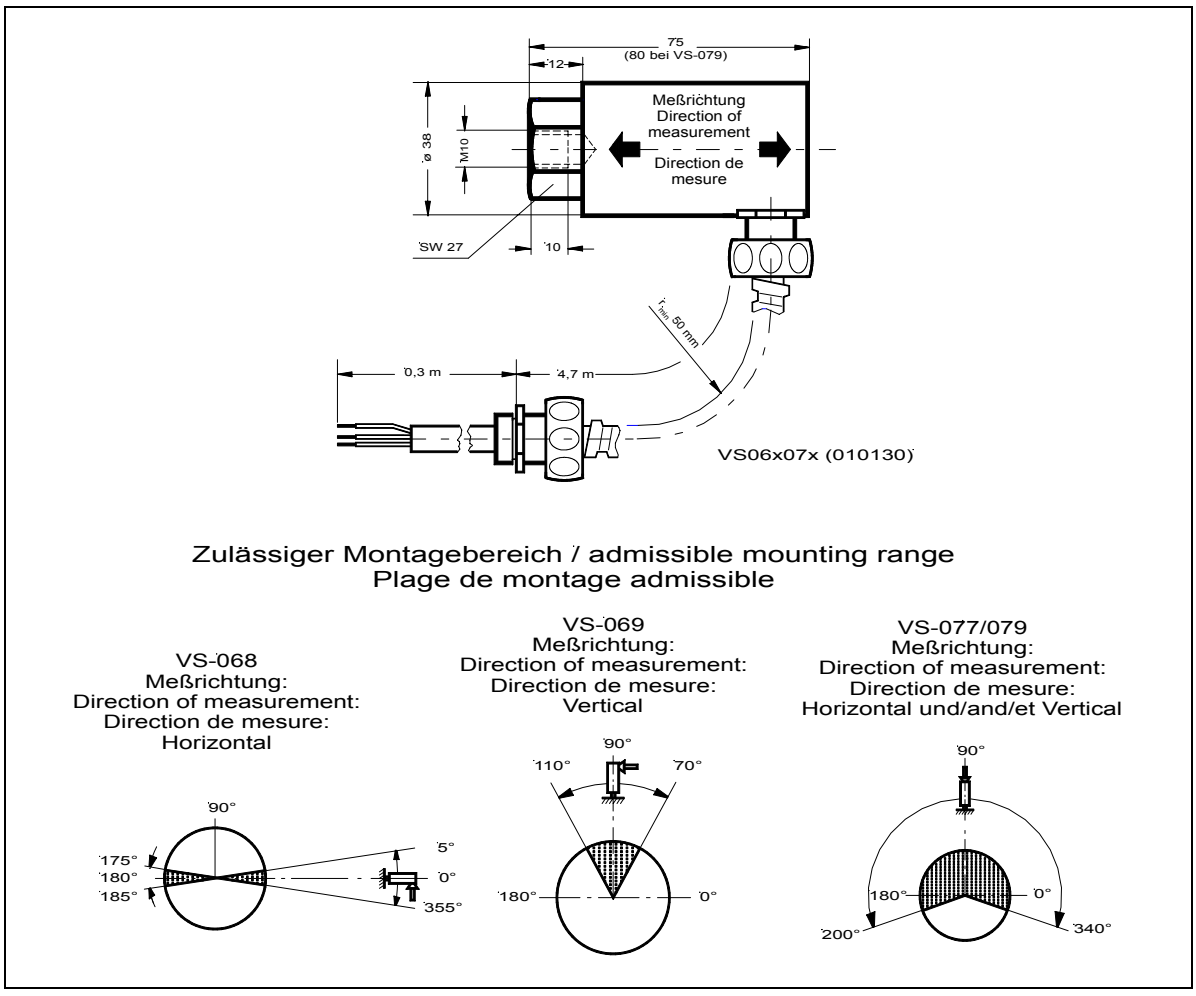
# Vibration Velocity Sensors

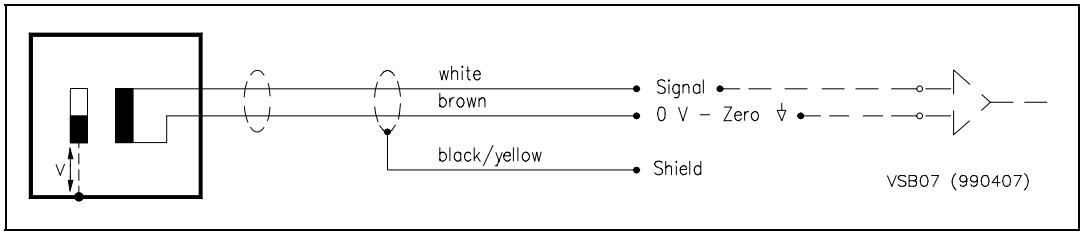
# VS - 068 / 069 / 077 / 079



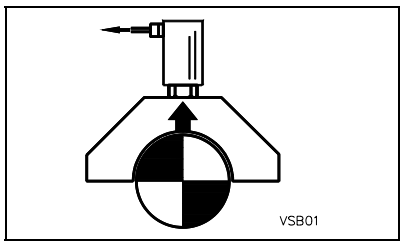

# 1 Application

Brüel & Kjær Vibro vibration velocity sensors operate in accordance with the electrodynamic principle and are used for measuring the bearing absolute vibration of machines.

# 2 Connection Diagram




## 2.1 Polarity




With the illustrated direction of movement of the bearing shell, a positive polarity signal is produced at the white wire of the cable.

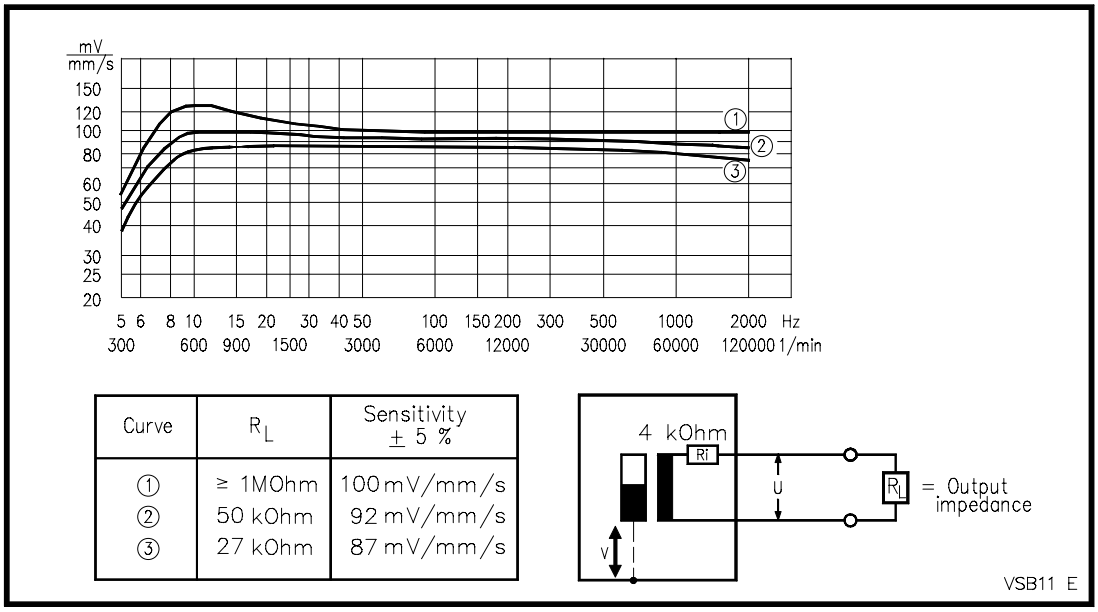
# 3 Technical Data

## 3.1 General Data

| | |
|---|---|
| Sensor cable | Teflon cable; PTFE (C)<br>2 x 0,38 $mm^2$; shielded |
| Length | 5 m; wire ends: open<br>Extension of the sensor connecting cable to a max. of 200 m is possible (wiht a terminal box) |
| Housing | stainless steel; hermetically sealed |
| Fixing | Central mounting by means of stud M10 x 25; DIN 914; A2F<br>max. tightening torque 87 Nm |
| Protective class as per DIN 40 050 | IP 66 |
| Weight of sensor without cable | approx. 500 g |
| EMC | EN 50082-2: 1995 Pkt. 1.1, 1.2, 1.4, 2.1, 2.2<br>EN 50081-2: 1994 Pkt. 1.1, 1.2 |

# 3.2 Technical data for VS-068 and VS-069

| | |
|---|---|
| Measuring parameter | Vibration velocity |
| Measuring principle | electrodynamic |
| Sensitivity E at f = 80 Hz | $E = \frac{100\ mV}{mm/s} \times \frac{R_L}{4\ k\Omega + R_L}$ |

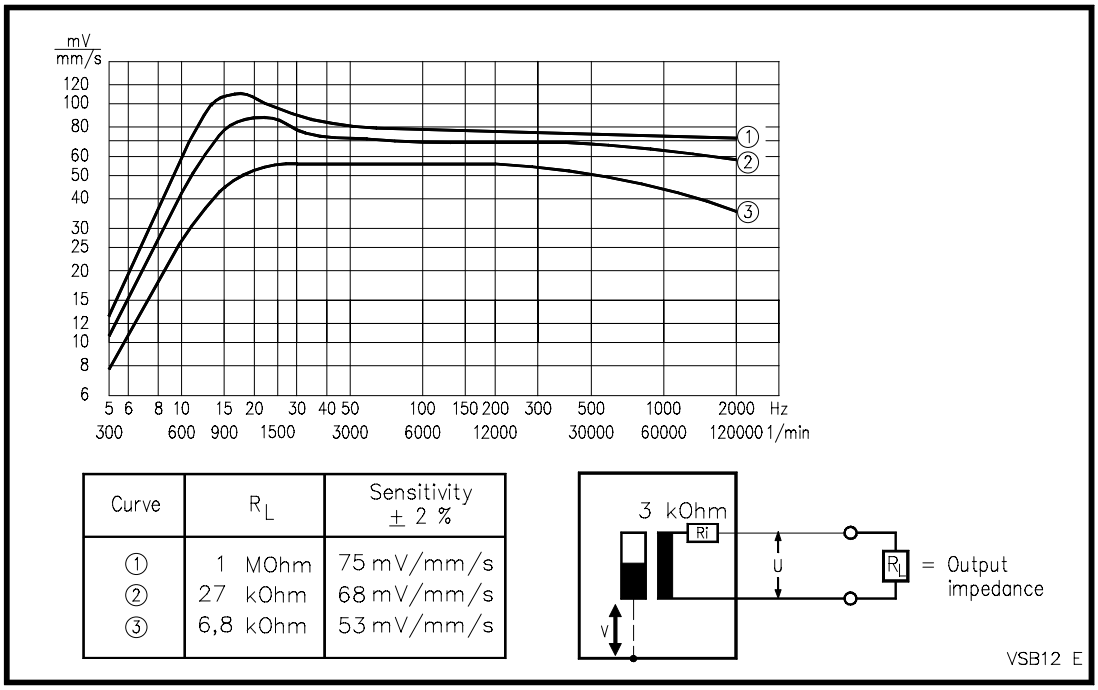



*Typical frequency response and sensitivity*

| | |
|---|---|
| Internal impedance | 4 kΩ ± 5 % |
| Transverse sensitivity | ≤ 7 % |
| Natural frequency $f_o$ | 8 Hz ± 10 % |
| Operating temperature range | -40 ... + 80 °C (short-term max. + 100 °C) |
| Max. admissible vibration displacement | ± 0,45 mm |
| Cable protection | Flexible steel protective hose encased with PU material |
| Magnetic field sensitivity | $\frac{< 0{,}03\ mm/s}{0{,}1\ mT}$ |

# 3.3 Technical data for VS-077

| | |
|---|---|
| Measuring parameter | Vibration velocity |
| Measuring principle | electrodynamic |
| Sensitivity E at f = 80 Hz | $E = \frac{75\ mV}{mm/s} \times \frac{R_L}{3\ k\Omega + R_L}$ |

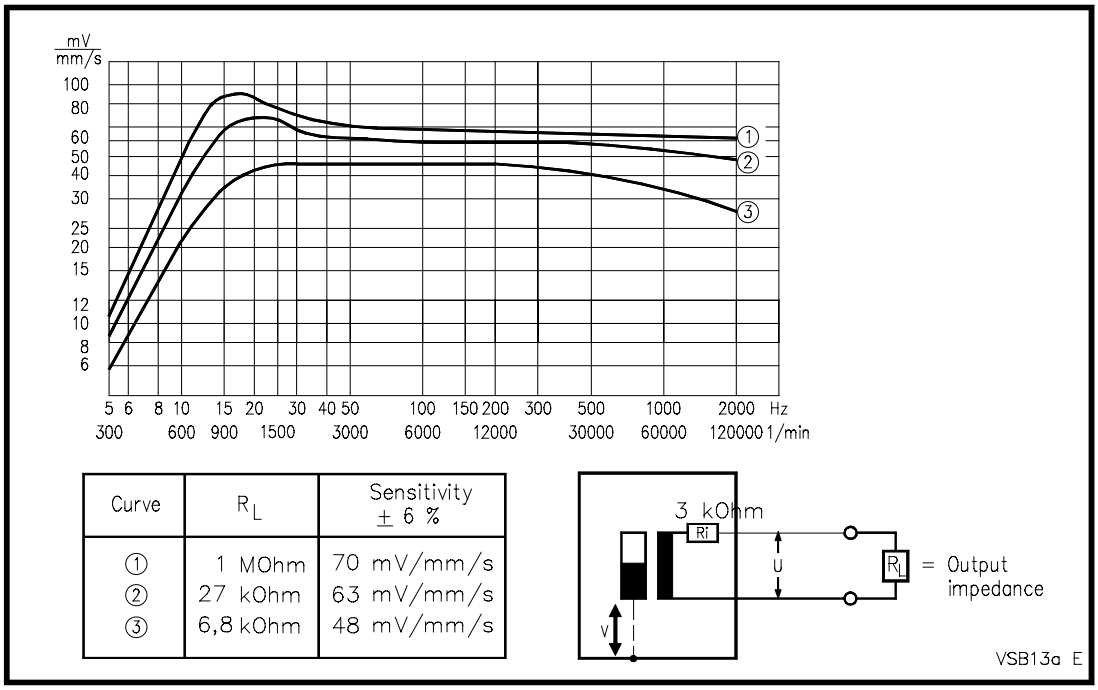



*Typical frequency response and sensitivity*

| | |
|---|---|
| Internal impedance | 3 kΩ ± 5 % |
| Transverse sensitivity | ≤ 5 % |
| Natural frequency $f_o$ | 15 Hz ± 2 % |
| Operating temperature range | -40 ... + 80 °C |
| Max. admissible vibration displacement | ± 1 mm |
| Cable protection | Flexible steel protective hose encased with PU material |
| Magnetic field sensitivity | $\frac{< 0{,}024\ mm/s}{0{,}1\ mT}$ |

# 3.4 Technical data for VS-079

| | |
|---|---|
| Measuring parameter | Vibration velocity |
| Measuring principle | electrodynamic |
| Sensitivity E at f = 80 Hz | $E = \frac{70\ mV}{mm/s} \times \frac{R_L}{3\ k\Omega + R_L}$ |

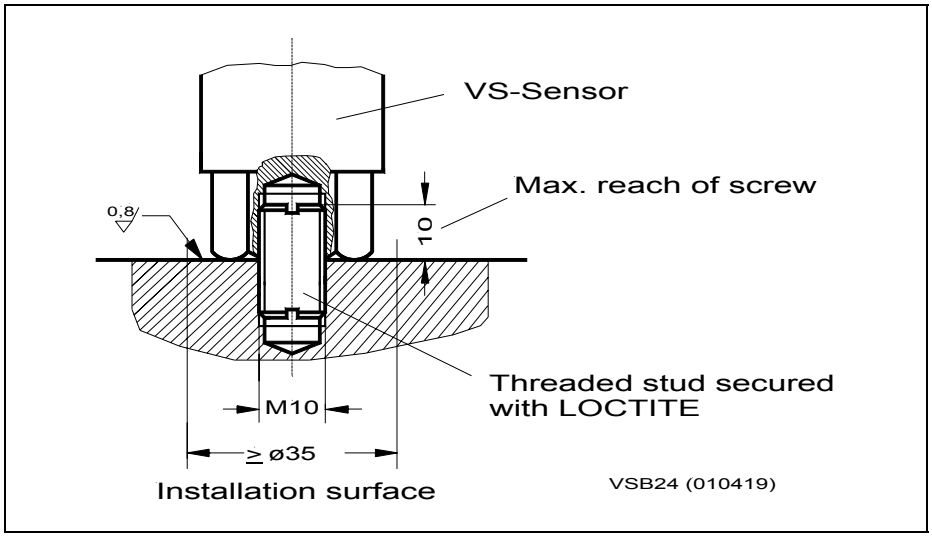



*Typical frequency response and sensitivity*

| | |
|---|---|
| Internal impedance | 3 kΩ ± 5 % |
| Transverse sensitivity | ≤ 6 % |
| Natural frequency $f_o$ | 15 Hz ± 5 % |
| Operating temperature range | -40 ... + 200 °C |
| Max. admissible vibration displacement | ± 1 mm |
| Cable protection | Rust-free stainless-steel, not encased |
| Magnetic field sensitivity | $\frac{< 0{,}024\ mm/s}{0{,}1\ mT}$ |

# 4 Mounting Instructions

## 4.1 Fastening of sensor




### The following applies on principle:

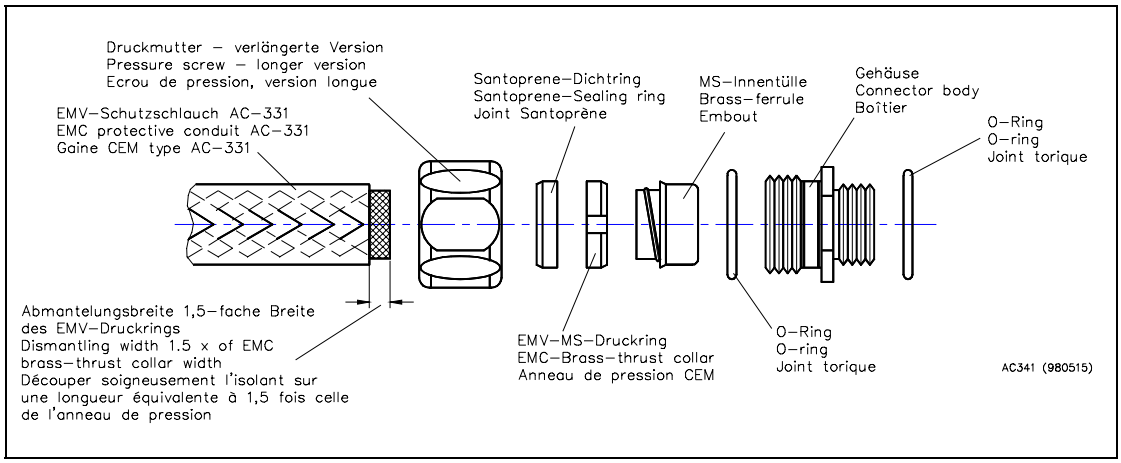
- Mounting surface flat and clean, i.e. without paint, rust etc
- Threaded stud perpendicular to mounting surface; the sensor must be tightened to the mounting surface
- Secure stud with LOCTITE
  (e.g. LOCTITE 243 medium-duty, LOCTITE 270 heavy-duty)
- Avoid auxiliary fixtures for mounting;if unavoidable, the fixture should be as rigid as possible
- For protection against mechanical damage and for increase EMC safety the connection cable should be laid in flexible steel protective conduit. Bending radius $r_{min}$ = 50 mm
- Tighten sensor directly to mounting surface
  Max. tightening torque 87 Nm

## 4.2 Preparing the steel protective conduit

Adapt the steel protective conduit to the site conditions by taking the following steps:

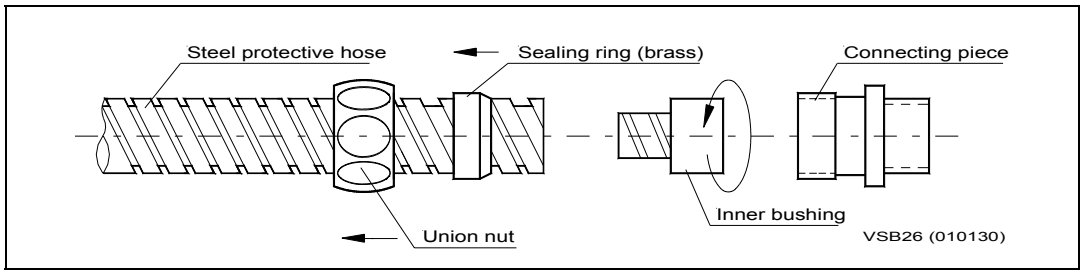
- If the protective conduit has a braided shield, to ensure a clean cut through the braided wrap a strip of metallised adhesive tape around the area where the cut is to be made before starting the cut.
- Cut the protective conduit with a suitable cutting tool, e.g. metal saw, cutting disc.
- De-burr the cut end.

# 4.3 Mounting steel protective hose at VS-068 / 069 / 077




- To achleve the optimum shielding performance of AC-331 according VDE 0245 and DIN 47250 part 4, the protective conduit with connector should be assembled as follows:
- Cut protective conduit to appropriate length (see 3.2).
- Disassemble connector and slide pressure screw (long version) over the conduit.
- Slide sealing ring over the conduit with tapered edge facing the pressure screw.
- Uncover the outer jacket of the conduit with care leaving a section as long as 1.5 x the width of the brass-thrust collar.
- Cut copper shield with scissors flush with the conduit.
- Slide brass-thrust collar (with taper side as shown) over the conduit as illustrated above.
- Screw brass ferrule into the conduit until it stops.
- Assemble the rest of the individual components and tighten so that the O-ring is not movable.
- For liquid-tight installations install the additional O-ring at the connector thread side.

## 4.4 Fixing steel protective conduit at VS-079




- Cut protective conduit to appropriate length (see 3.2)
- Slide the union nut and sealing ring on steel protective hose behind the cutting point
- Screw the inner tube onto the steel protective conduit
- Slide steel protective hose slide over sensor cable and fix protective hose joint to the sensor and the steel protective hose
- Adjust sensor cable length to suit and ansulate
- Solder screen onto sensor cable; protect soldering joint by means of shrink tubing and rubber bushing
- Fix end sleeves to cable ends