HHVB82
Vibration Meter
Acceleration & Velocity
OMEGAnet® Online Service
omega.com

Internet e-mail
info@omega.com

Servicing North America:

U.S.A.: Omega Engineering, Inc., One Omega Drive, P.O. Box 4947
ISO 9001 Certified
Stamford, CT 06907-0047
Toll-Free: 1-800-826-6342
Tel: (203) 359-1660
FAX: (203) 359-7700
e-mail: info@omega.com

Canada:
976 Bergar
Laval (Quebec), Canada H7L 5A1
Toll-Free: 1-800-826-6342
TEL: (514) 856-6928
e-mail: info@omega.ca

For immediate technical or application assistance:

U.S.A. and Canada: Sales Service: 1-800-826-6342/1-800-TC-OMEGA®
Customer Service: 1-800-622-2378/1-800-622-BEST®
Engineering Service: 1-800-872-9436/1-800-USA-WHEN®

Mexico: En Español: 001 (203) 359-7803
info@omega.com.mx
TEL: (001) 203-359-7807
e-mail: espanol@omega.com

Servicing Europe:

Benelux: Managed by the United Kingdom Office
Toll-Free: 0800 099 3344
TEL: +31 20 347 21 21
FAX: +31 20 645 46 13
e-mail: sales@omega.nl

Czech Republic: Frystatska 184
733 01 Karviná, Czech Republic
Toll-Free: 0800-1-66342
TEL: +420-59-6311899
FAX: +420-59-6311114
e-mail: info@omega.com.cz

France: Managed by the United Kingdom Office
Toll-Free: 0800 466 342
TEL: +33 (0) 161 37 29 00
FAX: +33 (0) 130 57 54 27
e-mail: sales@omega.fr

Germany/Austria: Daimlerstrasse 26
D-75392 Deckenpfronn, Germany
Toll-Free: 0 800 6397678
TEL: +49 (0) 7059 9398-0
FAX: +49 (0) 7056 9398-29
e-mail: info@omega.de

United Kingdom:
OMEGA Engineering Ltd.
ISO 9001 Certified
One Omega Drive, River Bend Technology Centre, Northbank
Irland, Manchester M44 5BD England
Toll-Free: 0800-488-488
TEL: +44 (0)161 777-6611
FAX: +44 (0)161 777-6622
e-mail: sales@omega.co.uk

It is the policy of OMEGA Engineering, Inc. to comply with all worldwide safety and EMCEMI regulations that apply. OMEGA is constantly pursuing certification of its products to the European New Approach Directives. OMEGA will add the CE mark to every appropriate device upon certification.

The information contained in this document is believed to be correct, but OMEGA accepts no liability for any errors it contains, and reserves the right to alter specifications without notice.

WARNING: These products are not designed for use in, and should not be used for, human applications.
TABLE OF CONTENTS

1. FEATURES .................................................................................. 1

2. SPECIFICATIONS ........................................................................ 2

3. FRONT PANEL DESCRIPTION ......................................................... 4
   3–1 Display ........................................................................... 4
   3–2 BNC socket of meter ....................................................... 4
   3–3 RMS/PEAK switch .......................................................... 4
   3–4 Acceleration/Velocity switch ........................................... 4
   3–5 Data hold button ............................................................ 4
   3–6 Power button ................................................................. 4
   3–7 Memory RECORD button ............................................... 4
   3–8 Memory RECALL button ............................................... 4
   3–9 Battery compartment/cover ........................................... 4
   3–10 BNC plug of cable ....................................................... 4
   3–11 Mini plug of cable ....................................................... 4
   3–12 Input socket of vibration sensor ................................. 4
   3–13 Vibration sensor (VB–81A) ....................................... 4
   3–14 Magnetic base ........................................................... 4

4. MEASURING PROCEDURE .......................................................... 5

5. ZERO ADJUSTMENT PROCEDURE ............................................ 6

6. AUTO POWER OFF DISABLE ................................................... 10

7. BATTERY REPLACEMENT ....................................................... 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.
  * 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/s².
  * 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.
2. SPECIFICATIONS

| Display          | 61 mm x 34 mm supper large LCD display.
|                 | 15 mm (0.6") digit size. |
| Measurement     | Velocity, Acceleration RMS value, Peak value, Data hold, Max. & Min. value. |
| Range           | Velocity:
|                 | 200 mm/s : 0.5 to 199.9 mm/s |
|                 | Acceleration:
|                 | 200 m/s² : 0.5 to 199.9 m/s² |
| Frequency range | 10 Hz to 1 KHz
|                 | * 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. @ 23 ± 5 °C |
| Calibration     | Velocity: 50 mm/s (160 Hz)
<p>| point           | Acceleration: 50 m/s² (160 Hz) |
| Circuit         | Exclusive microcomputer circuit. |
| Data hold       | Freeze the desired reading. |
| Peak measurement| To measure the peak value. |
| Memory          | Maximum &amp; Minimum value. |
| Power off       | Auto shut off, saves battery life, or manual off by push button. |
| Sampling time   | Approx. 1 second. |
| Operating       | 0 °C to 50 °C (32 °F to 122 °F). |
| temperature     | Operating humidity | Less than 80% RH. |</p>
<table>
<thead>
<tr>
<th>Power supply</th>
<th>Alternating current duty type, DC 8V battery, 005P, MN1604 (FPC) or equivalent.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power consumption</td>
<td>Approx. DC 6 mA.</td>
</tr>
<tr>
<td>Weight</td>
<td>Meter: 274 g/0.60 LB</td>
</tr>
<tr>
<td></td>
<td>Probe with magnetic base: 38 g/0.08 LB</td>
</tr>
<tr>
<td>Dimension</td>
<td>Main instrument: 185 x 78 x 38 mm (7.3 x 3.1 x 1.5 inch).</td>
</tr>
<tr>
<td></td>
<td>Vibration sensor probe: Round 16 mm Dia. x 29 mm.</td>
</tr>
<tr>
<td>Accessories</td>
<td>Instruction manual: 1 PC.</td>
</tr>
<tr>
<td>included</td>
<td>Vibration sensor (VB-81A): 1 PC.</td>
</tr>
<tr>
<td></td>
<td>Cable: 1 PC.</td>
</tr>
<tr>
<td></td>
<td>Magnetic base: 1 PC.</td>
</tr>
<tr>
<td></td>
<td>Carrying Case: 1 PC.</td>
</tr>
</tbody>
</table>

3
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.
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.
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-spect measurement may still be made for several hours after low battery indicator appears.

2) Loos 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 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)

<table>
<thead>
<tr>
<th>Good</th>
<th>0 to 1.80 mm/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptable</td>
<td>1.81 to 4.50 mm/s</td>
</tr>
<tr>
<td>Still permissible</td>
<td>4.51 to 11.2 mm/s</td>
</tr>
<tr>
<td>Dangerous</td>
<td>&gt; 11.2 mm/s</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Good</th>
<th>0 to 2.80 mm/s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acceptable</td>
<td>2.81 to 7.10 mm/s</td>
</tr>
<tr>
<td>Still permissible</td>
<td>7.11 to 18.0 mm/s</td>
</tr>
<tr>
<td>Dangerous</td>
<td>&gt; 18 mm/s</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Frequency Hz</th>
<th>Normal value</th>
<th>Minimum value</th>
<th>Maximum value</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Hz</td>
<td>1.0</td>
<td>0.8</td>
<td>1.1</td>
</tr>
<tr>
<td>20 Hz</td>
<td>1.0</td>
<td>0.9</td>
<td>1.1</td>
</tr>
<tr>
<td>40 Hz</td>
<td>1.0</td>
<td>0.9</td>
<td>1.1</td>
</tr>
<tr>
<td>80 Hz</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>160 Hz</td>
<td>1.0</td>
<td>0.9</td>
<td>1.1</td>
</tr>
<tr>
<td>500 Hz</td>
<td>1.0</td>
<td>0.9</td>
<td>1.1</td>
</tr>
<tr>
<td>1000 Hz</td>
<td>1.0</td>
<td>0.8</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Table 1
OMEGA ENGINEERING, INC. warrants this unit to be free of defects in materials and workmanship for a period of 13 months from date of purchase. OMEGA’s WARRANTY adds an additional one (1) month grace period to the normal one (1) year product warranty to cover handling and shipping time. This ensures that OMEGA’s customers receive maximum coverage on each product.

If the unit malfunctions, it must be returned to the factory for evaluation. OMEGA’s Customer Service Department will issue an Authorized Return (AR) number immediately upon phone or written request. Upon examination by OMEGA, if the unit is found to be defective, it will be repaired or replaced at no charge. OMEGA’S WARRANTY does not apply to defects resulting from any action of the purchaser, including but not limited to mishandling, improper interfacing, operation outside of design limits, improper repair, or unauthorized modification. This WARRANTY is VOID if the unit shows evidence of having been tampered with or shows evidence of having been damaged as a result of excessive corrosion; or current, heat, moisture or vibration; improper specification; misapplication; misuse or other operating conditions outside of OMEGA’s control. Components in which wear is not warranted, include but are not limited to contact points, fuses, and triacs.

OMEGA is pleased to offer suggestions on the use of its various products. However, OMEGA neither assumes responsibility for any omissions or errors nor assumes liability for any damages that result from the use of its products in accordance with information provided by OMEGA, either verbal or written. OMEGA warrants only that the parts manufactured by the company will be as specified and free of defects. OMEGA MAKES NO OTHER WARRANTIES OR REPRESENTATIONS OF ANY KIND WHATSOEVER, EXPRESSED OR IMPLIED, EXCEPT THAT OF TITLE, AND ALL IMPLIED WARRANTIES INCLUDING ANY WARRANTY OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE HEREBY DISCLAIMED. LIMITATION OF LIABILITY: The remedies of purchaser set forth herein are exclusive, and the total liability of OMEGA with respect to this order, whether based on contract, warranty, negligence, indemnification, strict liability or otherwise, shall not exceed the purchase price of the component upon which liability is based. In no event shall OMEGA be liable for consequential, incidental or special damages.

CONDITIONS: Equipment sold by OMEGA is not intended to be used, nor shall it be used: (1) as a “Basic Component” under 10 CFR 21 (NRC). Used in or with any nuclear installation or activity; or (2) in medical applications or used on humans. Should any Product(s) be used in or with any nuclear installation or activity, medical application, used on humans, or misused in any way, OMEGA assumes no responsibility as set forth in our basic WARRANTY/DISCLAIMER language, and, additionally, purchaser will indemnify OMEGA and hold OMEGA harmless from any liability or damage whatsoever arising out of the use of the Product(s) in such a manner.

RETURN REQUESTS/INQUIRIES

Direct all warranty and repair requests/inquiries to the OMEGA Customer Service Department. BEFORE RETURNING ANY PRODUCT(S) TO OMEGA, PURCHASER MUST OBTAIN AN AUTHORIZED RETURN (AR) NUMBER FROM OMEGA’S CUSTOMER SERVICE DEPARTMENT (IN ORDER TO AVOID PROCESSING DELAYS). The assigned AR number should then be marked on the outside of the return package and on any correspondence.

The purchaser is responsible for shipping charges, freight, insurance and proper packaging to prevent breakage in transit.

FOR WARRANTY RETURNS, please have the following information available BEFORE contacting OMEGA:
1. Purchase Order number under which the product was PURCHASED,
2. Model and serial number of the product under warranty, and
3. Repair instructions and/or specific problems relative to the product.

FOR NON-WARRANTY REPAIRS, consult OMEGA for current repair charges. Have the following information available BEFORE contacting OMEGA:
1. Purchase Order number to cover the COST of the repair,
2. Model and serial number of the product, and
3. Repair instructions and/or specific problems relative to the product.

OMEGA’s policy is to make running changes, not model changes, whenever an improvement is possible.

© Copyright 2008 OMEGA ENGINEERING, INC. All rights reserved. This document may not be copied, photocopied, reproduced, translated, or reduced to any electronic medium or machine-readable form, in whole or in part, without the prior written consent of OMEGA ENGINEERING, INC.
Where Do I Find Everything I Need for Process Measurement and Control?

OMEGA...Of Course!

Shop online at omega.com℠

TEMPERATURE
- Thermocouple, RTD & Thermistor Probes, Connectors, Panels & Assemblies
- Wire: Thermocouple, RTD & Thermistor
- Calibrators & Ice Point References
- Recorders, Controllers & Process Monitors
- Infrared Pyrometers

PRESSURE, STRAIN AND FORCE
- Transducers & Strain Gages
- Load Cells & Pressure Gages
- Displacement Transducers
- Instrumentation & Accessories

FLOW/LEVEL
- Rotameters, Gas Mass Flowmeters & Flow Computers
- Air Velocity Indicators
- Turbine/Paddlewheel Systems
- Totalizers & Batch Controllers

pH/CONDUCTIVITY
- pH Electrodes, Testers & Accessories
- Benchtop/Laboratory Meters
- Controllers, Calibrators, Simulators & Pumps
- Industrial pH & Conductivity Equipment

DATA ACQUISITION
- Data Acquisition & Engineering Software
- Communications-Based Acquisition Systems
- Plug-in Cards for Apple, IBM & Compatibles
- Datalogging Systems
- Recorders, Printers & Plotters

HEATERS
- Heating Cable
- Cartridge & Strip Heaters
- Immersion & Band Heaters
- Flexible Heaters
- Laboratory Heaters

ENVIRONMENTAL MONITORING AND CONTROL
- Metering & Control Instrumentation
- Refractometers
- Pumps & Tubing
- Air, Soil & Water Monitors
- Industrial Water & Wastewater Treatment
- pH, Conductivity & Dissolved Oxygen Instruments