Model TEC-6400 DIN Rail Mount Temperature Controller

Design Features
- DIN Rail Mount, 35 mm
- Fuzzy modified PID heat and cool control
- Universal input (TC, PT100, mA, V) with high accuracy 18-bit D-A
- Countdown display
- RS - 485 and Analog Retransmission Available
- Micro USB Programming Port
- Fast sampling rate (200 msec)
- Manual control & auto-tune function
- Wide range of alarm mode selection
- Lockout protection
- Bumpless transfer during failure mode
- Soft-start ramp & dwell timer
- Bright LCD display stabilized with digital filter
- High performance with low cost

Agency Approvals:
RoHS, REACH, WEEE

Hardware Code: TEC-6400

Power Input BOX 1
- 4 = 90-250 VAC
- 5 = 11-40 VDC / 20-28 VAC

Output 1 BOX 2
- 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
- 5 = Isolated VDC, 0-10 scalable
- C = Pulse DC for SSR drive: 14 VDC (40mA max)

Output 2 / Alarm 1 BOX 3
- 0 = None
- 1 = Pulse DC for SSR drive: 5 VDC (30 mA max)
- 2 = Isolated, 4-20 mA (default), 0-20 mA
- 3 = Isolated VDC, 0-10 scalable
- 4 = Relay: 2A / 240 VAC
- 5 = Isolated, VDC, 0-10 scalable

Option 1 BOX 4
- 0 = None
- 1 = RS-485 Interface
- 2 = 1 Event Input EI 1
- 3 = 1 CT Input (CT 1)

Option 2 BOX 5
- 0 = None
- 1 = Retransmit: 4-20mA / 0-20mA
- 2 = Retransmit: 0-10 VDC
- 3 = Alarm 2 Relay: 2A / 240 VAC
- 4 = 1 Event Input EI 2
- 5 = 1 CT Input (CT 2)

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.

Transformer for Heater Break Alarm
(0-50 Amp current)
- Part Number: TEC99998
- Specifications on page 13-47

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New Page (1-19)
**Power Input**
- Standard: 90-250 VAC, 47-63 Hz, 8VA, 4W maximum
- Optional: 11-40 VDC / 20-8 VAC, 47-63 Hz, 8VA, 4W maximum

**Signal Input**
- Resolution: 18 Bits
- Sampling Rate: 5 Times / Second (200msec)
- Maximum Rating: -2VDC minimum, 12VDC maximum
- Sensor Break Detection: Sensor open for thermocouple and RTD inputs, sensor short for RTD input, below 1mA for 4-20mA input, below 0.25V for 1-5V input, not available for other inputs
- Sensor break responding time: Within 4 seconds for thermocouple and RTD inputs, 0.1 second for 4-20mA and 1-5V inputs

**Event Input**
- Number of Event Inputs: 1
- Logic Low: -10V minimum, 0.8V maximum
- Logic High: 2V minimum, 10V maximum

**CT Input**
- CT type: TEC99998
- Accuracy: ±2% of full scale reading, ± 1 digit maximum
- Input Impedance: 294Ω
- Measurement Range: 0-50A AC
- Output of CT: 0-5V DC
- CT Mounting: Wall (Screw) mount
- Sampling Rate: 1 time/second

**Output 1 /Output 2**
- Type: Relay, pulsed voltage, linear voltage and linear current
- Relay Rating: 2A, 240V AC, 200,000 life cycles for resistive load
- Pulsed Voltage: Source voltage 5V, Current limiting resistance 66Ω
- Linear Output Resolution: 15 Bits
- Isolation Breakdown Voltage: 1000 V AC
- Load Capacity of Linear Output: Linear current: 500Ω maximum, Linear voltage: 10KΩ minimum

**Alarm**
- Relay Type: Form A
- Maximum Rating: 2A, 240VAC, 200,000 life cycles for resistive load
- Alarm Functions: Dwell timer, Deviation low, Deviation high, Deviation band low, Deviation band high, Process high, Process low
- Alarm Mode: Latching, Hold, Normal, Latching/Hold
- Dwell Timer: 0.1-453.6 minutes

**Data Communications**
- Interface: RS-485
- Protocol: Modbus RTU
- Address: 1-247
- Parity Bit: None, Even or Odd
- Stop Bit: 1 or 2 Bits
- Data Length: 7 or 8 Bits
- Communication Buffer: 160 bytes

**Analog Retransmission**
- Output Signal: 4-20 mA, 0-20 mA, 0-10V
- Resolution: 15 Bits
- Accuracy: ±0.05% of span ± 0.0025% / °C
- Load Resistance: 0-50Ω for current output, 10Ω minimum for voltage output
- Isolation Breakdown: 1000VAC minimum
- Linear Output Ranges: 0-2.2mA (0-20mA / 4-20mA), 0-5.5V (0-5V, 1-5V), 0-11.1V (0-10V)

**User Interface**
- Keypad: 4 Keys
- Display Type: 4 digit LCD display
- No. of Display: 2
- Upper Display Size: 0.31" (8mm)
- Lower Display Size: 0.25" (6.5mm)

**Programming Port**
- Interface: Micro USB
- PC Communication Function: Automatic Setup, Calibration and Firmware Upgrade

**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 ~ 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 0.1 ~ 900.0°F, Integral time 0–3600 seconds, Derivative time 0-360.0 seconds
- Cycle Time: 0.1-90.0 seconds
- Manual Control: Heat (MV1) and Cool (MV2)
- Failure Mode: Auto transfer to manual mode while sensor break or A-D Converter damage
- Ramping Control: 0 to 900.0°F / Minute or 0 to 900.0°F / Hour Ramp Rate

**Environmental and Physical Specifications**
- Operating Temperature: -10°C to 50°C
- Storage Temperature: -40°C to 60°C
- Humidity: 0 to 90 % RH (Non-Condensing)
- Insulation Resistance: 20MΩ minimum (@500V DC)
- Dielectric Strength: 2000V AC, 50/60 Hz for 1 Minute
- Vibration Resistance: 10 to 55 Hz, 10m/s² for 2 Hours
- Shock Resistance: 200 m / s² (20g)
- Moldings: Flame retardant polycarbonate
- Mounting: DIN Rail, 35 mm
- Dimensions W × H × D: 3-3/4 × 7/8 × 3-11/16" (96 × 22.5 × 83 mm)
- Depth Behind Panel (mm): n/a
- Cut Out Dimensions (mm): n/a
- Weight: .35 lbs. (160 g)

**CT Mounting**
- Wall (Screw) mount

**Dwell Timer**
- 0.1-453.6 minutes

**Alarm Functions**
- Dwell timer, Deviation low, Deviation high, Deviation band low, Deviation band high, Process high, Process low

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

**Data Communications**
- Interface: RS-485
- Protocol: Modbus RTU
- Address: 1-247
- Parity Bit: None, Even or Odd
- Stop Bit: 1 or 2 Bits
- Data Length: 7 or 8 Bits
- Communication Buffer: 160 bytes

**Rear Terminal Connections**

![Rear Terminal Connections](image)

**Stock and Common Part Numbers**

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Output 1</th>
<th>Out 2/Alm 1</th>
<th>Option 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEC80001</td>
<td>Relay</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TEC80002</td>
<td>Relay</td>
<td>Relay</td>
<td>None</td>
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<td>Relay</td>
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<td>None</td>
</tr>
<tr>
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<td>Pulse DC</td>
<td>Relay</td>
<td>None</td>
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<tr>
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<tr>
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<td>4-20mA</td>
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<td>None</td>
</tr>
<tr>
<td>TEC80008</td>
<td>4-20mA</td>
<td>Relay</td>
<td>None</td>
</tr>
</tbody>
</table>

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