FM Approved
High Limit Control with External Reset!

Standard lead time is stock to 2 weeks.

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.

Hardware Code: TEC-410-
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.

Hardware Code: TEC-910-
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.

Power Input BOX 1
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.

View Product Inventory @ www.tempco.com
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**: ±0.24% 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 ±0.0 μV / °C for mA input
- **Sensor Lead Resistance Effect**: T/C: 0.2μV/ohm

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
  - 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-1
- **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>
</tr>
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<tbody>
<tr>
<td>TEC51001</td>
<td>tc</td>
<td>relay</td>
<td>none</td>
</tr>
<tr>
<td>TEC51002</td>
<td>tc</td>
<td>relay</td>
<td>relay</td>
</tr>
<tr>
<td>TEC51005</td>
<td>tc</td>
<td>SSR-1A</td>
<td>none</td>
</tr>
<tr>
<td>TEC51006</td>
<td>tc</td>
<td>SSR-1A</td>
<td>relay</td>
</tr>
</tbody>
</table>

TEC-910 Stock and Common Part Numbers
* (Power Input: 90-264 VAC)

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Signal Input</th>
<th>Out 1</th>
<th>Prog. I/O</th>
</tr>
</thead>
<tbody>
<tr>
<td>TEC16001</td>
<td>tc</td>
<td>relay</td>
<td>event input</td>
</tr>
<tr>
<td>TEC16003</td>
<td>tc</td>
<td>SSR-1A</td>
<td>event input</td>
</tr>
<tr>
<td>TEC16004</td>
<td>tc</td>
<td>relay</td>
<td>none</td>
</tr>
<tr>
<td>TEC16006</td>
<td>tc</td>
<td>SSR-1A</td>
<td>none</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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