Temperature Controllers

Model **TEC-4400** 1/4 DIN

Model TEC-4400 1/4 DIN Temperature Controller

Design Features

✳ 1/4 DIN size – 96 mm × 96 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:

c(UL)us LISTED
CE
RoHS, REACH, WEEE

File #: **E244198**

Hardware Code: TEC-4400 - ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐
  1   2   3   4   5   6   7   8   9

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

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 (40 mA 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
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

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

Part Number	Output 1	Out 2/ Alm 1	Alarm 2 & 3
TEC44001	Relay	None	None
TEC44002	Relay	Relay	None
TEC44003	Relay	Relay	(2) Relays
TEC44004	Pulse DC	None	None
TEC44005	Pulse DC	Relay	None
TEC44006	Pulse DC	Relay	(2) Relays
TEC44007	4-20mA	None	None
TEC44008	4-20mA	Relay	(2) Relays

View Product Inventory @ www.tempco.com

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

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
Sensor Break Detection: Below 1mA for 4-20mA input,
below 0.25V for 1 - 5V input, not available for other inputs

Event Input
Number of Event Inputs: 6
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, 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   **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, 0-10V
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
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: 0.98" (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) 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: 3-3/4 × 3-3/4 × 2-3/8" (96 × 96 × 59 mm)
Depth Behind Panel: 2" (50 mm)
Cut Out Dimensions: 3-5/8 × 3-5/8" (92 × 92 mm)
Weight: 10 oz (290 g)
IP50 for the front panel, IP20 for rear terminals and housing.
All indoor use.

Rear Terminal Connections