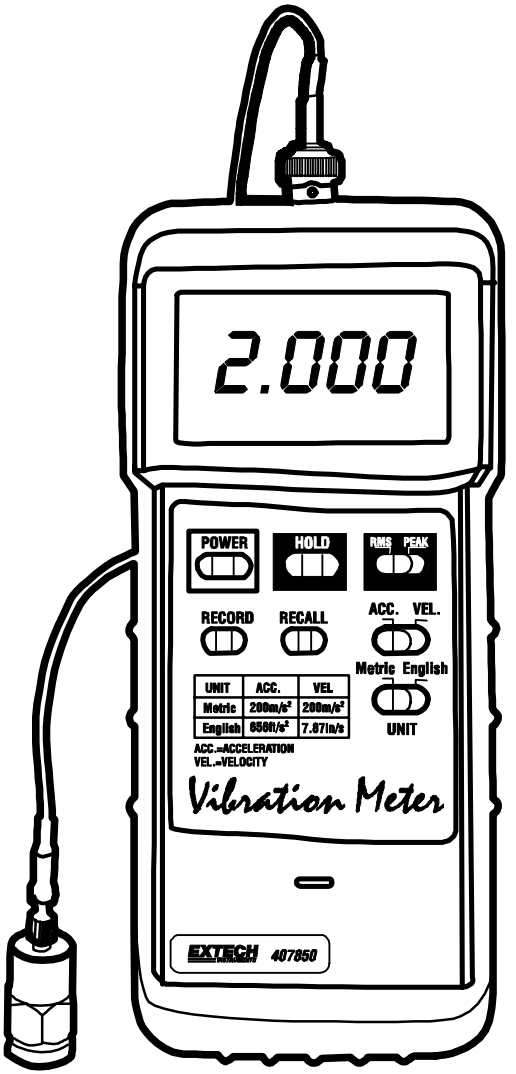
User's Guide

EXTECH INSTRUMENTS

Heavy Duty Vibration Meter

Model 407850



Introduction

Congratulations on your purchase of the Extech 407850 Vibration Meter. The 407850 can confirm normal vibration levels and detect abnormal levels in industrial machinery due to poor balancing, misalignment, structural compromises, and other factors. Careful use of this meter will provide years of reliable service.

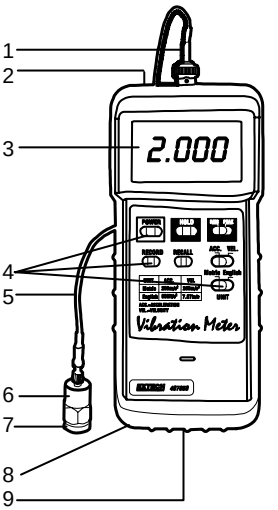
Specifications

General Specifications

Display	3-1/2 digit LCD
Measurement ranges	Velocity: 0.02 to 7.87 inches/sec (0.5 to 199.9 mm/sec)
	Acceleration: 2 to 656 ft/s^2 (0.5 to 199.9 m/s^2)
Frequency range	10Hz to 1KHz (frequency sensitivity meets ISO-2954)
Accuracy	± (5% of reading + 2 digits)
Calibration points	Velocity: 50mm/sec @ 160Hz
	Acceleration: 50m/s^2 @ 160Hz
Sampling time	One (1) second approx.
Data output	Isolated serial RS-232 PC Interface
Data Hold	Freezes displayed reading
Min/Max Memory	Meter stores highest and lowest readings for later recall
Auto Power OFF	Meter automatically shuts off after 30 minutes of inactivity
Low battery indication	Battery symbol appears on the LCD
Power supply	9V Battery
Power consumption	6mA DC approx.
Operating Temperature	32 to 122^{o}F (0 to 50^{o}C)
Operating Humidity	Less than 80% RH
Dimensions	Meter: 7.1 x 2.8 x 1.3" (180 x 72 x 32mm)
	Probe: 0.75” (19mm) diameter x 0.83” (21mm)
Weight	Meter: Approx. 0.5 lbs (230g)
	Probe with magnetic base: 0.09 lbs (38g)

Meter Description

1. Probe connector
2. RS-232 Connector
3. LCD Display
4. Function switches and pushbuttons
5. Probe cable
6. Probe
7. Magnetic base
8. Rubber meter jacket
9. Battery compartment (on rear)



Meter Operation

Connecting the Probe

1. Note that this meter accepts only the supplied vibration probe.
2. Plug the BNC connector side of the probe into the BNC connector at the top of the meter.
3. The probe can be connected to the machinery under test in three ways.
   a. Attach the magnetic end of the probe to a ferrous material on the equipment under test.
   b. Hold the probe in place against the equipment under test manually.
   c. Unscrew the magnet from the probe end and use the threaded mount to connect to a screw, bolt, or stud on the equipment under test.

Powering the meter

1. Press the POWER button to turn the meter ON or OFF.
2. The meter is equipped with an automatic power off utility that conserves battery life. If the meter is left inactive for 10 minutes it will automatically turn off. The automatic power off utility is disabled in the RECORD mode (see below).

Using the Selector switches

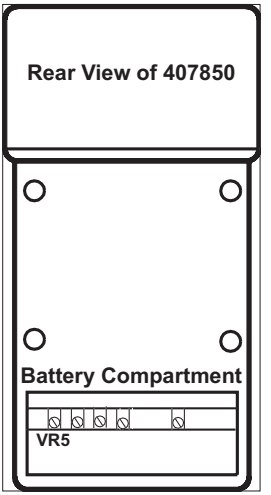
1. RMS/PEAK Switch: Select the RMS setting for RMS measurements. Select the PEAK mode for peak measurements. Peak measurements are derived from the RMS reading multiplied by 1.414.
2. ACC/VEL Switch: Use this switch to select ACCELERATION measurements or VELOCITY measurements. Note that VELOCITY measurements are the most widely used measurements in industrial applications.
3. METRIC/ENGLISH Switch: Use this switch to select the desired units' convention.

Zero Adjustment Procedure

Please perform a zero calibration before each use. This will ensure the highest accuracy.

Note: If the meter is used for a long period of time, temperature change and battery power loss may cause the zero calibration to drift. For continued precision measurement, the meter's zero calibration should be readjusted.

1. Set the ACC/VEL switch to the ACC (Acceleration) position.
2. Insure that there is no signal present at the vibration sensor.
3. Remove the protective rubber holster and open the battery cover (described below).
4. Use a screwdriver to adjust the "**Zero adjust VR5**" potentiometer until the display reads 0000.



Data Hold

To freeze the LCD display, press the HOLD key. The 'D.H.' hold icon will appear at the top of the LCD. Press the HOLD key again to return to normal operation (the 'D.H.' hold icon will switch off).

MIN / MAX RECORD / RECALL Modes

To begin capturing the Minimum (MIN) and Maximum (MAX) vibration values, press the RECORD key ('REC' will appear on the LCD). After taking measurements in the RECORD mode, press the RECALL button. 'MAX' will appear on the display along with the highest reading recorded since the RECORD button was pressed. Press the RECALL button again to view the lowest reading ('MIN' will appear on the display). To return to normal operation, press the RECORD button. 'REC' will switch off indicating that the meter has returned to the normal mode.

RS-232 Serial PC Interface

The meter is equipped with an RS-232 serial data port (located at the top of the meter next to the probe input jack). This interface was designed to operate with the Extech Data Acquisition Software (PN 407001) and enables the user to capture, store and display readings on a PC. For more information, contact Extech or refer to the 407001 user manual for details.

Appendix: Machinery Classification

When evaluating machinery and equipment it is useful to know their classification range and group type. There are four machine groups and classification ranges recognized internationally. The limits for vibration severity (mm/s) are shown in the Tables below:

GROUP K – Small Machinery up to 15KW (for example, production motors)

Testing Status	Vibration Severity (mm/s)
Good	0 to 0.71
Acceptable	0.72 to 1.80
Permissible	1.81 to 4.5
Dangerous	Greater than 4.5

GROUP M – Medium-sized Machinery up to 75KW (for example, motors without special foundations)

Testing Status	Vibration Severity (mm/s)
Good	0.00 to 1.12
Acceptable	1.13 to 2.80
Permissible	2.81 to 7.10
Dangerous	Greater than 7.10

GROUP G – Large Machinery on Heavy Foundations

Testing Status	Vibration Severity (mm/s)
Good	0.00 to 1.80
Acceptable	1.81 to 4.50
Permissible	4.51 to 11.20
Dangerous	Greater than 11.20

GROUP T – Large Turbo Machinery on Special Foundations

Testing Status	Vibration Severity (mm/s)
Good	0 to 2.80
Acceptable	2.81 to 7.10
Permissible	7.11 to 18.00
Dangerous	Greater than 18.00