Temperature Controllers

Model TEC-7400 3/16 DIN

Model TEC-7400 3/16 DIN Temperature Controller

Design Features

✴ 3/16 DIN size – 72 mm × 72 mm
✴ Fuzzy Logic PID Autotune heat and cool control
✴ Universal input, field configurable (Type J/T/C default, 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

Agency Approvals:

RoHS, REACH, WEEE

Hardware Code: TEC-7400 -

A Part Number based on the hardware code and any software pre-programming will be issued at time of order.

Standard lead time is stock to 2 weeks.

Power Input BOX 1

<table>
<thead>
<tr>
<th>Output 1</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>4 = 90-250 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 = 11-40 VDC / 20-28 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Output 2 / Alarm 1 BOX 3

<table>
<thead>
<tr>
<th>Output 2 / Alarm 1</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = Relay: 2A / 240 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 = Pulse DC for SSR drive: 5 VDC (30 mA max)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 = Isolated, 4-20 mA (default), 0-20 mA</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 = Isolated VDC, 0-10 scalable</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C = Pulse DC for SSR drive: 14 VDC (40 mA max)</td>
<td></td>
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</tbody>
</table>

Alarm 2 and 3 BOX 4

<table>
<thead>
<tr>
<th>Alarm 2 and 3</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 = None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = Alarm 2: Relay: 2A / 240 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 = Alarm 2 and 3: Relays: 2A / 240 VAC</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Event Inputs BOX 5

<table>
<thead>
<tr>
<th>Event Inputs</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>0 = None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = 6 Event Inputs</td>
<td></td>
<td></td>
<td></td>
</tr>
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</table>

Option 1 BOX 6

<table>
<thead>
<tr>
<th>Option 1</th>
<th></th>
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</thead>
<tbody>
<tr>
<td>0 = None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = RS-485 Interface &amp; Remote Setpoint</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Option 2 BOX 7

<table>
<thead>
<tr>
<th>Option 2</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>0 = None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = 1 CT Input and Remote Setpoint</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 = 2 CT Inputs and Remote Setpoint</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Option 3 BOX 8

<table>
<thead>
<tr>
<th>Option 3</th>
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</tr>
</thead>
<tbody>
<tr>
<td>0 = None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = Retransmit: 4-20 mA / 0-20 mA and Remote Setpoint</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 = Retransmit: 0-10 VDC and Remote Setpoint</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 = Alarm 4 Relay: 2A / 240 VAC and Remote Setpoint</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

Option 4 BOX 9

<table>
<thead>
<tr>
<th>Option 4</th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>0 = None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 = Terminal Covers</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 = Ramp and Soak Firmware</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 = Terminal Covers and Ramp and Soak Firmware</td>
<td></td>
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</tr>
</tbody>
</table>

Stock and Common Part Numbers

(All Stock Part Numbers Include Terminal Covers)

(Initial Type "J" Thermocouple Input)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Output 1</th>
<th>Out 2 / Alm 1</th>
<th>Option 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEC45001</td>
<td>Relay</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TEC45002</td>
<td>Relay</td>
<td>Delay</td>
<td>None</td>
</tr>
<tr>
<td>TEC45003</td>
<td>Relay</td>
<td>Delay</td>
<td>None</td>
</tr>
<tr>
<td>TEC45004</td>
<td>Pulse DC</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TEC45005</td>
<td>Pulse DC</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TEC45006</td>
<td>Pulse DC</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TEC45007</td>
<td>4-20mA</td>
<td>None</td>
<td>Delay</td>
</tr>
<tr>
<td>TEC45008</td>
<td>4-20mA</td>
<td>None</td>
<td>Delay</td>
</tr>
</tbody>
</table>

Transformer for Heater Break Alarm

(0-50 Amp current)

Part Number: TEC99998

Specifications on page 13-47

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
Temperature Controllers

Model TEC-7400 Specifications (3/16 DIN)

Power Input
- Standard: 90-250 VAC, 47-63 Hz, 12VA, 6W maximum
- Optional: 11-40 VDC / 20-8 VAC, 47-63 Hz, 12VA, 6W maximum

Signal Input
- Resolution: 18 Bits
- Sampling Rate: 5 Times / Second (200ms/sec)
- 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, above 0.25mA 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

Remote Set Point Input
- Type: Linear current, linear voltage
- Range: -3-27mA, -1.3-11.5V
- Accuracy: ±0.05%
- Input Impedance: Current: 2.5Ω, Voltage: 1.5MΩ
- Resolution: 18 bits
- Sampling Rate: 1.66 times/second
- Maximum Rating: 280mA maximum for current input, 12VDC maximum for voltage input
- Temperature Effect: ±1.5μV / °C for voltage input, ±30μV / °C for current input
- Sensor Break Detection: Below 1mA for 4-20mA input, below 0.25mA for 1-5V input, not available for other inputs

Event Input
- Number of Event Inputs: 2
- 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: 249Ω
- 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, 200000 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, 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
- 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: 0-500Ω for current output, 10KΩ minimum for voltage output
- Isolation Breakdown: 1000VAC minimum
- Integral Linearity Error: ±0.005% of span
- Linear Output Ranges: 0-22.2mA (0-20mA / 4-20mA), 0-5.55V (0-5V, 1-5V), 0-11.1V (0-10V)

User Interface
- Keypad: 4 Keys
- Display Type: 4 digit LCD display
- No. of Display: 3
- Upper Display Size: 0.58" (15mm)

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 -30~30 % of PB
- ON-OFF: 0.1-90.0% 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°F / Minute or 0 to 900°F / Hour Ramp Rate

Profiler
- Availability: Option
- No. of Segments / Program: 4 / 8 / 16

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: Panel
- Dimensions W × H × D: 2-7/32 × 2-7/32 × 2-3/8" (72 × 72 × 59 mm)
- Depth Behind Panel: 2" (50 mm)
- Cut Out Dimensions: 2-11/16 × 2-11/16" (68 × 68 mm)
- Weight: 0.41 lbs. (190 g)

Rear Terminal Connections

(800) 323-6859 • Email: sales@tempco.com

13-3H
Rev 1 (0-19)