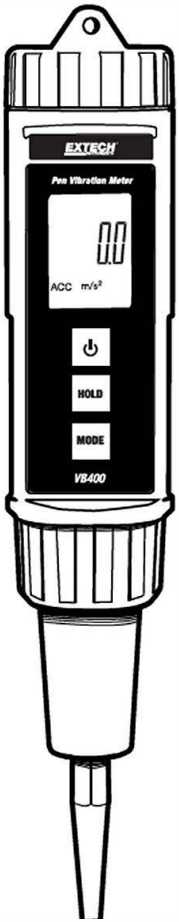
EXTECH INSTRUMENTS

User's Guide

Pen Vibration Meter

Model VB400



Introduction

Congratulations on your purchase of the Extech VB400 Meter. The VB400 is designed to provide easy and accurate velocity and acceleration measurements on industrial machinery. This meter is shipped fully tested and calibrated and, with proper use, will provide years of reliable service.

Features

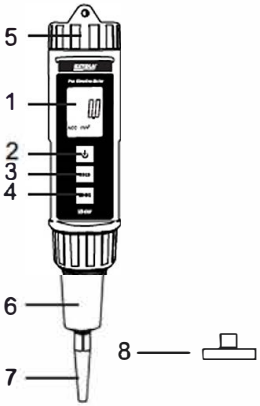
- Applications for industrial vibration monitoring :
- All in one pen type digital vibration meter.
- Acceleration, Velocity measurement, RMS measurement value.
- Metric & Imperial display unit
- Frequency range 10 Hz - 1 kHz, sensitivity designed to meet ISO 2954.
- High accuracy and easy to read LCD display.
- Complete with the test pin and magnetic base.
- Low battery indicator.
- IP65 protection.

Safety

This symbol, adjacent to another symbol or terminal, indicates the user must refer to the manual for further information.

Meter Description

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



Display Icons

HOLD	HOLD has been activated
ACC	Acceleration with units : m/s^2, ft/s^2, g
VEL	Velocity with units: mm/s, cm /s, inch/s
⌧	Low battery

Magnetic base and Tip sensing head

When measuring non-ferrous materials, place the Tip sensing head onto the vibration sensor. Unscrew the magnetic base from the sensor and screw on the Tip.

When measuring a ferrous surface, place the magnetic base onto the vibration sensor. Unscrew the tip from the sensor and screw on the magnetic base.

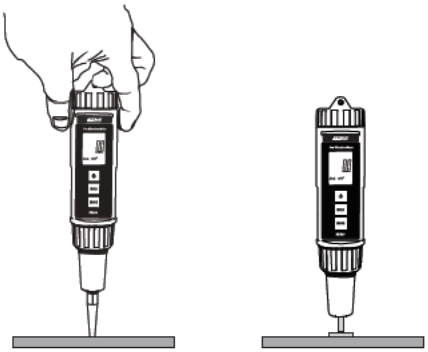
Operation

Preparation for measurements

1. Press the POWER button to turn the meter on.
2. Check that the display is on and that the low battery icon is not on.
3. If the low battery icon appears, replace the batteries.
4. Attach either the sensing head or the magnetic base by screwing it into the vibration sensor.

Measurements

1. Press the MODE button to step through and set the function (velocity or acceleration) and the units desired.
2. For non-ferrous surfaces, gently hold the meter (as shown) with the sensing tip against the v brating surface.
3. For ferrous surfaces, attach the meter to the surface with the magnetic base.
4. The meter must be held perpendicular to the surface to maintain measurement accuracy
5. Read the measured value in the display.



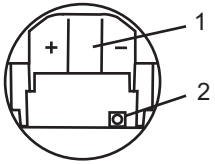
Data Hold

1. Press the HOLD button to freeze the display and hold the measured value.
2. Press the HOLD button again to exit and return to normal operation

Zero Adjustment Procedure

Over time the meter ‘0” may drift by a few digits. This is caused by temperature change, battery voltage and other ageing factors. Usually this small change is not of significance for typical measurements. To remove the error:

1. Open the battery compartment
2. Hold the battery lid down so contact is made and the meter can be turned on.
3. With no vibration, adjust the meter zero adjustment until the display reads zero (no minus sign).



Battery lid (1) and Zero adjustment (2)

Battery Replacement

1 Unscrew the meter’s top cover

2 Lift the battery lid and replace the four AAA batteries, observing polarity

3 Replace the cover.

ISO Vibration Severity Guidelines

ISO 10816 Standards provide guidance for evaluating vibration severity in machines operating in the 10 to 200Hz (600 to 12,000 RPM) frequency range. Examples of these types of machines are small, direct-coupled, electric motors and pumps, production motors, medium motors, generators, steam and gas turbines, turbo-compressors, turbo-pumps and fans. The axis of the rotating shaft may be horizontal, vertical or inclined at any angle.

VIBRATION SEVERITY PER ISO 10816

Machine			Class I small machines	Class II medium machines	Class III large rigid foundation	Class IV large soft foundation
	in/s	mm/s				
Vibration Velocity Vrms	0.01	0.28				
	0.02	0.45				
	0.03	0.71		good		
	0.04	1.12				
	0.07	1.80				
	0.11	2.80		satisfactory		
	0.18	4.50				
	0.28	7.10		unsatisfactory		
	0.44	11.2				
	0.70	18.0				
	0.71	28.0		unacceptable		
	1.10	45.0				

Specifications

General Specifications

Display	LCD, 20 mm x 28 mm.
Measurement	Velocity, Acceleration. (RMS value).
Mode	Acceleration: g, m/s^2, ft/s^2 Velocity: mm/s, cm/s, inch/s
Frequency range	10 Hz to 1 KHz
Sampling time	Approx. 1 second.
Operating temperature	0 to 50°C (32 to 122°F).
Operating humidity	< 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). Sensing head: Round 9 mm Dia. x 30 mm.

Accuracy Specifications

Mode	Range	Resolution	Accuracy
Acceleration	0.5 to 199.9m/s^2	0.1	±(5%rdg+2digits) @160Hz, 80Hz, 23±5°C
	0.05 to 20.39g	0.01	
	2 to 656ft/s^2	1	
	Calibration point: 50m/s^2 (160Hz)		
Velocity	0.5 to 199.9 mm/s	0.1mm/s	±(5%rdg+2digits) @160Hz, 80Hz, 23±5°C
	0.05 to 19.99 cm/s	0.01	
	0.02 to 7.87inch/s	0.01inch/s	
	Calibration point: 50mm/s (160Hz)		