650	Rooflights with module 710mm
1000 x 1000	Rooflights with module 1060mm
1200 x 1000	Rooflights with module 1060mm
1400 x 1000	Rooflights with module 1060mm
1000 x 2000	Rooflights with module 1060mm
1200 x 2000	Rooflights with module 1060mm
1400 x 2000	Rooflights with module 1060mm
1000 x 1300	Rooflights with module 710mm
1200 x 1300	Rooflights with module 710mm
1260 x 1300	Rooflights with module 710mm
1000 x 1900	Rooflights with module 710mm
1200 x 1200	Rooflights with module 710mm
1400 x 1900	Rooflights with module 710mm
1500 x 1900	Rooflights with module 710mm

(*) Module – Dimension between 2 bearing profiles of the rooflight which is either m_1 = 710 mm or m_2 = 1060 mm

6.4. pyramid skylights

6.4.1. technical description of standard

- continuous rooflights in accordance with EN14963:2006,
- width 1200 mm ÷ 5000 mm,
- straight base of height 300 mm ÷ 700 mm made of galvanized steel sheet of thickness adequate to the skylight parameters (width, length, glazing thickness),
- bottom part of base has a circumferential flange of standard width 70 mm, for installing on the roof structure,
- skylight base adapted for installing thermal insulation of min. thickness 50 mm,
- skylight structure made of aluminum profiles of shape ensuring water run-off,
- continuous rooflights glazing made of multi-chamber polycarbonate, available in various thicknesses and colors,
- continuous rooflights may be delivered with openable vents:
  - ventilation vents for daily ventilation of facilities,
- ventilation control: electric ~230V.

6.4.2. pyramid skylight design

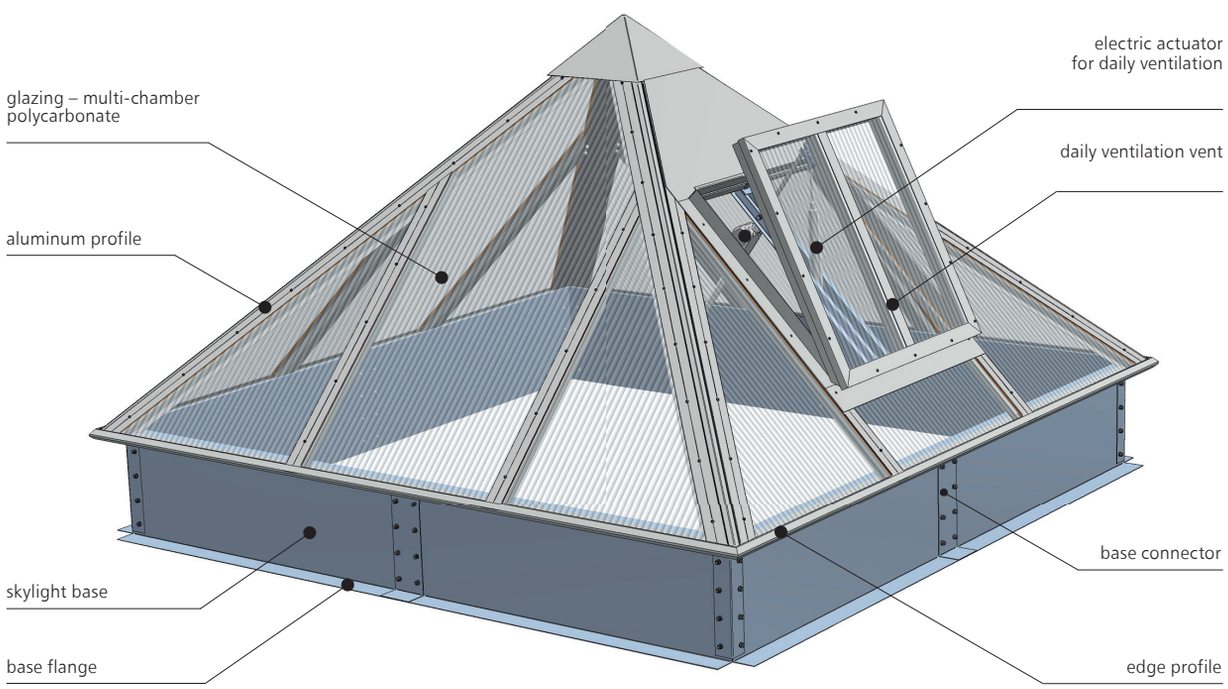


Fig. 90 – Design of mcr PROLIGHT pyramid skylight with smoke vent, with electric actuator for daily ventilation

6.4.3. technical drawings of pyramid skylight

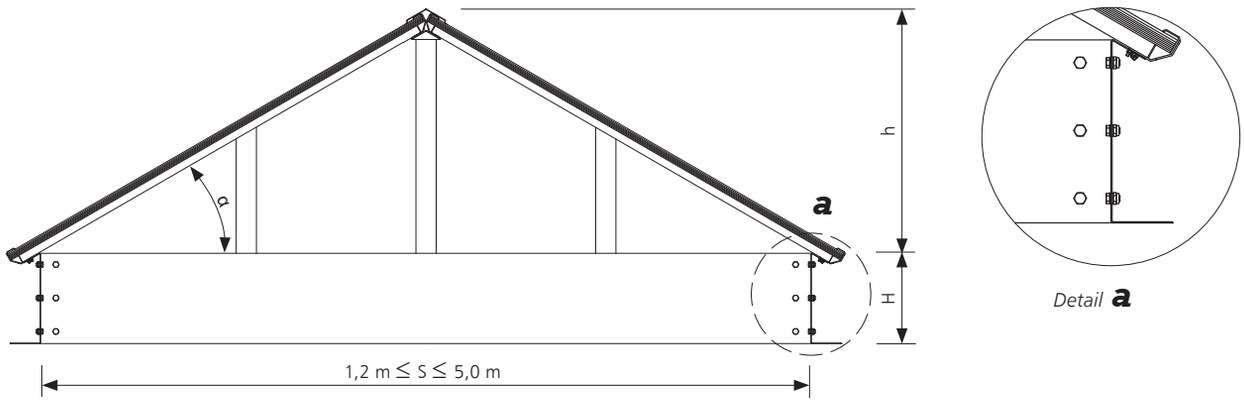


*Fig. 91 – Cross section **A-A** of mcr PROLIGHT pyramid skylight*

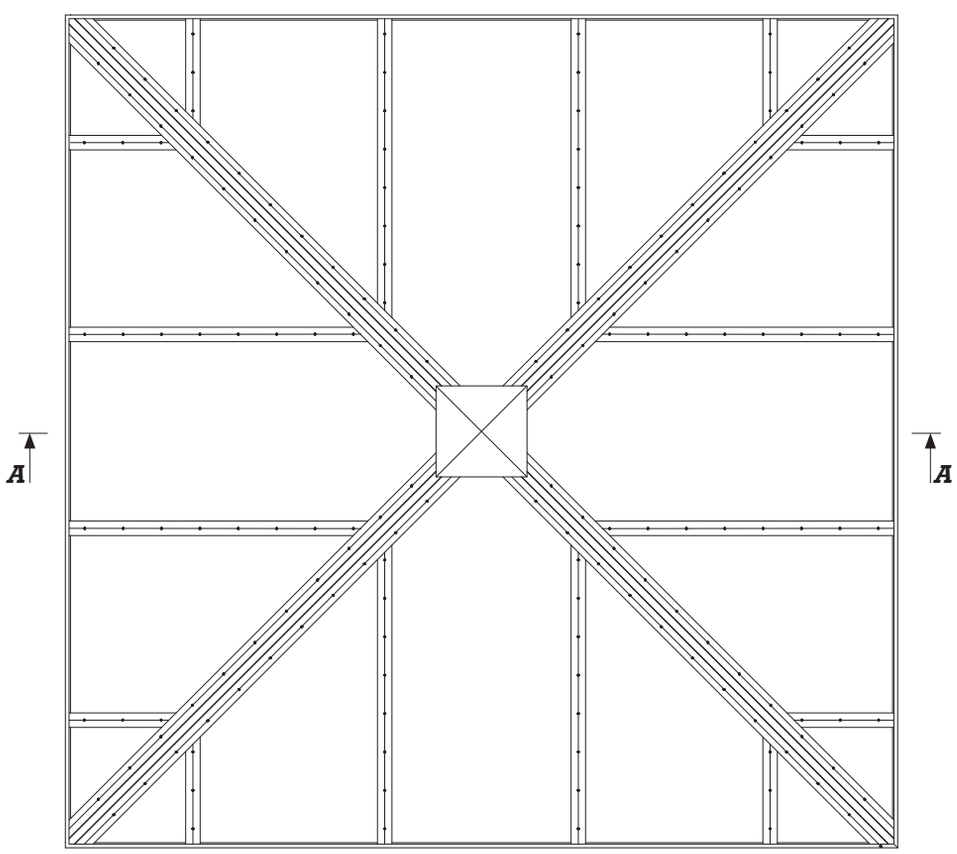


Fig. 92 – Top view of mcr PROLIGHT pyramid skylight

S – skylight span [m]
H – skylight base height [mm]
h – skylight height [mm] – dependent on inclination angle
α – inclination angle of rooflight walls, $30° < \alpha < 60°$

6.4.4. technical drawings of pyramid skylight with ventilation vent

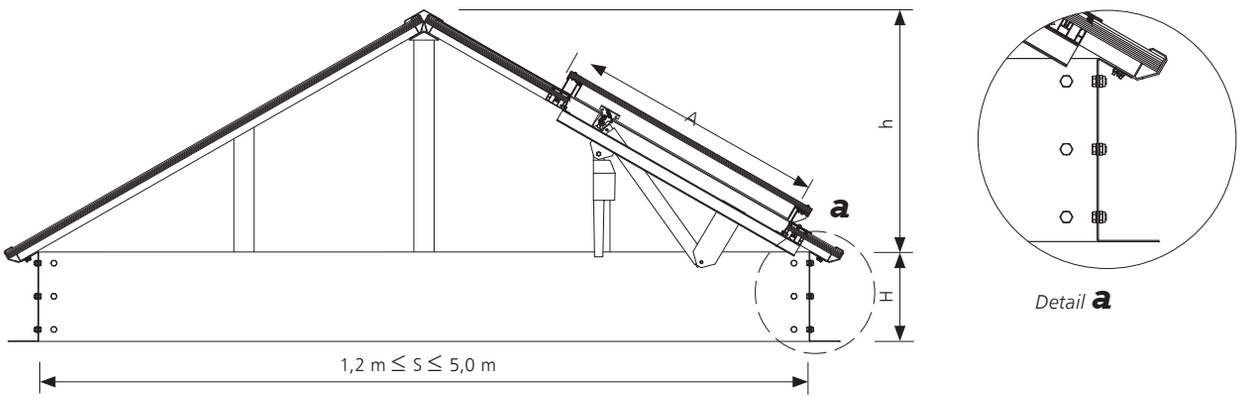


*Fig. 93 – Cross section **A-A** of mcr PROLIGHT pyramid skylight with daily ventilation vent*

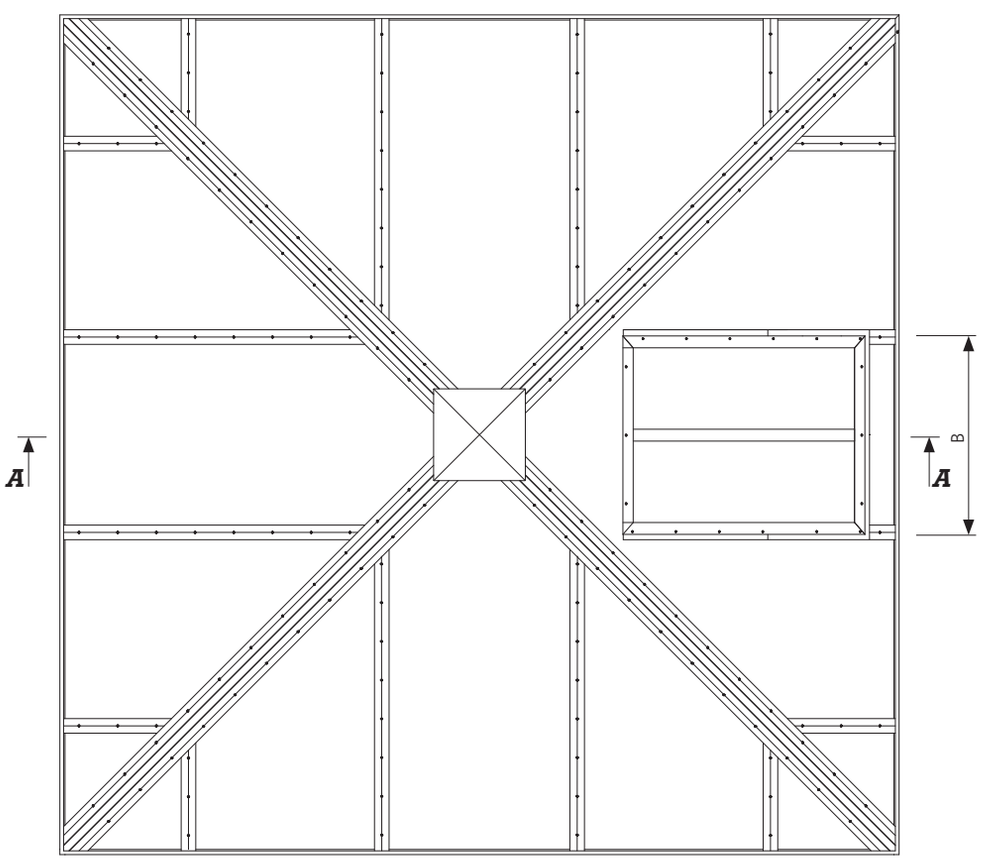


Fig. 94 – Top view of mcr PROLIGHT pyramid skylight with daily ventilation vent

S – skylight span [m]
H – skylight base height [mm]
h – skylight height [mm] – dependent on inclination angle
A, B – nominal vent dimensions

6.4.5. available sizes table for ventilation vents in pyramid skylights

NOMINAL DIMENSIONS [A x B] [mm]	Notes(*)
650 x 650	Skylights with module 710mm
1000 x 650	Skylights with module 710mm
1200 x 650	Skylights with module 710mm
1000 x 1000	Skylights with module 1060mm
1200 x 1000	Skylights with module 1060mm
1400 x 1000	Skylights with module 1060mm
1000 x 1300	Skylights with module 710mm
1200 x 1300	Skylights with module 710mm
1260 x 1300	Skylights with module 710mm

(*) Module – Dimension between 2 bearing profiles of the rooflight which is either m_1= 710mm or m_2= 1060mm

6.5. igloo skylights

6.5.1. technical description of standard

- continuous rooflights in accordance with EN14963:2006,
- width 1200 mm ÷ 6000 mm,
- straight base of height 300 mm ÷ 700 mm made of galvanized steel sheet of thickness adequate to the skylight parameters (width, length, glazing thickness)
- bottom part of base has a circumferential flange of standard width 70 mm, for installing on the roof structure,
- skylight base adapted for installing thermal insulation of min. thickness 50 mm,
- skylight structure made of aluminum profiles of shape ensuring water run-off,
- multi-chamber polycarbonate skylight glazing available in various thicknesses and colors.

6.5.2. igloo skylight design

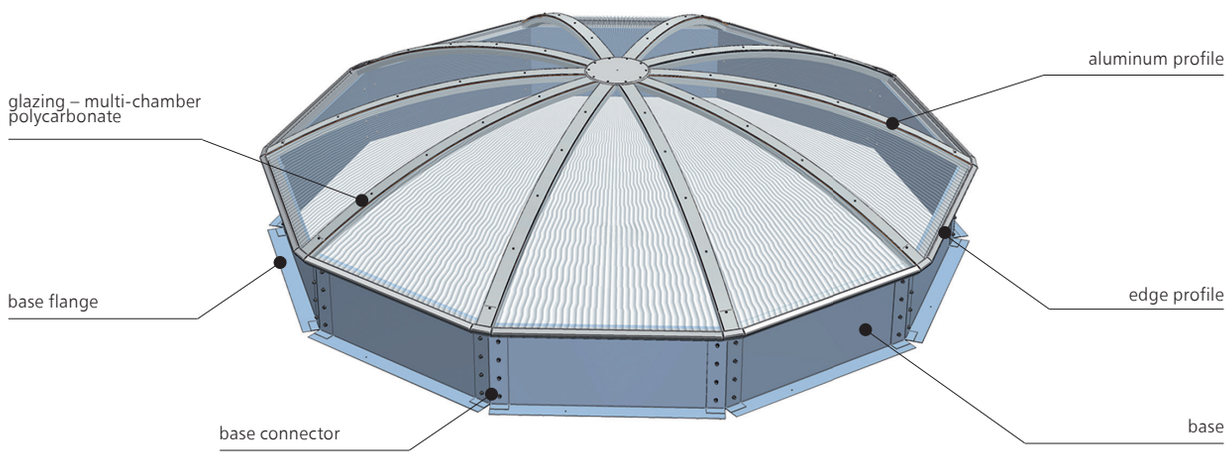


Fig. 95 – mcr PROLIGHT igloo skylight design

6.5.3. technical drawings of igloo skylight

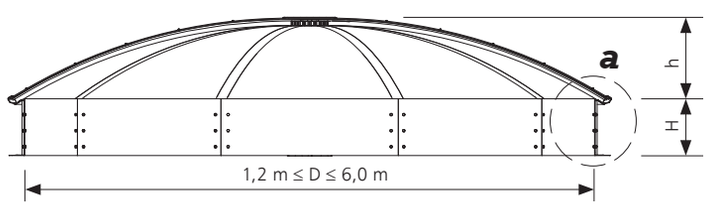
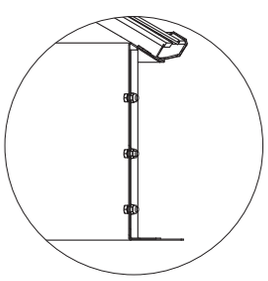


*Fig. 96 – Cross section **A-A** of mcr PROLIGHT igloo skylight*



*Detail **a***

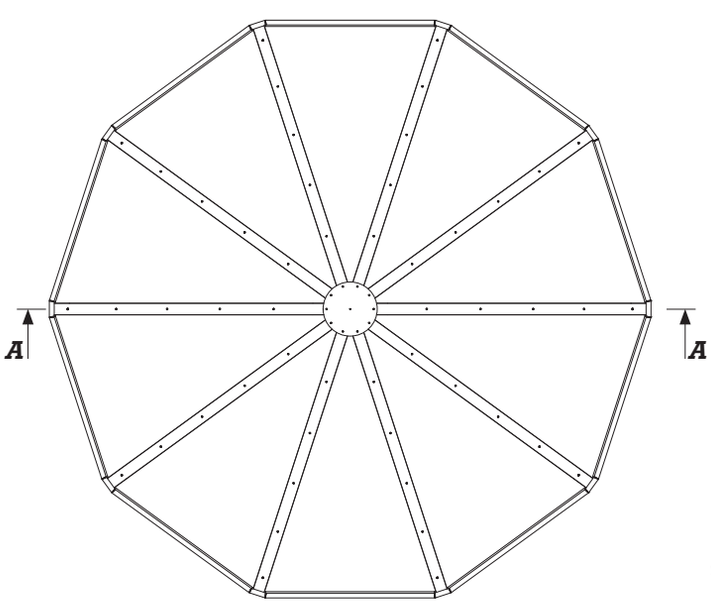


Fig. 97 – Top view of mcr PROLIGHT igloo skylight

D – skylight diameter [m]

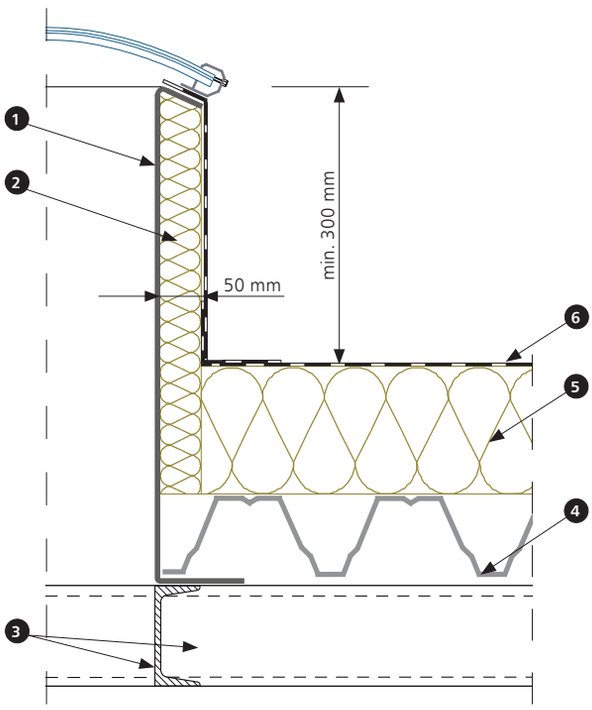
H – skylight base height [mm]

h – skylight height [mm], dependent on igloo radius and skylight diameter [mm]

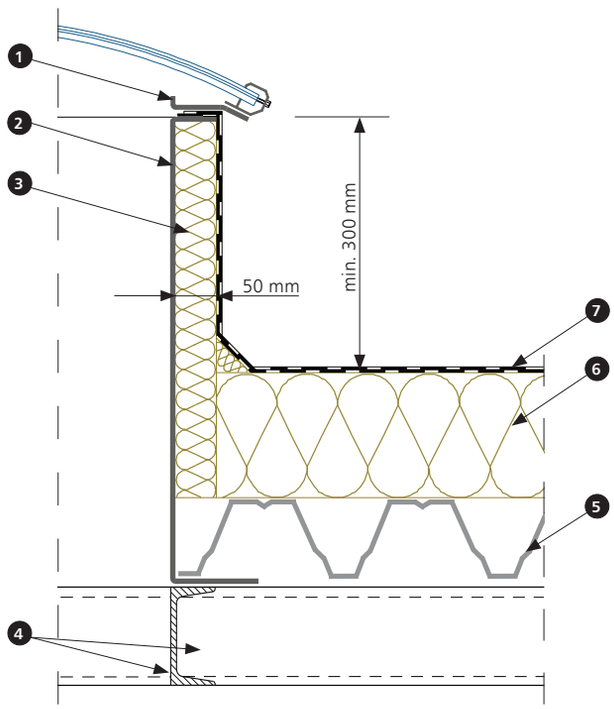
R – igloo radius, dependent on glazing thickness [mm]

7. installation of continuous rooflight bases

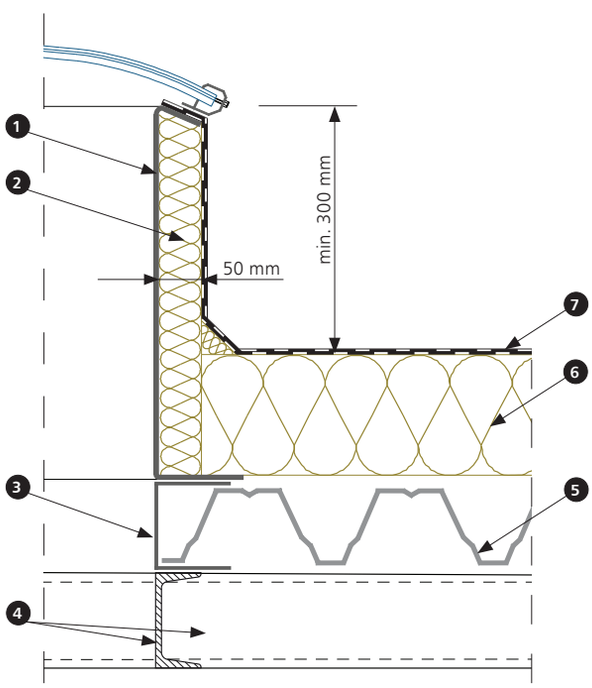
7.1. installation of continuous rooflight bases on steel structure



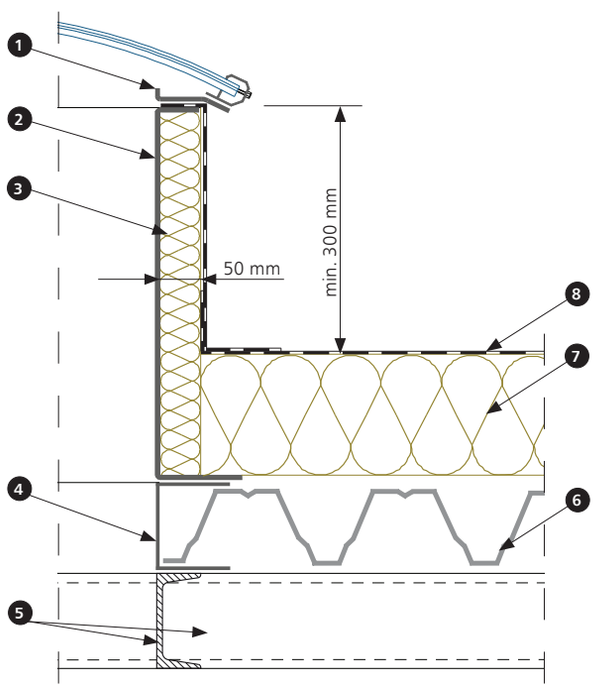
1 – continuous rooflight standard base
2 – thermal insulation of base
3 – supporting steel profile
4 – trapezoidal metal sheet
5 – thermal insulation of roof
6 – PVC membrane



1 – continuous rooflight standard base
2 – thermal insulation of base
3 – additional flashing
4 – supporting steel profile
5 – trapezoidal metal sheet
6 – thermal insulation of roof
7 – roofing paper

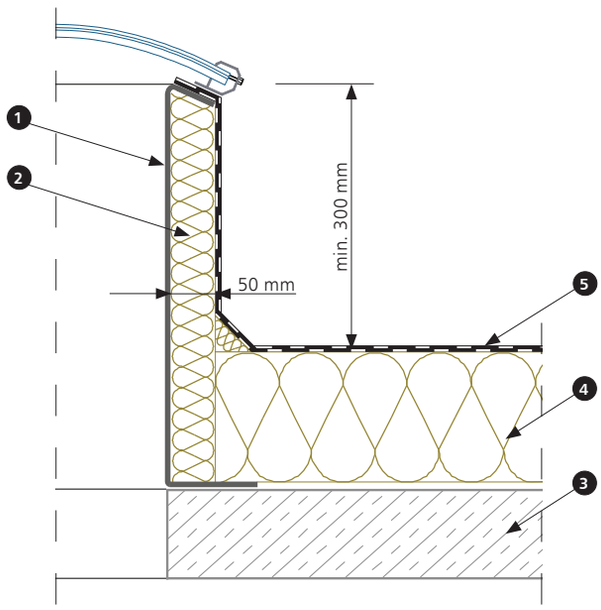


1 – continuous rooflight overlay base
2 – continuous rooflight standard base
3 – thermal insulation of base
4 – supporting steel profile
5 – trapezoidal metal sheet
6 – thermal insulation of roof
7 – roofing paper

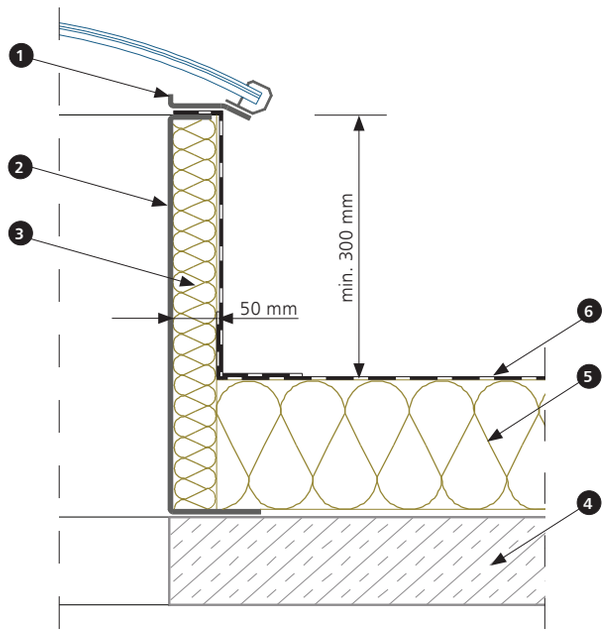


1 – continuous rooflight overlay base
2 – continuous rooflight standard base
3 – thermal insulation of base
4 – additional flashing
5 – supporting steel profile
6 – trapezoidal metal sheet
7 – thermal insulation of roof
8 – PVC membrane

7.2. installation of continuous rooflight bases on reinforced concrete structure

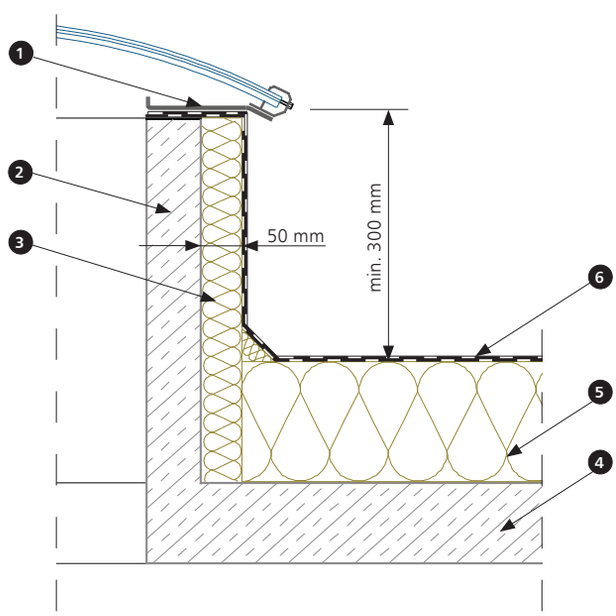


1 – continuous rooflight standard base
2 – thermal insulation of base
3 – ceiling, e.g. reinforced concrete slab
4 – thermal insulation of roof
5 – roofing paper



1 – continuous rooflight overlay base
2 – continuous rooflight standard base
3 – thermal insulation of base
4 – ceiling, e.g. reinforced concrete slab
5 – thermal insulation of roof
6 – PVC membrane

7.3. installation of continuous rooflight standard bases on reinforced concrete, steel or wooden plinth

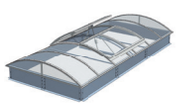
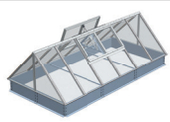
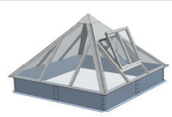
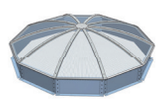
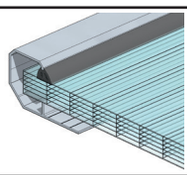
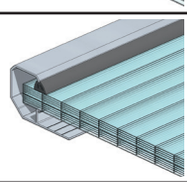
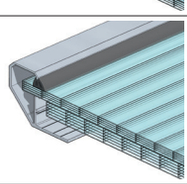
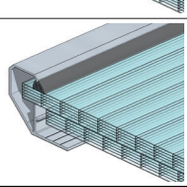
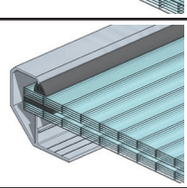
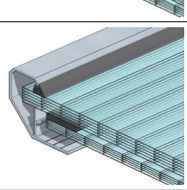
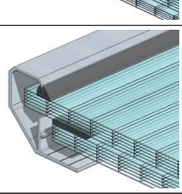


1 – continuous rooflight overlay base
2 – plinth (concrete, steel or wooden)
3 – thermal insulation of plinth
4 – ceiling, e.g. reinforced concrete slab
5 – thermal insulation of roof
6 – roofing paper

8. CONTINUOUS ROOFLIGHT GLAZING

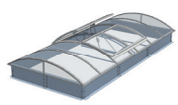
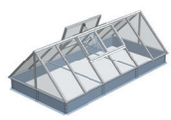
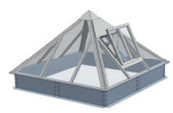
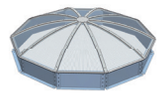
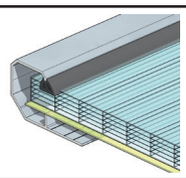
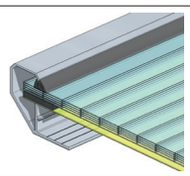
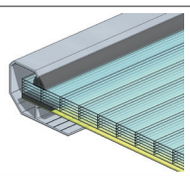
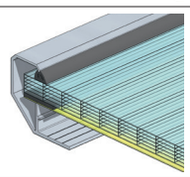
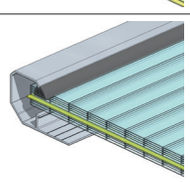
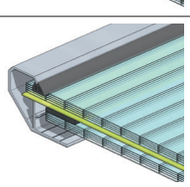
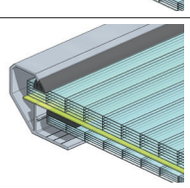
A wide range of glazing options is available for mcr PROLIGHT continuous rooflights.
Choosing the right glazing will contriubute:

- sunlight intensity,
- thermal insulation of building, and
- operating safety.

Glazing type			Type			
			Arch shaped rooflight	Triangular shaped rooflight	Pyramidal shaped rooflight	Dome rooflight
						
Single	PCA		●	●	●	●
Multiple(*)	PCA10 + PCA10		●	-	-	-
	PCA10 + PCA16		●	-	-	-
	PCA16 + PCA16		●	-	-	-
Multiple with air gap (PP)(*)	PCA10 + PP + PCA10		●	-	-	-
	PCA16 + PP + PCA10		●	-	-	-
	PCA16 + PP + PCA16		●	-	-	-

LEGEND:
PCA - multi-chamber polycarbonate panel
PCA10 / PCA16 / PCA20 - multi-chamber polycarbonate panel of 10/16/20 mm thickness
PP - air gap
NRO - NRO polyester panel, BROOF(t1) glazing
(*) dimensional range for skylight specified to 4.0 m

8. CONTINUOUS ROOFLIGHT GLAZING

	Glazing type		Type: Arch shaped rooflight	Triangular shaped rooflight	Pyramidal shaped rooflight	Dome rooflight
						
Classification $B_{ROOF}(t1)(*)$	PCA + NRO		●	●	●	–
	PCA10 + PP + NRO		●	–	–	–
	PCA16 + PP + NRO		●	–	–	–
	PCA20 + PP + NRO		●	–	–	–
	PCA10+NRO+PCA10(**)		●	–	–	–
	PCA10+NRO+PP+PCA10		●	–	–	–
	PCA16+NRO+PP+PCA10		●	–	–	–

LEGEND:
PCA- multi-chamber polycarbonate panel
PCA10 / PCA16 / PCA20 - multi-chamber polycarbonate panel of 10/16/20 mm thickness
PP - air gap
NRO - NRO polyester panel, $B_{ROOF}(t1)$ glazing
(*) dimensional range for skylight specified to 4.0 m
(**) dimensional range for skylight specified to 3.5 m

8.1. single glazing

8.1.1. multi-chamber polycarbonate panel (PCA)

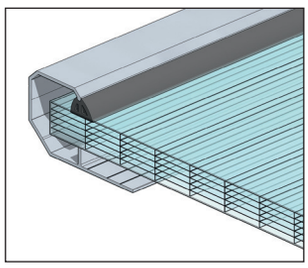


Fig. 98 – Skylight glazing – multi-chamber polycarbonate panel (PCA)

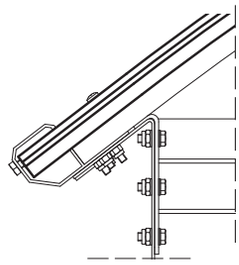


Fig. 99 – Skylight section; glazing: single multi-chamber polycarbonate panel

SINGLE PANEL PARAMETERS (PCA)	PCA 10 mm		PCA 16 mm	
	CLEAR	OPAL	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	2,2÷2,9 W/m²K		1,77÷2,0 W/m²K	
LIGHT TRANSMISION L_t	64÷65 %	44÷66 %	54÷64 %	45÷47 %
ACOUSTIC INSULATION R_W	18÷19 dB		18÷19 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0		B-s1,d0/ B-s2,d0	

SINGLE PANEL PARAMETERS (PCA)	PCA 20 mm		PCA 25 mm	
	CLEAR	OPAL	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,59÷1,8 W/m²K		1,4÷1,6 W/m²K	
LIGHT TRANSMISION L_t	53÷62 %	45÷47 %	51 %	44 %
ACOUSTIC INSULATION R_W	21 dB		22 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0/B-s2,d0		B-s2,d0	

8.2. multi-layer glazing

8.2.1. two multi-chamber polycarbonate 10 mm panels (PCA10 + PCA10)

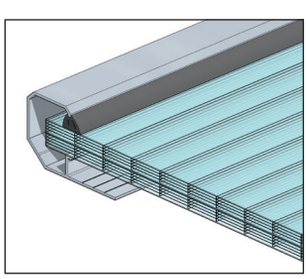


Fig. 100 – Skylight glazing – two multi-chamber polycarbonate panels (PCA10 + PCA10)

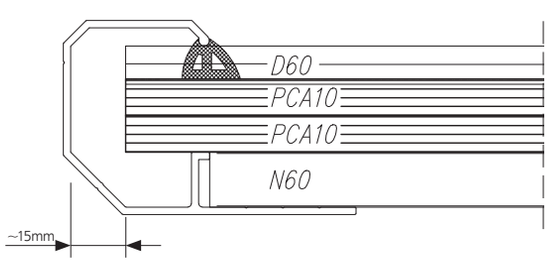


Fig. 101 – Section of skylight of width 1.2÷3.5 m; supporting profile (N) and pressing profile (D) of width 60 mm

PANEL SET PARAMETERS (PCA10 + PCA10)	PCA 10mm + PCA 10 mm	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,3÷1,8 W/m²K	
LIGHT TRANSMISION L_t	53÷77%	19÷58%
ACOUSTIC INSULATION R_W	min. 19 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0	

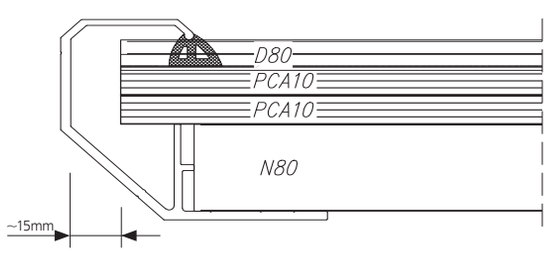


Fig. 102 – Section of skylight of width 3.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 80 mm

8.2.2. two multi-chamber polycarbonate 10 mm and 16 mm panels (PCA10 + PCA16)

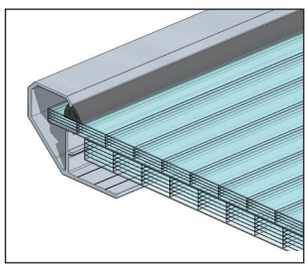


Fig. 103 – Skylight glazing – two multi-chamber polycarbonate panels (PCA10 + PCA16)

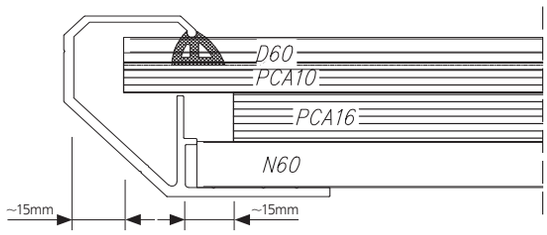


Fig. 104 – Section of skylight of width 1.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 60 mm

PANEL SET PARAMETERS (PCA10 + PCA16)	PCA 10mm + PCA 16 mm	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,1÷1,4 W/m²K	
LIGHT TRANSMISION L_t	39÷64%	13÷54%
ACOUSTIC INSULATION R_w	min. 18 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0/B-s2,d0	

8.2.3. two multi-chamber polycarbonate 16mm panels (PCA16+PCA16)

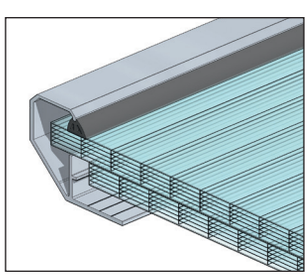


Fig. 105 – Skylight glazing – two multi-chamber polycarbonate panels (PCA16 + PCA16)

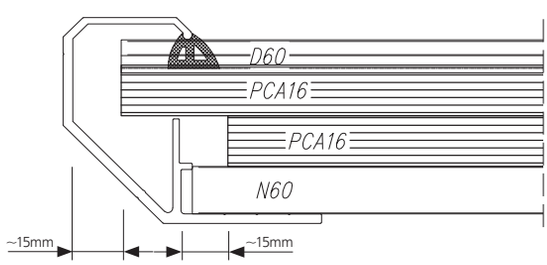


Fig. 106 – Section of skylight of width 1.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 60 mm

PANEL SET PARAMETERS (PCA16 + PCA16)	PCA 16mm + PCA 16 mm	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,0÷1,1 W/m²K	
LIGHT TRANSMISION L_t	29%÷47%	9%÷29%
ACOUSTIC INSULATION R_w	min. 18 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0/B-s2,d0	

8.2.4. two multi-chamber polycarbonate 10 mm panels with air gap (PCA10 + PP + PCA10)

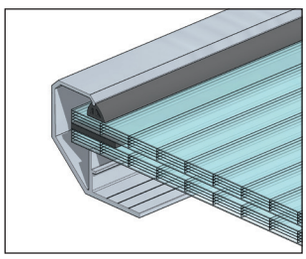


Fig. 107 – Skylight glazing – two multi-chamber polycarbonate panels (PCA10 + PCA10) with air gap between (PP)

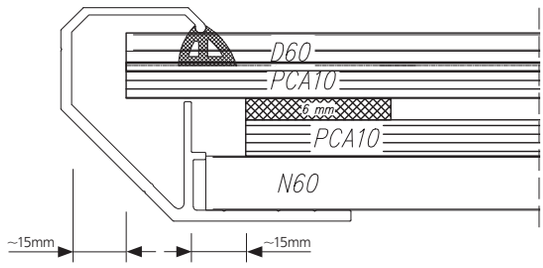


Fig. 108 – Section of skylight of width 1.2÷3.5 m; supporting profile (N) and pressing profile (D) of width 60 mm

PANEL SET PARAMETERS (PCA10 + PP + PCA10)	PCA 10mm + PP + PCA 10 mm	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,2÷1,3 W/m²K	
LIGHT TRANSMISION L_t	53÷77%	19÷58%
ACOUSTIC INSULATION R_W	min. 18 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0	

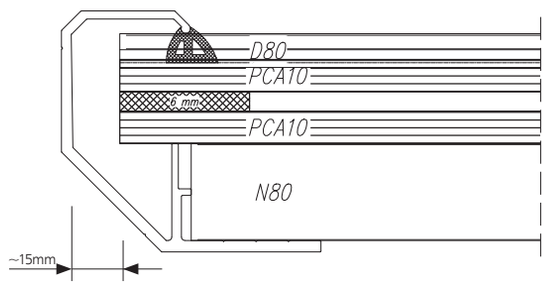


Fig. 109 – Section of skylight of width 3.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 80 mm

8.2.5. two multi-chamber polycarbonate 16 mm and 10 mm panels with air gap (PCA16 + PP + PCA10)

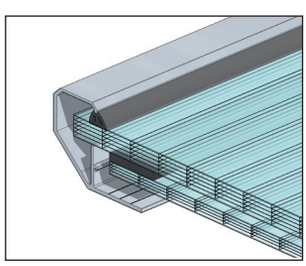


Fig. 110 – Skylight glazing – two multi-chamber polycarbonate panels (PCA16 + PCA10) with air gap between (PP)

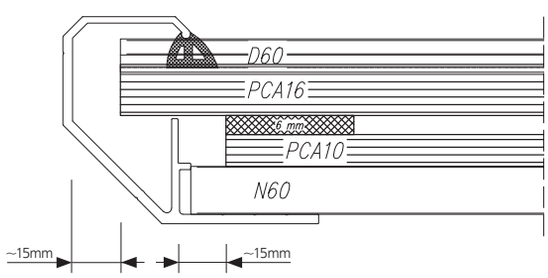


Fig. 111 – Section of skylight of width 1.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 60 mm

PANEL SET PARAMETERS (PCA16 + PP + PCA10)	PCA 16mm + PP + PCA 10 mm	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,0÷1,1 W/m²K	
LIGHT TRANSMISION L_t	39÷64%	13÷54%
ACOUSTIC INSULATION R_W	min. 18 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0/B-s2,d0	

8.2.6. two multi-chamber polycarbonate 16 mm panels with air gap (PCA16 + PP + PCA16)

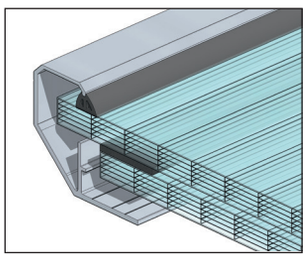


Fig. 112 – Skylight glazing – two multi-chamber polycarbonate panels (PCA16 + PCA16) with air gap between (PP)

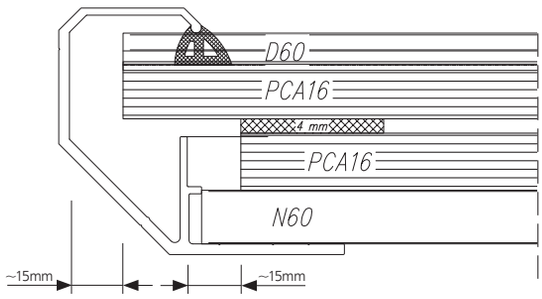


Fig. 113 – Section of skylight of width 1.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 60 mm

PANEL SET PARAMETERS (PCA16 + PP + PCA16)	PCA 16mm + PP + PCA 16 mm	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	0,9÷1,0 W/m²K	
LIGHT TRANSMISION L_t	29÷38%	20÷22%
ACOUSTIC INSULATION R_W	min. 21 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	B-s1,d0	

8.2.7. multi-chamber polycarbonate panel and NRO panel (PCA + NRO)

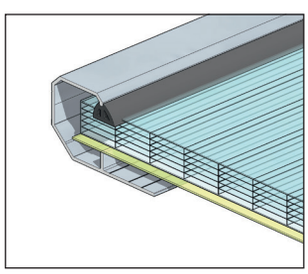


Fig. 114 – Skylight glazing – multi-chamber polycarbonate panel (PCA), NRO panel

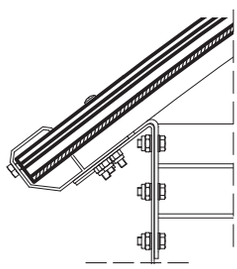


Fig. 115 – Skylight section; glazing - single multi-chamber polycarbonate panel and NRO panel

PANEL SET PARAMETERS (PCA) I PŁYTY NRO	PCA 10 mm + NRO		PCA 16 mm + NRO	
	CLEAR	OPAL	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	2,2÷2,9 W/m²K		1,77÷2,0 W/m²K	
LIGHT TRANSMISION L_t	64÷65 %	44÷66 %	54÷64 %	45÷47 %
ACOUSTIC INSULATION R_W	18÷19 dB		18÷19 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	$B_{ROOF}(t1)$		$B_{ROOF}(t1)$	

PANEL SET PARAMETERS (PCA)	PCA 20 mm + NRO		PCA 25 mm + NRO	
	CLEAR	OPAL	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,59÷1,8 W/m²K		1,4÷1,6 W/m²K	
LIGHT TRANSMISION L_t	53÷62 %	45÷47 %	51 %	44 %
ACOUSTIC INSULATION R_W	21 dB		22 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	$B_{ROOF}(t1)$		$B_{ROOF}(t1)$	

8.2.8. 10 mm multi-chamber polycarbonate panel, air gap and NRO panel (PCA10 + PP + NRO)

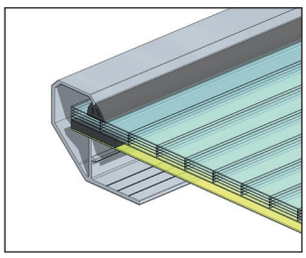


Fig. 116 – Skylight glazing: multi-chamber polycarbonate panel (PCA10), NRO panel with air gap between (PP)

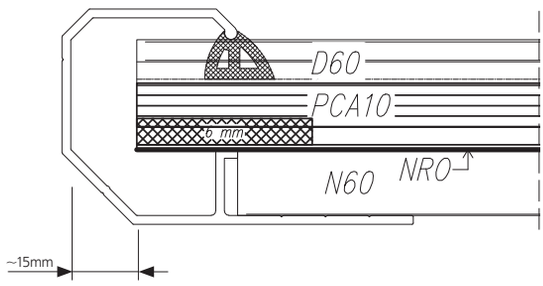


Fig. 117 – Section of skylight of width 1.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 60 mm

PANEL SET PARAMETERS (PCA10 + PP + NRO)	PCA 10 mm + PP + NRO	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,8÷2,0 W/m²K	
LIGHT TRANSMISION L_t	13÷24%	06÷18%
ACOUSTIC INSULATION R_W	min. 19 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	$B_{ROOF}(t1)$	

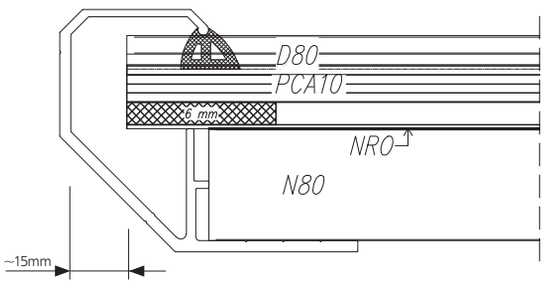


Fig. 118 – Section of skylight of width 1.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 80 mm

8.2.9. 16 mm multi-chamber polycarbonate panel, air gap and NRO panel (PCA16 + PP + NRO)

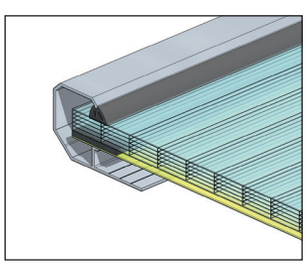


Fig. 119 – Skylight glazing: multi-chamber polycarbonate panel (PCA16), NRO panel with air gap between (PP)

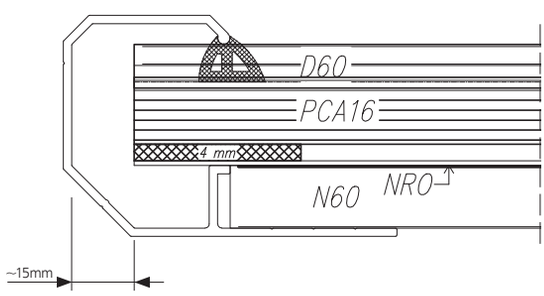


Fig. 120 – Section of skylight of width 1.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 60 mm

PANEL SET PARAMETERS (PCA16 + PP + NRO)	PCA 16 mm + PP + NRO	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,5÷1,6 W/m²K	
LIGHT TRANSMISION L_t	11÷21%	06÷16%
ACOUSTIC INSULATION R_W	min. 19 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	$B_{ROOF}(t1)$	

8.2.10. 20 mm multi-chamber polycarbonate panel, air gap and NRO panel (PCA20 + PP + NRO)

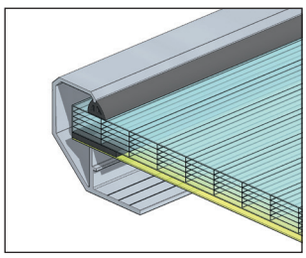


Fig. 121 – Skylight glazing: multi-chamber polycarbonate panel (PCA20), NRO panel with air gap between (PP)

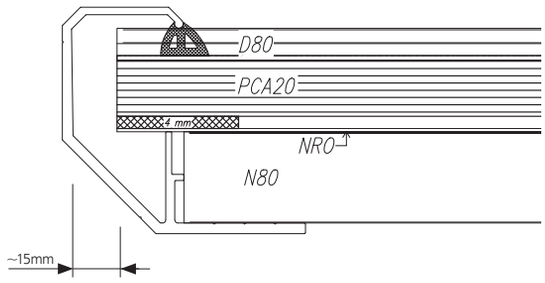


Fig. 122 – Section of skylight of width 1.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 80 mm

PANEL SET PARAMETERS (PCA20 + PP + NRO)	PCA 20 mm + PP + NRO	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,3÷1,4 W/m²K	
LIGHT TRANSMISION L_t	11÷19%	5÷16%
ACOUSTIC INSULATION R_W	min. 19 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	$B_{ROOF}(t1)$	

8.2.11. two multi-chamber polycarbonate 10 mm panels and NRO panel (PCA10 + NRO + PCA10)

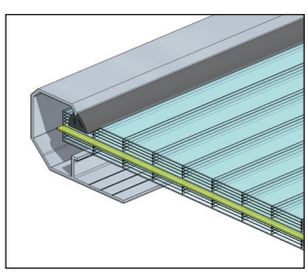


Fig. 123 – Skylight glazing: two multi-chamber polycarbonate panels (PCA10+PCA10) with NRO panel between

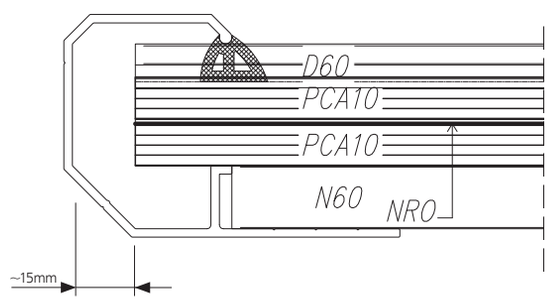


Fig. 124 – Section of skylight of width 1.2÷3.5 m; supporting profile (N) and pressing profile (D) of width 60 mm

PANEL SET PARAMETERS (PCA10 + NRO + PCA10)	PCA 10 mm + NRO + PCA10	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,3÷1,5 W/m²K	
LIGHT TRANSMISION L_t	10÷22%	4÷17%
ACOUSTIC INSULATION R_W	min. 19 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	$B_{ROOF}(t1)$	

8.2.12. two multi-chamber polycarbonate 10 mm panels with NRO panel and air gap (PCA10 + NRO + PP + PCA10)

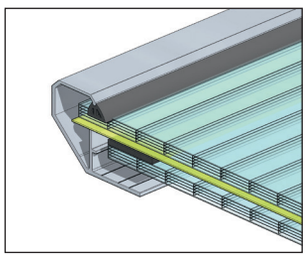


Fig. 125 – Skylight glazing: two multi-chamber polycarbonate panels (PCA-10+PCA10) with air gap (PP) and NRO panel between

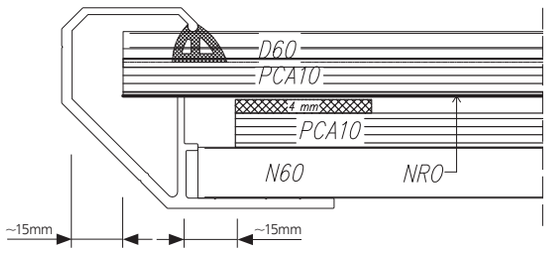


Fig. 126 – Section of skylight of width 1.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 60 mm

PANEL SET PARAMETERS (PCA10 + NRO + PP + PCA10)	PCA 10 mm + NRO + PP + PCA10	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,2÷1,3 W/m²K	
LIGHT TRANSMISION L_t	10÷22%	4÷17%
ACOUSTIC INSULATION R_W	min. 18 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	$B_{ROOF}(t1)$	

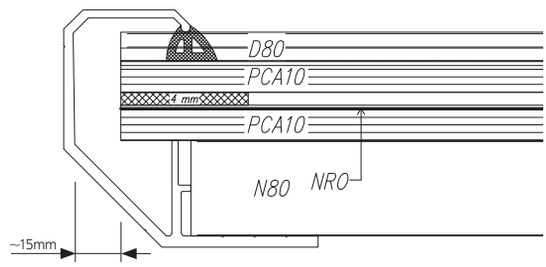


Fig. 114 – Skylight glazing – multi-chamber polycarbonate panel (PCA), NRO panel

8.2.13. two multi-chamber polycarbonate 16 mm and 10 mm panels with NRO panel and air gap (PCA16 + NRO + PP + PCA10)

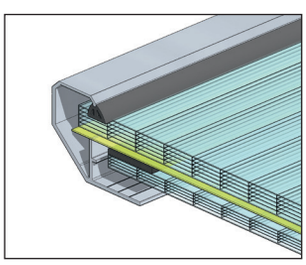


Fig. 127 – Skylight glazing: two multi-chamber polycarbonate panels (PCA-16+PCA10) with NRO panel and air gap (PP) between

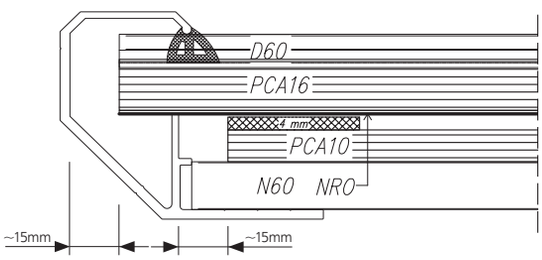
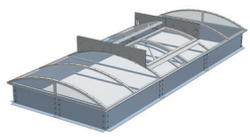
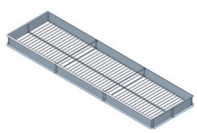
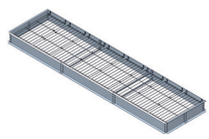
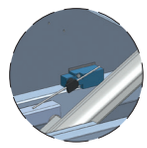


Fig. 128 – Section of skylight of width 1.5÷4.0 m; supporting profile (N) and pressing profile (D) of width 60 mm

PANEL SET PARAMETERS (PCA16 + NRO + PP + PCA10)	PCA 16 mm + NRO + PP + PCA10	
	CLEAR	OPAL
HEAT TRANSFER COEFFICIENT U	1,0÷1,1 W/m²K	
LIGHT TRANSMISION L_t	8÷19%	2÷16%
ACOUSTIC INSULATION R_W	min. 18 dB	
FIRE PERFORMANCE (AS PER EN 13501-1)	$B_{ROOF}(t1)$	

9. additional equipment for continuous rooflights

Equipment / Product type	Wind deflectors	Anti-burglar grid	Safety net	Limit switch
				
Smoke vents in continuous rooflights	●	●	●	●
Daily ventilation vents in continuous rooflights	●	●	●	●
Fixed continuous rooflights (without vents)	-	● (*)	● (**)	-

(*) Anti-burglar grid available only for selected dimensions of continuous rooflights

(**) Safety net available only for selected dimensions of continuous rooflights

9.1. wind deflectors

- a smoke vent element increasing its active area,
- wind deflectors are used in:
  - vents installed in arch-shaped rooflight as optional accessory,
- they consists of wind shield fixed to the base with mounting consoles,
- wind deflectors dimensions range: 100 ÷ 300 mm (depending on type and width of vent integrated in rooflight),
- wind shields made of aluminum sheet; mounting consoles made of galvanized steel sheet,
- wind shields delivered as separate elements to be assembled on site (with previously installed mounting consoles),
- non-standard options:
  - powder coating of wind deflectors

Wind deflectors are installed in smoke vents in pairs:
- at corners of the vent base, opposite to the hinges side (PROLIGHT C, E, NG-A type vents)
- along side walls of the base (mcr PROLIGHT DVP, DVPS type)

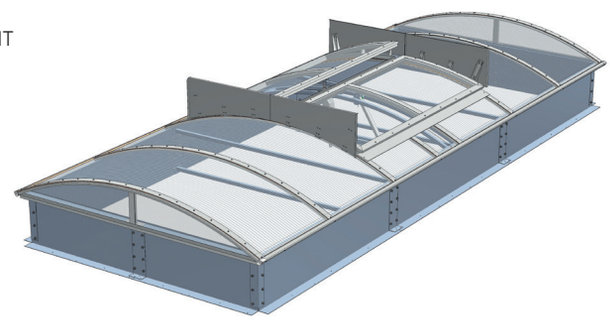


Fig. 130 – Wind deflectors in smoke vent installed in continuous rooflight

9.2 anti-burglar grid

- application in vents within the full dimensional range in continuous rooflights of span up to 6 m,
- prevents from access of unauthorized persons, and from falling inside,
- conforms to class 2 anti-burglar resistance as per ENV 1627:2009,
- resistant to impact of large, soft body, up to maximum energy of 1200 J - corresponds to SB1200 class as per EN 1873:2009 standard,
- made of 21 mm galvanized steel rods fixed in steel sections; the pipes rotate, preventing sawing off,
- rods additionally stringed with cross-bar,
- grid installed in the device base,
- maximum distance between rods of the grid - 180 mm,
- powder painted or galvanized grid.

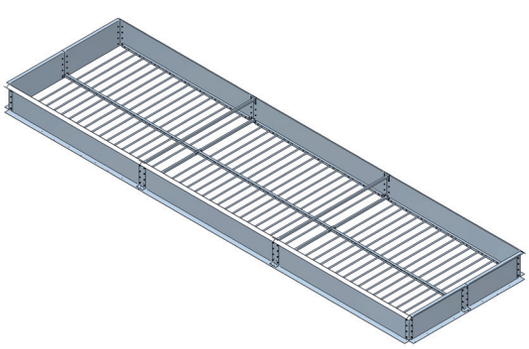


Fig. 136 – Anti-burglar grid installed in continuous rooflight base

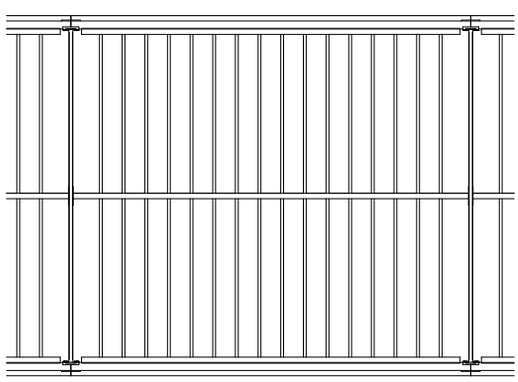


Fig. 137 – Top view of anti-burglar of installed in continuous rooflight

9.3. safety net

- application in vents within the full dimensional range in continuous rooflights of span up to 3.6 m,
- protects from falling through the vent,
- resistant to impact of large, soft body, up to maximum energy of 1200 J - corresponds to SB1200 class as per EN 1873:2009 standard,
- net installed in the device base,
- made of galvanized steel rods of 4÷8 mm diameter, with 100x100 mm to 150x650 mm mesh,
- net non-standard options:
  - powder coating
  - openable net for mcr PROLIGHT smoke vents with roof access function
- optional safety (safeguard) net making, conformant with EN 1263-1, providing fall protection; the net is made of polypropylene ropes and installed in the vent base.

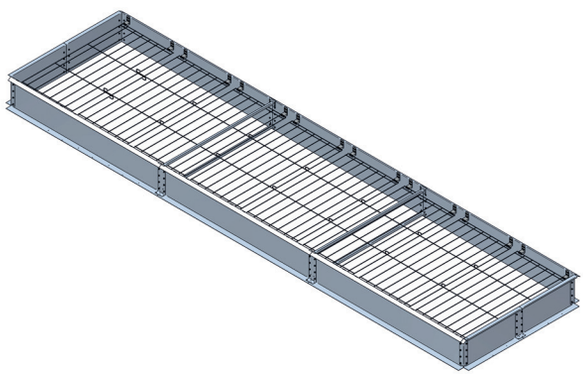


Fig. 138 – Safety net installed in continuous rooflight

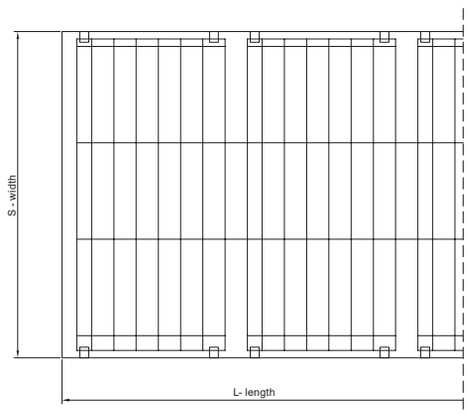


Fig. 139 – Top view of safety net installed in continuous rooflight

9.4. limit switch

- indicates the position of smoke vent or ventilation vent leaf, displaying the position status on a control panel, or gives signal to fire signalling system
- three position status indications are possible:
  - full closed position,
  - full open position,
  - any open position,
- includes 1xNO and 1xNC voltage-free contacts,
- nominal voltage range up to 250 VDC or up to 400 VAC,
- maximum current-carrying capacity of contacts 10A (resistance load), dependent on load characteristics,
- switching frequency 3 600 cycles/hour,
- operating temperature range -25°C ÷ 70°C.
- switch casing protection rating IP65

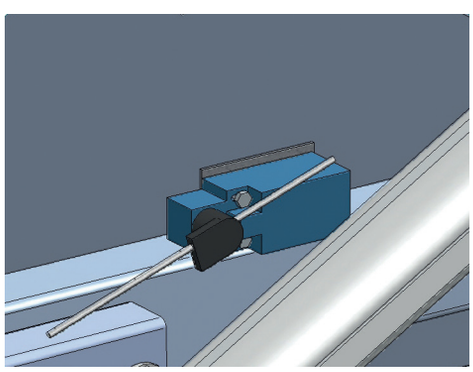


Fig. 140 – Limit switch in smoke vent installed in continuous rooflight

10. louvered smoke vents

mcr LAM smoke vents are an element of natural smoke exhaust system. Their purpose is to remove smoke, hot combustion gases and heat energy outside the building. They allow to:

- maintain emergency routes in a state of moderate smoke level, permitting effective evacuation,
- enabeling rescue operations by ensuring bottom passage of moderate smoking level,w
- reduce the risk of damaging or destroying the building structure by a sudden decrease in indoor temperature,
- limit fire losses caused by smoke and hot burning fumes

	Parameters	Roof mounted louvered vents	Façade mounted louvered vents
			
Product classification	Certificate of Conformity CE 1396-CPR-0032 *(as per EN 12101-2)*	• **Re300** – operational reliability during 300 cycles of opening and closing to smoke exhaust position (vent with E1 electric control and C1, C2 pneumatic control), • **Re1000** – operational reliability during 1000 cycles of opening and closing to smoke exhaust position (vent with C3 pneumatic control with gas spring), • **10 000** – operational reliability during 10 000 cycles of opening and closing to ventilation position (double -function vent), • **SL** – operational certainty of vents under snow load N/m2 - **SL250÷SL1300** – vents equipped with E1 electric control - **SL550÷SL2000** – vents equipped with C1, C2 pneumatic control - **SL125÷SL250** – vents equipped with C3 pneumatic control with gas spring • **WL**– operational certainty of vents under wind load - **WL1500** – for all louvered vent types - **WL3000** – vents (max. 12 blades) of length 150 cm - **WL4000** – vents (max. 12 blades) of length 100 cm • **B300** – resistance of vents to high temperature of 300°C, • **T(-25) or T(00)** – resistance of vents to low temperature of -25°C or 0°C, • **Aa** – active smoke exhaust area • **60s** – maximum vent opening time to working position	• **Re300** – operational reliability during 300 cycles of opening and closing to smoke exhaust position (vent with E1 electric control and C1, C2 pneumatic control), • **Re1000** – operational reliability during 1000 cycles of opening and closing to smoke exhaust position (vent with C3 pneumatic control with gas spring), • **Re10 000** – operational reliability during 10 000 cycles of opening and closing to ventilation position (double-function vent), • **SL** – operational certainty of vents under snow load N/m2 - **SL 0** – façade vents • **WL** – operational certainty of vents under wind load - **WL1500** – for all louvered vent types - **WL3000** – vents (max. 12 blades) of length 150 cm - **WL4000** – vents (max. 12 blades) of length 100 cm • **B300** – resistance of vents to high temperature of 300°C, • **T(-25) or T(00)** – resistance of vents to low temperature of -25°C or 0°C, • **Aa** – active smoke exhaust area **60s** – maximum vent opening time to working positionworking position
Control	pneumatic	•	-
	electric 24V-- *(ventilation)*	•	•
Glazing	polycarbonate panel (PCA 16 mm)	•	•
	polycarbonate panel (PCA 25 mm)	•	•
	non-insulated aluminum profile (SO)(*)	•	•
	insulated aluminum profiles (SO+XPS)(**)	•	•

(*) Opaque glazing – two layers of aluminum sheet with air gap between
(**) Opaque glazing – two layers of aluminum sheet with XPS panel (extruded polystyrene) between

10.1 mcr LAM louvered smoke vents

10.1.1. technical description of standard

- classification as per Certificate of Conformity in accordance with EN 12101-2 (CE Certificate),
- base of height 150–250 mm, made of galvanized steel sheet of thickness 1.25 mm or aluminum sheet of th. 2 mm (grade AlMg3),
- bottom part of the base has a circumferential flange of width 100 mm, through which the base is fitted to the roof structure,
- upper part of base has shape enabling water runoff,
- thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m2K
- leaf glazing: PCA 16 mm or 25 mm multi-chamber polycarbonate panel, non-insulated aluminum sheets (opaque glazing - SO), aluminum sheets insulated with XPS panel of th. 20 mm (SO+XPS opaque glazing),
- vent blades opening angle 90°,
- smoke exhaust control: pneumatic, electric 24V-

10.1.2. smoke vent design

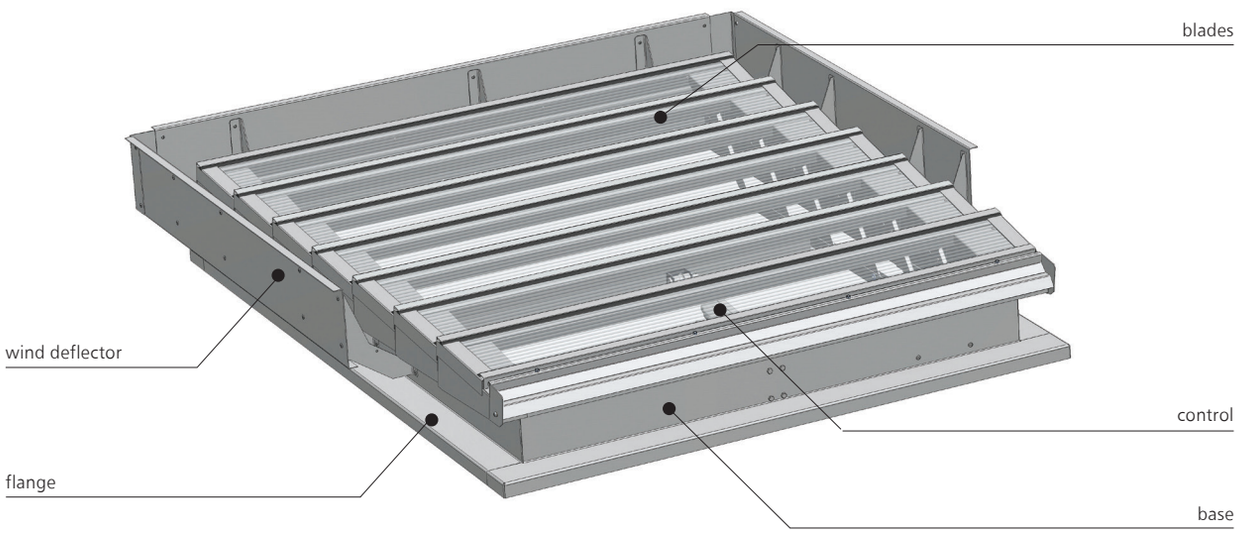


Fig. 141 – Design of mcr LAM louvered smoke vent

10.1.3. non-standard options

- vent elements (base, wind deflectors) painted to any RAL color,
- metal blade elements painted,
- non-insulated base (H),
- optional production and delivery of bottom base (plinth) of maximum height 700 mm, made of galvanized steel sheet of thickness 1.25 mm, or aluminum sheet of th. 2 mm (non-insulated element),
- custom blade lengths – every 50 mm
- wide selection of base flange types (for upper and lower [plinth] base) and its width (min. 70 mm),
- limit switch – open/closed indication,
- possible connection of louvered vent with a continuous rooflights through special flange.

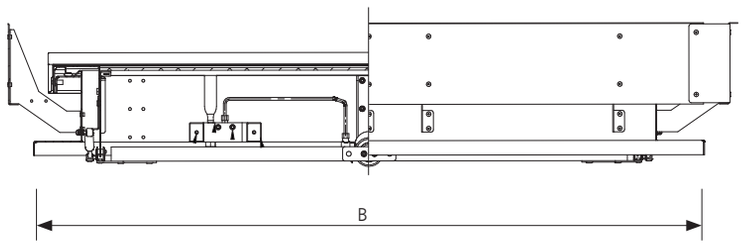


*Fig. 142 – Section **B-B** of mcr LAM louvered smoke vent in closed position (roof installation)*

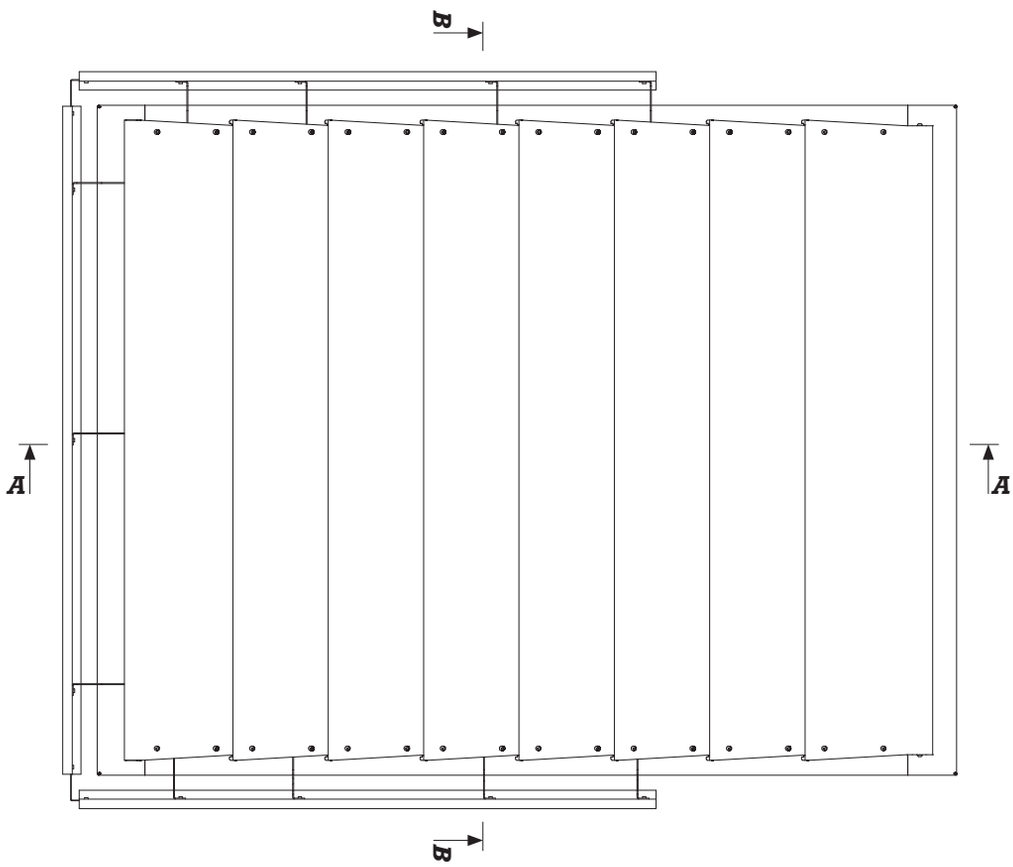


Fig. 143 – Top view of mcr LAM louvered smoke vent in closed position

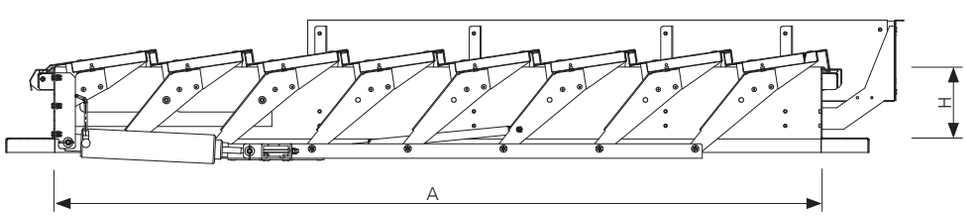


*Fig. 144 – Section **A-A** of mcr LAM louvered smoke vent in closed position (roof installation)*

A – width of louvered smoke vent [mm]
B – length of louvered smoke vent [mm]
H – louvered vent base height [mm]

10.2. mcr LAM façade mounted louvered smoke vents

10.2.1. technical description of standard

- classification as per Certificate of Conformity in accordance with EN 12101-2 (CE Certificate),
- base of height 150-250mm, made of galvanized steel sheet of thickness 1.25 mm, or of aluminum sheet of th. 2 mm (grade AlMg3),
- thermal insulation of base made of mineral wool of thickness 20 mm; heat transfer coefficient U=1.41 W/m2K,
- leaf glazing: PCA 16 mm multi-chamber polycarbonate panel, non-insulated aluminum sheets (opaque glazing - SO), aluminum sheets insulated with XPS panel of th. 20 mm (SO+XPS opaque glazing),
- vent blades opening angle 90°,
- control: electric 24V-, pneumatic.

10.2.2. façade mounted vent design

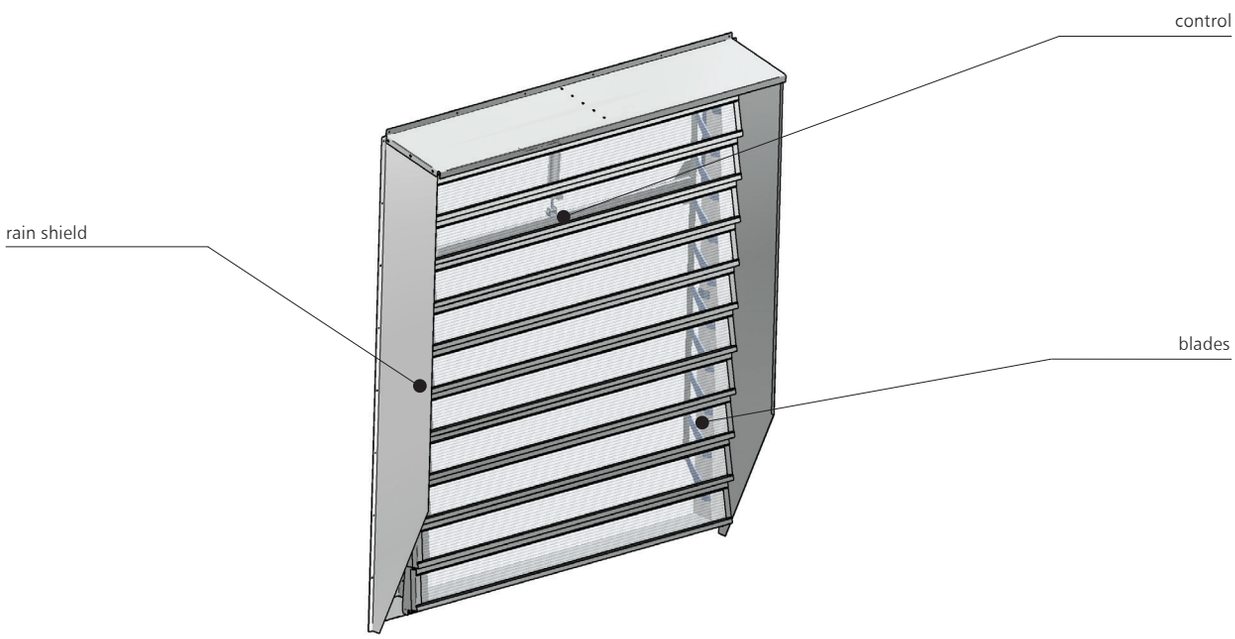


Fig. 145 – Design of mcr LAM louvered smoke vent with rain shield

10.2.3. non-standard options

- vent elements (base, rain shield, blades) painted to any RAL color,
- non-insulated base (H),
- custom blade lengths – every 50 mm,
- wide variety of flange types and its' width (min. 70 mm),
- rain shields extending vent's protection against weather conditions (optional),
- limit switch – open/closed indication

10.2.4. technical drawings

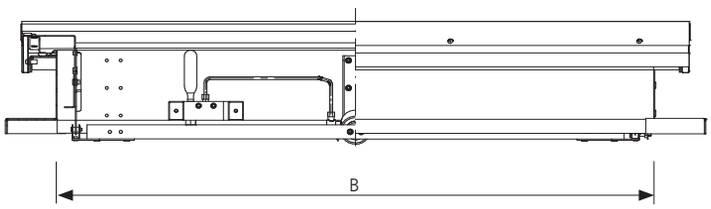


*Fig. 145 – Section **B-B** of mcr LAM louvered vent in closed position (façade installation)*

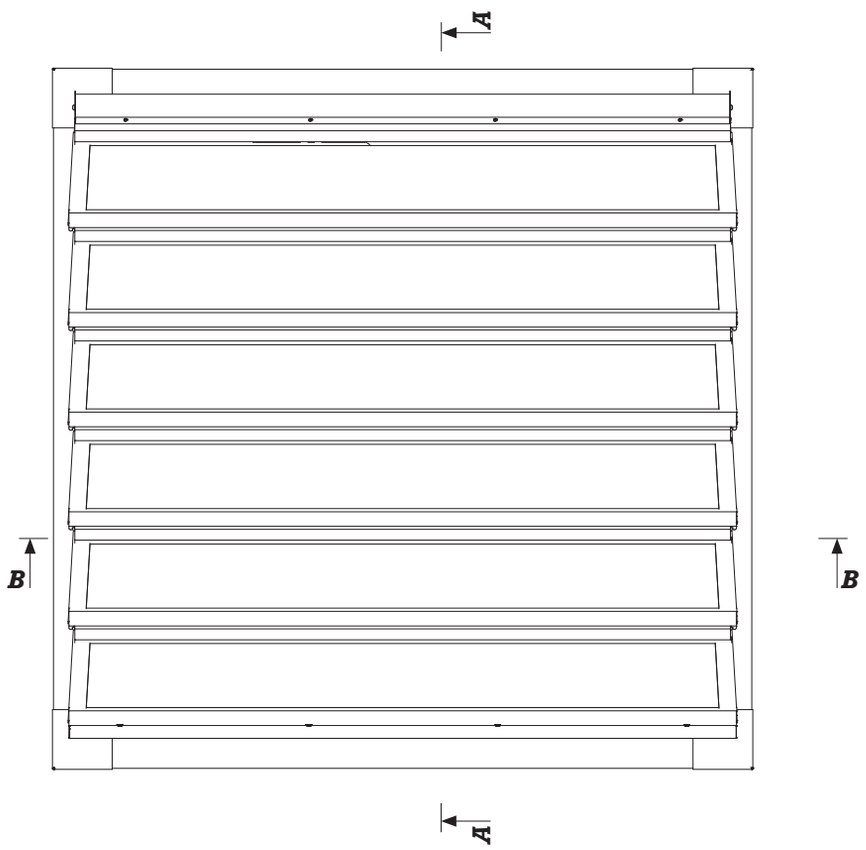


Fig. 146 – Top view of mcr LAM louvered vent in closed position (façade installation)

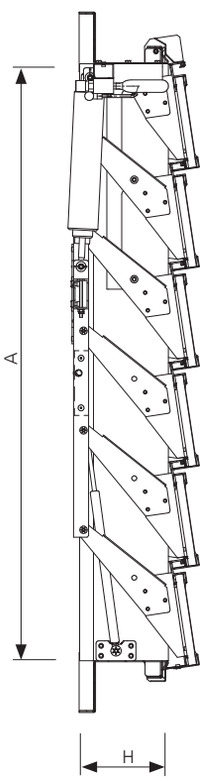


*Fig. 147 – Section **A-A** of mcr LAM louvered vent in closed position (façade installation)*

A – width of louvered smoke vent [mm]
B – length of louvered smoke vent [mm]
H – louvered vent base height [mm]

10.3. technical details

VENT TYPE	NUMBER OF BLADES	NOMINAL DIMENSIONS (width x length)	ACTIVE AREA [Aa]	ELECTRIC CONTROL - POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR							ESTIMATED WEIGHT
				SL 1300	SL 950	SL 750	SL 550	SL 250	SL 125	SL 0 (installation in façade)	MIN(*)-MAX(**)
	[pcs.]	[mm]	[m^2]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[kg]
mcr LAM 4 50	4	800 x 500	0.24	0.8	0.8	0.8	0.8	0.8	-	0.8	23 - 27
mcr LAM 4 80	4	800 x 800	0.39	1.3	1.0	0.8	0.8	0.8	-	0.8	27 - 32
mcr LAM 4 100	4	800 x 1000	0.49	1.3	1.0	0.8	0.8	0.8	-	0.8	30 - 36
mcr LAM 4 120	4	800 x 1200	0.60	2.0	1.3	1.0	0.8	0.8	-	0.8	33 - 40
mcr LAM 4 140	4	800 x 1400	0.70	2.0	1.3	1.0	0.8	0.8	-	0.8	35 - 43
mcr LAM 4 160	4	800 x 1600	0.80	2.6	1.8	1.3	1.0	0.8	-	0.8	38 - 47
mcr LAM 4 170	4	800 x 1700	0.85	2.6	1.8	1.3	1.0	0.8	-	0.8	40 - 49
mcr LAM 5 50	5	1000 x 500	0.30	1.0	0.8	0.8	0.8	0.8	-	0.8	26 - 31
mcr LAM 5 100	5	1000 x 1000	0.62	2.0	1.3	1.0	0.8	0.8	-	0.8	34 - 41
mcr LAM 5 120	5	1000 x 1200	0.75	2.0	1.3	1.3	1.0	0.8	-	0.8	37 - 46
mcr LAM 5 140	5	1000 x 1400	0.88	2.6	2.0	1.6	1.0	0.8	-	0.8	40 - 50
mcr LAM 5 160	5	1000 x 1600	1.01	2 x 1.3	2.0	1.6	1.3	0.8	-	0.8	43 - 54
mcr LAM 5 180	5	1000 x 1800	1.14	2 x 1.3	2.6	2.0	1.3	0.8	-	0.8	47 - 58
mcr LAM 5 200	5	1000 x 2000	1.27	1 x 2.0	2.6	2.0	1.3	0.8	-	0.8	50 - 63
mcr LAM 5 210	5	1000 x 2100	1.32	2 x 2	2 x 1.3	2.6	2.0	1.0	-	0.8	52 - 67
mcr LAM 6 50	6	1200 x 500	0.36	2.0	1.3	1.3	1.0	0.8	-	0.8	26 - 32
mcr LAM 6 100	6	1200 x 1000	0.75	2.0	1.3	1.3	1.0	0.8	-	0.8	38 - 47
mcr LAM 6 120	6	1200 x 1200	0.91	2.6	2.0	1.6	1.0	0.8	-	0.8	42 - 52
mcr LAM 6 140	6	1200 x 1400	1.06	2 x 1.3	2.0	2.0	1.3	0.8	-	0.8	45 - 57
mcr LAM 6 160	6	1200 x 1600	1.22	2 x 1.6	2.6	2.0	1.3	0.8	-	0.8	49 - 61
mcr LAM 6 180	6	1200 x 1800	1.37	2 x 2.0	2 x 1.3	2.0	1.6	0.8	-	0.8	53 - 66
mcr LAM 6 200	6	1200 x 2000	1.53	2 x 2.0	2 x 1.3	2.6	2.0	1.0	-	0.8	56 - 71
mcr LAM 6 220	6	1200 x 2200	1.68	-	2 x 2.0	2 x 1.3	2.6	1.0	-	0.8	60 - 76
mcr LAM 6 240	6	1200 x 2400	1.84	-	2 x 2.0	2 x 1.3	2.6	1.0	-	0.8	63 - 81
mcr LAM 6 250	6	1200 x 2500	1.92	-	2 x 2.0	2 x 1.3	2.6	1.0	-	0.8	67 - 85
mcr LAM 7 50	6	1400 x 500	0.42	2.6	2.0	1.6	1.0	0.8	-	0.8	30 - 36
mcr LAM 7 60	7	1400 x 1000	0,52	2.6	2.0	1.6	1.0	0.8	-	0.8	32 - 38
mcr LAM 7 100	7	1400 x 1000	0.88	2.6	2.0	1.6	1.0	0.8	-	0.8	42 - 52
mcr LAM 7 120	7	1400 x 1200	1.06	2 x 1.3	2.0	2.0	1.3	0.8	-	0.8	47 - 58
mcr LAM 7 140	7	1400 x 1400	1.24	2 x 2.0	2.6	2.0	1.3	0.8	-	0.8	51 - 63
mcr LAM 7 160	7	1400 x 1600	1.43	2 x 2.0	2 x 1.3	2.6	2.0	0.8	-	0.8	54 - 68
mcr LAM 7 180	7	1400 x 1800	1.61	2 x 2.0	2 x 1.3	2 x 1.3	2.0	1.0	-	0.8	58 - 73
mcr LAM 7 200	7	1400 x 2000	1.79	2 x 2.6	2 x 2.0	2 x 1.3	2.0	1.0	-	0.8	61 - 78
mcr LAM 7 220	7	1400 x 2200	1.97	-	2 x 2.0	2 x 2.0	2 x 1.3	1.3	-	0.8	65 - 83
mcr LAM 7 240	7	1400 x 2400	2.15	-	2 x 2.0	2 x 2.0	2 x 1.3	1.3	-	0.8	69 - 89
mcr LAM 7 250	7	1400 x 2500	2.24	-	2 x 2.0	2 x 2.0	2 x 1.3	1.3	-	0.8	72 - 93
mcr LAM 8 55	8	1600 x 550	0.53	2 x 1.3	2.0	1.6	1.3	0.8	-	0.8	32 - 38
mcr LAM 8 70	8	1600 x 700	0.69	2 x 1.3	2.0	1.6	1.3	0.8	-	0.8	40 - 50
mcr LAM 8 100	8	1600 x 1000	1.01	2 x 1.3	2.0	1.6	1.3	0.8	-	0.8	46 - 57
mcr LAM 8 120	8	1600 x 1200	1.22	2 x 1.6	2.6	2.0	1.3	0.8	-	0.8	52 - 65
mcr LAM 8 140	8	1600 x 1400	1.43	2 x 2.0	2 x 1.3	2.6	2.0	0.8	-	0.8	58 - 72
mcr LAM 8 160	8	1600 x 1600	1.63	2 x 2.0	2 x 1.6	2 x 1.3	2.0	1.0	-	0.8	63 - 79
mcr LAM 8 180	8	1600 x 1800	1.84	2 x 2.6	2 x 2.0	2 x 1.3	2.0	1.0	-	0.8	69 - 86
mcr LAM 8 200	8	1600 x 2000	2.05	-	2 x 2.0	2 x 1.6	2.6	1.3	-	0.8	74 - 94

10.3. technical details

VENT TYPE	NUMBER OF BLADES	NOMINAL DIMENSIONS (width x length)	ACTIVE AREA [Aa]	ELECTRIC CONTROL - POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR							ESTIMATED WEIGHT
				SL 1300	SL 950	SL 750	SL 550	SL 250	SL 125	SL 0 (instal-lation in façade)	MIN(*)-MAX(**)
	[pcs.]	[mm]	[m^2]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[kg]
mcr LAM 8 220	8	1600 x 2200	2.26	-	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	0.8	80 - 101
mcr LAM 8 240	8	1600 x 2400	2.47	-	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	0.8	86 - 108
mcr LAM 8 250	8	1600 x 2500	2.57	-	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	0.8	91 - 114
mcr LAM 9 60	9	1800 x 600	0,67	-	2,0	1,3	1,3	0,8	-	0,8	42 - 52
mcr LAM 9 80	9	1800 x 800	0,9	-	2,0	1,3	1,3	0,8	-	0,8	45 - 55
mcr LAM 9 100	9	1800 x 1000	1.14	2 x 1.6	2.6	2.0	1.3	0.8	-	0.8	51 - 63
mcr LAM 9 120	9	1800 x 1200	1.37	2 x 2.0	2 x 1.3	2.6	1.6	0.8	-	0.8	57 - 71
mcr LAM 9 140	9	1800 x 1400	1.61	2 x 2.0	2 x 1.6	2 x 1.3	2.0	1.0	-	0.8	63 - 79
mcr LAM 9 160	9	1800 x 1600	1.84	2 x 2.6	2 x 2.0	2 x 1.3	2.0	1.0	-	0.8	69 - 86
mcr LAM 9 180	9	1800 x 1800	2.08	-	2 x 2.0	2 x 1.6	2.6	1.3	-	0.8	75 - 94
mcr LAM 9 200	9	1800 x 2000	2.31	-	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	1.0	81 - 102
mcr LAM 9 220	9	1800 x 2200	2.55	-	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	1.0	87 - 110
mcr LAM 9 240	9	1800 x 2400	2.78	-	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	1.0	93 - 118
mcr LAM 9 250	9	1800 x 2500	2.90	-	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	1.0	99 - 125
mcr LAM 10 65	10	2000 x 650	0,8	2 x 2.0	2 x 1.3	2.0	1.3	0.8	-	0.8	52 - 64
mcr LAM 10 100	10	2000 x 1000	1.27	2 x 2.0	2 x 1.3	2.0	1.3	0.8	-	0.8	55 - 68
mcr LAM 10 120	10	2000 x 1200	1.53	2 x 2.0	2 x 1.3	2.6	2.0	1.0	-	0.8	61 - 77
mcr LAM 10 140	10	2000 x 1400	1.79	2 x 2.6	2 x 2.0	2 x 1.3	2.0	1.0	-	0.8	68 - 85
mcr LAM 10 160	10	2000 x 1600	2.05	-	2 x 2.0	2 x 1.6	2.6	1.3	-	0.8	74 - 94
mcr LAM 10 180	10	2000 x 1800	2.31	-	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	1.0	81 - 102
mcr LAM 10 200	10	2000 x 2000	2.57	.	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	1.0	88 - 111
mcr LAM 10 220	10	2000 x 2200	2.84	-	-	2 x 2.0	2 x 2.0	1.3	-	1.3	94 - 120
mcr LAM 10 240	10	2000 x 2400	3.10	-	-	2 x 2.0	2 x 2.0	1.3	-	1.3	101 - 128
mcr LAM 10 250	10	2000 x 2500	3.23	-	-	2 x 2.0	2 x 2.0	1.3	-	1.3	107 - 136
mcr LAM 11 70	11	2200 x 700	0,97	2 x 2.0	2 x 1.3	2.6	2.0	0.8	-	0.8	59 - 73
mcr LAM 11 100	11	2200 x 1000	1.40	2 x 2.0	2 x 1.3	2.6	2.0	0.8	-	0.8	59 - 73
mcr LAM 11 120	11	2200 x 1200	1.68	2 x 2.6	2 x 2.0	2 x 1.3	2.0	1.0	-	0.8	66 - 83
mcr LAM 11 140	11	2200 x 1400	1.97	-	2 x 2.0	2 x 1.3	2.6	1.0	-	0.8	73 - 92
mcr LAM 11 160	11	2200 x 1600	2.26	-	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	0.8	80 - 101
mcr LAM 11 180	11	2200 x 1800	2.55	-	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	1.0	87 - 110
mcr LAM 11 200	11	2200 x 2000	2.84	-	-	2 x 2.6	2 x 1.6	1.6	-	1.0	94 - 120
mcr LAM 11 220	11	2200 x 2200	3.12	-	-	-	2 x 2.0	2	-	1.3	101 - 129
mcr LAM 11 240	11	2200 x 2400	3.41	-	-	-	2 x 2.0	2	-	1.3	109 - 138
mcr LAM 11 250	11	2200 x 2500	3.56	-	-	-	2 x 2.0	2.0	-	1.3	116 - 146
mcr LAM 12 80	12	2400 x 800	1,21		2 x 2.0	2 x 1.3	2.6	1.0	-	0.8	63 - 79
mcr LAM 12 100	12	2400 x 1000	1.52		2 x 2.0	2 x 1.3	2.6	1.0	-	0.8	63 - 79
mcr LAM 12 120	12	2400 x 1200	1.84	2 x 2.6	2 x 2.0	2 x 1.3	2.0	1.0	-	0.8	70 - 89
mcr LAM 12 140	12	2400 x 1400	2.15	-	2 x 2.0	2 x 2.0	2 x 1.3	1.3	-	0.8	78 - 99
mcr LAM 12 160	12	2400 x 1600	2.47	-	2 x 2.6	2 x 2.0	2 x 1.3	1.3	-	1.0	86 - 109
mcr LAM 12 180	12	2400 x 1800	2.78	-	-	2 x 2.0	2 x 1.6	1.6	-	1.0	93 - 118
mcr LAM 12 200	12	2400 x 2000	3.10	-	-	2 x 2.6	2 x 2.0	2.0	-	1.3	101 - 128
mcr LAM 12 220	12	2400 x 2200	3.41	-	-	-	2 x 2.6	2.6	-	1.3	109 - 138
mcr LAM 12 240	12	2400 x 2400	3.73	-	-	-	2 x 2.6	2.6	-	1.3	116 - 148

10.3. technical details

VENT TYPE	NUMBER OF BLADES	NOMINAL DIMENSIONS (width x length)	ACTIVE AREA [Aa]	ELECTRIC CONTROL - POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR							ESTIMATED WEIGHT
				SL 1300	SL 950	SL 750	SL 550	SL 250	SL 125	SL 0 (instal-lation in façade)	MIN(*)-MAX(**)
	[pcs.]	[mm]	[m^2]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[kg]
mcr LAM 12 250	12	2400 x 2500	3.88	-	-	-	2 x 2.6	2.6	-	1.3	124 - 157
mcr LAM 13 85	13	2600 x 850	1,39	-	-	2 x 2.0	2 x 1.3	1.3	-	1.0	75 - 95
mcr LAM 13 120	13	2600 x 1200	1.99	-	-	2 x 2.0	2 x 1.3	1.3	-	1.0	75 - 95
mcr LAM 14 90	14	2800 x 900	1,58	-	-	2 x 2.6	2 x 2.0	2.0	-	1.3	80 - 101
mcr LAM 14 120	14	2800 x 1200	2.15	-	-	2 x 2.6	2 x 2.0	2.0	-	1.3	80 - 101
mcr LAM 14 140	14	2800 x 1400	2.52	-	-	2 x 2.6	2 x 2.0	2.0	-	1.3	88 - 112
mcr LAM 14 160	14	2800 x 1600	2.88	-	-	2 x 2.6	2 x 2.0	2.0	-	1.3	97 - 123
mcr LAM 14 180	14	2800 x 1800	3.25	-	-	-	2 x 2.0	2.0	-	1.3	106 - 135
mcr LAM 14 200	14	2800 x 2000	3.62	-	-	-	2 x 2.6	2.6	-	1.3	114 - 146
mcr LAM 14 220	14	2800 x 2200	3.99	-	-	-	2 x 2.6	2.6	-	1.3	123 - 157
mcr LAM 14 240	14	2800 x 2400	4.35	-	-	-	-	2 x 1.3 (SL400)	-	1.3	131 - 168
mcr LAM 14 250	14	2800 x 2500	4.54	-	-	-	-	2 x 1.3 (SL400)	-	1.3	140 - 178
mcr LAM 15 95	15	3000 x 950	1,82	-	-	2 x 2.6	2 x 2.0	2.0	-	1.3	84 - 107
mcr LAM 15 120	15	3000 x 1200	2.30	-	-	2 x 2.6	2 x 2.0	2.0	-	1.3	84 - 107
mcr LAM 15 140	15	3000 x 1400	2.70	-	-	2 x 2.6	2 x 2.0	2.0	-	1.3	93 - 119
mcr LAM 15 160	15	3000 x 1600	3.09	-	-	2 x 2.6	2 x 2.0	2.0	-	1.3	103 - 131
mcr LAM 15 180	15	3000 x 1800	3.49	-	-	-	2 x 2.0	2.0	-	1.3	112 - 143
mcr LAM 15 200	15	3000 x 2000	3.88	-	-	-	2 x 2.6	2.6	-	1.3	121 - 155
mcr LAM 15 210	15	3000 x 2100	4.08	-	-	-	2 x 2.6	2.6	-	1.3	125 - 160
mcr LAM 15 220	15	3000 x 2200	4.27	-	-	-	2 x 2.6	2.6	-	1.3	130 - 166
mcr LAM 15 230	15	3000 x 2300	4.47	-	-	-	-	2 x 1.3 (SL400)	-	1.3	134 - 172
mcr LAM 15 240	15	3000 x 2400	4.67	-	-	-	-	2 x 1.3 (SL400)	-	1.3	139 - 178
mcr LAM 15 250	15	3000 x 2500	4.87	-	-	-	-	2 x 1.3 (SL400)	-	1.3	148 - 189
mcr LAM 16 105	16	3200 x 1050	2,15	-	-	-	-	2 x 1.3	2 x 0.8	0.8	89 - 113
mcr LAM 16 120	16	3200 x 1200	2.46	-	-	-	-	2 x 1.3	2 x 0.8	0.8	89 - 113
mcr LAM 16 140	16	3200 x 1400	2.88	-	-	-	-	2 x 1.3	2 x 0.8	0.8	98 - 125
mcr LAM 16 160	16	3200 x 1600	3.30	-	-	-	-	2 x 1.3	2 x 0.8	0.8	108 - 138
mcr LAM 16 180	16	3200 x 1800	3.72	-	-	-	-	2 x 1.3	2 x 0.8	0.8	118 - 150
mcr LAM 16 200	16	3200 x 2000	4.14	-	-	-	-	2 x 1.3	2 x 0.8	0.8	127 - 163
mcr LAM 16 220	16	3200 x 2200	4.56	-	-	-	-	2 x 1.3	2 x 0.8	0.8	137 - 176
mcr LAM 16 240	16	3200 x 2400	4.98	-	-	-	-	2 x 1.3	2 x 1.0	0.8	146 - 188
mcr LAM 16 250	16	3200 x 2500	5.19	-	-	-	-	2 x 1.3	2 x 1.0	0.8	156 - 199
mcr LAM 17 110	17	3400 x 1100	2,39	-	-	-	-	2 x 1.3	2 x 0.8	0.8	93 - 119
mcr LAM 17 120	17	3400 x 1200	2.61	-	-	-	-	2 x 1.3	2 x 0.8	0.8	93 - 119
mcr LAM 17 140	17	3400 x 1400	3.06	-	-	-	-	2 x 1.3	2 x 0.8	0.8	104 - 132
mcr LAM 17 160	17	3400 x 1600	3.51	-	-	-	-	2 x 1.3	2 x 0.8	0.8	114 - 145
mcr LAM 17 180	17	3400 x 1800	3.96	-	-	-	-	2 x 1.3	2 x 0.8	0.8	124 - 158
mcr LAM 17 200	17	3400 x 2000	4.40	-	-	-	-	2 x 1.3	2 x 0.8	0.8	134 - 172
mcr LAM 17 220	17	3400 x 2200	4.85	-	-	-	-	2 x 1.3	2 x 1.0	0.8	144 - 185
mcr LAM 17 240	17	3400 x 2400	5.30	-	-	-	-	2 x 1.3	2 x 1.0	0.8	154 - 198
mcr LAM 17 250	17	3400 x 2500	5.52	-	-	-	-	2 x 1.3	2 x 1.0	0.8	159 - 205

10.3. technical details

VENT TYPE	NUMBER OF BLADES	NOMINAL DIMENSIONS (width x length)	ACTIVE AREA [Aa]	ELECTRIC CONTROL - POWER CONSUMPTION [A] BY ELECTRIC ACTUATOR							ESTIMATED WEIGHT
				SL 1300	SL 950	SL 750	SL 550	SL 250	SL 125	SL 0 (instal-lation in façade)	MIN(*)-MAX(**)
	[pcs.]	[mm]	[m^2]	[A]	[A]	[A]	[A]	[A]	[A]	[A]	[kg]
mcr LAM 18 115	18	3600 x 1150		-	-	-	-	2 x 1.3	2 x 0.8	0.8	98 - 125
mcr LAM 18 120	18	3600 x 1200	2.77	-	-	-	-	2 x 1.3	2 x 0.8	0.8	98 - 125
mcr LAM 18 140	18	3600 x 1400	3.24	-	-	-	-	2 x 1.3	2 x 0.8	0.8	109 - 139
mcr LAM 18 160	18	3600 x 1600	3.72	-	-	-	-	2 x 1.3	2 x 0.8	0.8	119 - 153
mcr LAM 18 180	18	3600 x 1800	4.19	-	-	-	-	2 x 1.3	2 x 0.8	0.8	130 - 167
mcr LAM 18 200	18	3600 x 2000	4.66	-	-	-	-	2 x 1.3	2 x 0.8	0.8	140 - 181
mcr LAM 18 220	18	3600 x 2200	5.14	-	-	-	-	2 x 1.3	2 x 1.0	0.8	151 - 195
mcr LAM 18 240	18	3600 x 2400	5.61	-	-	-	-	2 x 1.3	2 x 1.0	0.8	162 - 209
mcr LAM 18 250	18	3600 x 2500	5.85	-	-	-	-	2 x 1.3	2 x 1.0	0.8	167 - 216
mcr LAM 19 120	19	3800 x 1200	2.93	-	-	-	-	2 x 1.3	2 x 0.8	2 x 0.8	103 - 131
mcr LAM 19 140	19	3800 x 1400	3.43	-	-	-	-	2 x 1.3	2 x 0.8	2 x 0.8	114 - 145
mcr LAM 19 160	19	3800 x 1600	3.93	-	-	-	-	2 x 1.3	2 x 0.8	2 x 0.8	125 - 160
mcr LAM 19 180	19	3800 x 1800	4.43	-	-	-	-	2 x 1.3	2 x 0.8	2 x 0.8	136 - 175
mcr LAM 19 200	19	3800 x 2000	4.93	-	-	-	-	2 x 1.3	2 x 1.0	2 x 0.8	147 - 189
mcr LAM 19 220	19	3800 x 2200	5.43	-	-	-	-	2 x 1.3	2 x 1.0	2 x 0.8	158 - 204
mcr LAM 19 240	19	3800 x 2400	5.93	-	-	-	-	2 x 1.3	-	2 x 0.8	169 - 219
mcr LAM 19 250	19	3800 x 2500	6.18	-	-	-	-	2 x 1.3	-	2 x 0.8	175 - 226

(*) minimum weight value: mcr LAM louvered smoke vent with wind deflectors on aluminum base of height 20 cm; base without insulation (H), blades without insulation (S)

(**) maximum weight value: mcr LAM louvered smoke vent with wind deflectors on aluminum base of height 20 cm insulated with mineral wool of thickness 20 mm (HO); blades insulated with XPS of 20 mm thickness (SO+XPS)

10.4. louvered smoke vents control

For correct operation, louvered smoke vents require connecting to devices controlling their opening and closing. A set of such devices constitutes a system for smoke exhaust control or smoke exhaust and ventilation control.
Depending on the type of devices used, it may be designed as a:

- pneumatic smoke exhaust control system,
- 24V electric smoke exhaust control system with ventilation function,
- pneumatic and electric control system; the pneumatic part is responsible for smoke exhaust, while the 230V~ electric part - for ventilation.

Smoke exhaust control systems are activated as follows:

4) automatic – through a thermo switch installed in the vent (pneumatic system) or by optical smoke sensors (electric system),
5) manual – by a release of CO_2 cartridges in alarm box (pneumatic system) or by operation of RPO emergency pushbutton(electric system),
6) FAS signal – by external impulse from fire alarm system (FAS) sent to an electromagnet installed in the alarm box (pneumatic system), or directly to smoke exhaust control unit (electric system).

Control system elements are described in section 13.

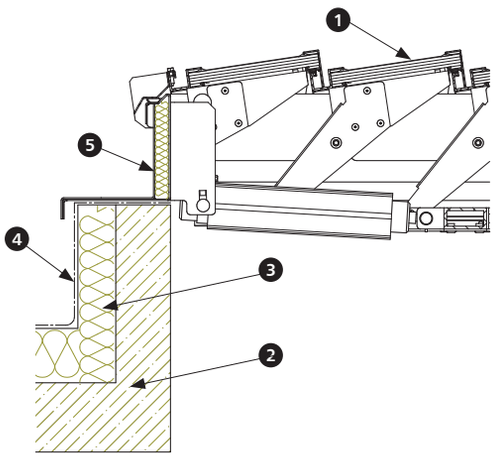
Louvered smoke vent control types

C1 – vent with pneumatic actuator with ampule and CO_2 cartridge installed in a thermal fuse - CO_2 opening only (manual closing from roof)
C2 – vent with pneumatic actuator with ampule and CO_2 cartridge installed in a thermal fuse - CO_2 opening and closing
C3 – vent with pneumatic actuator with ampule and CO_2 cartridge installed in a thermal fuse - CO_2 opening only, with gas spring for closing
E1 – vent with 24VDC electric actuator
E2 – vent with 230VAC electric actuator for daily ventilation

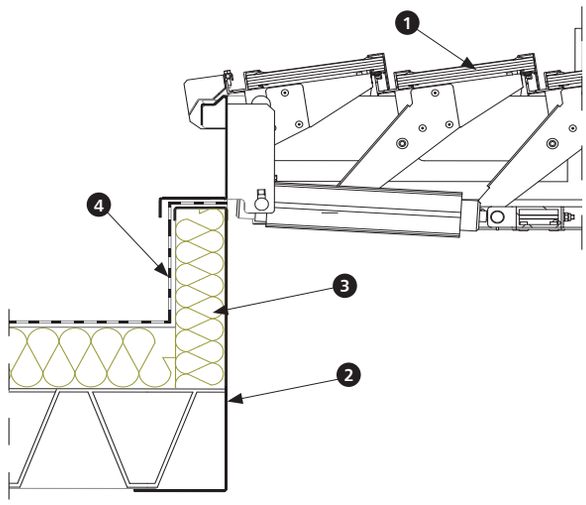
Control system elements are described in section 13.

10.5. installation

10.5.1. installation of louvered vents on a roof



Installation of louvered vent with plinth type insulated base on a roof, on a pre-existing plinth
1 – louvered vent
2 – roof plinth
3 – thermal insulation of plinth
4 – waterproof insulation of plinth and roof
5 – thermal insulation of vent base



Installation of louvered vent with plinth type non-insulated base on a roof, on a steel plinth
1 – louvered vent
2 – bottom base of vent
3 – thermal insulation
4 – waterproof insulation

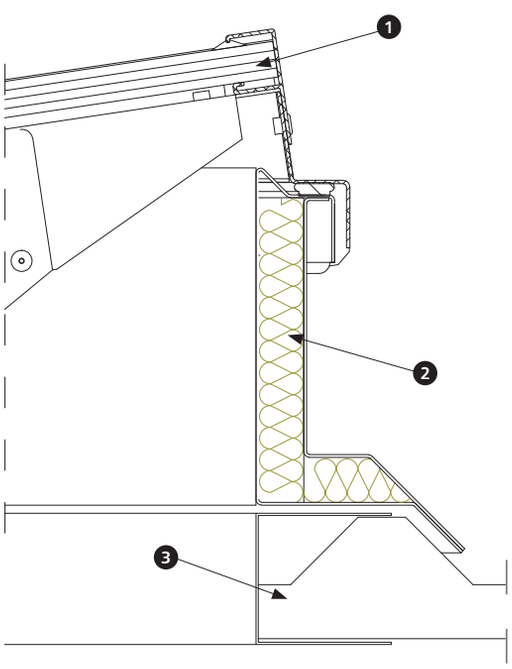
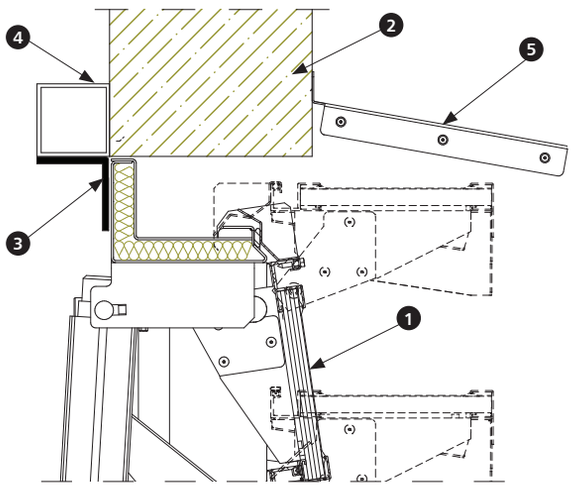
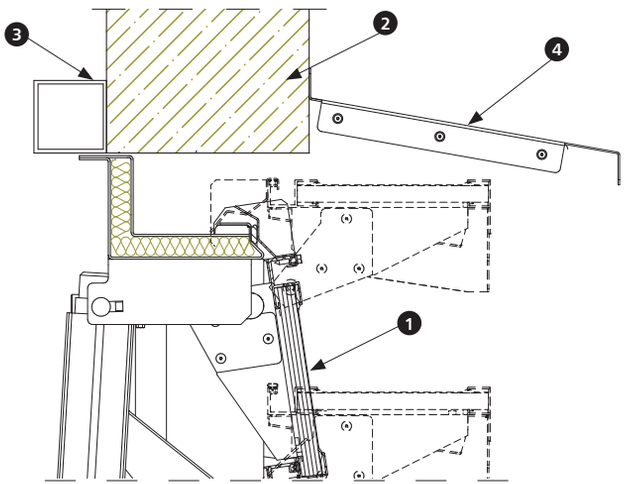


Fig. 186 – Installation of louvered vent on a sheet-covered system roof
1 – louvered vent
2 – base insulation
3 – system roofing

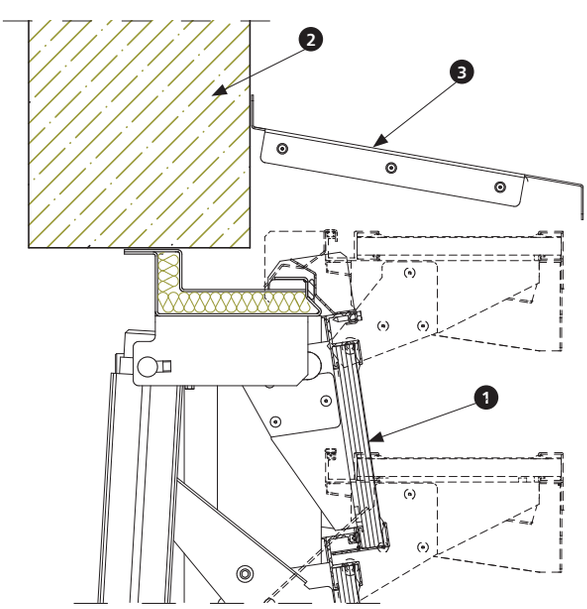
10.5.2. installation of louvered vents in a wall (façade)



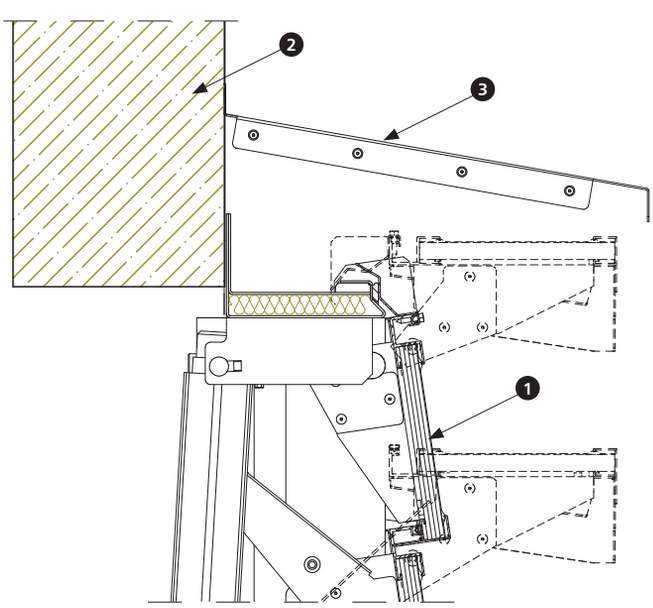
Installation of louvered vent in a wall (façade) using additional steel section
1 – louvered vent
2 – wall (façade)
3 – fixing angle profile
4 – supporting steel profile
5 – rain shield (optional)



Installation of louvered vent in a wall (façade) to a supporting steel profile
1 – louvered vent
2 – wall (façade)
3 – supporting steel profile
4 – rain shield (optional)

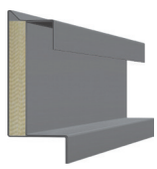
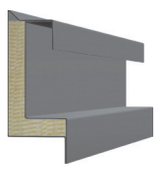
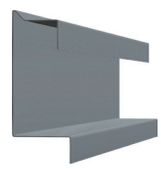
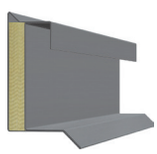
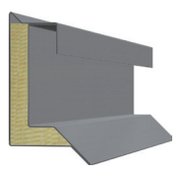
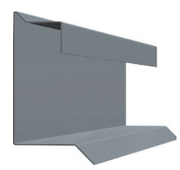
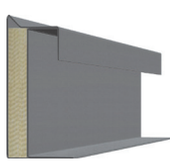
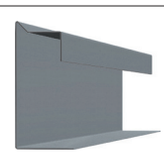
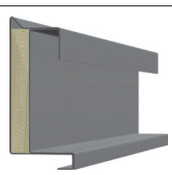
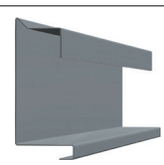
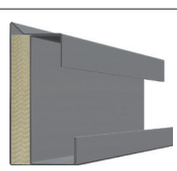
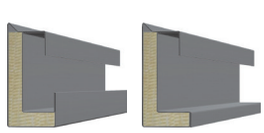
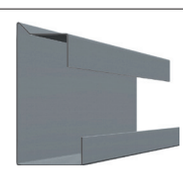


Installation of louvered vent directly to a wall (façade)
1 – louvered vent
2 – wall (façade)
3 – rain shield (recommended)



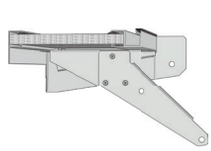
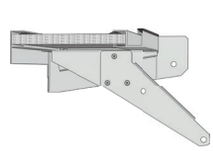
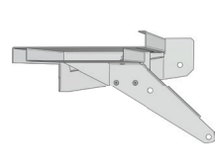
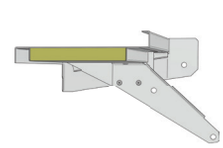
Installation of louvered vent directly to a wall (façade) from the outside
1 – louvered vent
2 – wall (façade)
3 – rain shield (recommended)

10.6. flange types

TYPE	FLANGE WITH INSULATION		FLANGE WITHOUT INSULATION	APPLICATION
	V(*)	H(**)		
P1				plinth type roof vents (installation onto existing plinth)
P2				vents installed on trapezoidal roofs (sandwich type)
P3		-		façade vents, vents installed on trapezoidal roofs (sandwich type)
P4		-		façade vents
P11				vents connected with continuous rooflights

(*) Only vertical wall insulated
(**) Both vertical and horizontal walls insulated

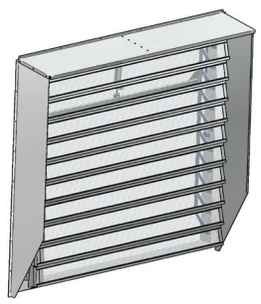
10.7. glazing

TYPE	MULTI-CHAMBER POLYCARBONATE PCA16 (*)	MULTI-CHAMBER POLYCARBONATE PCA25 (*)	ALUMINUM SHEET NON-INSULATED (S0) (**)	ALUMINUM SHEET INSULATED (SO+XPS) (***)
				
SMOKE VENTS MCR LAM	●	●	●	●

(*) Blade glazing with multi-chamber polycarbonate panel of 16 mm or 25 mm thickness, OPAL or CLEAR;
(*) Opaque glazing – two layers of aluminum sheet with air gap between
(**) Opaque glazing – two layers of aluminum sheet with XPS panel (extruded polystyrene) between

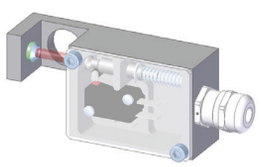
10.8. additional equipment

Rain shield



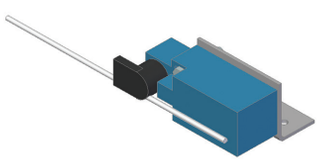
- rain shields extending weather-proof properties,
- can be an element of façade vent equipment.

Thermo switch



- Thermo switch with alcohol-containing thermal fuse, installed in louvered vent base with E1 type electric control,
- connected between the control unit and the vent actuator,
- supplied continuously with 24V- voltage (actuators cut off from the supply); after the thermal fuse breaks, voltage is supplied to the vent actuators as a result of temperature increase, causing vent opening. A new fuse must be provided in order to shut the vent.

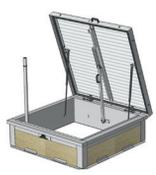
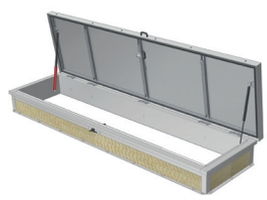
Limit switch



- limit switch indicating open and/or closed position of blades

11. roof hatches

mcr PROROOF roof hatches are designed to provide safe, quick and easy access to the roof. In configuration with clear leaf glazing, mcr PROROOF hatches can also be used for providing additional lighting for interiors.

Parameters		mcr PROROOF LD hatch	mcr PROROOF ST hatch
			
Purpose		Roof access - ladder	Roof access - stairs
Glazing	multi-chamber polycarbonate panel	●	●
	1 or 2 multi-chamber polycarbonate panels of thickness 20 mm, with envelope cover	●	●
	solid polycarbonate dome	●	–
	acrylic dome	●	–
	mixed dome (*)	●	–
	sandwich panel (**)	●	●

(*) Mixed dome: outer layer made of solid polycarbonate, inner layer made of acrylate
(**) Available variants for selected dimensions: aluminum sheet – XPS 20 mm or XPS 40 mm – aluminum sheet

11.1. roof hatches - LD type

11.1.1. description of standard

- mcr PROROOF LD hatches are adapted for accessing the roof using a ladder,
- straight base made of aluminum sheet of 2 mm thickness and 300 mm height,
- thermal insulation of base – PIR panel of 60 mm thickness,
- leaf opening system: single or double gas springs for supporting opening, with mounting consoles,
- two-side opening – entrance and exit functionality thanks to a lock and handle on both sides of the device (inside and outside),
- leaf glazing: multi-chamber polycarbonate, multi-chamber polycarbonate with aluminum envelope cover, solid polycarbonate dome, acrylic dome, mixed dome (solid polycarbonate and acrylate), sandwich panels,
- leaf blockade made of aluminum profile,
- device is closed using slam latch with a keylock.

11.1.2. LD hatch design

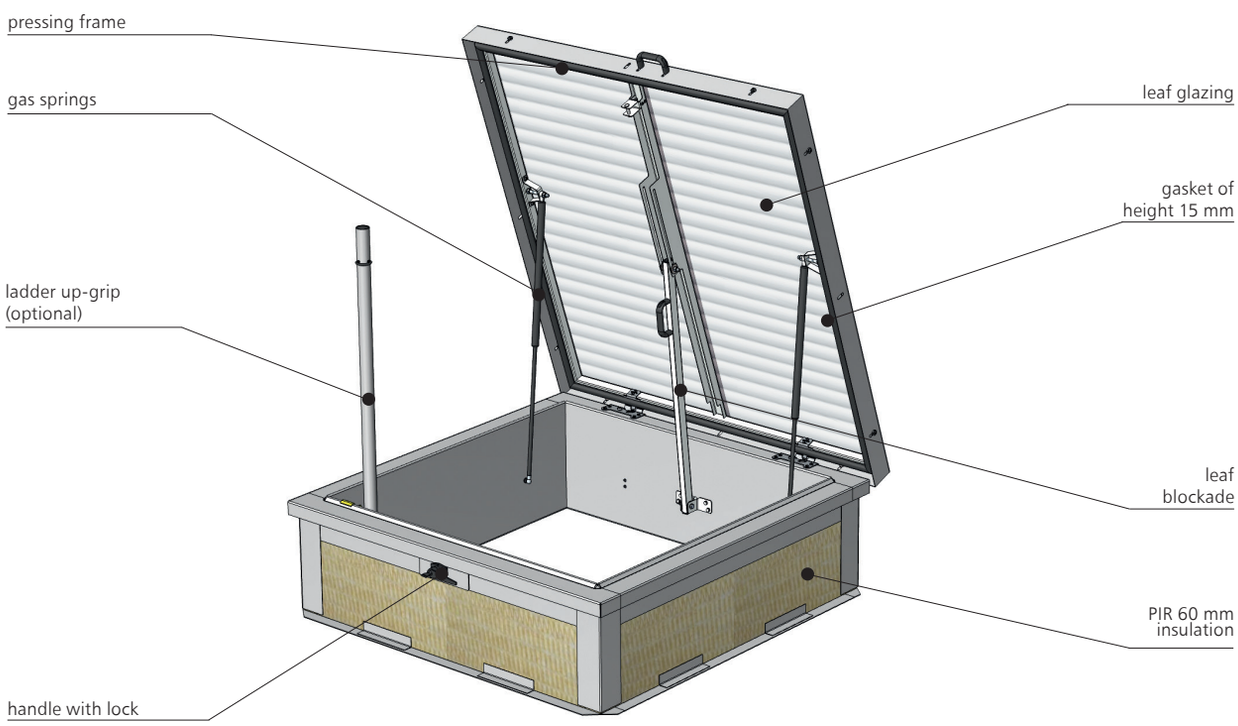


Fig. 148 – Design of mcr PROROOF LD roof hatch for installing over a ladder, with ladder up-grip

11.1.3. hatch non-standard options

- device elements painted to any RAL color from outside and/or, inside,
- optional ergonomic ladder up-grip,
- variable base heights within the range of 250 mm ÷ 700 mm (base of minimum height 250 mm, in making adapted to installation on existing plinth),
- variable thermal insulation material of base,
- adaptation of lower flange of base to specific installation requirements,
- optional limit switches for indication of leaf position,
- hatch making with declared soft body impact resistance up to 1200 J.

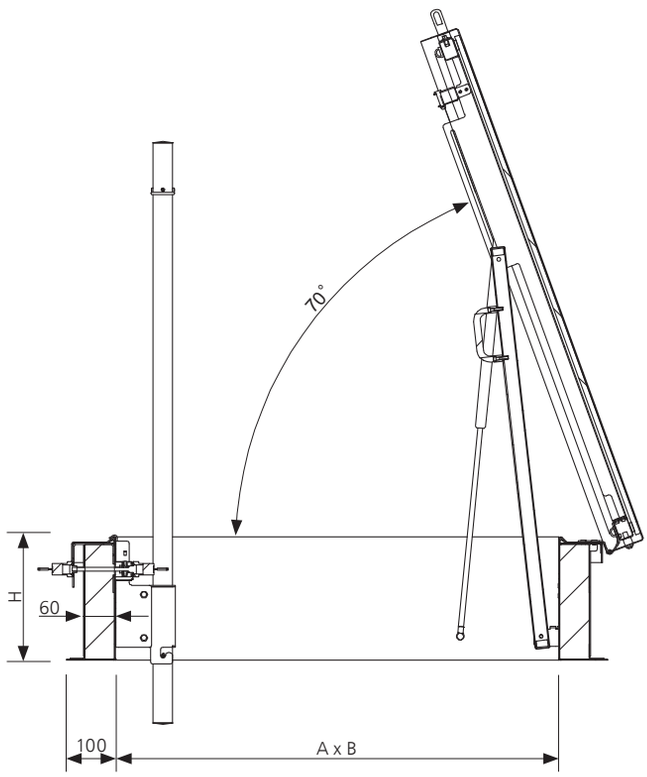


*Fig. 149 – Section **B-B** of mcr PROROOF LD roof hatch in open position (over a ladder), dimensions in [mm]*

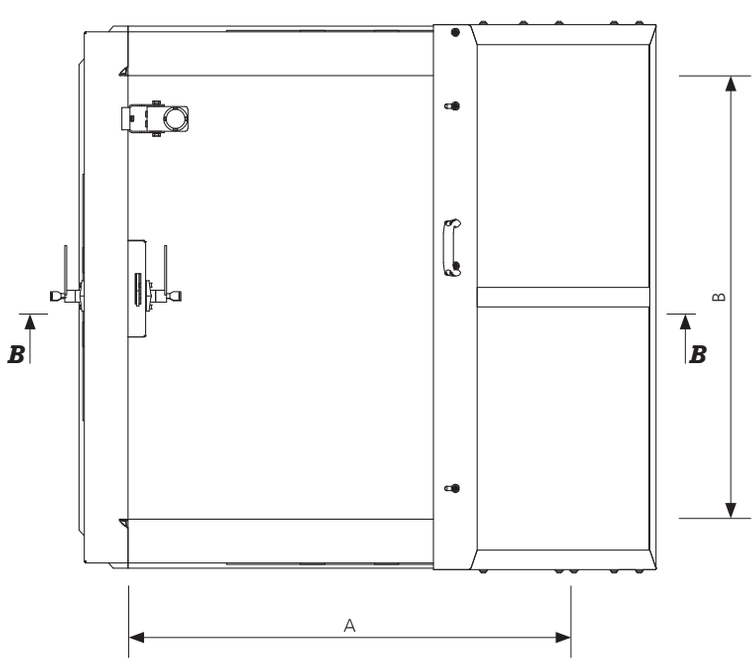


Fig. 150 – Top view of mcr PROROOF LD roof hatch in open position (over a ladder), dimensions in [mm]

A, B – nominal dimensions [mm], clear opening of roof hatch
H – roof hatch base height [mm]

11.1.5. technical details

AVAILABLE DIMENSIONS (*) MCR PROROOF LD		WIDTH - DIMENSION A [mm]									
		600	750	800	900	1000	1100	1200	1300	1400	1500
LENGTH - DIMENSION B [mm] (hinges side)	600	•	•	•	•	•	•	•	•	•	•
	750	•	•	•	•	•	•	•	•	•	•
	800	•	•	•	•	•	•	•	•	•	•
	900	•	•	•	•	•	•	•	•	•	•
	1000	•	•	•	•	•	•	•	•	•	•
	1100	•	•	•	•	•	•	•	•	•	•
	1200	•	•	•	•	•	•	•	•	•	•
	1300	•	•	•	•	•	•	•	•	•	•
	1400	•	•	•	•	•	•	•	•	•	•

(*) Intermediate dimensions available upon request

MCR PROROOF LD HATCHES WEIGHTS	
NOMINAL DIMENSIONS [mm]	ESTIMATED WEIGHT(*) [kg]
600 x 600	29
750 x 750	34
800 x 800	36
900 x 600	34
900 x 750	37
900 x 900	44
1000 x 1000	49
1100 x 800	43
1100 x 1100	54
1200 x 600	41
1200 x 900	52

(*) Estimated weight for mcr PROROOF LD hatch of base height 300 mm and leaf glazing with double, multichamber polycarbonate panel of thickness 20 mm, and envelope cover.

11.2. roof hatches - ST type

11.2.1. description of standard

- mcr PROROOF ST hatches are adapted for accessing the roof using stairs,
- straight base made of aluminum sheet of 2 mm thickness and 300 mm height,
- thermal insulation of base – PIR panel of thickness 60 mm,
- leaf opening system: gas springs for supporting opening, with mounting consoles,
- one of the springs includes leaf blockade,
- two-side opening – entrance and exit functionality thanks to a lock and handle on both sides of the device (inside and outside),
- leaf glazing: multi-chamber polycarbonate, multi-chamber polycarbonate with aluminum envelope cover, sandwich panel – selected sizes,
- device is locked using slam latch with a keylock.

11.2.2. ST hatch design

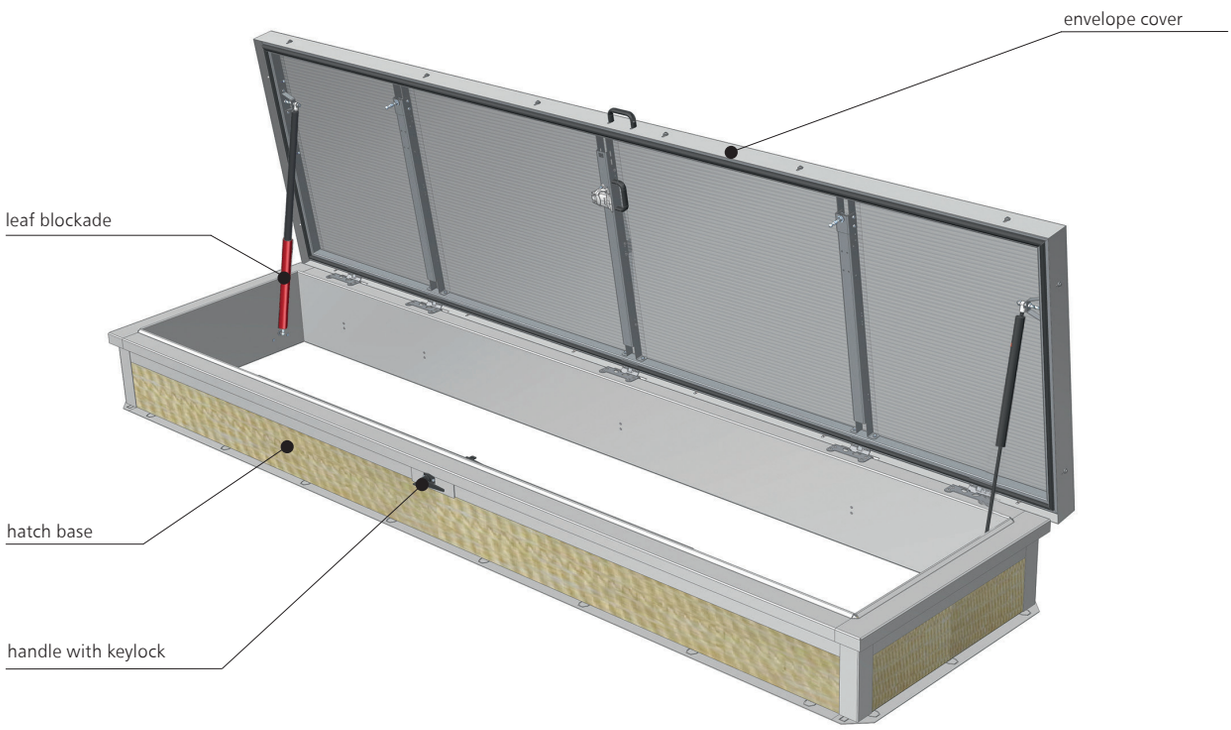


Fig. 151 – Design of mcr PROROOF ST roof hatch for installing over stairs, with leaf blockade

11.2.3. hatch non-standard options

- device elements painted to any RAL color from outside and/or inside,
- variable base heights within the range of 250 mm ÷ 700 mm (base of minimum height 250 mm, in making adapted to installation on existing plinth),
- variable thermal insulation material of base,
- adaptation of flange to specific installation requirements,
- optional limit switches for leaf (leaf position monitoring),
- hatch making with declared soft body impact resistance up to 1200 J.

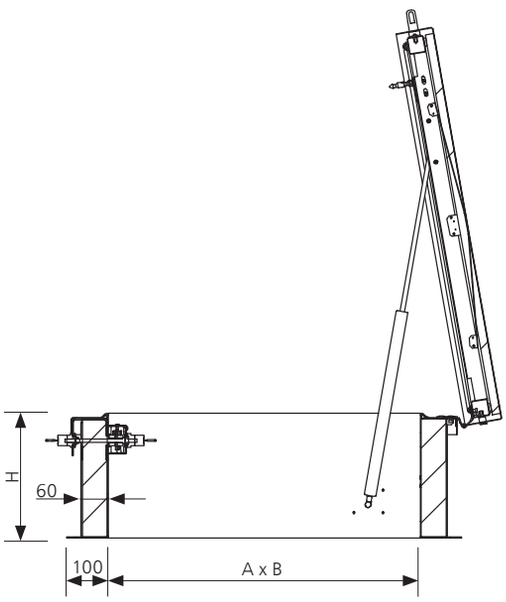


*Fig. 152 – Section **B-B** of mcr PROROOF ST roof hatch in open position (over stairs), dimensions in [mm]*

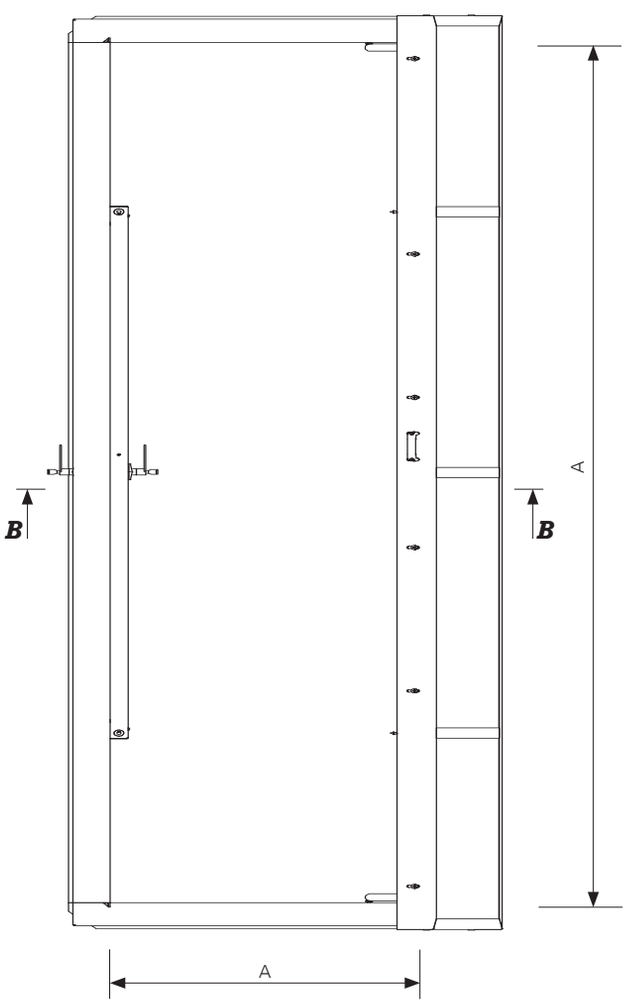


Fig. 153 – Top view of mcr PROROOF ST roof hatch in open position (over stairs), dimensions in [mm]

A, B – nominal dimensions [mm], clear opening of roof hatch
H – roof hatch base height [mm]

11.2.5. technical details

AVAILABLE DIMENSIONS (*) MCR PROROOF ST		WIDTH - DIMENSION A [mm]
		750
LENGTH - DIMENSION B [mm] (hinges side)	1500	•
	2500	•
	3300	•

(*) Intermediate dimensions available upon request

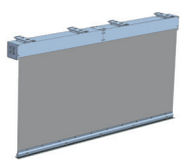
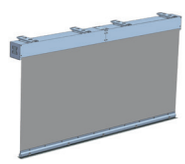
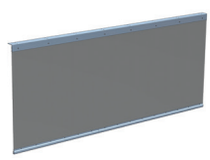
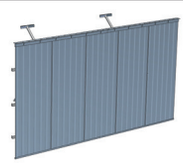
MCR PROROOF ST HATCHES WEIGHTS	
NOMINAL DIMENSIONS [mm]	ESTIMATED WEIGHT [kg]
750 x 1500	54
750 x 2500	90
750 x 3300	115

(*) Estimated weight for mcr PROROOF ST hatch of base height 300 mm and leaf glazing in the form of double polycarbonate panel of thickness 20 mm, and envelope cover.

12. smoke curtains

Smoke curtains are one of the important elements of natural smoke exhaust system. Due to their basic function - separation of smoke zones within a building, they allow to:
- stop the spreading of smoke within the building
- direct smoke flow towards smoke exhaust devices installed in the building

Depending on the characteristics of the building, natural smoke exhaust systems comprise:
- fixed smoke curtains (fabric or steel)
- automatic smoke curtains

Parameters		**FS smoke curtain** automatic – gravitational drop	**CE smoke curtain** automatic – extended by motor	**S smoke curtain** fixed, fabric	**ST smoke curtain** fixed, steel
					
Classification *(as per Certificate of Conformity according to EN 12101-1:2005, EN 12101-1:2005/A1:2006)*		Certificate of Performance 1396-CPR-033	Certificate of Performance 1396-CPR-021	Certificate of Performance 1396-CPR-022	Certificate of Performance 1396-CPR-0037
Curtain type *(as per standard EN 12101-1:2005)*		ASB 3 ASB 1	ASB 2 ASB 4	SSB	SSB
Fire resistance class		D30÷D180 DH60	D30 ÷ D60 DH30 ÷ DH60	D180 DH60	DH180
Reliability		1000 cycles	1000 cycles	-	-
Response time		• max. 60s	• max. 60s (max. high 4.8m) • max. 85s (max. high 6.5m)	-	-
Air permeability of barrier		max. 9,4 m^3/h	max. 9,4 m^3/h	max. 9,4 m^3/h	obtained
Material		smoke-tight fabric	smoke-tight fabric	smoke-tight fabric	trapezoidal metal sheet
Minimum dimensions	**height**	0,5 m	0,5 m	0,5 m	0,5 m
	length	2,0 m	0,8 m	0,8 m	0,5 m
Maximum dimensions	**height**	6,5 m	6,5 m	6,5 m	4,5 m
	length	unlimited	unlimited	unlimited	unlimited
Max. number of modules per single control unit mcr 9705 - 5A		12	10(*)	-	-
Max. number of modules per single control unit mcr 0204		8	-	-	-

(*) with extension module mcr R0448

12.1. automatic smoke curtains - FS and CE type

12.1.1. technical description of standard

- classification as per EN 12101-1:2005 and EN 12101-1:2005/A:2006,
- automatic smoke curtains are responsible for separation of smoke zones within the building, and stop smoke from spreading within passages, on staircases or escalators,
- automatic smoke curtains are used in buildings where the visual aspect of building plays an important role,
- the casing of standard dimensions 163x163 mm, made of galvanized steel sheet, comprises two elements: fixed part and inspection cover, allowing to perform service actions;
- the casing is a housing for the roller with smoke-tight fabric with weight, and for the curtain drive system,
- MECU XL motor control unit, installed on casing, allows lowering of curtain for service purposes (FS curtains),
- handles made of galvanized steel sheet, allow fixing the curtain to the ceiling or bearing structure using slings in the form of galvanized steel rods with a set of nuts,
- smoke-tight fabric made of glass fiber, double-coated with polyurethane, sewn horizontally,
- width of the material used in the curtain: 1.6 m or 2.0 m,
- a bottom balast is installed in the bottom part of the fabric, for proper unrolling and rolling of curtain,
- the bottom balast is made of galvanized steel sheet of standard dimensions 29x66 mm,
- bottom balast made of 3 m long profiles,
- curtain height range is 0.5 ÷ 6.5 m,
- maximum length of a single curtain 6.0 m; longer curtains are made in modular configuration (see pages 179-181 for details),
- control: electric 24V- (additional 230V supply for FS curtains).

12.1.2. single, automatic smoke curtain design

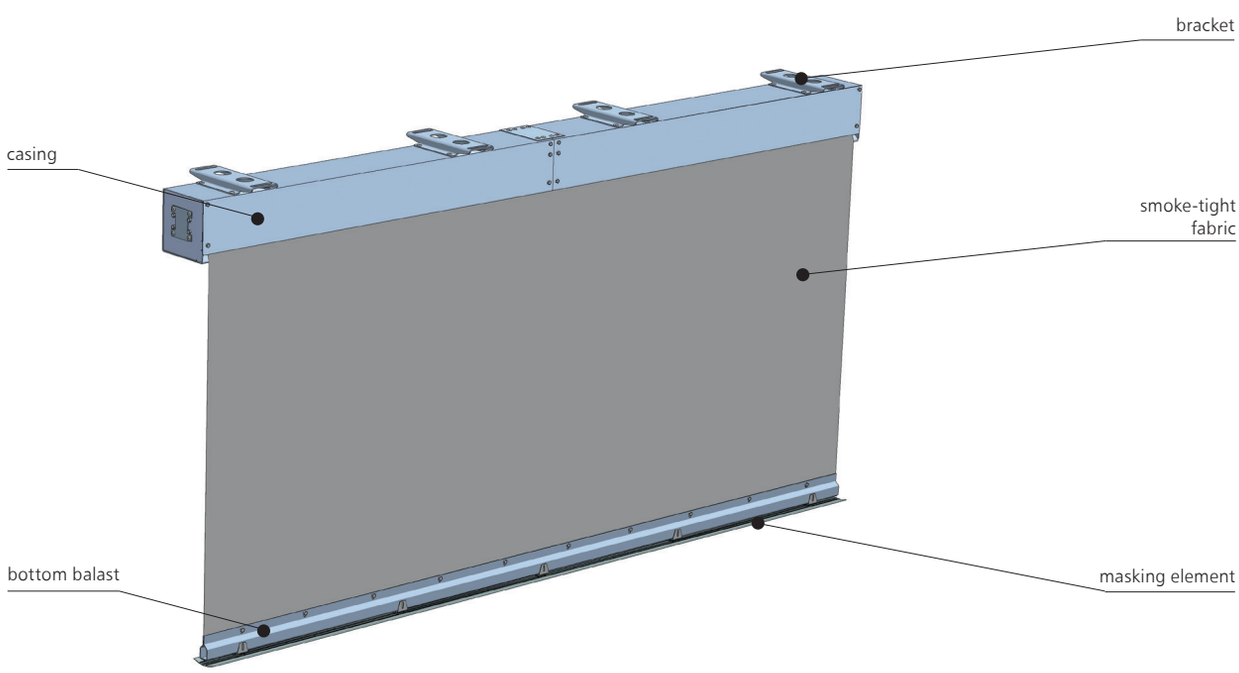


Fig. 154 – Design of single, automatic mcr PROSMOKE FS/ CE smoke curtain

12.1.3. technical drawings - single, automatic smoke curtain

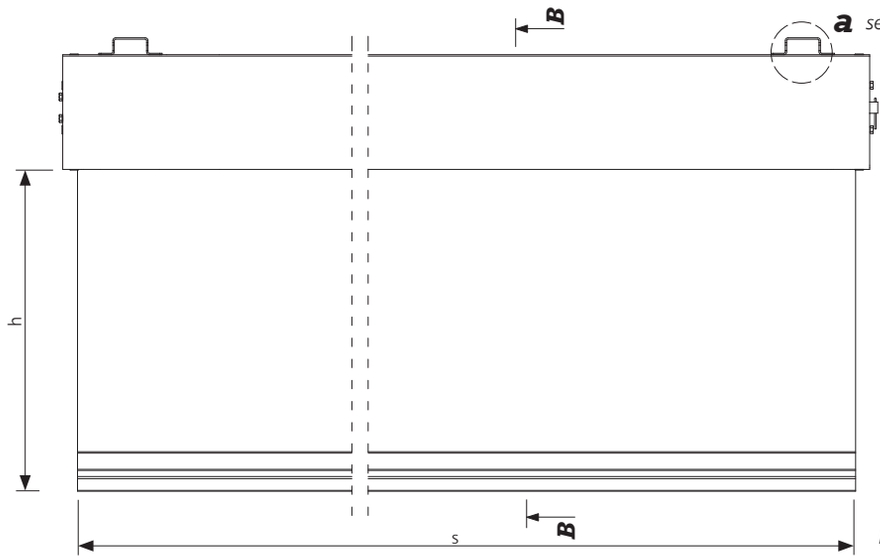


Fig. 155 – Single, automatic mcr PROSMOKE FS/ CE smoke curtain

h – curtain height [m]
s – curtain length [m]

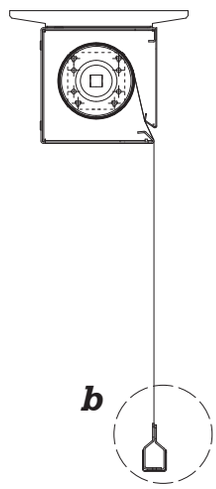
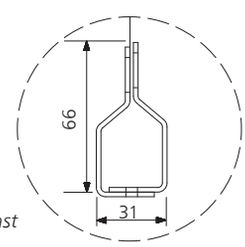


*Fig. 156 – Section **B-B** of single FS CE smoke curtain*



*Detail **b** – Bottom balast*

12.1.4. technical drawings - types of mounting brackets (detail **a**)

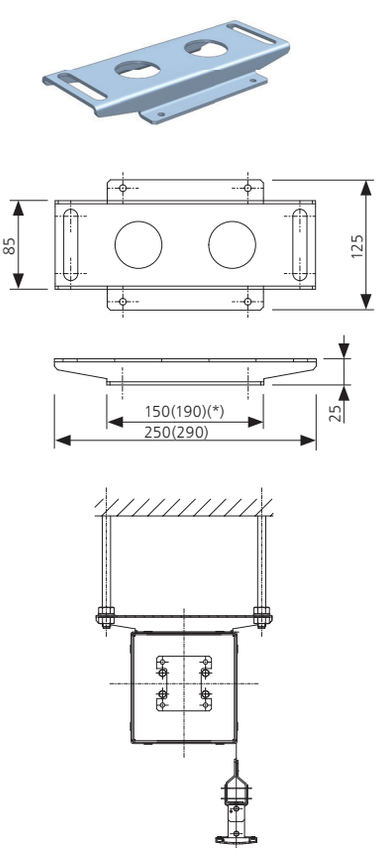


Fig. 157 – Wide bracket
(*) Dimensions on drawings in mm

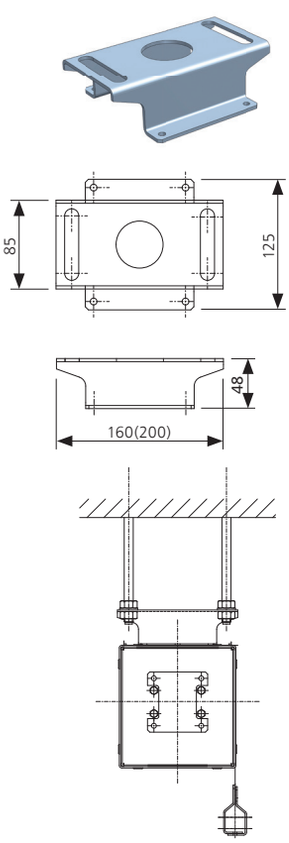


Fig. 158 – Narrow bracket

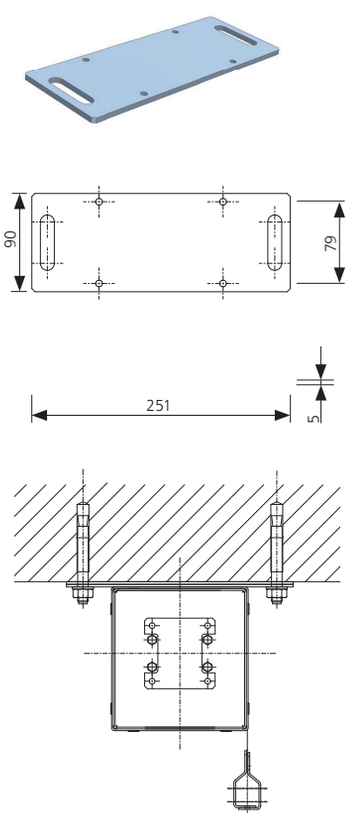


Fig. 159 – Flat bracket (**)
(**) not available for mcr Prosmoke One smoke curtain

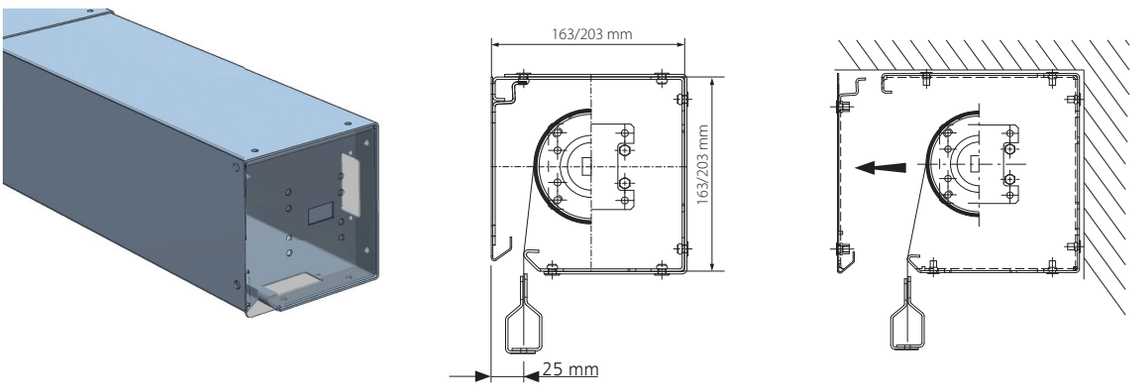


Fig. 160 – C casing - curtain rolls down 25 mm from casing edge

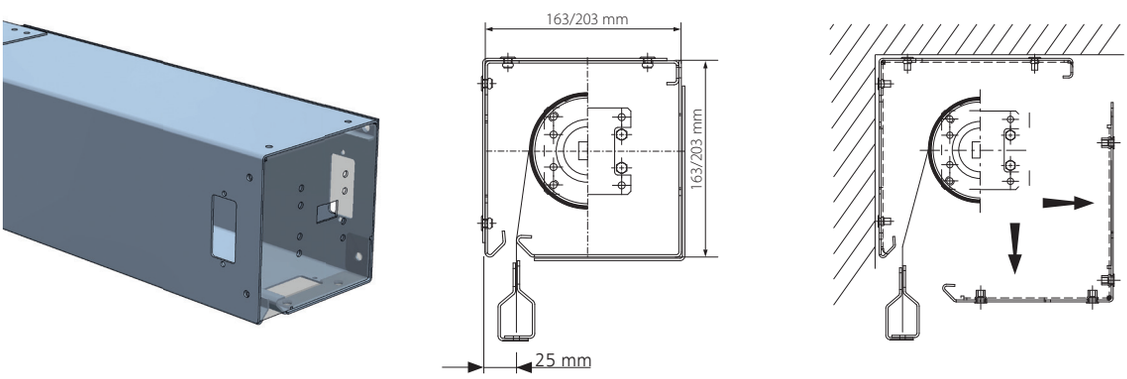


Fig. 161 – L casing - curtain rolls down 25 mm from casing edge, allowing to fix curtain directly to the wall

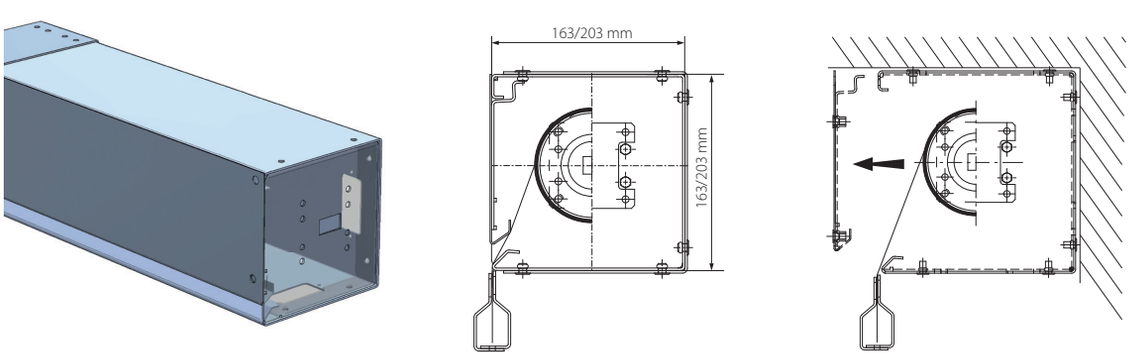


Fig. 162 – K(*) casing - curtain rolls down directly by casing edge

(*) K casing also available in K-T version, used for curtains with angular connections

12.1.6. technical drawings - modular automatic smoke curtain in vertical layout

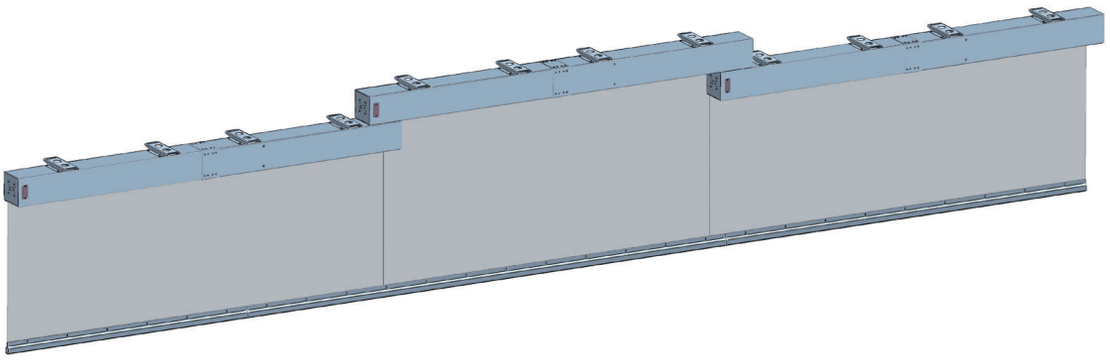


Fig. 163 – mcr PROSMOKE FS/ CE modular smoke curtain in vertical layout

Fig. 164 – Top view of mcr PROSMOKE FS/ CE modular smoke curtain in vertical layout

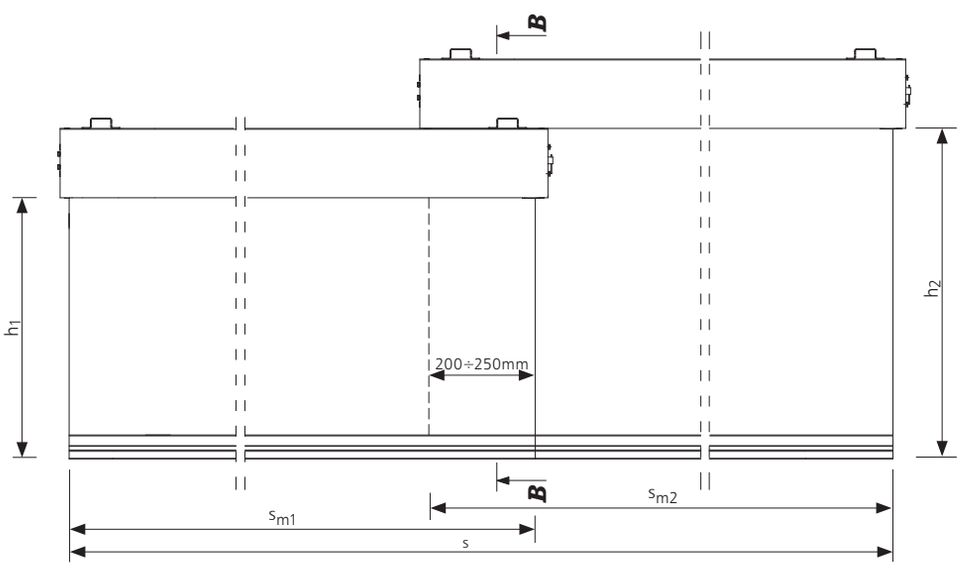


Fig. 165 – mcr PROSMOKE FS/ CE modular curtain in vertical layout, with overlap of material

*Fig. 166 – Section **B-B** of modular smoke curtain in vertical layout.*

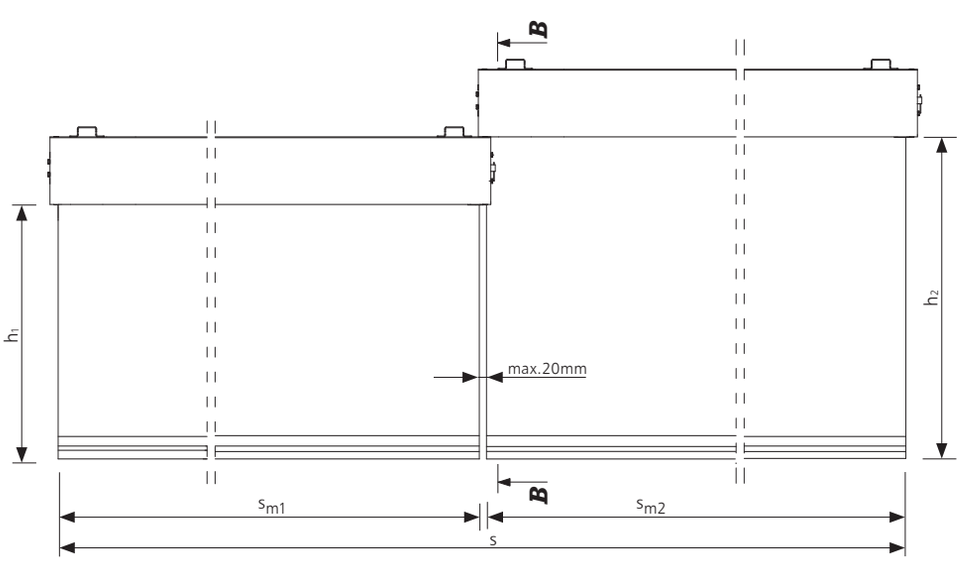


Fig. 167 – mcr PROSMOKE FS/ CE modular curtain in vertical layout, without overlap of material

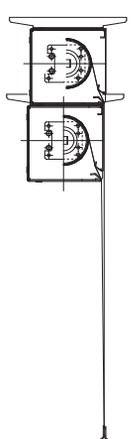


*Fig. 168 – Section **B-B** of modular smoke curtain in vertical layout.*

h_1, h_2 – curtain modules height [m]
s_{m1}, s_{m2} – curtain modules length [m]

12.1.7. technical drawings - modular automatic smoke curtain in horizontal layout

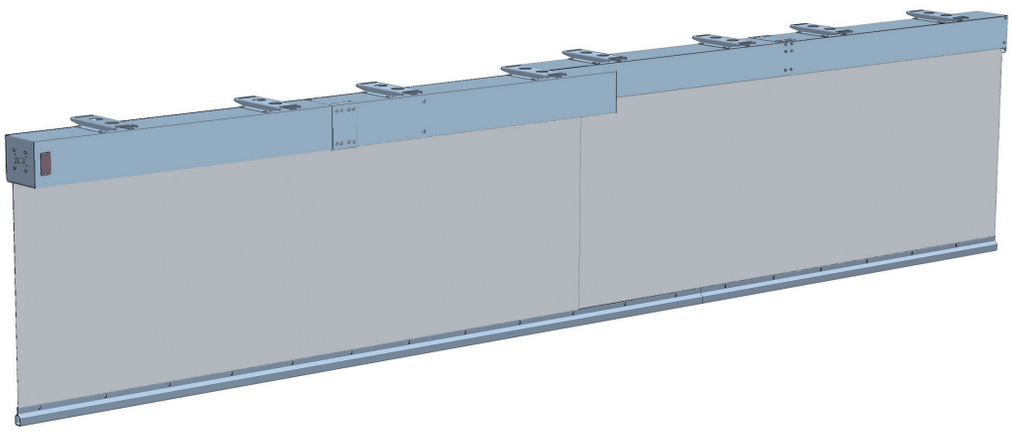


Fig. 169 – mcr PROSMOKE FS/ CE modular smoke curtain in horizontal layout

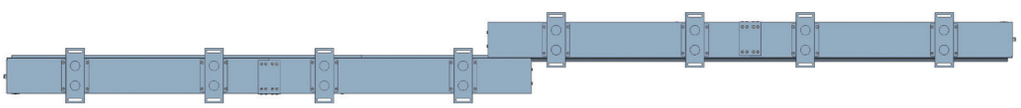


Fig. 170 – Top view of mcr PROSMOKE FS/ CE modular smoke curtain in horizontal layout

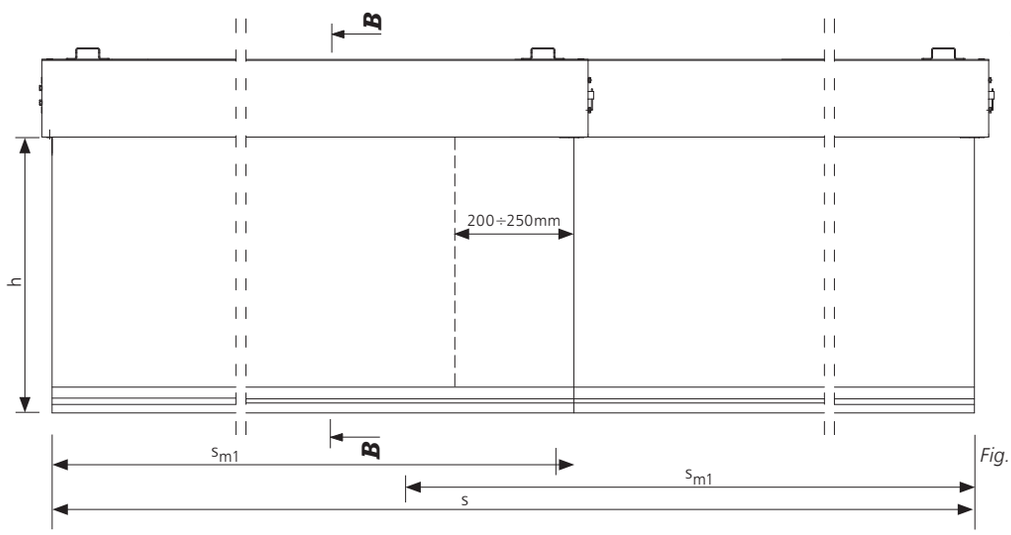


Fig. 171 – mcr PROSMOKE FS/ CE modular curtain in horizontal layout, with overlap of material

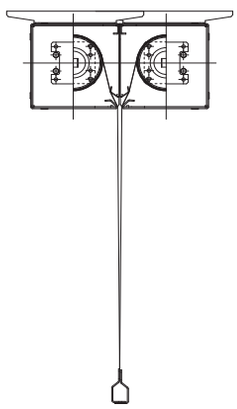


*Fig. 172 – Section **B-B** of modular smoke curtain in horizontal layout.*

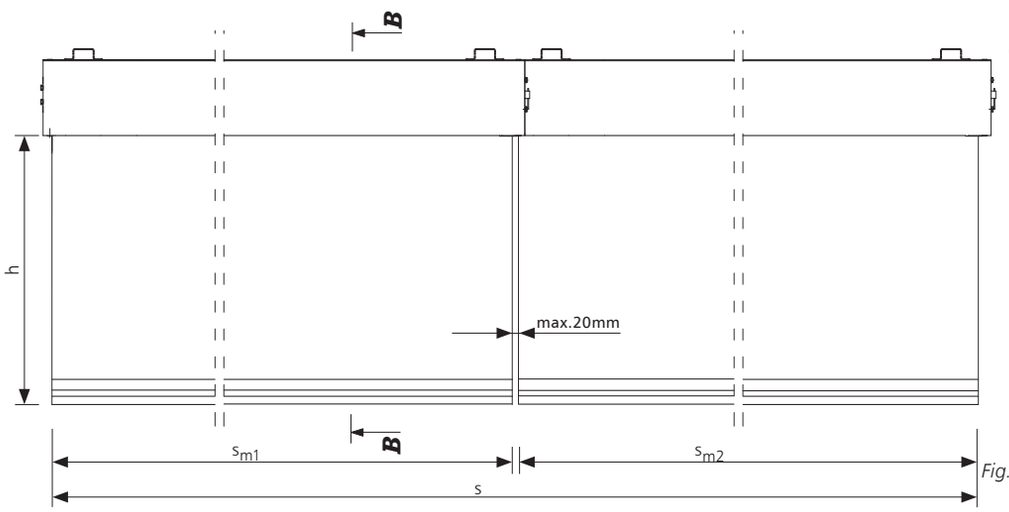


Fig. 173 – mcr PROSMOKE FS/ CE modular curtain in horizontal layout, without overlap

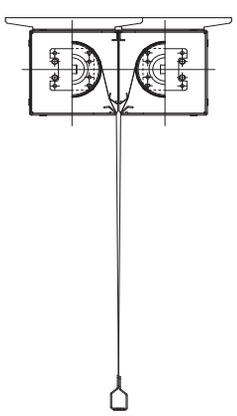


*Fig. 174 – Section **B-B** of modular smoke curtain in horizontal layout.*

h – curtain modules height [m]

s_{m1}, s_{m2} – curtain modules length [m]

12.1.8. technical drawings - modular automatic smoke curtain in one casing

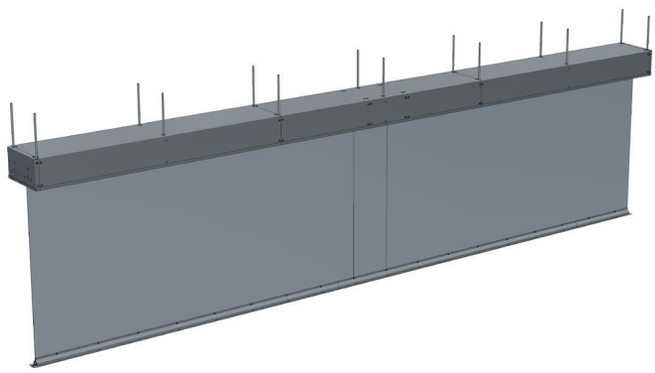


Fig. 175 – mcr PROSMOKE ONE modular automatic smoke curtain in one casing

Fig. 176 – Top view of mcr PROSMOKE ONE modular automatic smoke curtain in one casing

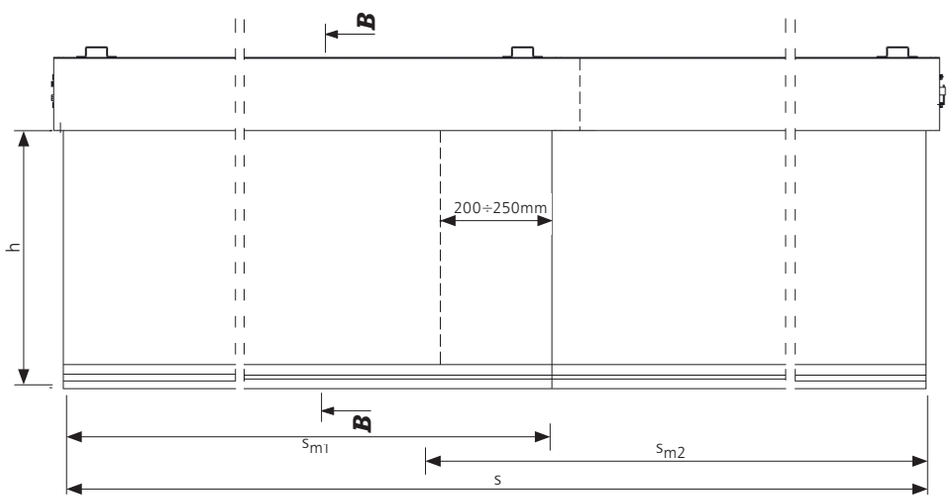


Fig. 177 – mcr PROSMOKE ONE modular automatic smoke curtain in one casing H

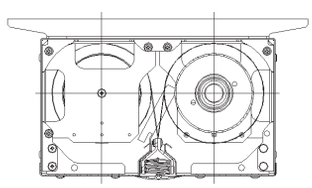


*Fig. 178 – Section **B-B** of mcr PROSMOKE ONE H modular automatic smoke curtain in one casing*

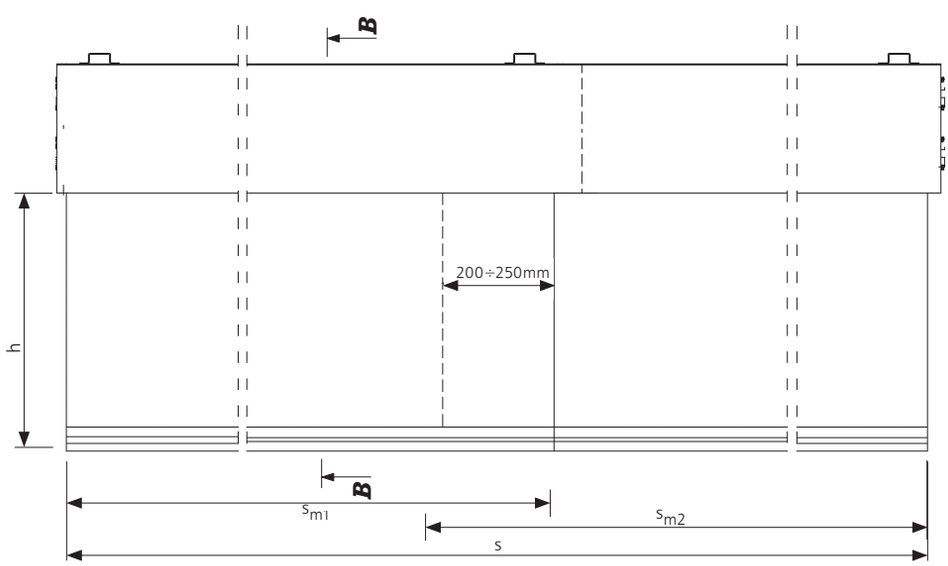


Fig. 179 – mcr PROSMOKE ONE modular automatic smoke curtain in one casing V

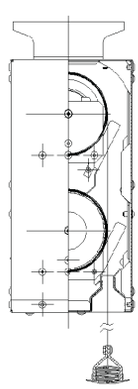


*Fig. 180 – Section **B-B** of mcr PROSMOKE ONE V modular automatic smoke curtain in one casing*

h – curtain modules height [m]

s_{m1}, s_{m2} – curtain modules length [m]

12.1.9. non-standard options of automatic smoke curtains

- curtain elements painted to any RAL color (applies to casing, bottom balast, side guides and masking element),
- casing dimensions: 203 x 203 mm (external dimensions) for curtains in higher fire resistance class,
- optional common casing for curtains in case of lack of suspended ceilings.

Angular connections (*)

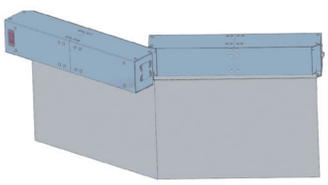


Fig. 181 – Curtains connection at obtuse angle

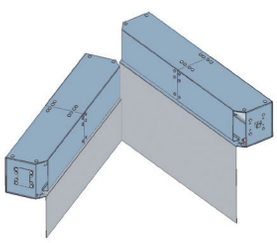
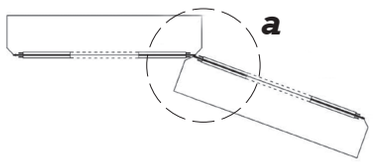
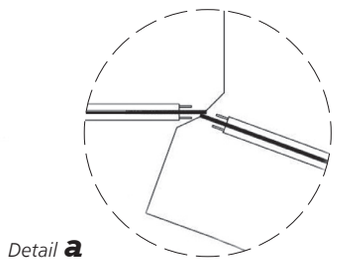
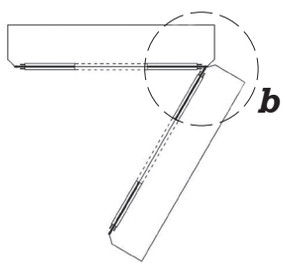
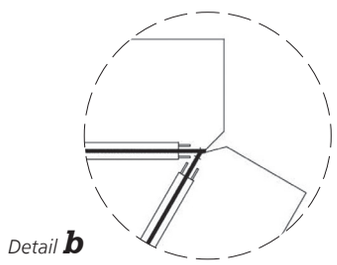


Fig. 182 – Curtains connection at acute angle









Bottom ballast (*)

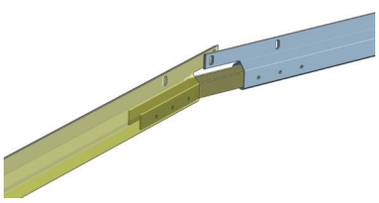
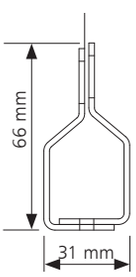


Fig. 183 – Bottom balast for curtains joined at angle



Masking element (cover) for mcr Prosmoke CE/FS (*)

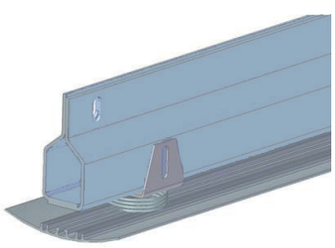
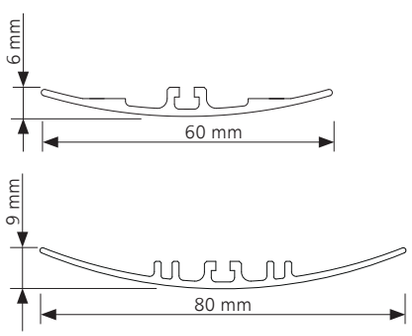


Fig. 184 – Masking element with spring and bottom balast



Curtain with side guides

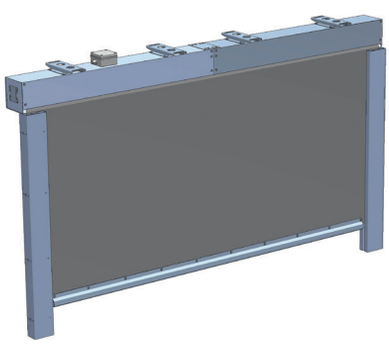


Fig. 185 – Side guides installed at both sides of curtain

12.1.10. mcr PROSMOKE FS smoke curtains control

mcr PROSMOKE FS automatic smoke curtains remain in stand-by position at continuous power supply from mcr 0204 or mcr 9705 control unit. In case of interrupting the supply, which may happen as a result of:

1) alarm signal,
2) failure of 230V~ power to mcr 0204/ mcr 9705 control unit, or discharging of batteries in the control unit,
3) interruption of circuit between mcr 0204/ mcr 9705 control unit and MECU XL motor control system,
4) smoke curtain rolls down by gravity force to designed height.

Restoring of the curtain to stand-by position is performed by an actuator:

1) after resetting fire alarm signal,
2) after deleting alarm in mcr 0204/ mcr 9705 control unit
3) by pressing RPO-1 emergency pushbutton.

mcr PROSMOKE FS drive system comprises BECKER motor integrated into the curtain casing.

- XL40 motor parameters:
- torque - 40 Nm
- power 230V~ (motor)
- control 24V- (brake)
- work mode – max. 8 minutes
- installed horizontally
- working speed 8 min^{-1}
- thermal protection of engine by built-in Thermo switch
- powder painted motor casing
- performance efficiency: 10000 cycles

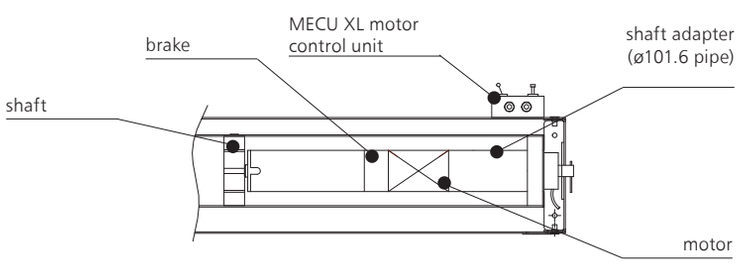


Fig. 186 – mcr PROSMOKE FS curtain drive

12.1.11. cabling installation diagram - mcr PROSMOKE FS single curtain

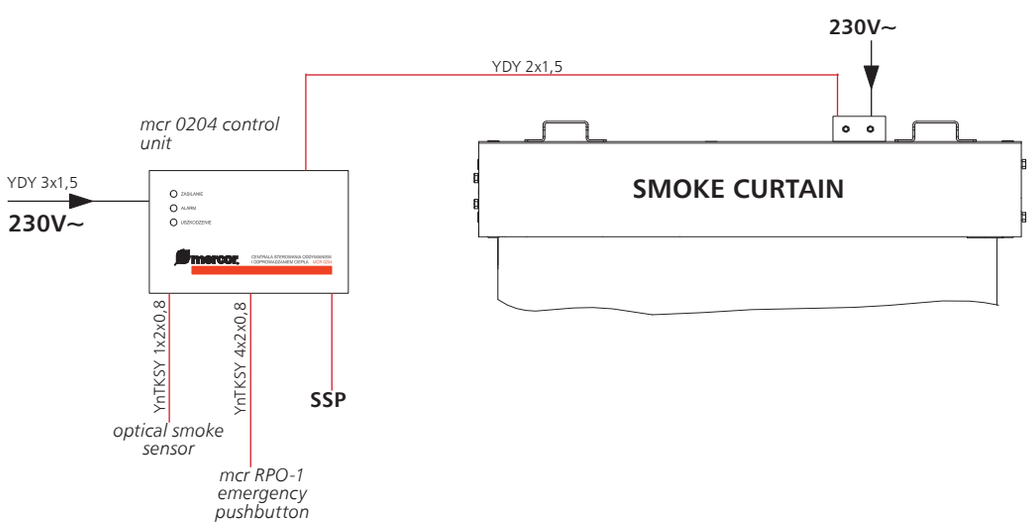


Fig. 187 – Cabling diagram of PROSMOKE FS single curtain

12.1.12. cabling diagram - mcr PROSMOKE FS modular curtains

mcr 0204 control unit - possible connection of up to 8 curtain modules

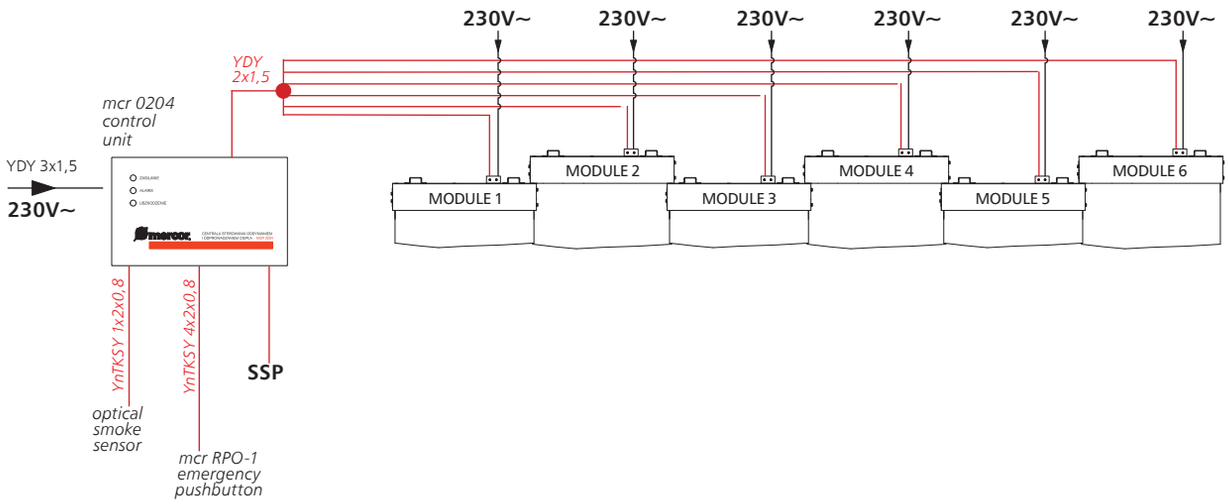


Fig. 188 – Connection diagram of maximum number of mcr PROSMOKE FS curtain modules to mcr 0204 control unit

mcr 9705-5A control unit - possible connection of up to 12 curtain modules

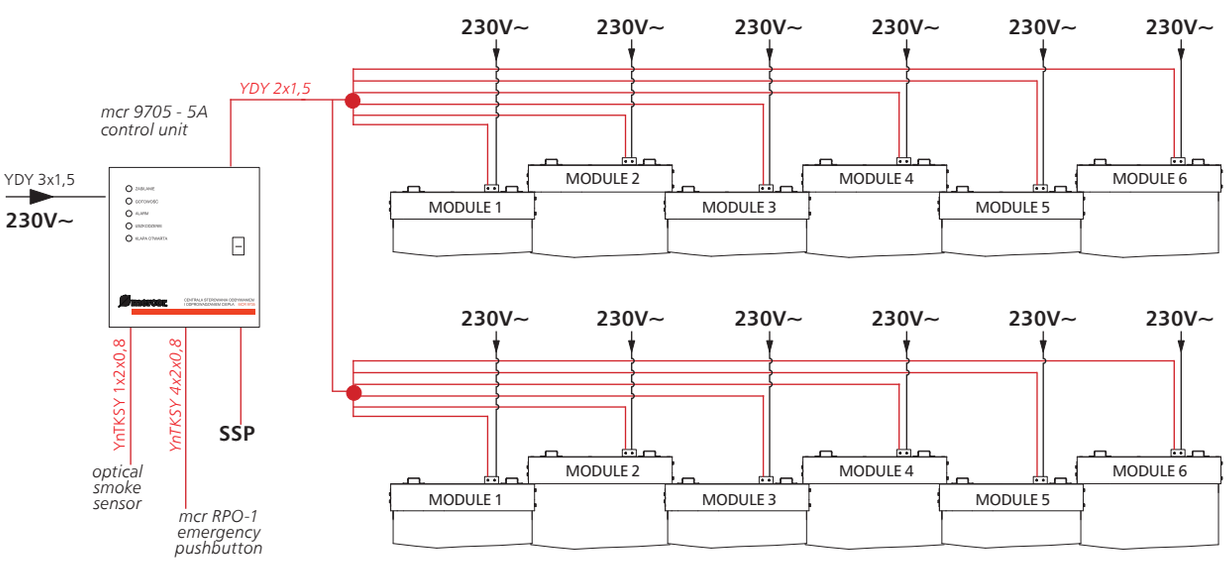


Fig. 189 – Connection diagram of maximum number of mcr PROSMOKE FS curtain modules to mcr 9705 control unit

TIME OF HOLDING THE CURTAIN IN STAND-BY POSITION BY MCR CONTROL UNIT AT BASIC POWER FAILURE			
mcr 9705 - 5A control unit	1 curtain – up to 20 h	2 curtains – 10 h	3 curtains – 6.5 h etc.
mcr 0204 control unit	1 curtain – up to 12 h	2 curtains – 6 h	3 curtains – 4 h etc.

12.1.13. mcr PROSMOKE CE curtains control

In case of fire, mcr PROSMOKE CE automatic smoke curtains roll down:
1) automatically, after signal from fire signaling system,
2) automatically, through the fuseing of optical smoke sensors (or thermal sensors) as a result of increase in smoking (temperature),
3) manually, by pressing of RPO-1 emergency pushbutton.

Alarm signal is given to mcr 9705 control unit. The signal is then transmitted to the curtain actuator, which rolls it down to an appropriate, designed height.

Restoring of the curtain to stand-by position is performed by an actuator:
1) after resetting fire alarm signal,
2) after deleting alarm in mcr 9705 control unit,
3) by pressing RPO-1 emergency pushbutton.

mcr PROSMOKE CE curtain drive system comprises BECKER motor, integrated in the curtain casing.

- R60/8G motor parameters:
- torque - 60 Nm
- power: 24V-
- work mode – max. 4 minutes
- installed horizontally
- working speed 8 min^{-1}
- electromagnetic brake in closed circuit
- powder painted motor casing
- performance efficiency: 1000 cycles

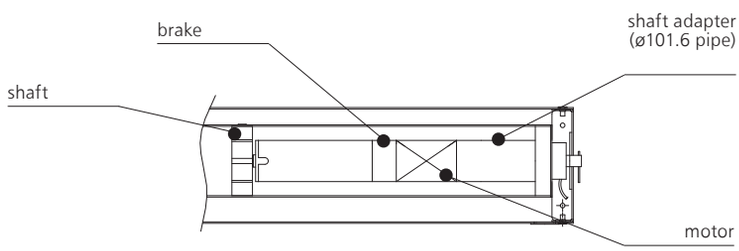


Fig. 190 – Cabling diagram of PROSMOKE CE single curtain

12.1.14. cabling diagram - mcr PROSMOKE CE single curtain

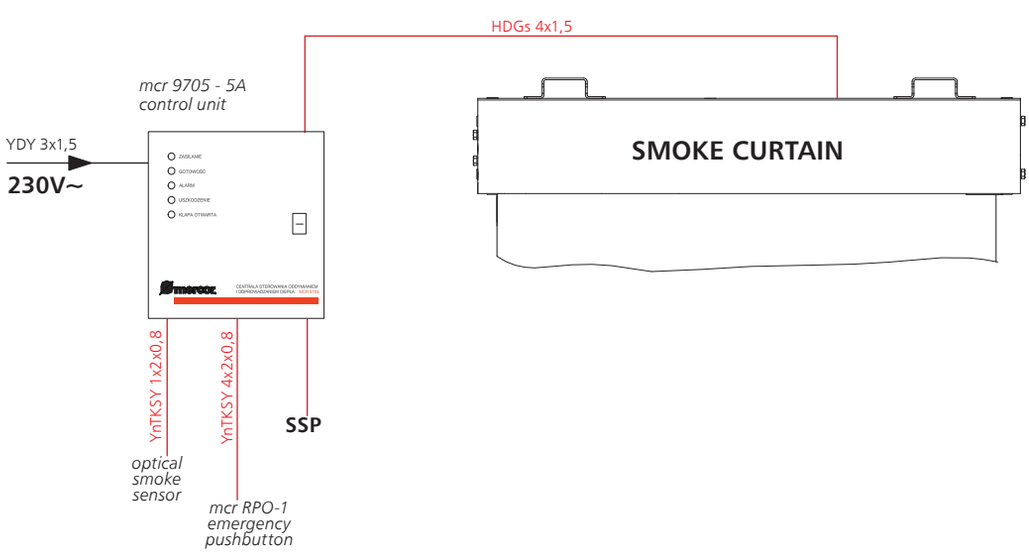


Fig. 191 – PROSMOKE CE curtains drive

12.1.15. cabling diagram - mcr PROSMOKE CE modular curtains

mcr 9705 - 5A control unit - possible connection of up to 2 curtain modules

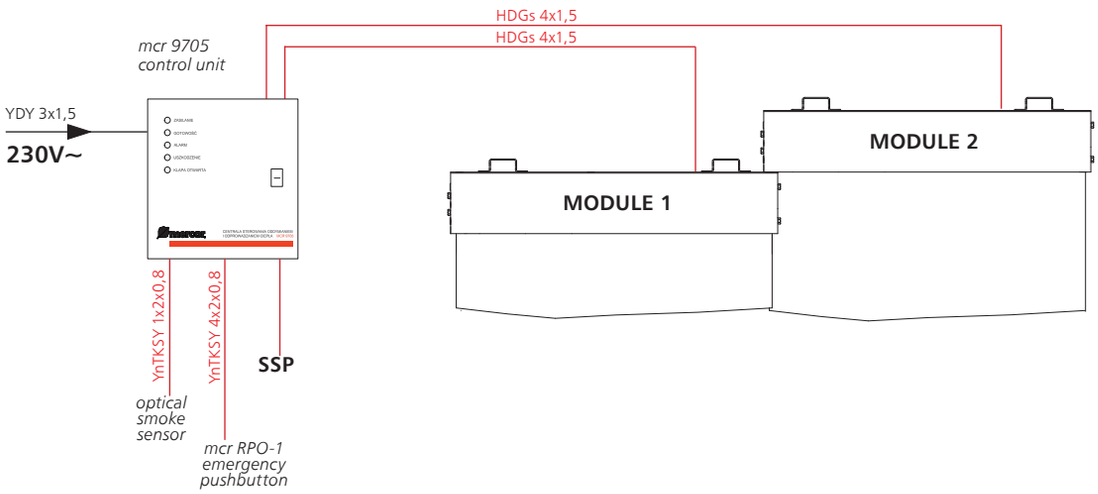


Fig. 192 – Connection diagram of maximum number of mcr PROSMOKE CE curtain modules to mcr 9705 control unit

mcr 9705 - 5A control unit with mcr R0424 extension module - possible connection of up to 4(*) curtain modules

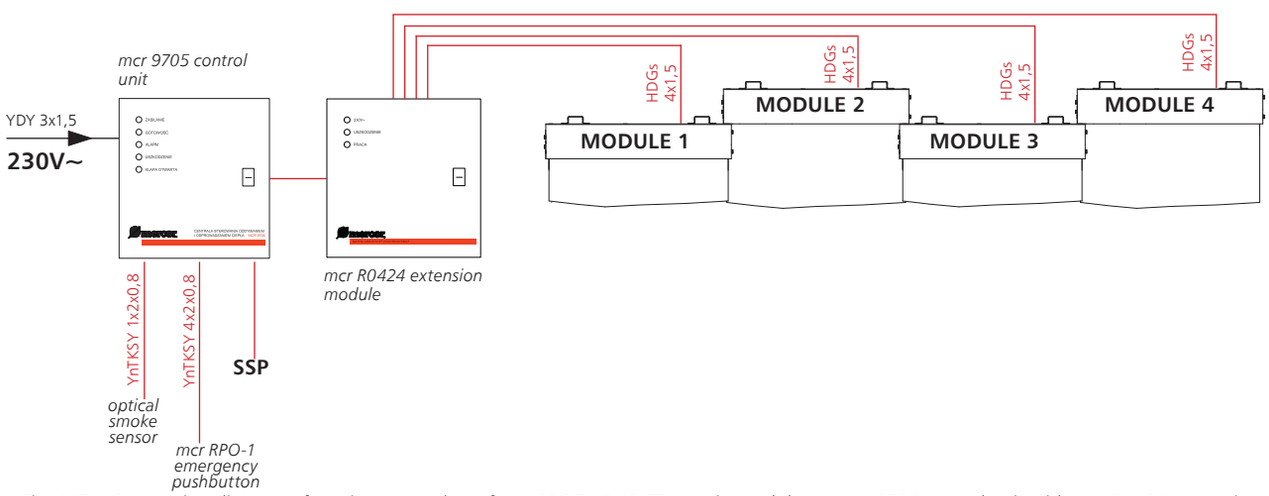


Fig. 193 – Connection diagram of maximum number of mcr PROSMOKE CE curtain modules to mcr 9705 control unit with mcr R0424 extension module

mcr 9705 - 5A control unit with mcr R0424 extension module - possible connection of up to 5 (**) curtain modules

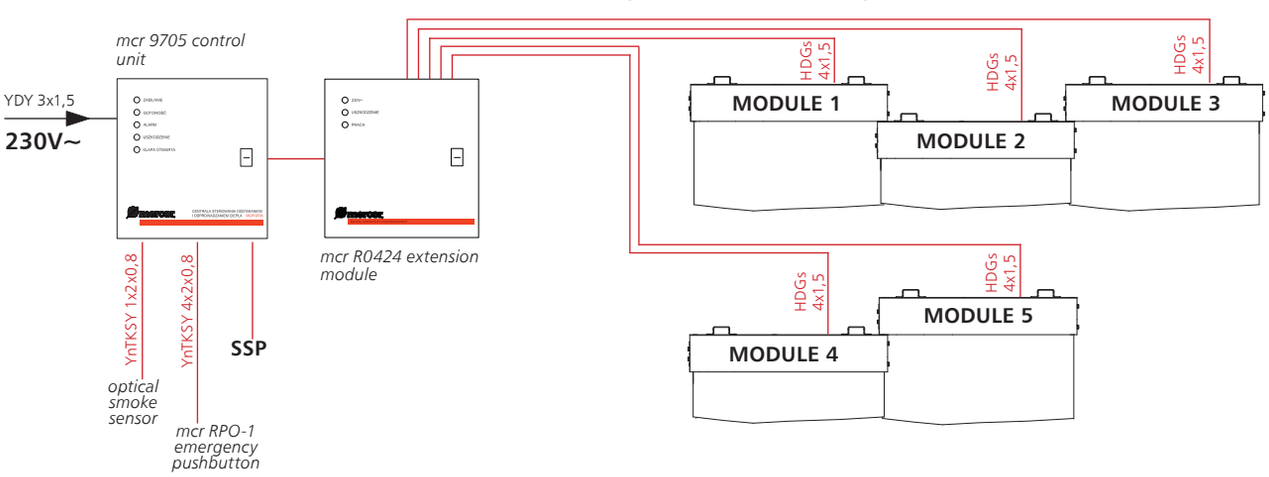


Fig. 194 – Connection diagram of maximum number of mcr PROSMOKE CE curtain modules to mcr 9705 control unit with mcr R0424 extension module

(*) Maximum curtain module width 4 ÷ 6 m

(**) Curtain module width 3.99 m

12.1.15. cabling diagram - mcr PROSMOKE CE modular curtains

mcr 9705 - 5A control unit with mcr R0448 extension module - possible connection of up to 8 (*) curtain modules

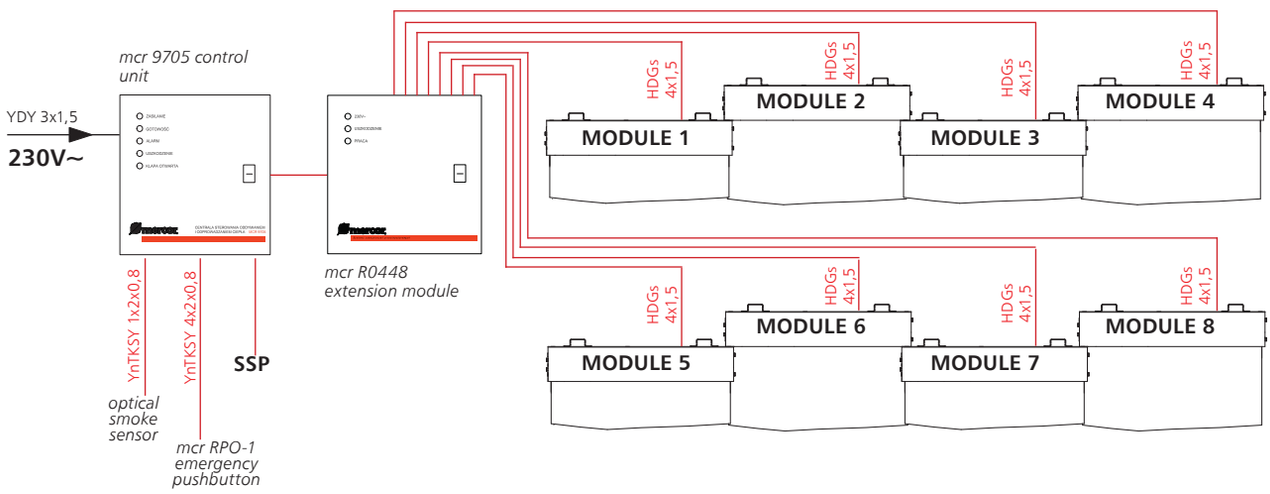


Fig. 195 – Connection diagram of maximum number of mcr PROSMOKE CE curtain modules to mcr 9705 control unit with mcr R0448 extension module

mcr 9705 - 5A control unit with mcr R0448 extension module - possible connection of up to 10 (*) curtain modules

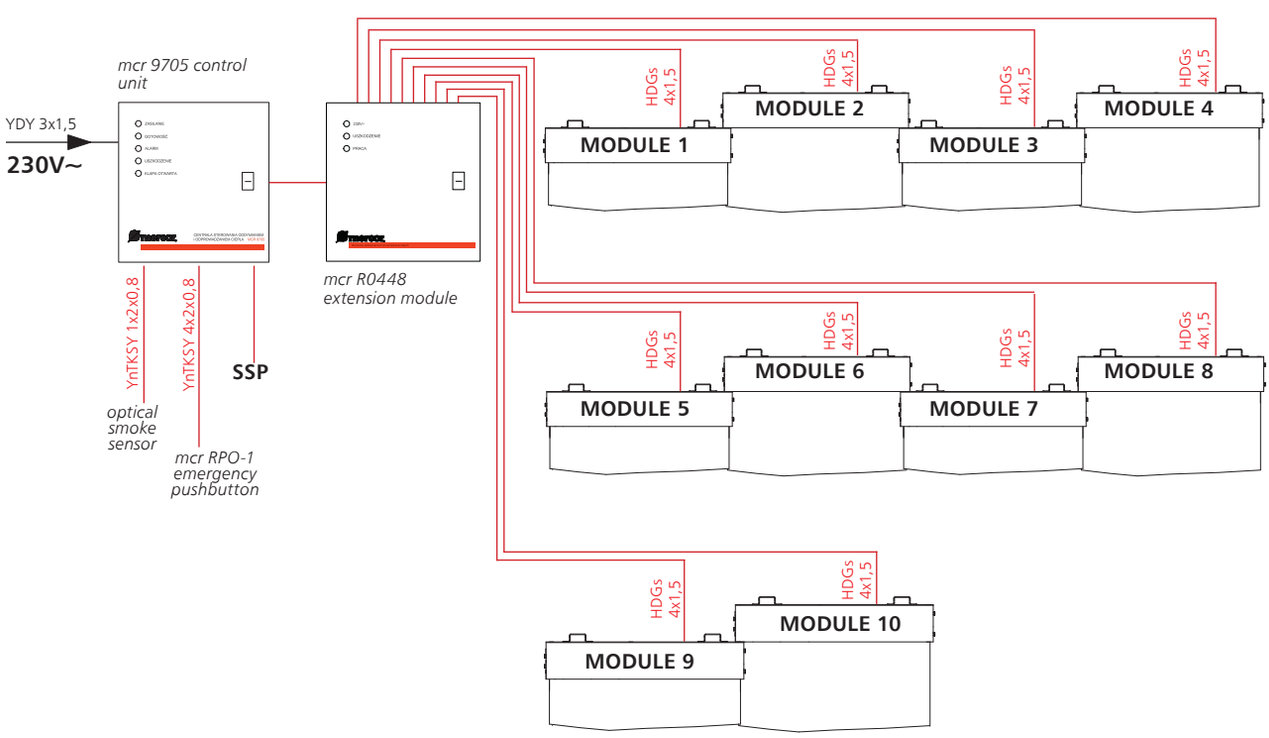


Fig. 196 – Connection diagram of maximum number of mcr PROSMOKE CE curtain modules to mcr 9705 control unit with mcr R0448 extension module

(*) Maximum curtain module width 4 ÷ 6 m
(**) Curtain module width 3.99 m

The time of keeping the curtain in stand-by position by mcr 9705 control unit at basic power failure is 72 hours.

12.1.16. installation

- smoke curtains must be installed in accordance with the construction design, while maintaining all designed gap dimensions, as specified in PN-EN 12101-5, with maximum values as follows:
- 20 mm for curtains of height up to 2 m
- 40 mm for curtains of height 2 - 6 m
- 60 mm for curtains of height above 6 m
- when designing the load bearing element, curtain weight of about 250-300 N/mb must be taken into consideration; different types of handles and curtain casings must be used depending on curtain height and installation place
- the use of masking element allows to completely hide the curtain in the under-ceiling space when installing modular curtains; observe the order of installation of individual modules as follows: end module, middle modules, far-end module
- when installing modular curtains it is necessary keep the required overlapping dimensions of smoke-tight fabric of individual modules

Automatic smoke curtain order of installation:

1. casing with the use of handles with steel rods to the building's bearing structure
2. curtain weight
3. masking element

Installing automatic curtains to ceiling

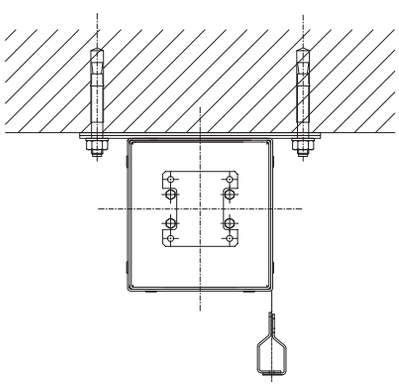


Fig. 197 – Fixing curtain directly to ceiling using flat handle

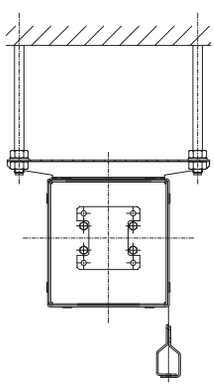


Fig. 198 – Fixing curtain directly to ceiling using wide handle

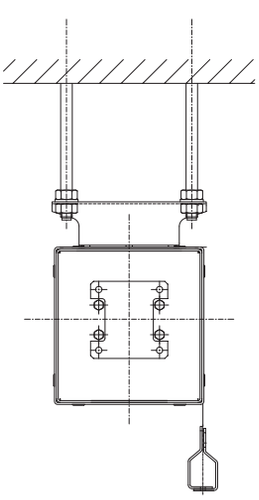


Fig. 199 – Fixing curtain to rods using narrow handle

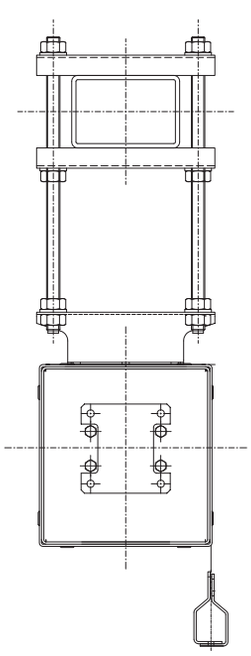


Fig. 200 – Fixing curtain to section using narrow handle and clamp

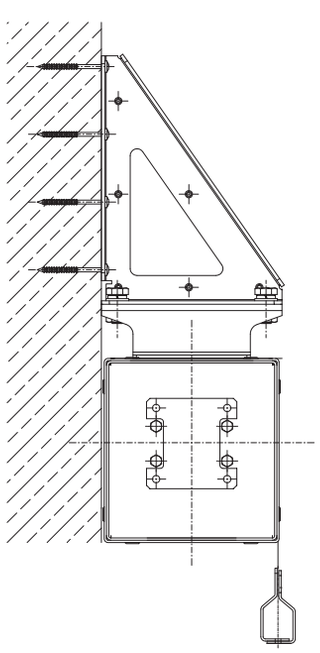


Fig. 201 – Fixing curtain to wall using narrow handle

12.2. fixed smoke curtains - fabric, S type

12.2.1. technical description of standard

- Declaration of Conformity CE 1396-CPR-0022 as per EN 12101-1:2005/ A1:2006,
- S type fixed smoke curtains serve the purpose of separating smoke zones under the building ceiling,
- they are mainly used in large-area buildings, such as warehouses, production and sports halls or malls, where the use of light curtains of large size and guaranteed resistance to high temperature is necessary,
- smoke-tight fabric made of glass fibre double-coated with polyurethane,
- load bearing element made of galvanized or painted steel sheet in form of angle or flat profiles,
- pressing profile made of galvanized or painted steel sheet,
- bottom balast made of steel elements of maximum length 3 m.

12.2.2. design of fabric-made fixed smoke curtain

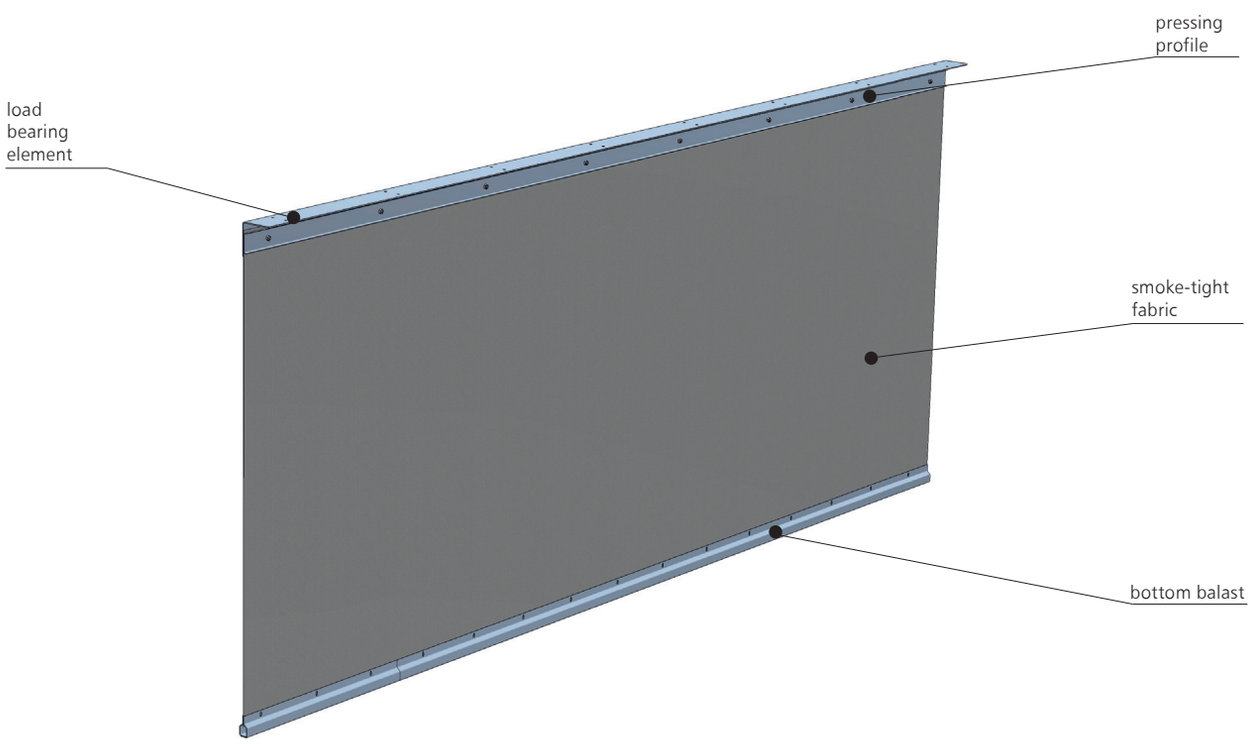


Fig. 202 – Design of Prosmoke S fixed fabric-made smoke curtain

2.3. non-standard options

- optional holes in the fabric for technical routing,
- steel elements painted to any RAL color.

12.2.4. technical drawings

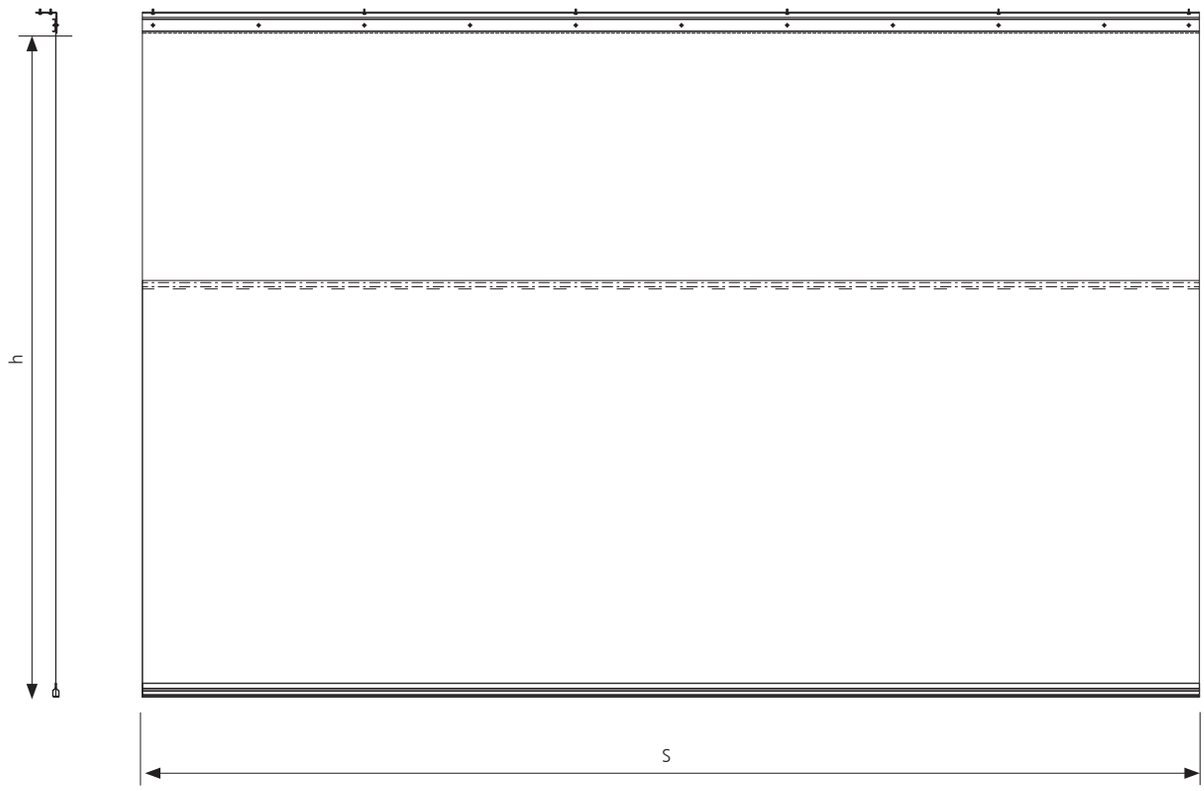


Fig. 203 – mcr PROSMOKE S fixed smoke curtain

h – curtain height [m]
s – curtain length [m]

12.2.5. technical details

PARAMETERS	MCR PROSMOKE S SMOKE CURTAIN
length	unlimited
height	min. 0.5 m max. 6.5 m
curtain type	SSB
classification	D180, DH60
air permeability	≤9,4 m^3/h

12.2.6. installation

- installation of fixed curtains made of smoke-tight fabric should be made in accordance with the construction design,
- mcr PROSMOKE S smoke-tight fabric fixed curtains are fixed to permanent elements of the building (lintel, ceiling, wall, beam),
- curtain may be installed using metal joints (anchors, rods, screws), in intervals on the curtain's load bearing element of 1 m,
- space between the ceiling and curtain should be covered with a material of A1 non-flammability class (as per EN 13501-1:2005).

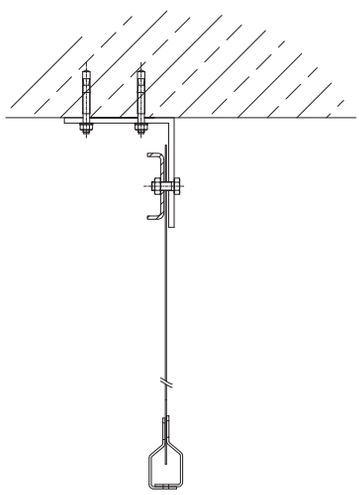


Fig. 204 – S type curtain installation under lintel, using angle profile

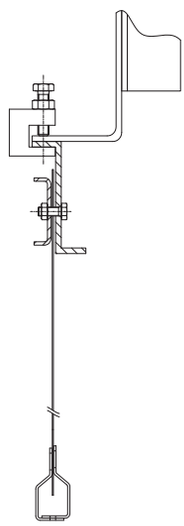


Fig. 205 – S type curtain installation to beam, using vice

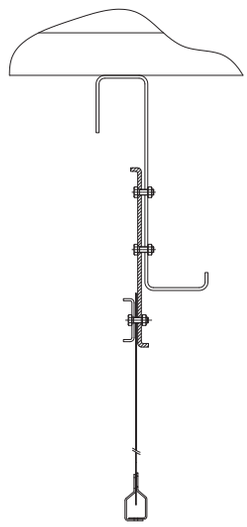
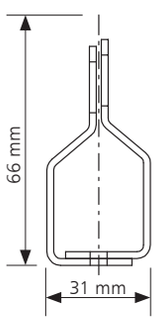


Fig. 206 – S type curtain installation to lintel



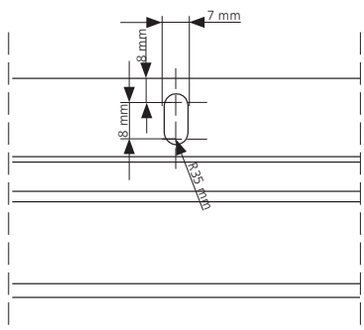


Fig. 207 – Bottom balast of S type fixed curtain

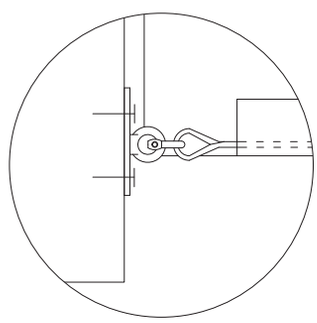


Fig. 208 – Fixture of curtain bottom with cable

12.3. fixed smoke curtains - steel, ST type

12.3.1. technical description of standard

- Declaration of Conformity CE 1396-CPR-0037 as per EN 12101-1:2005/ A1:2006,
- mcr PROSMOKE ST fixed smoke curtains are used for separating smoke zones in large hall buildings, mainly production and storage halls, where no limitations to the loading of bearing structure of the building exist,
- made of TR35 trapezoidal steel sheet of 0.5 mm thickness, zinc coated, Al-Zn or polyester paint,
- bracing elements in the form of galvanized or painted square pipes,
- bracing profile in the shape of steel angle profile,
- covering profile made of galvanized or painted steel sheet,
- load bearing element of mcr PROSMOKE ST curtain shaped as angle or flat profile made of galvanized or painted steel sheet.

12.3.2. design of steel fixed smoke curtain

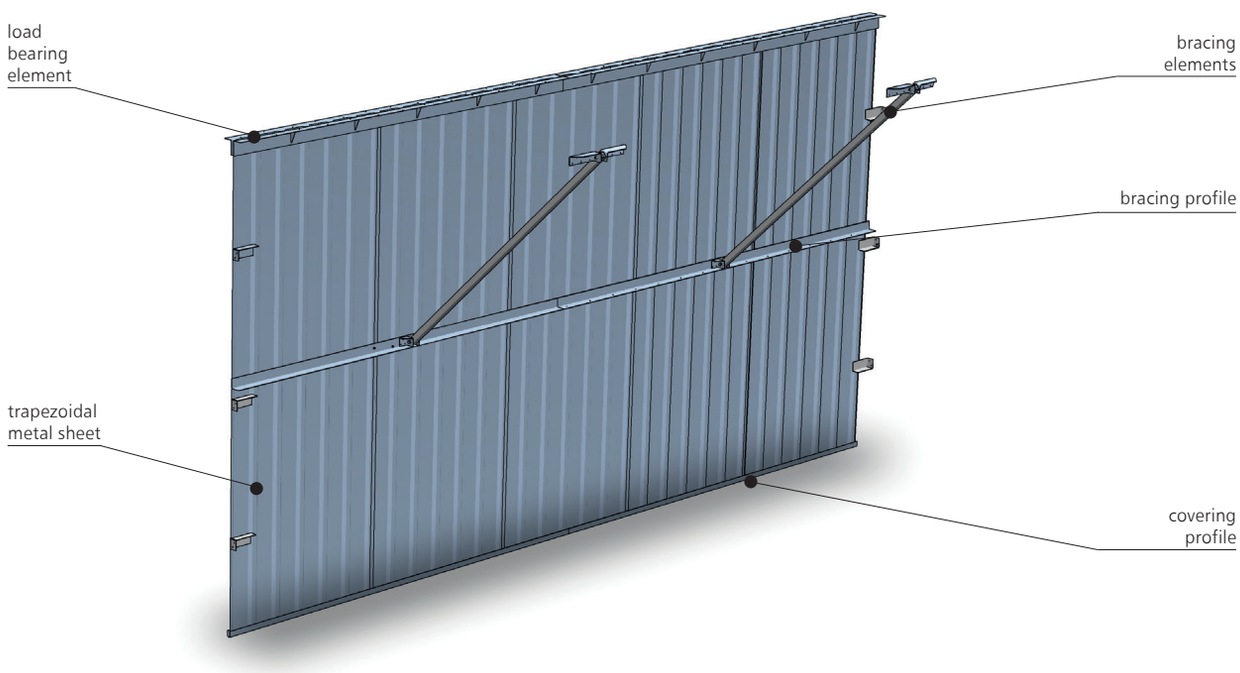


Fig. 209 – Design of mcr PROSMOKE ST fixed smoke curtain

12.3.3. non-standard options

- optional holes in the fabric for technical routing steel duct of maximum dimensions 600 mm x 300 mm; steel ducts fixed to curtain using angles, sealed at circumference on both sides,
- additional bracing elements used for steel curtains of height ≥ 2.5 m:
  - steel angle along curtain, up to its mid-height,
  - angle profiles made of steel squared pipe, placed every 3 m,
- metal sheet painted on both sides to any RAL color.

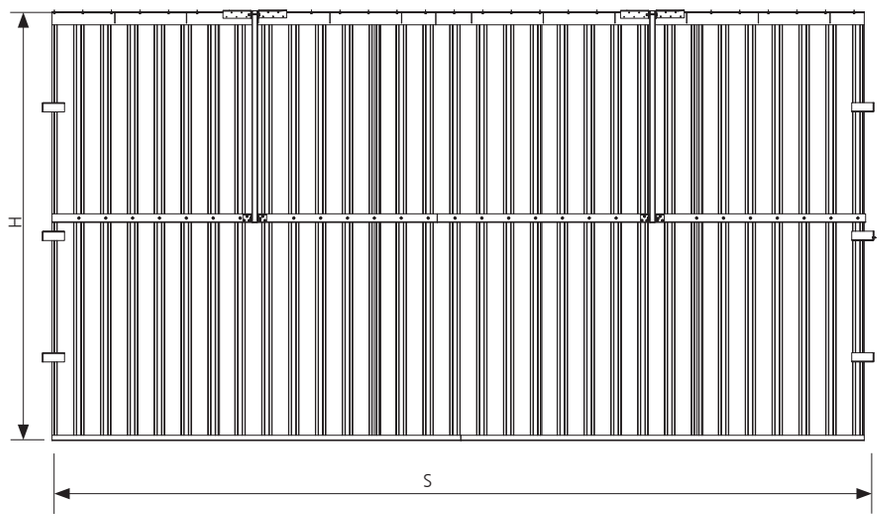


Fig. 210 – mcr Prosmoke ST Steel sheet fixed curtain.

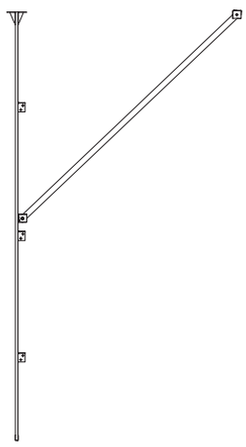


Fig. 211 – Side view of steel sheet fixed curtain.

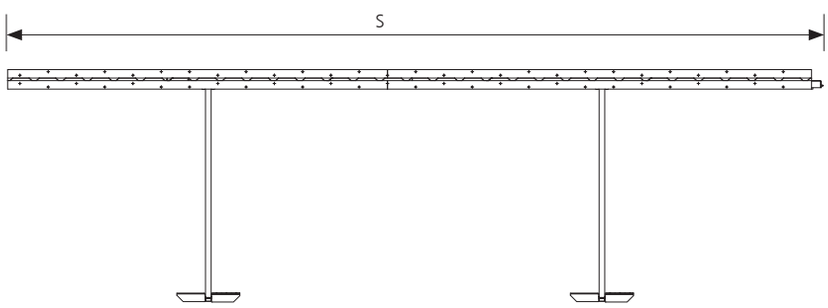


Fig. 212 – Top view of steel sheet fixed curtain.

H – curtain height [m]
s – curtain length [m]

12.3.5. technical details

PARAMETERS	mcr PROSMOKE ST curtains
length	unlimited
height	min. 0.5 m max. 4,5 m
curtain type	SSB
classification	DH120
curtain sheet weight	4 kg/m^2
standard elements weight	5÷6 kg /1 rm of curtain
bracing elements weight	2÷3 kg /1 rm of curtain

12.3.6. installation

- fixed smoke curtains made of steel sheet should be installed in accordance with the construction design, and in conformance with EN 12101-1 standard,
- steel curtains are fixed to structural elements of the building (lintels, beams, girder, etc.) using suitable steel joints,
- installation penetrations can be made in steel curtains using a steel duct of maximum dimensions 600 mm x 300 mm; the duct is fixed to steel curtain using angles, and then sealed at circumference on both sides.

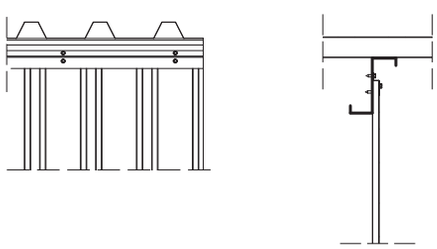


Fig. 213 – Sample installation of mcr PROSMOKE ST steel curtain along beam

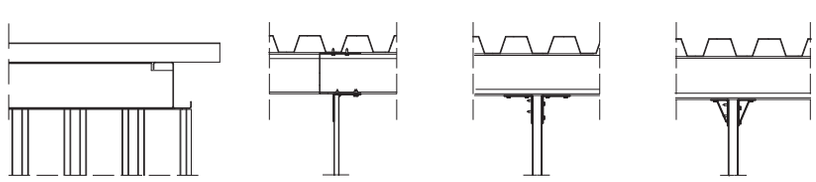


Fig. 214 – Sample installation of mcr PROSMOKE ST steel curtain across beam

13. general description

Smoke exhaust control systems

Smoke exhaust control systems are dedicated to smoke vents, but may also control other devices, such as: smoke exhaust louvered vents, automatic smoke curtains, or smoke exhaust and air inlet windows.

The choice of control type depends on the function of the protected building, the type of other fire safety elemets with which the natural smoke exhaust control system is to work, financial expectations of investor, and other requirements the user may have.

Pneumatic smoke exhaust control system

Industrial and warehouse facilities. Its' biggest advantage is the simplicity of the design and execution, reliability of operation, and the attractive price. It is most often seen in co-operation with sprinklers, where the natural smoke exhaust system is activated through thermal fuses calibrated to appropriate temperature, in relation to the sprinkler system.

The system is supplied from cartridges containing compressed CO_2. Installations are most often copper pipe, with compression fittings used for joining. The system may be fixed to structural elements, eliminating the need of introducing additional installation channels. Manual activation of the smoke exhaust system is operated by the lever in alarm boxes. Pneumatic actuators feature higher operating parameters than electric actuators. The greater push and pull force of the pneumatic actuators' piston rod, and the shorter time of work cycle are the parameters that make this type of control preferable for vents of bigger dimensions.

In buildings with compressed air systems, it is worth to consider using it as a supply source for vents used for ventilation purpose. Smoke exhaust vents with additional ventilation function greatly improve the comfort of using the hall, at a relatively minor increase of costs. It is possible to integrate weather automatics with the control system, through additional electric valves installed in ventilation boxes.

Smoke exhaust electric control system

Natural smoke exhaust systems with electric control are usually designed for staircases, low and medium-high buildings, and in evacuation routes, such as corridors between offices, passages and atriums in malls. They are used less often in large-area halls, due to high costs.

Smoke exhaust vents may be opened manually, e.g. by pressing smoke exhaust alarm button, automatically - through smoke detectors, or remotely - through smoke detection system. In such case, the system is starting to work in the initial fire phase, improving evacuation conditions of building users, or - with more sophisticated control systems - the smoke exhaust scenario may be adapted to changing fire conditions.

A frequent addition to the vents control system are buttons for manual activation of natural ventilation. The ventilation system may be equipped with a weather monitoring unit with wind-rain sensors, allowing automatic closing of vents in case of adverse weather conditions.

13.1. system description

Smoke vents with pneumatic smoke exhaust control system, of spot type, or vents installed in continuous rooflights are mainly used in large-area, single-storey buildings, such as storage halls, industrial halls, industrial-storage halls or shopping malls.

Components of pneumatic smoke exhaust control system
- mcr PROLIGHT smoke vent equipped with: pneumatic actuator and thermal valve with thermal fuse (alcohol ampule) and CO2 cartridge;
- alarm boxes with CO_2 cartridges: alarm opening manually and through electric signal (24 V; 0.3A);
- pneumatic smoke exhaust installation made of copper pipe;

Pneumatic smoke exhaust control system may be activated
- automatically – after detecting temperature increase by thermal valves at 68/93/110/141°C, installed in vents.
- automatically (remotely) – through 24V- signal;; 0.3A, e.g. from fire signaling central unit (as option, after connection)
- manually – by operator, using CO_2 alarm box.

The main advantages of pneumatic control system of vents are: easy installation, high reliability, lower price in comparison with electric control systems.

13.1.1. flow controller with thermal fuse (thermal valve)

Flow controller with thermal fuse, also called thermal valve is used for supplying pneumatic smoke exhaust actuator from its integrated CO_2 cartridge or CO_2 installation. The releasing of CO_2 cartridge installed in the regulator is performed automatically after exceeding the temperature of thermal fuse (alcohol ampule) - its breakage causes the release of the needle and punching the CO_2 cartridge protection. The released gas is directed to pneumatic smoke exhaust actuator, causing the opening of the vent leaf.

Specific features of thermal valves:
- options:
  -TAVE/TAG WV – single-way
  -TAVZ/TAG W – double-way,
- disposable CO_2 cartridge with 1/2" UN threaded connection,
- alcohol ampules for trigger temperatures: 68°C, 93°C, 110°C, 141°C,
- maximum working pressure: 6 MPa,
- for needle tensioning and ampule replacement in TAVE/TAVZ thermal fuses any tools are required.

TAVE / TAG WV type
- smoke exhaust function: manual and remote vent opening (opening only),
- thermal release valve adapted to operation with an alarm box equipped only with manual emergency opening function,
- may be used for single and triple pipe installations (example executions of pneumatic control system on pages 197-198),
- 2 x 1/8" connectors,
- integrated initial valve for deaeration of the system or for connecting other control devices (e.g. alarm box or
- ventilation box),
- optional remote activation through electric or pneumatic signal, allowing co-operation with other control systems, e.g. a fire alarm signalling system.

Fig. 215 – TAVE thermal valve

TAVZ / TAG WV type
- smoke exhaust function: manual and remote vent opening and closing (opening, and possible remote closing),
- thermal release valve adapted to operation with an alarm box equipped only with manual emergency opening function,
- may be used for double and four-pipe installations (example executions of pneumatic control system on pages 197-198),
- 4 x 1/8" connections,
- integrated initial valve for deaeration of the system or for connecting other control devices (e.g. alarm box or
- ventilation box),
- optional remote activation through electric or pneumatic signal, allowing co-operation with other control systems, e.g. a fire alarm signalling system.

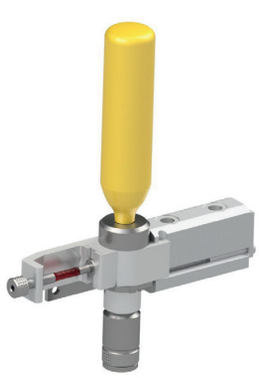


Fig. 216 – TAVZ thermal valve

13.1.2. pneumatic actuator

Pneumatic actuator is used for opening the vents' leafs for ventilation and/or smoke exhaust function:

- double action pneumatic actuator (opening/closing),
- body of anodised aluminium,
- piston rod of stainless steel with anti-dust protection,
- recommended working pressure: 0.6 ÷ 1.0 MPa,
- maximum static working pressure: 6.0 MPa,
- locking in fully extended position – other executions optional,
- maximum axial force transferred by lock: 8000 N,
- manual lock releasing possible.

Fig. 217 – Pneumatic actuator

13.1.3. alarm boxes

Alarm boxes are devices used for remote emergency opening of vents using the energy of compressed CO_2 contained in the cartridge installed in the box. The release of gas occurs after manual activation of the valve by using the marked lever which causes the release of the needle, the punching of the CO_2 cartridge, and then the outflow of gas to the system.

Specific features:

- steel sheet box painted in RAL3000 red color,
- lockable cover,
- lever or button controlling emergency opening, including activation indicator, visible through glass panel,
- replaceable glass panel,
- equipped with valves in a configuration depending on the customer's needs; basic executions: opening only, or opening and closing; optionally: opening by remote 24V signal,
- sizes and number of cartridges in the box dependent on customer's application; box size dependent on the size of installed cartridges,
- connections for 6 mm pipe; optionally: for 8 mm pipe, output in upper part,
- connections for CO_2 cartridges: ½"UNF,
- working temperature: –20 ÷ 50 °C,
- maximum working pressure in CO_2 circuits: 8.0 MPa,
- note: connection of boxes in series or parallel is not possible without additional elements,
- designed for single group of smoke vents; on special request for larger number of groups,
- AK10 and AK11 type of boxes with reserve cartridge handles,
- AK6 and AK7 type of boxes without reserve cartridge handles.

Fig. 218 – AK type 10.5 alarm box (closed and after opening)

Dimensions of selected ventilation boxes

BOX TYPE	BOX DIMENSIONS - WIDTH X HEIGHT X DEPTH [MM]				MAXIMUM CARTRIDGE SIZE [g]
	MANUAL OPENING	MANUAL AND ELECTRIC OPENING	MANUAL AND ELECTRIC CLOSING	MANUAL AND ELECTRIC OPENING, MANUAL CLOSING	
AK6	110 x 500 x 100	-	-	-	500
AK7	110 x 300 x 100	-	-	-	55
AK 10.3	200 x 350 x 130	200 x 350 x 130	-	-	150
AK 10.5	200 x 500 x 130	200 x 500 x 130	-	-	500
AK 10.7	200 x 650 x 130	200 x 650 x 130	-	-	750
AK 10.9	200 x 700 x 170	200 x 700 x 170	-	-	1500
AK 11.3	-	-	300 x 350 x 130	300 x 350 x 130	150
AK 11.5	-	-	300 x 500 x 130	300 x 500 x 130	500
AK 11.7	-	-	300 x 650 x 130	300 x 650 x 130	750
AK 11.9	-	-	320 x 700 x 170	320 x 700 x 170	1500

13.1.4. example configurations of alarm boxes from point

MANUAL ALARM OPENING (HA)

- CO_2 releasing for emergency opening of smoke vents by manual pressing of pushbutton or valve lever.

MANUAL AND REMOTE ALARM OPENING (HXA)

- CO_2 releasing for emergency opening of smoke vents is effected by manual pressing of pushbutton or valve lever, or remotely - through electric (HEA) or pneumatic (HPA) signal, which allows for co-operation with other control systems, e.g. fire alarm signalling system.

MANUAL ALARM OPENING AND CLOSING (HA-HZ)

- CO2 releasing for emergency opening and then closing the vents is effected by manual pressing of button or valve lever,
- the box is equipped with separate cartridges for opening and closing,
- protection against faulty operation: the closing button is not visible through the glass panel,
- after switching from opening to closing function, there is automatic deaeration of the part of installation responsible for opening – it is not necessary to remove the cartridge. Deaeration also occurs after switching from losing to opening.

MANUAL ALARM OPENING AND CLOSING AND MANUAL OPENING (HEA-HZ)

- CO_2 releasing for alarm opening of vents is performed by manual pressing of valve lever, or remotely - through electric (HEA) signal, which allows for co-operation with other control systems, e.g. fire alarm signalling system,
- CO_2 releasing for alarm closing of vents is performed by manual pressing of valve button,
- the box is equipped with separate cartridges for opening and closing,
- protection against faulty operation: the closing button is not visible through the glass panel,
- after switching from opening to closing function, there is automatic deaeration of the part of installation responsible for opening – it is not necessary to remove the cartridge. Deaeration also occurs after switching from closing to opening.

13.1.5. ventilation boxes

Ventilation boxes are used for remote controlling of vent opening and closing actuators for the purpose of ventilating spaces. The boxes contain valves controlling the opening and closing of vents, and an air preparation system.

Specific features:

- steel sheet box painted in RAL 5012 color,
- lockable door, opened to the bottom in standard,
- valves control through levers outside the box,
- 6 mm pipe connections,
- includes filter, dehydrator, pressure reducer (output pressure 0÷1 MPa),
- options 1: valves control lever located inside, no air preparation system, configurations for multiple ventilation and smoke exhaust zones, and co-operation with alarm boxes,
- options 2: possibility of optional co-operation with alarm box for alarm opening or opening and closing, with weather monitoring unit for automatic vent closing in case of rain and strong wind; optional electric or pneumatic remote opening and closing.

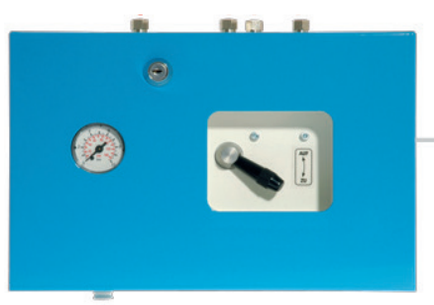


Fig. 219 – Example of ventilation box

Dimensions of selected ventilation boxes

BOX TYPE	BOX DIMENSIONS WIDTH X HEIGHT X DEPTH [MM]	Notes
PLZ 10.0.1	300 x 200 x 80	for single ventilation group, manual control
PLZ 20.1.1-EA230-EZ230	300 x 200 x 80	1 smoke exhaust group – opening only (co-operation with alarm box for opening), 1 ventilation group with possible ventilation control through 230 V~ signal
PLZ 30.1.1-EZ-230-EA230	300 x 200 x 80	1 smoke exhaust group – opening and closing (co-operation with alarm box for opening and closing), 1 ventilation group with possible ventilation control through 230 V~ signal

13.1.6. sample configurations

13.1.6.1 automatic vent opening by thermal valve (smoke exhaust)

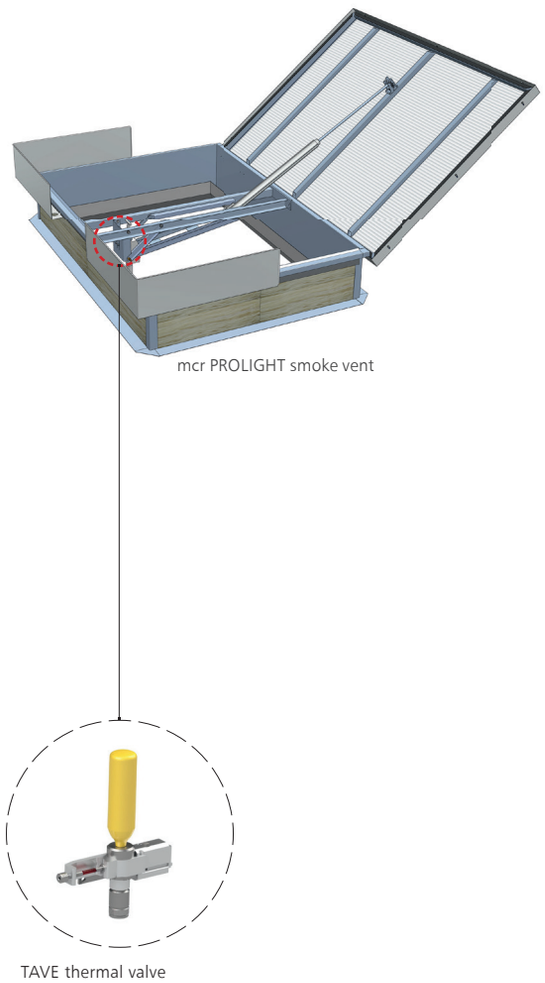


Fig. 220 – Smoke exhaust function – automatic alarm opening, with flow controller with thermal fuse

DEVICES LIST

- pneumatic actuator for smoke exhaust,
- TAVE thermal valve.

NOTE:

Depending on client's needs, the smoke exhaust system devices may vary from the specifications.

13.1.6.2 automatic and manual vent opening (smoke exhaust)

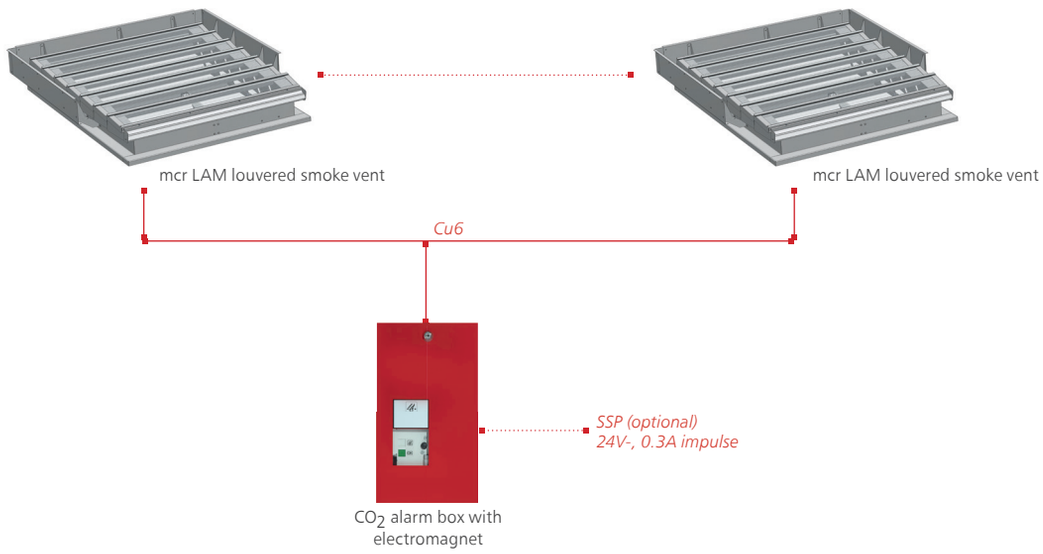


Fig. 221 – Smoke exhaust function – automatic and manual alarm opening, with flow controller with thermal fuse and alarm box

DEVICES LIST

- pneumatic actuator for smoke exhaust,
- TAVE thermal valve,
- alarm box, e.g. AK6-HA-BVE.

NOTE:

Depending on client's needs, the smoke exhaust system devices may vary from the specifications.

13.1.6.3 automatic and manual vent opening (smoke exhaust) with 230V~ electric ventilation

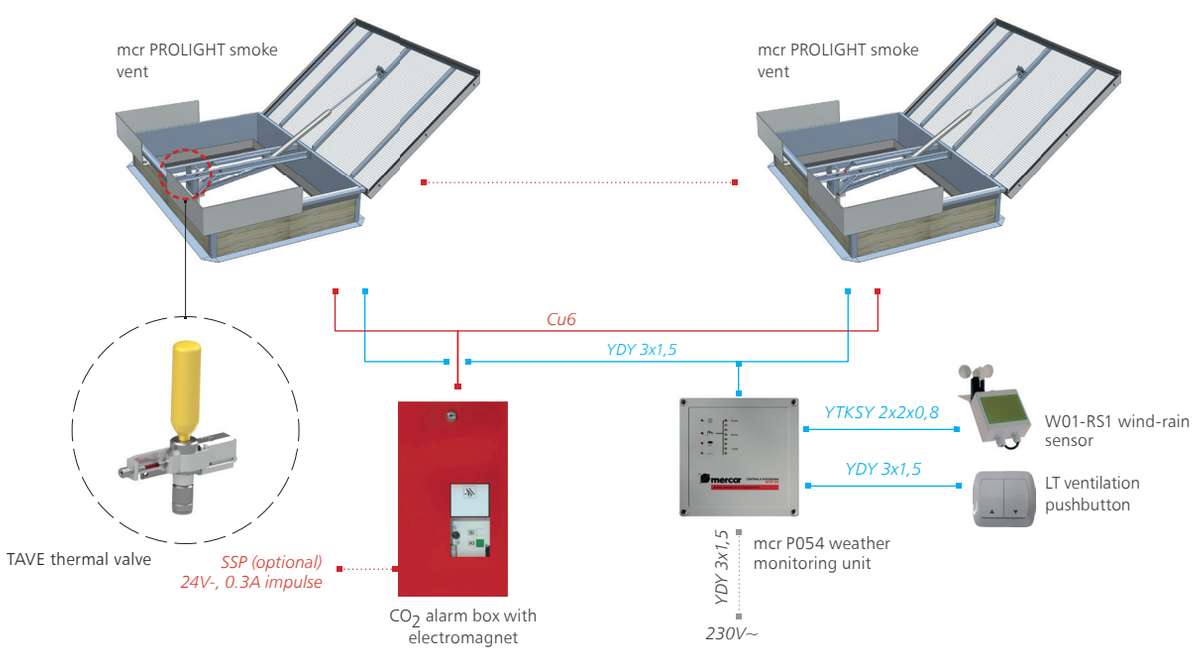


Fig. 222 – Smoke exhaust function – automatic and manual alarm opening, with flow controller with thermal fuse and alarm box and ventilation function with 230V~ electric actuator

DEVICES LIST

- pneumatic actuator for smoke exhaust,
- TAVE thermal valve,
- alarm box, e.g. AKx-CA-HA-SA,
- E type actuator for daily ventilation,
- ventilation pushbutton,
- mcr P054 weather monitoring unit,
- wind-rain sensor.

NOTE:

Depending on client's needs, the smoke exhaust system devices may vary from the specifications.
The use of weather automatics is recommended for systems with daily ventilation system.

13.1.6.4 automatic and manual vent opening, manual vent closing (smoke exhaust)

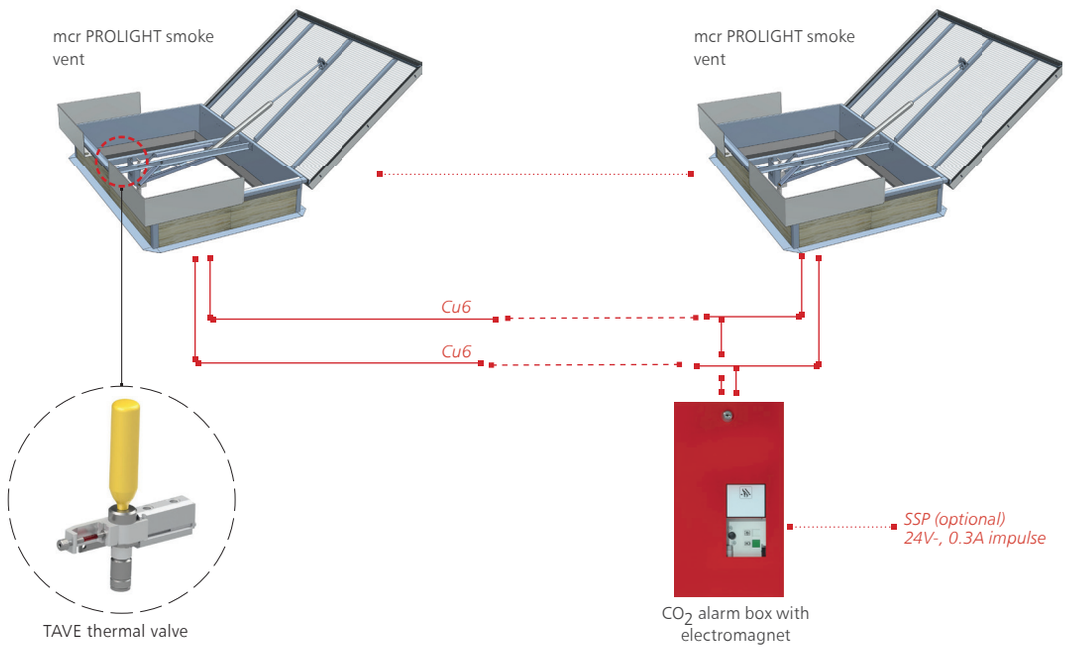


Fig. 223 – Smoke exhaust function – automatic alarm opening and manual opening, manual closing with flow controller with thermal fuse and open/shut alarm box.

DEVICES LIST
- pneumatic actuator for smoke exhaust,
- TAVZ thermal valve,
- alarm box with HA-HZ option, e.g. AKx-CA-HA-HZ-SA.

NOTE:
Depending on client's needs, the smoke exhaust system devices may vary from the specifications.

13.1.6.5 automatic and manual vent opening, manual vent closing (smoke exhaust) with 230V~ electric ventilation

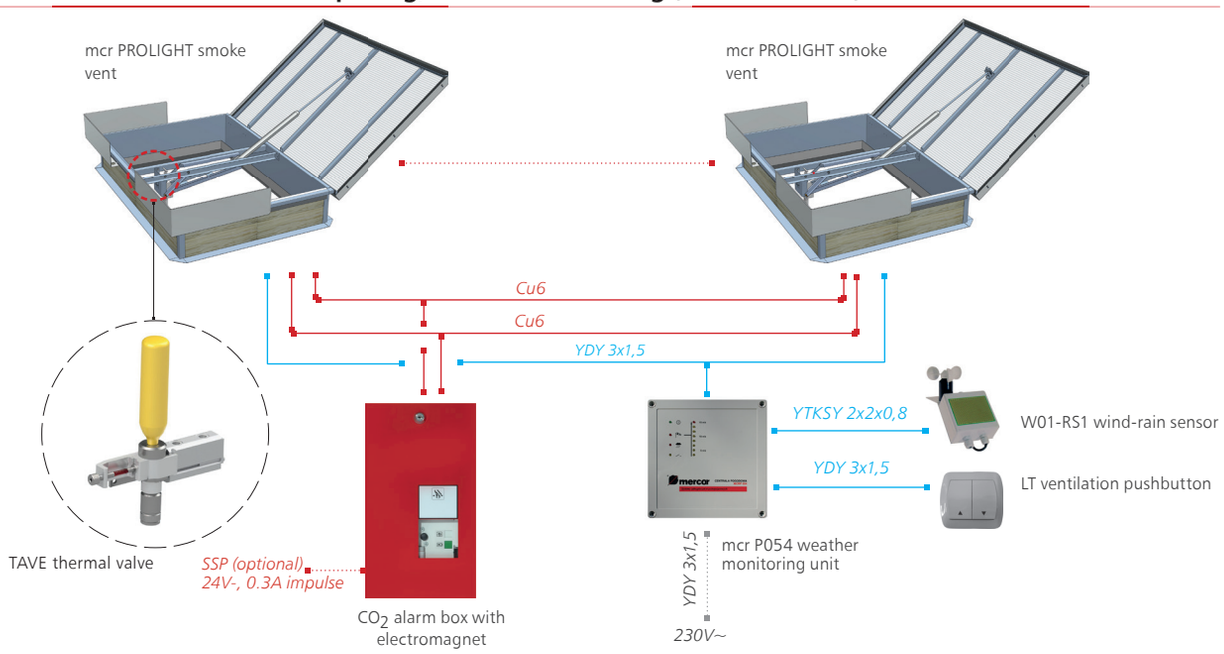


Fig. 224 – Smoke exhaust function – automatic and manual alarm opening, manual closing with flow controller with thermal fuse and open/closed alarm box - and ventilation function with electric actuator

DEVICES LIST
- pneumatic actuator for smoke exhaust,
- TAVZ thermal fuse,
- alarm box, e.g. AKx-CA-HA-HZ-SA,
- E type air inlet actuator,
- ventilation pushbutton,
- mcr P054 weather monitoring unit,
- wind-rain sensor.

NOTE:
Depending on client's needs, the smoke exhaust system devices may vary from the specifications.
The use of weather automatics is recommended for systems with ventilation system.

13.1.6.6 automatic and manual vent opening, manual vent closing (smoke exhaust) with pneumatic ventilation

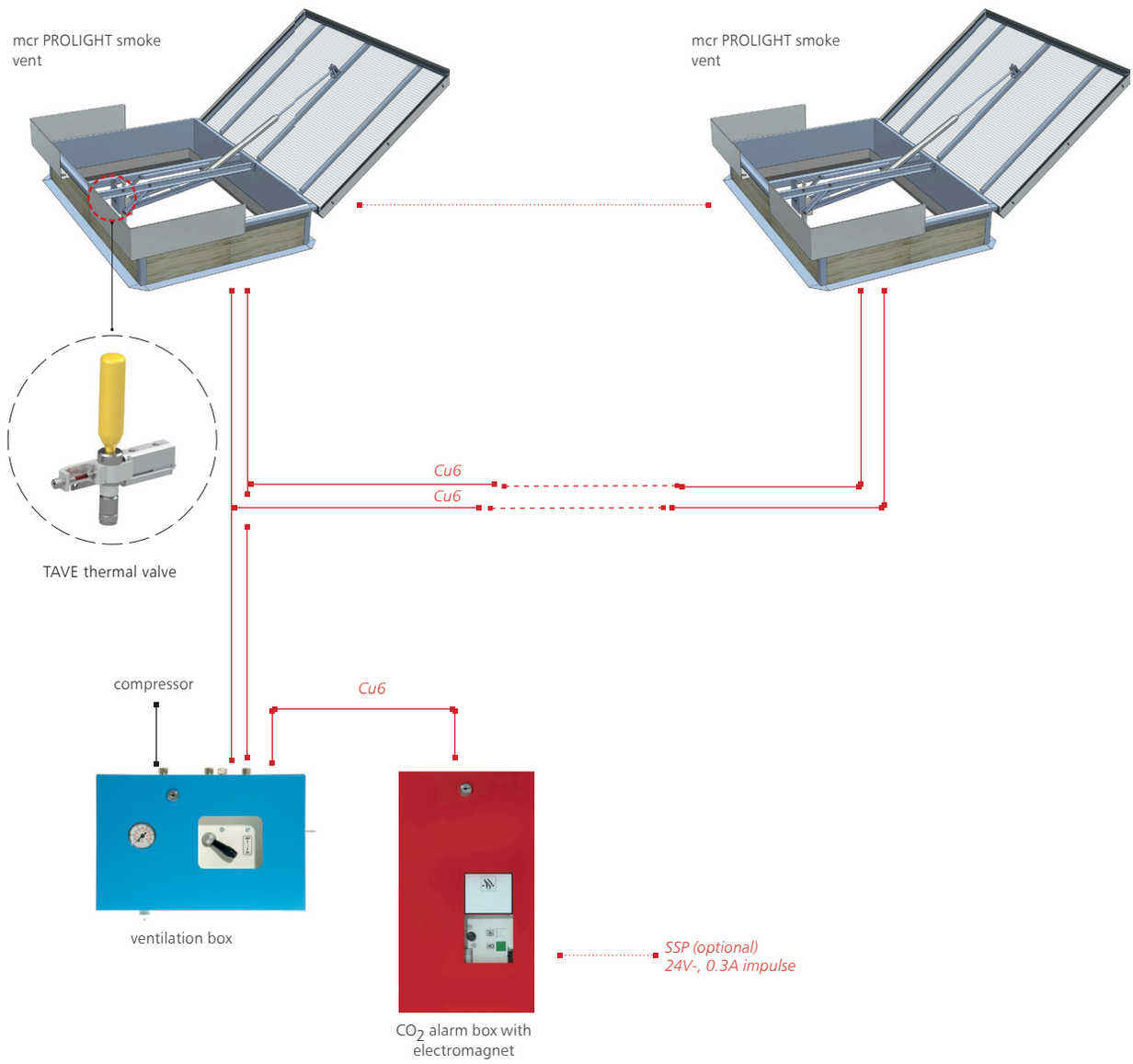


Fig. 225 – Smoke exhaust function – automatic and manual alarm opening, with flow controller with thermal fuse and alarm box (opening) and pneumatic ventilation function with ventilation box (open/shut) - 2-pipe system

DEVICES LIST

- pneumatic actuator for smoke exhaust,
- pneumatic actuator for ventilation,
- ZSV-BVE valve,
- TAVZ thermal valve,
- ventilation box with VVZ option,
- alarm box, e.g. AK 10.

NOTE:

Depending on client's needs, the smoke exhaust system devices may vary from the specifications.
The use of weather automatics is recommended for systems with ventilation system.

13.2. system description

Smoke vents with electric smoke exhaust control system are mainly used for staircases of public utility buildings, in passages of malls, and - sporadically - in smaller storage or industrial halls.

Components of electric smoke exhaust control system:
- MCR PROLIGHT vent with 24 V- electric actuator,
- electric smoke exhaust and ventilation control unit,
- mcr RPO-1 emergency pushbuttons,
- optical smoke sensors,
- ventilation pushbuttons (LT buttons) – optional,
- weather monitoring unit with wind-rain sensor – optional,
- electric installations.

Activation options of electric smoke exhaust control system:
- automatic – after smoke detection – through a signal from optical smoke sensor,
- automatic (remote) – through signal e.g. from fire signaling unit (as option, after connection),
- manually – by operator, using RPO-1 smoke exhaust button.

Ventilation control through electric smoke exhaust system.
Vents with 24 V- electric actuators may be used for daily ventilation after connecting ventilation pushbuttons to smoke exhaust control unit. Use of weather automatics is recommended for closing vents in ventilation position in case of strong wind (to protect the vent structure) and/or wind (to protect property).
Alarm signals and alarm functions of the control units have priority over ventilation functions.

13.2.1. mcr 9705 control unit

mcr 9705 smoke exhaust control unit is used to activate devices of MERCOR electric smoke exhaust system based on alarm signal from thermal or optical smoke sensors, from manual fire alarming devices (red call point buttons), or from another control unit (e.g. fire alarm system, building automatics system).
The control unit is supplied from 230 V alternating current and feeds 24V= voltage to electric smoke exhaust system devices. Thanks to its batteries, the control unit is not exposed to power shortage, and may stand-by for 72 hours from power failure, with a single launching of devices possible after that time (e.g. opening smoke vents).

The control unit allows for:

- remote activation of smoke exhaust system devices from fire alarm unit (NC voltage-free contact or 24V- signal),
- fuseing with the use of alarm buttons,
- automatic fuseing from conventional smoke sensors (thermal or optical),
- indicating the unit status through diodes on its face plate and buzzer,
- co-operation with mcr RPO-1 emergency pushbutton,
- providing information on alarm activation of unit (NC/NO contact and diode on mcr RPO-1 emergency pushbutton),
- providing information on failure or power shortage (NC/NO contact and diode on mcr RPO-1 emergency pushbutton),
- providing information on vent opening (NC/NO contact),
- monitoring readiness of connected smoke exhaust devices and indicating failures on a panel inside the control unit,
- manual opening of smoke exhaust vents for daily ventilation during normal operation (without fuseing alarm state, separately for each group),
- automatic closing of vents opened for daily ventilation in case of rain fall or strong window, in response to a signal from weather monitoring unit (does not interfere with alarm operation).

Fig. 226 – mcr 9705 control unit

13.2.1.1 technical data of mcr 9705 control unit

PARAMETER	VALUE	
range	5 A	8 A
supply voltage	230 V~, 50 Hz	
output voltage (actuators supply)	150 VA	250 VA
output voltage - actuators	24 V-, max. 5,2 A	24 V-, max. 8 A
back-up power supply	2 psc. of batteries 12V, 3,2 Ah, connected in series	
operating temperature range	–5°C ÷ +40°C °	
time of operation after mains failure in ready state	min. 72 h	
carrying capacity of relay outputs	max. 100 mA, 24 V	
casing protection rating	IP 54	
dimensions (width x height x depth)	300 x 300 x 120 mm	

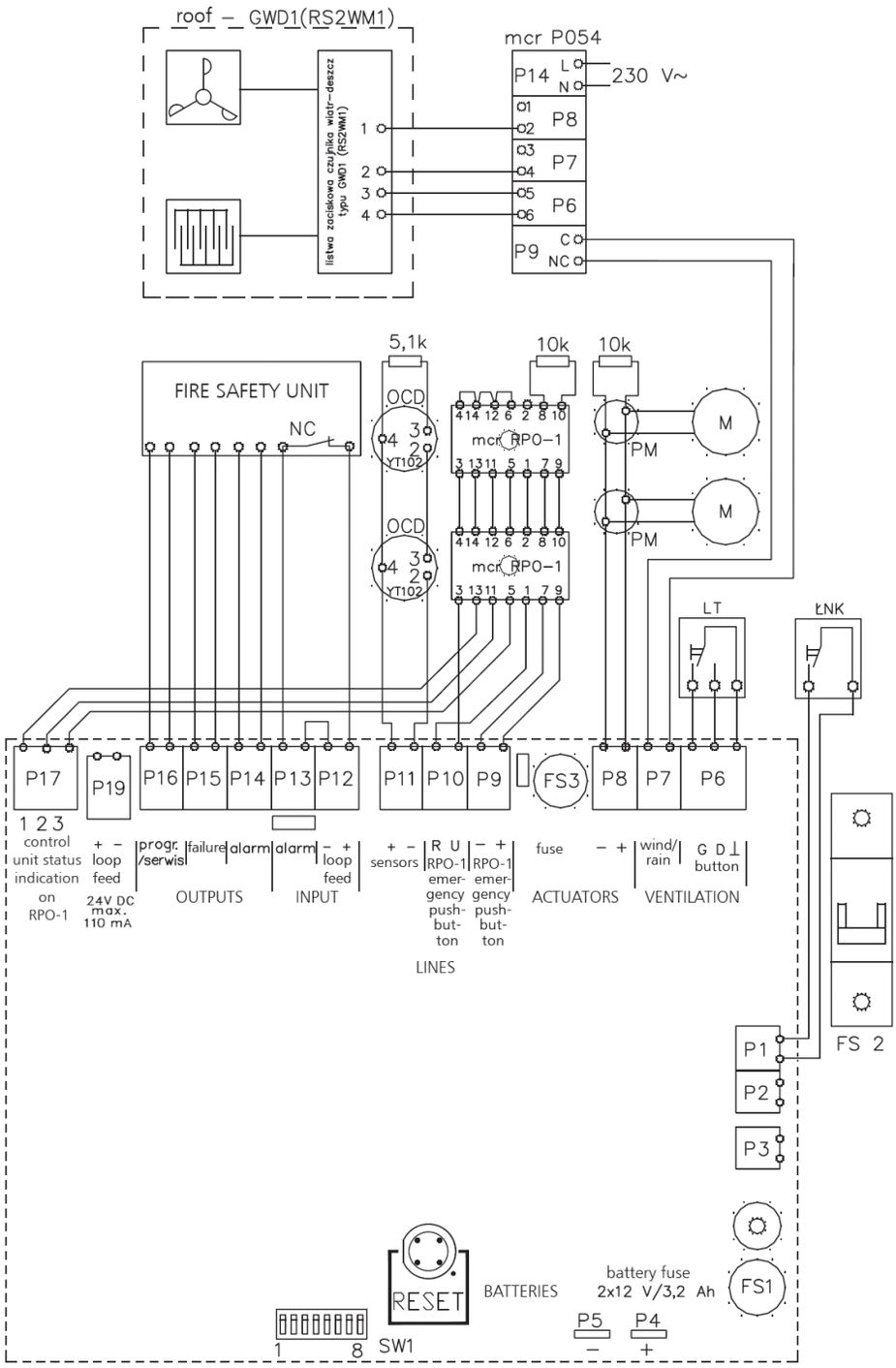
mcr 9705 - 5A control units series of types

UNIT TYPE	SUPPLY VOLTAGE	NUMBER OF OUTPUTS (ACTUATOR LINES) LOAD CAPACITY	CASING VERSION [MM]	NOMINAL POWER INPUT [VA]	SECONDARY SUPPLY SOURCE
mcr 9705-5a	230 V~ 50 Hz	5 A (basic)	300 x 300 x 150	150	2 x (12 V,. 3.3…3.6 Ah)
mcr 9705-10a		2 x 5 A	400 x 400 x 200	300	4 x (12 V, 3.3…3.6 Ah)
mcr 9705-15a		3 x 5 A	600 x 600 x 200	450	6 x (12 V, 3.3…3.6 Ah)
mcr 9705-20a		4 x 5 A	600 x 600 x 200	600	8 x (12 V, 3.3…3.6 Ah)
mcr 9705-25a		5 x 5 A	800 x 600 x 300	750	10 x (12 V, 3.3…3.6 Ah)
mcr 9705-30a		6 x 5 A	800 x 600 x 300	900	12 x (12 V, 3.3…3.6 Ah)
mcr 9705-35a		7 x 5 A	1000 x 600 x 400	1050	14 x (12 V, 3.3…3.6 Ah)
mcr 9705-40a		8 x 5 A	1000 x 600 x 400	1200	16 x (12 V, 3.3…3.6 Ah)
mcr 9705-45a		9 x 5 A	1000 x 800 x 400	1350	18 x (12 V, 3.3…3.6 Ah)
mcr 9705-50a		10 x 5 A	1000 x 800 x 400	1500	20 x (12 V, 3.3…3.6 Ah)
mcr 9705-55a		11 x 5 A	1000 x 800 x 400	1650	22 x (12 V, 3.3…3.6 Ah)
mcr 9705-60a		12 x 5 A	1000 x 800 x 400	1800	24 x (12 V, 3.3…3.6 Ah)

mcr 9705 - 8A control units series of types

UNIT TYPE	SUPPLY VOLTAGE	NUMBER OF OUTPUTS (ACTUATOR LINES) LOAD CAPACITY	CASING VERSION [MM]	NOMINAL POWER INPUT [VA]	SECONDARY SUPPLY SOURCE
mcr 9705-8a	230 V~ 50 Hz	8 A (basic)	300 x 300 x 150	250	2 x (12 V, 3.3…3.6 Ah)
mcr 9705-16a		2 x 8 A	400 x 400 x 200	500	4 x (12 V, 3.3…3.6 Ah)
mcr 9705-24a		3 x 8 A	600 x 600 x 200	750	6 x (12 V, 3.3…3.6 Ah)
mcr 9705-32a		4 x 8 A	600 x 600 x 200	1000	8 x (12 V, 3.3…3.6 Ah)
mcr 9705-40a		5 x 8 A	800 x 600 x 300	1250	10 x (12 V, 3.3…3.6 Ah)
mcr 9705-48a		6 x 8 A	800 x 600 x 300	1500	12 x (12 V, 3.3…3.6 Ah)
mcr 9705-56a		7 x 8 A	1000 x 600 x 400	1750	14 x (12 V, 3.3…3.6 Ah)
mcr 9705-64a		8 x 8 A	1000 x 600 x 400	2000	16 x (12 V, 3.3…3.6 Ah)

13.2.1.2 typical configuration of smoke exhaust system with mcr 9705-5A control unit and with mcr P054 weather monitoring unit



LT – ventilation pushbutton
mcr RPO-1 – mcr RPO-1 emergency pushbutton
M – electric actuator
OCD – optical smoke sensor (YT102 here)
PM – installation box
FS1 – battery fuse
FS2 – automatic 230 V~ mains fuse
FS3 – actuators line fuse
SW 1 – configuration switch for control unit (see operation and maintenance)

13.2.2. mcr 0204 control unit

mcr 0204 smoke exhaust control unit is a control device for electric smoke exhaust system. mcr 0204 unit is used for activating electric systems of MERCOR smoke exhaust system based on alarm signal from thermal or optical smoke sensors, and mcr RPO-1 emergency pushbuttons. The device is supplied with 230 V~ alternating current, the output operating voltage is 24 V-. The control unit includes batteries allowing operation of the system for 72 hours from mains voltage failure - a single alarm opening of vents or smoke windows is possible after that time.

The control unit allows for:

- remote activation of smoke exhaust system devices from fire alarm unit (NC voltage-free contact or 24V- signal),
- fuseing with the use of alarm buttons,
- automatic fuseing from conventional smoke sensors (thermal or optical),
- indicating the unit status through diodes on its face plate and buzzer,
- co-operation with mcr RPO-1 emergency pushbutton,
- providing information on alarm activation of unit (NC/NO contact and diode on mcr RPO-1 emergency pushbutton),
- providing information on failure or power shortage (NC/NO contact and diode on mcr RPO-1 emergency pushbutton),
- providing information on vent opening (NC/NO contact),
- monitoring readiness of connected smoke exhaust devices and indicating failures on a panel inside the control unit,
- manual opening of smoke exhaust vents for daily ventilation during normal operation (without fuseing alarm state, separately for each group),
- automatic closing of vents opened for daily ventilation in case of rain fall or strong window, in response to a signal from weather monitoring unit (does not interfere with alarm operation).

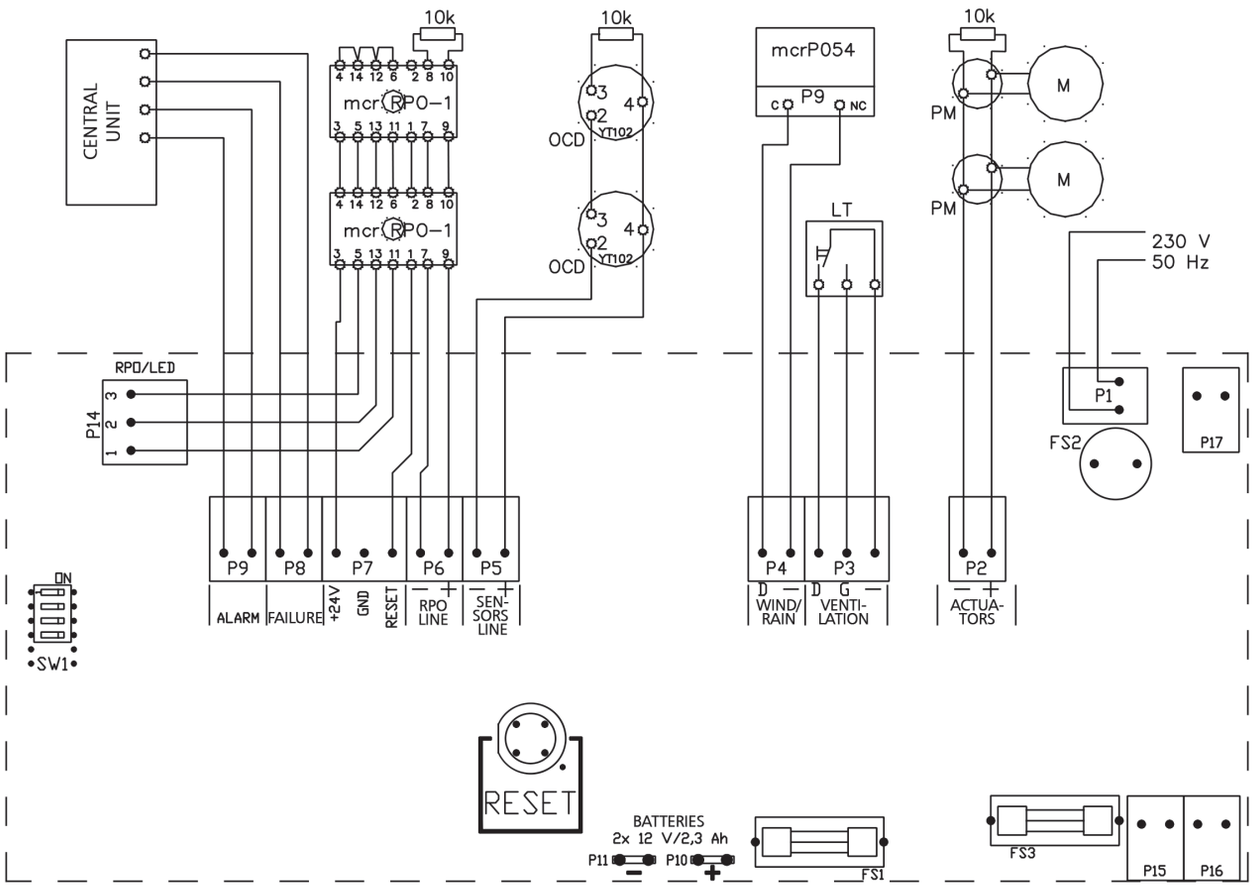
Fig. 227 – mcr 0204 control unit

13.2.2.1 technical data of mcr 0204 control unit

mcr 0204 unit series of types

PARAMETER	VALUE
power supply voltage	230 V~, 50 Hz
rated power	100 VA
output voltage (actuators supply)	24 V=, max. 4 A
secondary supply	2 pcs. of 12 V, 2 Ah batteries, connected in series
operating temperature range	–10°C ÷ 40°C
maximum diameter of cords entering the unit	1,5 mm^2
time of operation after mains failure in READY state	min. 72 h
carrying capacity of relay outputs	max. 100 mA, 24 V
casing protection rating	IP 54
insulation grade	II
dimensions (width x height x depth)	300 x 230 x 86 mm

13.2.2.2 typical configuration of smoke exhaust system with mcr 0204 control unit and with mcr RPO-1 emergency pushbutton



OCD – optical smoke sensor (YT102 here)
mcr RPO-1 – emergency pushbutton
PM – mount box
M – electric actuator
mcrP054 – weather monitoring unit
LT – ventilation pushbutton
SW1 – configuration switch for control unit (see operation and maintenance)
FS1 – battery fuse
FS2 – 230 V~ main fuse
FS3 – power supply fuse

13.2.3. mcr R 0424, mcr R 0448 extension modules

mcr R-04xx extension module is used for supplying a single group of 24V- actuators of total current consumption up to 48 A or 24 A, depending on variant. The module is controlled by 24 V- signal from mcr 9705 or mcr 0204 smoke exhaust control units (from actuators line output). The modules are made in 7 variants, of different carrying capacity and number of output lines:

- mcr R 0424-1 or mcr R-0424K — 1 output line 24 A,
- **mcr R 0424-2** — **2 output lines, 12 A each**,
- mcr R 0448-1 or mcr R 0448K — 1 output line 48 A,
- **mcr R 0448-4** — **4 output lines, 12 A each**,
- mcr R 0448-2 — 2 output lines, 24 A each,

Bolded font – typical making.
K or Kx suffix – making for mcr PROSMOKE CE/CE1 curtains, where x stands for number of output lines of curtains.

The device, in combination with mcr control unit, allows for detection of all actuator lines connected to it. mcr R04xx module has 2 sources for supplying the connected devices: primary, from mains, or secondary, from the batteries, which are activated automatically engaged in case of mains failure. The battery allows for a 72 h stand-by, and at least a single opening of vents in that time.
The batteries charging time from complete discharge is up 24 hours.

mcr R04xx module features signaling of the following states

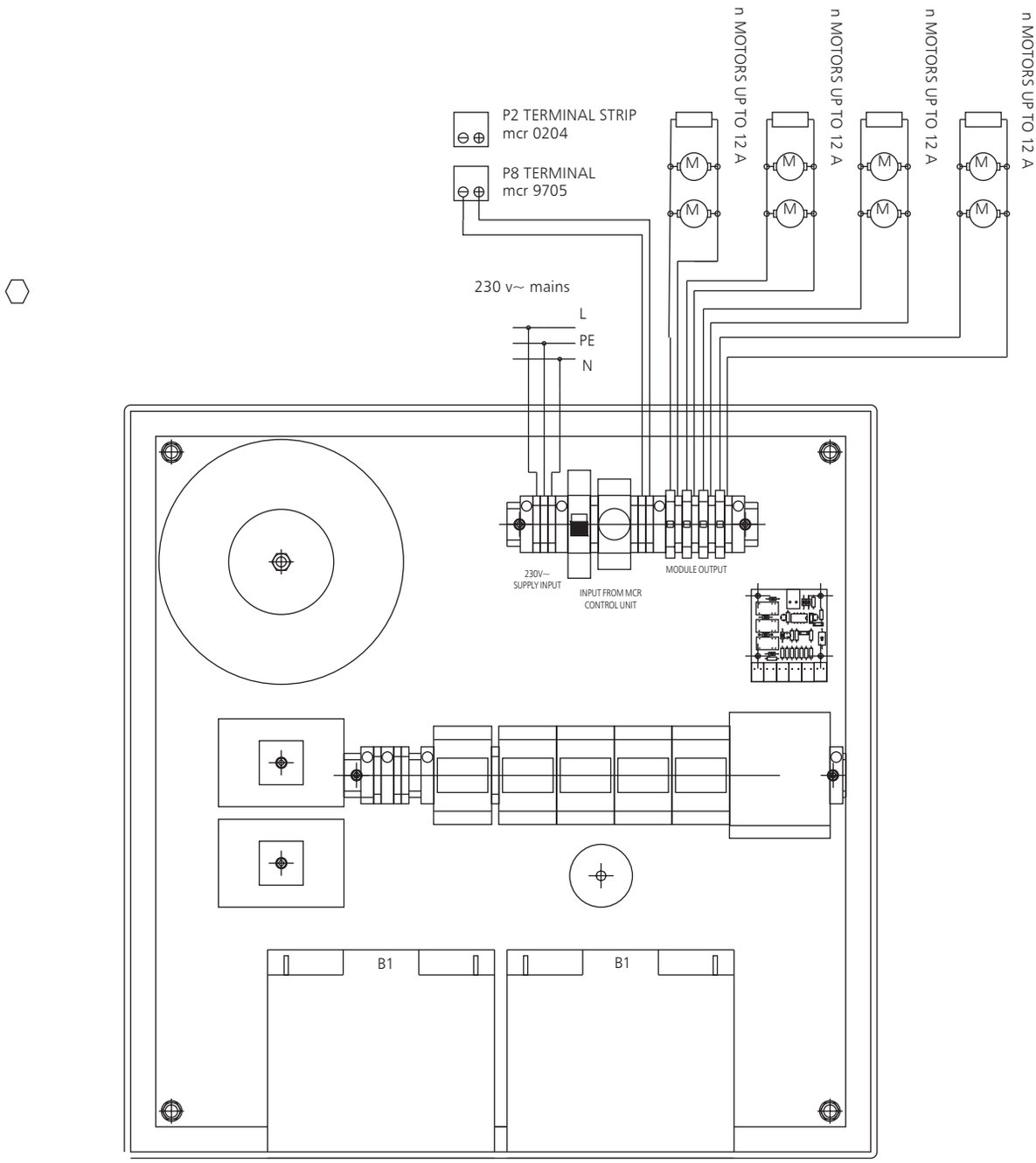
- 230 V~ supply correct, green diode lit,
- actuators actions - yellow diode lit,
- failure - yellow diode lit,
- and signal providing to control unit (in case of actuators line failure, mains failure, secondary 24 V= supply failure).

Fig. 228 – mcr R04xx extension module

13.2.3.1 technical data of mcr R0424 AND MCR R0448 extension modules

PARAMETER	VALUE							
type	**mcr R 0424**				**mcr R 0448**			
variant	0424-1	0424-2	0424-K for mcr PROSMOKE CE curtains	0424-K4 for mcr PROSMOKE CE curtains	0448-1	0448-2	0448-4	0448-Kx for mcr PROSMOKE CE curtains
number of output lines (actuators) and line carrying capacity	1 x 24 A	2x 12 A	1x 24 A	4x 6 A	1x 48 A	2x 24 A	4x 12 A	up to 8 lines, 6,3 A each
power supply voltage	230 V~, 50 Hz							
max. power consumption from mains	750 V A				1500 V A			
output voltage	24 V-							
operating temperature range	-5°C … 40°C							
dimensions (height x width x depth)	60 x 60 x 20 cm							
casing protection rating	IP 54							
cords running:	from the back or top of casing							

13.2.3.2 typical configuration of mcr R04xx extension module (4 x 12A)



13.2.4. 24V electric actuators

13.2.4.1 spindle electric actuators

Actuators are used for opening smoke exhaust vents and windows of smoke exhaust system, as well as for daily ventilation. They are supplied by 24V- direct voltage. Casings cover is made of anodized aluminum. In standard, they feature anti-interference condenser, overload switch and limit switches. Optional voltage-free contact informing about actuator status (E position). IP 40 casing protection ratingfor actuators, working mode (as per DIN EN 0530) S2.

Sample reference of mcr W spindle actuator

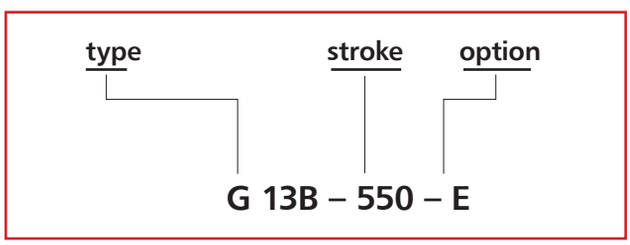


Fig. 229 – mcr W spindle electric actuator

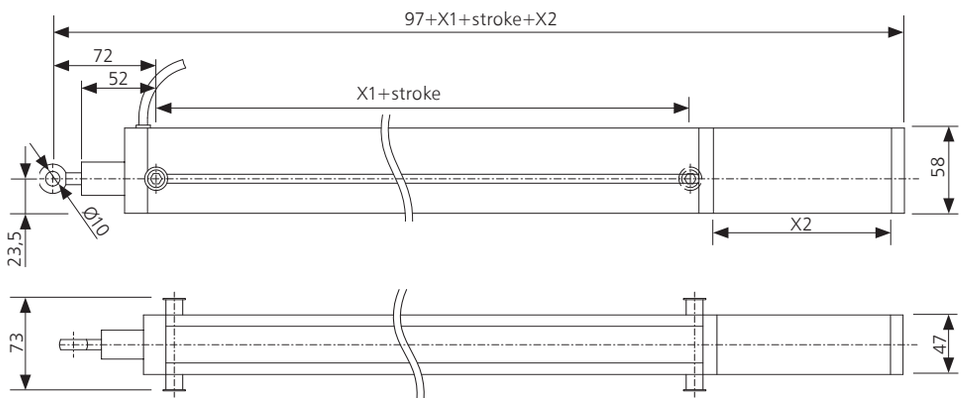


Fig. 230 – Dimensions of spindle electric actuator (standard variant)

ACTUATOR TYPE	SUPPLY VOLTAGE [V]	RATED CURRENT [A]	MAX. LOAD [N]	RATED LOAD [N]	SPEED AT RATED LOAD [mm/s]	STANDARD STROKE LENGTHS [mm]
G (08A)	24	0,8	900	900	3,4	350
G (10A)	24	1,0	1200	900	3,4	350
G (10B)	24	1,0	850	650	6,1	350
G 13B	24	1,3	1150	650	6,1	350
G 13C	24	1,3	830	450	8,4	350,550
G 13G	24	1,3	870	490	8,1	350,550
G 16B	24	1,6	1240	860	7	350
G 16G	24	1,6	940	650	9,3	550
G 20B	24	2,0	1630	860	7	550
G 20G	24	2,0	1240	650	9,3	550,750
G (20H)	24	2,0	870	460	13,3	750
G 26G	24	2,6	1670	650	9,3	550
G 26H	24	2,6	1180	460	13,3	750
G 40G	24	4,0	2500	2110	9,7	550
G 40H	24	4,0	1600	1350	13,9	750
G 40N	24	4,0	1890	1590	10,4	600
G 60J	24	6,0	2160	1120	17,9	750
G 60P	24	6,0	2560	1320	13,4	750

13.2.4.2 electric chain actuators

Actuators are used for opening smoke exhaust vents and windows of smoke exhaust system, as well as for daily ventilation. They are supplied by 24V- direct voltage. Casings cover is made of anodized aluminum. In standard, they feature anti-interference condenser, overload switch and limit switches. Optional voltage-free contact informing about actuator status (E position). IP 20 casing protection rating for actuators, working mode (as per DIN EN 0530) S2.

Sample reference of mcr S spindle actuator

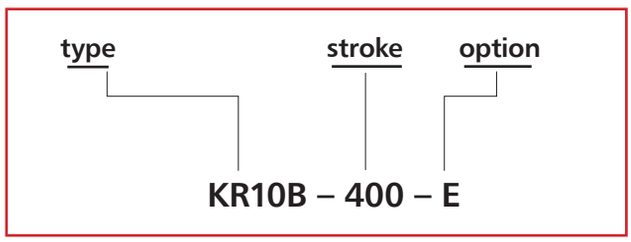


Fig. 231 – mcr L spindle electric actuator

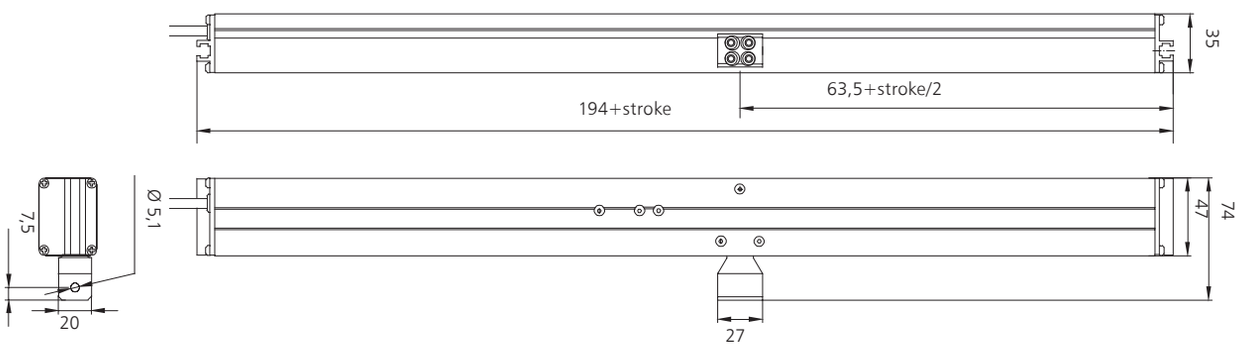


Fig. 232 – Dimensions of electric chain actuator

ACTUATOR TYPE	SUPPLY VOLTAGE [V]	RATED CURRENT [A]	CLOSING/OPENING FORCE [NN]	SPEED AT RATED LOAD [mm/s]	STANDARD STROKE LENGTHS [mm]
KR10B	24	1,0	300/300	7,6	400
KR10B	24	1,0	300/300	7,6	500
KR10B	24	1,0	100/100	10	600

13.2.5. OCD optical smoke sensors

Optical smoke sensors are used for detecting visible smoke that appears during the majority of fires. It allows to detect smoke in its initial stage, where the material has just started to burn, which usually comes long before the outburst of open flame and the noticeable increase in temperature. The sensors feature resistance to wind, pressure changes and water vapour condensation. They have large sensitivity to visible smoke.

Optical sensor comprises of a set of two diodes. The first of them – infrared LED diode – emits a light beam. The other, receiving diode is placed in a labyrinth tunnel. In normal conditions, this diode is not exposed to visible light from outside, or from the sender diode. Upon penetration of smoke into the sensor, the receiving diode starts to receive the light emitted through the sending diode, scattered on smoke particles. This causes response of the sensor, and the fuseing of alarm state.
The sensors are equipped with optical fuseing indicators (alarm) in the form of diode diode. This facilitates finding activated sensor. Additionally, if the sensors are placed in invisible places, they can be equipped with external fuseing indicators.
The sensors are installed in appropriate consoles.

technical details

PARAMETER	VALUE
operating voltage	24V (9 ÷ 28)
max. monitoring current	60 [μA]
alarm current	30< [mA]
operating temperature range	-10 ÷ 50 [°C]
max. relative humidity	93 [%]
dimensions of sensor, incl. socket	Ø103 x 55 [mm]
weight, incl. socket	~0,155 [kg]
color	white

Fig. 233 – Optical smoke sensor

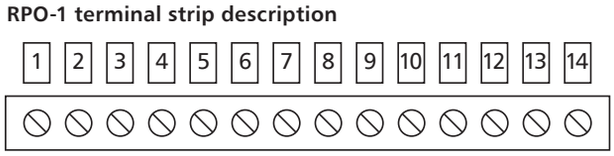
13.2.6. mcr RPO-1 emergency pushbutton

mcr RPO-1 emergency pushbutton is used in smoke exhaust systems for manual alarm fuseing, and for indication of operating status of the smoke exhaust unit. Additionally, the button allows for remote deleting errors.
The button includes three indication diodes:
- red – ALARM
- yellow – FAILURE
- green – OK

The diodes are connected directly and independently to terminal strip, which ensures versatility of mcr RPO-1 emergency pushbutton. The button is dedicated for working with mcr 0204 and mcr 9705 smoke exhaust control units.
Button is designed for installation inside buildings.

Fig. 234 – mcr RPO-1 emergency pushbutton

RPO-1 terminal strip description

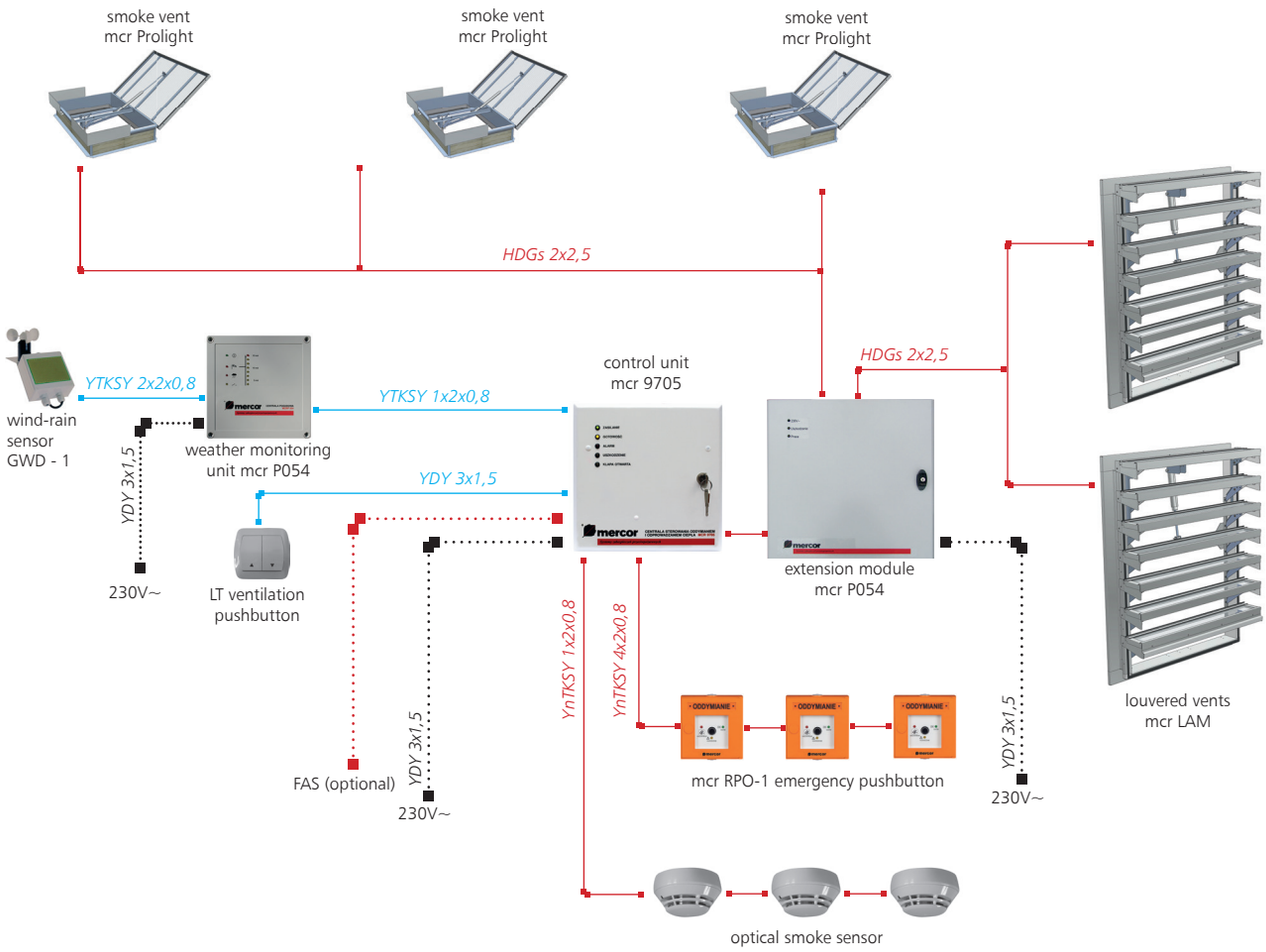


1, 2 – RESET line, cable 1
3, 4 – RESET line, cable 2
5 – diode ALARM cathode
6 – diode ALARM anode
7, 8 – RPO line, cable 1
9, 10 – RPO line, cable 2
11 – FAILURE diode, cathode
12 – FAILURE diode, anode
13 – OK diode, cathode
14 – OK diode, anode

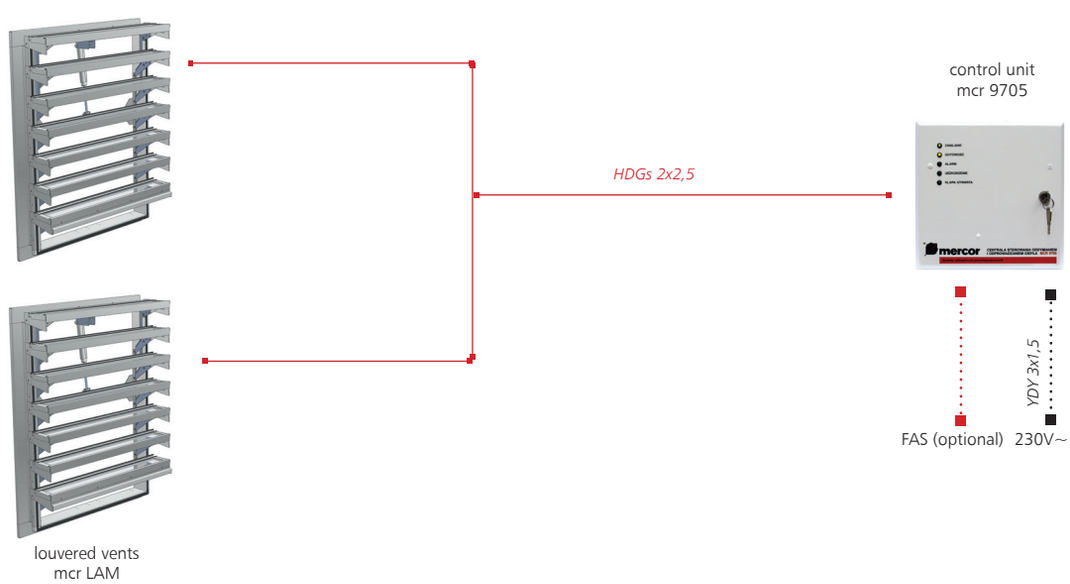
PARAMETER	VALUE
alarm button parameters	24 V-, max 100 mA
operating temperature range	-10°C ÷ 55°C
casing protection rating	IP 30
dimensions (width x height x depth)	135 x 135 x 33 mm
min. number of wires in cable running to unit	7 (i.e. 4 x 2 x 0.8)
casing color	orange

13.2.7. sample configurations

13.2.7.1 sample connection diagram of 24V- smoke exhaust and ventilation



13.2.7.2 sample connection diagram of 24V- smoke exhaust or ventilation



13.3. system description

Smoke exhaust vents with pneumatic control, spot skylights, as well as vents in continuous rooflights may be delivered with 230V~ electric actuators for ventilation. The use of such actuators allows for daily ventilation of the building, without the necessity of activating alarm opening of vents.

Components of electric ventilation control system:
The ventilation system comprises
- weather monitoring unit with wind-rain sensor
- LT ventilation pushbutton, and additional equipment
- ventilation actuators

Operating principle of electric ventilation system
Ventilation pushbutton is used for opening and closing vents/windows during their everyday operation. It is additionally recommended to provide the system with weather monitoring unit with wind-rain sensor, causing automatic closing of vents opened for ventilation during adverse weather conditions (rain fall or wind).

13.3.1. mcr P054 weather monitoring unit

mcr P054 control unit is used for controlling the operation of actuators of vents or ventilation windows, which should be closed during rain or wind. Smoke exhaust control units, ventilation control units or drives supplied by 230 V~ current may be connected to the device. Closing signal is sent based on parameters from W01 wind sensor and RS1 rain sensor.

- the device includes 4 switchable contacts which are fuseed in case of rain/wind, or at mains supply failure; the contact remains switched for a preset time after the ending of rain fall/wind,
- alarm fuseing rain intensity is preset by the user (minor rainfall - intense rainfall),
- alarm fuseing wind force value is preset by the user, ranging from weak wind (about 5 m/s) to strong wind (about 15 m/s),
- additional input for vent opening sensor (closed when open), allows for optical monitoring of the vents status,
- the device includes indication of the following states:
  - 230 V~ supply - green diode,
  - "wind" alarm - red diode,
  - "rain" alarm - red diode,
  - "vent open" indication - yellow diode,
  - wind speed indication - light scale: 7 yellow and 1 red diode (red for wind speed above 15 m/s).
- plastic wall casing, dimensions height x width x depth: 180 x 180 x 75 mm. IP 54, light grey (RAL 7035), cables outputfrom top or back of casing.

Fig. 235 – mcr P05 weather monitoring unit

Weather monitoring unit additional accessories

KE 2a extension module

Controlling contactor for expansion of mcr P054 weather monitoring unit to over four independent control groups that are simultaneously shut during wind or rain.
- 230 V~ control voltage, 5A/ 230 V~ voltage-free contact,
- thermoplastic casing, grey RAL 7035,
- dimensions: 158 x 118 x 76 [mm] (width x height x depth).
- controlling contactor with six contacts for expanding the weather monitoring unit to five independent groups.

13.3.2. GWD-1 wind-rain sensor

WM1 wind sensor
- sensor for measuring wind speed,
- sold with rain sensor on mounting console,
- option: available separately.

RS1/ RS2 rain sensor
- heated rain sensor (heating is enabled after sensor fuseing, and is disabled after its drying),
- gold-plated sensing area 80 cm2,
- sold with wind sensor on mounting console,
- option: available separately.

Sample connection cord of GWD-1 sensors set to weather monitoring unit: YTKSY2x2x0.8.

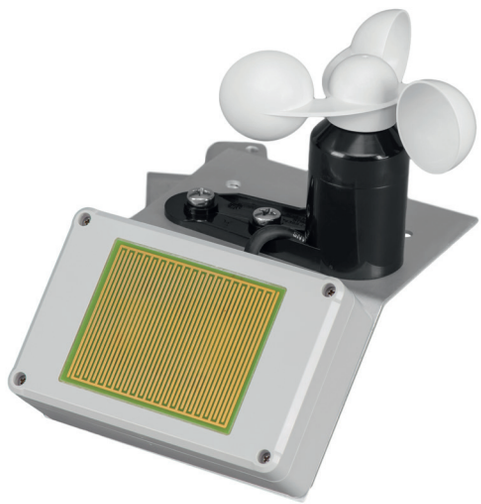


Fig. 236 – GWD-1 wind-rain sensor

13.3.3. connection diagrams of mcr P054 weather monitoring unit and WM1-RS1/RS2 wind-rain sensors

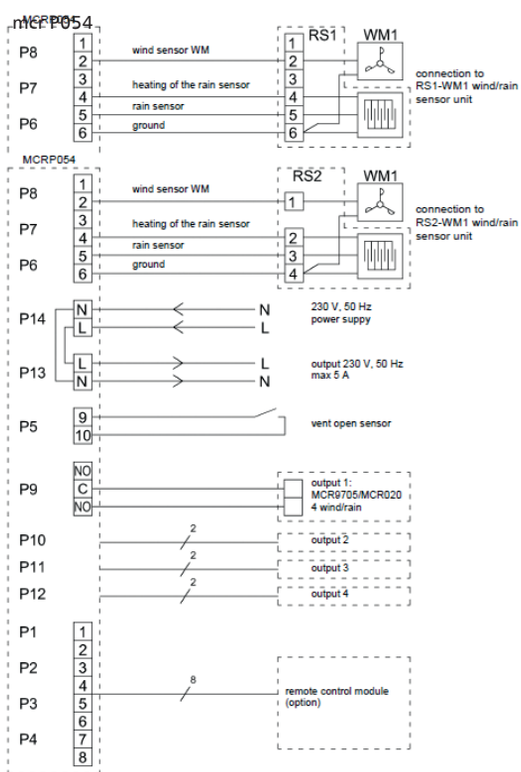


Fig. 237 – Connection diagram of mcr 054 weather monitoring unit with WM1-RS1 sensors

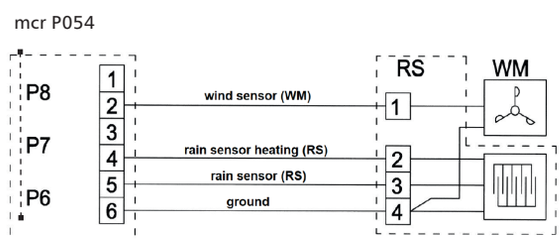


Fig. 238 – Connection diagram of mcr 054 weather monitoring unit with WM1-RS2 sensors

13.3.4. mcr E electric actuators

Actuators for ventilation are used in smoke vents with pneumatic control, in ventilation vents, and in vents in continuous rooflights. They can be controlled through LT ventilation pushbutton and/or mcr P054 weather monitoring unit.

ACTUATOR TYPE	PUSH FORCE [N]	PULL FORCE [N]	POWER CONSUMPTION [W]	STROKE [MM]	CASING MATERIAL	DUTY CYCLE (AS PER DIN VDE 0530)
E-300-230	500	250	23	300	plastic	S3 25%
E-500-230	500	250	23	500	plastic	S3 25%
E-750-230	500	250	23	750	plastic	S3 25%

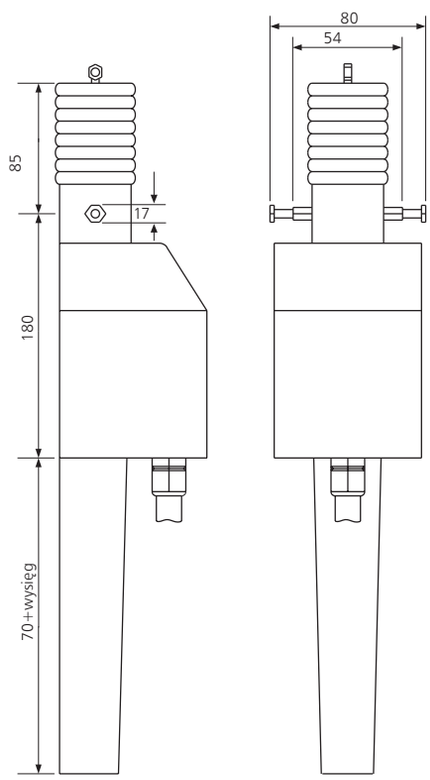


Fig. 239 – Dimensions of mcr E actuator

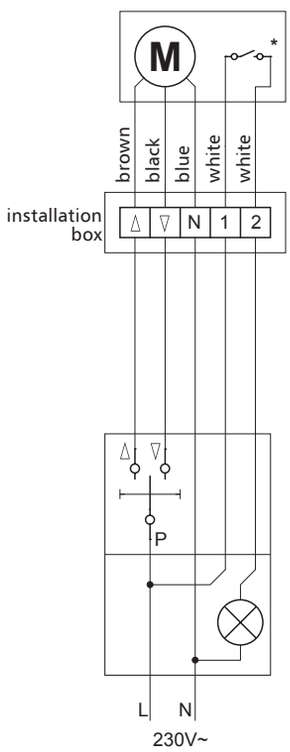


Fig. 240 – Connections diagram for mcr E actuator

13.3.5. LT ventilation pushbutton switch

Used for activating (opening and closing) ventilation vents or windows during regular use.

- casing color: white,
- dimensions: 80 x 80 x 55 mm.

electric diagram

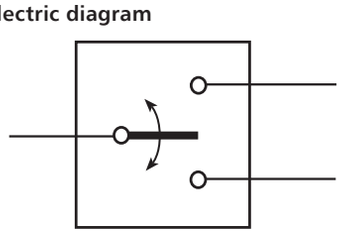
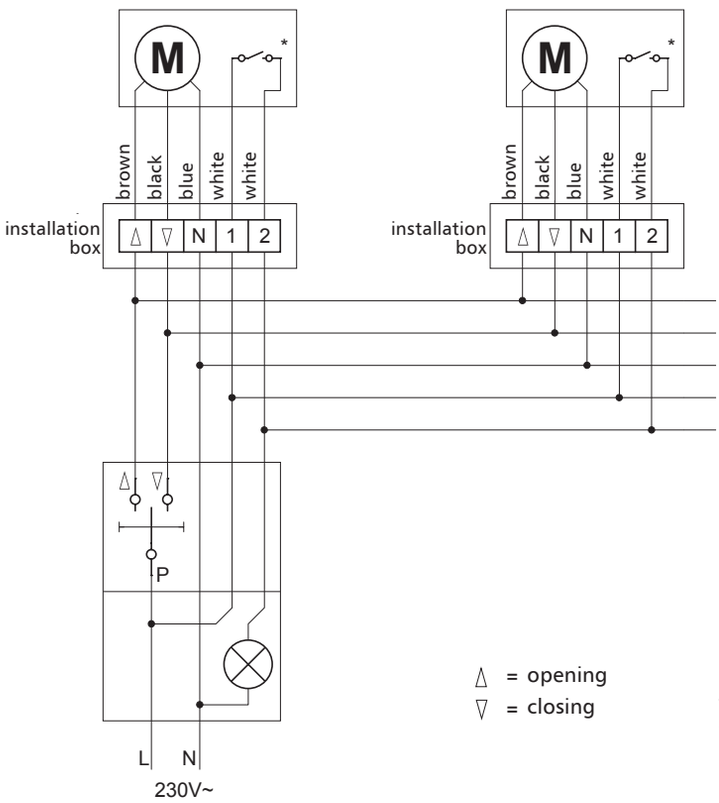


Fig. 241 – LT ventilation pushbutton switch

13.3.6. configurations of ~230V electric ventilation control system



NOTE

The use of weather automatics in ventilation vents and windows activated through actuators is recommended.

Fig. 242 – Connections diagram for 230V~ electric ventilation control system

13.3.7. electric ventilation control system - with weather monitoring unit

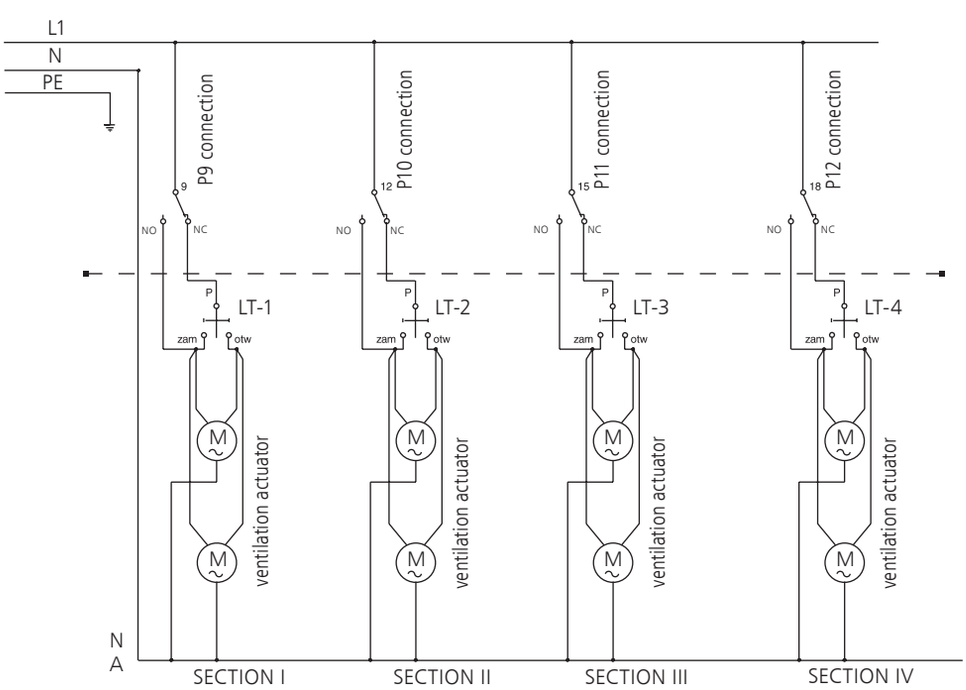


Fig. 243 – Connections diagram of ventilation actuators to mcr P054 weather monitoring unit and GWD-1 wind-rain sensor

13.3.8. sample configurations

13.3.8.1 sample configurations of - 230-V~ electric ventilation control system