Ordering Code:

**Power Input**

- **BOX 1**
  - 4 = 90-250 VAC
  - 5 = 11-26 VAC / VDC
  - 9 = Other

**Signal Input**

- **BOX 2**
  - Universal, can be programmed in the field for item 5 or 6
  - 5 = Thermocouple: *J, K, T, E, B, R, S, N, L
  - 0-60mV
  - 6 = RTD: *PT100 DIN, PT100 JIS
  - 7 = 0-1 VDC
  - 8 = *0-5, 1-5 VDC
  - A = 0-10 VDC
  - B = *4-20, 0-20 mA
  - 9 = Other

**Output 1**

- **BOX 3**
  - 1 = Relay: 2A / 240 VAC
  - 2 = Pulse dc for SSR drive: 5 VDC (30 mA max)
  - 3 = Isolated, 4-20 mA (default), 0-20 mA
  - 4 = Isolated, VDC, 1-5 (default), 0-5, 0-1
  - 5 = Isolated, VDC, 0-10
  - 6 = Triac-SSR output 1A / 240 VAC
  - 9 = Other

**Output 2**

- **BOX 4**
  - 0 = None
  - 1 = Relay: 2A / 240 VAC
  - 2 = Pulse dc for SSR drive: 5 VDC (30 mA max)
  - 3 = Isolated, 4-20 mA (default), 0-20 mA
  - 4 = Isolated VDC, 1-5 (default), 0-5, 0-1
  - 5 = Isolated VDC, 0-10
  - 6 = Triac-SSR output 1A / 240 VAC
  - 7 = Isolated 20V @ 25 mA DC, Output Power Supply
  - 8 = Isolated 12V @ 40 mA DC, Output Power Supply
  - 9 = Isolated 5V @ 80 mA DC, Output Power Supply
  - C = Pulse dc for SSR drive: 14 VDC (40 mA max)
  - A = Other

**Alarm**

- **BOX 5**
  - 0 = None
  - 1 = Relay: 2A / 240 VAC, SPDT
  - 9 = Other

**Communication**

- **BOX 6**
  - 0 = None
  - 1 = RS-485 Interface
  - 2 = RS-232 Interface
  - 3 = Retransmission 4-20 mA (default), 0-20 mA
  - 4 = Retransmission 1-5 VDC (default), 0-5 VDC
  - 5 = Retransmission 0-10 VDC
  - 9 = Other

**Case Options**

- **BOX 7**
  - 0 = Panel mount standard
  - 1 = Panel mount with NEMA 4X/IP65 front panel
  - 2 = DIN rail mount adapter

**Note:** Detailed information on features common to digital microprocessor-based TEC temperature controls and the complete Table of Input Range and Accuracy can be found on pages 13-36 and 13-37.

**List Prices Starting at $170.00**

**Quantity Discounts Available!**
Power Input
Standard: 90-250 VAC, 47-63 Hz, 10 VA, 5W maximum
Optional: 11-26 VAC / VDC, 10 VA, 5W maximum

Signal Input
Accuracy: Thermocouple: ±0.10% of full scale, ±1 LSD at 77°F/25°C
RTD: ±0.07% of full scale, ±1 LSD at 77°F/25°C
Resolution: 18 bits
Sampling Rate: 5 times per second
Temperature Effect: ±1.5 µV / °C for all inputs except mA input
For mA input: ±3.0 µV / °C
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, below 1 mA for 4-20 mA input, below 0.25V for 1 - 5 VDC input, unavailable for other inputs.

Output 1 / Output 2
Relay Rating: 240 VAC, 2 Amp
Pulsed Voltage: Source voltage 5V, Current limiting resistance 66Ω

Linear Output — Characteristics

<table>
<thead>
<tr>
<th>Type</th>
<th>Zero Tolerance</th>
<th>Span Capacity</th>
<th>Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>mA</td>
<td>3.6-4.0 mA</td>
<td>20-21 mA</td>
<td>500Ω max</td>
</tr>
<tr>
<td>0-20mA</td>
<td>0 mA</td>
<td>20-21 mA</td>
<td>500Ω max</td>
</tr>
<tr>
<td>0-5 VDC</td>
<td>0 VDC</td>
<td>5-5.25 VDC</td>
<td>10 KΩ min</td>
</tr>
<tr>
<td>1-5 VDC</td>
<td>0.9-1.0 VDC</td>
<td>5-5.25 VDC</td>
<td>10 KΩ min</td>
</tr>
<tr>
<td>0-10 VDC</td>
<td>0 VDC</td>
<td>10-10.5 VDC</td>
<td>10 KΩ min</td>
</tr>
</tbody>
</table>

Resolution: 15 bit analog to digital converter

Output Regulation: 0.02% for full load change
Output Settling Time: 0.1 sec. (stable to 99.9%)
Isolation Breakdown Voltage: 1000 VAC
Temperature Effect: ±0.01% of span/°C

Solid State Relay (Triac) Output
Rating: 1A / 240VAC
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

Approval Standards
Safety: UL61010C-1, CSA C22.2 No. 24-93
EN61010-1 (IEC1010-1)
EMC: EN61326
Protective Class: Front Panel: IP50, optional NEMA 4X/IP65
Housing and Terminals: IP 20

Data Communications
Interface: RS-232 (1 unit), RS-485 (up to 247 units)
Protocol: Modbus Protocol – RTU mode
Address: 1-247
Baud Rate: 0.3 - 38.4 Kbits/sec
Data Bits: 7 or 8 bits
Parity Bit: None, Even or Odd
Stop Bit: 1 or 2 bits
Communication Buffer: 160 bytes

User Interface
Dual 4-digit LED Display: 0.40” (10 mm) Red Process Display
0.31” (8 mm) Green Setpoint Display
Keypad: 4 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 50-300% of PB, dead band 36.0 to 36.0% of PB
On-Off: 0.1 - 90.0°F hysteresis control (P band = 0)
P or PD: 0 - 100.0% offset adjustment
PID: Fuzzy logic modified
Proportional band: 0 - 900°F
Integral time: 0 - 1000 seconds
Derivative time: 0 - 360 seconds
Cycle Time: 0.1 - 90 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

Environmental and Physical
Operating Temperature: 14 to 122°F (-10 to 50°C)
Humidity: 0 to 90% RH, non-condensing
Dielectric Strength: 2000 VAC, 50/60 Hz for 1 minute
Dimensions: 1-7/8 × 1-7/8 × 4-9/16” (48 × 48 × 116 mm) H<W<D
Depth behind panel: 4-1/8” (105 mm)
Panel Cutout: 1-25/32 × 1-25/32” (45 × 45 mm) H<W
Weight: 0.33 lb. (150 grams)

Stock and Common Part Numbers
(Power Input: 90-250 VAC, no data com, no NEMA 4X)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Signal Input</th>
<th>Output 1</th>
<th>Output 2</th>
<th>Alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEC14001</td>
<td>tc</td>
<td>relay</td>
<td>relay</td>
<td>none</td>
</tr>
<tr>
<td>TEC14002</td>
<td>tc</td>
<td>relay</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>TEC14003</td>
<td>tc</td>
<td>relay</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>TEC14004</td>
<td>tc</td>
<td>relay</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>TEC14005</td>
<td>RTD</td>
<td>relay</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>TEC14006</td>
<td>RTD</td>
<td>relay</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>TEC14007</td>
<td>RTD dc pulse</td>
<td>relay</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>TEC14008</td>
<td>RTD dc pulse</td>
<td>relay</td>
<td>none</td>
<td>none</td>
</tr>
</tbody>
</table>

Call Toll Free: (800) 323-6859 • Fax: (630) 350-0232 • E-Mail: sales@tempco.com

13-9