Model TEC-8100 1/8 DIN Temperature Controller

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

Agency Approvals

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 *BOX 1*

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

Hardware Code: **TEC-8100-**

1	2	3	4	5	6	7

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 *BOX 2*

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

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
C = Pulse DC for SSR drive: 14 VDC (40 mA max)
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 VDC (default), 0-5 VDC
5 = Retransmission 0-10 VDC
9 = Other

Output 2 *BOX 4*

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

NEMA 4X / IP65 *BOX 7*

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.**

WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

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
Maximum Rating: -2 VDC minimum, 12 VDC maximum (1 minute for ma input)
Temperature Effect: ±1.5 μV / °C for all inputs except mA input ±3.0 μV / °C for mA input
Sensor Lead Resistance Effect: T/C: 0.2μV/ohm
3-wire RTD: 2.6°C/ohm of resistance difference of two leads
Burn-out Current: 200nA
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; sensor short for RTD input; below 1 mA for 4-20 mA input; below 0.25V for 1-5V input; unavailable for other inputs
Sensor Break Response Time: Within 4 seconds for TC, RTD and mV inputs; 0.1 second for 4-20 mA and 1-5 V inputs

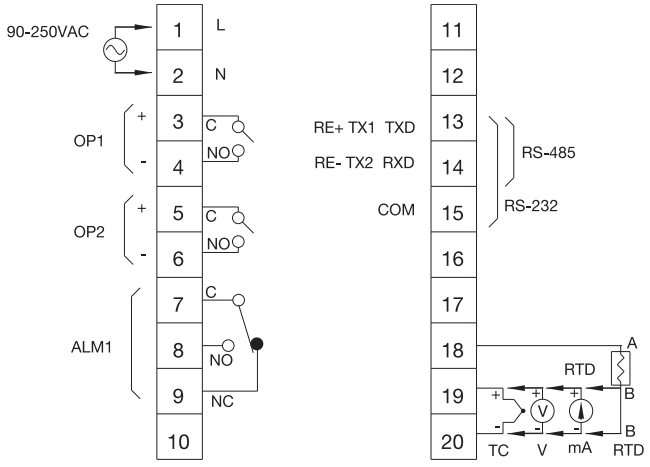
Output 1 / Output 2
Relay Rating: 240 VAC, 2 Amp
Pulsed Voltage: Source voltage 5V, Current limiting resistance 66Ω

Linear Output — Characteristics

Type Tolerance	Zero Tolerance	Span Capacity	Load
4-20 mA	3.6-4.0 mA	20-21 mA	500Ω max
0-20 mA	0 mA	20-21 mA	500Ω max
0-5 VDC	0 VDC	5-5.25 VDC	10 KΩ min
1-5 VDC	0.9-1.0 VDC	5-5.25 VDC	10 KΩ min
0-10 VDC	0 VDC	10-10.5 VDC	10 KΩ min

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)
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
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: 0.1 - 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
Depth behind panel: 2-9/16" (65 mm)
Panel Cutout: 3-5/8" × 1-25/32" (92 x 45 mm) H×W
Weight: 0.46 lb. (210 grams)

Approval Standards
Safety Standard: UL61010C-1 and CSA C22.2 No. 24-93
EN61010-1 (IEC1010-1)
Protective Class: **Front panel**: 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)

Part Number	Signal Input	Out 1	Out 2	Alarm
TEC34001	tc	relay	none	none
TEC34002	tc	relay	relay	relay
TEC34003	tc	4-20 mA	none	none
TEC34004	tc	DC pulse	none	none
TEC34005	RTD	relay	none	none
TEC34006	RTD	DC pulse	none	none
TEC34007	RTD	DC pulse	relay	none
TEC34008	RTD	DC pulse	relay	relay