Model TEC-220 1/32 DIN Temperature Controller

Design Features

- 1/32 DIN size – 24 mm x 48 mm
- Fuzzy Logic PID Autotune heat and cool control
- Short panel depth – only 3-7/8” (98 mm) required
- Universal input, field configurable (Type J/T/C default, PT100, mA, V)
  with high accuracy 18-bit D/A
- Highly versatile – 6 types of inputs available
- Output 2 can be programmed as output or alarm
- NEMA 4X / IP65 gasketed front panel
- Universal input power, 90-250 VAC or 11-26 VAC/VDC
- Bumpless transfer to manual mode during sensor failure
- Wide variety of alarm mode selections
- RS-485 and RS-232 data communications interface optional
- Bright 0.40” (10 mm) LED display
- High performance at a very low price

Power Input

BOX 1

1 = 90-250 VAC
5 = 11-26 VAC / VDC
9 = Other

Signal Input

Universal, can be programmed in the field for item 5 or 6

BOX 2

5 = Thermocouple: *J, K, T, E, B, R, S, N, L
0-60 mV

6 = RTD: *PT100 DIN, PT100 JIS
0-1 VDC

8 = *-0.5, 1-5 VDC

A = 0-10 VDC

B = *-4-20, 0-20 mA

9 = Other

* indicates default value

Output 1

BOX 3

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
8 = Isolated 20V @ 25 mA DC, Output Power Supply

BOX 4

A = Isolated 12V @ 40 mA DC, Output Power Supply

B = Isolated 5V @ 80 mA DC, Output Power Supply

C = Pulse DC for SSR drive: 14 VDC (40 mA max)

9 = Other

Communications

BOX 5

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

Units — °F or °C

BOX 6

1 = °F on faceplate
2 = °C on faceplate
3 = None (process units)

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.
Temperature Controllers

Model TEC-220 Specifications (1/32 DIN)

Output 2 / Alarm 1 — Programmable

Alarm 1 Relay: Form A, (NO)
Maximum 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
Communication Buffer: 160 bytes

User Interface

Single 4-digit LED Display: 0.4" / 10 mm
Keypad: 3 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, dead band ±36.0 to ±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°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: 1-3/4" × 11-1/8" × 2-5/16" (26.5 × 50 × 110.5 mm) H×W×D
Depth behind panel: 3-7/8” (98 mm)
Panel Cutout: 7/8 × 1-1/16" (22 × 45 mm) H×W
Weight: 0.26 lb. (120 grams)

Approval Standards

Safety: UL61010C-1, CSA C22.2 No. 24-93
EN61010-1 (IEC1010-1)
Protective Class: Front Panel: NEMA 4X / IP65
Housing and Terminals: IP 20
EMC: EN61326

Stock and Common Part Numbers

(Power Input: 90-250 VAC, no data com)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Signal Input</th>
<th>Out 1</th>
<th>Out 2/Alarm 1</th>
<th>°F/°C</th>
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<td>°F</td>
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<td>°F</td>
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<td>none</td>
<td>°F</td>
</tr>
</tbody>
</table>

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