Brüel & Kjær Vibro

A member of the NSK Group

Instructions

VIBROSTORE 100E

Vibration Monitoring & Analysis

Retain for subsequent use

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Instructions - **VST-100E**
C108031.002 / V03, en, date of issue: 04/29/2025

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BG Внимание!

Инструкциите за експлоатация трябва да бъдат прочетени и разбрани, преди продуктът да бъде пуснат в експлоатация. Ако е необходимо, инструкциите за експлоатация в липсващия език на ЕС от следния адрес: www.bkvibro.com

CS Pozor!

Před uvedením výrobku do provozu je nutné přečíst si návod k provozu a porozumět mu. V případě potřeby si návod k provozu v chybějící řeči EU vyžádejte na následující adrese: www.bkvibro.com

DA Giv agt!

Før produktets ibrugtagning skal brugsanvisningen læses og forstås! Brugsanvisningen kan bestilles på et EU-sprog ved henvendelse til: www.bkvibro.com

DE Achtung!

Vor Inbetriebnahme des Produktes muss die Betriebsanleitung gelesen und verstanden werden. Bei Bedarf die Betriebsanleitung in fehlender EU-Sprache unter folgender Adresse anfordern: www.bkvibro.com

EL Προσοχή!

Προτού λειτουργήσετε την συσκευή, πρέπει να διαβάσετε και να καταλάβετε το εγχειρίδιο. Εάν χρειάζεσθε εγχειρίδιο σε κάποια άλλη Ευρωπαική γλώσσα, αποτανθείται στην εξής διεύθυνση : www.bkvibro.com

EN Attention!

Before operating the product, the manual must be read and understood. If necessary, you may order the manual in the missing European Union language under the following address: www.bkvibro.com

ES ¡Atención!

Antes de utilizar este producto debe leer y comprender el manual. Si necesita el manual en otro idioma de la Unión Europea, puede pedirlo en la siguiente dirección: www.bkvibro.com

ET Tähelepanu!

Enne toote kasutuselevõtmist tuleb kasutusjuhend läbi lugeda ja sellest aru saada. Vajaduse korral on kasutusjuhend puuduvas ELi keeles järgmisest aadressist: www.bkvibro.com

FI Huomio!

Ennen käyttöönottoa tulee lukea ja ymmärtää käyttöohjeet. Kun tarvitset käyttöohjeita muilla EU-kielillä ota yhteys seuraavaan osoitteeseen: www.bkvibro.com

FR Attention !

Il faut avoir lu et assimilé le manuel avant d'utiliser le produit. Si nécessaire, vous pouvez commander le manuel dans la langue qui manque à l'adresse suivante : www.bkvibro.com

GA Contúirt!

Sula gcuirfear an táirge i bhfeidhm, ní mór na treoracha oibriúcháin a léamh agus a thuiscint. Más gá, iarr na treoracha oibriúcháin sa teanga AE atá ar iarraidh ón seoladh seo a leanas: www.bkvibro.com

HR Opasnost!

Prije puštanja proizvoda u rad potrebno je pročitati i razumjeti upute za uporabu. Ako je potrebno, zatražite upute za uporabu na EU jeziku koji nedostaje na sljedećoj adresi: www.bkvibro.com

HU Figyelem!

A termék üzembe helyezése előtt az üzemeltetési utasítást el kell olvasni, és meg kell érteni. Szükség esetén hiányzó EU-nyelven az üzemeltetési utasítást, az alábbi címen lehet igényelni: www.bkvibro.com

IT Attenzione!

Il manuale deve essere letto e compreso prima della messa in servizio del prodotto. Se necessario, il manuale mancante nella lingua Europea desiderata, è ordinabile al seguente indirizzo: www.bkvibro.com

LT Dėmesio!

Prieš pradedant naudoti gaminį, būtina perskaityti ir suprasti naudojimo instrukciją. Jei reikia, naudojimo instrukcijas, esančias trūkstamose ES kalba iš šio adreso: www.bkvibro.com

LV Uzmanību!

Pirms izstrādājuma nodošanas ekspluatācijā ir jāizlasa un jāizprot lietošanas instrukcija. Vajadzības gadījumā lietošanas instrukcijas, kas nav iekļautas ES valodā no šādas adreses: www.bkvibro.com

MT Periklu!

Qabel ma jitħaddem il-prodott, l-istruzzjonijiet tat-tħaddim għandhom jinqraw u jinftiehmu. Jekk meħtieġ, itlob l-istruzzjonijiet operattivi fil-lingwa nieqsa tal-UE mill-indirizz li ġej: www.bkvibro.com

NL Attentie!

Voor ingebruikname van het produkt dient de gebruiksaan-wijzing gelezen en begrepen te zijn. Bij behoefte aan een gebruiksaan-wijzing in een ontbrekende EU-taal is deze op onderstaand adres aan te vragen: www.bkvibro.com

PL Uwaga!

Przed rozpoczęciem użytkowania urządzenia prosimy o uważne zapoznanie się z instrukcją obsługi. Instrukcje obsługi dla naszych urządzeń dostępne są we wszystkich oficjalnych językach Unii Europejskiej. Brakujące egzemplarze można zamawiać pod wskazanym poniżej adresem: www.bkvibro.com

PT Atenção!

Antes de usar o produto é necessário ler a documentação e entender-la. Se for necessário é favor pedir a documentação na língua europeia que necessita dirigindo-se a está direção: www.bkvibro.com

RO Atenție!

Instrucțiunile de utilizare trebuie citite și înțelese înainte de punerea în funcțiune a produsului. Dacă este necesar, instrucțiunile de utilizare din manualul de utilizare care lipsește limba UE de la următoarea adresă: www.bkvibro.com

RU Внимание!

Перед работой с изделием необходимо прочесть и усвоить инструкцию по эксплуатации. Если потребуется, инструкцию по эксплуатации на отсутствующем в комплекте языке можно заказать на следующем интернет-сайте: www.bkvibro.com

SK Pozor!

Pred uvedením zariadenia do prevádzky si treba dôkladne prečítať prevádzkový návod a treba jeho obsah správne pochopiť. V prípade potreby si prevádzkový návod vyžiadajte v príslušnom jazyku EÚ na nasledovnej adrese: www.bkvibro.com

SL Pozor!

Navodila za uporabo je treba prebrati in razumeti, preden izdelek začnete uporabljati. Če je potrebno, je treba navodila za uporabo v manjkajočem jeziku EU na naslednjem naslovu: www.bkvibro.com

SV Givakt!

Före idrifttagning av produkten måste bruksanvisningen läsas och förstås. Om nödvändigt kan bruksan-visningen beställas i det saknade EU-språket under följande adress: www.bkvibro.com

ZH 注意！

操作产品之前，必须阅读并理解本手册。如有必要，请通过以下网址预订所需语言版本的手册：www.bkvibro.com

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UNRESTRICTED DOCUMENT

1 Safety Instructions

1.1 Disclaimer of Liability

The observance of this technical documentation is essential for the proper and safe operation of the product. We assume no liability for injury to persons, damage to property or financial losses resulting from failure to comply with this technical documentation. In this case the liability for material defects is also excluded.

1.2 Pictograms and their Meanings

This symbol warns of dangerous situations which can result from misuse of the product.

HINT!

This symbol provides general and useful information for using the product.

1.3 User Qualification

Ensure that all work in conjunction with our device and accessories is performed by skilled, expert and authorized workers (for ATEX device and accessories according to EN 60079-14). Among these works are:

Installation and Commissioning

Installation and commissioning primarily concern work on electrical equipment. These works may be performed exclusively by electricians or workers instructed and supervised by an electrician in accordance with electrotechnical regulations/directives.

Change of System Specification

Any change of system specification has its effects on monitoring process with stationary systems and on the measuring sequence with portable measuring systems.

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1.4 Intended Use

If devices, sensors and cables are used in a way not described in the relevant user manuals, function and protection may be impaired and serious personal damage, death or serious, irreversible injuries may result.

of System

- Handle the device and accessories with care in order to prevent damage to the systems or personal damage due to falling.
- Use system exclusively as originally intended. Any use other than originally intended is prohibited. Brüel & Kjær Vibro does not assume any liability for damages resulting from inappropriate use. The user is solely responsible. For originally intended use, see device and accessories documentation.
- Ensure that device and accessories is exposed only to admissible environmental influences specified in technical device and accessories data sheet.
- Maintain electrical equipment in regular intervals. Remedy defects, e.g. loose wires, defective connectors, immediately.

of Sensor

Exclusively use sensor as specified in data sheet. Any use other than specified is considered inappropriate. Mounted sensors must not be used as steps.

of Cable

- Exclusively use cable as specified in data sheet. Any use other than specified is considered inappropriate.
- Never use cable to pull plug out of socket.
- Check cable and connectors in regular intervals. Have any damage immediately repaired by a specialist
- Install cables properly in order to protect them from mechanical damage (e.g. squashing, abrasion of insulation) and to prevent trip hazards.

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Use of Bought-In Items

For pickups and accessories not supplied by Brüel & Kjær Vibro the user is solely responsible. The user is bound to ensure that the demands on electrical safety and technical properties conform with the agreed data.

Brüel & Kjær Vibro does not assume any responsibility for bought-in items.

The user is liable for any defect on Brüel & Kjær Vibro products caused by bought-in items.

Hot surfaces

In line with the user manuals, the devices, sensors and cables can be operated in extensive ambient temperature ranges, whereby they can become hot through self-heating on housing walls and can produce burning.

When mounted at external heat or cold sources (e.g. machine parts), devices, sensors and cables can adopt dangerous temperatures, whereby burning, among other things, can occur in the event of contact.

WARNING!

Ensure that no parts such as sensors, connecting lead, carrying straps etc. get close to open rotating machine parts. There is the danger that these parts will be pulled in and cause damage to property and/or serious injuries.

NOTE!

In addition to the general installation regulations for electrical systems, when installing electrical systems in potentially explosive atmospheres IEC 60079-14 and the relevant national requirements on the installation of explosion-proof systems must be observed.

1.5 Recommendations to User

If the use of the system in conjunction with machines or plant sections can produce risks outside of Brüel & Kjær Vibro's responsibility, the user is expected to prepare and distribute safety technical instructions or warnings and to ensure that the personnel concerned has received and understood same.

1.6 General Hints

Never operate damaged products. Upon delivery inspect the packaging for damage and compare the delivered items with your order documents.

Prohibition of Unauthorized Modifications

System and accessories must not be changed neither in construction nor safety technology without the express consent of Brüel & Kjær Vibro. Any unauthorized modification excludes Brüel & Kjær Vibro's liability for resulting damages.

This applies in particular to repair work, soldering work on P.C. boards and replacement of components/modules/P.C. boards.

When replacing parts, exclusively use the original Brüel & Kjær Vibro spare parts.

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2 Overview

The **VIBROSTORE 100E** (VST-100E) is a simple to use rugged vibration monitoring and portable analysis instrument with on-board display of vibration levels. VST-100E provide basic vibration indication functions based on machine running speed. This functionality may help to diagnose faults, indicating main parameter for unbalance, misalignment, and looseness, to be confirmed with further analysis.

The **VIBROSTORE 100E** is approved for use in “Potentially explosive atmospheres” in accordance with the ATEX Directive. Here, this approval also extends to cover use as Category 2 equipment for gases (ATEX).

The system is designed to take vibration measurements from assets (e.g. pumps, motors, fans and bearings) a simple route-based data collection mode. The unit displays vibration frequency plots and allows vibration severity and bearing condition to be monitored. VST-100E will collect and display all measurements in in as little as 3 seconds with one push of a button.

Combined with the powerful ReO software, the collected measurement data can be exported and used to perform even more advanced analytics and computing tasks. ReO is able to display valuable plots and graphs, to effectively detect and analyse vibration related problems of rotating machinery.

2.1 Control buttons

The VST-100E features an OLED display and 7 control buttons. Please refer to section “Operation” for a detailed description. When off, turning the VST-100E ON is achieved simply by pressing the center button. The unit will automatically turn OFF if not used for a 1 to 60 minutes selectable auto turn off time.
When the main menu is displayed the device can be turned off by pressing the button for 3 seconds.

2.2 Protective boot

The VST-100E is guarded by a removable protective rubber sleeve, which can be removed, by peeling back the protective boot on the narrow bottom part of the device and pulling the boot upwards.

WARNING!

If used in explosive atmospheres, the VST-100E must always be equipped with the rubber protective sleeve.

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2.3 Batteries

WARNING!

Always replace the batteries outside the explosive atmosphere!

The VST-100E requires two type AA size batteries, which are replaced by removing the protective rubber boot first and second the battery compartment cover (held in place by multiple screws) as shown in the photographs below:
L91 lithium-Iron type AA batteries are recommended.

For installing new batteries, please remove all empty batteries first, before installing new or fully charged batteries. Always assure the correct battery orientation shown on the battery cover label. Pay attention to the proper fit of the rubber gasket, before closing.

2.4 Docking Cradle

VST-100E uses an infrared link on the back of the device to an included docking cradle. Do not obstruct the line of sight. The cradle interfaces the infrared communication of the VST-100E to an USB-port of a host PC. Use the supplied USB cable. To use the docking cradle, slide the VST-100E without the rubber sleeve with the narrow end of the device first. is the VST-100E should be held by the two brackets on the sides. The cradle has a belt clip and screw hole to be mounted on any rigid surface.

2.5 Service

VST-100E contains no user serviceable parts. In the unlikely case of malfunction, please return the complete unit to your supplier for repair.

UNRESTRICTED DOCUMENT

2.6 Explosion protection

WARNING!

If used in explosive atmospheres, the VST-100E must always be equipped with the rubber protective sleeve.

WARNING!

Always replace the batteries outside the explosive atmosphere!

- T4 T_{amb}: .... -20°C to +40°C
- ATEX approval (Baseefa16ATEX0182X): .... II 2G Ex ib IIC T4 Gb
- IECEx approval (IECEx BAS 16.0131X) : .... Ex ib IIC T4 Gb

The BNC connector has (for sensors) has the following intrinsically safe values:

- U_o = 21.42 V
- I_o = 75 mW
- P_o = 400 mW
- C_i = 0
- L_i = 0
- C_o = 100 nF
- L_o = 3 mH

- UL hazardloc area approval (SGSNA/21/CA/00012X): ..... Class I, Zone I, IIC
  .... Class I, Division 2, Groups A-D

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3 Operation

3.1 Basic Operation

Color coded display shows ISO value, bearing condition in Bearing Damage Units (BDU) and RMS acceleration (g).

ISO and BDU values are alarm colour coded in Green, Yellow and Red.

Additional screens show displacement (mm or mils), frequency spectrum with cursor, and diagnostics for unbalance, misalignment and looseness.

Press and hold the **centre** button to turn ON and press to take measurements - left, right, up and down arrows to navigate display
Separate buttons to switch the unit on and off and to open the menu .

Route manager button for downloading routes to the VST-100E or transferring machine readings to PC for trending. **via Bluetooth**

Accesses menu
Data collection. Take, assign and display route measurements.

Standard BNC connector for IEPE accelerometers.

Additional Functions when in main screen.
To turn on/off IEPE Power, press and **hold** the left arrow button when on the main numbers screen

To show the battery level, press and **hold** the up arrow button when on the main numbers screen, this function is optimized for alkaline manganese batteries.

To turn the unit off, press and **hold** the down arrow button when on the main numbers screen

To switch to the menu, press and **hold** the centre button when on the main numbers screen

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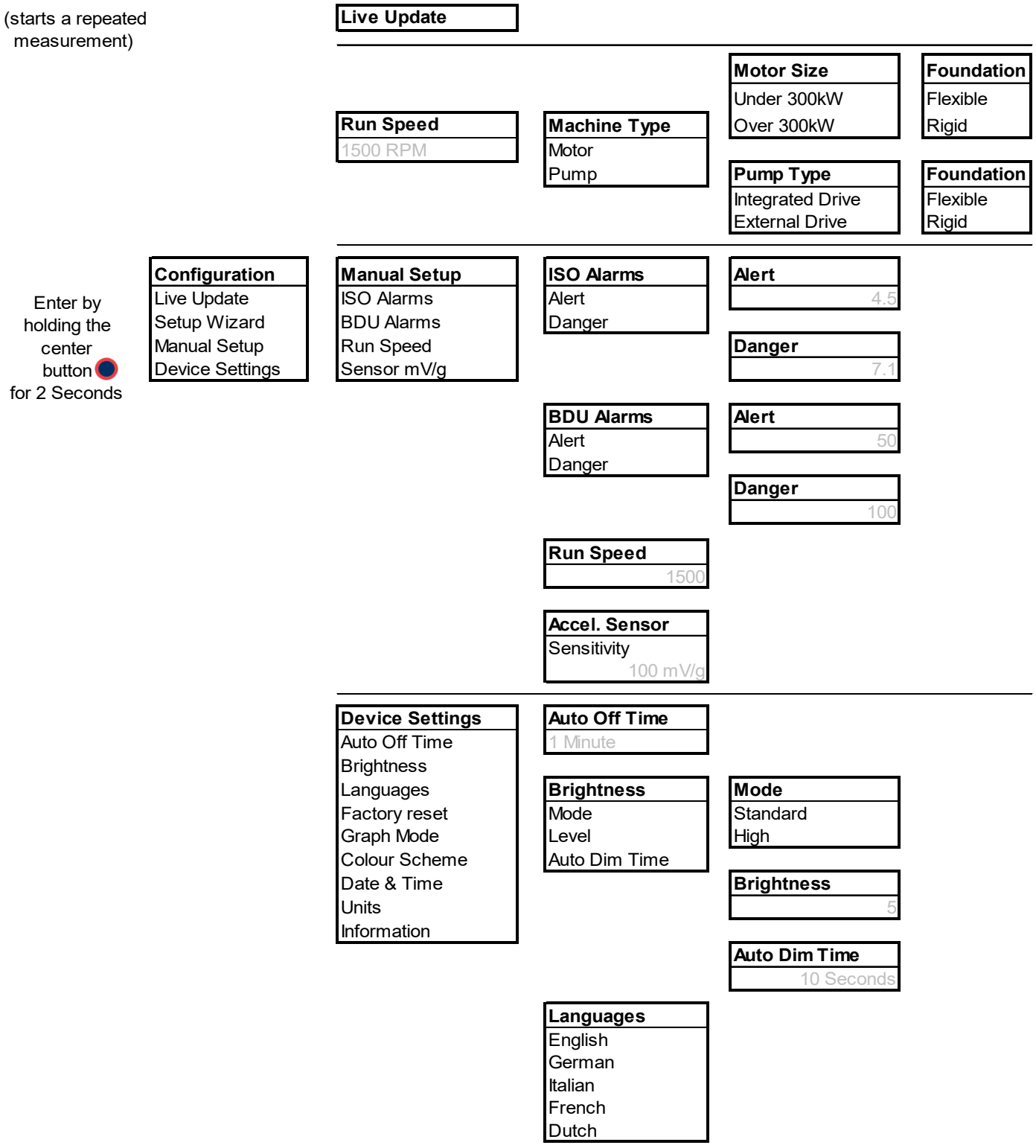
3.2 Menu navigation



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Menu navigation (continuation)

Enter by holding the center button for 2 Seconds

Configuration
Live Update
Setup Wizard
Manual Setup
Device Settings

Device Settings
Auto Off Time
Brightness
Languages
Factory Reset
Graph Mode
Colour Scheme
Date & Time
Units
Information

Factory Reset
Metric
Imperial

Graph Mode
Bar
Line

Color Scheme
Standard
White on Black
Black on White

Date & Time
12:00:00
01.01.2020

Units
Velocity
Run Speed
Velocity Type
Displacement

Velocity
mm/s - in/s

Run Speed
RPM - CPM - Hz

Velocity Type
RMS
Peak

Displacement
Pk
Pk-Pk

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Menu navigation (continuation)

Enter by holding the factory button

Machines
[Machine 1]
[Machine 2]
[Machine 3]
[Machine 4]

[Machine 1]
[Meas. Point 1]
[Meas. Point 2]
[Meas. Point 3]
[Meas. Point 4]

[Meas. Point 1]
Take Measurement
Run Speed
Save Measurement
Load Measurement

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3.3 Fitting the sensor

VST-100E is supplied with a cable connected sensor (accelerometer) that connects to the BNC connector on VST-100E. The nominal sensitivity of the sensor is 100 mV/g.

VST-100E can also accept any standard IEPE (CCS) accelerometer and the sensor sensitivity setting can be adjusted to accommodate other sensitivities (see section 3.5.2.3 in this manual). The default setting is 100 mV/g.

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3.4 Taking a reading

To take a reading, press the center button to turn the unit ON.

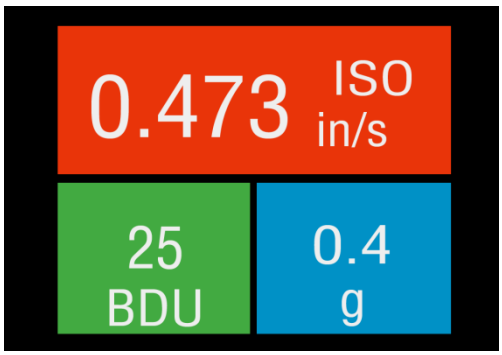
Place the sensor on a **rigid** part of the machine as close as possible to the desired measurement point (e.g. bearing block) using the magnet mount.

Pressing the circle button again takes the reading.

N.B. for best results the sensor should be placed gently onto the measurement point by "rolling" the magnet onto the machine.

This is to avoid any sudden shocks that would be seen as large acceleration peaks by the sensor and could take some time (several seconds) to die away.

After placing the sensor or switching on the device, it is recommended to wait this time before taking a reading.



Taking a reading causes the overall vibration numbers screen to be displayed as shown in the example screen left.

This screen gives an overall view of the machine's vibration condition as explained in the following section.

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3.4.1 Vibration readings

WARNING!

Through electro-magnetic interferences (acc. to EN 61000-4-3) influences on the measured values may arise.

Once a vibration reading has been taken, the display will show three values, as shown in the example screen (see chapter 3.4 Taking a reading). The values are color coded to show their alarm status as explained in the following sections. VST-100E can show the results as peak, peak to peak and root mean square (rms) values.
The three values shown in the readings screen are:

- ISO value (velocity in mm/second or inch/s)
- Bearing Noise in BDU (Bearing Damage Units)
- Total g (acceleration)

These readings are explained in more detail below with some examples.

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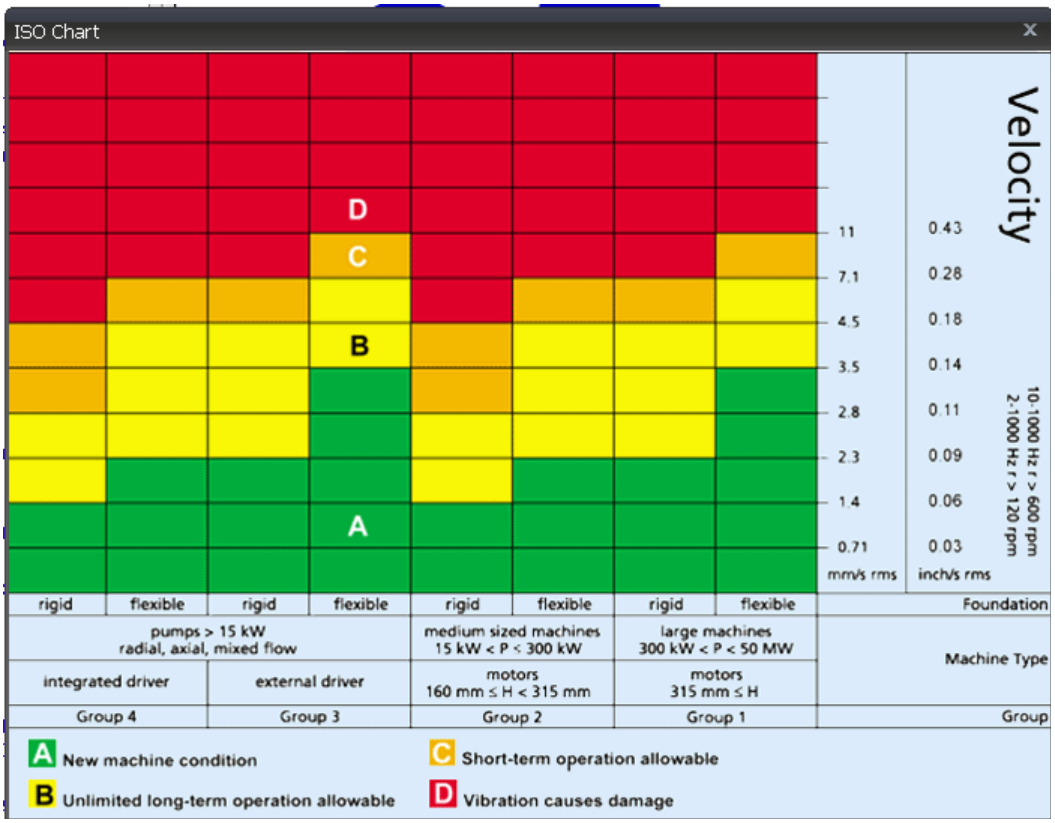
ISO value (mm/s)

The ISO value (in mm/s or inch/s) is the large number displayed at the top of the screen. This is the RMS measurement of the calculated peak measurement of the vibration velocity in the frequency band 10Hz (600 RPM) to 1kHz (60,000 RPM) or 2Hz (120 RPM) to 1kHz (60,000 RPM) as specified by the ISO standard[1]. The correct frequency band is automatically selected by VST-100E based on running speed.

The ISO value background is colour coded according to the ISO 10816-1 vibration velocity level chart (see below). The colour coded background indicates the condition of the machine according to the size and type of machine selected with the **Setup Wizard** (see section 3.5.1).



[1] *ISO 10816-1:1995. Mechanical vibration -- Evaluation of machine vibration by measurements on non-rotating parts*

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Bearing Condition (BDU)

Below the displayed ISO value and to the left is the value of bearing noise (high frequency vibration) in **Bearing Damage Units** (BDU), where 100 BDU corresponds to 1 g RMS vibration measured in the frequency band between 1kHz and 10kHz. This is an indicator of the wear state of a bearing; higher number = higher bearing wear.

It is commonly held that 1g of high frequency vibration (100 BDU) corresponds to a relatively high level of bearing noise and so can be considered indicative of a damaged bearing. In other words, it may be helpful to think of the Bearing Noise figure as being very roughly equivalent to **"percentage"** of bearing wear. To quickly and easy identify the wear state of the bearings the background of this tile is colour coded like the ISO value as well. By default, the bearing noise is displayed on a Red background if it is above 100 BDU, a Yellow background between 50 and 100 BDU and a Green background below 50 BDU. However, the BDU alarm levels can be changed using the **Manual Setup** menu (see section 3.5.2.1).

Broadband acceleration (g)

This is the acceleration vibration value in g (RMS) of a bandpass filtered signal.
The filter spans from 10Hz to 10kHz. This reading is shown in units of g (Earth's gravitational constant, where 1 g = 9.81 m/s^2).

Displacement (µm or mils)

Pressing either the left ◁ or right ▷ arrow button when the reading screen is displayed will cause the VST-100E to display calculated peak or peak-to-peak displacement values (in µm or mils) on a blue background. There is no alarm level coding. The frequency band is chosen analogue to the ISO value measurement. Pressing either left ◁ or right ▷ arrow button again will revert to display of the ISO value (mm/s or inch/s).

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3.4.2 Vibration Analysis (Vibration bands)

Pressing the down arrow button ▽ brings up a display. It shows the readings of vibration velocity (mm/s or inch/s), or displacement (mm or mils) if selected, broken down into each of 3 bands.

The display shows the vibration level in frequency ranges that are all based on multiples (1X, 2X and 3X) of the specified Run Speed of the machine as displayed beneath the 3 bar graphs.

N.B. in order to perform a vibration analysis it is important that the running speed of the machine is entered correctly. This can be done with the "Setup Wizard" as described in Section 3.5.1 of this user guide.

Typical but not exclusive for the appearance of following multiples of running speed[2] are:

1X = Unbalance:

The level of vibration in the frequency band based on the running speed is usually indicative of how well balanced the machine is. A **large** vibration at the running speed usually indicates that the machine is out of balance. However even a very well-balanced machine will typically show some vibration at the running speed, but this value should ideally be quite low (e.g. typically less than about 2 mm/sec for a medium sized machine).

2X = Misalignment:

A high level of vibration in the frequency band centred at twice the running speed is a possible indication of misalignment. Shaft misalignment can result in a double peak in the waveform. This will typically give rise to a vibration signal at double the running speed of the machine.

3X = Looseness:

High vibration in the frequency band centred at 3 times running speed is a possible indication of high mechanical looseness (e.g. loose mounting bolts, weak foundations etc.).

[2] *Multiples of running speed are sometimes referred to as "orders".*

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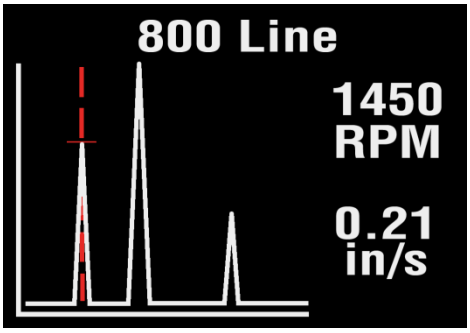
3.4.3 Frequency spectrum



Pressing the down arrow button ▽ once more brings up a display, where the vibration levels are shown as a frequency spectrum plot in the range from 0 to 1 kHz.

The heights of the peaks indicate the RMS vibration level (in mm/s or inch/s) at each frequency point in the spectrum.

The values to the right of the screen show the frequency (in Hz or RPM) and the RMS vibration level (in mm/s or inch/s) at the position of the cursor (red dotted line). The cursor position can be moved by use of the left ◁ and right ▷ arrow buttons.

Pressing the down arrow button ▽ increases the resolution of the frequency axis from 100 Lines (i.e. 10 Hz or 600 RPM resolution) to 800 Lines (i.e. 1.25 Hz or 75 RPM resolution). Increasing the resolution effectively **zooms** into the frequency spectrum. To display the full spectrum at the higher resolution the display must be **scrolled** using the left ◁ and right ▷ arrow buttons.

3.4.4 Live Update Mode

It is possible to have the VST-100E continuously display readings that are taken at intervals of approx. 1 second.

Live Update is selected from the **Configuration menu,** which is entered by holding down the center button ● for **2 seconds**.

It is possible to use live update with the basic readings screen, the VA bands screen or 100 line frequency spectrum. Pressing the center button ● at any time during live update will take a single measurement and stop live update mode.

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3.5 Configuration menus

The configuration menu is entered by pressing and holding down the center button for **2 seconds**.

Moving up and down the menu is achieved by pressing the up and down buttons which causes the menu item to be highlighted. Pressing the circle button will select the highlighted menu item. Left and right arrow buttons can be used to move backward and forward through the menus.

All changed settings will be saved immediately and do not require to be saved additionally.

3.5.1 Setup Wizard

Selecting the Setup Wizard opens a dialogue that allows the machine running speed to be entered and the ISO alarm levels to be set automatically according to the size and type of machine to be monitored.

The first Setup Wizard screen to be displayed shows the currently selected running speed in the pre-selected units (Hz or RPM).

Changing the running speed is achieved by pressing the up arrow button (to increase run speed) or down arrow button (to decrease run speed). Pressing and holding either of the buttons will quickly change the displayed value.

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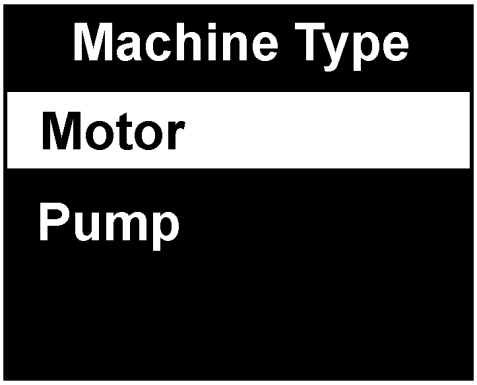
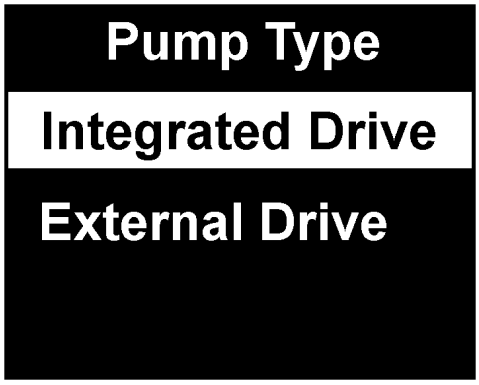
Pressing the center button again brings up the next screen which allows the machine type (motor or pump) to be selected.

If a **motor** is selected the size must also be selected (under or over 300 kW) or if a **pump** is selected, it must be specified whether it has an integrated or external drive unit.





Selecting the machine type and size allows the ISO alarm levels to be set accordingly, as does specifying the type of mounting (rigid or flexible).

As a basic “rule of thumb”, unless a machine is bolted down to a concrete floor, its mounting should be considered as being **flexible.**

Many motors and pumps are mounted on a frame or structure and should be considered as flexibly mounted.

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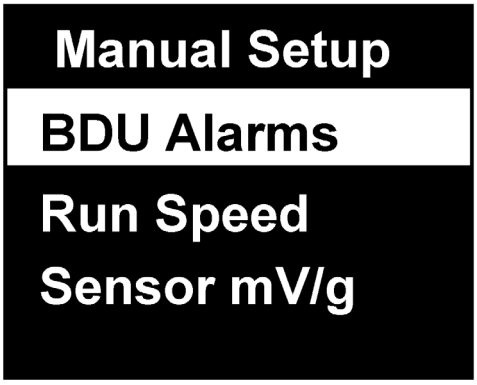
3.5.2 Manual Setup

3.5.2.1 BDU alarm settings

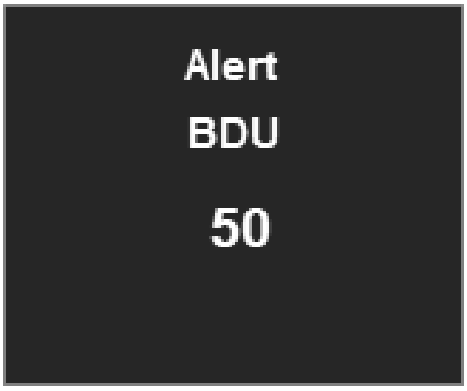
Selecting **BDU Alarms** allows the alarm levels at which the BDU readings change color to be altered by the user. Normal levels are displayed on a Green background.



The BDU threshold values are designated as ALERT (where readings turn Yellow) and DANGER (where readings turn Red).

Both these threshold values can be set independently using the up ⓐ and down ⓥ arrow buttons.

The default BDU thresholds are 50 for ALERT and 100 for DANGER. These levels are typical for medium sized machine bearings operating at run speeds in the region of 1000 to 3000 RPM. Larger bearings or higher run speeds may need increased BDU threshold values to identify worn or bad bearings.



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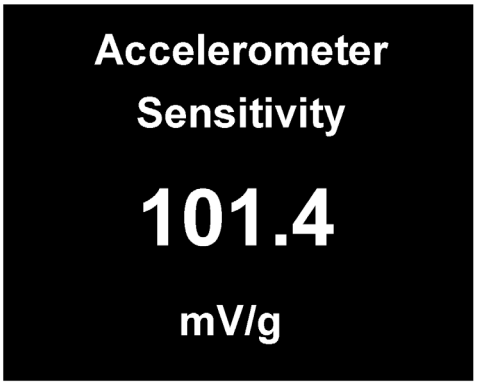
3.5.2.2 Run Speed

Run speed can also be set manually via the up △ and down ▽ arrow buttons.

3.5.2.3 Sensor mV/g

Accelerometer sensitivity (in mV/g) can be manually set using the up △ and down ▽ arrow buttons to allow the use of any desired sensor within the range 1mV/g to 1000mV/g. This enables the resolution and range of the VST-100E to be set by the user.

Even measurements defined in the in the route management context will use this setting. Remember to restore this setting if you had to change it for a specific measurement point.



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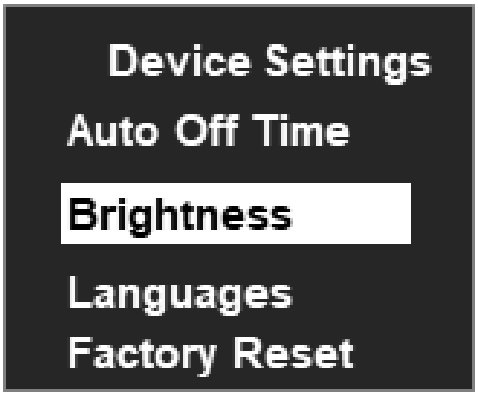
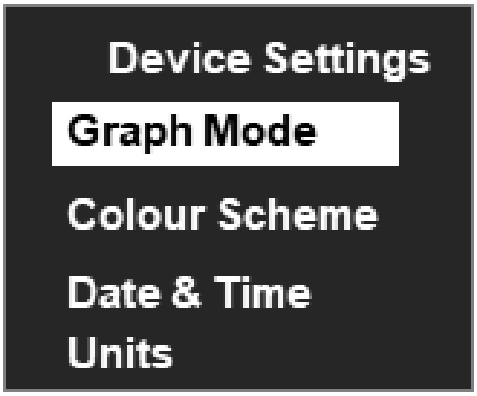
3.5.3 Device Settings

There are two pages of **Device Settings** menus. To advance to the second page the down arrow button ▽ should be used. Selecting a menu option is achieved by the up △ and down ▽ arrow buttons and by pressing the center button ●.





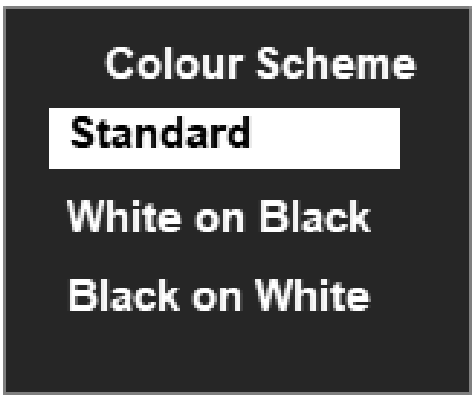
The **Auto Off Time** can be set from 1 minute up to a maximum value of 60 minutes, in increments of 1 minute.

The **Brightness** level can be set anywhere between 1 (least brightness) up to 10 (full brightness).

The operating **Language** can be selected depending on the exact model. Please refer to the product specifications.

The **Graph Mode** can be set to display the frequency spectrum as either a Line graph or a Bar graph.

The display **Color Scheme** can be configured as standard (full colour) or monochrome, e.g. for convenient viewing in direct sunlight.



Date & Time setting can be achieved using the up △, down ▽, left ◁ and right ▷ arrow buttons.

Selecting **Units** from the Advanced Settings menu allows the velocity readings to be displayed in either mm/s or inch/s.

Run Speed units can be displayed in units of Hertz[3] (Hz), revolutions per minute (RPM) or cycles per minute (CPM).

[3] *Hertz are equivalent to, and also sometimes referred to as, cycles per second (CPS).*

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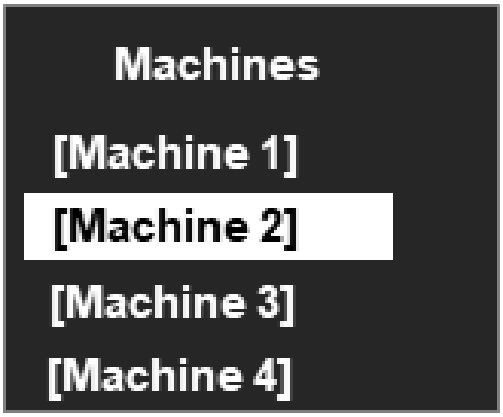
4 Route Management

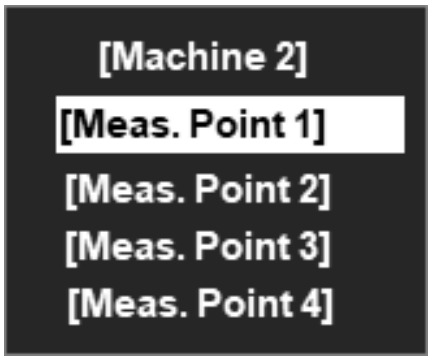
Pressing the Route Manager button (industry icon , located just below the down arrow button) brings up the Machines menu.

Machines have user-defined names **up to 16 characters long.**

Scrolling the list of machines is achieved with the up and down arrow buttons.

Selecting a machine is done with the center button , which then brings up a list of **measurement points** for that machine.



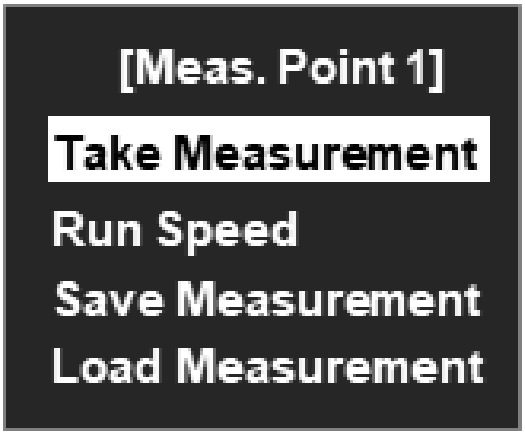


Measurement points also have user-defined names up to 16 characters long.

The list of measurement points can also be scrolled by using the up and down arrow buttons and each measurement point can be selected using the center button .

The various options for each measurement point (MP) are then displayed:

1. **Take Measurement** – takes a new reading and saves it to this MP
2. **Run Speed** – adjust the run speed of the Machine for this measurement point.
3. **Save Measurement** – saves the previously taken reading to this MP.
4. **Load Measurement** – loads a previous reading (e.g. for re-display)



Machines and their measurement points are downloaded from the **ReO** trending and route management software for PC using the supplied USB docking cradle or the Bluetooth interface.

The exact list of machines to be downloaded is determined by the user in **ReO**.

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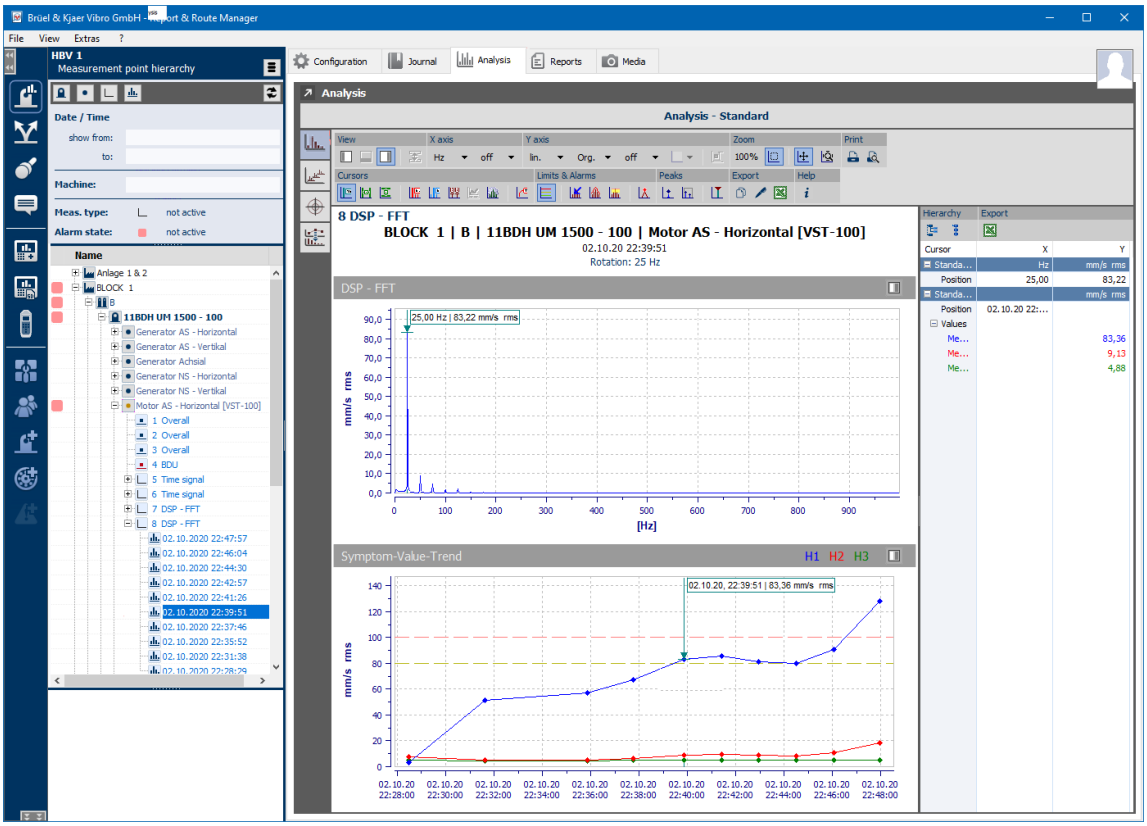
5 ReO Software

ReO is the PC based software that allows users to view trends of vibration readings taken with VST-100E, in a way that enables predictions to be made about machine condition.

ReO is very powerful and highly functional route editor and analysing software, which is described in more detail in its own instruction manual. This can be downloaded from our website.

ReO allows display of vibration data in a variety of different ways including vibration frequency spectra, bearing noise and ISO trend plots, waterfall diagrams (see figure below) and can generate reports either manually or automatically (e.g. by sending out **email alerts**).



HINT!

When viewing spectral data in ReO, it is recommended to use a user defined x-axis limiting the range to 10Hz to 10kHz or 2Hz to 1kHz in order to avoid being distracted by measurement artefacts.

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6 Optional accessories

6.1 BNC to BNC connecting cable

WARNING!

Before connecting the VST-100E to any buffered output, make sure to turn off the IEPE Power (CCS) by pressing and holding the left arrow button ◁ when on the main numbers screen. IEPE can be activated again by pressing holding the left arrow button ◁ when on the main numbers again. Otherwise this connection could damage both devices permanently.

Connecting the BNC to BNC cable to a buffered output of machine vibration detectors, the VST-100E can collect vibration data and visualize the data. This powerful function enables the user to connect the VST-100E to existing vibration monitoring devices. Watch out for installations with inverted polarity. Measurements will be false.

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7 Specifications

Size	200 mm x 60 mm x 26 mm
Weight	280 g
Environmental	
Degree of Protection	IP67
Operating:	0 °C to 50 °C (32 °F to 122 °F) (pay attention to temperature ranges for explosive atmospheres)
Storage:	-20 °C to 70 °C (-4 °F to 158 °F)
Power supply	2 x AA L91 lithium-iron batteries
Battery life	With Auto power OFF: typically 30 hours (with Firmware versions prior to 7.07: 50 hours) continuous operating time (with type AA L91 lithium-iron batteries) depending on brightness setting
Frequency range	2/10 Hz to 1 kHz (ISO) 1 kHz to 10 kHz (BDU) 10 Hz to 1 kHz (vibration bands)
Max frequency resolution	1.25 Hz @ 800 lines FFT setting
Measurements displayed	Acceleration in g Velocity in mm/s (or inch/s) Bearing noise in BDU (bearing damage units) Displacement (microns, mils)
Displayed Frequency Units	Hertz (Hz), RPM or CPM
Input range	User selectable with accelerometer sensitivity
Dynamic range	96 dB (0.01 g resolution)
Vibration bands for quick failure indication (RPM = run speed)	Unbalance 1x RPM Alignment 2x RPM Looseness 3x RPM
Accuracy	+/-5 % (acceleration: +/- 10% below 20Hz)
Languages in device	German / English / French / Italian / Spanish / Portuguese / Dutch / Chinese / Korean / Japanese / Russian / Czech
Data storage capability	Up to 1000 measurements/ machines (with a maximum of 10 measurements each machine)
Hazardous Area Approvals	T4 T_{amb} -20°C to +40°C **ATEX approval** Baseefa16ATEX0182X II 2G Ex ib IIC T4 Gb **IECEx approval** IECEx BAS 16.0131X Ex ib IIC T4 Gb **UL hazardloc area approval** SGSNA/21/CA/00012X Class I, Zone I, IIC Class I, Division 2, Groups A-D

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Accessories	• AC-7312 docking cradle & USB cable • AC-438 Spiral cable with two pin connectors • ASA-063 Acceleration sensor • AC-7316 Nylon carrying case • AC-7313 Protective boot • AC-276 Magnet with M8 Stud
Options	• REO/VST-100 Report & Route Manager Software

8 Maintenance

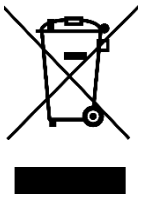
HINT!

Maintenance and service work must only be performed by trained qualified personnel!

1. Clean the device on the outside in regular intervals using a damp cloth.
2. Ingress of humidity, i.e. from water or other liquids, into the device must be prevented!

9 Disposal

The device is subject to the Waste Management Act for electrical and electronic devices.



Dispose of devices, cables or sensors after use in an environmentally responsible manner and in compliance with applicable national regulations.

WEEE Reg. No. DE 69572330

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10 EU Declaration of Conformity

Brüel & Kjær Vibro
A member of the NSK Group

EU-Konformitätserklärung / *EU- Declaration of conformity*

Hiermit bescheinigt das Unternehmen / *The company*

Brüel & Kjær Vibro GmbH
Wittichstraße 6
64295 Darmstadt

CE

die Konformität des Produkts / *herewith declares conformity of the product*

Portables Vibrations-Messgerät / Portable vibration measuring instrument

Typ / *Type*
VST-100E (VIBROSTORE 100E)

mit folgenden einschlägigen Bestimmungen / *with applicable regulations below*
EU-Richtlinie / *EU-directive*

2014/30/EU EMV-Richtlinie / *EMC-Directive*

2014/34/EU ATEX-Richtlinie / *ATEX-Directive*

2011/65/EU + (EU) 2015/863 Richtlinie zur Beschränkung der Verwendung bestimmter gefährlicher Stoffe in Elektro- und Elektronikgeräten/ *EU Directive for the restriction of the use of certain hazardous substances in electrical and electronic equipment*

Angewendete harmonisierte Normen / *Harmonized standards applied*

EN IEC 61326-1: 2021
EN IEC 60079-0:2018; EN 60079-11:2012
EN IEC 63000:2018

EU-Baumusterprüfbescheinigung / *EU-Type Examination Certificate*
Baseefa16ATEX0182X Ausgabe 4 / *Issue 4* erstellt von */created from* SGS Fimko Oy, Takomotie 8, FI-00380 Helsinki, Finnland

Mitteilungsnummer der Qualitätssicherung / Notification number of quality assurance
DEKRA 24ATEXQ0126 erstellt von DEKRA als notifizierte Stelle (0344) / created from DEKRA as notified body (0344)

Die alleinige Verantwortung für die Ausstellung dieser Konformitätserklärung trägt der Hersteller. / *This declaration of conformity is issued under the sole responsibility of the manufacturer.*

Bereich / Division
Brüel & Kjær Vibro GmbH

Unterschrift / Signature
CE-Beauftragter / *CE-Coordinator*

i.A. Karg
(Niels Karg)

Ort/*Place* **Darmstadt**
Datum / *Date* **25.04.2025**

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