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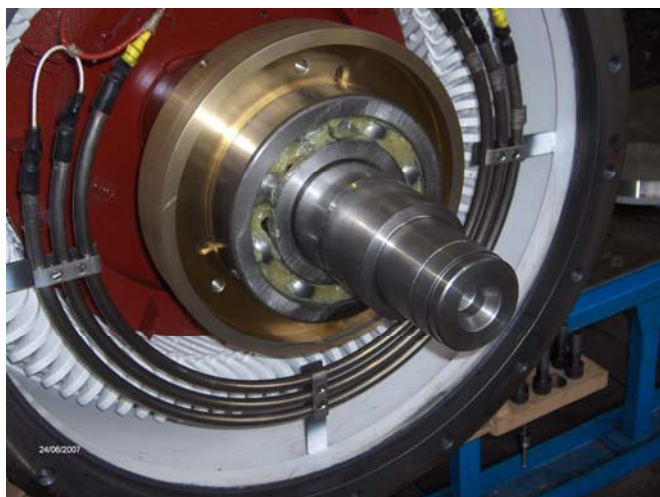
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Технические характеристики на взрывобезопасные элементы (электронагреватели трубчатые EX-E) КОМПАНИИ MASTERWATT

SINGLE ANTICONDENSATION HEATERS

In some cases the areas where condensation shall be prevented are characterised by a narrow size and a complex shape which prevent to select the heaters shown in pages 10 or 9. This is typically happening within the casing of explosion-proof motors.



At the same time, the heating need is normally very limited in these cases since the air volume affected is really small. On the contrary, the need is to keep the surface temperature to very low values, without requiring dedicated control systems, since this would affect adversely the plant cost and complexity.

In these cases the ideal solution is represented by single armoured heaters manufactured in accordance with the “increased safety” Ex e requirements. They are simple smooth or finned (depending on the heat exchange needs) heating elements which are characterised by a very low specific heat (normally below 0.1 W/cm^2). Also the total power is very often quite limited (few hundred watts in most cases).

Thanks to this design feature, these heaters can reach naturally stable operational temperatures which are quite low:

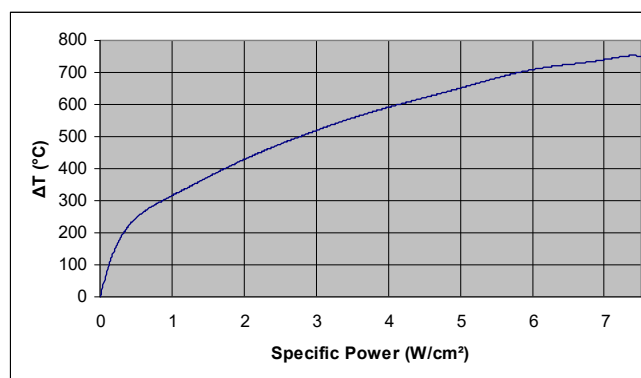
- from $20 \text{ }^\circ\text{C}$ to $60 \text{ }^\circ\text{C}$ (about) in terms of granted ambient temperature
- from $100 \text{ }^\circ\text{C}$ to $200 \text{ }^\circ\text{C}$ (max) in terms of sheath temperature

The real operational ambient temperature and sheath temperature for a given application depends by the thermal balance conditions of the case in question. In fact, the temperature reached will be the one which results in a thermal power loss towards the external environment that equals the heating power delivered by the heater.

As a consequence of the above, only the manufacturer of the assembly where the anticondensation heater is inserted can define the thermal equilibrium conditions and the consequent temperature class.

Masterwatt is however ready to provide support to its customer in the conduction of this important task. Under this respect Masterwatt has collected, during several test campaigns performed in its laboratory, a set of experimental data which relate the ambient temperature and the heater sheath temperature as a function of the heater specific power (see, as an example, Figure 9).

Figure 9: ΔT between ambient temperature and sheath temperature for heaters in static air as function of the specific power



NOTE: ΔT values in the range $0 \div 0.8 \text{ W/cm}^2$ are obtained interpolating the experimental data

It is for this reason that this family of heaters, differently from all other explosion-proof heaters produced by Masterwatt, is provided of a component certification and not of an assembly one. In fact, it is a responsibility of the plant manufacturer to prove to the Certification Body that its plant, intended as a unique assembly, complies to the applicable prescriptions. In addition, he has to define, based on adequate thermal analyses or thermal tests, the pertinent temperature class of the plant. This, in turn, depends on the thermal behaviour of the heater and on the heat exchange conditions which affect the overall behaviour of the plant itself.

It is undoubtedly a complex task. When coping with it, the plant manufacturer can rely:

- on the “increased safety” construction of the heater:
 - ATEX certificate n° EPT 17 ATEX 2629 U
 - IECEx certificate n° EUT 17.00010U
 - marking II 2G Ex eb IIC T...
- on Masterwatt cooperation for the definition of the plant temperature class

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