



**ENGINEERED
ELECTRICAL HEATING AND COOLING
SOLUTIONS FOR THE INDUSTRY**

www.vulcanic.com



Vulcanic

The Vulcanic group has been designing and manufacturing safe and hazardous area electrical process heating and temperature control solutions since 1973. Employing 550 people across 8 manufacturing locations, Vulcanic currently services 30 000 customers in 100 different countries across the globe and is an ISO 9001 v 2008 accredited company.



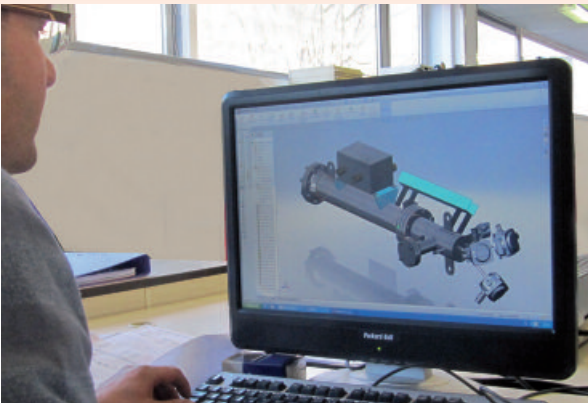
Engineered Projects

Our engineering projects division is a world leader in the design and manufacture of electrical process heating and temperature control solutions, to meet the requirements of varying customer specifications and international standards. Our extensive experience spans many industries and extreme environments in both on and offshore locations.

Design Expertise

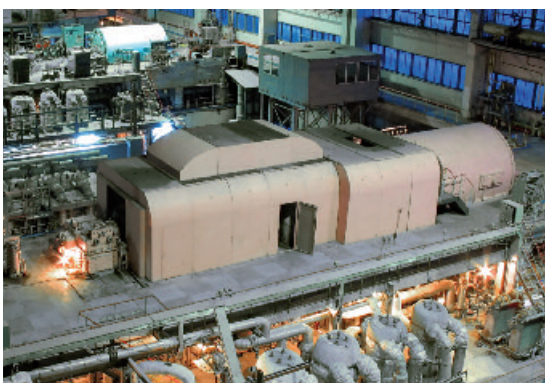
Vulcanic design teams support our partners from conceptual design and feasibility study throughout the life cycle of the equipment. Our design capabilities include:

- Process heater design
- Electrical design
- Mechanic design
- Hazardous area certification
- Thermal design
- Electronic design (hardware and software)
- Temperature Control design



Industries Served

- Oil and Gas
- Petrochemical
- Power Generation
- Nuclear
- Industrial Gas production
- Chemical
- Pharmaceutical
- Marine
- Aeronautical
- Rail Transportation
- Alternative Energies



Typical Applications

- Fuel gas conditioning
- Fuel oil forwarding
- TEG Dehydration
- MEG Dehydration
- Hydrocracking
- Isomerization
- Continuous Catalyst Regeneration (CCR)
- Hydrotreating (HDT/HDS)
- KO Drum
- LNG heating and vaporizing
- Industrial gases (eg O₂,N₂,H₂,CO₂)
- Air separation
- HVAC
- Lube oil preheating
- Seal gas heating
- Gland steam heating
- Heat transfer fluids
- Heat transfer salts
- Radioactive waste water treatment (TEU)
- Primary effluent treatment (TEP)





SOME CUSTOMISED SOLUTIONS



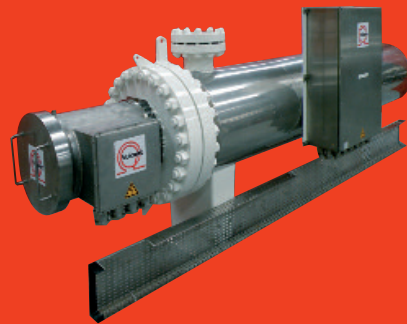
- Lube oil tank heater
- 23 kW - 45°C
- ATEX certification : II 2 G Ex e II T6



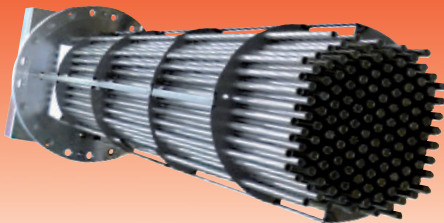
- Seal gas super steam heater unit
- Cyclon drop separator
- 260 kW - 320°C - 16 bar g
- Design code : ASME



- Seal gas heater
- 45 kW - Natural gas - 239 bar g
- ATEX and IECEx certification : II 2 G IIC T3
- Ex d high flux heating rod



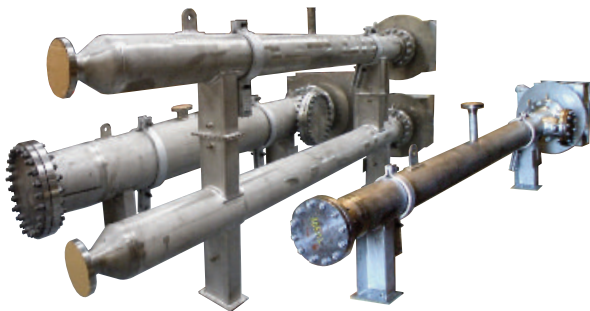
- Offshore fuel gas heater
- 1 490 kW - ND 24" - 49 bar g
- ATEX certification : II 2 G IIC T3
- Heater : II 2 G Ex de IIC T3
- Junction box : II 2 G Ex e II T3



- Flange heater for large oil tank
- 248 kW - ND 20"
- Withdrawable heating rods
- Gost R certification



- Suction line heater
- 680 kW - ND 28" - 45°C
- Design code : ASME
- ATEX certification : II 2 G Ex e II T3

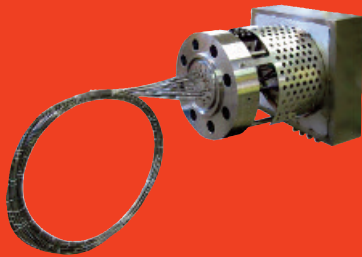


- Flow heater package for CCR's regenerator
- Heating capacity from 77 up to 1380 kW
- Air/N2/H2 heating up to 565°C - 10 bar g
- ATEX certification : II 2 G IIC T3

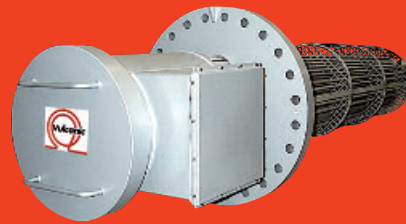


- Power control panels from 150 up to 2500 A for CCR heaters
- 100% power controlled by thyristors.
- Incoming / outgoings protected by MCCB

SOME CUSTOMISED SOLUTIONS



- Hydrotreater/Hydrocracker temperature measurement
- 24 individual flexible thermocouple flanged assembly
- 6" 2500# RTJ flange, 444°C - 204 bar g
- ATEX certification : II 1 G Ex ia IIC T3



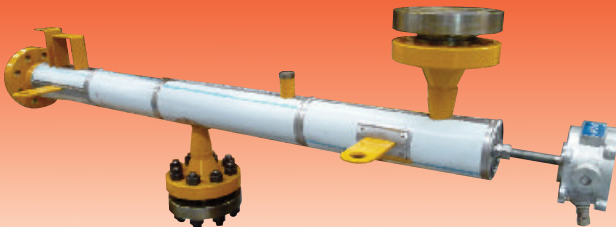
- Immersion flange heater for TEG reboiler.
- 500 kW - 204°C - 3 bar g
- NACE MR0175/ISO15156-3 compliance.
- ATEX certification : II 2 G Ex de IIC T3



- Onshore LNG vaporiser
- 380 kW - 4 x ND 8" - 300°C - 18 bar g
- Design code : CODAP
- ATEX certification : II 3 G IIC T390°C
- PED certification : 97/23/EC - Cat IV



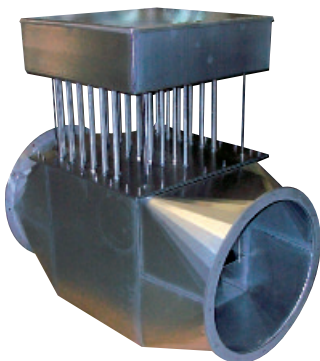
- Power panel 1 100 A
- Combination thyristor / step contactor control
- PLC monitoring



- Natural gas flow heater before pressure reduction station
- 20 kW - 40°C - 229 bar g
- ATEX certification : II 2 G IIC T3
- Ex d High flux heating rod



- Air separation unit regeneration heater
- 960 kW - 0,1 bar g - 290°C
- Low pressure drop design (< 20 mbar)
- Design code : AD 2000



- Air duct heater
- 105 kW - 480°C - 0,5 bar g

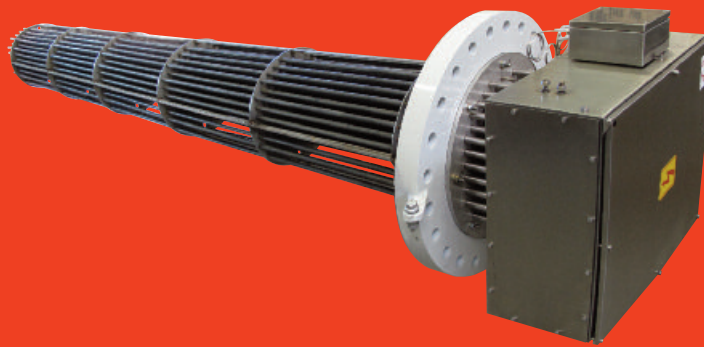


- Air heaters - Air convectors - Fan air heaters
- Seismic level 1-2-3
- Safety Quality Class 2-3



Flanged Immersion Heaters

A range of flanged immersion heaters, designed for tank or vessel heating.



Process Flow Heaters

A range of flow heaters designed to heat circulating liquids or gases, in a closed loop circuit or continuous process.



Features

- Liquid, gas or emulsion static or flow heating applications
- Heating capacities up to 7 000 kW
- Baffle assemblies designed to suit static or flow heating applications and to control heat transfer and pressure drop
- Supply voltages up to 700 VAC
- Heat densities up to 12 W/cm²
- IP rating up to IP66
- Vertical or horizontal mounting

Certification

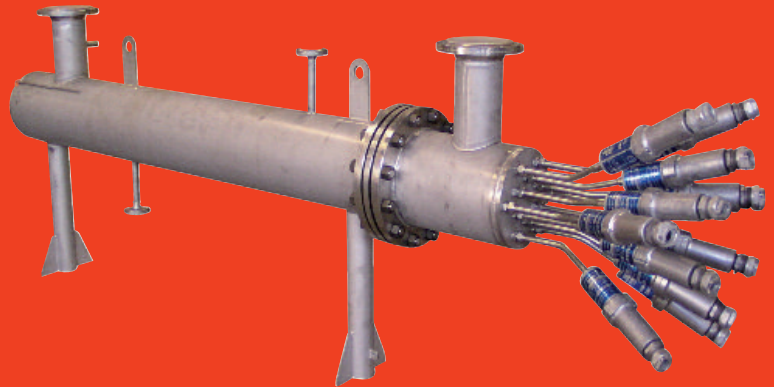
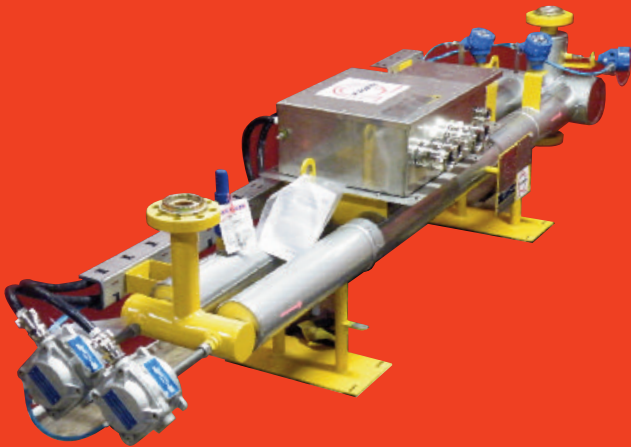
- 97/23/EC PED cat I-IV
- 94/9/EC ATEX
- II 2 G Ex d IIC T1 to T6
- II 2 G Ex de IIC T1 to T6
- II 2 G Ex e II T1 to T6
- IECEx
- GOST
- CCOE

Design

- AD 2000
- ASME
- CODAP
- EN 286
- PD 5500
- RCC-M / RCC-E
- STOOMWEZEN

COMPATHERM Technology

COMPATHERM heating elements are unique to Vulcanic and offer an advanced, effective heating solution for high pressure and high temperature applications. Compatherm offers significant benefits over other methods of direct electric heating.



Advantages of COMPATHERM

- Compact
- Excellent heat transfer / low inertia
- Heat density 0,5 to 80 W/cm²
- Removable heating rods
- ATEX certification II 2 G IIC T1 to T6
- 97/23/EC PED compliance

Applications

COMPATHERM is designed to heat liquids and gases, in fixed or varying flow conditions. The technology is suitable for heating processes up to 750°C at pressure levels of up to 250 bar and is particularly effective for low flow rate applications.

The process fluid circulates within an annular space around the heating element, which greatly improves the heat transfer. The heating elements can be designed with flux densities up to 80 W/cm², resulting in an extremely compact design. The technology is therefore ideally suited to applications where there are space and weight limitations.

For higher power requirements multiple rods can be installed within a process vessel to achieve duties up to 2 500 kW.





Process Duct Heaters

A range of duct heaters designed to heat flowing air or industrial gases at low operating pressures, in a closed loop circuit or continuous process.

Features

- Heating capacities up to 3 000 kW
Supply voltages up to 700 VAC
- Outlet temperatures up to 650°C
- IP rating up to IP66
- Individual heating element replacement
- Rectangular or circular flange connections
- Reinforced design for harsh environment

Certification

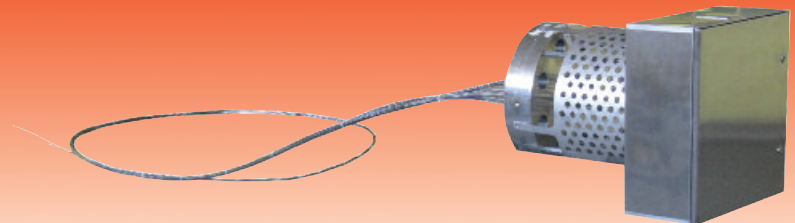
- ATEX certification II 2 G Ex e II T1 to T6
- Seismic design level 1-2-3
- Nuclear safety quality class level 1-2-3



Multipoint Flexible Thermocouple Assemblies

A range of multipoint assemblies used for simultaneous measurement of temperature, at different locations and elevations within a process.

Applications include measurement of critical temperature profiles in reactors, regenerators, catalyst beds, distillation columns and furnaces.



Features

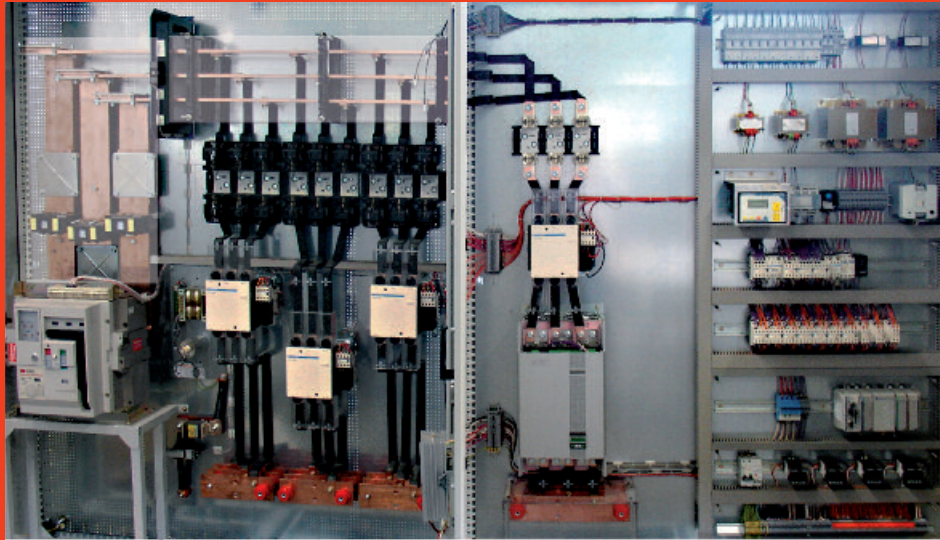
- Up to 36 individual thermocouples sealed with high pressure sealing glands
- Pressure and temperature conditions up to 300 bar and 500°C
- Nozzle or remote wall-mount enclosure
- Thermocouples outer diameter from 3 to 8 mm
- Compliance with ANSI MC96.1 and ASTM E230 or IEC 584
- Easy individual replacement of thermocouple
- Global package available with reactors supports

Certification

- ATEX certification
II 2 G Ex d IIC T1 to T6
II 2 G Ex e II T1 to T6
II 1 G Ex ia IIC T1 to T6
- IECEx
- GOST
- CCOE

Electrical Heater Control Expertise

The performance of an electrical process heater is only as good as the system controlling it allows. Vulcanic offers extensive experience in the design and manufacture of power control systems, with many of the core control components being manufactured directly by ourselves. Our control systems are CE marked, compliant with the EU directives for low voltage equipment 73/23/EC and electromagnetic compatibility 89/336/EC.



Power Control Modes

- Controls systems for 0-100% power turndown
- Thyristor power controllers
- Zero crossover single cycle or burst firing
- Phase angle firing
- Step contactor control
- Combination thyristor/step contactor control
- Load splitting

Specifications

- Stainless steel
- Mild steel painted
- Ex 'p' purged enclosures
- Ex 'd' flameproof enclosures
- Up to IP55 ingress protection

Control Methods

- PID controller
- Programmable logic controller
- Closed single or multi loop control
- Remote control using field bus
- Modbus, Profibus, Devicenet or similar

Safety Devices

- Safety control of process variables such as temperature, pressure, flow and level
- Earth leakage
- Interconnection with plant ESD system
- Over or under voltage
- Partial load failure
- Modbus, Profibus, Devicenet or similar





Manufacturing

Vulcanic offers the benefits of integrated "in house" manufacturing processes, using "state of the art" equipment to manufacture the electric elements and virtually all other components utilised within our product ranges. With only minimal dependence upon subcontractors for certain specialist requirements, we remain in full control of all production schedules throughout the contract execution process.

In House Capabilities



Heating element manufacturing



CNC machining



Sheet metal cutting and bending



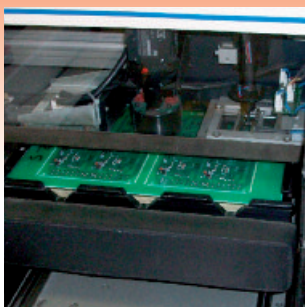
Sensor manufacturing

Testing

- NDT: DPI, MPI, X-Ray, Ultrasonic, PMI
- Hydrostatic
- Helium leak test
- Insulation resistance
- High voltage dielectric
- Harmonic test
- Waveform test
- Load test (power controls)
- Functional



Welding



Converter and controller manufacturing



Cabinet wiring



Wiring

Complete Supply

- In house manufacturing
- Technical design support
- Dedicated project teams
- After sales support services
- On site commissioning and start up assistance

Vulcanic is the proven partner to meet your expectations.

A selection of customer references



- ABB
- ADCO
- AIR LIQUIDE
- AIR PRODUCTS
- AKER PROCESS SYSTEMS
- ALSTOM
- AREVA
- AXENS
- BP
- CPCL
- DCN
- DESMO
- DONGFANG BOILER GROUP
- DSME
- EDF
- EIED
- EXXON MOBIL
- FOSTER WHEELER
- GENERAL ELECTRIC
- GS ENGINEERING
- IFP
- INDIAN OIL CORPORATION (IOCL)
- KELLOGG BROWN AND ROOT (KBR)
- LARSEN & TOUBRO
- LINDE
- LUKOIL
- LURGI
- MAN
- NEXEN
- NIOC
- PDVSA
- PETROBRAS
- PETROCHINA / CNPC
- PETROFAC
- PETRONAS
- PUNJ LLOYD
- QATAR PETROLEUM
- SAIPEM
- SASOL
- SAUDI ARAMCO
- SHANGHAI ELECTRIC
- SHELL
- SIEMENS
- SINOPEC
- TAKREER
- TAQA
- TECNICAS REUNIDAS
- TECHNIP
- TECNIMONT
- TOTAL
- UHDE



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ALL IN ONE SOLUTIONS