**Temperature Controllers**

**Model TEC-4400 Specifications (1/4 DIN)**

### 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
- 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: 294Ω
- 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: 50-50Ω for current output, 10KΩ minimum for voltage output
- Isolation Breakdown: 1000VAC minimum
- Linear Output Ranges: 0-2.2mA (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 (°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: 0.64 lbs. (290 g)

### Rear Terminal Connections

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