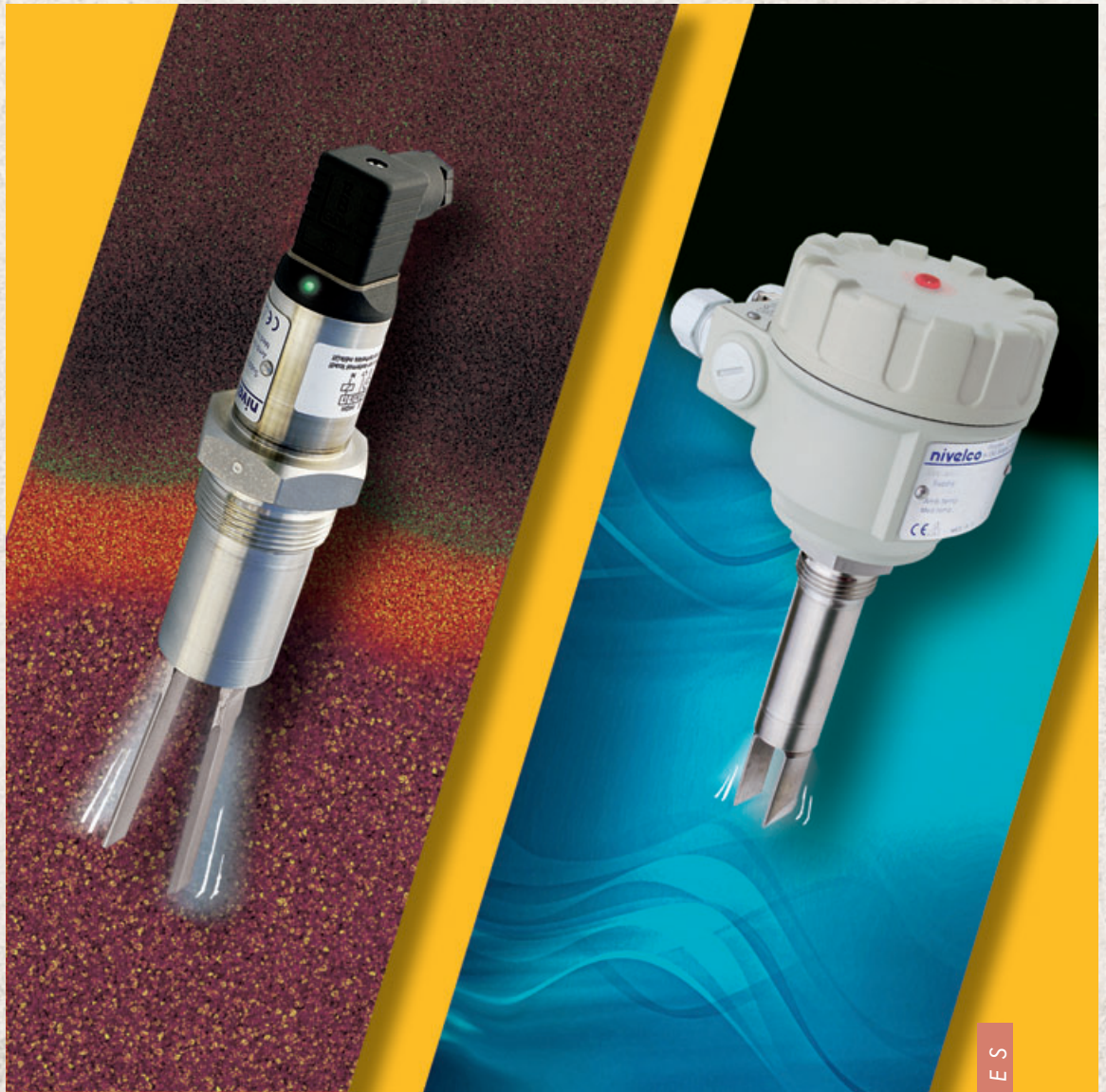


For liquids and solids

NIVOSWITCH

VIBRATING FORK LEVEL SWITCHES



30 YEARS

LEVEL



OUR PROFESSION IS YOUR LEVEL

LEVEL SWITCHES

NIVOSWITCH VIBRATING FORK LEVEL SWITCHES

MAIN FEATURES

- Compact and mini compact type
- Rod extension up to 3 meters
- Plastic (PFA) coated version (option)
- Polished vibrating part
- Switching performance does not depend on the change of liquid conductivity, dielectric constant, viscosity, pressure and temperature
- Selectable sensitivity
- Relay or electronic output
- Hygienic versions with various process connections and 0.5 micron fine polishing (option)
- Medium temperature max. 130°C
- Output test with optional test magnet
- Ex version
- IP 67, 65/68 protection

APPLICATIONS

- For liquids: min. 0.7 kg/dm³ density and max. 10⁴ mm²/s viscosity, for solids: min. 0.01 kg/dm³ density
- For liquids / free-flowing, powdered solids, granules
- Food & beverages, animal feed, chemical-, oil industry
- For normal or hazardous, aggressive (acids, solvents) liquids
- Covers a large variety of level detection applications such as high/low fail safe limit switch or dry run protection, pump controls



GENERAL DESCRIPTION





NIVOSWITCH vibrating fork level switches are suitable for level detection of liquids or granular, powdered solids. Units with parallel vibrating fork are suitable for liquids, units with non parallel vibrating fork are suitable for solids. Mounted on pipes, silos, tanks or hopper bins filling / emptying can be controlled using these devices just as well they can generate fail-safe alarms providing overflow- or dry run protection.

The operation principle is based on the electronic circuit exciting the fork probe making it vibrate. As the medium reaches and covers the fork its vibration changes, or stops. The fork will start vibrating again as the medium sets it free. The electronics senses the change of vibration and gives output signal after a selected delay.

Plastic coated version is recommended in aggressive mediums, highly polished version is recommended for abrasive mediums. The PNP/NPN transistor output versions can be connected directly to PLC, or relay unit. The NIVOSWITCH vibrating forks are able to solve switching tasks of high-current loads with the help of UNICONT PPK switching amplifiers. The UNICONT PPK-312-8 Ex intrinsically safe switching unit is designed to serve Ex rated vibrating forks.

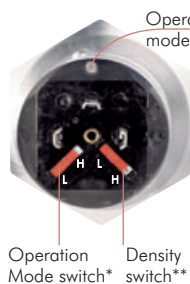
TYPE SELECTION

Type selection is aided by this table for choosing the proper version to a given level switching task. Most essential aspect is the consistency (liquid or solid) of the measurement medium.

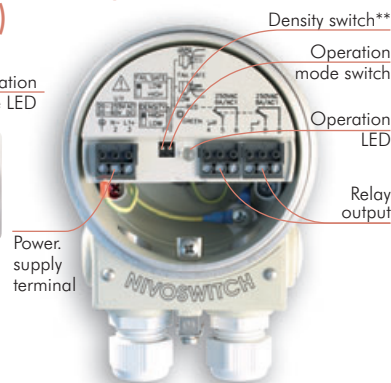
Application	Liquids	Solids
Features	 Mini compact	 Compact
	 Mini compact	 Compact
Steel housing	■	■
Plastic housing		■
Extension	■	■
Highly polished version	■	■
Plastic coated fork	■	■
1" process connection	■	■
1 1/2" process connection		■
Relay output		■
Electronic output	■	■
Electrical connection	terminal	■
	connector	■
	cable	■
Intrinsically safe version	■	
Dust Ex version		■
Function setting (low-high level)	■*	■*
Function indication	■	■
Density selection		■
Output test magnet	■	■

WIRING

Mini compact (connector version)



Compact



* Only for 3-wire DC versions

** Only for vibrating forks for solids

TECHNICAL DATA

Type	Mini compact		Compact	
	For liquids	For solids	For liquids	For solids
Insertion length	69-3000 mm	137-3000 mm	69-3000 mm	137-3000 mm
Material of wetted parts	DIN 1.4571 PFA coating	DIN 1.4571	DIN 1.4571 PFA coating	DIN 1.4571
Process connection	As per order codes			
Medium temperature	- 40°C ... +130°C (see: temperature diagrams)			
Ambient temperature	- 40°C ... +70°C (see: temperature diagrams)		- 30°C ... +70°C	- 40°C ... +70°C
Medium pressure	max. 4 MPa (40bar) (see: temperature diagrams)			
Medium density	> 0.7 kg/dm ³	≥ 0.01 kg/dm ³	> 0.7 kg/dm ³	≥ 0.01 kg/dm ³
Medium viscosity	≤ 10000 mm ² /s (cSt)	–	≤ 10000 mm ² /s (cSt)	–
Power supply	2-wire DC: 15-29 V DC	2-wire DC: 15-27 V DC	20-255V AC or 20-60V 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		AC:1.2-17 VA; DC: < 3 W	
Housing material	DIN 1.4571		Aluminium: Painted Al cast; Plastic: PBT fibre glass	
Electrical connection	Connector, or 3 m cable ⁽¹⁾ 2x0.5mm ² / 4x0.75mm ² / 5x0.5mm ²		2xM20x1.5 cable gland, for Ø 6-12 mm cable, terminal, for 0.5 – 1.5 mm ² wire cross section	
Electrical protection	AC version: Class I.; DC version: Class III.		Class I.	
Mechanical protection	Connector: IP65; cable: IP68		IP67	
Mass	≈ 0.5 kg + 1.2 kg/m extension		≈ 1.3 kg + 1.2 kg/m extension	

1.) available cable length: max. 30 m

SPECIAL DATA FOR Ex CERTIFIED MODELS

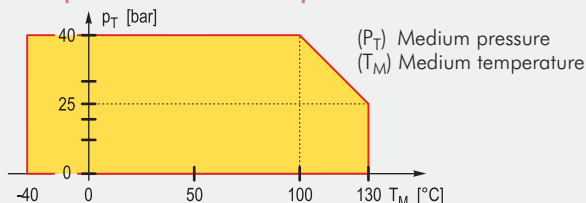
Type	Stainless steel vibrating part	PFA coated vibrating part
Mini compact vibrating forks for liquids (2-wire DC version)		
Ex marking	ATEX II 1 G Ex ia IIC T4...T6 Ga	ATEX II 1 G Ex ia IIB T4...T6 Ga
Power supply and signal circuit limits ⁽²⁾	U _i =29 V, I _i =100 mA, P _i =1,4W; C _i =7 nF, L _i =0 mH	
Mini compact and compact vibrating forks for solids	Connector version (IP 65) ⁽³⁾	Cable version (IP 68) ⁽³⁾
		Compact type (IP 67) ⁽⁴⁾
Ex marking	ATEX II 1/2 D Ex IP6x T160°C	

2.) Intrinsically safe vibrating forks should be powered by Ex ia certified and approved devices

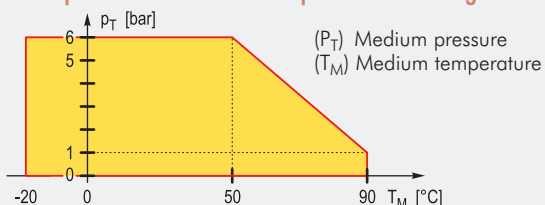
3.) only for 2-wire AC, or 3-wire DC version 4.) only with aluminium housing

TEMPERATURE DATA

Medium pressure – Medium temperature



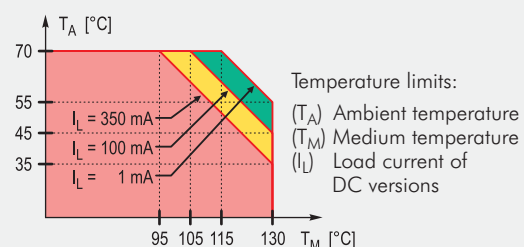
Medium pressure – Medium temperature PP flange version



Mini compact Ex types for liquids

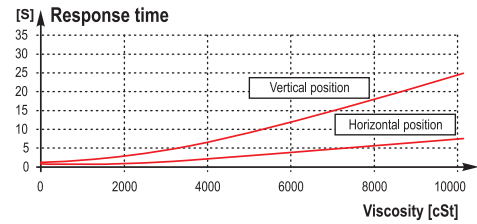
Temperature classes	T6	T4	T3
T _M	+70°C	+60°C	+60°C
T _A	+70°C	+75°C	+130°C

Mini – Compact version



OUTPUT DATA

Compact type			
Output	For liquids	For solids	
Relay	1 or 2 pcs (SPST) relays 250VAC, 8A, AC1/250 V AC, 6A, AC1		
Response time	when immersed	≤ 0.5 sec	
	when free	≤ 1sec*	≤ 1 sec – H density 3 sec – L density



Mini compact type					
Type	Output	For liquids	For solids		
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): < 6mA			
		Current load	max. continuous	350 mA, AC 13	350 mA, AC 13; Ex version: 140 mA
			min. continuous	10 mA / 255V; 25 mA / 24V	
max. impulse	1.5 A / 40 msec				
3-wire DC	Transistor switch	Connector version: Field selectable NPN- and PNP Cable version: galvanically isolated PNP/NPN			
	Voltage drop (in switched-on state)	< 4.5 V	< 1.8 V		
	Current load (max. continuous)	350 mA / Umax=55V	350 mA / Umax=55V; Ex version: 200mA		
	Residual current (in switched-off state)	< 100 µA	< 10 µA		
	Response time	when immersed	0.5 sec		
when free		< 1sec*	≤ 1 sec – H density < 3 sec – L density		

* see viscosity diagram

OPERATION

Compact and Mini compact type						
Power supply	Switching	Fail-Safe switch *	Status LED	Output		
				Relay	Electronic	
ON	High level		high			
			high			
	Low level		low			
			low			
OFF	–	–	High or Low			

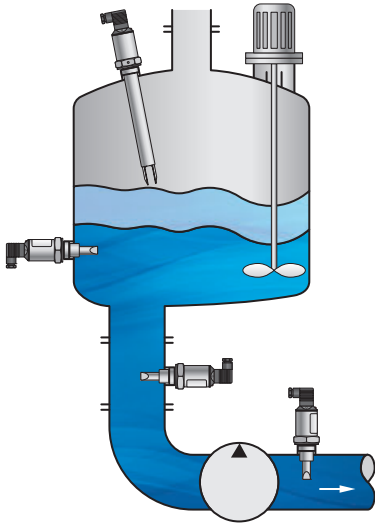
2-wire DC version			
Power supply	Switching	Status LED	Output
ON			14 ± 1 mA
			9 ± 1 mA
OFF	Fork immersed, or fork is free		–

** Mini compact type: With appropriate wiring or with Fail-Safe switch on the connector
Compact type: with Fail-Safe switch

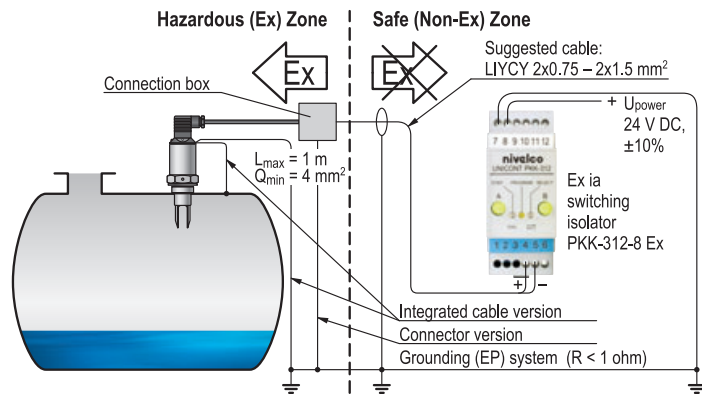
OPERATION MODE SWITCHES

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

INSTALLATION

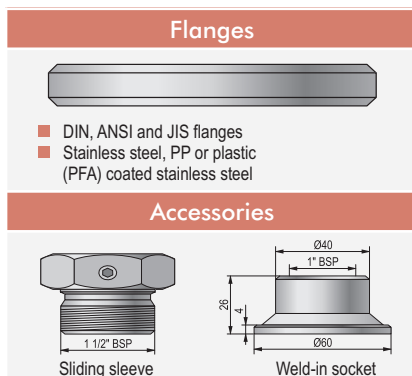
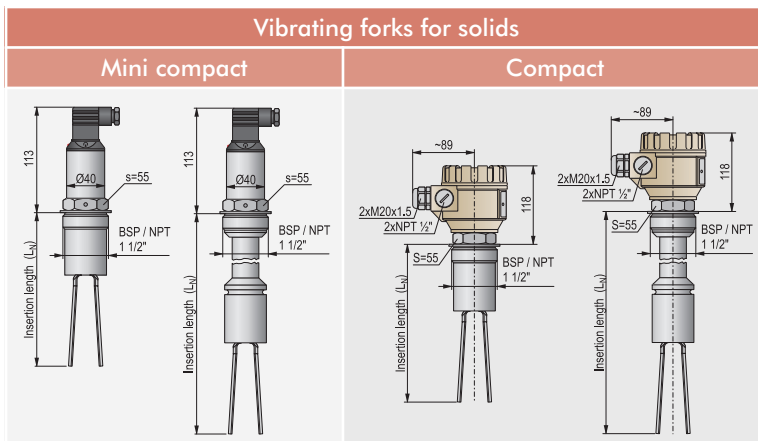
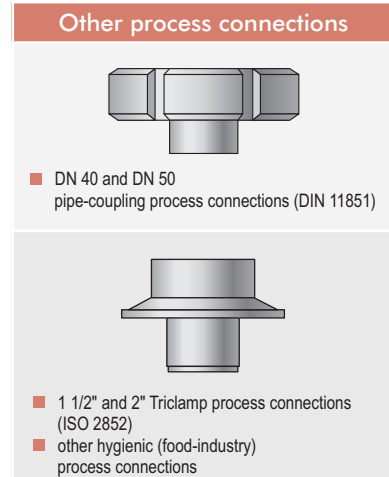
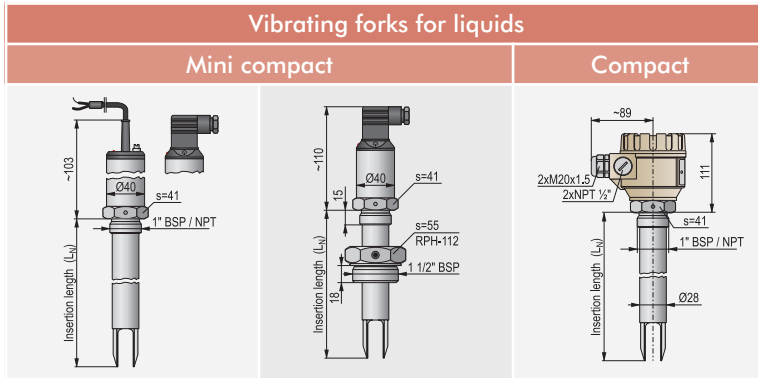


RECOMMENDED SET-UP VARIATION



- Applied in low viscosity medium (no risk of subsidence remaining on the fork-tines) any of the mounting varieties shown is possible.
- Applied in higher viscosity medium (risk of subsidence remaining on the fork-tines) only vertical (top) mounting can be suggested.
- If applied as side mount, take care of the positioning mark (Mark "0")

DIMENSIONS



ACCESSORIES TO ORDER

Megnevezés		For vibrating forks	
		for liquids	for liquids with plastic coating
Weld-in socket	1" BSP	RPG - 101	-
Sliding sleeve for extended versions	1 1/2" BSP	RPH - 112	RPH - 122
	1 1/2" NPT	RPN - 112	RPN - 122

RPS-101 test magnet for mini compact versions

ORDER CODES (NOT ALL CODE VARIATIONS ARE AVAILIBLE)

NIVOSWITCH vibrating fork level switches for liquids

NIVOSWITCH R ■ ■ ■ - ■ ■ ■ - ■ ■ ■ ¹

Type	Code	Process conn.	Code	Insertion length	Code	Output / Ex	Code			
Mini compact	PFA coated fork	A	1" BSP	M	69 mm	0 0	Mini compact Connector	2 wire AC	1	
	1.4571 fork	C	1" NPT	P	125 mm	0 1		3 wire DC	3	
	1.4571 fork, highly polished	G	1/2" TRICLAMP	T	200 mm	0 2		2 wire DC	6	
Compact	PFA coated fork	D	1 1/2" TRICLAMP	R	⋮	⋮		Mini compact Cable	2 wire DC/Ex	8
	1.4571 fork	F	DN40 pipe-coupling, DIN 11851	D	900 mm	0 9			2 wire AC	2 ⁵
	1.4571 fork, highly polished	J	DN50 pipe-coupling, DIN 11851	E	1 m	1 0			3 wire DC	4 ⁵
Housing	Code	DN 50 PN40, 1.4571	G ^{2,3}	⋮	⋮	⋮			2 wire DC	7 ⁵
		2" ANSI RF600, 1.4571	B ^{2,3}	3 m	3 0	2 wire DC/Ex			9 ⁵	
		JIS40K50A, 1.4571	K ^{2,3}	⋮	⋮	⋮	1 relay		0	
		DN50 PN40, PP	F ⁴				2 relays		A	
		2" ANSI RF150, PP	A ⁴							
		JIS10K50A, PP	J ⁴							

¹ The order code of an Ex version should end in „Ex“
² Special versions with weld-in process connection are available to order. Flanges of the flanged models meet the requirements of DIN2501, DIN2526 Form C; ANSI B16.5 standards
³ PFA coated forks have PFA coated flanges
⁴ Max. 6 bar, -20°C ... +90°C
⁵ Maximal cable length: 30 m
⁶ Not available in Ex version

NIVOSWITCH vibrating fork level switches for solids

NIVOSWITCH R ■ ■ ■ - ■ ■ ■ - ■ ■ ■ ¹

Type	Code	Process conn.	Code	Insertion length	Code	Output / Ex	Code					
Mini compact	L	1 1/2" BSP	H	137 mm	0 1	Mini compact Connector	2 wire AC	1				
Compact	R	1 1/2" NPT	N	175 mm	0 2		3 wire DC	3				
		DN50 PN40, 1.4571	G ²	300 mm	0 3		2 wire DC	6				
		2" ANSI RF600, 1.4571	B ²	⋮	⋮		⋮	2 wire AC/Ex	C			
Housing	Code	JIS40K50A, 1.4571	K ²	900 mm	0 9		⋮	⋮	3 wire DC/Ex	E		
		DN50 PN16, PP	F ⁴						1 m	1 0	2 wire AC	2 ⁵
		2" ANSI RF150, PP	A ⁴						⋮	⋮	⋮	3 wire DC
		JIS10K50A, PP	J ⁴	3 m	3 0		⋮	⋮	2 wire DC	7 ⁵		
		Mini compact	Cable	⋮	⋮	⋮	⋮	⋮	2 wire DC/Ex	D ⁵		
									3 wire DC/Ex	F ⁵		
1 relay	0											
Compact	Cable	⋮	⋮	⋮	⋮	⋮	2 relays	A				
							1 relay / Ex	B				

ACCESSORIES TO ORDER

DIN rail mountable switching amplifiers unit recommended for NIVOSWITCH vibrating forks

UNICONT PKK-312-■

Power Supply	Code	Power Supply	Code
230 V AC	1	24 V AC/DC	4
110 V AC	2	24 V AC/DC Ex	8 Ex
24 V AC	3		



UNICONT PKK-312-8 Ex

Intrinsically safe remote switching unit dedicated to the Ex ia versions of the NIVOSWITCH vibrating forks.