

FOR SOLIDS

# NIVOCONT R

VIBRATING ROD LEVEL SWITCHES



3 YEARS WARRANTY @ NIVELCO – WHERE ELSE?

**NIVELCO**

LEVEL SWITCHES

## NIVOCONT R VIBRATING ROD LEVEL SWITCHES

### MAIN FEATURES

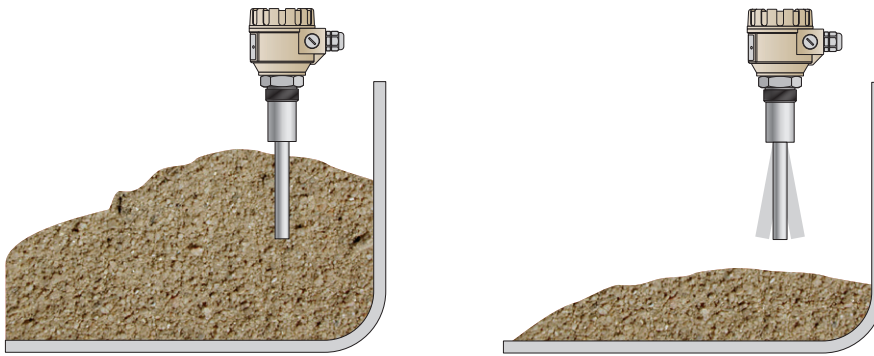
- Extension up to 20 m (65.5 ft)
- Adjustable sensitivity
- Max. medium temperature 160°C (320 °F)
- Universal supply voltage
- Dust explosion protection
- Fine polished probe

### APPLICATIONS

- Powders, pellets, granulates
- Grains
- Ground products
- Stone-powder, chippings
- Cement, sand
- Coal, slag

### GENERAL DESCRIPTION

The NIVOCONT R series of vibrating rod level switches are robust instruments designed for low and high level indication of granules and powders with a minimum of 0.05 kg/dm<sup>3</sup> (50 oz/ft<sup>3</sup>) density. Mounted on tanks, silos or hopper bins it can control filling / emptying, or give fail-safe alarm signals. The highly polished version is recommended to use for abrasive mediums. The operation principle is based on that the electronic circuit excites the vibration in the rod probe. When the medium reaches and covers the rod vibration stops, when the medium leaves the rod it returns to vibrate freely. The electronics senses the change of vibration and gives output signal after a selected delay.



### TYPE SELECTION

Position of the switching point (high, low) and the mounting (side, bottom, top) determines the selection of the appropriate type.

Type	Standard	Pipe extended	Cable extended	
High limit switch	Side mounted	Top mounted	Top mounted	
Low limit switch	Side or bottom mounted			
Dimensions				
Maximum load	Force	500 N	–	45 kN
	Torque	100 Nm	100 Nm	–

## TECHNICAL DATA

Tipus		Standard	Pipe extended	Cable extended
Insertion length		207 mm (8.15 inch)	0.3 ... 3 m (1 ... 33 ft)	1 ... 20 m (3.3 ... 65.5 ft)
Material of wetted parts		1.4571 (316 Ti)		vibrating part: 1.4571 (316 Ti) cable: PE cover
Process connection		1 1/2" BSP; 1 1/2" NPT as per order code		
Output		see output data		
Temperature range		standard: -30 °C...+110 °C (-22 °F...+230 °F); High temp. version: -30 °C...+160 °C (-22 °F...+320 °F); Ex version: see temperature data		
Maximum pressure		max. 25 bar g (2.5 MPa) / 363 psi g		max. 6 bar g (0.6 MPa) / 87 psi g
Max. load	Force	500 N	–	45 kN
	Torque	100 Nm	100 Nm	–
Medium density <sup>(1)</sup>		min. 0.05 kg/dm <sup>3</sup> (50 oz/ft <sup>3</sup> ) (Max. granular size: 10 mm (0.4 inch))		
Response time (selectable)		< 2 sec or 5 sec ±1.5 sec		
Power supply		20...255 V AC/DC, Ex type: 20...250 V AC (50/60Hz) or 20...50 V DC		
Power consumption		≤ 2.5 VA / 2 W		
Housing material		Paint coated aluminium or plastic (PBT)		
Electrical connection		2 x M20x1.5 plastic cable glands for Ø 6...12 mm (0.25...0.5 inch) cable For Ex version: 2 x M20x1.5 cable glands: protection Ex tD (ATEX) for Ø 9...13 mm (0.35...0.5 inch) cable 2 x M20x1.5 cable glands: protection Ex IIIC IP67 (IEC Ex) for Ø 6...12 mm cable 2 pcs. terminal blocks for max. 1.5 mm <sup>2</sup> (AWG15) wire cross section		
Electrical protection		Class I.		
Ingress protection		IP67		
Ex marking <sup>(2)</sup>	ATEX	⊕ II 1/2 D tD A20/A21 IP67 T* °C (-30°C ≤ T <sub>A</sub> ≤ +60°C) (see temperature limit values for Ex versions)		
	IEC EX	Ex t IIIC T* Da/Db IP67 (-30°C ≤ T <sub>A</sub> ≤ +60°C) (see temperature limit values for Ex versions)		
Mass	Metal housing	1.88 kg (4.15 lb)	1.88 kg +1.4 kg/m (4.15 lb + 1lb/ft)	1.88 kg +0.6 kg/m (4.15 lb + 0.4lb/ft)
	Plastic housing	1.5 kg (3.3 lb)	1.5 kg +1.4 kg/m (3.3 lb + 1lb/ft)	1.5 kg +0.6 kg/m (3.3 lb + 0.4lb/ft)

(1) Depends on the internal friction and the granular size of the medium

(2) Only with metal housing

## OUTPUT DATA

Type	Relay	Electronic
Output type and rating	SPDT 250 V AC, 8 A, AC1	SPST 50 V, 350 mA
Output protection	–	Overvoltage, overcurrent and overload
Voltage drop (switched on)	–	< 2.7 V at 350 mA
Residual current (switched off)	–	< 10 µA

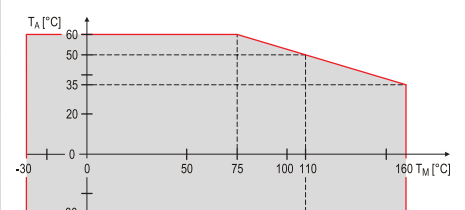
## TEMPERATURE DATA

### Temperature limit values for Ex versions:

Temperature data	Cable extended			Standard and pipe extended				High temp.
	+60°C	+70°C	+80°C <sup>(3)</sup>	+60°C	+70°C	+95°C	+110°C	
Medium temp. (T <sub>M</sub> ) Min.: -30°C	+60°C	+70°C	+80°C <sup>(3)</sup>	+60°C	+70°C	+95°C	+110°C	+160°C
Ambient temp. (T <sub>A</sub> ) Min.: -30°C	+60°C	+50°C	+60°C	+60°C	+50°C	+60°C	+50°C	+35°C
Max. surface temp. of process conn.	+85°C	+85°C	+95°C	+85°C	+85°C	+95°C	+95°C	+135°C
Max. surface temp.	+85°C	+85°C	+95°C	+85°C	+85°C	+95°C	+110°C	+160°C
<b>Temp. classes</b>	<b>T90°C</b>	<b>T100°C</b>		<b>T90°C</b>	<b>T100°C</b>	<b>T115°C</b>	<b>T170°C</b>	

(3) Medium temperature for max. 1 hour: + 95 °C

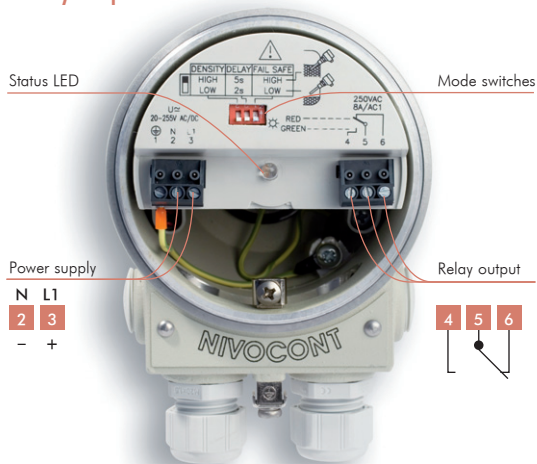
### Temperature diagram



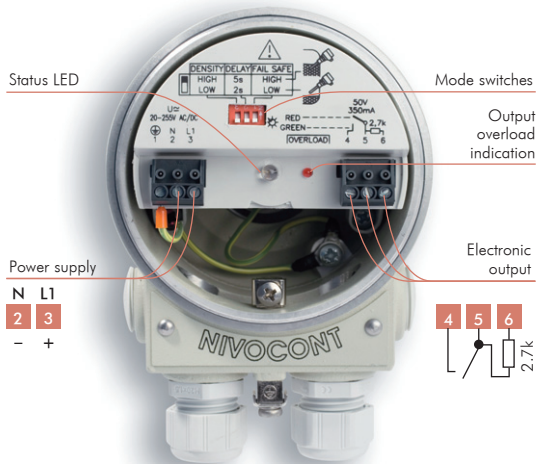
Ambient temperature (T<sub>A</sub>) versus medium temperature (T<sub>M</sub>)

## WIRING

### Relay output



### Electronic output

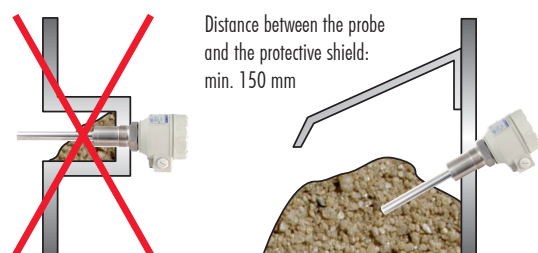
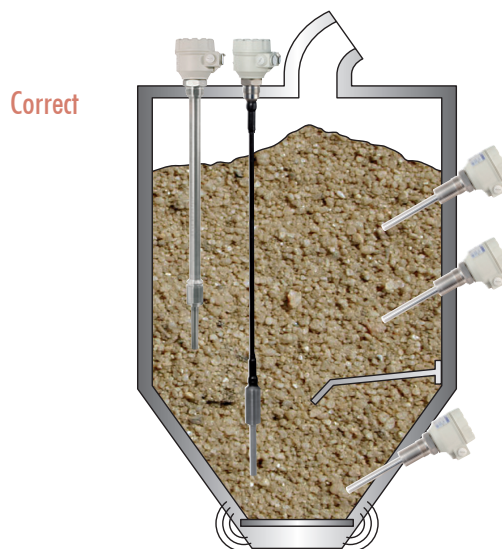
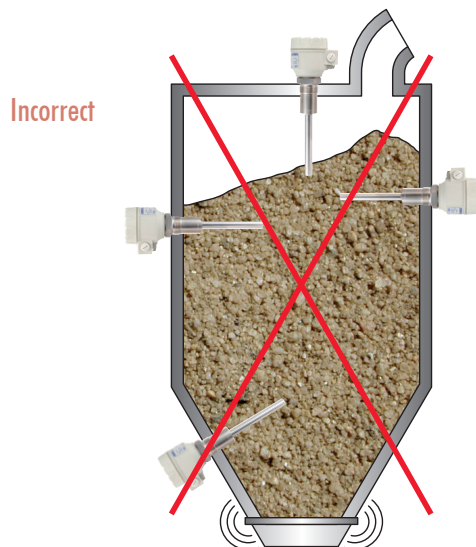


## MODE SWITCHES

Density		Delay	
To be selected depending on the density of the measured medium		Response time delay to be selected	
High	medium density is $>0.1 \text{ kg/dm}^3$ or abrasive materials	5 sec	Output does not change if the rod is blocked for a moment (e.g. falling material)
Low	medium density is $<0.1 \text{ kg/dm}^3$	2 sec	Fast switching
Fail-Safe			
High	High Fail-safe	Fail-safe alarm is indicated with de-energised relay or open state of the solid state output.	
Low	Low Fail-safe		

## INSTALLATION

The probe should be protected against strong material inflow by appropriate selection of the mounting position or by using an overhead protective shield. When the instrument is mounted on the side of the tank, coning or arching of the material should be taken into consideration. In dusty mediums the inclination of the side mounted probe should be greater than the angle of repose to ensure self cleaning and avoid deposition of material on the vibration rod switches. Avoid mounting the unit close to the filling entry or near to medium accumulation.



Incorrect

Correct

rkh5s13a0603b

## OPERATION

Power supply	Switching	Fail-Safe kapcsoló	Status LED	Output	
				Relay	Electronic
ON	High level	High			
		High			
	Low level	Low			
		Low			
OFF	-	High or Low			

## ORDER CODES (NOT ALL CODE VERSIONS ARE AVAILABLE)

### NIVOCONT R vibrating rod level switches

NIVOCONT R ■■■■■■ (1)

Version	Code	Housing	Code	Insertion length	Code	Power supply/Output/Ex	Code
Standard	K	Metal	5	Standard	207 mm 02	20-255 V AC/DC / Relay	1
Standard polished	S	Plastic	6 <sup>(3)</sup>	Pipe extension	300 mm 03	20-255 V AC/DC / electronic	3
High temperature <sup>(2)</sup>	H <sup>(2)</sup>				400 mm 04	20-250 V AC 20-50 V DC / Relay / Ex	•
High temperature polished <sup>(2)</sup>	T <sup>(2)</sup>	•					
		•					
		•					
		1000 mm 10					
		1100 mm 11					
		•					
		•					
		3000 mm 30					
				Cable extension	1 m 01		
					2 m 02		
					•		
					•		
				•			
				20 m 20			

Process connection / Extension		Code
1 1/2" BSP	Standard version	H
	Pipe extended	R
	Cable extended	K
1 1/2" NPT	Standard version	N
	Pipe extended	L
	Cable extended	C

(1) The order code of an Ex version should end in „Ex“  
 (2) Only for Standard and Pipe extended versions  
 (3) Not available in Ex version

Specifications in metric & US units!

Nivelco reserves the right to change technical data without notice!

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