VIBSCANNER®

Machine diagnostics
and data collection

Operating instructions

Dear Customer,
If you have any suggestions for
improving this product or this manual,
please let us know.
eMail: info@pruftechnik.com

$C \, \epsilon$ **0044**

Contents

Introduction

Foreword

This manual describes the main functions of the VIBSCAN-NER as well as the most important steps of its operation. The optional firmware modules 'FFT Analysis', 'Balancing' and 'Signal Analysis' are described in the manual 'VIB-SCANNER - FFT-Analysis & Balancing' (VIB 9.664.G).

An online help function is integrated in the instrument that can be called up at any time via the menu.

This manual is valid for firmware version 2.00 and higher.

Symbols used in this manual

WARNING!

Danger to life and limb!

Attention!

This symbol warns of operating errors that can lead to data loss or equipment damage.

Note

This symbol denotes information and tips on operating VIBSCANNER.

Intended use

- VIBSCANNER may only be used for the measurement of machine signals in industrial environments while taking into consideration the technical specifications (see "Appendix - Technical data").
  The housing is made of an electrically conducting plastic. Consequently, the instrument may only be used to measure small signal voltage (±30V) or small signal current (±20mA).

- Transducers and cables may be used only for their respective intended uses as defined in the corresponding sales leaflets.

Any other use constitutes improper use and is prohibited. PRÜFTECHNIK assumes no liability for damage resulting from improper use.

General safety

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

Risk of injury when measuring on a running machine! Observe the safety regulations. Install the measurement equipment properly. During measurement on machines with rotating parts exposed, ensure that no brackets, cables etc. can become caught in rotating machine parts.

WARNING!

- VIBSCANNER must be treated in such a way that it is not subject to any mechanical knocks.
- VIBSCANNER 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 VIBSCANNER 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.

Attention!

Environmental influences

- Portable radio-based devices can interfere with proper functioning of VIBSCANNER when operated nearby. In case of doubt, check the connecting cable between the device and its transducer.
- Keep the protective caps on the connector sockets when they are not in use to keep them clean.
- VIBSCANNER is only dustproof and watertight (IP65) when the battery is plugged into the instrument. Please note that, during the battery change, the instrument and the battery only comply with protection class IP 50 (dustproof).

Attention!

* The computer meets the requirements of the Equipment Safety Act.

Specific provisions for VIBSCANNER EX

- When equipment to be measured is located in hazardous areas, the intrinsically safe VIBSCAN-NER EX (VIB 5.400 EX) and the appropriate intrinsically safe sensors and accesories must be used.
- For vibration measurements in hazardous areas you may only use the following transducers:
Industrial accelerometer, type VIB 6.1xx DEX, VIB 6.1xx EX, VIB 6.1xx REX;
VIBCODE, type VIB 8.660 EX , VIB 8.660 HEX;
TIPTECTOR hand-held probe, type VIB 8.606 XVS.
- In hazardous areas you may not use the connection cable for extra-low signal currents (VIB 5.434) and extra-low signal voltages (VIB 5.433).
- In hazardous areas you may not recharge the battery.
- The VIBSCANNER case (VIB 5.428, VIB 5.429) and the carrying pouch (VIB 5.450) are not allowed in hazardous areas.
- VIBSCANNER EX may only be connected outside the hazardous area to a computer*.
- In hazardous areas, never use the automatic channel switchbox (VIB 5.446). Only the manual channel switchbox (VIB 5.445) is permitted.

General provisions for VIBSCANNER EX

- The installation and operation of the device must be in accordance with the regulations in the European Installation Rules (EN 60079-10:2003ff), the equipment safety law as well as the generally recognized codes of practice. The instructions in this manual must also be observed.

- The most current regulations regarding servicing, maintenance and testing, as they appear in EN 60079-14 and EN 60079-17, must be observed. The rules of the manufacturer, as they appear in this manual, and the supplied EC-type Examination Certificate must also be observed.

CERTIFICATE

Declaration of conformity in accordance with ISO/IEC Guide 22

This is to certify that the following product

Equipment / designation: **VIBSCANNER / VIBSCANNER EX**

Type / Order-no(s).:   **VIB 5.400 / VIB 5.400 EX incl. VIB 5.425/EX**

Configuration: **Measurement system and data collector for offline machine condition monitoring**

corresponds to the fundamental safety requirements as laid down in the guidelines of the advice for the approximation of laws of the member states on electromagnetic compatability **(89/336/EWG)** and electrical resources for application within specific voltage limits **(73/23/EWG).**

As additional information we notify that our production quality system complies with Annex IV of the Council Directive **94/9 EC**

EC-Type Examination Certification Number: **TÜV 01 ATEX 1699**

Marking of the equipment: (Ex) II 2 G EEx e m ib IIC T4

For the appraisal of this certication the following standards were consulted:

- **EN 61000-4-2/A1, Edition 10/1998**
- **EN 61000-4-3, Edition 10/1999**
- **EN 61000-4-4, Edition 03/1996**
- **EN 61000-4-5, Edition 09/1996**
- **EN 61000-4-6, Edition 04/1997**

- **EN 61000-4-11, Edition 04/1995**
- **EN 55011, Edition 12/98**
- **EN 50014:1997**
- **EN 50019:1994**
- **EN 50020:1994**
- **EN 50028:1987**

The party responsible for this declaration is

PRÜFTECHNIK AG
Postfach/P.O. Box 1263
D-85730 Ismaning
Telephone: 089/99616-0
Telefax: 089/99616-200

issued by   *Josef Grevenstein*
- Board of Directors -
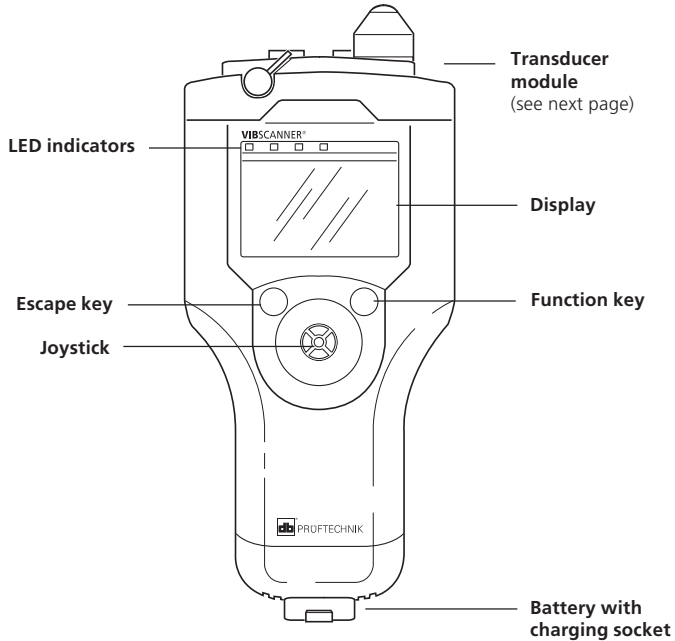
Ismaning, 18. February 2002
_____
Place and date of issue

_____
Signature

db PRÜFTECHNIK

Description

Interfaces and functional elements

Transducer module
(see next page)

LED indicators

Display

Escape key

Function key

Joystick

Battery with charging socket

LED indicators

Blue LED ...

... lights up after the measurement if the result is valid.

Green LED ...

... flashes / lights up during measurement with the internal RPM transducers.

Red LED ...

... flashes after the instrument is switched on: Battery is empty.

... flashes after the measurement: Meas. signal is overflowing/ underflowing or is instable: Repeat measurement.
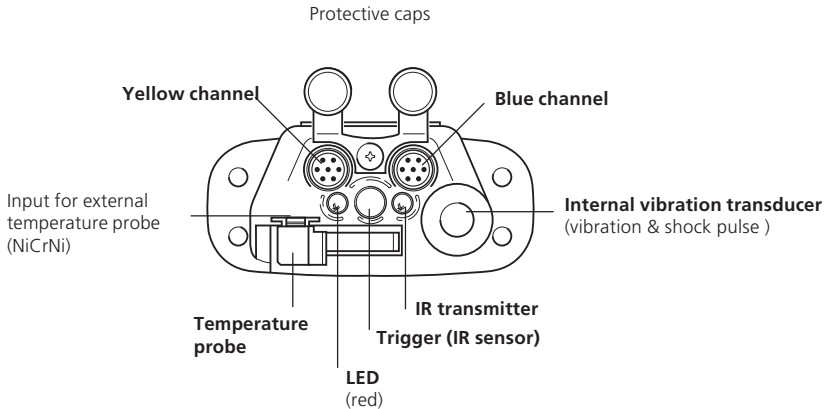
... lights up after the instrument is switched on: Instrument error. The relevant error message appears in the status line.

For the evaluation of the measurement results, the LEDs light up according to the selected limits:

Blue   = OK   Green = Prewarning
Yellow = Warning   Red   = Alarm

Transducer module

(view from above)

Protective caps

Yellow channel

Blue channel

Input for external
temperature probe
(NiCrNi)

Internal vibration transducer
(vibration & shock pulse)

**Temperature
probe**

IR transmitter

Trigger (IR sensor)

LED
(red)

Blue channel: Input for vibration transducers, Pt100 tem-
perature sensor and small signal voltage /currents ($\pm$
30V / $\pm$ 20mA). The relevant connection cables are
marked with a blue protective rubber sleeve at the
connector.

Yellow channel: Interface for data transmission (RS 232),
connection for external trigger and output for analog
signals. The relevant connection cables are marked with
a yellow protective rubber sleeve at the connector.

Internal vibration transducers: Permanently-installed
transducers for the measurement of machine vibrations
above 10 Hz and high-frequency cavitation and bearing
shock pulse signals.

Temperature: The temperature sensor (NiCrNi) is swung
out for measurement and pressed onto the object. Can
be unplugged for connection of the external probe
(NiCrNi-compatible).

Trigger: Infrared (IR) sensor for internal trigger and for
RPM measurement. The sensor registers the reflection
signals of the IR transmitter. The red LED must be aimed
at the measurement mark on the rotating shaft.

Power supply

VIBSCANNER is powered by a rechargeable NiMH battery, which is installed in the handle of the device. The battery is charged by the VIBSCANNER Charger (VIB 5.420). During the charging process, VIBSCANNER is switched off and the battery remains inside the instrument. Reserve batteries can also be charged outside the instrument.

Note

What happens ...
... if VIBSCANNER is switched on and the battery charger is connected?
> The charging process is interrupted and...
- VIBSCANNER is supplied with mains power.
- VIBSCANNER EX is supplied with battery power.

... if measurements are perfomed during charging?
> This can result in measurement errors.

... if the battery is removed longer than 10 minutes?
> VIBSCANNER loses the time and date setting.

What to do ...
... if VIBSCANNER is not in use for a prolonged period (> 3-4 weeks)?
> Remove the battery and leave it connected to the charger (does not apply to VIBSCANNER EX).
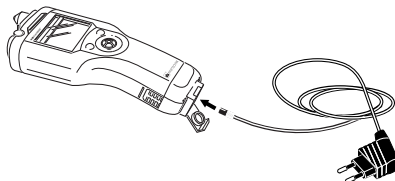
Charging the battery

Attention!

Rechargeable batteries must not be charged in hazardous areas!

- Open the protective cap on the battery.
- Connect the battery charger to the battery and to the power supply.

Before charging, the battery should be discharged as much as possible. The maximum charging time is approx. 6 hours (approx. 10 hours for intr. safe battery).
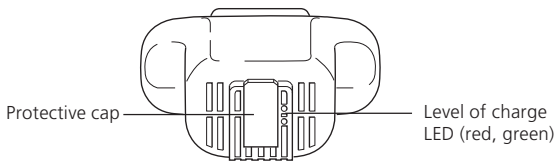

VIB 5.420

Operating state during charging

The charge level of the batteries is indicated by two LEDs:

- Red lights up: battery is being charged
- Green lights up: battery is charged
- Red flashes: battery is defective or initialization (only beginning to charge; can flash for several minutes).

Protective cap ——————— Level of charge
LED (red, green)

Charge level of the battery

The charge level of the battery appears at the bottom right of the VIBSCANNER display:

—— Level of charge
(black= battery full)
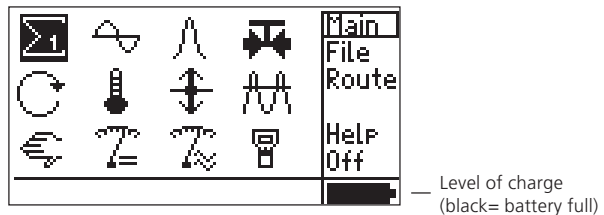
Even if the battery exhibits only a very slight memory effect, it should only be charged when it is completely discharged. Otherwise, the display of the charge level can vary from the actual charging status after several 'incomplete' charging cycles and the following message appears:

> Information: BATTERY LEVEL INACCURATE!
> The battery level display may be inaccurate....

In order for the display to show the actual charge level of the battery again, proceed as follows:

- Leave the VIBSCANNER switched on until the battery is almost fully discharged when the message appears:

> Battery empty

☞

Note

If the message appears during a measurement, you have approximately another 30 minutes time to terminate your work and save the data.

- Recharge the battery again.
  When the VIBSCANNER is switched on, the message 'Battery level inaccurate...' appears again.

- Discharge the battery again as described above, and recharge it again.
  Only when this step has been completed is the display of the charge level correct.

Handling VIBSCANNER batteries correctly

1. Never deeply discharge the battery
If the battery is nearly empty, VIBSCANNER automatically switches off to avoid deeply discharging the batteries. Since a low residual current flows even when VIBSCANNER is switched off, the battery should be taken out of the instrument if it is to be stored for a lengthy period of time and charged at regular intervals (1 month) to avoid a complete self-discharge.

2. Charge and discharge the battery completely:
Repeated incomplete discharging/charging leads to a reduction of the battery capacity through the so-called memory effect and to an imprecise loading status display. However, this can be remedied by a number of complete charging and discharging cycles ('Battery empty').

3. Store the battery in a cool place
The self-discharge of the batteries increases greatly at higher temperatures. Therefore, the battery should be stored as cool as possible (0-25°C) or, if the storage temperatures are higher, it should be recharged more often. Batteries that are not intrinsically safe should always be connected to the charger during storage ('conservation charging')
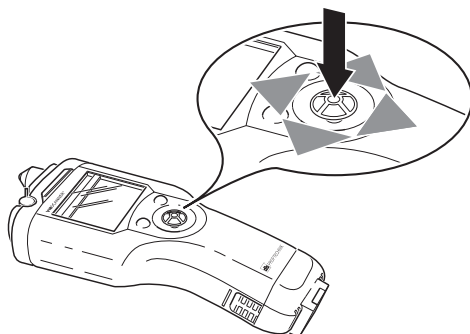
Operation

Operating elements

The VIBSCANNER has three operating elements:

Joystick

The joystick moves the cursor either horizontally or vertically on the screen. By pressing down on the joystick ('clicking'), the selection is confirmed (ENTER function).
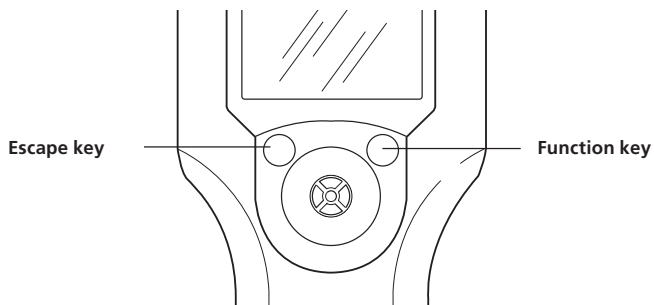

Function key

The function key is used to move the cursor from the display field into the menu column and vice-versa. As a result, you can delete incorrect entries in the text editor.

Escape key

The 'Escape key' is used to cancel a selection. It enables you to return to the higher menu from a submenu.

Escape key   Function key

Program structure

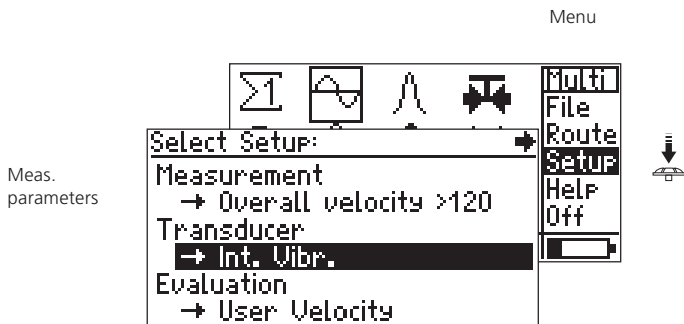The VIBSCANNER application program is graphic-oriented and menu-driven.

Graphic-oriented

a) The measurement tasks are started via corresponding icons on the screen.

b) In the basic version the measurement tasks are stored in two screens that are opened via the screen icon Σ_1 or Σ_2:

The Σ_1 screen contains measurement tasks for overall vibration and other important variables (see page 16).

The Σ_2 screen contains measurement tasks for overall vibration that are optimized for specific machine types and RPM ranges. The first line depicts the machine types and the left column defines the RPM range (see page 34).

c) A corresponding selection screen exists for the optional program modules (details of the optional modules are given in the 'VIBSCANNER - FFT analysis and balancing' operating manual - VIB 9.664.G).

Measurement tasks are selected via icons.
The selection screens are opened via the screen icon at the top left in the order they appear.
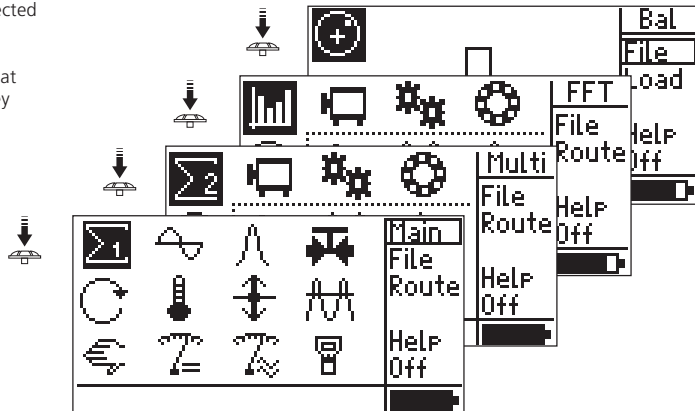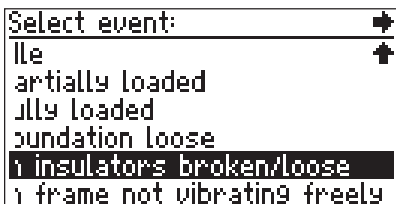
Menu-driven

a) All functions (e.g. Setup, Help, Save , File,...) are called up via the menu.
   The menu is hidden in some screens due to lack of space. To display it, either press the function key or move the joystick to the right.

b) All the measurement and instrument parameters can be changed with the joystick.

Menu

Meas.
parameters

```
Select Setup:                    →
Measurement
   → Overall velocity >120
Transducer
   → Int. Vibr.
Evaluation
   → User Velocity
```

```
Multi
File
Route
Setup
Help
Off
```

To display text that runs off the right-hand edge of the screen, push the joystick to the right.

```
Select event:              →
M 6 Machine idle           ↑
M 7 Machine partially loaded
M 8 Machine fully loaded
M 9 Machine foundation loose
M 10 Vibration insulators br
M 11 Vibration frame not vib
```

```
Select event:              →
lle                        ↑
artially loaded
ılly loaded
ıundation loose
ı insulators broken/loose
ı frame not vibrating freely
```
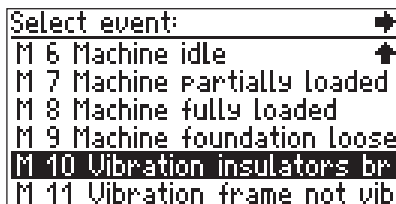
Getting started

Push the joystick upwards towards the display for one to two seconds. Release the joystick and the VIBSCANNER main window appears:

Cursor (reverse video)

Display field

Menu column

Status line
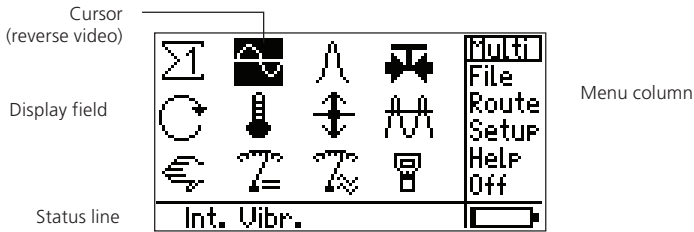
Main window[1]

The following measurement tasks can be started directly via the relevant icon in the display field:

Preset measurement tasks (line 1):
- Vibration velocity
- Shock pulse measurement (bearing condition)
- Cavitation (e.g. in pumps)

Preset measurement tasks (line 2):
- RPM
- Temperature
- Vibration displacement
- Vibration acceleration

User-defined measurement tasks (line 3)
- Manual input of measured values
- Measurement of small signal currents / voltages (DC)
- Measurement of small signal currents / voltages (AC)

Σ: Icon for the measurement of characteristic overall values. Clicking on it calls up the next screen that has measurement tasks.

VIBSCANNER setup: Instrument settings

Status line: When a measurement task has been selected, the sensor is displayed. Date and time appear when the 'VIBSCANNER Setup' symbol is highlighted.

[1] The sequence of the selection screens can be changed (p. 19)

[2] Only in the optional balancing and 'Analysis' module

Menu column:
FILE: To open the File manager
ROUTE: To start the 'Route' operating mode
SETUP: Settings for measurement, transducer, evaluation, recording[2], machine[2]
HELP: Online help on the highlighted icon
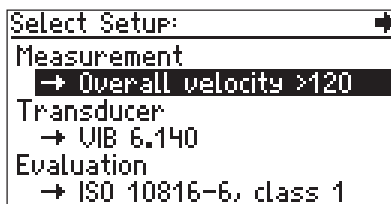OFF: to switch off the instrument

Setup menu

In the Setup menu, you can check the parameters of the selected measurement task and change them if necessary.

> The Setup menu is task-specific, i.e. the settings only apply to the selected measurement task.

- Select the measurement task with the cursor.

- Press the function key and click on 'Setup':

```
Select Setup:              ➡
Measurement
  → Overall velocity >120
Transducer
  → VIB 6.140
Evaluation
  → ISO 10816-6, class 1
```

Setup menu

Setup for measurement
- The parameters in the preselected setups can be changed.
- Changes in the measurement setup can be reset to the default settings.

Setup for transducers
Select the transducer to be used for the measurement or create a new transducer in this submenu.
- The parameters of the preselected transducer cannot be changed.
- Only transducers that conform to the settings of the measurement setup and were activated in the VIBSCAN-NER setup (see page 21) can be selected.
  Example: The lower frequency limit is set to 2 Hz in the measurement setup. For this reason, no transducers with a linearity range that begins at 10 Hz (e.g. internal transducers) can be selected for these tasks.

Setup for evaluation (optional)
Limiting values can be defined in this submenu to evaluate the measurement. Optionally, the evaluation setup can be activated.

Setup for recording (optional)
This setup forms part of the optional 'Signal analysis' program module (for details, see Operating Instructions VIB 9.664.G).

Changing parameters

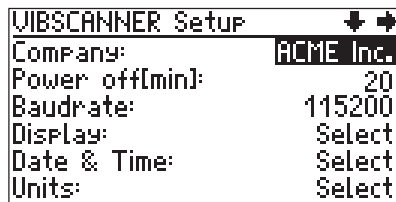Click on the parameter to open an entry mask, the text editor or a submenu:

- Parameter type 'Number': Press the joystick up/ down to change the value; Press the joystick to the left/ right to select the units, 10s, 100s, 1000s digits (multidigit numbers can be set up more quickly in this way).

- Parameter type 'Text': Enter the text in the text editor (see page 63)

- Parameter type 'Selection': The settings are selected from a submenu (i.e. 'Units'). If only a few parameters are available for selection, the submenu does not appear. The parameters can be set simply by clicking on them (e.g. 'tool tips = yes/no').

The cursor for variable parameters is displayed inverted. A frame appears around non-variable parameters.

Example of parameter types in the transducer setup
- Num: 'Power off'
- Text: 'Company'
- Selection: 'Display'

```
VIBSCANNER Setup        ⬇ ➡
Company:            ACME Inc.
Power off[min]:            20
Baudrate:             115200
Display:              Select
Date & Time:          Select
Units:                Select
```
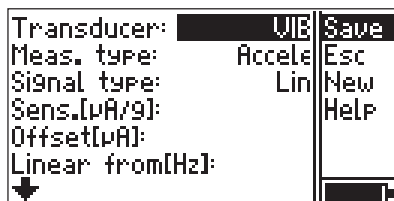
➡ Show menu
⬇ Scroll forwards

To accept the setting, click on the parameter. To cancel it, press the 'Escape key'.

If all the menu items cannot be displayed in a single window, an arrow symbol appears at the upper edge of the window. Move the cursor across the lower edge of the window to scroll forwards. To scroll backwards, move the cursor across the upper edge of the window.

*Alternatively:
Move the cursor across the right edge of the window.

Finally, save the changes. Press the function key* to show the menu and click on 'Save':

```
Transducer:      VIB  Save
Meas. type:    Accele  Esc
Signal type:      Lin  New
Sens.[µA/g]:           Help
Offset[µA]:
Linear from[Hz]:
⬇
```

Instrument settings (setup)

Click on the VIBSCANNER icon in the main window:

```
VIBSCANNER Setup      ↓ →
Company:           ACME Inc.
Power off[min]:           20
Baudrate:             115200
Display:              Select
Date & Time:          Select
Units:                Select
```

COMPANY: Company name; enter in the text editor*.

POWER OFF (MIN.): Instrument switches off if no action takes place in the selected period of time (never, 1..250 min.). No automatic switch-off occurs for the 'Never' setting.

BAUD RATE, DATA / PRINT: Speed of data transmission / print out of a balancing report.

DISPLAY: Click on 'Select' to change the following settings:

CONTRAST: Can be set between 1 and 63; the optimum setting lies between 40 and 50 units.

BACKLIT STAGE: Display illumination can be adjusted between 0 (no illumination) and 3 (very light). To save energy, the illumination should be set to '0' when working in light rooms.

BACKLIT.OFF (S): Illumination switches off if no action takes place in the selected period of time (Never, 1...240 s). To switch it on again, press any key.

SCREEN SEQUENCE: Sequence of selection screens. To alter the position of a screen, click on the list and select the required screen.

TOOLTIPS: In addition to the online help, a brief text can be displayed for each icon marked on the screen.

PRESEL. SIGNAL TYPES: Display of the transducer signal type in the transducer selection list.

DISPLAY CHANNEL A/B: Only for 2-channel measurements with the automatic switchbox - VIB 5.446. If you wish to control a channel independently of the switchbox, use the 'A/B' menu item in the Setup menu. This menu item only appears if 'Yes' is set.

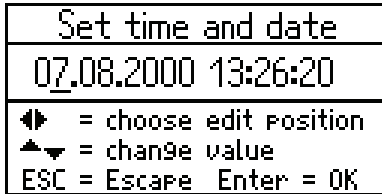FILE MANAGER SETUP: see 'File Manager' page 64.

DISPLAY: (Continued)

OVERALL VALUES: Standard display for the results of a vibration measurement (RMS + Crest (factor) / RMS + 0-P / RMS + P-P / 0-P + P-P).

SCALING (FOR) SPECTRUM: Amplitude as 0-P / RMS value

DATE & TIME: Click on 'Select' to change the following settings:

*The date and time appear in the status line if the VIBSCAN-NER symbol is marked in selection screen Σ1.

DATE & TIME: Click on 'Select' and set date and time:

```
┌─────────────────────────┐
│    Set time and date    │
├─────────────────────────┤
│  07.08.2000 13:26:20     │
├─────────────────────────┤
│ ◀▶  = choose edit position│
│ ▲▼ = change value        │
│ ESC = Escape  Enter = OK │
└─────────────────────────┘
```

- Move the cursor to the left / right to select the year, month, day and time.
- Push the joystick up (down) to increase (to decrease) the value.
- Click the joystick to accept the settings

DATE FORMAT: The available selection is: DD-MM-YYYY / MM-DD-YYYY / YYYY–MM–DD

DAYLIGHT SAVING: Selected time corresponds to summertime ('Yes') or wintertime ('No').

TIME ZONE: Time shift for 'Greenwich mean time' (GMT).

TIME FORMAT: HH:mm:ss / hh:mm:ss xx* / hh:mm:ssxx*

*'xx': AM or PM

UNITS: Click on 'Select' to set the units (ISO/US) for the following parameters:
- Vibration acceleration, velocity, displacement,
- Temperature,
- Speed
- Frequency
- Mass (only in the optional balancing module)
- Length/ radius (only in the optional balancing module)
- Production line speed (only in 'Route mode')

LANGUAGE: Click on 'Select' to change the dialog language; Delete any languages that you do not need with 'Del.' (Delete).

*'English' cannot be deleted.

SELECT AVAILABLE SENSORS: VIBSCANNER contains a comprehensive transducer database. Since, usually, only particular transducers are used, it is possible to select 'favorite' transducers here. Only these transducers then appear for selection in the list of the setup.

• Click on 'Select' to open the transducer list:
• Click on the required transducer. Selected transducers are marked by a tick.

Transducer list:
'Available transducers' with signal type

SETTL. (OPTION IN MENU), SETTLING TIME: Applies only for pulse-triggered measurement with the 'Balance', 'FFT' and 'Signal analysis' modules. In this submenu you can set the settling time for external trigger sensors.

REGISTRATION: Click on 'Select' to register the optional firmware modules (FFT, Balance, Analysis). Click on the corresponding module and enter the password in the text editor. The 'FFT' and 'Analysis' modules can be enabled for a trial period of 30 hours of operation.
Communication with the OMNITREND PC software can be enabled via 'PC License VIB.'

DEVICE INFO: Click on 'Display' to show the following information about the instrument:

- Serial number, ID number
- Date of the next calibration; A follow-up calibration is required two years after the instrument is delivered. An appropriate warning message first appears on the display four weeks before the deadline.

*Max. 97-99%, as 1-3% are occupied by languages, transducers and evaluation.

- Available memory in percent*.
- Hardware status: instrument/ digital and analog board, sensor carrier module, joystick board, LED board.
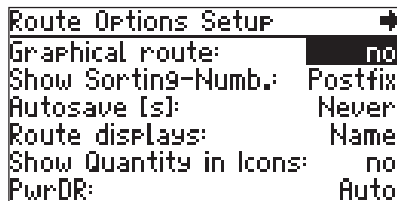This information is required in the case of a repair or calibration.

OFFSET COMP.: Various factors (aging, temperature) cause an offset in the DC circuit that increases with time. Thus, this offset should be balanced approximately every 2 months. Click on 'Select' to start the compensation procedure.

AUTOORBIT: Only applies for orbit measurements with the 'Signal analysis' module. Recording of the shaft movement begins automatically after the RPM measurement ('Yes').

SIGNAL OUTPUT: Setting the signal output (yellow socket) to 100 mV/g, 'headphone' or 1 mV/ms^{-2} (see page 51).

ROUTE OPTIONS: All settings of a route are presented in this menu:

```
Route Options Setup      ➡
Graphical route:        no
Show Sorting-Numb.:  Postfix
Autosave [s]:        Never
Route displays:       Name
Show Quantity in Icons:  no
PwrDR:               Auto
```

GRAPHIC ROUTE: Display the graphic symbols in a 'graphic route' ('Yes') or display the corresponding text-based route ('No').

SHOW SORT NUMBER: The order in which measurement locations are handled in a route can be arranged as desired. You can display the number of each measurement location before or after the name of the measurement location or not at all ('Never').

AUTOSAVE: In the route mode, the result can be saved automatically after the measurement. By adjusting the time period between the measurement and saving of the data, this function is activated.

ROUTE DISPLAYS: Display of the machine names or of the ID number in the database.

SHOW QUANTITY IN ICONS: The quantity can be displayed in the measurement task symbol for spectrum and time waveform (a,v,s).

PWRDR: (Power during route) Supply voltage for sensor on the yellow channel.
'Auto': Measurement without RFID scan head, e.g. when the RPM sensor is connected.
'Always': Measurement with the RFID scan head. The supply voltage for the RFID scan head is constantly available during the route.

ROUTE SHOWS BATTERY: The battery load icon can be hidden in the status line in order to display long machine names ('No'). This setting does not apply to the route selection window and the 'Task selection' window.

Multimeter measurement

VIBSCANNER can be used as a measuring instrument for characteristic overall values. This section describes the operating sequence of these measurements in the multimeter mode.

Vibration measurement, internal transducer

You can measure machine vibrations above 10 Hz as well as high frequency shock pulse signals of bearings and cavitation using the built-in vibration transducers.

Note
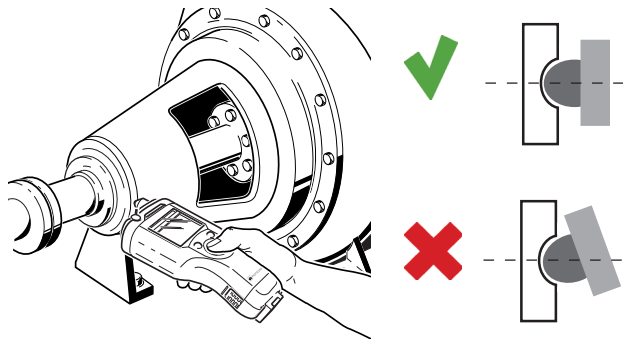
Countersink the measurement location (e.g. with special countersink bit VIB 8.610) and clean it.

- To measure the vibration level (effective vibration velocity, 10 Hz), select the vibration symbol shown on the left of the main window.

- Press the transducer perpendicular to the prepared measurement location with sufficient force (s. above).

- Click the joystick to start the measurement.

Measurement screen for vibration level

Unit

RMS / 0-peak-value

Number of averages

Transducer

Before the measurement:
If the internal vibration transducer is not selected in the transducer setup, an error message appears (for external transducer, see page 58). If a sensor fault or line fault (short-circuit, open line) occurs, a corresponding error message also appears.

After the measurement:
If the blue LED lights up after the measurement, the measurement is valid and the result can be stored (p. 26).

If the selected limits are exceeded, either the green, yellow or red LED lights up (details are given on page 53).

The red LED flashes if the signal overflows, underflows or is instable. The measurement is invalid and must be repeated:

• Press the function key to move the cursor back into the display field.
• Press the transducer against the measurement location.
• Click the joystick (ENTER) to start the measurement.

Results display for more than 2 overall values
Up to two overall values can be displayed at the same time in the results screen. When measuring more than two overall values*, you can display the hidden measurement values by leafing up and down. The standard display can be set in the VIBSCANNER setup (see page 20)**:

* RMS, 0-P, P-P value and Crest factor for vibration displace-ment, velocity and acceleration.

** If a limit is exceeded, the characteristic overall values concerned are always displayed.

1. Press the function key to move the cursor into the display field.

2. By repeatedly pushing the joystick upwards, you can display the following pairs of values:

  • RMS / Crest
  • RMS / Peak-Peak (see above)
  • 0 - Peak / Peak - Peak
  • RMS / 0 - Peak

Saving the result

If the measurement is valid, the result can be saved.

— 'Save' menu function

• The cursor automatically jumps back to the 'Save' menu function after the measurement. Click on it to open the 'File Manager'*:

File manager

— free memory in %

Directory —

File —

• Press the function key to display the menu column and click on 'New'.

• Enter the filename (max. 8 characters) in the text editor and click on 'OK'.
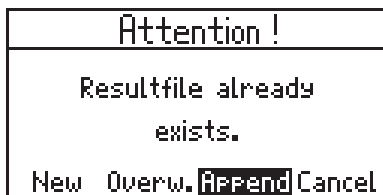
Text editor

☞

Note

Details on the text editor are given on page 63

If you click on a file in the file manager, the measurement data that are already saved are displayed.

Further options and functions in the file manager are given on page 64.

If a file already exists, the following window appears:

```
┌─────────────────────────────┐
│        Attention !          │
│                             │
│      Resultfile already     │
│           exists.           │
│                             │
│   New  Overw.│Append│Cancel  │
└─────────────────────────────┘
```

NEW: The result is saved in a new file.

OVERW.: File is overwritten. The measurement data in the file are deleted and replaced by the current result.

APPEND: The result is appended to the measurement data already saved in the file. The data record represents a trend (see page 35).

> In order not to falsify the trend, only the results that were collected at the same measurement location under the same conditions should be saved in the file.

Note

CANCEL: Save process is aborted. The program returns to the 'File Manager'.

If the evaluation setups of the two data records are incompatible, you can overwrite the 'older' evaluation.

> The files which are displayed in the file manager depend on which symbol is marked in the selection screen.
>
> For example, if the 'temperature symbol' is marked, only temperature measurements appear in the file manager.
>
> If the screen symbol (e.g. Σ1) is marked, all saved files appear.

Note

Temperature measurement

The temperatures of surfaces and liquids can be measured with the built-in temperature probe (-50 to +100 °C). External transducers must be used for wider temperature ranges (see page 60)

Note

Please note that it can take some seconds until the probe reaches the temperature of the surface. If necessary, perform a second measurement.

The measurement stops when the temperature is stable for N consecutive measurements. N is the number of averages in the 'Measurement' setup. At least three measurements must be performed. After 4xN measurements, the measurement is stopped and the last measured value is accepted.

- Swing out the probe and select the temperature icon in the main window.
- Press the probe onto the object to be measured.
- Click on the temperature icon. The measurement starts automatically and only stops when the measured value has stabilized.
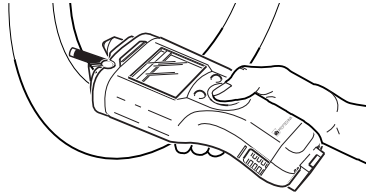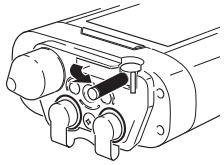
Temperature measurement screen

RPM measurement

> For a reliable RPM measurement, a reflecting mark (e.g. Reflective tape, VIB 3.306) must be attached to the shaft.
> If you attach more than one measurement mark to the circumference of the shaft, you must enter the number in the transducer setup ('Pulse/Rev.' parameter).
>
> The optimum measuring distance lies between 10 and 50 cm.

Note

- Select the RPM symbol in the main window.

- Point the VIBSCANNER at the shaft.

- Click on the RPM icon to start the measurement.

- Line up the red beam with the mark on the shaft. Hold the device horizontally.
  Every time the mark passes the beam, the reflected beam generates a trigger pulse in the device and the green LED flashes on the display. The measurement stops when the measured value has stabilized.

Line up the red beam with the mark
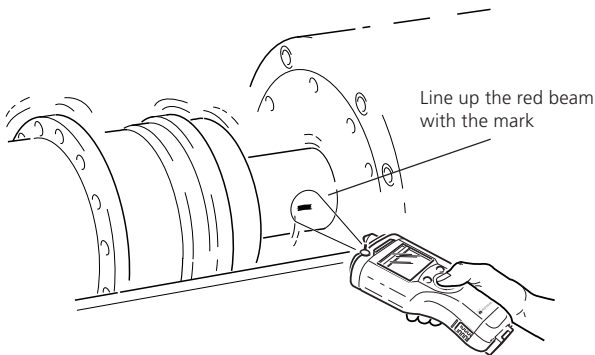
RPM measurement screen

Shock pulse measurement (bearing condition)

☞

Note

To measure high frequency shock pulse signals, use either the internal vibration transducers, the TIPTEC-TOR, the VIBCODE hand-held probe or industrial transducers with a resonant frequency of 36kHz from PRÜFTECHNIK.

Mount the transducer at the location with the strongest signal within the load zone. The signal path to the measuring location should be direct and include only one material transition. For measurement with the internal transducer or the TIPTECTOR, the measurement location should be prepared with the countersink bit (VIB 8.610).

• Click on the shock pulse symbol in the main window:

```
┌─────────────────────────────┐
│Shock pulse normalization    │
│Mode: Measure RPM intern     │
│dBa: 0          dBia:  --    │
│ ⟳  --   1/MIN  Meas. RPM    │
│ ⌀  50   MM                  │
└─────────────────────────────┘
```

• Enter the parameters required for normalization of the measured values. The 'Mode' parameter can be set by repeatedly pressing the joystick.

If you do not want to make normalized measurements, set the 'Mode' parameter to 'No normalization'.

☞

Note

The RPM and shaft diameter determine the initial value (dBi). External influences on the signal are taken into account in the adapted value, dBa. Both factors result in the adapted initial value, dBia:

$dBia = dBi(RPM; \emptyset) + dBa$

The normalized shock pulse value (dBn) is given by:

$dBn = dBsv - dBia$;   dBsv: measured value

- The RPM can be entered manually or measured before the shock pulse measurements are performed.

- Manual input:
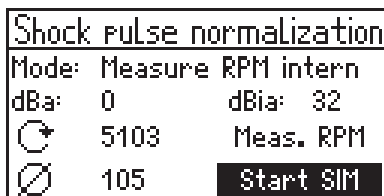 Set the 'Mode' parameter to 'Manual Input' and enter the RPM value[1].

- Measurement:
  Set the 'Mode' parameter to 'Measure internal RPM' or 'Measure external RPM'[2] and click on 'Measure RPM'. Measure the RPM as described on page 29 and then click on OK to accept the RPM value.
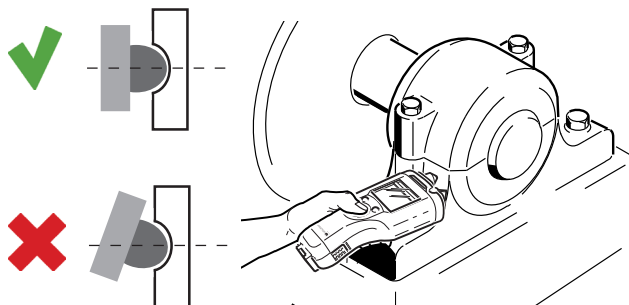
[1] 60Hz: 3600 rpm
  50Hz: 3000 rpm;
The value is retained after the instrument is switched off.

[2] External RPM sensor required (see page 61)

- Select the 'Start SIM' option.

```
┌─────────────────────────────┐
│Shock pulse normalization    │
├─────────────────────────────┤
│Mode: Measure RPM intern     │
│dBa:  0          dBia:  32    │
│ ☞    5103       Meas. RPM    │
│ ⌀    105        Start SIM    │
└─────────────────────────────┘
```

- Press the transducer perpendicular to the prepared measurement location with sufficient force.

If the transducer is permanently installed, connect the transducer cable to the instrument.

- Click on 'Start SIM' to start the measurement.

Manual input of the measured value

Measurement data that were collected with another measuring instrument can be entered manually.

Set unit and measured quantity

Before entering a measured value, ensure that the correct measured quantity and unit have been selected. To do so, check the transducer setup:

- Select the 'Hand icon' in the main window.
- Open the transducer setup (Setup -> Transducer)

```
Manometer              ← →
  →             Manometer
Sens. Name:        Select
Meas. type:          User
Signal type:       Manual
Edit quantity:    Pressure
Engin.Unit:          none
```

New transducer:
- Click on the first line ('->') to display the list of 'manual' transducers.
- Press the function key and click on 'New' in the menu.
- Enter a name in the text editor.
- Set up the following parameters:

  SENS. NAME: Name of transducer (text editor)
  MEAS.TYPE: Measured quantity depends on the signal type
  SIGNAL TYPE: Set to 'manual'
  EDIT QUANTITY: Description of the measured quantity
  ENGIN. UNIT: Unit (text editor)
  DECIMAL: Decimal places of the results display

Enter the measured value

- Click on the 'Hand icon' in the main window.
- Enter the measured value in the numerical editor and then click on OK.
- Save the input with 'Save'.

```
      Enter Pressure
            55 hPa
 1 2 3 0  │ OK  │MIN:
 4 5 6 .  │ Del │        0.0
 7 8 9 ±  │ ESC │MAX:
                 │    10000.0
```
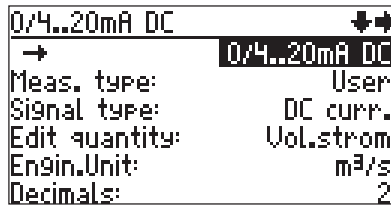
User-defined measurement tasks

Process parameters (e.g. pressure) can be measured as a level (DC) or as a characteristic value of a signal (AC).

Level measurement (DC)
To check and set up the measuring parameters:
- Select the icon for level measurements in the main window.
- Open the 'Measurement' setup (Setup -> Measurement) and set up the number of averages, the delay and the type, if necessary.
- Open the 'Transducer' setup (Setup -> Transducer) and set up the following parameters:

```
0/4..20mA DC            ← →
→              0/4..20mA DC
Meas. type:            User
Signal type:       DC curr.
Edit quantity:     Vol.strom
Engin.Unit:           m³/s
Decimals:               2
```

-> (FIRST LINE):	Opens the transducer list
MEAS.TYPE:	User-defined quantity
SIGNAL TYPE:	DC voltage or DC current
EDIT QUANTITY:	Description of the measured quantity
ENGIN. UNIT::	Unit as 'engineering unit'
DECIMAL:	Decimal places of the results display
SENSITIVITY:	Sensitivity of the transducer
OFFSET:	Offset of the transducer

To perform the measurement, connect the VIBSCANNER to the transducer and click on the relevant icon in the main window.

Signal measurement (AC)
For a user-defined signal measurement (AC), proceed in the same way as described in the previous section. The frequency range and resonating frequency must be entered as additional transducer parameters.

Machine specific measurement tasks (screen Σ2)

A reliable assessment of the vibration status of a machine can be carried out with the aid of suitable variables. It has been shown that - independent of the machine type and RPM range - only certain vibration values can be used.

For example, the shock pulse value provides satisfactory results for high-speed and medium high-speed running bearings, but, for slow-speed bearings ($n < 120$ min^{-1}), the vibration acceleration should be recorded.

For these cases VIBSCANNER has adapted measurement tasks ready that are located in the 2nd selection screen. Each measurement icon on the screen is assigned a machine type (top line) and an RPM range (left column).

Click on the screen symbol at the top left until selection screen Σ2 appears:

Adapted vibration measurements:
2nd window (Σ2)

High RPMs

Medium RPMs

Machines (general)   Gears   Bearings

☞

Note

For a detailed description of the measurement task, select the relevant icon and click on 'Help' in the menu.

To display the measurement tasks for low RPM ranges, move the cursor across the lower edge of the window.

Trend

The development of the machine condition can be recorded and documented with the aid of a trend measurement. In this case, characteristic values are always regularly recorded at the same measurement location under the same conditions. The results are saved in a file.

Trend display

- Mark a measurement task in the selection screen (Σ1, Σ2), and click on 'File' in the menu to open the file manager (see Note, page 27):

'File Manager'
(see page 64)

- Click on the file containing the trend data:
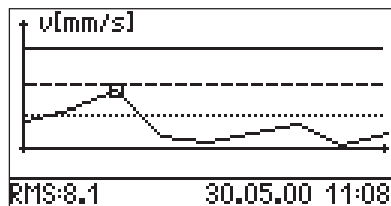
Limit for
'Alarm'
'Warning'
'Prewarning'

The status line displays the measured value as well as the date and time of the highlighted measurement.

Joystick functions:

Right/ left: Move the cursor along the trend curve
Top/ bottom: Display trend for RMS, 0-p, p-p
Double-click: Start a new measurement
Single-click: Zoom the trend curve (see next page)

Zooming the trend curve

Individual sections of the trend curve can be zoomed on the display by clicking on them. For example, measurements recorded shortly after one another can be displayed with a better resolution as a result.

The following example shows the trend of several measurements from 26.08.02 and one measurement from 09.09.02. The time axis is linear. This displays the 'older' measurements across a width of only a few pixels and cannot be resolved any further:

7 measurements from 26.8.02 (not resolved)

1 measurement from 09.09.02
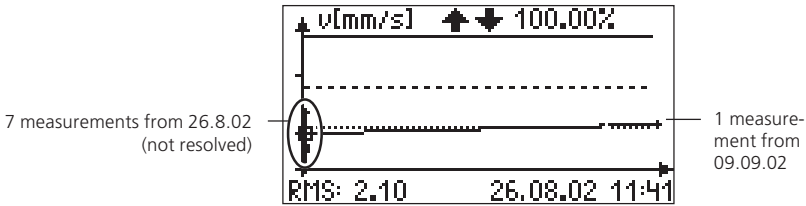
Procedure:
- Move the cursor to the section to be zoomed.
- Click once with the joystick:

Display range = 0.01%

7 measurements from 26.8.02 (resolved)
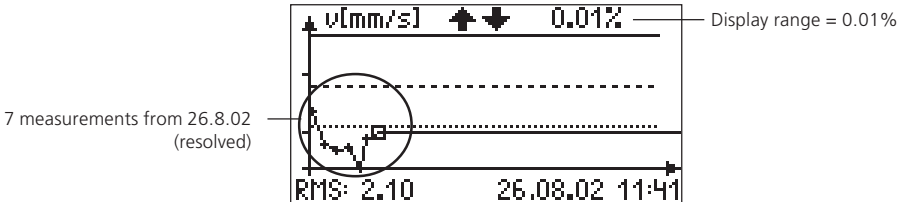
Trend information

The measured value, date and time for each individual measurement are saved.

• Press the function key, and click on 'Info' in the menu.
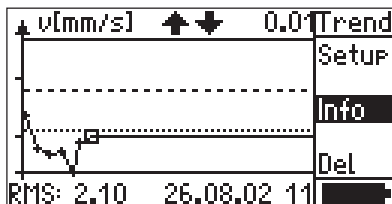
Display setup parameters

Route

In the 'Route' mode, you can record measurement data that - when measured at regular intervals - reliably reflect the operating state of a machine and how it develops. The measurement locations and their order are defined in OMNITREND*.

*The measurement location order in a route may differ from the order in the OMNITREND database.

☞

Note

- User-guidance on a route is text- or graphics-based.
- Text-based: Measurement locations are listed with their name and path in the OMNITREND database in the order in which they are measured.
- Graphics-based: Measurement locations are displayed as graphics (see page 45). The measurement order may differ from the graphical display. Graphics-based routes can also be displayed on a text basis.
- Settings for the 'Route' mode are found in the VIBSCANNER setup and in the menu of the route selection window (changes are only temporary).

• Click on 'Route' in the menu to open the route selection window.

• Click on the required route.

Selection of the route

```
Please select route       ➡
    ACME Inc. daily
    ACME Inc. weekly
                        ▮▮▯
```

• Select the aggregate on which you want to measure from the list:

Selection of the aggregate
= driving & processing machines
(e.g. motors & pumps)

```
Please select node        ➡
    Paint Shop SM
    VSC_RPM
    Exhaust fan
    Test Blower
\North Area               ▮▮▯
```
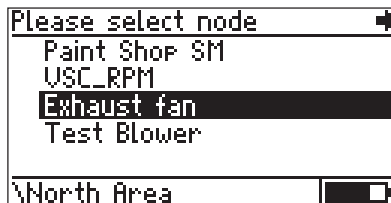
- Click on the measurement location in the next window. The number (#) indicates the measurement order. If a reference measurement (e.g. RPM) has been set up, it will be the first measurement to be called up (page 47).
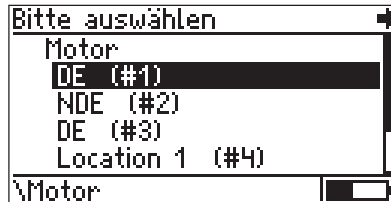
Selection of the measurement location

- Select the measurement task:
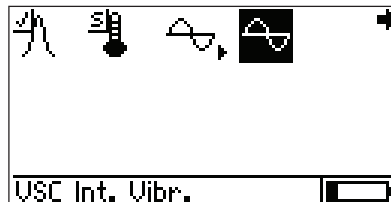
Selection of the measurement task

- Connect the transducer specified in the status line to the measurement location and to the VIBSCANNER.

- Click the joystick to start the measurement.

- Click on 'Save'. If the 'AutoSave' function is active, VIBSCANNER saves the result automatically (page 23).

After saving, the next measurement starts automatically. Keep the sensor connected to the measurement location if you wish to perform...
... several measurement tasks,
... at the same location,
... with the same sensor.

Note

Options in the Route mode

* Route element:
Aggregate, Machine, Location,
Task

```
Route
Help
Info
Skip

Setup
```

- Info:
  Statistical data on route; current location in the route and next measurement location.

- Skip:
  Enables you to skip the selected route element*. Thereafter, the route is considered to have been processed. Example: If an aggregate is temporarily switched off, no measurements can be performed on it.
  'Skipped' elements are marked by an 'S symbol'.

- Setup: (in the Route selection window, page 38)
  Here you can check the settings for the 'Route' mode and change them if necessary. Changes are only stored until the device is switched off.

```
Route
Help

Del
Pool
  <<-
```
<<- : Return

- Delete: (in the Route selection window, page 38)
  Delete a route.

- Pool:
  Contains measurement tasks that have been added to the route as 'reserve measurements'. Pool measurements are only performed when needed. The measurement order corresponds to that of the route. To return to the route measurements, click on 'Route' in the menu.

Icons in the measurement task screen

Measured task	Skipped task	Adaptive task	Diagn. task	Reference task

VSC Int. Speed
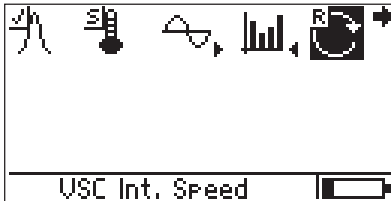
Adaptive measurement task

(only for characteristic overall values)

In 'adaptive measurement tasks' a further diagnostic measurement starts automatically when a limit has been exceeded. In this way, the sequence of the route adapts itself to the local machine status ('adaptive'). This diagnostic measurement may be a spectrum or further characteristic overall value and was defined in the OMNITREND software.

The limit that triggers the diagnostic measurement (prewarning, warning, alarm), is defined as an 'adaptive trigger' in the OMNITREND software. If no 'adaptive trigger' is defined, the diagnostic measurement is triggered when the smallest limit is exceeded.

☞

Note

Adaptive measurement tasks are marked by an arrow in the task screen:
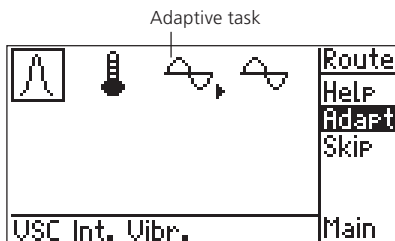
Adaptive task

The stored diagnostic measurement task can be displayed by clicking on 'Adapt' (Adaptive) in the menu. To hide the task, click again on 'Adapt'.

Diagnostic task (spectrum)
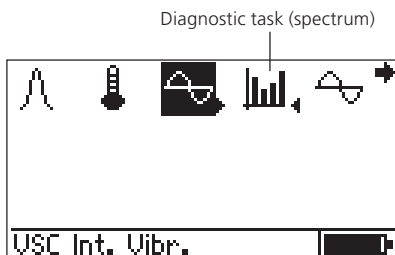
Event

You can store additional information on special incidents on the machine together with the measuring result. You can select these data from a predefined event list (EVENT) and add a comment (COMM) to the data record if necessary.

```
┌─────────────────────┬───────┐
│     Temperature     │ Route │
│         °C          │       │
│                     │       │
│        33           │       │
│                     │ Event │
├─────────────────────┤ Save  │
│     up. Alarm       │       │
│       △: 305        │ ▬▬▬   │
└─────────────────────┴───────┘
```

- Click on 'Event' (EVENT) after the measurement and select the event group (e.g. 'drive motor problem'):

```
┌──────────────────────────────┐
│ Select event group:       ➤  │
│ B Anti-friction bearing proble│
│ D Drive motor problem        │
│ F Transport medium problem   │
│ G Gearbox problem            │
│ H Bearing housing problem    │
│ I Fan problem             ➥  │
└──────────────────────────────┘
```

- Click on the event (e.g. 'drive RPM high').
- Press the function key and, if necessary, enter a comment (COMM).
- Finally, click on 'Save'.

```
┌──────────────────────┬───────┐
│ Select event:        │ Event │
│ D 1 Drive motor replac│ Comm │
│ D 2 Drive motor repair│ Esc  │
│ D 3 Drive motor rewou │      │
│ D 4 Drive RPM low     │      │
│ D 5 Drive RPM high    │ Save │
│ D 6 Drive RPM fluctuate│      │
└──────────────────────┴───────┘
```

Note

To display text that runs off the right-hand edge of the screen, push the joystick to the right.

Visual inspection

In addition to electrically measurable machine signals, you can also enter data in VIBSCANNER that you collect by visual inspection. The designated measurement tasks are created in the OMNITREND PC software and downloaded within a route into the data collector. The inspection data can then be entered onsite either as an event or choosen from a list with predefined results.

For example, you can be asked to check the oil level at a pump:

• Click on the Visual inspection 'eye' icon to open the input screen.
   The possible results were defined when setting up the 'measuring task' in the OMNITREND PC software:
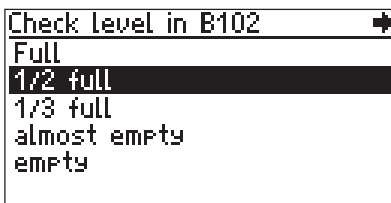
• Click on the corresponding result.
• Press the function key and enter a comment ('Comm') if required.
• Then click on 'Save'.
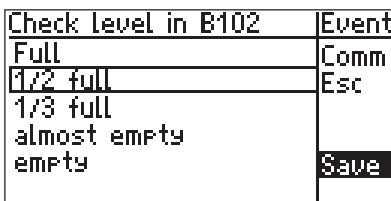
Measurement with the VIBCODE transducer

The processing of the route is simplified by the use of the VIBCODE transducer as the transducer recognizes the measurement location from the coding and the programmed measurement tasks are performed automatically.

- Connect the VIBCODE transducer to the instrument. Use the cable supplied for this (VIB 5.436).

- Connect the VIBCODE transducer to the meas. location.

* If the measurement location is stored in the pool, the VIBSCANNER changes to 'Pool mode'.

- Click on 'Route' in the main window and open the route. VIBSCANNER reads the number of the meas. location and automatically starts the measurement task*:

```
┌──────────────────────┬────────┐
│  RMS        0-P       │Route   │
│       mm/s            │        │
│                       │        │
│  2.7      17.7        │        │
│                       │Event   │
│2/2                    │Save    │
├──────────────────────┼──────  │
│VIBCODE: 0003          │   ▬▬   │
└──────────────────────┴────────┘
```

- Click on 'Save' to save the result.
  If further tasks are stored at this VIBCODE measurement location, these tasks are performed automatically.
  If all the tasks at this measurement location have been processed, the list of measurement locations is displayed

```
┌──────────────────────────────┐
│Please select node         ➡  │
│  Pumpe 3116-208              │
│  DE Lager                    │
│  Coupling Side               │
│  VIBCODE 0003                │
│  VIBCODE 1785             ⬇  │
├──────────────────────────────┤
│\Pumpe 3116-208      ▬▬▬  │
└──────────────────────────────┘
```

- Unplug the VIBCODE transducer and connect it to the next VIBCODE measurement location. The measurement procedure as described above is repeated.

Graphical route

A graphical* route eases data acquisition by providing a graphical display of the machine, measurement location positions and measurement direction. The selection and arrangement of the graphical elements can be adjusted in the OMNITREND PC software.

The order is the same as in the text-based route (page 38ff) and is identical up to the selection of the aggregates:
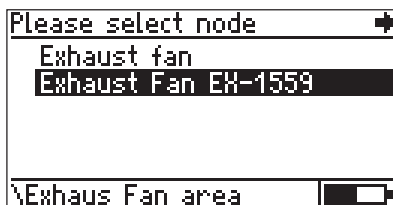
Selection of the aggregate

Example:

The aggregate selected here ('Exhaust fan EX-1559') consists of a ventilator ('Ventilator 12') and a drive motor ('Motor B145').

The selected machine is surrounded by a frame; to navigate, move the joystick in the corresponding direction (here: to the left).
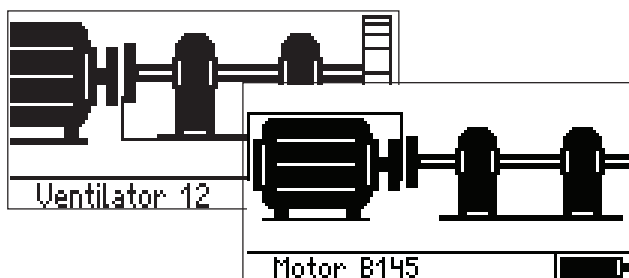
Aggregate (graphical overview)

* The display of the machine symbols can be deactivated in the instruments settings ('Route setup'). The route is then displayed as text.

• Click on the motor. Depending on whether the machines are shown in the side view (see fig.) or in the top view, the symbols indicate the following measurement directions:

	Side	Top
⬇ ⬆	vert.	horiz.
⊠ ▣	horiz.	vert.
◆ ➡	axial	axial

Location and measurement direction

- Select the required measurement position using the joystick (selection flashes), and click on:
- Connect the transducer specified in the status line (here: Industrial accelerometer VIB 6.142).
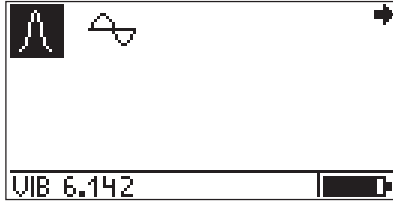
- Start the measurement by clicking on the task icon.

After all measurement locations of the motor have been completed, the program jumps automatically to the next machine (here: 'Ventilator 12').

Note

Gear is stored in the route, but gear symbol is missing

A question mark (?) appears if a graphic element has not been selected in OMNITREND for the particular route element.

In this case, you can either continue to process the route by clicking on the question marks, or correct the graphical route in the OMNITREND software and reload it into the instrument.

RPM-dependent parameters

The RPM is required as an additional parameter in the following measurements:

- Shock pulse measurement ->
  for the normalization of carpet and maximum value

- FFT spectrum ->
  for the display of RPM-dependent (damage) frequencies in OMNITREND

So that the RPM does not always need to be recorded before each of these measurements, VIBSCANNER together with OMNITREND provides the following functions for the route mode:

- Train speed
- Production line speed

Train speed

For a single machine train (e.g. motor-gear-pump), a reference RPM is always recorded first. The RPM value is then converted for all measurement locations on the machine train and saved together with the results of the measurements listed above. The conversion factors are defined in OMNITREND and take into account the different RPM relations in the machine train (e.g. in gearing).

*You can measure the speed on-site or enter it manually. To enter it manually, select a sensor of the 'Manual Entry' type in OMNITREND.

Shock pulse (roller bearing), 1000 rpm

Gear spectrum (OUT), 1000 rpm

Reference RPM, 1500 rpm

Motor spectrum, 1500 rpm

Gear ratio = 3:2
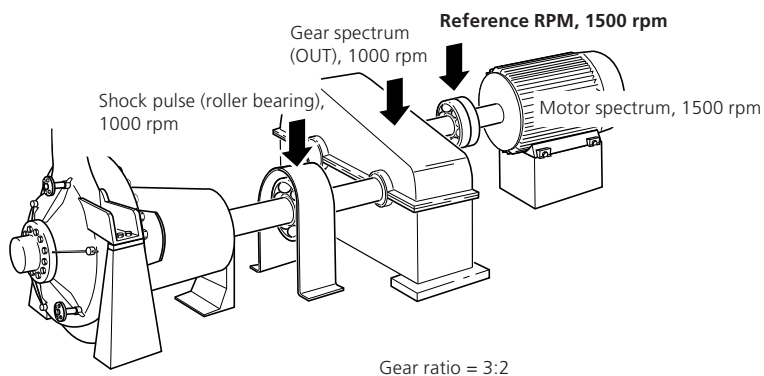
The measurement location for the reference measurement is called up first before all other measurement locations on the machine. An 'R' symbol indicates the corresponding route element:

Reference measurement ('R') in the measurement location selection
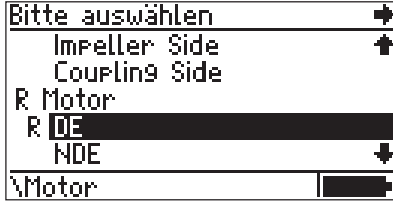
• Click on the reference measurement locations (here: 'Motor/DE') and start the reference RPM measurement:
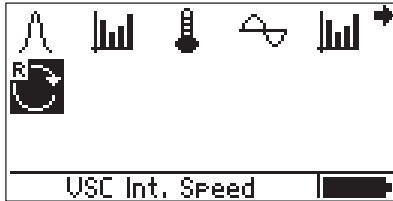
• Then carry out the remaining measurements on the machine train.

If you start a measurement without first having measured the reference RPM, the following warning appears:
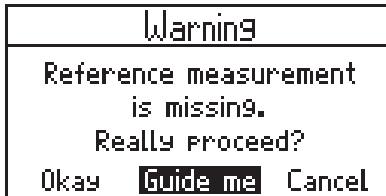
OKAY: Measure without reference RPM.
GUIDE ME: Call up reference measurement location.
CANCEL: Return to measurement task selection.

☞
Note

Parameters that are not dependent on the RPM (e.g. temperature) can also be measured before the reference RPM. Click on 'Okay' when the above warning appears.

Production line speed

A production line consists of several machine trains. In the case of a paper machine, a machine train consists of, e.g. the drive motor, the gear, the bearing roller and associated bearings.

The RPM at any measurement location can be calculated from the line speed in a production line (e.g. paper machine, conveyor belt,...) and the diameter of the individual bearings. In addition, the different RPM ratios (e.g. due to gears, slip,...) are taken into account for each bearing (see previous section 'Train speed').

The bearing diameter and RPM conditions are set up in OMNITREND, and the production line speed is entered in VIBSCANNER before the measurement on site.

Example:
Shock pulse measurement and envelope spectra on rolling bearings with different RPMs.

ni: RPM   n1   n2   n3
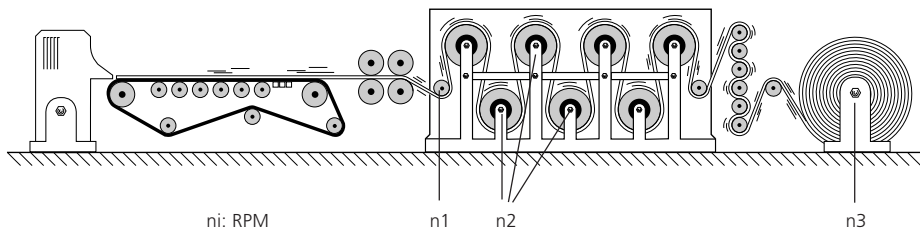
When you click on a machine train at the beginning of a route that is part of a production line, this screen appears:

- Enter the speed, and click on 'OK'.
- Then continue with the route as usual.

👉 **Note**

The entered speed applies to all machine trains of the production line and is only requested once. If the route is discontinued and recorded again later, the speed must be entered again.

If you leave the entry screen with 'ESC', and want to start a measurement, the following warning appears:

```
┌─────────────────────────────┐
│          Warning            │
│─────────────────────────────│
│                             │
│    Linespeed is missing.    │
│                             │
│ Proceed   Cancel  █Enter█   │
└─────────────────────────────┘
```

- Press 'Proceed' to continue and record variables that are not RPM-dependent (e.g. temperature).
- Press 'Enter' to then enter the production line speed.
- Press 'Cancel' to return to the previous screen.

If the production line speed is changed during the route, you can update the value:

- Press the function key in the measurement location selection to open the menu.
- Click on 'Line', and enter the speed*.

```
┌──────────────────────┬──────┐
│Please select node    │Route │
│  Centrifugal Pump    │Help  │
│ █Impeller Side█      │Info  │
│  Coupling Side       │Skip  │
│  New Measurement L   │      │
│                      │█Line█│
│\Centrifugal Pump     │ <<-  │
└──────────────────────┴──────┘
```

👉 **Note**

The updated speed does not apply to the already saved measurement results.

Signal output

The recorded vibration signal is available at the analog output (yellow socket). It can be tapped with the VIBSCANNER cable - VIB 5.431 - and displayed on a further processing measuring instrument (oscilloscope, vibration analyzer,...). The signal can be listened to via a headphone that is directly connected (VIB 6.670).
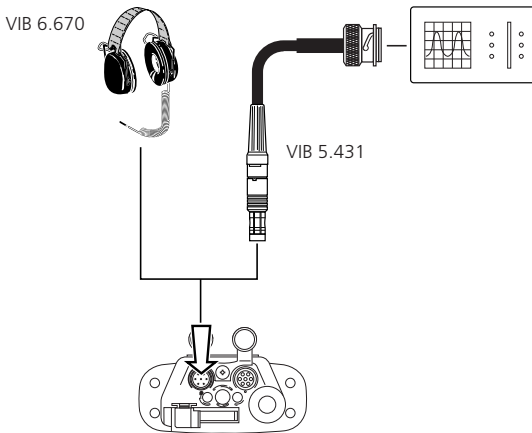
In the VIBSCANNER setup (page 22), the output level can be set to:

'1mV/ms^{-2}'   (vibration acceleration)
'100mV/g'   (vibration acceleration)
'Heaphone'   (vibration acceleration/
     envelope for shock pulse)

Headphones

The headphone is used to listen to the machine vibration signal (vibration acceleration) or the bearing signal (shock pulse).

Measuring procedure
- Set the 'Signal output' parameter in the VIBSCANNER setup to 'Headphones'.
- Connect the transducer to the measurement locations, and start a vibration measurement.
- Put on the headphone in order to listen to the signal.

Changing the volume

- To change the volume, wait until VIBSCANNER has completed the measurement. The signal continues to be available on the analog output.
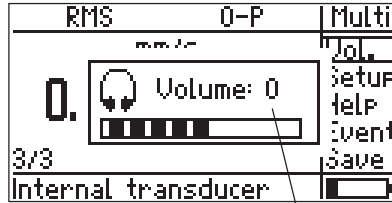
Volume (-4 to +4)

- Then click on 'Vol' (volume) in the menu.

- Move the joystick to the right to increase the volume (up to +4), or to the left to reduce the volume (down to -4).

- To terminate the volume adjustment, press any key.

Note

In the comparison of two measurement locations, adjust the volume at the 'louder' measurement locations. When switching to the second measurement location no new measurement may be started, as otherwise the amplifier setting and, thus, the volume will change ('Autorange'). Consequently, comparison would no longer be possible.

Normalized noise level

With the amplifier setting '100mV/g', the normalized machine noise is output. Comparison measurements are possible, but the volume cannot be changed in this mode.

Limits

The VIBSCANNER uses limits that comply with ISO norms or user-defined settings to evaluate the measurement results. Depending on the limits selected, one of the four LEDs above the display lights up after measurement:

Blue=OK;
Green=Prewarning;
Yellow=Warning;
Red=Alarm

For vibration measurements, limits corresponding to the new ISO 10816-3 can be set up (page 66).
For the shock pulse measurement (bearing condition), the upper alarm value is preset:
- Carpet value = 15 dBn
- Max. value = 35 dBn

User-defined limits must be set up for all further measurement tasks.

Display when a limit is exceeded

If a limiting value is exceeded, the limit that is exceeded and the difference between both values are also displayed as well as the measured value.

Example: Vibration velocity measurement with limiting values according to ISO 10816-3 Group 1, rigid foundation (Prewarning limit: 2.3 mm/s). The green LED above the display lights up.

'Upper Prewarning limit'

Meas. value 'minus' limit

For the characteristic overall values, 0-Peak (0-p) and Peak-Peak (p-p), no limiting values are specified in the ISO 10816-3 norm.

Note

Limits according to ISO

The ISO 10816-3 norm (page 69) can be used for the evaluation of vibration measurements.

Setting up the setup for evaluating the results

• Select the vibration icon* and click on 'Setup'.

*The limits for vibration displacement measurement are set up in the same way.

```
Select Setup:              ➡
Measurement
  → Overall velocity >120
Transducer
  → Int. Vibr.
```
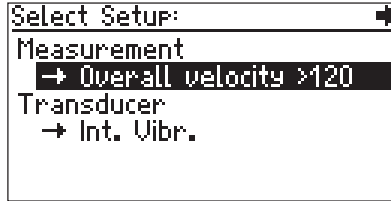
• Move the joystick to the right and click on 'Opt.' (optional setups):

```
Select Setup:        |Multi
Measurement          |Opt.
  → Overall velocity >|
Transducer           |
  → Int. Vibr.        |
                     |Help
                     |     ▶
```
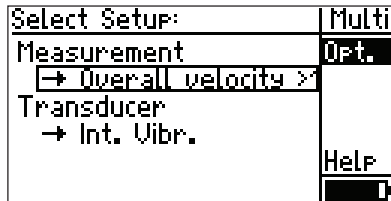
• Click to activate the optional setup for 'Evaluation'.

```
Select Setup Option:
Evaluation:          active
```

• Press the function key and click on OK. The evaluation setup list appears:

```
Select Eval. Setup:      ↓→
ISO 10816-3   (8 subs.)
ISO 10816-4   (1 subs.)
ISO 10816-5   (5 subs.)
ISO 10816-6   (7 subs.)
IEC 60034-14  (16 subs.)
ISO/DIS 14694 (10 subs.)
```
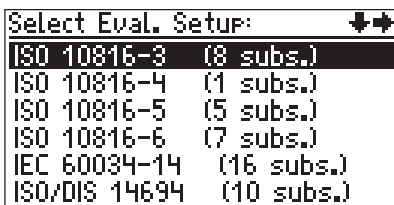
- Click on 'ISO 10816-3' to select the machine group and the type of foundation.

```
ISO 10816-3              ↓→
group1, rigid
group1, flexible
group2, rigid
group2, flexible
group3, rigid
rotat. machines, 300kW..50MW
```
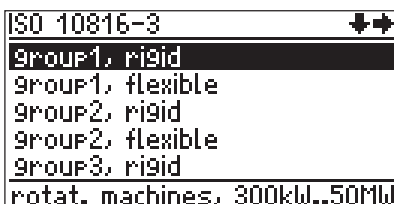
This sets the limits for Prewarning, Warning and Alarm. The program returns to the setup menu.

To view the limit, click on 'Evaluation' in the 'Setup menu':

```
Select Setup:            →
Measurement
  → Overall velocity >120
Transducer
  → Int. Vibr.
Evaluation
  → ISO 10816-3, group1
```

Move the cursor to the end of the list:

```
ISO 10816-3              ↑↓→
Limit:          Prewarning
Upper Limit RMS:      2.30
Limit:             Warning
Upper Limit RMS:      4.50
Limit:               Alarm
Upper Limit RMS:      7.10
```
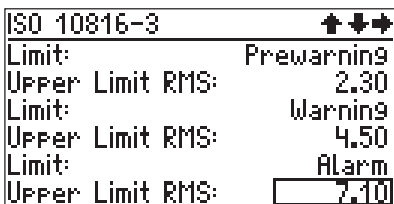
Limits for vibration velocity
(ISO 10816-3; Group 3, rigid foundation)

User-defined limits

The new setup and changing of user-defined limits is shown using the example of a temperature measurement:

- Mark the temperature symbol and click on 'Setup' in the menu.

Note

If no evaluation setup is yet active:
Activate the evaluation setup (previous section) and select a setup in the following screen (e.g. 'Temp1'):

```
Select Eval. Setup:        ➡
Temp1
Temp2
None
```
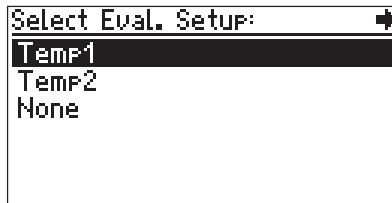
- Click on the evaluation setup in the setup menu.

```
Select Setup:              ➡
Measurement
  ➜ Temperature
Transducer
  ➜ Int.Temp.
Evaluation
  ➜ Temp1
```
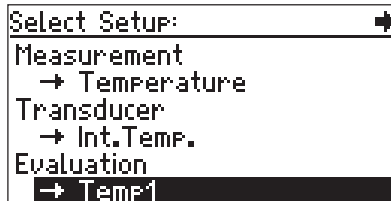
- Click on 'Evaluation Name' and change the name in the text editor if necessary.

Setup for user-defined limits

```
Temp1                    ⬇➡
  ➜                    Temp1
Evaluation Name:      Select
Meas. type:      Temperature
Unit:                     °C
No. of Limits:             2
- - - - - - - - - - - - - -
```

- Set up the number of limits:

```
┌─────────────────────────────────┐
│Temp1                    ✦   ➡    │
│Unit:                         °C  │
│No. of Limits:              � 2  │────── 1 = Alarm
│ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─   │       2 = Alarm & warning
│Limit 'Warning'            -Edit- │       3 = Alarm & warning &
│Limit 'Alarm'              -Edit- │           Pre-warning
│ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─   │
└─────────────────────────────────┘
```

- Click on the limit to change it or to adjust it again:

```
┌─────────────────────────────────┐
│Temp1                        ➡    │
│Limit Name:              Alarm    │
│ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─   │
│Upper Limit [°C]:            80   │
│Lower Limit [°C]:            10   │
│                                  │
└─────────────────────────────────┘
```
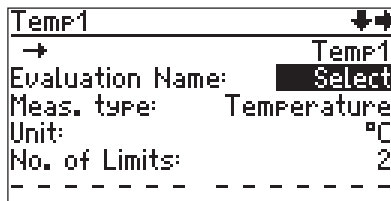
- If necessary, change the name, and enter the new limit.

To deactivate a limit ('Upper' / 'Lower'), press the function key and click on 'Opt.' (options) in the menu. Set the parameter to 'inactive' and click on 'OK' in the menu.

☞

Note

```
┌─────────────────────────────────┐
│Temp1                        ➡    │
│Limit:                   Alarm    │
│ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─ ─   │
│Upper Limit [°C]:        active   │
│Lower Limit [°C]:      inactive   │
│                                  │
└─────────────────────────────────┘
```

- Press the function key and click on 'OK'.
- If necessary, repeat the procedure for 'Warning' and 'Prewarning'.
- To accept the settings, press the function key in the 'Setup for user-defined limits' (see page 56), and click on 'Save'.
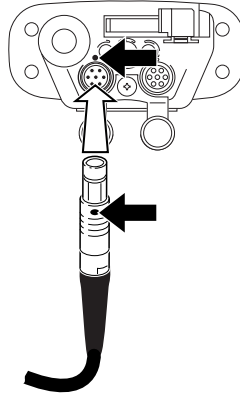
Transducers

External vibration transducers

... are required for vibration measurements on

– low-speed machines (< 10 Hz $/ < 600$ min.$^{-1}$)
– measurement locations that are difficult to access
– permanently-installed measurement locations
– VIBCODE measurement locations

– ...

Connect the transducer cable to the socket marked in blue. For correct orientation, line up the red point on the plug with the point on the socket:

Connecting an external transducer

Before the measurement, you must check the transducer selected in the transducer setup and, if necessary, change it.

☞

Note

VIBSCANNER automatically recognizes the transducer connected to the blue analog socket. If another transducer type is selected in the transducer setup, the measurement is not performed. Also in the case of short-circuit or open line, VIBSCANNER does not start the measurement.

VIBSCANNER only displays those transducers for selection that have parameters that conform with the settings in the 'measurement' setup.

Check that the transducer (or a compatible type) is entered and selected in the instrument setup as an 'available transducer' (page 21).

Setting up the transducer

- Mark the vibration measurement task in the selection screen without clicking on it.

- Press the function key and click on 'Setup'.

- Click on 'Transducer' to open the transducer setup:

```
Int. Vibr.                        ➡
 ➡                        Int. Vibr.
Meas. type:       Acceleration
Signal type:      Int. Transd.
Linear from:[Hz]            10
Linear to:[Hz]           10000
Reson.freq.:[Hz]         36000
```

Transducer setup

- Click on the first line ('->') to display the list of available transducers*:

*Preselection of the transducers takes place in the instrument setup (page 21)

```
Select a Transducer:       ⬇➡
Int. Vibr.        (Int. Transd.)
VIB 6.140            (LineDrive)
VIB 6.142            (LineDrive)
TIPTECTOR           (LineDrive)
VIBCODE               (VIBCODE)
VIB 6.146            (LineDrive)
```

Transducer selection list

Transducer signal type (page 19)

- Click on the required transducer. The program returns to the transducer setup.

- Press the function key and click on 'Save' to save the change. The program returns to the Setup menu.

- Press the Escape key twice to return to the main window.

- To start the measurement, click on the measurement icon.

If the transducer you are using is not installed in the VIBSCANNER, you must install it. Details of how to do this are given on page 62.

☞

Note

External temperature probes

... are required for temperature measurements at

– measurement locations with temperatures over +100° C
– measurement locations that are difficult to access
– permanently-installed measurement locations (mostly Pt100)

NiCrNi To connect an external probe (NiCrNi-compatible), you must first remove the internal probe:

• Swing out the internal probe.

• Press the ejector (1), and pull the probe out of the instrument (2).

• Connect the external probe to the QLA socket that is now free.

☞ **Note** | Sensor detection is not functional on this port.

Connection for Pt100 temperature probe

Connection for NiCrNi temperature probe
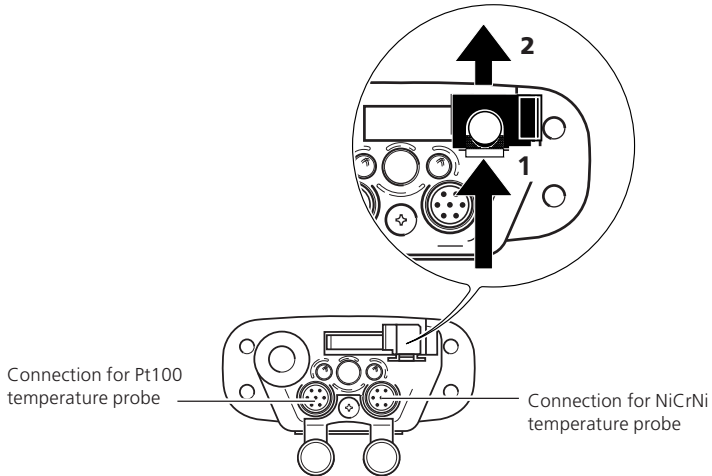
Before the measurement, you must change the transducer selected in the transducer setup (see the 'External vibration transducer' section on page 58).

Pt 100 An external Pt100 probe is connected to the analog socket marked in blue using the cable supplied (VIB 5.439). In order to compensate for the line resistance, an appropriate offset value must be entered in the transducer setup.

External RPM transducers

... are required for
- externally triggered vibration measurements
- measurement locations that are difficult to access
- 1-/ 2-plane balancing
- Orbit and Phase measurement

Connect the external RPM transducer (VIB 6.631) to the yellow channel with the supplied cable (VIB 5.432-2,9). You can adjust the settling time of the sensor in the VIBSCANNER setup (page 21).

Sensor detection is not functional on this port.
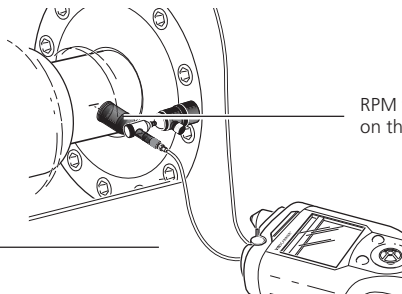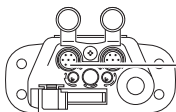
Note

Mounting

- Mount the trigger sensor with the trigger bracket (VIB 6.632) while the machine is at a standstill.

- Apply a reflective mark to the shaft (reflective tape - VIB 3.306).

- Point the sensor optics toward the mark on the shaft. To adjust the sensor, the ball joint can be fixed in virtually any position. The maximum measurement distance for the trigger sensor (VIB 6.630) is 2 meters.

- As far as possible, the laser beam should be perpendicular to the shaft surface and shaft axis. If the machine shafts are very shiny (polished), the trigger sensor should be mounted at an angle of less than approx. 10°-15° to the perpendicular.

Observe the safety instructions in the technical data sheet 0 0594 0223.

Attention!

RPM transducer (VIB 6.631) mounted on the trigger stand (VIB 6.632)

Connection for external RPM transducer: yellow channel

Creating / deleting transducers

If a transducer does not appear in the selection list (page 59), click on the last list entry ('X more...') to display all compatible transducers that were created in the factory or specific to the user.

Otherwise, create a new transducer as follows:

⚠ **Attention!**

> The new transducer must the fulfill the signal specifications for output voltage / current (±30V; ±20mA).

- Select the measurement task in the main window.

- Open the transducer setup ('Setup'->'Transducer') and click on the first line ('->').

```
Select a Transducer:   |Multi
VIBREX      (VIBREX,VIBR|Ok
VIBRONET    (VIBREX,VIBR|
ICP 74                  |New
ICP 74                  |Del
Sensor 85           (AC |Help
   16 more ...          |    ⬛
```

- Press the function key and click on 'New'.

```
Sensor 85                    ◆➡
Sens. Name:          Select
Meas. type:     Acceleration
Signal type:        AC volt.
Sensitivity:[mV/m/s²]   1.000
Offset:[mV]             10.00
Linear from:[Hz]           10
```

- Enter a name for the transducer in the text editor.

- Set up the other parameters.

- To accept the settings, press the function key and click on 'Save'.

To delete a user-defined transducer, proceed in the same way but select the 'Delete' option ('Del') instead of 'New'.

Appendix

Text editor

```
┌─────────────────────────────┐
│     Enter file name         │
├─────────────────────────────┤
│                   FILE_1     │        Text line
├──────────────────┬──────────┤
│ a b c d e f 9 1 2 3 !│  OK    │
│ h i j k l m n 4 5 6 %│  Del   │
│ o p q r s t u 7 8 9 (│  ESC   │
│ v w x y z _ - 0 + )  │        │
└──────────────────┴──────────┘
```

    Character field   Menu

To use a default name:
• Move the cursor to the menu and click on 'OK'.

To enter a new name:
• Delete the default name as follows:
- Place the cursor in the text line and select this with a click (inverted text)
- Press the function key
• Move the cursor into the character field and click on the required characters.
• Finally, click on 'OK'.

To delete characters in the text line:
• Place the cursor on the right of the character to be deleted and press the function key.

To cancel the input and close the text editor, use the Escape key.

File Manager

The saved (multimode) measurement results are held in the file manager. Depending on which measurement task symbol is marked in the selection screen, only the files of the relevant type of measurement are displayed. If the screen symbol itself is marked (e.g. Σ1), all files are displayed.

• Click on 'File' in the main window:

free memory

File Manager
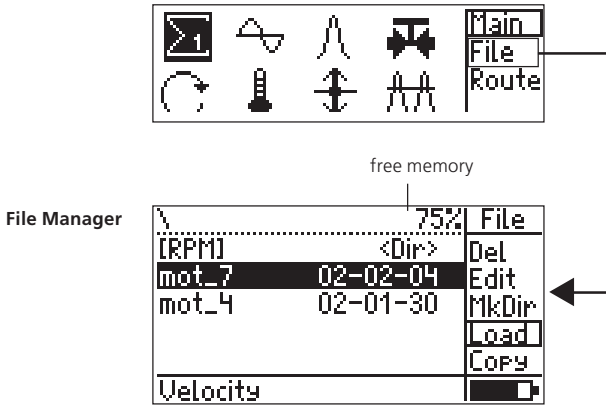
1. To open a file:
• Click on the required file in the list, or on 'Load' in the menu to open the marked file.

2. To create a directory:
• Click on the higher directory to open it.
• Click on 'MkDir' ('Make directory') and enter the directory name in the text editor.

3. To rename a file / directory
• Select the file / directory and press the function key.
• Click on 'Edit' and enter the new name in the text editor.

4. To delete a file / directory
• Select the file / directory, press the function key and click on 'Del' ('Delete').
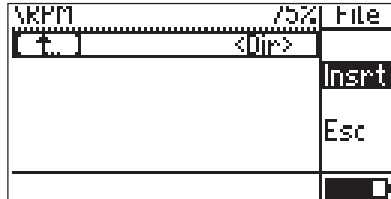
☞

Note

Only empty directories can be deleted.

5. To copy a file:

• Mark the file and click on 'Copy' in the menu.
• Click on the required directory to open it.

```
\RPM              /57% File
  t.          <Dir>
                        Insrt

                        Esc


                           ▮
```

• Click on 'Ins' (Insert) in the menu to insert the copy of the file in the directory.
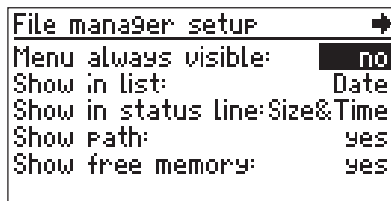
6. To move a file:
• Delete the original file after inserting the copy.

File manager setup
The information (except for the filenames) to be displayed is determined in the file manager setup:

• Open the 'Device setup'.
• Click on the 'Display' parameter, and click on "File manager setup":

```
File manager setup      ➡
Menu always visible:      no
Show in list:           Date
Show in status line:Size&Time
Show path:               yes
Show free memory:        yes
```

|	
Menu always visible:	yes/ no
Show in list:	file size / save date
Show in status (line):	file size & date / time
Show (file) path:	yes / no
Show free memory:	yes / no
Open on first:	File / Directory

• Finally, save the settings: Press the function key to open the menu and click on 'OK'.

Tips & Tricks

a. Online help

VIBSCANNER has a context-sensitive help function which you can use to call up information on the current screen or marked symbol:

• Mark the symbol and click on 'Help'.
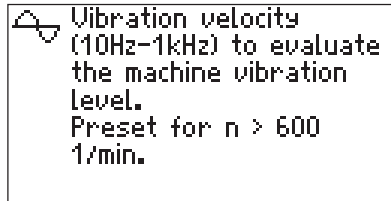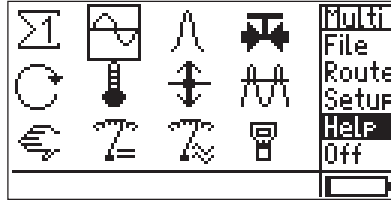
b. Tooltips

In addition to the online help, a brief text can be displayed for each symbol marked on the screen. The 'Tooltips' function can be switched on/off in the VIBSCANNER setup (Option 'Display', page 19).
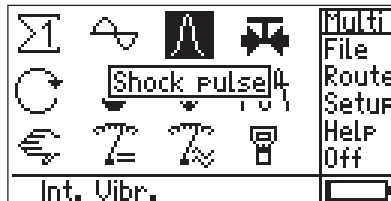
c. If you want to carry out a measurement with the settings of a file that is already saved, open this file, start the measurement, and save the result under a new name.

d. To display the current firmware version:
  • Switch the instrument off.
  • Push the joystick up towards the display and keep it pressed. The VIBSCANNER info window appears:

db PRÜFTECHNIK

VIBSCANNER®

SERNO: 00105   16.04.2007 13:04:35
MAIN: 200 (0328)   BOOT: 116 (0038)
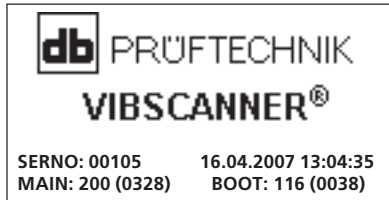
SERNO: Serial number of the instrument
MAIN: Firmware version   (build number*)
BOOT: Boot program version (build number*)

* = Subversion

e. To carry out permanent measurements
  If you hold down the joystick after starting the measurement, VIBSCANNER measures permanently without carrying out any averaging. Only when you release the joystick the actual measurement begins with the selected averaging number.
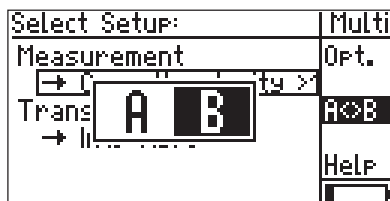 Application example: Initially, heavily fluctuating values are measured on a machine that stabilize after a certain amount of time. This measurement function lets you trace the incoming values on the screen and to start recording the data only when the values have stabilized.

f. Signal check (2-channel measurement)
  To check the signal before a measurement with the automatic switchbox (VIB 5.446) on each channel (A/B), proceed as follows:

  • Activate the 'Display channel A/B' display option in the device setup (see page 19).
  • Change to the Setup menu (see page 17).
  • Click on 'A< >B' in the menu, and select the channel.
  • Start the measurement. The signal is only output on the selected channel.

```
Select Setup:          Multi
Measurement            Opt.
   → [        ]ty >
Trans   A   B          A⊗B
   → [        ]
                       Help
                       [    ]
```

Data exchange with the PC

The routes and the current firmware version (update) are loaded from the PC into the VIBSCANNER.

The VIBSCANNER transmits processed routes and multi-mode measurement data to the PC.

How to transmit measurement data to the PC:
- Switch VIBSCANNER on.
- Connect VIBSCANNER to the PC. Use the serial PC cable (VIB 5.430-2) and, if required, the USB to serial cable adapter (VIB 5.448) provided.
- Start the data transfer in OMNITREND (see OMNI-TREND Online Help for details).

How to update the VIBSCANNER firmware:
- Switch VIBSCANNER off.
- Connect the battery charger so that the VIBSCANNER is supplied with power during the update.
- Start the 'VIBSCANNER UpdateTool' program.

☞

Note

The update program is contained in the 'VIBSCANNER' section of the PRÜFTECHNIK CD. It is installed under the following directory on the PC by default:

C:/Programs/Pruftechnik/VSCUpdateTool/VSCUpdateTool.exe

- Follow the instructions that appear on the screen.

ISO 10816-3 / ISO 10816-7

DIN ISO 10816-3	Group 1		Group 2	
Machine type	Large machines 300 kW < P < 50 MW		Medium sized machines 15 kW < P < 300 kW	
	Motor H > 315 mm		Motor 160 mm < H < 315 mm	
Foundation	flexible	rigid	flexible	rigid

Velocity v_{eff} mm/s rms

10 – 1000 Hz r > 600 rpm

2 – 1000 Hz 120 < r < 600 rpm

11,0
7,1
4,5
3,5
2,8
2,3
1,4

D
C
B
A

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A	Newly commissioned machines	B	Unrestricted long term operation	C	Restricted long term operation	D	Vibration causing damage

DIN ISO 10816-7	Category 1			Category 2			
Pump type	Rotodynamic pumps with high reliability, availability or security requirements.			Rotodynamic pumps for general or less critical applications.			r < 600 rpm 0.5 rpm 1.0 rpm 2.0 rpm
Power	< 200 kW	> 200 kW		< 200 kW	> 200 kW		

Velocity v_{eff}

10 – 1000 Hz r > 600 rpm

2 – 1000 Hz r < 600 rpm

7,6   6,5   5,0   4,0   3,5   2,5   mm/s rms

9,5   8,5   6,1   5,1   4,2   3,2   mm/s rms

Displacement s_{p-p}

130   80   50   µm

D   C   B   A

D   C   B   A

D   C   B   A

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A	Newly commissioned machines	B	Unrestricted long term operation	C	Restricted long term operation	D	Vibration causing damage

Technical data

Hardware

Measurement channels
Analog: Vibration signals (LineDrive, ICP*)
Temperature (Pt 100*, NiCrNi)
Transducer and instrument outputs
AC (± 30V; 0-20mA*)
DC (± 30V; 0-20mA*)
Digital: Trigger (5V TTL)

Outputs
RS 232 (PC conn., up to 115 kbaud), Head-
phone, Analog signal (4V$_{pp}$; R$_{out}$= 200 Ohm)

Operating elements
1 joystick (Cursor & ENTER function)
2 keys   (Menu and Escape)

LED indicators
Four LEDs for device status / signal evaluation

Display
Graphical pixel display (backgr. illumination)
Dimensions   54 x 27mm/ 2.1 x 1.1inch
128 x 64 pixels
Contrast   Adjustable
Illumination   Adjustable

Power supply
NiMH rechargeable pack (7.2V / 1.5 Ah)
Charg. dur.   < 6 hours (intr. safe: <10 hours)
Operat. dur.   > 10 hours in intermit. use
> 6 hours in continuous use
with illumination
Charg. display 2 LEDs (green, red)
Charg. temp. 10 ... 40°C / 50 ... 104°F
'Sleep' mode Adjustable

Internal sensors
Vibration/ shock pulse (bearing condition)
Frequency range: 10Hz ... 10kHz** (±10%)
Resonance frequency: 36 kHz**
RPM (IR sensor with light point for adjustment)
Temperature (NiCrNi)

Signal processing
RMS, 0-P, P-P, max/carpet, envelope curve,
rectifying
Filter: Highpass (2 /10 Hz; 1 / 5 kHz)
Lowpass (1 / 5 / 10*** / 40 kHz)
Integrat.: Two selectable stages
Sampling frequencies: Up to 64kHz (depending
on measuring range)

Memory
512 MB (intr. safe: 4 MB)

Housing
ABS strengthened with steel fiber

Environmental protection
IP 65

Relative humidity
10 ... 90%

Temperature range
Operation   0... +60°C / 32...140°F
Storage   -20... +80°C / -4...176°F

Dimensions (HxWxD)
250 x 100 x 55 mm / 9.8 x 3.9 x 2.2 inch

Weight
approx. 690 g / 24 oz.

Transport case
Polypropylene, black
Dimensions   390 x 340 x 90 mm
(HxWxD)   15.3 x 13.4 x 3.5 inch

Measurement range / Accuracy
RPM   60 ... 60000 min^{-1} / 0.1‰
Temperature
• Pt 100   -50..+600°C / 1°+ sensor%
(-58 ...+1112°F)
• NiCrNi   -50...+100°C / 0.5° + 3%
(internal) (-58...+212°F)
(external) -50...+100°C / 0.5°+ sensor%
(-58...+212°F)
(external) +100..+1000°C / 1°+ sensor%
(212...1832°F)
Extra-low   -9...+9V / 2% (R$_i$=30kOhm,
voltage   with cable VIB 5.440)
(AC/DC)   -30...+30V / 2% (R$_i$=100kOhm,
with cable VIB 5.433)
Extra-low   -20...+20mA / 2%;
current   4...20mA / 2% (R$_{shunt}$=200 Ohm
(AC/DC)   with cable VIB 5.434)

For internal sensors, external sensors (1µA/ms^{-2}
CLD*; 100mV/g ICP®) and external measure-
ment devices (1mV/ms^{-2}), the following applies:

Displacement < 9000 µm (p-p) / 1%
Velocity   < 9000 mm/s (p-p) / 1%
Acceleration < 961 m/s² (p-p) / 1%
Shock pulses < 81 dBsv / ± 3dB

Fulfilled standards
Frequency response according to ISO 2954 -
other parameters and measured variables
according to DIN 45662 class 1

Noise, internal sensor (from 10 Hz)
Velocity   0.1 mm/s eff.
Displacement 2µm eff. (instr.+sensor)
Shock pulse   < 0dBsv , peak

* not for VIBSCANNER EX,
** in cone sinking,
*** optional for VIBSCANNER EX

Firmware

Measurement functions
Velocity / displacement / acceleration in machine-specific measurement tasks;
Shock pulse (bearing condition);
Temperature;
RPM

Process parameters
Manual input;
User-defined   DC: ± 30V; -20...+20mA
tasks   AC: ± 30V; -20...+20mA
                    (Extra-low voltage/ current)

Data processing
Evaluation functions for characteristic overall value;
Bearing diagnosis using shock pulse;
Machine-condition evaluation according to ISO standards (vibration according to the new ISO 10816-3);
Data collection functions for characteristic overall value and for machine inspection;

Measurement parameters
Averaging: free, linear, peak hold, exponential, time-synchronous;
Av. no.   adjustable
Av. time   adjustable
Meas. time: adjustable
Ampl. range autorange

Measurement setups
Predefined, knowledge based measurement setups for machines, bearing and gear diagnosis;
Freely selectable multimeter measurement functions;

User interface
Graphic-oriented and cursor controlled:
   Icons for measurement tasks;
   Machine pictures for measurement location scanning;
   Graphic route guide;
Integrated help function

Units
ISO and US units, switchable

Comments
User-defined events with comments

Language
English, German, French, Italian, Czech, Dutch, Swedish, Russian, Polish

Compatibility (external transducer)
Vibration
         • CurrentLineDrive accelerometers
VIBCODE with location recognition;
TIPTECTOR hand-held probe
Quick fit transducer for SPM studs;
Industrial transducer with magnetic, threaded, adhesive mounting
         • ICP transducer*
         • Velocity transducer (mV/mms^{-1})
         • Displacement transducer (mV/µm), w/o power supply
RPM   • Laser optical sensor
         • 5V TTL (opt. or induct. transducer)
Temp.   • NiCrNi (magnetic/ probe)
         • IR probe
         • Pt100*

CE conformity (for cable length < 3m)
Interference   EN 50081-1
emission   (Residential area)

Interference   EN 50082-1
sensibility   (industrial area)
                < 4% of meas. value or
                < twice noise value

VIBSCANNER, intrinsically safe

Protection class
(Ex) II 2 G E6x em ib IIC T4

EC-type Examination Certificate
TÜV 01 ATEX 1699

Temperature range
Operation   0... +45°C / 32...113°F
Storage   -20... +45°C / -4...113°F

Electrical data
Digital output circuit
in type of protection intr. safety E6x ib IIC only suitable for the connection to devices intended for this
U_0 10,1 V   / I_0 55 mA
C_i 330 nF   / C_0 370 nF
L_0 0.5 mH

Analog output circuit
in type of protection intr. safety E6x ib IIC only suitable for the connection to devices intended for this
U_0 12 V   / I_0 36 mA
P_0 200 mW
C_i 31 nF   / C_0 1410 nF
L_0 31 mH

Temperature sensor circuit
in type of protection intr. safety E6x ib IIC only suitable for the connection to NiCr-Ni-thermocouple

* not for VIBSCANNER EX

Troubleshooting

• Symptom:
After the power has been switched on, the blue LED flashes slowly.

Meaning:
The device is in boot mode. This can have two reasons:
1. Boot mode was manually entered by the user
2. The application firmware is missing or corrupted.

What to do:
If the charger is connected to the device, disconnect it.
Reset the device (page 75).
If the device still goes into boot mode, update the firmware using the VIBSCANNER update tool.

• Symptom:
When switching on the device, the red LED flashes quickly.

Meaning:
The battery is empty.

What to do:
Charge the battery using the charger VIB 5.420.

• Symptom:
When switching on the device the backlight of the displays lights up but nothing appears on the display.

Meaning:
The firmware is not running properly.

What to do:
Reset the device (page 75).
If this doesn't work, update the firmware using the VIB-SCANNER update tool.

• Symptom:
Charging process does not start, red LED on the storage battery flashes continuously (>20min).

Meaning:
Error condition identified during the charging process, or battery defective.

What to do:
Ambient temperature 10–40°C? Discharge the battery again. Charge the battery separately. If charging is still not possible, return the battery for repair.

• Symptom:
Battery does not charge (red LED on the battery does not light up) when the charger is connected and VIBSCANNER is switched off.

Meaning:
VIBSCANNER erroneously sends a starting signal to the battery.

What to do:
Remove the battery from VIBSCANNER and charge it separately.

• Symptom:
Charging process terminates prematurely (5min – 1h), green LED lights up on the battery.

Meaning:
Deeply discharged battery.

What to do:
Switch on VIBSCANNER without the charger connected. Leave it switched on until the battery is empty again and VIBSCANNER switches off by itself. Then repeat the charging process. If necessary, charge the battery separately.

• Symptom:
"Battery level inaccurate" appears when switching off or the display of the level of charge is obviously wrong.

Meaning:
Charge electronics must be newly programmed.

What to do: see page 11

• Symptom:
VIBSCANNER housing is dirty.

What to do:
Clean the VIBSCANNER housing using a lint-free cloth and a commercial household detergent.

Clean the VIBSCANNER display using window cleaner and a cloth or an absorbent kitchen roll.

> When cleaning the instrument, make sure that the battery plugged into the instrument and the dust protection caps cover the connector sockets.

Attention!

• Symptom: The following message appears on the display:

```
** Filesystem Error **
        Media status == ....
        Volume == .....
        Serial # == ....
        Volume is ....
        .....
    ** Select Action **
Format          Abort
```

Meaning:

A serious error occurred while accessing the internal VIBSCANNER hard disc.

What to do:

Try to abort the current action by pressing the right button (function key).

If this doesn't help, try to reset the device.

If this doesn't help, try to format the VIBSCANNER hard disc by pressing the left button (ESC key). Formatting the hard disc may take a few minutes.

If the format is successful, all files on the VIBSCANNER are deleted. In order to restore these files, use the VIBSCANNER UpdateTool and download the files by choosing the 'Filetransfer' button in step 4. Make sure that you download the files from the same firmware version as that already on the VIBSCANNER.

If the format is not successful, return the device for repair.

• Symptom: The following message appears on the display:

```
** Filesystem Error **
    Media status == ....
    Volume == .....
    Serial # == ....
    Volume is ....
.....
    ** Select Action **
Retry    Clear    Abort
```

Meaning:

A serious error occurred while accessing the internal VIBSCANNER hard disc

What to do:

Retry the current action by pressing the left button (ESC key).

If this doesn't help, clear the current action by pressing the joystick.

If this doesn't help, try to reset the device.

If the problem persists, return the device for repair.

• Symptom: The following message appears on the display:

```
** Filesystem Error **
    Media status == ....
    Volume == .....
    Serial # == ....
    Volume is ....
.....
** Select Action **
   Retry          Abort
```

Meaning:

A serious error occurred while accessing the internal VIBSCANNER hard disc.

What to do:

Retry the current action by pressing the left button (ESC key). If this doesn't help, try to abort by pressing the right button (function key). If this doesn't help, clear the current action by pressing the joystick. If this doesn't help, try to reset the device.

If the problem persists, return the device for repair.

How to set the device into boot mode
• Connect the battery charger to the device and to the mains.
• Press all three buttons (the left key, the right key and the joystick) for at least 5 seconds.
• Release the joystick, but keep the left and right button pressed.
• After 1 second, release the left and right button. The blue LED should now flash slowly.

To leave the boot mode, reset the device.

How to reset the device
• Press both the keys and the joystick at the same time for approx. 5 seconds.
• Release the keys and the joystick to switch the instrument on again.

db ® PRÜFTECHNIK

Productive maintenance technology