



Laboratory Equipment Manufacturer
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Acceleration, Velocity

RMS measurement, Metric & Imperial unit

PEN VIBRATION METER

Model : PVB-820



Your purchase of this PEN VIBRATION METER marks a step forward for you into the field of precision measurement. Although this METER is a complex and delicate instrument, its durable structure will allow many years of use if proper operating techniques are developed. Please read the following instructions carefully and always keep this manual within easy reach.



OPERATION MANUAL

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MRC.7.20

TABLE OF CONTENTS

1 FEATURES.....	1
2 SPECIFICATIONS.....	2
2-1 General Specifications.....	2
2-2 Electrical Specifications.....	3
3 FRONT PANEL DESCRIPTION.....	5
3-1 Display.....	5
3-2 Power Button.....	5
3-3 Hold Button	5
3-4 Function Button	5
3-5 Battery Cover/Compartment.....	5
3-6 Vibration Sensor.....	5
3-7 Sensing head.....	5
3-8 Magnetic base.....	5
4. MEASURING PROCEDURE.....	6
5. ZERO ADJUSTMENT PROCEDURE.....	9
6. BATTERY REPLACEMENT.....	10
7. CARRYING CASE (included).....	10
8. CLASSIFICATION RANGES.....	11
9. SENSITIVITY RELATIVE TABLE ACCORDING ISO 2954.....	12

1. FEATURES

- * Applications for industrial vibration monitoring :
All industrial machinery vibrates. The level of vibration is a useful guide to machine condition. Poor balance, misalignment & looseness of the structure will cause the vibration level increase, it is a sure sign that the maintenance is needed.
- * Pen type digital vibration meter, vibration sensor is built in, all in one.
- * Acceleration, Velocity measurement, RMS measurement value.
- * Metric & Imperial display unit
- * Frequency range 10 Hz - 1 kHz, sensitivity relative meet ISO 2954.
- * Microcomputer circuit, intelligent function, high accuracy.
- * LCD display, easy read out.
- * Complete set with the Test pin and the Magnetic base are the standard accessories.
- * Built-in low battery indicator.
- * Heavy duty & compact housing case.
- * IP65 protection.
- * Compact size, light weight.
- * Soft carrying case is the optional accessory

2. SPECIFICATIONS

2-1 General Specifications

Display	LCD, size : 20 mm x 28 mm.	
Measurement	Velocity, Acceleration. * <i>RMS value.</i>	
Function	Acceleration	m/s ² , g, ft/s ²
	Velocity	mm/s, cm/s, inch/s
Frequency range	10 Hz to 1 KHz * <i>Sensitivity relative during the the frequency range meet ISO 2954 Refer to table 1, page. 12.</i>	
Circuit	Exclusive microcomputer circuit.	
Zero adjust	Build in the Zero adjustment VR, easy to make adjustment.	
Sampling time	Approx. 1 second.	
Operating temperature	0 to 50 °C (32 to 122 °F).	
Operating humidity	Less than 80% RH.	
Power supply	DC 1.5V battery (UM-4/AAA) x 4 PCs.	
Power consumption	Approx. DC 12 mA.	
Weight	240 g (0.53 lb).	
Dimension	Meter : 175 x 40 x 32 mm (6.9 x 1.6 x 1.3 inch). * <i>Meter without sensing head,</i>	
	Sensing head : Round 9 mm Dia. x 30 mm.	
Accessories included	Instruction manual..... 1 PC. Meter with sensing head..... 1 Set Magnetic base..... 1 PC. Soft carrying case, CA-52A..... 1 PC.	

2-2 Electrical Specifications

Acceleration (RMS)

Unit	m/s^2
Range	0.5 to 199.9 m/s^2
Resolution	0.1 m/s^2
Accuracy	$\pm (5 \% + 2 d)$ reading <i>@ 160 Hz, 80 Hz, 23 \pm 5 $^{\circ}C$</i>
Calibration Point	50 m/s^2 (160 Hz)

Unit	g <i>@ 1 g = 9.8 m/s^2</i>
Range	0.05 to 20.39 g
Resolution	0.01 g
Accuracy	$\pm (5 \% + 2 d)$ reading <i>@ 160 Hz, 80 Hz, 23 \pm 5 $^{\circ}C$</i>
Calibration Point	50 m/s^2 (160 Hz)

Unit	ft/s^2
Range	2 to 656 ft/s^2
Resolution	1 ft/s^2
Accuracy	$\pm (5 \% + 2 d)$ reading <i>@ 160 Hz, 80 Hz, 23 \pm 5 $^{\circ}C$</i>
Calibration Point	50 m/s^2 (160 Hz)

Velocity (RMS)

Unit	mm/s
Range	0.5 to 199.9 mm/s
Resolution	0. 1 mm/s
Accuracy	$\pm (5 \% + 2 d)$ reading <i>@ 160 Hz, 80 Hz, 23 \pm 5 $^{\circ}$C</i>
Calibration Point	50 mm/s (160 Hz)

Unit	cm/s
Range	0.05 to 19.99 cm/s
Resolution	0. 01 cm/s
Accuracy	$\pm (5 \% + 2 d)$ reading <i>@ 160 Hz, 80 Hz, 23 \pm 5 $^{\circ}$C</i>
Calibration Point	50 mm/s (160 Hz)

Unit	inch/s
Range	0.02 to 7.87 inch/s
Resolution	0.01 inch/s
Accuracy	$\pm (5 \% + 2 d)$ reading <i>@ 160 Hz, 80 Hz, 23 \pm 5 $^{\circ}$C</i>
Calibration Point	50 mm/s (160 Hz)

3. FRONT PANEL & LAYOUT DESCRIPTION

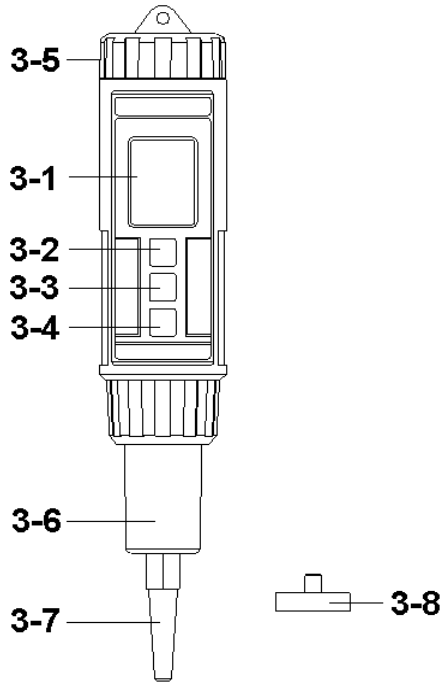


Fig. 1

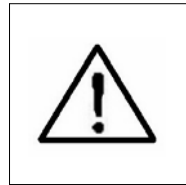
- 3-1 Display
- 3-2 Power Button
- 3-3 Hold Button
- 3-4 Function Button
- 3-5 Battery Cover/Compartment
- 3-6 Vibration Sensor
- 3-7 Sensing Head
- 3-8 Magnetic Base

4. MEASURING PROCEDURE

1) Attaching Meter Body with the Sensing head

- a. Connect (Screw) the " Sensing Head " (3-7, Fig. 1 to the bottom of the " Vibration Sensor " (3-6, Fig. 1).
- b. Hold the meter's body by hand loosely. Touch the front pin of the " Sensing head " to the area that you intend to measure the vibration value.

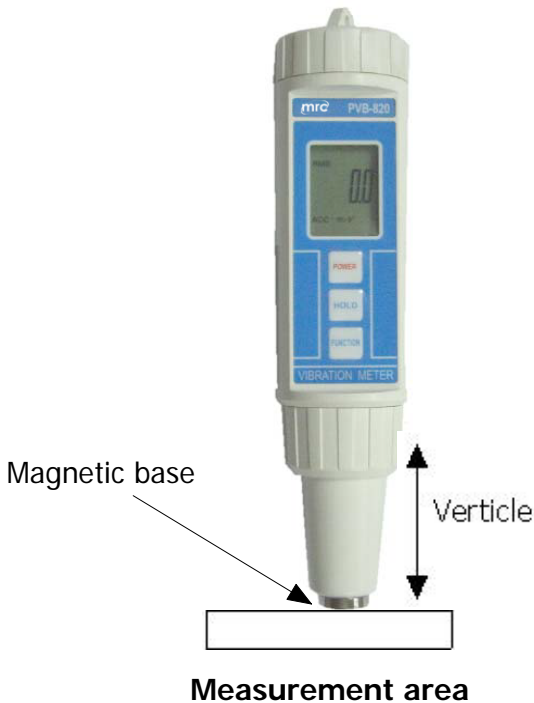
For best results: The Meter body should be perpendicular with the measurement surface area.



2) **Cooperate with the Magnetic base**

- a. If the measuring surface is a ferrous material, you may consider using the " Magnetic base " (3-8, Fig. 1) on the " Measurement area ", screw the " Magnetic base " (3-8, Fig. 1) to the bottom of " Vibration sensor " (3-6, Fig. 1).

For best results: The Meter body should be perpendicular with the measurement surface area.



3) Function Selection

Select the desired function by pressing the " Function Button " (3-4, Fig. 1) once the measurement Function will be present in sequence.

<i>Measurement</i>	<i>Metric unit</i>	<i>Imperial unit</i>
Acceleration	m/s ² , g	ft/s ²
Velocity	mm/s, cm/s	inch/s

The Display will show the indicator :

ACC	m/s ²
ACC	g
ACC	ft/s ²
VEL	mm/s
VEL	cm/s
VEL	inch/s

ACC : Acceleration

VEL : Velocity

4) Power ON :

Power on the meter by pressing the " Power Button " (3-2, Fig. 1) once, the LCD Display (3-1, Fig. 1) will light up, the meter is ready for the measurement.

5) Data Hold :

During the measurement, push the "Hold button" (3-3, Fig. 1) to hold the measured value, the LCD will indicate the " HOLD " symbol. Push the " Data hold button " again to release the data hold function and the " HOLD " symbol will be removed.

5. ZERO ADJUSTMENT PROCEDURE

- 1) Open the " Battery Cover " (3-5. Fig. 1).
Use one finger to press the " Battery holder " to the battery snap can contact the batteries completely.
- 2) Power on the meter by pressing the " Power Button " (3-2, Fig. 1) once.
- 3) There is an " Zero Adjust VR " near the battery compartment, . Use the crew driver to adjust the " Zero VR " until the Display show zero value (not show the minus symbol), refer Fig, 2

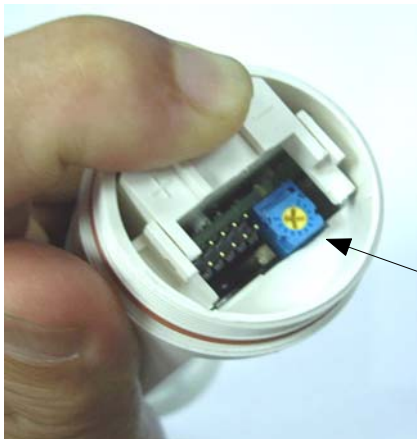


Fig. 2

Zero adjust VR

6. BATTERY REPLACEMENT

1) When the LCD display shows



It is necessary to replace the battery. However, some measurements may still be made for several hours after Low Battery Indicator first appears, before the instrument can become less accurate.

2) To replace the battery, rotate and remove the " Battery Cover " (3-5, Fig. 1), take out the old batteries, install new batteries, watching polarity.

DC 1.5V alkaline battery (UM-4/AAA) x 4 PCs.

7. CARRYING CASE (included)

Soft carrying case

CA-52A

Size : 200 x 80 x 50 mm.



8. CLASSIFICATION RANGES

For the valuation of machines and equipment in the ISO 2372 and VDI 2056, four different kinds of machine groups with four classification ranges and their limits for vibration severity (mm/s) are determined.

The classifications for each machine group are specified as follows :

Small machines, especially production electrical motors of up to 15 KW (Group K)

Good	0 to 0.71 mm/s
Acceptable	0.72 to 1.80 mm/s
Still permissible	1.81 to 4.5 mm/s
Dangerous	> 4.5 mm/s

Medium sized machines, especially electrical motors with 15 up to 75 KW output, without special foundations (Group M)

Good	0 to 1.12 mm/s
Acceptable	1.13 to 2.80 mm/s
Still permissible	2.81 to 7.1 mm/s
Dangerous	> 7.1 mm/s

Large machines on heavy foundations (Group G)

Good	0 to 1.80 mm/s
Acceptable	1.81 to 4.50 mm/s
Still permissible	4.51 to 11.2 mm/s
Dangerous	> 11.2 mm/s

Largest machines and turbo machines with a special foundations (Group T).

Good	0 to 2.80 mm/s
Acceptable	2.81 to 7.10 mm/s
Still permissible	7.11 to 18.0 mm/s
Dangerous	> 18 mm/s

9. SENSITIVITY RELATIVE to the reference sensitivity at 80 Hz , according ISO 2954

Frequency	Normal value	Relative sensitivity	
		Minimum value	Maximum value
10 Hz	1.0	0.8	1.1
20 Hz	1.0	0.9	1.1
40 Hz	1.0	0.9	1.1
80 Hz	1.0	1.0	1.0
160 Hz	1.0	0.9	1.1
500 Hz	1.0	0.9	1.1
1000 Hz	1.0	0.8	1.1

Table 1