

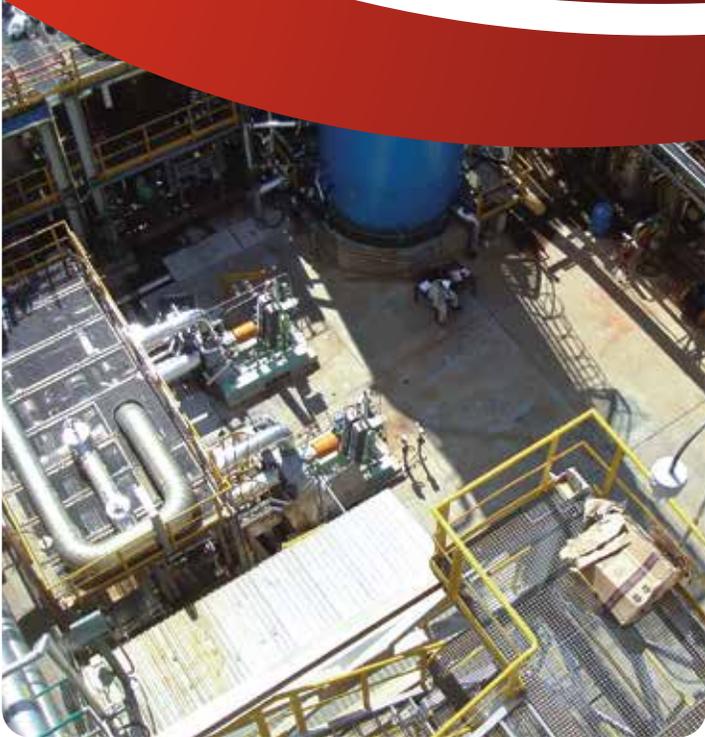


CONTROL AND MONITORING FOR PROCESS HEATING SYSTEMS





CONTROL AND MONITORING FOR HEAT TRACING SYSTEMS



In today's plant environments, control and monitoring plays an essential role in heat tracing system performance. Whether freeze protecting water lines or maintaining critical process temperatures, Thermon control and monitoring systems can ensure accurate temperatures, conserve energy, avoid costly down time and extend system life.

While mechanical thermostats have been used successfully for many heat tracing applications, most industrial heat trace applications require a more complete, advanced control and monitoring solution.

Thermon provides a full line of industry leading control and monitoring systems to meet the most demanding heat trace requirements. With conventional thermostats and multi-circuit microprocessor controllers, Thermon offers the engineering expertise and total system solution to meet any demanding heat trace requirements tailored to YOUR plant applications.

THERMOSTATS

AMBIENT SENSING

Conventional ambient sensing controls typically include a thermostat and a mechanical contactor to energize multiple heaters with a common thermostat.

Common Plant Use: Freeze Protection / Winterization.



Mechanical Thermostat



Electronic Thermostat

LINE SENSING (DISTRIBUTED) CONTROL

Line sensing controllers are used for more accurate temperature maintenance and can also be adapted for high and/or low temperature alarms. A typical heating circuit with line-sensing control is more energy efficient than conventional ambient sensing control.

Common Plant Use: Accurate Temperature Maintenance and Critical Process Lines.



Bulb and Capillary
Mechanical Thermostat



Electronic Thermostat
with RTD Sensor

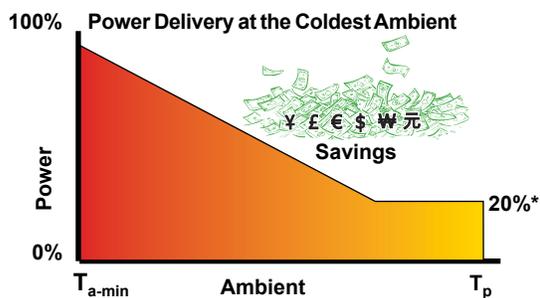
ELECTRONIC CONTROL FOR CENTRALIZED SOLUTIONS

Microprocessor-based electronic control and monitoring systems can be used for winterization and process maintenance applications. Theron offers multiple control and monitoring options for heat trace circuits, including ambient sensing, APC, line sensing, on/off, and proportional.



Ambient Proportional Control (APC) uses logic to deliver 100% of the power at only the lowest possible ambient, and proportionally reduces the power delivered as the ambient rises. APC reduces operating costs up to 80% when compared to conventional ambient control for winterization. Higher process temperatures can also be controlled with APC. This approach may not reduce operating cost, but can reduce the number of heat tracing circuits, which reduces the installed cost of otherwise complex electric heat trace systems.

Ambient Proportional Control (APC)



T_p = Pipe Maintain Temperature

T_{a-min} = Minimum Ambient Temperature

* **Note:** No less than 20% power delivery when energized to maintain electrical current monitoring functions.

Theron controllers provide soft start and delayed start functions for specific systems to distinguish and prioritize critical service circuits on large systems. This minimizes in-rush current impact on large systems and provides additional energy management functions and value. Theron electronic control systems can also communicate directly with PLC and DCS systems. The versatility of TraceNet™ Command and its capabilities of cataloging electric heat tracing isometrics and other custom files makes this system widely sought.

CENTRALIZED SURVEILLANCE

Theron has raised the bar on control and monitoring with TraceNet™ Command. This innovative suite of applications offers superior centralized control and monitoring of an industrial plant's electrical heat tracing system. **Operators optimize system performance, and save energy costs.**

Flexible Operations Reduce Operating Costs

- Applications allow for lean plant operations
- Access for alarm troubleshooting, circuit control, and key performance indicators
- Centralized data = flexible network construction = optimized operator interaction

Optimizing Return on Investment

Theron is the industry leader in electrical process heating solutions. We have elevated the standard for industrial process control and monitoring with TraceNet™ Command. Using the TraceNet DCD™ Data Concentrator Device, plant operators connect to multiple controllers rapidly. By employing a server to store plant data, operators monitor and control any authorized workstation in the plant. Plant supervisors can dedicate less operator time to monitoring electrical heat tracing, while still ensuring the expected high level of safety and operational continuity of the heat trace system, saving plant operation costs.

Improving Plant Efficiencies

- Electrical operators control current
- Plant operators monitor temperature
- Engineers access trend and alarm records

Lowest Cost of Ownership





CONTROL AND MONITORING FOR PROCESS HEATING SYSTEMS



**Controller Skid with Seal Breaker
for IEC Hazardous Locations**



Controller Skid for IEC Locations

Pre-assembled Controller Skids are an integral component of Thermon's total systems approach to provide you with the most cost effective heat tracing system.

Designed specifically for YOUR electrical requirements, Thermon Controller skids can include transformer(s), distribution panel, electrical heat tracing controller panel, and connection accessories. All on one convenient skid.

- Reduce site installation costs
- Pre-wiring is done in a controlled environment
- Completed assembly is delivered to your site ready for hook-up to your main power feed(s)
- Reduce RTD and power wiring costs
- Reduce maintenance and total costs of ownership
- Components are secured to a structurally designed, pre-wired skid

Knowing your particular application's requirements up front facilitates the rapid procurement of components and Controller Skid assembly, keeping the electric heat tracing project on track.

Thermon recommends pre-approval of any non-standard skid layout and drawings and/or electrical specifications in the early stages of a project.

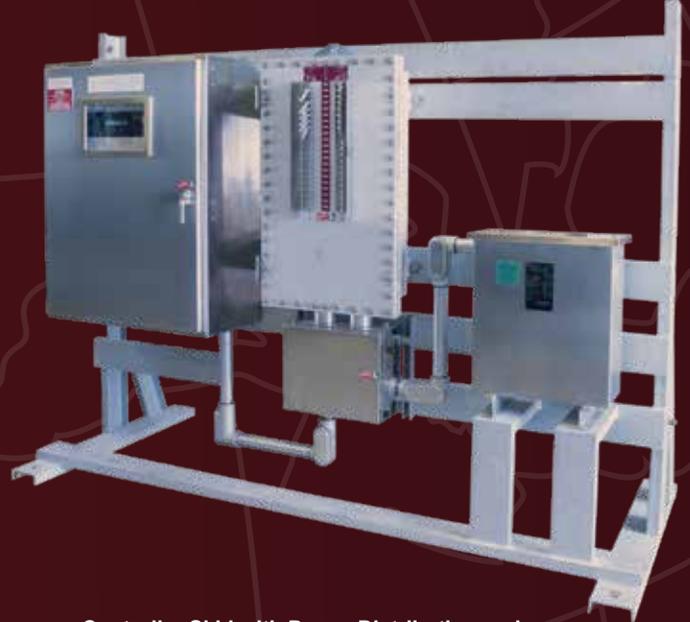


**Typical Skid Frame
with Weather Protection Canopy**

THERMON **SOLUTIONS** IMPROVE YOUR BOTTOM LINE



Controller Skid with Power Distribution and Transformer for Non-Hazardous Locations



Controller Skid with Power Distribution and Transformer for NEC Hazardous Locations



Power Distribution with Sealed Breakers



Basic Freeze Protection Panel



EHT Controller Panel without Power Distribution



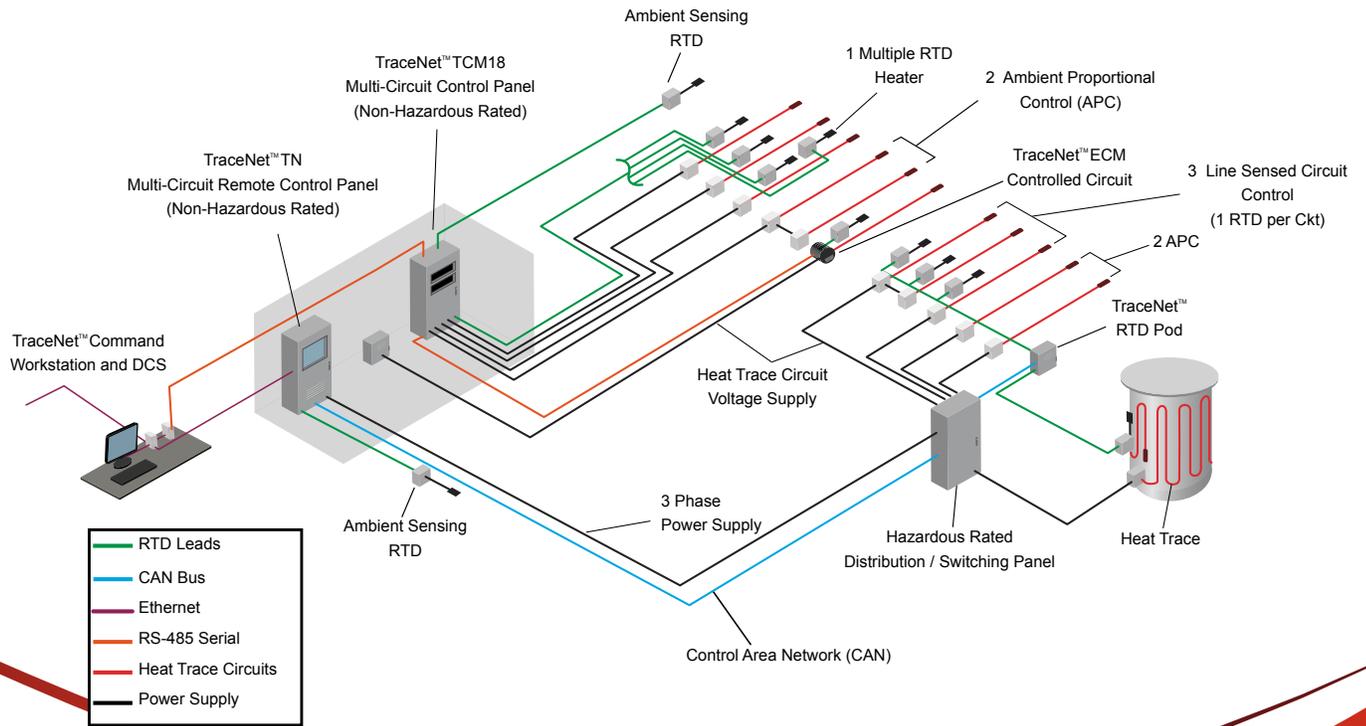
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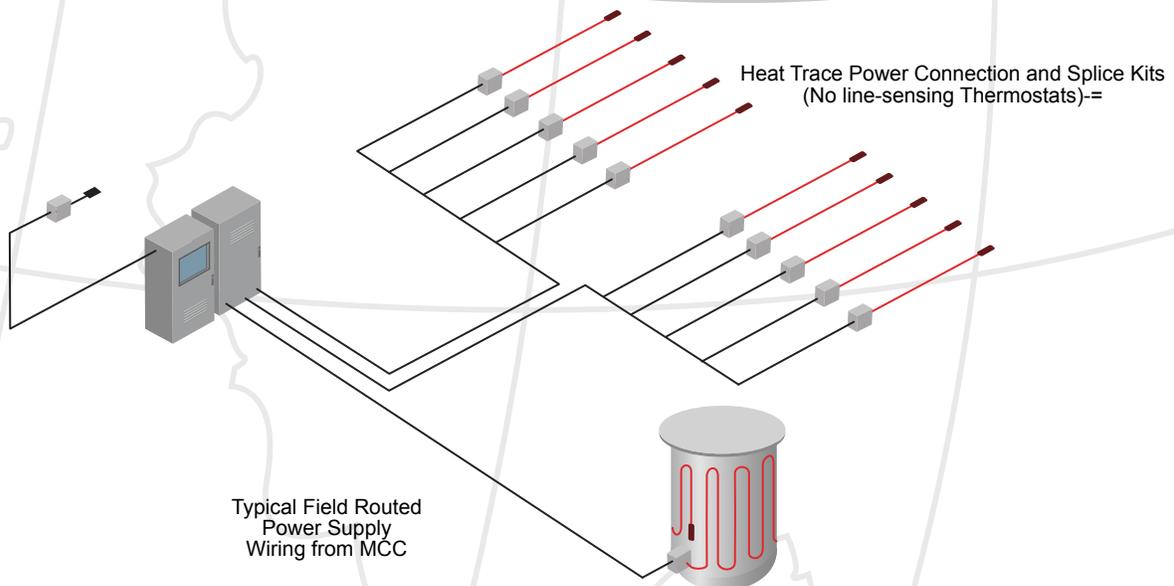
SELECTION CHART

Capabilities	Mechanical Thermostat	ECM Electronic Thermostat	TraceNet™ TCM2	TraceNet™ TCM18	TraceNet™ TN
Location of Controller					
Panel Mounted			●	●	●
Field Mounted	●	●	●	●	●
Hazardous Area	●	●	●	●	●
Control					
Ambient Sensing	●	●	●	●	●
Line Sensing	●	●	●	●	●
Proportional			●	●	●
Temperature Limiter		●	●	●	●
Monitoring					
Pipe Temperature	●	●	●	●	●
Earth / Ground Leakage Current			●	●	●
Heater Load Current			●	●	●
Alarm Relay		●	●	●	●
Communication					
Local Display			●	●	●
Remote Display		●	●	●	●
TVNE		●	●	●	●
DCS Integration		●	●	●	●
No. of Circuits per Controller	1	1	2	18	180

Centralized/Distributed Control and Monitoring Systems



Conventional Ambient Sensing Control



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INDUSTRIAL PROCESS HEATING
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