Model TEC-9090 1/16 DIN Temperature Controller

**Design Features**
- 1/16 DIN size – 48 mm × 48 mm
- Fuzzy Logic PID heat and cool control
- PID Control – Auto-tuning on cold or warm start
- Short panel depth – only 3-7/8" (86 mm) required
- Universal programmable sensor input
- Highly versatile – 6 types of inputs available
- Optional relay alarm output
- Universal input power 90-264 VAC, 20-32 VAC/VDC or 10-18 VDC
- Wide variety of alarm mode selections
- Bright 0.40" (10 mm) red LED process display
- 0.31" (8 mm) green LED setpoint display
- High performance at a low price

**Agency Approvals**

**Hardware Code:** TEC-9090-

*Power Input* BOX 1
- 4 = 90-264 VAC
- 5 = 20-32 VAC/VDC
- 6 = 10-18 VDC
- 9 = Other

*Signal Input* — (hardware jumper change between TC & RTD) BOX 2
- 6 = RTD: Universal Configurable: DIN or JIS (default: alpha 0.00385/DIN)
- 9 = Other

*Range code* BOX 3
- 1 = Field configurable (default – max per input type)
- 9 = Other

*Control Mode* BOX 4
- 3 = Field Configurable (default: PID reverse acting, °F)
- 9 = Other

*Output 1* BOX 5
- 1 = Relay: 3A / 240 VAC
- 2 = Pulse DC for SSR drive: 20 VDC (20 mA max)
- 3 = 4-20 mA, linear (max load 500Ω)
- 4 = 0-20 mA, linear (max load 500Ω)
- 5 = 0-10 VDC, linear (min. impedance 10 KΩ)
- 6 = Triac-SSR output 1A / 240 VAC
- 9 = Other

*Output 2* BOX 6
- 0 = None

*Alarm* BOX 7
- 0 = None
- 1 = Relay: 2A / 240 VAC, Field Configurable
- 9 = Other

*Data Communications* BOX 8
- 0 = None

*Units – °F or °C* BOX 9
- 1 = °F on faceplate
- 2 = °C on faceplate

**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 page 13-46.

View Product Inventory @ www.tempco.com
**Power Input**

- **Standard:** 90-264 VAC, 47-63 Hz, 5VA, 5W maximum
- **Optional:** 20-32 VAC/VDC, 5VA, 5W maximum or 10-18 VDC, 5W maximum

**Signal Input**

- **Accuracy:** ±2.4% of span typical
- **Cold Junction Compensation:** 0.1°C/°C ambient typical
- **Sensor Break Detection:** Protection mode configurable
- **External Resistance:** 100 ohms maximum
- **Normal Mode Rejection:** 60 dB
- **Common Mode Rejection:** 120 dB
- **Sampling Rate:** 5 samples/second

**Output 1**

- **Relay Rating:** 240 VAC, 3 Amp
- **Pulsed Voltage:** Source voltage 20V (20 mA max)
- **Current:** 4 - 20 mA, at 500Ω max
- **Voltage:** 0 - 10 VDC, at 10 KΩ min
- **Solid State Relay (Triac) Output**
  - **Rating:** 1A / 240 VAC
  - **Inrush Current:** 20A for 1 cycle
  - **Min. Load Current:** 50 mA rms
  - **Dielectric Strength:** 2500 VAC for 1 minute

**Approval Standards**

- **Safety:** UL873, CSA22.2/142-87, IEC1010-1
- **EMC Emission:** EN50081-1
- **EMC Immunity:** EN50082-1
- **Protective Class:** Front Panel: IP30
  - Housing and Terminals: IP 20

**Alarm — Programmable**

- **Alarm Relay:** Form A, (NO)
- **Maximum rating:** 240 VAC, 3 Amp
- **Alarm Functions:** Dwell timer
  - Deviation High or Low Alarm
  - Deviation Band High or Low Alarm
  - Process High Alarm
  - Sensor Break Alarm
- **Dwell Timer:** 0 - 6553.5 minutes

**User Interface**

- **Dual 4-digit LED Display:** 0.40" (10 mm) Red Process Display
  - 0.31" (8 mm) Green Setpoint Display
- **Keypad:** 4 keys

**Control Mode**

- **Output 1:** Reverse (heating) or direct (cooling) action
- **On-Off:** 0 - 20% of span hysteresis control (P band = 0)
- **P or PD:** 0 - 100.0% offset adjustment
- **PID:** Fuzzy logic modified
  - **Proportional band:** 0.1 - 360°F (0 - 200°C)
  - **Integral time:** 0 - 3600 seconds
  - **Derivative time:** 0 - 1000 seconds
- **Cycle Time:** 0 - 120 seconds
- **Auto-tuning:** Cold start and warm start
- **Ramping Control:** 0 - 360°F/min (200°C/min)

**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 × 3-3/4" (48 × 48 × 94 mm) H×W×D
  - Depth behind panel: 3-3/8" (86 mm)
- **Panel Cutout:** 1-25/32 × 1-25/32" (45 × 45 mm) H×W
- **Weight:** 0.37 lb. (170 grams)

**Stock and Common Part Numbers**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Signal Input</th>
<th>Out 1</th>
<th>Alarm</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEC11002</td>
<td>TC</td>
<td>relay relay</td>
<td>relay relay</td>
</tr>
<tr>
<td>TEC11001</td>
<td>TC</td>
<td>relay relay</td>
<td>relay none</td>
</tr>
<tr>
<td>TEC11007</td>
<td>TC</td>
<td>4-20 mA</td>
<td>none</td>
</tr>
<tr>
<td>TEC11003</td>
<td>TC</td>
<td>pulse pulse</td>
<td>pulse pulse</td>
</tr>
<tr>
<td>TEC11009</td>
<td>RTD</td>
<td>relay</td>
<td>none</td>
</tr>
<tr>
<td>TEC11010</td>
<td>RTD</td>
<td>pulse</td>
<td>pulse</td>
</tr>
</tbody>
</table>

**Rear Terminal Connections**

- **Power Input:** 90-264 VAC or 20-32 VAC/VDC
- **Output 1:**