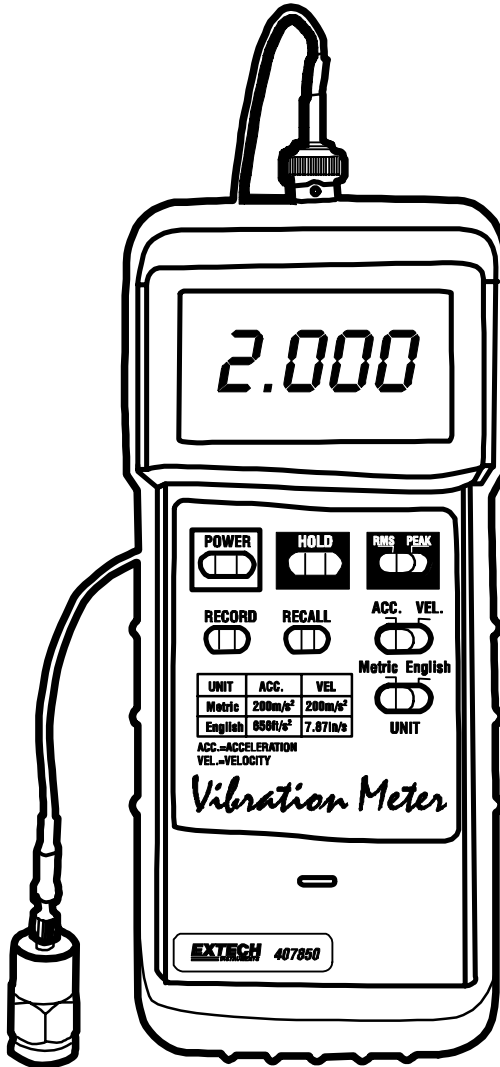


User's Guide

**EXTECH**  
INSTRUMENTS

## Heavy Duty Vibration Meter

Model 407850



## Warranty

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EXTECH INSTRUMENTS CORPORATION warrants this instrument to be free of defects in parts and workmanship for three years from date of shipment (a six month limited warranty applies on sensors and cables). If it should become necessary to return the instrument for service during or beyond the warranty period, contact the Customer Service Department at (781) 890-7440 ext. 210 for authorization or visit our website at [www.extech.com](http://www.extech.com) (click on 'Contact Extech' and go to 'Service Department' to request an RA number). A Return Authorization (RA) number must be issued before any product is returned to Extech. The sender is responsible for shipping charges, freight, insurance and proper packaging to prevent damage in transit. This warranty does not apply to defects resulting from action of the user such as misuse, improper wiring, operation outside of specification, improper maintenance or repair, or unauthorized modification. Extech specifically disclaims any implied warranties or merchantability or fitness for a specific purpose and will not be liable for any direct, indirect, incidental or consequential damages. Extech's total liability is limited to repair or replacement of the product. The warranty set forth above is inclusive and no other warranty, whether written or oral, is expressed or implied.

## Introduction

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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

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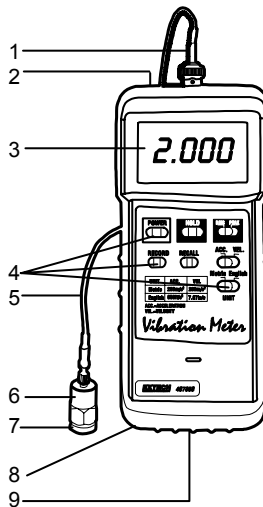
### General Specifications

|                        |   |
|------------------------|---|
| Display                | 3-1/2 digit LCD   |
| Measurement ranges     | Velocity: 0.02 to 7.87inches/sec (0.5 to 199.9mm/sec)<br>Acceleration: 2 to 656 ft <sup>2</sup> (0.5 to 199.9m/s <sup>2</sup> ) |
| Frequency range        | 10Hz to 1KHz (frequency sensitivity meets ISO-2954)   |
| Accuracy               | ± (5% of reading + 2 digits)  |
| Calibration points     | Velocity: 50mm/sec @ 160Hz<br>Acceleration: 50m/s <sup>2</sup> @ 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°F (0 to 50°C)   |
| Operating Humidity     | Less than 80% RH  |
| Dimensions             | Meter: 7.1 x 2.8 x 1.3" (180 x 72 x 32mm)<br>Probe: 0.75" (19mm) diameter x 0.83" (21mm)  |
| Weight                 | Meter: Approx. 0.5 lbs (230g)<br>Probe with magnetic base: 0.09 lbs (38g)   |

## Meter Description

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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

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### 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

- a. 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.
- b. 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.
- c. METRIC/ENGLISH Switch: Use this switch to select the desired units' convention.

## 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.

## Battery Replacement

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When the 9V battery voltage falls to a critical level, the 'LBT' indicator appears on the LCD. Follow these steps to replace the battery:

1. Remove the probe and the RS-232 cable from the meter.
2. Remove the rubber boot that encases the entire meter by pulling it over the bottom of the meter.
3. Open the battery compartment (located on the lower back of the meter) with a flat head screwdriver.
4. Replace the 9V battery, replace the compartment cover, and affix the rubber boot.

## Calibration and Repair Services

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**Extech offers complete repair and calibration services** for all of the products we sell. For periodic calibration, NIST certification on most products or repair of any Extech product, call customer service for details on services available. Extech recommends that calibration be performed on an annual basis to ensure calibration integrity.



### Support Hotline (781) 890-7440

Tech support: Ext. 200; Email: [support@extech.com](mailto:support@extech.com)

Repair>Returns: Ext. 210; Email: [repair@extech.com](mailto:repair@extech.com)

Website: [www.extech.com](http://www.extech.com)

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## **Appendix: Machinery Classification**

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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)**

| <b>Testing Status</b> | <b>Vibration Severity (mm/s)</b> |
|-----------------------|----------------------------------|
| 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)**

| <b>Testing Status</b> | <b>Vibration Severity (mm/s)</b> |
|-----------------------|----------------------------------|
| 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**

| <b>Testing Status</b> | <b>Vibration Severity (mm/s)</b> |
|-----------------------|----------------------------------|
| 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**

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