



0.56"
LEDs



UM-45MV

50mV DC Full Scale
4 1/2 DIGIT with 0.56" LEDs
in a Traditional NEMA Style Case



Accepting DC signals as low as 50mV full scale, this meter can economically measure high DC Amps, using low voltage drop current shunts, or for other precision low DC mV measurements.

General Features

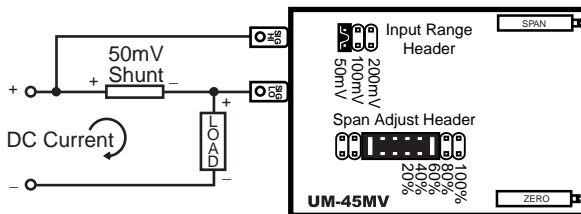
The UM-45MV is an economical, high resolution DC voltage measuring meter with three header selectable full scale ranges of 50mV, 100mV and 200mV. A five position Span Adjust header facilitates scaling in engineering units.

The meter is particularly suited for measuring DC current using 50mV standard current shunts. The ability to accurately measure shunts with even lower voltage drops can produce substantial energy savings, for example 10mV can display 5000 Amps. Display Hold and Display Test functions are also provided.

The standard meter has a high efficiency red LED display and user selectable AC power inputs of 100V AC to 120V AC or 200V AC to 240V AC are provided. An Optional 24V AC or an auto sensing isolated AC/DC 24V switching power supply can be ordered. (See ordering information)

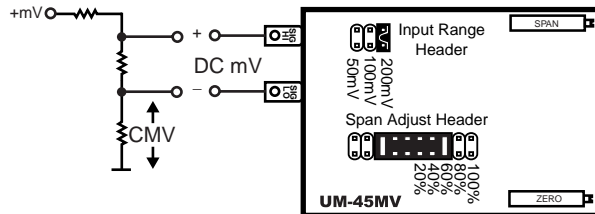
Typical Application Connections

DC Current measurement using 50mV Shunt.
Easily User Scaled to Display Currents up to 19999 Amps.



Shunt may be in Hi or Lo side of Load.

DC mV measurement with a Resolution of 10 microVolts.
Easily User Scaled to Display Voltages up to 199.99 mV.



Can be used to measure single-ended or differential inputs. Max CMV (common mode voltage) = 50V*

Compatibility

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

Traditional
NEMA
STYLE USA
CASE

Specifications

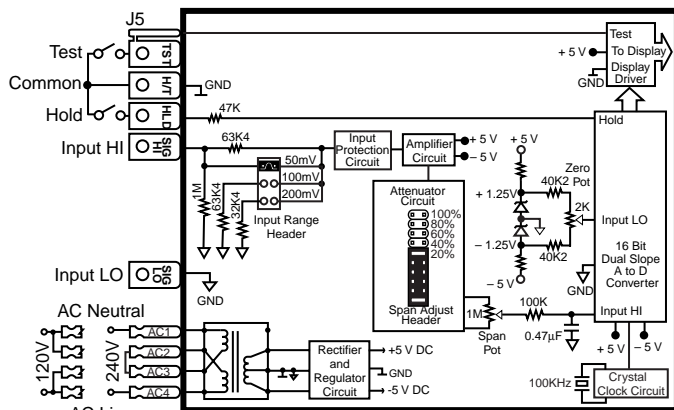
- Input Configuration:**Single-ended, however isolated power supply enables differential measurements up to a maximum common mode of 50V.*
A Zero Potentiometer is provided that can offset the displayed reading ± 500 counts.
- Full Scale Ranges:**Three header selectable ranges of ± 50 mV DC, ± 100 mV DC & ± 200 mV DC full scale
- Input Impedance:**50K Ω /100K Ω /65K Ω in 50/100/200mV ranges
- A/D Converter:**16 bit dual slope
- Accuracy:** $\pm (0.05\%$ of reading + 3 digits)
- Temp. Coefficient:**100ppm/ $^{\circ}$ C (Typical)
- Warm Up Time:**2 minutes to specified accuracy
- Conversion Rate:**3 readings per second
- Display:**0.56" high efficiency LED
Display Hold and Test Function
- Polarity:**Bipolar. Assumed +, displays -
- Decimal Selection:**Header under face plate, X•X•X•X•
- Overload Indication:**When input exceeds the full scale on any range being used, the meter displays flashing "0000"
- Power Supply (std):**120/240V AC, 50/60 Hz. approx 2.5W.
(Optn) VO-DC/ISOIsolated Switcher. 9 to 36V DC/12 to 24V AC
(Optn) VO-24VIsolated Transformer 24V AC $\pm 10\%$
(Optn) VO-5V DCNon-isolated 5V DC $\pm 10\%$
- Operating Temp.:**-10 to 50 $^{\circ}$ C
- Storage Temperature:**-20 to 70 $^{\circ}$ 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:**10 oz., 13 oz when packed.

UM-Series low cost utility meters for switchboard and process indication

- UM-35AC11/5** AC amps, Scaled RMS, (1 or 5 Amp internal shunt), 3.5 digit
- UM-35AC**AC volts, Scaled RMS. **199.9V AC/500V AC** Header Selectable Ranges, 3.5 digit
- UM-40AC**AC volts, Scaled RMS. **500.0V AC** full scale, high resolution 4 digit
- UM-35HZ**15Hz to 199.9Hz or optionally 40Hz to 500Hz up to 500V AC input, 3.5 digit
- UM-35**DC Volts ± 2 /20V DC Header selectable or optionally ± 2 /200V DC, 3.5 digit
- UM-35MV**DC mV ± 50 mV and ± 100 mV select inputs to suit DC current shunts, 3.5 digit
- UM-45**DC Volts ± 2 V/ ± 20 V/ ± 200 V DC Header selectable ranges 4.5 digit
- UM-45MV**DC mV ± 50 mV, ± 100 mV, or ± 200 mV selectable inputs to suit DC current shunts, 4.5 digit

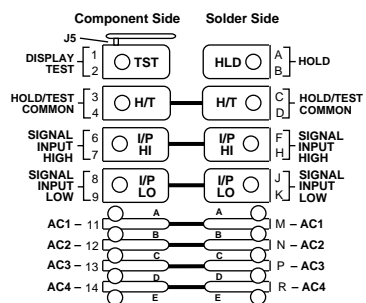
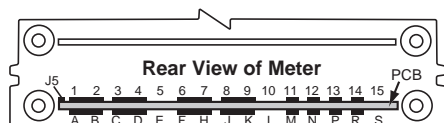
- UM-35CL**Process 4 to 20mA (**100.0**), easily user scalable, 3.5 digit
- UM-35CLE**Process 4 to 20mA (**100.0**) with 24V DC excitation, easily user scalable in engineering units anywhere from -1999 to +1999. 3.5 digit
- UM-45CL**Process 4 to 20mA (**100.00**), easily user scalable, 4.5 digit
- UM-35P**Pressure, strain gage and load cell, 4 and 6 wire, 5V DC excitation, Header Selectable Sensitivity 2mV/V, 5mV/V, 10mV/V, **20mV/V**, 3.5 digit
- UM-35J/K**J or K thermocouple input, 1 $^{\circ}$ resolution, order $^{\circ}$ C or $^{\circ}$ F, 3.5 digit
- UM-35RTD**100 Ω platinum RTD, 3 or 4 wire, order $^{\circ}$ C or $^{\circ}$ F and 0.1 $^{\circ}$ or 1 $^{\circ}$, 3.5 digit

Functional Diagram



Connector Pinouts

UM-Series are connectable using the TB-KIT screw terminal blocks provided with the meter. For greatest convenience, order a Texmate Push-On screw terminal connector. Alternatively, a pcb edge connector can be used. (see connector options)



WARNING: AC and DC input signals and power supply voltages can be hazardous. Do Not connect live wires to screw terminal plugs, and do not insert, remove or handle screw terminal plugs with live wires connected.

Pins 1 & 2 - Display Test: All numeric display segments will light up when this pin is connected to the H/T Common Pin. When a TB-KIT Screw Terminal is used the Display Test function will operate unless J5 is cut which cancels test and enables the Hold function.

Pins 3, 4, C & D - H/T Common Pin: The Hold and Display Test pins have to be connected to this pin to activate their respective functions.

Pins A & B - Hold Reading: When this pin is connected to the H/T Common pin, A/D conversions will continue, but the display will not be updated until Pins A & B are disconnected from the H/T Common pin. When using a Texmate TB-KIT Screw Terminal, J5 has to be opened to disconnect the Test function and enable the Hold function. If both hold and test functions need to be accessed, a Push-On Screw Terminal can be used. **Pins 6, 7, F & H - Signal High Input:** Signal high input for the meter. Full-scale ranges of 50mV, 100mV or 200mV can be selected on the Range Select Header.

Pins 8, 9, J & K - Signal Low Input: Signal low input of the A/D Converter.

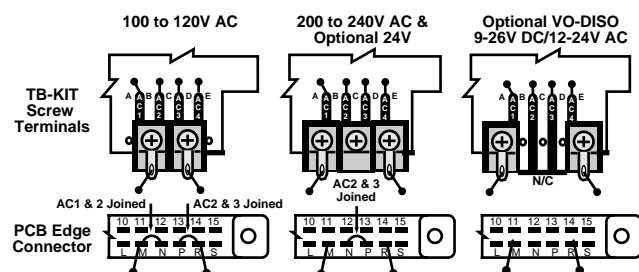
Pins 11 & M - AC1 - Live AC Power Input:

Pins 12 & N - AC2 - 110/220V AC Power Select:

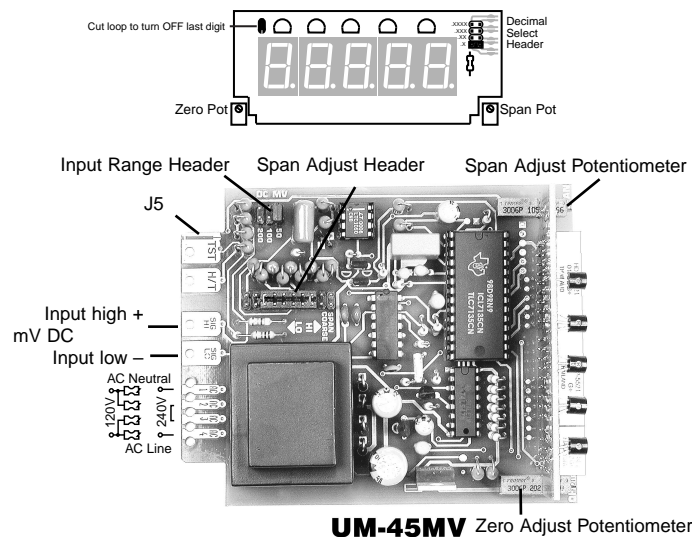
Pins 13 & P - AC3 - 110/220V AC Power Select:

Pins 14 & R - AC4 - Neutral AC Power Input:

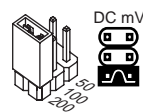
See below for connections



Component Layout

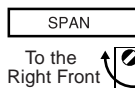


Signal Conditioning Components



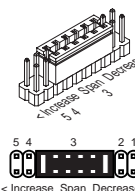
INPUT RANGE Header

Range values are marked on the PCB. Three positions are provided. After selecting a new range with the single jumper clip, recalibration is required.



SPAN Potentiometer (Pot)

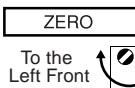
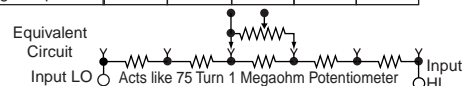
The 15 turn SPAN pot is always on the right side (as viewed from the front of the meter). Typical adjustment is 20% of the input signal range.



SPAN ADJUST Header

This unique five-position header expands the adjustment range of the SPAN pot into five equal 20% steps, across 100% of the input Signal Span. Any input Signal Span can then be precisely scaled down to provide any required Digital Display span from ± 19999 (40000 counts) to 0001 (one count).

SPAN Adjust Header position	1	2	3	4	5
SPAN Pot %	20%	20%	20%	20%	20%
Signal Span %	20%	40%	60%	80%	100%



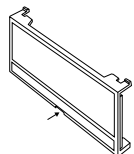
ZERO Potentiometer (Pot)

The ZERO pot is to the left of the SPAN pot (as viewed from the front of the meter). Typically it enables the displayed reading to be offset ± 1000 counts.

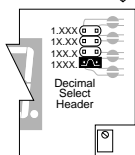
Calibration Procedure

1. Select the required full scale voltage range by repositioning the jumper clip on the Range Select Header. A range of 50mV, 100mV or 200mV full scale may be selected.
2. Select the required span adjust setting (% of display range) by repositioning the jumper clip on the Span Adjust Header.
3. Apply an input of 0 volts. Adjust the Zero Offset Pot until the meter reads 0000.
2. Apply a known high input signal that is within the full scale voltage range selected.
3. Adjust the Span Pot until the meter displays the required reading for the signal being applied.
6. The UM-45MV is now calibrated and ready for use. (Whenever a new range is selected, re-calibration is required to meet the specified accuracy).

Decimal Point Selection



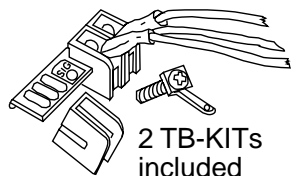
Remove faceplate by inserting a screwdriver blade in the slot at the bottom center of the faceplate. Press blade in to release catch and gently pry face plate outward from the bottom. (see also Case Dimension drawing)



Decimal selection is made on the front of the display board by moving the jumper clip to the desired position on the header.

TB-Kit Screw Connectors

Six Screw Terminals included Free with each UM Series meter

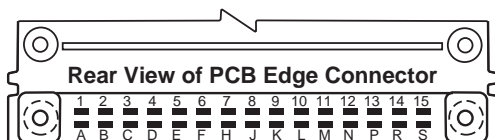


2 TB-KITS included

A TB-KIT consists of 3 insulated Quick Connects and 3 of Texmate's patented individual screw terminal blocks which attach directly to PCB inputs. These provide a Quick Connect tab and screw clamp termination. When using the TB-KIT screw terminal blocks, it is possible to

select between 120V AC and 240V AC power, the optional low voltage switching power supply or the 24V AC power supply by connecting the screw terminals as shown in the diagrams below.

Optional PCB Edge Connector



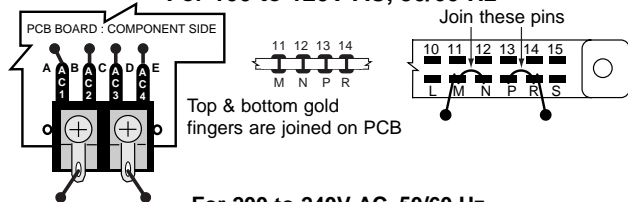
A standard 30 pin edge connector (two rows of 15 pins on 0.156" centers) may also be used to connect the UM-Series. Order part no. CN-L15. For different power supply voltage connection details, see pin connections below.

Selecting Power Supply Voltages

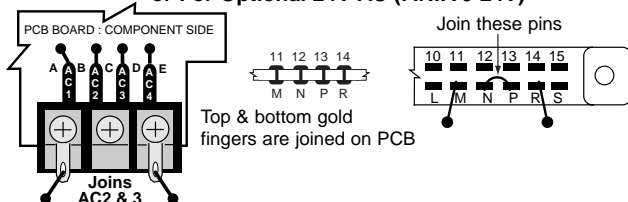
With TB-KIT Screw Terminals

With Optional PCB Edge Connector

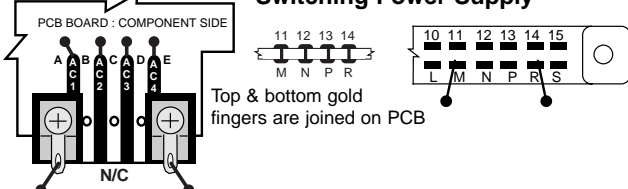
For 100 to 120V AC, 50/60 Hz



**For 200 to 240V AC, 50/60 Hz
or For Optional 24V AC (P.N.:V0-24V)**



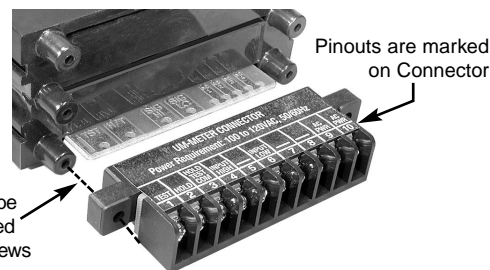
**For Isolated 9-36V DC/12-24V AC, 50/60 Hz
Switching Power Supply**



Push-On Screw Terminals

They provide the greatest convenience and ease of use

Texmate's exclusive optional Push-On Connectors combine an edge card connector and a 10 position screw terminal block. Push-On Connectors are ordered preconfigured for each specific power supply voltage and each optional power supply available for the UM-Series.

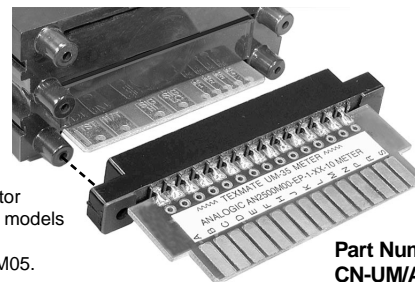


Connector can be securely attached to case with screws

CN-PUSH/UM	100/120V AC
CN-PUSH/UM01	200/240V AC
CN-PUSH/UM02	Switch Selectable 120/240V AC
CN-PUSH/UM03	24V AC
CN-PUSH/UM04	9-36V DC/12-24V AC
CN-PUSH/UM05	5V DC

Pinout Change-Over Connectors

To replace DPMs in existing panels where matching pinouts are required, Texmate can provide custom pinout Change-over Connectors, either with PCB gold finger terminations, (shown below) or customized versions of Push-On Screw Terminals. (shown above)



Change-over Connector shown is for Analogic models AN25M02, AN25M03, AN25M04 and AN25M05.

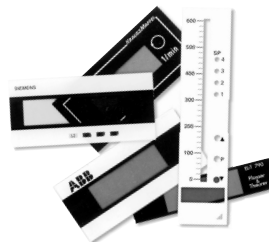
Part Number
CN-UM/ANLGC

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	m ³ /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.

September 10, 2003 UM-45MV Data Sheet (UM14)