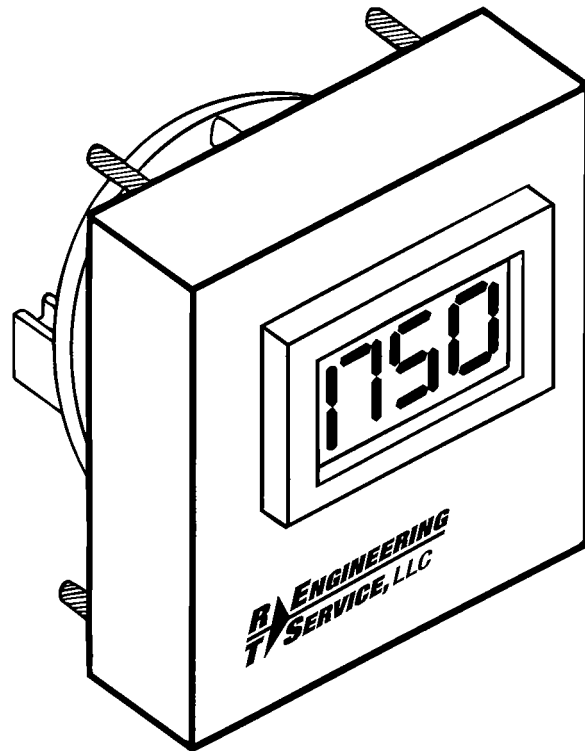


Universatile™

DIGITAL PANEL METERS



INSTALLATION, WIRING & CALIBRATION

FOR THE

DPM35P/H & 35PV/H

PANEL METERS

R ENGINEERING
T SERVICE, LLC



(800) 343-1182

www.rteng.com

The R.T. Engineering model DPM-35P/H (DPM35P/L) was designed to accommodate pulse (digital) type input from a standard pick-up or a certain type of zero speed (Hall Effect) magnetic pick-up. Along with the ability to be installed in the same cut-outs as a standard 4-1/2" analog meter, the meter offers a great deal of flexibility and is very easily calibrated. No mathematical calculations are required.

The DPM-35P/H (DPM35P/L) can also be used for monitoring the variable frequency output from either a six (6) step or pulse width modulated (pwm) inverter when equipped with the appropriate interface kit (field modifiable). The meter can be calibrated to monitor either frequency or the desired engineering units.

SPECIFICATIONS

- | | |
|--------------------|--|
| Accuracy | - 1% linear ± 2 digits full scale. |
| Input Signal | <ul style="list-style-type: none">- Standard magnetic input (1000 inches per min. maximum) gear or socket speed at 1/64 inch gap.- Hall effect pick-up (5VDC type only at 2 milliamps max.) zero speed with 1/32 inch gap. (+5 VDC max. with respect to common.) Can use R.T. Engineering P/N RT-58426.- Output from either six step or PWM inverter up to 480 VAC when meter has proper interface. Signal isolation transformer P/N RT-TA-1-81210 is recommended. |
| Sampling Time | - 3 readings/second update. |
| *Maximum Frequency | - Consult the frequency vs. display curves. |
| Display | - 3-1/2 active digits (0 to 1999) .5" LED non-blinking. Optional decimal points at the following positions X.X.X.X (user selectable). |

* - A 60 tooth gear on the shaft of a motor going 1750 RPM would produce a digital frequency of 1750 pulses per second.

Power Requirement	- 115 VAC (+ 10V), 50/60Hz, 2 watts, (230 VAC 50/60Hz optional)
Operating Temperature	- 5 C to 50 C
Overrange	- Indication by a "1" in the most significant position with remaining display unlit.
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)
Weight	- 1 pound

NOTE

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

INSTALLATION AND CALIBRATION

A) Installation

If this meter is to replace an existing 4 1/2" panel meter, all that should be required is to pull out the old meter and insert the DPM35P/H in its place. If the meter being replaced has non-standard dimensions or if the DPM35P/H is a new meter addition, see the layout attached for proper cut-out dimension. Insert the meter in cut-outs and tighten retaining nuts. See Page 7.

B) Wiring

Connect the 115 VAC power to "115 VAC" terminals. Meter is internally fused. Connect the signal leads to the input terminals (the last two on the right hand side marked + - or AC). No polarity need be observed for the standard magnetic pickup. If

the signal source is a magnetic pickup, we recommend using shielded wire (such as Belden P/N 8760 or equivalent) with the shield being terminated at the second terminal from the right. The pickup end of the shield should be floating and insulated from ground.

C) Calibration

General

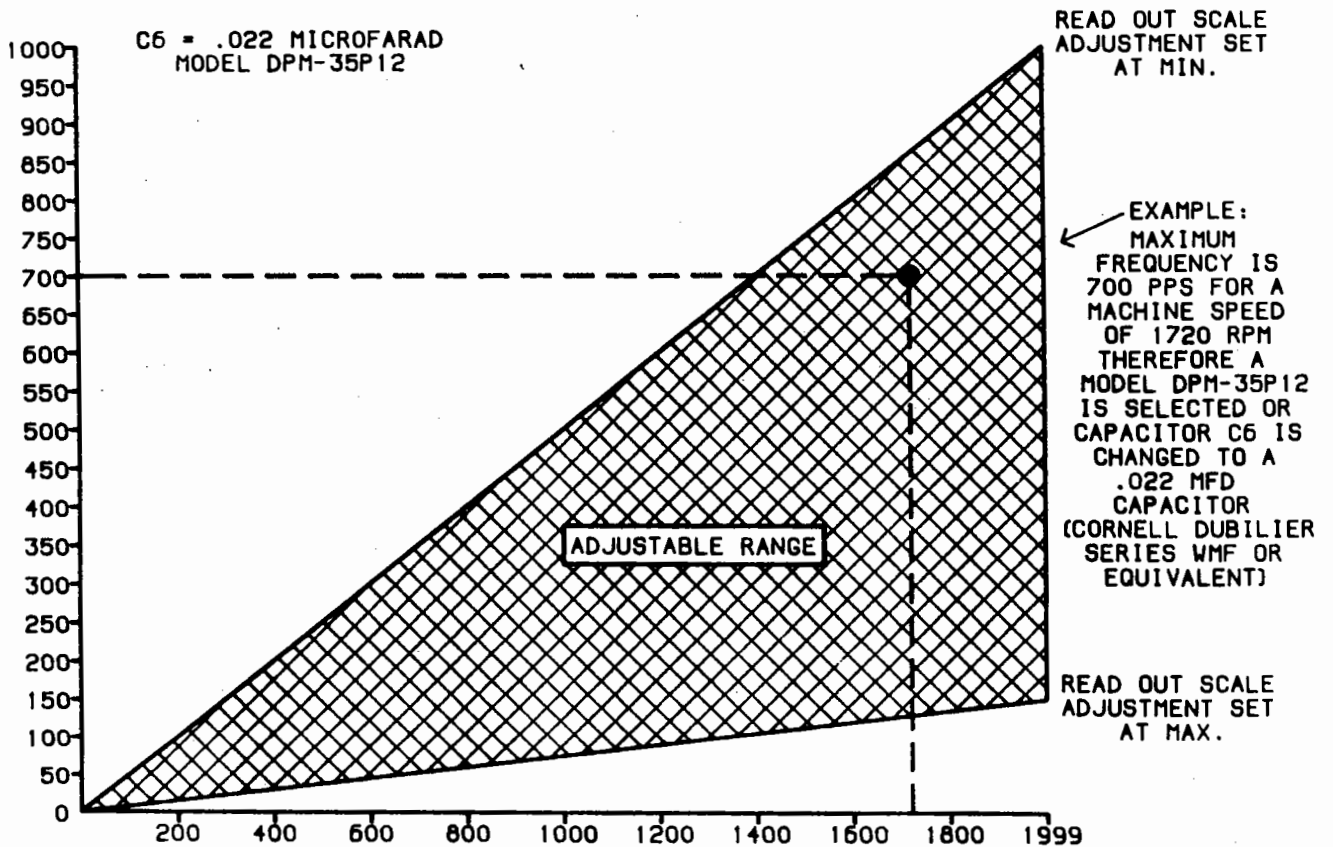
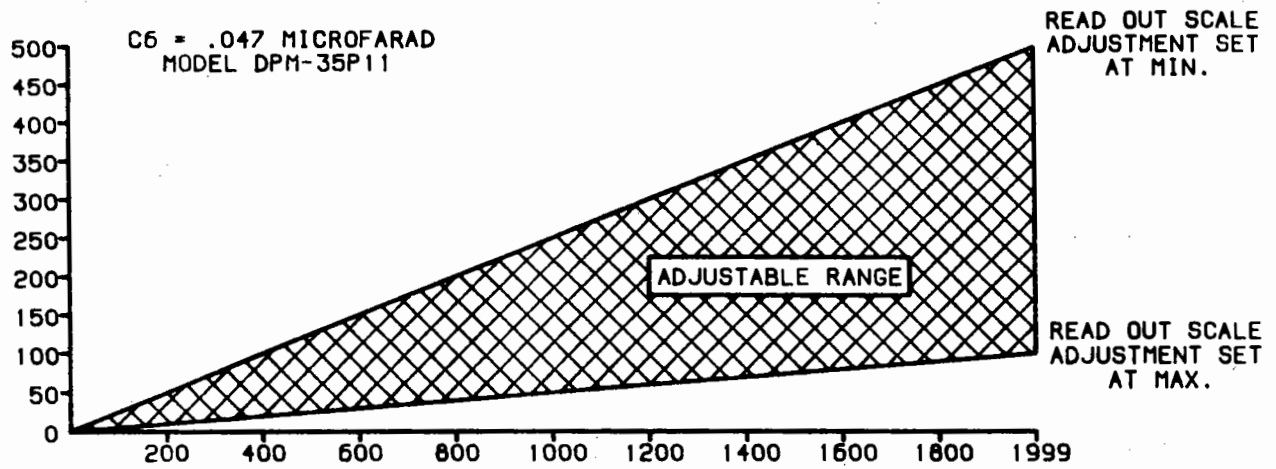
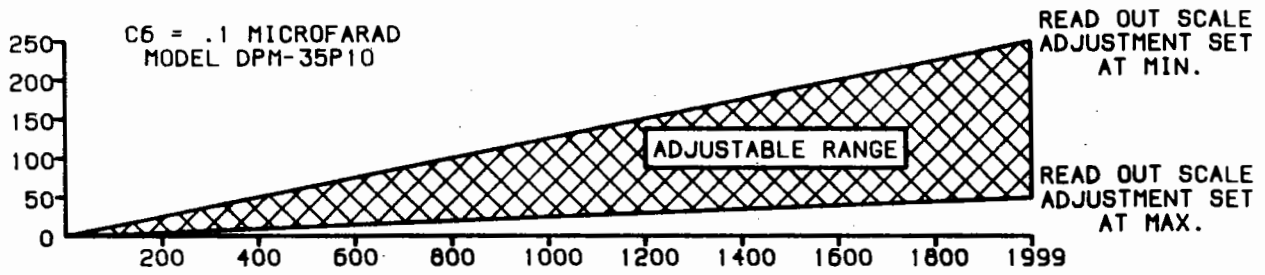
If desired parameters were not specified to the factory when ordering, the proper range capacitor must be installed at C6 position on the back of the meter before calibration can begin. To select proper range capacitor please refer to the frequency vs. display curves on pages 5 and 6. Using the frequency (PPS) input value and the desired display parameters, plot a point and select the best capacitor for your application. See example on page 4 for clarification. For calibration of meter use one of the following techniques.

1. Standard Magnetic Pickup P/N RT-SM3C
 - a. Locate the solder stakes lettered a-b-c-d on the converter board.* For a standard magnetic pickup there should be a jumper between the a and d terminals only. Any other jumper should be removed.
 - b. Be sure the sensing head is between $1/64$ and $1/32$ of an inch from the face of the gear teeth. The tip of the pickup must be smaller in diameter than the width between the gear teeth.
 - c. Run the machine at maximum speed. Adjust the 25-turn potentiometer labeled READOUT SCALE to the desired reading. The meter should now be calibrated.

*Upper semi-circle shaped board

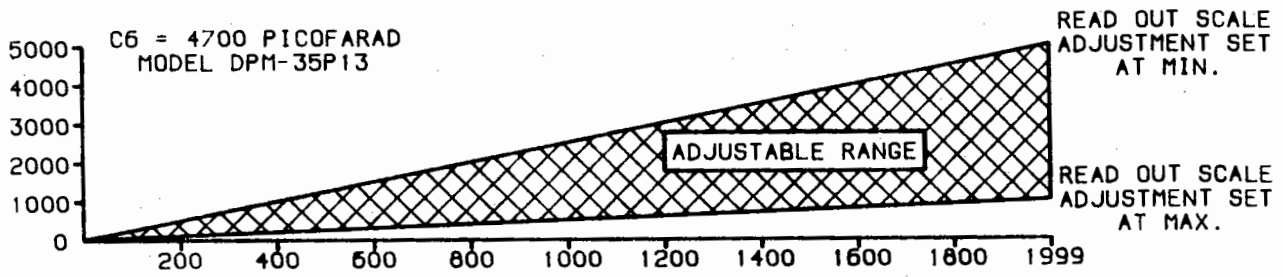
TYPICAL FREQUENCY VS. DISPLAY CURVES

FREQUENCY IN PULSES PER SECOND (PPS)

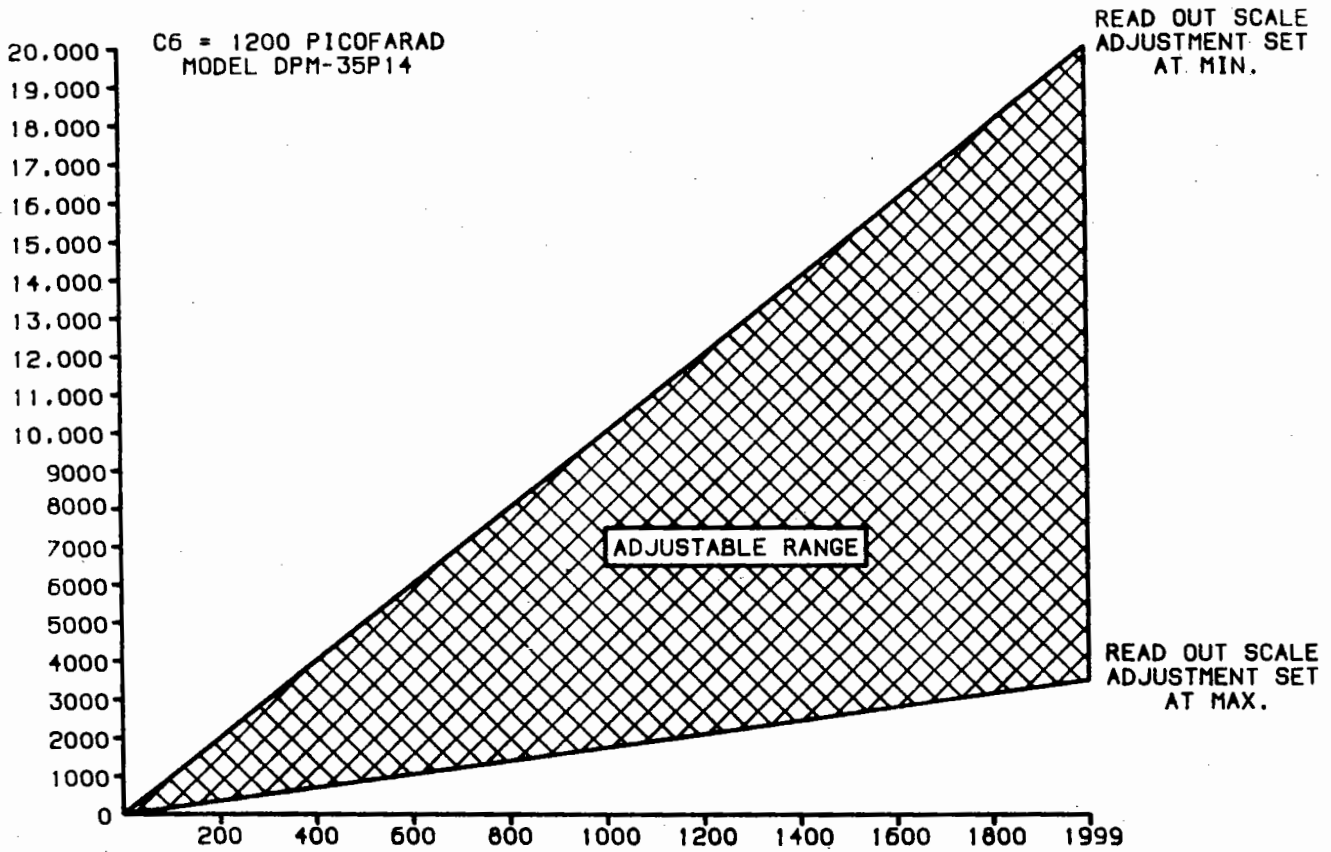


READ OUT DISPLAY

TYPICAL FREQUENCY VS. DISPLAY CURVES



FREQUENCY IN PULSES PER SECOND (PPS)



READ OUT DISPLAY

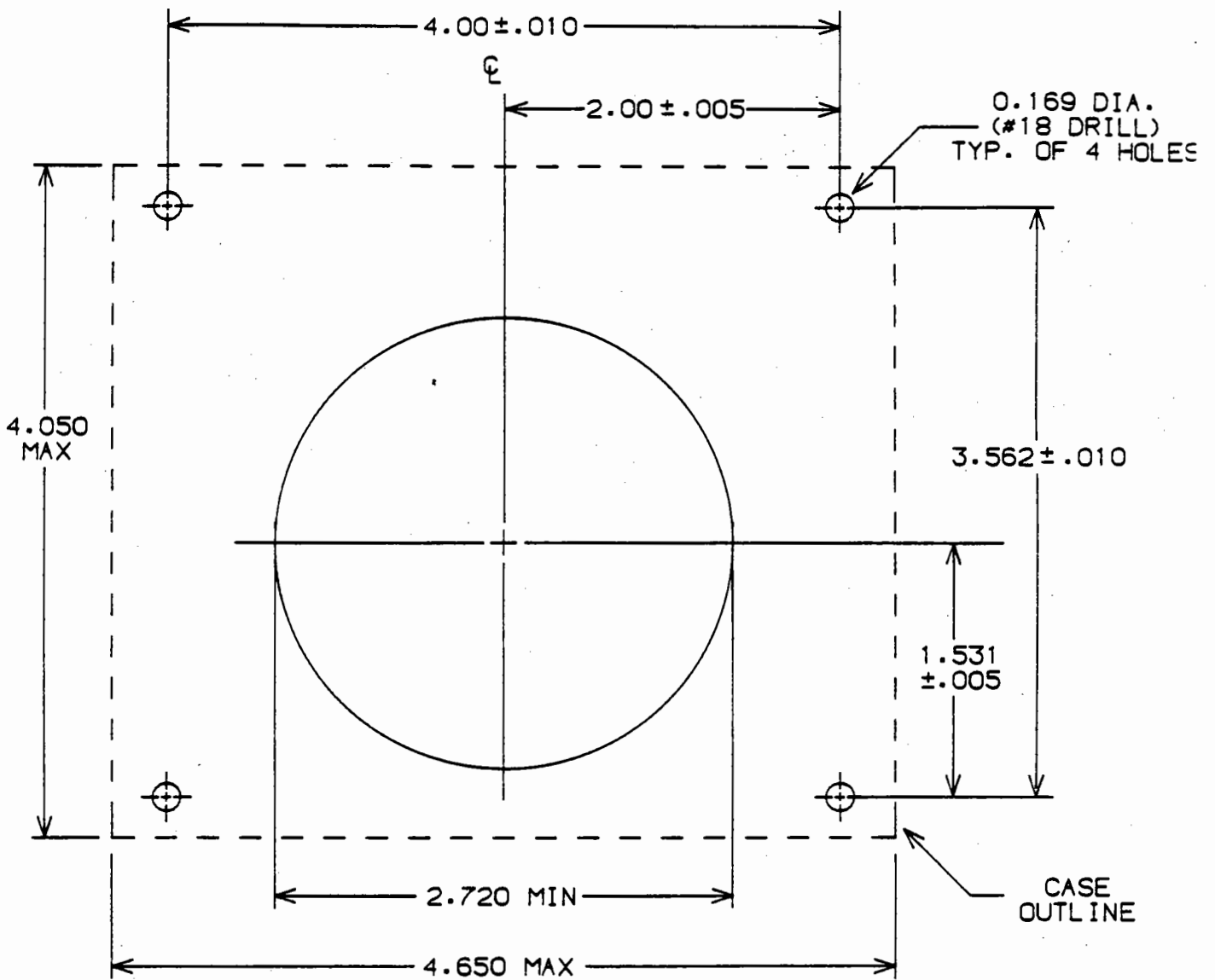
$$\text{MAX. FREQUENCY} = \frac{(\text{NO. OF GEAR TEETH}) (\text{MAXIMUM RPM})}{60}$$

EXAMPLE:

$$\text{MAX. FREQ.} = \frac{(60 \text{ TEETH}) (1750)}{60}$$

$$\text{MAX. FREQ.} = 1750 \text{ PPS}$$

MOUNTING LAYOUT



NOTES:

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

DPM35P/H

(REAR OF METER)

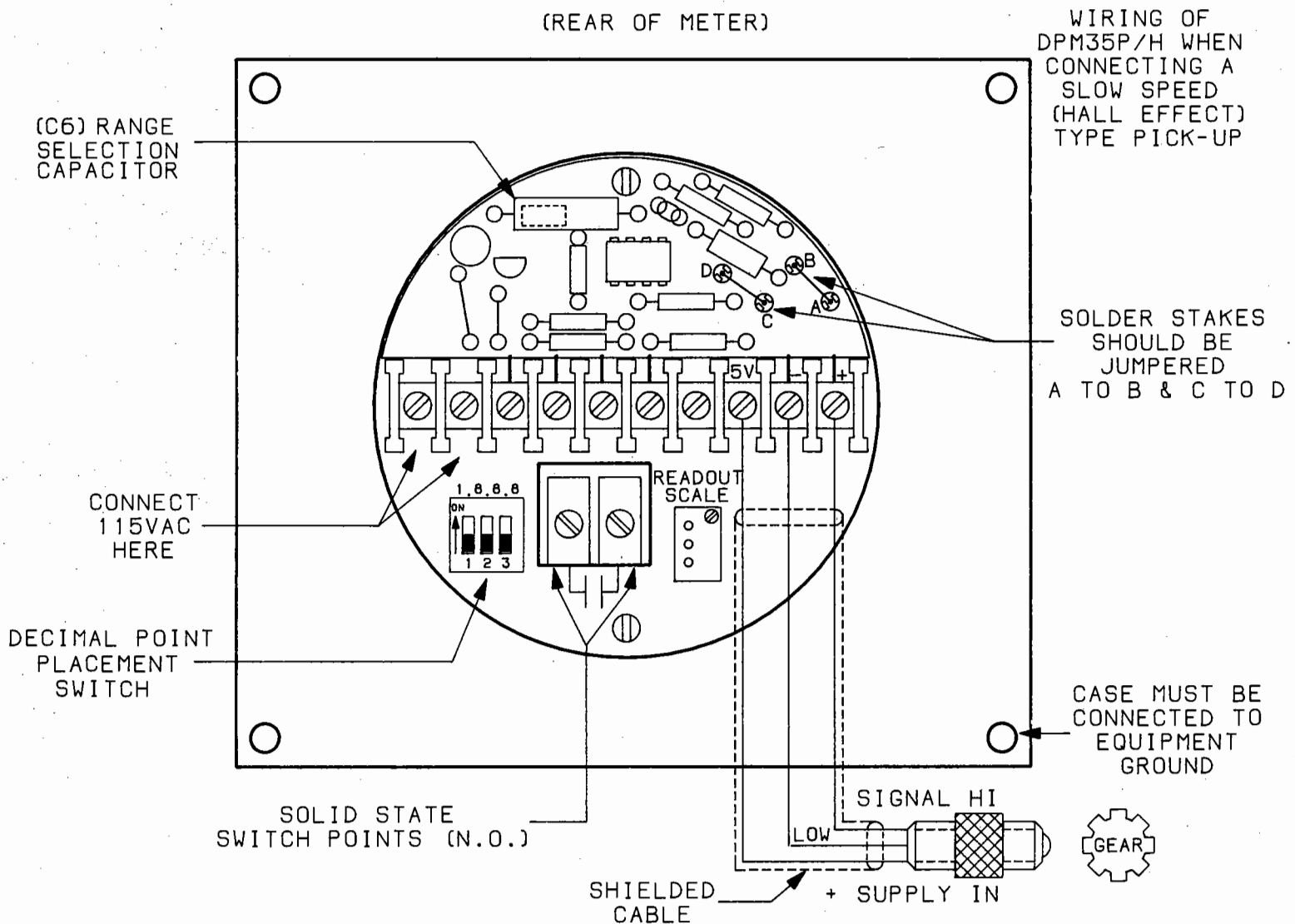


FIGURE 1

2.) Hall Effect Type Magnetic Pick-up (See Fig. 1) P/N RT-58426

- The meter has a +5VDC supply available which is capable of supplying a maximum 2 milliamp load. Use the third terminal from the right (5V) and the second terminal from the right (-) as the power supply for the pick-up. The signal output from the pick-up should connect to the signal input terminal marked (+). This is the first terminal on the right.
- Locate the solder stakes lettered a-b-c-d on the converter board.* To accommodate the Hall Effect Pick-up there should be a jumper between a-b and another jumper between c-d. Any other jumpers on these terminal should be removed.
- Follow the procedure described under the standard magnetic pick-up to complete the calibration.

3.) Inverter Output (See Fig. 2)

- Be sure jumpers on the converter board* are located as described in step 2b above.
- Mount the interface fanning strip on the extreme right side of the terminal strip.
- Replace frequency range capacitor C6 (unless previously done at the factory) with the 0.1mfd capacitor supplied with the interface kit.

* UPPER SEMI-CIRCLE SHAPED BOARD.

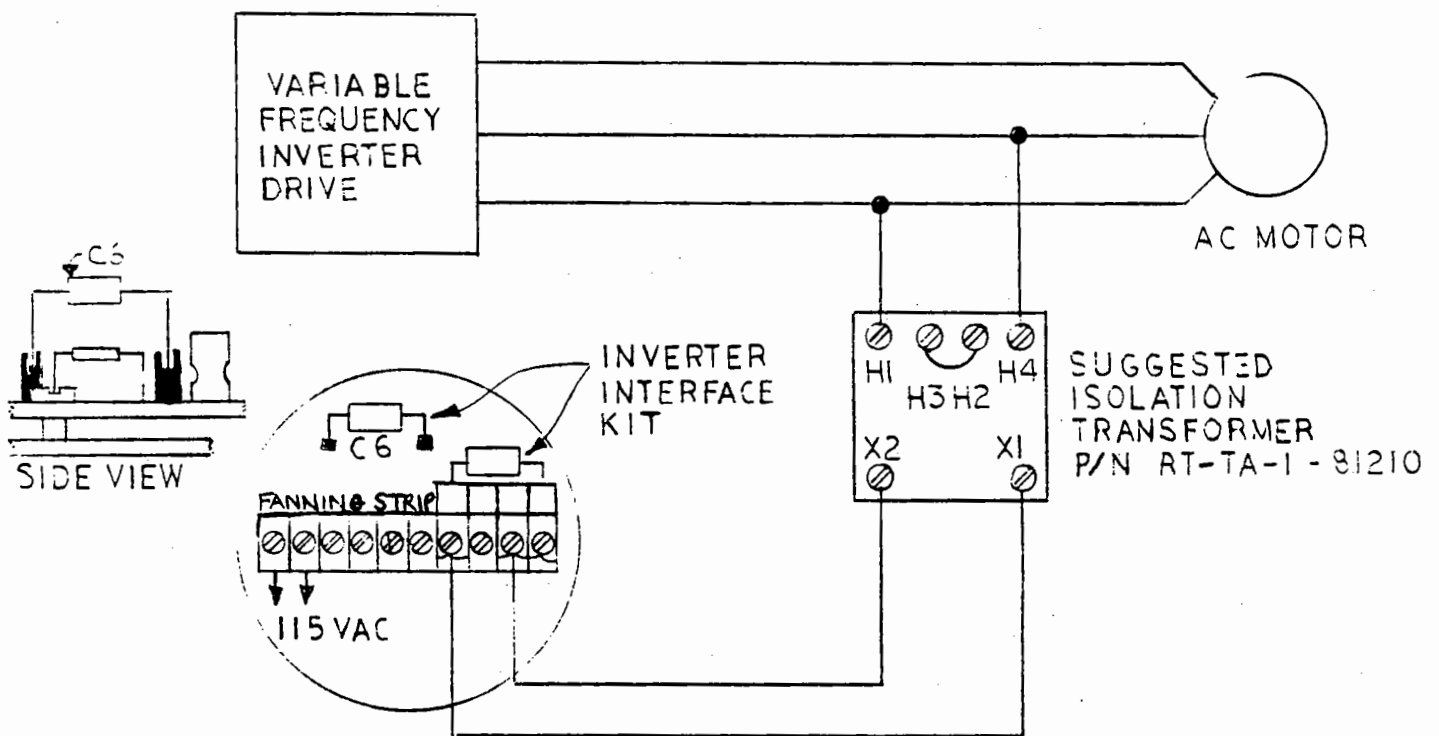


FIGURE 2

- d. The output of the inverter (or the associated signal isolation transformer) should be connected between the 2nd (-) terminal on the right and the fourth terminal from the right.
- e. Run the inverter to maximum speed and adjust the twenty-five (25) turn calibration pot (read out scale) to the proper reading on the meter. This completes calibration. If the display is to be calibrated for frequency, temporary jumper connections can be made between the 115 VAC supply terminals and the signal input terminals. The meter should then be adjusted to 60.0. Remove jumpers and reconnect to input terminals.

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 (lower if DPM35P/L) 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 (greater 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 (below) set point. If SW1-3 is on (↑) the alarm will be on as long as the meter stays above (below) 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 an unlit display indicates an overscale reading and requires recalibration via the "readout scale" potentiometer and/or a new range capacitor selection (Refer to section D).
2. As with any piece of electronic equipment, care is recommended in handling and applying voltages. For further information or service contact:

R.T. Engineering Service, LLC
P.O. Box 520
65 Maple Street
Mansfield, MA 02048

1-800-372-2123 (MA)
1-800-343-1182 (Outside MA)

F) Warranty

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

Standard products manufactured by R.T.E. are warranted to be free from defects in workmanship and material for a period of two years from date of shipment, and any products which are defective in workmanship or material 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, transportation charges prepaid by 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.

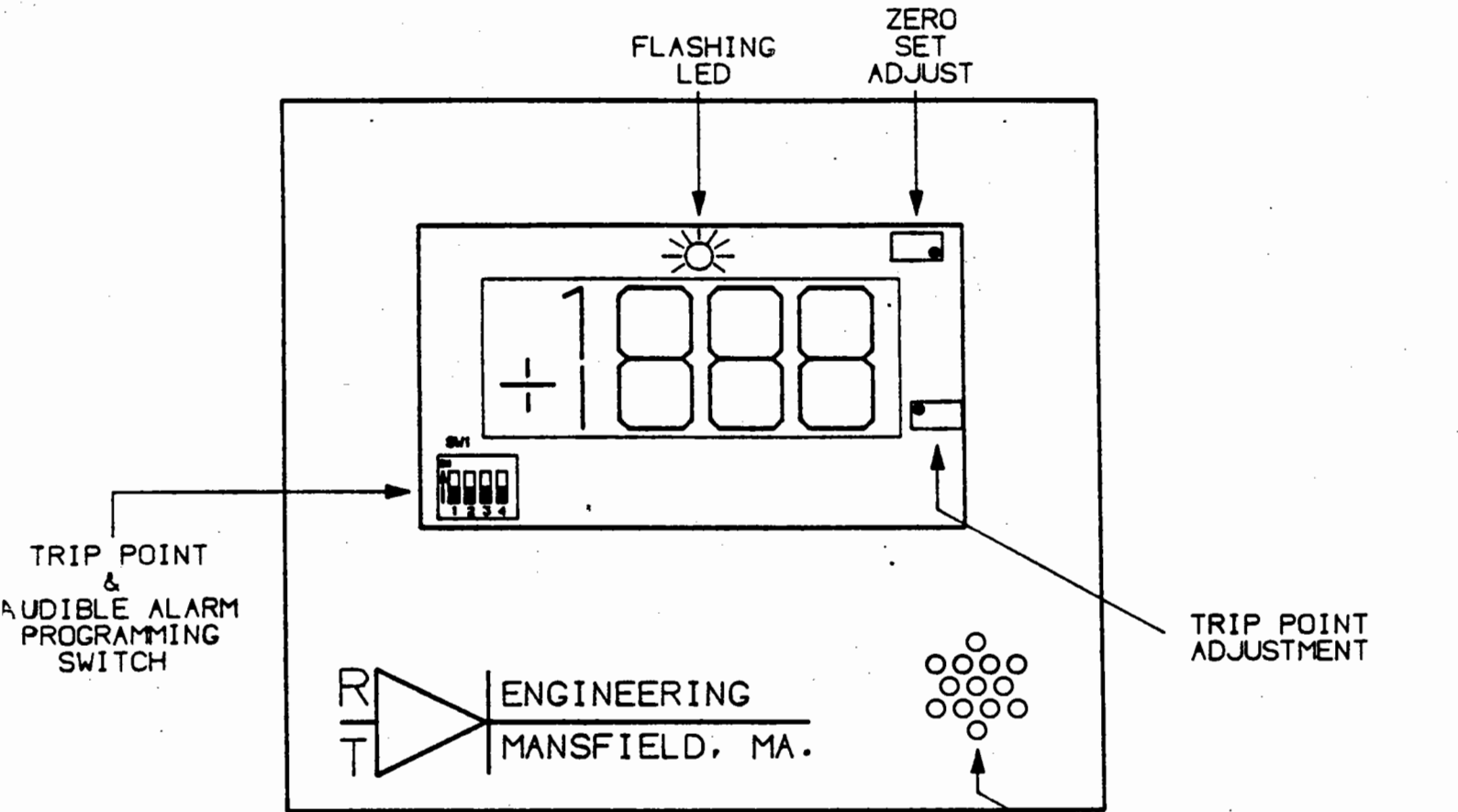
The foregoing warranty is exclusive and in lieu of all other warranties expressed or implied, including, but not limited to any warranty of merchantability or of fitness for a particular purpose. R.T. Engineering shall not be liable for consequential damages of any kind.

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

MBP87016

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

