

NIVOSWITCH R-200/300 vibrating fork level switches with diverging vibrating fork are suitable for detecting the level of granular or powdered solids. Mounted on silos, bins it can control filling/emptying, also can generate fail-safe alarms providing overfill protection. The operation principle is based on that the electronic circuit excites a vibration in the fork probe. When the medium reaches and covers the fork, its vibration changes or stops. The fork will start vibrating freely again as the medium sets it free. The electronics senses the change of vibration and gives output signal after a selected delay.

The PNP/NPN transistor output versions can be connected directly to PLC, or relay unit. **NIVOSWITCH** vibrating forks are able to solve switching tasks of high-current loads with the help of **UNICONT PPK** switching amplifiers.

FEATURES

- Compact and mini compact version
- Rod length up to 3 meters
- Selectable sensitivity
- Relay or electronic output
- Switching performance does not depend on the change of liquid conductivity, dielectric constant, pressure and temperature
- Medium temperature max. +130 °C
- Output can be toggled by test magnet (optional)
- Ex variants
- IP67, IP65 / IP68

APPLICATIONS

- For solids: min. 0.01 kg/dm³ density
- Level switching for powders, granules
- Chemical industry, food & beverages, paper mill and plastic industry
- For free-flowing, powdered solids, granules
- Covers a large variety of level detection, applications such as high/low fail-safe limit switch, overfill protection

CERTIFICATES

- ATEX (Ex ta/tb D)

VARIANTS

This table helps choose the proper version for a given level switching task. Most essential aspect is the consistency of the measurement medium.

		Solids	
Features		Mini compact RC/RL□-300	Compact RF/RR□-200/300
Metal housing		■	■
Plastic housing			■
Extension		■	■
1", 1½" process connection		■	■
Relay output			■
Electronic output		■	
Electrical connection	Terminal		■
	DIN connector	■	
	Cable	■	
Dust Ex version			■
Function setting (low-high level)		■ ⁽¹⁾	■
Function indication		■	■
Density selection		■	■
Output test magnet		■	

⁽¹⁾ Only for 3-wire DC versions



RLH-302



RCM-301



RRH-301

TECHNICAL DATA

	Mini compact RC□/RL□-300	Compact RF□/RR□-200/300
Insertion length	137...3000 mm	
Material of wetted parts	1.4571 stainless steel	
Process connection	As per order code	
Medium temperature	-40...+130 °C (see temperature diagrams)	
Ambient temperature	-40...+70 °C (see "Thermal properties")	
Medium pressure	Up to 40 bar (4 MPa) (see: pressure diagrams)	
Medium density	$\geq 0.01 \text{ kg/dm}^3$	
Power supply	2-wire DC: 15...27 V DC	20...255 V AC / 20...60 V DC
	2-wire AC: 20...255 V AC; 3-wire DC: 12...55 V DC	
Power consumption	AC: depending on load; DC: < 0.6 W	< 3 W
Housing material	1.4571 stainless steel	Powder-coated aluminum or plastic (PBT)
Electrical connection	DIN or M12 connector, or 3 m integrated cable ⁽¹⁾ 2× 0.5 mm ² / 4× 0.75 mm ² / 5× 0.5 mm ²	2× M20×1.5 plastic cable glands for Ø6...Ø12 mm cable, 2× terminal blocks for max. 2.5 mm ² wire cross section, Two internally threaded ½" NPT connection for protective pipes.
Electrical protection	AC version: Class I, DC version: Class III	Class I
Ingress protection	DIN connector: IP65; M12 connector: IP67; cable: IP68	IP67
Weight	~0.5 kg + 1.2 kg/m extension	~1.3 kg + 1.2 kg/m extension

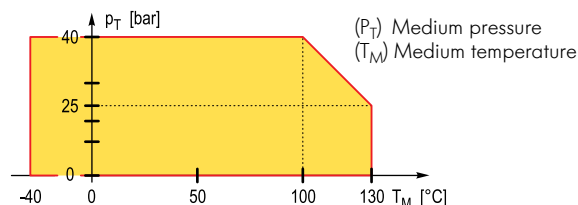
⁽¹⁾ Available cable length: max. 30 m

Ex INFORMATION

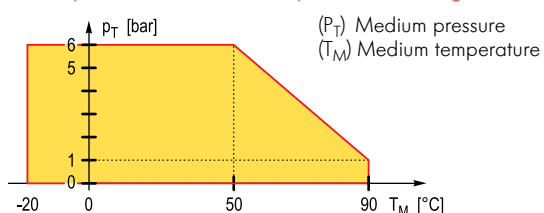
	Compact version (metal housing) RF/RR□-300-BEx
Explosion protection	Dust-ex
Ex marking	ATEX II 1/2 D Ex ta/tb IIIC T140 °C Da/Db
Power supply	20...250 V AC / 20...50 V DC
Electrical connection	2x M20×1.5 cable glands for Ø7...Ø12 mm cable
	Ex ta IIIC protection
	2x terminal blocks for max. 1.5 mm ² wire cross section, 2x ½" NPT internal threads for cable protective pipes.

THERMAL PROPERTIES

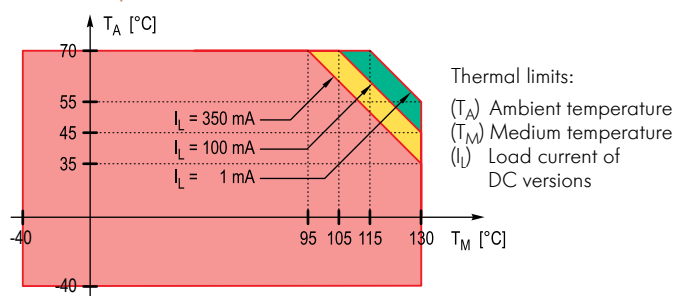
Medium pressure – Medium temperature



Medium pressure – Medium temperature PP flange version



Mini compact version



OUTPUT PROPERTIES

Compact version				
Output		RF□/RR□-200/300		
Relay		1 or 2 (SPDT) relays 250 V AC, 8 A, AC1 / 250 V AC, 6 A, AC1		
Response time	when immersed	≤ 0.5 s		
	when free	≤ 1 s – H density	3 s – L density	

Mini compact version				
Type	Output		RC□/RL□-300	
2-wire DC	DC current change		When immersed: 14 mA ± 1 mA	
			When free: 9 mA ± 1 mA	
2-wire AC	AC output for serial connection		Voltage drop (in switched-on state): < 10.5 V	
			Residual current (in switched-off state): < 6 mA	
	Current load	max. continuous	350 mA, AC 13	
		min. continuous	10 mA / 255 V; 25 mA / 24 V	
3-wire DC	Transistor switch		NPN or PNP output can be realized with appropriate wiring	
	Voltage drop (in switched-on state)		< 1.8 V	
	Current load (max. continuous)		350 mA / $U_{\max} = 55 \text{ V}$	
	Residual current (in switched-off state)		< 10 µA	
	Response time	when immersed	0.5 s	
		when free	≤ 1 s – H density	< 3 s – L density

OPERATION

Compact and Mini compact version						
Power supply	Switching		Fail-Safe setting ⁽²⁾	Status LED	Output	
					Relay	Electronic
ON	High level					
	Low level					
OFF	–	–	High / Low			

2-wire DC version			
Power supply	Switching	Status LED	Output
ON			14 ± 1 mA
			9 ± 1 mA
OFF	Fork immersed, or fork is free		–

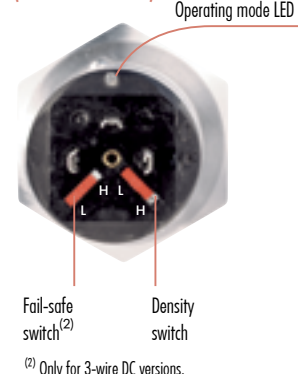
OPERATING MODE SWITCHES

Compact		Compact	
Fail-safe		Density	
	Fail-safe alarm is indicated with de-energized relay or open state of the output		Medium density ≥ 0.5 kg/dm ³
			Medium density < 0.5 kg/dm ³

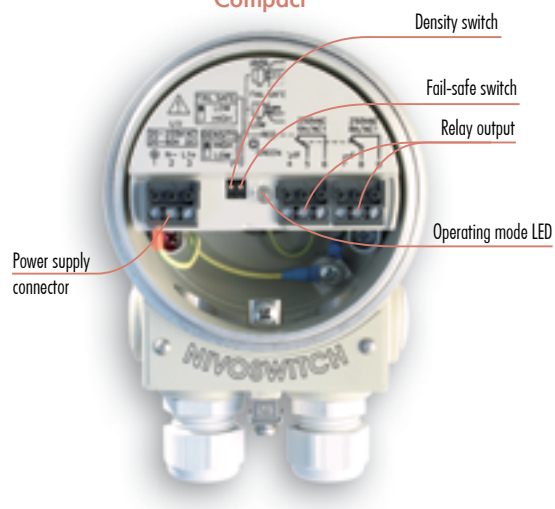
⁽²⁾ In the case of the mini-compact version with integrated cable, it is determined by the appropriate wiring.

WIRING

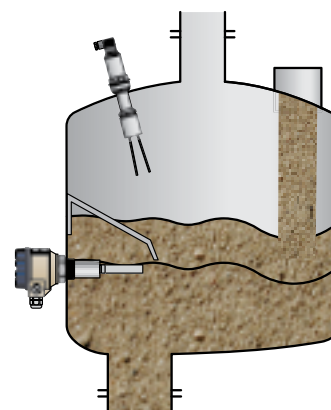
Mini compact (connector version)



Compact



INSTALLATION



NIVOSWITCH RF-200/RF-300 standard version 3 years

Compact vibrating fork level switch for light free-flowing solids
Standard probe length: 125 mm

Process connection

R F	-	-	-	-	-
M					1" BSP
P					1" NPT
Stainless steel flanges; not welded unless specifically requested Flanges conform to: EN 1092-1 / ANSI B 16.5					
G					DN50 PN40/25
B					ANSI 2" RF 600/400 psi
K					JIS 40K 50A
PP flanges (max. 6 bar; -20 °C to +90 °C)					
F					DN50 PN16
A					ANSI 2" FF 150 psi
J					JIS 10K 50A

Housing

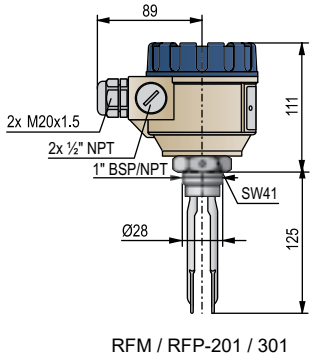
R F	-	-	-	-	-
2					Plastic, PBT, fiberglass-reinforced (Ex version not available)
3					Aluminium (powder-coated)

Probe length

R F	-	-	-	-	-
0 1					125 mm

Output / Certificates

R F	-	-	-	-	-
0					1 SPDT relay: 250 V AC, 8 A
A					2 SPDT relays: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A
B					1 SPDT relay: 250V AC, 8 A / Ex ta/tb D

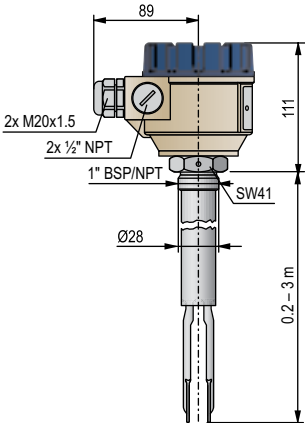


RFM / RFP-201 / 301

NIVOSWITCH RF-200/RF-300 extension rod version 3 years

Compact vibrating fork level switch for light free-flowing solids with stainless steel extension rod up to 3 m

Process connection		
R F	□ - □ □ □ - □	
M	1" BSP	
P	1" NPT	
Stainless steel flanges; not welded unless specifically requested		
Flanges conform to: EN 1092-1 / ANSI B 16.5		
G	DN50 PN40/25	
B	ANSI 2" RF 600/400 psi	
K	JIS 40K 50A	
PP flanges (max. 6 bar; -20 °C to +90 °C)		
F	DN50 PN16	
A	ANSI 2" FF 150 psi	
J	JIS 10K 50A	
Housing		
R F	□ - □ □ □ - □	
2	Plastic, PBT, fiberglass-reinforced (Ex version not available)	
3	Aluminium (powder-coated)	
Probe length		
R F	□ - □ □ □ - □	
0 2	0.2 m	
n n	0.3...3 m; sold by the 0.1 m	
nn = 03...30 : 0.3...3 m		
Output / Certificates		
R F	□ - □ □ □ - □	
0	1 SPDT relay: 250 V AC, 8 A	
A	2 SPDT relays: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A	
B	1 SPDT relay: 250V AC, 8 A / Ex ta/tb D	



RFM / RFP-202 / 230
RFM / RFP-302 / 330

NIVOSWITCH RC-300 standard version 3 years

Mini compact vibrating fork level switch for light, free-flowing solids
Standard probe length: 125 mm

Process connection

R C ☐ - 3 ☐ ☐ - ☐	
M	1" BSP
P	1" NPT
Stainless steel flanges; not welded unless specifically requested Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN50 PN40/25
B	ANSI 2" RF 600/400 psi
K	JIS 40K 50A
PP flanges (max.: 6 bar; -20 °C to +90 °C)	
F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

Probe length

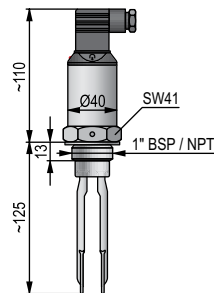
R C ☐ - 3 ☐ ☐ - ☐	
0 1	125 mm

Output / Certificates

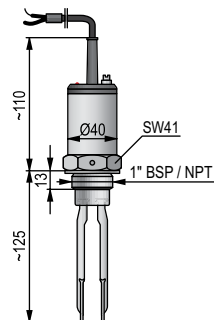
R C ☐ - 3 ☐ ☐ - ☐	
1	2-wire AC, connector
2	2-wire AC, cable
3	3-wire DC, connector
4	3-wire DC, cable
6	2-wire DC, connector
7	2-wire DC, cable

Cable

Maximum length 30 m; sold by the meter over the standard 3 m



RCM / RCP-301



RCM / RCP-301

NIVOSWITCH RC-300 extension rod version 3 years

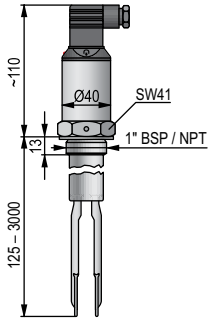
Mini compact vibrating fork level switch for light, free-flowing solids with stainless steel extension rod up to 3 m

Process connection	
R C ☐ - 3 ☐ ☐ - ☐	
M	1" BSP
P	1" NPT
Stainless steel flanges; not welded unless specifically requested	
Flanges conform to: EN 1092-1 / ANSI B 16.5	
G	DN50 PN40/25
B	ANSI 2" RF 600/400 psi
K	JIS 40K 50A
PP flanges (max.: 6 bar; -20 °C to +90 °C)	
F	DN50 PN16
A	ANSI 2" FF 150 psi
J	JIS 10K 50A

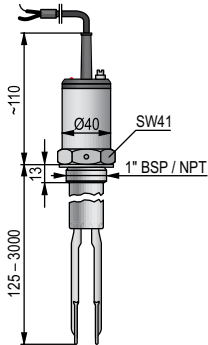
Probe length	
R C ☐ - 3 ☐ ☐ - ☐	
0 2	0.2 m
n n	0.3...3 m; sold by the 0.1 m
nn = 03...30 : 0.3...3 m	

Output / Certificates	
R C ☐ - 3 ☐ ☐ - ☐	
1	2-wire AC, connector
2	2-wire AC, cable
3	3-wire DC, connector
4	3-wire DC, cable
6	2-wire DC, connector
7	2-wire DC, cable

Cable	
Maximum length 30 m; sold by the meter over the standard 3 m	



RCM / RCP-302 / 330



RCM / RCP-302 / 330

NIVOSWITCH RR-200/300 short or standard version**3 years**

Compact vibrating fork level switch with welded fork for powders and granules
 Short probe length: 137 mm, standard probe length: 175 mm

Type

R R ■ - ■ ■ ■ - ■

0 1 Short probe, Probe length: 137 mm

0 2 Standard probe, Probe length: 175 mm

Process connection

R R ■ - ■ ■ ■ - ■

H 1½" BSP

N 1½" NPT

Stainless steel flanges; not welded unless specifically ordered so
 Flanges conform to: EN 1092-1 / ANSI B 16.5

G DN50 PN40/25

B ANSI 2" RF 600/400 psi

K JIS 40K 50A

PP flanges (maximum 6 bar; -20 °C to +90 °C)

F DN50 PN16

A ANSI 2" FF 150 psi

J JIS 10K 50A

Housing

R R ■ - ■ ■ ■ - ■

2 Plastic, PBT, fiberglass-reinforced (Ex version not available)

3 Aluminium (powder-coated)

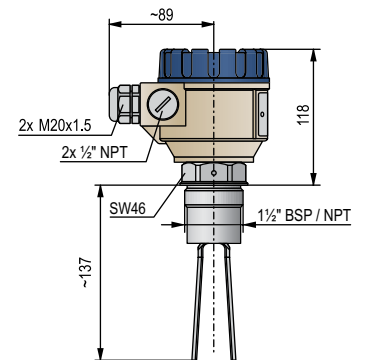
Output / Certificates

R R ■ - ■ ■ ■ - ■

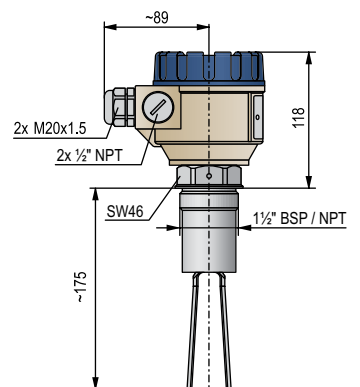
0 1 SPDT relay: 250 V AC, 8 A

A 2 SPDT relays: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A

B 1 SPDT relay: 250 V AC, 8 A / Ex ta/tb D



RRH / RRN-201 / 301

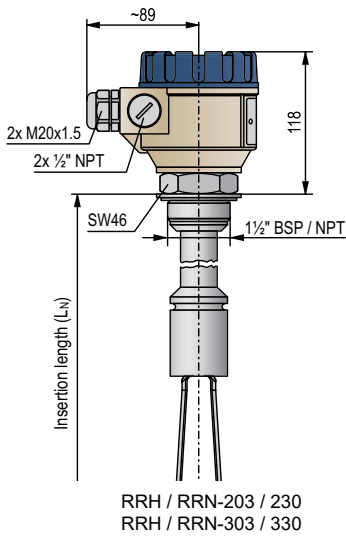


RRH / RRN-202 / 302

NIVOSWITCH RR-200/RR-300 extension rod version 3 years

Compact vibrating fork level switch with welded fork for powders and granules with stainless steel extension rod up to 3 m

Process connection		
R R		
H		1½" BSP
N		1½" NPT
Stainless steel flanges; not welded unless specifically requested		
Flanges conform to: EN 1092-1 / ANSI B 16.5		
G		DN50 PN40/25
B		ANSI 2" RF 600/400 psi
K		JIS 40K 50A
PP flanges (maximum 6 bar; -20 °C to +90 °C)		
F		DN50 PN16
A		ANSI 2" FF 150 psi
J		JIS 10K 50A
Housing		
R R		
2		Plastic, PBT, fiberglass-reinforced (Ex version not available)
3		Aluminium (powder-coated)
Probe length		
R R		
0 3		0.3 m
n n		0.4...3 m; sold by the 0.1 m
nn = 04...30 : 0,4...3 m		
Output / Certificates		
R R		
0		1 SPDT relay: 250V AC, 8 A
A		2 SPDT relay: 1x 250 V AC, 8 A and 1x 250 V AC, 6 A
B		1 SPDT relay: 250V AC, 8 A / Ex ta/tb D



NIVOSWITCH RL-300 short or standard version**3 years**

Mini compact vibrating fork level switch with welded fork for powders and granules
 Short probe length: 137 mm, standard probe length: 175 mm

Type**R L** ☐ - 3 ☐ ☐ - ☐**0 1** Standard probe, Probe length: 137 mm**0 2** Standard probe, Probe length: 175 mm**Process connection****R L** ☐ - 3 ☐ ☐ - ☐**H** 1½" BSP**N** 1½" NPT

Stainless steel flanges; not welded unless specifically requested

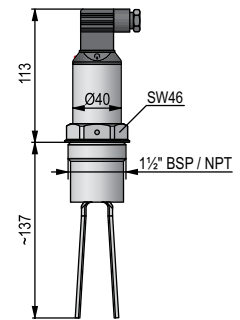
Flanges conform to: EN 1092-1 / ANSI B 16.5

G DN50 PN40/25**B** ANSI 2" RF 600/400 psi**K** JIS 40K 50A

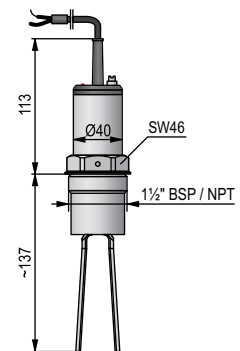
PP flanges (max. 6 bar; -20 °C to +90 °C)

F DN50 PN16**A** ANSI 2" FF 150 psi**J** JIS 10K 50A**Output / Certificates****R L** ☐ - 3 ☐ ☐ - ☐**1** 2-wire AC, DIN connector**2** 2-wire AC, integrated cable**3** 3-wire DC, DIN connector**4** 3-wire DC, integrated cable**6** 2-wire DC, DIN connector**7** 2-wire DC, integrated cable**Cable**

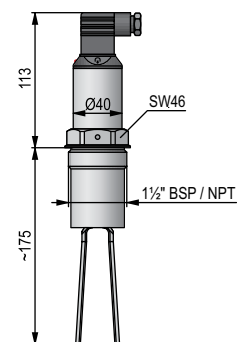
Maximum length 30 m; sold by the meter over the standard 3 m



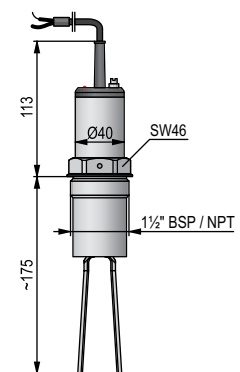
RLH / RLN-301



RLH / RLN-301



RLH / RLN-302

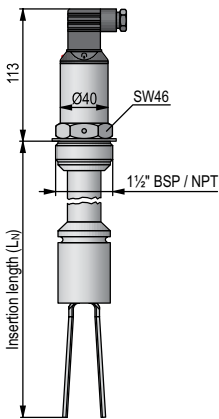


RLH / RLN-302

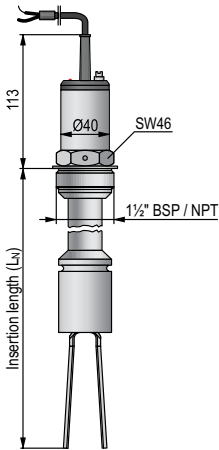
NIVOSWITCH RL-300 extension rod version 3 years

Mini compact vibrating fork level switch with welded fork for powders and granules with stainless steel extension rod up to 3 m

Process connection		
R L	 - 3   - 	
H	1½" BSP	
N	1½" NPT	
Stainless steel flanges; not welded unless specifically ordered so		
Flanges conform to: EN 1092-1 / ANSI B 16.5		
G	DN50 PN40/25	
B	ANSI 2" RF 600/400 psi	
K	JIS 40K 50A	
PP flanges (max. 6 bar; -20 °C to +90 °C)		
F	DN50 PN16	
A	ANSI 2" FF 150 psi	
J	JIS 10K 50A	
Probe length		
R L	 - 3   - 	
	0 3	0.3 m
	n n	0.4...3 m; sold by the 0.1 m
nn = 04...30 : 0,4...3 m		
Output / Certificates		
R L	 - 3   - 	
	1	2-wire AC, DIN connector
	2	2-wire AC, integrated cable
	3	3-wire DC, DIN connector
	4	3-wire DC, integrated cable
	6	2-wire DC, DIN connector
	7	2-wire DC, integrated cable
Cable		



RLH / RLN-303 / 330



RLH / RLN-303 / 330