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

FM Approved
High Limit Control
with External Reset!

Agency Approvals 410

Agency Approvals 910

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/contactors are highly discouraged for high limit safety circuits as solid state devices can fail in the closed position.**

Hardware Code: **TEC-410-** (1) (2) (3) (4) (5) (6)

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-** (1) (2) (3) (4)

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)
Thermocouple: J, K, T, E, B, R, S, N, L, C, P
mV: 0 to 60
9 = Other

Output 1 *BOX 3*

1 = Relay: 2A / 240 VAC, Form C
6 = Triac-SSR output 1A / 240 VAC
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.**

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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 ±3.0 μV / °C for mA input

Sensor Lead Resistance Effect: T/C: 0.2μV/ohm

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 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)

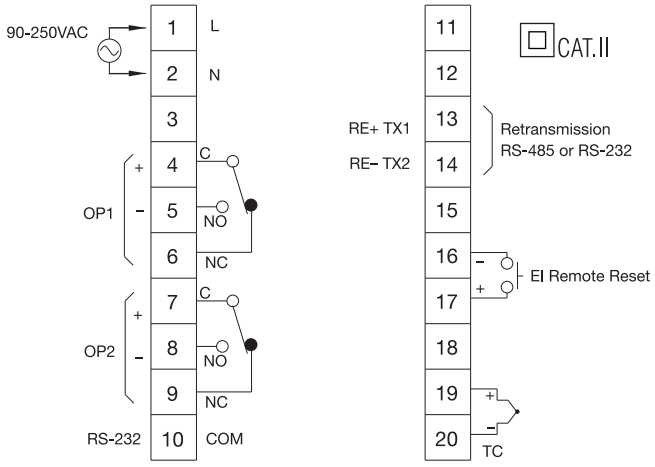
Approval Standards

Safety: FM Class 3545 (OCT. 1998)
CSA: C22.2 No. 24-93
EN61010-1 (IEC1010-1)
TEC-410: UL61010C-1
TEC-910: UL873

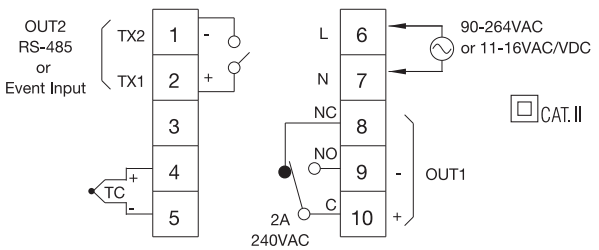
Protective Class: IP30 front panel, indoor use, IP20 housing and terminals (with protective cover)

EMC: EN61326

TEC-410 1/4 DIN Rear Terminal Connections



TEC-910 1/16 DIN Rear Terminal Connections



TEC-410 Stock and Common Part Numbers

(Power Input: 90-250 VAC)

Part Number	Signal Input	Out 1	Out 2
TEC51001	tc	relay	none
TEC51002	tc	relay	relay
TEC51005	tc	SSR-1A	none
TEC51006	tc	SSR-1A	relay

TEC-910 Stock and Common Part Numbers

(Power Input: 90-264 VAC)

Part Number	Signal Input	Out 1	Prog. I/O
TEC16001	tc	relay	event input
TEC16003	tc	SSR-1A	event input
TEC16004	tc	relay	none
TEC16006	tc	SSR-1A	none

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