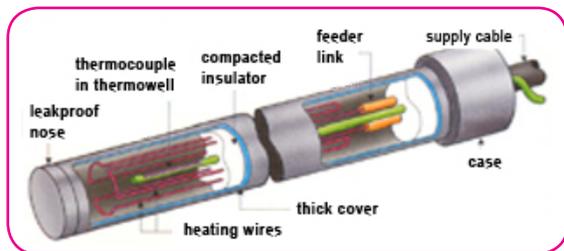


High Flux Heater type Compatherm

The high thermal flux shielded resistor technology derives from research carried out at the French Nuclear Studies Centre in Grenoble as part of the thermohydraulic investigations carried out into the cores of nuclear reactors. The specific nature and reliability of this technology have found ready-made applications in the world of industry with performances capable of solving most of the heating issues in places where conventional technologies reach their limits.

Applications

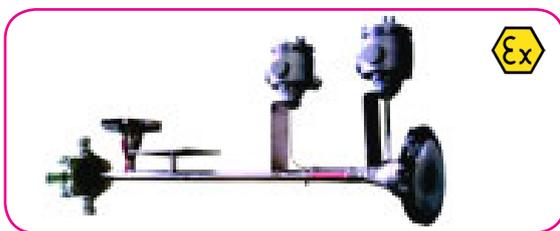
COMPATHERM is designed to heat liquids and gases. It heats a fixed or variable flow of fluid up to 750°C continuously at high pressure levels up to 250 bar.



COMPATHERM High Flux Heating Element

Construction

Construction consists of a refractory steel or stainless steel tube with two ports for flanged connections to the inlet and outlet of the fluid to be heated. It contains one or several high flux technology heating rods. COMPATHERM are supplied from DN20 (3/4") to DN600 (24"), with 1 to 61 pieces "high flux" heating rods with an output up to 2.5MWatt. The heaters are supplied with temperature sensors for temperature control and safety (Pt100, thermocouple).



COMPATHERM Explosion Proof Heater

COMPATHERM units are built in compliance with 97/23/EC Pressure Equipment Directive, as per article 3 §3 categories I to IV. According to your requirement, they can be ATEX 94/9/CE protection EEx d II C certified and mounted on a skid with a full power and control system.

Temperature control

Temperature control of the COMPATHERM heater is done with a thermocouple or Pt100 with the sensor tube in the medium at the outlet of the heater.

The power can be controlled with an electronic PID-controller via Solid State Relays or a thyristor.



COMPATHERM Heater with Control Panel

The different temperature sensors are connected to a controller and alarm unit which are built in a control panel. Enon can supply the COMPATHERM heater including the control panel.

Temperature safety

The COMPATHERM heater has one or more high flux heating rods with one or more integrated thermocouples type K. This thermocouple is for guarding the maximum element temperature. When there is no flow of the medium, the temperature of the heating rod will rise. The thermocouple will detect immediately even the smallest temperature rise. If the element temperature rises above the maximum allowed element temperature, the heater will be shut down automatically. This prevents the elements for damage and for overheating of the medium.

As an extra safety the surface temperature of the vessel can be guarded with a temperature sensor. This is normally done with explosion proof heaters. Via a thermocouple which is clamped upon the vessel the surface temperature of the vessel can be measured and guarded. The heater will be shut down when the vessel temperature reaches a maximum temperature level.

Advantages in comparison with tubular heating elements

- The COMPATHERM heaters watt density is between 0,5 and 80W/cm². The insulation material which is used between the heating wire and tube is boron nitride. Boron nitride has a better thermal conductivity as magnesium oxide, which is used by standard tubular elements. Because of this, the temperature difference between heating wire and tube surface is less as with standard tubular elements (a higher temperature difference increases burning of the heating wire).
- A COMPATHERM heater equipped with only one high flux element can be supplied with an output up to 80kW.
- Longer life time because of:
 - the heating wire is made of high quality material and the low temperature difference between heating wire and tube surface is small, which allows surface temperatures up to +1000°C.
 - the heating rods have a bigger wall thickness and therefore a better resistance against corrosion.
 - using more heating wires in only one heating rod.
 - high crushing strength and shock resistance, even when hot.
- As a result of the high watt density the heaters are very compact.
- High speed medium flow, because of the compact building. Therefore the outside surface temperature of the vessel is much lower in comparison with the use of tubular heating elements. This is a big advantage by building explosion proof process heaters, where low surface temperatures are very important, to comply to a certain temperature class (T1...T6).
- In comparison with a process heater with tubular heating elements a COMPATHERM heater has with the same power, a lower internal volume. A relative low medium volume is in contact with a relative big heating surface, through which a temperature difference in the outlet can be measured much quicker.
- A big advantage of the small inner volume in many cases is, there can be supplied according PED 97/23/EC art. 3 §3. By using tubular heating elements with an identical power the heater will be much bigger and an "expensive" Notified Body is mandatory to comply to category II, III of IV of the PED 97/23/EC.
- With explosion proof applications, even temperature class T6 (+85°C) is possible because of the low vessel surface temperature. Therefore it is not needed

- to build a big heater or even use several heaters to guarantee a low vessel surface temperature.
- As a result of the compact building concept in many cases the COMPATHERM heater is cheaper as the pro-cess heaters equipped with tubular heating elements.



COMPATHERM Heaters for water, 40kW 40barg 120°C



COMPATHERM Explosion Proof Heaters

Other products

- Heating Elements
- Space Heaters
- Proces Heaters
- Explosion Proof Heaters
- Road & Ramp Heating
- Under Floor Heating
- Tracing
- Measuring & Temperature Control Equipment

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