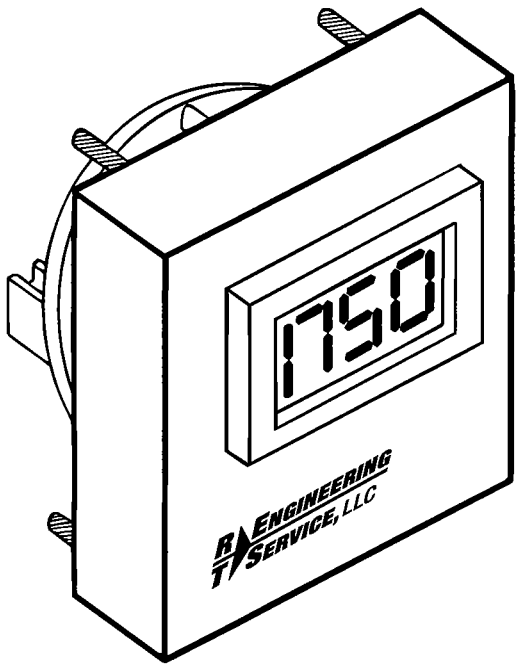
Universatile™

DIGITAL PANEL METERS



INSTALLATION, WIRING & CALIBRATION

FOR THE

DPM35P, DPMJR35P DPM35PV & DPMJR35PV

PANEL METERS

R/T ENGINEERING SERVICE, LLC

MFG IN USA

(800) 343-1182 www.rteng.com

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The R.T. Engineering Models DPM35P & DPMJR35P were designed to accommodate pulse (digital) type input from a standard pick-up or a certain type of zero speed (Hall Effect) magnetic pick-ups. Along with the ability to be installed in the same cut-outs as a standard 4-1/2" analog meter (3-1/2" for the DPMJR35P), the meters offer a great deal of flexibility and are very easily calibrated. No mathematical calculations are required.

The DPM35P & DPMJR35P 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 pick-up (5 VDC 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-53Z..
	- 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), 50/60 Hz, 2 watts, (230 VAC 50/60 optional).
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).
Operating Temperature	- 5 degrees C to 50 degrees 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 analog panel meter, all that should be required, in most cases, is to pull out the old meter and insert the DPM35P or DPMJR35P in its place. If the meter being replaced has non-standard dimensions or if the meter is a new addition, see the layout attached for proper cut-out dimensions. Insert the meter in cut-outs and tighten retaining nuts.

B) WIRING:

Connect the 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 pick-up. If the signal source is a magnetic pick-up, 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 pick-up end of the shield should be floating and insulated from ground.

C) DECIMAL POINT SELECTION:

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 just cut and separated a small amount, the decimal points may be easily reestablished in the future simply by moving the end together and tack soldering.

D) CALIBRATION:

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 5 for clarification. For calibration of meter, use one of the following techniques:

1. Standard Magnetic Pick-Up P/N RT-SM3C or RT-SM3N (2 Wire Pick-Ups)
   a. Locate the solder stakes lettered a-b-c-d on the converter board.* For a standard magnetic pick-up (2 wire) 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 face of the gear teeth. The tip of the pick-up must be smaller in diameter than the width between the gear teeth.
   c. Run the machine at maximum speed. If the maximum reading of the engineering units (RPM, FPM, etc.) is greater than 199.9, cut the J2 jumper to eliminate the decimal point.
   d. Adjust the 25 turn potentiometer labeled READOUT SCALE to the desired reading. The meter should now be calibrated.

**Upper semi-circle shaped board.*

Calibration for 3 Wire Pick Ups (5VDC Excitation)

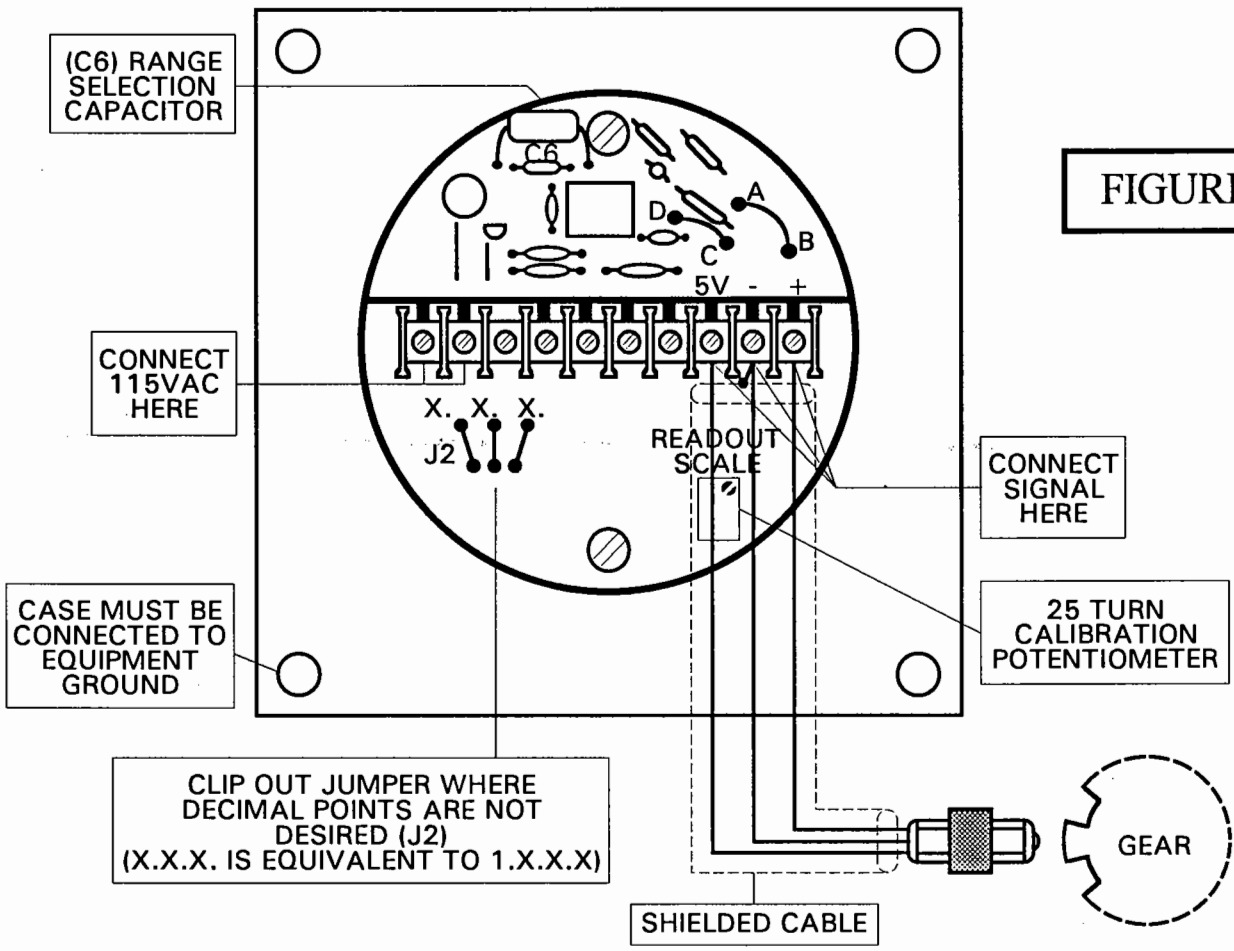
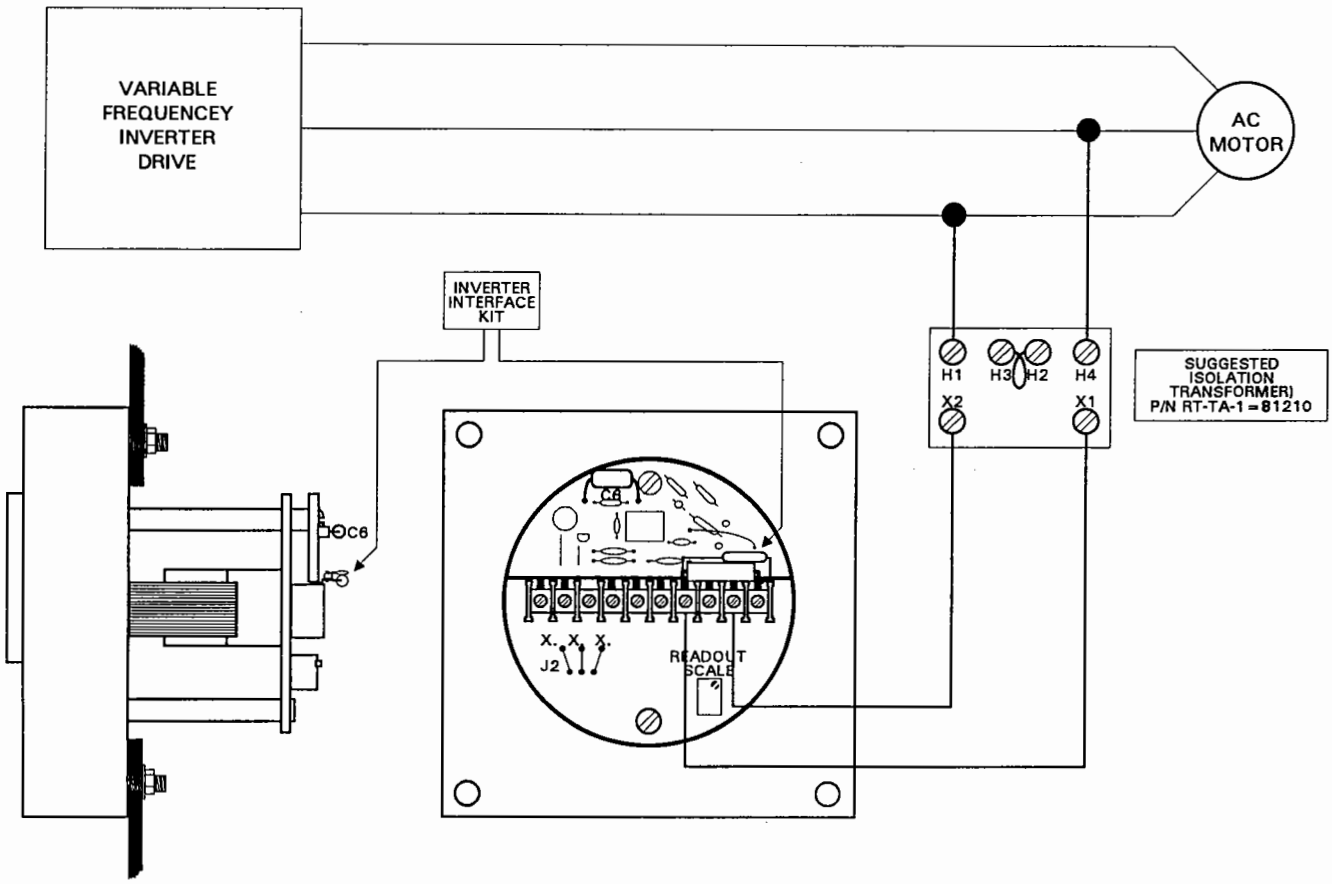


FIGURE 1

2. Calibration for 3 Wire Pick Ups
   a. The meter has a +5VDC 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 3 wire 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 0.1 microfarad 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 readout scale calibration pot to proper reading. 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

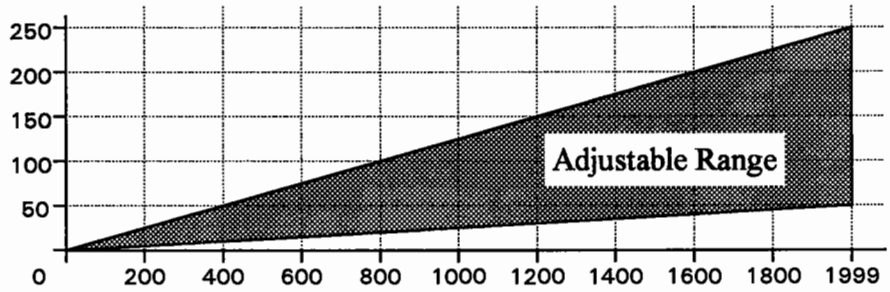
1. A display of a 1 on the left hand digit followed by an unlit display indicates an overscale reading and requires recalibration via the "readout scale" potentiometer and/or a new range capacitor selection (refer to SECTION D).
2. As with any piece of electronic equipment, care is recommended in handling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

R. T. Engineering Service, LLC
1 Merchant Street, Suite L1
Sharon MA 02067
Tel. (800) 343-1182
Fax (617)784-3296

TYPICAL FREQUENCY VS. DISPLAY CURVES

FREQUENCY IN PPS PULSES PER SECOND

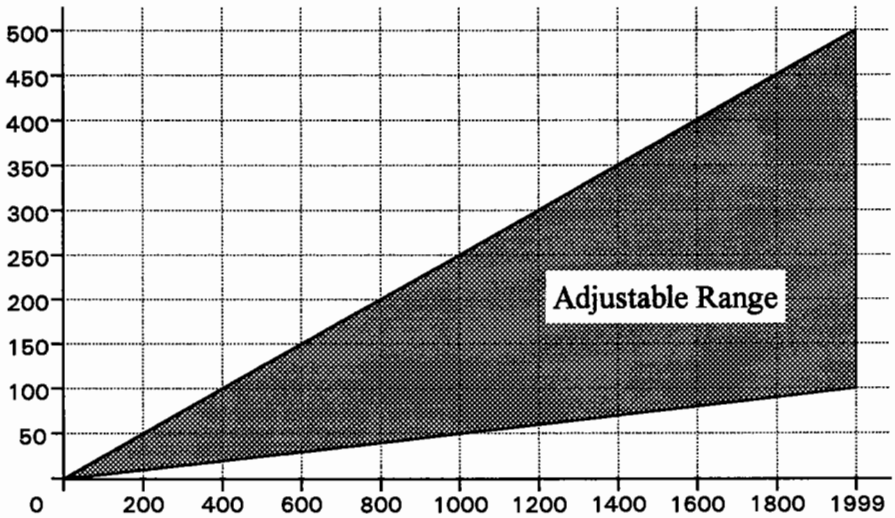
Model Number DPM-35P10 C6 = 0.1 Microfarad



Calibration pot at MIN.

Calibration pot at MAX.

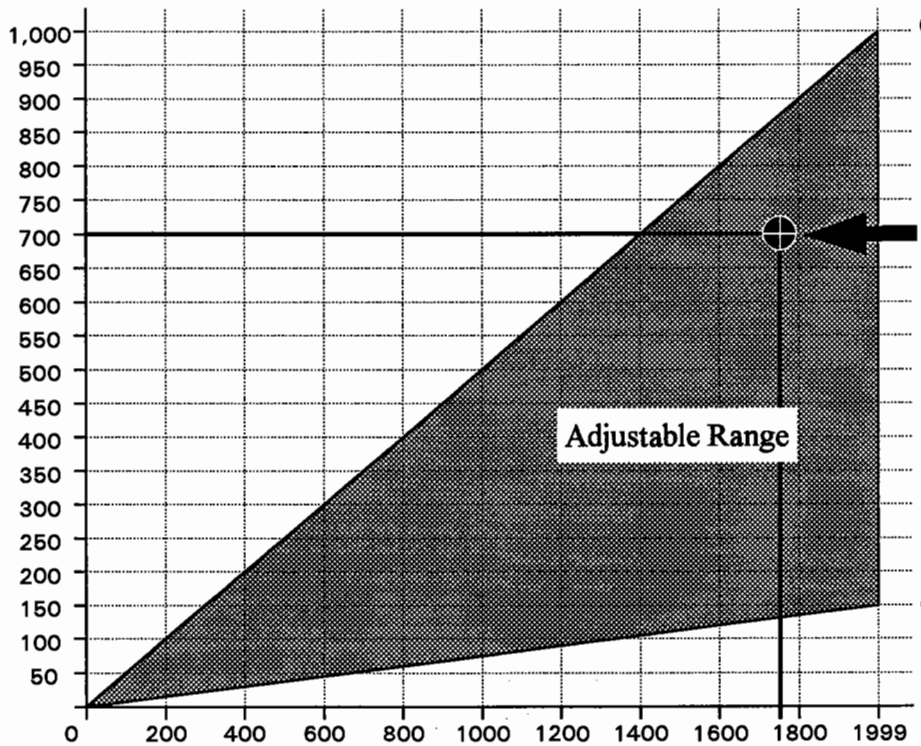
Model Number DPM-35P11 C6 = 0.047 Microfarad



Calibration pot at MIN.

Calibration pot at MAX.

Model Number DPM-35P12 C6 = 0.022 Microfarad



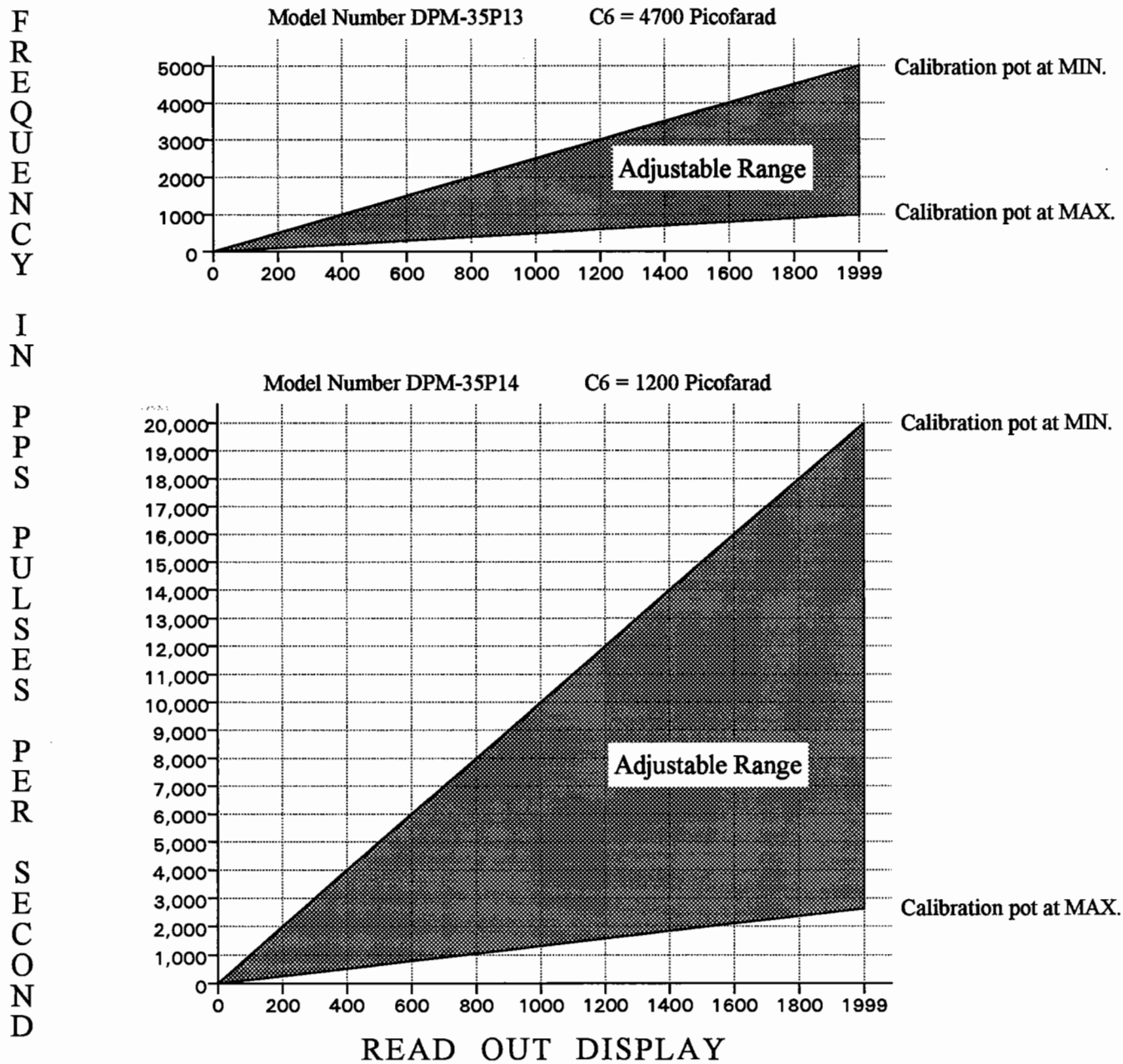
Calibration pot at MIN.

EXAMPLE: Maximum Frequency is 700 PPS for a machine speed of 1750 RPM, therefore a model DPM35P12 is selected or capacitor C6 is changed to a .022 MFD capacitor (Cornell Dubilier series WMF or equivalent)

Calibration pot at MAX.

READ OUT DISPLAY

TYPICAL FREQUENCY VS. DISPLAY CURVES



Formula for Maximum Frequency on Pickups or Ring Kits

$$\text{Maximum Frequency} = \frac{(\text{No. of Gear Teeth})(\text{Maximum RPM})}{60}$$

Example:

A Ring Kit on a Motor that has a Maximum speed of 1750 RPM.

$$\text{Maximum frequency} = \frac{(60 \text{ Teeth})(1750 \text{ RPM})}{60}$$

Maximum frequency = 1750 PPS (Pulses Per Second)

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.

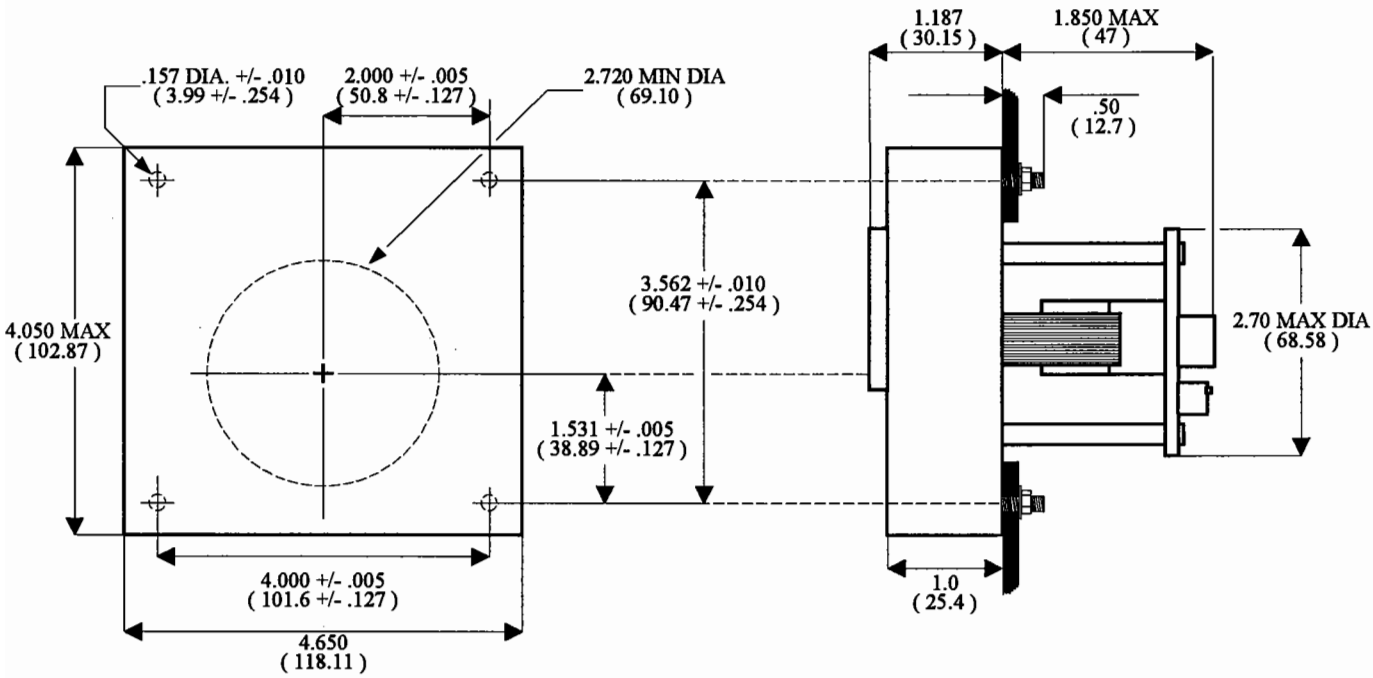
The foregoing warranty is exclusive and in lieu of all other warranties expressed or implied including but not limited to any warranty of merchantability or fitness for a particular purpose. RTE is not liable for consequential damages of any kind.

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

4½" Case Size

(Dimensions in Parenthesis are in Millimeters.)



DPM JUNIOR (JR)

3½" Case Size

(Dimensions in Parenthesis are in Millimeters.)