

Heat-Trace Control system

Product overview

The DigiTrace HTC-915 system is a compact, full-featured microprocessor-based single-point heat-trace controller. The HTC-915-CONT provides control and monitoring of electrical heat-tracing circuits for both freeze protection and temperature maintenance and can be set to monitor and alarm for high and low temperature, high and low current, ground fault level, and voltage. The DigiTrace HTC-915-CONT is provided with two outputs: one to drive an external contactor coil, and the other to drive an external solid-state relay (SSR). Communications capability is included for remote control and configuration, complete with Supervisor software capability.

Control

The DigiTrace HTC-915-CONT measures temperature via 3-wire platinum PT100 connected directly to the unit. When used with an Ex approved PT100 sensor (as is the MONI-PT100-EXE) the controller can measure temperatures in a hazardous area. Open, shorted, or out of range PT100 resistance is automatically detected. If an PT100 failure occurs, the control output trips open and an alarm is generated. The controller can be used in line sensing, ambient sensing, proportional ambient sensing, and power limiting mode.

Monitoring

A broad variety of parameters are measured including: temperature, voltage, power, contactor cycles, hours in use, load resistance, load current, and ground-fault current. To ensure system integrity, the system can be programmed to periodically check the heating cable for faults, alerting maintenance personnel of a heat-tracing problem. A potential free relay is provided for alarm annunciation back to a Distributed Control System (DCS) or alarm indicator.

Ground-fault Alarming

Optionally, the HTC-915-CONT can be programmed to measure ground leakage current. This option allows for the generation of early warnings before the ELCB trips. The trip level of the early alarm is user definable and can be set at any value between 10 and 250mA. The ground fault alarms allow for preventive maintenance to be scheduled before the safety device trips and causes down time of important pipelines. Note that this alarm may only be used to generate a warning, it is not intended to replace the RCD (ELCB), which is mandatory for most applications.

Overtemperature prevention

In order to assure that T class temperatures inside hazardous areas are not being exceeded the HTC-915-CONT

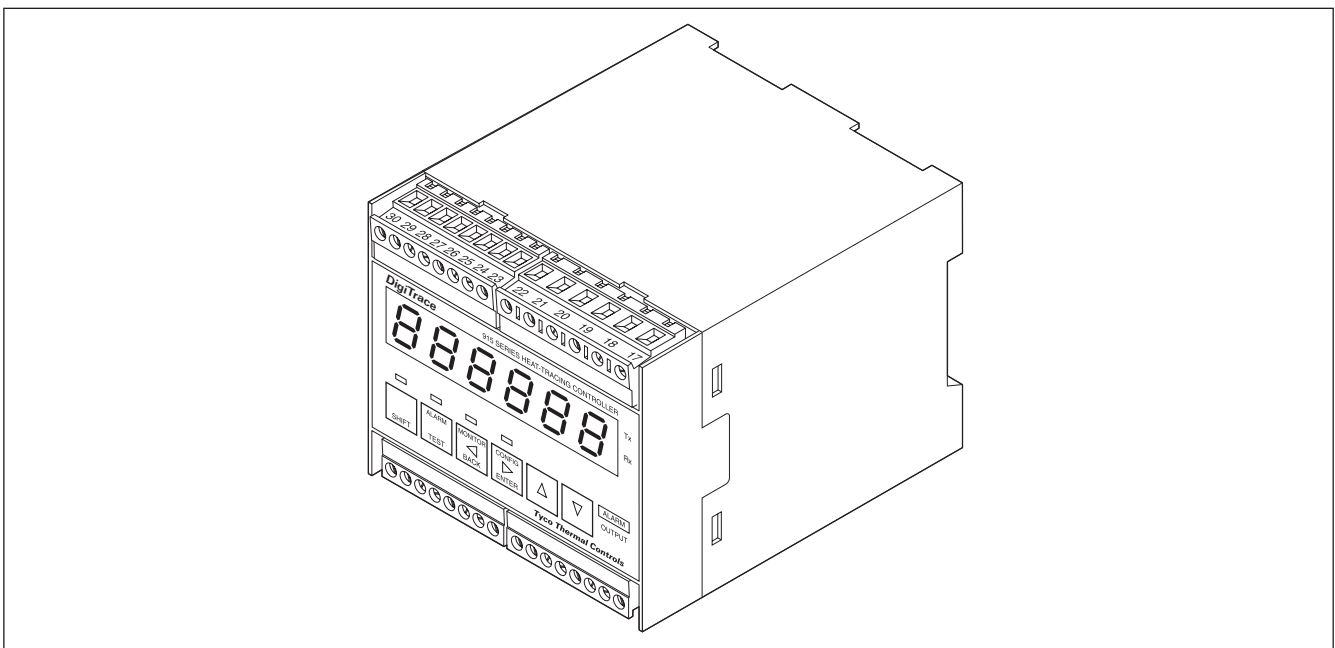
can be equipped with the temperature limiter HTC-915-LIM. The HTC-915-LIM is a compact microprocessor based temperature limiter that provides protection against overtemperature of heating cables. (Refer to the installation instructions of the HTC-915-LIM for the full list of details.)

Installation

The DigiTrace HTC-915-CONT comes ready to install, and the DIN rail mount plastic enclosure is approved for use in indoor locations. The HTC-915-CONT operator interface includes LED displays and function keys that make it easy to set-up and maintain - no additional devices are needed. Alarm conditions and program settings are easy to interpret on the full-text front panel. Settings are stored in nonvolatile memory in the event of power failure.

Communications

Multiple DigiTrace HTC-915-CONT units may be networked to a host PC running Windows-based Supervisor software for central programming, status review, and alarm annunciation. The HTC-915-CONT supports the Modbus protocol and includes an RS-485 communications interface.



| Application | |
|----------------------------------|---|
| Type | Surface sensing/ambient sensing |
| Area of use | Non-hazardous area indoors, typically panel mounted |
| Approval certification | CE marked |
| Product specification | |
| Temperature range controller | -60°C to 570°C in steps of 1K |
| Control algorithms | EMR: Line sensing on/off, proportional ambient SSR: Line sensing on/off, proportional, proportional ambient, power limiting, soft start |
| Switching accuracy | 1K |
| Electrical properties | |
| Connection terminals | Screw type terminals. All terminals suitable for stranded and solid core connection cables having a cross section between 0.5 and 2.5 mm ² (24 to 12 Awg) |
| Supply voltage | 100 to 250 Vac nom, +/-10%, 50/60Hz, 0.15A to 0.06A |
| Power consumption | Max 20 VA with limiter connected |
| Control output | |
| Contactor control output | (EMR) Electromechanical relay rated 250V/3A 50/60Hz |
| Solid-state relay control output | (SSR) 12Vdc, 75 mA. max. to drive normally open Solid state relays. Depending on the application, one, two or three phase switching elements have to be used. (Solid state relays are not included) |
| Switching capacity | Depends on the type of switch element used (The switch element is external) |
| Alarm output relay | Relay contact rated 250V/3A 50/60Hz. Output is user programmable to open or to close on alarm. |
| Power output | 12 Vdc, 200 mA max. |
| Temperatur sensor | |
| Type | 100 Ω platinum PT100, 3-wire, $\alpha = 0.00385 \Omega/^{\circ}\text{C}$. Can be extended with a three core shielded cable of maximum 20 Ω lead resistance per conductor. |
| Quantity | 2 RTD inputs available |
| Communications | |
| Protocol | Modbus RTU or ASCII |
| Topology | Multidrop / daisychain |
| Cable | Single shielded twisted pair, 0.5 mm ² (24Awg) or larger |
| Length | Typical 2.7 km max @ 9600 Baud |
| Quantity | Up to 32 devices without repeater |
| Address | Programmable |
| Programming and setting | |
| Method | Via programmable keypad or via RS485 interface |
| Units of measure | °C or °F |
| Digital Display | Actual temperature, control temperature, heater current, load power, voltage, resistance, ground fault level, alarm status, programming parameter values. |
| LED indicators | LEDs available for: display mode, heater ON, alarm condition, receive/transmit data. |
| Memory | Nonvolatile, restore after power loss. |
| Stored parameters (measured) | Minimum and maximum process temperature. Maximum ground fault current, maximum heater current. Power accumulator. Contactor cycle counter. Time in use clock. |
| Alarm conditions | Low/high temperature, Low/high current, Low/high voltage. Low/high resistance. Groundfault alarm/trip. RTD failure, loss of programmed values, switch failure. |
| Other | Multi language support, password protection. |

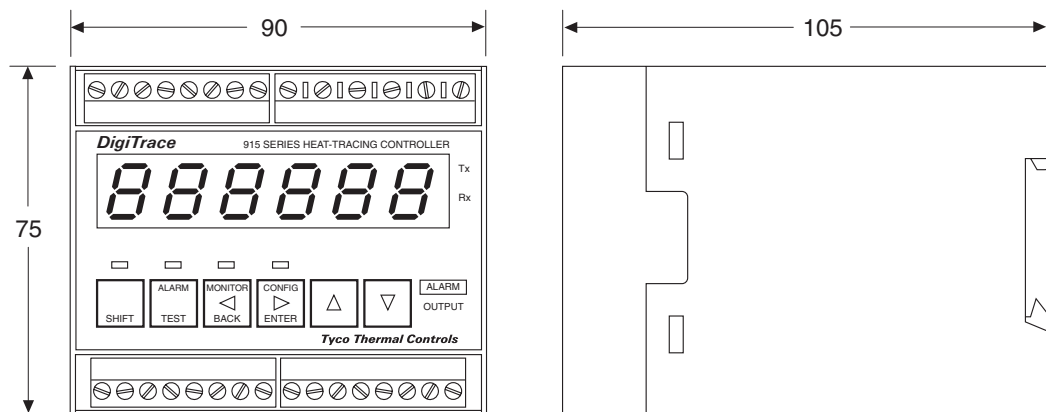
Monitoring

| | |
|--|---|
| Temperature | Low / High alarm range -60°C to 570°C or OFF |
| Ground fault (via external CT, optional) | Alarm / Trip range 10 mA to 250 mA or OFF |
| Load current (via external CT, optional) | Low / High alarm range 0.3A to 100A or OFF (can be adjusted to match heater current) |
| Voltage | Low / High alarm range 10 V to 330V or OFF |
| Resistance | Low resistance range 1 to 100% deviation (can be adjusted to match heater current) High resistance range 1 to 250% deviation |
| Power | Power limit 3 W to 33KW |
| Auto cycle | Diagnostic test interval adjustable from 1 to 240 minutes or 1 to 240 hours |

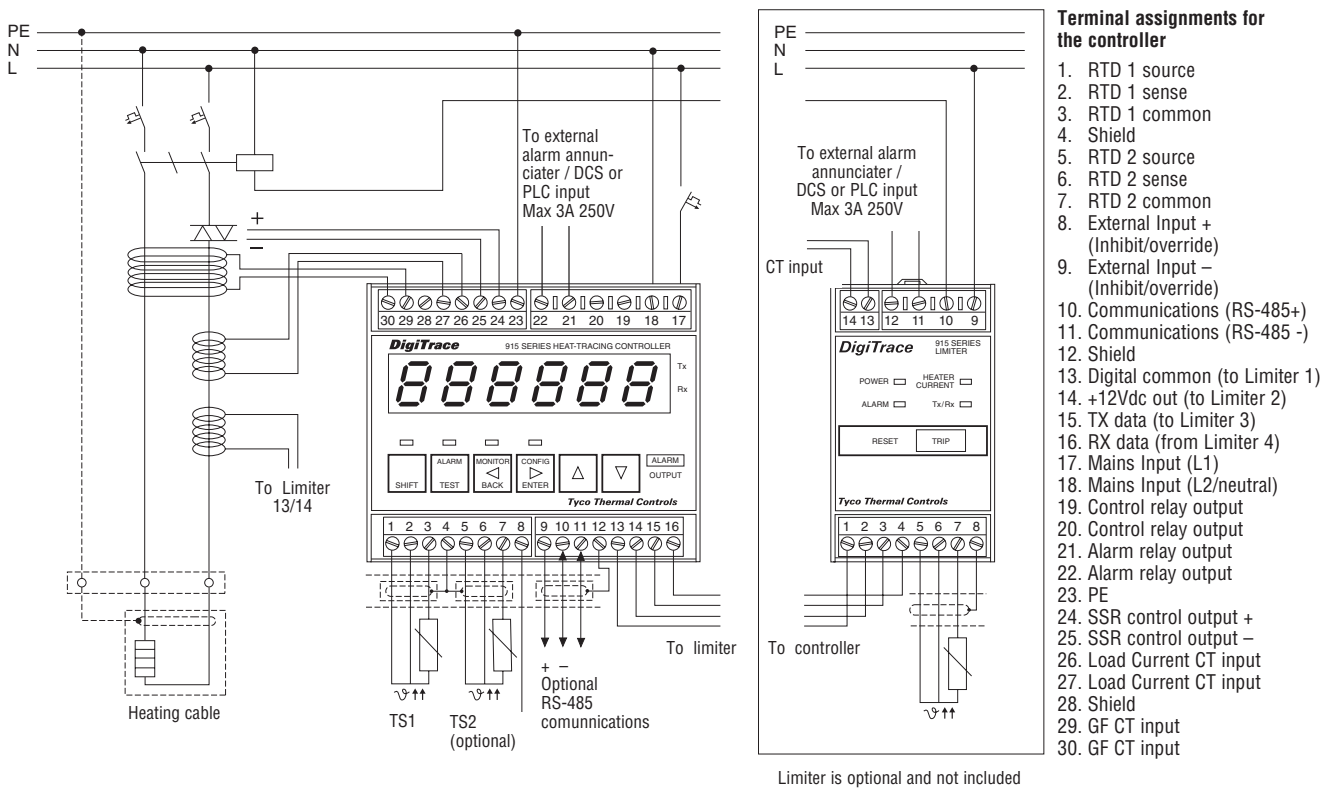
Enclosure

| | |
|-------------------------------------|----------------------------------|
| Ambient operating temperature range | -40°C to +50°C |
| Ambient storage temperature range | -40°C to +85°C |
| Relative humidity | 0% to 90% Non condensing |
| Ingress Protection | Housing: IP40, Terminals: IP20 |
| Material | ASA-PC, color: green |
| Flammability class | V0 (UL94) |
| Mounting method | Panel mounting on 35 mm DIN rail |

Enclosure dimensions



Wiring diagram



Ordering details

| Controller | | |
|--|----------------------|-------------|
| Part description | HTC-915-CONT | |
| PN (Weight) | 8550-000002 (400 gr) | |
| Limiter | | |
| Part description | HTC-915-LIM | |
| PN (Weight) | 8550-000001 (200 gr) | |
| Current sensor (load current transformer) | HTC-915/CT | 1244-000276 |
| Current sensor (earth leakage current transformer) | HTC-915/ELCT | 1244-000277 |
| RTD for Hazardous area zone 1 | MONI-PT100-EXE | 967094-000 |
| RTD for non hazardous area | MONI-PT100-NH | 140910-000 |
| Communication cable | MONI-RS485-WIRE | 549097-000 |