

TC 101a

Control and Monitoring Module

Product Specifications

Application . . .

Electric Heat Tracing Control and Monitoring Controls One Circuit With One RTD Input

The TC 101a is a microprocessor-based temperature control and monitoring module developed specifically for heat tracing. The unit provides control and monitoring capabilities via digital information display for one heat tracing circuit with input from an RTD.

As a modular unit, the TC 101a is typically located within an enclosure suitable for the application and can be configured to control a solid-state or mechanical relay. Multiple modules can be installed in a common enclosure.

Ratings/Specifications . . .

Control and monitoring capacity 1 heat tracing circuit
(up to 30 amps)

Module supply voltage 110-120 or 208-240 Vac

Controlled output voltage 110-480 Vac

Power consumption 6 watts

Module operating ambient¹ -40°F to 140°F
(-40°C to 60°C)

Maximum storage ambient 158°F (70°C)

Data retention nonvolatile EEPROM

Power clamp function programmable from 20% to 100%

Temperature input one 3-wire platinum 100 W RTD

Temperature control range -40°F to 932°F
or -40°C to 500°C

Control band programmable in increments of 1 degree

Module dimensions (HxWxD) 8.25" x 5.125" x 2.625"
(222 x 130 x 67 mm)

High operating current alarm 1.0 to 30.0 amps

Low operating current alarm 0.0 to 30.0 amps

Ground leakage alarm/trip 30 to 150 mA
(in 1 mA increments)

Alarm relay AC only, rated @ 1-amp resistive
(110-120 or 208-240 Vac)

Self-test frequency programmable from 2 to 99 hours

Communication² Modbus ASCII via RS 485 port

Notes . . .

1. LCD heater is recommended for ambients below -4°F (-20°C).
2. Only a single memory location can be read for each communication.



Product Features . . .

Real time data for:

- Temperature
- Heater current
- Ground leakage current

Stored data for:

- Highest temperature encountered
- Lowest temperature encountered

Alarm information for:

- Low temperature
- High temperature
- Low heater current
- High heater current
- Ground leakage current
- Damaged RTD sensor



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100 Thermon Dr. PO Box 609 • San Marcos, TX 78667-0609
Phone: (512) 396-5801 • Facsimile: (512) 754-2431 • **1-800-730-HEAT**
www.thermon.com

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Control Methods . . .

Heat tracing circuits are controlled with the TC 101a via a solid-state or mechanical relay.

Solid-State Relay: The TC 101a configured with a zero crossing solid-state relay will allow four different modes of operation:

- On-off control - User input for maintain temperature and control band provides the on-off limits for the controlled heater.
- On-off control with soft start - Adds a three-minute 0% to 100% ramp-up feature to the on-off control function to minimize the effects of start-up power.
- Proportional - Adjusts the amount of heat generated through time sequencing of the heater. Reduces energy consumption for ambient controlled systems and provides uniform maintain temperatures when line sensing control is used.
- Self-adjust - The user inputs the setpoint and the control band (maximum on temperature); the controller adjusts the heat generated to stay within the limits imposed.

The enclosure size, ambient conditions and heat sink style determine the electrical load capability of a solid-state relay. The chart below indicates the amperage ratings (at the temperatures indicated) using the standard enclosures and heat sinks. The 40°F (4°C) ratings should be used with freeze protection applications, as the controlled circuit would not be energized above this temperature.

Amperage Ratings			
Configuration	Max. Energized Operating Temp.	Enclosure Size	
		14" x 12" x 6" (355 x 305 x 152 mm)	14" x 16" x 6" (355 x 406 x 152 mm)
Internal Heat Sink (double pole)	40°F (4°C)	22 amps	24 amps
	104°F (40°C)	9 amps	12 amps
Internal Heat Sink (single pole)	40°F (4°C)	30 amps	30 amps
	104°F (40°C)	19 amps	24 amps
External Heat Sink (single pole) (metallic enc. only)	40°F (4°C)	30 amps	30 amps
	104°F (40°C)	30 amps	30 amps

Mechanical Relay: Two standard types of mechanical relay configurations are available:

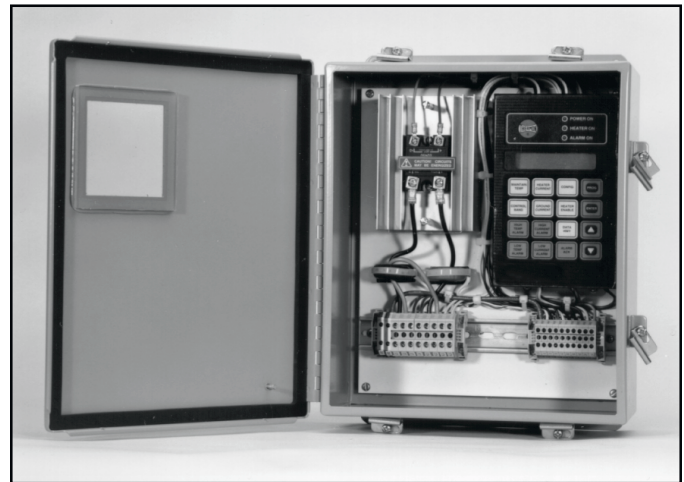
- 120 Vac coil, single pole, rated @ 30 amps
- 240 Vac coil, double pole, rated @ 25 amps

Enclosures . . .

The TC 101a control and monitoring module must be located in an enclosure suitable for the application. Thermon offers both metallic and nonmetallic enclosures to meet a variety of application environments. Two standard sizes are available: 14" x 12" x 6" (355 x 305 x 152 mm) or 14" x 16" x 6" (355 x 406 x 152 mm). Each enclosure includes a 3" x 3" (76 x 76 mm) clear polycarbonate viewing window.

Metallic: Available in a NEMA 4 painted steel or NEMA 4X stainless steel with a hinged cover held in place by screw closures. A quick release latch option is available.

Nonmetallic: Available in a NEMA 4X fiberglass reinforced polyester with a hinged cover held in place with quick release latches.



TC 101a mounted in a NEMA 4 painted steel enclosure

Approvals . . .

When housed in a NEMA 4 or 4X enclosure and equipped with a solid-state relay, the TC 101a is approved for use in ordinary (nonclassified) and hazardous (classified) areas.

Equipped with a mechanical relay and a NEMA 4 or 4X enclosure, the TC 101a is approved for use in ordinary (nonclassified) areas.

