PRÜFTECHNIK

# VIBXPERT® II Balancer
## Short instructions

# VIBXPERT® II Balancer

**Mobile balancing instrument**

## Short instructions

CE

Version 3.2x
Edition April 2012
LIT 53.103.EN

# Contents



**About this manual**

This short instruction manual is intended to provide a handy day-to-day reference for the most important functions of the instrument and basic program operation procedures.

For truly complete information, however, the full-length VIBXPERT II Balancer operating manual (LIT 53.203.EN) contains detailed explanations of all functional features as well as considerable background information on condition monitoring.

**Definitions**

For VIBXPERT II Balancer the following short designations are used in this manual: VIBXPERT, Balancer, instrument.

# Safety notes

## Symbols used

| | |
|---|---|
| Danger to life and limb. |  WARNING! |
| Warning of operating errors that can lead to data loss or equipment damage. |  Attention! |
| Information and tips on operating the instrument. |  Note |

## Intended use

- VIBXPERT II Balancer is intended for use as a portable balancing device for the balancing of *stationary* machines equipped *solely with rotating components (rotors)*, e.g. turbine rotors, inductors, circulating pumps, centrifugal compressors, fans, etc. This does not include machines with oscillating components, e.g. all reciprocating machines.
- VIBXPERT II Balancer can be used without any restrictions for the balancing of rigid rotors. Elastic (soft) rotors may only be balanced with VIBXPERT at the resonant frequency (±25%) by an experienced user. The measurement instrument and its accessories may only be operated by authorized personnel.
- VIBXPERT II Balancer may only be used for the measurement of machine signals in industrial environments while taking into consideration the technical specifications.
- Transducers and cables may be used only for their respective intended uses as defined in the corresponding sales leaflets.

PRÜFTECHNIK Condition Monitoring assumes no responsibility for any damage arising from improper use.

WARNING!

## General safety notes

The following notes must be carefully read and completely understood before the device is put into service.

Attention!

- During measurement on machines with rotating parts exposed, ensure that no brackets, cables etc. can become caught in rotating machine parts.
- The measurement device may only be operated if it is undamaged, dry and clean.
- Operation and maintenance are to be performed only by properly trained personnel.
- Repairs to the device may be carried out only by a PRÜFTECHNIK-authorized service technician.
- Only original spare parts and accessories may be used.
- Only properly functioning, regularly-maintained electrical equipment may be used. Any defects such as broken plugs or loose sockets must be corrected immediately. Damaged cables must be replaced by an authorized service technician.
- Any alterations that affect device design or operating safety are not permitted.

WARNING!

## Balancing safety notes

Attention!

- The respective manufacturer's instructions must be followed when mounting balancing weights.

  Make sure that attachment points for balancing weights to be welded on are clean; clamp the ground electrode of the welding device onto the rotor and not onto the machine.

  For balancing weights that need to be screwed on, the maximum permitted RPM of the motor must be observed.

- The machine must be disconnected in order to work on the rotor and must be secured against being switched on again in accordance with the applicable regulations.

- Before the first measurement (initial run), it is important to ensure that the preparatory activities have been carried out correctly and completely. In addition to the assembly of measurement components, particular attention must be paid to the correct input of parameters in the machine setup. If an incorrect rotor mass

is entered, a trial weight that is too large may be calculated as a result. This could have serious consequences for personnel and machine!

- No one is allowed to remain in the radial vicinity of the rotor during balancing runs. This area must be properly secured against unauthorized entry. If the trial weight of the rotor on a running machine detaches, there is a risk of fatal injury in this area!
- If the rotor is in a protective housing, any gaps in the housing must be closed before switching on the machine.
- The permitted switch-on frequency of the machine may not be exceeded. Otherwise, the motor could be damaged.
- The cause of the imbalance must be determined before balancing, and must be corrected if necessary (e.g. remove any caking on the rotor, weld any cracks on the impeller or replace the impeller).

## Environmental influences


- Portable radio-based devices can interfere with proper functioning of the device when operated nearby. In case of doubt, check the connecting cable between the device and its transducer.
- Avoid exposing the device, its transducers and cables to environmental conditions that exceed the tolerances listed in the 'Technical Data sheets'.
- Keep the protective caps on the connector sockets when they are not in use to keep them clean.

# Description

## Overview

① **Full color display** - large, backlit, high-contrast.

② **Light sensor** controls key board illumination.

③ **LEDs** indicate:
- Alarm condition
- Measurement error
- Battery charge status.

④ **Keyboard** can be comfortably operated with the thumb.

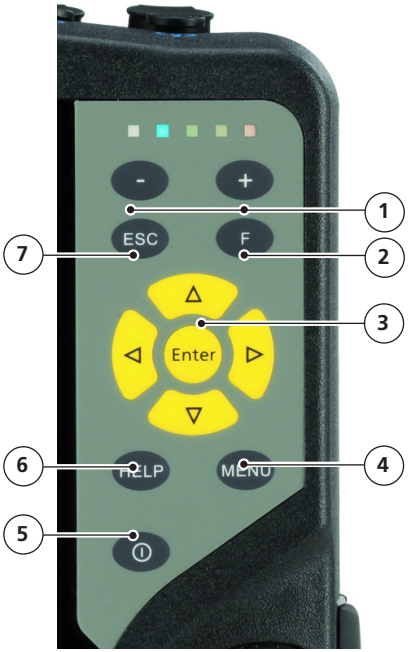

⑤ **A / B -** Measuring channels for analog signals and charging sockets.

⑥ **Temperature** - interface for thermo couple type K

⑦ **Digital input / analog output** for:
- Trigger / RPM sensor
- Data transfer via RS 232
- Strobe control

⑧ **Communication** via Ethernet / USB

## Keyboard




① **Plus (+) / Minus (-)** key
- Zoom for X axis
- Change tab

② **F key** for special functions such as tab, fast menu, search,...

③ **Navigation keys** and **Enter key**

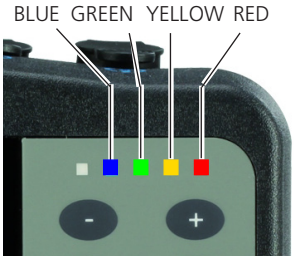
④ **MENU key** opens the menu with context-sensitive functions

⑤ **On/Off key** for switching on, switching off and restarting VIBXPERT.

⑥ **HELP key** opens context-sensitive help page.

⑦ **ESC key** is used to cancle an operation, to page back and to switch off VIBXPERT in the start screen.

## LED display




### Status indication during measurement

| LED | RED ■ | YELLOW ■ | GREEN ■ | BLUE ■ |
|---|---|---|---|---|
| **constant** | Alarm | Warning | Prewarning | Meas. OK |
| **flashing slow** | Signal overload | Signal unstable | Display off/ Measurem. incomplete | Battery almost empty |
| **flashing fast** | Battery empty (when switching on) | | Trigger signal | |

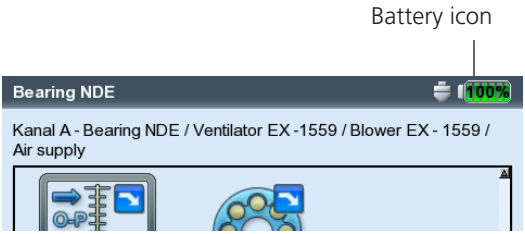
Flashing LEDs have the higher priority.
Examples:
Signal overloads and exceeds the alarm level => RED flashes.
Signal unstable and exceeds the alarm level => YELLOW flashes.

### Battery status during charging

| LED | RED ■ | YELLOW ■ | GREEN ■ | BLUE ■ |
|---|---|---|---|---|
| **constant** | Error | Battery charging | Battery full | --- |

## Power supply

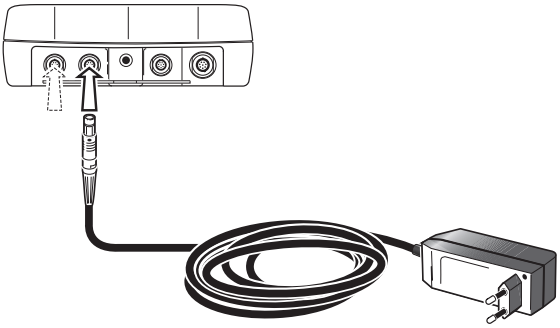
VIBXPERT is supplied with energy by a Lithium-Ion rechargeable battery. With the power on the battery icon on the display indicates the residual charge of the battery.




If the battery is almost empty, a message appears on the display and the blue LED flashes. The battery can be charged either in the device or in the external charging station (option, VIB 5.324) using the VIBXPERT charger (VIB 5.320-INT).

Follow the safety notes enclosed with the charger.

**Attention!**



Connect the VIBXPERT charger either to channel A or to channel B.

## Reports

VIBXPERT can generate the following report types:

*Screenshot*: Contains the content of the current screen.

*Measurement report:* Contains the measurement results and information on the operator and measurement.

The reports can be printed directly to a USB-printer or to a PDF file. The PDF file can be stored on a USB pendrive. Using the 'VIBXPERT utility' tool the PDF file can be copied to a PC and printed from there.

**Note**

Details on configuring the measurement report, selecting the PDF printer and transferring PDF files to a PC can be found in the VIBXPERT II Balancer manual (art. no.: LIT 53.203.EN).

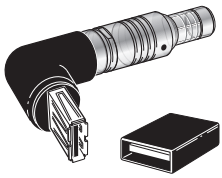
### Loading reports onto USB pen drive

Reports in PDF format can be transferred to a USB pen drive and then to a PC, where they can then be printed.

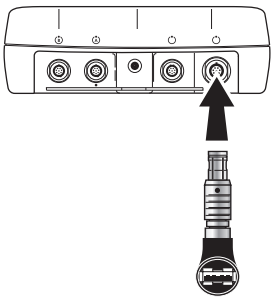
To do this, you need the following:

- VIBXPERT adapter for USB pen drive - VIB 5.330 MEM
- USB pen drive - VIB 5.330-USB

Connect the USB adapter to the communication channel (green jack). In the file manager, the USB pen drive is shown as a separate directory 'USB'.



VIB 5.330 MEM VIB 5.330-USB



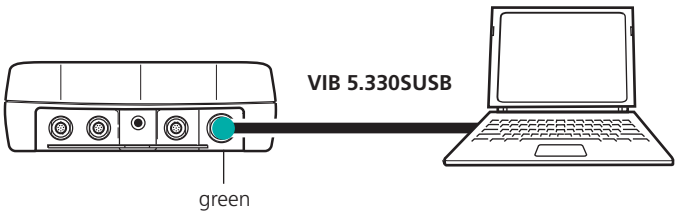
To transfer the report:

- Mark the file.
- Press MENU and click ‘Copy’ or ‘Move’.
- Mark the directory ‘USB’.
- Press MENU and click ‘Insert’.

**Measurement report in Excel format**

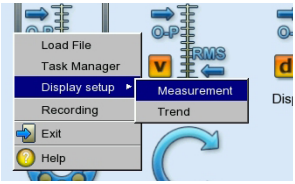
With the VIBXPERT utility from version 1.4.2, all results can be exported to Excel format. The results are documented as numerical value and shown graphically in a diagram.

## Connection to the PC



# Operation

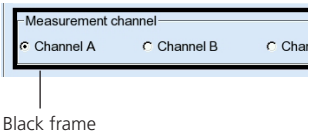
## Basic functions

| | | |
|---|---|---|
|  | Switching on, switching off, resetting VIBXPERT. | Switching on:<br>• Hold the key down for 2 seconds.<br>• The start screen appears after approx. 30 seconds.<br>Switching off:<br>• Hold the key down for 2 seconds.<br>• Confirm the query to switch off with 'YES'.<br>Resetting:<br>• Hold the key down for 5 seconds until the device switches off and restarts. |
|  | Move the cursor. | • Press the respective navigation key. |
|  | Confirm selection. | • Press the Enter key. |
|  | Open the 'Menu'. |  <br>The functions of the current program section are found in the ‚Menu'. |
|  | Cancel operation and close current screen. | • Only in the start screen: Switch off devive. |

# Examples for typical operation procedures

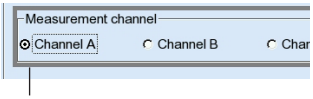
## Example 1: How to change the setting in a field

Select the respective field.



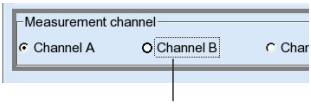

Black frame


Confirm selection and start edit mode.



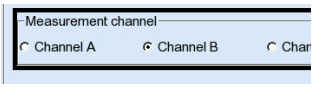

Grey frame (edit mode)

Select new setting.



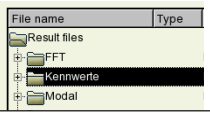
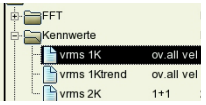

Selection has dotted frame.


Save new setting.




The Edit mode is closed. The cursor can be moved over the entire screen again.

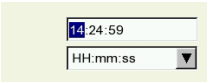
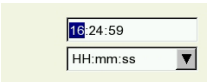
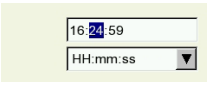
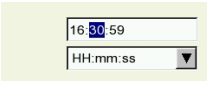
## Example 2: How to navigate in a tree view (File manager,...)

| | | |
|---|---|---|
| △ ▽ | Select a tree node in the same hierarchy. |  |
| Enter | Open the parent node and show the child nodes. |  |





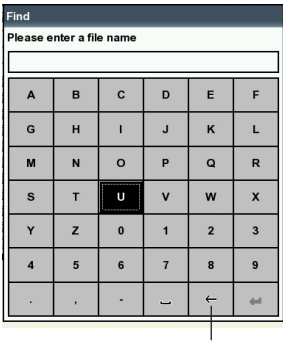
## Example 3: How to enter numbers (Time, Date, IP address,...)

| | | |
|---|---|---|
| △ ▽ | Select the respective field. |  |
| Enter | Enter Edit mode. |  |
| △ ▽ | Increase / decrease value. |  |
| ▷ | Select next value. |  |
| △ ▽ | Increase / decrease value. |  |
| Enter | Confirm changes and exit edit mode. |  |

## **Example 4: How to enter a text** (name, comment, ...)

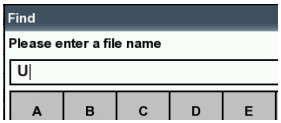
Select the respective character.

- Changing character table -> 0.1
- Deleting text -> 0.2
- Special characters (, + / ) are not allowed in a file name





Confirm selection, and enter the next character.



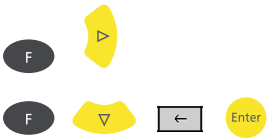


Finally save the text.


0.1 Changing character table:

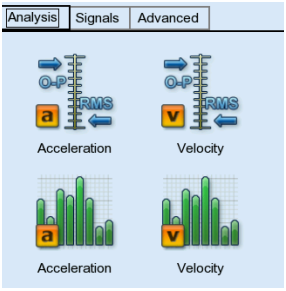

0.2 Deleting text:

- Position the cursor in the text field.
- Delete the character left to the cursor with the Backspace 'key'



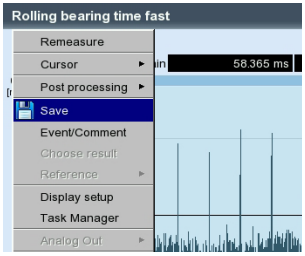

**Note**

## Analysis measurement (‘Multimode’)

| | | |
|---|---|---|
|  | Switch on VIBXPERT. | • see section ‘Basic functions’, p. 12. |
|  | Start ‘Multimode’. |   |
|  | Open tab for overall, signal or advanced measurements. |   |
|  | Select measurement icon. |   • Changing the meas. task -> 1.1<br>• New / edit task -> 1.2<br>• Connecting the sensor -> 1.3 |
|  | Start measurement. | • Sensor connection is checked, if sensor detection is enabled.<br>• Green LED is flashing during meas: Trigger OK.<br>• Blue LED lights up after the meas.: Measuement OK.<br>• Live mode: Keep the Enter key pressed when the measurement starts.<br>• Repeating the measurement -> 1.4 |

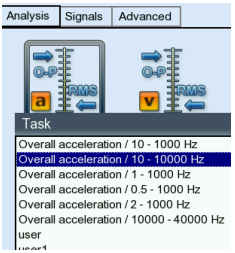
MENU Enter

Save result.




1.1 Changing the measurement task:

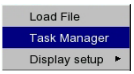
F



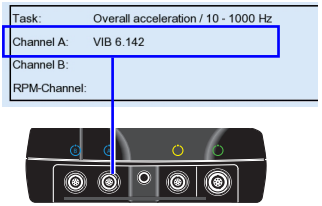

**Note**

1.2 New task / edit task:

MENU



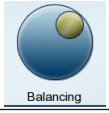
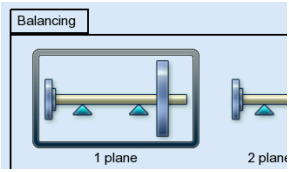
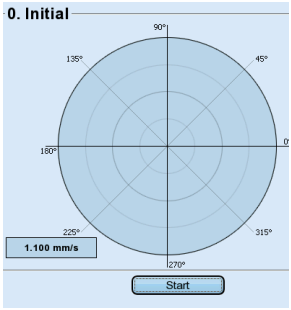

1.3 Sensor and measurement channel are displayed in the info field.

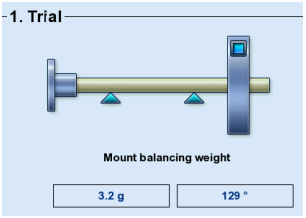
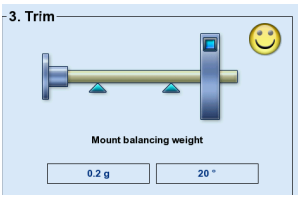



1.4 Repeating the measurement:
In the measurement screen press 'Enter' twice.

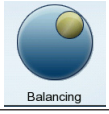
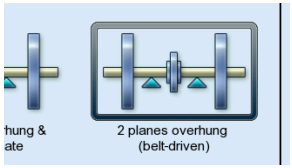
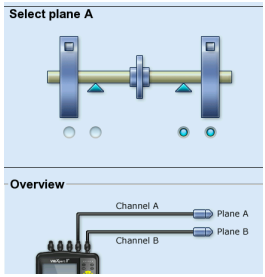
Enter Enter

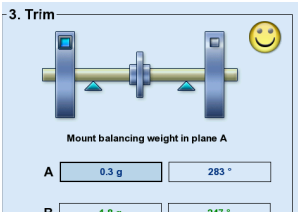
## Balancing in one plane

| | | |
|---|---|---|
| | Switch on VIBXPERT. | • see section ‘Basic functions’, p. 12. |
| Enter | Start ‚Balancing‘ mode. |  |
| △ ◁ ▷ ▽ | Select 1-plane balancing icon. |  <br>• Changing the meas. task -> 1.1<br>• New / edit task -> 1.2<br>• Connecting the sensor -> 1.3<br>page 17 |
| Enter | Open measurement screen for the Initial run. |  <br>• Switch the machine on. |
| Enter | Click on ‘Start’. | • Green LED flashes if trigger signal is OK. |
| Enter | Click on ‘Pause’, if the measurment values are stable. | • Switch the machine off. |

| | | |
|---|---|---|
| ▷ | Open the data screen for the trial run. |  <br>• Attach the trial weight on the rotor.<br>• Enter the mass and the angle.<br>• Switch the machine on. |
| ▷ Enter<br>Enter | Measure the trial run. | • Click on ‚Start'.<br>• Click on ‚Pause', if the values are stable.<br>• Imbalance should change significantly to steadily reduce the residual imbalance in the subsequent balancing runs.<br>• Switch the machine off. |
| ▷ | Prepare the 1st trim run. | • Leave the trial weight on the rotor, if the imbalance has decreased, otherwise take it off.<br>• Attach the recommended trim weight.<br>• Switch the machine on. |
| ▷ Enter<br>Enter | Measure the 1st trim run. | • Click on ‚Start'.<br>• Click on ‚Pause', if the values are stable.<br>• Switch the machine off. |
| ▷ | Prepare next trim run. |  <br>• Balancing is finished, when Smiley appears (machine setup), or the vibration level is acceptable. |

## Balancing in two planes

| | | |
|---|---|---|
|  | Switch on VIBXPERT. | • see section 'Basic functions', p. 12. |
|   | Start ‚Balancing' mode. |   |
|  | Select 2-planes balancing icon. |   • Changing the meas. task -> 1.1<br>• New / edit task -> 1.2<br>• Connecting the sensor -> 1.3 page 17 |
|   | Select plane A. |   • Connect sensor in plane A to channel A, and sensor in plane B to channel B.<br>• Switch the machine on. |
|   | Measure the initial imbalance. | • Click on ‚Start'.<br>• Click on ‚Pause', if the values are stable.<br>• Switch the machine off. |
|  | Prepare trial run in plane A. | • Attach the trial weight on the rotor.<br>• Enter the mass and the angle.<br>• Switch the machine on. |

| | | |
|---|---|---|
| ▷ Enter<br>Enter | Measure the trial run A. | • Influence of trial weight in plane A is measured in both planes.<br>• Switch the machine off. |
| ▷ | Prepare trial run in plane B. | • Attach the trial weight on the rotor.<br>• Enter the mass and the angle.<br>• Switch the machine on. |
| ▷ Enter<br>Enter | Measure the trial run B. | • Influence of trial weight in plane A is measured in both planes.<br>• Switch the machine off. |
| ▷ | Prepare the 1st trim run. | • Leave the trial weights on the rotor, if the imbalance has decreased, otherwise take it off.<br>• Attach the recommended trim weights in plane A and B.<br>• Switch the machine on. |
| ▷ Enter<br>Enter | Measure the 1st trim run. | • Influence of trim weights is measured in both planes.<br>• Switch the machine off. |
| ▷ | Prepare next trim run. |  <br>• Balancing is finished, when Smiley appears (machine setup), or the vibration level is acceptable. |
| MENU Enter | Save the results. | • Enter the file name in the text editor (page 15). |

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## Faithful companion

VIBSCANNER® is the ideal partner for your daily measuring and inspection rounds. Integrated transducers record all important machine signals. Process parameters can be supplied as analog signals or entered manually. A checklist of visual inspection tasks, e.g. 'Check oil level', assists in tracing faults. FFT and balancing is also included. Graphic user guidance and intuitive joystick navigation make operating childs play.

VIBSCANNER® – Machine evaluation, data collection & balancing


## Condition monitoring made feasible

Economical modular components and simple installation make condition monitoring with VIBREX® feasible even for smaller production aggregates. Alarm-activated switching via PLC and direct mA signal output allow machine control and measurement trending by external systems.

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VIBROWEB® lets you monitor and analyze your machine condition from around the globe. It is the first telediagnosis system in the world to takes advantage of Internet technology for communication and data transmission. When the situation at hand demands immediate attention, the VIBROWEB® instantly notifies the specialists by eMail or SMS.

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