



### Power Input

**Standard:** 90-264 VAC, 47-63 Hz, 15 VA, 7W maximum  
**Optional:** 11-26 VAC / VDC, 15 VA, 7W maximum

### Signal Input

#### Input 1

**Resolution:** 18 bits **Sampling Rate:** 5 samples / second  
**Accuracy:**  $\pm 0.24\%$  of span typical  
**Maximum Rating:** -2 VDC minimum, 12 VDC maximum (1 minute for mA input)

**Temperature Effect:**  $\pm 1.5 \mu V / ^\circ C$  for all inputs except mA input  $\pm 3.0 \mu V / ^\circ C$  for mA input

**Sensor Lead Resistance Effect:** T/C:  $0.2 \mu V / \text{ohm}$   
 3-wire RTD:  $2.6^\circ C / \text{ohm}$  of resistance difference of two leads

**Burn-out Current:** 200nA

**Common Mode Rejection Ratio (CMRR):** 120 dB

**Normal Mode Rejection Ratio (NMRR):** 55 dB

**Sensor Break Detection:** Sensor open for TC, RTD and mV inputs; sensor short for RTD input; below 1 mA for 4-20 mA input; below 0.25V for 1-5V input; unavailable for other inputs

**Sensor Break Response Time:** Within 4 seconds for TC, RTD and mV inputs; 0.1 second for 4-20 mA and 1-5 V inputs

#### Input 2

**Resolution:** 18 bits

**Sampling Rate:** 1.66 times per second

**Sensor Break Response Time:** 0.5 second

**Types:** **Current Transducer:** 0 to 50 Amp  
**mA:** -3 to 27 mA **V:** -1.3 to 11.5 VDC

**Event Input Functions:** Select 2nd setpoint and/or PID, disable output 1 and/or output 2, remote lockout, reset alarm 1 and/or alarm 2

### Output 1 or Output 2 / Alarm 2

**Relay Rating:** 240 VAC, 2 Amp

**Pulsed Voltage:** Source voltage 5V,  
 Current limiting resistance 66 $\Omega$

#### Linear Output — Characteristics

Type	Zero	Span	Load
4-20 mA	3.6-4.0 mA	20-21 mA	500 $\Omega$ max
0-20 mA	0 mA	20-21 mA	500 $\Omega$ max
0-5 VDC	0 VDC	5-5.25 VDC	10 K $\Omega$ min
1-5 VDC	0.9-1.0 VDC	5-5.25 VDC	10 K $\Omega$ min
0-10 VDC	0 VDC	10-10.5 VDC	10 K $\Omega$ min

**Resolution:** 15 bit analog to digital converter

**Isolation Breakdown Voltage:** 1000 VAC

#### Solid State Relay (Triac) Output

**Rating:** 1A / 240 VAC **Inrush Current:** 20A for 1 cycle

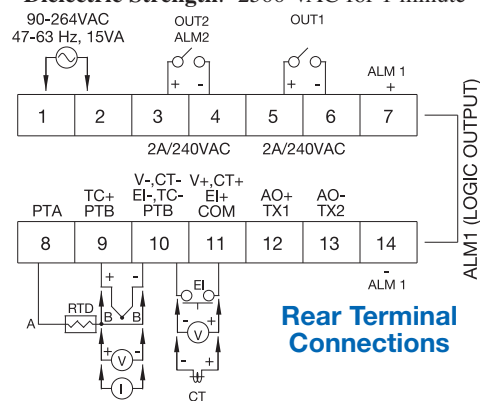
**Min. Load Current:** 50 mA rms

**Max. Off-state Leakage:** 3 mA rms

**Max. On-state Voltage:** 1.5 VAC rms

**Insulation Resistance:** 1000 Megohms minimum at 500 VDC

**Dielectric Strength:** 2500 VAC for 1 minute



**Rear Terminal Connections**

### Alarm 1 / Alarm 2

**Alarm 1:** 5 VDC logic output

**Alarm 2 Relay:** Form A, (NO) **Maximum rating:** 240 VAC, 2 Amp

#### Alarm Functions:

Dwell timer PV1-PV2 High / Low Alarm  
 Deviation Band High / Low Alarm Loop Break Alarm  
 PV2 High / Low Alarm Sensor Break Alarm

**Alarm Mode:** Normal, Latching, Hold, Latching / Hold

**Dwell Timer:** 0 - 6553.5 minutes

### Data Communications

**Interface:** RS-232 (1 unit), RS-485 (up to 247 units)

**Protocol:** Modbus Protocol – RTU mode

### User Interface

**Single 4-digit LED Displays:** 0.4" / 10 mm Keypad: 3 keys

**Programming Port:** For automatic setup, calibration and testing

### Control Mode

**Output 1:** Reverse (heating) or direct (cooling) action

**Output 2:** PID cooling control, cooling P band 1-255% of PB

**On-Off:** 0.1 - 100.0°F hysteresis control (P band = 0)

**P or PD:** 0 - 100.0% offset adjustment

**PID:** Fuzzy logic modified

**Proportional band:** 0.1 - 900°F (500°C)

**Integral:** 0 - 1000 seconds **Derivative:** 0 - 360 seconds

**Cycle Time:** 0.1 - 100 seconds

**Manual Control:** Heat (MV1) and Cool (MV2)

**Auto-tuning:** Cold start and warm start

**Failure Mode:** Auto-transfer to manual mode with sensor break or A-D converter damage

**Ramping Control:** 0 - 900°F/min or 0 - 900°F/hr ramp rate

**Power Limit:** 0 - 100% for output 1 and output 2

**Remote Setpoint:** Programmable range for voltage or current input

**Digital Filter:** Time constant: settable from 0.2 to 60 seconds

### Analog Retransmission

**Analog Retransmission Functions:** PV1, PV2, PV1-PV2, PV2-PV1, setpoint, MV1, MV2, PV-SV deviation value

**Output Signal:** 4-20 / 0-20 mA, 0-1, 0-5, 1-5, 0-10 VDC

**Accuracy:**  $\pm 0.05\%$  of span,  $\pm 0.0025\%$  / °C

### Environmental and Physical

**Operating Temperature:** 14 to 122°F (-10 to 50°C)

**Storage Temperature:** -40 to 140°F (-40 to 60°C)

**Humidity:** 0 to 90% RH, non-condensing

**Dielectric Strength:** 2000 VAC, 50/60 Hz for 1 minute

**Dimensions:** 1-3/64 × 2 × 4-3/8" (26.5 × 50 × 110.5 mm) H×W×D  
 Depth behind panel: 3-7/8" (98 mm)

**Panel Cutout:** 7/8 × 1-25/32" (22 × 45 mm) H×W

**Weight:** 0.26 lb. (120 grams)

### Approval Standards

**Safety Standard:** UL 3121-1, CSA C22.2 No. 24-93  
 EN61010-1 (IEC1010-1)

**EMC:** EN61325

**Protective Class:** Front Panel: NEMA 4X / IP65  
 Housing and Terminals: IP 20

**Stock and Common Part Numbers**  
*(Power Input: 90-264 VAC, w/ alarm 1, no data com)*

Part Number	Signal Input	Out 1	Out 2 / Alarm 2	°F/°C
TEC02001	tc	relay	none	°F
TEC02002	tc	relay	relay	°F
TEC02003	tc	4-20 mA	none	°F
TEC02004	tc	4-20 mA	relay	°F
TEC02005	tc	DC pulse	none	°F
TEC02006	tc	relay	none	°C
TEC02007	tc	4-20 mA	none	°C
TEC02008	tc	DC pulse	none	°C