



TEXMATE INC

TM-150 TEMPERATURE METER

A LOW COST, DIRECT READING TEMPERATURE
METER COMPATIBLE WITH MANY POPULAR PROBES

DESCRIPTION

The Texmate Model TM-150 is a precision digital panel meter having a full scale input capability of $\pm 1.999\text{VDC}$. The instrument has been designed for direct temperature measurement with most popular IC temperature transducers and platinum RTD probes. Temperature indication is by means of a $3\frac{1}{2}$ digit, 0.3" LED display having a full scale resolution of ± 1999 counts.

As is customary with most temperature indicating instruments, the TM-150 assumes positive temperatures and no "+" sign is displayed. Minus temperatures are automatically indicated by a "-" sign. Provision has been made internally for the user to add additional components to enable the display of both "+" or "-" symbols if required. The display of either a $^{\circ}\text{C}$ or $^{\circ}\text{F}$ indicator may be enabled, depending on the temperature scale to be represented. The user may also control the selection of either of two decimal point indicators located at 1X.XX or 1XX.X.

The Model TM-150 provides an adjustable voltage for the purpose of offsetting the transducer signal voltage to permit the meter to display a zero reading when the temperature being sensed is zero degrees. This offset voltage may also be used to perform other scaling functions. Without temperature bath calibration, the meter can be used directly with the National Semiconductor LM135, LM235, LM335, the Analog Devices AD590, and the Motorola MTS102 transducers. These transducers can provide accuracies to $\pm 0.5^{\circ}\text{C}$ over a temperature range of from -55°C to $+150^{\circ}\text{C}$. As an expedient alternative, an inexpensive temperature transducer can be created from any type of silicon diode or transistor junction. These devices, however, require a temperature bath for accurate calibration.

As an option, the Model TM-150 can be user modified or factory supplied at small extra cost with a precision internal $1\mu\text{A}$ to 10mA current source. This modification enables direct temperature measurement with most 100Ω platinum RTD probes, as well as the Texas Instruments TSP102F transducer. Use of the current source can also enhance the performance of Motorola's MTS102, as well as that of silicon diode transducers.

The Model TM-150 may be powered from any regulated 5 volt $\pm 10\%$ DC source having a capacity of delivering 200mA with all LED segments displayed. In order to conserve power when operating from a battery source, the user can enable a "press-to-read" mode of display operation. A run/hold mode of display operation can also be enabled. The meter's A to D converter and logic circuits continue to function when either of these display functions is utilized, thereby permitting data to be accessed or updated without any settling time delay.

SPECIFICATIONS

Input Configuration:	True differential and single-ended
Full Scale Ranges:	$\pm 199.9\text{mVDC}$ and $\pm 1.999\text{VDC}$
Input Impedance:	$1000\text{M}\Omega$
Input Protection:	$\pm 500\text{VDC}$ or 350VAC
Constant Current Output:	$1\mu\text{A}$ to 10mA at maximum voltage of 5.4VDC ; available on Models TM-150R and TM-150RF
Normal Mode Rejection:	30dB at 50Hz and up
Common Mode Rejection:	60dB at $50/60\text{Hz}$
Common Mode Voltage:	-1.5 to $+2.8\text{V}$
Accuracy:	$\pm (0.05\%$ of reading $+1$ digit)
Maximum Resolution:	$100\mu\text{V}$ over ± 1999 counts
Temperature Coefficient:	$30\text{PPM}/^{\circ}\text{C}$ Typ., $60\text{PPM}/^{\circ}\text{C}$ Max.
Zero Stability:	Autozeroed; $1\mu\text{V}/^{\circ}\text{C}$ Typ.
Conversion Rate:	3 readings per second nominal
Compatible Transducers:	LM135 (-55°C to $+150^{\circ}\text{C}$) AD590L (-55°C to $+150^{\circ}\text{C}$) MTS102 (-55°C to $+150^{\circ}\text{C}$) TSP102F (-55°C to $+150^{\circ}\text{C}$) requires linearization Silicon Diodes (-55°C to $+150^{\circ}\text{C}$) Platinum 100Ω RTD Probes (-200°C to $+800^{\circ}\text{C}$)
Display:	0.3" LED
Polarity:	Automatic; assumed positive, displays "-"
Decimal:	User programmable to 2 positions
Descriptors:	User programmable for either $^{\circ}\text{C}$ or $^{\circ}\text{F}$ indicator
Overload:	When input exceeds full scale range, or if the transducer is either open or shorted, most significant "1" digit accompanied by "-" sign (if reading negative temp) is displayed with all other digits blank
Power Requirements:	Regulated 5VDC , $\pm 10\%$ at 200mA with all display segments lighted
Warmup Time:	10 seconds to specified accuracy
Operating Temperature:	0°C to $+60^{\circ}\text{C}$

ORDERING INFORMATION

STANDARD TEMPERATURE METER (volts and current sensing)
Prescaled To Display -50° to $+150^{\circ}\text{C}$

TM-150 Prescaled To Display -58° to $+199.9^{\circ}\text{F}$

RTD TEMPERATURE METER (resistance sensing with internal $1\mu\text{A}$ to 10mA source) Prescaled To Display -195° to $+600^{\circ}\text{C}$

TM-150R Prescaled To Display -320° to $+1200^{\circ}\text{F}$

ACCESSORIES: Edge Connector (20 pin; solder tabs)

TRANSUCERS: NSC LM-135 T046 Hermetic Can (-55° to $+200^{\circ}\text{C}$)

NSC LM-235 T046 Hermetic Can (-55° to $+200^{\circ}\text{C}$)

NSC LM-335 T092 Plastic (-50° to $+150^{\circ}\text{C}$)

Order Part No.

TM-150

TM-150F

TM-150R

TM-150RF

CN-L10

35-LM135H

35-LM235H

35-LM335Z

ACID PROOF ALL TEFLON PROBE (voltage output sensor)

-50° to $+150^{\circ}\text{C}$; non-contaminating;

particularly suitable for hydrofluoric etchant baths:

12" Teflon probe with 24" Teflon coax cable

TP-12 With Extra Cable Length: use this part # and insert desired cable length in feet at (?)

EVALUATORS KIT (selected components to evaluate most circuit applications—includes LM-335 Temp. Sensor)

OPTIONAL CASES: End Mount Case (see back page for details)

Center Mount Case (see details on back pg.)

Full Bezel Case (see back page for details)

Slim Line Case (supplied as standard)

Order Part No.

TP-12

TP-12EXT?FT

TM-150KIT

EM-CASE

CM-CASE

FB-CASE

SL-CASE