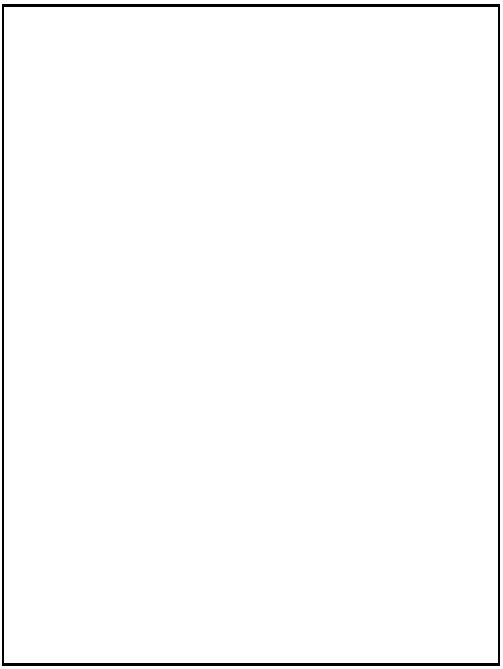
# VIBRATION METER

***Acceleration & Velocity***

***Model : VB-8201HA***



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## 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.*
* Frequency range 10 Hz - 1 kHz, sensitivity relative meet ISO 2954.
* Professional vibration meter supply with vibration sensor & magnetic base, full set.
* Velocity measuring range 200 mm/s.
* Acceleration measuring range 200 m/s .
* RMS & Peak measurement.
* Wide frequency range.
* Data hold button to freeze the desired reading.
* Memory function to record maximum and minimum reading with recall.
* Separate vibration probe, easy operation
* Super large LCD display.
* Microcomputer circuit, high performance.
* Auto shut off saves battery life.
* Built-in low battery indicator.
* Heavy duty & compact housing case.
* Complete set with the hard carrying case.

| | |
|---|---|
| Display | 61 mm x 34 mm supper large LCD display.<br>15 mm ( 0.6" ) digit size. |
| Measurement | Velocity, Acceleration RMS value, Peak value, Data hold, Max. & Min. value. |
| Range | *Velocity :*<br>200 mm/s : 0.5 to 199.9 mm/s |
| | *Acceleration :*<br>200 m/s : 0.5 to 199.9 m/s 2 |
| Frequency range | 10 Hz to 1 KHz<br>* *Sensitivity relative during the the frequency range meet ISO 2954 Refer to table 1, page 11.* |
| Accuracy | ( 5 % + 2 d ) reading , 160 Hz, 80 Hz.<br>*@ 23 5 蚓* |
| Calibration point | *Velocity :* 50 mm/s ( 160 Hz ) |
| | *Acceleration :* 50 m/s 2( 160 Hz ) |
| Circuit | Exclusive microcomputer circuit. |
| Data hold | Freeze the desired reading. |
| Peak measurement | To measure the peak value. |
| Memory | Maximum & Minimum value. |
| Power off | Auto shut off, saves battery life,<br>or manual off by push button. |
| Sampling time | Approx. 1 second. |
| Operating temperature | 0 蚓 to 50 蚓 ( 32 蚌 to 122 蚌 ). |
| Operating humidity | Less than 80% RH. |

| | | |
|---|---|---|
| Power supply | Alkaline or heavy duty type,<br>DC 9V battery, 006P,<br>MN1604 (PP3) or equivalent. | |
| Power consumption | Approx. DC 6 mA. | |
| Weight | *Meter* | 274 g/0.60 LB |
| | *Probe with magnetic base* | 38 g/0.08 LB |
| Dimension | *Main instrument:*<br>185 x 78 x 38 mm ( 7.3 x 3.1 x 1.5 inch ). | |
| | *Vibration sensor probe:*<br>Round 16 mm Dia. x 29 mm. | |
| Accessories included | Instruction manual..... 1 PC.<br>Vibration sensor ( VB-81A )..... 1 PC.<br>Cable..... 1 PC.<br>Magnetic base..... 1 PC.<br>Carrying Case..... 1 PC. | |

## 3. FRONT PANEL DESCRIPTION

Fig. 1

3-1 Display
3-2 BNC socket of meter
3-3 RMS/PEAK switch
3-4 Acceleration/Velocity switch
3-5 Data hold button
3-6 Power button
3-7 RECORD button
3-8 RECALL button
3-9 Battery compartment /cover
3-10 BNC plug of cable
3-11 Mini plug of cable
3-12 Input socket of vibration sensor
3-13 Vibration sensor
3-14 Magnetic base

## 4. MEASURING PROCEDURE

1) Plug in the " BNC plug of cable " ( 3-10, Fig. 1 ) to the " BNC socket of meter " ( 3-2, Fig. 1 ).
2) Plug in the " Mini plug of cable " ( 3-11, Fig. 1 ) to the " Input socket of vibration sensor " ( 3-12, Fig. 1 ).
3) For the acceleration measurement, select the " Acceleration/Velocity switch " ( 3-4, Fig. 1 ) to the " ACC. " position.
   For the velocity measurement, select the " Acceleration/Velocity switch " ( 3-4, Fig. 1 ) to the " VEL. " position.

> ***For general applications of industrial vibration monitoring, select " Velocity measurement " typically.***

4) Select the " RMS/PEAK switch " ( 3-3, Fig. 1 ) to the " RMS " position.
5) Power on the meter by pushing the " Power button " ( 3-6, Fig. 1 ) once.
6) If the surface material of measuring article is not the ferrous material, hold the vibration sensor by hand & touch the sensor to the surface of the measuring article, refer to the Fig. 2, page 6.

Fig. 2

8) If the surface material of measuring article is the ferrous material, connect " Vibration sensor " ( 3-13, Fig. 1 ) with the " Magnetic base " ( 3-14, Fig. 1 ), refer to Fig. 3, page 6. Put the whole unit ( Vibration sensor & Magnetic base ) to the surface of measuring article, refer to Fig. 4, page 7

Fig. 3

Fig. 4

**9)PEAK value measurement**

Before the measurement if select the " RMS/PEAK switch " ( 3-3, Fig. 1 ) to the " PEAK " position. Then during the measurement, the display will display the peak value.

10) Data Hold

During the measurement, push the " Data Hold button " ( 3-5, Fig. 1 ) will hold the measured value & the LCD will indicate " D.H." symbol.

Push the " Data hold button " again to release the data hold function.

11) Data Record ( Max., Min. reading )

* The DATA RECORD function displays the maximum, minimum and average readings. To start the DATA RECORD function, press the " RECORD Button " ( 3-7, Fig. 1 ) once. " REC " symbol will appear on the LCD display.
* With the " REC " symbol on the display :
  (a) Push the " RECALL button " ( 3-8, Fig. 1 ) once, the " Max " symbol along with the maximum value will appear on the display.
  (b) Push the " RECALL Button" again, the " Min " symbol along with the minimum value will appear on the display.
  (c) To exit the memory record function, push the " RECORD " button once again. The display will revert back to the current reading.

## 5. ZERO ADJUSTMENT PROCEDURE

Due to drift of environment temperature value, battery power change or, meter used for a long time or other reasons. The display value may exist not zero value ( few digits ) in case of no signal into the " Vibration Sensor ". General speaking those not zero value will not effect the measurement typically. However if intend to make the precision measurement, the following zero adjustment procedures should be executed as :

1) Select the " Acceleration/Velocity Switch " to the " Acceleration " position.
2) No signal into the vibration sensor.
3) Open the battery cover.
4) Use a convenient screw driver to adjust " Zero adjust VR " until the display reach the zero value.

6. AUTO POWER OFF DISABLE

The meter is built the " Auto power shut off " to prolong battery life. If no function buttons be pushed for approx. 10 minutes, the power will be off automatically.

If the user intend to disable the " Auto Power off " function, following procedures should be taken. :

| |
|---|
| During the measurement, push the " Record Button " ( 3-7, Fig. 1 ) to execute the memory record function. |

7. BATTERY REPLACEMENT

1) When the left corner of LCD display show " LBT ", it is necessary to replace the battery. However, in-spec measurement may still be made for several hours after low battery indicator appears.
2) Loose the screw from the battery cover, then open the " Battery Cover " ( 3-9, Fig. 1 ) away from the instrument and remove the battery.
3) Install a 9 V battery ( Alkaline or heavy duty ) and replace the cover.

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 specia 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 sensivity at 80 Hz , according ISO 2954

| Frequency Hz | Relative snesivity | | |
|---|---|---|---|
| | Normal value | 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