RP-35AR

3.5 DIGIT AUTORANGING PANEL METER

CE

Low Cost Precision AC Powered Differential Input Autoranging Panel Meter to Fit Most Cutouts, Including DIN/NEMA Standard.

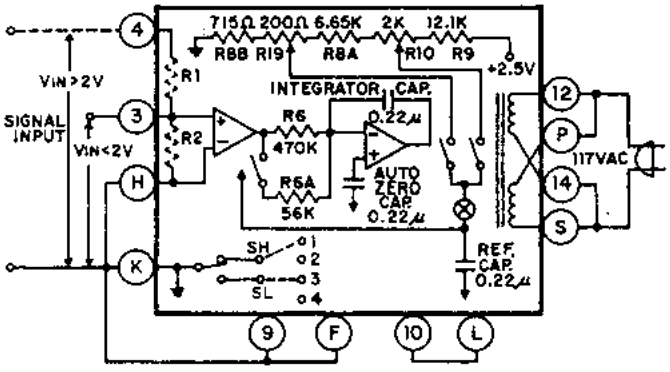
General Features

The Texmate Model RP-35AR is a precision autoranging, autozeroing, AC powered 3½ digit panel meter. The rugged plastic case is designed to fit most other manufacturers' panel cutouts, including DIN/NEMA standard. While measuring bipolar true differential and single-ended DC voltages this versatile meter autoranges between any two adjacent ranges in four user programmable groups 199.9mV to 1.999V, 1.999V to 19.99V, 19.99V to 199.9V and 199.9V to 1200V full scale. In addition, the meter automatically switches any two user selectable decimal points.

The meter may be scaled to display and autorange any known engineering unit. Provision has also been made for a signal offset capability. This feature enables the RP-35AR to measure 4 to 20mA transducer signals. Another useful feature of the meter is the provision of a user installed auxiliary divider network that enables front panel trimming for input signal attenuator or the balancing of half bridge transducers.

Typical Application Connections

SINGLE ENDED METER - 200mV/2V RANGE, AND HIGHER RANGES
200mV/2V Range: Omit R1 and R2.
For Higher Ranges: Install Voltage Dividing Resistors R1 and R2 as specified. Enable decimal points by connecting appropriate Decimal Select Pins to High/Low Range Decimal Select Common.



View more application connections and connection instructions on page 3.

Compatibility

The RP-Series NEMA case style is complementary to Texmate's Classic UM-Series. For economy, each RP model is dedicated to a specific application. RPs are ideal for upgrading or replacing the traditional USA NEMA case panel meters presently in use.

Traditional NEMA STYLE USA CASE

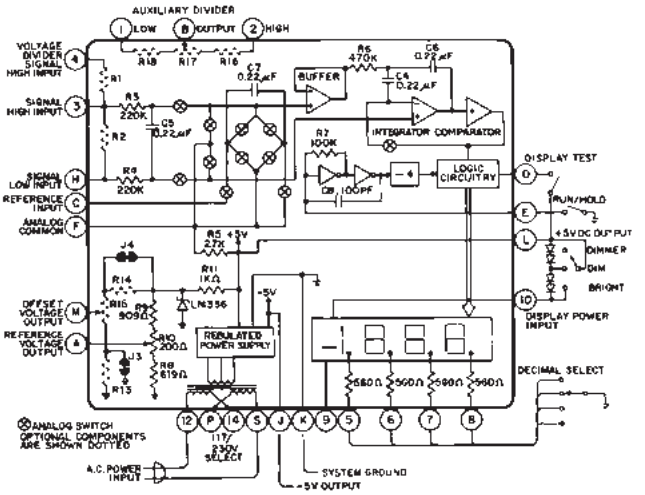
Specifications

Input Configuration:.....True differential and single-ended
Full Scale Ranges: .....±199.9mVDC
±1.999VDC (standard)
±19.99VDC
±199.9VDC
±1200VDC
Input Impedance: .....Exceeds 1000MΩ on 200mV and 2V ranges; 10MΩ on all other ranges
Input Protection:.....±500VDC or 350VAC maximum on 200mVand 2V ranges; ±1200VDC or 850VAC on all other ranges
Accuracy: .....±(0.05% of reading = 1 digit)
Temperature Coefficient: ..5PPM/°C in ratiometric operation; 60 PPM/°C Typ. using internal reference on 200mV and 2V ranges
Warm Up Time: .....10 minutes to specified accuracy
Conversion Rate: .....3 readings per second nominal, controllable from 1 to 20 readings per second
Display: .....0.56" LED
Decimal Selection: .....User programmable to 4 positions
Overrange Indication: ..When input exceeds full scale on any range being used, most significant "1" digit & "-" symbol (for negative inputs) is displayed with all other digits blanked
Power Requirements:....110V or 220V, ±5% at 50Hz; 117V or 230V, ±5% at 60 and 400Hz
Operating Temperature: ....-10° to +50°C
Storage Temperature:....-20° to +70°C
Relative Humidity .....95% (non-condensing)
Case Dimensions: .....Bezel 4.06"Wx1.89"H (102.7Wx47.9Hmm) Depth behind bezel 3.64" (92.22 mm) Plus 0.5 to .9" (12.7 to 22.8mm) depending on connector used.
Weight: .....8 oz (227 gms)

RP-Series, a reliable replacement for your application

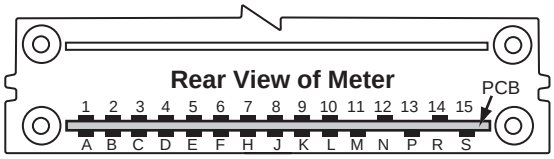
RP-3500D2 .....3.5 digit Red LED Ultra Stable, Differential, 2VDC std
RP-3500D2BCD .....RP-3500D2 with Tri-State Parallel BCD, 2VDC std
RP-35A .....3.5 digit Red LED with Differential Inputs, 2VDC std
RP-35AR .....3.5 digit Red LED, Autoranging, 200mV / 2VDC
RP-35U .....3.5 digit Red LED, Low Cost, 2VDC std
RP-4500D2 .....4.5 digit RED LED Ultra Stable, Differential, 2VDC std
RP-4500D2BCD .....RP-4500D2 with Tri-State Parallel BCD, 2VDC std

Functional Diagram



Connector Pinouts

The Texmate Model RP-35A interconnects by means of a standard PC board edge connector having two rows of 15 pins, on 0.156" centers. Connectors are available from Texmate, or from almost any connector manufacturer.



Component Side		Solder Side	
AUXILIARY DIVIDER LOW	1	A	REFERENCE VOLTAGE OUTPUT
AUXILIARY DIVIDER HIGH	2	B	AUXILIARY DIVIDER OUTPUT
SIGNAL HIGH INPUT	3	C	REFERENCE INPUT
VOLTAGE DIVIDER SIG HI IN	4	D	DISPLAY TEST
DECIMAL SELECT (1.XXX)	5	E	RUN/HOLD
DECIMAL SELECT (1X.XX)	6	F	ANALOG COMMON
DECIMAL SELECT (1XX.X)	7	H	SIGNAL LOW INPUT
DECIMAL SELECT (1XXX.)	8	J	-5 V OUTPUT
NO CONNECTION	9	K	SYSTEM GROUND
DISPLAY POWER INPUT	10	L	+5 V POWER OUTPUT
NO CONNECTION	11	M	OFFSET VOLTAGE OUTPUT
AC POWER INPUT	12	N	NO CONNECTION
NO CONNECTION	13	P	117/230V SELECT
117/230V SELECT	14	R	NO CONNECTION
NO CONNECTION	15	S	AC POWER INPUT

Pin A – Reference Voltage Output: Internal precision voltage reference. Standard output is 1.000 V, adjustable by ±5 % with R10 potentiometer. Usable voltages from 0.05 V to 2.5 V for special high-impedance scaling can be obtained by changing the value of internal dividing resistors R8 and R9.

Pin B – Auxiliary Divider Output: Pin B is the wiper of the optional R17 potentiometer located behind the front-panel filter on the right side. Solder pads for the optional divider network formed by R16, R17, and R18 have been provided for user convenience and the divider is intended for field installation. This divider can be used for any appropriate application, such as balancing a half-bridge transducer or providing trimmable input signal attenuation.

Pin C– Reference Input: Reference voltage input for A to D converter. Normally supplied from Reference Voltage Output Pin A. However, an external reference source referred to Analog Common Pin F may be used instead. Pin C may be used as an input for ratiometric measurements by connecting Analog Common Pin F to System Ground Pin K. (Signal Input Voltage ÷ Reference Input Voltage) X 1000 = Displayed Reading. The maximum signal input voltage is 5 V. Higher voltages must be scaled down through a voltage divider. Reference input voltage must remain stable during measurement period.

Pin D – Display Test: All display segments will operate when Pin D is connected to +5 V Output Pin L.

Pin E – Run/Hold: If Pin E is left open, the meter will operate in a free-running mode. If Pin E is connected to System Ground Pin K, the internal R-C oscillator will be shorted and the meter will latch up, continuously displaying the reading. If Pin E is released from Pin K, it will take 3 to 4 conversions before the new reading settles.

Pin F – Analog Common: This is the floating common for the analog section of the meter. It is normally +2.2 V referenced to System Ground Pin K. For single-ended inputs, Pin F should be joined to grounded side of input signal.

Pin H – Signal Low Input: Signal low input of A to D converter. Maximum overvoltage protection is ±500 VDC or 350 VAC.

Pin J – –5V Output: Auxiliary –5 V output at 50 mA maximum, produced by internal regulated power supply.

Pin K – System Ground: Pin K is the system ground and is common for all input and output circuits.

Pin L – +5 V Output: Auxiliary +5 V output at 50 mA maximum, produced by internal regulated power supply. Connecting Pin L to Display Input Pin 10 will light the display at full brightness.

Pin M – Offset Voltage Output: 0 to +2.5 V is available with the addition of a ¾", 50 KΩ pot in the R15 position on the printed circuit board. Finer adjustment may be obtained by installing R13 and R14 and cutting open J3 and J4.

Pins N, R, 11, 13, and 15 – No Connection: The PCB pads which would normally correspond to these pins do not exist on the PCB.

Pin P – 117/230 V Select: Connect Pin P to AC Power Input Pin 12 for 117 V operation. Connect Pin P to 117/230 V Select Pin 14 for 230 V operation. (Also see Pin 14.)

Pin S – AC Power Input: Connect one side of 117 or 230 VAC power input to Pin S.

Pin 1 – Auxiliary Divider Low: Pin 1 is the low side of the optional resistor divider represented by R16, R17, and R18. For measuring bridge circuits in the differential ratiometric mode, Pin 1 should be connected to the low side of the excitation voltage source.

Pin 2 – Auxiliary Divider High: Pin 2 is the high side of the optional resistor divider represented by R16, R17, and R18. For measuring bridge circuits in the differential ratiometric mode, Pin 2 should be connected to the high side of the excitation voltage source.

Pin 3 – Signal High Input: Signal high input of the A to D converter. Maximum overvoltage protection is ±500 VDC or 350 VAC.

Pin 4 – Voltage Divider Signal High Input: Signal high input for voltages that require attenuation or scaling. Dividing resistors R1 and R2 may be mounted internally for voltages up to 1200 V max. Matched dividing resistors for 20 V (1/10), 200 V, (1/100), and 1200 V (1/1000) ranges are available from Texmate. Shunt resistors for current measurements up to 200 mA may be internally mounted in the R2 position. The current loop input is then applied to Signal High Input Pin 3 and returned through Pin H.

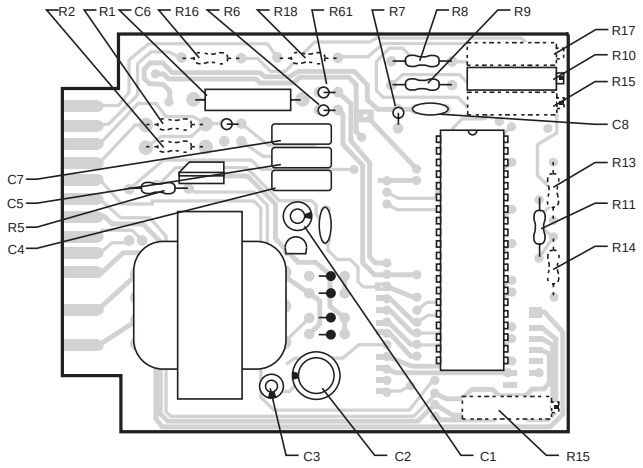
Pins 5, 6, 7, and 8 – Decimal Select: Decimal points may be displayed as required by connecting appropriate pin to System Ground Pin K.

Pin 10 – Display Power Input: Power input for LED display drive. For normal operation, connect directly to +5 V Output Pin L. Display may be blanked or dimmed by reducing or removing voltage between Pin 10 and Pin L. The power supply to the A to D converter and logic circuits is independent of that of the display. In the power-conserving "press-to-read" mode, the reading is instantaneously displayed without settling time.

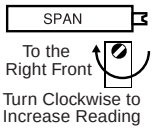
Pin 12 – AC Power Input: Connect one side of 117 or 230 V AC power input to Pin 12.

Pin 14 – 117/230 V Select: Connect Pin 14 to AC Power Input Pin S for 117 V operation. Connect Pin 14 to 117/230 V Select Pin P for 230 V operation. (Also see Pin P.)

Component Layout

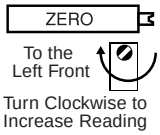


Signal Conditioning Components



SPAN Potentiometer (Pot)

The SPAN pot is on the right side of the display. Typical adjustment is 20% of the input signal range.



ZERO Potentiometer (Pot) optional

The ZERO pot is on the right side of the SPAN Pot. Typically it enables the displayed reading to be offset ±500 counts.

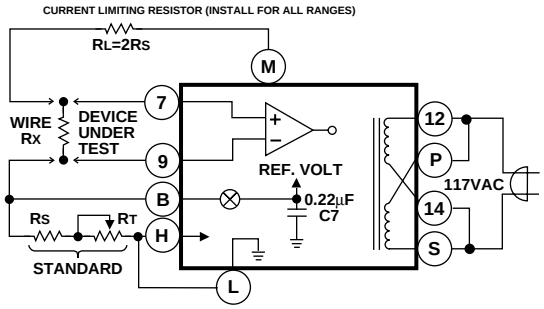
Calibration Procedure

Apply power to the meter. Then with a precision DC reference source apply +1.900 VDC between the Signal High Input Pin 3 and Signal Low Input Pin H. Adjust R10 potentiometer (behind front-panel filter on right side as viewed from front) until the display reads +1.900 V. **Note:** The voltage applied in this case is for a +2.000 V full-scale meter. For other ranges, the voltage applied should be similarly proportional to the particular full-scale voltage.

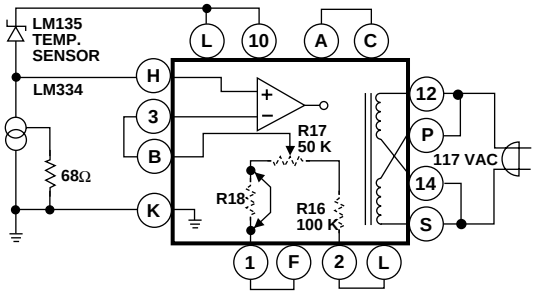
Typical Application Connections

The RP-35AR may be used in a wide variety of configurations. The following circuits illustrate some of the possibilities and demonstrate the exceptional versatility of Texmate products. Components called for in the applications which are not part of the standard meter may be supplied by the user or in some cases purchased from Texmate. The circuit diagrams explain the basic pinout connections required for each application. Unless otherwise specified, the diagrams will show the component values and solder junctions that would normally be installed on a standard 2V range meter. For those applications which have alternative ranges and/or input configurations, the required component values and any modifications are described in the text.

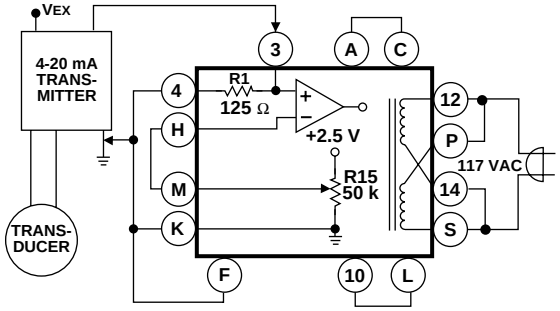
DIFFERENTIAL RATIOMETRIC OHMMETER.
1) Install Rs and RT as specified under section titled Useful Tables: 2) (RS + RT) x 2= Full Scale Value; 3) Rx÷(RS+RT) X 1000 = Reading Displayed.



OFFSET CAPABILITY FOR THERMOMETER OPERATION
(1) Install R16 and R17 (2) Install a jumper (short circuit) in place of R18.



4 to 20 mA RECEIVER
Install R1 and R15 using values shown in diagram.



Optional PCB Edge Connector

PCB Edge Connector

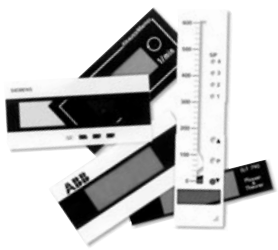
A standard 30-pin edge connector (two rows of 15 pins on 0.156" centers) may be used to connect the RP-Series of meters. Order part no. CN-L15.

Face Plate Descriptors

Volts AC	Volts DC	Hz	RPM
Amps AC	Amps DC		DCµA
Milliamps AC	Milliamps DC		˚C
Millivolts AC	Millivolts DC		˚F
Kilowatts	Watts	% pH	Ω
kg/cm ²	Kilovolts AC		psi
kWH	kVAR	Power Factor	
kΩ	CosØ	M/min	m³/hr

To customize the face plate, each UM-meter is supplied with a white printed clear adhesive label containing various popular descriptors. Choose the descriptor, peel off the adhesive backing and align the descriptor in the lower right corner of the standard face plate.

Custom Face Plates



Texmate Produces Thousands of Custom OEM Face Plates

Have Texmate Design and produce a Custom Face Plate for your next project!

• Custom face plates have a non-recurring artwork charge. A serial number is then assigned to each artwork to facilitate reordering.

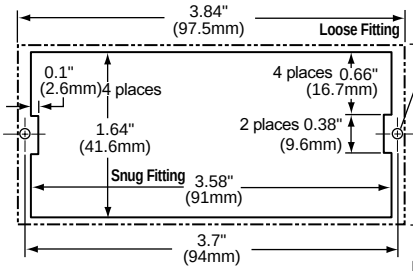
• Small Run or One-Off custom face plates incur an installation charge, and are generally printed on a special plastic film, which is then laminated to custom faceplate blanks as required.

• Large Run (250 pieces min): custom face plates are production silk screened, issued a part number, and held in stock for free installation as required by customer orders.

• OEMs may also order Custom Meter Labels, Box Labels, Custom Data Sheets and Instruction Manuals.

RP Case Dimensions and Panel Cutouts

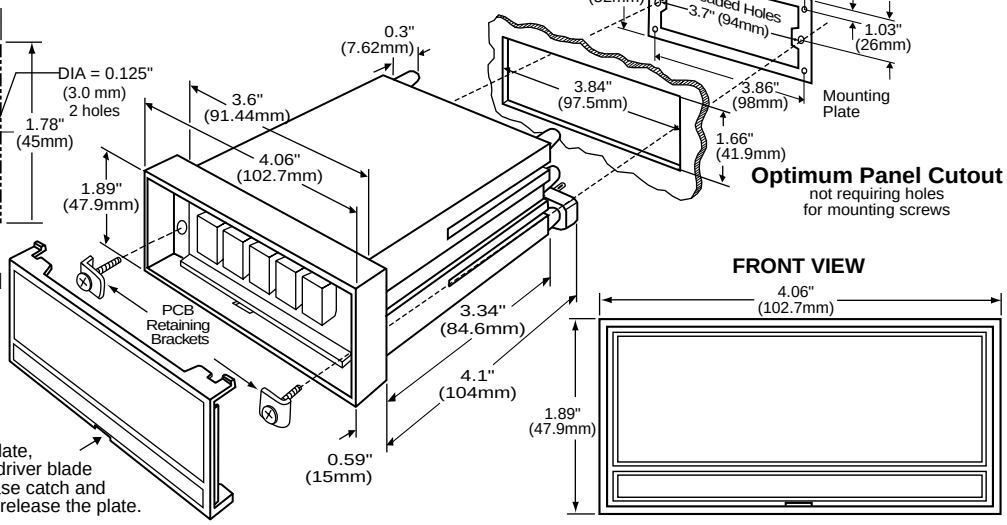
This NEMA Case will fit any existing cutout with dimensions that are between the Snug and Loose Fitting dimensions shown below.



Panel Cutout for Front Panel Removal

To enable removal of the panel meter from a mounting panel without requiring rear access, make the panel cutout as shown above, using the mounting plate supplied with the meter as a template. The mounting holes should then be tapped to match the mounting screws.

For new installations see Optimum Panel Cutout or Panel Cutout for Front Panel Removal



Optimum Panel Cutout
not requiring holes
for mounting screws

To remove the face plate, carefully insert screwdriver blade at bottom slot to release catch and gently pry outward to release the plate.

FRONT VIEW

Ordering Information

Standard Options for this Model Number

Part Number .Description

▸ BASIC MODEL NUMBER

RP-35AR . . . .3.5 digit Red LED, Autoranging, 200mV/2VDC

Special Options and Accessories

Part Number .Description

▸ SPECIAL OPTIONS (Specify Inputs & Req. Reading)

VA-200MVFI . . . .200mVDC Range Change
VF-0020V . . . . . .20VDC Range Change
VF-0200V . . . . . .200VDC Range Change for 3.5 digit RP Series
VF1200V . . . . . .1200VDC Range Change for 3.5 digit RP Series
VS-3.5 . . . . . .Non-Std Range and Scale - 3.5 Digit RP Meters

▸ ACCESSORIES

CN-L15 . . . . . .PCB Edge Connector, Solder Type, Dual row 15 Pins
OP-NSEAL/UM . .96x48mm clear lockable front cover - NEMA 4X, splash proof for RP & UM Series (Factory Installed)
RP.CASE . . . . . .Replacement Case w/Mount Hardware
DN.CAS96X24 . .Din Case 96 X 24 Short Depth Plus Accessories

Prices subject to change without notice.

WARRANTY

Texmate warrants that its products are free from defects in material and workmanship under normal use and service for a period of one year from date of shipment. Texmate's obligations under this warranty are limited to replacement or repair, at its option, at its factory, of any of the products which shall, within the applicable period after shipment, be returned to Texmate's facility, transportation charges pre-paid, and which are, after examination, disclosed to the satisfaction of Texmate to be thus defective. The warranty shall not apply to any equipment which shall have been repaired or altered, except by Texmate, or which shall have been subjected to misuse, negligence, or accident. In no case shall Texmate's liability exceed the original purchase price. The aforementioned provisions do not extend the original warranty period of any product which has been either repaired or replaced by Texmate.

USER'S RESPONSIBILITY

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