

KOBOLD Model NVI
Vibrating Rod Level Switch
User Instructions



USA

**1801 Parkway View Drive
Pittsburgh, PA 15205
PH 412-788-2830**

Canada

**9A Aviation
Point Claire, QC H9R 4Z2
PH 514-428-8090**

www.koboldusa.com

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Manufactured and sold by:

Kobold Messring GmbH
Nordring 22-24
D-65719 Hofheim
Tel.: +49(0)6192-2990
Fax: +49(0)6192-23398
E-Mail: info.de@kobold.com
Internet: www.kobold.com

2. Note

Please read these operating instructions before unpacking and putting the unit into operation. Follow the instructions precisely as described herein.

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EWG-machine guidelines.

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition. Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:

The standard delivery includes:

- Vibrating Level Switch model NVI
- Operating Instructions

4. Regulation Use

Any use of the Vibrating Level Switch, model: NVI, which exceeds the manufacturers specification may invalidate its warranty. Therefore any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

5. Operating Principle

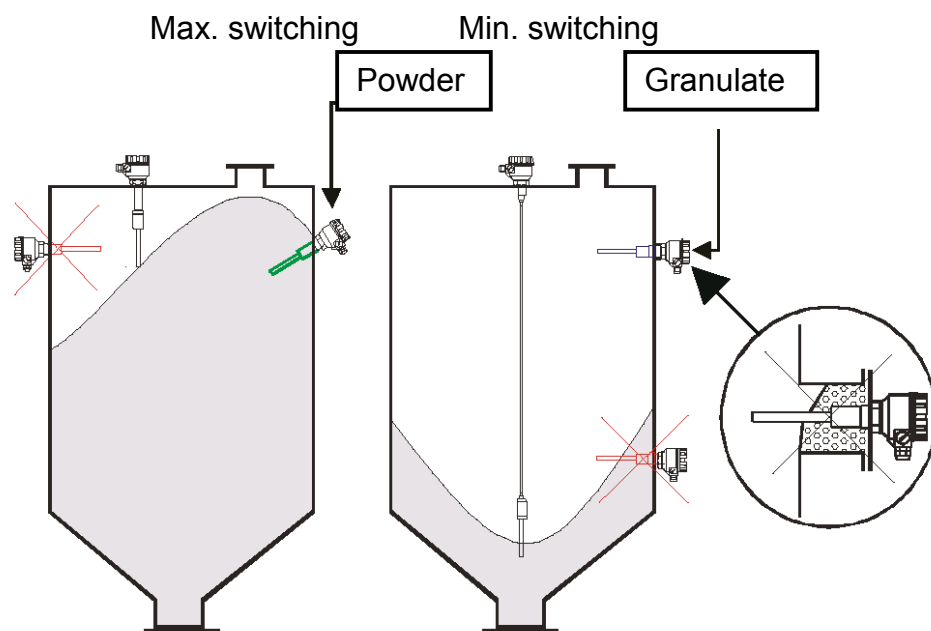
The Kobold NVI level switch is a mechanical system that is made to resonate by an electronic switching operation. When the probe is covered by a medium, the vibrations are damped. This change in the resonance frequency is converted to a switching signal by electronic means.

6. Mechanical Connection



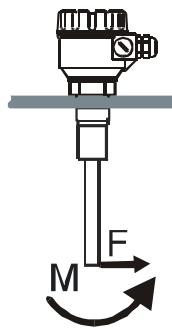
Important! Handle the device with great care, especially the sensing probe. A larger impact on the sensing probe may ruin its resonance system. Probes exposed to falling material or mechanical loads should be protected.

- Prior to the installation, it is advised to test the switching function of the unit on a sample quantity of material and to set „Density“ switch according to the density of medium. (see 8. Commissioning)
- Screw in the device by its hexagon neck. After screwing tight the process connection, the housing can be rotated (max. 300 °), to adjust the cable glands to the required position. In some cases such as material caving or arching you will need to mount the vibration rod at a clearance from the desired limit.



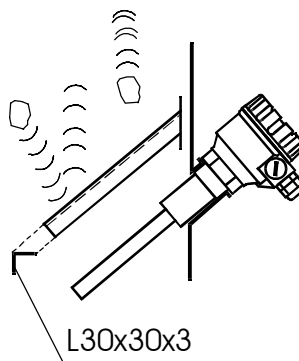
- The model NVI is not suggested to be used for low level detection in high density materials.

Limits for bending or pulling force and torque should be considered:

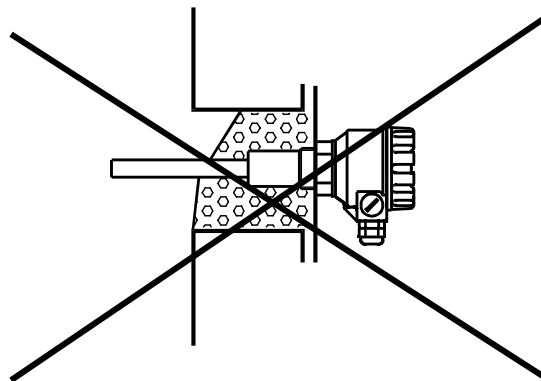


$F = 445 \text{ N}$
 $M = 85 \text{ Nm}$

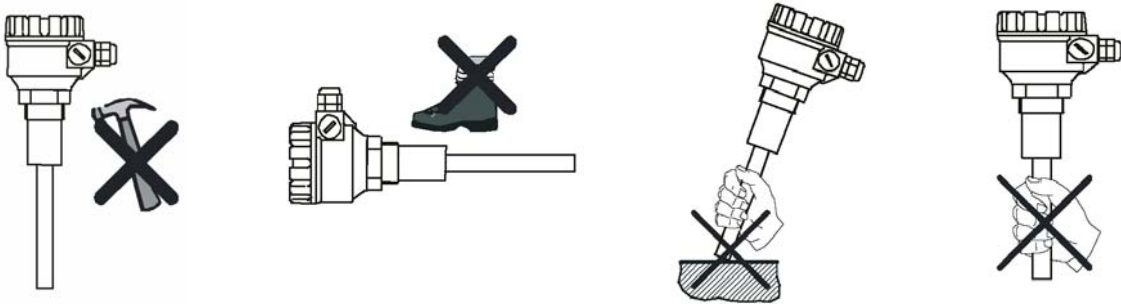
- Probes exposed to falling material or mechanical loads should be protected.



- When working with powdery bulk materials you should install the device at an inclination greater than the existing angle of repose, or even vertically to detect maximum level. This is necessary in order to prevent too much powder clinging to the vibration rod and hindering vibration and self-cleaning of the rod when the silo/tank is being emptied. Avoid mounting the device as shown in the diagram.



- Use rubber shims for example to protect the device in bins/silos where large vibrations occur.

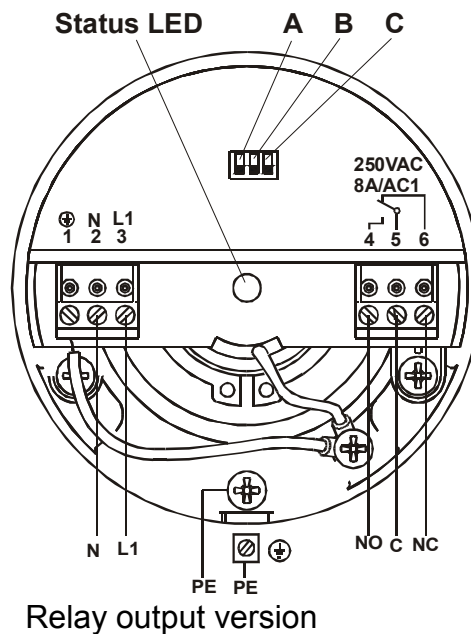


7. Electrical Connection

7.1. General


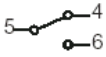

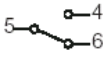

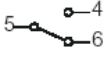

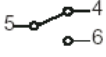
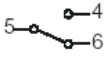


Attention! Check that the electrical power supply to the instrument complies with the operating data for the instrument.



Attention! Incorrect wiring will lead to damage of the unit's electronics.

7.2. Operation Diagram

Power	Probe	Fail-safe mode	Status LED	RELAY
On	Not vibrating (covered)	 LOW	GREEN	 Energised
		 HIGH	RED	 De-energised
	Vibrating (free)	 LOW	RED	 De-energised
		 HIGH	GREEN	 Energised
Fails	-	LOW or HIGH	NOT LIT	 De-energised

8. Commissioning

Unscrew the housing cover to access the terminals and setting switches. **Do not disconnect the wire from terminal connection point 1.** Ground the device at terminal PE or use the grounding screw on the device.

When you have properly connected the device, it is ready for operation. The LED lights up when the device is switched on.

8.1. Density (Sensitivity) Adjustment (Switch A)

The potentiometer DENSITY (switch A) needs to be set to suit the material density. The density setting affects the operation of the rod threefold:

- LOW position, recommended for loose and light materials with **density** around and below 0.1 kg/dm³ represents **low energy** and **amplitude** of vibration as well as **great sensitivity** of detection.
- HIGH position, recommended for (thick and heavy) materials with **density** over 0.1 kg/dm³ represents vibration with **high energy and amplitude** and **small sensitivity** of detection.

8.2. High/Low Fail-Safe Mode (Switch C)

De-energised status of the relay is preferred to be used for fail-safe alarm, thus a power breakdown will be considered as alarm (see 7.2 Operation Diagram)

8.3. Time Delay (Switch B)

Though the density of the medium is within the specific range, the device may not detect if the internal friction of the medium is too low. Choose a switch delay (switch B) to suit process requirements.

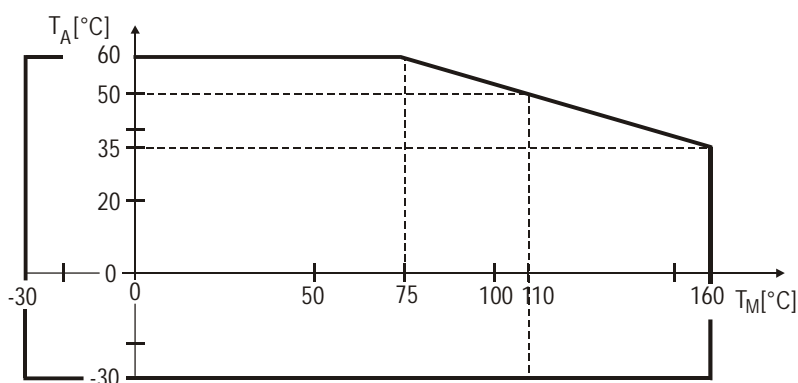


Note: The device can be damaged by electrostatic discharge (e.s.d.) from the DIP switch. To prevent such damage, the general precautions must be strictly observed.

9. Technical Information

Special lengths:	235 mm
Process connection:	G 1 1/2 or 1 1/2" NPT
Material for wetted parts:	1.4571 (AISI316Ti)
Sensor surface:	bright
Medium temperature:	- 30 °C to + 110 °C standard - 30 °C to + 160 °C high-temperature
Ambient temperature:	- 40 °C to + 60 °C
Maximum pressure:	25 bar
Power supply:	85...265 V _{AC} ; ≤ 2.5 VA; 1.2W 120...375 V _{DC} ; ≤ 2.5 VA; 1.2 W 16...40 V _{AC} ; ≤ 2.5 VA; 1.3 W 19...55 V _{DC} ; ≤ 2.5 VA; 1.3 W
Electrical connection:	conduit thread 16
Protection:	IP 67
Weight:	2.5 kg

10. Derating Diagram



Ambient temperature (T_A) versus medium temperature (T_M)

11. Order Codes

Example: **NVI-1 300 R**

Model	Version	Power supply	Connection
NVI-	1 = standard 2 = High-temperature	300 = 85...265 V _{AC} 120...375 V _{DC} 302 = 16...40 V _{AC} 19...55 V _{DC}	R = G 1 ½ 2 = 1 ½ NPT

12. Maintenance

Series NVI devices require no regular maintenance. You may need to remove product stuck to the probe and clean the probe every now and then. Handle the sensing probe **with great care** to avoid any damage.

The manufacturer will carry out all repairs within and beyond the guarantee period. Clean or disinfect all parts before returning them for repair.

13. Storage

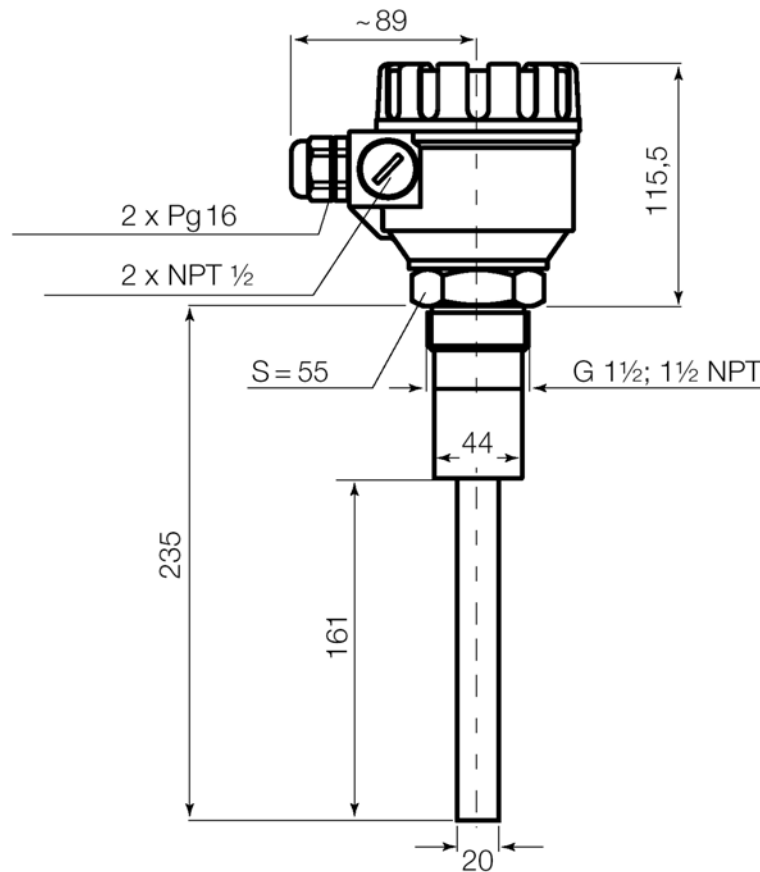
Ambient temperature: -35 up to +60 °C
Relative humidity: max. 98 %

14. Guarantee

All guarantee repair work will be carried out in the manufacturer's workshop. The costs of demounting, installation, and transportation shall be borne by the purchaser.

All rights to claims under guarantee for faults caused by incorrect installation, rupture, improper handling or force majeure will not be honoured.

15. Dimensions



16. Declaration of Conformance

We, Kobold Messring GmbH, Hofheim-Ts, Germany, declare under our sole responsibility that the product:

Vibrating Level Switches Model: NVI

to which this declaration relates is in conformity with the standards noted below:

DIN EN 61010-1	1993/A2	1995	
EN 50081-1	1992		
EN 50081-2	1993		
EN 50082-2	1997		
EN 55022	1994		
IEC 61000-4-2	1995/ A1	1998/ A2	2000
IEC 61000-4-3	1995/ A1	1998/ A2	2000
IEC 61000-4-4	1995/ A1	2000	
IEC 61000-4-5	1995/ A1	2000	
IEC 61326	1997/ A1	1998	

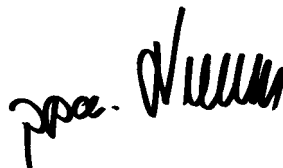
Also the following EWG guidelines are fulfilled:

89/336/EWG
73/23 EWG (93/68)
94/9



Signed:

H. Peters



M. Wenzel

date: 06.12.02