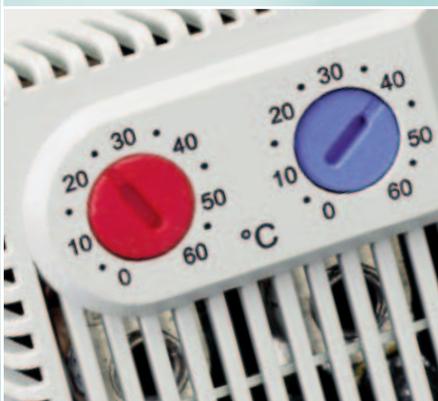


Product Catalogue



Thermal Management Products & Accessories from STEGO

successfully used worldwide



for control panels and enclosures



for traffic control and monitoring systems in the transport industry



for high voltage switchgear in outdoor and indoor substations



for system protection in the automotive industry



in transmitter stations of cellular phone networks



for motor control centres and control cabinets

Problem

Condensation forms due to fluctuating temperature, even in sealed enclosures. In combination with dust and aggressive gases condensation causes corrosion which results in stray currents and arcing. Too high a temperature or too low a temperature, can also lead to serious component failure. The safety risk is enormous and the cost of the operational delays as a consequence is incalculable.

Solution

Only constant optimum climatic conditions allow components to function properly. The right climate can be attained by a temperature and moisture control system. When temperatures are too low or when temperature differences (e.g., night/day) are large heating is required. It may also be necessary to keep components cool by controlled ventilation.

Applications

Whether for telecommunications or traffic systems, power stations or outdoor plants, ATMs or parking control systems, where electronics have to be protected against humidity, heat or cold, STEGO's comprehensive product range offers effective economical solutions.

Our Products

Conventional and PTC semiconductor control panel heaters and fan-assisted heaters ranging from 5W to 1200W, as well as EX variations. Temperature and humidity controls ranging from 0 to 60°C (32 to 140°F) and 35% to 100% RH. Filter fan series in EMC and standard versions from 21 to 550m³/h with excellent shielding characteristics. Panel lighting and accessories.

About Us

We have been developing and producing innovative products for thermal management for more than thirty years. Our products are renowned for their reliability and long life, simplicity of use and high quality. Used and proven worldwide even under extreme conditions. STEGO is ISO 9001:2008 and 14001:2004 certified and has branches in eleven countries.

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Indication of measurements in mm. Errors and omissions excepted. Specifications are subject to change without notice. Suitability of the products for their intended use and any associated risks must be determined by the end customer/buyer in their final application. Up-to-date versions of all technical data sheets in pdf-format can be found in the Internet at www.stego.de, www.stego.co.uk or www.stegonorden.se for download.



- **Wide voltage range**
- **Dynamic heating up**
- **Energy saving**
- **Compact**

Small heaters designed to prevent condensation and to ensure a minimum operating temperature in small enclosures. The heaters are designed for permanent operation.

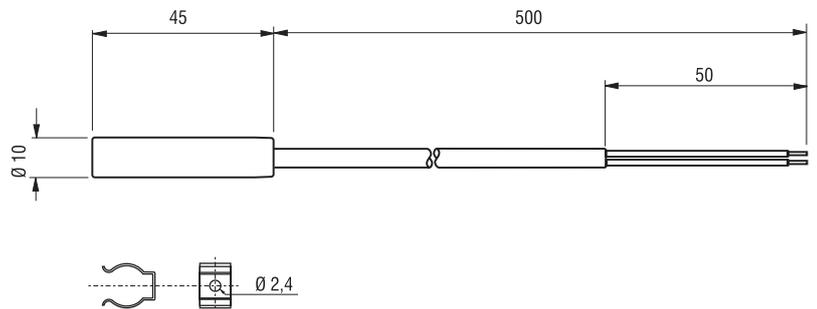
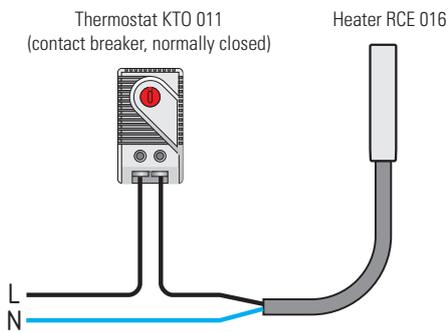


Technical Data

Operating voltage	120-240V AC/DC* (min. 110V, max. 265V)
Heating element	PTC resistor - temperature limiting
Heater body	aluminium
Mounting	see Accessories
Fitting position	variable
Dimensions	length 45mm, Ø 10mm
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP54 / II (double insulated)
Approvals	VDE + UL File No. E150057
Accessories	mounting clips (see illustration), Art. No. 09008.0-01
Note	other voltages on request

*Operating with voltages below 140V AC/DC reduces heating performance by approx. 10%.

Example of connection



Mounting clips Art. No. 09008.0-01 (1 packing unit = 2 pieces)

Art. No.	Heating capacity*	Inrush current max.	Pre-fuse T (time-delay)	Surface temperature (approx.)	Connection	Weight (approx.)
01622.0-00	5W	2.0A	1A	165°C	2 x AWG 22 sheathed cable (silicone)	20g
01623.0-00	9W	2.5A	2A	175°C	2 x AWG 22 sheathed cable (silicone)	20g

*at 20°C (68°F) ambient temperature



Wide voltage range

Dynamic heating up

Energy saving

Compact

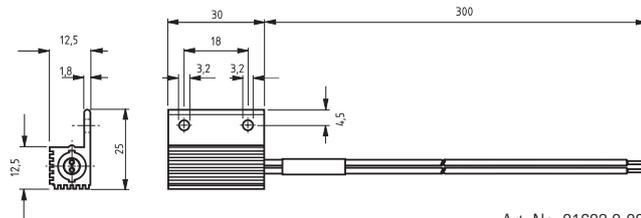
These small heaters are designed to prevent condensation and to ensure a minimum operating temperature in small enclosures. The heaters are designed for permanent operation.



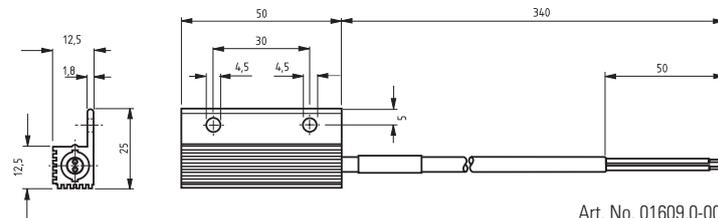
Technical Data

Operating voltage	120-240V AC/DC* (min. 110V, max. 265V)
Heating element	PTC resistor - temperature limiting
Heater body	aluminium, anodised
Mounting	screw fixing
Fitting position	variable
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP54 / II (double insulated)
Approvals	VDE + UL File No. E150057
Note	other voltages on request

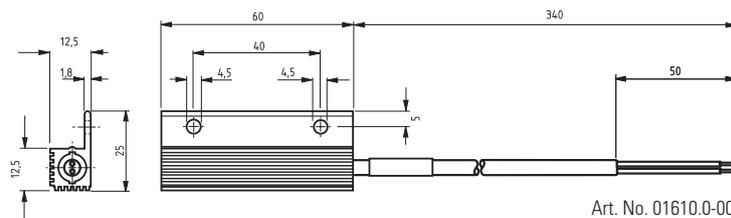
*Operating with voltages below 140V AC/DC reduces heating performance by approx. 10%.



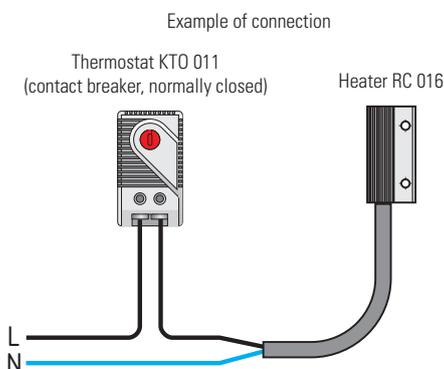
Art. No. 01602.0-00



Art. No. 01609.0-00



Art. No. 01610.0-00



Art. No.	Heating capacity*	Inrush current max.	Pre-fuse T (time-delay)	Surface temperature (approx.)	Connection	Weight (approx.)
01602.0-00	8W	2.0A	1A	150°C	2 x AWG 18 stranded wire	20g
01609.0-00	10W	2.5A	2A	155°C	2 x AWG 24 sheathed cable (silicone)	30g
01610.0-00	13W	3.0A	2A	170°C	2 x AWG 24 sheathed cable (silicone)	40g

*at 20°C (68°F) ambient temperature



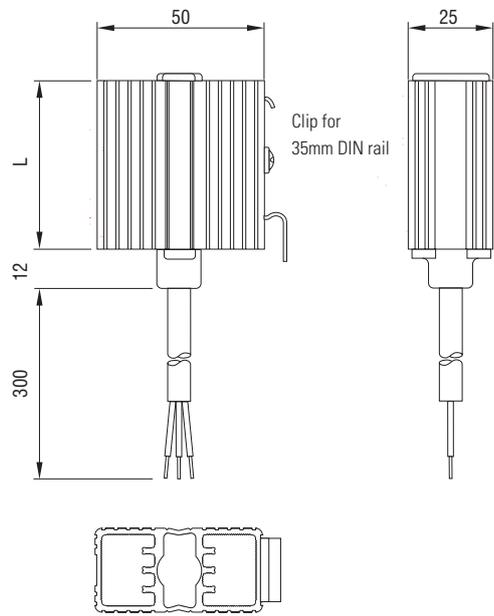
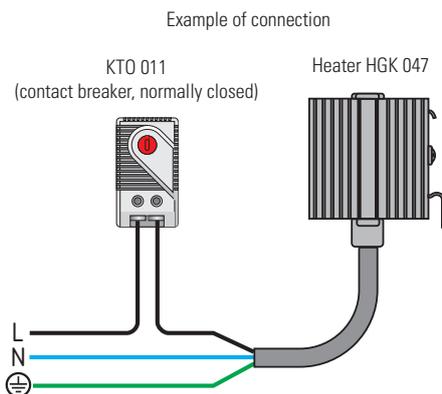
- **Dynamic heating up**
- **Energy saving**
- **Wide voltage range**
- **Clip fixing**

The heaters are used in enclosures where condensation is to be prevented or the temperature may not fall below a minimum value. In this way corrosion is avoided and an even temperature is ensured. The heaters are designed for permanent operation.



Technical Data

Heating element	PTC resistor - temperature limiting
Heater body	extruded aluminium profile, anodised
Mounting	clip for 35mm DIN rail, EN 60715
Fitting position	vertical airflow (air outlet up, connection on bottom)
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP44 / I (earthed)
Accessories	screw fixing, Art. No. 09024.0-00 (1 packing unit = 2 pieces)
Note	other voltages on request



Art. No.	Operating voltage	Heating capacity ¹⁾	Inrush current max.	Pre-fuse T (time-delay)	Length (L)	Weight (approx.)	Connection	Approvals
04700.0-00	120-240V AC/DC ²⁾	10W	1.0A	1A	52mm	0.1kg	3 x 0.5mm ² x 300mm cable (silicone)	VDE
04701.0-00	120-240V AC/DC ²⁾	20W	2.5A	2A	60mm	0.2kg	3 x 0.5mm ² x 300mm cable (silicone)	VDE
04702.0-00	120-240V AC/DC ²⁾	30W	3.0A	2A	70mm	0.2kg	3 x 0.5mm ² x 300mm cable (silicone)	VDE
04700.9-00	110-120V AC/DC	10W	1.0A	1A	52mm	0.1kg	3 x AWG 20 x 300mm cable	UL File No. E150057
04701.9-00	110-120V AC/DC	20W	1.5A	2A	70mm	0.2kg	3 x AWG 20 x 300mm cable	UL File No. E150057
04702.9-00	110-120V AC/DC	30W	1.5A	2A	100mm	0.2kg	3 x AWG 20 x 300mm cable	UL File No. E150057

¹⁾ at 20°C (68°F) ambient temperature; ²⁾ (min. 110V, max 265V) Operating with voltages below 140V AC/DC reduces heating performance by approx. 10%.

Touch-safe small Heater CSK 060 Series (Semiconductor)

10W, 20W



- **Low surface temperature**
- **Double insulated (plastic housing)**
- **Wide voltage range**
- **Dynamic heating up**
- **Clip fixing**

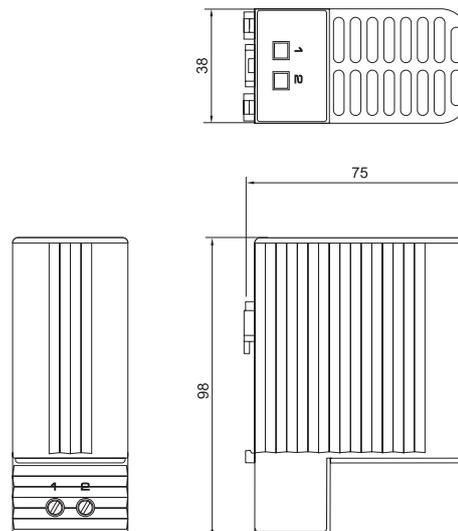
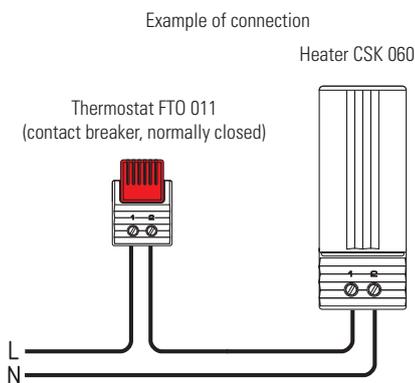
The heaters are used in enclosures where condensation is to be prevented or the temperature may not fall below a minimum value. In this way corrosion is avoided and an even temperature is ensured. The heaters are designed for permanent operation.



Technical Data

Operating voltage	120 - 240V AC/DC* (min. 110V, max. 265V)
Heating element	PTC resistor - temperature limiting
Surface temperature	< 85°C (185°F) (according to VDE 0100), except upper protective grille
Connection	2-pole terminal 2.5mm ² , torque 0.8Nm max.
Casing	plastic according to UL94 V-0, black
Dimensions	98 x 38 x 75mm
Mounting	clip for 35mm DIN rail, EN 60715
Fitting position	vertical airflow (air outlet up, connection on bottom)
Operating / Storage temperature	-45°C to +70°C (-49°F to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Approvals	VDE + UL File No. E150057 (according to UL 499, intended for the use within an enclosure in accordance with UL 508A)
Note	other voltages on request

*Operating with voltages below 140V AC/DC reduces heating performance by approx. 10%.



Art. No.	Heating capacity*	Inrush current max.	Pre-fuse T (time-delay)	Weight (approx.)
06040.0-00	10W	1.0A	1A	0.2kg
06030.0-00	20W	2.5A	2A	0.3kg

* at 20°C (68°F) ambient temperature



- Pressure clamp connectors
- Dynamic heating up
- Wide voltage range
- Energy saving
- Clip fixing
- Quick installation

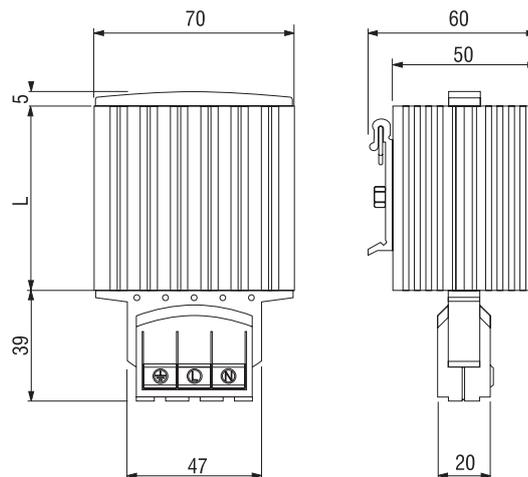
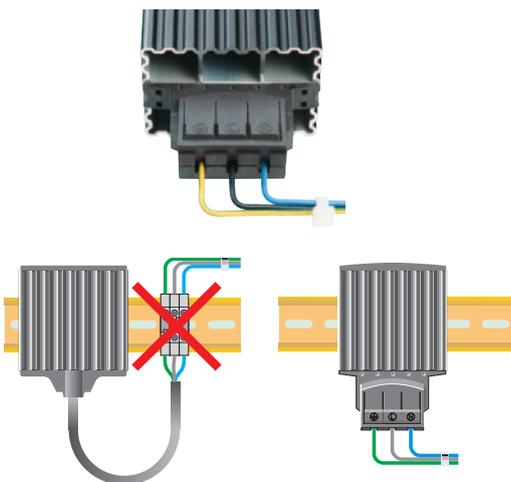
These heaters are used in enclosures where damage from condensation must be prevented, or where the temperature may not fall below a minimum value. The aluminium profile heater body design has a chimney effect and distributes the heat evenly. The heaters are designed for permanent operation. Pressure clamp connectors save time and simplify installation.



Technical Data

Operating voltage	120-240V AC/DC* (min. 110V, max. 265V)
Heating element	PTC resistor - temperature limiting
Heater body	extruded aluminium profile, anodised
Connection	3 pressure clamps for stranded wire 0.5-1.5mm ² (with wire end ferrule) and rigid wire 0.5-2.5mm ²
Connection casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 60715
Fitting position	vertical airflow (air outlet up, connection on bottom)
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / I (earthed)
Approvals	VDE + UL File No. E150057
Accessories	screw fixing, Art. No. 09024.0-00 (1 packing unit = 2 pieces)
Note	other voltages on request

*Operating with voltages below 140V AC/DC reduces heating performance by approx. 10%.



Art. No.	Heating capacity*	Inrush current max.	Pre-fuse T (time-delay)	Length (L)	Weight (approx.)
14000.0-00	15W	1.5A	1A	65mm	0.3kg
14001.0-00	30W	3.0A	2.5A	65mm	0.3kg
14003.0-00	45W	3.5A	2.5A	65mm	0.3kg
14005.0-00	60W	2.5A	2.5A	140mm	0.4kg
14006.0-00	75W	4.0A	4A	140mm	0.5kg
14007.0-00	100W	4.5A	4A	140mm	0.5kg
14008.0-00	150W	9.0A	6.3A	220mm	0.7kg

*at 20°C (68°F) ambient temperature

Hazardous area Heater CREx 020 Series 50W, 100W



- Large convection surface
- Clip fixing
- Ready for use
- Maintenance free

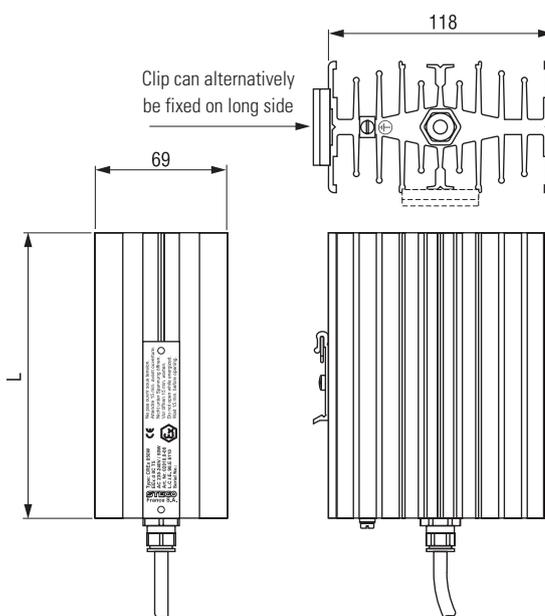
Compact convection heater for use in areas with explosion hazard for prevention of formation of condensation, temperature fluctuations and for protection against frost in transmitter housings, switch cabinets and measuring equipment.



Technical Data	
Explosion protection according to EN	LCIE (Laboratoire Central des Industries Electriques)
Conformity certificate	01 ATEX 6073/03, LCIE N° 06 ATEX Q8011, IECEx LCI 07. 0020
Heating element	high performance cartridge
Heater body	aluminium profile, black anodised
Connection	Si HF-JZ 3 x 0.75mm ² cable, length 1m
Connection PE	4mm ²
Mounting	clip for 35mm DIN rail, EN 60715
Fitting position	vertical airflow (connection on bottom)
Operating / Storage temperature	-40 to +40°C (-40 to +104°F) / -45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP65 / I (earthed)



Hazardous area Thermostat REx 011
see page 41



Art. No.	Operating voltage	Heating capacity	Pre-fuse T (time-delay)	Ex protection type	Surface temperature	Length (L)	Weight (approx.)
02010.0-00	230-240VAC	50W	0.5A	Ex d IIC T5 - Ex tD A21 IP6X T100°C	100°C	150mm	1.3kg
02011.0-00	230-240VAC	100W	1A	Ex d IIC T4 - Ex tD A21 IP6X T135°C	135°C	180mm	1.5kg
02010.0-01	110-120VAC	50W	0.5A	Ex d IIC T5 - Ex tD A21 IP6X T100°C	100°C	150mm	1.3kg
02011.0-01	110-120VAC	100W	1.25A	Ex d IIC T4 - Ex tD A21 IP6X T135°C	135°C	180mm	1.5kg

Touch-safe Heater CS 060 Series (Semiconductor)

50W to 150W



- Low surface temperature**
- Quick mounting due to clip fixing**
- Double insulated (plastic)**
- Wide voltage range**
- Small size**

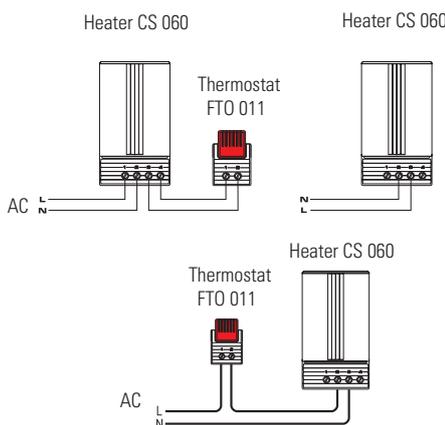
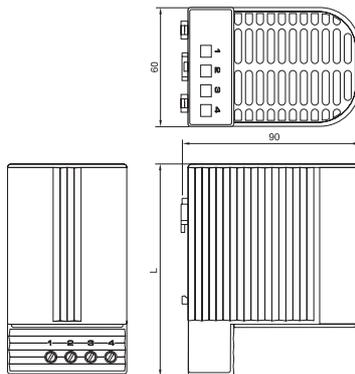
Touch-safe heater for the use in enclosures with electrical/electronic components. The design of the heater supports the natural convection which results in a high air-current of warm air. The surface temperatures on the accessible side surfaces of the housing are kept down as a result of the heater design. Our complete range of thermostats and hygrostats can directly be connected to the heater CS 060. This heater is also available in a version with plug-in thermostat requiring no additional wiring (CSF 060). The heaters are designed for permanent operation.



Technical Data

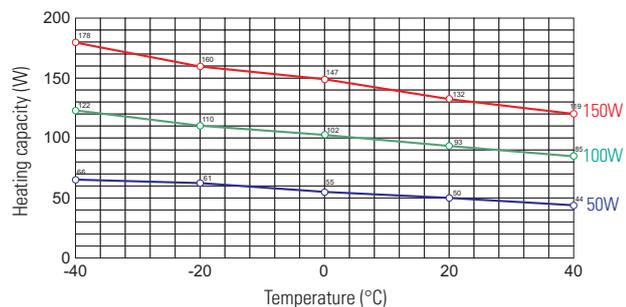
Operating voltage	120-240V AC/DC* (min. 110V, max. 265V)
Heating element	PTC resistor - temperature limiting
Surface temperature	< 80°C (176°F), except upper protective grille
Connection	4-pole terminal 2,5mm ² , torque 0.8Nm max.
Casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 60715
Fitting position	vertical airflow (air outlet up, connection on bottom)
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Approvals	VDE + UL File No. E150057 (according to UL 499, intended for the use within an enclosure in accordance with UL 508A)
Note	other voltages on request

*Operating with voltages below 140V AC/DC reduces heating performance by approx. 10%.



Examples of connection

Heating capacity / Ambient temperature diagram CS 060



Art. No.	Heating capacity ¹⁾	Inrush current max.	Pre-fuse T (time-delay)	Air outlet temperature ²⁾	Dimensions	Weight (approx.)
06000.0-00	50W	2.5A	4A	+86°C (186.8°F)	110 x 60 x 90mm	0.3kg
06010.0-00	100W	4.5A	8A	+120°C (248°F)	110 x 60 x 90mm	0.3kg
06020.0-00	150W	8A	8A	+145°C (293°F)	150 x 60 x 90mm	0.5kg

¹⁾ ambient temperature - see Heating capacity / Ambient temperature diagram; ²⁾ measured 50mm above protective grille

Touch-safe Heater CSF 060 Series (Semiconductor)

50W to 150W



- Low surface temperature
- Integrated thermostat
- Quick mounting due to clip fixing
- Double insulated (plastic)
- Wide voltage range
- Small size

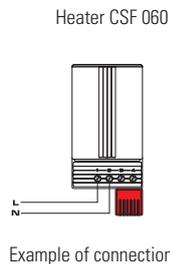
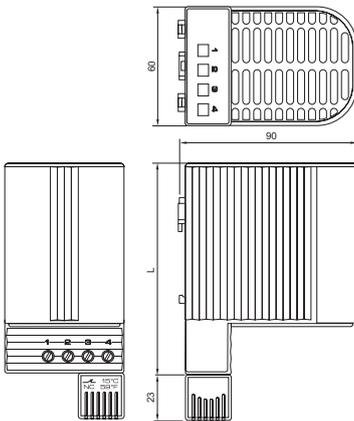
Touch-safe heater for the use in enclosures with electrical/electronic components. The design of the heater supports the natural convection which results in a high air-current of warm air. The surface temperatures on the accessible side surfaces of the housing are kept down as a result of the heater design. This model with plug-in thermostat does not require additional wiring. The heaters are designed for permanent operation. This heater is also available in a version without thermostat (CS 060).



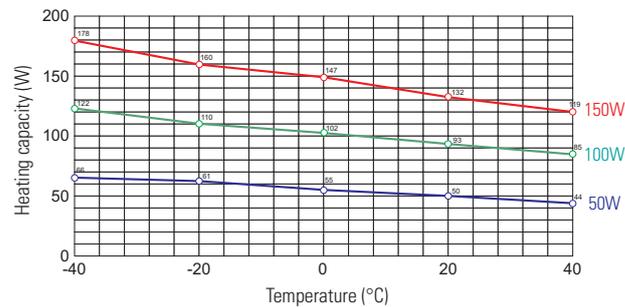
Technical Data

Operating voltage	120-240VAC* (min. 110V, max. 265V)
Heating element	PTC resistor - temperature limiting
Surface temperature	< 80°C (176°F), except upper protective grille
Connection	2-pole terminal 2,5mm ² , torque 0.8Nm max.
Casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 60715
Fitting position	vertical airflow (air outlet up, connection on bottom)
Operating / Storage temperature	-40 to +70°C (-40 to +158°F) / -45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Approvals	VDE
Note	other voltages on request

*Operating with voltages below 140VAC reduces heating performance by approx. 10%.



Heating capacity / Ambient temperature diagram CSF 060

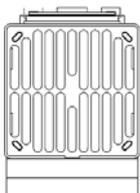
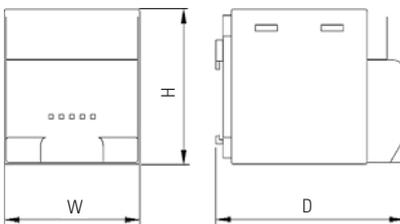


Art. No.	Heating capacity ¹⁾	Inrush current max.	Pre-fuse T (time-delay)	Air outlet temperature ²⁾	Switch-off temperature ³⁾	Switch-on temperature ³⁾	Dimensions	Weight (approx.)
06001.0-00	50W	2.5A	4A	+86°C (186.8°F)	+15°C (59°F)	+5°C (41°F)	110 x 60 x 90mm	0.3kg
06002.0-00	50W	2.5A	4A	+86°C (186.8°F)	+25°C (77°F)	+15°C (59°F)	110 x 60 x 90mm	0.3kg
06011.0-00	100W	4.5A	8A	+120°C (248°F)	+15°C (59°F)	+5°C (41°F)	110 x 60 x 90mm	0.3kg
06012.0-00	100W	4.5A	8A	+120°C (248°F)	+25°C (77°F)	+15°C (59°F)	110 x 60 x 90mm	0.3kg
06021.0-00	150W	8A	8A	+145°C (293°F)	+15°C (59°F)	+5°C (41°F)	150 x 60 x 90mm	0.5kg
06022.0-00	150W	8A	8A	+145°C (293°F)	+25°C (77°F)	+15°C (59°F)	150 x 60 x 90mm	0.5kg

¹⁾ ambient temperature - see Heating capacity / Ambient temperature diagram; ²⁾ measured 50mm above protective grille; ³⁾ tolerance of ± 5K



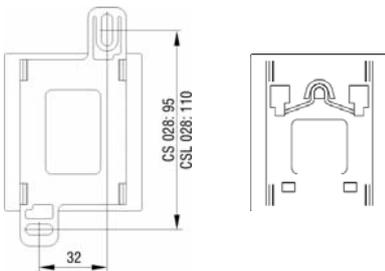
Photo: Fan Heater CSL 028



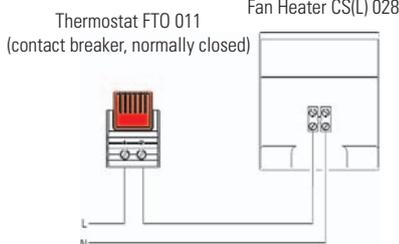
View: back side

Screw fixing

Clip fixing



Example of connection



Small, compact design

Quiet in operation

Dynamic heating up

Clip or screw fixing

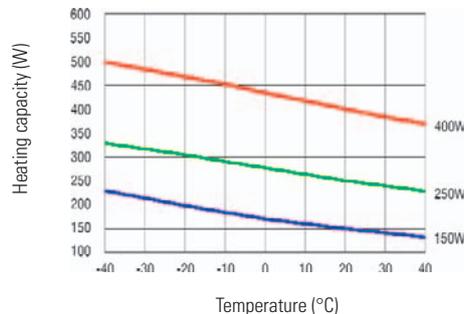
Fan heater prevents formation of condensation and frost and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The heater is connected using the internal terminal connectors. The small size of the CS 028 / CSL 028 makes it ideal for use in enclosures where space is at a premium.



Technical Data

Heating element	PTC resistor - temperature limiting
Surface temperature	150W/250W: max. 50°C (122°F), except upper protective grille 400W: max. 65°C (149°F), except upper protective grille at 20°C (68°F) ambient temperature
Axial fan, ball bearing	air flow, free flow: CS 028: 13.8m³/h CSL 028: 45m³/h (230VAC), 54m³/h (120VAC) service life 40,000h at 40°C (104°F)
Connection	2-pole clamp max. 2.5mm² (CSL 028 with strain relief), clamping screw torque 0.8Nm max.
Casing	plastic according to UL94-0, black
Mounting	clip for 35 mm DIN rail, EN 60715 or screw fixing (Ø 5.3mm)
Fitting position	vertical airflow (air outlet up)
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Approvals	UL File No. E150057 (according to UL 499, intended for the use within an enclosure in accordance with UL 508A)
Note	230V versions: VDE other voltages on request

Heating capacity / Ambient temperature diagram
CS 028 / CSL 028



Art. No. Clip fixing	Art. No. Screw fixing	Series	Operating voltage	Heating capacity*	Inrush current max.	Pre-fuse T (time-delay)	Dimensions	Weight approx.
02800.0-00	02800.0-01	CS 028	230VAC, 50/60Hz	150W	12A	6.3A	75 x 65 x 90mm	0.3kg
02811.0-00	02811.0-01	CSL 028	230VAC, 50/60Hz	250W	9A	6.3A	90 x 85 x 111mm	0.5kg
02810.0-00	02810.0-01	CSL 028	230VAC, 50/60Hz	400W	15A	10A	90 x 85 x 111mm	0.5kg
02800.9-00	02800.9-01	CS 028	120VAC, 50/60Hz	150W	6A	6.3A	75 x 65 x 90mm	0.3kg
02811.9-00	02811.9-01	CSL 028	120VAC, 50/60Hz	250W	6A	6.3A	90 x 85 x 111mm	0.5kg
02810.9-00	02810.9-01	CSL 028	120VAC, 50/60Hz	400W	9A	6.3A	90 x 85 x 111 mm	0.5kg

*at 20°C (68°F) ambient temperature



- **Compact Design**
- **Clip fixing**
- **Long service life**
- **Maintenance free**
- **Temperature safety cut-out**

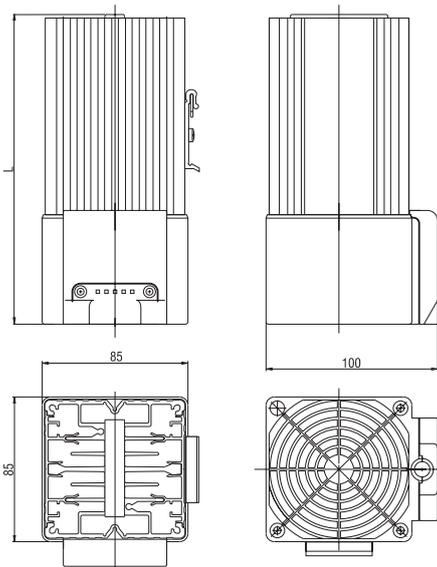
Compact fan heater prevents formation of condensation and frost. The integrated high-performance axial fan provides an evenly distributed interior air temperature in enclosures with electric/electronic components.



Technical Data

Heating element	resistance heater
Temperature safety cut-out	to protect against overheating in case of fan failure, automatic reset
Heater body	anodised extruded aluminium profile
Surface temperature	max. 75°C (400W)
Axial fan, ball bearing	Airflow, free flow AC: 45m³/h (50Hz) or 54m³/h (60Hz) DC: 54m³/h service life 50,000h at 25°C (77°F)
Connection	internal connection terminal 1.5mm² with strain relief, clamping torque 0.8Nm max.
Connection casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 60715
Fitting position	vertical airflow (air outlet up)
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / I (earthed)

Note: In the case of 24VDC and 48VDC the fan heater has to be switched via a relay. For this purpose we recommend our electronic relay SM 010 (Art. No. 01000.0-00 and 01001.0-00).



View from below

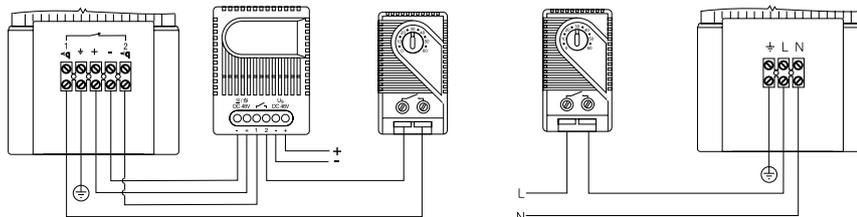
Switch Module
SM 010

Control contact,
e.g. Temperature regulator KTO 011

Control contact,
e.g. Temperature regulator KTO 011

Heater

Fan Heater HGL 046 (DC 24V and 48V) with temperature safety cut-out



Heater

Fan Heater HGL 046 (AC 230V and 120V) with temperature safety cut-out

Art. No.	Operating voltage	Heating capacity	Pre-fuse T (time-delay)	Length (L)	Weight (approx.)	Approvals
04640.0-00	230VAC, 50/60Hz	250W	2A	182mm	1.1kg	VDE + UL File No. E150057
04641.0-00	230VAC, 50/60Hz	400W	4A	222mm	1.4kg	VDE + UL File No. E150057
04640.9-00	120VAC, 50/60Hz	250W	4A	182mm	1.1kg	VDE + UL File No. E150057
04641.9-00	120VAC, 50/60Hz	400W	5A	222mm	1.4kg	VDE + UL File No. E150057
04640.1-00	24VDC	250W	16A	182mm	1.1kg	-
04640.2-00	48VDC	250W	8A	182mm	1.1kg	-
04641.2-00	48VDC	400W	12.5A	222mm	1.4kg	-



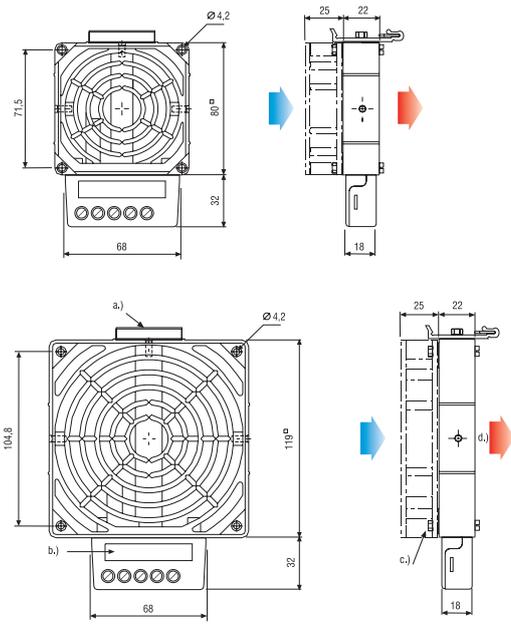
- Compact**
- Flat design**
- High air through-flow**
- Temperature safety cut-out**
- Clip fixing**

Compact high-performance fan heater prevents formation of condensation and frost and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. This fan heater is available without fan (HV 031) and with fan (HVL 031).



Technical Data

HV 031	Heater without fan (fan mounting kit included)
HVL 031	Heater with fan
Heating element	high performance cartridge
Temperature safety cut-out	to protect against overheating in case of fan failure, automatic reset
Heater body	die-cast aluminium (glass bead blasted)
Connection	3-pole screw connector 2.5mm ² , clamping torque 0.8Nm max.
Connection casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 60715
Fitting position	vertical airflow (air outlet up)
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / I (earthed)
Approvals	UL File No. E187294 (230V only; VDE)
HVL 031 only:	
Axial fan, ball bearing	airflow see table service life 50,000h at 25°C (77°F)
Connection (axial fan)	2-pole screw connector 2.5mm ² (L2/N2)



a.) Clip
b.) Type plate
c.) Axial fan
d.) Air direction



Important! Heater may only be operated together with fan. Danger of overheating!

Art. No. HV 031 230VAC, 50/60Hz	Art. No. HV 031 120VAC, 50/60Hz	Heating capacity	Pre-fuse T (time-delay) 230VAC / 120VAC	Dimensions	Weight (approx.)
03100.0-00	03100.9-00	100W	1A / 1.4A	80 x 112 x 22mm	0.4kg
03101.0-00	03101.9-00	150W	1.25A / 2A	80 x 112 x 22mm	0.4kg
03110.0-00	03110.9-00	200W	1.4A / 2.5A	119 x 151 x 22mm	0.5kg
03111.0-00	03111.9-00	300W	2A / 4A	119 x 151 x 22mm	0.5kg
03112.0-00	03112.9-00	400W	4A / 5A	119 x 151 x 22mm	0.5kg

Art. No. HVL 031 230VAC, 50/60Hz	Art. No. HVL 031 120VAC, 50/60Hz	Heating capacity	Pre-fuse T (time-delay) 230VAC / 120VAC	Airflow min., free flow	Dimensions	Weight (approx.)
03102.0-00	03102.9-00	100W	1A / 1.4A	35m ³ /h	80 x 112 x 47mm	0.6kg
03103.0-00	03103.9-00	150W	1.25A / 2A	35m ³ /h	80 x 112 x 47mm	0.6kg
03113.0-00	03113.9-00	200W	1.4A / 2.5A	108m ³ /h	119 x 151 x 47mm	0.9kg
03114.0-00	03114.9-00	300W	2A / 4A	108m ³ /h	119 x 151 x 47mm	0.9kg
03115.0-00	03115.9-00	400W	4A / 5A	108m ³ /h	119 x 151 x 47mm	0.9kg



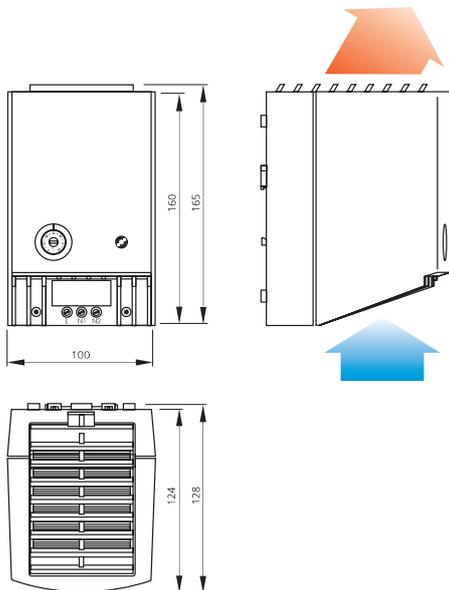
- Compact heater
- Integrated thermostat
- Clip fixing
- Optical indicator
- Temperature safety cut-out

Semiconductor fan heater prevents formation of condensation and frost and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The integrated thermostat is used to set the desired temperature.

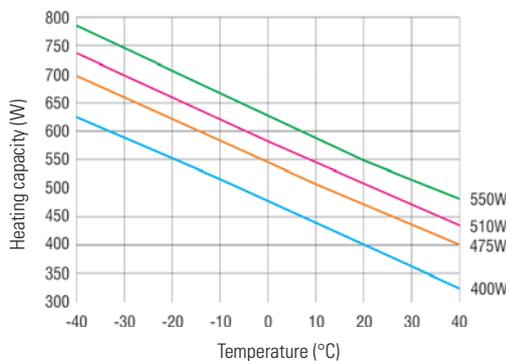


Technical Data

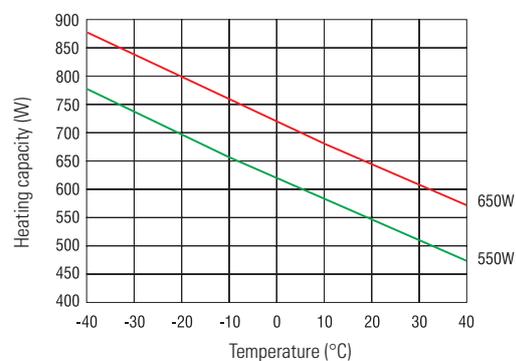
Heating element	PTC resistor - temperature limiting
Temperature safety cut-out	to protect against overheating in case of fan failure, automatic reset
Axial fan, ball bearing	airflow see table service life 50,000h at 25°C (77°F)
Connection	2-pole clamp 2.5mm ² , clamping torque 0.8Nm max.
Casing	plastic according to UL94 V-0, light grey
Optical indicator	thermostat control lamp
Mounting	clip for 35mm DIN rail, EN 60715
Fitting position	vertical airflow (air outlet up) – other fitting positions possible
Dimensions	100 x 128 x 165mm
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Approvals	UL File No. E204590



Heating capacity / Ambient temperature diagram CR 027 (50Hz)



Heating capacity / Ambient temperature diagram CR 027 (60Hz)



Art. No.	Operating voltage	Heating capacity* (50Hz)	Heating capacity* (60Hz)	Inrush current max.	Pre-fuse T (time-delay)	Airflow, free flow	Setting range Temp. regulator	Weight (approx.)
02700.0-00	220-240VAC, 50/60Hz	475W	550W	11.0A	6.3A	35m ³ /h	0 to +60°C	0.9kg
02701.0-00	220-240VAC, 50/60Hz	550W	650W	13.0A	8A	45m ³ /h	0 to +60°C	1.1kg
02700.9-00	100-120VAC, 50/60Hz	400W	550W	14.0A	8A	35m ³ /h	+32 to +140°F	0.9kg
02701.9-00	100-120VAC, 50/60Hz	510W	650W	15.0A	8A	45m ³ /h	+32 to +140°F	1.1kg

*at 20°C (68°F) ambient temperature



- **Compact design**
- **Double insulated**
- **Integrated thermostat or hygrostat**

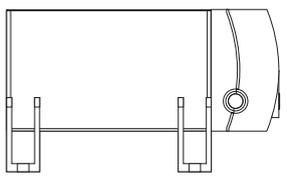
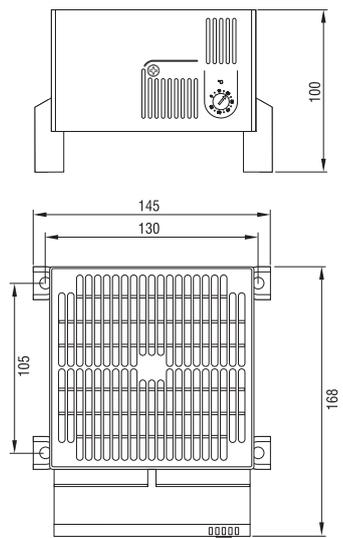
The compact high performance fan heater prevents formation of condensation and frost and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. The fan heater is available with integrated thermostat or pre-set hygrostat for temperature or humidity control. The CR 030 was designed as a stationary unit for the bottom of the enclosure. For wall fixing the fan heater CR 130 is recommended.



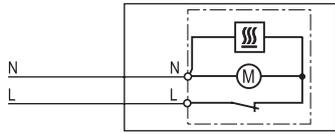
Technical Data

Heating element	high performance cartridge
Temperature safety cut-out	to protect against overheating in case of fan failure, automatic reset
Heater body	extruded aluminium profile
Axial fan, ball bearing	airflow 160m ³ /h, free flow service life 50,000h at 25°C (77°F)
Connection	2-pole max. 2.5mm ² , clamping screw with strain relief, torque 0.8Nm max.
Casing	plastic according to UL94 V-0, black
Mounting	screw fixing (M5)
Fitting position	vertical airflow (air outlet up) – other fitting positions possible
Dimensions	168 x 145 x 100mm
Weight	approx. 1.4kg
Operating* / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Note	other heating capacities from 200W up available on request

*Operating temperature of heater with integrated hygrostat: 0 to +60°C (+32 to +140°F)



Connection diagram



Art. No.	Model	Operating voltage	Heating capacity	Pre-fuse T (time-delay)	Setting range	Approvals
03051.0-00	Fan Heater with thermostat	230VAC, 50/60Hz	950W	8A	0 to +60°C	VDE + UL File No. E234324*
03051.0-02	Fan Heater with hygrostat	230VAC, 50/60Hz	950W	8A	65% RH, factory-set	VDE + UL File No. E234324*
03059.9-00	Fan Heater with thermostat	120VAC, 50/60Hz	950W	12.5A	+32 to +140°F	UL File No. E234324*

*according to UL 499, intended for the use within an enclosure in accordance with UL 508A



- **Compact design**
- **Double insulated**
- **Integrated thermostat or hygrostat**
- **Optional clip or screw fixing**

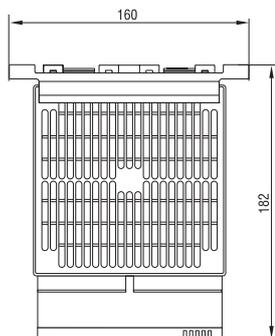
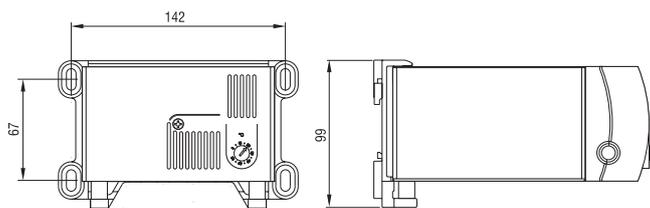
The compact high performance fan heater prevents formation of condensation and frost and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. The fan heater is available with integrated thermostat or pre-set hygrostat for temperature or humidity control. The CR 130 was designed as a stationary unit for wall fixing. For fixing on the bottom of the enclosure the fan heater CR 030 is recommended.



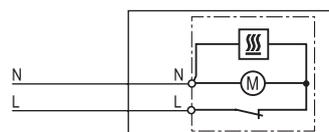
Technical Data

Heating element	high performance cartridge
Temperature safety cut-out	to protect against overheating in case of fan failure, automatic reset
Heater body	extruded aluminium profile
Axial fan, ball bearing	airflow 160m ³ /h, free flow service life 50,000h at 25°C (77°F)
Connection	2-pole max. 2.5mm ² , clamping screw with strain relief, torque 0.8Nm max.
Casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 60715 or screw fixing (M6)
Fitting position	vertical airflow (air outlet up) – other fitting positions possible
Dimensions	182 x 160 x 99mm
Weight	approx. 1.5kg
Operating* / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Note	other heating capacities from 200W up available on request

*Operating temperature of heater with integrated hygrostat: 0 to +60°C (+32 to +140°F)



Connection diagram



Art. No.	Model	Operating voltage	Heating capacity	Pre-fuse T (time-delay)	Setting range	Approvals
13051.0-00	Fan Heater with thermostat	230VAC, 50/60Hz	950W	8A	0 to +60°C	VDE + UL File No. E234324*
13051.0-02	Fan Heater with hygrostat	230VAC, 50/60Hz	950W	8A	65% RH, factory-set	VDE + UL File No. E234324*
13059.9-00	Fan Heater with thermostat	120VAC, 50/60Hz	950W	12.5A	+32 to +140°F	UL File No. E234324*

*according to UL 499, intended for the use within an enclosure in accordance with UL 508A

(Semiconductor)



Compact and slim design

High heating performance

Double insulated

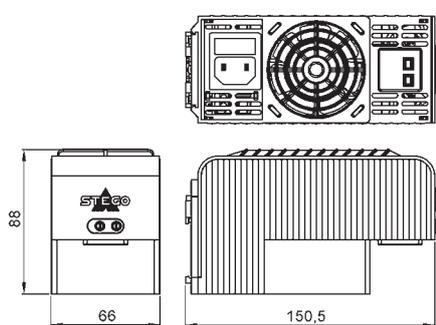
Quick connection

The compact high performance fan heater prevents formation of condensation and frost and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. Two screw connectors at the front allow comfortable wiring of an external thermostat. The fan heater is also available with pre-set thermostat (fan heater CSF 032). The CS 032 was designed as unit for wall fixing. A fan heater for fixing on the bottom of the enclosure is available on request.

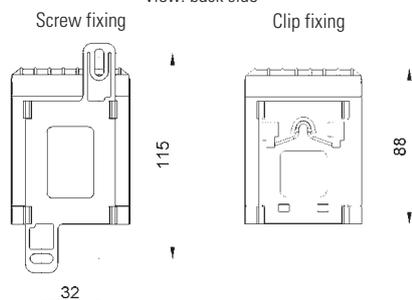


Technical Data

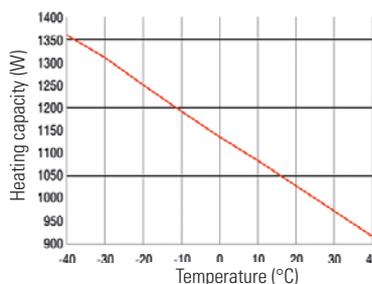
Heating element	PTC resistor - temperature limiting
Surface temperature	max. 80°C (176°F), except upper protective grille at 20°C (68°F) ambient temperature
Air outlet temperature	max. 110°C (212°F), 50mm above the grille
Temperature safety cut-out	to protect against overheating in case of fan failure, automatic reset
Axial fan, ball bearing	air flow 63m³/h, free flow service life 70,000h at 25°C (77°F)
Connection	male power insert connector according to IEC320 C18
Fuse	10A time lag (T) integrated in connector - exchangeable
Casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 60715 or screw fixing (M5), tightening torque 2Nm max.
Fitting position	airflow direction up
Dimensions	150.5 x 88 x 66mm
Weight	approx. 0.5kg
Operation / Storage temperature	-40 to +60°C (-40 to +140°F) / -40 to +70°C (-40 to +158°F)
Operation / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Approvals	VDE + UL File No. E234324



View: back side



Heating capacity / Ambient temperature diagram
CS 032



Art. No. clip fixing	Art. No. screw fixing	Operating voltage	Heating capacity ¹⁾	Inrush current max.
03209.0-00	03209.0-01	220-240VAC, 50/60Hz	1,000W	12A
03209.9-00	03209.9-01	100-120VAC, 50/60Hz	1,000W	18A

¹⁾ at 25°C (77°F) ambient temperature

Compact high-performance Fan Heater Serie CSF 032 (Semiconductor)

1,000W



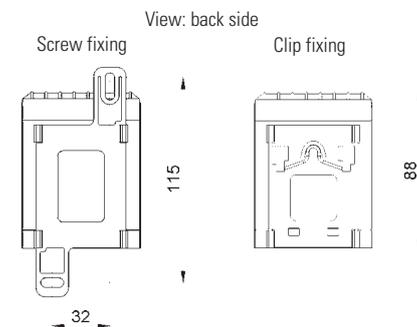
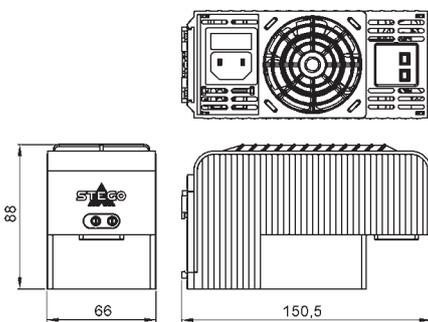
- Compact and slim design
- High heating performance
- Double insulated
- Integrated pre-set thermostat
- Quick connection

The compact high performance fan heater prevents formation of condensation and frost and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. Due to the integrated thermostat no additional wiring of an external thermostat is required. The fan heater is also available without thermostat (fan heater CS 032). The CSF 032 heater was designed as unit for wall fixing. A fan heater for fixing on the bottom of the enclosure is available on request.

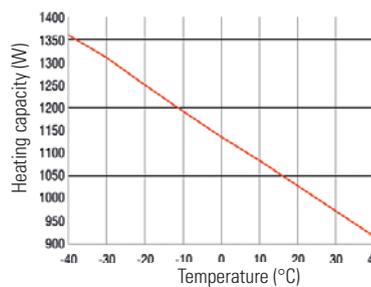


Technical Data

Heating element	PTC resistor - temperature limiting
Surface temperature	max. 80°C (176°F), except upper protective grille at 20°C (68°F) ambient temperature
Air outlet temperature	max. 110°C (212°F), 50mm above the grille
Temperature safety cut-out	to protect against overheating in case of fan failure, automatic reset
Axial fan, ball bearing	air flow 63m³/h, free flow service life 70,000h at 25°C (77°F)
Connection	male power insert connector according to IEC320 C18
Fuse	10A time lag (T) integrated in connector - exchangeable
Casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 60715 or screw fixing (M5), tightening torque 2Nm max.
Fitting position	airflow direction up
Dimensions	150.5 x 88 x 66mm
Weight	approx. 0.5kg
Operation / Storage temperature	-40 to +60°C (-40 to +140°F) / -40 to +70°C (-40 to +158°F)
Operation / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Approvals	VDE + UL File No. E234324



Heating capacity / Ambient temperature diagram
CSF 032



Art. No. clip fixing	Art. No. screw fixing	Operating voltage	Heating capacity ¹⁾	Inrush current max.	Switch-off temperature ²⁾	Switch-on temperature ²⁾
03201.0-00	03201.0-01	220-240VAC, 50/60Hz	1,000W	12A	+25°C (77°F)	+15°C (59°F)
03202.0-00	03202.0-01	220-240VAC, 50/60Hz	1,000W	12A	+15°C (59°F)	+5°C (41°F)
03201.9-00	03201.9-01	100-120VAC, 50/60Hz	1,000W	18A	+25°C (77°F)	+15°C (59°F)
03202.9-00	03202.9-01	100-120VAC, 50/60Hz	1,000W	18A	+15°C (59°F)	+5°C (41°F)

¹⁾ at 25°C (77°F) ambient temperature; ²⁾ tolerance ± 5K

Compact high-performance Fan Heater CS 030 Series (Semiconductor)

1,200W



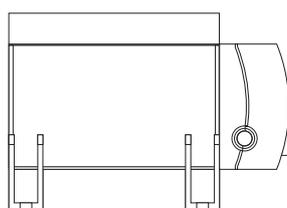
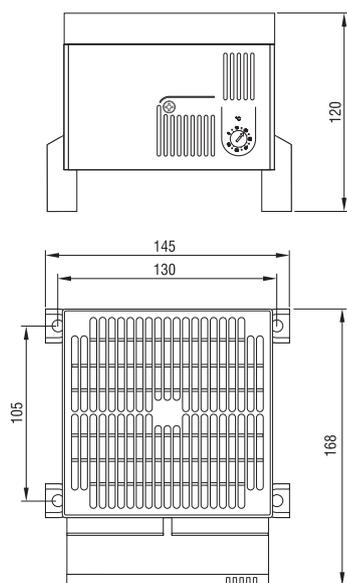
- **Compact design**
- **High heating performance**
- **Double insulated**
- **Integrated thermostat (optional)**

The compact high performance fan heater prevents formation of condensation and frost and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. The fan heater is available with optional integrated thermostat for temperature control. The CS 030 was designed as a stationary unit for the bottom of the enclosure. For wall fixing the fan heater CS 130 is recommended.

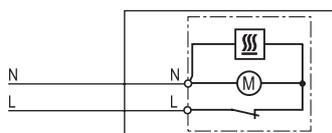


Technical Data

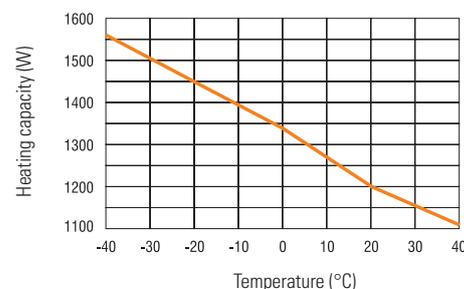
Heating element	PTC resistor - temperature limiting
Temperature safety cut-out	to protect against overheating in case of fan failure, automatic reset
Axial fan, ball bearing	airflow 160m³/h, free flow service life 50,000h at 25°C (77°F)
Connection	2-pole max. 2.5mm², clamping screw with strain relief, torque 0.8Nm max.
Casing	plastic according to UL94 V-0, black
Mounting	screw fixing (M5)
Fitting position	vertical airflow (air outlet up) – other fitting positions possible
Dimensions	168 x 145 x 120mm
Weight	approx. 1.2kg
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)



Connection diagram



Heating capacity / Ambient temperature diagram CS 030



Art. No.	Model	Operating voltage	Heating capacity ¹⁾	Inrush current max.	Pre-fuse T (time-delay)	Setting range	Approvals
03060.0-00	Fan Heater with thermostat	230VAC, 50/60Hz	1,200W	13A	8A	0 to +60°C	VDE + UL File No. E150057 ²⁾
03060.0-01	Fan Heater without thermostat	230VAC, 50/60Hz	1,200W	13A	8A	-	VDE + UL File No. E150057 ²⁾
03060.9-00	Fan Heater with thermostat	120VAC, 50/60Hz	1,200W	16A	10A	+32 to +140°F	UL File No. E150057 ²⁾
03060.9-01	Fan Heater without thermostat	120VAC, 50/60Hz	1,200W	16A	10A	-	UL File No. E150057 ²⁾

¹⁾ at 20°C (68°F) ambient temperature; ²⁾ according to UL 499, intended for the use within an enclosure in accordance with UL 508A

Compact high-performance Fan Heater CS 130 Series (Semiconductor)

1,200W



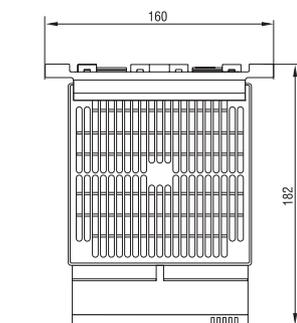
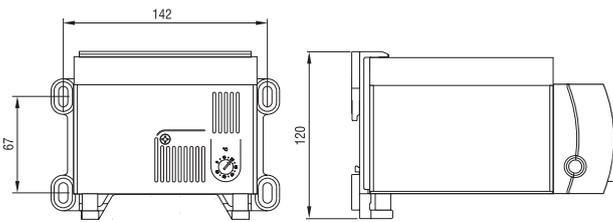
- Compact design
- High heating performance
- Double insulated
- Integrated thermostat (optional)
- Optional clip or screw fixing

The compact high performance fan heater prevents formation of condensation and frost and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. The fan heater is available with optional integrated thermostat for temperature control. The CS 130 was designed as a stationary unit for wall fixing. For fixing on the bottom of the enclosure the fan heater CS 030 is recommended.

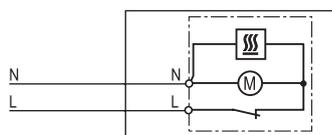


Technical Data

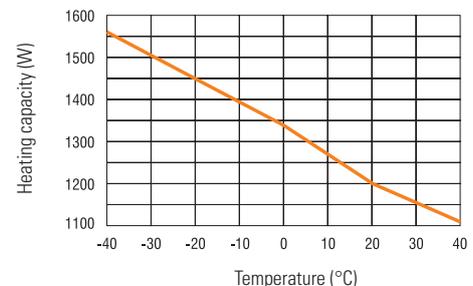
Heating element	PTC resistor - temperature limiting
Temperature safety cut-out	to protect against overheating in case of fan failure, automatic reset
Axial fan, ball bearing	airflow 160m ³ /h, free flow service life 50,000h at 25°C (77°F)
Connection	2-pole max. 2.5mm ² , clamping screw with strain relief, torque 0.8Nm max.
Casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 60715 or screw fixing (M6)
Fitting position	vertical airflow (air outlet up) – other fitting positions possible
Dimensions	182 x 160 x 120mm
Weight	approx. 1.3kg
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)



Connection diagram



Heating capacity / Ambient temperature diagram CS 130



Art. No.	Model	Operating voltage	Heating capacity ¹⁾	Inrush current max.	Pre-fuse T (time-delay)	Setting range	Approvals
13060.0-00	Fan Heater with thermostat	230VAC, 50/60Hz	1,200W	13A	8A	0 to +60°C	VDE + UL File No. E150057 ²⁾
13060.0-01	Fan Heater without thermostat	230VAC, 50/60Hz	1,200W	13A	8A	-	VDE + UL File No. E150057 ²⁾
13060.9-00	Fan Heater with thermostat	120VAC, 50/60Hz	1,200W	16A	10A	+32 to +140°F	UL File No. E150057 ²⁾
13060.9-01	Fan Heater without thermostat	120VAC, 50/60Hz	1,200W	16A	10A	-	UL File No. E150057 ²⁾

¹⁾ at 20°C (68°F) ambient temperature; ²⁾ according to UL 499, intended for the use within an enclosure in accordance with UL 508A



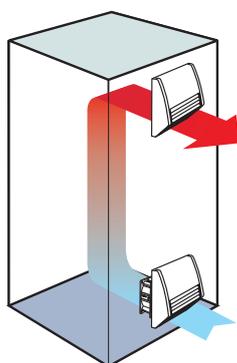
- **Very low noise**
- **Minimal depth in enclosure**
- **Functional design**
- **Time-saving installation**
- **Weather proof and UV resistant**

Filter fans are used to provide an optimum climate in enclosures. The interior temperature of an enclosure can be reduced by channelling cooler filtered outside air into the enclosure thus expelling heated internal air. The resulting air flow prevents formation of localised hot pockets and protects the electronic components from overheating. The plastic used for the hood of this filter fan series is highly weather proof and UV light resistant.



Technical Data

Axial fan, ball bearing	service life min. 50,000h at 25°C/77°F (65% RH) fan body aluminium, rotor plastic
Connection	2 wires with pressure clamps 2.5mm ² , length 100mm
Casing (filter fan and exit filter)	Plastic according to UL94 V-0, light grey
Hood (filter fan and exit filter)	Plastic according to UL94 V-0, light grey; weather proof and UV light resistant according to UL746C (f1)
Mounting frame	with double-sided industrial adhesive band for fixing to the outside of enclosure; certain operating circumstances can make the additional use of screws necessary (see drilling template); included in the delivery of the filter fans is a template for the enclosure cut-out
Filter mat	G4 acc. to DIN EN 779, filtering degree 94%
Filter material	synthetic fibre with progressive construction, temperature resistant to 100°C, self-extinguishing class F1; moisture resistant to 100% RH, reusable – cleaning by washing or vacuuming
Operating / Storage temperature	-10 to +70°C (+14 to +158°F) / -40 to +70°C (-40 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Prot. Type / Protection class	IP55 / I (earthed)



Enclosure air-conditioning using a filter fan and exit filter

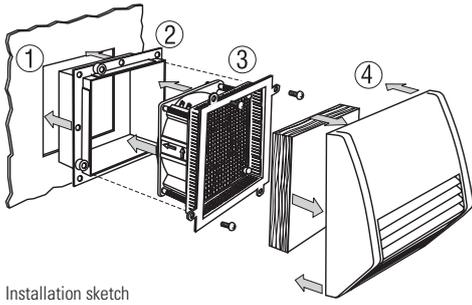
Special features

- The **self-adhesive seal** of the mounting frame prevents dust and water from entering the cabinet.
- **Functional design** of the intake and exit fan hoods very effectively prevents direct intrusion of falling water and dust. The advantage is that the filter mat does not get so quickly contaminated with dirt and thus does not need to be exchanged so often.
- The **air channelling** makes the filter fan particularly quiet in operation.
- Functional and **modern design** enables time-saving assembly and maintenance.
- EMC versions and other voltages on request.
- The **direction of air can easily be switched** by reversing the axial fan (sizes 1 to 3).

Filter Fan FF 018 Series

Art. No.	Operating voltage	Air volume, free flow	Air volume with exit filter	Current consumption	Power consumption	Average noise level (DIN EN ISO 4871)	Depth in enclosure	Enclosure cut-out	Weight (approx.)	Approvals
01800.0-00	230VAC, 50Hz	21m ³ /h	16m ³ /h	80mA	13W	31dB (A)	45mm	97 x 97mm + 0.4	0.6kg	VDE + UL File No. E234324
01801.0-00	230VAC, 50Hz	55m ³ /h	42m ³ /h	100mA	15W	40dB (A)	58mm	125 x 125mm + 0.4	1.0kg	VDE + UL File No. E234324
01802.0-00	230VAC, 50Hz	102m ³ /h	68m ³ /h	100mA	15W	39dB (A)	86mm	176 x 176mm + 0.4	1.3kg	VDE + UL File No. E234324
01800.0-01	120VAC, 60Hz	24m ³ /h	18m ³ /h	160mA	13W	31dB (A)	45mm	97 x 97mm + 0.4	0.6kg	UL File No. E234324
01801.0-01	120VAC, 60Hz	63m ³ /h	48m ³ /h	180mA	15W	40dB (A)	58mm	125 x 125mm + 0.4	1.0kg	UL File No. E234324
01802.0-01	120VAC, 60Hz	117m ³ /h	78m ³ /h	180mA	15W	39dB (A)	86mm	176 x 176mm + 0.4	1.3kg	UL File No. E234324

Low maintenance Filter Fan FF 018 Series



Installation sketch

Time-saving assembly and maintenance

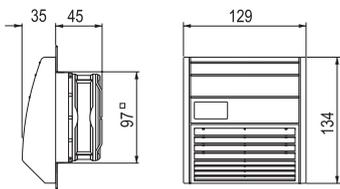
STEGO's filter fans are easily installed by one person **from outside** the cabinet.

- 1.) Make cut-out in the cabinet wall. The cut edge of the cabinet opening should be free of dirt, filings and grease. A template for the enclosure cut-out is included in the delivery of the filter fan.
- 2.) Remove protective film from the sealing strips on the mounting frame. Press mounting frame into the cabinet opening. The frame stays permanently in the cabinet. (For size 176mm and up we recommend additional screw fixing.)
- 3.) Electrically connect the axial fan using the clip connectors. Push the unit into the mounting frame. Fix using screws.
- 4.) Insert the filter mat in the hood. Clip on. Finished.

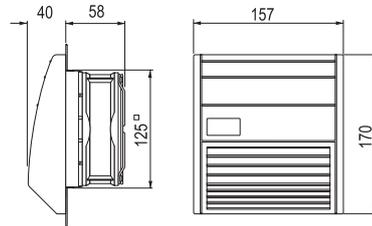
Changing the filter mat or fan is quickly done by one person. To change the filter mat simply remove the filter hood, insert the new mat and snap the hood back again. No tools required. Maintenance of the fan can easily be done without removing the mounting frame (2).

Dimensional Drawing

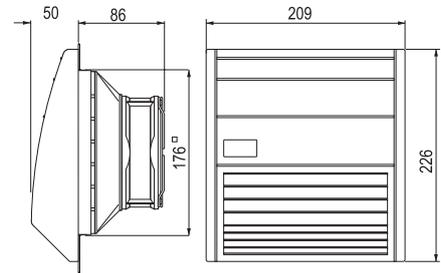
Size 1



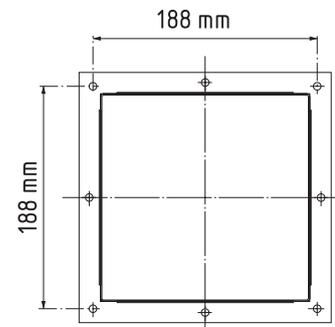
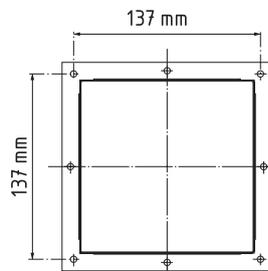
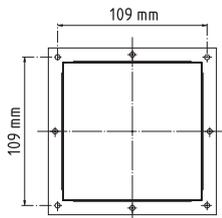
Size 2



Size 3



Drilling template for mounting frame

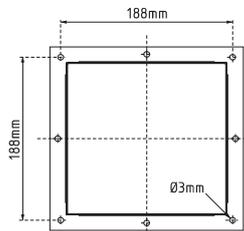
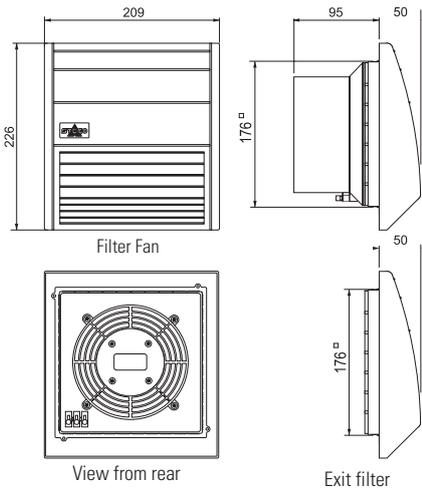


Exit Filter EF 118 Series

Art. No.	Depth in enclosure	Enclosure cut-out	Weight (approx.)	Filter mat	Protection type
11800.0-00	16mm	97 x 97mm + 0.4	0.3kg	G4 acc. to DIN EN 779, filtering degree 94%	IP55
11801.0-00	16mm	125 x 125mm + 0.4	0.4kg	G4 acc. to DIN EN 779, filtering degree 94%	IP55
11802.0-00	16mm	176 x 176mm + 0.4	0.6kg	G4 acc. to DIN EN 779, filtering degree 94%	IP55

Filter Mat FM 086

Filter mat	89 x 89mm	118 x 118mm	168 x 168mm
G4 (1 packing unit = 3 pcs.)	Art. No. 08600.0-00	Art. No. 08601.0-00	Art. No. 08602.0-00



Drilling template for mounting frame

- **Low maintenance**
- **High through-flow air volume**
- **Functional design**
- **Time-saving installation**
- **Weather proof and UV resistant**

Filter fans are used to provide an optimum climate in enclosures. The interior temperature of an enclosure can be reduced by channelling cooler filtered outside air into the enclosure thus expelling heated internal air. The resulting air flow prevents formation of localised hot pockets and protects the electronic components from overheating. The plastic used for the hood of this filter fan series is highly weather proof and UV light resistant.



Technical Data

Axial fan, ball bearing	service life min. 50,000h at 25°C/77°F (65% RH) fan body aluminium, rotor metal
Connection	3-pole clamp for 2.5mm ² , clamping torque 0.8Nm max.
Casing (filter fan and exit filter)	Plastic according to UL94 V-0, light grey
Hood (filter fan and exit filter)	Plastic according to UL94 V-0, light grey; weather proof and UV light resistant according to UL746C (f1)
Mounting frame	with double-sided industrial adhesive band for fixing to the outside of enclosure; certain operating circumstances can make the additional use of screws necessary (see drilling template); included in the delivery of the filter fans is a template for the enclosure cut-out
Filter mat	G4 acc. to DIN EN 779, filtering degree 94%
Filter material	synthetic fibre with progressive construction, temperature resistant to 100°C, self-extinguishing class F1; moisture resistant to 100% RH, reusable – cleaning by washing or vacuuming
Operating / Storage temperature	230VAC: -25 to +50°C (-13 to +122°F) 120VAC: -25 to +60°C (-13 to +140°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Prot. Type / Protection class	IP55 / I (earthed)

Filter Fan FF 018 Series

Art. No.	Operating voltage	Air volume, free flow	Air volume with exit filter	Current consumption	Power consumption	Average noise level (DIN EN ISO 4871)	Depth in enclosure	Enclosure cut-out	Weight (approx.)	Approvals
01804.0-00	230VAC, 50Hz	200m ³ /h	125m ³ /h	320mA	45W	52dB (A)	95mm	176 x 176mm + 0.4	1.7kg	UL File No. E234324
01804.0-01	120VAC, 60Hz	230m ³ /h	143m ³ /h	470mA	39W	52dB (A)	95mm	176 x 176mm + 0.4	1.7kg	UL File No. E234324

Exit Filter EF 118 Series

Art. No.	Depth in enclosure	Enclosure cut-out	Weight (approx.)	Filter mat	Protection type
11802.0-00	16mm	176 x 176mm + 0.4	0.6kg	G4 acc. to DIN EN 779, filtering degree 94%	IP55

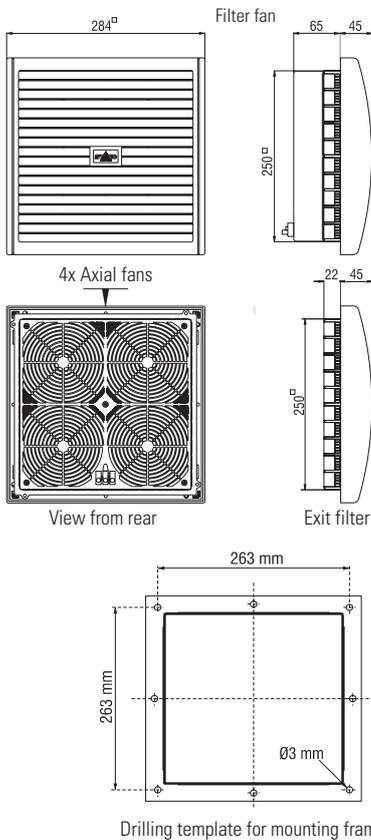
Filter Mat FM 086

Filter mat	168 x 168mm
G4 (1 packing unit = 3 pcs.)	Art. No. 08602.0-00



- **Very low noise**
- **Minimal depth in enclosure**
- **High through-flow air volume**
- **Uniform air circulation**
- **High reliability**
- **Weather proof and UV resistant**

Filter fans are used to provide an optimum climate in enclosures. The interior temperature of an enclosure can be reduced by channelling cooler filtered outside air into the enclosure thus expelling heated internal air. The resulting air flow prevents formation of localised hot pocket and protects the electronic components from overheating. **Four integrated axial fans** provide a particularly high and uniform air circulation thus contributing to higher reliability. The plastic used for the hood of this filter fan series is highly weather proof and UV light resistant.



Technical Data	
Axial fan, ball bearing	service life min. 50,000h at 25°C/77°F (65% RH) fan body aluminium, rotor plastic
Connection	3-pole clamp for 2.5mm ² , clamping torque 0.8Nm max.
Casing (filter fan and exit filter)	Plastic according to UL94 V-0, light grey
Hood (filter fan and exit filter)	Plastic according to UL94 V-0, light grey; weather proof and UV light resistant according to UL746C (f1)
Mounting frame	with double-sided industrial adhesive band for fixing to the outside of enclosure; certain operating circumstances can make the additional use of screws necessary (see drilling template); included in the delivery of the filter fans is a template for the enclosure cut-out
Filter mat	G4 acc. to DIN EN 779, filtering degree 94%
Filter material	synthetic fibre with progressive construction, temperature resistant to 100°C, self-extinguishing class F1; moisture resistant to 100% RH, reusable – cleaning by washing or vacuuming
Operating / Storage temperature	-10 to +70°C (+14 to +158°F) / -40 to +70°C (-40 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP55 / I (earthed)

Filter Fan FF 018 Series

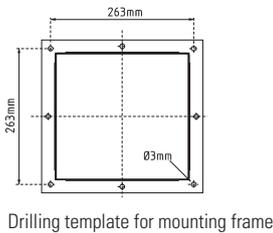
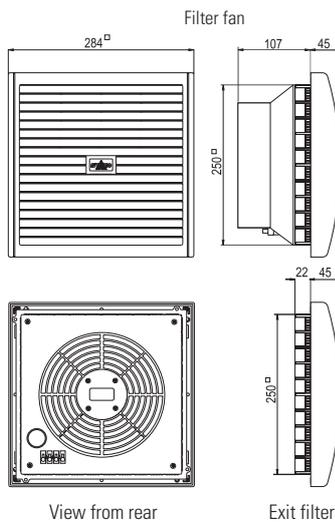
Art. No.	Operating voltage	Air volume, free flow	Air volume with exit filter	Current consumption	Power consumption	Average noise level (DIN EN ISO 4871)	Depth in enclosure	Enclosure cut-out	Weight (approx.)	Approvals
01803.0-00	230VAC, 50Hz	300m ³ /h	230 m ³ /h	400 mA	60W	53dB (A)	65mm	250 x 250mm + 0.4	3.3kg	UL File No. E234324
01803.0-01	120VAC, 60Hz	345m ³ /h	264 m ³ /h	700 mA	60W	53dB (A)	65mm	250 x 250mm + 0.4	3.3kg	UL File No. E234324

Exit Filter EF 118 Series

Art. No.	Depth in enclosure	Enclosure cut-out	Weight (approx.)	Filter mat	Protection type
11803.0-00	22mm	250 x 250mm + 0.4	1.0kg	G4 acc. to DIN EN 779, filtering degree 94%	IP55

Filter Mat FM 086

Filter mat	247 x 247mm
G4 (1 packing unit = 3 pcs.)	Art. No. 08608.0-00



- **High through-flow air volume**
- **Functional design**
- **Time-saving installation**
- **Weather proof and UV resistant**

Filter fans are used to provide an optimum climate in enclosures. The interior temperature of an enclosure can be reduced by channelling cooler filtered outside air into the enclosure thus expelling heated internal air. The resulting air flow prevents formation of localised hot pocket and protects the electronic components from overheating. The high-performance axial fan provides high air circulation. The plastic used for the hood of this filter fan series is highly weather proof and UV light resistant.



Technical Data	
Axial fan, ball bearing	service life min. 50,000h at 25°C/77°F (65% RH) fan body aluminium, rotor metal
Connection	3-pole clamp for 2.5mm ² , clamping torque 0.8Nm max.
Casing (filter fan and exit filter)	Plastic according to UL94 V-0, light grey
Hood (filter fan and exit filter)	Plastic according to UL94 V-0, light grey; weather proof and UV light resistant according to UL746C (f1)
Mounting frame	with double-sided industrial adhesive band for fixing to the outside of enclosure; certain operating circumstances can make the additional use of screws necessary (see drilling template); included in the delivery of the filter fans is a template for the enclosure cut-out
Filter mat	G4 acc. to DIN EN 779, filtering degree 94%
Filter material	synthetic fibre with progressive construction, temperature resistant to 100°C, self-extinguishing class F1; moisture resistant to 100% RH, reusable – cleaning by washing or vacuuming
Operating / Storage temperature	-25 to +70°C (-13 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Prot. Type / Protection class	IP55 / I (earthed)

Filter Fan FF 018 Series

Art. No.	Operating voltage	Air volume, free flow	Air volume with exit filter	Current consumption	Power consumption	Average noise level (DIN EN ISO 4871)	Depth in enclosure	Enclosure cut-out	Weight (approx.)	Approvals
01805.0-00	230VAC, 50Hz	550m ³ /h	300m ³ /h	300mA	64W	65dB (A)	107mm	250 x 250mm + 0.4	2.7kg	UL File No. E234324
01805.0-01	120VAC, 60Hz	632m ³ /h	345m ³ /h	780mA	85W	65dB (A)	107mm	250 x 250mm + 0.4	2.7kg	UL File No. E234324

Exit Filter EF 118 Series

Art. No.	Depth in enclosure	Enclosure cut-out	Weight (approx.)	Filter mat	Protection type
11803.0-00	22mm	250 x 250mm + 0.4	1.0kg	G4 acc. to DIN EN 779, filtering degree 94%	IP55

Filter Mat FM 086

Filter mat	247 x 247mm
G4 (1 packing unit = 3 pcs.)	Art. No. 08608.0-00

Outdoor Filter Fan FF 018 Series



Filter changeable from outside

Safe, lockable

Impact resistant

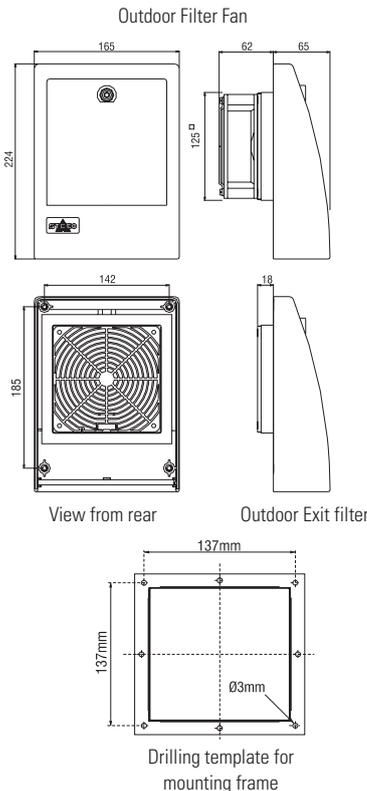
Weather proof and UV resistant

The outdoor filter fan can be used in outdoor enclosures where warm air has to be dissipated on account of increased thermic development. To clean and exchange the filter mat, it is only necessary to open the lockable door of the outdoor hood. A protection type of IP55 is achieved due to the special design of the hood and the use of fine filter mats. The plastic casing is highly weather proof and resistant to UV light.



Technical Data

Axial fan, ball bearing	service life min. 50,000h at 25°C/77°F (65% RH) fan body aluminium, rotor plastic
Connection	2 wires with pressure clamps 2.5mm ² , length 100mm
Casing (filter fan and exit filter)	Plastic according to UL94 V-0, light grey
Hood (filter fan and exit filter)	Plastic according to UL94 V-0, light grey; weather proof and UV light resistant according to UL746C (f1)
Mounting frame	with double-sided industrial adhesive band for fixing to the outside of enclosure; certain operating circumstances can make the additional use of screws necessary (see drilling template); included in the delivery of the filter fans is a template for the enclosure cut-out
Filter mat	F5 acc. to DIN EN 779, filtering degree 98%
Filter material	synthetic fibre with progressive construction, temperature resistant to 100°C, self-extinguishing class F1; moisture resistant to 100% RH
Operating / Storage temperature	-10 to +70°C (+14 to +158°F) / -40 to +70°C (-40 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP55 / I (earthed)
Approvals	UL File No. E234324



The hood is fixed permanently to the enclosure from the inside using screws. Filter mats can be easily changed from outside the enclosure through the lockable door in the hood.

Outdoor Filter Fan FF 018 Series

Art. No.	Operating voltage	Air volume, free flow	Current consumption	Power consumption	Average noise level (DIN EN ISO 4871)	Depth in enclosure	Enclosure cut-out	Weight (approx.)
01821.0-00	230VAC, 50Hz	20m ³ /h	100mA	15W	40dB (A)	62mm	125 x 125mm + 0.4	1.2kg
01821.0-02	120VAC, 60Hz	23m ³ /h	180mA	15W	40dB (A)	62mm	125 x 125mm + 0.4	1.2kg

Exit Filter EF 118 Series

Art. No.	Depth in enclosure	Enclosure cut-out	Weight (approx.)	Filter mat	Protection type
11821.0-00	16mm	125 x 125mm + 0.4	0.6kg	F5 acc. to DIN EN 779, filtering degree 98%	IP55

Filter Mats FFM 086

Filter mat	122 x 122mm
F5 (1 packing unit = 3 pcs.)	Art. No. 08607.0-00



Photo: Art. No. 01860.0-00



Photo: Art. No. 01861.0-00

- **Very low noise**
- **Minimal depth in enclosure**
- **High through-flow air volume**
- **High reliability**
- **Time-saving installation and mat exchange**

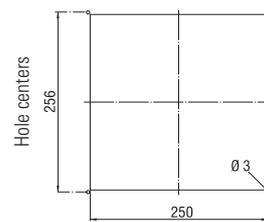
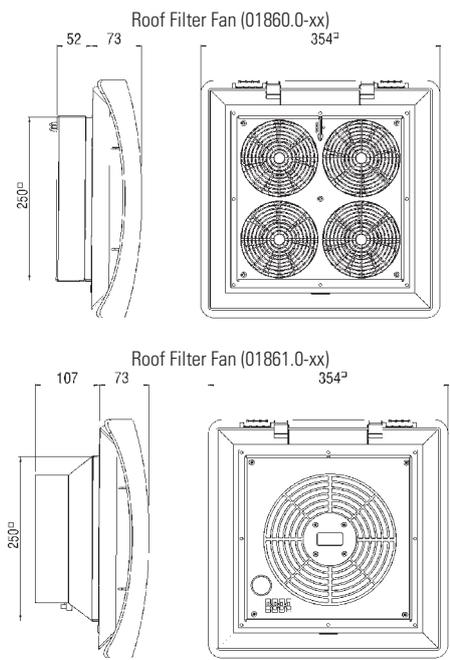
Roof filter fans find use in enclosures and housings, from which warm air has to be diverted to lower the internal temperature. These low-noise roof filter fans are used to expel warm air from within the enclosure which has been generated by the stray power of the components and so protects the internal devices from overheating. To exchange the filter mat the hood can be easily opened without tools. The roof exit filter provides passive ventilation.



Technical Data

Axial fans, ball bearing	service life 50,000h at 25°C/77°F (65% RH) fan body aluminium, rotor plastic
Connection	3-pole clamp for 2.5mm ² , clamping torque 0.8Nm max.
Case	plastic according to UL94 V-0, light grey; weather proof and UV light resistant according UL746C (f1)
Filter mat	G3 acc. to DIN EN 779, filtering degree 85%
Filter material	synthetic fibre with progressive construction, temperature resistant to 100°C, self-extinguishing class F1; moisture resistant to 100% RH, reusable - cleaning by washing or vacuuming
Operating / Storage humidity	max. 90% RH (non-condensing)
Prot. type / Protection class	IP32 / I (earthed)
Approvals	UL intended; (230V only: VDE)

Important note: For reasons of pressure compensation the roof filter fan must always be operated in combination with a passive intake filter (e.g. Art. No. 11803.0-00) or another filter fan (e.g. Art. No. 01803.0-00).



Enclosure cut-out

Roof Filter Fan RFP 018 Series

Art. No.	Operating voltage	Air volume, free flow	Current consumption	Average noise level (DIN EN ISO 4871)	Depth in enclosure	Enclosure cut-out	Weight (approx.)	Operating / Storage temperature
01860.0-00	230VAC, 50Hz	300m ³ /h	68W	55dB (A)	52mm	250 x 250mm + 0.4	3.3kg	-10 to +70°C (+14 to +158°F) / -40 to +70°C (-40 to +158°F)
01861.0-00	230VAC, 50Hz	500m ³ /h	64W	67dB (A)	107mm	250 x 250mm + 0.4	2.6kg	-25 to +70°C (-13 to +158°F)
01860.0-02	120VAC, 60Hz	345m ³ /h	60W	55dB (A)	52mm	250 x 250mm + 0.4	3.3kg	-10 to +70°C (+14 to +158°F) / -40 to +70°C (-40 to +158°F)
01861.0-02	120VAC, 60Hz	575m ³ /h	85W	67dB (A)	107mm	250 x 250mm + 0.4	2.6kg	-25 to +70°C (-13 to +158°F)

Roof Exit Filter REP 118 Series

Art. No.	Depth in enclosure	Enclosure cut-out	Weight (approx.)	Filter mat	Protection type
11860.0-00	11mm	250 x 250mm + 0.4	1.0kg	G3 acc. to DIN EN 779, filtering degree 85%	IP32

Filter Mat FM 086

Filter mat	282 x 282mm
G3 (1 packing unit = 3 pcs.)	Art. No. 08613.0-01

High-performance 19" Fan Tray LE 019 Series

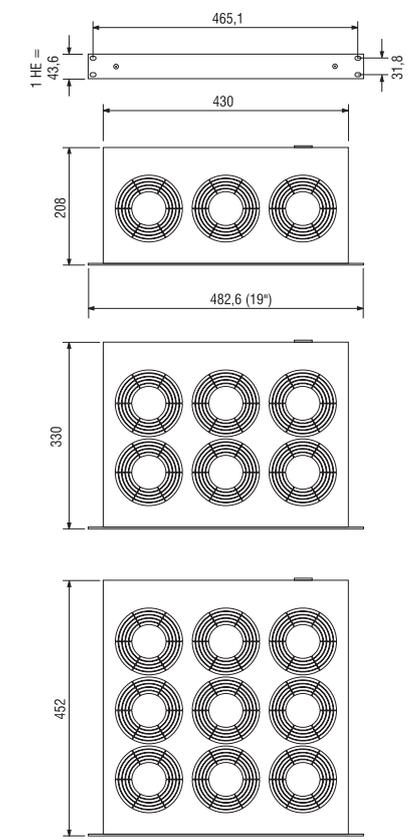


- High air output
- Long service life
- Ball bearing fans
- Ready for connection
- Optical function indicator

Compact high performance fan tray for enforced circulation of air in switch and server enclosures and for concerted cooling of 19" component groups. Natural convection is improved and the formation of localised hot pockets is avoided. Also available with integrated thermostat (see photo).



Technical Data	
Axial fans, ball bearing	service life 50,000h at 25°C (65% RH) fan body aluminium, rotor plastic
Material	front panel aluminium, bright anodised casing steel sheet, electrogalvanized
Optical indicator	integrated in front panel
Connection	appliance power inlet on rear of casing, plug included
Fitting position	vertical airflow (air outlet up)
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / I (earthed)
Approvals	UL File No. E234324



Use in 19" enclosures:
We recommend using the fan tray without integrated thermostat in combination with our dual thermostat (ZR 011 Art. No. 01176.0-00) for regulating temperature in electronic enclosures and for protection against overheating due to possible fan failure. The dual thermostat regulates the operation of the fan tray and – when connected to a signal device – also triggers an early warning if the enclosure interior temperature rises above a set limit.

When using a fan tray with integrated thermostat, the use of an additional thermostat (KTS 011 Art. No. 01141.0-00) provides the extra safety of activating a signal device.

Art. No.	Model	No. of fans	Operating voltage	Air flow, free flow	Power consumption	Average noise level (DIN EN ISO 4871)	Speed (rpm ⁻¹)	Impact pressure	Weight (approx.)
01930.0-00	without thermostat	3	230VAC, 50Hz	486m ³ /h	45W	55db (A)	2600 min ⁻¹ (50Hz)	74Pa	3.0kg
01930.1-00	with thermostat 0 to +60°C	3	230VAC, 50Hz	486m ³ /h	45W	55db (A)	2600 min ⁻¹ (50Hz)	74Pa	3.4kg
01940.0-00	without thermostat	6	230VAC, 50Hz	972m ³ /h	90W	57db (A)	2600 min ⁻¹ (50Hz)	74Pa	5.3kg
01940.1-00	with thermostat 0 to +60°C	6	230VAC, 50Hz	972m ³ /h	90W	57db (A)	2600 min ⁻¹ (50Hz)	74Pa	5.7kg
01950.0-00	without thermostat	9	230VAC, 50Hz	1458m ³ /h	135W	58db (A)	2600 min ⁻¹ (50Hz)	74Pa	7.8kg
01950.1-00	with thermostat 0 to +60°C	9	230VAC, 50Hz	1458m ³ /h	135W	58db (A)	2600 min ⁻¹ (50Hz)	74Pa	7.9kg
01931.0-00	without thermostat	3	120VAC, 60Hz	576m ³ /h	45W	55db (A)	2900 min ⁻¹ (60Hz)	88Pa	3.0kg
01931.1-00	with thermostat 0 to +60°C	3	120VAC, 60Hz	576m ³ /h	45W	55db (A)	2900 min ⁻¹ (60Hz)	88Pa	3.4kg
01941.0-00	without thermostat	6	120VAC, 60Hz	1152m ³ /h	90W	57db (A)	2900 min ⁻¹ (60Hz)	88Pa	5.3kg
01941.1-00	with thermostat 0 to +60°C	6	120VAC, 60Hz	1152m ³ /h	90W	57db (A)	2900 min ⁻¹ (60Hz)	88Pa	5.7kg
01951.0-00	without thermostat	9	120VAC, 60Hz	1728m ³ /h	135W	58db (A)	2900 min ⁻¹ (60Hz)	88Pa	7.8kg
01951.1-00	with thermostat 0 to +60°C	9	120VAC, 60Hz	1728m ³ /h	135W	58db (A)	2900 min ⁻¹ (60Hz)	88Pa	7.9kg

Small compact Thermostat KTO 011 / KTS 011 Series



- Large setting range
- Small size
- Simple to mount
- High switching performance

KTO 011: Thermostat (normally closed); contact breaker for regulating heaters.

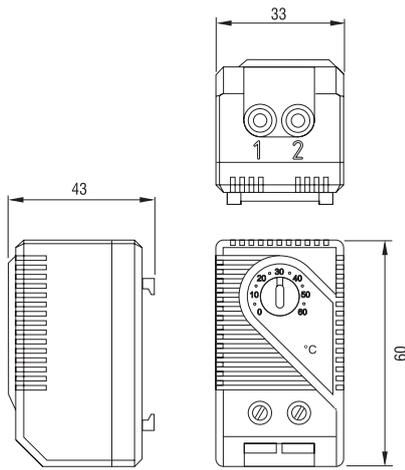
KTS 011: Thermostat (normally open); contact maker for regulating of filter fans and heat exchangers or for switching signal devised when temperature limit has been exceeded.

Regulating



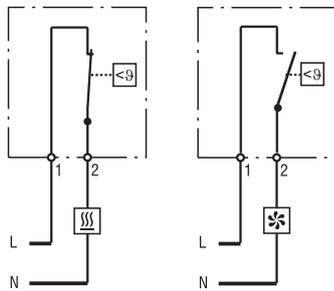
Technical Data

Switch temperature difference	7K (± 4K tolerance)
Sensor element	thermostatic bimetal
Contact type	snap-action contact
Service life	> 100,000 cycles
Max. switching capacity	250VAC, 10 (2) A 120VAC, 15 (2) A 30WDC at 24VDC to 72VDC
Max. inrush current	16AAC for 10 sec.
Connection	2-pole terminal, clamping torque 0.5Nm max.: rigid wire 2.5mm ² stranded wire (with wire end ferrule) 1.5mm ²
Mounting	clip for 35mm DIN rail, EN 60715 (or for exit filter EF 118 Series)
Casing	plastic according to UL94 V-0, light grey
Dimensions	60 x 33 x 43mm
Weight	approx. 40g
Fitting position	variable
Operating / Storage temperature	-45 to +80°C (-49 to +176°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20

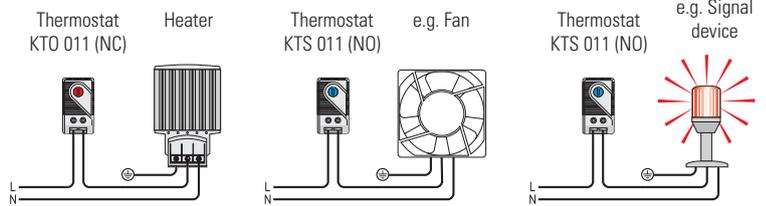


Thermostat KTO 011 (NC)

Thermostat KTS 011 (NO)



Connection diagrams



Examples of connection

Setting range	Art. No. Contact Breaker (NC)	Art. No. Contact Maker (NO)	Approvals
0 to +60°C	01140.0-00	01141.0-00	VDE
-10 to +50°C	01142.0-00	01143.0-00	VDE + UL File No. E164102
+20 to +80°C	01159.0-00	01158.0-00	VDE + UL File No. E164102
+32 to +140°F	01140.9-00	01141.9-00	VDE + UL File No. E164102
+14 to +122°F	01142.9-00	01143.9-00	VDE + UL File No. E164102
0 to +60°C	01146.9-00	01147.9-00	VDE + UL File No. E164102

Tamper-proof Thermostat (Pre-set) FTO 011 / FTS 011 Series

Small size

Default temperature settings

Easy to install

High switching tolerance



Tamper-proof (Pre-set) Thermostat FTO 011

Contact breaker / NC (red casing) for regulating heaters or for switching signal devices when temperature has fallen below the minimum value. The contact opens when temperature is rising.

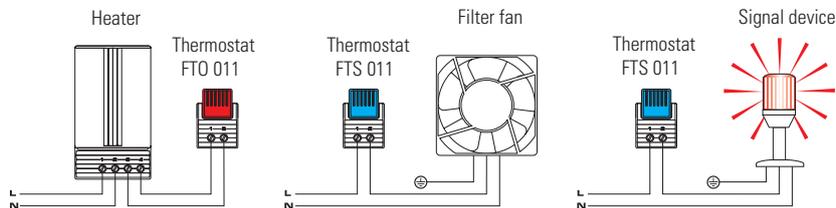
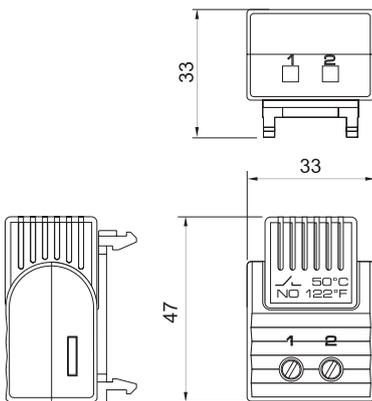
Tamper-proof (Pre-set) Thermostat FTS 011

Contact maker / NO (blue casing) for regulating filter fans, heat exchangers, cooling devices or for switching signal devices when temperature limit has been exceeded. The contact closes when temperature is rising.



Technical Data

Sensor element	thermostatic bimetal
Contact type	snap-action contact
Service life	> 100,000 cycles
Max. switching capacity	250VAC, 5 (1.6) A 120VAC, 10 (2) A 30WDC
Max. inrush current	16AAC for 10 sec.
Connection	2-pole terminal for 2.5mm ² , torque 0.8Nm max.
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	47 x 33 x 33mm
Weight	approx. 30g
Fitting position	variable
Operating / Storage temperature	-40 to +80°C (-40 to +176°F) / -45 to +80°C (-49 to +176°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20
Approvals	VDE + UL File No. E164102



Examples of connection

Art. No.	Contact	Switch-off temperature	Switch-on temperature
01160.0-00	Contact breaker (NC)	+15°C / +59°F (± 5K tolerance)	+5°C / +41°F (± 5K tolerance)
01160.0-01	Contact breaker (NC)	+25°C / +77°F (± 5K tolerance)	+15°C / +59°F (± 5K tolerance)
		Switch-on temperature	Switch-off temperature
01161.0-00	Contact maker (NO)	+50°C / +122°F (± 6K tolerance)	+40°C / +104°F (± 7K tolerance)
01161.0-01	Contact maker (NO)	+60°C / +140°F (± 6K tolerance)	+50°C / +122°F (± 7K tolerance)
01161.0-02	Contact maker (NO)	+35°C / +95°F (± 6K tolerance)	+25°C / +77°F (± 7K tolerance)

Dual Thermostat ZR 011 Series



- **NO and NC in one casing**
- **Separate adjustable temperatures**
- **High switching capacity**
- **Terminals easily accessible**
- **Clip fixing**

Two thermostats in one casing:

Thermostat (contact breaker, normally closed) for regulating heaters.

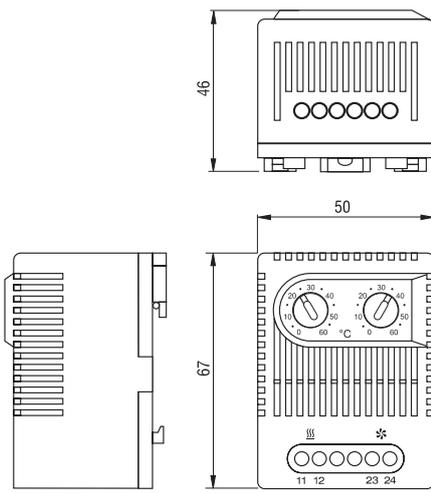
Thermostat (contact maker, normally open) for regulating filter fans and heat exchangers or switching signal devices when temperature limit has been exceeded.

Heaters and cooling equipment can be switched independently from each other with a temperature offset as opposed to the usual change-over contacts.

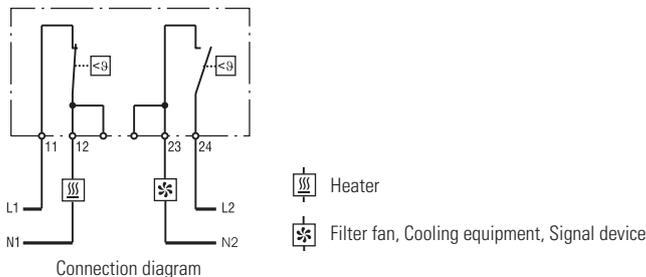


Technical Data

Switch temperature difference	7K (± 4K tolerance)
Sensor element	thermostatic bimetal
Contact type	snap-action contact
Service life	> 100,000 cycles
Max. switching capacity	250VAC, 10 (2) A 120VAC, 15 (2) A 30WDC at 24VDC to 72VDC
Max. inrush current	16AAC for 10 sec.
Connection	4-pole terminal, clamping torque 0.5Nm max.: rigid wire 2.5mm ² stranded wire (with wire end ferrule) 1.5mm ²
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	67 x 50 x 46mm
Weight	approx. 90g
Fitting position	variable
Operating / Storage temperature	-45 to +80°C (-49 to +176°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20
Approvals	VDE + UL File No. E164102



Thermostat ZR 011 (NC/NO)



Art. No.	Setting Range	Setting Range
01172.0-00	Contact breaker (NC) 0 to +60°C	Contact maker (NO) 0 to +60°C
01172.0-01	Contact breaker (NC) +32 to +140°F	Contact maker (NO) +32 to +140°F
01175.0-00	Contact breaker (NC) -10 to +50°C	Contact maker (NO) +20 to +80°C
01175.0-01	Contact breaker (NC) +14 to +122°F	Contact maker (NO) +68 to +176°F
01176.0-00*	Contact maker (NO) 0 to +60°C	Contact maker (NO) 0 to +60°C
01176.0-01*	Contact maker (NO) +32 to +140°F	Contact maker (NO) +32 to +140°F

*For regulating heat exchangers and fans (e.g. LE 019) and as an alarm contact for monitoring the interior temperature of electronic enclosures.

Tamper-proof Dual Thermostat (Pre-set) FTD 011 Series



- **NO and NC in one casing**
- **Default temperature settings**
- **High switching accuracy**
- **Clip fixing**

Two thermostats in one casing:

Tamper-proof (Pre-set) Thermostat/Contact breaker (NC) for regulating heaters or for switching signal devices when temperature has fallen below the minimum value. The contact opens when temperature is rising.

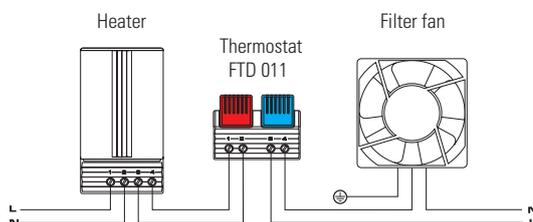
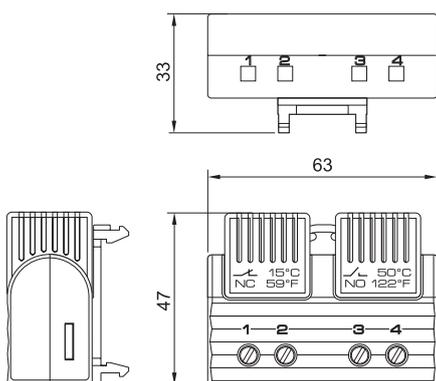
Tamper-proof (Pre-set) Thermostat/Contact maker (NO) for regulating filter fans, heat exchangers or for switching signal devices when temperature limit has been exceeded. The contact closes when temperature is rising.

Heaters and cooling equipment can be switched independently from each other with a temperature offset as opposed to the usual change-over contacts.



Technical Data

Sensor element	thermostatic bimetal
Contact type	snap-action contact
Service life	> 100,000 cycles
Max. switching capacity	250VAC, 5 (1.6) A 120VAC, 10 (2) A 30WDC
Max. inrush current	16AAC for 10 sec.
Connection	4-pole terminal for 2.5mm ² , torque 0.8Nm max.
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	47 x 63 x 33mm
Weight	approx. 40g
Fitting position	variable
Operating / Storage temperature	-40 to +80°C (-40 to +176°F) / -45 to +80°C (-49 to +176°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20
Approvals	VDE + UL File No. E164102



Example of connection

Art. No.	Contact breaker (NC)		Contact maker (NO)	
	Switch-off temperature	Switch-on temperature	Switch-on temperature	Switch-off temperature
01163.0-00	+15°C / +59°F (± 5K tolerance)	+5°C / +41°F (± 5K tolerance)	+50°C / +122°F (± 6K tolerance)	+40°C / +104°F (± 7K tolerance)
01163.0-01	+25°C / +77°F (± 5K tolerance)	+15°C / +59°F (± 5K tolerance)	+60°C / +140°F (± 6K tolerance)	+50°C / +122°F (± 7K tolerance)
01163.0-02	+15°C / +59°F (± 5K tolerance)	+5°C / +41°F (± 5K tolerance)	+35°C / +95°F (± 6K tolerance)	+25°C / +77°F (± 7K tolerance)
01163.0-03	+25°C / +77°F (± 5K tolerance)	+15°C / +59°F (± 5K tolerance)	+50°C / +122°F (± 6K tolerance)	+40°C / +104°F (± 7K tolerance)
Art. No.	Contact maker (NO)		Contact maker (NO)	
	Switch-on temperature	Switch-off temperature	Switch-on temperature	Switch-off temperature
01164.0-00	+50°C / +122°F (± 6K tolerance)	+40°C / +104°F (± 7K tolerance)	+60°C / +140°F (± 6K tolerance)	+50°C / +122°F (± 7K tolerance)

Small compact Thermostat STO 011 / STS 011 Series

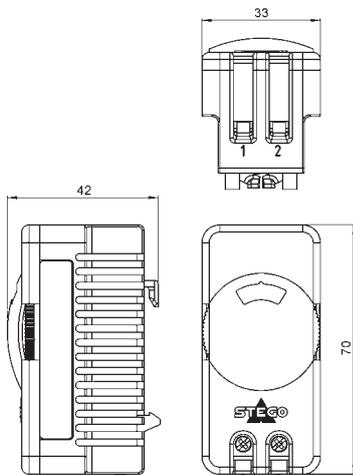


- **Thumbwheel setting dial**
- **Small hysteresis**
- **High switching capacity**
- **Anti frost assurance**
- **Optimized housing for better air flow**

The mechanical thermostat is a two state regulator with small hysteresis. The setting wheel has an anti frost assurance. The housing ensures an optimized air circulation around the bimetal.

STO 011: Thermostat (NC); contact breaker for regulating heaters.

STS 011: Thermostat (NO); contact maker for regulating of filter fans and heat exchangers or for switching signal devised when temperature limit has been exceeded.



Technical Data

Switch temperature difference	4K (±3K tolerance)
Sensor element	thermostatic bimetal
Contact type	snap-action contact
Service life	> 100,000 cycles
Max. switching capacity	250VAC, 10 (2) A 120VAC, 15 (2) A 30WDC at 24VDC to 72VDC
Max. inrush current	16AAC for 10 sec.
Connection	2-pole terminal for 2.5mm ² (AWG13), torque 1Nm max.
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	70 x 33 x 42mm
Weight	approx. 50g
Fitting position	variable
Operating / Storage temperature	-45 to +80°C (-49 to +176°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20

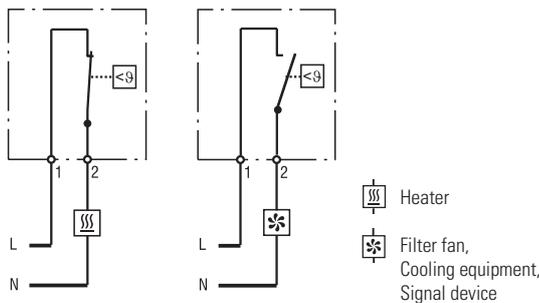
Anti frost assurance



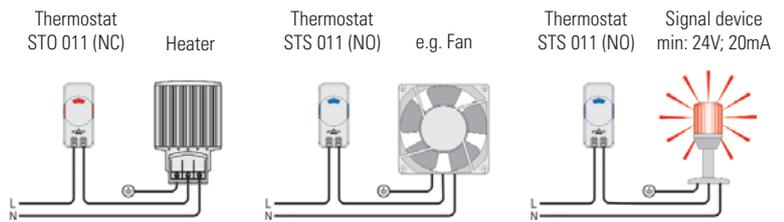
The anti frost assurance is a symbol on the setting scale of the NC thermostat (STO 011) at 11°C. This setting assures closing of the switching contact before 0°C.

Thermostat STO 011 (NC)

Thermostat STS 011 (NO)



Example of connection



Example of connection

Setting range	Art. No. Contact breaker (NC)	Art. No. Contact maker (NO)	Approvals
0 to +60°C	01115.0-00	01116.0-00	VDE + UL submitted
+32 to 140°F	01115.9-00	01116.9-00	VDE + UL submitted

Mechanical Thermostat FZK 011 Series



- Adjustable temperature
- High switching capacity
- Small hysteresis
- Terminals easily accessible
- Clip fixing
- Change-over contact

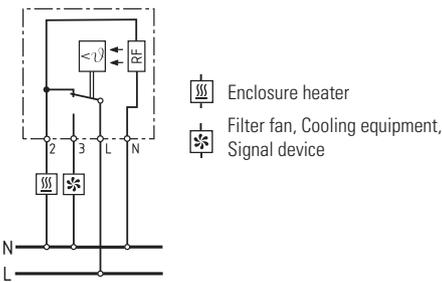
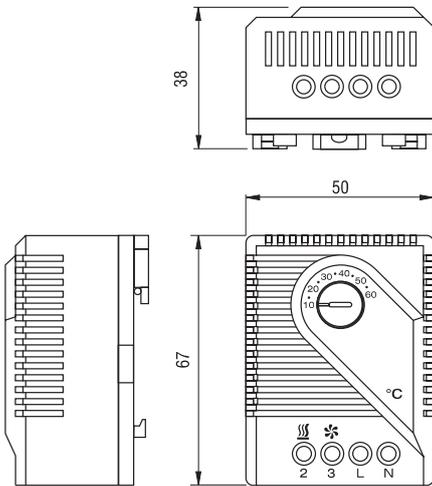
The mechanical thermostat is used for controlling heating and cooling equipment, filter fans or signal devices. The thermostat registers the surrounding air and can switch both inductive and resistive loads via snap-action contact. Due to the integrated thermal feedback the switch temperature difference could be reduced. Functionality: The temperature setting on the scale equals to the upper switch point, which means that the NC contact opens. The temperature setting minus switch temperature difference (and tolerances) equals to the lower switch point, which means that the NC contact closes.



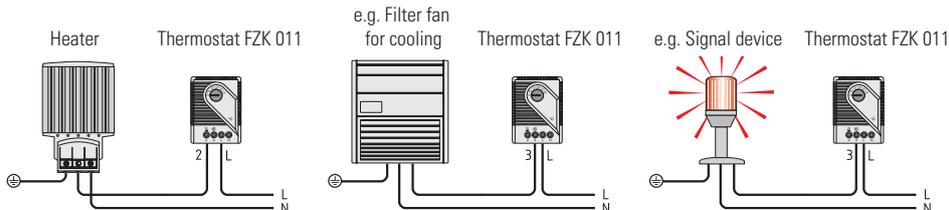
Technical Data

Switch temperature difference	5K (-3/+2K tolerance)*
Sensor element	thermostatic bimetal
Contact type	change-over snap-action contact
Service life	> 100,000 cycles
Min. switching capacity	10mA
Max. switching capacity, NC	250VAC, 10 (4) A 120VAC, 10 (4) A 30WDC
Max. switching capacity, NO	250VAC, 5 (2) A 120VAC, 5 (2) A 30WDC
Max. inrush current	16AAC for 10 sec.
Connection	4-pole terminal, clamping torque 0.5Nm max.: rigid wire 2.5mm ² stranded wire (with wire end ferrule) 1.5mm ²
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	67 x 50 x 38mm
Weight	approx. 0.1kg
Fitting position	variable
Operating / Storage temperature	-45 to +65°C (-49 to +149°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20
Approvals	UL File No. E164102

*If the Normally Closed contact is used, the switch temperature difference could be reduced by connecting terminal "N" (RF heating resistor). It causes the thermal feedback which is subject to surrounding conditions and thus has to be determined for each individual application.



Connection diagram



Examples of connection

Art. No.	Operating voltage	Setting range
01170.0-00	230VAC	+5 to +60°C
01170.0-01	230VAC	+40 to +140°F
01170.0-02	230VAC	-20 to +35°C
01170.9-00	120VAC	+40 to +140°F
01170.9-01	120VAC	+5 to +60°C

Electronic Thermostat ETR 011 Series



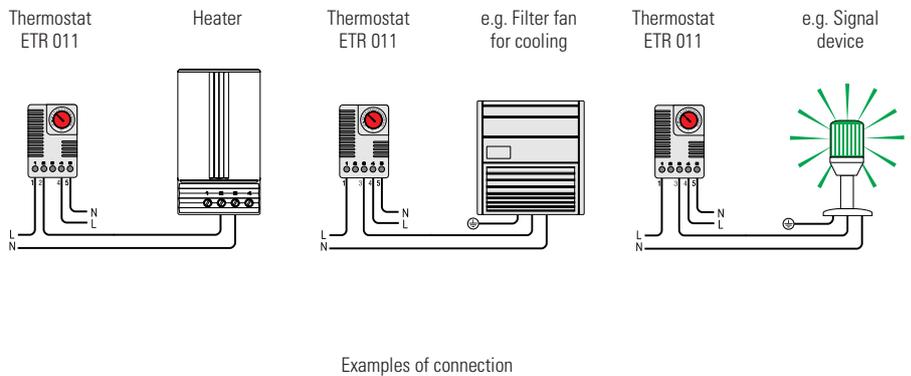
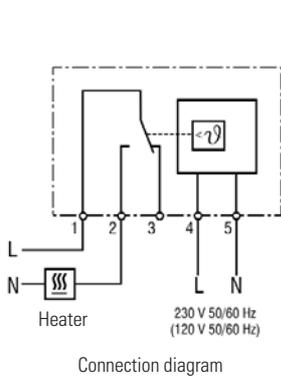
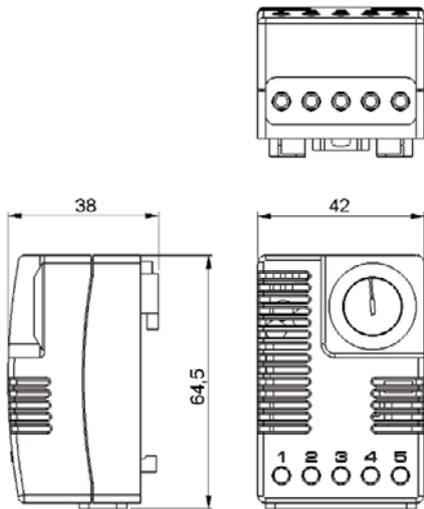
- Large setting range**
- Small hysteresis**
- Optical operating display (LED)**
- Change-over contact**
- Clip fixing**

The electronic thermostat is used for controlling heating and cooling equipment, filter fans or signal devices. The thermostat registers the surrounding air and can switch both inductive and resistive loads via relay with change-over contact. The LED integrated in the adjustment knob is lit when the NC contact is closed (e.g. when a connected heater is operating).



Technical Data

Switch difference	4K ($\pm 1K$ tolerance) at 20°C/68°F
Sensor element	NTC
Reaction time	5 sec.
Contact type	change-over contact (relay)
Service life	> 50,000 cycles
Max. switching capacity (relay output)	240VAC, 8 (1.6) A 120VAC, 8 (1.6) A 100WDC at 24VDC
Max. inrush current	16AAC for 10 sec.
Optical indicator	LED
Connection	5-pole terminal, clamping torque 0.5Nm max.: rigid wire 2.5mm ² stranded wire (with wire end ferrule) 1.5mm ²
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	64.5 x 42 x 38mm
Weight	approx. 70g
Fitting position	vertical
Operating / Storage temperature	-40 to +85°C (-40 to +185°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20



Art. No.	Operating voltage	Setting range	Approvals
01131.0-00	230VAC, 50/60Hz	-20 to 60°C	VDE + CSA-US
01131.9-00	120VAC, 50/60Hz	-4 to 140°F	CSA-US



High DC breaking capacity

Low hysteresis

Adjustable temperature

Change-over contact

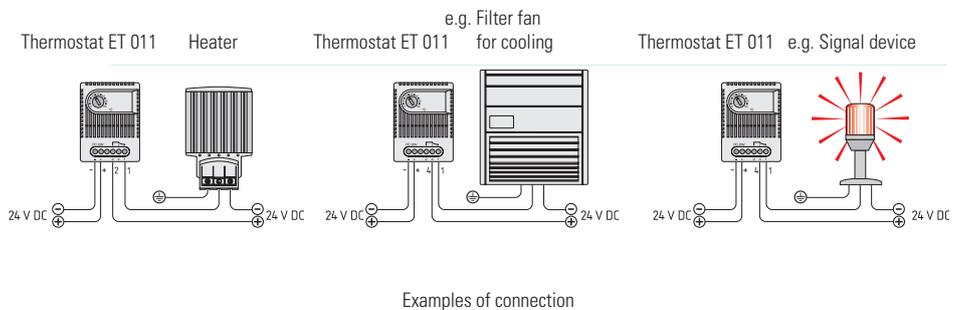
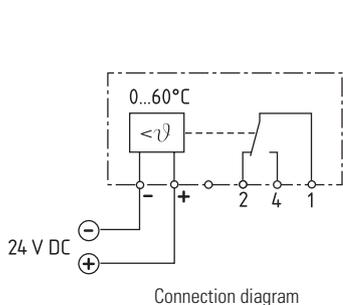
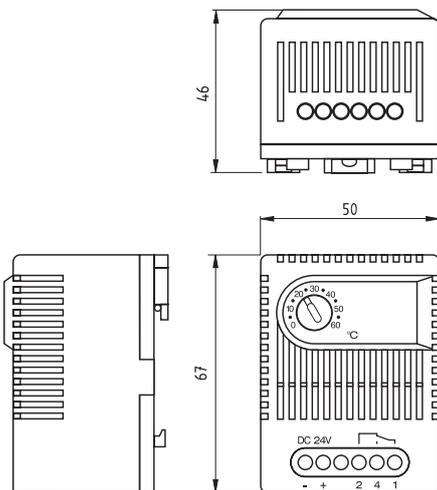
Clip fixing

Electronic thermostat for regulating high performance 24VDC equipment. Heating or cooling appliances as well as signal devices can be switched via the potential free change-over contact. In comparison to mechanical thermostats, the ET 011 has a low hysteresis making the switching point and setting accuracy more precise.



Technical Data

Switch temperature difference	approx. 3K
Sensor element	PTC
Contact type	change-over
Service life	> 100,000 cycles
Max. switching capacity	28VDC, 16A
Max. inrush current	16ADC
Connection	5-pole terminal, clamping torque 0.5Nm max.: rigid wire 2.5mm ² stranded wire (with wire end ferrule) 1.5mm ²
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	67 x 50 x 46mm
Weight	approx. 80g
Fitting position	vertical
Operating / Storage temperature	0 to +60°C (32 to +140°F) / -45 to +80°C (-49 to +176°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20
Approvals	-



Art. No.	Operating voltage	Setting range
01190.0-00	24VDC (20-28VDC)	0 to +60°C

Mechanical Hygrostat MFR 012



Adjustable relative humidity

Change-over contact

High switching capacity

Easily accessible terminals

Clip fixing

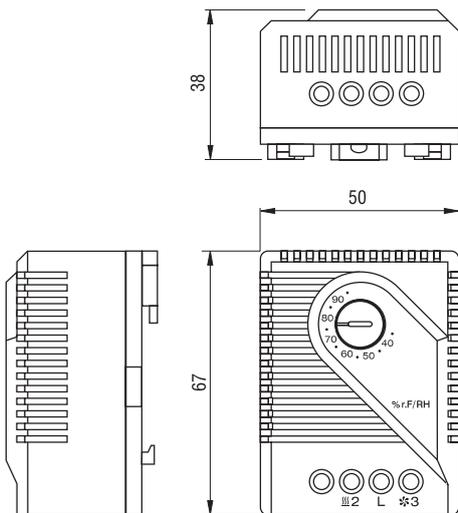
The electromechanical hygrostat is designed to control enclosure heaters so that the dew point is raised when a critical relative humidity of 65% is exceeded. In this way condensation and corrosion in enclosures with electric/electronic components is effectively prevented.



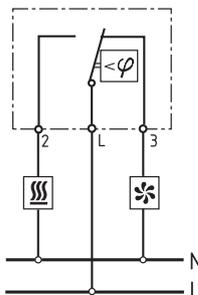
Technical Data

Switch difference*	4% RH ($\pm 3\%$ tolerance)
Permissible air velocity	15m/sec.
Contact type	change-over contact
Service life	> 50,000 cycles
Min. switching capacity	20V AC/DC, 100mA
Max. switching capacity	250VAC, 5A
	20WDC
Max. inrush current	5AAC
Connection	3-pole terminal for 2.5mm ² , clamping torque 0.5Nm max.: rigid wire 2.5mm ² stranded wire (with wire end ferrule) 1.5mm ²
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	67 x 50 x 38mm
Weight	approx. 60g
Fitting position	variable
Operating / Storage temperature	0 to +60°C (+32 to +140°F) / -40 to +60°C (-40 to +140°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20
Approvals	UL File No. E164102

*at 50% RH

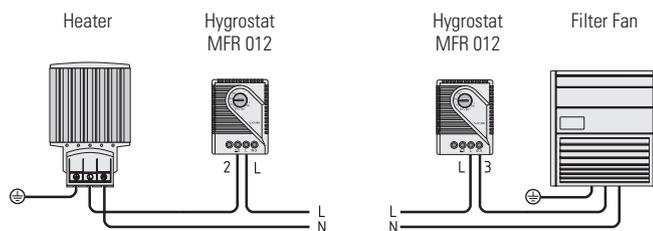


Connection diagram



Enclosure heater

Filter fan, Cooling equipment, Signal device



Examples of connection

Art. No.	Setting range
01220.0-00	35 to 95% RH

Electronic Hygrostat EFR 012 Series



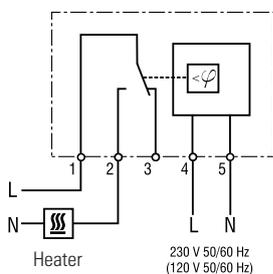
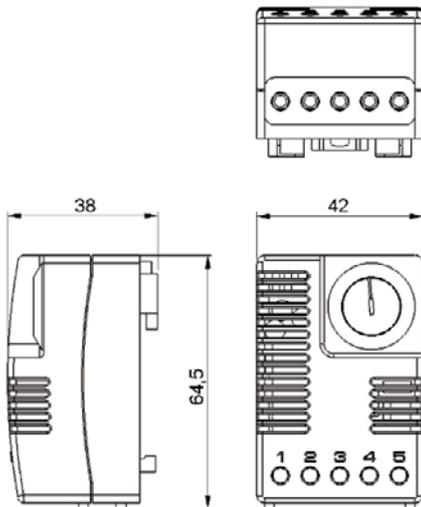
- Adjustable and pre-set relative humidity
- Optical operating display (LED)
- High switching capacity
- Clip fixing
- Temperature-compensated

The electronic hygrostat senses the relative humidity in an enclosure with electric/electronic components, and turns on a heater at the set point, helping prevent the formation of condensation in the enclosure. The LED integrated in the adjustment knob is lit when the connected heater is in operation.

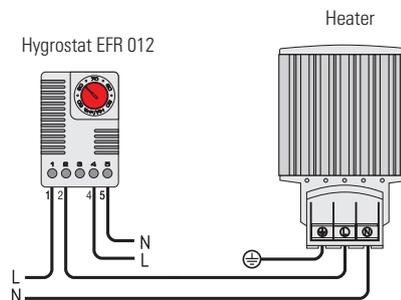


Technical Data

Switch difference	5% RH ($\pm 3\%$ RH tolerance) at 25°C/77°F (50% RH)
Reaction time	5 sec.
Contact type	change-over contact (relay)
Service life	> 50,000 cycles
Max. switching capacity (relay output)	240VAC, 8 (1.6) A 120VAC, 8 (1.6) A
	100WDC at 24VDC
Max. inrush current	16AAC for 10 sec.
Optical indicator	LED
Connection	5-pole terminal, clamping torque 0.5Nm max.: rigid wire 2.5mm ² stranded wire (with wire end ferrule) 1.5mm ²
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	64.5 x 42 x 38mm
Weight	approx. 70g
Fitting position	vertical
Operating / Storage temperature	0 to +60°C (+32 to +140°F) / -20 to +70°C (-4 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20



Connection diagram



Example of connection

Art. No.	Operating voltage	Setting range	Approvals
01245.0-00	230VAC, 50/60Hz	40 to 90% RH	VDE + CSA-US
01246.0-00	230VAC, 50/60Hz	65% RH pre-set	VDE + CSA-US
01245.9-00	120VAC, 50/60Hz	40 to 90% RH	CSA-US
01246.9-00	120VAC, 50/60Hz	65% RH pre-set	CSA-US

Electronic Hygrotherm ETF 012 Series



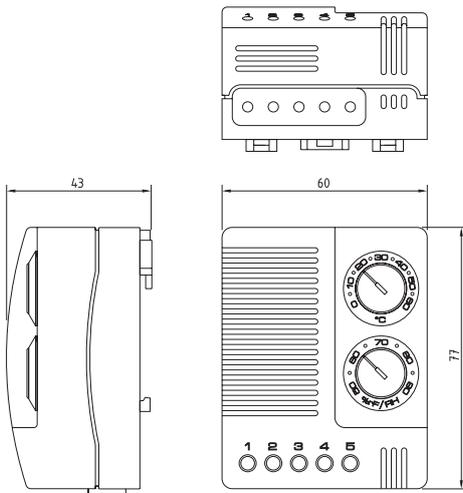
- **Temperature and humidity adjustable**
- **Optical operating display (LED)**
- **High switching capacity**
- **Clip fixing**

The electronic hygrotherm senses the ambient temperature and relative humidity in an enclosure with electric/electronic components, and turns on a heater (or alternatively a fan) at either set point, helping prevent the formation of condensation in the enclosure. The LED integrated in the adjustment knob on the active controller is lit when the connected device is in operation.

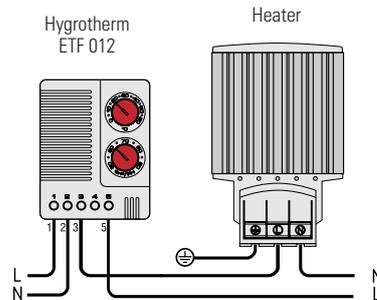
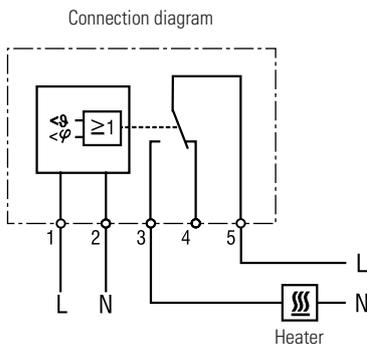


Technical Data

Switch difference (temperature)	2K (± 1K tolerance) at 25°C/77°F (50% RH)
Switch difference (humidity)	4% RH (± 1% tolerance) at 25°C/77°F (50% RH)
Reaction time (humidity)	5 sec.
Contact type	change-over contact (relay)
Service life	NC: > 50,000 cycles NO: > 100,000 cycles
Max. Switching capacity (Relay output)	NC: 240VAC, 6 (1) A NO: 240VAC, 8 (1.6) A NC: 120VAC, 6 (1) A NO: 120VAC, 8 (1.6) A 100WDC at 24VDC
Max. inrush current	16AAC for 10 sec.
Optical indicator	LED
Connection	5-pole terminal, clamping torque 0.5Nm max.: rigid wire 2.5mm ² stranded wire (with wire end ferrule) 1.5mm ²
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	77 x 60 x 43mm
Weight	approx. 0.2kg
Fitting position	vertical
Operating / Storage temperature	0 to +60°C (+32 to +140°F) / -20 to +80°C (-4 to +176°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20



Example of connection



Art. No.	Operating voltage	Setting range temperature	Setting range humidity	Approvals
01230.0-00	230VAC, 50/60Hz	0 to +60°C	50 to 90% RH	VDE + UL File No. E164102
01230.9-00	120VAC, 50/60Hz	+32 to +140°F	50 to 90% RH	UL File No. E164102
01230.9-01	120VAC, 50/60Hz	0 to +60°C	50 to 90% RH	UL File No. E164102



Compact design

Set temperature

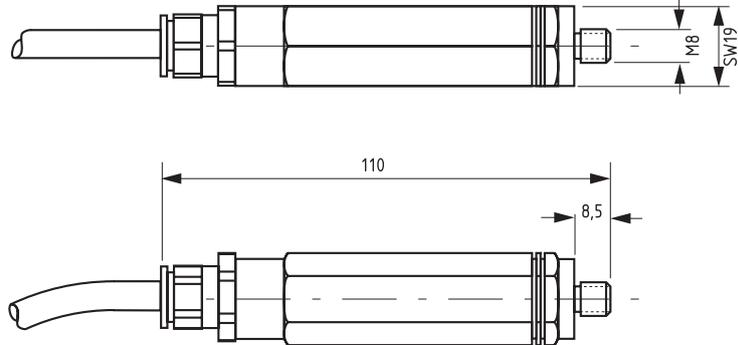
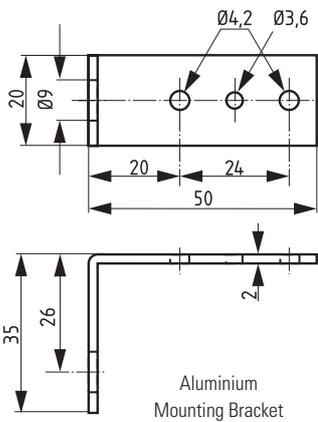
High switching capacity

Compact small mechanical thermostat for temperature regulation and monitoring of heaters, for example in transmitter cabinets, control panels and measuring equipment which are deployed in areas with explosion hazard. The special switch construction enables high response accuracy, small switch temperature difference and a very long service life. High switching performance allows direct control of the heaters.



Technical Data

Explosion proof according to EN	LCIE (Laboratoire Central des Industries Electriques)
Conformity certificate	01 ATEX 6074/02, LCIE N° 06 ATEX Q8011, IECEx LCI 07. 0021
Sensor element	thermostatic bimetal
Contact type (1-pole)	opens with rising temperature
Service life	> 100,000 cycles
Max. Switching capacity	250VAC, 4 (1) A
Connection	Si HF - JZ 3 x 0.75mm ² , length 1m
Mounting	mounting bracket with nut M8 (see illustration)
Casing	aluminium, black anodised
Dimensions	length 110mm
Weight	approx. 0.2kg
Fitting position	variable
Operating / Storage temperature	-40 to +40°C (-40 to +104°F) / -45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP65 / I (earthed)

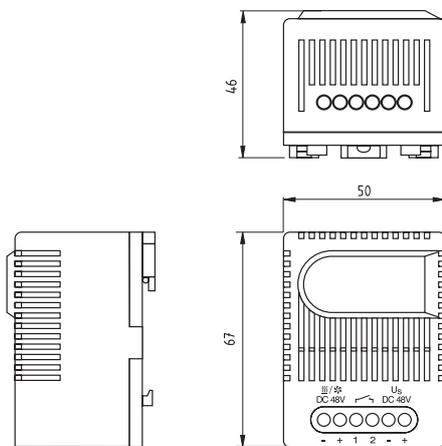


Art. No.	Ex protection type	Switch-off temperature	Switch temperature difference
01180.0-00	d IIC T6 - Ex tD A21 IP6X T85°C	+15°C (± 4K tolerance)	4K (± 1K tolerance)
01181.0-00	d IIC T6 - Ex tD A21 IP6X T85°C	+25°C (± 4K tolerance)	4K (± 1K tolerance)



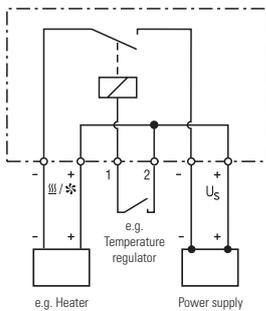
- **High DC switching capacity**
- **Variety of applications**
- **Compact design**
- **Simple connection**
- **Clip fixing**

Switch module for switching DC appliances with high switching capacity. A separate conventional switch contact is used as controller (e.g. temperature regulator, humidity regulator). The Switch module is available in 24VDC and 48VDC versions.



Technical Data

Contact type	contact maker, normally open (Relay/MOSFET)
Service life	> 100,000 cycles
Connection	6-pole terminal, clamping torque 0.5Nm max.: rigid wire 2.5mm ² stranded wire (with wire end ferrule) 1.5mm ²
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	67 x 50 x 46mm
Weight	approx. 90g
Fitting position	variable
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20
Approvals	VDE submitted



Load, e.g. heater, cooling device with temperature cut-out

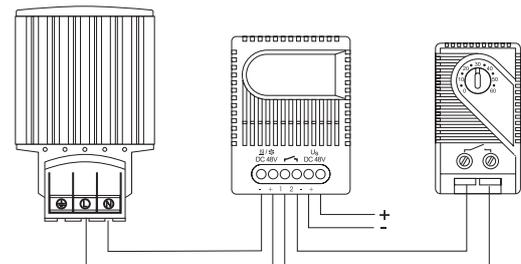
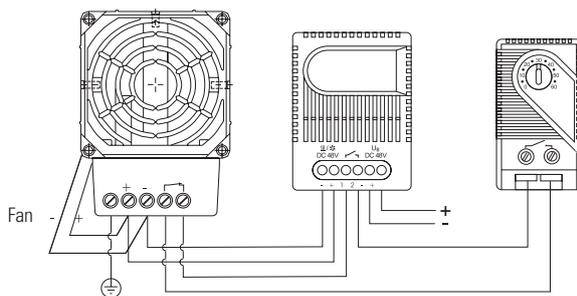
Switch Module, SM 010

Control contact, e.g. temperature, humidity or pressure regulator

Load, e.g. heater, cooling device without temperature cut-out

Switch Module, SM 010

Control contact, e.g. temperature, humidity or pressure regulator



Art. No.	Operating voltage	Max. switching capacity	Max. inrush current
01001.0-00	24VDC (20-28VDC)	28VDC 16A	16ADC
01000.0-00	48VDC (38-56VDC)	56VDC 16A	16ADC

Lamp shown with protective plastic cover (see Accessories)



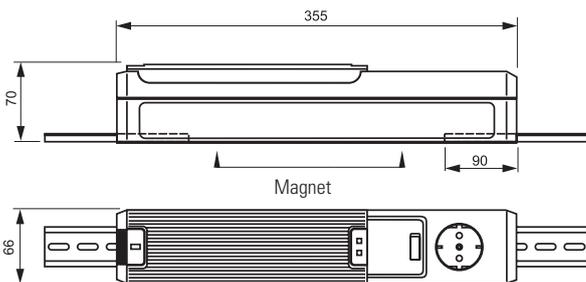
- Magnetic or optional DIN rail mounting**
- Energy-saving lamp**
- Lamp without/with electrical socket
(choice of sockets)**
- On/Off switch**

The compact lamp KL 025 was especially designed for use in enclosures with electric/electronic components. A powerful magnet enables the lamp to be mounted freely in any desired position in metal enclosures saving time and installation problems. The integrated electrical socket allows the use of additional appliances.



Technical Data

Luminosity	900 Lm (equals light bulb 75W/230VAC, 60W/120VAC)
Lamp type	compact fluorescent lamp with integral starter
Service life	5,000 h
Switch	on/off light switch
Connection	3-pole terminal 2.5mm ² with cable clamp, torque 0.8Nm max.
Mounting	magnet fixing
Casing	plastic, light grey
Dimensions	355 x 65 x 70mm
Weight	approx. 1.kg
Fitting position	variable
Operating / Storage temperature	-20 to +50°C (-4 to +122°F) / -45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20
Accessories	lamp cover, Art. No. 09520.0-00 (see photo)



In plastic, aluminium or stainless steel cabinets the lamp can be fixed using screws together with inserted 35mm DIN rail sections.



Art. No.	Operating voltage	Socket	Power consumption	Nominal current	Protection class	Approvals
02500.0-00	230VAC, 50Hz	Germany/Russia (1)	11W	16.0A	I (earthed)	VDE
02500.0-07	230VAC, 50Hz	none	11W	-	II (double insulated)	-
02501.0-00	230VAC, 50Hz	F/PL/CZ/SK (2)	11W	16.0A	I (earthed)	-
02502.0-00	230VAC, 50Hz	Switzerland (3)	11W	10.0A	I (earthed)	-
02510.0-00	230VAC, 50Hz	UK/Ireland (4)	11W	13.0A	I (earthed)	-
02512.0-00	230VAC, 50Hz	Italy (6)	11W	16.0A	I (earthed)	-
02505.9-00	120VAC, 60Hz	USA/Canada (5)	9W	15.0A	I (earthed)	-
02505.9-01	120VAC, 60Hz	none	9W	-	II (double insulated)	-

Lamp LED 025 Series

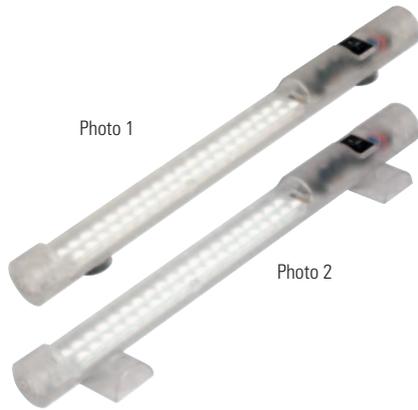


Photo 1: Lamp LED 025 with magnet fixing
Photo 2: Lamp LED 025 with screw fixing

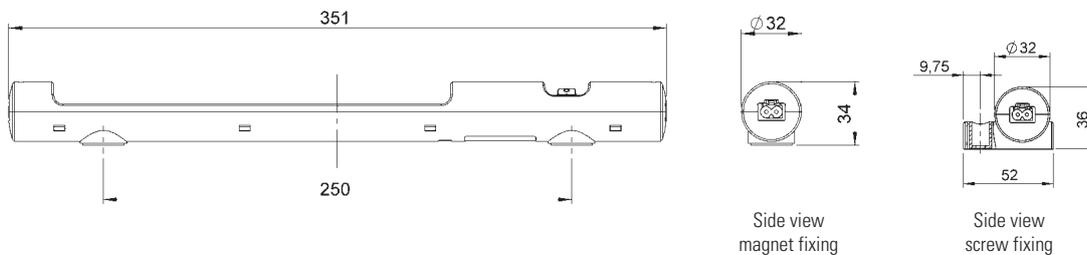
- Wide voltage range**
- Integrated power unit**
- Daisy chain**
- Long-lived, maintenance-free**
- Magnet or screw fixing**
- Energy-saving by LED technology**
- Quick connection**

The lamp series LED 025 is suitable for all types of panels and enclosures, especially where space is at a premium. The lamps have a very long service life thanks to the use of LED technology. They are available with powerful non-slip rubberized magnets allowing them to be quickly positioned in any steel enclosure. Alternatively they can be fixed mechanically. The power output allows up to 10 lamps to be connected to each other (daisy chain). Both the power input and output connectors snap lock into their sockets. With the integrated power unit and the plugs the lamp can quickly be connected.



Technical Data	
Power consumption	max. 5W
Luminosity	290Lm at 120° (870Lm at 360° or equivalent 75W light bulb)
Lamp type	LED, angle of radiation 120° light color: daylight, color temperature: 6,500K
Service life	60,000h at 20°C (68°F)
Connection	2-pole connector with snap lock AC: max. 2.5A / 240VAC, color: white DC: max. 2.5A / 60VDC, color: blue
Mounting	magnet fixing or screw fixing, M5, 250mm centers
Casing	plastic, transparent
Dimensions	351 x 34 x 32mm (with magnet fixing) 351 x 36 x 32mm (with screw fixing)
Operating / Storage temperature	-30 to +60°C (-22 to +140°F) / -40 to +85°C (-40 to +185°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Approvals	UL File No. E234324, VDE intended

Important note: Connectors and cables for electrical connection are not included in the delivery. These parts need to be ordered separately, see Accessories on next page.



Art. No. magnet fixing	Art. No. Screw fixing	Operating voltage	Switch	Weight (approx.)
02540.0-00	02540.0-01	100-240VAC, 50/60Hz (min. 90VAC, max. 265VAC)	on/off light switch	0.2kg
02540.1-00	02540.1-01	24-48VDC (min. 20VDC, max. 60VDC)	on/off light switch	0.2kg

Connection cable with female connector and open end



Photo: Connection cable, Art. No. 244356

Art. No.	Model	Length	Voltage type	Color	Use for	Approvals
244356	connection cable 2x1.5mm ² with female connector	2.0m	AC	connector: white; cable: white	power input	VDE
244357 	connection cable 2xAWG 16 with female connector	2.0m	AC	connector: white; cable: white	power input	VDE + UL
244360	connection cable 2x1.5mm ² with female connector	2.0m	DC	connector: blue; cable: white	power input	VDE
244361 	connection cable 2xAWG 16 with female connector	2.0m	DC	connector: blue; cable: white	power input	VDE + UL

Extension cable with 2 connectors for daisy chain connection



Photo: Extension cable, Art. No. 244358

Art. No.	Model	Length	Voltage type	Color	Use for	Approvals
244358	extension cable 2x1.5mm ² with 2 connectors	1.0m	AC	connectors: white; cable: white	daisy chain	VDE
244359 	extension cable 2xAWG 16 with 2 connectors	1.0m	AC	connectors: white; cable: white	daisy chain	VDE + UL
244362	extension cable 2x1.5mm ² with 2 connectors	1.0m	DC	connectors: blue; cable: white	daisy chain	VDE
244363 	extension cable 2xAWG 16 with 2 connectors	1.0m	DC	connectors: blue; cable: white	daisy chain	VDE + UL

Female / Male connectors



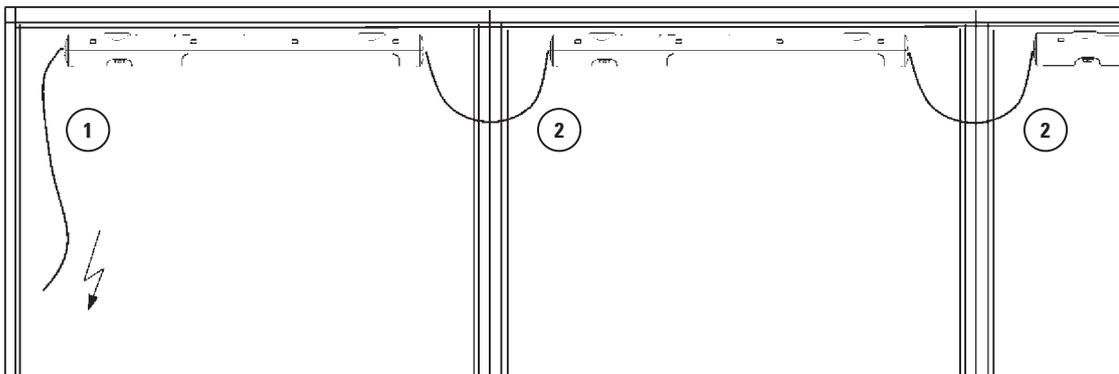
Photo: Female connector, Art. No. 264057



Photo: Male connector, Art. No. 264058

Art. No.	Model	Voltage type	Color	Use for	Approvals
264057	female connector	AC	white	power input	VDE + UL
264058	male connector	AC	white	power output	VDE + UL
264059	female connector	DC	blue	power input	VDE + UL
264060	male connector	DC	blue	power output	VDE + UL

Connection Example



This illustration shows the LED 025 lamp in a daisy chain application. The lamps are conveniently connected via quick connection plugs – up to 10 lamps max. can be daisy-chained this way. The snap lock connectors ensure a stable electrical connection even if subjected to heavy vibration. The connection example shows a 230VAC application, using the following cables: connection cable with female connector, Art. No. 244356 (1); daisy chain extension cable with 2 connectors, Art. No. 244358 (2).

Female/male connectors are also available to assemble cables in non-standard lengths.

Slimline Lamp with on/off switch SL 025 Series

Photo: Slimline lamp with on/off switch, with integrated electric socket (Germany), Art. No. 02520.0-00



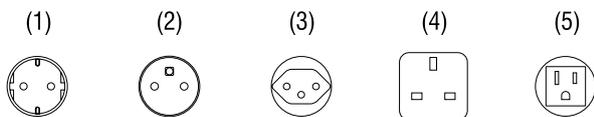
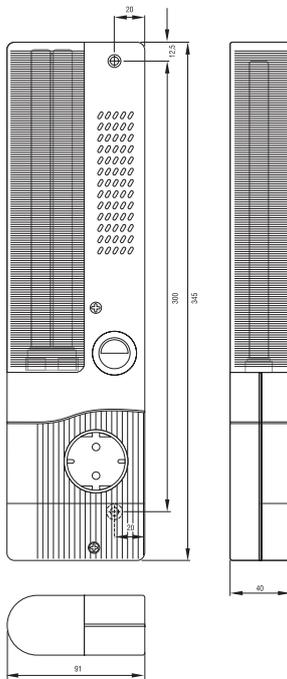
- Slim casing
- Electronic ballast
- Lamp without/with electrical socket (choice of sockets)
- Magnet fixing (option)
- Energy saving lamp
- On/Off switch

The flat slimline lamp SL 025 is suitable for all types of panels and enclosures, especially where space is at a premium. The lamp can be mounted on its narrow or broad surface using screws. It is also available with a magnet which allows it to be fitted quickly in any position in a steel enclosure. Both versions are available with an integrated electrical socket enabling the use of additional appliances.



Technical Data

Power consumption	11W
Luminosity	900Lm (equals 75W light bulb)
Lamp type	energy saving lamp, 2G7 socket
Service life	10,000h
Switch	on/off light switch
Connection	terminal 2.5mm ² with cable clamp, torque 0.8Nm max.
Mounting	screw fixing, M5, 300mm centers magnet fixing (optional)
Casing	plastic according to UL94 V-0, light grey
Dimensions	345 x 91 x 40mm
Fitting position	narrow surface/broad surface
Operating / Storage temperature	-20 to +50°C (-4 to +122°F) / -45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20
Note	The slimline lamp SL 025 is also available with a 19" front panel
	24VDC to 48VDC on request



Art. No.	Model	Operating Voltage	Socket	Nominal Current	Weight (approx.)	Protection class	Approvals
02520.0-00	without magnet	230VAC, 50/60Hz	Germany/Russia (1)	16.0A	0.4kg	I (earthed)	VDE
02520.1-01	with magnet	230VAC, 50/60Hz	Germany/Russia (1)	16.0A	0.5kg	I (earthed)	VDE
02521.0-00	without magnet	230VAC, 50/60Hz	F/PL/CZ/SK (2)	16.0A	0.4kg	I (earthed)	VDE
02521.1-04	with magnet	230VAC, 50/60Hz	F/PL/CZ/SK (2)	16.0A	0.5kg	I (earthed)	VDE
02522.0-00	without magnet	230VAC, 50/60Hz	Switzerland (3)	10.0A	0.4kg	I (earthed)	VDE
02522.1-01	with magnet	230VAC, 50/60Hz	Switzerland (3)	10.0A	0.5kg	I (earthed)	VDE
02523.0-00	without magnet	230VAC, 50/60Hz	UK/Ireland (4)	13.0A	0.4kg	I (earthed)	VDE
02523.1-05	with magnet	230VAC, 50/60Hz	UK/Ireland (4)	13.0A	0.5kg	I (earthed)	VDE
02524.0-01	without magnet	120VAC, 50/60Hz	USA/Canada (5)	15.0A	0.4kg	I (earthed)	UL File No. E234324
02524.1-05	with magnet	120VAC, 50/60Hz	USA/Canada (5)	15.0A	0.5kg	I (earthed)	UL File No. E234324
02527.0-00	without magnet	230VAC, 50/60Hz	none	-	0.4kg	II (double insulated)	VDE + UL File No. E234324
02527.1-14	with magnet	230VAC, 50/60Hz	none	-	0.5kg	II (double insulated)	VDE
02527.0-10	without magnet	120VAC, 50/60Hz	none	-	0.4kg	II (double insulated)	UL File No. E234324
02527.1-11	with magnet	120VAC, 50/60Hz	none	-	0.5kg	II (double insulated)	UL File No. E234324

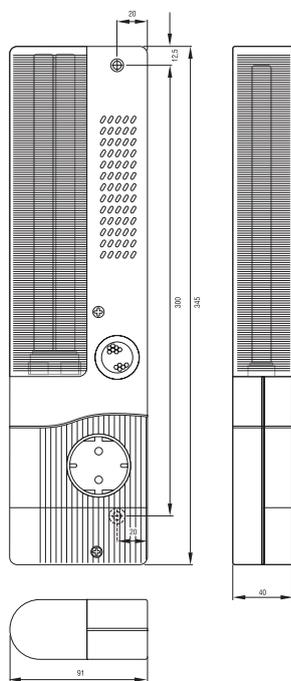
Slimline Lamp with movement sensor SL 025 Series

Photo: Slimline lamp with movement sensor and with integrated electric socket (Germany), Art. No. 02520.0-03



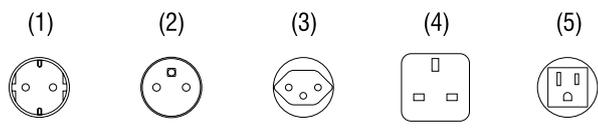
- Slim casing**
- Electronic ballast**
- Lamp without/with electrical socket (choice of sockets)**
- Magnet fixing (option)**
- Energy saving lamp**
- Automatic switching**

The flat slimline lamp SL 025 with movement sensor is suitable for all types of panels and enclosures, especially where space is at a premium. The lamp can be mounted on its narrow or broad surface using screws. It is also available with a magnet which allows it to be fitted quickly in any position in a steel enclosure. Both versions are available with an integrated electrical socket enabling the use of additional appliances. The movement sensor substitutes a door contact switch.



Technical Data	
Power consumption	11W
Luminosity	900Lm (equals 75W light bulb)
Lamp type	energy saving lamp, 2G7 socket
Service life	10,000h
Switch	PIR movement sensor, approx. 6 min. fixed switch-on duration
Connection	terminal 2.5mm ² with cable clamp, torque 0.8Nm max.
Mounting	screw fixing, M5, 300mm centers magnet fixing (optional)
Casing	plastic according to UL94 V-0, light grey
Dimensions	345 x 91 x 40mm
Fitting position	narrow surface/broad surface
Operating / Storage temperature	-20 to +50°C (-4 to +122°F) / -45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type	IP20
Note	The slimline lamp SL 025 is also available with a 19" front panel
	24VDC to 48VDC on request

The PIR movement sensor switches the lighting on when the enclosure door is opened. The switch-on time is reset with every further registered movement. The movement sensor does not react to movement on the other side of glass and so can be used in enclosures with glass doors.



Art. No.	Model	Operating Voltage	Socket	Nominal Current	Weight (approx.)	Protection class	Approvals
02520.0-03	without magnet	230VAC, 50/60Hz	Germany/Russia (1)	16.0A	0.4kg	I (earthed)	VDE
02520.1-04	with magnet	230VAC, 50/60Hz	Germany/Russia (1)	16.0A	0.5kg	I (earthed)	VDE
02521.0-03	without magnet	230VAC, 50/60Hz	F/PL/CZ/SK (2)	16.0A	0.4kg	I (earthed)	VDE
02521.1-05	with magnet	230VAC, 50/60Hz	F/PL/CZ/SK (2)	16.0A	0.5kg	I (earthed)	VDE
02522.0-03	without magnet	230VAC, 50/60Hz	Switzerland (3)	10.0A	0.4kg	I (earthed)	VDE
02522.1-04	with magnet	230VAC, 50/60Hz	Switzerland (3)	10.0A	0.5kg	I (earthed)	VDE
02523.0-03	without magnet	230VAC, 50/60Hz	UK/Ireland (4)	13.0A	0.4kg	I (earthed)	VDE
02523.1-04	with magnet	230VAC, 50/60Hz	UK/Ireland (4)	13.0A	0.5kg	I (earthed)	VDE
02524.0-04	without magnet	120VAC, 50/60Hz	USA/Canada (5)	15.0A	0.4kg	I (earthed)	UL File No. E234324
02524.1-06	with magnet	120VAC, 50/60Hz	USA/Canada (5)	15.0A	0.5kg	I (earthed)	UL File No. E234324
02527.0-04	without magnet	230VAC, 50/60Hz	none	-	0.4kg	II (double insulated)	VDE + UL File No. E234324
02527.1-15	with magnet	230VAC, 50/60Hz	none	-	0.5kg	II (double insulated)	VDE
02527.0-12	without magnet	120VAC, 50/60Hz	none	-	0.4kg	II (double insulated)	UL File No. E234324
02527.1-17	with magnet	120VAC, 50/60Hz	none	-	0.5kg	II (double insulated)	UL File No. E234324

Dual Lamp DL 026 Series



Photo 1

Photo 2

Photo 1: Dual Lamp DL 026 Series with on/off switch
Photo 2: Dual Lamp DL 026 Series with movement sensor

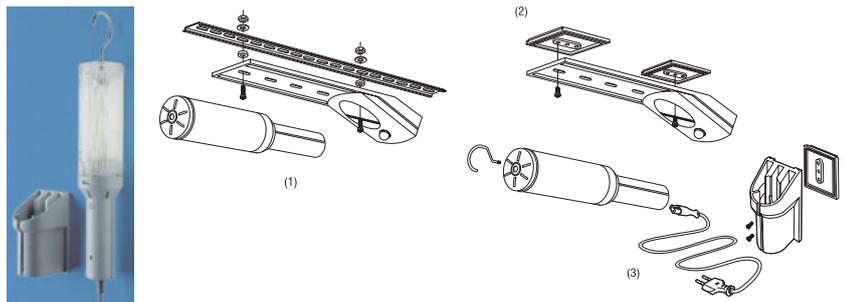
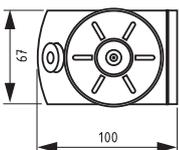
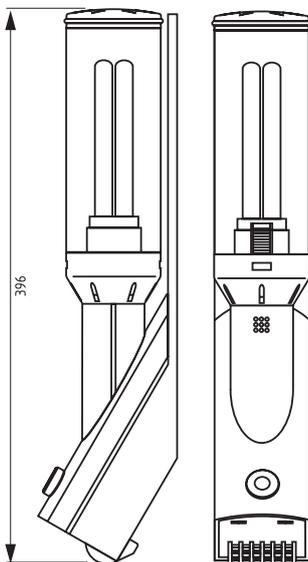
- Versatile – base lamp or hand lamp**
- Long-life energy saving lamp**
- On/off switch or movement sensor**
- Connections for further lamps**

The Dual Lamp 026 is available with on/off switch or movement sensor (the movement sensor version was designed to eliminate the need for a door switch). The PIR movement sensor switches the lamp on when the enclosure door is opened. The switch-on time is reset with every further registered movement. The movement sensor does not react to movement on the other side of glass and so can be used in enclosures with glass doors.



Technical Data

Luminosity	1.000 Lm (equals 100W light bulb)
Lamp type	energy saving lamp, E27 socket
Service life	10,000h
Mounting	screw fixing (e.g. 35mm DIN rail)
Casing	plastic according to UL94 V-0, light grey
Weight	approx. 0.6kg
Fitting position	variable
Operating / Storage temperature	-20 to +50°C (-4 to +122°F) / -45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Approvals	-
Accessories	see illustration below
Note	120VAC and DC voltages on request



- (1) Standard screw fixing to DIN rail
- (2) 2 self-adhesive fixing plates, Art. No. 09515.0-00
- (3) Wall holder with connection cable (2m), hook and self-adhesive fixing plate, Art. No. 03410.0-00.
By using an additional wall holder the lamp can be used as a hand lamp.

Art. No.	Operating voltage	Power consumption	Switch	Connection
02600.0-00	230VAC, 50Hz	20 W	on/off push switch	6-pole screw connector 2.5mm ² (torque 0.5Nm max.) for power connection, further lamps and external door contact switch
02601.0-00	230VAC, 50Hz	20 W	PIR movement sensor, approx. 3 min. fixed switch-on duration	4-pole screw connector 2.5mm ² (torque 0.5Nm max.) for power connection and further lamps

Hand Lamp with lamp holder DL 026 Series



Long-life energy saving lamp

Versatile

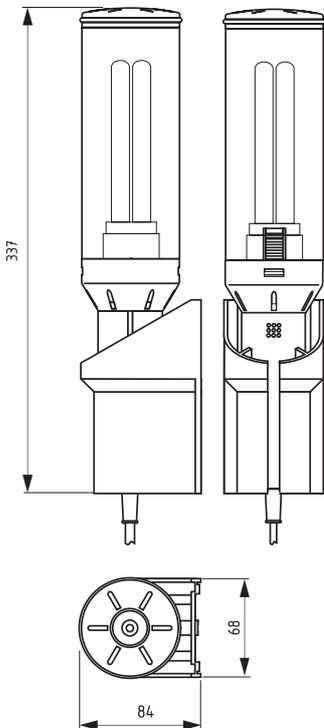
Selective illumination

Handlamp for the use in enclosures with electrical/electronic components. The lamp is removable and therefore suitable for a selective illumination.



Technical Data

Luminosity	1.000Lm (equals 100W light bulb)
Lamp type	energy saving lamp, E27 socket
Service life	10,000h
Connection	power cable (2m) with Euro plug
Mounting	screws or fixing plate (self-adhesive)
Casing	plastic according to UL94 V-0, light grey
Weight	approx. 0.6kg
Fitting position	variable
Operating / Storage temperature	-20 to +50°C (-4 to +122°F) / -45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / II (double insulated)
Approvals	-
Included in delivery	lamp holder, hook and fixing plate
Note	120VAC and DC voltages on request



Art. No.	Operating voltage	Power consumption
02610.0-00	230VAC, 50Hz	20W

Electrical Socket SD 035 Series



Quickly connected

Available with or without fuse

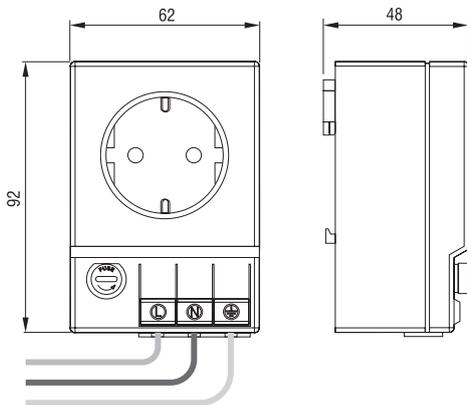
Clip fixing

The DIN rail mounted electrical socket can be quickly fitted and connected in enclosures allowing the use of auxiliary products such as hand lamps, measuring devices, soldering irons etc. The unit is available with and without fuse and in many world socket standards.

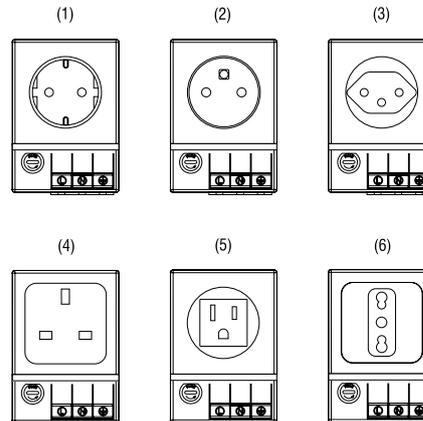


Technical Data

Connection	3 x pressure clamps for stranded and rigid wire 0.5 - 2.5mm ²
Mounting	clip for 35mm DIN rail, EN 60715
Casing	plastic according to UL94 V-0, light grey
Dimensions	92 x 62 x 48mm
Weight	approx. 0.2kg
Fitting position	variable
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Operating / Storage humidity	max. 90% RH (non-condensing)
Protection type / Protection class	IP20 / I (earthed)



Connections from mains



Art. No.	Operating Voltage max.	Socket	Model	Nominal Current	Approvals
03500.0-00	250VAC	Germany/Russia (1)	with fuse*	6.3A	-
03500.0-01	250VAC	Germany/Russia (1)	without fuse	16.0A	-
03501.0-00	250VAC	F/PL/CZ/SK (2)	with fuse*	6.3A	-
03501.0-01	250VAC	F/PL/CZ/SK (2)	without fuse	16.0A	-
03502.0-00	250VAC	Switzerland (3)	with fuse*	6.3A	-
03502.0-01	250VAC	Switzerland (3)	without fuse	10.0A	-
03503.0-00	250VAC	UK/Ireland (4)	with fuse*	6.3A	-
03503.0-01	250VAC	UK/Ireland (4)	without fuse	13.0A	-
03504.0-00	125VAC	USA/Canada (5)	with fuse*	6.3A	UL File No. E222026
03504.0-01	125VAC	USA/Canada (5)	without fuse	15.0A	UL File No. E222026
03505.0-00	250VAC	Italy (6)	with fuse*	6.3A	-
03505.0-01	250VAC	Italy (6)	without fuse	16.0A	-

*fuse Ø 5 x 20mm

High degree of protection

Easy to install



Photo: Inside view

It has become more and more important to provide a protected enclosure environment for valuable and crucial electrical and electronic components. In a tightly closed enclosure, pressure differentials can occur during extreme temperature variations. The specially designed pressure compensation device DA 084 permits a controlled change in pressure and avoids the entering of dust and water. The pressure compensation device is suitable for the use in enclosures and housings in accordance with DIN EN 62208.



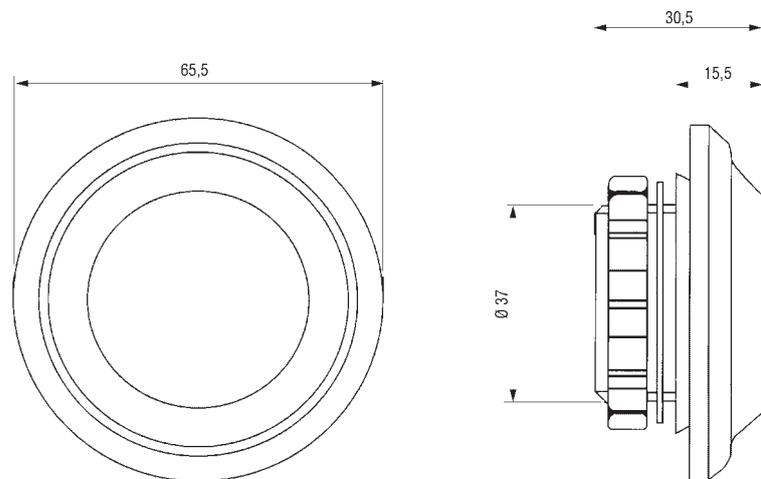
Technical Data

Mounting	PG 29 thread with union nut
Torque	5Nm (max. 10Nm)
Material	plastic according to UL94 V-0, pebble grey
Sealing	sealing gasket NBR
Air interface	approx. 7cm ²
Dimensions	Ø 65.5 x 30.5mm
Fitting position	vertical*
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)

*Protection type is restricted to IP54 if fitting position of DA 084 is not vertical.

Installation

Make cut-out Ø 37⁺¹mm in enclosure wall and mount pressure compensation device with nut. Please make sure that the sealing gasket is put in place on the outer side panel of the enclosure. For optimal pressure compensation we recommend to use two devices on opposite sides towards the top of the enclosure.



Art. No.	Protection type	1 packing unit	Weight (approx.)
08400.0-04	IP55	2 pieces	62g (31g/piece)



Photo: Inside view

- **High degree of protection**
- **Waterproof membrane**
- **Easy to install**

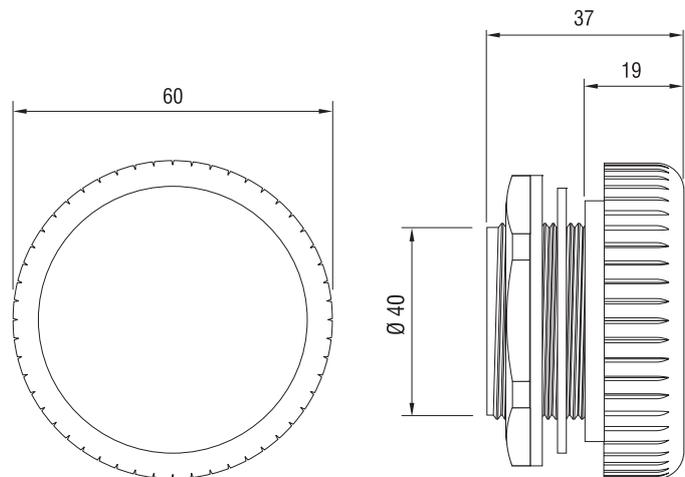
Pressure differentials in enclosures with a high degree of protection are a result of internal and external temperature changes. In the case of negative pressure or partial vacuum, dust and humidity can enter the enclosure through the door seal. When the air inside the enclosure cools down, condensation may occur because the humidity cannot escape the enclosure. The easy-to-install pressure compensation device DA 284 provides compensation of pressure at a protection degree of IP66. Even with a slight overpressure, a waterproof membrane inside the plug allows the humidity to escape whilst blocking water and dirt from entering the enclosure.



Technical Data	
Mounting	thread M40 x 1.5 with nut
Torque	5Nm (max. 10Nm)
Depth in enclosure	approx. 16mm
Material	plastic, light grey
Sealing	sealing gasket NBR
Filter	waterproof membrane
Air permeability	1200l/h at a pressure difference of min. 70mbar
Dimensions	Ø 60 x 37mm
Fitting position	variable
Operating / Storage temperature	-35 to +70°C (-31 to +158°F)

Installation

Make cut-out Ø 40.5^{+0.5}mm in enclosure wall and mount pressure compensation device with nut. Please make sure that the sealing gasket is put in place on the outer side panel of the enclosure. For optimal pressure compensation we recommend to use two devices on opposite sides towards the top of the enclosure.



Art. No.	Protection type	1 packing unit	Weight (approx.)
28400.0-00	IP66 (EN 60529) / IPX9K (EN 40050-9)	2 pieces	90g (45g/piece)
28400.0-01	IP66 (EN 60529) / IPX9K (EN 40050-9)	1 piece	45g



Photo: Inside view

- High degree of protection**
- Waterproof membrane**
- Corrosion resistant**
- Food safe**

Pressure differentials in enclosures with a high degree of protection are a result of internal and external temperature changes. In the case of negative pressure or partial vacuum, dust and humidity can enter the enclosure through the door seal. When the air inside the enclosure cools down, condensation may occur because the humidity cannot escape the enclosure. The easy-to-install pressure compensation device DA 284 provides compensation of pressure at a protection degree of IP66. Even with a slight overpressure, a waterproof membrane inside the plug allows the humidity to escape whilst blocking water and dirt from entering the enclosure.

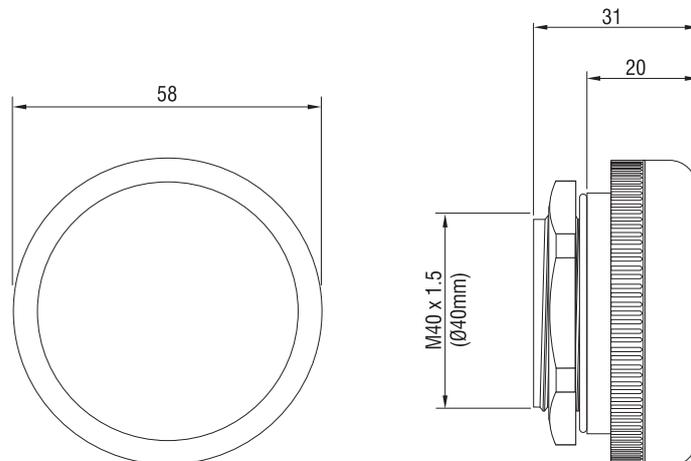


Technical Data

Mounting	thread M40 x 1.5 with nut
Torque	5Nm (max. 10Nm)
Depth in enclosure	approx. 9mm
Material	stainless steel V2A (DIN 1.4305 / AISI 303)
Sealing	sealing gasket NBR
Filter	waterproof membrane
Air permeability	1200l/h at a pressure difference of min. 70mbar
Dimensions	Ø 58 x 31mm
Fitting position	variable
Operating / Storage temperature	-45 to +80°C (-49 to +176°F)

Installation

Make cut-out Ø 40.5^{+0.5}mm in enclosure wall and mount pressure compensation device with nut. Please make sure that the sealing gasket is put in place on the outer side panel of the enclosure. For optimal pressure compensation we recommend to use two devices on opposite sides towards the top of the enclosure.



Art. No.	Protection type	1 packing unit	Weight (approx.)
28401.0-00	IP66 (EN 60529) / IPX9K (EN 40050-9)	1 piece	160g



Photo: Inside view

- High degree of protection**
- Good drainage performance**
- Easy to install**
- Robust, weather and UV-light protected housing**

Condensate occurs in enclosures and housings with high protection type by variations in temperature. The use of a drainage device allows the conveying of the condensate without losing the maximum protection type of IP66. The water permeable membrane makes sure the drainage of the enclosure by the capillary attraction. The construction prevents the infiltration of splash water into the enclosure.

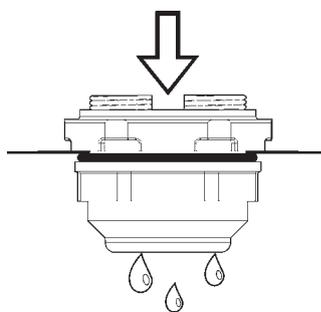


Technical Data

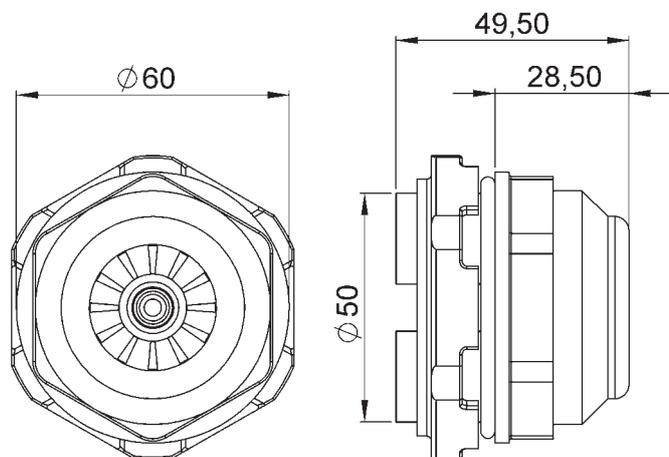
Mounting	thread M50 x 1.5 with nut (wrench size: nut 60mm, housing 50mm)
Torque	6Nm max.
Depth in enclosure	max. 17.5mm
Material	plastic according to UL94 V-0, umbra grey, weather proof and UV light resistant according UL746C (f1)
Water entry hight	0mm (at 0.5mm wall thickness)
Sealing	sealing gasket NBR
Water flow-through	approx. 200ml/h at a water column of 5mm
Dimensions	Ø 60 x 49.5mm
Fitting position	vertical, lowest point
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)

Installation

Make cut-out Ø 50,5^{+0.5}mm in enclosure bottom and mount pressure compensation device with nut. Please make sure that the sealing gasket is put in place on the outer side panel of the enclosure and the hole is free of burrs.



Fitting position



Art. No.	Protection type	Enclosure wall thickness	1 packing unit	Weight (approx.)
08410.0-00	IP66 / IP67 (EN 60529) / IP69K (EN 40050-9)	0.5 - 5.5mm	1 piece	60g

Self-adhesive Appliance Holder STEGOFIX

Direct fixing of small appliances and 35mm DIN rails

Simple to mount

Self-adhesive



With STEGOFIX small appliances can be mounted in enclosures significantly quicker, easier and more economically than before, without drilling holes. Mounting DIN rails is a simple matter with STEGOFIX. Longer rails are mounted on several STEGOFIX units and joining two rails is also not a problem. Subsequent changes and the mounting of additional appliances can be carried out with ease – even in confined spaces. STEGOFIX is a self-adhesive plastic unit with an adhesion power which will bear a continuous load of 500g. The high-performance industrial adhesive band is also non-ageing and designed with safety tolerances.



Technical Data

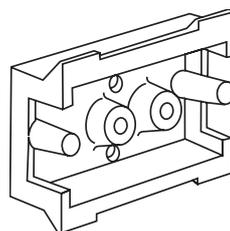
Load	500g after a 24h waiting period*
Mounting	self-adhesive (non-ageing, high-performance adhesive band)
Material	plastic according to UL94 V-0
Dimensions	43 x 38 x 14mm
Screw pitch	12.8mm; Ø 3.6mm, for perforated 35mm DIN rails
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)

*depending on the conditions of use (e.g. surface condition, size of the device to be mounted, etc.) higher loads were achieved.

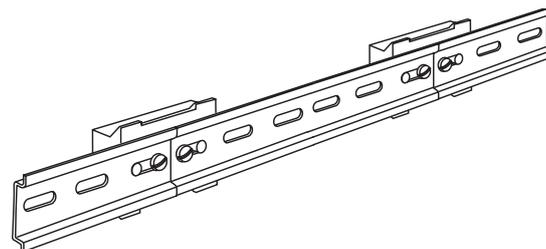
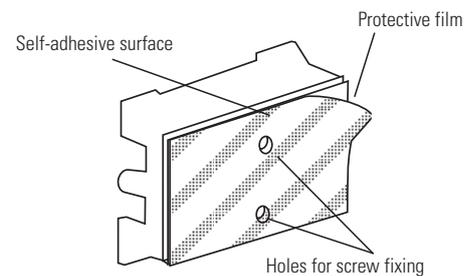
Installation

STEGOFIX can only be mounted on smooth surfaces, e.g. metals, lacquered surfaces and plastics (except polyethylene, polypropylene and rubber). The surfaces must be dry, free from dust, oil, separating agents and other contamination.

Application examples



STEGOFIX



Art. No.	1 packing unit	Weight (approx.)
09510.0-01	5 pieces	60g (12g/piece)

Calculation of temperature control in enclosures

What's needed:

1. The dimensions of the enclosure (Height, Width, Depth) [m]
2. The enclosure position (e.g. single enclosure, enclosure in a row) according to calculation formula, enclosure surface area A [m²]
3. The enclosure material (metal, plastic) heat transfer coefficient from table, k [W/m² K]
4. The temperature difference between desired enclosure interior temperature Ti [°C] and the expected ambient temperature Tu [°C] (e.g. day/night, summer/winter, climate zones) ΔT [K=Kelvin]
5. The stray power (self-warming) of all installed components during operation (e.g. transformers, relays, semiconductors) Pv [W]

Calculation and selection of parameters: enclosure surface area - heat transfer coefficient - temperature difference

1. Enclosure surface area from dimensions

2. Enclosure position (plan view) according to VDE 0660 part 500

	Single enclosure free on all sides
	Single enclosure, wall mounted
	First or last enclosure in free standing row
	First or last enclosure in wall mounted row
	Middle enclosure in free standing row
	Middle enclosure in wall mounted row
	Middle enclosure in wall mounted row with covered top

Formula for cabinet surface area A [m²]

(H = Height W = Width D = Depth)

$$A = 1.8 \times H \times (W + D) + 1.4 \times W \times D$$

$$A = 1.4 \times W \times (H + D) + 1.8 \times D \times H$$

$$A = 1.4 \times D \times (H + W) + 1.8 \times W \times H$$

$$A = 1.4 \times H \times (W + D) + 1.4 \times W \times D$$

$$A = 1.8 \times W \times H + 1.4 \times W \times D + D \times H$$

$$A = 1.4 \times W \times (H + D) + D \times H$$

$$A = 1.4 \times W \times H + 0,7 \times W \times D + D \times H$$

Example: enclosure free on all sides, 2000mm high / 800mm wide / 600mm deep. $A = 1.8 \times 2.0 \times (0.8 + 0.6) + 1.4 \times 0.8 \times 0.6 = 5.712\text{m}^2$

3. Enclosure material and its heat transfer coefficient k [W/m² K]

Steel sheet, painted	k ~ 5.5W/m ² K
Steel sheet, stainless	k ~ 4.5W/m ² K
Aluminium	k ~ 12W/m ² K
Aluminium, double-walled	k ~ 4.5W/m ² K
Polyester	k ~ 3.5W/m ² K

4. Temperature difference ΔT [K=Kelvin]

$$\Delta T = T_i - T_u$$

i.e. the temperature difference between the interior and exterior temperatures

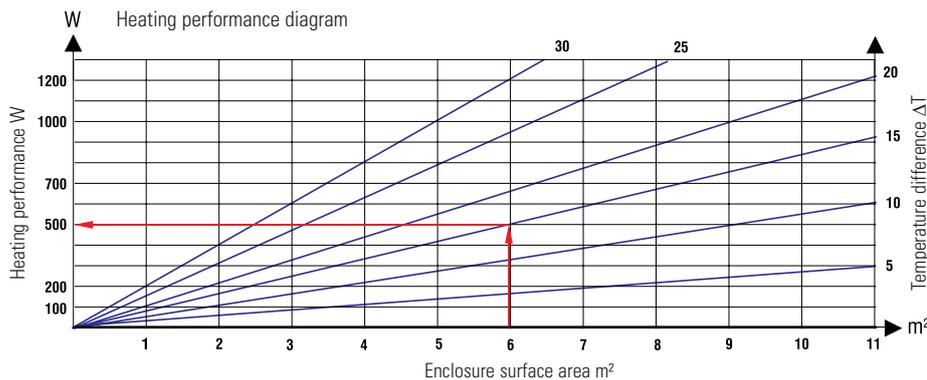
CALCULATION FORMULA FOR REQUIRED HEATING PERFORMANCE (HEATER):

Required heating performance P_H [W] = enclosure surface area A [m²] x heat transfer coefficient k [W/m² K] x temperature difference ΔT [K]

Example: $W = 5.712\text{m}^2 \times 5.5\text{W/m}^2\text{K} \times 15\text{K} = 471.24\text{W}$

Result: Heater with 500W heating performance is required. If enclosure is situated outdoors the calculated heating performance must be doubled!

OR CHOOSE REQUIRED HEATING PERFORMANCE FROM DIAGRAM:



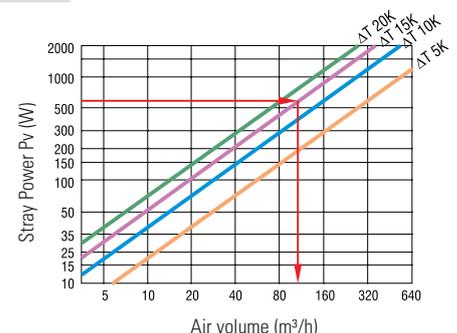
5. In the case of continuous stray power Pv [W] (self-warming) this must be deducted from the calculated heating performance.

CHOOSE REQUIRED COOLING PERFORMANCE FROM DIAGRAM:

OR CALCULATE USING FORMULA FOR REQUIRED COOLING PERFORMANCE (FILTER FAN):

$$\text{Required air volume } V \text{ [m}^3\text{/h]} = \frac{\text{installed stray power } P_v \text{ [W]}}{\text{temperature difference } \Delta T \text{ [K]}} \times \text{air constant } f^* \text{ [3.3m}^3 \text{ K/Wh]}$$

$$\text{Example: } V = \frac{600\text{W}}{15\text{K}} \times 3.3\text{m}^3 \text{ K/Wh} = 132\text{m}^3\text{/h}$$



*f (0-100) = 3.1m³ K/Wh, f (100-250) = 3.2m³ K/Wh, f (250-500) = 3.3m³ K/Wh, f (500-750) = 3.4m³ K/Wh, f (750-1000) = 3.5m³ K/Wh



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