Thank you for choosing a NIVELCO instrument!

NIVOSWITCH

R–200, R–300
VIBRATING FORK LEVEL SWITCHES

USER'S MANUAL

1. APPLICATION

NIVOSWITCH RF□–2□□–□, RF□–3□□–□ vibrating forks are designed for detection of level of powders and granules. When they are used as high or low fail safe switches overfilling and emptying of silos and other containers can be prevented. The RF fork series (base model, insertion length = 125 mm [4.9"]) with cast forks are recommended for small granules, while the RR fork series (base model, insertion length = 137 mm [5.4"]) with welded forks are recommended for larger granules. Dust-Ex versions of the R–300 forks with aluminum housing are also available.

2. TECHNICAL DATA

2.1 GENERAL DATA

Type		R□□–3□□–□	R□□–2□□–□
Material of wetted parts		1.4571 stainless steel	
Process connection		As per order code	
Housing material		Powder-coated aluminum	Plastic, PBT, fiberglass-reinforced
Temperature ranges	Medium	–40…+130 °C (–40…+266 °F);	PP flange: –20…+90 °C (–4…+194 °F)
	Ambient	–40…+70 °C (–40…+158 °F)	
Medium pressure		Up to 40 bar (4 MPa, 580 psi) see: 2.5 diagram	
Insertion length		125…3000 mm (5"…10 feet), as per order code	
Medium density		≥ 0.01 kg/d m³ (>0.7 S.G.)	
Response time	Getting immersed	≤ 0.5 sec	
	Getting free	≤ 1 sec at high-density setting (≥ 0.5 kg/dm³)	
		≤ 3 sec at low-density setting (< 0.5 kg/dm³)	
Operating mode indicator		Two-tone LED	
Operating mode selection		Switch for selecting HIGH or LOW fail-safe mode	
Density adjustment		Switch for selecting HIGH or LOW Density	
Output (1)		1 or 2 SPDT relays Relay 1: 250 V AC, 8 A, AC1 / Relay 2: 250 V AC, 6 A, AC1	
Electrical connection (1)		2× M20x1.5 cable glands for Ø6…12 mm (Ø0.25"…0.5") cable; 2× internally threaded ½" NPT connection for protective pipes. Terminal blocks for max. 1.5 mm² (AWG16) wire cross section	
Power supply (1)		20…255 V AC/DC	
Power consumption		DC: < 3 W	
Electrical protection		Class I	
Ingress protection		IP67	
Weight		1.3 kg + 1.2 kg/m (~2.86 lb + 1 lb/ft)	0.95 kg + 1.2 kg/m (~2 lb + 1 lb/ft)

(1) For Ex type, see chapter **2.2 Explosion protection, Ex markings, Ex limit data**.

2.2 Explosion protection, Ex markings, Ex limit data

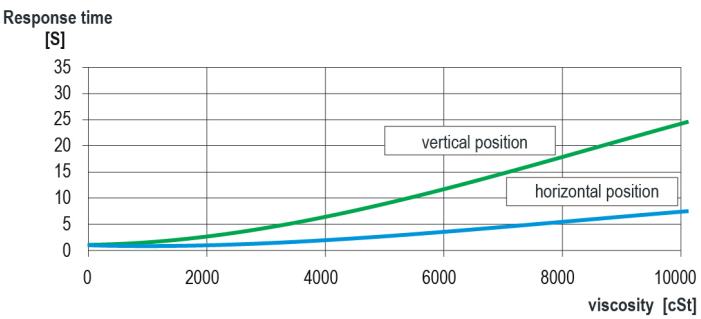
2.2.1 ATEX certificate, No. BKI16ATEX0011/1

R□□–3□□–B Ex		
Ex marking		II 1/2 D Ex ta/tb IIIC T140 °C Da/Db
Power supply (universal)		20…250 V AC (50/60Hz) or 20…50V DC
Electrical connection		2× M20x1.5 Ex ta IIIC cable glands for Ø7…12 mm (Ø0.28"…0.5") cable; 2× terminal blocks for max. 1.5 mm² (AWG16) wire cross section 2× internally threaded ½" NPT connection for protective pipes
Temperature ranges	Medium	–40…+130 °C (–40…+266 °F)
	Ambient	–40…+70 °C (–40…+158 °F)
Output		1× SPDT relay 250 V AC, 8 A, AC1
Reference document number		rfm3010m060bh_09

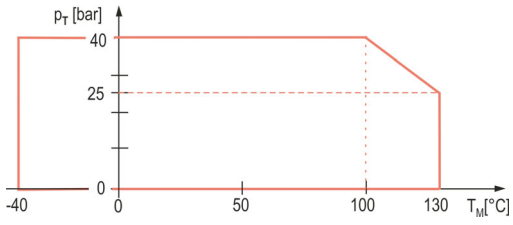
2.3 Accessories

- User's manual
- Warranty Card
- EU-Declaration of Conformity
- 2× M20x1.5 plastic cable gland
- 1× 2 mm (0.08") thick KLINGER OILIT seal (only for 1" BSP-threaded process connection)
- 2× plug-in type, 3-pole terminal block (3× for models with 2 relays)

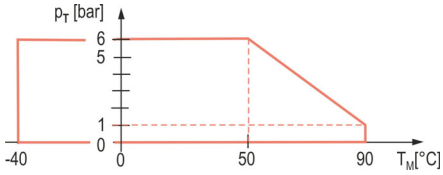
2.4 Response time – medium viscosity diagram



2.5 Pressure – temperature diagrams



Medium pressure (pT) – Medium temperature (TM)



Medium pressure (pT) – Medium temperature (TM) PP flange version

2.6 Order codes (not all combinations possible!)

NIVOSWITC R ☐☐ – ☐☐☐ – ☐ *

Type	Code
Cast fork	F
Welded fork	R

Process connection	Code
1" BSP	M
1½" BSP	H
1" NPT	P
1½" NPT	N
DN50, PN16 PP DIN	F
DN50, PN40 1.4571 DIN	G
2" ANSI RF150 PP	A
2" ANSI RF600 1.4571	B
JIS 10K 50A PP	J
JIS 40K 50A 1.4571	K
1½" TriClamp	T
2" TriClamp	R
DN40 pipe coupling	D
DN50 pipe coupling	E
2" BSP	C
2" NPT	L

Housing	Code
Aluminum (powder-coated)	3
Plastic, PBT	2

Probe length	Code
125 / 137 mm	01
200 / 175 mm	02
0.3…3 m	03…30

Output / Ex	Code
1× SPDT relay	0
2× SPDT relay	A
1× SPDT relay / Dust-Ex ta/tb IIIC	B

* Ex versions are marked 'Ex' right after the type designation on the label.

Components and accessories (sold separately)

NIVOSWITCH R P ☐ – 1 ☐☐ – 0

Type	Code
Accessories	P

Sliding sleeve	Code
1½" BSP	H
1½" NPT	N
2" ANSI	A
2" BSP	B
2" NPT	C
DIN DN50	F
JIS 10K 50A	J

Application	Code
For normal version	1
For coated version	2

Material	Code
A38	1
1.4571	2

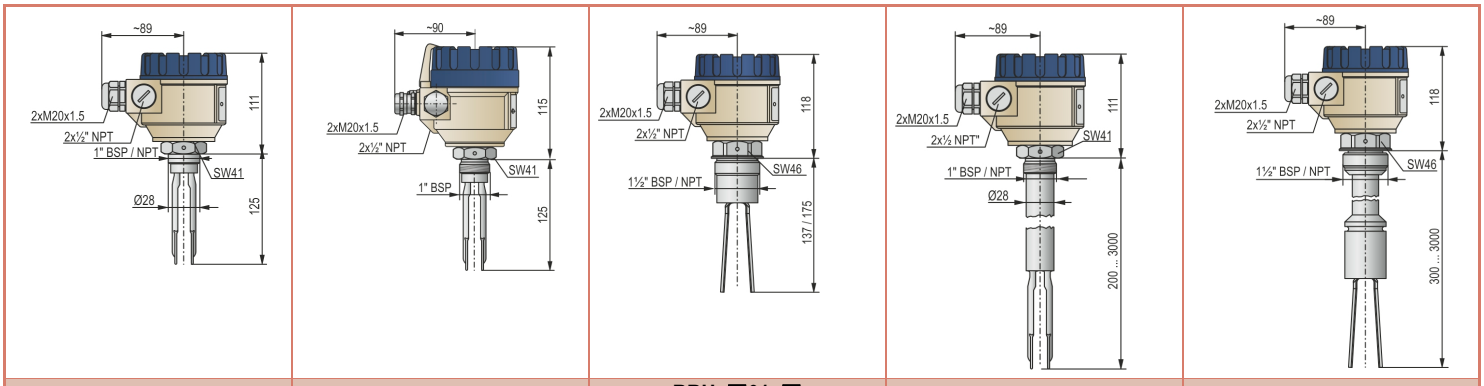
NIVOSWITCH R P ☐ – 1 0 1 – 0

Type	Code
Accessories	P

Accessories	Code
Weld-in socket 1" BSP	G
Weld-in socket 1" NPT	K
Magnetic test screwdriver	S

Material	Code
1.4571	1

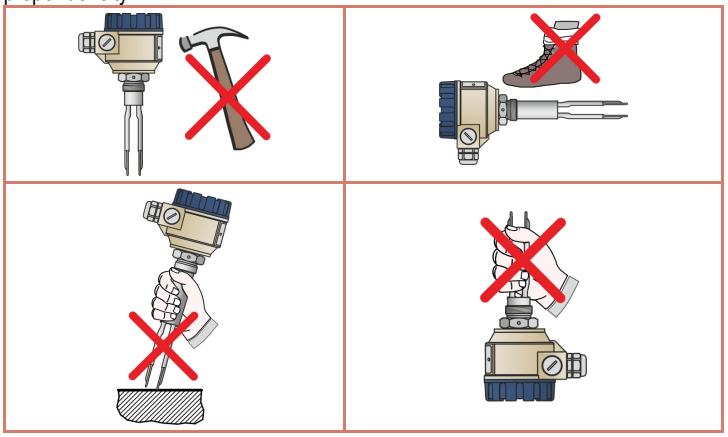
2.7 Dimensions



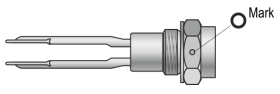
RFM–☐01–☐	RFM–301–B Ex	RRH–☐01–☐ RRH–☐02–☐	RF☐–☐02…30–☐	RRH–☐03…30–☐

3. INSTALLATION

Protect the device from any mechanical damage. Before installing, it is advised to test the operation of the level switch in a small sample of the material to set the proper density.



Positioning: the plane of the prongs is perpendicular to the marked plane of the hexagonal neck.
For a 1" BSP connection, the position of the prongs is irrelevant, use the sealing ring provided.



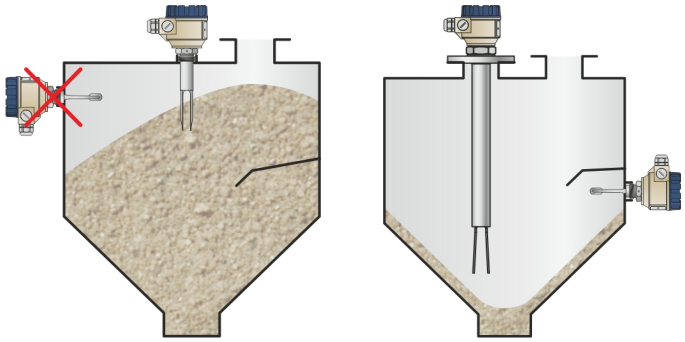
If orientation of the fork is required (e.g., for piping, side mounting), seal with Teflon (PTFE) tape to help positioning the prongs. For side mounting, vertical positioning of the fork is suggested.

Do not use the housing to fasten the device!
When screwing the level switch into the tank, use the hex nut part of the device.

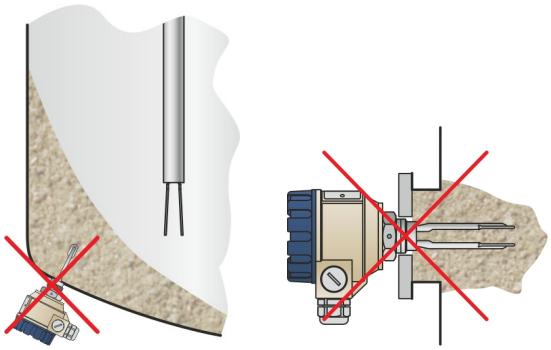
After screwing the device in tight, the housing can be rotated by hand (max. 300°), to adjust the cable outlets to the required position.

It is recommended to mount the device vertically (at the top) to detect light, free-flowing solids. Mounting on the side of the container is recommended only if the prongs are easily freed from the medium. If the device is mounted on the side, it must be mounted with the prongs positioned vertically. The caving and arching of the material in the tank must also be considered to determine optimal installation location.

The fork must be protected against falling material and material stuck between the fork and the protection plate.

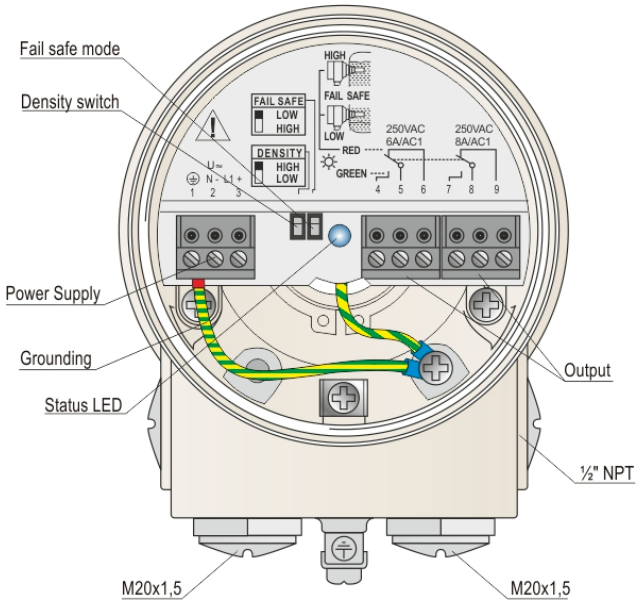


Recommended and false installations



4. WIRING

Use Ø6…12 mm (Ø0.25"…0.5") diameter cables with max. 1.5 mm² (AWG16) wire cross section and tighten cable glands as well as housing cover after installation, to ensure IP67 sealing. Use the external or internal grounding screw terminal for grounding the unit. Common cables must not be used for AC and DC voltage, as well as for low and mains voltage.



5. ADJUSTMENT

Power supply	Fork	Operation mode			Output (as per order code)	
		Switch pos.		Status LED		
Yes	Immersed	■	HIGH	red	4 5 6 7 8 9	De-energized
		■	LOW	green	4 5 6 7 8 9	Energized
	Free	■	HIGH	green	4 5 6 7 8 9	Energized
		■	LOW	red	4 5 6 7 8 9	De-energized
No	Free or immersed	HIGH / LOW		Not lit	4 5 6 7 8 9	De-energized

The mode indicator is still visible in the top view of the cover after the cover is closed. After wiring and adjustment, check the seals and close the cover carefully!

6. SPECIAL CONDITIONS FOR SAFE USE

In dust explosion hazardous environment, the unit can only be powered on after properly closing the housing cover and tightening the screws of the safety locking clamp.

7. MAINTENANCE AND REPAIR

NIVOSWITCH vibrating forks do not require regular maintenance. In some instances, however, the vibrating section may need to be cleaned from material deposits. This must be carried out carefully.

The warranty card contains the terms and conditions. Before returning the device for repairs, it must be cleaned thoroughly. The parts in contact with the medium may contain harmful substances; therefore, they must be decontaminated. Our official form (Returned Equipment Handling Form) must be filled and enclosed in the parcel. Download it from our website www.nivelco.com. The device must be sent back with a declaration of decontamination. A statement must be provided in the declaration that the decontamination process was successfully completed and that the device is clean from any hazardous substances.

8. STORAGE CONDITIONS

Ambient temperature: −40…+70 °C (−40…+158 °F)
Relative humidity: max. 98%

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