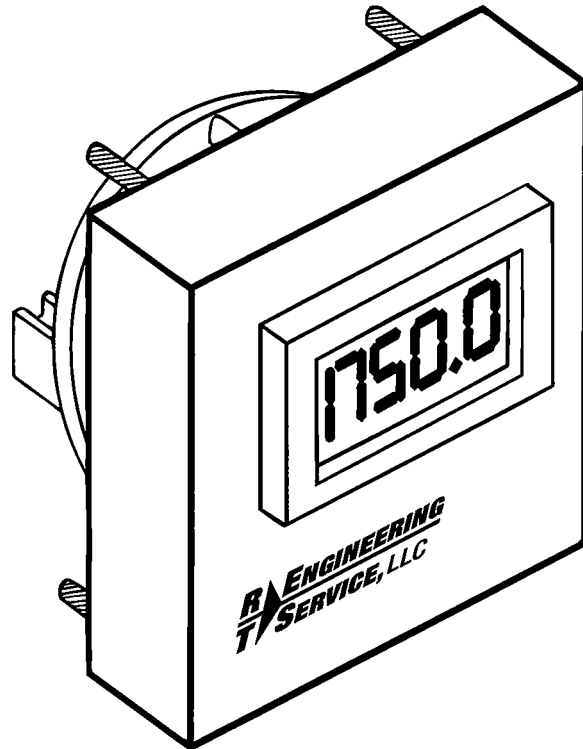


Universatile™

DIGITAL PANEL METERS



INSTALLATION, WIRING &
CALIBRATION
FOR THE
DPM45P & DPM45PV
PANEL METERS

R ENGINEERING
T SERVICE, LLC



(800) 343-1182

www.rteng.com

The R.T. Engineering model DPM45P was designed to accommodate pulse (digital) type inputs from a standard pickup or a certain type of zero speed (Hall Effect) magnetic pickup. 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-45P 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	- Standard Magnetic input (1000 inches per min. maximum) gear or socket speed at 1/64 inch gap - Hall Effect pickup (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.
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.
Weight	- 1 pound

NOTE

- 1 - The common mode voltage between the input terminals and ground (case) should never exceed 600 volts.
- * - A 60 tooth gear on the shaft of a motor going 1750 RPM would produce a digital frequency of 1750 pulses per second.

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 DPM45P in its place. If the meter being replaced has nonstandard dimensions, or if the DPM45P is a new meter addition, see the attached layout for proper cutout dimensions. Insert meter in cutouts and tighten retaining nuts.

B) Wiring:

Connect 115VAC power to "115VAC" 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 equiv.) 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) Decimal:

See Diagram B for decimal point selection.

D) 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 the frequency vs. display curves on pages 3 and 4. 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:

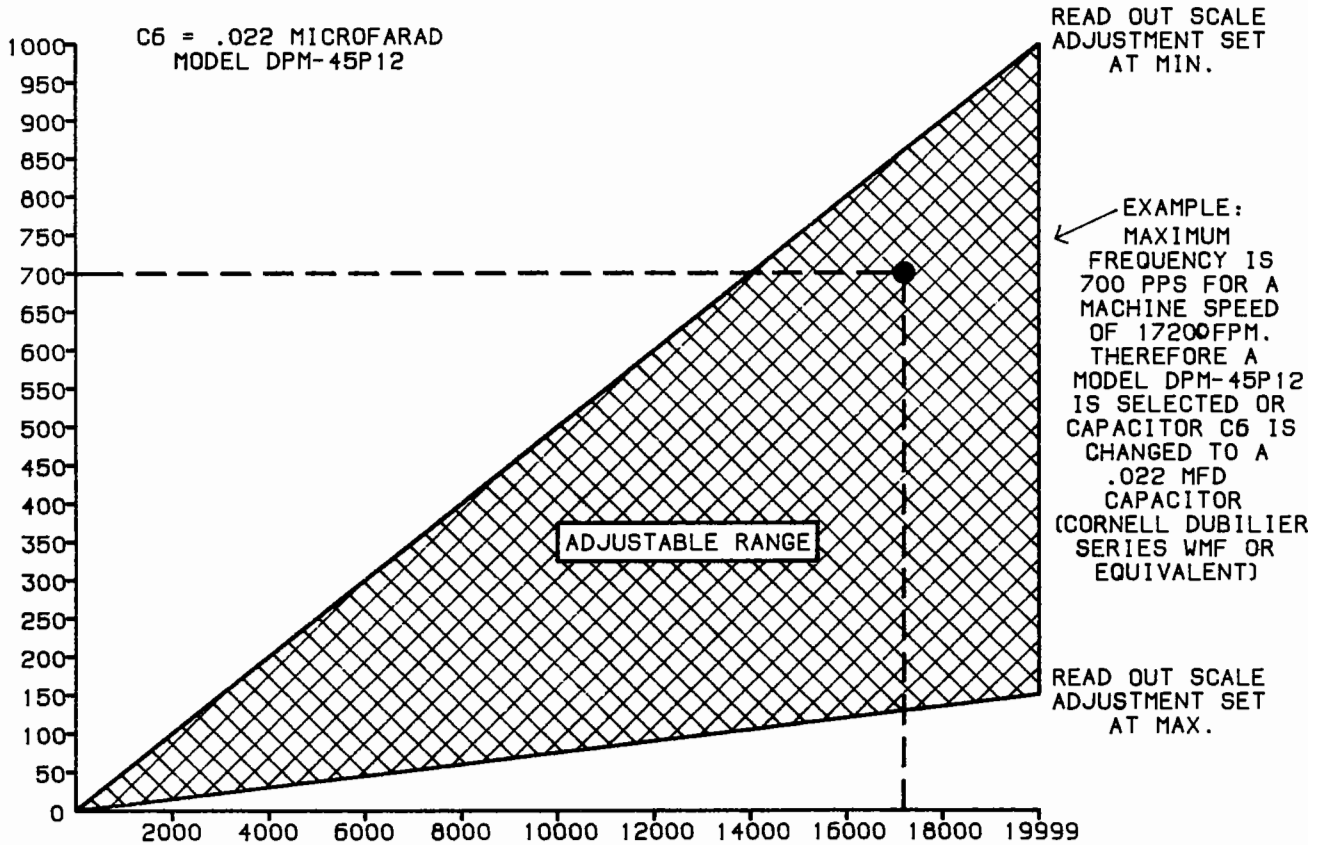
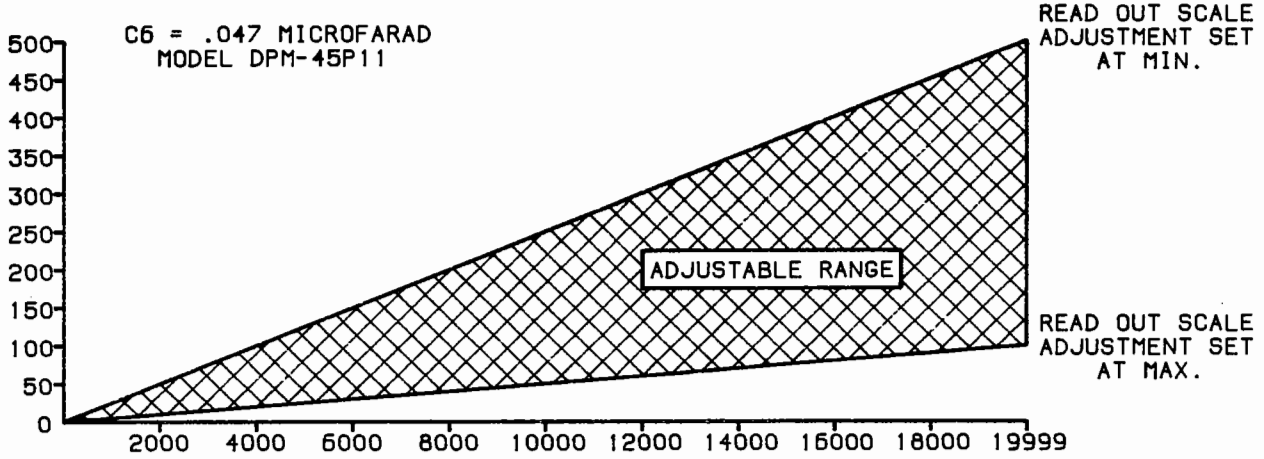
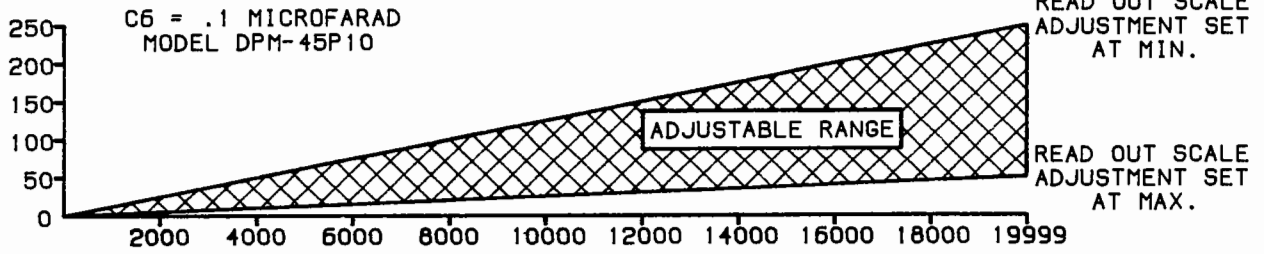
1. Standard Magnetic Pickup P/N RT-SM3C

- 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 gear teeth.
- c. Run the machine at maximum speed. Adjust the 25-turn potentiometer labeled coarse until display reads close to desired reading (± 200 counts) then adjust the potentiometer labeled fine until display is reading the desired value.

*Upper semi-circle shaped board

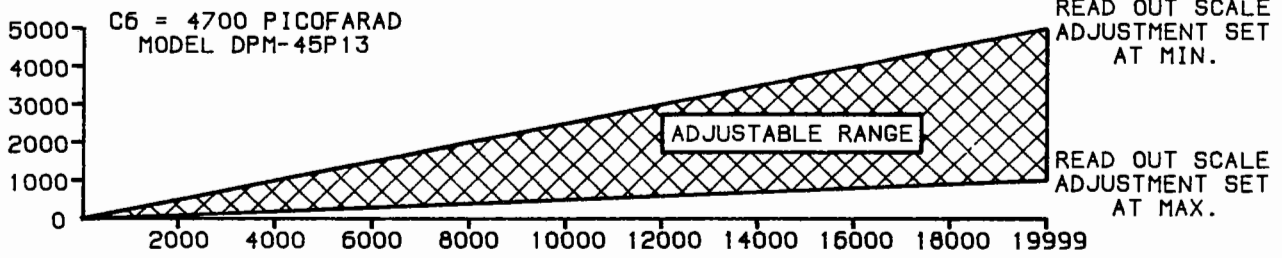
TYPICAL FREQUENCY VS. DISPLAY CURVES

FREQUENCY IN PULSES PER SECOND (PPS)

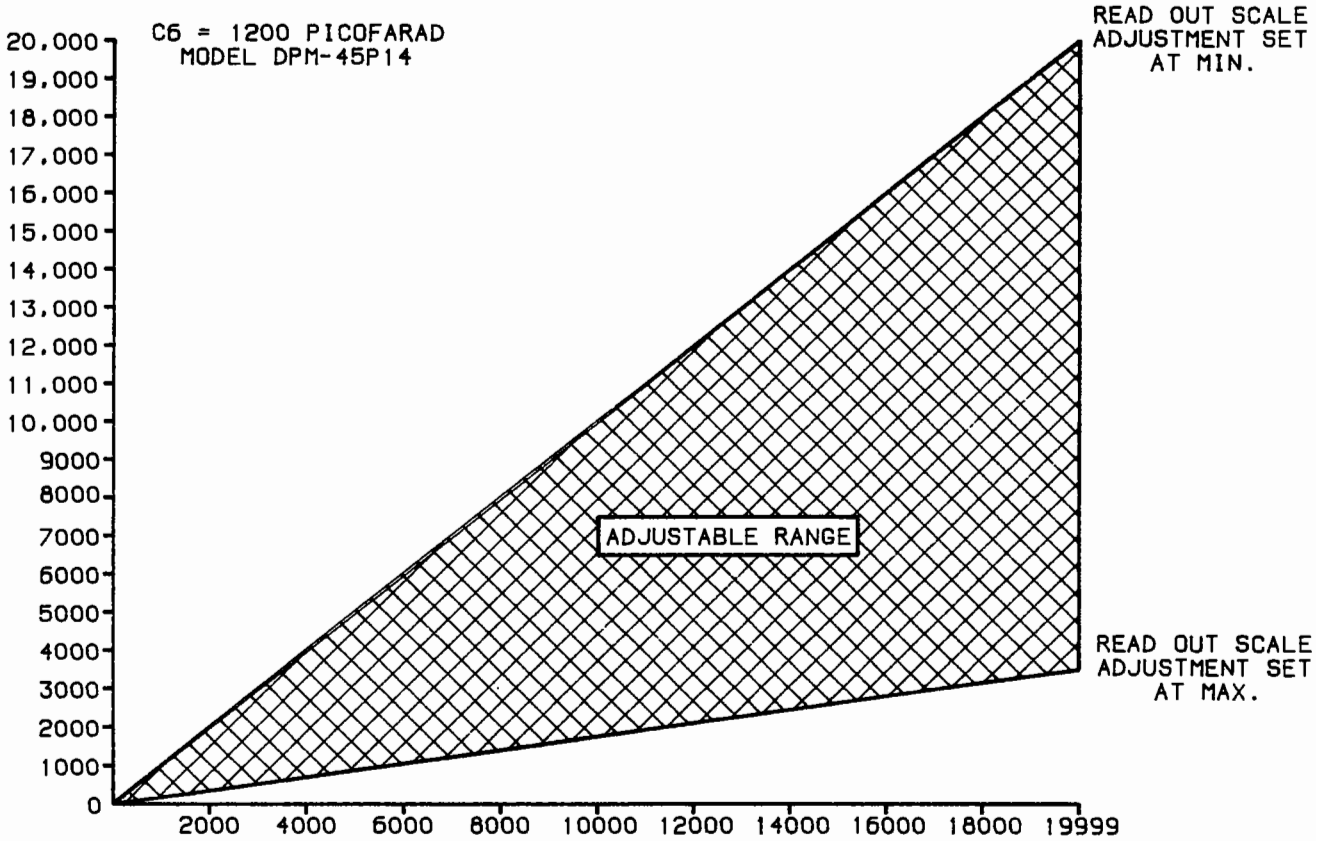


READ OUT DISPLAY

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:

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

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

DPM45P

(REAR OF METER)

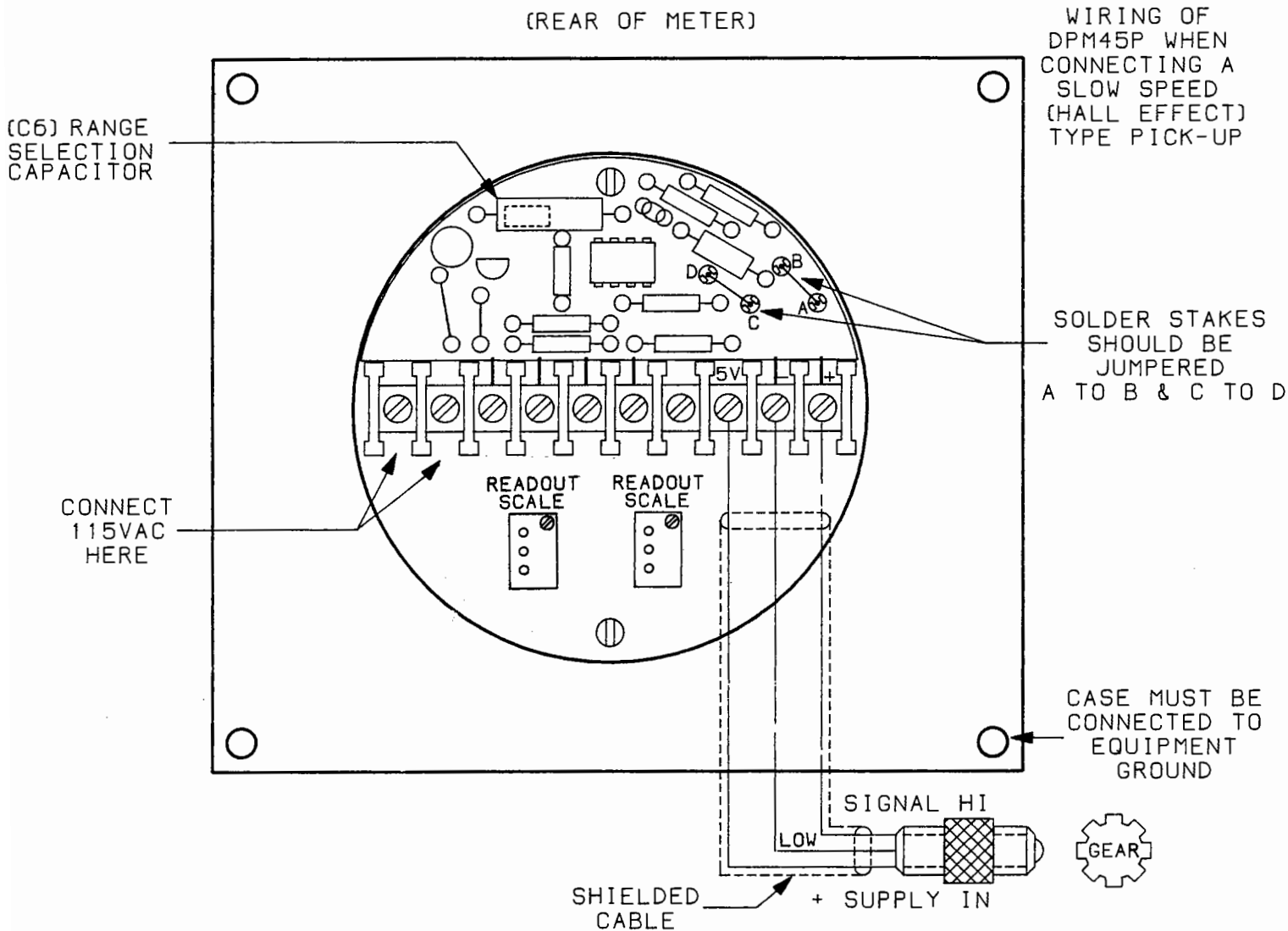


FIGURE 1

- 2.) Hall Effect Type Magnetic Pick-up (See Fig. 1) P/N RT-58426
 - a.) 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.
 - b.) 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 terminals should be removed.
 - c.) Follow the procedure described under the standard magnetic pick-up to complete the calibration.
- 3.) Inverter Output (See Fig. 2)
 - a.) Be sure jumpers on the converter board* are located as described in step 2b above.
 - b.) Mount the interface fanning strip on the extreme right side of the terminal strip.
 - c.) 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.

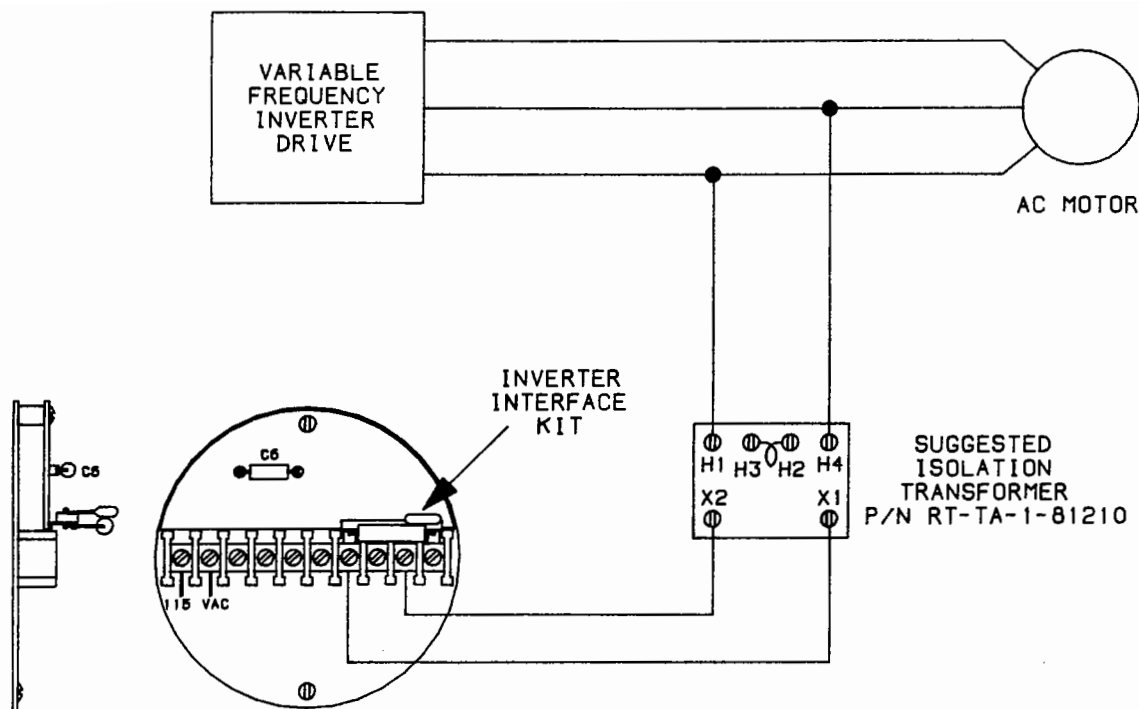


FIGURE 2

- d.) The output of the inverter (or the associated signal isolation transformer) should be connected between the 2nd (-) terminal on the right and the 4th terminal from the right.
- e.) Run the inverter to maximum speed and adjust the coarse calibration pot close to proper reading (± 200 counts). Then adjust fine calibration pot until display is reading desired valve. 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.

E) Service Notes

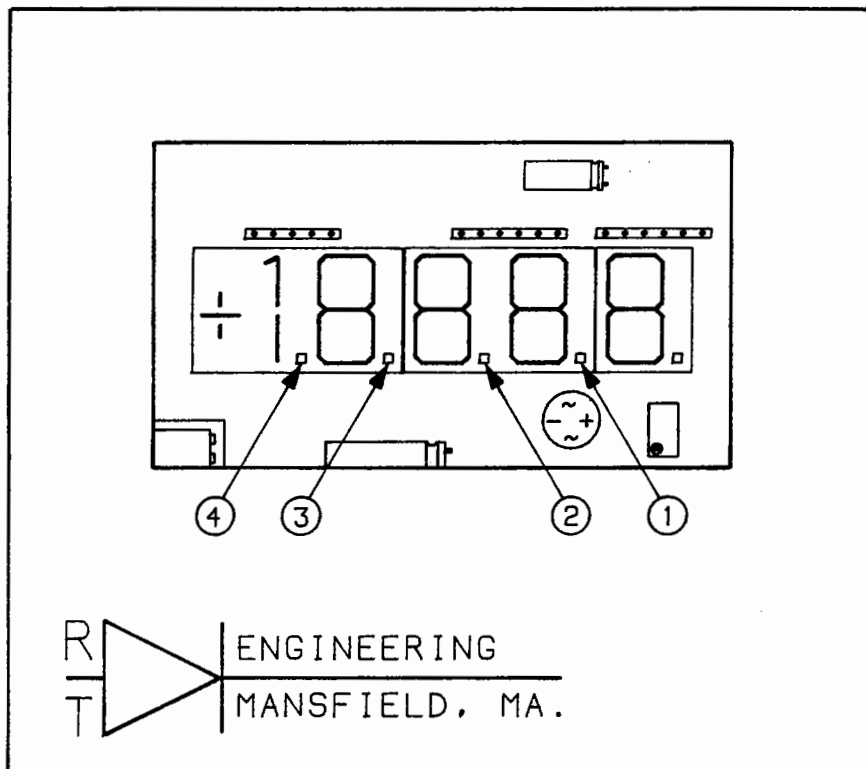
- 1.) A display of 1 on the left hand digit followed by an unlit display indicates an overscale reading and requires recalibration via the "readout scale" potentiometer and/or a new range capacitor selection (Refer to section D).
- 2.) As with any piece of electronic equipment, care is recommended in handling and applying voltages. For further information or service contact:

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

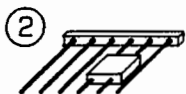
1-800-372-2123 (Ma.)
 1-800-343-1182 (Outside Ma.)

DIAGRAM "B"

(FRONT OF METER)



- 1.) The decimal point may be selected to indicate in one of four places by moving the small blue jumper to the appropriate position. Once a selection has been made, the decimal point will always light in that position until you move the jumper to another position.



- 2.) Slide off the jumper clip, and place in one of these locations to light the corresponding decimal point.



- 3.) This position is used to store the clip, and does not light decimal.



- 4.) Decimal point selection only effects the display. It does not effect operation or calibration of the meter.

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 material for a period of two years from date of shipment, and 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 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.