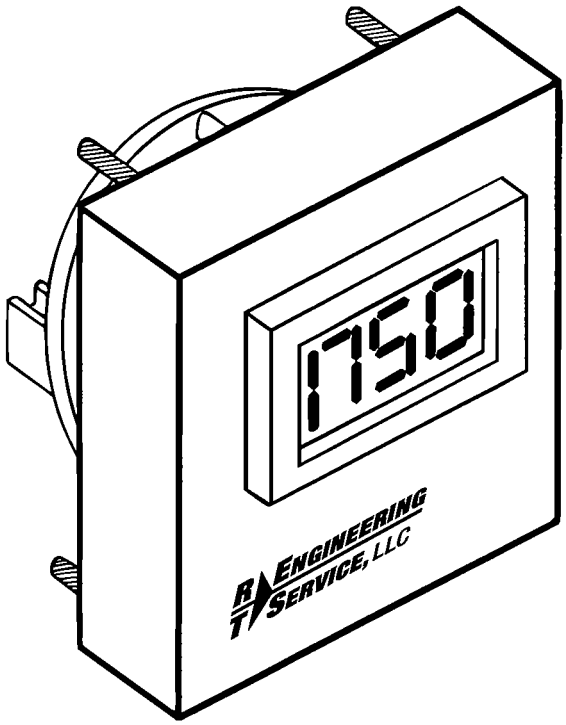
Universatile™

DIGITAL PANEL METERS



INSTALLATION, WIRING & CALIBRATION

FOR THE

DPM35B & DPMJR35B

PANEL METERS

R/T ENGINEERING SERVICE, LLC

MFG IN USA

(800) 343-1182 www.rteng.com

Table of

Contents

SPECIFICATIONS

Typical Signal Inputs	- Process Control Signals 4 - 20 MilliAmp Current 5 - 50 MilliAmp Current 1 - 5 Volt Offset Voltage
Bias Range	- 0 to 1000
Scale Range	- 0 to full scale (1999) A shunt resistor must be added for current measurement, 50 ohms to 600 ohms inclusive.
Maximum Input & Overvoltage	- 1000% of range or 500VDC (480VAC) whichever is less
Accuracy	- .5% linear ±1 digit Full scale
Input Resistance at Nominal Scale Values	- 20K ohms / Volt D.C. 9K ohms / Volt A.C.
A.C. Voltage Measurements	
Maximum Signal Frequency	- 2KHz
Minimum Input Frequency	- 40Hz ... lowest signal frequency for maximum reading
Sampling Time	- 3 Readings / Second Update
Response (000 to 1999)	- 6.5 Seconds
Power Requirement	- 115VAC Nominal (±10V), 50/60Hz, 2 Watts, (230VAC, 50/60Hz Optional)
Operating Temperature	- 5 Degrees C to 50 Degrees C
Display	- 3 1/2 Active Digits (0-1999). 0.56 inch non-blinking LEDs. Optional decimal points at the following positions: 1.X.X.X (user selectable)
Over-range	- Indicated by a "1" in the most significant position with the remaining display blank.
Weight	- 1 pound

CAUTION: THE COMMON MODE VOLTAGE PRESENT BETWEEN THE INPUT TERMINALS AND GROUND (CASE) SHOULD NEVER EXCEED 600 VOLTS.

The R.T. Engineering DPM35B or DPMJR35B digital panel meter is a versatile instrument designed to fit into the same mounting cutout as a standard 4½" or 3½" analog meter. This device will accept a wide range of voltage inputs from a variety of input signal devices. Calibration is performed using a 25-turn potentiometer on the signal input board and will display any 3½ digit parameter. The display uses selectable decimal points to provide readings from .000 through 1999.

INSTALLATION AND CALIBRATION

A) Installation:

If this unit replaces an existing analog panel meter, remove the old meter and insert the new DPM35B / DPMJR35B in its place. See **Figure 1** for cutout dimensions when replacing a non-standard device or making a new meter installation. Once the meter has been inserted into the panel tighten the retaining nuts.

B) Wiring:

Connect 115VAC power to the internally fused "115VAC" terminals. Connect the signal from its source to the terminals marked "input" making sure to note the polarity if this is a D.C. signal source.* Low voltage signals or feedback signals from a drive system require using shielded cable to minimize noise interference. The shield should be connected to the meter common (+ input) with the other end floating and insulated.

*This unit has been tested for peak operational voltage isolation integrity between the input terminals and the input to case. We recommend, on input signals greater than 200 volts RMS, placing a 100K ohm 1/2 watt metal film resistor in series with each leg of the input signal wire. This is for the protection of the signal device in the event of a fault to ground or short within the meter itself.

Note: *Before calibration, the meter should be powered for ten to fifteen minutes, to allow for warm up.*

C) Calibration:

1. Calibration Procedure for Milliamp Inputs

As shipped the range selection jumper is installed on the "B" scale which will accommodate milliamp inputs. The meter is also shipped with a burden resistor installed across the signal input terminals for milliamp applications.

There are two adjustments through which the meter is calibrated. These are 1. Bias, 2. Readout Scale. The setting of these adjustments are as follows (with the burden resistor in place).

Step 1. Apply input of 4 ma.
Step 2. Set the readout for the desired offset value (0 to 1000) by adjusting the bias potentiometer.
Step 3. Apply input of 20 ma.
Step 4. Set the readout for the desired value by adjusting the readout scale potentiometer.
Step 5. Repeat steps 1 through 4 until the desired readouts are achieved. This is due to the interaction of the two adjustments.

2. Calibration Procedure for Voltage Offset Applications

The DPM-35B can be utilized as an offset meter where a readout of from 0 to 1000 is desired when the input signal equals zero, and the display is linear from that preloaded offset value up to full scale (1999). For this application the burden resistor across the input terminals is not required. Care must be taken in selecting the proper jumper range. (*The meter is shipped with the jumper on scale "B", this is the normal range for milliamp inputs.*) For a voltage input the jumper position must be determined by the method following.

Method of Calibration (For Voltage Input)

Install jumper (J1) on the range scale "D". Apply maximum signal and adjust the "readout scale" potentiometer located on the back of the meter until the approximate desired readout is obtained. If this readout cannot be obtained remove the signal input and move the jumper (J1) down on range to scale "C". Reapply input signal again adjusting the "readout scale" potentiometer to the desired readout. If necessary repeat above on the next lower range scale until desired readout is obtained.

After the proper scale selections have been chosen the offset and final calibration can be made through these two adjustments 1. Bias, 2. Readout Scale.

The setting of these adjustments is done as follows (use of burden resistor is not required).

Step 1. Apply zero or lowest input signal.
Step 2. Set the readout for the desired offset value (0 to 1000) by adjusting the Bias potentiometer.
Step 3. Apply maximum input.
Step 4. Set the readout for the desired value by adjusting the "readout scale" potentiometer.
Step 5. Repeat steps 1 through 4 until the desired parameters are achieved.

Note: *Several adjustments may be required before the desired readouts are achieved. This is due to the interaction of the two adjustments.*

This meter is shipped with all decimal points displayed. To eliminate the decimal points not desired please locate J2, just below the terminal strip on the back of the meter and cut the jumpers where the decimal points are not desired.

Note: *If the jumpers are cut and separated a small amount, a new selection can be made in the future by tack soldering the ends together.*

This completes the installation and set-up procedures.

SERVICE NOTES

A) A display of 1 in the most significant position followed by a blank display indicates an overscale reading and requires recalibration via the "readout scale" potentiometer and or a new range selection (refer to section C).

B) The indicator installed, wired and powered with no signal input, the display should be adjustable through a bias range of 0 to 1000 plus or minus a count. If this is not the case, remove the signal input leads and install a short jumper between the signal input terminals. Check for zero reading. If a zero is now displayed, a "noise signal" is being induced through the signal input cable. This can be corrected with shielded cable (see wiring notes page 2, section B). If a zero reading is still not obtained with the input shorted, adjust the offset potentiometer located on the face of the meter at the upper right hand corner. (See **Figure 3**).

Note: *If the above procedures do not work please contact the factory.*

C) A display of "000" may indicate either reverse polarity or a zero input signal.

D) The meter will accept an input signal voltage up to 10 times the rated value for a given range or 500 volts whichever is less. Example: range "B" is rated 5VDC/10VAC and will accept up to 50VDC or 100VAC.

E) As with any piece of electronic equipment, care is recommended when handling and applying voltages. For further information or service contact the factory.

WARRANTY

R.T. Engineering Service, LLC (RTE) warrants this equipment against defects in material or workmanship for a period of two years from the date of shipment. Material or workmanship defects within the first two years will be repaired or replaced at the option of RTE at no charge. Final determination of the actual defect rests with RTE.

This warranty does not apply to any product which has been misapplied, modified or subjected to misuse, negligence or accident. Any unauthorized repair, service or modification to this equipment voids the warranty.

The foregoing warranty is exclusive and in lieu of all other warranties expressed or implied including but not limited to any warranty of merchantability or fitness for a particular purpose. RTE is not liable for consequential damages of any kind.

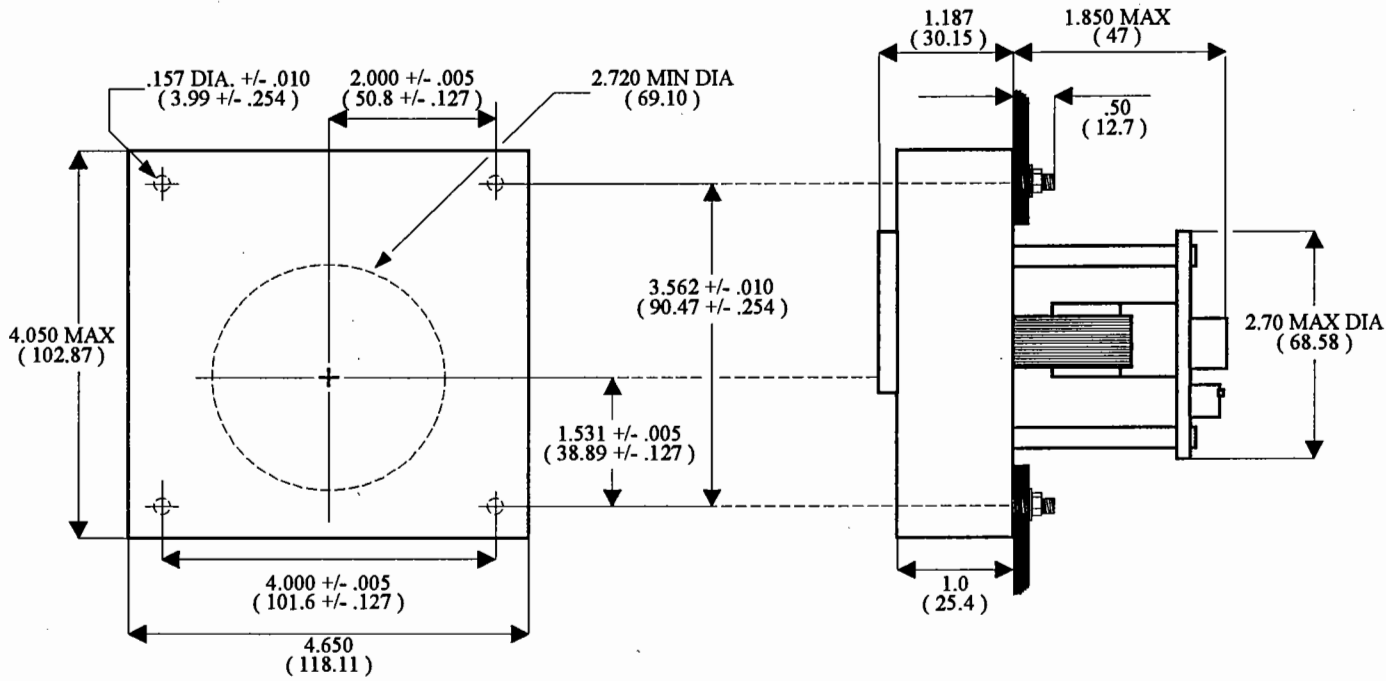
Note: *Any product found defective should be returned to RTE. The defective meter should be returned freight prepaid by the buyer to RTE.*

DPM STANDARD

FIGURE 1

4½" Case Size

(Dimensions in Parenthesis are in Millimeters.)



DPM JUNIOR (JR)

3½" Case Size

(Dimensions in Parenthesis are in Millimeters.)

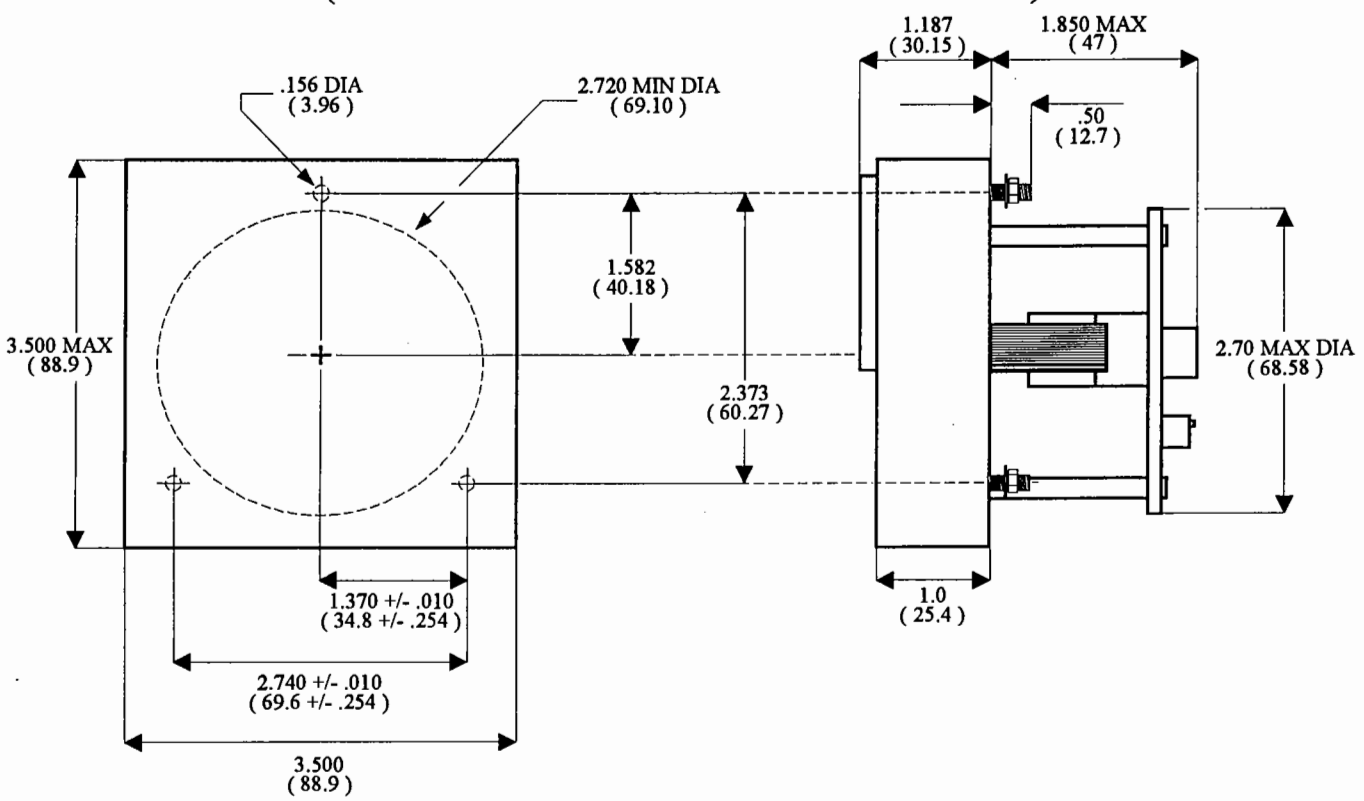
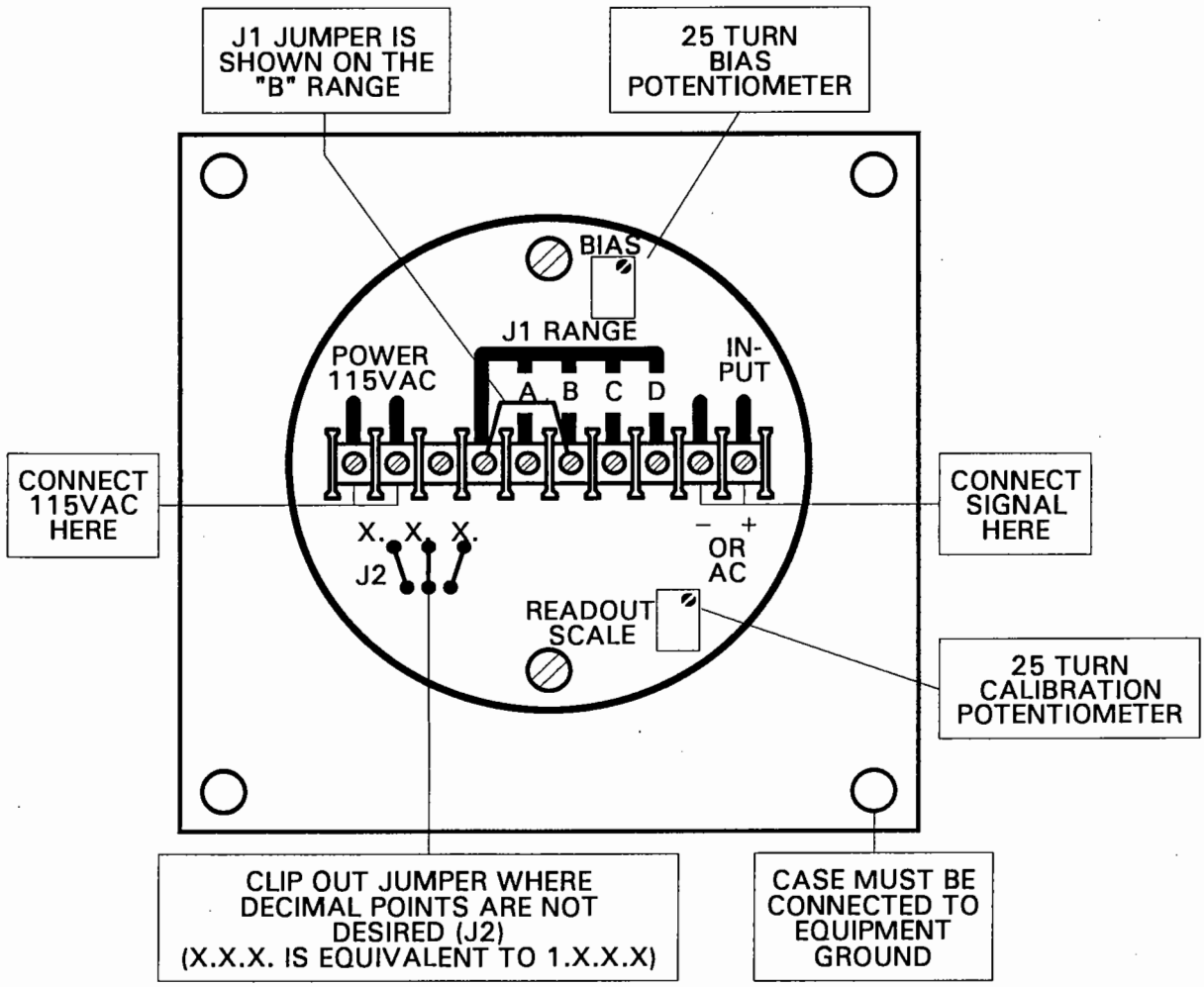


FIGURE 2

DPM(JR)35B CONNECTION DIAGRAM

(REAR OF METER)



INPUT RANGES (J1) FOR FULL SCALE:

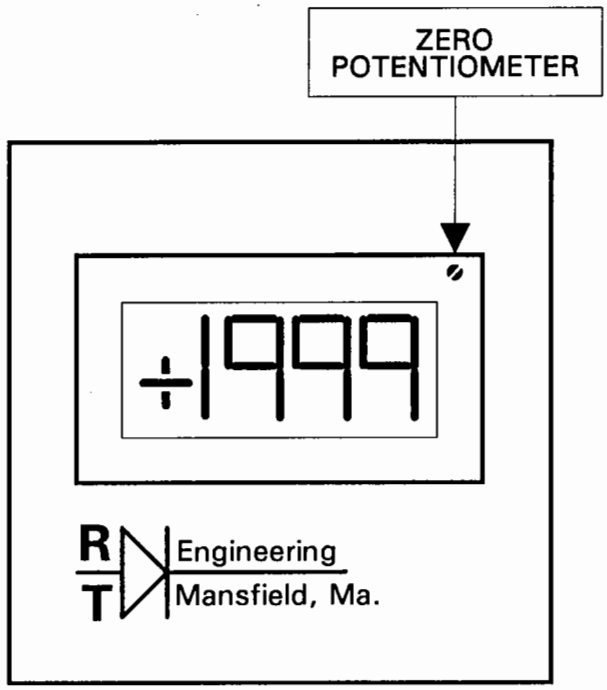
JUMPER CONNECTION	DC INPUT SIGNALS		AC INPUT SIGNALS	
	MINIMUM (1)	MAXIMUM	MINIMUM (1)	MAXIMUM
J1 TO A *	50M VDC	500M VDC	100M VAC	1 VAC
J1 TO B	5 VDC	50 VDC	10 VAC	100 VAC
J1 TO C *	50 VDC	500 VDC	100 VAC	480 VAC
J1 TO D *	300 VDC	500 VDC	250 VAC	480 VAC

(1) These rated values represent minimum voltages necessary to read "1999" (Full Scale). Maximim input voltage for each range is 10 times the rated value or 500 volts, whichever is less.

* For non bias applications.

FIGURE 3

DPM35B



DPMJR35B