

G.2 Heating
G.7 Ventilation

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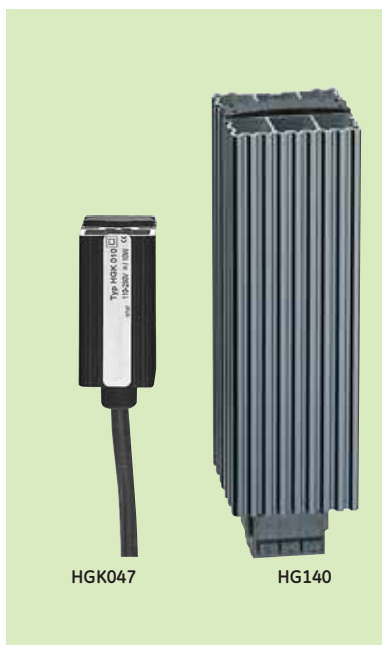
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Advantages

- Energy saving
- Dynamic heating-up
- Self-regulating
- Temperature-limiting
- Quick snap-on fixing
- No maintenance
- Long endurance
- Compact housing

Standards

VDE 0700
IEC 60 335-1
UL on request

Applications

Switch cabinets, instrument cases, display panels, control desks, automatic bank machines, car park control systems, etc.

Fitting

Push-fit onto DIN 35 mm rail (EN 50 022).

Installation preferably at the bottom of the cabinet, at about 40 mm from the equipment itself.

Heating units

Function

Small heating units for enclosures are important accessories for guaranteeing operational safety of control and distribution units.

They are mainly used to prevent formation of condensation or to maintain a minimum temperature inside the enclosure, that is, a few degrees above the temperature of the surrounding air.

Operating principle

Small heating units are fitted with PTC heating resistances (positive temperature coefficient semi-conductors). The self-regulating and self-limiting semi-conductor heating elements maintain a constant temperature on the heating surface of the small heating units. The aluminium casing transmits heat to the surrounding air by natural radiation. Special extruded sections ensure the heat is fully radiated.

Heating requirements calculation

Using the formula: $P = A \times \Delta T \times k$

P = power supplied by the resistance (W)

A = external free surface of the enclosure (m²)

ΔT = difference in temperature between the internal temperature after heating, and the external temperature, in °K.

k = thermal radiation coefficient: sheet steel: 5.5 W/m²K
polyester: 3.5 W/m²K

Approximation rule: recommended value 100 w/m³ of enclosure volume.

For an outdoor installation, the calorific power should be doubled.

Several small heating units are better than a single large heating unit.

Heating units HGK047-HG140

Technical data

Nominal voltage	140-250 V AC/DC (max. 265 V)
Power	10 to 150 W
Heating element	self-regulating PTC resistance
Heating body	anodised aluminium sections
Protection class	II, test voltage 4000 V/3 sec
Protection level	IP54
Connection	Series HGK047: silicon cable 2 x 0.75 mm ² length 300 mm Series HG140: with terminals 0.5 - 2.5 mm ²
Dimensions (H x D)	Series HGK047: 25 x 60 mm Series HG140: 70 x 60 mm



HGK047



HG140

Order codes

	W ⁽¹⁾	I max. (A)	H (mm)	Wt. (kg)	Ref. No.	Pack.
HGK047	10	0.8	50	0.10	818105	1
	20	1.0	60	0.11	818106	1
	30	1.5	70	0.12	818107	1
HG140	15	0.5	65	0.3	818092	1
	30	1.0	65	0.3	818093	1
	45	1.0	65	0.3	818094	1
	60	1.5	140	0.5	818097	1
	75	1.8	140	0.5	818098	1
	100	2.4	140	0.5	818099	1
	150	4.5	220	0.8	818102	1

(1) At ambient temperature 20°C

Heating unit HGL046 with fan

Technical data

Nominal voltage	220/280V 50-60Hz
Power	250 and 400W
Heating element	traditional heating element with built-in thermostat
Heating body	anodised aluminium sections
Surface temperature	±75°C
Protection class	I
Protection level	IP20
Connection	three-pole terminal strip 2.5 mm ²
Fitting	on DIN 35 mm rail
Fan	rate: 35 m ³ /h without counter-pressure ball bearing service: 30000 hrs at 20°C

Order codes

	W	B x D	H (mm)	Wt. (kg)	Ref. No.	Pack.
HGL046	250	80 x 80	178	0.95	818103	1
	400	80 x 80	252	1.30	818104	1



With forced ventilation with an axial fan.

Prevents formation of dangerous levels of condensation, and maintains a constant temperature inside the enclosure.



HV031: Heating element, extra compact, flatter, only 22mm thick.

HVL031: HV031 heating element with an axial fan to give optimal heat radiation. Fresh air drawn in from outside is heated and dried. If the fan fails, thermal power drops automatically to prevent overheating.

Applications

Telecommunications systems, control panels, display panels, control desks, bank cash machines, car park control systems.



- Compact heater with integrated ventilation CR 027 350/550W 230V.
- Heating capacity adjusts to ambient temperature.
- Safely cut-out in case of fan failure.
- Adjustable temperature range.

Heating units HV031 and HVL031 (with fan)

Technical data

Nominal voltage	220/230V 50-60Hz
Power	100 - 150 - 200 - 300 - 400W
Heating element	traditional heating element with built-in thermostat
Heating body	
Connection	anodised aluminium sections
Surface temperature with fan	five-pole terminal strip 2.5 mm ² 45°C at a distance of 50 mm
Fitting	on DIN rail
Protection class	I
Fan rate (without counter-pressure)	35 m ³ /h (100 - 150W) 108 m ³ /h (200 - 300 - 400W)
Dimensions (H x W x D)	80 x 112 x 22 mm (100 - 150W) 119 x 151 x 22 mm (200 - 300 - 400W)
Weight	240 g (100 - 150W) 490 g (200 - 300 - 400W)

Order codes

	Power	Ref. No.	Pack.
HV031	100W	818177	1
	150W	818178	1
	200W	818091	1
	300W	818162	1
	400W	818163	1
HVL031 with fan	100W	818179	1
	150W	818180	1
	200W	811542	1
	300W	818164	1
	400W	818165	1

Semi conductor fan heater

Technical data

Nominal voltage	220/230V 50-60Hz
Power	350 / 550W
Current at make	7.5 A - 350W / 230V 8.5 A - 550W / 230V
Heating element	PTC resistor - self regulating
Temperature regulation	Adjustment range 0 - 60°C
Optical indicator	Thermostat control lamp
Casing	Plastic, light grey
Protection class	II (double insulated)
Protection level	IP 20
Connection	4 pole terminal connector, 2.5 mm ²
Fitting	on DIN 35 mm rail
Axial fan	45 m ³ /h, ball bearing service life 50,000 h at 25°C
Dimensions	165 x 100 x 124 mm (HxWxD)
Weight	1.1 kg
Approval	UL file E 204590

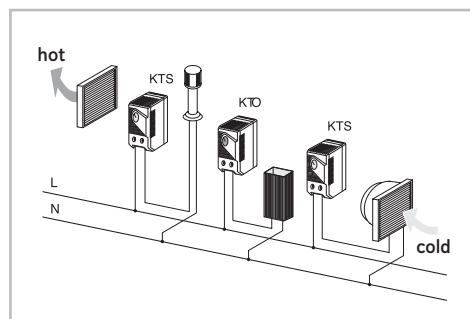
Order codes

	Ref. No.	Pack.
CR 027	818193	1

Temperature regulators

Function

FZK 011, KTO, KTS and ZR 011 elements regulate and control the temperature inside the enclosure by means of small heating elements, fans, heat exchangers and refrigeration units.

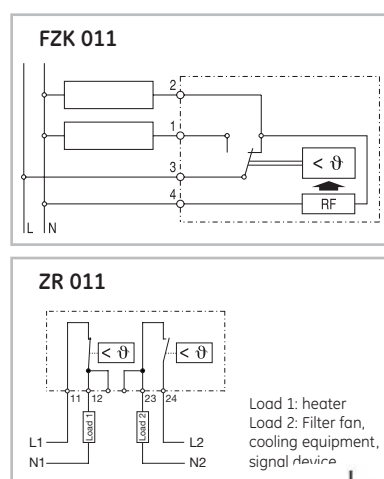


Technical data

Type	FZK 011	KTO	KTS	ZR 011
Range of adjustment: Temperature	10°C - 60°C	0°C - 60°C	0°C - 60°C	0°C - 60°C
Hysteresis	0.5K	7K	7K	7K
Contact type	Inverter: single pole	NC	NO	NO
Power ⁽¹⁾	NC 10A (4) 250V AC NO 5A (2) 250V AC resistive load	10A (2) 250V AC resistive load	10A (2) 250V AC resistive load	10A (2) 250V AC resistive load
Weight	100 g	36 g	36 g	90 g
Dimensions (H x W x D)	67 x 50 x 38	60 x 33 x 35	60 x 33 x 35	67 x 50 x 46
Application diagram	(see below)	red button: heating	blue button: cooling, fan, alarm signal	(see below)
Protection level	IP20	IP20	IP20	IP20
Connection	2.5 mm ² screw connector			
Fitting	push fit on DIN 35mm rail (EN 50022)			
Case	plastic UL 94 V0			
EMC	according to EN 55014-1-2, EN 61000-3-2, EN 61000-3-3			

(1) Values in brackets = inductive load $\cos \varphi = 0,60$

Application diagram



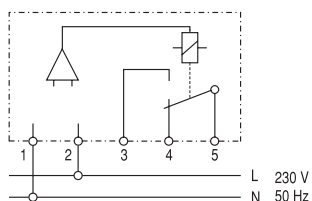
Order codes

	Ref. No.	Pack.
FZK 011	818079	1
KTO	818080	1
KTS	818081	1
ZR 011	818217	1



The electronic temperature regulator and humidity controller controls the temperature and humidity level of the air independently of each other by switching resistive and inductive loads (e.g. small heating units and refrigeration units).

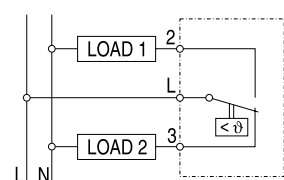
ETF 012



The electromechanical hygrostat is designed to control enclosure heaters so that the dew point is raised when a critical relative humidity of 65% is exceeded.

In this way condensation and corrosion are effectively prevented.

MFR 012



Humidity controller

Technical data

Range of adjustment:	
Temperature	0°C - 60°C
Hysteresis	2K
Humidity	50 %-90 %
Response time	160 sec.
Power supply voltage	230V/50-60Hz
Contact type	relay output/inverter contact
Power ⁽¹⁾	8A (4) 250V AC 0.5A 100V DC 8A 12V DC 5A 35V DC
On/off indicator	LED
Weight	140 g
Dimensions (H x W x D)	50 x 67 x 43
Protection level	IP20
Connection	2.5 mm ² screw connector
Fitting	push fit on DIN 35mm rail (EN 50022)
Case	plastic UL 94 VO
Interference protection	N according to VDE 0875

Order codes

	Ref. No.	Pack.
ETF 012	818083	1

(1) Values in brackets = inductive load $\cos \varphi = 0,80$

Mechanical hygrostat

Technical data

Adjustment range	35-95% relative humidity
Switching accuracy	$\pm 3\%$
Voltage	250V AC
Switching capacity, max. load	
resistive load	5 A 250V
inductive load $\cos \phi 0.8$	0.2 A AC 250V
inductive load $L/R = 3 \text{ ms}$	1 A DC 50V - DC 75V
switching capacity, min. load	100 mA DC/AC 20V
contact type	change over contact
Connection	terminals in casing 3 x 2.5 mm ²
Casing	Plastic, light grey
Mounting	on DIN 35 mm rail
Protection level	IP 20
Dimensions	67x50x38 mm (HxWxD)
Weight	60 g

Order codes

	Ref. No.	Pack.
MFR 012	818190	1



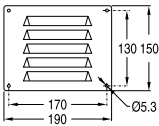
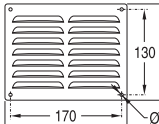
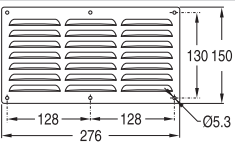
Enclosure ventilation

Pressure differences occur because of temperature variations between inside the enclosure with a high protection degree and the environment.

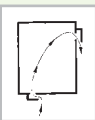
In case of vacuum, dust and humidity can be absorbed through the door seal and can enter the enclosure.

As the humidity cannot exit the enclosure condensation may occur.

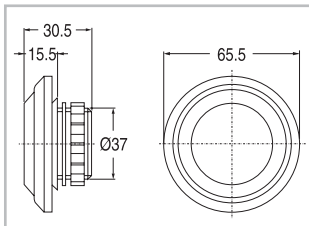
In order to prevent this pressure compensation plugs or ventilation grids should be used.

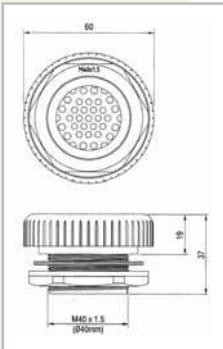
Louvre plate IP44	
	Fits one ventilation opening Package includes 2 grids and mounting accessories Total insulation
	832019 1 Outlet 2000 mm²
	832743 1 Outlet 3000 mm²
	832744 1 Outlet 4500 mm²

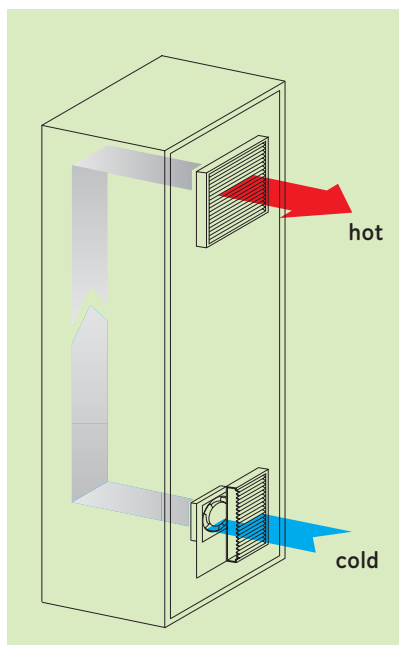
Ventilation grids - IP44 ⁽¹⁾	
	Set of 2 ventilation grids Drilling Ø 34.9 mm (1) If installed i.e. inside ARIA corners, underneath PolySafe roof
	831009 1

Air vents IP44	
	Kits of two pieces in polyamide RAL 7035 833677 1 Two air vents must be mounted per enclosure to ensure sufficient air circulation and prevent condensation water. Complete with template and screws. Air vents are preferably mounted in the upper and lower part of the base.
	

Air vent (IPx4)	
	To allow ventilation and prevent condensation. Air vents are preferably mounted in the upper and lower part of the box - M20
	861728 25

Pressure compensation plug - IP55	
	Kit of two pieces 818078 1 In a tightly closed enclosure, pressure differentials can occur during extreme temperature variations, such as day/night operation. The risk of dust and humidity being absorbed increases dramatically. The plug permits a controlled change in pressure. Easy installation in each enclosure. Technical data Dimensions: dia 65.5 mm x 30.5 mm Cut-out: dia 37 mm Fixation with PG 29 thread or nut Material: ABS / PC Air inlet: ± 7 cm² Protection: IP55 Remark: for optimal pressure compensation the use of 2 plugs, installed diagonally to each other, is recommended.
	

Pressure compensation plug - IP66	
	Set of 2 pieces 818223 1
	



The electrical operating elements built into a control enclosure, such as power converters, transformers, inductance coils, contactors, relays, etc., emit dissipation heat into the surrounding air.

If this dissipation heat is not removed, it may cause the temperature inside the enclosure to exceed the temperature permissible for electrical equipment. This poses a hazard to, in particular, electronic components.

The heat must therefore be removed to avoid malfunction and, ultimately, idle time. Natural aeration (by domes, gills, etc.) is not recommended, as the risk of contamination is very high and, in addition, the degree of protection of the enclosure cannot be maintained.

In such cases, forced aeration with appropriate built-in filters is the answer. In this system, the cooler ambient air is sucked by a fan into the lower part of the control enclosure, simultaneously filtered, and then blown into the body of the enclosure.

Here the air absorbs the dissipated heat and is then removed via an exhaust filter located in the upper part of the enclosure. An overpressure created simultaneously in the enclosure prevents dust particles penetrating any openings in the housing. Removing warm air by suction is not recommended, as the partial vacuum created within the enclosure would neutralise the dust-protective effect.

Enclosure ventilation

- Colour RAL 7035
- Gasket included
- IP54 as standard
- On request: filter fans and exhaust filters type LS...K and type LG...K in colour RAL 7032

Filter fan selection

The air flow (volume flow rate) of the filter fan depends on the total thermal loss and the temperature difference Δt between the permissible interior temperature and the ambient temperature.

The following formula applies here:

$$V \text{ (m}^3/\text{h)} = \frac{3.1 \text{ P (W)}}{\Delta T \text{ (K)}} \times 1.15$$

V = required air flow (m^3/h) - P = thermal loss in watts (W)

ΔT = interior/ambient temperature difference in Kelvin (K)

3.1 = constant numerical value of miscellaneous ventilation data

1.15 = 15% margin

Air flows (m^3/h) for thermal losses up to 3000 watts and temperature differences (DT) of 5...25 (K) can be taken from the selection chart.

It is recommended that a 15% margin be added to allow for contaminated filter mats or extreme conditions.

The air flows specified for the individual filter fans were measured in accordance with DIN 24163. At an air density of 1.2 kg/m^3 , the tolerance is $\pm 5\%$.

Filter material

DIN-tested VILEDON P15/350S, P15/500S or T3/290S filter mats (to DIN 24185) are used in the filter fans and exhaust filters. The material is thermally bonded. Behaviour in fire corresponds to DIN 53438, class F1.

The P15/350S filter mat collects dust particles of a minimum size of $10 \mu\text{m}$ at a separation efficiency of 85%, while the P15/500S filter mat collects dust particles of a minimum size of $5 \mu\text{m}$ at a separation efficiency of 94%.

If the dust particles are extremely fine, the supplementary, denser T3/290S filter mat may be used. This collects dust particles of a minimum size of $0.5 \mu\text{m}$ at a separation efficiency of 96% (please note the reduced air flow).

Soiled filter mats can be cleaned by rinsing out with water, by beating, or by blowing through with compressed air (do not wring out!).

Housing

Housings are made of heat-resistant ABS plastic (-35°C to $+85^\circ\text{C}$), self-extinguishing to UL 94 VO, tracking resistance to 3kA. Colour RAL 7035.

Other colours available upon request.

Degree of protection

Our filter fans are conform to relevant CE regulations.

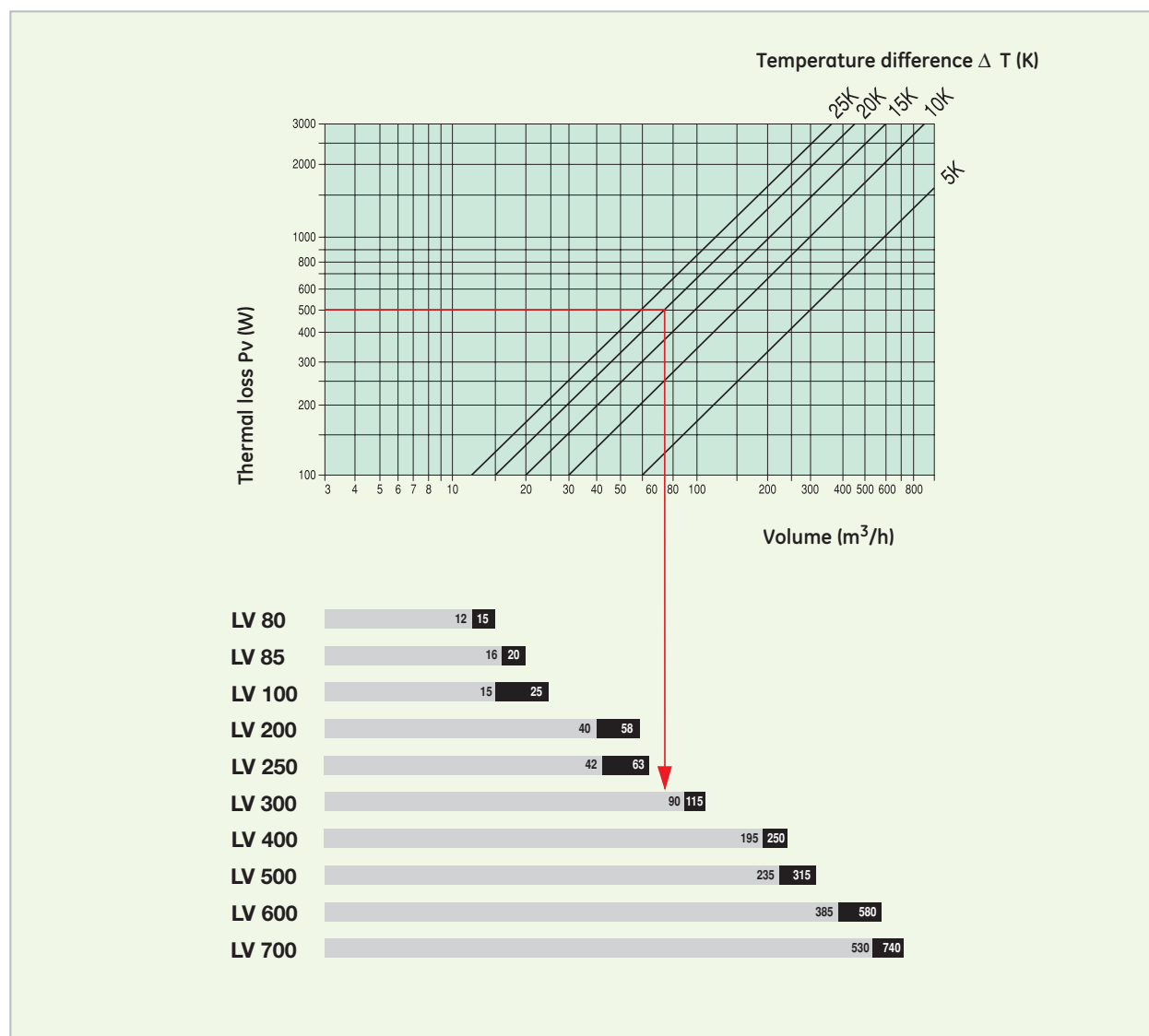
Contact-voltage proof to DIN 31001. Resistance to foreign bodies and water to IP54 (EN 60529) is achieved by combining a horizontal air flow with a gasket, delivered as a standard.

Advantages

Serie LV filter fans offer the follow advantages:

- Quick mounting $\Rightarrow$ Snaps into the cut-out, no screws needed
- Low shape $\Rightarrow$ Maximum protrusion of the cover is only 6.5 mm

Selection of the filter fan and the exhaust filter



Example

Parameters

Thermal loss 500W
Temperature difference 20K

Selection

LV 300 + GV 300

- 90 Filter fan + exhaust filter
- 115 Filter fan free blowing with filter mat P15/500S

Filter fans and exhaust filters

Standard delivery

Filter fan				Exhaust filter		
230VAC - 50/60Hz IP54 sealing included standard filter mat P15/350 S RAL 7035				IP54 sealing included standard filter mat P15/350 S RAL 7035		
						
Type	Ref. No.	m ³ /h	Cutout in mm ⁽³⁾	Type	Ref. No.	m ³ /h
LV 80 ⁽²⁾	818195	15	68 x 68	GV 80	818200	12
LV 85 ⁽¹⁾⁽²⁾	818196	20	68 x 68	GV 80	818200	16
LV 100 ⁽²⁾	818197	25	92 x 92	GV 100	818201	15
LV 200	818140	58	116 x 116	GV 200	818144	40
LV 250	818198	63	125 x 125	GV 250	818202	42
LV 300	818141	115	177 x 177	GV 300	818145	90
LV 400	818142	250	223 x 223	GV 400/500	818146	195
LV 500	818143	315	223 x 223	GV 400/500	818146	235
LV 600	818199	580	292 x 292	GV 600/700	818182	385
LV 700	818181	740	292 x 292	GV 600/700	818182	530

(1) 24VDC (2) P15/150S

(3) Detail drawing see page I.47

Technical data filter fan

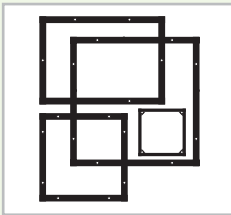
Filter fan 230VAC 50/60Hz		818195	818196	818197
Filter fan type		LV 80	LV 85	LV 100
Exhaust filter		GV 80	GV 80	GV 100
IP54 & sealing is standard		yes	yes	yes
Free air flow	m ³ /h	15	20	25
In combination with exhaust filter	m ³ /h	12	16	15
Standard filter mat P 15/150 S (67 % efficiency)		yes	yes	yes
Standard filter mat P 15/350 S (85 % efficiency)		-	-	-
Optional filter mat P 15/500 S (94 % efficiency)				
Free air flow	m ³ /h	-	-	-
In combination with exhaust filter	m ³ /h	-	-	-
Optional filter mat P 15/350 S + fine filter mat T3/290 S (96 % efficiency)				
Free air flow	m ³ /h	-	-	-
In combination with exhaust filter	m ³ /h	-	-	-
Power input 230VAC - 50/60Hz	W	5/4	3 (24VDC)	12
Current 230VAC - 50/60Hz	A	22/16mA	130mA	70mA
Noise level	dB (A)	27	48.5	30
Service life	hour	40000	60000	37500
Speed	rpm	2550/3100	6850	2700/3200
Temperature	-10°C to +55°C	-20°C ... +65°C	-20°C ... +65°C	yes
Approval	CE/UL/CSA	yes	yes	yes
Turn motor 180° to change from blowing to sucking (reduced air flow)		yes	yes	yes
Suction version can be ordered as option		-	-	-
115VAC	on request	-	-	yes
400VAC	on request	-	-	-
24VDC	on request	yes	standard	yes
12VDC	on request	yes	yes	yes
Options				
Spare filter mat P15/350 S		-	-	yes
Spare filter mat P15/500S		-	-	-
Fine filter mat T3/290S		-	-	-
Gasket IP 54		-	-	-

Dimensional drawings ● Page I.47



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Тел. (+375 44) 592 00 86

Gasket (spare part)		Filter mat (spare part)							
IP54 Polyethylene		P15/150S degree of separation 67% filter class ⁽⁴⁾ G2 (EU 2)		P15/350S degree of separation 85% filter class ⁽⁴⁾ G3 (EU 3)		P15/500S degree of separation 94% filter class ⁽⁴⁾ G4 (EU 4)		T3/290 S degree of separation 96% filter class ⁽⁴⁾ G4 (EU 4)	
									
Type	Ref. No.	Type	Ref. No.	Type	Ref. No.	Type	Ref. No.	Type	Ref. No.
D 80	818203	AM 815 P	818206		-		-		-
D 80	818203	AM 815 P	818206		-		-		-
D 100	818204	AM 115 P	818207		-		-		-
D 200	818173		-	AM 235 P	818208	AM 200 P	818166		-
D 250	818205		-	AM 0135 P	818209	AM 01 P	818213		-
D 300	818174		-	AM 335 P	818210	AM 300 P	818167	AM 300 T	818170
D 400	818175		-	AM 435 P	818211	AM 400 P	818168	AM 400 T	818171
D 400	818175		-	AM 435 P	818211	AM 400 P	818168	AM 400 T	818171
D 700	818176		-	AM 735 P	818212	AM 700 P	818169	AM 700 T	818172
D 700	818176		-	AM 735 P	818212	AM 700 P	818169	AM 700 T	818172

(4) DIN EN 779

818140	818198	818141	818142	818143	818199	818181
LV 200	LV 250	LV 300	LV 400	LV 500	LV 600	LV 700
GV 200	GV 250	GV 300	GV 400/500	GV 400/500	GV 600/700	GV 600/700
yes	yes	yes	yes	yes	yes	yes
58	63	115	250	315	580	740
40	42	90	195	235	385	530
-	-	-	-	-	-	-
yes	yes	yes	yes	yes	yes	yes
46	48	90	220	260	430	580
30	31	60	165	195	250	410
-	-	58	125	165	255	390
-	-	51	115	145	210	330
19/18	19/18	19/18	45/39	50/61	64/80	115/155
0.11	0.11	0.11	0.3	0.24/0.27	0.39/0.45	0.51/0.68
42	42	51	52	65	60	70
27500	27500	27500	40000	40000	40000	40000
2650/3100	2650/3100	2650/3100	2760/3030	2740/3120	2550/2800	2550/2750
yes	yes	yes	yes	yes	yes	-10°C ... +50°C
yes	yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	-	yes	-
-	-	-	-	818218	-	818194
yes	yes	yes	yes	yes	yes	yes
-	-	-	-	yes	-	yes
yes	yes	yes	yes	-	yes	-
-	-	-	-	-	-	-
yes	yes	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	yes
-	-	yes	yes	yes	yes	yes
yes	yes	yes	yes	yes	yes	yes

Notes

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Application guide / e-catalogue

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Insulated wall mounting cabinets

Wall mounting system enclosures

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General accessories

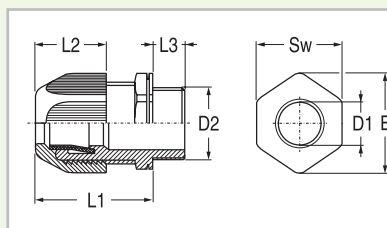
General characteristics

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Compression glands - Metric - IP68 in polyamide (RAL 7035)									
Metric size D2	Drill Ø (mm)	Clamping range D1 (mm)	L1	L2	L3	E	Keywidth Sw (mm)		
M12	12.5	3 - 6,5	21	12	8	17	15	851650	50
M16	16.5	4 - 8	25	15	8	21	19	851651	50
M20	20.5	6 - 12	35	20	10	27	24	851652	50
M25	25.5	12 - 18	36	22	12	36	33	851653	25
M32	32.5	17 - 25	42	25	12	47	42	851654	10
M40	40.5	20 - 32	46	30	13	58	53	851655	10
M50	50.5	32 - 38	47	30	13	66	60	851656	5
M63	63.5	37 - 44	47	30	14	71	65/68*	851657	5

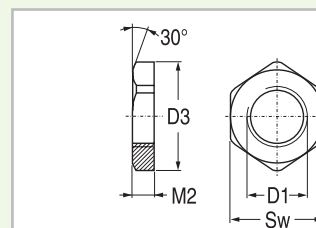
*body 68 / nut 65

Temperature : - 30° C up to + 100° C



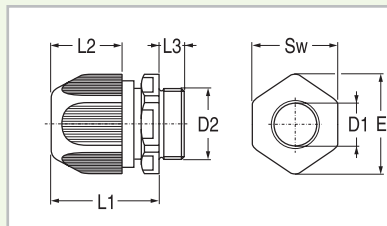
Lock nuts in polyamide - Metric - (RAL 7035)					
		Metric size	Width	Thickness	Keywidth
		D1	D3	M2	Sw (mm)
851664	100	M12	19	5	17
851665	100	M16	25	5	22
851666	100	M20	29	6	26
851667	100	M25	36	6	32
851668	50	M32	46	7	41
851669	25	M40	54	7	50
851670	25	M50	67	8	60
851671	25	M63	83	8	75

Temperature : - 40° C up to + 100° C



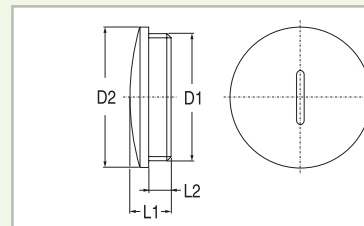
Compression glands - Metric - IP54 in polystyrene (RAL 7035)									
Metric size D2	Drill Ø (mm)	Clamping range D1 (mm)	L1	L2	L3	E	Keywidth Sw (mm)		
M12	12.5	3 - 6	22	13.6	8	18	16	851658	50
M16	16.5	5 - 9,5	24	14.2	8	23	21	851659	50
M20	20.5	8 - 13	27	16.2	9.5	28	25	851660	50
M25	25.5	10 - 16	30	18.2	10	33	30	851661	50
M32	32.5	14 - 20	35	21.5	12	40	36	851662	10
M40	40.5	19 - 27	43	24.5	12	51	46	851663	10

Temperature : - 30° C up to + 60° C



Blanking plugs - Metric - IP54 in polyamide (RAL 7035)						
			Metric size	Width	Thickness	Thread L2
			D1	D2	L1	length (mm)
851672	100		M12	15	10	6
851673	100		M16	20	10.5	6
851674	100		M20	24	10.5	6
851675	100		M25	30	13	8
851676	100		M32	37	13.5	8
851677	100		M40	46	14	8
851678	50		M50	56	16.5	10
851679	25		M63	70	18	12

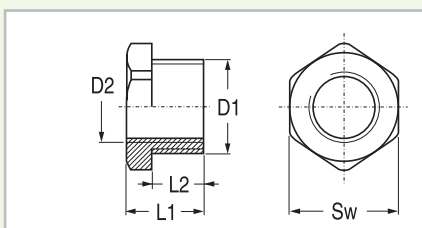
Temperature : - 40° C up to + 100° C



Reducing ring - Metric - IP54 in polyamide (RAL 7035)

Metric size	Thread (mm)		Keywidth		
D1 - D2	L1	L2	Sw (mm)		
M20 - M16	12.5	8.5	24	851680	50
M25 - M20	14	8	29	851681	50
M32 - M25	16	10	36	851682	25
M40 - M32	16	10	46	851683	10
M50 - M40	18	12	55	851684	5
M63 - M50	18	12	68	851685	5

Temperature : - 40° C up to + 100° C

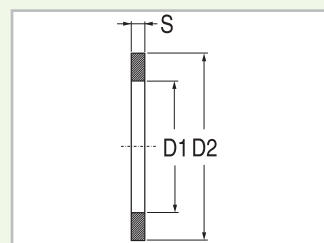


Connection thread grummet - Metric - in polyethylene (RAL 7035)

		Metric size	S (mm)	D1 (mm)	D2 (mm)
851691	100	M12	1.5	11.6	16
851692	100	M16	1.5	15.6	21
851693	100	M20	2	19.4	25
851694	100	M25	2	24.4	32
851695	100	M32	2	31.4	39
851696	100	M40	2	39.4	47
851697	100	M50	3	49.3	57
851698	100	M63	3	62.2	70

Temperature : up to + 70° C

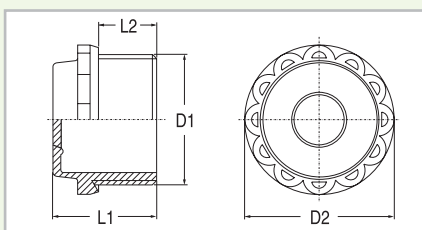
thickness s - diameter d1 - diameter d2



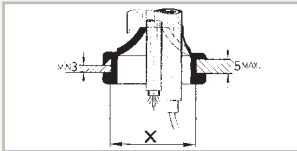
Universal cable entries - Metric - IP54 in polyethylene (RAL 7035)

Metric size	Cable section		Thread in mm			
D1	D2	(mm)	L1	L2		
M16	20	6 - 8	16	8	851686	100
M20	24	9 - 12	19	10	851687	100
M25	30	11 - 17	22	12	851688	50
M32	37	16 - 22	25	14	851689	25
M40	46	19 - 25	28	16	851690	10

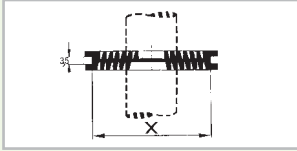
Temperature : - 40° C up to + 80° C



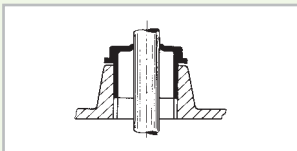
Universal cable entries (grey)					
Max. Ø cable	PG	Drill Ø X (mm)	Colour		
18	16	23	grey	610130	25
24	21	29	grey	610132	25
32	29	38	grey	610133	25
49	42	54	grey	852191	1

Min. Ø cable	Max. Ø PG	Drill Ø X (mm)	Colour		
12	48	55	grey	851096	20
12	30	35	grey	851097	20
12	36	45	grey	851098	20
22	66	75	grey	851099	10
22	58	65	grey	851100	10

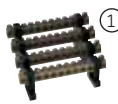



Max. Ø cable	PG	Colour		
13.5	11	grey	851082	100
14	13.5	grey	851083	100
16.5	16	grey	851084	100
21	21	grey	851085	100



Terminals

	①	610022	12
4 pole terminal - 6.5 x 9 mm bars 63A For DIN-rail mounting			
	②	617992	1
4 pole terminal with cover - 160A For DIN-rail mounting			
	③	610020	12
4 pole terminal - 12 x 5 mm bars 160A For DIN-rail mounting			
	④	610021	12
Protective screen for 610020			
		610017	10
Earth-neutral bar 12 x 5 mm Length 1.2 m + 50 clamps + 50 nuts Max. distance between supports: 200 mm To use with support 851192			
		610018	1
Support for four bars 12 x 5 Max. distance between support: 200 mm For DIN-rail mounting Use with above bars			

Cable on bus bar connection

- 4 connections possibility
- Aluminium cable can be connected
- Bar thickness: max. 12 mm
- Bar width: no limit

35-70 mm²

1 cable 779220 4

2 cables 779221 4

3 cables 779222 4

+ 4 connections (16 mm²)

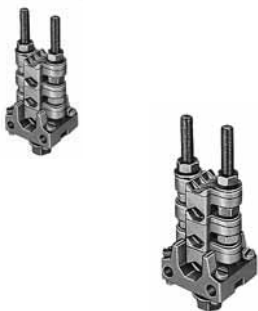
90-150 mm²

1 cable 779217 4

2 cables 779218 4

3 cables 779219 4

+ 4 connections (25 mm²)



Insulation hood in rubber



779224 4

For terminal 35-70 mm²

779223 4

For terminal 95-150 mm²

Branch terminals

610185	4
Phase bar - black 6 x 10 mm ² and 2 x 16 mm ² To clip on 12 x 2 mm bar	
610186	4
Earth bar - green 6 x 10 mm ² and 2 x 16 mm ² To clip on 12 x 2 mm bar	
610187	4
Neutral bar - blue 6 x 10 mm ² and 2 x 16 mm ² To clip on 12 x 2 mm bar	
610065	4
14 x 16 mm ² Fixation on DIN-rail	
851021	10
Earth bar 12 x 4 with 3 clamps Screw fixation	
851325	5
Neutral clamp with screw fixation (also snap on bar 12 x 2)	
851172	10
Neutral clamp with screw fixation	



Bar on busbar connections

		Main bar	Secondary bar	Total bar thickness	
				Min.	Max.
851125	50	12	12	5	15
851120	10	20	15-20	5-4	26-24
851129	10	30	15-20-30	7-6-5	28-27-26



Cable on bar connection

		Max. Ø Cable cross (mm ²)	Bar thickness (mm)	Bar width (mm)
851117	10	10 to 50	5 to 6	30
851118	10	4 to 35	3 to 5	15
851121	10	16 to 120	2 to 5	5 to 12



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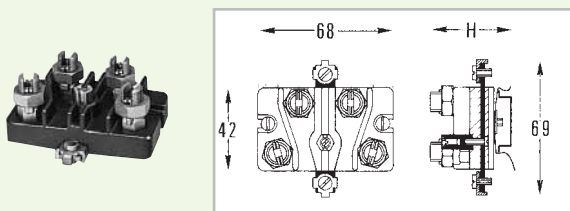
Terminals for Al and Cu cable 10-16 mm²

4 terminals with max. capacity

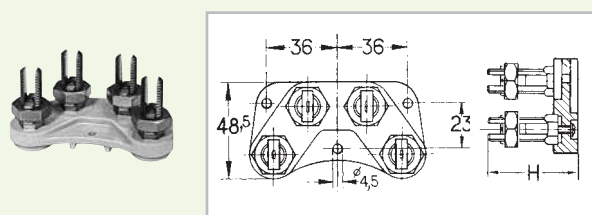
Single compression unit: 4 x 4 mm² - 4 x 6 mm² - 4 x 10 mm² - 3 x 16 mm²

Double compression unit is optional

Fixation	Earth terminal	H	10-16 mm ²	
with screws	without	46	779212	5
on DIN-profile	without	48	779213	5
with screws	with	46	779214	5
on DIN-profile	with	48	779215	5



with screws	without	48	890705	5
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Double compression unit

779216 1

Set of 4 compression nuts

Insulated hood



890704 20

In rubber

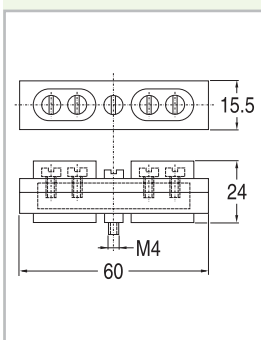
Conduct through terminal

16 mm² with double clamp

Conductors 4 - 16 mm² - 500V

Al conductors 4 - 25 mm²

601231 20



Terminals 25-35 mm²

Without insulation hood

779201 10

1 compression nut • Al/Cu cable

779202 10

2 compression nuts • Al/Cu cable

With insulation hood

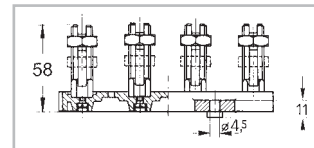
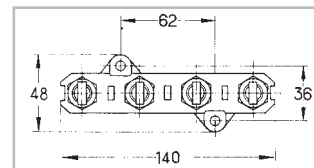
779204 10

2 compression nuts • Al/Cu cable

With insulation hood and DIN-rail fixation

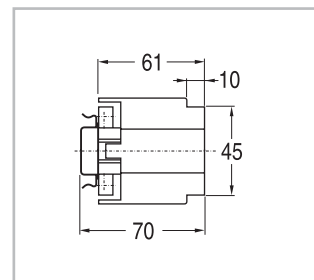
779205 10

2 compression nuts • Al/Cu cable



Insulation hood

890838 10



Double compression unit

779203 10

Set of 4 compression nuts

Key

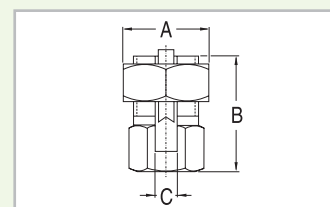
601222 1

Insulated key M20 - 1000V for terminals 25-35 mm².

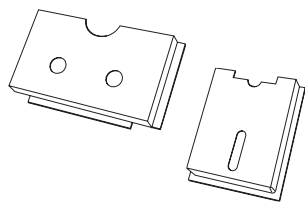


Cable connection for outer lines

		Section	A	B	C
601227	100	10 mm ²	14	24	4.5
601228	50	16 mm ²	22	29	5.5
601229	25	35 mm ²	25	35	7.5
601230	25	50 mm ²	28	43.5	9.0



Document pocket - Self adhesive



	811516	1
DIN A4	325 W x 180 H	
	832000	1
DIN A5 transparent	155 W x 225 H	

Marking strip



	851321	1m
Self-adhesive		

Blanking plates

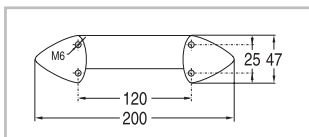


	610142	10
For 4 modules break off 1/2 module		



	828056	1m
Spare blank plate for screening off rectangular openings		

Handle



	851244	1
Height 50 mm		
With reinforced rib + screws		
Made of Vyncolite		

Enclosure lighting



230V 50/60Hz 11W		
With magnetic attachment		
355 x 65 x 65 mm		
	818192	1



With "Schuko" socket 250V/16A		
	818112	1
With "CEBEC" socket 250V/16A		
Without cover		



	818191	1
Cover for lamp		

Surface-mounted windows

Including drill template and mounting

①	861395	1
77 x 60 mm - 2 mod.		

①	861396	1
77 x 96 mm - 4 mod.		

①	861397	1
77 x 130 mm - 6 mod.		

①	861398	1
77 x 163 mm - 8 mod.		

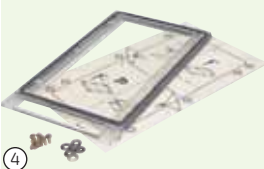
①	861399	1
77 x 200 mm - 10 mod.		

②	866001	1
Screwed IP67		

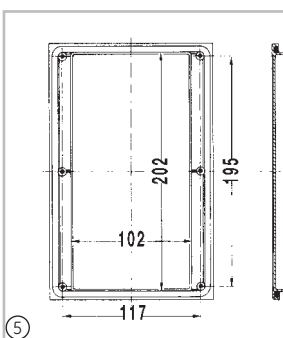
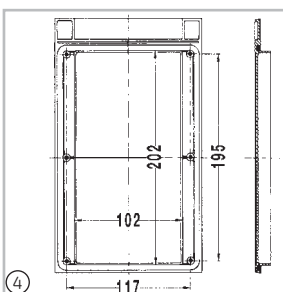
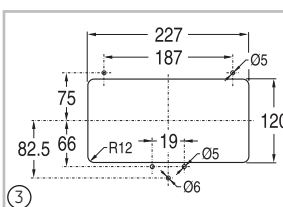
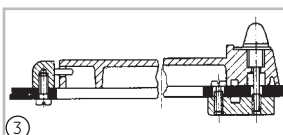
③	890837	1
Hinged, with gasket IP55		



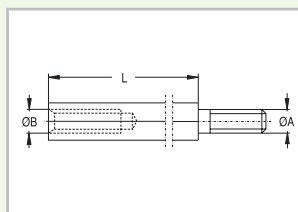
④	866002	1
Screwed IP67, with indication strip		



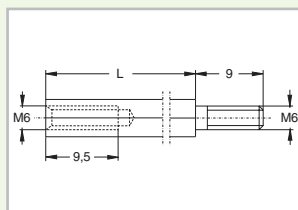
⑤	866003	1
Screwed IP67, without indication strip		



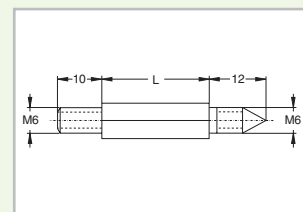
Height extension studs				
L (mm)	Ø A	Ø B	Type M4	
10	M4	M4	890800	50
15	M4	M4	890801	50
20	M4	M4	890802	50
25	M4	M4	890803	50
30	M4	M4	890804	50
60	M4	M4	890805	50
65	M4	M4	890806	50
97	M4	M4	890807	50
102	M4	M4	890808	50



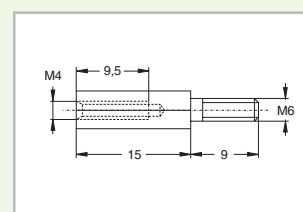
Height extension studs			
L (mm)	Ø	Type M6	
15	M6-M6	811337	100
20	M6-M6	811338	100
25	M6-M6	811454	100
30	M6-M6	811339	100
35	M6-M6	811455	100
45	M6-M6	811456	100
55	M6-M6	811457	100
65	M6-M6	811458	100
70	M6-M6	811340	100
80	M6-M6	811460	100
100	M6-M6	811461	100
120	M6-M6	811341	100



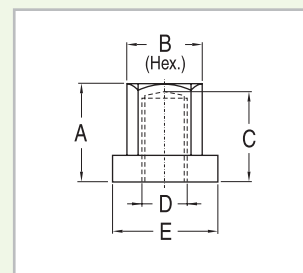
Height extension studs			
Type M6		L (mm)	Ø
811342	100	60	M6-M6
811343	100	30	M6-M6



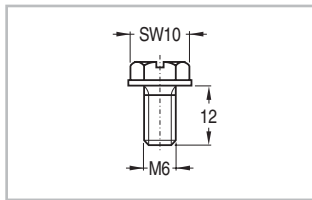
Type M4-M6			
811336	100	15	M6-M4



Insulated nuts (grey RAL 7035)							
			A	B	C	D	ØE
601223	100	M4	15	13,2	8,5	M4	11
601224	100	M5	18	17,0	10	M5	14
601225	100	M6	22,3	20,4	9	M6	17
601226	50	M8	25,3	24,2	10	M8	20

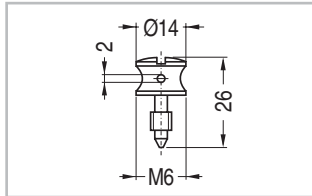


Screws



811483 100

Screws M6 with flanges

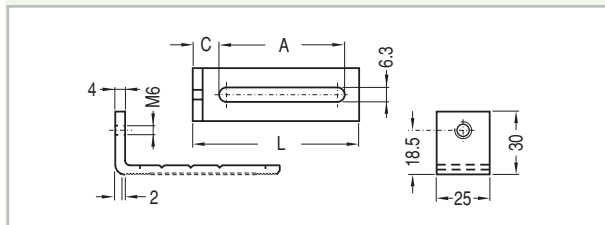


811451 100

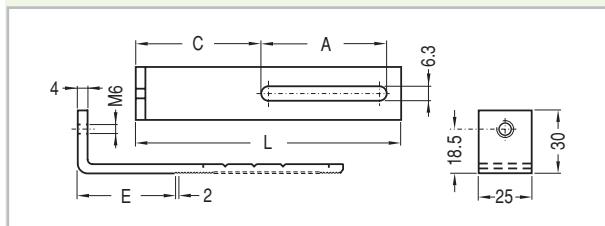
Screws M6 in PVC for cover plate
(sealable)

Brackets

L	A	C	E		
25	10	9,5	-	811477	100
40	24	9,5	-	811478	100
80	64	9,5	-	811479	100



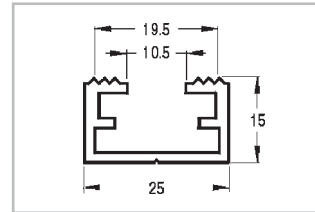
120 64 49,5 41,5 811480 100



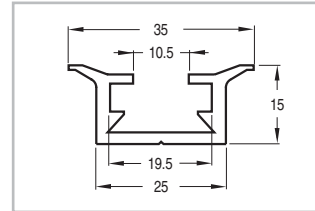
Aluminium profiles

Profile length 3 m

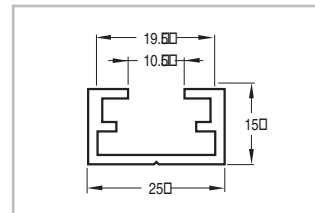
811417 1



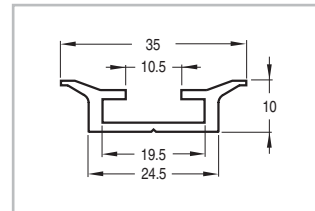
811501 1



811421 1



811502 1



A

B

C

D

E

F

G

H

I

X

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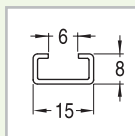
H.9

Galvanised profiles

890848 1

Profile C 15 x 8 x 1

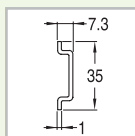
Length: 3 m



890847 1

DIN profile 35 x 7.3 x 1

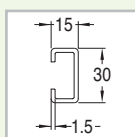
Length: 3 m



811619 1

Profile C 30 x 15 x 1.5

Length: 3 m



811363 25

Sliding nuts for C 30 x 15

M6



811365 50

Sliding nuts for C 25 x 10

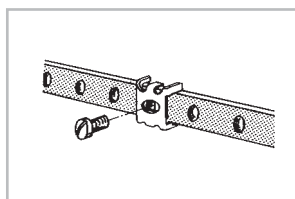
M6



811263 1

Cu profile 12 x 5 with thread M 5

Length: 3 m



851123 10

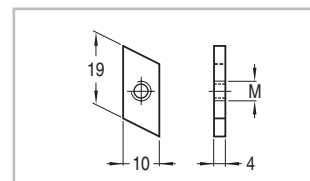
Connectors + screws M 5 x 13

Max. 2 x 10 mm² per connector

Nuts in metal

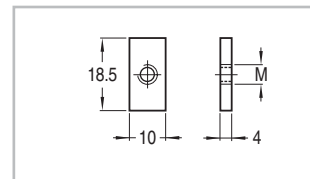
811435 100

M6



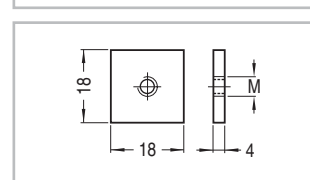
811438 100

M4



811442 100

M6



811446 100

M6

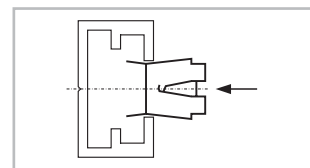
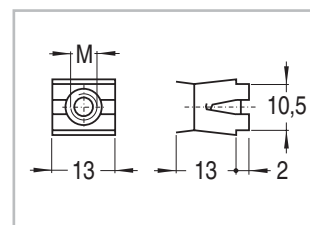
811447 100

M8

Nuts in PVC

811443 100

M6



Sliding nuts

For perforated mounting plate

831328 50

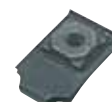
Bolt M4

831329 50

Bolt M5

831330 50

Bolt M6



Height extension studs

610312 10

For use on symmetrical

DIN-rail

Height: 21 mm



Fixation material	
	890835 10
Sliding contact + screw M4	
	890836 10
Sliding contact + washer + screw M4	
	890842 10
Set for meter fixation M4	
	890843 20
Screw M5 for meter fixation L = 11 mm	
	890844 20
Screw M5 for meter fixation L = 21 mm	
	890849 50
Screw M 4 x 8	
	890841 50
Sliding nut M4	
	890850 20
Washer M4	
	890840 20
Coupling kit	
	890839 25
Cross fixation for C-profiles	

Profiles			
Type AB (C 15 x 8)			
Profile length	Width of the box		
100 mm	150	890809	10
135 mm	185	890812	10
250 mm	300	890817	10
320 mm	370	890822	10
506 mm	555	890827	10
550 mm	600	890831	10
Type HB (C 15 x 8)			
Profile length	Width of the box		
110 mm	185	890813	10
225 mm	300	890818	10
295 mm	370	890823	10
481 mm	555	890828	10
525 mm	600	890832	10
Type UB (1)			
Profile length	Width of the box		
90 mm	150	890810	10
100 mm	150	890811	10
135 mm	185	890814	10
200 mm	250	890816	10
250 mm	300	890820	10
276 mm	300	890819	10
320 mm	370	890824	10
506 mm	355	890829	10
550 mm	600	890833	10
(1) DIN 46.277/bl.3			
Type ZB (C 15 x 8)			
Profile length	Height of the box		
105 mm	185	890815	10
220 mm	300	890821	10
290 mm	370	890825	10
405 mm	485	890826	10
476 mm	555	890830	10
520 mm	600	890834	10

