

Installation and Operation Instructions for TDX6 Temperature Scanner/Pyrometer

TDX-9110N
Revised 2014-05-06
Section 10
(00-02-0169)



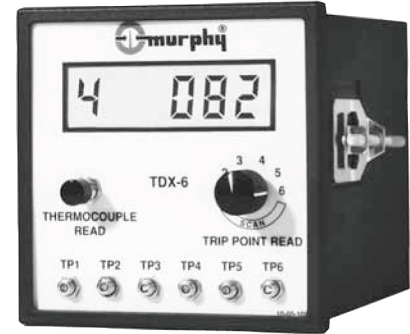
Please read the following information before installing. A visual inspection of this product for damage during shipping is recommended before mounting. It is your responsibility to have a qualified person install this unit.

GENERAL INFORMATION

WARNING

BEFORE BEGINNING INSTALLATION OF THIS MURPHY PRODUCT

- ✓ Disconnect all electrical power to the machine.
- ✓ Make sure the machine cannot operate during installation.
- ✓ Follow all safety warnings of the machine manufacturer.
- ✓ Read and follow all installation instructions.



Description

The TDX6 is an advanced design 6-point temperature scanner and pyrometer. It continually scans six grounded†† or ungrounded thermocouples, displays the temperature of the thermocouple selected and has adjustable trip points for each input. A trip point read/scan knob provides for display and check/adjustment of the thermocouple temperature trip point. If any trip point is reached, its output “turns on” and can be used as a control signal, or to initiate alarms and/or shutdown.

Specifications

Power Requirements (Operating Voltages): 120 VAC or 80-250 VDC, CD ignition or 24 VDC.

Outputs:

Models TDX6-A and TDX6-C: Six (6) isolated Silicon Controlled Rectifier (S.C.R.) outputs; 0.5 A @ 250 VDC; switches on (applies ground) above trip point and switches off (removes ground) when power is switched off.

Models TDX6-B and TDX6-D: Six (6) isolated Field-Effect Transistor (F.E.T.) outputs; 0.1 A @ 250 VDC; switches on (applies ground) above trip point and switches off (removes ground) below trip point.

Operating Temperature: -4 to 158°F (-20 to 70°C).

Storage Temperature: -40 to 300°F (-40 to 150°C).

Case: ABS 1/4 DIN (90 x 90 mm).

Scanning Speed: Complete scan in 30 seconds.

Reset Differential: F.E.T. models: Decreases 3 Degrees (°F or °C).
S.C.R. models: Turn input power off to reset.

Display Update Time: Updates temperature every 0.3 seconds.

Start-up Time Delay: Unit is locked out for 10 seconds after ignition voltage is sensed.

Ambient Cold Junction Compensation Range:
2°F from 32°F to 122°F (1°C from 0°C to 50°C).

Measurement Range: Monitor Range 0-1999°F or °C.

Accuracy: With J-type thermocouple: from 50-150°F (10-66°C) +3°F(+2°C),
from 150-1200°F (66-649°C) ±1.0% of reading.

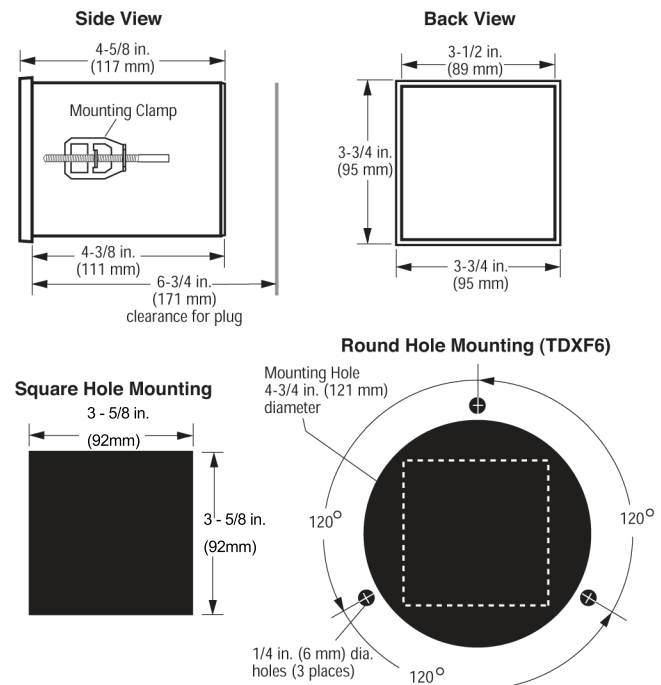
With K-type thermocouple: from 400-2000°F (204-1076°C) ±1.0% of reading.

Trip Point Accuracy: ±3°F (±2°C) of reading.

Trip Point Adjustment Range: 0-1999 Degrees.

Open Thermocouple Input: A number 1 appears in the display to the right of the channel number and the trip point operates.

Dimensions



TDX6 Interface Capabilities

Model	Power Source	Rating
LCDT	CD Ign., 120 VAC, 12/24 VDC	Cl.I, Div.1, Gr.D, Haz. areas*
S1400	120 VAC or 12/24 VDC	Cl.I, Div.1, Gr.D, Haz. areas*
MARK II	CD Ignition, pos. or neg. grnd	Cl.I, Div.2, Gr.D, Haz. areas**
TATTLETALE®	CD Ign., 120 VAC, 12/24 VDC	Non-Hazardous areas

PLC's and various non-Murphy annunciators—contact factory.

*An isolation barrier is needed between the TDX6 and an Annunciator rated for Class I, Division 1, Group D, Hazardous Areas.

**When used with approved ignition. Contact Enovation Controls for details.

†When power requirements are used as stated in Specifications section.

††Using grounded thermocouples introduces the risk of odd currents or voltages being imposed on the thermocouple signal which can affect the accuracy of the reading. This is an inherent problem of grounded thermocouples, the reason why we prefer ungrounded thermocouples.

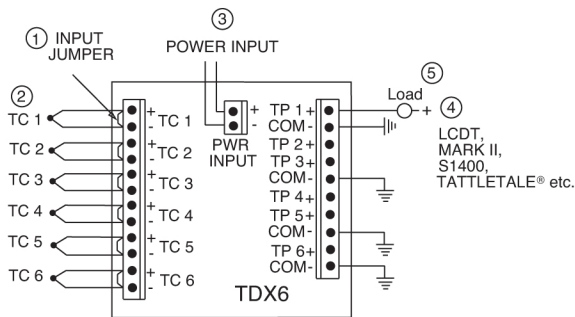
WIRING AND OPERATION

Even though the TDX6 is a six channel temperature monitor, it will monitor and display from 1 to 6 thermocouples with equal results. When monitoring less than six temperature channels, always jumper the unused thermocouple terminals on the back of the TDX6 with the factory installed jumper provided. The unused channel will display approximate ambient temperature.

Wiring

Grounded†† or ungrounded thermocouples

1. Connect the thermocouple leads to the thermocouples (if using extension wire, see “Using Thermocouple Extension Wire” section). **NOTE:** Attach wire markers to each thermocouple lead identifying polarity and thermocouple number.
2. Remove factory installed jumper on the TDX6 for each thermocouple to be installed.
3. Connect positive lead of thermocouple TC1 to the positive (+) terminal of terminal strip TC1 (see wiring diagram below).



NOTES:

- ① Remove input jumper when the thermocouple is connected to input.
 - ② Thermocouple Input
 - ③ Power input 120 VAC, 80-250 VDC, CD ignition or 24 VDC, positive or negative ground.
 - ④ Interfaced components must meet area classification requirements.
 - ⑤ When using the TDX6 with inductive loads, we recommend installing a suppression diode across all coils.
4. Connect negative lead of thermocouple TC1 to the negative (-) terminal of terminal strip TC1.
 5. Repeat steps 2 thru 4 with each thermocouple to be monitored.

Using Thermocouple Extension Wire

If the thermocouple leads are not long enough, you will need to use thermocouple extension wire. Thermocouple extension wire must be of the same material as the thermocouple lead wires (see “Thermocouple Extension Wire Color Code” chart). Metallic-shielded thermocouple wire is recommended. It provides electrical shielding as well as protection against wear and abrasion.

CAUTION: The use of non-thermocouple wire will cause inaccurate temperature sensing and erratic operation. **KEEP ALL HIGH VOLTAGE WIRING SUCH AS SPARK PLUG OR IGNITION WIRES AWAY FROM THERMOCOUPLES AND EXTENSION WIRING.**

Thermocouple Extension Wire Color Code Chart

Thermocouple Type (P/N)	Thermocouple Extension Wire (P/N)	Color Code/Material	
		Positive Lead	Negative Lead
J (10-00-0526)	Jx (00-00-3271)	White/Iron	Red/Constantan
K (10-00-0527)	Kx (00-00-3272)	Yellow/Chromel	Red/Alumel

To prevent problems of interference from electrical noise, DO NOT route thermocouple wires in the same conduit or within 12 in. (305 mm) of ignition wires or alternating current conductors.

When connecting the thermocouple leads, twist the wire connections, then install wire nuts, such as ceramic, which have no metal insert.

Connecting Power Wires

1. Be sure power is “OFF”.
2. Connect the power input leads to the small terminal block located on back of the TDX6 (TDX6 connections have no polarity).

Operation Test

Perform the Operation Test after the TDX6 is installed and wired appropriately.

1. Slowly rotate each trip point potentiometer clockwise until detent is felt.
 2. Apply power to the monitor.
 3. Verify that the “Trip Point Read” knob is in the “scan” mode. The left side of the display will show the thermocouple number. The right side of the display will show the temperature of that thermocouple.
- NOTE:** When “Trip Point Read” knob is in the “scan” mode, depressing the “Thermocouple Read” push button will stop the scan sequence at the next channel, and display the thermocouple number and its reading. Scanning will resume approximately 3 seconds after the “Thermocouple Read” push button is released. With “Trip Point Read” knob selecting a number, the “Thermocouple Read” push button should not be depressed.
4. Set “Trip Point Read” knob to the “1” setting. On the right side of the display window you will see the trip point reading of the TC1 thermocouple. The left side of the display will continue to scroll 1 to 6 indicating that the unit is still scanning all channels.
 5. Rotate the TP1 trip point potentiometer counterclockwise until trip point TP1 turns on and trips the shutdown device or alarm. Verify by observation.
 6. Rotate the trip point potentiometer TP1 clockwise several turns to turn off TP1.
 7. Reset alarm or shutoff device.
 8. Set “Trip Point Read” knob to the TP2 position to display the TP2 temperature trip point.
 9. Repeat steps 4 thru 7 with each thermocouple to be tested.

Trip Point Adjustment

1. Apply power to the temperature monitor.
2. Set “Trip Point Read” knob to the “1” position.
3. Rotate the trip point adjustment potentiometer TP1 until the display indicates the desired trip point temperature for TP1.
4. Repeat steps 2 and 3 for each thermocouple to be set.
5. Turn “Trip Point Read” knob to “scan” position to resume operations.

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