



Thank you for choosing a NIVELCO instrument.
We are sure that you will be satisfied throughout its use!

1. APPLICATION

The NIVOCONT vibrating rod level switches are suitable for low and high level indication of granules and powders with a min. 0.05 kg/dm³ density such as cement, lime, sand, grain, feed, sugar, etc. Dust Ex versions are available for using the instrument in explosion-proof environment.

2. TECHNICAL DATA

2.1 GENERAL SPECIFICATION

VERSION	STANDARD	PIPE EXTENDED	CABLE EXTENDED
Probe length	207 mm	0.3 ... 3 m	1 ... 20 m
Material of wetted parts	1.4571		Probe: 1.4571 Cable: PE coated
Housing material	Aluminium: Powder paint coated (R-500 series) Plastic: PBT fibre-glass reinforced, flame-retardant (R-600 series)		
Process connection	R_H; R_R; R_K: 1½" BSP R_N; R_L; R_C: 1½" NPT		
Temperature ranges	See table 2.2 and Temperature diagram		
Max. pressure (absolute)	25 bar (2.5 MPa)		6 bar (0.6 MPa)
Minimum medium density*	0.05 kg/dm³ (max. granular size: 10 mm)		
Response time (selectable)	Not vibrating (covered)	< 1.8 sec or 5 ±1.5 sec	
	Vibrating (free)	< 2 sec or 5 ±1.5 sec	
Supply voltage (universal)	normal type: 20...255 V AC/DC Ex type: 20...250 V AC (50/60Hz) or 20...50V DC		
Power consumption	≤ 2.5 VA / 2 W		
Electrical connections	2 pcs. M20x1.5 plastic cable glands  II 2GD Ex e II/ Ex tD for Ø10 to 15 mm cable for Ex version or M20x1.5 plastic for cable Ø6 to 12 mm 2 pcs. plug-in type terminal blocks for max. 1.5 mm² wire cross section		
Ingress protection	IP67 (NEMA6) MSZ EN 60529:2001		
Electrical protection	Class I. (to be grounded!)		
Ex protection mark	 II 1/2 D tD A20/A21 IP67 T (see table 2.2)		
Mass	plastic housing	1.5 kg	1.5 kg (+ 0.6 kg/m)
	aluminium housing	1.88 kg	1.88 kg (+ 0.6 kg/m)

* Depend on friction and granular size of the medium

2.2 SPECIAL DATA

TEMPERATURE DATA	CABLE EXTENDED VERSION			STANDARD AND PIPE EXTENDED VERSION				
	R K-5_-5Ex R C-5_-5Ex			RK_-5_-5Ex, RS_-5_-5Ex with the exception of the cable extended version				
				HIGH TEMP. RH_-5_-5Ex, RT_-5_-5Ex				
Medium temperature min.: -30°Cmax.:	+60°C	+70°C	+95°C	+60°C	+70°C	+95°C	+110°C	+160°C
Ambient temperature range min.: -30°Cmax.:	+60°C	+50°C	+60°C	+60°C	+50°C	+60°C	+50°C	+35°C
Max. surface temperature of process connection	+85°C	+85°C	+95°C	85°C	85°C	+95°C	+95°C	+135°C
Max. surface temperature	+85°C	+85°C	+95°C	85°C	85°C	+95°C	+110°C	+160°C
Temperature class	T90°C			T90°C T100°C T115°C T170°C				

OUTPUT DATA	RELAY		SOLID STATE	
	R_-5_-1	R_-5_-5Ex	R_-5_-3	
Output type	SPDT (potential free)		SPST (electronic)	
Output rating	250 V AC, 8A, AC 1		50 V, 350 mA peak	
Output protection	—		Overvoltage, overcurrent and overload	
Voltage drop (switched on)	—		< 2.7 V @ 350 mA	
Residual current (switched off)	—		< 10 µA	

TEMPERATURE DIAGRAM

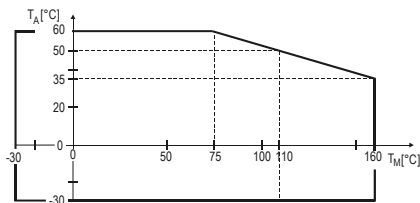


Figure 2.
Ambient temperature (T_A) versus medium temperature (T_M)

2.4 ORDER CODE

NIVOCONT R - - **

VERSION	CODE
Standard	K
High temp.	H*
Standard polished	S
High temp. polished	T*

PROCESS. CONN.	CODE		
	Standard	Pipe	Cable
1 ½" BSP	H	R	K
1 ½" NPT	N	L	C

HOUSING	CODE
Alu cast	5
Plastic	6

PROBE LENGTH	CODE		
	Standard	Pipe	Cable
207 mm	02	—	—
0.3 ... 3 m	—	03...30	—
1 ... 20 m	—	—	01...20

SUPPLY / OUTPUT / Ex	CODE
20-255 V AC/DC / Relay	1
20-255 V AC/DC / Electronic	3
20-255 V AC/DC / Relay / Ex	5

* only for standard and pipe extended versions

** The order code of an Ex version should end in „Ex“

NIVOCONT

VIBRATING ROD LEVEL SWITCHES

USER'S MANUAL



NIVELCO

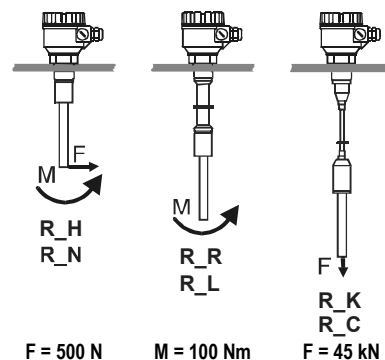


Figure 1.
Maximum allowed torque and force

2.3 ACCESSORIES

- User's manual
- Warranty Card
- Declaration of Conformity
- 2 pcs. 3-pole terminal blocks
- 1 ½" sealing, for BSP only
- 2 pcs. M20x1.5 cable glands

2.5 DIMENSIONS

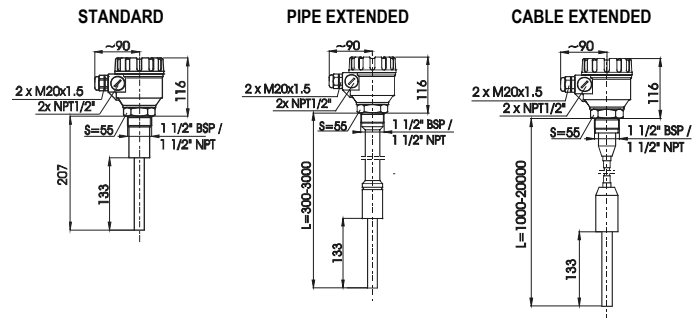


Figure 3.

3. MOUNTING

Prior to installation, it is advised to check the switching function for proper adjustment on a sample quantity of material (see: Adjustment). The unit may not work with mediums within the specified density range but having very large size of granules or extremely little friction.

WARNING! Handle the device with great care, especially the sensing probe. Any impact on the sensing probe may ruin its resonance system. A protective shield should be installed (see Figure 6) if the probe is exposed to falling material or excessive mechanical load.

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 gland to the required position.

It might be necessary to install the device at an offset level position relative to the switching level actually required taking into account caving or arching of the material in the silo (see Figure 4).

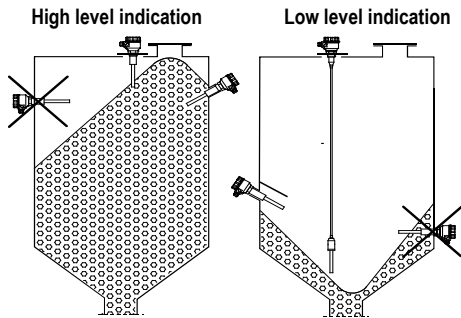


Figure 4.

With powder level detection device should be installed at an inclination exceeding the angle of repose (or, in case of high level detection vertically), to prevent powder deposition on vibrating rod that might substantially reduce the self-cleaning effect. Also avoid mounting the rod in a recess (see Figure 5)

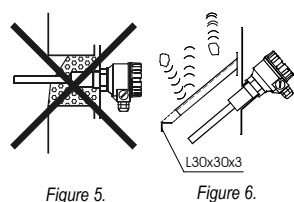


Figure 5.

Figure 6.

In case of tanks that are likely to be exposed to intense vibrations, necessary provisions shall be made for damping the vibrations acting on the device (e.g. vibration damping inserts made of rubber have to be applied).

4. INSTALLATION, PUTTING INTO OPERATION

Remove the top cover of the housing to access the connection terminals and adjusting switches.

Do not remove the wire form terminal pin 1 (Figure 7) because it is an internal connection. For grounding the unit use the PE grounding screw terminal PE.

After proper installation and the electrical connection, established the device is ready for operation. The switched-on state is indicated by the lighting of the LED.

The DENSITY (switch A) switch is to be set in accordance with the density of the material:

- LOW position, recommended for loose and light materials with **density** below 0.1 kg/dm³ represents **small 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 **great energy** and **amplitude** and **small sensitivity** of detection

The instrument may not switch correctly in mediums with density less than 0.05 kg/dm³ or with very small internal friction.

To obtain FAIL SAFE alarm (switch C), use the de-energised or open state of the output as an alarm, thus a power breakdown will also be considered as alarm (see Table below).

The delay (switch B) is to be selected to comply with requirements of the process control technology the units is used for.

Note: The instrument may be damaged via switches by electrostatic discharge (ESD), thus the precautions commonly used to avoid ESD is to be applied.

5. WIRING

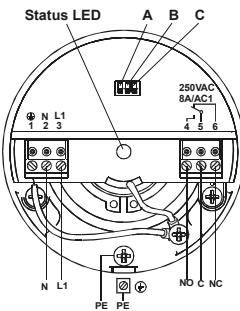


Figure 7.

Wiring of relay output version

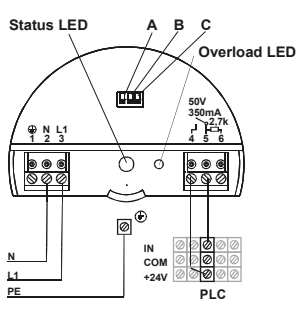


Figure 8.

Wiring of optocoupled sink input to solid state output version supplied from a AC line

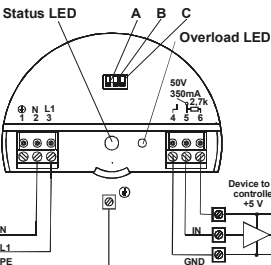


Figure 9.

Wiring of a logical voltage input to a solid state output version supplied from a AC line

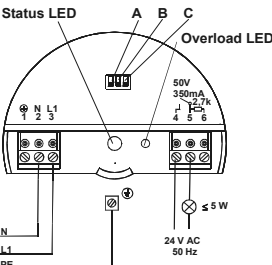


Figure 10.

Wiring of a load to a solid state output version supplied from a AC line

5.1 OPERATION DIAGRAM

POWER	PROBE	FAIL-SAFE MODE	LED	RELAY	SOLID STATE OUTPUT
ON	NOT VIBRATING (COVERED)	LOW	GREEN	5-4-6 ENERGISED	6-2.7 k-5 4-ON-5
		HIGH	RED	5-4-6 DE-ENERGISED	6-2.7 k-5 4-OFF-5
	VIBRATING (FREE)	LOW	RED	5-4-6 ENERGISED	6-2.7 k-5 4-OFF-5
		HIGH	GREEN	5-4-6 ENERGISED	6-2.7 k-5 4-ON-5
FAILS		LOW or HIGH	NOT LIT	5-4-6 DE-ENERGISED	6-2.7 k-5 4-OFF-5

5.2 SPECIAL CONDITIONS FOR SAFE USE

The enclosure shall be not opened while it is energized!

6. MAINTENANCE AND REPAIR

The NIVOCONT R-500/R-600 series devices do not require maintenance on a regular basis. In some instances, however, the vibrating section may need a cleaning from deposited material. **This must be carried out gently, without harming the vibrating section of the vibrating rod.**

Repairs during or after the warranty period are effected at the Manufacturers. The equipment sent back for repairs should be cleaned or neutralised (desinfected) by the User.

7. STORAGE

Ambient temperature: -35 ... +60°C

Relative humidity: max. 98 %

8. WARRANTY

NIVELCO provides warranty of 3 (three) years in compliance with details described in the Warranty Card.

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November 2010

NIVELCO reserves the right to change technical data without notice.