

# Unlock Your Ability to Electrify Larger Thermal Loads

with POWERSAFE<sup>™</sup> Medium Voltage Integrated Heater and Control System

**POWERSAFE<sup>™</sup>** is a medium voltage electric thermal solution that offers longer heater life and reduces the downtime associated with fossil fueled equipment by fully integrating a safe and reliable electric heat exchanger and control system with unique design to lower coil temperatures.

As your process requires higher power, **POWERSAFE** lowers the overall installation and capital expense by eliminating the need for additional cabling and step-down transformers that is typical with lower voltage systems. If you are looking for a safe and reliable way to reduce your carbon footprint and eliminate the need for fossil fueled equipment, Watlow's **POWERSAFE** offers a unique and efficient integrated system design with smaller footprint that aligns with your sustainability and net-zero goals.

## Features and Benefits

### Operates safely and reliably up to 5000V

- Eliminates the need for costly step-down transformers typically required with lower voltage systems
- Operates at low current allowing for up to 90% reduction in cable costs

### Fully integrated thermal control system

- Delivers reliable and safe operation
- Integrates a full thermal system including an electric heat exchanger, process controller and power system
- Includes isolated low voltage enclosure for heater control system and DCS communications



- **Flexible combination of SCR/contacter circuits up to 15MW**
- Delivers high-efficiency power > 99%
- Reduces overall size and weight of power controller solution

### Available power feeder with high speed protective relay and E-Fuse

- Offers rapid shut down protecting personnel and equipment

### Includes safety interlocks in controller and heater

- Provides safety while in service and security during operation

### Zero-cross SCR control

- Offers low electromagnetic interference

### Heater sizes from 16NPS to 36NPS

- Supports heating systems up to 100MW+

### Heater lengths up to 20 feet for design optimization

- Consolidates heat exchangers and reduces number of vessels
- Allows for smaller and lighter heat exchangers

## Features and Benefits (cont)

### Enhanced fluid dynamics and optimized film temperature proprietary technologies

- Provides advanced flow throughout the system improving heat transfer
- Allows vessel to perform consistently at shorter lengths

### Patent-pending medium voltage heater busing system

- Provides ease of connection and service
- Provides the required creepage and clearance distances
- Eliminates partial discharge to ensure high reliability
- Accommodates heater spares

### Patent-pending replacement of 180° hairpin bend

- Eliminates single-ended element with power and return pins in close proximity
- Isolates power and return pins at sealed termination

### Double epoxy sealing method to prevent IR degradation over time

- No bake-out needed. (validated the IR to stay above 1 GigOhm after 6 months of testing in humidity chamber)

## Thermal System Specifications

### Control Specifications

#### SCR Power Controller

- Up to 5000VAC 300A (max) 3-phase, 3 controlled legs
- SCCR/Arc Flash rating: 50kA at 1 sec
- Integrated fuses to meet customer amperage
- Zero-cross PVM burst firing
- Forced Air N+1 redundant SCR cooling fans
- Cooling load approx. 8.5W per amp of load current

#### Arc Fault Management

- Optical arc sensing with signaling to feeder

#### Arc Fault Signaling Delay

- 7 milliseconds

#### LV/MV Isolation

- SCR firing: optical fiber isolation
- Feed monitoring: high-impedance resistive divider or potential transformers

#### 120VAC Control Power

- Internal CPT or external (model dependent)

#### MV Feed Connection

- Bottom-entry cable, or bus bar (from feeder panel)

#### MV Load Connection

- Bottom-exit cable

#### Load Monitoring

- Phase current measurement
- Ground fault
- Current imbalance

#### Power Circuit

- 300A SCR
- Up to 1200A total
- Up to 260A for each SCR cabinet
- Up to 300A for each Contactor cabinet
- Overcurrent protection devices
- Arc Flash detection

#### Incoming Power Feed

- Manual disconnect with Lockout/Tagout
- Mechanical and electrical safety interlocks
- Line voltage measurement

#### Connectivity

- Ethernet 10BaseT with Modbus® TCP
- Select Analog and Digital I/O from a standard list

#### Process Limit Inputs

- TC, RTD, 4-20mA, 0-10V

#### Process Inputs

- 4-20mA

#### Power Controller Certification Approval and Regulatory

- UL 347 (non-hazardous)

### Additional Heater Information

#### Flange Heater Agency Approval and Regulatory

- Ordinary and Class 1, Div. 2 Groups B, C and D
- IEC Ex 'eb' and IEC Ex "db"
- Designed and stamped to ASME Code

#### Flange Heater

- ANSI compatible
- Elements certified to UL 1030
- 4800VAC 3-phase
- Multiple unit configurations: Parallel, in series or a combination of these

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