Model TEC-8100 1/8 DIN Temperature Controller

Configurable for 4 Programmable Outputs and optional NEMA 4X/IP65 Front Panel!

Design Features

✴ 1/8 DIN size – 96 mm × 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 inputs available
✴ Output 2 can be used for cooling function
✴ Universal input power – 90-250 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

Power Input

4 = 90-250 VAC
5 = 11-26 VAC / VDC
9 = Other

Hardware Code: TEC-8100-

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.

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
B = *0-5, 1.5 VDC
A = 0-10 VDC
B = *4-20, 0-20 mA
9 = Other
* indicates default value

Output 1

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
4 = Isolated VDC, 1-5 (default), 0-5, 0-1
5 = Isolated VDC, 0-10
6 = Triac-SSR output 1A / 240 VAC
C = Pulse DC for SSR drive: 14 VDC (40 mA max)
9 = Other

Output 2

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
4 = Isolated VDC, 1-5 (default), 0-5, 0-1
5 = Isolated VDC, 0-10
6 = Triac-SSR output 1A / 240 VAC
7 = Isolated 20V @ 25 mA DC, Output Power Supply
8 = Isolated 12V @ 40 mA DC, Output Power Supply
9 = Isolated 5V @ 80 mA DC, Output Power Supply
C = Pulse DC for SSR drive: 14 VDC (40 mA max)
A = Other

Alarm

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

Communication

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

NEMA 4X / IP65

0 = No
1 = Yes

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.

View Product Inventory @ www.tempco.com
Temperature Controllers

Model TEC-8100 Specifications (1/8 DIN)

Power Input
Standard: 90-250 VAC, 47-63 Hz, 12 VA, 5W maximum
Optional: 11-26 VAC / VDC, 12 VA, 5W maximum

Signal Input
Resolution: 18 bits Sampling Rate: 5 samples / second
Accuracy: ± 24% of span typical
Max. On-state Voltage: 1.5 VAC rms
Max. Off-state Leakage: 3 mA rms
Min. Load Current: 20A for 1 cycle
Inrush Current: 1A / 240 VAC

Output 1 / Output 2
Relay Rating: 240 VAC, 2 Amp
Pulsed Voltage: Source voltage 5V, Current limiting resistance 66Ω

Linear Output — Characteristics

<table>
<thead>
<tr>
<th>Type</th>
<th>Tolerance</th>
<th>Zero Tolerance</th>
<th>Span Capacity</th>
<th>Load</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-20 mA</td>
<td>3.6-4.0 mA</td>
<td>20-21 mA</td>
<td>500Ω max</td>
<td></td>
</tr>
<tr>
<td>0-20 mA</td>
<td>0 mA</td>
<td>20-21 mA</td>
<td>500Ω max</td>
<td></td>
</tr>
<tr>
<td>0-5 VDC</td>
<td>0 VDC</td>
<td>5.5-25 VDC</td>
<td>10 KΩ min</td>
<td></td>
</tr>
<tr>
<td>1-5 VDC</td>
<td>0.9-1.0 VDC</td>
<td>5.5-25 VDC</td>
<td>10 KΩ min</td>
<td></td>
</tr>
<tr>
<td>0-10 VDC</td>
<td>0 VDC</td>
<td>10-10.5 VDC</td>
<td>10 KΩ min</td>
<td></td>
</tr>
</tbody>
</table>

Resolution: 15 bit analog to digital converter
Output Regulation: 0.0% for full load change
Output Settling Time: 0.1 sec. (stable to 99.9%)
Isolation Breakdown Voltage: 1000 VAC
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 VAC rms
Insulation Resistance: 1000 Megohms minimum at 500 VDC
Dielectric Strength: 2500 VAC for 1 minute

Rear Terminal Connections

Alarm 1 — Programmable
Alarm 1 Relay: Form A, (NO)
Max. Rating: 240 VAC, 2 Amp
Alarm Functions: Dwell timer
Deviation High / Low Alarm
Deviation Band High / Low Alarm
Process High / Low Alarm
Sensor Break Alarm
Alarm Mode: Normal, Latching, Hold, Latching / Hold
Dwell Timer: 0 - 4553.6 minutes

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

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: 0.1 - 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” × 1-7/8” × 3-1/8” (96 × 48 × 80 mm) H×W×D
Panel Cutout: 3-5/8” × 1-25/32” (92 × 45 mm) H×W
Weight: 0.46 lb. (210 grams)

Approval Standards
Safety Standard: UL61010-1 and CSA C22.2 No. 24-93
EN61010-1 (IEC1010-1)
Protective Class: IP 50, optional NEMA 4X/IP65
Housing and Terminals: IP 20
EMC: EN61326

Stock and Common Part Numbers
(Power Input: 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>
</tr>
</thead>
<tbody>
<tr>
<td>TEC34001</td>
<td>tc</td>
<td>relay</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>TEC34002</td>
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<td>relay</td>
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<td>none</td>
</tr>
<tr>
<td>TEC34003</td>
<td>tc</td>
<td>4-20 mA</td>
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<td>none</td>
</tr>
<tr>
<td>TEC34004</td>
<td>tc</td>
<td>DC pulse</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>TEC34005</td>
<td>RTD</td>
<td>relay</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>TEC34006</td>
<td>RTD</td>
<td>DC pulse</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>TEC34007</td>
<td>RTD</td>
<td>DC pulse</td>
<td>none</td>
<td>none</td>
</tr>
<tr>
<td>TEC34008</td>
<td>RTD</td>
<td>relay</td>
<td>none</td>
<td>none</td>
</tr>
</tbody>
</table>

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