Model TEC-410 1/4 DIN & Model TEC-910 1/16 DIN High Limit Temperature Controls

Common Design Features
- High Limit Control protects personnel, equipment and materials from over-temperature process conditions
- Universal programmable thermocouple sensor input
- Versatile – 2 types of outputs available
- Highly accurate universal input with 18 bit analog to digital converter
- FM approved for electric & gas heat systems
- Bright 0.40” (10 mm) red LED process display
- Short panel depth required
- Output 2 can be programmed as output or input

TEC-410 Design Features
- Universal input power – 90-250 VAC or 11-26 VAC/VDC
- Event input for remote reset
- Two programmable outputs
- Optional RS-485 or RS-232 communications interface
- Optional retransmission
- Optional NEMA 4X/IP65 front face

TEC-910 Design Features
- Universal input power – 90-264 VAC or 11-26 VAC/VDC
- Optional event input for remote reset
- Optional RS-485 communications interface
- Output 2 can be programmed as output or input

Note: The use of solid state relays/contacts are highly discouraged for high limit safety circuits as solid state devices can fail in the closed position.

Power Input BOX 7
- 4 = 90-250 VAC (TEC-410)
- 90-264 VAC (TEC-910)
- 5 = 11-26 VAC / VDC

Signal Input — Universal, can be programmed in the field BOX 2
- 1 = Input 1 – Universal input (factory default = TC type J)
  - mV: 0 to 60
- 9 = Other

Output 1 BOX 3
- 1 = Relay: 2A / 240VAC, Form C
- 6 = Triac-SSR output 1A / 240VAC
- 9 = Other

Output 2 BOX 4
- For TEC-410
  - 0 = None
  - 1 = Relay: 2A / 240VAC, Form C
  - 6 = Triac-SSR output 1A / 240VAC
  - 7 = Isolated 20V @ 25mA DC, Output Power Supply
  - 8 = Isolated 12V @ 40mA DC, Output Power Supply
  - 9 = Isolated 5V @ 80mA DC, Output Power Supply
- For TEC-910
  - 0 = None
  - 1 = Form A Relay: 2A / 240 VAC
  - 6 = Triac Output 1A / 240VAC, SSR
  - 7 = Isolated 20V @ 25mA DC Output Power Supply
  - 8 = Isolated 12V @ 40mA DC Output Power Supply
  - 9 = Isolated 5V @ 80mA DC Output Power Supply
- A = RS-485
- B = Event Input
- D = Retransmit 4-20mA/0-20mA
- E = Retransmit 1-5V/0-5V
- F = Retransmit 0-10V
- H = Special order

Communications BOX 5 (TEC-410 only)
- 0 = None
- 1 = RS-485 Interface
- 2 = RS-232 Interface
- 3 = Retransmission 4-20 mA, 0-20 mA
- 4 = Retransmission 1-5 VDC, 0-5 VDC
- 5 = Retransmission 0-10 VDC
- 9 = Other

Mounting Option BOX 6 (TEC-410 only)
- 0 = Standard Mounting, IP50
- 1 = NEMA 4X/IP65

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

Models TEC-410 & TEC-910 Specifications

Power Input
Standard: (TEC-410) 90-250 VAC, 47-63 Hz, 10 VA, 5W maximum (TEC-910) 90-264 VAC, 47-63 Hz, 10 VA, 5W maximum
Optional: 11-26 VAC / VDC, 10 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
Sensor Lead Resistance Effect: T/C: 0.2µV/ohm
Burn-out Current: 200mA
Common Mode Rejection Ratio (CMRR): 120 dB
Normal Mode Rejection Ratio (NMRR): 55 dB
Sensor Break Detection: Sensor open for TC inputs
Sensor Break Response Time: Within 4 seconds for TC 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
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
VDC Voltage Supply (Output 2 only)
20 VDC, ±0.5V, at 25 mA
12 VDC, ±0.3V, at 40 mA
5 VDC, ±0.15V, at 80 mA

Event Input (standard TEC-410, optional TEC-910)
Resolution: 18 bits
Logic Low: -10 VDC minimum, 0.8 VDC maximum
Logic High: 2 VDC minimum, 10 VDC maximum
Functions: Remote reset, remote lockout

Limit Control
Modes available: High Limit, Low Limit and High/Low Limit

Data Communications
Interface: RS-485 (up to 247 units), RS-232, TEC-410 only
Protocol: Modbus Protocol – RTU mode
Address: 1-247  Baud Rate: 0.3 - 38.4 Kbits/sec
Data Bits: 8 bits  Parity Bit: None, Even or Odd
Stop Bit: 1 or 2 bits  Communication Buffer: 50 bytes

User Interface
Single 4-digit LED Displays: 0.4” / 10 mm
Keypad: 4 keys
Programming Port: For automatic setup, calibration and testing

Environmental and Physical
Operating Temperature: 14 to 122°F (-10 to 50°C)
Humidity: 0 to 90% RH, non-condensing
Dielectric Strength: 2000 VAC, 50/60 Hz for 1 minute

Dimensions:
TEC-410: 3-3/4 × 3-3/4 × 2-9/16” (96 × 96 × 65 mm) H × W × D
Depth behind panel: 2” (53 mm)
Panel Cutout: 3-21/32” × 3-21/32” (93 × 93 mm) H × W
Weight: 0.55 lb. (250 grams)

TEC-910: 1-7/8 × 1-7/8 × 3-3/4” (48 × 48 × 94 mm) H × W × D
Depth behind panel: 3-3/8” (86 mm)
Panel Cutout: 1-25/32” × 1-25/32” (45 × 45 mm) H × W
Weight: 0.33 lb. (150 grams)

Approval Standards
Safety: FM Class 3545 (OCT. 1998)
CSA: C22.2 No. 24-93
EN61010-1 (IEC1010-1)
TEC-410: UL61010C-I
TEC-910: UL873
Protective Class: IP30 front panel, indoor use,
IP20 housing and terminals (with protective cover)
EMC: EN61326

TEC-410 Stock and Common Part Numbers
(Power Input: 90-250 VAC)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Signal Input</th>
<th>Out 1</th>
<th>Out 2</th>
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<tbody>
<tr>
<td>TEC51001</td>
<td>tc</td>
<td>relay</td>
<td>none</td>
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<tr>
<td>TEC51002</td>
<td>tc</td>
<td>relay</td>
<td>relay</td>
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<tr>
<td>TEC51005</td>
<td>tc</td>
<td>SSR-1A</td>
<td>none</td>
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<tr>
<td>TEC51006</td>
<td>tc</td>
<td>SSR-1A</td>
<td>relay</td>
</tr>
</tbody>
</table>

NOTE: See page 13-46 for features common to TEC digital microprocessor-based temperature controls and the complete Table of Input Range and Accuracy.

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