Model TEC-4400 1/4 DIN Temperature Controller

Design Features

- 1/4 DIN size – 96 mm × 96 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 using NFPA/IEC standard colors
- High performance with low cost

Hardware Code: TEC-4400 -

Power Input BOX 1

0 = 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 (40 mA max)

Alarm 2 and 3 BOX 4

0 = None
1 = Alarm 2: Relay: 2A / 240 VAC
2 = Alarm 2 and 3: Relays: 2A / 240 VAC

Event Inputs BOX 5

0 = None
1 = 6 Event Inputs

Option 1 BOX 6

0 = None
1 = RS-485 Interface and Remote Setpoint

Option 2 BOX 7

0 = None
1 = 1 CT Input and Remote Setpoint
2 = 2 CT Inputs and Remote Setpoint

Option 3 BOX 8

0 = None
1 = Retransmit: 4-20 mA / 0-20 mA and Remote Setpoint
2 = Retransmit: 0-10 VDC and Remote Setpoint
3 = Alarm 4 Relay: 2A / 240 VAC and Remote Setpoint
4 = Alarm 4 Relay: 2A / 240 VAC, Retransmit: 4-20 mA / 0-20 mA and Remote Setpoint
5 = Alarm 4 Relay: 2A / 240 VAC, Retransmit: 0-10 VDC and Remote Setpoint

Option 4 BOX 9

0 = None
1 = Terminal Covers
2 = Ramp and Soak Firmware
3 = Terminal Covers and Ramp and Soak Firmware

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

Agency Approvals:

RoHS, REACH, WEEE

Stock and Common Part Numbers

(All Stock Part Numbers Include Terminal Covers)
(Default Type "J" Thermocouple Input)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Output 1</th>
<th>Out 2/Alm 1</th>
<th>Alarm 2 &amp; 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEC44001</td>
<td>Relay</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TEC44002</td>
<td>Relay</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TEC44003</td>
<td>Relay</td>
<td>(2) Relays</td>
<td>None</td>
</tr>
<tr>
<td>TEC44004</td>
<td>Pulse DC</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TEC44005</td>
<td>Pulse DC</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TEC44006</td>
<td>Pulse DC</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TEC44007</td>
<td>4-20mA</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TEC44008</td>
<td>4-20mA</td>
<td>(2) Relays</td>
<td>None</td>
</tr>
</tbody>
</table>

Specifications on page 13-47

View Product Inventory @ www.tempco.com
Temperature Controllers
Model TEC-4400 Specifications (1/4 DIN)

Power Input
- Standard: 90 to 250 VAC, 47-63 Hz, 12 VA, 6 W maximum
- Optional: 11 to 40 VDC / 20 to 28 VAC, 47-63 Hz, 12 VA, 6 W maximum

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

Remote Set Point Input
- Type: Linear current, Linear voltage
- Range: -3-27 mA, -1.3-11.5 V
- Accuracy: ±0.05 %
- Input Impedance: Current: 2.5Ω, Voltage: 1.5 MΩ
- Resolution: 18 bits
- Sampling Rate: 1.66 times/second
- Maximum Rating: 280 mA maximum for Current Input, 12 VDC maximum for Voltage Input
- Sensor Break Detection: Below 1 mA for 4-20 mA input, below 0.25 V for 1 - 5 V input, not available for other inputs

Event Input
- Number of Event Inputs: 6
- Logic Low: -10 V minimum, 0.8 V maximum
- Logic High: 2 V minimum, 10 V maximum

CT Input
- CT type: TEC99998
- Accuracy: ±2 % of full scale reading, ± 1 digit maximum
- Input Impedance: 294Ω
- Measurement Range: 0 - 50 A AC
- Output of CT: 0 - 5 V 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: 2 A, 240 V AC, 200000 life cycles for resistive load
- Pulsed Voltage: Source voltage 5 V, Current limiting resistance 66 Ω
- Linear Output Resolution: 15 Bits
- Isolation Breakdown Voltage: 1000 V AC
- Load Capacity of Linear Output: Linear current: 50 Ω maximum, Linear voltage: 10 kΩ minimum

Alarm
- Relay Type: Form A
- Maximum Rating: 2 A, 240 VAC, 200000 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: 0.1-4553.6 minutes

Data Communications
- Interface: RS-485
- Protocol: Modbus RTU
- Address: 1-247
- Baud Rate: 2.8 - 115.2 Kbits/sec
- 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, 0-10 V
- Resolution: 15 Bits
- Accuracy: ±0.05 % of span ± 0.0025 % / °C
- Load Resistance: 0-5002 Ω for current output, 10 kΩ minimum for voltage output
- Isolation Breakdown: 1000 V AC minimum
- Linear Output Ranges: 0-2.22 mA (0-20 mA / 4-20 mA), 0-5.55 V (0-5 V, 1-5 V), 0-11.1 V (0-10 V)

User Interface
- Keypad: 4 Keys
- Display Type: 4 digit LCD display
- No. of Display: 3
- Upper Display Size: 0.98" (25mm)
- Lower Display Size: 0.55" (14mm)

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 hysteretic 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 ≥ 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
- Humidity: 0 to 90 % RH (Non-Condensing)
- Insulation Resistance: 20 MΩ minimum (@ 500 V DC)
- Dielectric Strength: 2000 V AC, 50/60 Hz for 1 Minute
- Vibration Resistance: 10 to 55 Hz, 10m/s² for 2 Hours
- Shock Resistance: 200 m / s² (20 g)
- Moldings: Flame retardant polycarbonate
- Mounting: Panel
- Dimensions W x H x D: 3-3/4 " x 3-3/4 " x 2-3/8 " (96 x 96 x 59 mm)
- Weight: 0.64 lbs. (290 g)

Environmental and Physical Specifications
- Ramping Control: 0 to 900.0 °F / Minute or 0 to 900.0 °F / Hour Ramp Rate
- Cut Out Dimensions: 3-5/8" x 3-5/8" (92 x 92 mm)
- Weight: 0.64 lbs. (290 g)

Rear Terminal Connections

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