



Product catalogue

The „insurance“  
for your regulation!

**MORE THAN 55 YEARS**  
the specialist for individual  
electric cabinet heaters

- HEATERS WITH INTEGRATED THERMOSTAT
- FAN- AND BLOWER HEATERS
- PTC-HEATERS & EX-HEATERS

[www.lm-therm.de](http://www.lm-therm.de)



**MADE IN GERMANY**

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## CORE COMPETENCES

### INDUSTRIAL CLIMATISATION

#### Heating

Condensed water or frost are only two of the dangers that can impair or endanger the functionality of control cabinets. Lm-therm always has the right solution to this problem. Lm-therm control cabinet heaters prevent these dangers and support a stable ambient temperature for the technology installed. We offer various heating systems which are precisely adapted to your application, such as heaters with a built-in thermostat, PTC heaters, fan heaters or Ex-protected heaters.

#### Cooling

Lm-therm cooling devices can discharge the exhaust heat of the installed components, which is known as power dissipation without air exchange. We can offer and adapt different versions for your specific application or problem.

#### Controlling

A separate controller is generally not required for Lm-therm heaters. The size of the control cabinet, the number of installed devices and other external influences may however make it necessary for a separate controller to be installed for functional reasons. We'll be very pleased to offer you advice on this subject.

#### Cable Technology

We are pleased to be able to offer cable configuration and manufacture of cable harnesses and stranded wires with a specialised machine by the company Metzner. Our machinery is oriented towards short set-up times and flexible production. This strategy enables us to achieve a wide range of different products and production processes. But we are glad to also offer the production of small batches and individual pieces.

Put our experience of more than 20 years in this area to the test!

**Our know-how allows us to produce Lm-therm products according to your wishes or project requirements, even in small batches. Benefit from our experience of over 55 years!**

**Test us! We'll be glad to assist you.**

**Lm-therm – the original „Made in Germany“**

## THE DEVELOPMENT OF THE „LM-THERM“ BRAND:

### LM-THERM GMBH

- 1961 Leo Möskes founds a one-man company for the production of waste water treatment plants in Röthenbach b. Nbg.
- 1972 First utility model of a control cabinet heater
- 1979 A company building is built in Altdorf b. Nbg.
- 1996 The company moves into the newly acquired company building in Arnstorf.

### ACHTER ELEKTRONIK AG

- 1993 Founding of the individual enterprise: Franz Achter Elektrohandel & Systemtechnik
- 1996 Business premises of approx. 400m<sup>2</sup> are now available to the company.
- 1999 A production hall is built; approx. 1200 m<sup>2</sup> are now available to the company.
- 2001 The company is converted into a joint-stock company.

## LM-THERM ELEKTROTECHNIK AG

- 2002 Achter Elektronik AG acquires the partnership shares of Lm-therm GmbH.
- 2004 The Lm-therm product range is revised and significantly expanded.
- 2005 Lm-therm GmbH moves into the new company building on the premises of Achter AG.
- 2011 Lm-therm GmbH celebrates its 50-year anniversary
- 2013 Achter Elektronik AG celebrates its 20-year anniversary
- 2014 Achter Elektronik AG and Lm-therm GmbH merge into Lm-therm Elektrotechnik AG
- 2016 Lm-therm Elektrotechnik AG celebrates its 55-year-anniversary



## CERTIFICATES



The Lm-therm Elektrotechnik AG is certified in accordance with DIN EN ISO 9001 since 2001. For many years it has emerged that our DEKRA certificate stands for quality.



The AEO certificate (AEO - Authorised Economic Operator) is an integral part of the safety concept in the European Union. The holder is considered to be particularly reliable and trustworthy and is therefore entitled to special privileges in customs clearance. Lm-therm Elektrotechnik AG has been AEO certified for several years.



For use in the North American territories, Lm-therm Elektrotechnik AG produces devices which have been certified as permitted components according to the North American standards and has these standards checked regularly.



Lm-therm Elektrotechnik AG is also certified for the manufacture of products which have to meet the requirements of the Canadian standards. Compliance with these standards is checked regularly.

## WHY IS HEATING/COOLING NECESSARY?

### Efficient control cabinet climatisation

Lm-therm's heating and cooling devices ensure a suitable climate in the control cabinet and thus increase the reliability of control systems and ensure that they function properly. Fans and cooling devices prevent individual components or entire control systems from overheating, for example.

Influences like temperature variations, temperatures below dew point, or the difference between inside and outside temperatures may result in condensed water. Moisture and dust formation may lead to corrosion and cause leakage current, which may lead to a complete failure of the controllers and control system installed in the control cabinet.

Furthermore, control cabinets are often used in environments that do not correspond to the device specifications, such as ambient temperatures far below the freezing point, for example. A heating system which is precisely designed to fit the requirements can ensure smooth operation.

### Selection criteria for the installation of heating and cooling devices and controllers:

- Ambient temperature at the installation site (indoor/outdoor installation)
- Housing (open or closed)
- Temperature – extreme differences between day and night temperatures
- Power dissipation through the heat which is produced by the built-in devices
- Humidity
- Free convection of the heater

### Your advantages at a glance:

- Protection from condensed water
- Frost protection
- Balancing temperature fluctuation
- Stable ambient temperature
- Protecting the components from condensation
- Preventing heat pockets through steady convection
- Preventing built-in components from falling below or rising above operating temperature

Describe your application to us. We will gladly offer you the appropriate device for your application, and of course we will also make a project-based recommendation.



## INDUSTRIAL CLIMATE CONTROL

### FREQUENTLY ASKED QUESTIONS

#### 1. What is the ideal place for installation in the control cabinet?

Natural convection is the best way to achieve optimum heat distribution. It is therefore recommended to install the heater in the lower third of the housing. This way air flows through the heating fins and therefore heats up faster.

For cooling devices, on the other hand, an installation in the upper part is recommended so that cold air can escape.

#### 2. What has to be considered with regard to convection?

The goal is not to affect the natural convection of the heater negatively by packing the installed devices extremely densely. Installing heaters with fans or blowers or using circulation fans can lead to forced convection. This gives the heating system a higher degree of efficiency and therefore achieves better heat distribution. This results in an increase in the efficiency of the whole concept. In principle, attention particularly needs to be paid to the release of the heat output to the air.

Cooling devices are generally equipped with fans.

#### 3. What do you need to know about the surface temperatures on PTC heaters?

Due to the lower surface temperature, Lm-therm heaters with integrated thermostats are a safe alternative to PTC heaters. PTC heaters do not have a temperature-triggered shut-off function. Their surface temperature is therefore generally high. For this reason it is important to ensure a touch guard is in place and the distance from sensitive components and cables is big enough.

#### 4. Which devices are suitable for big control cabinets?

To achieve better heat distribution it is recommended to install several heating devices, circulation fans or fan heating systems with separate temperature control.

#### 5. Which temperature settings can be preset in Lm-therm heaters?

- Standard: <25°C switch on / 60°C switch off
- Tropical setting: <35°C switch on / 70°C switch off
- Highly tropical setting: <50°C switch on / 80°C switch off
- Frost protection: <10°C switch on / 60°C switch off

However, attention needs to be paid to the heater's intrinsic temperature if heaters with integrated thermostats and with a high performance level are used in tropical or cold regions!

#### 6. When does the installation position achieve the maximum degree of efficiency?

Please take note of the specific device information in this regard. Generally, however, the natural convection mentioned in point 1 of the FAQ applies.

#### 7. Is it necessary to install separate controllers?

Heaters with integrated thermostats do not require separate controllers. However, factors like the size of the control cabinet, the number of built-in devices, and other external influences may make the installation of a separate controller necessary. For PTC heaters it is generally recommended to insert a controller.

#### 8. Are Lm-therm heaters electrically fused?

Heaters with a integrated thermostat are linear (ohmic). It is therefore possible to fuse them equal to the load current ( $I=P/U$ ). PTC heaters, on the other hand, are to be protected by a slow-blow fuse with five times the load current ( $I=P/U \times 5$ ) because of the high inrush current (PTC effect).

#### 9. How are heating devices fastened?

Heating devices can be snapped onto a 35 mm DIN rail or screwed in directly (take note of the device specifications). The electrical connection can be implemented via a connection line or a connection terminal on the device.

## DETERMINATION OF HEATING/COOLING POWER REQUIRED

### 1. Surface of cabinet / enclosure according to VDE 0660, part 500

Type of placement	Calculation formula (m <sup>2</sup> )
Single cabinet, free standing	$A = 1,8 \times H \times (B + T) + 1,4 \times B \times T$
Single cabinet, at wall	$A = 1,4 \times B \times (H + T) + 1,8 \times T \times H$
Cabinet wall, left / right end free-standing	$A = 1,4 \times T \times (H + B) + 1,8 \times B \times H$
Cabinet wall, left / right end at wall	$A = 1,4 \times H \times (B + T) + 1,4 \times B \times T$
Cabinet wall, middle part, free-standing	$A = 1,8 \times B \times H + 1,4 \times B \times T + T \times H$
Cabinet wall, middle part, at wall	$A = 1,4 \times B \times (H \times T) + T \times H$
Cabinet wall, middle part, at wall + top covered	$A = 1,4 \times B \times H + 0,7 \times B \times T + T \times H$

#### Fill in to calculate

Length L = \_\_\_\_\_ m)

Width W = \_\_\_\_\_ m) Area A = \_\_\_\_\_ m<sup>2</sup>

Height H = \_\_\_\_\_ m)

### 2. k-value of cabinet material

Steel sheet enclosure, painted:  $k = 5,5 \text{ W / m}^2 / \text{°C}$   
 Polyester enclosure:  $k = 3,5 \text{ W / m}^2 / \text{°C}$   
 Aluminium enclosure:  $k = 12 \text{ W / m}^2 / \text{°C}$   
 Stainless steel enclosure:  $k = 3,7 \text{ W / m}^2 / \text{°C}$

$k = \text{_____ W / m}^2 / \text{°C}$

### 3. Environs facts

Timax Maximum inside temperature permissible  
 Timin Minimal inside temperature permissible

Timax = \_\_\_\_\_ °C  
 Timin = \_\_\_\_\_ °C

r. h. Relative humidity  
 Tdew Dew point temperature see table 3

r.h. = \_\_\_\_\_ %  
 Tdew = \_\_\_\_\_ °C

Tamin Minimal ambient temperature  
 Tamax Maximal ambient temperature  
 Ploss Power loss of the implemented components

Tamin = \_\_\_\_\_ °C  
 Ploss = \_\_\_\_\_ W

### 4. Calculation

Heating Power  $P = A \times k \times (T_{\text{min}} - T_{\text{amin}}) - P_{\text{loss}}$   
 Calculated Power  $P = P_{\text{loss}} - k \times A \times (T_{\text{max}} - T_{\text{amax}})$

Calculated Power - P = \_\_\_\_\_  
 Calculated Power - P = \_\_\_\_\_

## DUE POINT TEMPERATURES (VALUES BASED ON EXPERIENCE)

		Ambient temperature (Ta °C)							
		20	25	30	35	40	45	50	55
Relative humidity r.h. in %	40	6	11	15	19	24	28	33	37
	50	9	14	19	23	28	32	37	41
	60	12	17	21	26	31	36	40	45
	70	14	19	24	29	34	38	43	48
	80	16	21	26	31	36	41	46	51
	90	18	23	26	33	38	43	48	53
	100	20	25	30	35	40	45	50	55

To successfully prevent formation of condensation water, the temperature inside an enclosure must not drop below dew point temperature.

## SPECIAL SOLUTIONS AND CUSTOM PRODUCTS

### A leading edge thanks to customised products

Contact us if you need a special solution specifically tailored to your requirements. We will provide you with custom-fit components tailored to your requirements. Discuss the details in a personal conversation with your in-house Engineering Department contact partner.

Use the core competence of Lm-therm in the areas of Heating, Ventilation, Cooling and Controlling for your customised product. This also includes the manufacture of cables - irrespective of whether it involves single pieces or small batches.

Of course, we will continue to assist you as a competent contact partner after the order has been completed and delivered.



#### YOUR BENEFITS AT A GLANCE:

- Competent advice
- In-house Engineering Department
- Customised solutions
- Fair cost-performance ratio
- Single pieces or high volume

**Made in Germany**

## INDIVIDUAL ELECTRIC CABINET HEATERS FROM LM-THERM THE „INSURANCE“ FOR YOUR REGULATION!

### Our all-round package for your special solution for electric cabinet heaters:

- special mounting according to demand
- individual cable and plug – perfectly tailored to you
- adaptation of dimensions to your requirements
- adaptability of power zones
- an exclusive model only for you

### Profit from our experience gained in more than 55 years in the sector of electric cabinet heating!

Please contact us! We advise you individually and in detail!

We are pleased to support you in your project!



## SUMMARY HEATING SYSTEMS

### HEATING



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### Heaters with integrated thermostat:

Lm-therm heaters with integrated thermostat are equipped with durable ceramic heatable window panes and are embedded in an aluminium cabinet, which accords to the thermotechnical guidelines.

#### Configuration characteristics:

- power zones: 10W – 1000W
- voltage zones: 12V – 750V
- industrial safety through the integrated thermostat
- different temperature settings
- low surface temperature
- possibility of variation regarding heating power, voltage, assembly, connection and dimensions
- high degree of protection
- energy-saving
- possibility of UL-certification
- customer-specific applications are possible

### HEATING



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### PTC-heaters:

The PTC-heaters of Lm-therm are equipped with special drafted aluminium frames and the PTC-elements are equipped with a sophisticated system of cooling fins.

#### Configuration characteristics:

- power zones: 10W – 500W
- for applications in high voltage zones (110V – 265V)
- electrical grounding is not necessary because of protection class II
- dynamical heating
- self-regulating
- customer-specific applications are possible

## SUMMARY HEATING SYSTEMS

HEATING



### Fan- and blower heaters:

Lm-therm fan- and blower heaters are suited for power-intensive sectors and for applications with a difficult convection.

#### Configuration characteristics:

- power zones: 100W – 8000W
- mechanical sturdy metal case without plastics
- vibration-safe
- adequate for high heat output
- power-coated surface
- temperature limiter in case of heat accumulation
- dynamic heat power
- guaranteed living period
- constant heat dissipation
- shock – and shake test according to the norms EN60068-2-6 and EN60068-2-27
- customer-specific applications are possible

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HEATING



### Ex-heaters / Ex-thermostats:

Ex-heaters of Lm-therm are drafted for the application in explosion-periled sectors, for example in biogas establishments, chemistry laboratory or gas stations. As explosion-protected equipment the heaters accord to the requirements of standard 2014/34/EU.

#### Configuration characteristics:

- zone 1/21 and zone 2/22
- different temperature classes: T3-T5
- voltage 115V or 230V
- special screw connection
- degree of protection: IP66/67
- high performance cartridge

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## SUMMARY CONTROLLING AND VENTILATING SYSTEMS

### CONTROLLING



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### Control technology:

The portfolio of Lm-therm includes electronic and electromechanical controller. The high quality thermostats and hygrometers ensure the industrial safety of the heaters in the electric cabinet.

#### Configuration:

- thermostats with opener-, closer- or changer-contact
- electronic or electromechanical
- hygrometers

## SUMMARY COOLING SYSTEMS

### KÜHLEN



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### Cooling technology:

The Peltier cooling devices and the compressor cooling devices of Lm-therm are tailored for multifaceted requirements and different power zones.

#### Configuration characteristics of the Peltier devices:

- suitable for the cooling of smaller cabinets
- work in the medium range of power (50-380W)
- compact design
- position-independent assembly
- no refrigerant fluid
- degree of protection up to IP67

#### Configuration characteristics of the compressor cooling devices:

- high cooling power zone: 380W-4000W
- FCKW-free refrigerant fluid
- suitable for door-, wall- and roof-assembly



## HEATERS WITH INTEGRATED THERMOSTAT

### CUSTOMISED ALL-ROUNDERS

**Lm-therm heaters** with integrated thermostat ensure a climate that is optimally adapted to operational processes. The devices make optimum use of the waste heat from running processes and prevent condensate from forming. This has a positive impact on the service life of switch cabinets and will also actively reduce the energy requirement.

A **2-point bi-metal temperature controller** will reliably prevent high surface temperatures. Depending on the application, it is also possible to adjust the temperature controller in the factory to various switch-on and switch-off temperatures.

It also includes a high-quality aluminium housing designed according to thermotechnical specifications. In addition to the high-class casing of the heater, the ceramic heating elements are of high quality. The **Lm-therm heaters** with integrated thermostat do also not need an additional control unit.

**Your price advantage!**



In case of special installation conditions, a separate temperature controller is suggested. Use our **modular system** for an installation customised for your application.

**Contact us – we will be happy to advise you.**

ALL-  
ROUNDER

#### YOUR BENEFITS AT A GLANCE:

- Ceramic heating element
- Plug'n`Play
- Low surface temperature
- No external controller required
- Easy assembly
- Tamper-proofed



## ELECTRIC CABINET HEATER WITH INTEGRATED THERMOSTAT

- ceramic heating elements
- plug'n'play
- low surface temperature
- no need of an external controller

Type: Lm-therm

Power range: 30W – 90W  
Voltage range: 12V – 400V

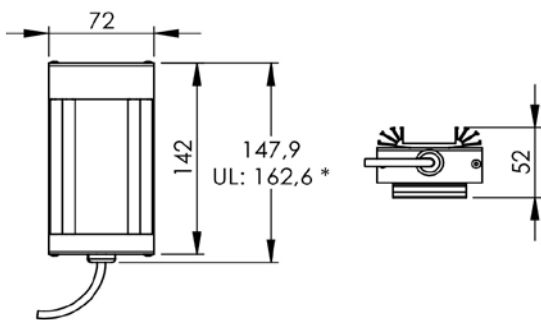


### Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP30 / IP20 with DK	IP30 or IP20
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	according to temperature setting (see switch-off temperature)	-
Wiring cable	0,50m 3x0,75mm <sup>2</sup> *	exact specification
Heating element	ceramic heating elements	-
Mounting	snap-mounting for 35mm DIN-rail	SPS
	screw-mounting (horizontal or vertical)	SRW or SRS
Connection	wiring cable 3x0,75 mm <sup>2</sup>	AL
	plug-in terminal 0,08 - 2,5mm <sup>2</sup>	DK
Temperature settings (intrinsic temperature)	standard: < 25°C On / 60°C Off	ST
	tropic: < 35°C On / 70°C Off	T
	high tropic: < 50°C On / 80°C Off	HT
	anti-freeze: < 10°C On / 60°C Off	F
Mounting position	vertical	-
Special voltages	12V AC or DC, 24V AC or DC, 48V AC or DC, 115V, 400V	exact specification
UL-license	UL-File: E-317613	UL

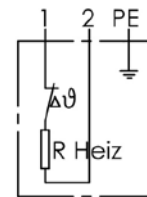
\* variable length is possible

### Dimension



\* with cable gland instead of cable entry point

### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
<= 48V DC	+	-	⏏
<= 48V AC	~	~	⏏
>= 115V AC	L1	N (L2)	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	TEMPERATURE SETTING
23033AL0	230V / 50/60Hz	30W	0,13A	0,13A	350g	147,9x72x52mm	cable 0,50m	snap	<25°C On / 60°C Off
23055AL0	230V / 50/60Hz	55W	0,24A	0,24A	350g	147,9x72x52mm	cable 0,50m	snap	<25°C On / 60°C Off
23090AL0	230V / 50/60Hz	90W	0,39A	0,39A	350g	147,9x72x52mm	cable 0,50m	snap	<25°C On / 60°C Off

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The mentioned technical data have been determined under labor conditions by universal test instructions. Only insofar characteristics are ensured. The test for the suitability for the intended use scheduled by the purchaser is incumbent on the purchaser, we do not take warranty for that. Errors reserved. Status: 04/2017



## ELECTRIC CABINET HEATER WITH INTEGRATED THERMOSTAT

- ceramic heating elements
- low surface temperature
- plug`n`play
- no need of an external controller

Type: LH-1502

Power range: 33W – 125W  
Voltage range: 12V – 400V

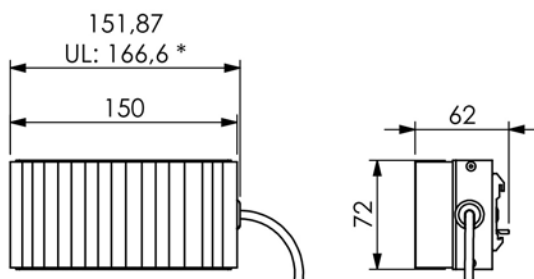


### Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP30	IP30
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	according to temperature setting (see switch-off temperature)	-
Wiring cable	0,50m 3x0,75mm <sup>2</sup> *	exact specification
Heating element	ceramic heating elements	-
Mounting	snap-mounting for 35mm DIN-rail	SPW
	screw-mounting (horizontal)	SRW
Connection	wiring cable 3x0,75 mm <sup>2</sup>	AL
Temperature settings (intrinsic temperature)	tropic: < 35°C On / 70°C Off	T
	high tropic: < 50°C On / 80°C Off	HT
	anti-freeze: < 10°C On / 60°C Off	F
	normal setting: < 25°C On / 60°C Off	ST
Mounting position	horizontal	-
Special voltages	12V AC or DC, 24V AC or DC, 48V AC or DC, 115V, 400V	exact specification
UL-license	UL-File: E-317613	UL

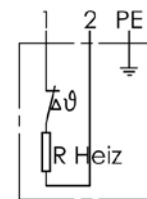
\* variable length is possible

### Dimension



\* with cable gland instead of cable entry point

### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
<= 48V DC	+	-	⊥
<= 48V AC	~	~	⊥
>= 115V AC	L1	N (L2)	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	TEMPERATURE SETTING
23033LAL0	230V / 50/60Hz	33W	0,14A	0,14A	650g	151,9x72x62mm	cable 0,50m	snap	<35°C On / 70°C Off
23055LAL0	230V / 50/60Hz	55W	0,24A	0,24A	650g	151,9x72x62mm	cable 0,50m	snap	<35°C On / 70°C Off
23090LAL0	230V / 50/60Hz	90W	0,39A	0,39A	650g	151,9x72x62mm	cable 0,50m	snap	<35°C On / 70°C Off
230125LAL0	230V / 50/60Hz	125W	0,54A	0,54A	650g	151,9x72x62mm	cable 0,50m	snap	<35°C On / 70°C Off

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## ELECTRIC CABINET HEATER WITH INTEGRATED THERMOSTAT

- ceramic heating elements
- plug`n`play
- low surface temperature
- no need of an external controller

### Type: Maxi

Power range: 130W – 180W  
Voltage range: 12V – 440V

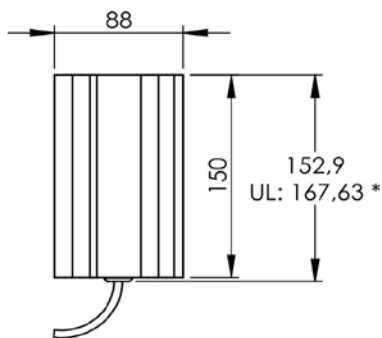


### Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP30 / IP20 with DK / special version IP54	IP30 or IP20 or IP54
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	according to temperature setting (see switch-off temperature)	-
Wiring cable	0,50m 3x0,75mm <sup>2</sup> *	exact specification
Heating element	ceramic heating elements	-
Mounting	snap-mounting for 35mm DIN-rail	SPS
	screw-mounting (horizontal or vertical)	SRS or SRW
Connection	wiring cable 3x0,75 mm <sup>2</sup>	AL
	plug-in terminal 0,08 - 2,5mm <sup>2</sup>	DK
Temperature settings (intrinsic temperature)	standard: < 25°C On / 60°C Off	ST
	tropic: < 35°C On / 70°C Off	T
	high tropic: < 50°C On / 80°C Off	HT
	anti-freeze: < 10°C On / 60°C Off	F
Mounting position	vertical	-
Special voltages	12V AC or DC, 24V AC or DC, 48V AC or DC, 115V, 400V, 440V	exact specification
UL-license	UL-File: E-317613	UL

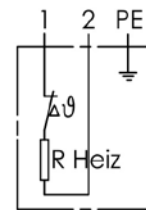
\* variable length is possible

### Dimension



\* with cable gland instead of cable entry point

### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
<= 48V DC	+	-	⊥
<= 48V AC	~	~	⊥
>= 115V AC	L1	N (L2)	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	TEMPERATURE SETTING
230130AL0	230V / 50/60Hz	130W	0,56A	0,56A	800g	152,9x88x79mm	cable 0,50m	snap	<25°C On / 60°C Off
230150AL0	230V / 50/60Hz	150W	0,65A	0,65A	800g	152,9x88x79mm	cable 0,50m	snap	<25°C On / 60°C Off
230180AL0	230V / 50/60Hz	180W	0,78A	0,78A	800g	152,9x88x79mm	cable 0,50m	snap	<25°C On / 60°C Off

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## ELECTRIC CABINET HEATER WITH INTEGRATED THERMOSTAT

- ceramic heating elements
- low surface temperature
- plug`n`play
- no need of an external controller

**Type: LH-3002**

Power range: 130W – 500W  
Voltage range: 115V – 440V

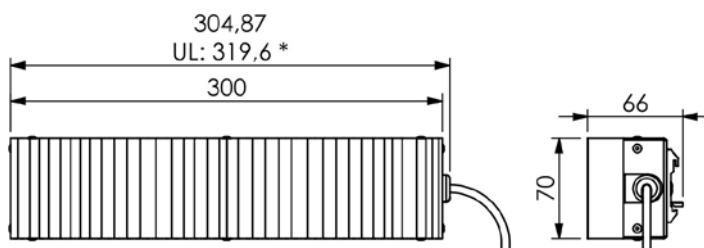


### Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP30 / IP20 with DK	IP30 or IP20
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	according to temperature setting (see switch-off temperature)	-
Wiring cable	0,50m 3x0,75mm <sup>2</sup> *	exact specification
Heating element	ceramic heating elements	-
Mounting	snap-mounting for 35mm DIN-rail	SPW
	screw-mounting (horizontal)	SRW
Connection	wiring cable 3x0,75 mm <sup>2</sup>	AL
	plug-in terminal 0,08 - 2,5mm <sup>2</sup>	DK
Temperature settings (intrinsic temperature)	tropic: < 35°C On / 70°C Off	T
	high tropic: < 50°C On / 80°C Off	HT
	anti-freeze: < 10°C On / 60°C Off	F
	normal setting: < 25°C On / 60°C Off	ST
Mounting position	horizontal	-
Special voltages	115V, 400V, 440V	exact specification
UL-license	UL-File: E-317613	UL

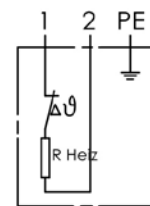
\* variable length is possible

### Dimension



\* with cable gland instead of cable entry point

### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
>= 115V AC	L1	N (L2)	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	TEMPERATURE SETTING
230130LAL0	230 V / 50/60Hz	130W	0,57A	0,57A	1400g	304,9x70x66mm	cable 0,80m	snap	<35°C On / 70°C Off
230220LAL0	230V / 50/60Hz	220W	0,96A	0,96A	1400g	304,9x70x66mm	cable 0,80m	snap	<35°C On / 70°C Off
230300LAL0	230 V / 50/60Hz	300W	1,30A	1,30A	1400g	304,9x70x66mm	cable 0,80m	snap	<35°C On / 70°C Off
230400LAL0	230 V / 50/60Hz	400W	1,74A	1,74A	1400g	304,9x70x66mm	cable 0,80m	snap	<35°C On / 70°C Off
230500LAL0	230 V / 50/60Hz	500W	2,17A	2,17A	1400g	304,9x70x66mm	cable 0,80m	snap	<35°C On / 70°C Off

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## ELECTRIC CABINET HEATER WITH INTEGRATED THERMOSTAT



- ceramic heating elements
- low surface temperature
- plug'n'play
- no need of an external controller

### Type: Doppel-LH

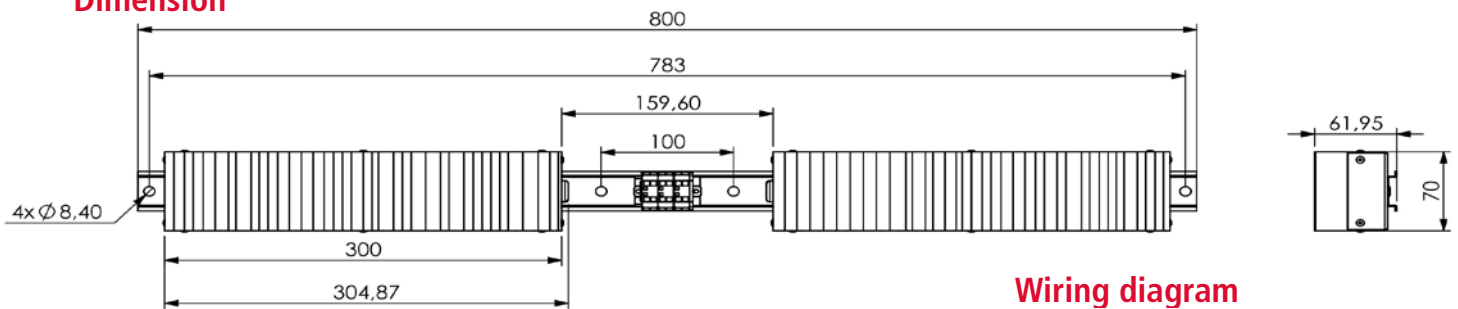
Power range: 500W – 1000W  
Voltage range: 115V – 440V



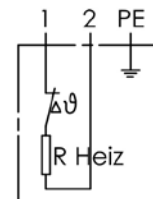
### Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP20	IP20
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	according to temperature setting (see switch-off temperature)	-
Heating element	ceramic heating element	-
Mounting	screw-mounting (horizontal)	SRW
Connection	WAGO-plug-in terminal	WAGO
Temperature settings (intrinsic temperature)	tropic: < 35°C On / 70°C Off	T
	high tropic: < 50°C On / 80°C Off	HT
	anti-freeze: < 10°C On / 60°C Off	F
	normal setting: < 25°C On / 60°C Off	ST
Mounting position	horizontal	-
Special voltages	115V, 400V, 440V	exact specification

### Dimension



### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
>= 115V AC	L1	N (L2)	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	TEMPERATURE SETTING
230500LTKO	230V / 50/60Hz	500W	2,17A	2,17A	ca. 3,0kg	800x70x62mm	plug-in terminal	screw	<35°C On / 70°C Off
2301000LTKO	230V / 50/60Hz	1000W	4,38A	4,38A	ca. 3,0kg	800x70x62mm	plug-in terminal	screw	<35°C On / 70°C Off

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## ELECTRIC CABINET HEATER WITH INTEGRATED THERMOSTAT

- ceramic heating elements
- low surface temperature
- plug`n`play
- no need of an external controller

Type: super-maxi

Power range: 250W – 500W  
Voltage range: 115V – 440V

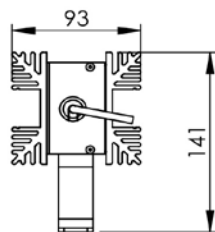
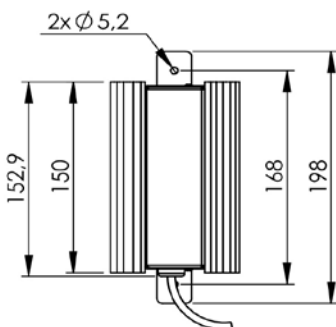


### Technical data

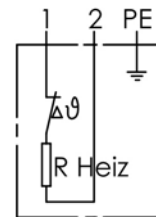
	DESCRIPTION	ORDER INDEX
Kind of protection	IP30 / IP20 with DK	IP30 or IP20
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	according to temperature setting (see switch-off temperature)	-
Wiring cable	0,50m 3x0,75mm <sup>2</sup> *	exact specification
Heating element	ceramic heating elements	-
Mounting	screw-mounting	SRS
Connection	wiring cable 3x0,75 mm <sup>2</sup>	AL
	plug-in terminal 0,08 - 2,5mm <sup>2</sup>	DK
Temperature settings (intrinsic temperature)	tropic: < 35°C On / 70°C Off	T
	high tropic: < 50°C On / 80°C Off	HT
	anti-freeze: < 10°C On / 60°C Off	F
	normal setting: < 25°C On / 60°C Off	ST
Mounting position	vertical	-
Special voltages	115V, 400V, 440V	exact specification

\* variable length is possible

### Dimension



### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
>= 115V AC	L1	N (L2)	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	TEMPERATURE SETTING
230250AL0	230V / 50/60Hz	250W	1,09A	1,09A	1400g	198x93x141mm	cable 0,50m	screw	<35°C On / 70°C Off
230500AL0	230V / 50/60Hz	500W	2,17A	2,17A	1400g	198x93x141mm	cable 0,50m	screw	<35°C On / 70°C Off

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## ELECTRIC CABINET HEATER WITH INTEGRATED THERMOSTAT

- ceramic heating elements
- IP65
- low surface temperature
- no need of an external controller

### Type: Wadi-IP65

Power range: 180W – 500W  
Voltage range: 115V – 440V

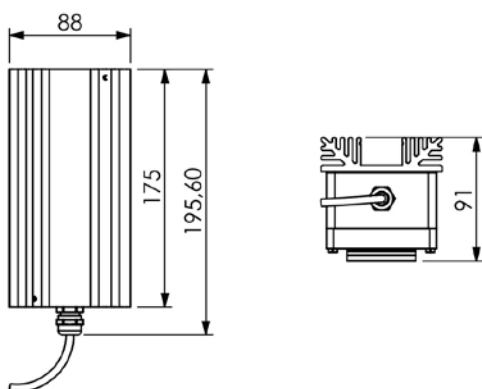


### Technical data

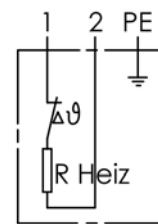
	DESCRIPTION	ORDER INDEX
Kind of protection	IP65	IP65
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	according to temperature setting (see switch-off temperature)	-
Wiring cable	0,50m 3x0,75mm <sup>2</sup> *	exact specification
Heating element	ceramic heating elements	-
Mounting	snap-mounting for 35mm DIN-rail	SPS
	screw-mounting (horizontal)	SRW
Connection	wiring cable 3x0,75 mm <sup>2</sup>	AL
Temperature settings (intrinsic temperature)	standard: < 25°C On / 60°C Off	ST
	tropic: < 35°C On / 70°C Off	T
	high tropic: < 50°C On / 80°C Off	HT
	anti-freeze: < 10°C On / 60°C Off	F
Mounting position	vertical	-
Special voltages	115V, 400V, 440V	exact specification

\* variable length is possible

### Dimension



### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
>= 115V AC	L1	N (L2)	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA. CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	TEMPERATURE SETTING
230180WDAL0	230V / 50/60Hz	180W	0,78A	0,78A	1400g	195,6x88x91mm	cable 0,50m	snap	<25°C On / 60°C Off
230250WDAL0	230V / 50/60Hz	250W	1,09A	1,09A	1400g	195,6x88x91mm	cable 0,50m	snap	<25°C On / 60°C Off
230500WDAL0	230V / 50/60Hz	500W	2,17A	2,17A	1400g	195,6x88x91mm	cable 0,50m	snap	<25°C On / 60°C Off

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## ELECTRIC CABINET HEATER WITH INTEGRATED THERMOSTAT

- ceramic heating elements
- IP65
- low surface temperature
- no need of an external controller

### Type: Wadi-LH IP65

Power range: 250W – 380W  
Voltage range: 115V – 440V

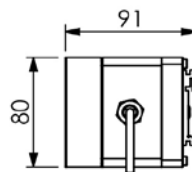
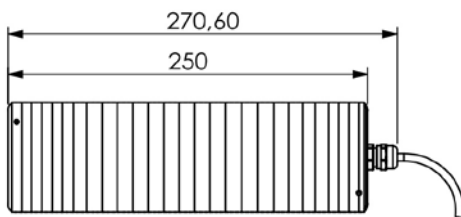


### Technical data

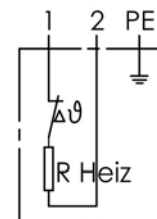
	DESCRIPTION	ORDER INDEX	
Kind of protection	IP65	IP65	
Protection class	PC I	-	
Operation- / storage temperature	-40 – +70 °C	-	
Surface temperature (at 20°C surrounding temperature)	according to temperature setting (see switch-off temperature)	-	
Wiring cable	0,50m 3x0,75mm <sup>2</sup> *	exact specification	
Heating element	ceramic heating elements	-	
Mounting	snap-mounting for 35mm DIN-rail	SPW	
	screw-mounting (horizontal)	SRW	
Connection	wiring cable 3x0,75 mm <sup>2</sup>	AL	
Temperature settings (intrinsic temperature)	tropic	< 35°C On / 70°C Off	T
	high tropic:	< 50°C On / 80°C Off	HT
	anti-freeze:	< 10°C On / 60°C Off	F
	normal setting:	< 25°C On / 60°C Off	ST
Mounting position	horizontal	-	
Special voltages	115V, 400V, 440V	exact specification	

\* variable length is possible

### Dimension



### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
>= 115V AC	L1	N (L2)	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	TEMPERATURE SETTING
230250WLAL0	230V / 50/60Hz	250W	1,09A	1,09A	1600g	270,6x80x91mm	cable 0,50m	snap	<35°C On / 70°C Off
230380WLAL0	230V / 50/60Hz	380W	1,65A	1,65A	1600g	270,6x80x91mm	cable 0,50m	snap	<35°C On / 70°C Off

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## ELECTRIC CABINET HEATER WITH INTEGRATED THERMOSTAT



- wire wound resistor
- low surface temperature
- plug`n`play
- no need of an external controller

### Type: super-mini

Power range: 10W – 20W  
Voltage range: 12V – 400V

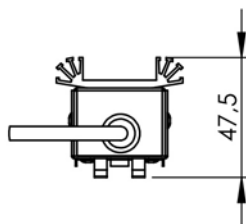
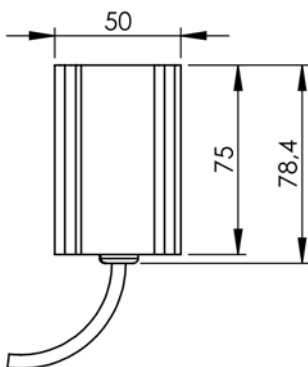


### Technical data

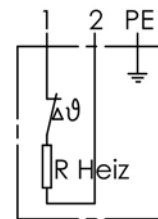
	DESCRIPTION	ORDER INDEX
Kind of protection	IP30	IP30
Protection class	PC I	-
Operation- / storage temperature	-40 – +70°C	-
Surface temperature (at 20°C surrounding temperature)	according to temperature setting (see switch-off temperature)	-
Wiring cable	0,25m 3x0,75mm <sup>2</sup> *	exact specification
Heating element	wire wound resistor	-
Mounting	snap-mounting for 35mm DIN-rail	SPS
	screw-mounting	SRW
Connection	wiring cable 3x0,75mm <sup>2</sup>	AL
Temperature settings (intrinsic temperature)	standard: < 25°C On / 60°C Off	ST
	tropic: < 35°C On / 70°C Off	T
	high tropic: < 50°C On / 80°C Off	HT
	anti-freeze: < 10°C On / 60°C Off	F
Mounting position	vertical	-
Special voltages	12V AC or DC, 24V AC or DC, 48V AC or DC, 115V, 400V	exact specification

\* variable length is possible

### Dimension



### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
<= 48V DC	+	-	⏏
<= 48V AC	~	~	⏏
>= 115V AC	L1	N (L2)	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	TEMPERATURE SETTING
23010AL0	230V / 50/60Hz	10W	0,04A	0,04A	200g	78,4x50x47,5mm	cable 0,25m	snap	<25°C On / 60°C Off
23020AL0	230V / 50/60Hz	20W	0,09A	0,09A	200g	78,4x50x47,5mm	cable 0,25m	snap	<25°C On / 60°C Off

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## ELECTRIC CABINET HEATER WITH INTEGRATED THERMOSTAT

- PTC-cartridge
- plug`n`play
- low surface temperature
- no need of an external controller

### Type: super-super-mini

Power range: 10W – 50W  
Voltage range: 24V, 110V – 265V

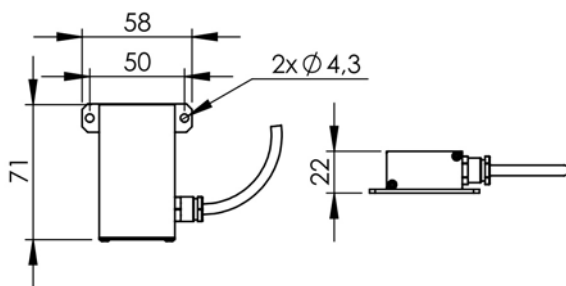


### Technical data

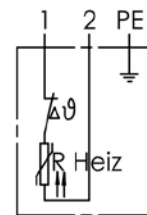
	DESCRIPTION	ORDER INDEX
Kind of protection	IP51 / special version IP54	IP51 or IP54
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	according to temperature setting (see switch-off temper.)	-
Wiring cable	0,25m 3x0,75mm <sup>2</sup> *	exact specification
Heating element	PTC-cartridge	-
Mounting	screw-mounting	SRW
	snap-mounting for 35mm DIN-rail (vertical)	SPS
Connection	wiring cable 3x0,75mm <sup>2</sup> (PVC 105°C)	AL
Temperature settings (intrinsic temperature)	standard: < 38°C On / 54°C Off	ST
	anti-freeze: < 05°C On / 30°C Off	F
Mounting position	vertical	-
Special voltages	24V AC, 24V DC (only possible with 20W)	exact specification
UL-license	UL-File: E-317613	UL

\* variable length is possible

### Dimension



### Wiring diagram



	bn (1)	bl (2)	gn/ge (3)
24V DC	+	-	⏏
24V AC	~	~	⏏
110-265V AC 50/60Hz	L1	N	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	TEMPERATURE SETTING
26510AL0	110-265V	10W	0,10A	1,20A	140g	71x58x22mm	cable 0,25m	screw	<38°C On / 54°C Off
26520AL0	110-265V	20W	0,10A	1,20A	140g	71x58x22mm	cable 0,25m	screw	<38°C On / 54°C Off
26530AL0	110-265V	30W	0,15A	1,30A	140g	71x58x22mm	cable 0,25m	screw	<38°C On / 54°C Off
26550AL0	110-265V	50W	0,25A	1,50A	140g	71x58x22mm	cable 0,25m	screw	<38°C On / 54°C Off

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## ELECTRIC CABINET HEATER WITH INTEGRATED THERMOSTAT

- for extremely cold regions
- thermostat is thermally uncoupled
- energy-efficient
- integrated thermostat

### Type: SRK-mini

Power range: 100W  
Voltage range: 115V – 230V

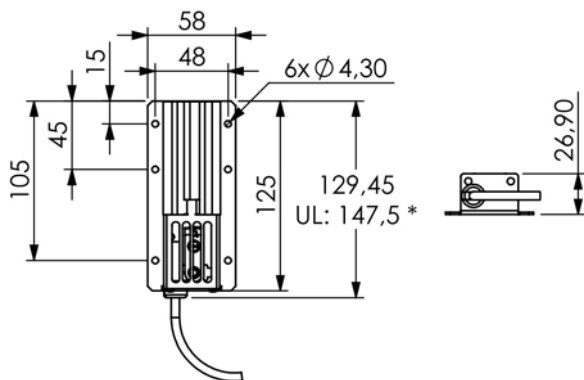


### Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP20	IP20
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Wiring cable	0,60m 3x0,5mm <sup>2</sup> *	exact specification
Heating element	PTC-cartridge	-
Mounting	screw-mounting	SRW
Connection	wiring cable 3x0,5mm <sup>2</sup>	AL
Temperature settings (intrinsic temperature)	high tropic : <50°C On / 80°C Off	HT
	tropic: < 35°C On / 70°C Off	T
	anti-freeze: < 10°C On / 60°C Off	F
	normal setting: < 25°C On / 60°C Off	ST
Mounting position	vertical	-
UL-license	UL-File: E317613	UL

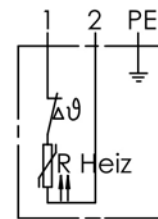
\* variable length is possible

### Dimension



\* with cable gland instead of cable entry point

### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
115-230V AC	L1	N (L2)	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	TEMPERATURE SETTING
265100ULAL0	115 - 230V AC	100W	0,45A	3,50A	220g	129,5x58x26,9mm	cable 0,60m	screw	<50°C On / 80°C Off

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## SILICONE HEATING MATS WITH INTEGRATED TEMPERATURE CONTROLLER

- fast heating-up time
- easy installation
- moisture-proof
- directed and uniform heat dissipation

### Type: Silicone heater\*

Power range: 150W – 500W

Voltage range: 230V

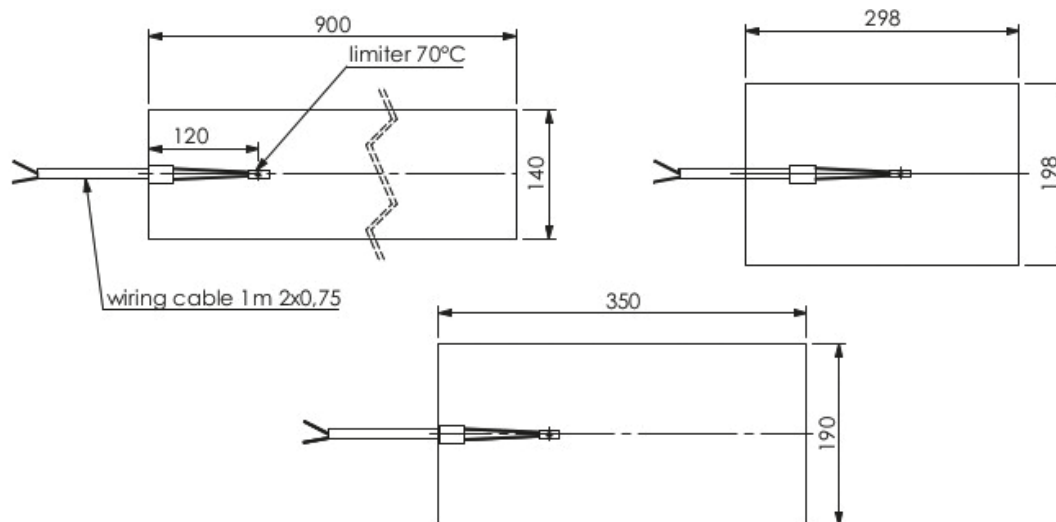
\* optional on an aluminium platter



### Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP54	IP54
Protection class	PC II	-
Operation- / storage temperature	-40 – +70 °C	-
Wiring cable	2x0,75mm <sup>2</sup>	-
Heating element	heating resistor	-
Mounting	screw-mounting	S
Connection	wiring cable 2x0,75mm <sup>2</sup>	AL
Switching temperature	70°C	-
Heating behavior	dynamically heating, self-regulating depending on the surrounding temperature	-
Mounting position	optional	-
Self-adhesive film	yes	-
Temperature controller	Uchiya U12 (normally close)	-
Special voltage	115V	exact specification

### Dimension



### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING
230150SHALO	230V	150W	0,65A	0,65A	500g	900x140x1,50mm	cable 0,50m	screw
230300SHALO	230V	300W	1,30A	1,30A	500g	298x198x1,50mm	cable 0,50m	screw
230500SHALO	230V	500W	2,17A	2,17A	500g	350x190x1,50mm	cable 0,50m	screw

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## PTC HEATERS

### CUSTOM-MADE AND SELF-REGULATING

The self-regulating **Lm-therm PTC heaters** are made up of specially designed aluminium bodies and custom-fit integrated PTC elements. The PTC heaters are characterised by high quality. A very sophisticated system of aluminium cooling fins supports the technology which is suitable for a wide operating voltage range.

Since a pre-defined shutdown of PTC heaters is not possible, we recommend the installation of a separate controller. We will gladly help you with the selection of a suitable **Lm-therm controller**.



#### YOUR BENEFITS AT A GLANCE:

- Self-regulating
- Dynamically heating
- High voltage range (110-265 V)
- Sophisticated system of cooling fins
- Variable connecting line/lead-through terminal



## PTC - HEATER

- self-regulating
- dynamically heating
- high voltage zone
- elaborated system with cooling fins

### Type: P-ssm

Power range: 20W – 30W\*\*  
Voltage range: 24V, 110V – 265V



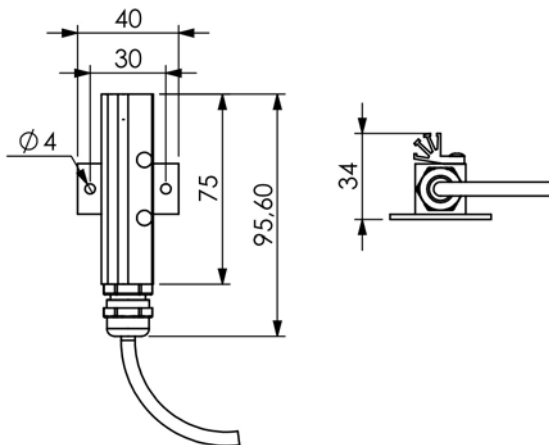
### Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP54	IP54
Protection class	PC II	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	20W: 80-90°C; 30W: 120-155°C	-
Wiring cable	0,25m 2x0,75mm <sup>2</sup> silicone*	exact specification
Heating element	PTC-cartridge	-
Mounting	screw-mounting	SRW
Connection	wiring cable 2x0,75mm <sup>2</sup> silicone	AL
Mounting position	vertical	-
Special voltages	24V AC/DC (only possible with 20W)	exact specification

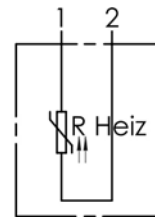
\* variable length is possible

\*\* at 0° C ice water

### Dimension



### Wiring diagram



U	bn (1)	bl (2)
24V DC	+	-
24V AC	~	~
110-265V DC	+	-
110-265V AC	L1	N (L2)

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING
P26520AL20	110-265V AC/DC	20W	0,10A	1,20A	125g	95,6x40x34mm	cable 0,25m	screw
P26530AL20	110-265V AC/DC	30W	0,15A	1,30A	125g	95,6x40x34mm	cable 0,25m	screw

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## PTC - HEATER

- self-regulating
- dynamically heating
- high voltage zone
- elaborated system with cooling fins

### Type: P-25

Power range: 10W – 50W\*\*

Voltage range: 110V – 265V



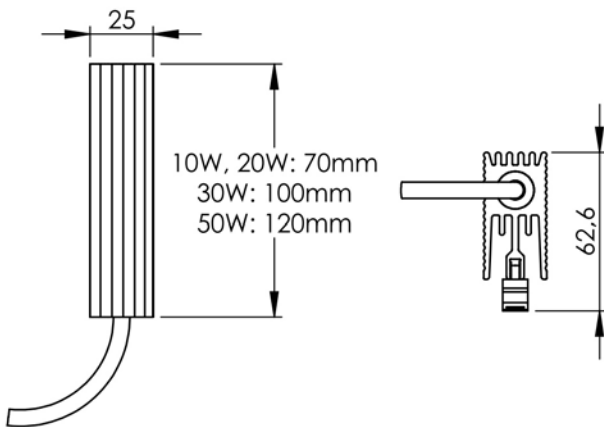
## Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP30 / IP20 with DK	IP30 or IP20
Protection class	PC II	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	10W/20W: 80-105°C; 30W: 90-110°C; 50W: 100-120°C	-
Wiring cable	0,40m 2x0,75mm <sup>2</sup> silicone *	exact specification
Heating element	PTC-cartridge	-
Mounting	snap-mounting for 35mm DIN-rail	SPS
	screw-mounting	SRW
Connection	wiring cable 2x0,75mm <sup>2</sup> silicone	AL
	plug-in terminal	DK
Mounting position	vertical	-

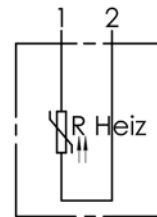
\* variable length is possible

\*\* at 0° C ice water

## Dimension



## Wiring diagram



U	bn (1)	bl (2)
110-265V DC	+	-
110-265V AC	L1	N (L2)

## Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING
P2651025AL2	110-265V AC/DC	10W	0,10A	1,20A	250g	70x25x62,6mm	cable 0,40m	snap
P2652025AL2	110-265V AC/DC	20W	0,10A	1,20A	250g	70x25x62,6mm	cable 0,40m	snap
P2653025AL2	110-265V AC/DC	30W	0,15A	1,30A	300g	100x25x62,6mm	cable 0,40m	snap
P2655025AL2	110-265V AC/DC	50W	0,25A	1,50A	350g	120x25x62,6mm	cable 0,40m	snap

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## PTC - HEATER

- self-regulating
- IP65
- high voltage zone
- elaborated system with cooling fins

### Type: P-65

Power range: 20W – 50W\*\*  
Voltage range: 12V – 48V, 110V – 265V

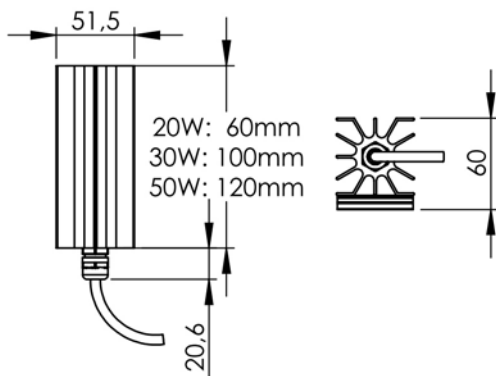


### Technical data

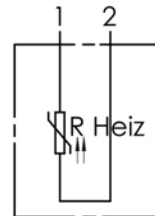
	DESCRIPTION	ORDER INDEX
Kind of protection	IP65	IP65
Protection class	PC II	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	20W: 80-90°C; 30W: 85-95°C; 50W: 90-105°C	-
Wiring cable	0,40m 2x0,75mm <sup>2</sup> silicone *	exact specification
Heating element	PTC-cartridge	-
Mounting	snap-mounting for 35mm DIN-rail	SPS
Connection	wiring cable 2x0,75mm <sup>2</sup> silicone	AL
Mounting position	vertical	-
Special voltages	12V - 48V (only possible with 20W)	exact specification

\* variable length is possible  
\* \* at 0° C ice water

### Dimension



### Wiring diagram



U	bn (1)	bl (2)
12-48V DC	+	-
12-48V AC	~	~
110-265V DC	+	-
110-265V AC	L1	N (L2)

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING
P26520AL2	110-265V AC/DC	20W	0,10A	1,20A	250g	60x51,5x60mm	cable 0,40m	snap
P26530AL2	110-265V AC/DC	30W	0,15A	1,30A	350g	100x51,5x60mm	cable 0,40m	snap
P26555AL2	110-265V AC/DC	50W	0,25A	1,50A	450g	120x51,5x60mm	cable 0,40m	snap

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## PTC - HEATER

- self-regulating
- dynamically heating
- high voltage zone
- elaborated system with cooling fins

### Type: P-80

Power range: 70W – 500W\*\*  
Voltage range: 110V – 265V

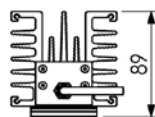
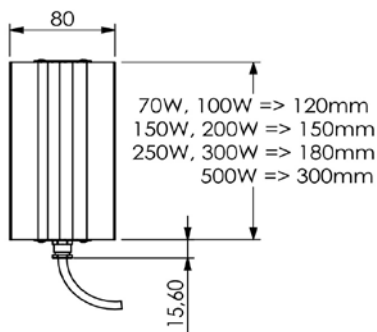


### Technical data

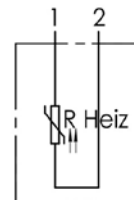
	DESCRIPTION	ORDER INDEX
Kind of protection	IP50 / IP20 with DK	-
Protection class	PC II	-
Operation- / storage temperature	-40 – +70 °C	-
Surface temperature (at 20°C surrounding temperature)	100W: 75-95°C; 150W: 70-90°C; 250W: 100-105°C	-
Wiring cable	0,50m 2x0,75mm <sup>2</sup> silicone *	desired length
Heating element	PTC-cartridge	-
Mounting	snap-mounting for 35mm DIN-rail	-
	screw mounting	S
Connection	wiring cable 2x0,75mm <sup>2</sup> silicone	AL
	plug-in terminal 0,08 - 2,5mm <sup>2</sup>	DK
Mounting position	vertical	-

\* variable length is possible  
\* \* at 0° C ice water

### Dimension



### Wiring diagram



U	bn (1)	bl (2)
110-265V DC	+	-
110-265V AC	L1	N (L2)

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING
P2657080AL2	110-265V AC/DC	70W	0,35A	2,50A	1050g	120x80x89mm	cable 0,50m	snap
P26510080AL2	110-265V AC/DC	100W	0,45A	3,50A	1050g	120x80x89mm	cable 0,50m	snap
P26515080AL2	110-265V AC/DC	150W	0,65A	5,00A	1200g	150x80x89mm	cable 0,50m	snap
P26520080AL2	110-265V AC/DC	200W	0,75A	5,50A	1650g	150x80x89mm	cable 0,50m	snap
P26525080AL2	110-265V AC/DC	250W	1,10A	6,50A	2000g	180x80x89mm	cable 0,50m	snap
P26530080AL2	110-265V AC/DC	300W	1,25A	7,50A	2000g	180x80x89mm	cable 0,50m	snap
P26550080AL2	110-265V AC/DC	500W	1,50A	10,00A	2500g	300x80x89mm	cable 0,50m	snap

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## CIRCULATION FANS AND FAN HEATERS FOR HIGH HEATING REQUIREMENTS VARIABLE AND CUSTOM-FIT

The **Lm-therm circulation fans and fan heaters** can be perfectly equipped to meet the requirements of the place of installation and are also suitable for modular constructions. Available are circulation fans and fan heaters with different voltage, power and fastening options.

With up to 8,000 W, the **Lm-therm circulation fans and fan heaters** ensure a maximum heat output - even in regions with temperatures as low as  $-40\text{ }^{\circ}\text{C}$ . An integrated temperature limiter prevents a dangerous heat built-up. The devices can also withstand high blow-out temperatures.

The **Lm-therm circulation fans and fan heaters** meet our high quality requirements. Stable metals such as aluminium or stainless steel ensure the mechanical robustness of the housings. With a guaranteed operating time of at least 50,000 h, the built-in vibration-proof quality fans boast a very high service life. The devices will also be subject to a shock test and shaking test according to the standards EN 60068-2-6 and EN 60068-2-27.



OUR  
TOPSELLER

### YOUR BENEFITS AT A GLANCE:

- ✓ High range of performance
- ✓ Active convection
- ✓ Protection against excess temperatures
- ✓ High heat efficiency
- ✓ Service life of the fan at least 50,000 h
- ✓ Vibration resistance
- ✓ Shock test and shaking test according to the standards EN 60068-2-6 and EN 60068-2-27.
- ✓ Robust metal housing
- ✓ Low housing temperature



## FAN HEATER

- high quality fans
- robust metal case
- Shock-and shake test according to the norms EN60068-2-6 and EN60068-2-27
- vibration-secured
- temperature limiter

### Type: Ventstar S

Power range: 100W – 200W

Voltage range: 24V

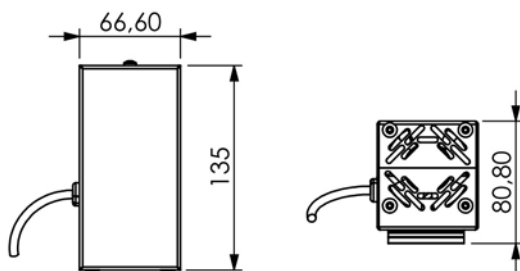


### Technical data

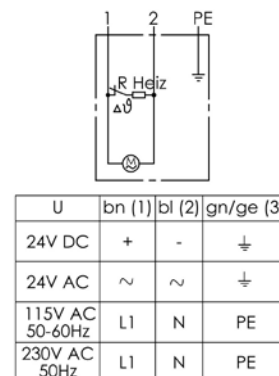
	DESCRIPTION	ORDER INDEX
Kind of protection	IP20	IP20
Protection class	SK I	-
Operation- / storage temperature	-40 – +70 °C	-
Wiring cable	0,50m 3x0,75mm <sup>2</sup> *	exact specification
Heating element	ceramic heating elements	-
Mounting	snap-mounting for 35mm DIN-rail	SPS
	screw-mounting (horizontal or vertical)	SRW or SRS
Connection	wiring cable 3x0,75mm <sup>2</sup>	AL
Temperature limiter	71°C +/- 7,5 K differential gap	-
Fan	fan durability: 50.000h	-
	air power: 54m <sup>3</sup> / h (free-blowing)	-
	blowing-out temperature: 40°C	-
	optional in selectable form with a separate wiring cable	SL
Mounting position	vertical	-

\* variable length is possible

### Dimension



### Wiring diagram



### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING
24100XVSAL1	24V DC	100W	4,17 A	4,17 A	750 g	135x66,6x80,8mm	cabl 0,50m	snap
24150XVSAL1	24V DC	150W	6,25 A	6,25 A	750 g	135x66,6x80,8mm	cabl 0,50m	snap
24200XVSAL1	24V DC	200W	8,33 A	8,33 A	750 g	135x66,6x80,8mm	cabl 0,50m	snap

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## FAN HEATER

- high quality fans
- robust metal case
- Shock-and shake test according to the norms EN60068-2-6 and EN60068-2-27
- vibration-secured
- temperature limiter

### Type: Ventstar M

Power range: 180W – 500W  
Voltage range: 24V – 230V

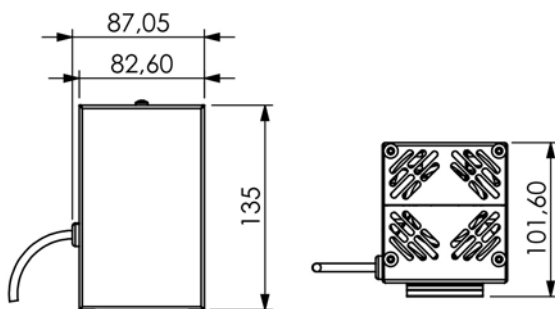


### Technical data

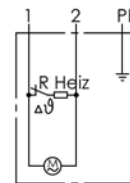
	DESCRIPTION	ORDER INDEX
Kind of protection	IP20	IP20
Protection class	SK I	-
Operation- / storage temperature	-40 – +70 °C	-
Wiring cable	0,50m 3x0,75mm <sup>2</sup> *	exact specification
Heating element	ceramic heating elements	-
Mounting	snap-mounting for 35mm DIN-rail	SPS
	screw-mounting (horizontal or vertical)	SRW or SRS
Connection	wiring cable 3x0,75mm <sup>2</sup>	AL
Temperature limiter	71°C +/- 7,5 K differential gap	-
Fan	fan durability: 50.000h	-
	air power: 45m <sup>3</sup> / h (freiblasend)	-
	blowing-out temperature: 40°C (250W); 110°C (500W)	-
	optional in selectable form with a separate wiring cable	SL
Mounting position	vertical	-
Special voltage	24V DC, 115V AC	exact specification

\* variable length is possible

### Dimension



### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
24V DC	+	-	⊥
24V AC	~	~	⊥
115V AC 50-60Hz	L1	N	PE
230V AC 50Hz	L1	N	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING
230180XVSALO	230V AC 50/60 Hz	180W	0,78 A	0,78 A	1250 g	135x87,1x101,6mm	cabl 0,50m	snap
230250XVSALO	230V AC 50/60 Hz	250W	1,09 A	1,09 A	1250 g	135x87,1x101,6mm	cabl 0,50m	snap
230400XVSALO	230V AC 50/60 Hz	400W	1,74 A	1,74 A	1250 g	135x87,1x101,6mm	cabl 0,50m	snap
230500XVSALO	230V AC 50/60 Hz	500W	2,17 A	2,17 A	1250 g	135x87,1x101,6mm	cabl 0,50m	snap

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## BLOWER HEATER

- high quality fans
- vibration-secured
- robust metal case
- temperature limiter

### Type: GH2000/GH4000

Power range: 2000W – 4000W

Voltage range: 115V – 400V



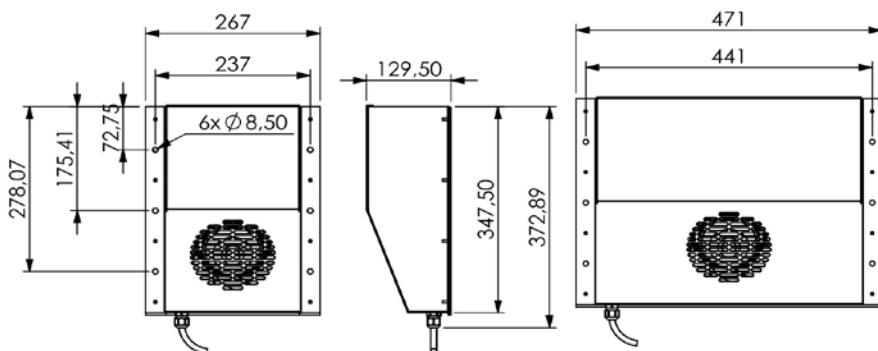
### Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP20	IP20
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Wiring cable	2,00m 3x1,5mm <sup>2</sup> *	exact specification
Heating element	high performance cartridge	exact specification
	PTC-heating register	exact specification
Mounting	screw-mounting	S
Connection	wiring cable 2,00m 3x1,5mm <sup>2</sup>	AL
Temperature limiter	71°C +/- 7,5 K differential gap	-
Fan	fan durability: 50.000h	-
	air power: 570m <sup>3</sup> / h (free-blowing)	-
	blowing-out temper.: ap. 43°C (GH2000); ap. 53°C (GH4000)	-
Mounting position	vertical (air outlet above or lateral)	-
Special versions	temperature controller	TR
	step switcher	S2
	ON/OFF-switch	EA
Special voltages	115V, 400V 3ph	exact specification

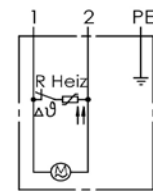
\* variable length is possible

\*\* with high performance cartridges

### Dimension



### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
115V 50/60Hz	L1 / L2 / L3	N	PE
230V 50/60Hz	L1 / L2 / L3	N	PE

U	bn	sw1	sw2	bl	gn/ge
400V 3ph	L1	L2	L3	N	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT**	DIMENSIONS	CONNECTION	MOUNTING
2302000G2AL0	230V	2000W	8,70A	16A	ca. 10,00kg	372,9x267x129,5mm	cable 2,00m	snap
2304000G4AL0	230V	4000W	17,40A	32A	ca. 15,00kg	372,9x267x129,5mm	cable 2,00m	snap

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## FAN HEATER



- high quality fans
- vibration-secured
- robust metal case
- high thermal efficiency

### Type: Coreg

Power range: 500W – 1000W

Voltage range: 115V – 230V

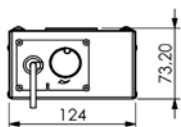
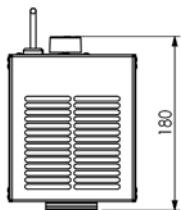


### Technical data

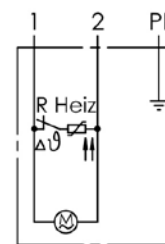
	DESCRIPTION	ORDER INDEX
Kind of protection	IP20	IP20
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Wiring cable	0,50m 3x0,75mm <sup>2</sup> oilflex*	exact specification
Heating element	PTC-heating register	-
Thermostat	circulation thermostat 5 - 35°C	UT
	capillar thermostat	KT
	hygrostat	HY
Mounting	snap-mounting for 35mm DIN-rail	SPS
	screw-mounting stainless steel	SRW
Connection	wiring cable 3x0,75mm <sup>2</sup> oilflex	AL
	plug-in terminal	DK
Fan (permanent on voltage)	fan durability 50.000h	-
	air power: 108m <sup>3</sup> / h (free-blowing)	-
	blowing-out temperature: ap. 84°C	-
Mounting position	vertical (air outlet above or lateral)	-
Special voltages	115V AC	exact specification

\* variable length is possible

### Dimension



### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
115V AC 50-60Hz	L1	N	PE
230V AC 50Hz	L1	N	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	THERMOSTAT
230500CRALO	230V AC 50/60 Hz	500W	2,20A	6,00A	1450g	180x124x73,2mm	cable 0,50m	snap	circulation 5-35°C
2301000CRALO	230V AC 50/60 Hz	1000W	4,30A	8,00A	1450g	180x124x73,2mm	cable 0,50m	snap	circulation 5-35°C

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## FAN HEATER

- high quality fans
- vibration-secured
- robust metal case
- high thermal efficiency

### Type: Vaero

Power range: 500W  
Voltage range: 115V – 230V

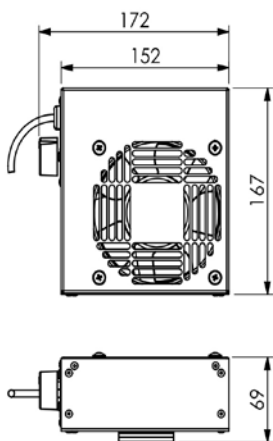


### Technical data

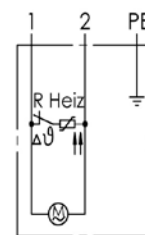
	DESCRIPTION	ORDER INDEX
Kind of protection	IP20	IP20
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Wiring cable	0,50m 3x0,75mm <sup>2</sup> *	exact specification
Heating element	PTC-heating register	-
Thermostat	circulation thermostat 5 - 35°C	UT
	capillar thermostat	KT
	hygrostat	HY
Mounting	snap-mounting for 35mm DIN-rail	SPS
	screw-mounting stainless steel	SRW
Connection	wiring cable 3x0,75mm <sup>2</sup>	AL
	plug-in terminal 0,08 - 2,5mm <sup>2</sup>	DK
Fan (permanent on voltage)	fan durability: 50.000h	-
	air power: 108m <sup>3</sup> / h (free-blowing)	-
	blowing-out temperature: ap. 82°C	-
Mounting position	vertical (air outlet above or lateral)	-
Special voltages	115V AC	exact specification

\* variable length is possible

### Dimension



### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
115V AC 50-60Hz	L	N	PE
230V AC 50Hz	L	N	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING	THERMOSTAT
230500VRAL0	230V AC 50/60 Hz	500W	2,20A	6,00A	1250g	167x172x69mm	cable 0,50m	snap	circulation 0-35°C

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## FAN HEATER

- high quality fans
- vibration-secured
- robust metal case
- high thermal efficiency

### Type: Revent

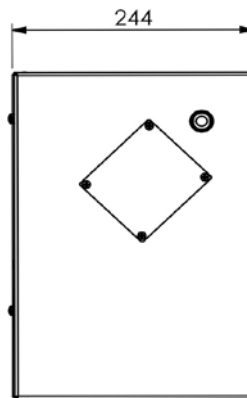
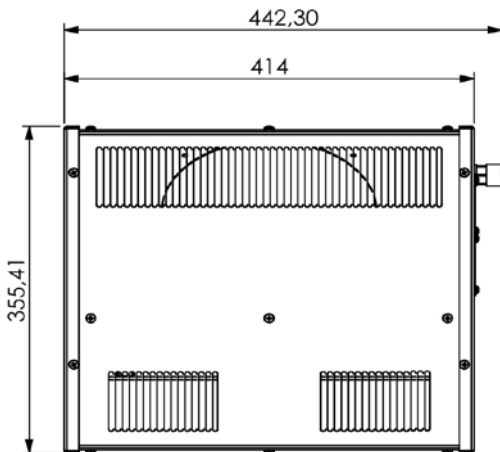
Power range: 4000W – 8000W  
Voltage range: 230V – 400V



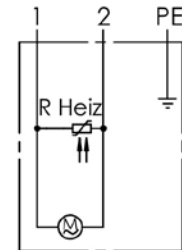
### Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP20	IP20
Protection class	PC I	-
Operation- / storage temperature	-40 – +70 °C	-
Heating element	PTC-heating register	-
Mounting	screw-mounting	S
Connection	plug-in terminal	DK
Fan	fan durability: 60.000h	-
	air power: 815m <sup>3</sup> / h (free-blowing)	-
	blowing-out temperature: ap. 93°C	-
Mounting position	optional	-
Special voltages	400V 3ph	exact specification

### Dimension



### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
230V 50/60Hz	L1 / L2 / L3	N	PE

U	bn	sw1	sw2	bl	gn/ge
400V 3ph	L1	L2	L3	N	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING
2304000RVAL0	230V	4000W	17,4A	32A	19kg	244x442,3x355,4mm	cable 2,00m	screw
2308000RVAL0	230V	8000W	34,8A	64A	19kg	244x442,3x355,4mm	cable 2,00m	screw

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## EX HEATERS AND EX CONTROLLERS

### HIGH PRECISION FOR SPECIAL REQUIREMENTS

The Ex protection zones 1/21 and 2/22 assume that special structural requirements are met. The Ex heaters from Lm-therm Elektrotechnik AG with a voltage of 115 V as well as 230 V are suitable for use in explosive areas such as gas stations, biogas plants, chemical labs etc. The **Lm-therm Ex heaters** meet the protection class IP66/67 and the requirements of standard 2014/34/EU.

The devices equipped with explosion-proof thermostats control and monitor thermal processes. The Ex heaters operate on the principle of liquid or gas expansion whereby a microswitch protected against explosion is used as an electrical switch element.



#### YOUR BENEFITS AT A GLANCE:

- Suitable for the Ex protection zones 1/21 and 2/22
- Approved for the temperature classes
  - T3 200°C
  - T4 135°C
  - T5 100°C
- High protection class (IP67)



## EX-HEATERS

Ex-certificate-no.: IBExU07ATEX1145 X  
Code no. of certification centre: IBExU: 0637

- zone 1/21 and 2/22
- different temperature classes
- high kind of protection
- use in explosion-endangered areas

### Type: Ex-heaters zone 1/21

Power range: 25W - 400W  
Voltage range: 115V, 230V

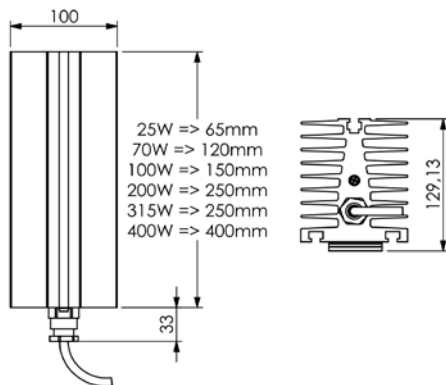


## Technical data

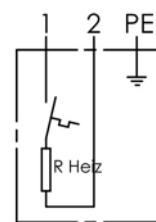
	DESCRIPTION	ORDER INDEX
Kind of protection	IP66	IP66
Protection class	PC I	-
Operation- / storage temperature	-40 °C ≤ Ta ≤ +60 °C	-
Heater	aluminium profile black anodized	-
Wiring cable	1,00m 3x1,50mm <sup>2</sup> *	exact specification
Heating element	high performance cartridge	-
Mounting	snap-mounting for 35mm DIN-rail	SPS
	screw-mounting	SRS
Connection	wiring cable 3x1,50 mm <sup>2</sup>	AL
Temperature class (according to power)	Ex II 2G Ex db IIC T3 Gb Ex II 2D Ex tb IIIC T200 °C	200W, 315W, 400W
	Ex II 2G Ex db IIC T4 Gb Ex II 2D Ex tb IIIC T135 °C	70W, 100W
	Ex II 2G Ex db IIC T5 Gb Ex II 2D Ex tb IIIC T100 °C	25W
Mounting position	vertical	-
CSA-certificate	12.2494381	-
Special voltages	115V	exact specification

\* variable length is possible

## Dimension



## Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
≥ 115V AC	L1	N (L2)	PE

## Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING
23025E1AL0	230V	25W	0,20A	0,20A	1200g	65x129x100mm	cable 1,00m	snap
23070E1AL0	230V	70W	0,30A	0,30A	2000g	120x129x100mm	cable 1,00m	snap
230100E1AL0	230V	100W	0,43A	0,43A	2500g	150x129x100mm	cable 1,00m	snap
230200E1AL0	230V	200W	0,87A	0,87A	3500g	250x129x100mm	cable 1,00m	snap
230315E1AL0	230V	315W	1,37A	1,37A	5000g	250x129x100mm	cable 1,00m	snap
230400E1AL0	230V	400W	1,74A	1,74A	5000g	400x129x100mm	cable 1,00m	snap

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## EX-HEATERS

- zone 1/21 and 2/22
- different temperature classes
- high kind of protection
- use in explosion-endangered areas

### Type: Ex-heaters zone 2/22

Power range: 25W - 400W  
Voltage range: 115V, 230V

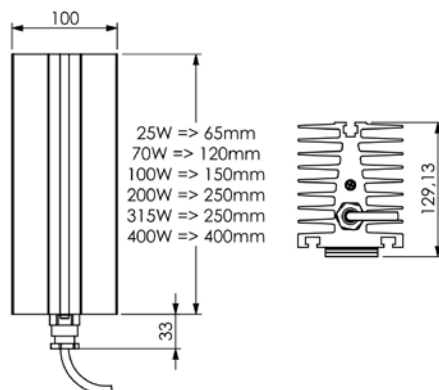


### Technical data

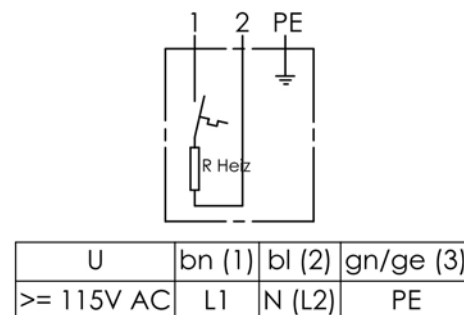
	DESCRIPTION	ORDER INDEX
Kind of protection	IP66	IP66
Protection class	PC I	-
Operation- / storage temperature	-40 – +60 °C	-
Heater	aluminium profile black anodized	-
Wiring cable	1,00m 3x1,50mm <sup>2</sup> *	exact specification
Heating element	high performance cartridge	-
Mounting	snap-mounting for 35mm DIN-rail	SPS
	screw mounting	SRS
Connection	wiring cable 3x1,50 mm <sup>2</sup>	AL
Temperature class (according to power)	Ex II 3G Ex dc IIC T3 Gb Ex II 3D Ex tc IIIC T200 °C Db	200W, 315W, 400W
	Ex II 3G Ex dc IIC T4 Gb Ex II 3D Ex tc IIIC T135 °C Db	70W, 100W
	Ex II 3G Ex dc IIC T5 Gb Ex II 3D Ex tc IIIC T100 °C Db	25W
Mounting position	vertical	-
Special voltages	115V	exact specification

\* variable length is possible

### Dimension



### Wiring diagram

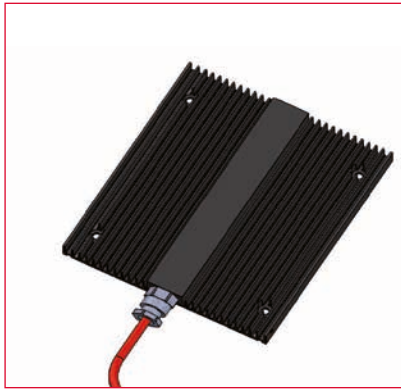


### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING
23025E2AL0	230V	25W	0,20A	0,20A	1200g	65x129x100mm	cable 1,00m	snap
23070E2AL0	230V	70W	0,30A	0,30A	2000g	120x129x100mm	cable 1,00m	snap
230100E2AL0	230V	100W	0,43A	0,43A	2500g	150x129x100mm	cable 1,00m	snap
230200E2AL0	230V	200W	0,87A	0,87A	3500g	250x129x100mm	cable 1,00m	snap
230315E2AL0	230V	315W	1,37A	1,37A	5000g	250x129x100mm	cable 1,00m	snap
230400E2AL0	230V	400W	1,74A	1,74A	5000g	400x129x100mm	cable 1,00m	snap

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## EX-HEATER FTH





- high heated release
- easy installation
- zone 2/22
- directed and uniform heat dissipation

### Type: FTH zone 2/22

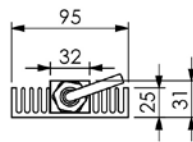
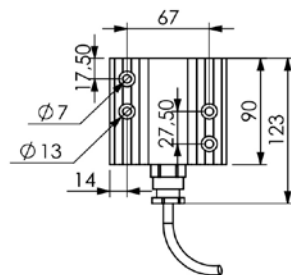
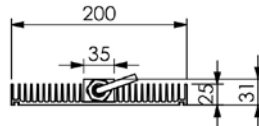
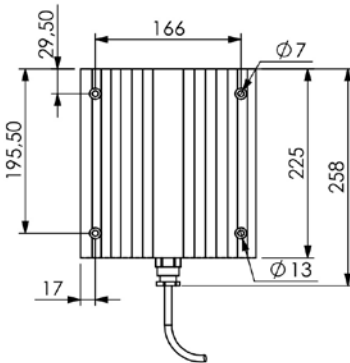
Power range: 50W - 200W  
Voltage range: 230V



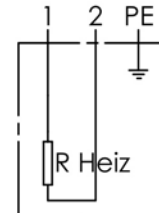
### Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP66/67	IP66/67
Protection class	SK II	-
Operation- / storage temperature	-40 – +70 °C	-
Wiring cable	1,00 m 2xAWG 18	-
Heating element	high performance cartridge	-
Mounting	screw-mounting	S
Connection	wiring cable 2xAWG18	AL
Temperature class (according to power)	 II 3G Ex dc IIC T3 Gb  II 3D Ex tc IIIC T200 °C Db	200W
	 II 3G Ex dc IIC T4 Gb  II 3D Ex tc IIIC T135 °C Db	50W, 80W
Mounting position	optional	-

### Dimensions



### Wiring diagram



U	bn (1)	bl (2)	gn/ge (3)
>= 115V AC	L1	N (L2)	PE

### Standard versions

ORDER-NO.	VOLTAGE	POWER	OPERA.CURRENT	INRUSH CURRENT	WEIGHT	DIMENSIONS	CONNECTION	MOUNTING
3000004	115-265V	50W	0,25A	1,50A	ca. 3,0kg	123x95x31mm	cabel 1,00m	screw
3000003	115-265V	80W	0,45A	3,00A	ca. 3,0kg	123x95x31mm	cabel 1,00m	screw
3000002	115-265V	200W	1,10A	5,50A	ca. 5,0kg	225x200x31mm	cabel 1,00m	screw

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## EX-CONTROLLER

Ex-certificate-no.: IBExU11ATEX1027 X  
Code no. of certification centre: IBExU: 0637

- zone 1/21
- different versions
- temperature zone 5-60°C
- contact versions normally close or normally open

### Type: Ex-R-1/21

fixed adjusted

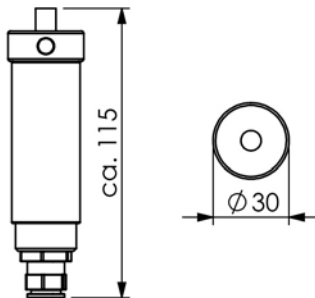


## Technical data

	DESCRIPTION	ORDER INDEX
Kind of protection	IP66/67	IP66/67
Protection class	PC I	-
Operation- / storage temperature	-40°C ... +60°C	-
Wiring cable	0,50m 3x1,50mm <sup>2</sup> *	exact specification
Connection	wiring cable 3x1,50 mm <sup>2</sup>	AL
Temperature class	Ex II 2G Ex db IIC T6 Gb Ex II 2D Ex tb IIIC T85 °C Db	
Mounting position	optional	-
Operating voltage / switching current	230V AC / 10A - 115V AC / 15A	-

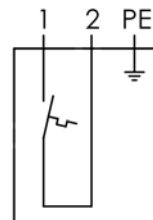
\* variable length is possible

## Dimension

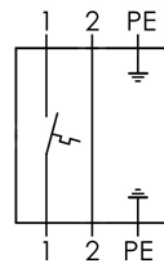


## Wiring diagrams

cable thermostat



switch thermostat



## Standard versions

ORDER-NO.	CASE TYPE	CONTACT**	SWITCH-ON TEMPERATURE***	DIMENSIONS	CONNECTION
ExR-1/21-KTOx-10°C	KTx / cable thermostat	normally close	10°C	115x30mm	cable 0,50m
ExR-1/21-KKTSx-40°C	KKTx / switch thermostat	normally open	40°C	130x30mm	cable 0,50m
ExR-1/21-KTO-20°C	KT / cable thermostat with stain-relief	normally close	20°C	158x30mm	cable 0,50m
ExR-1/21-KKTO-10°C	KKT / switch thermostat with stain-relief	normally close	10°C	216x30mm	cable 0,50m

\*\* all versions available as normally close or normally open contact \*\*\* all versions available for the temperature zone 5-60°C

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## CONTROL SYSTEMS

### MAXIMUM OPERATIONAL RELIABILITY

The product portfolio of the Lm-therm Elektrotechnik AG includes both electronic and electro-mechanical controllers. Efficient thermostats and high-quality hygrostats ensure the maximum operational reliability in switch cabinet heaters.

Depending on the requirements, **Lm-therm thermostats** are equipped with a contact breaker, contact maker or changeover contact. Customised to meet your exact requirements, the components ensure the operational reliability of your components. It is possible to equip the modules according to your requirements, for example, as an additional controller combined with a switch cabinet heater equipped with a thermostat. This allows you to combine a low surface temperature with a precise control. A further option is to combine large switch cabinets with a powerful heater.

**Lm-therm hygrostats** eliminate the often underestimated risks due to moisture. Hygrostats are therefore an important component in ensuring the functional reliability of your switch cabinet.



### CONTROLLING

#### YOUR BENEFITS AT A GLANCE:

- Many versions (maker, breaker, changeover)
- Easy assembly
- Different mounting options such as cap rail or screw connection

## ELECTROMECHANICAL THERMOSTATS



- easy installation
- different versions
- different mountings



### Technical data

ORDER NUMBER	SETTING RANGE	DIFFERENTIAL GAP	KIND OF SENSOR	OPERATING VOLTAGE	SWITCH. CURRENT - OHMIC (INDUCTIVE)	CONTACT	INSTALLATION	KIND OF PROTECTION	UL-LICENSE
THWe 2-SG	0 - 60°C	+/- ca. 3K	capillary 1,5m	24V - 250V AC	10(2)A / 5(2)A	changer	DIN-rail	IP20	yes
THÖ 1-SG	0 - 60°C	+/- ca. 3K	bimetal	250V AC	10(2)A	normally close	DIN-rail	IP20	yes
THS 1-SG	5 - 60°C	+/- ca. 3K	bimetal	250V AC	10(2)A	normally open	DIN-rail	IP20	yes
THWe 1-SG	0 - 60°C	+/- ca. 3K	bimetal	250V AC	10(2)A / 5(2)A	changer	DIN-rail	IP20	yes
THWe-SG*	10 - 60°C	+/- ca. 1K	bimetal	250V AC	10(4)A / 5(2)A	changer	DIN-rail	IP20	no
TM 101	0 - 40°C	+/- ca. 0,75K	capillary	24V - 250V	10(4)A AC	changer	wall	IP54	no
THWe-W	5 - 60°C	+/- ca. 1K	bimetal	250V AC	10(4)A	changer	wall	IP30	no
146218	-35 - +30°C	2 - 20K (adjustable)	capillary 1,8m	24 - 250V	10(4)A	changer	wall	IP65	no

\* also available with snap-mounting (THWe-SG-P)

### Pictures

THWe2-SG



THÖ1-SG



THS1-SG



THWe1-SG



146218



THWe-W



THWe-SG

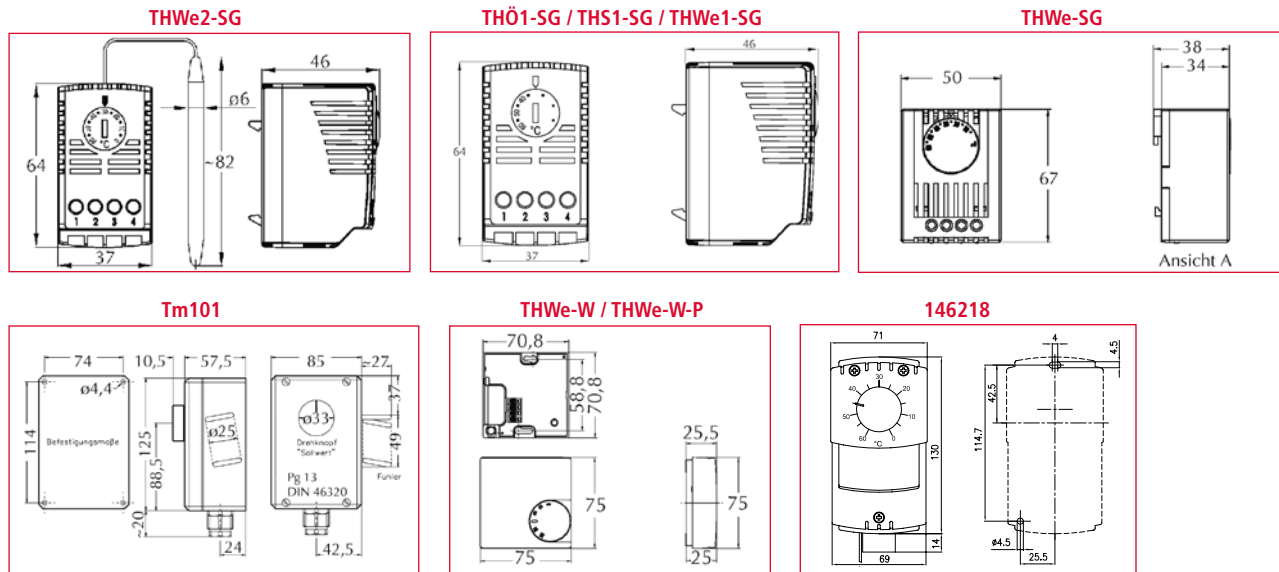


TM101

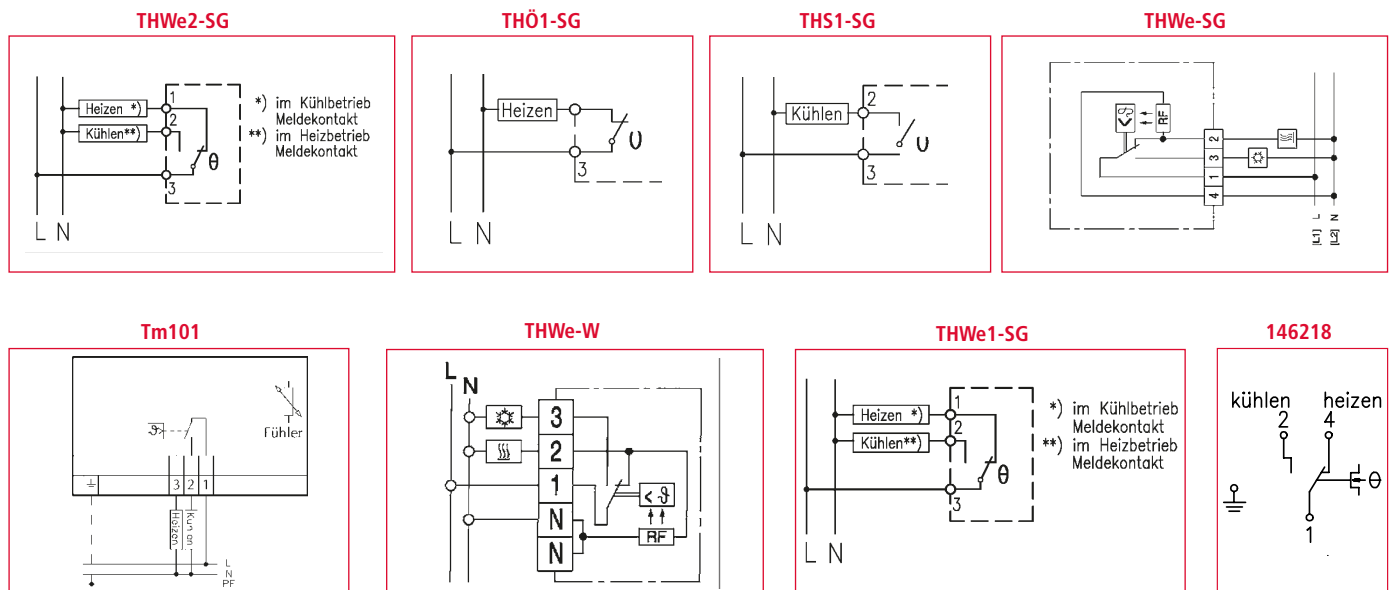




## Dimensions



## Wiring diagrams



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## ELECTRONICAL THERMOSTATS



- easy installation
- different versions
- different mountings



### Technical data

ORDER NUMBER	SETTING RANGE	DIFFERENTIAL GAP	KIND OF SENSOR	OPERATING VOLTAGE	SWITCH. CURRENT - OHMIC (INDUCTIVE)	CONTACT	INSTALLATION	KIND OF PROTECTION	UL-LICENSE
Te120-F	0 - 60°C	0,25 - 2,5K adjustable	electronic, KTY	24V DC	8(2)A	changer	DIN-rail	IP20	no
Te125-F	0 - 60°C	0,25 - 2,5K adjustable	electronic, KTY	230V AC	8(2)A	changer	DIN-rail	IP20	no
Ted 122-F	0 - 60°C	0,2 K	electronic, KTY	230V AC	8(2)A	2x normally open	DIN-rail	IP20	no
Te24VDC	0 - 60°C	2-3K	electronic internal	24V DC	16A	changer	DIN-rail	IP20	no
Te104	0 - 50°C	+/-0,1 - +/-2,5K adjustable	remote sensor	250V AC	10(4)A	changer	wall	IP20	no
Ted 108	0 - 50°C	+/-0,1 - +/-2,5K adjustable	remote sensor	250V AC	10(4)A	changer	wall	IP54	no
Te103-F	0 - 50°C	+/-0,1 - +/-2,5K adjustable	remote sensor	250V AC	10(4)A	changer	wall	IP20	no
Ted 105-F	0 - 50°C	+/-0,1 - +/-2,5K adjustable	remote sensor	250V AC	10(4)A	changer	wall	IP20	no

### Pictures

Te120-F



Te125-F



Te24VDC



Te24VDC



Te103-F



Ted 105-F



Ted 122-F

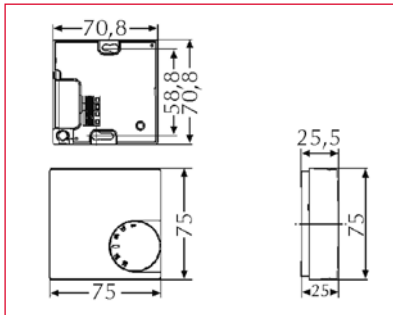


Te 104

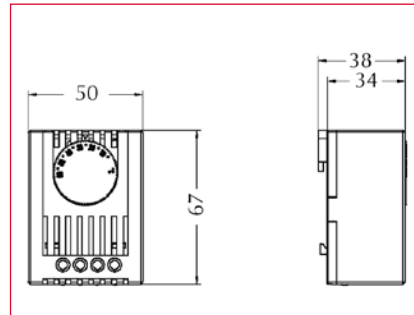


## Dimensions

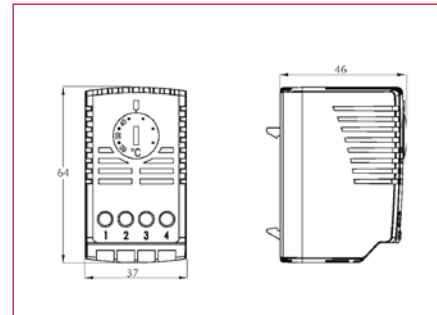
HyWe-W



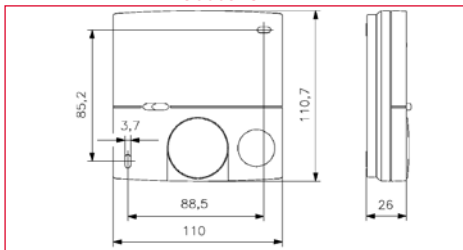
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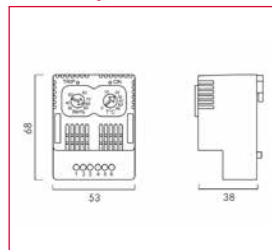
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3000345

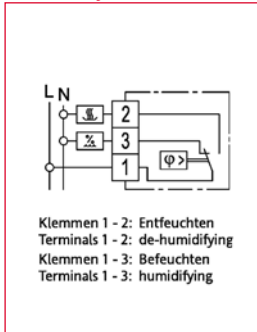


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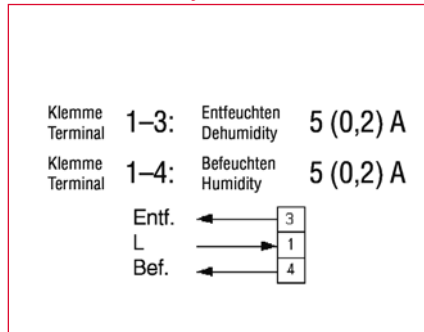


## Wiring diagrams

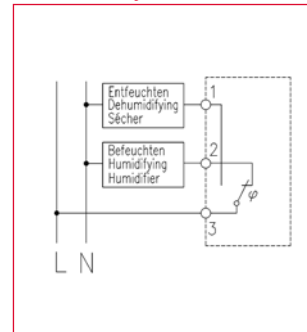
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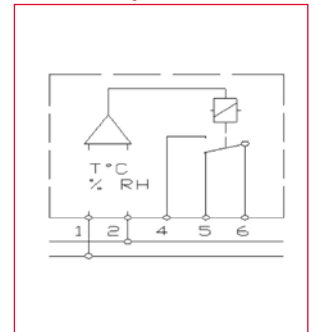
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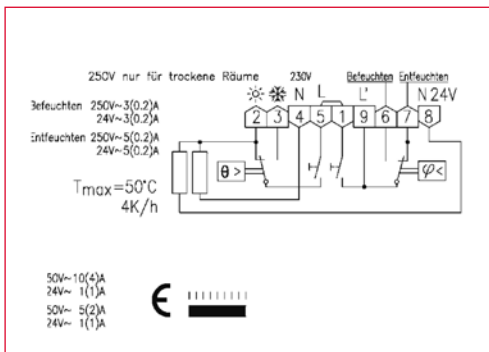
HyWe1-SG



HymTm22



3000345



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## HUMIDITY CONTROLLER - HYGROSTATS



- easy installation
- different versions
- different mountings



### Technical data

ORDER NUMBER	SETTING RANGE	DIFFERENTIAL GAP	KIND OF SENSOR	OPERATING VOLTAGE	SWITCH. CURRENT - OHMIC (INDUCTIVE)	CONTACT	INSTALLATION	KIND OF PROTECTION	UL-LICENSE
HymTm 22	30 - 90% rF 0 - 60°C	ap. 5% / ca. 2K	electronic	230V AC	5/3A	changer	DIN-rail	IP20	no
HYWe-W	35 - 100% rF	ca. 4%	plastic fiber	24 - 250V AC	5 (0,2)A	changer	wall	IP30	no
3000345	30 - 100% rF 10 - 35°C	ap. 4% / ca. 1K	plastic fiber / bimetal	24 - 250V AC	5 (0,2) / 3 (0,2) 10 (4) / 5 (2)A / 1 (1)A	changer	wall	IP30	no
HYWe-SG	35 - 100% rF	ca. 4%	plastic fiber	24 - 250V AC	5 (0,2)A	changer	DIN-rail	IP20	no
HYWe1-SG	40 - 90% rF	ca. 4%	plastic fiber	24 - 250V AC	5 (2)A	changer	DIN-rail	IP20	no

### Pictures

HymTm22



HyWe-W



3000345



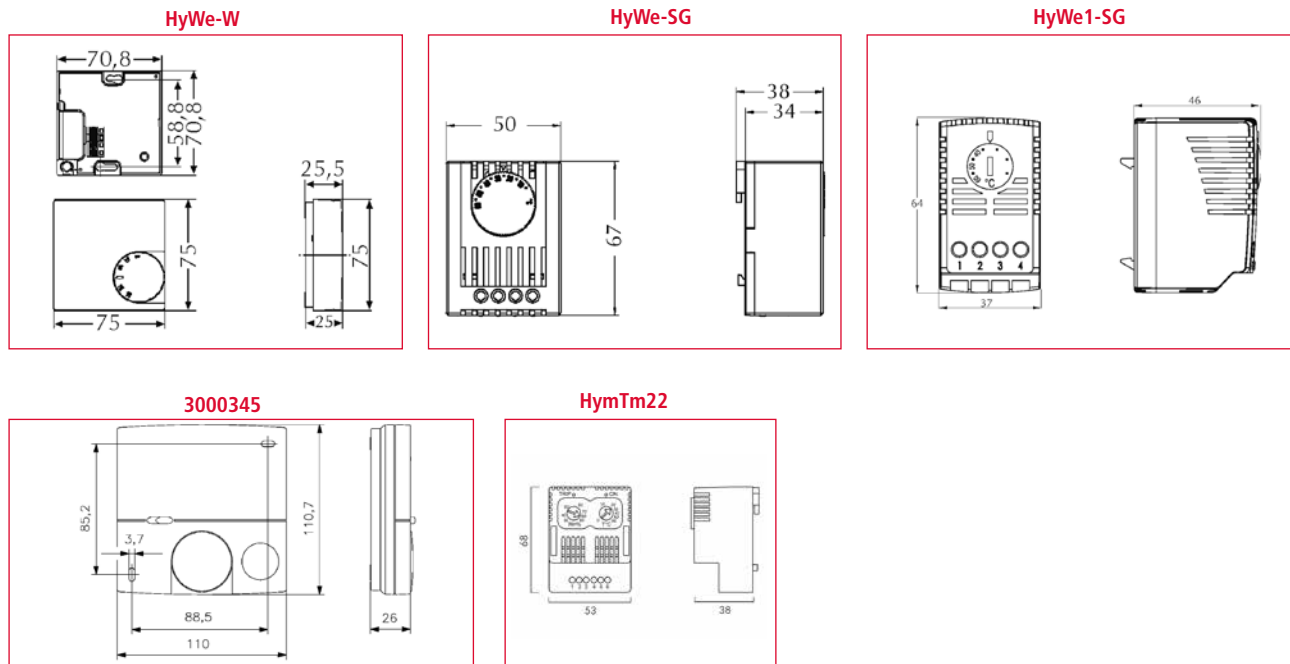
HYWe-SG



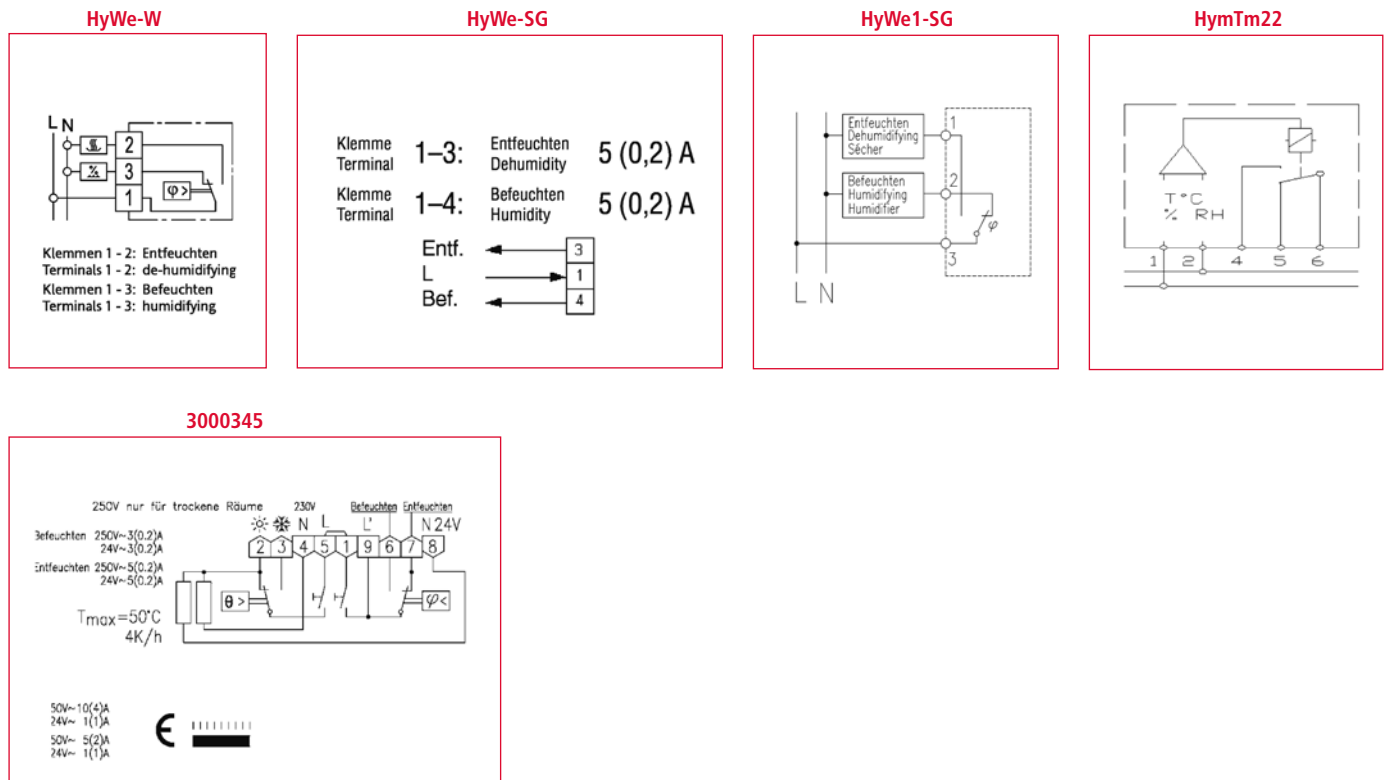
HYWe1-SG



## Dimensions



## Wiring diagrams



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## COOLING TECHNOLOGY

### SYSTEMS FOR AN IDEAL CLIMATE

#### Peltier cooling devices

**Lm-therm Peltier cooling devices** ensure a reliable and environmentally friendly climate control of switch cabinets. The Peltier cooling devices equipped with high-quality and robust metal housings operate on the same principle as electrical heat pumps. A fan integrated in the switch cabinet blows warm air onto cold exchanger. A Peltier element transports heat energy to a heat exchanger mounted on the exterior and the air cools down.

The fail-safe **Peltier technology** offers many advantages. As no coolant is required it effectively protects the environment. Furthermore, no exchange of gases or liquids takes place between the inside of the switch cabinet and the ambient air.

Should you require to have any models customised especially for your application, our in-house Engineering Department will gladly develop an optimally designed system together with you.



High-quality electronic systems integrated into switch cabinets, different locations indoors and outdoors as well as rapid changes in climate increasingly requires the use of cooling devices.

The **Lm-therm compressor-based cooling devices** for application between 380 W and 4,000 W using a CFC-free coolant are also suitable for applications with high power losses. Available are compressor-based cooling devices for the door or wall installation and roof installation of switch cabinets.

**IP67  
with Peltier  
technology**

#### YOUR BENEFITS AT A GLANCE:

- Protection class (outdoor)  
IP67 possible
- No use of coolants
- No exchange of gases and liquids

#### YOUR BENEFITS AT A GLANCE:

- Devices for small and large housings
- Suitable for door, wall or roof installation

## PELTIER COOLING UNITS



- no use of refrigerants
- electric cabinet- and surface cooler
- IP67 is possible
- special versions available



### Technical data electric cabinet cooler

ORDER-NO.	POWER (W)	SUPPLY VOLTAGE (V)	OPERATION TEMPERATURE	WEIGHT (KG)	KIND OF PROTECTION OUTSIDE	FAULT SIGNAL CONTACT	SIZE
FL-104	50	24V DC	-40 - +70°C	ca. 2,5	IP67	NO-contact max. 30 V DC 5A	1
FN-104	70	24V DC	-40 - +70°C	ca. 2,5	IP67	NO-contact max. 30 V DC 5A	1
FR-104	100	24V DC	-40 - +70°C	ca. 2,5	IP67	NO-contact max. 30 V DC 5A	1
FL-208	100	24V DC	-40 - +70°C	ca. 5,0	IP67	NO-contact max. 30 V DC 5A	2
FN-208	140	24V DC	-40 - +70°C	ca. 5,0	IP67	NO-contact max. 30 V DC 5A	2
FR-208	200	24V DC	-40 - +70°C	ca. 5,0	IP67	NO-contact max. 30 V DC 5A	2
FL-316	200	24V DC	-40 - +70°C	ca. 10,0	IP67	NO-contact max. 30 V DC 5A	3
FN-316	280	24V DC	-40 - +70°C	ca. 10,0	IP67	NO-contact max. 30 V DC 5A	3
FR-316	400	24V DC	-40 - +70°C	ca. 10,0	IP67	NO-contact max. 30 V DC 5A	3

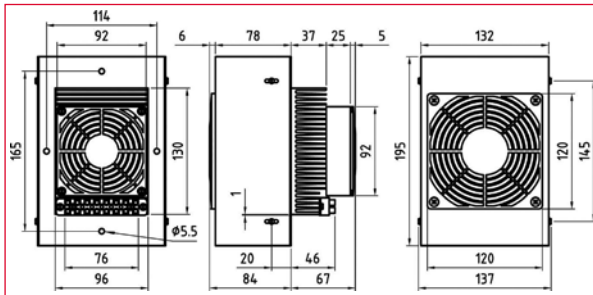
### Technical data surface cooler

ORDER-NO.	POWER (W)	SUPPLY VOLTAGE (V)	OPERATION TEMPERATURE	WEIGHT (KG)	KIND OF PROTECTION OUTSIDE	FAULT SIGNAL CONTACT	SIZE
GL-104	50	24V DC	-40 - +70°C	ca. 2,5	IP67	NO-contact max. 30 V DC 5A	1
GN-104	70	24V DC	-40 - +70°C	ca. 2,5	IP67	NO-contact max. 30 V DC 5A	1
GR-104	100	24V DC	-40 - +70°C	ca. 2,5	IP67	NO-contact max. 30 V DC 5A	1
GL-208	100	24V DC	-40 - +70°C	ca. 5,0	IP67	NO-contact max. 30 V DC 5A	2
GN-208	140	24V DC	-40 - +70°C	ca. 5,0	IP67	NO-contact max. 30 V DC 5A	2
GR-208	200	24V DC	-40 - +70°C	ca. 5,0	IP67	NO-contact max. 30 V DC 5A	2
GL-316	200	24V DC	-40 - +70°C	ca. 10,0	IP67	NO-contact max. 30 V DC 5A	3
GN-316	280	24V DC	-40 - +70°C	ca. 10,0	IP67	NO-contact max. 30 V DC 5A	3
GR-316	400	24V DC	-40 - +70°C	ca. 10,0	IP67	NO-contact max. 30 V DC 5A	3

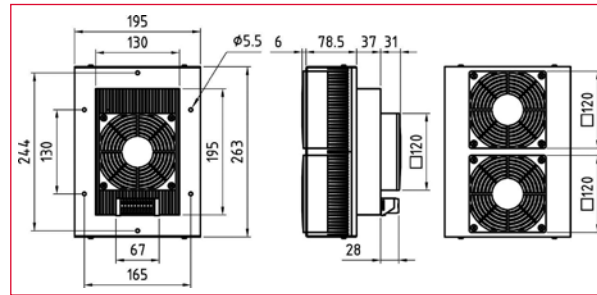


## Dimensions electric cabinet cooler

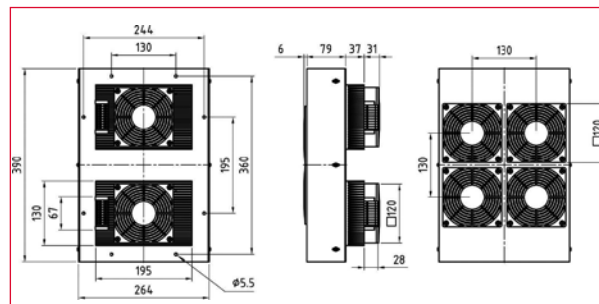
### Size 1



### Size 2

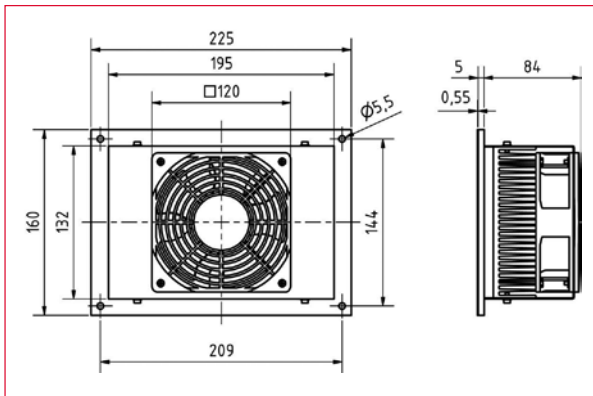


### Size 3

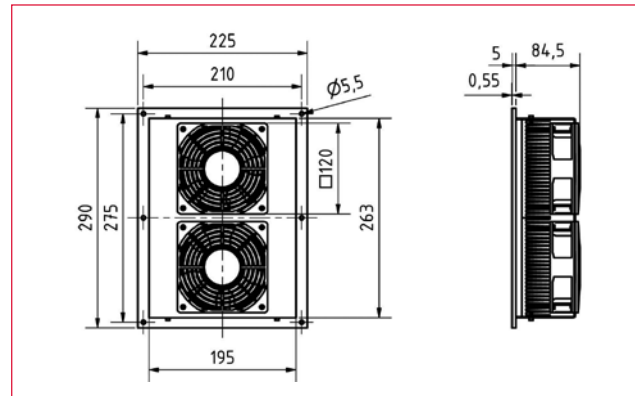


## Dimensions surface cooler

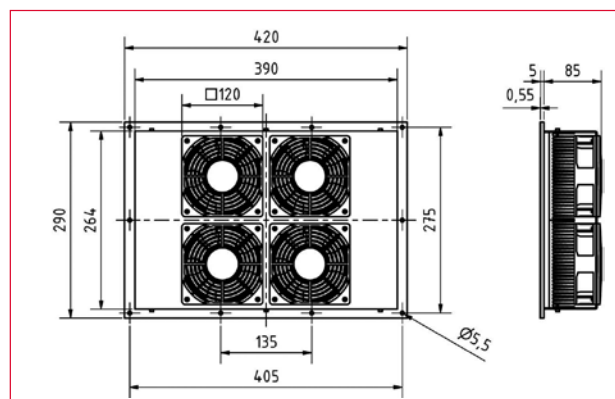
### Size 1



### Size 2



### Size 3



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## COMPRESSOR COOLING UNITS

- solutions for small and large cabinets
- high quality electronic
- FCKW-free refrigerant
- door-, wall-, roof-mounting

115V AND  
400V-VERSIONS ON  
REQUEST!



### Technical data series EGO

ORDER-NO.	SUPPLY VOLTAGE (V/Hz)	COOLING POWER EN814-A35A35 (W)	COOLING POWER EN814-A35A50 (W)	DIMENSIONS (MM)	MAX. CURRENT (A)	STARTING CURRENT (A)	FUSE T (A)	RATED POWER EN814-A35A35 (W)	RATED POWER EN814-A35A50 (W)	REFRIGERANT R134A (KG)	MAX. EXCESS PRESSURE (BAR)	AIR CAPACITY OUT/INSIDE CIRCULATION (M <sup>3</sup> /H)	NOISE LEVEL (DB (A))	WEIGHT (KG)
EGO04BT1B	230 / 50-60	380	240	285x460x180	1,6	6	4	280	330	0,11	26	280/280	60	17
EGO06BT1B	230 / 50-60	640	470	316x606x212	2,1	8,1	6	400	470	0,2	25	570/330	65	21
EGO08BT1B	230 / 50-60	820	680	348x783x215	2,6	10,8	6	440	490	0,21	25	570/330	65	27
EGO10BT1B	230 / 50-60	1000	790	348x783x215	3	10,5	6	570	650	0,23	25	570/330	65	28
EGO12BT1B	230 / 50-60	1250	910	405x999x237	3,8	11	6	650	760	0,38	25	860/570	65	38
EGO30BT1B	230 / 50-60	2900	2250	500x1270x336	8,2	37,4	16	1340	1560	0,84	25	1450/860	70	80
EGO40BT1B	230 / 50-60	3850	2870	500x1270x336	9,5	35,2	16	1710	1990	1,14	25	1450/1450	70	82

### Technical data series SKY

ORDER-NO.	SUPPLY VOLTAGE (V/Hz)	COOLING POWER EN814-A35A35 (W)	COOLING POWER EN814-A35A50 (W)	DIMENSIONS (MM)	MAX. CURRENT (A)	STARTING CURRENT (A)	FUSE T (A)	RATED POWER EN814-A35A35 (W)	RATED POWER EN814-A35A50 (W)	REFRIGERANT R134A (KG)	MAX. EXCESS PRESSURE (BAR)	AIR CAPACITY OUT/INSIDE CIRCULATION (M <sup>3</sup> /H)	NOISE LEVEL (DB (A))	WEIGHT (KG)
SKY10BT0B	230 / 50-60	1050	860	400x950x233	3,1	10,5	6	570	650	0,3	25	860/570	65	37
SKY15BT0B	230 / 50-60	1550	1200	400x950x233	5,3	18	10	880	980	0,44	25	1050/570	65	38
SKY20BT0B	230 / 50-60	2050	1560	400x1265x236	6,5	24	10	1080	1290	0,75	25	1050/860	65	60

### Technical data series DEK

ORDER-NO.	SUPPLY VOLTAGE (V/Hz)	COOLING POWER EN814-A35A35 (W)	COOLING POWER EN814-A35A50 (W)	DIMENSIONS (MM)	MAX. CURRENT (A)	STARTING CURRENT (A)	FUSE T (A)	RATED POWER EN814-A35A35 (W)	RATED POWER EN814-A35A50 (W)	REFRIGERANT R134A (KG)	MAX. EXCESS PRESSURE (BAR)	AIR CAPACITY OUT/INSIDE CIRCULATION (M <sup>3</sup> /H)	NOISE LEVEL (DB (A))	WEIGHT (KG)
DEK04BT0B	230 / 50-60	410	240	259x264x486	1,5	4	4	270	315	0,17	26	330/235	60	18
DEK08BT0B	230 / 50-60	820	680	340x340x600	2,9	12	6	510	560	0,31	25	860/570	62	23
DEK12BT0B	230 / 50-60	1150	900	401x415x567	3,2	11	6	550	660	0,63	25	1010/570	65	40
DEK15BT0B	230 / 50-60	1550	1200	401x415x567	4,5	18	8	810	930	0,8	25	1820/860	65	44
DEK20BT0B	230 / 50-60	2050	1560	401x415x567	6	24	10	1190	1300	1,05	25	1820/1050	65	50
DEK30BT0B	230 / 50-60	2900	2250	492x496x797	8,2	38,4	16	1350	1610	1,26	25	3410/860	75	80
DEK40BT0B	230 / 50-60	3850	2870	492x496x797	9	38,2	18	1690	1950	1,8	25	3410/1450	75	83

## Pictures

### Series EGO



### Series SKY



### Series DEK



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Version 1.0  
Stand 12/17

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