

# Universatile™

## DIGITAL PANEL METERS



### INSTALLATION, WIRING & CALIBRATION

FOR THE

## DPM35BP/H

### PANEL METERS

**R ENGINEERING**  
**T SERVICE, LLC**



(800) 343-1182

[www.rteng.com](http://www.rteng.com)

The R.T. Engineering series DPM-35MRH-BP Panel Meter is a uniquely versatile instrument. It is designed to fit in the same mounting cutout as a standard 4 1/2" Analog Meter, yet will accept a wide range of voltage inputs from a wide variety of input signal devices. The unit can be very simply calibrated, via a 25-turn pot in the rear, to read out any 3 1/2 digit parameter required from .000 to 1999 with user selectable decimal points at three locations.

The level at which the relay contacts are set to close, is easily set via a 10-turn pot underneath the display bezel. Once set, the relay contacts will close when the display value becomes greater than or equal to the value which was set. A LED will blink on and off and is visible through the display bezel. If desired, an audible alarm can be made to sound when the contacts become closed. If desired, it can be made to silence itself after 30 seconds.

The DPM-35MRH-BP has four input voltage ranges within which it can handle input signal levels of 50mVDC/100mVAC (F.S.) to 500VDC/480VAC (F.S.).

#### SPECIFICATIONS

Input Ranges	- (A) 50 millivolts DC - (B) 5 VDC - (C) 50 VDC - (D) 500 VDC
Maximum Input & Overvoltage	- 1000% of range or 500 VDC (480 VAC) whichever is less
Accuracy	- 0.5% linear +1 digit F.S.
Input Resistance at Nominal Scale Values	- 20K Ohms/Volt D.C.
Sampling Time	- 3 Readings/Second Update
Response (000 to 1999)	- 6.5 Seconds
Relay Contacts	
Type	- Internally Fused N.O. Solid State Triac
Rating	- 115VAC 50/60Hz, .5 Amps (500 Milliamps)
Trip Level Repeatability	- 0.1% of Full Scale (+1 Digit)

- Power Requirement - 115VAC Nominal (+10V), 50/60 Hz, 2 Watts, (230VAC, 50/60 Hz Optional)
- Operating Temperature - 5 C to 50 C
- Typical Signal Inputs - D.C. Signals from : Reference Voltage, Tachometers, Force Transducers (Load Cells), Shunt, Current Transformers, Pressure & Flow Tranducers
- Display - 3 1/2 Active Digit (0-1999). 0.5 Inch LED Non-blinking. Optional decimal points at the following positions: 1.8.8.8 (user selectable)
- Overrange - Indication by a "1" in the most significant position with remaining display unlit.
- Weight - 1 Pound

CAUTION: The common mode voltage between the input terminals and ground (case) should never exceed 600 volts.

## INSTALLATION AND CALIBRATION

### A) Installation

If the meter is to replace an existing standard 4 1/2" panel meter, simply remove the old meter and install the DPM-35MRH-BP in it's place. Wire and calibrate. If this is a new installation or if the meter you are replacing has nonstandard dimensions, make a new cutout using the layout template included in this manual. Then install the meter, wire and calibrate.

### B) Wiring

Refer to diagram "A". Connect 115 VAC power. Meter is internally fused. Connect the signal to the terminals on the back of the meter marked "input". Signal is a D.C. signal, make sure the polarity is correct. Low voltage signals, or signals relating to a reference or feedback for a drive system should be run in a shielded cable to minimize any noise pick-up from the cable run. The shield should be connected to the meter common (+ input). The other end of the shield should remain unconnected and insulated using electrical tape.

### C) Calibration

Refer to diagram "A". If the maximum voltage of the signal is not known, fasten the J1 jumper to the highest range, Terminal "D". Apply the maximum signal you will be using and adjust the "readout scale" adjustment located on the back of the meter, until the desired display reading is obtained. If the meter display cannot be adjusted to read high enough, remove the signal input. Unfasten the J1 jumper and place it on the next lower range, Terminal "C". Reapply the signal, and again adjust the "readout scale" adjustment to obtain the desired display reading. If you are still unable to adjust the display to read high enough, repeat the above steps by placing the J1 jumper on the next lower range, Terminal "B", then Terminal "A", until desired readout is obtained.

### D) Setting Meter Relay

This adjustment should be made only after you have calibrated the meter. Refer to diagram "B". Remove the red plastic bezel. This can be easily pried off with your fingers. Set SW1 1 and 2 to on (↑). The red trip light will come on. Using a small screwdriver, adjust the "trip" adjustment until the display reads the number you want the meter to trip at. Set SW1 1 and 2 to off (↓). The meter is now set to operate.

When the display reads the same number, or higher than the number you have set, the relay contacts will close. The red trip light will come on and blink to show that the meter is being tripped. The contacts will remain closed until the display value again becomes less than the number you have set.

Refer to Diagram "B". If SW1-4 is on (↑), an audible alarm will sound as the meter goes above set point. If SW1-3 is on (↑) the alarm will be on as long as the meter stays above set point, but if SW1-3 is off (↓) then the meter will automatically silence itself after 30 seconds.

The internally fused solid state relay contacts located on the back of the meter are rated at 115 VAC, 50/60 Hz @ .5 Amps (500 milliamps). If the device you wish to have the meter relay control requires more current, or is a D.C. voltage or any voltage other than 115 VAC, 50/60 Hz, an external relay having a coil rating of 115 VAC, 50/60 Hz must be used.

NOTE: Setting the trip level adjustment does not in any way affect the calibration of the meter.

Set the decimal point select switch on the back of the meter for the desired decimal point placement.

#### E) Service Notes:

1. A display of 1 on the left hand digit followed by a unlit display indicates an overscale reading and requires recalibration using the "readout scale" adjustment and/or a new range selection (refer to Section C).
2. With the indicator installed, wired, power applied and with no signal input, the display should read zero 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 and check for zero readings as above. If zero is now obtained, this indicates a "noise signal" is being induced in the signal input cable. This can be corrected with shielded cable (see wiring notes on page 3, section B. If a zero reading cannot be obtained with the input shorted, please consult the factory).

3. A display of "000" may indicate reversed polarity of the input signal or a zero input signal.
4. The input signal stage of the meter will accept a voltage up to 10 times the rated value for a given range or 500 volts whichever is less. (eg. range "B" is rated 5 VDC, 10 VAC and will accept up to 50 VDC, 100 VAC).
5. As with any given piece of electronic equipment, care is recommended in handling and applying voltages. For further information or service contact:

R.T. Engineering Service, Inc.  
P.O. Box 520  
65 Maple Street  
Mansfield, Ma. 02048

1-800-372-2123 (Ma.)

1-800-343-1182 (Outside Ma.)

#### E) Warranty

R.T. Engineering Service, LLC (R.T.E.) warrants this equipment against defects in materials or workmanship for a period of two (2) years from date of shipment.

Standard products manufactured by R.T.E. are warranted to be free from defects in workmanship and materials for a period of two years from date of shipment, and products which are defective in workmanship or materials will be repaired or replaced, at the option of R.T.E., at no charge to the buyer. Final determination as to whether a product is actually defective rests with R.T.E.. Any product found to be defective should be returned, with transportation charges prepaid by the buyer, to R.T.E. at the above address. This warranty will not apply to any product which has been subjected to misuse, negligence, or accident; or misapplied; or modified or repaired by unauthorized persons, or improperly installed. R.T.E. cannot assume responsibility or accept invoices for unauthorized repairs to its components, even though defective. Any modification made internal or external to the meter may void this warranty as will opening the meter enclosure.

R.T. Engineering Service, Inc., hereby disclaims any liability to purchaser, employees of the purchaser, or any other parties in connection with consequential injury or any other related damages thereto that have occurred as a result of any improper use of the meter product or malfunction of the meter product, including, but not limited to, malfunction of meter alarms.

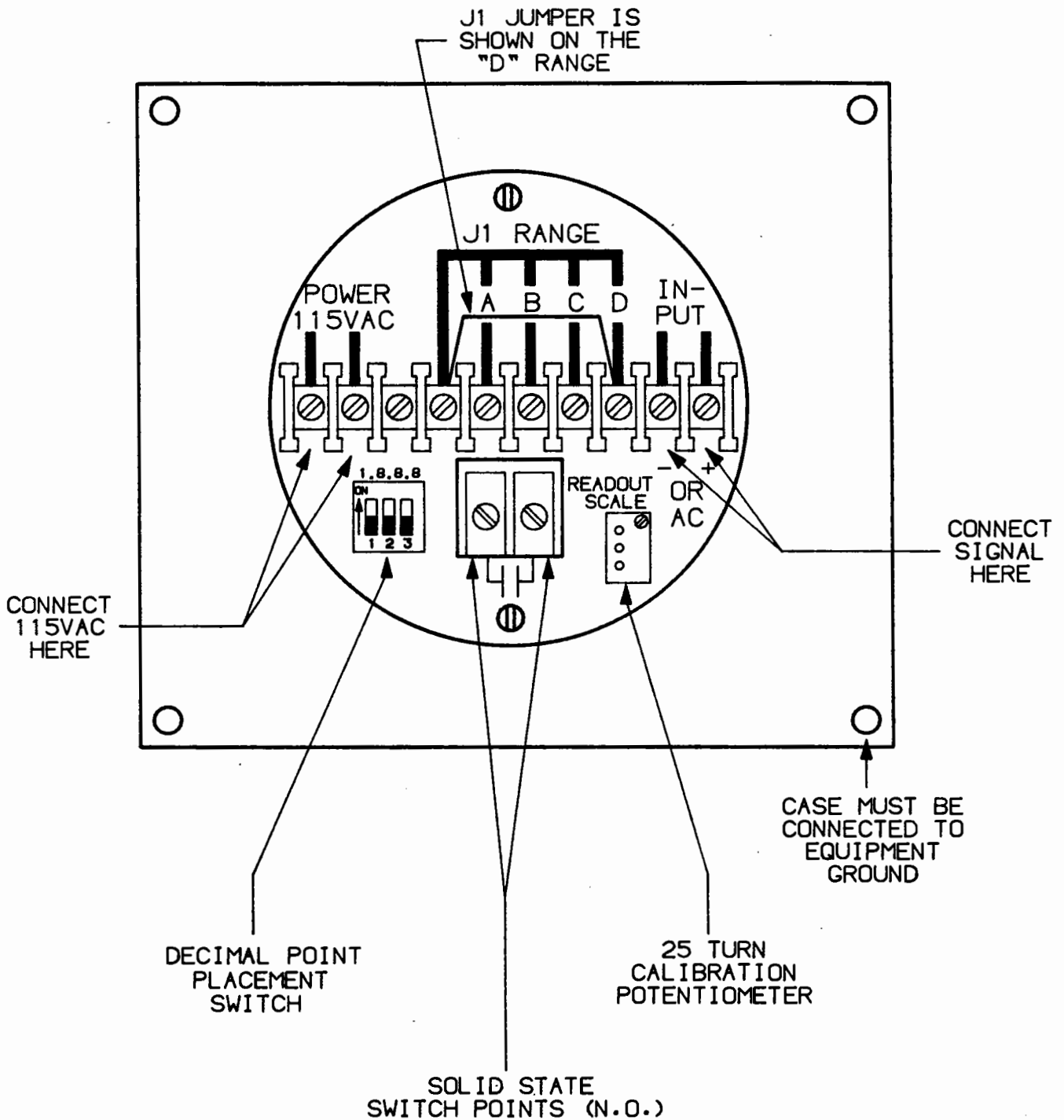
The foregoing warranty is exclusive and in lieu of all other warranties expressed or implied, including, but not limited to any warranty of merchantability or of fitness for a particular purpose. R.T. Engineering shall not be liable for consequential damages of any kind.

The aforementioned provisions do not extend the original warranty period of any article which as been either repaired or replaced by R.T. Engineering.

MBP88002

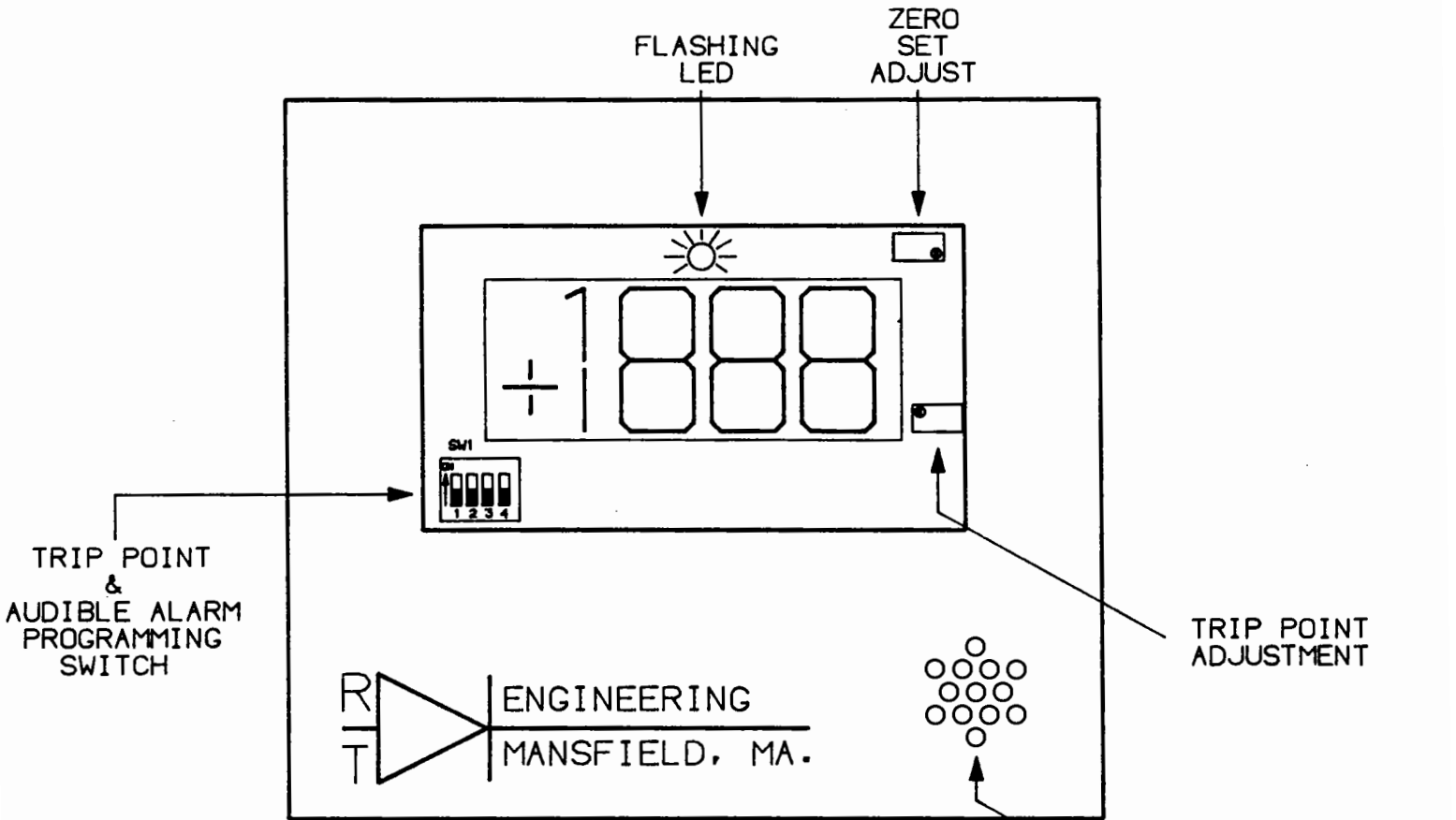
# DIAGRAM "A"

(REAR OF METER)



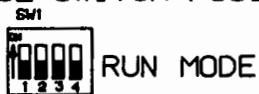
# DIAGRAM "B"

(FRONT OF METER)



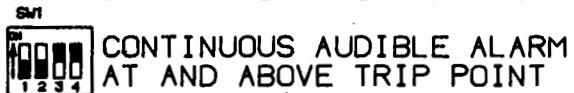
## TO PROGRAM TRIP POINT

USE SWITCH POSITIONS 1 AND 2

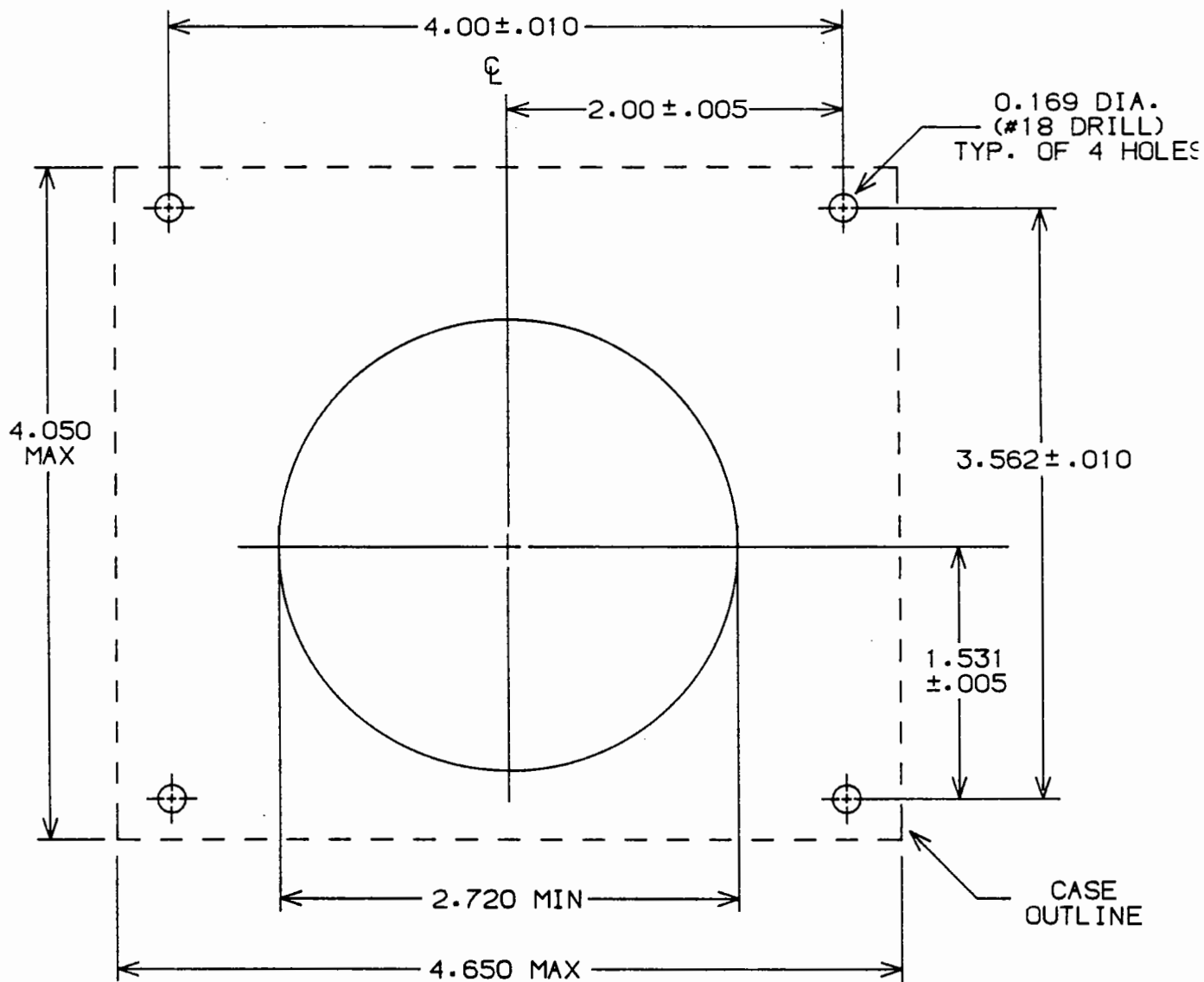


## TO PROGRAM AUDIBLE ALARM

USE SWITCH POSITIONS 3 AND 4



# MOUNTING LAYOUT



## NOTES:

- 1) ALL DIMENSIONS ARE IN INCHES.
- 2) TOLERANCE ON FRACTIONAL DIMENSIONS IS  $\pm 1/32$ .
- 3) THIS IS NOT A TEMPLATE.

Leave as is

INSTALLATION  
WIRING AND  
CALIBRATION  
FOR  
R.T. ENGINEERING  
MODEL ~~DPM-35MRH-BP~~  
PANEL METER  
DPM35BP/H

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Pat. Pending # 871,202