ANTI-CONDENSATION HEATER

Heating elements for dehumidification of sealed switchboards and control cabinets.

The increased demands on energy saving have resulted in development of components with a low power consumption. The old heat generating coils and relay, have been replaced by constructions with low heat loss and new technology. It results in development of small and compact components which causes increasing problems with moisture and condens.

Electronics will continue to be the preferred solution to control and regulation tasks and these often complex constructions, with small creepage distances on print, are very sensitive to moisture and variation in temperature.

In switchboards and cabinets the problem with moisture is solved by increasing the temperature with a few degrees above the surrounding temperature. The result is a dry cabinet without damaging the components inside.

Due to temperature limitations on e.g. print and plastic cabinets, it is important to use a heating element with a large surface and thus low surface temperature. The anti-condensation heater is designed to meet these properties. The temperature limit (approx. 65°C) is integrated into the construction, and the small physical dimensions enables installation in most cabinets and switchboards.

The cooling fin profile has an optimal surface in relation to heat transfer in circulating airflow. The element is made of black anodized aluminium which optimises heat conduction and emission.

The anti-condensation heater is supplied with temperature limit or as a self limiting construction where, a PTC element supplies the profiles with power according to the surrounding temperature.

HEATING ELEMENT IN EXTRUDED STAR-SHAPE

The profile is made of anodized aluminium and is designed for direct mounting into the cabinet.
The element can be mounted on DIN rail by using special suspension fittings (must be ordered separately). This type has a very high emission of heat in relation to the small physical measurements. Cable length 0.5m.

ATEX APPLICATION

HEATING ELEMENT IN EXTRUDED DOUBLE PROFILE

The profile is made of anodized aluminium. The double profile ensures a low and uniform surface temperature. Can be supplied in two profile lengths. Cable length 0.5m.

INSTALLATION

The anti-condensation heater must always be mounted with the cooling ribs in vertical position. The best circulation is achieved by placing the heating element at the lower part of the cabinet.

Due to the elements low surface temperature, the position in relation to other components in the cabinet is not critical. Although it is recommended to maintain 5cm free space on the sides and 3cm free space to the bottom due to air circulation.

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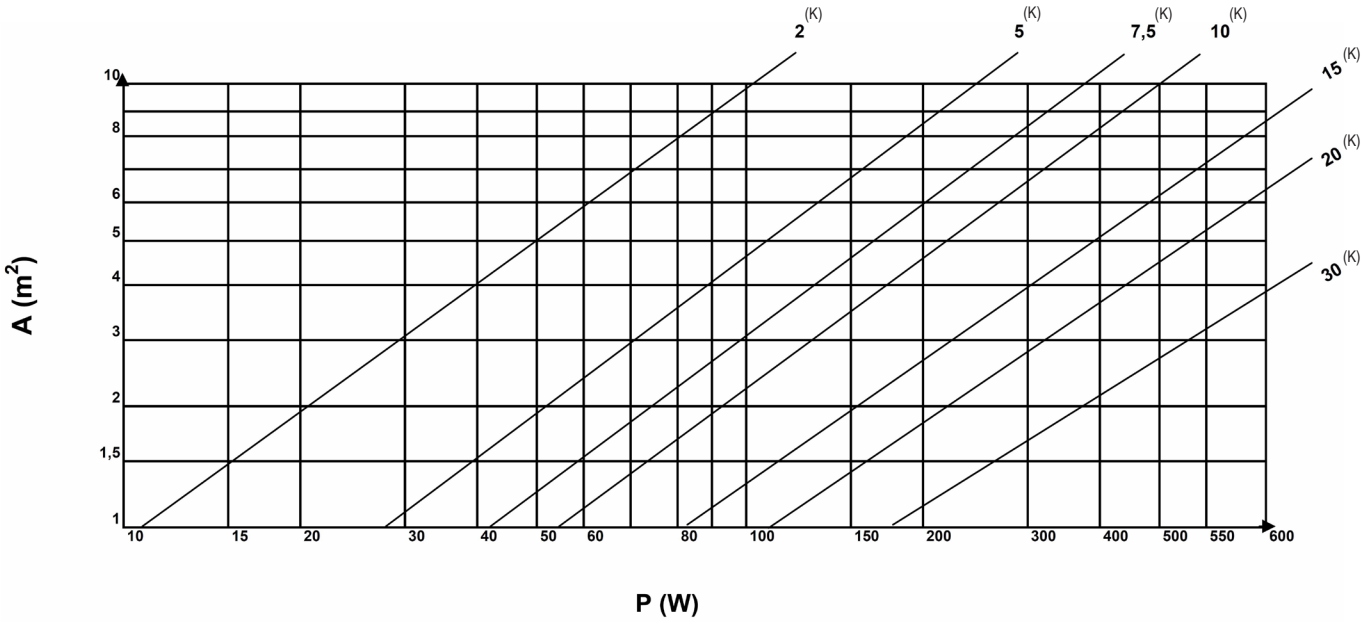
CALCULATION OF OUTPUT



Placed in static air:

Heat loss factor: k=5.5W/m² x ΔT

Placed in an airflow:

Multiply output demand (P_B) by a factor 2-3

EMISSION OF HEAT

A cabinet gives off a certain amount of heat to the surroundings through the surface. To calculate this amount up to a temperature difference of ΔT = 50°C the following factors are important:

1. Efficient cabinet surface (A)
2. Heat loss factor depending on the building material of the cabinet
3. Air cooling factor (K) around the cabinet (at the installation location)
4. Output emitting components in the cabinet (PW)

These factors only result in the efficient surface. Sections 3 and 4 can only be estimated.

For painted cabinets indoor in static air a medium heat loss factor of 5.5 W/m² x ΔT is assumed.

CALCULATION

The necessary output can be found by calculating:

$P_B = P_S - P_V$

$P_S = K \times A \times \Delta T$

P_B = Necessary output

P_V = Any installed self-heating in the cabinet

P_S = Heat loss through cabinet surface

K = Heat loss factor (W/m² x ΔT)

A = Efficient cabinet surface

ΔT = Requested temperature in the cabinet in relation to the surrounding temperature

Example:

P_V = OW (output when system is off)

K = 5.5 W/m² (in static air)

A = 1.7m²

ΔT = 10°C

P_S = 5.5 W/m² x 1.7 m² x 10°C = 93.5W

P_B = 93.5W - OW = 93.5W

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STANDARD PROGRAM

Item no.	Type	Voltage	Power	Size LxWxHmm	Degree of protection	Profile
60000220	PTC	120-240V	8W	30x25x12.5	IP32	
60505005	PTC	12-48V	15W	75x72x57	IP55	Star-shape
60505013	PTC	110-240V	15W	75x72x57	IP55	Star-shape
60505021	OHM	230V	75W	145x72x57	IP55	Star-shape
60900020	Ex T4	230V	100W	100x54x54	IP66	Star-shape
60505039	PTC	12-48V	20W	100x116x33	IP55	Double
60505047	PTC	110-240V	20W	100x116x33	IP55	Double
60505054	PTC	220-440V	20W	100x116x33	IP55	Double
60505062	PTC	12-48V	40W	250x116x33	IP55	Double
60505070	PTC	110-240V	40W	250x116x33	IP55	Double
60505088	PTC	220-440V	40W	250x116x33	IP55	Double
60505096	OHM	230V	100W	250x116x33	IP55	Double
60505104	OHM	230V	160W	250x116x33	IP55	Double

Item no.	Type	Length
09600227	Bracket for anti-condensation heater	115 mm
09600252	Bracket for Ex anti-condensation heater	90 mm
09600244	Bracket for anti-condensation heater	72 mm
09600610	Bracket for anti-condensation heater (long version)	72 mm

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