for control panels and enclosures

for traffic control and monitoring systems in the transport industry

for high voltage switchgear in outdoor and indoor substations

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 enclosu res.In combination with dust and aggressive gases condensation causes corrosion which results in stray cu rrents and arcing.Too high a temperature or toolow a temperature,can also lead to serious component failure. The safety risk is enormous and the COSt ofthe operational delays as a consequence is incalculable

Solution

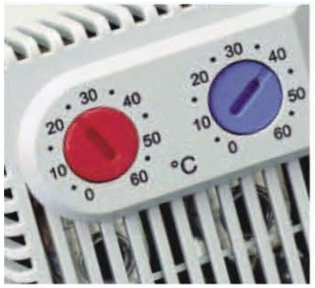
Only constant optimum climatic conditions allow components to function properly. The right climate can be attained by a temperature and moisture contol system When temperatures are too low or when temperature differences(e. g, night/day)are large heating is required it may also be necessary to keep components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

Applications

Whether for telecommunications or traffic systems, power stations or outdoor plants, ATMs or parkinq control systems, where electronics have t0 be protected aqainst humidity heat pr 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 tropicalised and EX variations Temperature and humidity controls ranging from 0 to 60℃ (32 to 140。F) and 35% to 100%RH. A new filter fan series in EMC and standard versions with excellent performance and shielding characteristics Panel lighting and accessories.



Product Catalogue

Zhejiang Ezitown Electric Co., Ltd.

Content

Small semiconductor Heater HGK 047 Series 10W to 30W

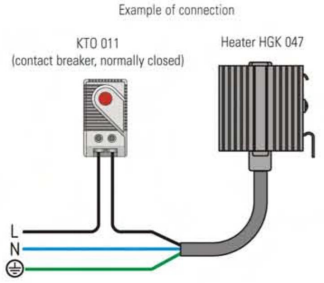
- Dynamic heating up
- Energy saving
- Wide voltage range
- Temperature limiting
- Clip fixing

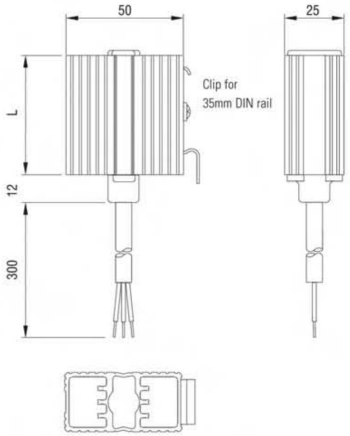
The heaters are used in enclosures where condensation is to be prevented or the temperature may not fall below a minimum value. In this way corrosion is avoided and an even temperature is ensured.

CE

Technical Data

Heating element	PTC resistor, self regulating and temperature limiting
Heater body	extruded aluminium profile, anodised
Mounting	clip for 35mm DIN rail, EN 50022
Fitting position	vertical
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP54 / I (earthed)
Accessories	screw fixing, Art. No. 09024.0-00 (1 packing unit = 2 pieces)





Art. No.	Operating voltage	Heating capacity[1]	Inrush current max.	Length (L)	Weight (approx.)	Connection
04700.0-00	120-240V AC/DC[2]	10W	1.0A	50mm	0.10kg	3 x 0.5mm² x 300mm sheathed cable (silicone)
04701.0-00	120-240V AC/DC[2]	20W	2.5A	60mm	0.20kg	3 x 0.5mm² x 300mm sheathed cable (silicone)
04702.0-00	120-240V AC/DC[2]	30W	3.0A	70mm	0.20kg	3 x 0.5mm² x 300mm sheathed cable (silicone)
04700.9-00	110-120V AC/DC	10W	1.0A	50mm	0.10kg	3 x AWG 20 x 300mm sheathed cable
04701.9-00	110-120V AC/DC	20W	1.5A	70mm	0.20kg	3 x AWG 20 x 300mm sheathed cable
04702.9-00	110-120V AC/DC	30W	1.5A	100mm	0.20kg	3 x AWG 20 x 300mm sheathed cable

[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%.

Semiconductor Heater HG 140 Series 15W to 150W

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

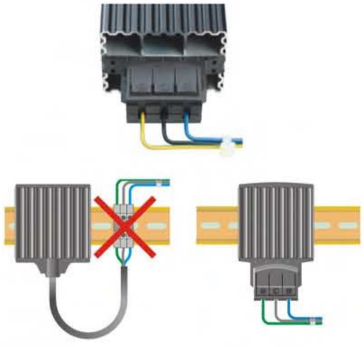
These heaters are used in enclosures where damage from condensation must be prevented, or where the temperature may not fall below a minimum value. The aluminium profile heater body design has a chimney effect and distributes the heat evenly. The pressure clamp connectors save time and simplify installation.

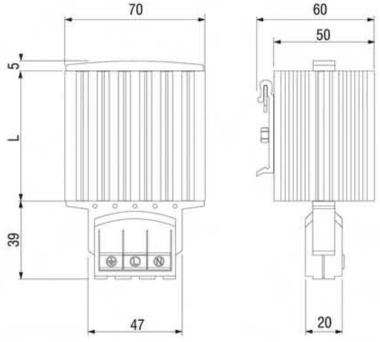
CE

Technical Data

Operating voltage	120-240V AC/DC* (min. 110V, max. 265V)
Heating element	PTC resistor, self regulating and temperature limiting
Heater body	extruded aluminium profile, anodised
Connection	3 pressure clamps for stranded wire 0.5-1.5mm² (with wire
	end ferrule) and rigid wire 0.5-2.5mm²
Connection casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 50022
Fitting position	vertical
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP20 / I (earthed)
Accessories	Screw fixing.Art.No.09024.0-00(1 packing unit=2 piecs)

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





Art. No.	Heating capacity*	Inrush current max.	Length (L)	Weight (approx.)
14000.0-00	15W	1.5A	65mm	0.30kg
14001.0-00	30W	3.0A	65mm	0.30kg
14003.0-00	45W	3.5A	65mm	0.30kg
14005.0-00	60W	2.5A	140mm	0.40kg
14006.0-00	75W	4.0A	140mm	0.50kg
14007.0-00	100W	4.5A	140mm	0.50kg
14008.0-00	150W	9.0A	220mm	0.70kg

*at 20°C (68°F) ambient temperature

Semiconductor Heater HG 140 Series 15W to 150W

- Dynamic heating up
- Temperature limiting
- Energy saving
- Self-regulating(PTC)
- Compact

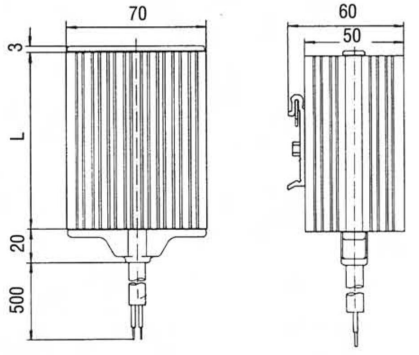
TheseCompact heater for avoiding malfunctions caused by condensation and for use in enclosures where the temperature may not fall below a minimum value. The aluminium radiator pofile has a chimney effect and helps to distribute heat evenly

CE

Art. No.	Heating capacity*	max.current at make	L	Weight
04000.0-00	15W	ca.0.5A	65mm	0.3kg
04001.0-00	30W	ca.1.0A	65mm	0.3kg
04003.0-00	45W	ca.1.0A	65mm	0.3kg
04005.0-00	60W	ca.1.5A	140mm	0.5kg
04006.0-00	75W	ca.1.8A	140mm	0.5kg
04007.0-00	100W	ca.2.4A	140mm	0.5kg
04008.0-00	150W	ca.4.5A	220mm	0.8kg
04000.9-00	15W	ca.0.5A	65mm	0.3kg
04001.9-00	30W	ca.1.0A	65mm	0.3kg
04004.9-00	50W	ca.1.2A	140mm	0.5kg
04007.9-00	80W	ca.2.0A	220mm	0.8kg
04009.9-00	100W	ca.2.4A	220mm	0.8kg
(UL: Operating voltage AC/DC 110-120V,3x AWG20 x 300mm sheathed cable)				
*at room temperature 20?				
Operating with voltages below 140V reduces heating performance by approx. 10%				

Other voltages available Dn request(e.g. AC/DC 48V)
Heaters for tropical conditions on request

Technical Data	
perating voltage:	AC/DC 110-250V max.265V
Heating capacity:	see table
Heating element:	PTC resistor,self regulating
Radiator:	Anodised extruded aJuminium profile
Protection class:	II,test voltage 4000V
Protection type:	IP 44
Connection cable:	2 x 0.75mm2 x 500mm silicone cable
Mounting:	Clip for 35mm DIN rail.EN 50022



Heating

Semiconductor Heater HG 240 Series — 15W to 150W

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

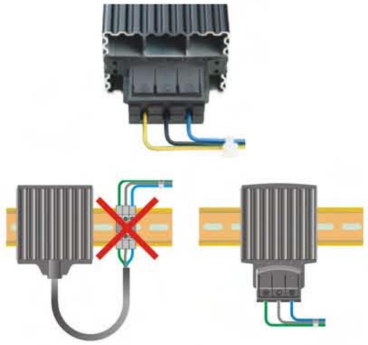
These heaters are used in enclosures where damage from condensation must be prevented, or where the temperature may not fall below a minimum value. The aluminium profile heater body design has a chimney effect and distributes the heat evenly. The pressure clamp connectors save time and simplify installation.

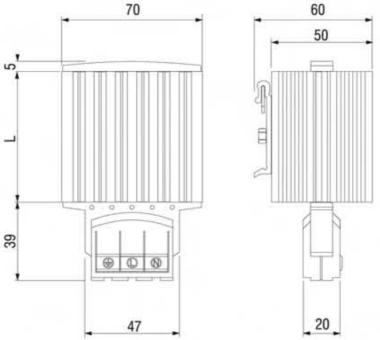
CE

Technical Data

Operating voltage	120-240V AC/DC* (min. 110V, max. 265V)
Heating element	PTC resistor, self regulating and temperature limiting
Heater body	extruded aluminium profile, anodised
Connection	3 pressure clamps for stranded wire 0.5-1.5mm² (with wire end ferrule) and rigid wire 0.5-2.5mm²
Connection casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 50022
Fitting position	vertical
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP20 / I (earthed)

*Operating with voltages below 240V AC/DC reduces heating performance by approx.10%





Art. No.	Heating capacity*	Inrush current max.	Length (L)	Weight (approx.)
24000.0-00	15W	1.5A	65mm	0.30kg
24001.0-00	30W	3.0A	65mm	0.30kg
24003.0-00	45W	3.5A	65mm	0.30kg
24005.0-00	60W	2.5A	140mm	0.40kg
24006.0-00	75W	4.0A	140mm	0.50kg
24007.0-00	100W	4.5A	140mm	0.50kg
24008.0-00	150W	9.0A	220mm	0.70kg

*at 20°C (68°F) ambient temperature

Small semiconductor Heater RCE 016 Series — 5W, 9W

- Temperature limiting
- 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.

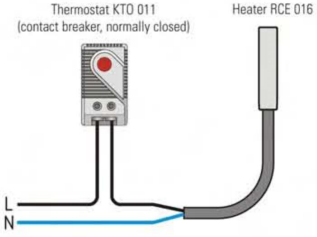
CE

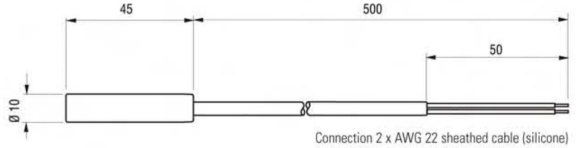
Technical Data

Operating voltage	120-240V AC/DC* (min. 110V, max. 265V)
Heating element	PTC resistor, self regulating and 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)
Protection type / Protection class	IP32 / II (double insulated)
Note	other voltages on request

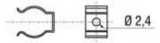
*Operating with voltages below 140V AC/DC reduces heating performance by approx. 10%.

Example of connection





Connection 2 x AWG 22 sheathed cable (silicone)



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

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

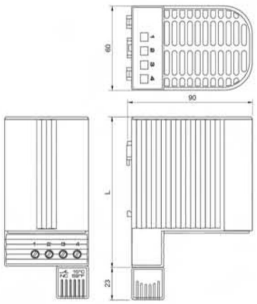
*at 20°C (68°F) ambient temperature

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/electronical 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).

CE

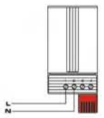


Technical Data

Operating voltage	120-240VAC* (min. 110V, max. 265V)
Heating capacity	see table
Heating element	PTC resistor - temperature limiting
Surface temperature	< 80°C (176°F), except upper protective grille
Connection	4-pole terminal 2,5mm², torque 0.8Nm max.
Casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 50022
Fitting position	vertical
Operating / Storage temperature	-20 to +70°C (-4 to +158°F) / -45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP20 / II (double insulated)
Note	other voltages on request

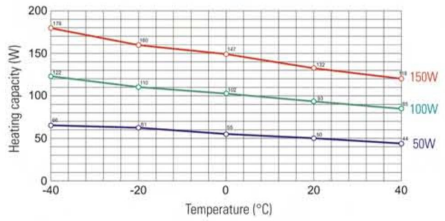
*Operating with voltages below 140V AC/DC reduces heating performance by approx. 10%.

Heater CSF 060



Example of connection

Heating capacity / Ambient temperature diagram CSF 060



Art. No.	Heating capacity[1]	Inrush current max.	Air outlet temperature[2]	Switch-off temperature[3]	Starting temperature[3]	Dimensions	Weight (approx.)
06001.0-00	50W	2.5A	+86°C (186.8°F)	+15°C (59°F)	+5°C (41°F)	110 x 60 x 90mm	0.30kg
06002.0-00	50W	2.5A	+86°C (186.8°F)	+25°C (77°F)	+15°C (59°F)	110 x 60 x 90mm	0.30kg
06011.0-00	100W	4.5A	+120°C (248°F)	+15°C (59°F)	+5°C (41°F)	110 x 60 x 90mm	0.30kg
06012.0-00	100W	4.5A	+120°C (248°F)	+25°C (77°F)	+15°C (59°F)	110 x 60 x 90mm	0.30kg
06021.0-00	150W	8A	+145°C (293°F)	+15°C (59°F)	+5°C (41°F)	150 x 60 x 90mm	0.50kg
06022.0-00	150W	8A	+145°C (293°F)	+25°C (77°F)	+15°C (59°F)	150 x 60 x 90mm	0.50kg

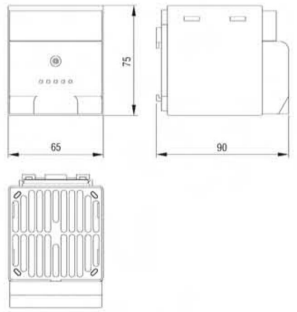
[1] ambient temperature - see Heating capacity / Ambient temperature diagram; [2] measured 50mm above protective grille; [3] tolerance of ± 5K;

Small semiconductor Fan Heater CS 028 150W

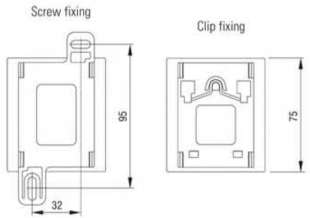
- Small, compact design
- Quiet in operation
- Dynamic heating up
- Clip or screw fixing

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

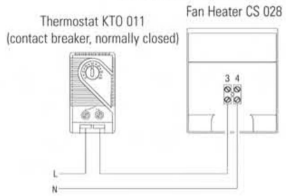
CE



View: back side



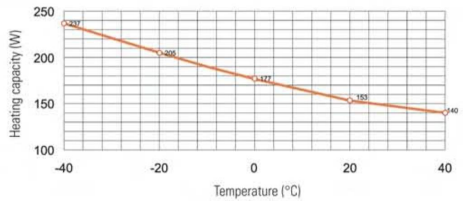
Example of connection



Technical Data

Heating element	PTC heating element
Inrush current max.	2A at 230VAC, 5A at 120VAC
Surface temperature	max. 50°C at casing; 100°C at upper protective grille at 20°C (68°F) ambient temperature
Axial fan, ball bearing	air flow 13.8 m³/h, free flow (service life 40,000h at 40°C)
Connection	2-pole clamp max. 2.5mm², clamping screw torque 0.8Nm max.
Casing	plastic according to UL94-0, black
Mounting	clip for 35 mm DIN rail, EN 50022 or screw fixing (Ø 5.3 mm)
Fitting position	vertical
Weight	approx. 0.30kg
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP20 / II (double insulated)
Note	other voltages on request

Heating capacity / Ambient temperature diagram CS 028 (150W)



Art. No.	Operating voltage	Heating capacity*	Dimensions	Mounting
)2800.0-00	230VAC, 50/60Hz	150W	87 x 65 x 75mm	Clip fixing
)2800.0-01	230VAC, 50/60Hz	150W	87 x 65 x 114mm	Screw fixing
02800.9-00	120VAC, 50/60Hz	150W	87 x 65 x 75mm	Clip fixing
02800.9-01	120VAC, 50/60Hz	150W	87 x 65 x 114mm	Screw fixing

*at 20°C (68°F) ambient temperature

Space-saving Fan Heater HV 031 / HVL 031 Series 100W to 400W

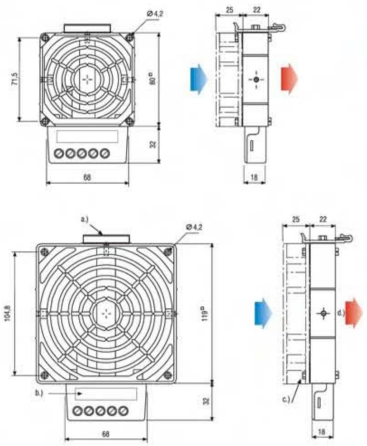
- Compact
- Flat design
- High air through-flow
- Temperature safety cut-out
- Clip fixing

The compact high-performance fan heater prevents formation of condensation in control or switch systems and provides an evenly distributed interior air temperature in enclosures. This fan heater is available without fan (HV 031) as well as with fan (HVL 031).

CE

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
Heater body	die-cast aluminium (glass bead blasted)
Connection	3-pole screw connector 2.5mm², clamping torque 0.8Nm max.
Connection casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 50022
Fitting position	horizontal
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP20 / I (earthed)
Connection(axial fan)	2-pole screw connector 2.5mm²(L2/N2)
HVL 031 only:	
Axial fan, ball bearing	airflow see table
	service life 50,000h at 25°C (77°F)



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	Dimensions	Weight (approx.)
03100.0-00	03100.9-00	100W	80 x 112 x 22mm	0.40kg
03101.0-00	03101.9-00	150W	80 x 112 x 22mm	0.40kg
03110.0-00	03110.9-00	200W	119 x 151 x 22mm	0.50kg
03111.0-00	03111.9-00	300W	119 x 151 x 22mm	0.50kg
03112.0-00	03112.9-00	400W	119 x 151 x 22mm	0.50kg

Art. No. HVL 031 230VAC, 50/60Hz	Art. No. HVL 031 120VAC, 50/60Hz	Heating capacity	Airflow min., free flow	Dimensions	Weight (approx.)
03102.0-00	03102.9-00	100W	35m³/h	80 x 112 x 47mm	0.60kg
03103.0-00	03103.9-00	150W	35m³/h	80 x 112 x 47mm	0.60kg
03113.0-00	03113.9-00	200W	108m³/h	119 x 151 x 47mm	0.90kg
03114.0-00	03114.9-00	300W	108m³/h	119 x 151 x 47mm	0.90kg
03115.0-00	03115.9-00	400W	108m³/h	119 x 151 x 47mm	0.90kg

Compact Fan Heater Series HGL 046 250W, 400W

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

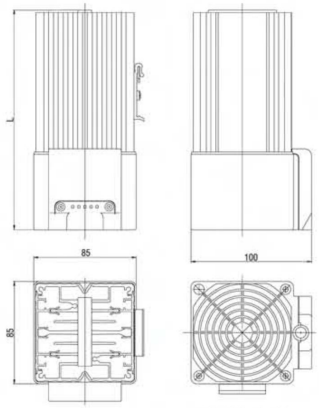
Compact fan heater prevents formation of condensation. The integrated high performance axial fan provides forced air circulation and so guarantees an even temperature in enclosures. With internal terminal connector.

CE

Technical Data

Heating element	resistance heater
Temperature safety cut-out	to protect against overheating in case of fan failure
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 50022
Fitting position	vertical
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
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).



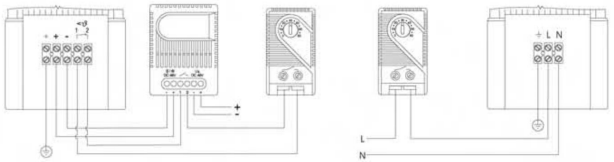
View from below

Electronic relay 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	Length (L)	Weight (approx.)
04640.0-00	230VAC, 50/60Hz	250W	182mm	1.10kg
04641.0-00	230VAC, 50/60Hz	400W	222mm	1.40kg
04640.9-00	120VAC, 50/60Hz	250W	182mm	1.10kg
04641.9-00	120VAC, 50/60Hz	400W	222mm	1.40kg
04640.1-00	24VDC	250W	182mm	1.10kg
04640.2-00	48VDC	250W	182mm	1.10kg
04641.2-00	48VDC	400W	222mm	1.40kg

Semiconductor Fan Heater CR 027 up to 650W

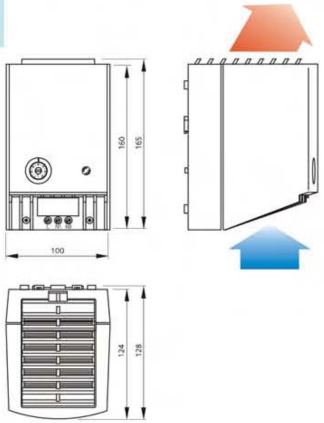
- Compact heater
- Heating capacity adjusts to ambient temperature
- Adjustable temperature range
- Clip fixing
- Optical indicator
- Temperature safety cut-out

Semiconductor fan heaters prevent the formation of condensation and ensure en even temperature in switch and control equipment. The built-in regulator is used to set the desired temperature.

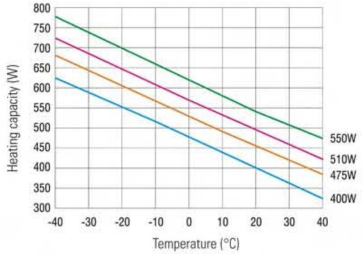
CE

Technical Data

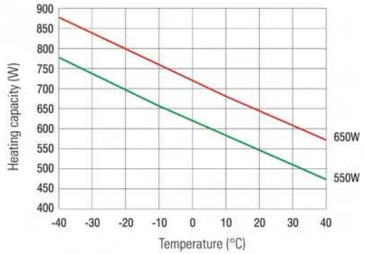
Heating element	PTC resistor, self regulating and temperature limiting
Temperature safety cut-out	to protect against overheating in case of fan failure
Axial fan, ball bearing	airflow see table
	service life 50,000h at 25°C (77°F)
Connection	2-pole clamp 2.5mm², clamping torque 0.8Nm max.
Casing	plastic according to UL94 V-0, light grey
Optical indicator	thermostat control lamp
Mounting	clip for 35mm DIN rail, EN 50022
Fitting position	vertical
Dimensions	100 x 128 x 165mm
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP20 / II (double insulated)



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.	Airflow, free flow	Setting range Temp. regulator	Weight (approx.)
02700.0-00	220-240VAC, 50/60Hz	475W	550W	11.0A	35m³/h	0 to +60°C	0.90kg
02701.0-00	220-240VAC, 50/60Hz	550W	650W	13.0A	45m³/h	0 to +60°C	1.10kg
02700.9-00	100-120VAC, 50/60Hz	400W	550W	14.0A	35m³/h	+32 to +140°F	0.90kg
02701.9-00	100-120VAC, 50/60Hz	510W	650W	15.0A	45m³/h	+32 to +140°F	1.10kg

*at 20°C (68°F) ambient temperature

Compact high-performance Fan Heater CR 030 950W

- Compact design
- Double insulated
- Integrated thermostat or hygrostat

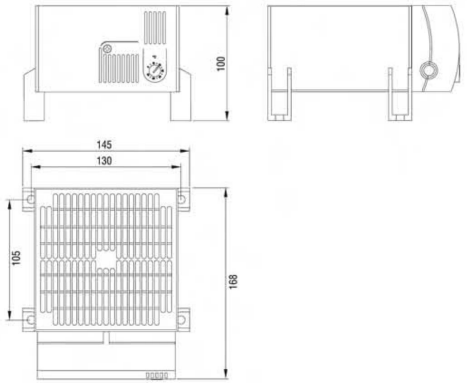
The compact high performance fan heater prevents formation of condensation and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. The fan heater is available 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.

CE

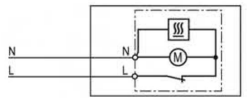
Technical Data

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 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	horizontal
Dimensions	168 x 145 x 100mm
Weight	approx. 1.40kg
Operating* / Storage temperature	-45 to +70°C (-49 to +158°F)
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	Setting range
03051.0-00	Fan Heater with thermostat	230VAC, 50/60Hz	950W	0 to +60°C
03051.0-02	Fan Heater with hygrostat	230VAC, 50/60Hz	950W	65% RH, factory-set
03059.9-00	Fan Heater with thermostat	120VAC, 50/60Hz	950W	+32 to +140°F

*according to UL499 in combination with UL508A

Compact high-performance Fan Heater CR 130 950W

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

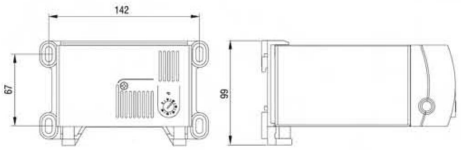
The compact high performance fan heater prevents formation of condensation and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. The fan heater is available 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.

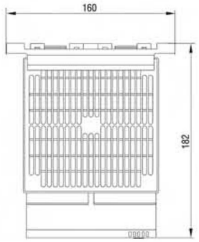
CE

Technical Data

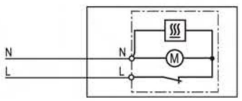
Heating element	high performance cartridge
Temperature safety cut-out	to protect against overheating in case of fan failure,
	automatic reset
Heater body	extruded aluminium profile
Axial fan, ball bearing	airflow 160m³/h, free flow
	service life 50,000h at 25°C (77°F)
Connection	2-pole max. 2.5mm², clamping screw with strain relief,
	torque 0.8Nm max.
Casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 50022 or screw fixing (M6)
Fitting position	horizontal
Dimensions	182 x 160 x 99mm
Weight	approx. 1.45kg
Operating* / Storage temperature	-45 to +70°C (-49 to +158°F)
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	Setting range
13051.0-00	Fan Heater with thermostat	230VAC, 50/60Hz	950W	0 to +60°C
13051.0-02	Fan Heater with hygrostat	230VAC, 50/60Hz	950W	65% RH, factory-set
13059.9-00	Fan Heater with thermostat	120VAC, 50/60Hz	950W	+32 to +140°F

*according to UL499 in combination with UL508A

Compact high-performance Fan Heater CS 030 (Semiconductor) 1,200W

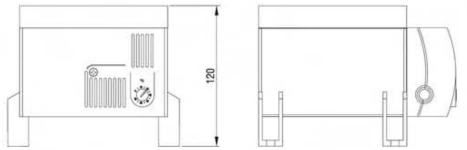
- Compact design
- High heating performance
- Double insulated
- Integrated thermostat (optional)

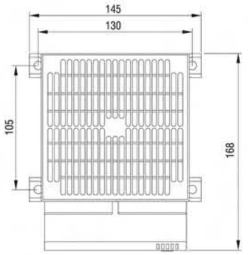
The compact high performance fan heater prevents formation of condensation and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. The fan heater is available 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.

CE

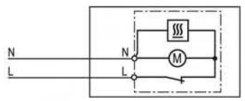
Technical Data

Heating element	PTC resistor - temperature limiting
Temperature safety cut-out	to protect against overheating in case of fan failure
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	horizontal
Dimensions	168 x 145 x 120mm
Weight	approx. 1.20kg
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP20 / II (double insulated)

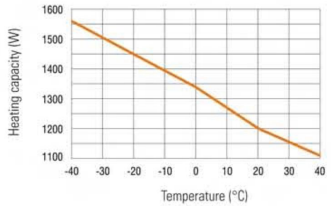




Connection diagram



Heating capacity / Ambient temperature diagram CS 030



Art. No.	Model	Operating voltage	Heating capacity*	Inrush current max.	Setting range
03060.0-00	Fan Heater with thermostat	230VAC, 50/60Hz	1,200W	13A	0 to +60°C
03060.0-01	Fan Heater without thermostat	230VAC, 50/60Hz	1,200W	13A	-
03060.9-00	Fan Heater with thermostat	120VAC, 50/60Hz	1,200W	16A	+32 to +140°F
03060.9-01	Fan Heater without thermostat	120VAC, 50/60Hz	1,200W	16A	-

* at 20°C (68°F) ambient temperature

Compact high-performance Fan Heater CR 130 950W

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

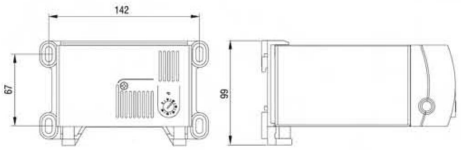
The compact high performance fan heater prevents formation of condensation and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. The fan heater is available 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.

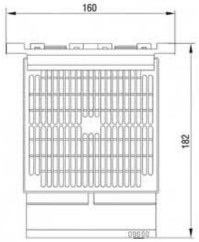
CE

Technical Data

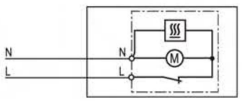
Heating element	high performance cartridge
Temperature safety cut-out	to protect against overheating in case of fan failure,
	automatic reset
Heater body	extruded aluminium profile
Axial fan, ball bearing	airflow 160m³/h, free flow
	service life 50,000h at 25°C (77°F)
Connection	2-pole max. 2.5mm², clamping screw with strain relief,
	torque 0.8Nm max.
Casing	plastic according to UL94 V-0, black
Mounting	clip for 35mm DIN rail, EN 50022 or screw fixing (M6)
Fitting position	horizontal
Dimensions	182 x 160 x 99mm
Weight	approx. 1.45kg
Operating* / Storage temperature	-45 to +70°C (-49 to +158°F)
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	Setting range
13051.0-00	Fan Heater with thermostat	230VAC, 50/60Hz	950W	0 to +60°C
13051.0-02	Fan Heater with hygrostat	230VAC, 50/60Hz	950W	65% RH, factory-set
13059.9-00	Fan Heater with thermostat	120VAC, 50/60Hz	950W	+32 to +140°F

*according to UL499 in combination with UL508A

Compact high-performance Fan Heater CS 030 (Semiconductor) 1,200W

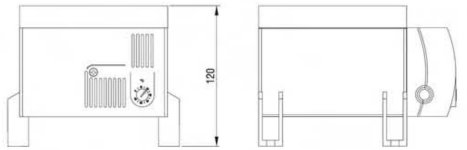
- Compact design
- High heating performance
- Double insulated
- Integrated thermostat (optional)

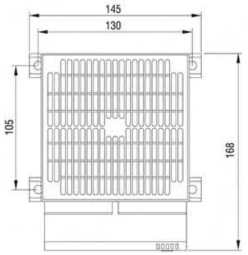
The compact high performance fan heater prevents formation of condensation and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. The fan heater is available 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.

CE

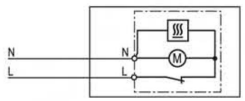
Technical Data

Heating element	PTC resistor - temperature limiting
Temperature safety cut-out	to protect against overheating in case of fan failure
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	horizontal
Dimensions	168 x 145 x 120mm
Weight	approx. 1.20kg
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP20 / II (double insulated)

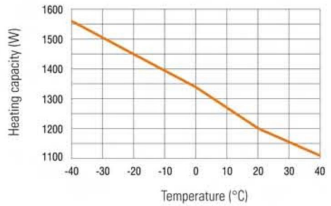




Connection diagram



Heating capacity / Ambient temperature diagram CS 030



Art. No.	Model	Operating voltage	Heating capacity*	Inrush current max.	Setting range
03060.0-00	Fan Heater with thermostat	230VAC, 50/60Hz	1,200W	13A	0 to +60°C
03060.0-01	Fan Heater without thermostat	230VAC, 50/60Hz	1,200W	13A	-
03060.9-00	Fan Heater with thermostat	120VAC, 50/60Hz	1,200W	16A	+32 to +140°F
03060.9-01	Fan Heater without thermostat	120VAC, 50/60Hz	1,200W	16A	-

* at 20°C (68°F) ambient temperature

Compact high-performance Fan Heater CS 130 (Semiconductor) 1,200W

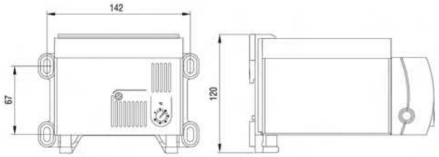
- Compact design
- High heating performance
- Double insulated
- Integrated thermostat (optional)
- Optional clip or screw fixing

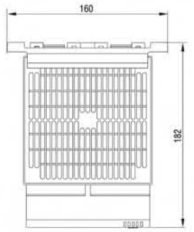
The compact high performance fan heater prevents formation of condensation and provides an evenly distributed interior air temperature in enclosures with electric/electronic components. The plastic enclosure provides double insulation and acts as protection against contact. The fan heater is available 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.

CE

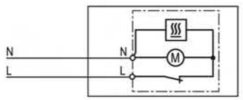
Technical Data

Heating element	PTC resistor - temperature limiting
Temperature safety cut-out	to protect against overheating in case of fan failure
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	clip for 35mm DIN rail, EN 50022 or screw fixing (M6)
Fitting position	horizontal
Dimensions	182 x 160 x 120mm
Weight	approx. 1.25kg
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Protection type / Protection class	IP20 / II (double insulated)

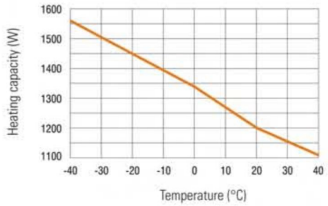




Connection diagram



Heating capacity / Ambient temperature diagram CS 130



Art. No.	Model	Operating voltage	Heating capacity*	Inrush current max.	Setting range
13060.0-00	Fan Heater with thermostat	230VAC, 50/60Hz	1,200W	13A	0 to +60°C
13060.0-01	Fan Heater without thermostat	230VAC, 50/60Hz	1,200W	13A	-
13060.9-00	Fan Heater with thermostat	120VAC, 50/60Hz	1,200W	16A	+32 to +140°F
13060.9-01	Fan Heater without thermostat	120VAC, 50/60Hz	1,200W	16A	-

* at 20°C (68°F) ambient temperature

Airflow Monitor LC 013 / LCF 013 for higher reliability

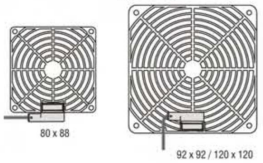
- Mechanical switch contact
- Versatile fields of application
- Small size
- Easy to connect

The airflow monitor (NC/NO) is designed to indicate the loss of air movement of a fan or filter fan. The contact detects the loss of air movement caused by fan failure or blocked filter media regardless of direction of air. Its simple mechanical operation makes it a viable alternative to electronic monitoring systems.

CE RoHS

Application:
The LC 013 is used as a signal contact to monitor fans or filter fans in stationary, self-contained Protection Class I enclosures. It can be connected to monitoring systems with remote control or can directly switch alarm devices, such as LED's or signal lamps. Loads with capacities exceeding the indicated switching capacity must be switched via a relay, e.g. our electronic relay SM 010. The airflow monitor with NC contact closes upon loss of air movement, i.e. it indicates fan failure (e.g. red signal lamp). The NO contact closes when fan is in operation and serves as optical function display (e.g. green signal lamp).

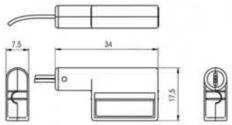
Airflow monitor integrated in protective grille

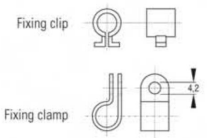


Technical Data

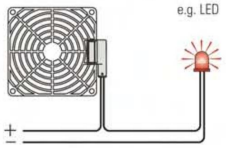
Contact type	reed / magnet contact
Normally Closed (NC)	switch contact open when air is flowing
Normally Open (NO)	switch contact closed when air is flowing
Max. switching voltage	NC: 240VDC (UL), 240V AC/DC (VDE) / NO: 60VDC
Max. switching current	NC: DC 500mA / NO: DC 170mA
Max. switching capacity	10W (resistive load)
Switching threshold of airflow velocity	> 2.5m/s (hysteresis: > 1m/s)
Max. airflow velocity	50m/s
Contact resistance	< 370mΩ (with wire)
Max. air humidity	70% RH (not precipitating)
Service life	> 100,000 cycles
Connection	2 x single strand AWG 26, length 500 mm, tip of stranded
	wire 5mm stripped and tinned (NC: black, NO: blue)
Mounting	alternatively integrated in protective grille (see table),
	mounting clamp or mounting clip
Casing	plastic according to UL94-HB, black
Fitting position	bidirectional tab perpendicular to airflow
Operating / Storage temperature	-20 to +50°C (-4 to +122°F) / -20 to +80°C (-4 to +176°F)
Protection type	IP20

Note: The product of switching voltage and switching current must not exceed 10W. The max. voltage and max. current must not be exceeded, not even short-term (voltage/current peaks). The resulting voltage and current peaks of inductive or capacitive loads must be restricted by a contact protection circuit.





Connection example



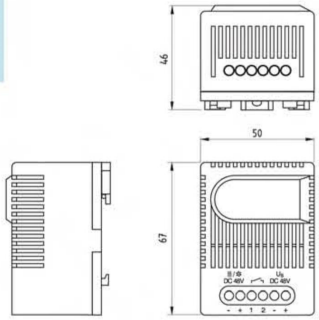
Installation notes:
1. The airflow monitor must not be installed in the impact range of permanent magnets or ferrous metals as the built-in permanent magnet will move unintentionally and consequently can not move in dependence with the air flow.
2. A suitable distance from electromagnetic fields, e.g. generated by transformers, motors, etc., must be maintained as otherwise the contact may switch incorrectly with the frequency of the power supply. Interferences must be checked with an oscillograph and the mounting position of the airflow monitor should be adjusted if necessary.
3. Avoid installing the airflow monitors in areas where air pockets or turbulence can be expected.
4. Ambient air with a high dust content should be avoided.
As there are many different conditions of use, suitability of this product must be assessed by the end user in its final application.

Description	Art. No. (NC)	Art. No. (NO)	Dimensions	Weight (approx.)
Airflow monitor with mounting clamp and mounting clip LC 013	01300.0-00	01300.1-00	34 x 17.5 x 7.5mm	5g
Airflow monitor integrated in protective grille (plastic) LCF 013	01301.0-00	01301.1-00	80 x 88 x 10.5mm	20g
	01302.0-00	01302.1-00	92 x 92 x 10mm	20g
	01303.0-00	01303.1-00	120 x 120 x 10mm	30g

Electronic Relay SM 010 (24VDC + 48VDC)

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

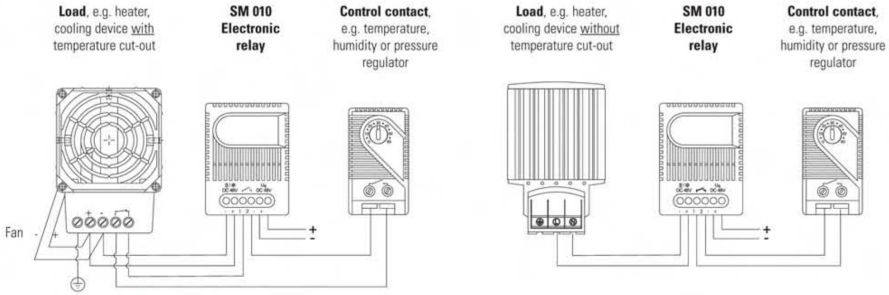
Electronic relay for switching DC appliances with high switching capacity. A separate conventional switch contact is used as controller (e.g. temperature regulator, humidity regulator). The electronic relay is available in 24VDC and 48VDC versions.



CE RoHS

Technical Data

Contact type	contact maker, normally open (Relay/MOSFET)
Contact resistance	< 10mΩ
Service life	> 100,000 cycles
EMC	acc. to EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connection	6-pole terminal, clamping torque 0.5Nm max.:
	rigid wire 2.5mm²
	stranded wire (with wire end ferrule) 1.5mm²
Mounting	clip for 35mm DIN rail, EN50022
Casing	plastic according to UL94 V-0, light grey
Dimensions	67 x 50 x 46mm
Weight	approx. 85g
Fitting position	variable
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)
Protection type	IP20



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

Small, compact Thermostat KTO 011 / KTS 011

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

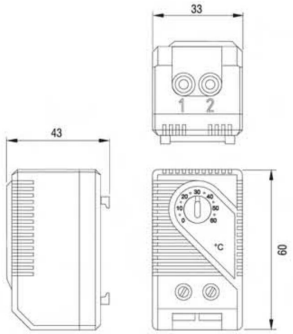
KTO 011: Thermostat (normally closed); contact breaker for regulating heaters.

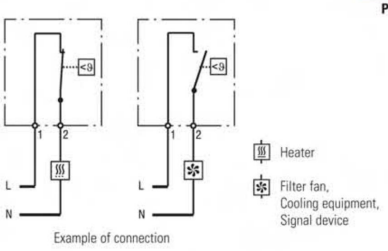
KTS 011: Thermostat (normally open); contact maker for regulating of filter fans and heat exchangers or for switching signal devised when temperature limit has been exceeded.

CE

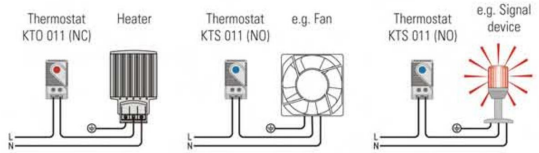
Technical Data

Switch temperature difference	7K (± 4K tolerance)
Sensor element	thermostatic bimetal
Contact type	snap-action contact
Contact resistance	< 10mΩ
Service life	> 100,000 cycles
Max. Switching capacity	250VAC, 10 (2) A
	120VAC, 15 (2) A
	DC 30W
EMC	acc. to EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connection	2-pole terminal, clamping torque 0.5Nm max.:
	rigid wire 2.5mm²
	stranded wire (with wire end ferrule) 1.5mm²
Mounting	clip for 35mm DIN rail, EN50022
	(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)
Protection type	IP20





Example of connection



Example of connection

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

Small, compact Thermostat KTO 011 / KTS 011

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

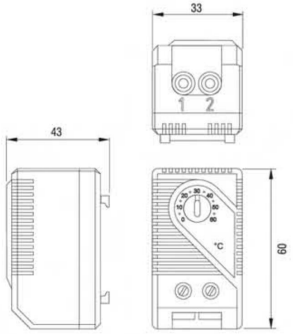
KTO 011: Thermostat (normally closed); contact breaker for regulating heaters.

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.

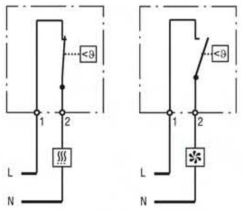
CE

Technical Data

Switch temperature difference	7K (± 4K tolerance)
Sensor element	thermostatic bimetal
Contact type	snap-action contact
Contact resistance	< 10mΩ
Service life	> 100,000 cycles
Max. Switching capacity	250VAC, 10 (2) A
	120VAC, 15 (2) A
	DC 30W
EMC	acc. to EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connection	2-pole terminal, clamping torque 0.5Nm max.:
	rigid wire 2.5mm²
	stranded wire (with wire end ferrule) 1.5mm²
Mounting	clip for 35mm DIN rail, EN50022
	(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)
Protection type	IP20



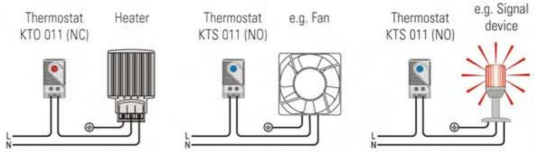
Thermostat KTO 011 (NC) | Thermostat KTS 011 (NO)



Example of connection

Heater

Filter fan, Cooling equipment, Signal device



Example 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
+20 to +80°C	01159.0-00	01158.0-00	VDE
+32 to +140°F	01140.9-00	01141.9-00	UL File No. E164102
+14 to +122°F	01142.9-00	01143.9-00	UL File No. E164102
0 to +60°C	01146.9-00	01147.9-00	UL File No. E164102

Regulating and Monitoring

Small, compact Thermostat

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

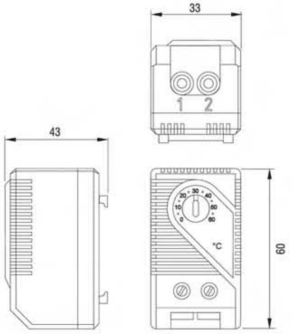
NTL-10A: Thermostat (normally closed); contact breaker for regulating heaters.

NTL-10B: Thermostat (normally open); contact maker for regulating of filter fans and heat exchangers or for switching signal devised when temperature limit has been exceeded.

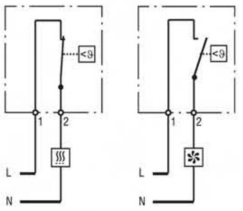
CE RoHS 2002/95/EC Compliant

Technical Data

Switch temperature difference	7K (± 4K tolerance)
Sensor element	thermostatic bimetal
Contact type	snap-action contact
Contact resistance	< 10mΩ
Service life	> 100,000 cycles
Max. Switching capacity	250VAC, 10 (2) A
	120VAC, 15 (2) A
	DC 30W
EMC	acc. to EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connection	2-pole terminal, clamping torque 0.5Nm max.:
	rigid wire 2.5mm²
	stranded wire (with wire end ferrule) 1.5mm²
Mounting	clip for 35mm DIN rail, EN50022
	(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)
Protection type	IP20



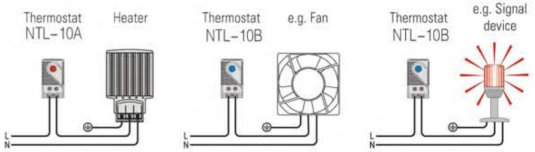
Thermostat NTL-10A | Thermostat NTL-10B



Example of connection

Heater

Filter fan, Cooling equipment, Signal device



Example 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
+20 to +80°C	01159.0-00	01158.0-00	VDE
+32 to +140°F	01140.9-00	01141.9-00	UL File No. E164102
+14 to +122°F	01142.9-00	01143.9-00	UL File No. E164102
0 to +60°C	01146.9-00	01147.9-00	UL File No. E164102

Dual Thermostat ZR 011

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

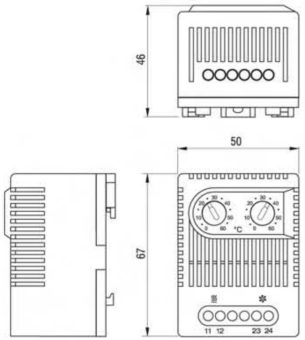
Two thermostats in one casing:
Thermostat (contact breaker, normally closed) for regulating heaters.
Thermostat (contact maker, normally open) for regulating filter fans and heat exchangers or switching signal devices when temperature limit has been exceeded.

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

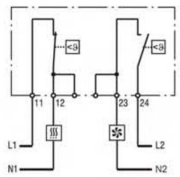
CE

Technical Data

Switch temperature difference	7K (± 4K tolerance)
Sensor element	thermostatic bimetal
Contact type	snap-action contact
Contact resistance	< 10mΩ
Service life	> 100,000 cycles
Max. Switching capacity	250VAC, 10 (2) A
	120VAC, 15 (2) A
	DC 30W
EMC	acc. to EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connection	4-pole terminal, clamping torque 0.5Nm max.:
	rigid wire 2.5mm²
	stranded wire (with wire end ferrule) 1.5mm²
Mounting	clip for 35mm DIN rail, EN50022
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)
Protection type	IP20



Thermostat
ZR 011 (NC/NO)



Example of connection

Heater

Filter fan, Cooling equipment, Signal device

Art. No.	Setting Range		Setting Range	
01172.0-00	contact breaker, normally closed	0 to +60°C	contact maker, normally open	0 to +60°C
01172.0-01	contact breaker, normally closed	+32 to +140°F	contact maker, normally open	+32 to +140°F
01175.0-00	contact breaker, normally closed	-10 to +50°C	contact maker, normally open	+20 to +80°C
01175.0-01	contact breaker, normally closed	+14 to +122°F	contact maker, normally open	+68 to +176°F
01176.0-00*	contact maker, normally open	0 to +60°C	contact maker, normally open	0 to +60°C
01176.0-01*	contact maker, normally open	+32 to +140°F	contact maker, normally open	+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.

Tamperproof Dual-Thermostat (Pre-set) FTD 011

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

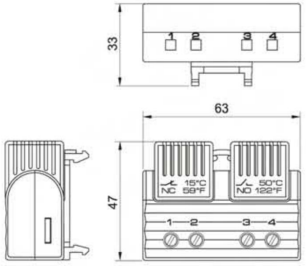
Two thermostats in one casing:
Tamperproof (Pre-set) Thermostat/Contact breaker (NC) for regulating heaters or for switching signal devices when temperature has fallen below the minimum value. The contact opens when temperature is rising.
Tamperproof (Pre-set) Thermostat/Contact maker (NO) for regulating filter fans, heat exchangers or for switching signal devices when temperature limit has been exceeded. The contact closes when temperaure is rising.

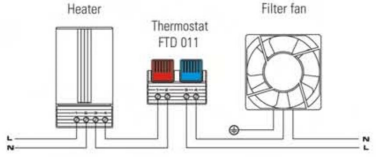
Heaters and cooling equipment can be switched independently from each other with a temperature offset as opposed to the usual change-over contacts.

CE

Technical Data

Sensor element	thermostatic bimetal
Contact type	snap-action contact
Contact resistance	< 20mΩ
Service life	> 100,000 cycles
Max. switching capacity	250V AC, 5 (1.6)A
	120V AC, 10 (2)A
	DC 30W
Max. inrush current	AC 10A
EMC	acc. to EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connection	4-pole terminal for 2.5mm², torque 0.8Nm max.
Mounting	clip for 35mm DIN rail, EN 50022
Casing	plastic according to UL94 V-0, light grey
Dimensions	47 x 63 x 33mm
Weight	approx. 40g
Fitting position	variable
Operating/Storage temperaure	-20 to + 80°C (-4 to +176°F) / -45 to + 80°C (-49 to +176°F)
Prot. type	IP20





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)

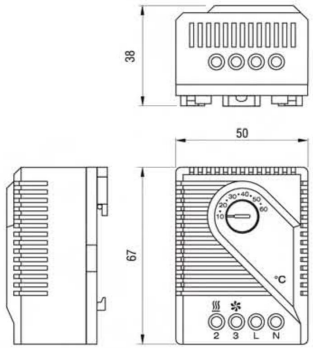
Art. No.	Contact maker (NO)		Contact maker (NO)	
	Switch-on temperature	Switch-off temperature	Switch-on temperature	Switch-off temperature
01164.0-00	+50°C / +122°F (± 6K tolerance)	+40°C / +104°F (± 7K tolerance)	+60°C / +140°F (± 6K tolerance)	+50°C / +122°F (± 7K tolerance)

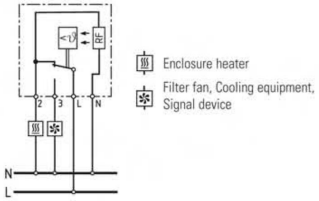
Mechanical Thermostat FZK 011

- 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.

CE



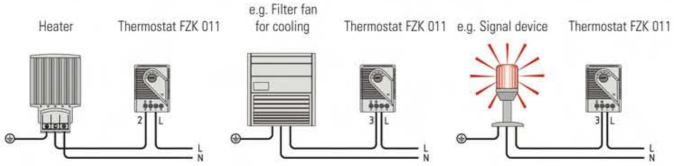


Enclosure heater
Filter fan, Cooling equipment, Signal device

Technical Data

Switch temperature difference	4K (± 1.5K tolerance)*
Sensor element	thermostatic bimetal
Contact type	change-over snap-action contact
Contact resistance	< 10mΩ
Service life	> 100,000 cycles
Max. Switching capacity, NC	250VAC, 10 (4) A
	120VAC, 10 (4) A
	DC 30W
Max. Switching capacity, NO	250VAC, 5 (2) A
	120VAC, 5 (2) A
	DC 30W
EMC	acc. to EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connection	4-pole terminal, clamping torque 0.5Nm max.:
	rigid wire 2.5mm²
	stranded wire (with wire end ferrule) 1.5mm²
Mounting	clip for 35mm DIN rail, EN50022
Casing	plastic according to UL94 V-0, light grey
Dimensions	67 x 50 x 38mm
Weight	approx. 0.10kg
Fitting position	variable
Operating / Storage temperature	-20 to +80°C (-4 to +176°F) / -45 to +80°C (-49 to +176°F)
Protection type	IP20

*Connecting terminal "N" (RF heating resistor) causes the thermal feedback to work and so reduces the switch temperature difference to approx. 0.5K.



Examples of connection

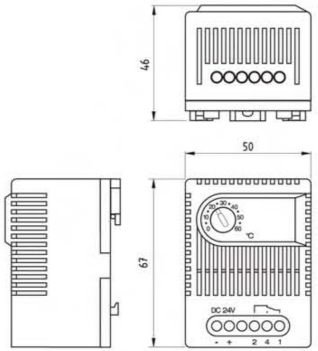
Art. No.	Operating voltage	Setting range
01170.0-00	230VAC	+5 to +60°C
01170.0-01	230VAC	+40 to +140°F
01170.0-02	230VAC	-20 to +30°C
01170.9-00	120VAC	+40 to +140°F
01170.9-01	120VAC	+5 to +60°C

Electronic Thermostat ET 011 (24VDC)

- High DC breaking capacity
- Low hysteresis
- Adjustable temperature
- Change-over contact
- Clip fixing

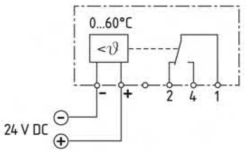
Electronic thermostat for regulating high performance DC 24V equipment. Heating or cooling appliances as well as signal devices can be switched via the potential free change-over contact. In comparison to mechanical thermostats, the ET 011 has a low hysteresis making the switching point and setting accuracy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

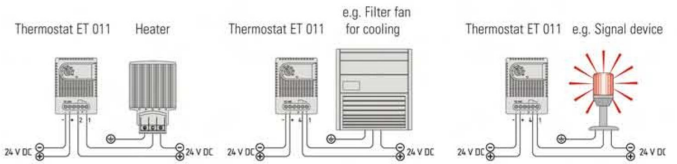
CE



Technical Data

Switch temperature difference	approx. 3K
Sensor element	PTC
Contact type	change-over
Contact resistance	< 10mΩ
Service life	> 100,000 cycles
Max. switching capacity	28VDC, 16A
EMC	acc. to EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connection	5-pole terminal, clamping torque 0.5Nm max.:
	rigid wire 2.5mm²
	stranded wire (with wire end ferrule) 1.5mm²
Mounting	clip for 35mm DIN rail, EN 50022
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)
Protection type	IP20
Approvals	-





Examples of connection

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

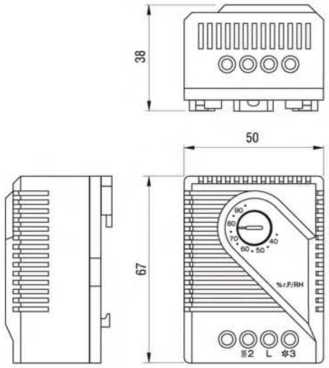
The electromechanical hygrostat MRF 012 is designed to control enclosure heaters so that the dew point is raised when a critical relative humidity of 65% is exceeded. In this way condensation and corrosion is effectively prevented.

CE

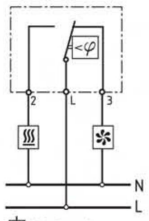
Technical Data

Switch difference*	4% RH (± 3% tolerance)
Permissible air velocity	15m/sec
Contact type	change-over contact
Contact resistance	< 10mΩ
Service life	> 100,000 cycles
Min. Switching capacity	20V AC/DC, 100mA
Max. Switching capacity	250VAC, 5 (1) A
	DC 20W
EMC	acc. to EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Connection	3-pole terminal for 2.5mm², clamping torque 0.5Nm max.:
	rigid wire 2.5mm²
	stranded wire (with wire end ferrule) 1.5mm²
Mounting	clip for 35mm DIN rail, EN50022
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) / -20 to +80°C (-4 to +176°F)
Protection type	IP20

*at 50% RH

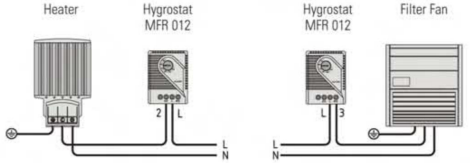


Connection diagram



Enclosure heater

Filter fan, Cooling equipment, Signal device



Example of connection

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

Electronic Hygrostat EFR 012

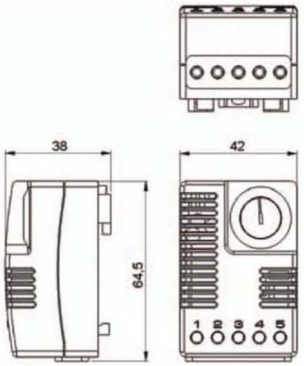
- Adjustable and pre-set relative humidity
- Optical operating display (LED)
- High switching capacity
- Clip fixing
- Temperature-compensated

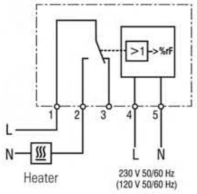
The electronic hygrostat senses the relative humidity in an enclosure with electric/electronic components, and turns on a heater at the set point, helping prevent the formation of condensation in the enclosure. The LED integrated in the adjustment knob is lit when the connected heater is in operation.

CE

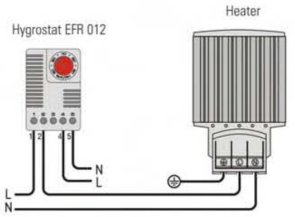
Technical Data

Switch difference	5% RH (± 1% RH tolerance) at 25°C/77°F (50% RH)
Reaction time	approx. 5 sec.
Contact type	change-over contact (relay)
Service life	> 50,000 cycles
Max. switching capacity (relay	240VAC, 8 (1.6) A
output)	120VAC, 8 (1.6) A
	24VDC, 4A
EMC	acc. to EN 55014-1-2, EN 61000-3-2, EN 61000-3-3
Optical indicator	LED
Connection	5-pole terminal, clamping torque 0.5Nm max.:
	rigid wire 2.5mm²
	stranded wire (with wire end ferrule) 1.5mm²
Mounting	clip for 35mm DIN rail, EN50022
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)
Max. storage humidity	90% RH (without condensation)
Protection type	IP20





Connection diagram



Example of connection

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

NTL-8000 Series of Mechanical Thermostat

Inner temperature controller for switchgear cabinet

Especially used for controlling fan filter, heater and heat exchanger, also could be monitoring the electric cabinetinner temperature when working as signal arouser.

CE

Parameter clarification

- Makebimetal sensor as heat sensitivity set to feedback of heat.
- Contact point scheme:single switchover contact point as instant switch component
- Allowed load of contact point

  KL5-3(Heating)

  AC10(4)A

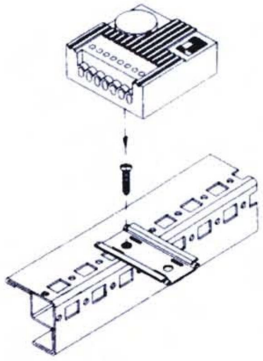
  DC=30W

  KL5-4(Cooling)

  AC5(4)DA

  DC=30W

  (D)=sensitivity load at cos ϕ=0.6
- Adjusting range:+5℃ to + 60℃
- Weight:105 gappr
- Size:70×70×33.5mm
- Switch discrepancy:1K±0.8K
- Voltage scope is wide,any type could be used from 24V to 230V
- Time-saving connection, terminal block could be installed with screw from outside
- Easy installation,could be installed to 35mm din rail vertically or horizontally.according to EN50 022,it could be clipped to NS/35 -ES cabinet profile with its accessory adapter.



Pressure compensation Device DA 084

Photo: Inside view

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

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, such as day/night operation. When this occurs, the risk of dust and humidity being absorbed into the control panel increases dramatically. The specially designed pressure compensation plug DA 084 permits a controlled change in pressure. It can be installed easily in any enclosure. Because of the pressure compensation plug's high degree of protection (IP45), the protection type of the enclosure will not be affected.

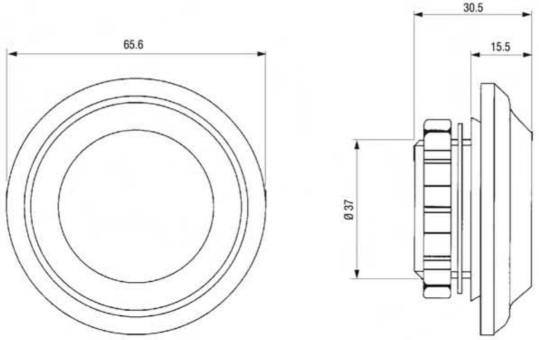
CE

Technical Data

Mounting	PG 29 thread with union nut
Material	plastic according to UL94 V-0
Air interface	approx. 7cm²
Dimensions	Ø 65.5 x 30.5mm
Fitting position	variable
Operating / Storage temperature	-45 to +70°C (-49 to +158°F)

Installation

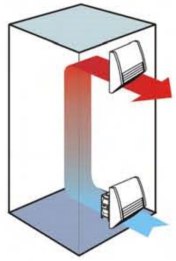
Make cut-out Ø 37^{+1}mm in enclosure wall and mount pressure compensation device with nut. Please make sure that the sealing gasket is put in place on the outer side panel of the enclosure. For optimal pressure compensation we recommend to use two devices on opposite sides towards the top of the enclosure.



Art. No.	Model	Protection type	1 packing unit	Weight (approx.)
08400.0-00	without gasket	IP45	2 pieces	62g (31g/piece)
08400.0-04	with gasket	IP55	2 pieces	62g (31g/piece)

- **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.



Enclosure air-conditioning using a filter fan and exit filter

CE

UV

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 2.5mm², 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	-45 to +70°C (-49 to +158°F)
Prot. Type / Protection class	IP54* / I (earthed)

*Using fine filter mats type F5 increases the protection type to IP55, but reduces the air volume.

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.
- All filter fan models are also available with **integrated airflow monitor**.
- 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.)
01800.0-00	230VAC, 50Hz	21m³/h	16m³/h	80mA	13W	31dB (A)	45mm	97 x 97mm + 0.4	0.60kg
01801.0-00	230VAC, 50Hz	55m³/h	42m³/h	100mA	15W	40dB (A)	58mm	125 x 125mm + 0.4	1.00kg
01802.0-00	230VAC, 50Hz	102m³/h	68m³/h	100mA	15W	39dB (A)	86mm	176 x 176mm + 0.4	1.30kg
01800.0-01	120VAC, 60Hz	24m³/h	18m³/h	160mA	13W	31dB (A)	45mm	97 x 97mm + 0.4	0.60kg
01801.0-01	120VAC, 60Hz	63m³/h	48m³/h	180mA	15W	40dB (A)	58mm	125 x 125mm + 0.4	1.00kg
01802.0-01	120VAC, 60Hz	117m³/h	78m³/h	180mA	15W	39dB (A)	86mm	176 x 176mm + 0.4	1.30kg

NTL-1000 Series of Mechanical Thermostat

NTL-1000 Series of Mechanical Thermostat

Summary

NTL-1000 series of thermostats are usually used on the commercial,industrial and civil constructions,which can control the fan coil of air – conditioning,water valve and wind valveect. It can make the temperature balance in the setting range in the location,and all switches are manual switch.Very simple to manipulate.

CE

Characteristics

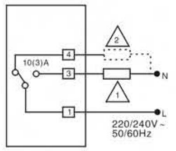
- Dialing button for setting the temperature: The place the finger points to is the current temperature value.
- ON/OFF Switch for System: Press ON/OFF Key to turn on/off of the thermostat.
- Working Mode Switch: Press HEATCOOL key to switch the heating /Cooling mode.
- Fan Speed Key: L-M-H, that is, Low speed-Middle speed-High speed, Wind valve controller does not have this fLJnction

Functions Spec

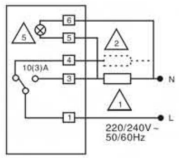
Model Name	Function Explanation	Objects controlled
NTL-1000A	2 tubes fan coil controller, can be set up to control the fan coil	3 gears of fan coil, 2 and 3 wire of motorized valve, magnetic valve on/off wind valve,3 wires of wind valve.
NTL-1000B	4 tubes fan coil controller, can be set up to control the fan coil	3 gears of fan coil, 2 and 3 wire of motorized valve, magnetic valve on/off wind valve,3 wires of wind valve.

Technique Parameters

- Emperature Controlling Range: 10 ~ 30℃
- Working Voltage: 230VAC±10%, 50Hz/60Hz
- Current Load: <3A(Resistant Load)
- Sensing element: Box with the gas.
- Temperature differential: ≤1℃(at the 25℃)
- Storing Environment:temperature:-20℃ ~ 55℃,relative humidity:RH<92%
- Surface material: ABS engineering plastic, manual switch is Off-white, the rest is ivory-white
- External dimension: 85×130×40mm(W×H×D)
- Installation: Standard 86 installing box



A



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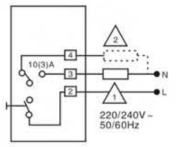

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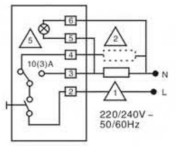

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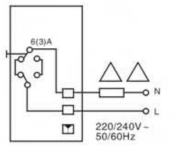


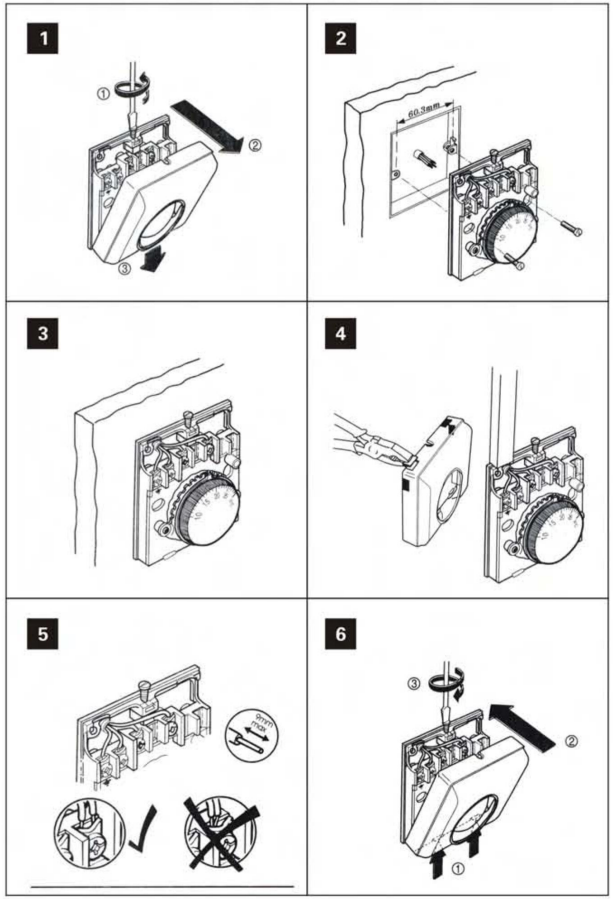
E

NTL-2000 Series of Mechanical Thermostat

- Application:control of central air conditioner or heating appliance for room temperature
- Temperature control range:10℃ ~ 30℃
- Work voltage:220V ~ /50Hz
- Max load:10A
- SENSOR type:gas filled sylphon
- With on/off Swich,without LED indicator for power

CE

Room Temperature Controller



NTL-6000 Series of Mechanical Thermostat

NTL-6000 Series of Mechanical Thermostat

Introduction

The RTC70.XX is used for 2-position control with on/off output for the control the temperature by means of an NTC sensor placed externally or internally in the thermostat.
Thethermostat acquires the room temperaturewith its built-in sensor or floor sensor, and the heating contact will close when the room temperature falls below theselected setpoint.

Application

For the control of warm-water(floor)heating systems and direct electric heating systems used in Commercial buildings, Residential buildings, Light industrial buildings···

Features

- LED indicator is light when heating is on
- With manual switch and knob for easy operation
- On/off control output for heating device

CE

Technical data

- Voltage: AC230V
- Power consumption: 5W
- Setting range: 4℃ ~ 45℃
- Switching differential: ±0. 5K
- Ambient temperature: -5℃ ~ 50~C
- Protective housing: IP20
- Housing material: self-extinguishing PC
- Floor sensor: rubber-thermoplastic NTC sensor,
- Cable length iS 3m

NTL-7000 Series of Motorized Valves

NTL-7000 Series of Mechanical Thermostat

Use instructions Room the rmostat

Bimetallic room thermostat for heating and air-conditioning installations
Thermail,electrical and mechanical features
Breaking capacity
on opening contact,10A-250V A.C.(ohmic load)
Differential:0.5K

Temperature's scale adjustment

Temperature's scale adjustment:
After almost two days from the installation,to obtain a precjse scale adjustment,measure the room temperature with a reference thermometer,placed aside the thermostat.Holding the shagrened part of the knob,turn the index with a coin,to reach the same value of the thermometer,We suggest to install the equipment at about 1.5 mt from the floor and far from any heat source.

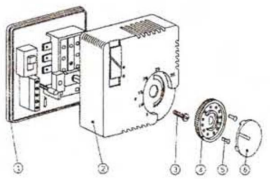
CE

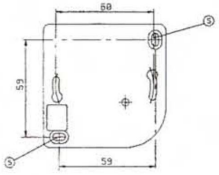
Pattern

B1-With N.C.contact.
B2-With N.C.contact and ON-OFF switch
B3-With SPDT contact(change-over)
B4-With change-over contact(SPDT) and ON-OFF switch
B7-With normally closed contact on "Winter" and normally open contact on "Summer" plus "Summer-Winter" selector-switch
1)Base.
2)Cover.
3)Cover screw.
4)Knob.
5)Lockpins.The lock pins for scale limitation(5) are to be detached from the base of the thermostat.They are Located on the fixing holes.
6)Index.
The fixing of the room thermostat can be done directly on the wall by screws and nags

Important

Accelerating resistance with voitage to 220-250V a.c.
This thermostat is provided with an accelerating resistance which must be absolutely connected in order to obtain the regulation's performances.The terminal 4has thus to be connected to the neutral according to the diagram shown on the cover. This connection allows also the working of the pilot lamp which indicates the operation of the heating.





NTL-4000 Series of Motorized Valves

NTL-4000 Series of Mechanical Thermostat

Summary

NTL-4000 series of Motorized Valves are usually applied to control the water valve of the HVAC System. It consists of a actuator and a valve body. The actuator(driver) adopts the synchmnous motor for its stable performance. It has limit relay contact placed inside.which can cut off the power when the valve is fully open or closed.The valve is casting with brass and the surface is plated with nickel.The valve can be opened manually, which is convenient for the spot debugging or pressure adjusting. It will recover when the power Is on.

Characteristics

- Valve body is plated with rustproof brass, and chromium on the surface
- Low power, the motor only consumes the power when the valve door is opening or closing
- It is set the limit relay contact inside to make the motor longer life.
- The actuator and the valve body can be separated and connected in short time, in order to install it more easily
- Provided with manual switch,the power will be recovered automatically when finishing the adjustment.
- The configuration of the valve is unique,which can ensure the closeness of the valve

CE

Technique Parameter

- Working Voltage:AC230V+/-10%,50/60Hz (we can special make 24V if you need)
- Power Consume:4VA(only when you open and close the valve)
- Motor Variety:Synchronous motor
- Running Time:<22s(ON-OFF)
- Leakage Capacity≤0.06%Kvs(when the pressure difference is less than 300Kpa)
- Nominal pressure:1600Kpa
- Connection way:tube screw thread G(Can not be connected with wimble screw thread)
- Medium which can be applied:cold water, hot water or 50%glycol water liquor.
- Medium Temperature:2℃-75℃
- Environment Temperature:-5℃ ~ 50℃
- The length of the down-lead:100cm

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

	Formula for cabinet surface area A **[m²]** (H = Height W = Width D = Depth)
Single enclosure free on all sides	A = 1.8 x H x (W + D) + 1.4 x W x D
Single enclosure, wall mounted	A = 1.4 x W x (H + D) + 1.8 x D x H
First or last enclosure in free standing row	A = 1.4 x D x (H + W) + 1.8 x W x H
First or last enclosure in wall mounted row	A = 1.4 x H x (W + D) + 1.4 x W x D
Middle enclosure in free standing row	A = 1.8 x W x H + 1.4 x W x D + D x H
Middle enclosure in wall mounted row	A = 1.4 x W x (H + D) + D x H
Middle enclosure in wall mounted row with covered top	A = 1.4 x W x H + 0,7 x W x D + D x H

Example: enclosure free on all sides, 2000mm high / 800mm wide / 600mm deep. A = 1.8 x 2.0 x (0.8 + 0.6) + 1.4 x 0.8 x 0.6 = 5.712m²

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

Steel sheet, painted	k ~ 5.5W/m² K
Steel sheet, stainless	k ~ 4.5W/m² K
Aluminium	k ~ 12W/m² K
Aluminium, double-walled	k ~ 4.5W/m² K
Polyester	k ~ 3.5W/m² K

4. Temperature difference ΔT **[K=Kelvin]**

$$\Delta T = Ti - Tu$$

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

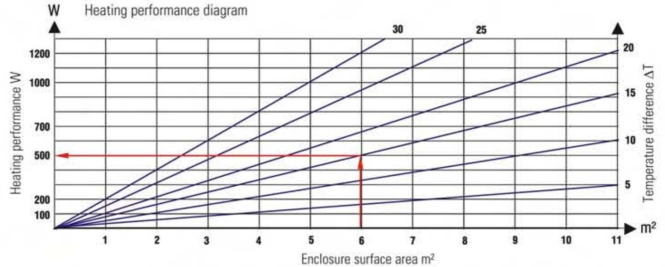
CALCULATION FORMULA FOR REQUIRED HEATING PERFORMANCE (HEATER):

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 = 5.712m² x 5.5W/m² K x 15K = 471.24W

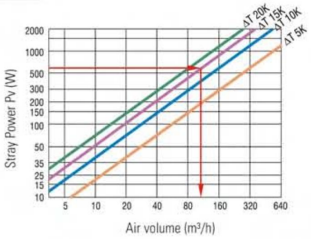
Result: Heater with 500W heating performance is required. If enclosure is situated outdoors the calculated heating performance must be doubled!

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):

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

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