



### 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

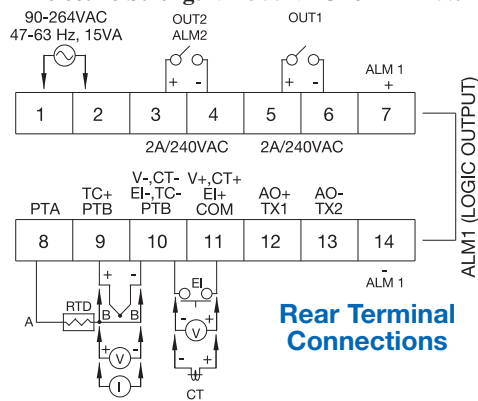
### Output 1 or Output 2 / Alarm 2

**Relay Rating:** 240 VAC, 2 Amp  
**Pulsed Voltage:** Source voltage 5V,  
 Current limiting resistance 66 $\Omega$

#### Linear Output — Characteristics

| Type     | Zero Tolerance | Span Capacity | 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,  $\pm 0.0025\%$  / $^\circ C$

### 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 x 2 x 4-3/8" (26.5 x 50 x 110.5 mm) HxWxD  
 Depth behind panel: 3-7/8" (98 mm)  
**Panel Cutout:** 7/8 x 1-25/32" (22 x 45 mm) HxW  
**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    |