VIBROWEB® XP

Diagnostic
Condition Monitoring

Installation

Dear Customer,

If you have any suggestions for improving this manual, the product itself or any of its accessories, please inform us accordingly.

We look forward to receiving your input!

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Edition May 2005
VIB 9.812.G

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Introduction

About this manual

This manual forms part of the VIBROWEB XP documentation and deals with the installation of the VIBROWEB XP system components, the transducers and the cable.

The installation procedures described in the main part of this manual are based upon the following 'normal' industrial conditions and are distinguished by the following features:

- No frequency converters or their supply lines must be located near the installed cables.
- No radio communication or remote control systems must be operated near the installed cables.
- No high-voltage cables must be present in the cable ducts, channels or trays.

No coaxial cables longer than 30 meters may be laid in the cabling area if there are sources of electromagnetic disturbance.

Safety instructions

The following notes must be observed to ensure safe and proper installation of the VIBROWEB XP system.

- VIBROWEB XP may only be installed by properly trained personnel.
- The measurement object must be grounded or double-insulated from the operating voltage.
- Only the original VIBROWEB XP components, sensors and cables listed in this manual may be used for installation.
- The VIBROWEB XP system must be disconnected from the power supply before any installation, repair or service work is performed.
- Only electrically insulated accelerometers may be installed.
- The mains voltage must fulfill IEC guidelines.
- Environmental conditions at the installation location must not exceed the specifications of components to be installed (see Technical Data - Appendix).
- During commissioning, interference signals must be checked with the sensors removed. A minimum signal-to-noise ratio of 20 dB must be maintained even when interference is unavoidable.
- Electrostatic discharge (ESD) near the VIBROWEB XP system can lead to measurement errors.

Introduction

Symbols used in this manual

This symbol denotes information which must be followed in order to avoid damage to the system or other equipment.

This symbol denotes general information and tips regarding VIBROWEB XP installation

CE conformity

VIBROWEB XP fulfills the EC guidelines for electric devices (73/23/EWG) and electromagnetic compatibility (EMC) (89/336/EWG). VIBROWEB XP has been tested in accordance with EN 61326 for electromagnetic compatability.

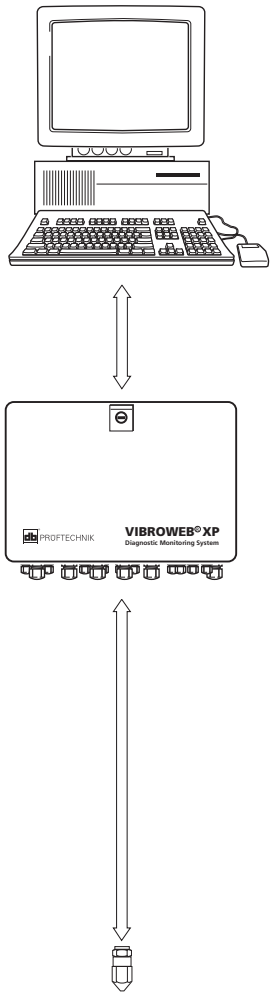
System overview

VIBROWEB XP is a compct system for the permanent monitoring and diagnosis of machine conditions. VIBROWEB XP records the following variables:

- Vibration acceleration
- Displacement
- RPM
- Additional process variables as current / voltage levels

Up to 8 accelerometers, two indictive displacement transducers and 2 tacho/pulse sensors (digital) can be connected to the VIBROWEB XP system unit. VIBROWEB XP also has three inputs for process parameters (0/4-20mA, ± 10V), two digital inputs and one digital output. Data exchange is carried out via Ethernet (TCP/IP) or via a serial interface (RS 232). There is another serial interfaces available for connection to process control systems or programmable controllers via field bus (Modbus, Profibus).

Main components and communication paths:



PC

OMNITREND PC software for the definition of measurement tasks and measuring procedures; display and archiving of measurement data; online measurements can be carried out and evaluated using an Internet-capable browser.

VIBROWEB XP

System unit with integrated web server for TCP/IP communication; checks and controls measurements; processes and stores measured data; displays alarm conditions and outputs alarm messages;

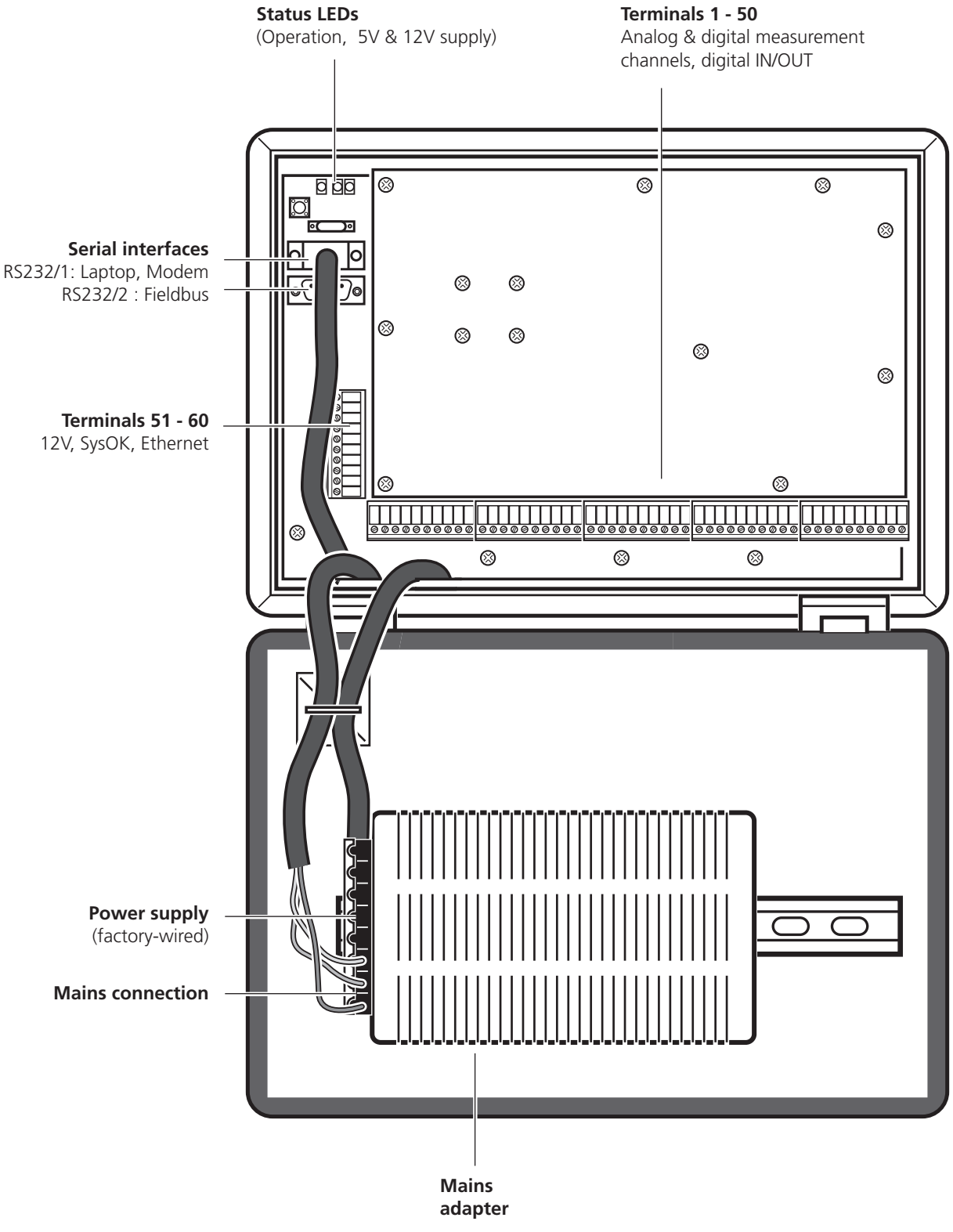
Transducers

Measurement of vibration acceleration, displacement, RPM and current levels (0/4-20 mA).

Introduction

Interfaces and Displays

VIB 7.510 / VIB 7.520



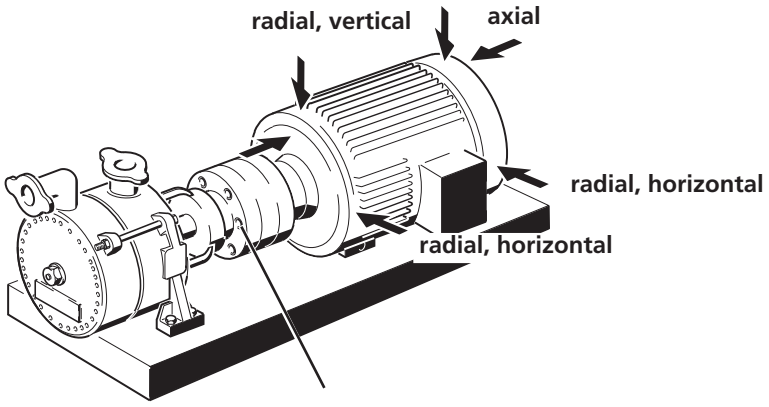
Preparation

Measurement location selection

The following guidelines for selecting measurement locations and mounting sensors should be observed to ensure good signal transmission.

A. Vibration monitoring

- The accelerometer should preferably be mounted in a radial direction (perpendicular to the shaft, in a vertical or horizontal orientation).
- Axial measurements are used primarily to detect shaft misalignment, gear tooth damage, loose machine mounting or bent shafts.
- Machines mounted on rigid foundations tend to exhibit higher vibration in a horizontal direction since vertical vibrations are limited by the rigid attachment to the baseplate.
- Machines mounted on elastic foundations must be fitted with accelerometers for both vertical and horizontal measurement because the machine can vibrate freely in both directions.



B. RPM measurement

Coupling flange bolts or shaft-mounted ferromagnetic components with a diameter greater than 10 mm can be used as reference marks for inductive RPM probes (VIB 5.992-BA).

Cabling

The following cables are laid in a VIBROWEB XP system:

- Shielded 2-core electrical cable TP* (ICP®, current)
- Shielded/non-shielded 3-core cable (RPM, path)
- Coaxial cable, RG 58 (for current LineDrive)
- Ethernet cable
- Power cable

* TP: 'Twisted-pair'

No coaxial cables longer than 30 meters may be laid in the cabling area if there are sources of electromagnetic disturbance.

Please note the following instructions when selecting the cable routes:

- Do not lay cables in high voltage cable ducts.

- No frequency converters or their supply lines must be located near installed cables.
- No radio communication or remote control systems must be operated near the installed cables.
- The lines between the VIBROWEB XP electrical switching cabinet and the transducers should be kept short to minimize interference and cable costs. The much less sensitive communication lines (modem, LAN, ...) can be extended to compensate for this.

Installation tools

The following mounting and inspection tools are required for installation:

Transducers

- 90° countersink, VIB 8.694
- Thread tap M8, VIB 8.693
- M8x1 fine thread tap
- Electric drill
- Bonding kit (VIB 3.100) for bonded sensor mounting

Standard tools such as:

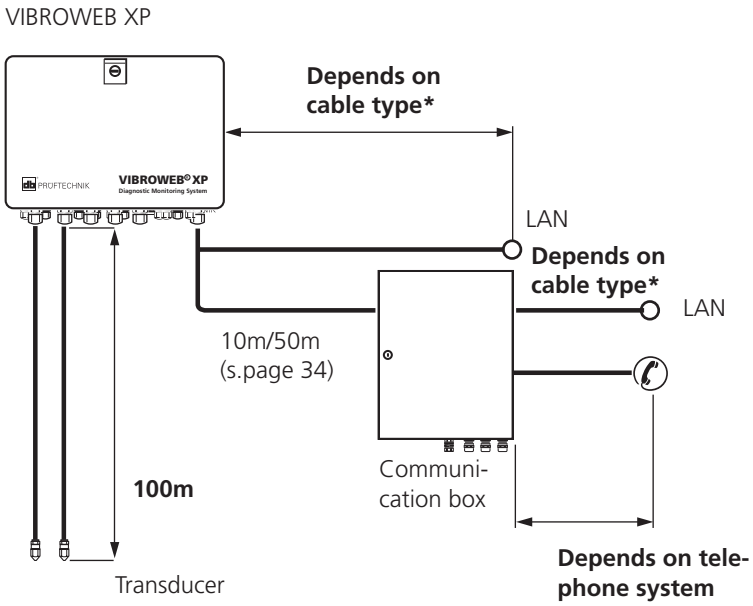
- Screwdriver set
- Wrench set
- Drill bit set
- Plier set
- Tape measure
- Scribing iron
- Chalk (white), felt-tip marker
- Calipers
- Tool for imperial dimensions

Cables

- Insulation stripper, VIB 81052
- Crimping pliers, VIB 81026
- Wire stripper for Ethernet cable
- Diagonal-nosed cutting pliers
- Installation checker, VIB 8.745
- Multimeter
- Open ring spanner, size 16, 20, 24

Maximum cable lengths

When installing the cables, do not exceed the following maximum lengths between the individual components. All bends, loops, and excess cable (approx. 30 cm) must be included in cable length calculations.



*** Maximum cable length for ethernet (LAN, 10Mbit/s):**

- 100m for CAT 5 / 10baseT (cable: UTP, RJ45 connectors)

Applies to connection 'Communication box - LAN' only:

- 185m for 10base 2base2 (cable: coaxial RG-58 / 50 Ohm; Hub with coax connector required)
- 2000m for glas fibre (Ethernet to fibre media converter required)

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Installation of transducers

The transducers can be mounted once the optimum measurement locations have been determined. PRÜFTECHNIK AG vibration transducers can be screwed or bonded into place. RPM sensors are always installed using threaded connectors.

Vibration transducers (CurrentLinedrive, el. insulated)

Installation factors can greatly influence the frequency response and dynamic range of vibration transducers. Poor connection to the measurement location can attenuate the signal and limit the frequency range.

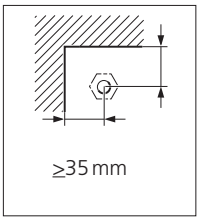
The most reliable and robust method of mounting vibration transducers is via threaded studs. Bonded mounting is required for thin-walled housings where mounting holes cannot be drilled.

When installing sensors on machines or parts of machines (e.g. belt-driven fans) that are not grounded, these must be subsequently grounded to avoid static charging.

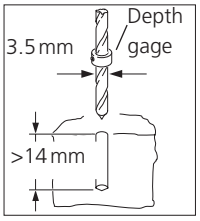
Attention !

Vibration transducers with M8 thread, 90° cone

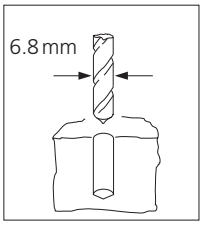
(VIB 6.122, VIB 6.123, VIB 6.125, VIB 6.127, VIB 6.129)



Select the stud location:
Leave at least 35 mm clearance between the stud mounting hole and any corners or walls to allow access for the wrench used to tighten the transducer into place.

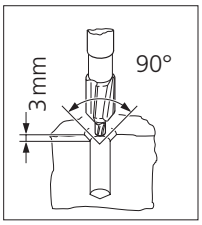


Pilot hole:
Use a 3.5 mm drill bit with depth gage. The hole must be at least 14 mm deep for the transducer to be securely seated.

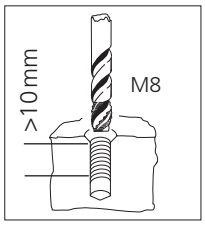


Bore hole:
Drill out the mounting hole using a 6.8 mm bit.

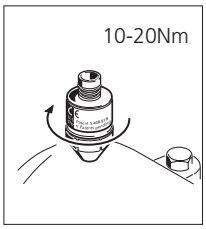
Installation - Transducers



Countersink:
Use the 90° countersink bit (VIB 8.694) to countersink a hole with a depth of 3 mm.



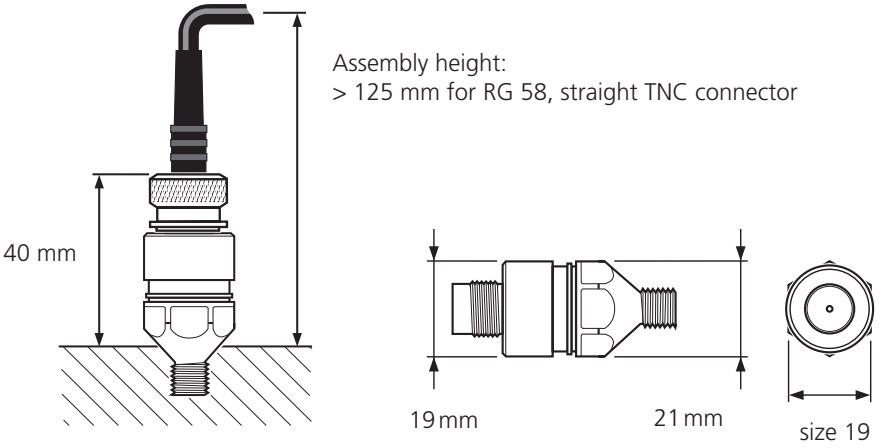
Tap thread:
Use an M8 tap to cut a thread to a depth of at least 10 mm. Blow any shavings out of the hole with compressed air and apply a bit of grease to the countersunk surface.



Mount transducer:
Screw the accelerometer into place and tighten it into place with a number 19 torque wrench.
Tighten the sensor with a torque of 10 – 20 Nm.

Check that the transducer is seated properly. Its tapered base should have even contact with the countersunk surface of the hole; the transducer must not 'wobble'.

Dimensions: Acceleration transducer VIB 6.122

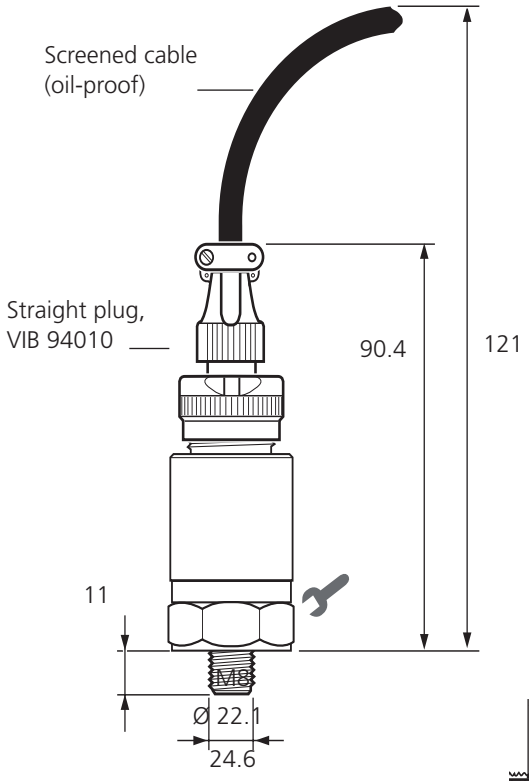


Vibration transducer for low-speed machines

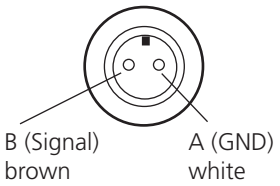
(VIB 6.195)

This transducer is suitable for vibration measurements up to 10 kHz on low speed machines (<60 rpm)

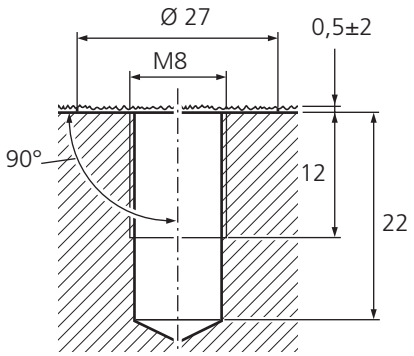
1. Drill the mounting hole as shown in the graphics.
2. Clean and smooth the area around the mounting hole (Abrasive paper, type 220).
3. Clean both contact surfaces with solvent.
4. Cover one of the dried surfaces with a thin film of LOCTITE 243 for better signal transmission.
5. Screw in the accelerometer (3-7Nm!).



Plug pin allocation



Mounting hole



Dimensions in mm

Installation - Transducers

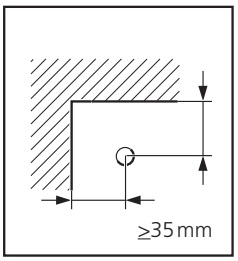
Bonded vibration transducers

(VIB 6.102, VIB 6.107)

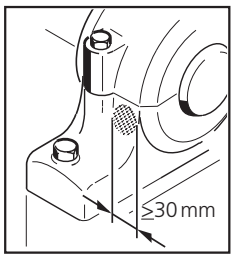
Use the PRÜFTECHNIK AG VIB 3.100 bonding kit for bonded mounting.

The machine must not be operated during bonding or for 24 hours afterwards; Otherwise, the bond quality could be adversely affected by mechanical vibration.

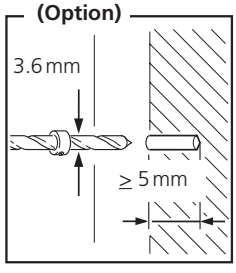
Attention !



Select location for bonding:
Leave at least 35 mm clearance between the stud mounting hole and any corners or walls so that the bonding compound can be easily applied using a wooden spatula.



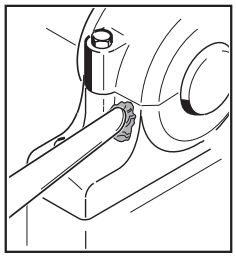
Prepare the mounting surface:
Grind the paint from an area of at least 30 mm diameter at the mounting location. If necessary, mill the area to ensure a flat mounting surface.
Roughen the surface with a file; bonding rigidity can be further increased by filing grooves into the surface in a crosshatch pattern.



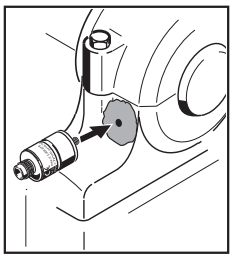
Mount centering pin (optional):
Bore a hole for the centering pin (3.6 mm in diameter, approx. 5 mm deep). The pin is self-threading and can be removed from the acceleromoter base if necessary.

Clean mounting surface, mix bonding compound:
Clean the roughened mounting surface and sensor base with a clean cloth. Brake/clutch cleaning fluid is ideal for degreasing the bare metal mounting surfaces of the machine and sensor as it leaves no residue. Allow both metal surfaces to dry thoroughly.

Mix equal parts (by weight or by volume) of the two bonding compound components.



Apply bonding compound:
Use a wooden spatula to spread a layer (approx. 1 mm) of bonding compound evenly on the accelerometer base and the mounting surface.



Mounting transducer:
Press the accelerometer lightly against the mounting surface. Rotate it a little to spread the adhesive evenly.

Do not remove excess bonding compound. The resulting bead should cover the entire groove in the circumference of the sensor base. If necessary, apply additional compound to seal the circumference.

Allow the bonding compound to harden for at least 24 hours (or longer if ambient temperature is cooler) before resuming machine operation.

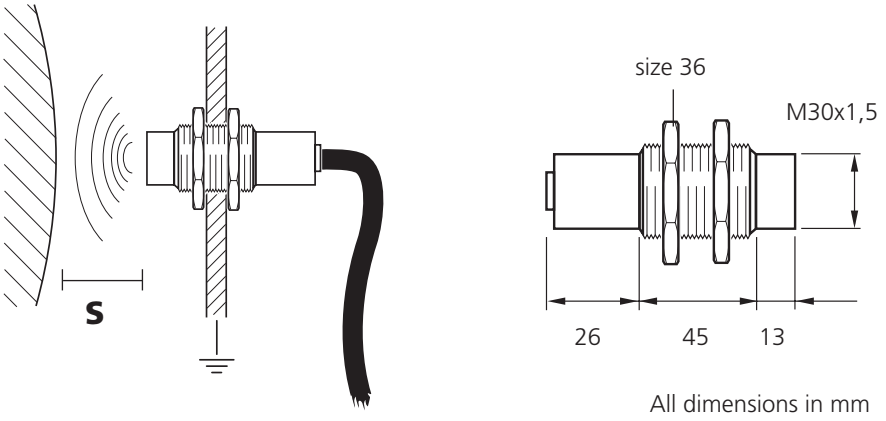
Installation - Transducers

Displacement transducer (VIB 5.991-DIS)

The displacement transducer is used for non-contact measurement and monitoring of the relative displacement and the relative strain.

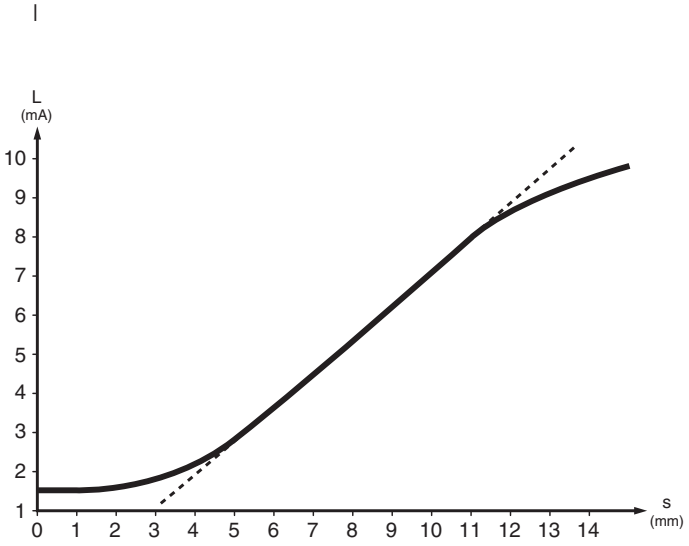
The continuous thread enables a simple mounting and positioning of the sensor. The distance to the shaft is set up with the aid of the characteristic curve (S = approx. 8mm).

Mounting

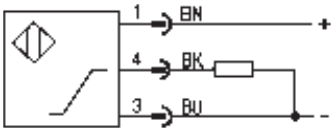


All dimensions in mm

Characteristic curve



Connection diagram



Trigger / RPM sensor (VIB 5.992-BA)

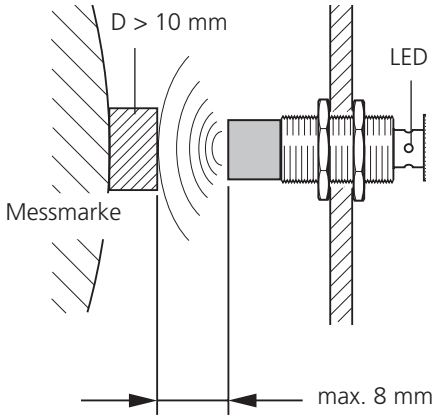
The inductive RPM sensor VIB 5.992-BA is used as a trigger sensor and for the measurement of machine RPM. The sensor should be mounted close to a suitable gage mark (e.g. coupling screws) to ensure optimum signal acquisition.

1. Select a suitable position close to the gage mark.

> The RPM sensor can be mounted on an angle section. Make sure that the arrangement is not subject to interference by machine vibrations.
>
> No 600 Hz electromagnetic fields may be present in the vicinity of the RPM sensor.
>
> At least two gage marks should be available on the shaft for the measurement of low RPMs (< 60 r/min.).

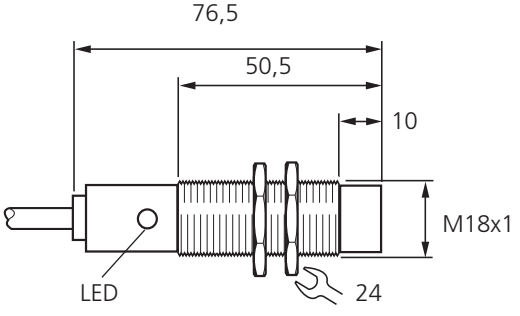
Note

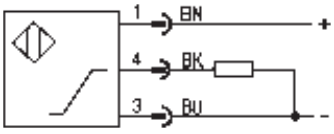
2. Drill a hole in the angle section; diameter = 18 mm.
3. Tighten the sensor into place with the locknuts.
4. Set the optimum distance with the locknuts: The LED extinguishes if a gage mark passes the sensor.



Mounting

All dimensions in mm





Connection diagram

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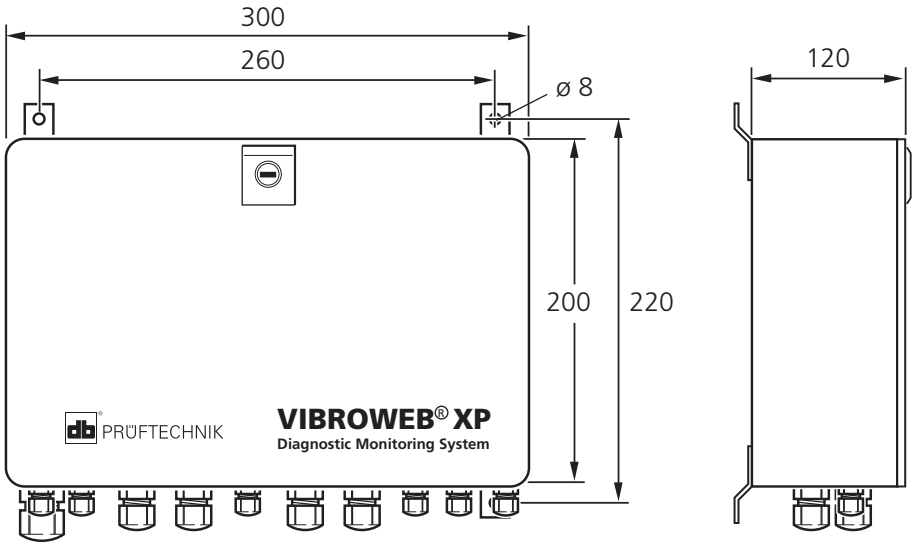
VIBROWEB XP switching cabinet

Before laying the sensor cable, mount the VIBROWEB XP switching cabinet.

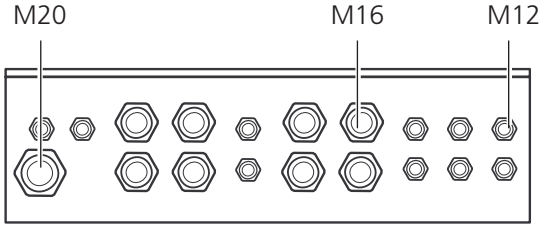
- Mount the electrical switching cabinet as close as possible to the machine or connection box in order to reduce cable costs. The communication line can be extended to compensate for this.
- The installation site should be easily accessible (e.g. control room)
- Observe the distances on the next page. Leave enough space in front of the electrical switching cabinet in order to open the cabinet door.
- Leave sufficient space in the vicinity of the cable gland to lay the required cable duct (approx. 30 cm).
- The switching cabinet is grounded via the power supply cable.

Dimensions

all dimensions in millimeter



Cable gland - basic configuration



Fitting	Wrench size	Specified use
M12	16	Sensor line, Communication
M16	20	Sensor line
M20	24	Power supply

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Cable installation

Following the installation of transducers and VIBROWEB XP electrical switching cabinet, the cables can be laid and connected: Sensor cables, communication connections and power supply.

Sensor cable

The installation with coaxial cables (RG 58) and with shielded twisted pair electrical cables in a low electrically contaminated industrial environment is described below.

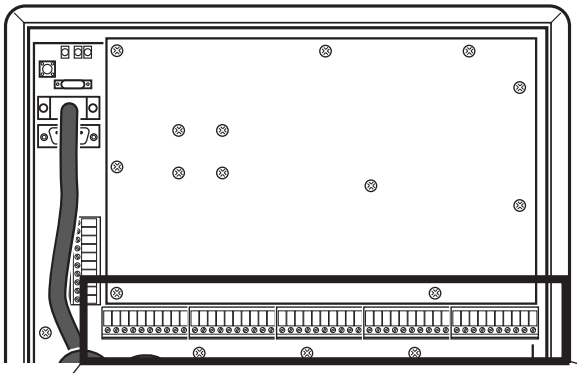
No coaxial cables longer than 30 meters may be laid in the cabling area if there are sources of electromagnetic disturbance.

Leave approx. 30 cm of cable slack at all connections in order to avoid straining cable connections later during service and repair.

Details of the crimping of coaxial cables are given in the Appendix on page 43 ff.

Note

Sensor cables are connected directly in the VIBROWEB XP electrical switching cabinet. The assignment of the terminals to the respective measurement channel is shown on page 36.



Terminals 1 - 12
Accelerometers

Terminals 13 - 15
Displacement transducers

Terminals 16 - 19
Process parameters (0/4-20mA; ±10V)

Terminals 20 - 31
Accelerometers

Terminals 32 - 34
Displacement transducers

Terminals 35 - 36
Process parameters (0/4-20mA; ±10V)

Terminals 37 - 42
Keyphaser / RPM sensor

Terminals 43 - 46
Digital inputs

Terminals 47 - 48
Digital output

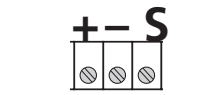
Cable installation

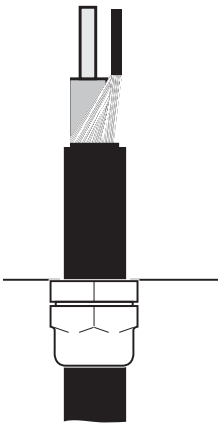
Vibration acceleration:
CLD* transducer with RG58 coaxial cable

Note

CLD transducers can only be connected to the 'VIBROWEB XP for LineDrive transducers' (VIB 7.710).

* **CLD = C**urrent Line**D**rive



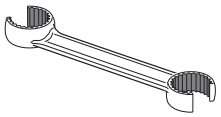


Connect cable to VIBROWEB XP:
Connect signal to plus (+) and shield to minus (-), leave shield terminal (S) open

Terminals:

Bank 1 (+/–/S)	**Bank 2 (+/–/S)**
1/2/3	20/21/22
4/5/6	23/24/25
7/8/9	26/27/28
10/11/12	29/30/31

Open cable gland (M16) with ring spanner (size 20).



Connect cable to transducer:
- Mount protective cap on the sensor-side cable end.
- Crimp TNC connector.

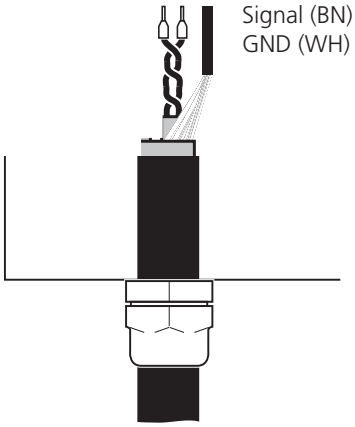
CLD* accelerometer, VIB 6.1xx

Vibration acceleration:
CLD* transducer with shielded twisted-pair sensor cable

CLD transducers can only be connected to the 'VIBROWEB XP for LineDrive transducers' (VIB 7.710).

Note

* **CLD = C**urrent Line**D**rive

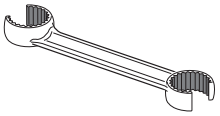


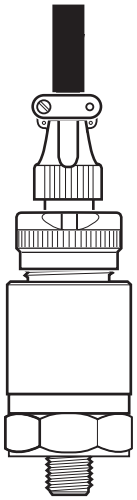
Connect cable to VIBROWEB XP:
Connect signal to plus (+), GND to minus (-) and shield to shield terminal (S)

Terminals:

Bank 1 (+/–/S)	**Bank 2 (+/–/S)**
1/2/3	20/21/22
4/5/6	23/24/25
7/8/9	26/27/28
10/11/12	29/30/31

Open cable gland (M16) with ring spanner (size 20).





Connect cable to transducer:
• Connect cable (VIB 90060) to connector (VIB 94010 / VIB 94011):
Pin 'b' = Signal (brown)
Pin 'a' = GND (white)
• Connect connector to transducer

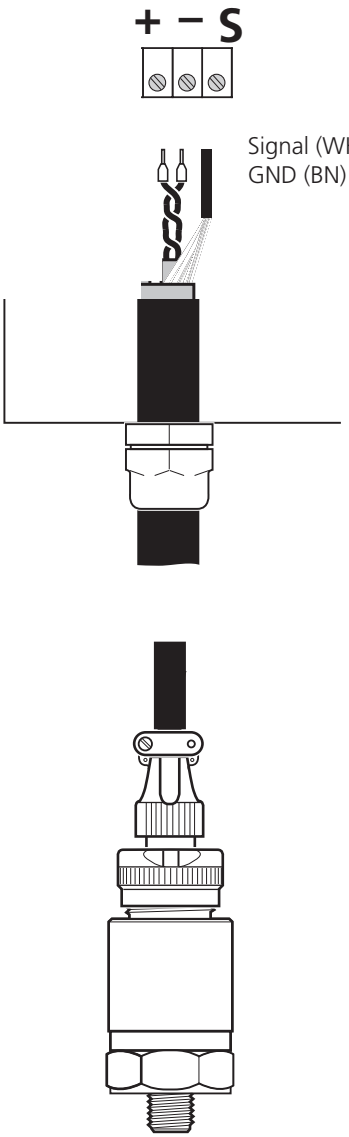
CLD* transducer , VIB 6.195

Cable installation

Vibration acceleration:
ICP transducer with shielded twisted-pair sensor cable

Note

ICP sensors can only be connected to the 'VIBROWEB XP for ICP sensor' (VIB 7.720).

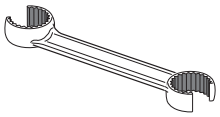


Connect cable to VIBROWEB XP:
Connect signal to plus (+), GND to minus (-) and shield to shield terminal (S)

Terminals:

Bank 1 (+/–/S)	**Bank 2 (+/–/S)**
1/2/3	20/21/22
4/5/6	23/24/25
7/8/9	26/27/28
10/11/12	29/30/31

Open cable gland (M16) with ring spanner (size 20).

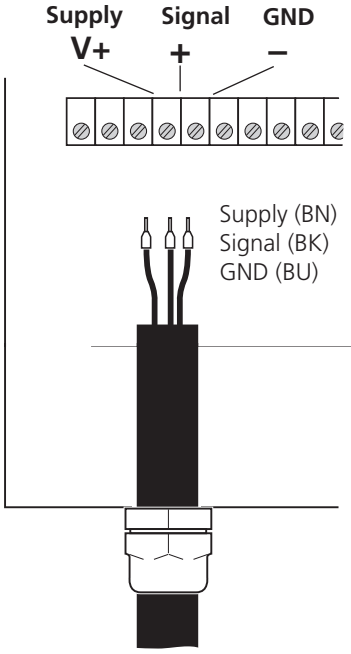


Transducer with MIL connector:
• Connect cable (VIB 90060) to MIL connector (VIB 94010 / VIB 94011):

Pin 'a' = Signal (white)
Pin 'b' = GND (brown)

• Connect MIL connector to transducer

Keyphaser, RPM: Inductive sensor - VIB 5.992-BA



Connect cable to VIBROWEB XP:
Connect supply to supply plus (V+),
signal to plus (+),
GND to minus (-)

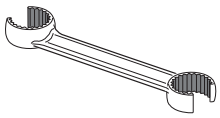
Terminals:

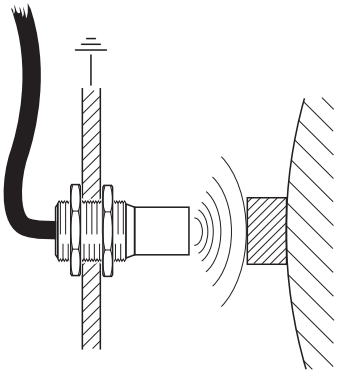
Bank 1
(V+/+/–)

37/38/39 (Keyphaser)
40/41/42 (RPM)

Both channels are bridged by jumpers, i.e. one sensor is sufficient for the RPM measurement and key phaser signal.

Open cable gland (M12) with ring spanner (size 16).

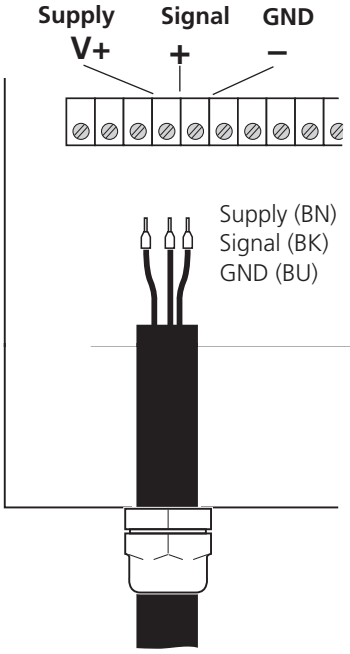




Inductive RPM sensor,
3 conductors
VIB 5.992-BA

Cable installation

Displacement: Inductive sensor - VIB 5.991-DIS

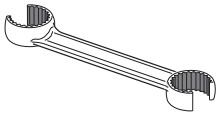


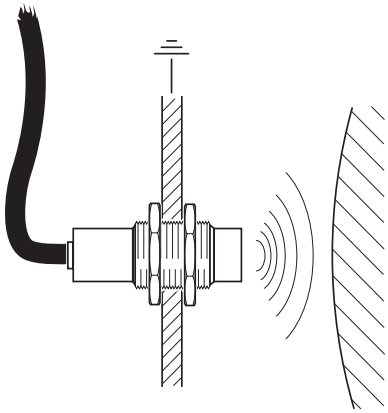
Connect cable to VIBROWEB XP:
Connect supply to supply plus (V+),
signal to plus (+),
GND to minus (-)

Terminals:

Bank 1 (V+/+/–)	**Bank 2 (V+/+/–)**
13/14/15	32/33/34

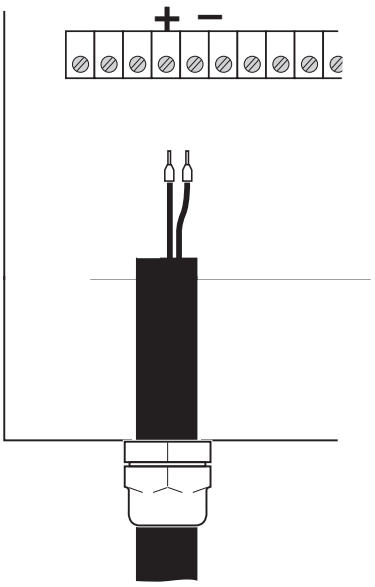
Open cable gland (M12) with ring spanner (size 16).





Displacement sensor, 3 conductors
VIB 5.991-DIS

Process parameters: 0/4 - 20 mA ; ± 10V

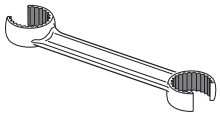


Connect cable to VIBROWEB XP:
Connect plus to plus (+),
minus to minus (-)

Terminals:

Bank 1 (+/–)	Bank 2 (+/–)
16/17 18/19	35/36

Open cable gland (M12) with ring spanner (size 16).



The AI7/1 (terminal 18/19) and AI6/2 (terminal 35/36) analog inputs can be reconfigured by jumper to ±10V process parameters at the factory.

Note

Digital inputs and digital output

VIBROWEB XP has two electrically insulated digital inputs for TTL signals. The open drain output can be used for switching inductive loads. The inductive load should have a free-running diode. The connection is made with a 2-wire electrical cable.

No alternating voltage (AC) should be placed on the digital inputs (Digital IN) in VIBROWEB XP!

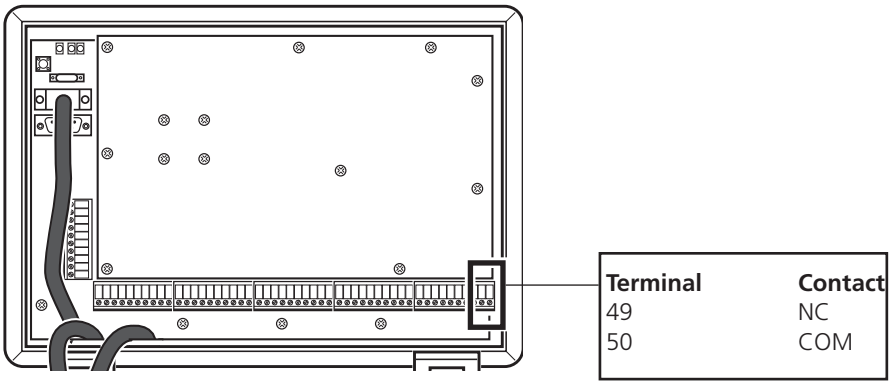
Attention !

Connection to a process control system or to a programmable controller is carried out via fieldbus systems (Modbus, Profibus) which are connected to the second serial interface (RS232/2).

System OK relay and 12V outputs

VIBROWEB XP is supplied as standard with a system OK relay output and a switchable and a non-switchable 12V output (12V switch, 12V-OUT / 1A) which, for example, supplies the communication components (hub, communication box).

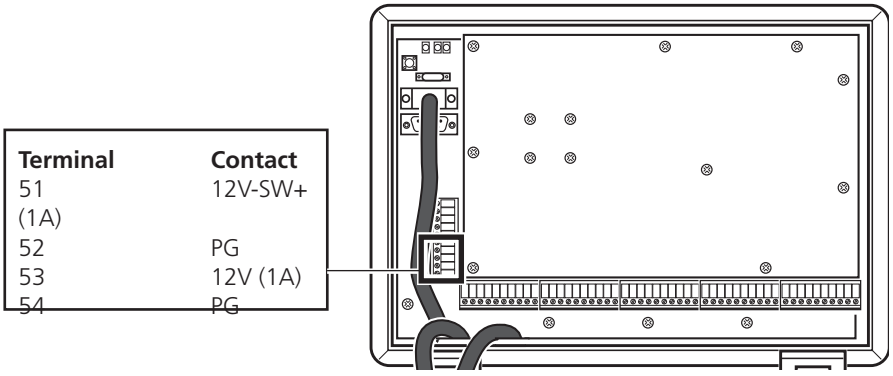
System-OK relay



Terminal	Contact
49	NC
50	COM

System status	Contact NC	Remark
Without supply	open	cannot be influenced
Boot process	closed	cannot be influenced
System OK	closed	programmable
System not OK	open	programmable

12V-Switch / 12V-Out



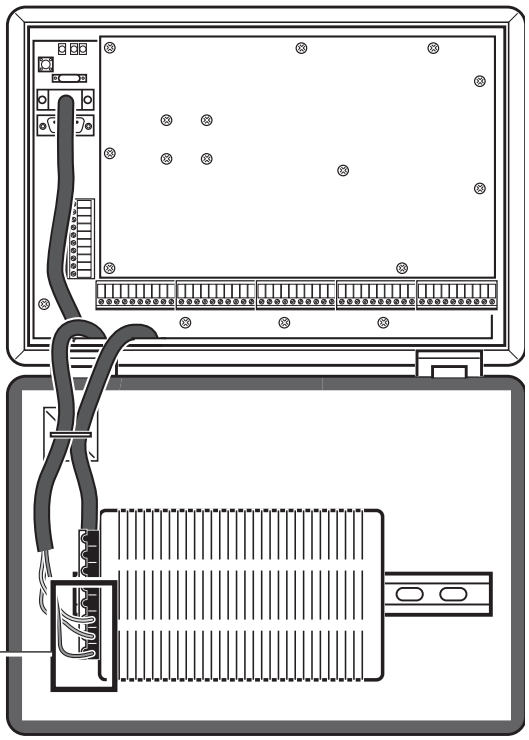
Terminal	Contact
51	12V-SW+
(1A)	
52	PG
53	12V (1A)
54	PG

System status	12V switch	Remark
Without supply	0V	cannot be influenced
Boot process	12V	cannot be influenced

After the boot process, the output can be individually programmed.

Supply

VIBROWEB XP is connected directly to the mains (90-260VAC) and switching it on puts it into operation. Connect the line cord to the mains adapter as follows:

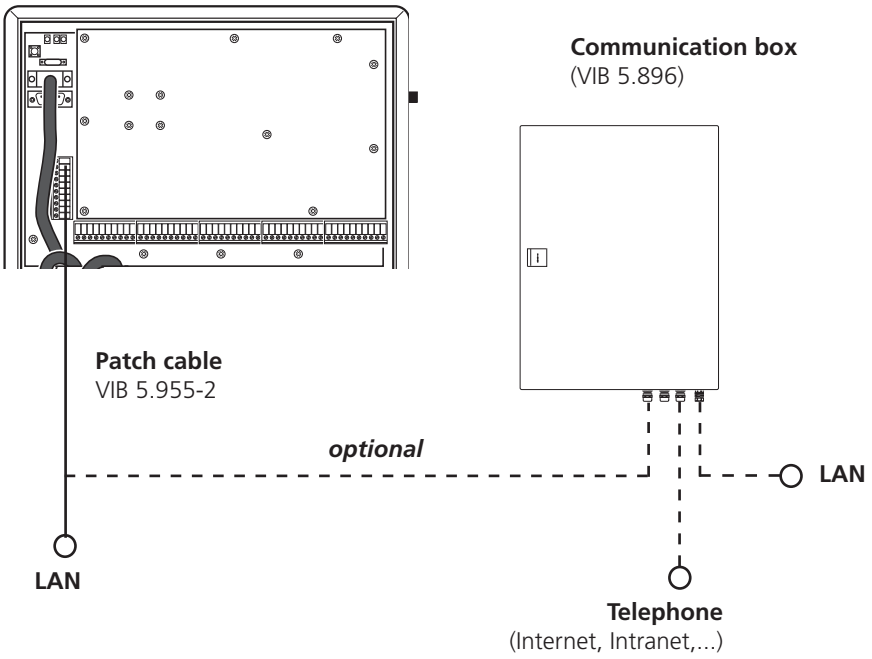


Mains supply

Terminal	Contact
6	PE
7	L1
8	N

Communication

VIBROWEB XP has a Webserver and, therefore, can be directly integrated in an Ethernet network. The optional communication box (VIB 5.896) enables data to be exchanged via Ethernet or via a telephone line (analog/ ISDN) and thus also via distributed networks (Internet, Intranet, ...).



Note

If the length of the patch cable (VIB 5.955-2 / 2 meter) is not sufficient, a suitable longer cable can be used, e.g.:

Lapp - Unitronic LiYcY (TP)
2x2x0.5 mm²

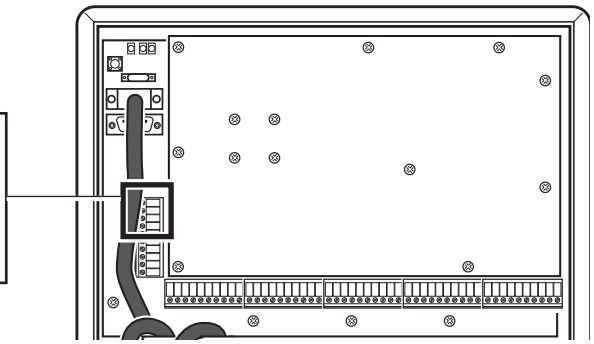
Connect the patch cable in the VIBROWEB XP switching cabinet as follows:

1. Open the switching cabinet and a suitable cable gland on the underside of the cabinet.
2. Feed the open cable end into the switching cabinet and leave a cable loop (approx. 30cm). If each of the cable ends have a connector, cut one of the connectors off.
3. Remove the insulation of the 4 wires with a stripping tool for Ethernet cables (Tx-, Tx+, Rx-, Rx+).

4. The Ethernet connections in the switching cabinet are on terminals 57-60:

Ethernet (LAN)

Terminal	Core
57	Tx+
58	Tx-
59	Rx+
60	Rx-



Ethernet connection in the VIBROWEB XP switching cabinet

Patch cable (color code)

Wire	Color
TX+	red-white
TX-	red
RX+	green-white
RX-	green

The blue and brown wires are not used in the Ethernet.

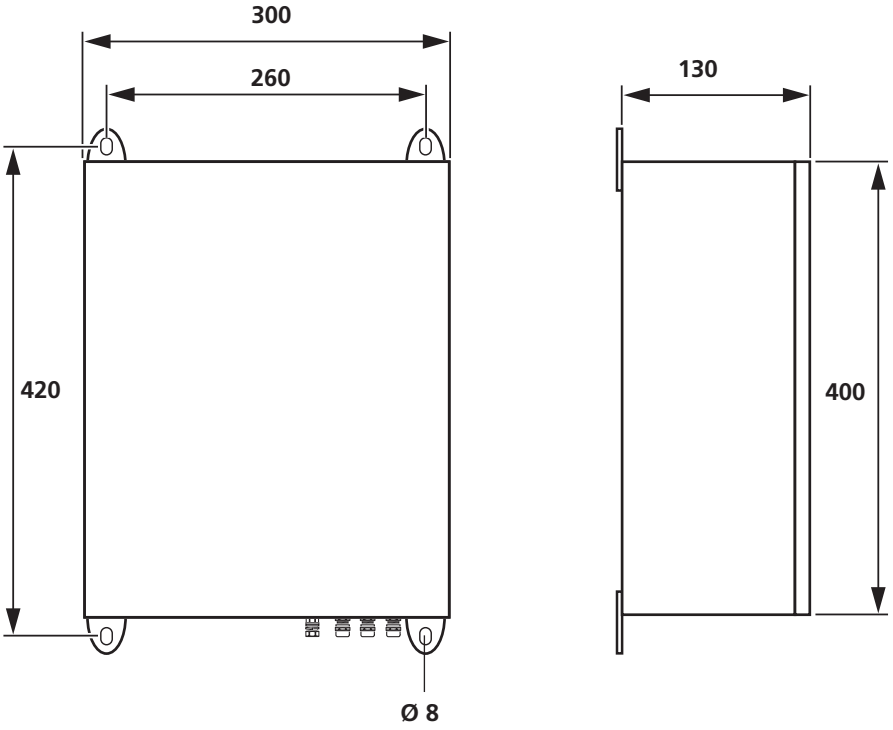
5. Retighten the open cable gland and connect the patch cable to the network.

Communication box - VIB 5.896

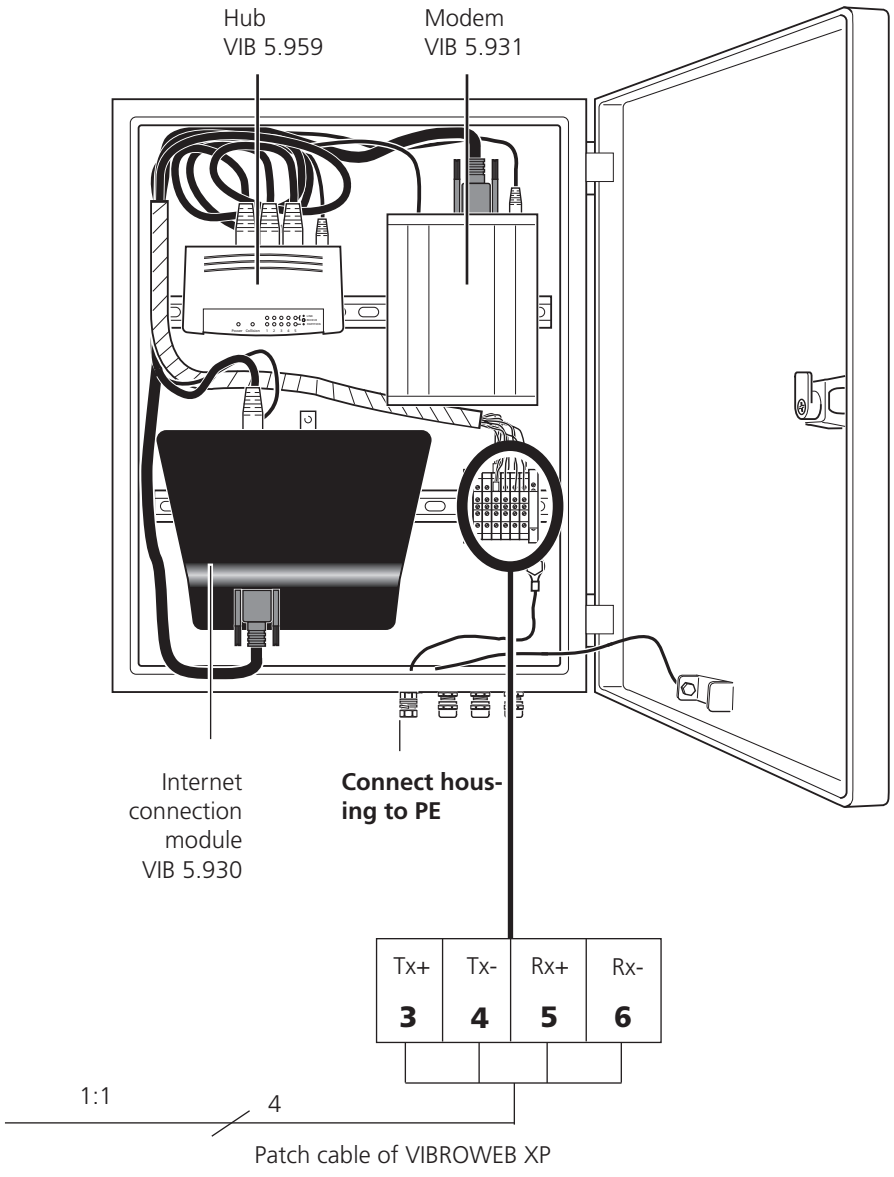
The optional communication box enables data exchange via the Ethernet and analog telephone lines (as well as ISDN). It contains an analog modem, a hub and the Internet connection module.

1. Mount the communication box as close as possible to the VIBROWEB XP switching cabinet so that the patch cable length can be kept short. The analog telephone line and the connection to the company network (LAN) respectively can be longer to compensate for this.

Dimensions
(all sizes in mm)



2. Connect the housing to PE via earthing bolts.
3. Open the communication box and a cable gland.
4. Feed the free end of the patch cable into the communication box. If there is still a connector on it, cut it off and insulate the wires.
5. Connect the wires to the terminal block in the communication box according to the following plan:



Connection to VIBROWEB XP

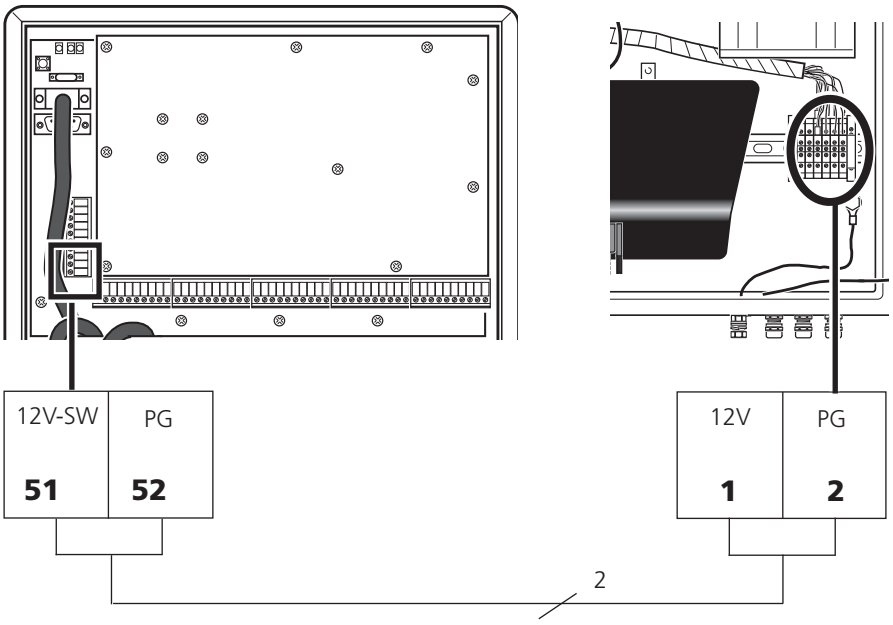
3 - 6: Terminal identification

Installation - Communication

The communication box is connected to the 12V switch in the VIBROWEB XP switching cabinet.

1. Use a 2-core cable, e.g.:
   Lapp oilflex 110 as supply line
   2 x 0.5 mm² (to approx. 10 meters long) or
   2 x 1.5 mm² (to approx. 50 meters long)
2. Connect the wires according to the following plan:

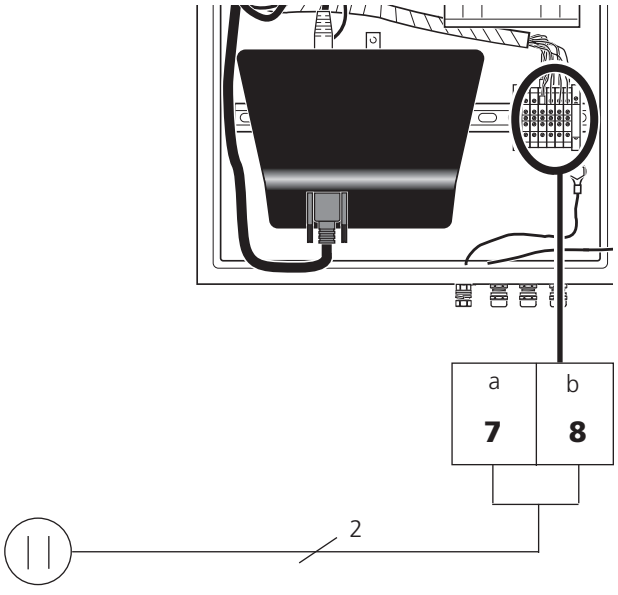
Power supply



51, 52, 1, 2 : Terminal identification

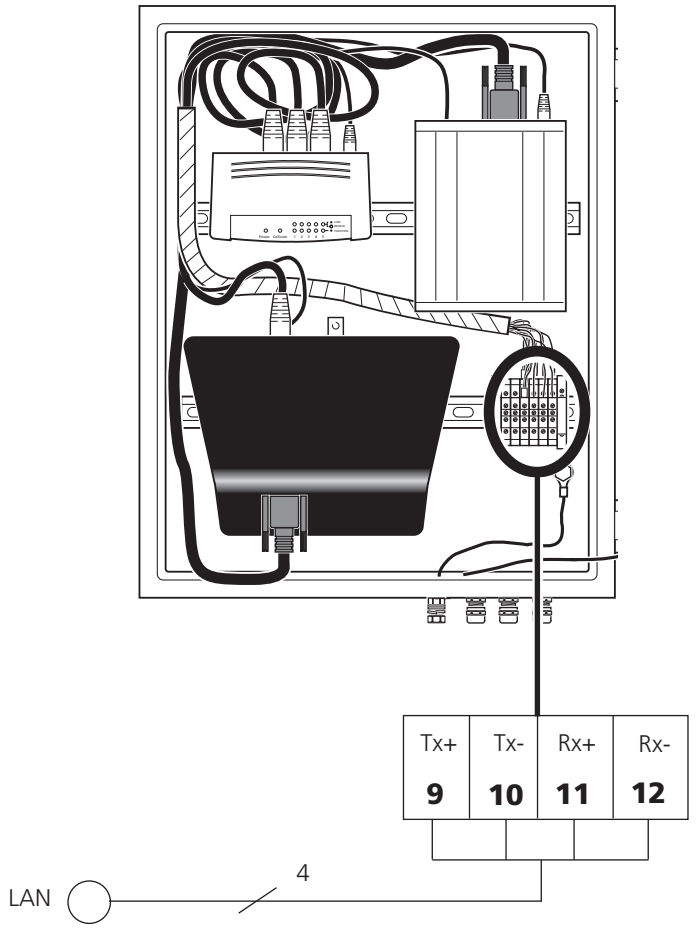
The modem is connected to an analog telephone line (also ISDN) according to the following plan:

Telephone connection



7, 8: Terminal identification

The communication box is connected to an internal company network (LAN) according to the following plan:



Ethernet connection

9 - 12: Terminal identification

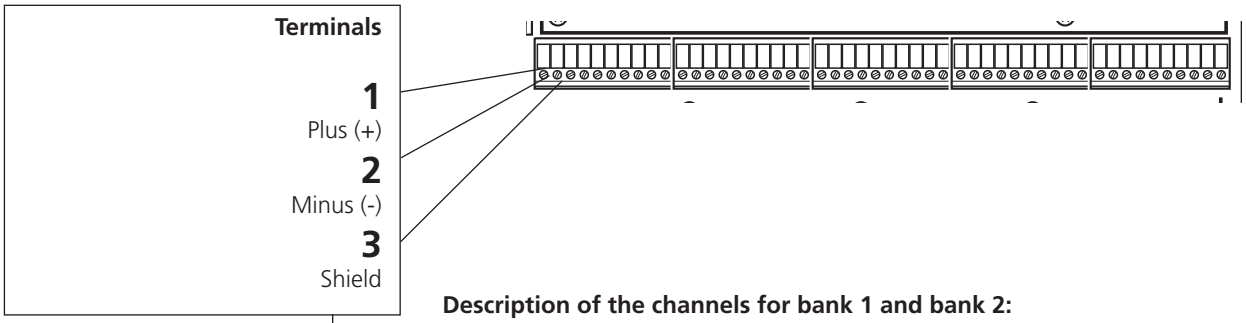
Ethernet cable (color code)

Wire	Color
TX+	red-white
TX-	red
RX+	green-white
RX-	green

The blue and brown wires are not used in the Ethernet.

Installation - Connection terminals

Assignment connection terminals for channel



Description of the channels for bank 1 and bank 2:

AI = Analog input
V... = Supply...
TPI = Tacho/ Pulse (RPM, trigger)
DI = Digital IN (control signal input)
DO = Digital OUT (control signal output)

Vibration acceleration

Terminal	Ch./Bank	Polarity
1	AI1/1	+
2	AI1/1	-
3	AI1/1	shield
4	AI2/1	+
5	AI2/1	-
6	AI2/1	shield
7	AI3/1	+
8	AI3/1	-
9	AI3/1	shield
10	AI4/1	+
11	AI4/1	-
12	AI4/1	shield
20	AI1/2	+
21	AI1/2	-
22	AI1/2	shield
23	AI2/2	+
24	AI2/2	-
25	AI2/2	shield
26	AI3/2	+
27	AI3/2	-
28	AI3/2	shield
29	AI4/2	+
30	AI4/2	-
31	AI4/2	shield

Process parameters

(0/4-20mA; ± 10V)

Terminal	Ch./Bank	Polarity
16	AI6/1	+
17	AI6/1	-
18	AI7/1	+
19	AI7/1	-
35	AI6/2	+
36	AI6/2	-

Keyphaser/ RPM

Terminal	Ch./Bank	Polarity
37	VTP1	+
38	TP1	+
39	TP1	-
40	VTP2	+
41	TP2	+
42	TP2	-

Displacement

Terminal	Ch./Bank	Polarity
13	VAI5/1	+
14	AI5/1	+
15	AI5/1	-
32	VAI5/2	+
33	AI5/2	+
34	AI5/2	-

Digital IN/OUT

Terminal	Ch./Bank	Polarity
43	DI1	+
44	DI1	-
45	DI2	+
46	DI2	-
47	DO1	+
48	DO1	-

Commissioning

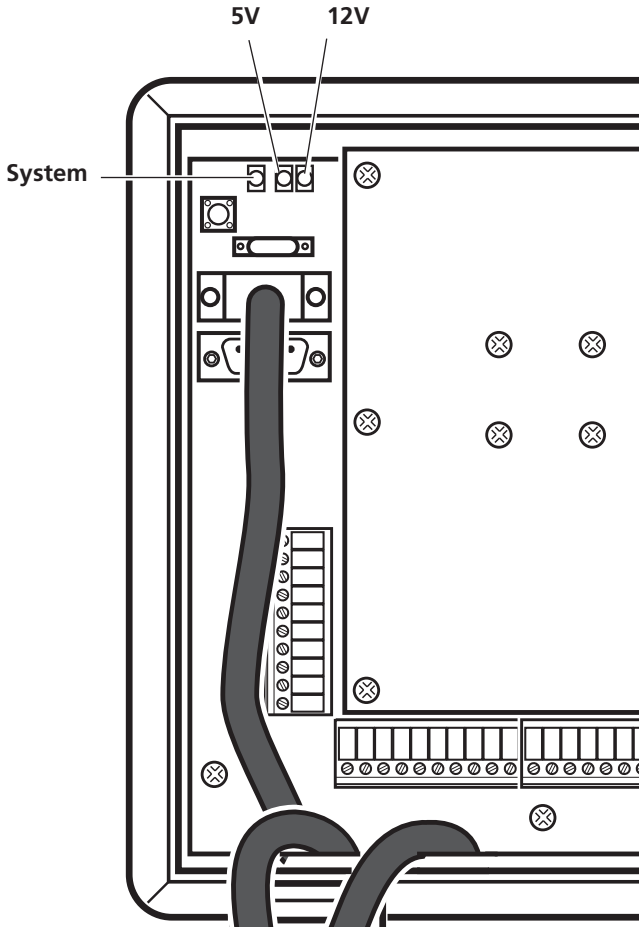
After all system components have been properly installed, put the system into operation by switching on the power supply. Check the sensor lines with the aid of a suitable measurement program (e.g. Progalog).

The motherboard in the electrical switching cabinet has three LEDs which display the operating status of the system and the DC voltage.

The system LEDs signal the following conditions:
ORANGE: System initialization (power up, reset,..)
GREEN: System in operation (OK)
RED: Measurement running

The LEDs of the DC supply light up green.

Status LEDs



Connection overview

Connection overview - VIBROWEB XP switching cabinet

Interfaces	Function	Specification	
Digital outputs	Outputs for the switching of DC relays with external recovery diode	+30V / +0.5A	
Tacho / Pulse	Inputs for RPM measurement, trigger	Switching threshold +3V	
Analog inputs	Inputs for analog sensor signals	CLD, ICP, Displacement, 0/4-20mA, ± 10V	
Ethernet	Connection to an Ethernet network	10 MBit/s, maximum line length 50m	
Digital inputs	Inputs for digital signals (TTL ... +30V)	Switching threshold +3V	
Mains	Voltage supply	90 - 260 VAC 50 Hz - 60 Hz	
12 V switch	Supply for communication box, hub,...	12 V DC / 1A	
RS 232	Serial interface for Laptop (PPP), field bus, display module	38.4 kbit	
System OK relay	Output of the system status	Opener	
DC source	Supply of optional systems	+12VDC	

	Electrical insulation	Terminal identification	Connection type
	no	47 - 48	Screw terminal 2.5 mm²
	no	37 - 42	Screw terminal 2.5 mm²
	no	1-36	Screw terminal 2.5 mm²
	yes	57 - 60	Screw terminal 2.5 mm²
	no	43 - 46	Screw terminal 2.5 mm²
	yes	6 = FG (Terminals of the 7 = L1 mains adapter) 8 = N	Screw terminal 2.5 mm²
	no	51 = 12V-SW+ (1A) 52 = PG	Screw terminal 2.5 mm²
	no	RS 232/1 (Laptop) RS 232/2 (field bus/ dis.)	9-pole D-Sub connector
	yes	49 = NC 50 = COM	Screw terminal 2.5 mm²
	no	53 = 12V 54 = PG	Screw terminal 2.5 mm²

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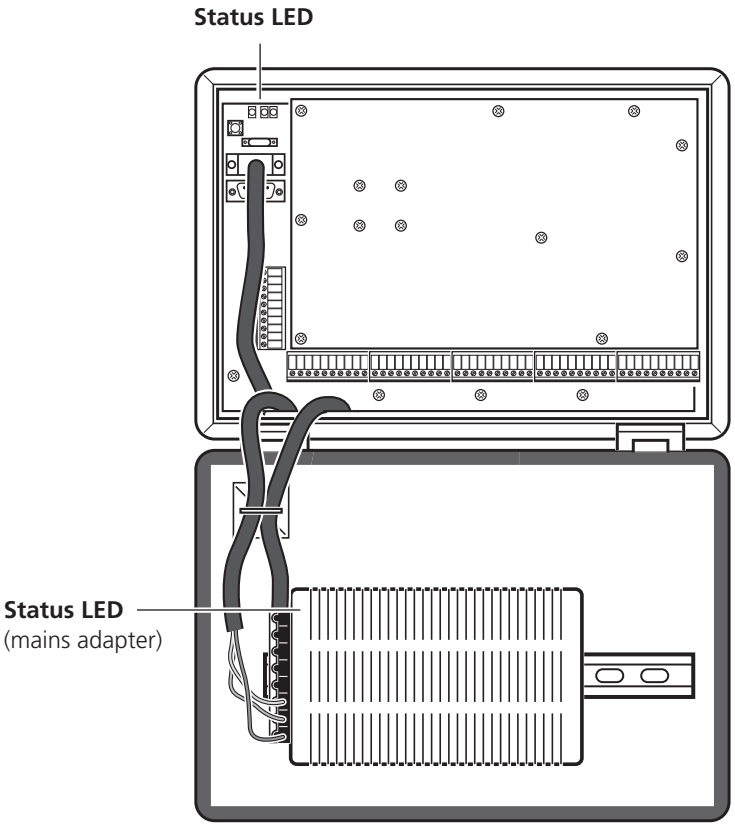
Appendix

What to do if

Symptom: VIBROWEB XP doesn't work after the power supply is switched on. The status LEDs on the motherboard and the power supply do not light up.

Possible cause: Sicherung im Netzteil ist durchgebrannt.

Remedy: Replace mains adapter.



Appendix

Symptom: No signal from LineDrive accelerometer.

Possible cause: Cable connection defective.

Remedy: Check cable connections in the switching cabinet and line to the transducer.

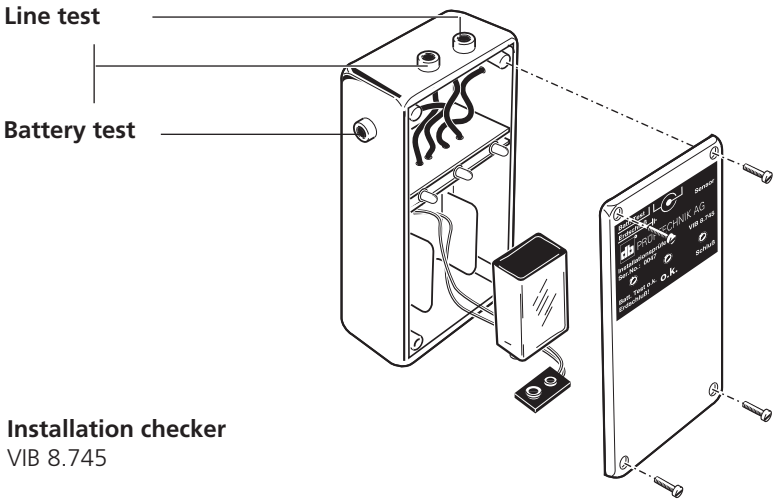
The line to the LineDrive accelerometer can be tested with the installation checker (VIB 8.745). Connect with a cable fitted with a banana plug and crocodile clamp. The line status is displayed on three LEDs on the housing:

- LED green: Line OK
- LED red: Short-circuit in the line
- LED yellow: Ground loop

The connection to the transducer is disconnected if no LEDs light up and the battery is sufficiently charged.

The installation checker is supplied by a 9V battery. The charge level of the battery is displayed as follows:

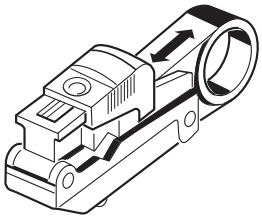
- Connect the 'BATT. TEST' and 'EARTH CONNECTION' connectors
- If the yellow LED lights up, the voltage is less than 5 volts and is not sufficient.



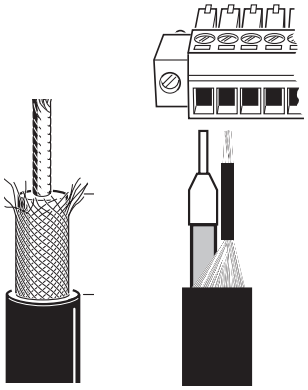
Installation checker
VIB 8.745

Connecting coaxial cables

1. Use the VIB 81052 cable stripper to strip the outer and inner cable insulation.
2. Twist the shield conductor and clamp a wire end sleeve on both the shield line and signal lines.
3. If necessary, insulate the exposed part of the shield conductor with a shrinkable tube.
4. Connect both wires to the intended terminal.

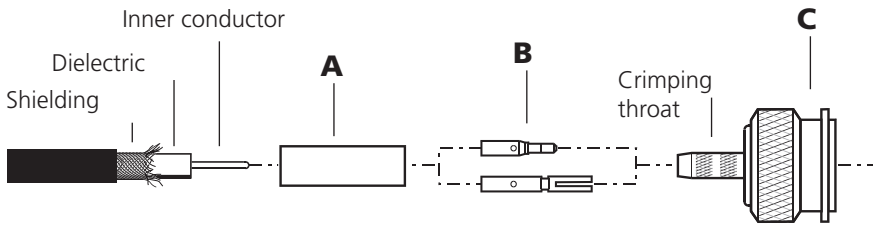


Insulation stripper VIB 81052



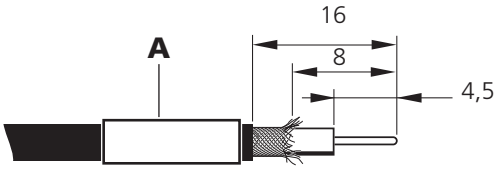
RG 58 coaxial cable (VIB 9005)
Specification: MIL-C-17/2BC

Instructions for crimping (BNC/ TNC)

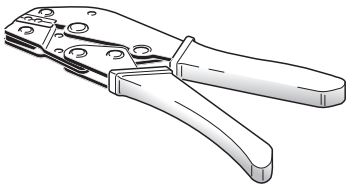


Coaxial cable (RG 58 ; RG 59) | **Sleeve** | **Signal pin** | **Connector housing**

- Slide sleeve A onto the cable.
- Strip the insulation of the cable using the crimping tool (e.g. VIB 81026) as shown in diagram:



Dimensions in mm



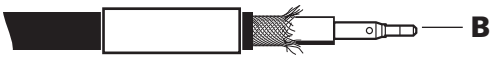
Crimping tool - VIB 81026

Appendix

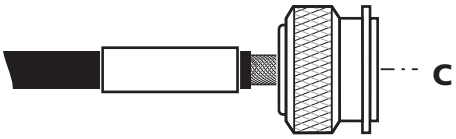
Attention !

Do not damage the shielding, dielectric or inner conductor!

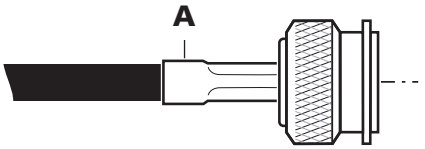
- Push contact B over the cable inner conductor up to the dielectric and crimp it.



- Spread the shielding slightly apart and insert the cable into the housing. The shielding must lie over the crimping throat.



- Push sleeve A over the shielding and crimp as close as possible to housing C.



Technichal data

VIBROWEB XP VIB 7.510 / VIB 7.520

Analog inputs	2x4 inputs for LineDrive (ICP optional) accelerometers (2 of them synchronous) each with four programmable frequency ranges: 0.1Hz to 10Hz / 10 Hz to 10kHz 10 Hz to 48kHz / 0.1 Hz to 48kHz
	2x1 input for inductive displacement sensors (2 of them synchronous); AC/DC coupling
	3x1 input for 0/4...20 mA signals
RPM / Counter input	1x counter input for inductive pulse sensor or pulse signal (5V to 30V)
Key phasor input	1x key phasor for inductive pulse sensor or pulse signal (5V to 30V)
Measurement range, analog input	±10 V, ±1 V, ±100 mV, ±10 mV
Dynamic Range / Resolution	96 dB / 16 bit
Accuracy, analog input	0,05% of full scale
Sampling rate, analog inputs	153,6 / 76,8 / 38,4 / 19,2 / 9,6 kHz
Frequency range	48 kHz to 48 Hz, 11 areas
Antialiasing	Dynamic adaptation
Frequency resolution	400, 800, 1600, 3200, 6400, 12800 lines
Envelope	Digital input filter, selectable
Digital inputs / Digital outputs	2 / 1
FET switch output	12 V DC, 1A, switchable
System OK relais	change-over contact
Measurement funct.	Time waveform, spectrum (amplitude, envelope), inegration of the spectrum, order analysis, cepstrum
RAM / Flash	32 MB / 32 MB
Ethernet interface	1, data rate: 10 Mbit
RS 232 interface	2, data rate: 38,4 kBit
Power supply	90-260 VAC / 50-60 Hz
Dimensions (LxWxH)	approx. 300 x 240 x135 mm / approx. 11.8 x 9.5 x 5.3 inch
Total weight	approx. 4 kg / 8.8 lb.

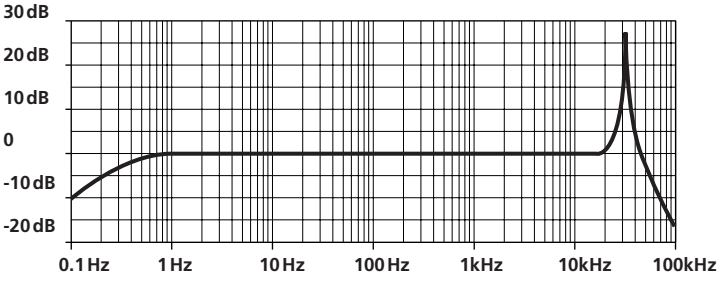
Appendix

Accelerometer, electrically insulated

(VIB 6.102, 6.122, 6.125)

Types	with bonding stud - VIB 6.102 with thread M8/90° - VIB 6.122 with thread M8/90°, high-temperature - VIB 6.125
Application	For vibration measurement up to 20 kHz and shock pulse measurement of anti-friction bearings and pump cavitation.
Signaling system	Current LineDrive, 3.5 mA closed current with superposed AC signal
Max. measurment range (r.m.s.)	up to 2000 m/s² (204g)
Transmission factor ±3%	1.0 µA/ms^{-2} at 159 Hz, 25°C = 9.8 µA/g at 159 Hz/77° F
Frequency range	± 5% 2 Hz to 8 kHz ±10% 1 Hz to 12 kHz ± 3dB 1 Hz to 20 kHz
Resonant frequency	36 kHz
Linearity range ±10%	±2000ms^{-2} (±204 g)
Temperature range Standard vers. (Rayolin cable)	-30°C to 100°C / -22°F to 212°F
Power requirement	3.5 mA DC / 8,5-18 V DC
Transverse sensitivity	< 5% at 10 kHz
Temperature sensitivity	< 0.05 ms^{-2}/K
Magnetic sensitivity	<5 ms^{-2}/T (at 50 Hz)
Base strain sensitivity	< 0.1 ms^{-2}/µm/m
Electrical noise, rms	< 0.01ms^{-2} from 2 Hz
Output impedance	> 1 MOhm
Shock limit	250 kms^{-2} = 25 000g
Case material (VIB 6.122, VIB 6.122 EX) (VIB 6.122S, chemical-proof)	stainless steel VA 1.4305 VA 1.4571
Environmental protection	IP65 (w/cable)
Mounting	M8 thread
Connector type	TNC
Weight	40 g / 1.4 oz.

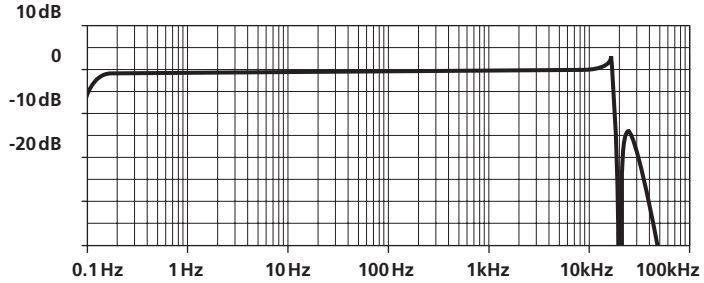
Frequency response



Accelerometer - VIB 6.195

Application	For vibration measurement up to 10 kHz on low speed machines (<60 rpm).
Signaling system	Current LineDrive, 3.5 mA closed current with superposed AC signal
Max. meas. range (r.m.s.)	up to 450 m/s² (46g)
Transmission factor ±3%	5.35 µA/ms^{-2} at 159 Hz, 25°C = 51.9 µA/g at 159 Hz/77° F
Frequency range ±3dB	0,3 Hz to 10 kHz
Resonant frequency	17 kHz; >20dB damped
Linearity range ±10%	±450ms^{-2} (±46 g)
Temperature range	-30°C to 80°C / -22°F to 176°F
Power requirement	3.5 mA DC / 8-18 V DC
Transverse sensitivity	< 5% at 5 kHz
Temperature sensitivity	< 0.01 ms^{-2}/K
Magnetic sensitivity	<1 ms^{-2}/T (at 50 Hz)
Base strain sensitivity	< 0.01 ms^{-2}/µm/m
Electrical noise, rms	< 0.002ms^{-2} from 2 Hz
Output impedance	> 300 kOhm
Shock limit	50 kms^{-2} = 5 000g
Case material	VA 1.4305 (stainless steel)
Environmental protection	IP67
Mounting	M8 thread
Connector type	Cable connector, 2 pin (Mil-C5015)

Frequency response



Anhang - Technische Daten

Keyphaser / RPM sensor - VIB 5.992-BA

Sensor type	DC / 3-lead/ PNP / opener
Installation	Not flush
Meas. principle	inductive
Switching distance	8 mm
Repeat accuracy	< 5%
Switching status display	Yes
Operating voltage	10 ... 30 V
Load current	200 mA
Switching frequency	600 Hz
No-load current	< 4/12 mA
Voltage drop	< 1,5 V
Cutoff current	0,5 mA
Short-circuit protection	yes
Reverse-connect protection	yes
Ambient temperature	-25°C to +70°C
Housing material:	Brass, nickel-plated
Active material surface:	PA 12
Protection class:	IP 68
Dimensions	M18 x 1 x 76,5 mm (DxH)
Connection cable	Cable (LiYY-O)

Displacement transducer - VIB 5.991-DIS

Measurement size:	Relative displacement and relative strain
Masurement principle:	Inductive
Frequency range (±3dB):	0 to 200 Hz
Displace. meas. range:	10 mm
Average working point:	approx. 8 mm
Output signal:	1.5 bis 12 mA
Transmission factor:	0.75 mA/mm
Repeatability:	<0.02mm or 0.2% v.E.
Temperature drift:	70 ppM/°K
Supply voltage:	24V DC, +/-5%
Supply current:	30 mA
Sensor/cable break. recog.:	Output signal <1 mA
Temperature range:	-10...+60°C
Connection:	5m cable, LiYY-0, 3x0.34mm²
Housing:	Continuous thread M30x1.5
Housing material:	Brass, nickel-plated
Active material surface:	PBTP
Protection class:	IP67

Coaxial cable - VIB 90005 / 90093

Application	Standard connection cable in electromagnetically noncontaminated environments
Type	Single-conductor shielded RG 58 according to MIL-C-17/2BC specification
Temperature range	80 °C / 176°F (VIB 90005-x) 125 °C / 257 °F (VIB 90093-x); x= cable length in meters, 1 meter = 3.28 ft.

Twinax cable (2 core) - VIB 90060

Configuration:	2 pairs of twisted and shielded lines with PUR outer sheath
Temperature range:	-30°C to +70°C; fix mounted
Outer diameter:	approx. 8 mm

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Printed in Germany VIB 9.812.05.05.0G

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