

# TC 202a

## Control and Monitoring Module

Product Specifications

### Application . . .

#### Electric Heat Tracing Control and Monitoring Controls Two Circuits With Two RTD Inputs

The TC 202a 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 two heat tracing circuits with input from two RTDs.

As a modular unit, the TC 202a is typically located within an enclosure suitable for the application and can be configured to control solid-state or mechanical relays. Multiple modules can be installed in a common enclosure.

### Ratings/Specifications . . .

Control and monitoring capacity ..... 2 heat tracing circuits  
(up to 30 amps each)

Module supply voltage ..... 110-120 or 208-240 Vac

Controlled output voltage ..... 110-480 Vac

Power consumption ..... 6 watts

Module operating ambient<sup>1</sup> ..... -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 ..... two 3-wire platinum 100 W RTDs

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

Communication<sup>2</sup> ..... 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(s)



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### Control Methods . . .

Heat tracing circuits are controlled with the TC 202a via solid-state or mechanical relays.

**Solid-State Relays:** The TC 202a configured with zero crossing solid-state relays 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.

Configuration	Max. Energized Operating Temp.	Amperage Ratings	
		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)	N/A	2 @ 19 amps
	104°F (40°C)	N/A	2 @ 6 amps
Internal Heat Sink (single pole)	40°F (4°C)	N/A	2 @ 30 amps
	104°F (40°C)	N/A	2 @ 12 amps
External Heat Sink (single pole) (metallic enc. only)	40°F (4°C)	2 @ 30 amps	2 @ 30 amps
	104°F (40°C)	2 @ 27 amps	2 @ 30 amps

**Mechanical Relays:** Two standard types of mechanical relay configurations are available:

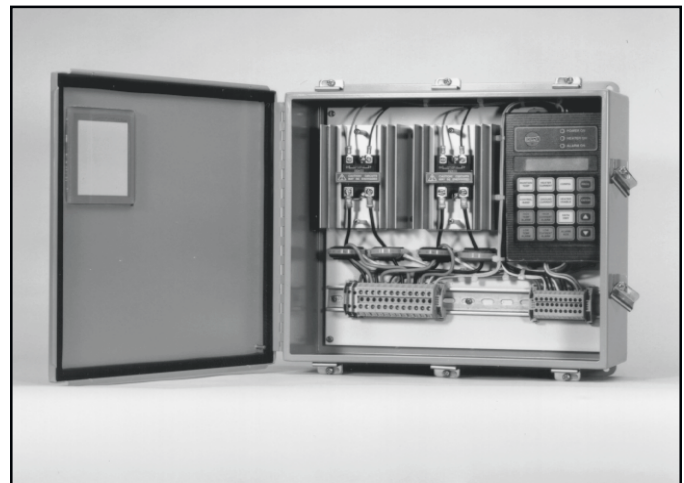
- 120 Vac coil, single pole, rated @ 30 amps
- 240 Vac coil, double pole, rated @ 25 amps

### Enclosures . . .

The TC 202a 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 202a mounted in a NEMA 4 painted steel enclosure

### Approvals . . .

When housed in a NEMA 4 or 4X enclosure and equipped with solid-state relays, the TC 202a is approved for use in ordinary (nonclassified) and hazardous (classified) areas.

Equipped with mechanical relays and a NEMA 4 or 4X enclosure, the TC 202a is approved for use in ordinary (nonclassified) areas.

