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

NIVOROTA
ROTARY PADDLE SWITCH

USER'S MANUAL

1. APPLICATION

NIVOROTA E rotary level switch series of robust design can be used for detecting level of lumpy or powdery materials and granules. Mounted to tanks, silos and hoppers it can monitor and control level, filling and emptying of stored materials such as stone, fly ash, sand, coal, feed, beet slice, etc. A small power electric motor drives the paddle, which rotates freely in the absence of the material. When the paddle is impeded by the material reaching it, the motor will be switched off the same time triggering a dry contact control switch. When the material level drops the paddles run free again, the motor is reactivated and the control switch returns to its original position.

2. TECHNICAL DATA

2.1 GENERAL DATA

TYPE	STANDARD		TRUE FAIL-SAFE	
	EK □ - 4□□	EH □ - 4□□	EK □ - 5□□	EH □ - 5□□
Intrusion length	Standard unit: 200 mm, Extended version: max 3 m			
Material and number of the vanes	Stainless steel DIN 1.4571: 1 – 3, plastic: 1 - 4			
Material of the wetted parts	Galvanised steel, stainless steel, plastic (glass reinforced epoxy)			
Material density	min. 0,08 kg / dm³			
Material temperature	- 40 °C … + 90 °C	- 40 °C…+ 400 °C (air purged)	- 40 °C … +90 °C	-40 °C…+400 °C (air purged)
Material pressure	max. 2 bar			
Ambient temperature	- 40 °C … + 65 °C			
Output	SPDT* 250 V AC, 15 A		SPDT* 277 V AC, 5 A	
Fault output	–		SPDT* 277 V AC, 5 A	
Process connection	1½" BSPT, 1¼" NPT, mounting plate			
Tápfeszültség	230 V AC, ±15%, 9 VA; 24 V AC ±15%, 11 VA;** 115 V AC, ±15%, 9 VA; 24 V DC ±15%, 11 W			
Electric connection	Cable gland: M20 x 1,5, screw terminal 2,5 mm², cable ∅ 10 … 14 mm			
Electric protection	Class I			
Ingress protection	IP 66			
Electronic housing material	Paint coated aluminium			
Dust Ex protection	ATEX II½ DT100°C	-	ATEX II½ DT100°C	-
Mass	~ 4 kg extension: 0,1 kg/m			

2.2 ACCESSORIES

– User's Manual, Declaration of Conformity, Warranty sheet, Gasket for mounting plate

2.3 ORDER CODE (NOT ALL COMBINATIONS OF ORDER NUMBERS ARE POSSIBLE)

NIVOROTA E □ □ – □ □ □ – □

FUNCTION	CODE
Switch	K
High temp switch	H

VERSION / PADDLE / CONNECTION	CODE
Standard / 1 x 1.4571 / 1½" BSPT	H
Standard / 3 x 1.4571 / mounting p.	F
Standard / 1 x plastic / 1½" BSPT	M
Standard / 4 x plastic / mounting p.	E
Cable / 1 x 1.4571 / 1½" BSPT	K
Cable / 3 x 1.4571 / mounting plate	L

VERSION	CODE
Standard	4
Fault ind.	5

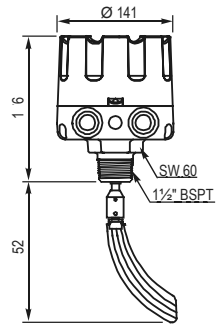
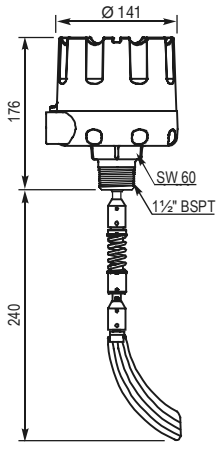
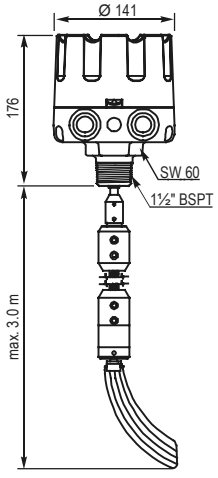
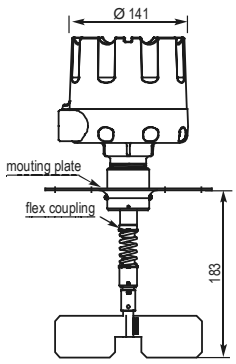
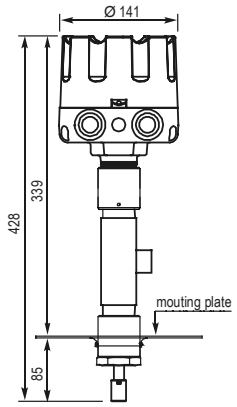
CODE	INSERTION		CODE
02	0.2 m	1 m	10
03	0.3 m	2 m	20
		3 m	30

POWER SUPPLY/ EX	CODE
230 V AC	1
115 V AC	2
24 V AC	3
24 V DC	4
230 V AC / Ex	5
115 V AC / Ex	6
24 V AC / Ex**	7
24 V DC / Ex	8

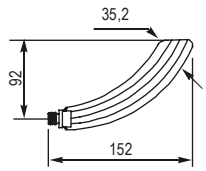
**SPDT= single pole double throw*

*** E□□ - 5□□ 24 V AC / DC ±15% 11 VA / W*

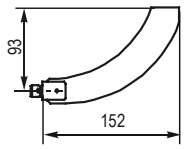
2.4 DIMENSIONS

EKH-402 *STANDARD VERSION*	*EKH-403* *STANDARD VERSION WITH FLEX COUPLING*	*EKK-410, -420, -430* *CABLE EXTENDED VERSION*	*EKF-403* *MULTIPLE-VANE WITH FLEX COUPLING AND MOUNTING PLATE*	*EH□-□□□* *HIGH TEMPERATURE VERSION*
				

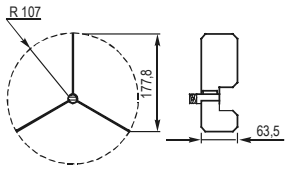
2.5 ACCESSORIES



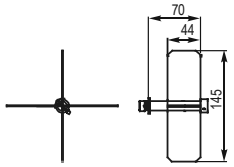
SINGLE VANE STAINLESS STEEL PADDLE



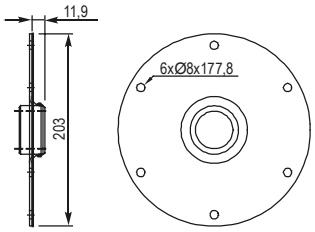
SINGLE VANE PLASTIC PADDLE



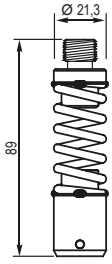
THREE-VANE STAINLESS STEEL PADDLE



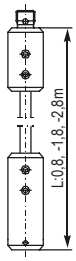
FOUR-VANE PLASTIC PADDLE



MOUNTING PLATE

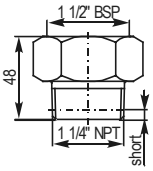


FLEX COUPLING



Cable extension can be cut to the customer length required

CABLE EXTENSION

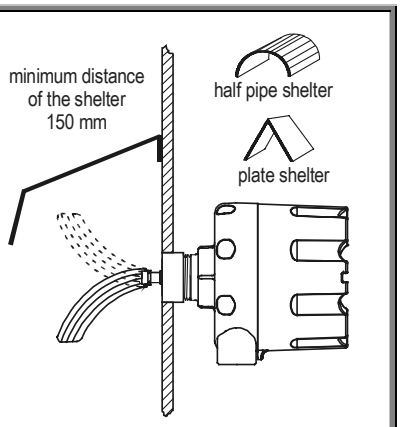


Fitting should be used for stub 1 ¼" NPT on the vessel

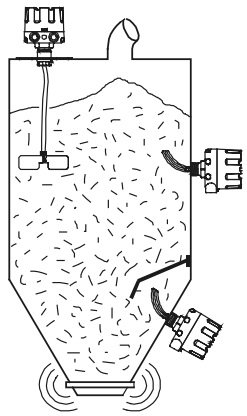
FITTING

3. ARRENGEMENT

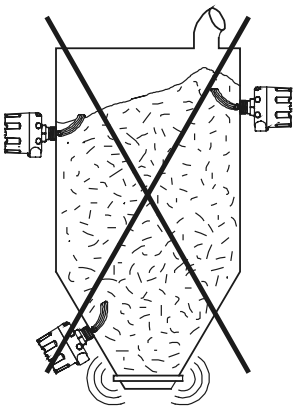
The unit should be saved from strong material flow by appropriate selection of the installation place or by shelter. Location with the less mechanical vibration is preferred.



PROTECTION OF A LOW FAIL-SAFE UNIT BY SHELTER



PROPER

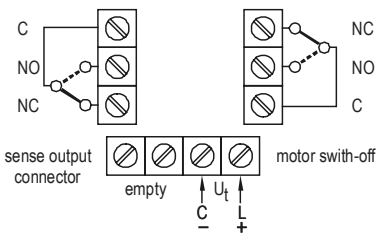


IMPROPER

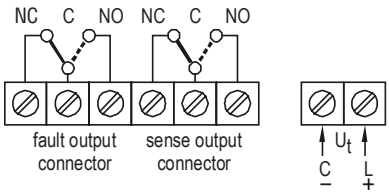
4. INSTALLATION

For customisation of the cable extension the two bolts on the cable bond should be loosened. After removing bound the cable can be cut to the required length.
There are two ways for the installation of the unit.
If the place of the installation can be accessed from inside of the tank then - after removing the rotary paddle - the unit should be screwed in a 1 ½" BSP stub mounted on the roof or wall of the vessel. Lastly the paddle should be reassembled on the shaft.
In a lot of cases, however vessels are not passable i.e. the rotary paddle can not be reassembled from inside of the tank. Single Vane paddles can be inserted through the hole of a 1 ½" BSP stub. Multiple-Vane paddles should be mounted to the 1 ½" BSP screw connection of the mounting plate above. The assembly of rotary paddle and mounting plate should be (using bolts and sealing gasket) installed on the vessel with proper opening to push the paddle through.

5. WIRING



EK□-4□□ (Standard version)



EK□-5□□ (True fail-safe version)

6. START UP / OPERATION

After installation and wiring if powered up the unit is fully operational.
If the paddle is rotating free the green LED on the cover of the type EK□-5□□ will be lit. When the material reaches the paddle impeding it the switch will be triggered and the LED turns to red. Material leaving the paddle behind due to emptying, the motor will be reactivated, the paddle starts to rotate and the LED turns to green again.
Improper selection of the paddle (Single Vane can cope with high density and lumpy solids, while light and small density materials require Three- or Four-Vane paddle) may result in malfunction i.e. paddle rotating in the material and not triggering the switch in spite of material reaching the level to be detected.

7. MAINTENANCE, REPAIR

NIVOROTA devices do not require maintenance on a regular basis. In some instances, however, the unit may need a cleaning from deposited material.
Repairs during or after the guarantee period are effected at the Manufacturers. The equipment sent back for repairs should be cleaned or neutralised (disinfected) by the User.

8. STORAGE CONDITIONS

Ambient temperature: -35 °C to + 60 °C
Relative humidity: max. 98 %

9. WARRANTY

All NIVELCO products are warranted to be free from defects according to the Warranty Sheet, within two (2) years from the date of purchase.

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