Model TEC-8100 1/8 DIN Temperature Controller

Design Features
- 1/8 DIN size – 96 mm x 48 mm
- Fuzzy Logic PID heat and cool control
- PID Control – Auto-tuning on cold or warm start
- Short panel depth – only 2-9/16” (65 mm) required
- Universal programmable sensor input
- Highly versatile – 6 types of output available
- Output 2 can be used for cooling function
- Universal input power – 90-264 VAC or 11-26 VAC/VDC
- Optional NEMA 4X/IP65 front panel
- Bumpless transfer to manual mode during sensor failure
- Wide variety of alarm mode selections
- Optional RS-232 or RS-485 communications interface
- Bright 0.40” (10 mm) red LED process display, 0.31” (8 mm) green LED setpoint display
- High performance at a very low price
- Agency Approvals:

Ordering Code:

Power Input BOX 1
4 = 90-250 VAC
5 = 11-26 VAC / VDC
9 = Other

TEC-8100-

Signal Input — Universal, can be programmed in the field for item 5 or 6
5 = Thermocouple: *J, K, T, E, B, R, S, N, L
0-60 mV
6 = RTD: *PT100 DIN, PT100 JIS
7 = 0-1 VDC
8 = *0-5, 1-5 VDC
A = 0-10 VDC
B = *4-20, 0-20 mA
9 = Other * indicates default value

Alarm BOX 5
0 = None
1 = Relay: 2A / 240 VAC, SPDT
9 = Other

Communication BOX 6
0 = None
1 = RS-485 Interface
2 = RS-232 Interface
3 = Retransmission 4-20 mA (default), 0-20 mA
4 = Retransmission 1-5 V DC (default), 0-5 VDC
5 = Retransmission 0-10 VDC
9 = Other

NEMA 4X / IP65 BOX 7
0 = No
1 = Yes

Ordering Information
Model TEC-8100 is offered with the options listed in the worksheet above. Create an ordering code by filling in the boxes with the appropriate number and/or letter designation for your requirements and a part number will be assigned, or choose from one of the part numbers listed.

Standard lead time is stock to 4 weeks.

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 pages 13-36 and 13-37.
**Power Input**
- Standard: 90-250 VAC, 47-63 Hz, 12 VA, 5W maximum
- Optional: 11-26 VAC / VDC, 12 VA, 5W maximum

**Signal Input**
- Accuracy: Thermocouple: ±0.10% of full scale, ±1 LSD at 77°F/25°C
  RTD: ±0.07% of full scale, ±1 LSD at 77°F/25°C
- Resolution: 18 bits
- Sampling Rate: 5 times per second
- Temperature Effect: ±1.5 µV / °C for all inputs except mA input
  For mA input: ±3.0 µV / °C
- Common Mode Rejection Ratio (CMRR): 120 dB
- Normal Mode Rejection Ratio (NMRR): 55 dB
- Sensor Break Detection: Sensor open for tc, RTD and mV inputs,
  below 1 mA for 4-20 mA input, below 0.25V for 1-5 VDC input,
  unavailable for other inputs.

**Output 1 / Output 2**
- Relay Rating: 240 VAC, 2 Amp
- Pulsed Voltage: Source voltage 5V, Current limiting resistance 66Ω
- Linear Output — Characteristics
  - Type: 4-20 mA
  - Tolerance: ±2.0 mA
  - Zero Tolerance: 20-21 mA
  - Span: 20-21 mA
  - Capacity: 2000 mA max
- Temperature Effect: ±0.01 % of span/°C

**Solid State Relay (Triac) Output**
- Rating: 1A / 240 VAC
- Inrush Current: 20A for 1 cycle
- Min. Load Current: 50 mA rms
- Max. Off-state Leakage: 3 mA rms
- Max. On-state Voltage: 1.5 V AC rms
- Isolation Breakdown Voltage: 1000 VAC
- Temperature Effect: ±0.01 % of span/°C

**Approval Standards**
- Safety Standard: UL61010-1 and CSA C22.2 No. 24-93
- Protective Class: Front panel: IP 50, optional NEMA 4X/IP65
- EMC: EN61326

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**Temperature Controllers**

Model **TEC-8100** Specifications (1/8 DIN)

**Alarm 1 — Programmable**
- Alarm 1 Relay: Form A, (NO)
- Alarm Functions: Dwell timer
- Alarm Mode: Normal, Latching, Hold, Latching / Hold

**Data Communications**
- Interface: RS-232 (1 unit), RS-485 (up to 247 units)
- Protocol: Modbus Protocol – RTU mode
- Address: 1-247
- Baud Rate: 0.3 - 38.4 Kbits/sec
- Data Bits: 7 or 8 bits
- Parity Bit: None, Even or Odd
- Stop Bit: 1 or 2 bits
- Communication Buffer: 160 bytes

**User Interface**
- Dual 4-digit LED Display: 0.40" (10 mm) Red Process Display
- 0.31" (8 mm) Green Setpoint Display
- Keypad: 4 keys
- Programming Port: For automatic setup, calibration and testing

**Control Mode**
- Output 1: Reverse (heating) or direct (cooling) action
- Output 2: PID cooling control, cooling P band 50-300% of PB
- On-Off: 0 - 90°F hysteresis control (P band = 0)
- P or PD: 0 - 100.0% offset adjustment
- PID: Fuzzy logic modified
  - Proportional band: 0 - 900°F
  - Integral time: 0 - 1000 seconds
  - Derivative time: 0 - 360 seconds
- Cycle Time: 0.1 - 90 seconds
- Manual Control: Heat (MV1) and Cool (MV2)
- Auto-tuning: Cold start and warm start
- Failure Mode: Auto-transfer to manual mode with sensor break or
  A-D converter damage
- Ramping Control: 0 - 900°F/min or 0 - 900°F/hr ramp rate

**Environmental and Physical**
- Operating Temperature: 14 to 122°F (-10 to 50°C)
- Storage Temperature: -40 to 140°F (-40 to 60°C)
- Humidity: 0 to 90% RH, non-condensing
- Dielectric Strength: 2000 VAC, 50/60 Hz for 1 minute
- Dimensions: 3-3/4 x 1-7/8 x 3-1/8" (96 x 48 x 80 mm) H x W x D
- Panel Cutout: 3-5/8 x 1-25/32" (92 x 45 mm) H x W
- Weight: 0.46 lb. (210 grams)

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**Stock and Common Part Numbers**

(Internal Power: 90-250 VAC, no data com, no NEMA 4X)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Signal Input</th>
<th>Out 1</th>
<th>Out 2</th>
<th>Alarm</th>
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<td>relay</td>
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<td>4-20 mA</td>
<td>dc pulse</td>
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<td>dc pulse</td>
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</table>

**Rear Terminal Connections**

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