

# VOLTcraft VBM-85 Vibration Meter Instruction Manual

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## Introduction

Dear customer,

Thank you for purchasing this product. This product complies with the statutory national and European requirements. To maintain this status and to ensure safe operation, you as the user must observe these operating instructions!



These operating instructions are part of this product. They contain important notes on commissioning and handling. Also consider this if you pass on the product to any third party. Therefore, retain these operating instructions for reference

If there are any technical questions, please contact: [www.conrad.com/contact](http://www.conrad.com/contact)

## Explanation of Symbols



The symbol with the lightning in the triangle is used if there is a risk to your health, e.g. due to an electric shock.



The symbol with the exclamation mark in the triangle is used to indicate important information in these operating instructions. Always read this information carefully.

The arrow symbol indicates special information and advice on operation.

## Intended Use

The vibration meter is used for mechanical measurement of machines and systems for maintenance and installation. It permits conclusions to the system condition such as concentric running, alignment errors or wobbly or loose parts in the vibration frequency range from 10 Hz to 10 kHz.

The vibration sensor is offset from the meter and can be additionally attached to ferromagnetic metal housings with a magnet. A data logger for recording measuring series is integrated. A USB interface permits further processing of the measured data

With average peak and max display and data hold function

The following measurements are available:

- **Acceleration:** 0.1 – 199 m/s<sup>2</sup> (peak value)
- **Vibration strength:** 0.01 – 19.99 cm/s
- **Vibration offset:** 0.001 – 1.999 mm (peak-peak value)

Operation requires a 9V block battery (type 1604A or same build). Measurement under unfavourable ambient conditions is not permitted.

- Wetness or high air humidity
- Dust and flammable gases, vapours or solvents
- Hot light sources

It is intended for indoor use only. Do not use it outdoors. Contact with moisture, e.g. in bathrooms, must be avoided under all circumstances.

For safety and approval purposes, you must not rebuild and/or modify this product. If you use the product for purposes other than those described above, the product may be damaged. In addition, improper use can result in short circuits, fires, electric shocks or other hazards. Read the instructions carefully and store them in a safe

place. Make this product available to third parties only together with its operating instructions.

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## Delivery Content

- Vibration meter VBM-85
- External sensor
- Screw-on magnet
- Sensor tip long
- Sensor tip short
- Threaded adapter
- USB cable
- Software-CD
- Plastic case
- Operating instructions

## Up-to-date Operating Instructions

Download the latest operating instructions at [www.conrad.com/downloads](http://www.conrad.com/downloads) or scan the QR code shown. Follow the instructions on the website.



## Safety Instructions



**Read the operating instructions carefully and especially observe the safety information. If you do not follow the safety instructions and information on proper handling in this manual, we assume no liability for any resulting personal injury or damage to property. Such cases will invalidate the warranty/guarantee.**



### a) General Information

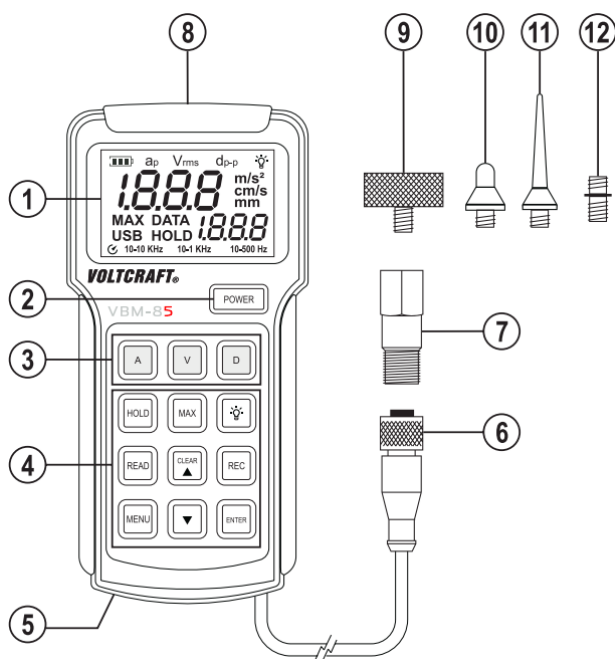
- This device left the manufacturer's factory in safe and perfect condition.
- Meters and accessories are not toys and have no place in the hands of children.
- Do not leave packaging material lying around carelessly. This may become dangerous playing material for children.
- Protect the appliance from extreme temperatures, direct sunlight, strong jolts, high humidity, moisture, flammable gases, steam and solvents.
- Do not place the product under any mechanical stress.

- If it is no longer possible to operate the product safely, take it out of operation and protect it from any accidental use. Safe operation can no longer be guaranteed if the product:
  - is visibly damaged,
  - is no longer working properly,
  - has been stored for extended periods in poor ambient conditions or
  - has been subjected to any serious transport-related stresses.
- Please handle the product carefully. Jolts, impacts or a fall even from a low height can damage the product.
- The meter contains magnetic parts. Keep them away from persons with pacemakers, etc.
- In commercial institutions, the accident prevention regulations of the Employer's Liability Insurance Associations for Electrical Systems and Operating Materials are to be observed.
- In schools, training centres, computer and self-help workshops, handling of meters must be supervised by trained personnel in a responsible manner.
- Do not switch the meter on immediately after it was taken from a cold to a warm environment. The condensation that forms might destroy your device. Allow the device to reach room temperature before switching it on.
- The vibration sensor must only be applied to surfaces that are free of electrical voltage.
- Also observe the safety information in each chapter of these instructions.
- Consult an expert when in doubt about the operation, safety or connection of the appliance.
- ⚠ Maintenance, modifications and repairs must only be completed by a technician or an authorized repair center.
- ⚠ If you have questions which remain unanswered by these operating instructions, contact our technical support service or other technical personnel. B

## b) Connected Devices




- Also observe the safety and operating instructions of any other devices which are connected to the product

## Operating Elements






1. Display
2. "POWER" button to switch on/off
3. Key panel for the measuring function
  - A = Acceleration
  - V = Vibration strength
  - D = Vibration offset
4. Key panel of the additional functions
5. Reverse battery compartment
6. Connection for sensor (7)
7. Sensor
8. USB Interface
9. Screw magnet
10. Sensor tip short
11. Sensor tip long
12. Threaded adapter

### a) Display-Symbols

- **ap**: Symbol for acceleration measurement
- **Vrms**: Symbol for vibration strength measurement
- **dp-p**: Symbol for vibration offset measurement
- **m/s<sup>2</sup>**: Unit of acceleration
- **cm/s**: Unit of vibration strength
- **mm**: Unit of vibration offset
- **REC**: Symbol for the recording mode
- **MAX**: The max. peak value is continually measured and recorded
- **DATA**: Symbol for data storage
- **USB**: Symbol for active USB interface
- **HOLD**: Data-hold, the display is "frozen"
- **10-10KHz**: Range of the vibration frequency at acceleration measurement
- **10-1KHz**: Range of the vibration frequency at vibration strength measurement
- **10-500Hz**: Range of the vibration frequency at vibration offset measurement
- **USb**: USB setting menu; 0 = off, 1 = on
- **APO**: Setting menu for automatic deactivation; 0 = off, 1 = on
- **rEC**: Setting menu for the data logger interval. 0.5s to 255s
- **dEF?**: Call factor settings and delete all data storages.
- **Button**: "Enter" = Yes, button "MENU" = No
-  Battery level display
-  Display lighting is active.
-  Automatic deactivation is active.

### b) Key Functions

- **POWER:** Operating switch; the meter can be switched on and off
- **A:** Acceleration measurement
- **V:** Vibration strength measurement
- **D:** Vibration offset measurement
- **HOLD:** Data hold
- **MAX:** The max. peak value is continually measured and recorded
- **READ:** Read internal data memory
- **CLEAR:** Call factor settings and delete all data storages
- **REC:** Record data: push briefly = single value recording, push long (2s) = Start data logger recording
- **MENU:** Opens the setting menu (USB, APO, dEF?)
- **ENTER:** Button for confirmation in the setting menu
-  Switches the display lighting on and off
-  Setting button up for value switching
-  Setting button down for value switching

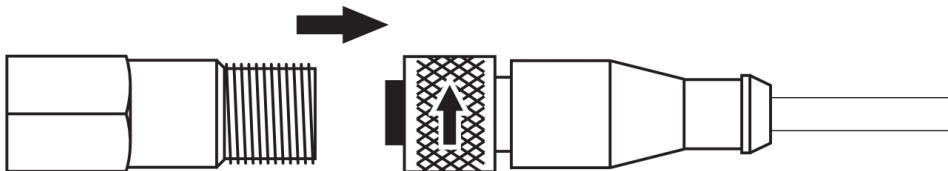
## Commissioning

### a) Inserting the Battery

Before you can work with the meter for the first time, you need to insert a new 9V block battery (alkaline). Insert the battery as described in the chapter "Cleaning and Maintenance".

### b) Connection of the Measuring Sensor

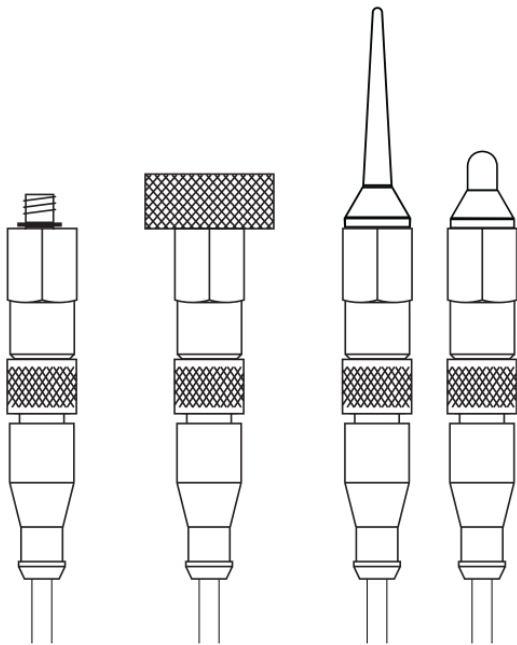
Connect the measuring cable (round sensor connection (6)) to the sensor (7). The plug only fits the sensor in the correct polarity. When connecting, observe the groove and the metal bridge in the plug. The plug connection is locked at the closure ring by turning. Always observe tight fit of the plug, since there may be wrong measurements otherwise.



### c) Selection of the Sensor Prods

The sensor can be equipped with different sensor prods for special surfaces. The prods are screwed onto the sensor tip with a thread. Always observe tight fit of the sensor prods, since there may be wrong measurements otherwise

The example image shows the different prods installed to the sensor.



#### d) Setting up the Meter

The meter can be set up with the rear folding bracket for better setup.

#### e) Automatic Deactivation Function “APO”

To avoid unnecessary shortening of the service life of the battery, an automatic deactivation is integrated. With the “APO” function activated, the meter is switched off automatically when no button has been pushed for approx. 10 minutes. The meter can be switched on again via the “POWER” button (2).

With the USB interface (USB) activated, the automatic deactivation function is deactivated.



If no measured value is recorded in the data logger operation anymore (machine is off), the meter switches off automatically after 10 minutes with the “APO” active. Data recording is ended

#### f) Switching On and Off

- Keep the button “POWER” (2) pushed for approx. 2 s for activation. After a brief initiation phase (display and system test), the meter is ready for use.
- Keep the button “POWER” (2) pushed for approx. 2 s for deactivation. After releasing the button “POWER”, the display “OFF” appears and the meter switches off.

#### g) Menu Pre-Setting

The button “MENU” can be used to pre-set some parameters such as interface, automatic deactivation and data logger interval. This menu can also be used to reset the device to the factory settings and delete the data storage.

To call the menu, push the button “MENU”.

1. **USB:** The display shows “Usb” and the figure “0” flashes. Use the two arrows buttons to change the value. Values: 0 = Interface deactivated, 1 = Interface active. Push the button “ENTER” to confirm the input and switch on to the next menu item
2. **APO:** (Automatic deactivation): The display shows “APO” and the figure “1” flashes. Use the two arrows buttons to change the value. Values: 0 = APO deactivated, 1 = APO active. When the USB interface is active, the APO

function cannot be activated! Push the button “ENTER” to confirm the input and switch on to the next menu item.

3. **DATA rEC:** The display shows “DATA rEC” and the figure “060” flashes. Use the two arrow buttons to change the value from 0.5 to 255. The values correspond to the interval time in seconds. Every time you push the arrow buttons, the next charging value is selected. Longer pushing permits fast forwarding or reversing. Push the button “ENTER” to confirm the input and switch on to the next menu item.
4. **dEF:** The display shows “dEF” and a question mark flashes. This menu item resets the meter to pre-set factory parameters. At the same time, all memory slots are deleted. Use the buttons “MENU” or “ENTER” to select the desired decision: Button “ENTER” = all set parameters and the data memory are retained and the menu is ended, Button “MENU” = the meter is reset to factory settings and all data memories are deleted. The menu is terminated
- Pre-set factory parameters
  - USB “0” = Off
  - APO “1” = On
  - DATA rEC “060” = interval 60 seconds

### Performing a Measurement



Observe rotating or moving parts during measurement. Danger of injury.

The measurement must only take place at current-free surfaces. The indicated temperature range must not be exceeded and undercut at the sensor either. Remove the sensor from the object to be measured after completion of each measurement and switch off the measuring device.

#### a) Preparation for Measurement

- Connect the sensor (7) to the meter (6). Turn the safety ring until it is hand-tight.
- Push the button “POWER” for approx. 2s to switch on the meter.
- Equip the sensor with a sensor prod as required.
- Hold the sensor (7) against the position to be measured. Observe a good level position. For ferro-magnetic materials (e.g. iron), the enclosed screwed magnet (9) can be screwed to the sensor (7). It will then adhere to the metal in an operating-friendly manner.

#### b) Selecting Measuring Functions

- Select the measuring function by pushing the corresponding button (3). Every time you push the button, you switch the function. Possible measuring functions are:

Button	Measurement	Display	Measuring type	Metric unit
A	Acceleration:	ap	Top value “Peak”	m/s <sup>2</sup>
V	Vibration strength	Vrms	Effective value (RMS)	cm/s
D	Vibration offset:	dp-p	Peak-Peak	mm



- For vibration monitoring, acceleration or vibration strengths are usually measured.
- Read the measured value at the display.

### c) HOLD Function


To record the measured value briefly, push the button “HOLD”. The display shows the active HOLD function with the icon “HOLD”. Pushing the button again switches the function off again.

### d) “MAX” Measured Value Display

The meter shows the currently highest measured value in the “MAX” mode. To switch the function on and off, push the button “MAX”. When the function is active, the display shows “MAX”.

### e) Display Lighting

The display can be lighted in low light using the button . Pushing the button again switches the lighting off again.

 The display lighting is not switched off automatically when the APO function is off. Ensure that the lighting is manually switched off again after use, or switch off the meter by the “POWER” button after the end of measurement.

## Data Logger

The meter can record up to 1999 measured data manually by pushing a button or automatically for a longer period. The automatic storage interval can be set from 0.5 s to 255 s.

When all memory slots are occupied, no further values will be stored. The present data records are not overwritten. The saved data remain stored in the device until they are manually deleted.

### a) Setting and Changing of the Automatic Interval Time

The interval time is set in chapter 7. Commissioning, item “Menu Pre-Setting”. The factory-set interval time is 60 seconds.

### b) Applying Data Logger

The data logger can be started from regular measuring mode. The pre-set interval time is applied for data recording. Depending on pre-set interval time, two modes are available. Automatic and manual data recording. Manual data recording stores the measured value only when a button is pushed. The logger data are retained in the memory even after switching off.

### Manual data recording

Proceed as follows to save a measured value:

- Switch on the meter (button “POWER”) and wait for the initialisation phase to complete.
- Start the measurement.
- To save the current measured values push the button “REC”. “DATA” appears in the display briefly, signalling storage in the next free slot. Each push of a button saves a measured value.

### Automatic data recording (interval time: 0.5 – 255 s)

Proceed as follows to activate the data logger:

- Switch on the meter (button “POWER”) and wait for the initialisation phase to complete.
- Start the measurement.
- Keep the button “REC” (2) pushed for approx. 2 s to start data recording. “DATA” starts flashing permanently and thus shows automatic data recording.
- A brief push of the button “REC” interrupts data recording. “DATA” goes out in the display



When all memory slots are occupied (max. 1999 measured values), the data recording is ended. “DATA” goes out in the display.

No further data can be recorded before the memory is deleted.

### c) Reading Data Storage at the Meter

- Switch on the meter.
- Select the data view with the button “READ”. The last slot recorded is displayed. Attention! If data recording is running, the button “READ” will interrupt data recording.
- Every time the arrow buttons are pushed, you will choose the next-higher or next-lower memory slot.
- To end the data view push the button “READ” again

### d) Delete Data Logger

The data can be deleted in two manners:

1. Via the menu in current operation. This procedure is described in chapter 7, Commissioning, item “Menu PreSetting”.
2. Via a shortcut at activation.
  - Switch off the meter.
  - Keep the two buttons “CLEAR” and “POWER” pushed until the display shows “CLR DATA”.
  - Release the buttons when the regular measuring display appears. The meter switches off again.
  - The data have been deleted.
  - Switch on the meter; the memory can be used again.
  - The empty memory is displayed in the display function “READ” with three dashes “- - -”

## USB Interface

The meter has a serial USB interface (8) for data exchange with a computer. It is located at the upper housing side.

The interface is designed in the form of a device-specific socket and requires the enclosed data cable.



At initial commissioning first install the enclosed software and the associated device drivers before connecting the meter to the computer.

The serial data signal is made up in the following order:

1. Baud Rate 19200

2. Message Head – Length – Type Function Code – Display 1 – Display 2 – Status Code – Validate – 2 Byte – 1 Byte – 1 Byte – Null – 5 Byte – 4 Byte – 6 Byte – 2 Byte

- Message Head ABCD
- Message Length 21 Bytes
- Message Type 0 Real time data, 1 Stored Data
- Display code Sent by 1(2) ASCII Sequence
- Example 1.003, “1”.”0”0”3”
- Status Code composed 0x30+Status code

**Format as follows:** 0 0 1 1 Ol2\_flag Ol1\_flag Manu\_flag Hold\_flag

- Validate Counts Checksum of “Message head” to the last status code

3. Status Code

- Status Code 1 0 0 1 1 Shutdown 10-500 hz 10-1khz 10-10khz
- Status Code 2 0 0 1 1 HOLD USB DATA MAX
- Status Code 3 0 0 1 1 Null MM CM/S M/S2
- Status Code 4 0 0 1 1 Bulb Vrms Dp-p Ap
- Status Code 5 0 0 1 1 Battery Power 3 level Battery Power 2 level
- Battery Power 1 level Battery no power
- Status Code 6 0 0 1 1 Null Null Null Null

### Install Software

The meter has a serial USB interface (8) for data exchange with a computer. It is located at the upper housing side.

The interface is designed in the form of a device-specific socket and requires the enclosed data cable.

Place the enclosed software CD in the CD drive. The Auto Start wizard will start the installation program.

If the automatic installation does not start, select the included “exe” file by double-clicking with the mouse pointer.

Follow the instructions on the screen during installation.

After installation, restart your computer. Connect the meter to a free USB interface at your computer with the enclosed USB data cable.


Use the menu Pre-Settings (Chapter 7. Commissioning item “Menu pre-settings”) to activate the USB interface at the meter.

The computer recognises a new device and installs the corresponding drivers. Start the installed software via the Windows®start menu – Programs – DMM.

The program starts. For a description of the software, see the software menu item “Help” – “Manual”

### Care and Cleaning





Except for the battery change and occasional cleaning, the device is maintenance-free.

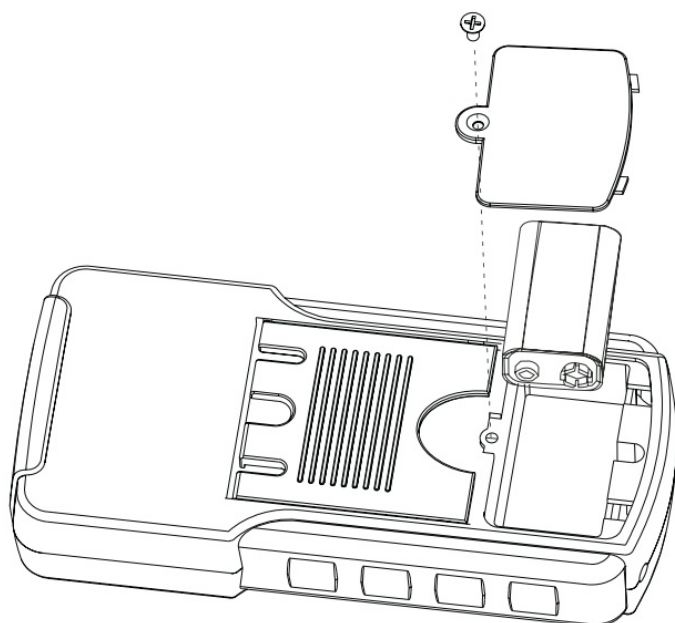
 Do not use any aggressive cleaning agents, rubbing alcohol or other chemical solutions as they can cause damage to the housing and malfunctioning.

- Disconnect the product from the mains before each cleaning.
- Use a clean, lint-free, antistatic and dry cloth to clean the device.

### Battery Change


The battery condition is displayed with an icon in the display. The fill bars show the battery capacity.

	Battery is full. Measurements are possible:
	Battery is 2/3 full. Measurements are possible:
	Battery is 1/3 full. Measurements are possible, the battery must be replaced soon.
	Battery is flat. To avoid wrong measurements, the battery must be replaced at once.



Proceed as follows to replace the batteries:

- Switch off the meter.
- Release the rear battery compartment screw and lift the battery compartment lid off of the housing
- Replace the flat battery with a new alkaline one of the same type (e.g. 1604 A).
- Close the casing carefully again in the reverse order

 Do not leave flat batteries in the meter. Even batteries protected against leaking can corrode and thus release chemicals which may be detrimental to your health or destroy the battery compartment.

Batteries and rechargeable batteries must not be short-circuited or thrown into fire. Regular batteries must not be recharged. Danger of explosion

Leaking or damaged batteries/rechargeable batteries may cause alkali burns if they come in contact with the skin.

Therefore, use suitable protective gloves.

A matching alkaline battery is available under order no. 652509.

## Disposal

### a) Product



Electronic devices are recyclable waste and must not be disposed of in the household waste. At the end of its service life, dispose of the product in accordance with applicable regulatory guidelines.

Remove any inserted (rechargeable) batteries and dispose of them separately from the product.

### b) (Rechargeable) batteries

You as the end user are required by law (Battery Ordinance) to return all used (rechargeable) batteries. Disposing of them in the household waste is prohibited.



Contaminated (rechargeable) batteries are labeled with this symbol to indicate that disposal in the domestic waste is forbidden. The designations for the heavy metals involved are: Cd = Cadmium, Hg = Mercury, Pb = Lead (name on (rechargeable) batteries, e.g. below the trash icon on the left)

Used (rechargeable) batteries can be returned to collection points in your municipality, our stores or wherever (rechargeable) batteries are sold.

You thus fulfill your statutory obligations and contribute to the protection of the environment.

## Troubleshooting

With this measuring device, you have purchased a product built to the latest state of the art and operationally safe. Nevertheless, problems or errors may occur.

For this reason, the following is a description of how you can easily remove possible malfunctions yourself:



Always observe the safety information!

Error	Possible cause	Remedy
The meter cannot be switched on.	Is the battery dead?	Check the battery condition. Disconnect and reconnect the battery (perform reset).
No correct measured value is displayed.	Wrong measurement? Is the sensor flat on the surface?	Check the flat position of the sensor on the measuring surface. If required, use the enclosed adhesive magnet.
The meter cannot be operated.	The hold function is activated (display "HOLD").	Deactivate the hold function with the button "HOLD".
	Undefined system condition.	Disconnect and reconnect the battery (perform reset).



Repairs other than those described above must only be carried out by an authorised specialist.  
If you have any questions about handling the meter, our technical support is available.

## Technical Data

**Input voltage:** 1x 9V block battery (6F22, MN1604 or same build)

**Power consumption:** max. 25 mA

**Display:** LC-display, refresh rate: 1s

**Measuring frequency of the sensor:** 10 Hz – 10 kHz

**Measuring principle:** Piezoelectrical acceleration sensor

**Line length sensor cable:** approx. 1.9 m

**Sensor (Ø x L):** 14 x 30 mm

**Sensor prod short (Ø x L):** 6 x 8.5 mm, 10 Hz – 10 kHz

**Sensor prod long (Ø x L):** 2 x 38 mm (conical), 10 Hz – 1 kHz

Magnetic probe (Ø x L): .....23 x 10 mm, 10 Hz – 10 kHz

Operating conditions: .....0 to +50 °C, 20 – 80 % RH (non-condensing)

Storage temperature .....-20 to +60 °C

Dimensions (L x W x H) .....166 x 80 x 32 mm (meter)

Weight ..... approx. 360 g (meter), approx. 40 g (sensor)



## Documents / Resources

<b>VOLTCRAFT.</b>	
<p>☐ Schwingungsmess- Schwingsensoren VBM85 für die DIN EN</p> <p>☐ Handhabungsanleitung: Vibration meter VBM85 nach EN ISO 10818</p> <p>Page 25 / 32</p>	<p>KWZ 1.26</p> <h2 style="color: #00AEEF;">VOLTCRAFT VBM-85 Vibration Meter [pdf] Instruction Manual</h2> <h3>VBM-85 Vibration Meter, VBM-85, Vibration Meter, Meter</h3>
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