**Model TEC-2400 1/32 DIN Temperature Controller**

### Design Features
- **1/32 DIN size –** 24 mm × 48 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**

### Agency Approvals:
- RoHS, REACH, WEEE

### Hardware Code:
- TEC-2400 - 1 2 3 4 5

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**
  - 1 = 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 = 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)

### Option 1
- **BOX 4**
  - 0 = None
  - 1 = RS-485 Interface
  - 2 = 1 Event Input
  - 3 = 1 CT Input

### Option 2
- **BOX 5**
  - 0 = None
  - 1 = Retransmit: 4-20mA / 0-20mA
  - 2 = Retransmit: 0-10VDC
  - 3 = Alarm 2 Relay: 2A / 240 VAC

---

**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

---

View Product Inventory @ www.tempco.com
Power Input
Standard: 90-250 VAC, 47-63 Hz, 8VA, 4W maximum
Optional: 11-40 VDC / 20-28 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
Maximum 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
Data Length: 7 or 8 Bits
Communication Buffer: 160 bytes

Rear Terminal Connections

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: 2
Upper Display Size: 0.4" (10mm)
Lower Display Size: 0.19" (4.8mm)

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 -30.0 ~ 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: Panel
Dimensions W × H × D: 15/16 × 1-7/8 × 3-13/16" (48 × 24 × 92 mm)
Depth Behind Panel: 3-1/16" (84 mm)
Cut Out Dimensions: 7/8 × 1-25/32" (22 × 45 mm)
Weight: 0.26 lbs (160 g)

Stock and Common Part Numbers

Model TEC-2400 Specifications (1/32 DIN)