Temperature Controllers

Model TEC-8400 & Model TEC-8450 1/8 DIN Temperature Controllers

Agency Approvals:

UL Listed
RoHS, REACH, WEEE

Hardware Code:

TEC-8400 -

TEC-8450 -

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.

Design Features

✴ 1/8 DIN size – 48 mm x 96 mm, horizontal: 96 mm x 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

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), 0-20 mA
5 = Isolated, VDC, 0-10 scalable
C = Pulse DC for SSR drive: 14 VDC (40 mA max)

Alarm and 2 3 BOX 4

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

Event Inputs BOX 5

0 = None
1 = 6 Event Inputs

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

Option 1 BOX 6

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

Option 2 BOX 7

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

Option 3 BOX 8

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

Option 4 BOX 9

0 = None
1 = Terminal Covers
2 = 2 Programs each with 8 Segments of Ramp & Soak
3 = Terminal Covers and Ramp & Soak Firmware

Hardware Code: TEC-8400 -

TEC-8450 -

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.

Standard lead time is stock to 2 weeks.

Agency Approvals:

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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.

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Temperature Controllers

Model TEC-8400 & -8450 Specifications

Power Input
- Standard: 90-250 VAC, 47-63 Hz, 8VA, 4W maximum
- Optional: 11-40 VDC / 20-8 VAC, 47-63 Hz, 10VA, 5W maximum or 12VA, 6W maximum

Signal Input
- Resolution: 18 Bits
- Sampling Rate: 5 Times/Sec. (200msec)
- Maximum Rating: 2VDC minimum, 12VDC maximum
- Normal Mode Rejection Ratio (NMRR): 55dB
- 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
- Temperature Effect: ±1.5μV/°C for voltage input, ±3μV/°C for current input
- Sensor Break Detection: Below 1mA for 4-20mA input, below 0.25V for 1-5V input, not available for other inputs

Event Input
- No. of Event Inputs: 6
- Logic Low: -10Vmin., 0.8V max.
- Logic High: 2V min., 10V max.

CT Input
- CT Type: TEC9999E
- Accuracy: ±2% of full scale reading, ±1 digit max.
- Input Impedance: 294Ω
- Measurement Range: 0-50A AC
- Output of CT: 0-5V DC
- CT Mount: Wall (Screw) mount
- Sampling Rate: 1 time/second

Output 1 /Output 2
- Type: Relay, pulsed voltage, linear voltage and linear current
- Relay Rating: 2A, 240VAC, 200000 life cycles for resistive load
- Pulsed Voltage: Source voltage 5V, Current limiting resistance 66Ω
- Linear Output Resolution: 15 Bits
- Isolation Breakdown Voltage: 1000 VAC
- 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 Communication
- Interface: RS-485
- Protocol: Modbus RTU
- Address: 1-247
- Baudrate: 2.8-115.2 KBPS
- 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: 0-2.2mA (0-20mA/4-20mA), 0-5.55V (0-5V, 1-5V), 0-1.1V (0-10V)

User Interface
- Keypad: 4 Keys
- Display Type: 4 digit LCD display
- No. of Display: 3
- Upper Display Size: 0.7” (17.7mm)
- Lower Display Size: 0.4” (11.2mm)

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 -360 ~ 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: 0-900.0°F/Minute or 0-900.0°F/Hour Ramp Rate

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

Environmental and Physical Specifications
- Operating Temp.: -10°C to 50°C
- Storage Temp.: -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: 10-55 Hz, 10m/s2 for 2 hours
- Shock Resistance: 200 m/s2 (20g)
- Moldings: Flame retardant polycarbonate
- Mounting: Panel

Dimensions H × W × D:
- TEC-8400: 3-3/4 × 1-7/8 × 2-3/8” (96 × 48 × 59 mm)
- TEC-8450: 3-5/8 × 1-25/32” (92 × 45 mm)

Weight: 0.48 lbs. (220 g)

Stock and Common Part Numbers (8400)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Output 1</th>
<th>Out 2/</th>
<th>Alarm 2 &amp; 3</th>
<th>Alarm Functions</th>
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</thead>
<tbody>
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Note: All Stock Part Numbers Include Terminal Covers

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Note: All Stock Part Numbers Include Terminal Covers

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Specifications
- Stock and Common Part Numbers (8400)
- (Default Type "J" Thermocouple Input)
- Part Number | Output 1 | Out 2/| Alarm 2 & 3 | Alarm Functions |
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