

# NIVOROTA

ROTARY PADDLE LEVEL SWITCH



3 YEARS WARRANTY

# НИВЕЛЛО

LEVEL SWITCHES

The NIVOROTA rotary paddle level switch detects the level of lumpy substances or powders, grains, and granules. Mounted onto tanks, silos, and hoppers, it monitors and controls the level, filling, and dumping of the stored materials such as stone, ash, sand, coal, feed, beet slices, etc. A small electric motor drives the paddle, which rotates freely in the absence of material. When the material reaches the paddle, the motor is switched off, and the output switch is triggered. When the material level drops, the paddle is free to spin again, the motor is reactivated, and the switch returns to its original state. The NIVOROTA E-700 & E-800 series rotary paddle level switches provide all the advantageous features of the previous series in one unit. Dust Ex versions are available for use in hazardous environments.

**FEATURES**

- Level switching of free-flowing solids
- Extension cable or rod up to 3 m
- Automatic motor shutdown
- High-temperature version
- IP67
- Dust-Ex certified version
- Rotary force independent of the supply voltage
- Low supply voltage is indicated by a blinking LED

**APPLICATIONS**

- Food industry: sunflower seeds, sunflower hulls, coffee and, cocoa powder, flour, sugar, etc.
- Chemical industry: plastic powders, granules, pellets
- Building industry: cement, sand, calcium powder, gypsum
- Energy industry: active soot, coal powder, fly ash

**VARIANTS**

	E-700	E-800
Metal housing	■	-
Plastic housing	-	■
Single-blade paddle	■	■
Multi-blade paddle	■	■
Flexible coupling	■	■
Cable length	■	■
DC power supply	■	■
Dust Ex version	■	-
High-temperature version	■	-
1" process connection	■	■
1 1/2" process connection	■	■
Torque adjustment	■	■

**CERTIFICATES**

- ATEX (Ex ta/tb D)
- UKCA Ex (Ex ta/tb D)

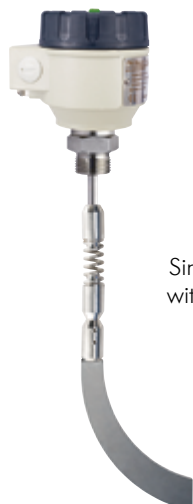
**VARIANTS**

For appropriate model selection the following must be taken into consideration:

- Insertion length: level switching application (low or high level switch) and the position of installation determine the insertion length.
- Number of blades: specific gravity and particle size of the material provides orientation for the number of blades. Most commonly used is the stainless steel, single blade paddle. The paddle can be passed through the respective threaded connection. For lighter materials the use of 3-blade paddle is recommended. The available devices have 1 or 3-blades, they can be ordered with either paddle variant, and the paddles can be ordered separately as well.
- Flexible coupling: Use if the shaft of the device has to be protected against falling materials. (rocks, larger, lumpy materials)



EM-700  
High-temperature version with extension rod



EL-700  
Single-blade paddle with flexible coupling

Material	Density (kg/dm <sup>3</sup> ) <sup>(1)</sup>
Wheat	0.4...0.5
Flour	0.6 ... 0.8
Wood chip	0.3 ... 0.4
Sawdust	0.3 ... 0.35
Whiting	0.8 ... 1
Lime hydrate dust	0.4 ... 0.5
PVC dust	0.3 ... 0.6
PVC granule	0.3 ... 0.6
Sunflower seeds	0.3 ... 0.5
Sunflower hulls	0.1 ... 0.2
Feed	0.2 ... 0.6
Ground paprika	0.8 ... 1

<sup>(1)</sup> Informational data



EL-700  
3-blade paddle version



TECHNICAL DATA

	Standard version		High-temperature version
	EL□-7□□	EL□-8□□	EM□-7□□
Insertion length	Standard: 200 mm; with extension rod: 0.3...3 m; with extension cable: 1...3 m		
Paddle material, number of blades	1.4571 stainless steel / 1, 2, 3; as per order code		
Rotation speed	~1 rpm (@50 Hz)		
Material of wetted parts	1.4571 stainless steel, material of the seal: NBR		1.4571 stainless steel, material of the seal: FPM
Medium density (guideline value)	Minimum 0.1 kg/dm <sup>3</sup>		
Process temperature	-20...+120 °C	-20...+80 °C	-20...+200 °C
Ambient temperature / relative humidity	Ex variant: see "Ex Information" -30...+60 °C / maximum 90%		
Process pressure	Up to 3 bar (0.3 MPa)		
Output	SPDT 250 V AC, 6 A, AC1		
Paddle-rotation / shutdown indication	Two-toned (green / red) LED		
Process connection	1"; 1½" universal thread (can be screwed into BSP and NPT threads) or 1¼ NPT		
Supply voltage	230 V AC, 120 V AC, 24 V AC, 24 V DC (18...28 V DC)		
Power consumption	Maximum 4 VA (4 W)		
Electrical connection	2× M20×1.5 plastic cable glands, for Ø6...12 mm cable + 2× internally threaded ½" NPT connection for protective pipes 2× terminal blocks for 0.5...1.5 mm <sup>2</sup> wire cross section		
Electrical protection	Class I		
Ingress protection	IP67		
Housing material	Painted aluminum	Plastic (PBT)	Painted aluminum
Weight	Standard: 1.6 kg, extension rod: 1.6 kg + extension 1.6 kg/m, extension cable: 2.6 kg + extension 1.4 kg/m, counterweight: 1 kg		

Ex INFORMATION

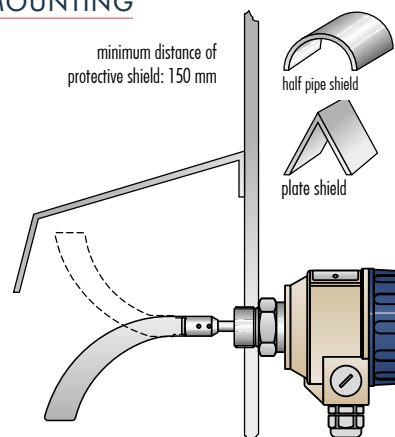
	Standard (EL□-7□□-5, 6, 7, 8 Ex)	High-temperature (EM□-7□□-5, 6, 7, 8 Ex)
Ex marking	⊕ II 1/2 D Ex ta/tb IIIC T85°C...T135°C Da/Db	⊕ II 1/2 D Ex ta/tb IIIC T85°C...T200°C Da/Db
Ex supply voltage	EL□-7□□-5 Ex: U <sub>0</sub> ≤ 253 V AC; EL□-7□□-7 Ex: U <sub>0</sub> ≤ 26.4 V AC;	EM□-7□□-6 Ex: U <sub>0</sub> ≤ 132 V AC; EM□-7□□-8 Ex: U <sub>0</sub> ≤ 28 V DC
Process and ambient temperature	See below	
Cable entry	M20×1.5 cable gland with "Ex ta" certification	
Cable outer diameter	Ø6...Ø12 mm	
Electrical connection	Wire cross-section: 0.5...1.5 mm <sup>2</sup>	

Type	Temperature class	T85°C	T100°C	T135°C	T200°C
Standard EL□-7□□-5, 6, 7, 8 Ex	Maximum surface temperature	+60 °C	+90 °C	+120 °C	
	Maximum process temperature		+60 °C	+50 °C	
	Maximum ambient temperature		40 minutes	30 minutes	
	Waiting time for opening the cover	+60 °C	+90 °C	+120 °C	
High-temperature EM□-7□□-5, 6, 7, 8 Ex	Maximum surface temperature	+60 °C	+90 °C	+120 °C	+200 °C
	Maximum process temperature	+60 °C			
	Maximum ambient temperature	40 minutes	30 minutes	15 minutes	0 minute
	Waiting time for opening the cover				

OPERATING MODES

Power supply	Status LED	Output microswitch	Paddle
ON	Green	 De-Energized	Rotates
	Red	 Energized	Does not rotate
OFF	Off	 De-Energized	Does not rotate

MOUNTING



Protective shield for low fail-safe unit

**NIVOROTA E-700 standard version**

**3 years**

Rotary paddle level switch for powders and granular solids  
Standard probe length: 200 mm

**Version**

- E**   -     -
- L** Standard bidirectional version
- M** High temperature bidirectional version (only with aluminum housing)

**Paddle / Process connection**

- E**   -     -
- A** 1-blade paddle (EAL-701-1) / 1" universal
- H** 1-blade paddle (EAL-701-1) / 1½" universal
- N** 1-blade paddle (EAL-701-1) / 1¼" NPT
- F** \* 3-blade paddle (EAL-709-1) / 1½" universal
- B** \* 3-blade paddle (EAL-709-1) / 1¼" NPT

\* Mounting plate is ordered separately

**Housing / Material of process connection**

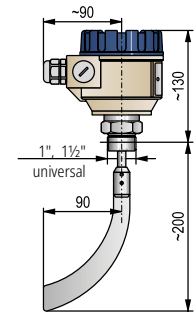
- E**    -     -
- 7** Painted aluminum / 1.4571
- 8** Fiberglass-reinforced plastic (PBT) / 1.4571 (Ex version not available)

**Insertion length**

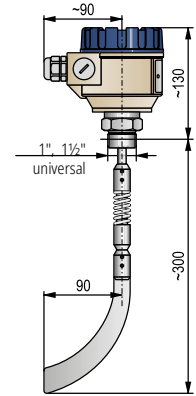
- E**    -     -
- 0 2** 200 mm

**Supply voltage / Certificates**

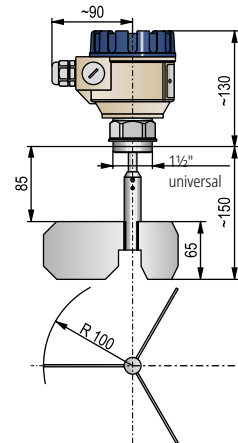
- E**    -     -
- 1** 230 V AC
- 2** 120 V AC
- 3** 24 V AC
- 4** 24 V DC
- 5** 230 V AC / Ex ta/tb D
- 6** 120 V AC / Ex ta/tb D
- 7** 24 V AC / Ex ta/tb D
- 8** 24 V DC / Ex ta/tb D



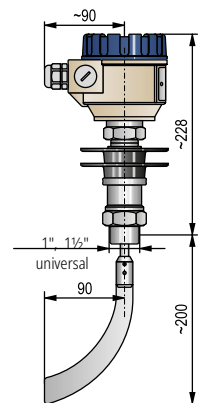
ELA / ELH-702 / 802



ELA / ELH-702 / 802 + EAS-701



ELF-702 / 802



EMA / EMH-702

**NIV24**  
ELA-702-1  
ELH-702-1

**NIVOROTA E-700 extension rod version**

**3 years**

Rotary paddle level switch for powders and granular solids with stainless steel extension rod up to 3 m

**Version**

<b>E</b> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/>	
<b>L</b>	Standard bidirectional version
<b>M</b>	High temperature bidirectional version (only with aluminum housing)

**Version / Paddle / Process connection**

<b>E</b> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/>	
<b>R</b>	With extension rod / 1-blade paddle (EAL-701-1) / 1½" universal
<b>C</b>	With extension rod / 1-blade paddle (EAL-701-1) / 1¼" NPT

**Housing / Material of process connection**

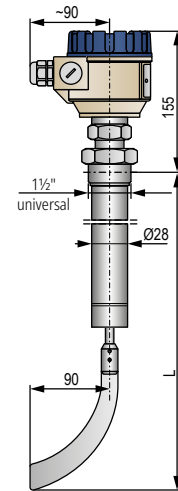
<b>E</b> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/>	
<b>7</b>	Painted aluminum / 1.4571
<b>8</b>	Fiberglass-reinforced plastic (PBT) / 1.4571 (Ex version not available)

**Insertion length**

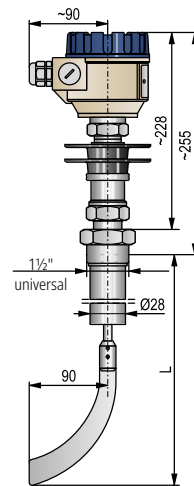
<b>E</b> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/>	
<b>nn</b>	0.3...3 m probe with extension rod; sold by the 0.1 m
nn = 03...30 : 0.3...3 m	

**Supply voltage / Certificates**

<b>E</b> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> - <input type="checkbox"/>	
<b>1</b>	230 V AC
<b>2</b>	120 V AC
<b>3</b>	24 V AC
<b>4</b>	24 V DC
<b>5</b>	230 V AC / Ex ta/tb D
<b>6</b>	120 V AC / Ex ta/tb D
<b>7</b>	24 V AC / Ex ta/tb D
<b>8</b>	24 V DC / Ex ta/tb D



ELR-703 / 730



EMR-703 / 730



**NIVOROTA E-700 accessories (sold separately)**

**3 years**

**Mounting – type / material**

**E A M – 7 0 □ – 0**

1	1" female nut / 1.4571
2	1½" female nut / 1.4571
3	Sliding sleeve for extension rod version / 1.4571
4	Mounting plate, 1" hole / 1.4571
5	Mounting plate, 1" hole / carbon steel
6	Mounting plate, 1½" hole / 1.4571
7	Mounting plate, 1½" hole / carbon steel
8	Mounting plate, 1¼" NPT / 1.4571
9	Mounting plate, 1¼" NPT / carbon steel

**Adapters**

E A A – 1 8 9 – 0	1" BSP / 1" NPT (1.4571)
E A A – 1 8 B – 0	1" BSP / 1½" BSP (1.4571)
E A A – 1 8 C – 0	1" BSP / 1½" NPT (1.4571)
E A A – 1 B A – 0	1½" BSP / 1¼" NPT (1.4571)
E A A – 1 B D – 0	1½" BSP / 2" BSP (1.4571)
E A A – 1 B E – 0	1½" BSP / 2" NPT (1.4571)

**Paddles – type / material**

**E A L – 7 0 □ – 1**

1	1-blade curved, 168 mm / 1.4571
2	1-blade curved, 120 mm / 1.4571
3	2-blade flexible, 172 mm / 1.4571
4	2-blade flexible, 120 mm / 1.4571
5	1-blade straight, 170 mm / 1.4571
6	1-blade straight, 70 mm / 1.4571
7	1-blade 90°, 130 mm / 1.4571
8	3-blade extended, 268 mm / 1.4571
9	3-blade standard, 120 mm / 1.4571

**Length size**

**E A R – 7 0 □ – 1**

n 0.1...0.5 m extension pipe; 1.4571, sold by the 0.1 m  
n = 1 ...5 : 0.1...0.5 m

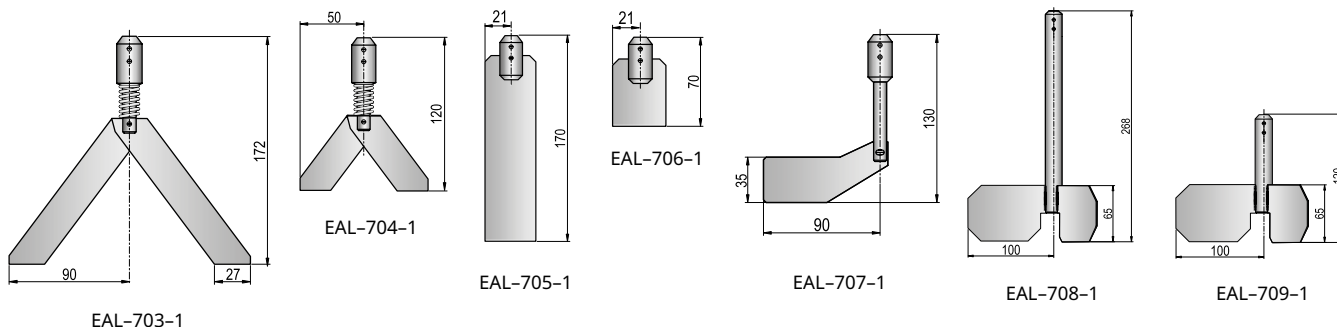
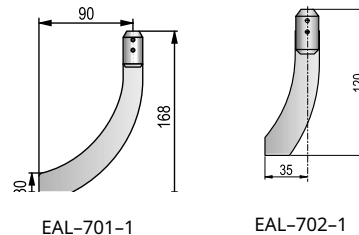
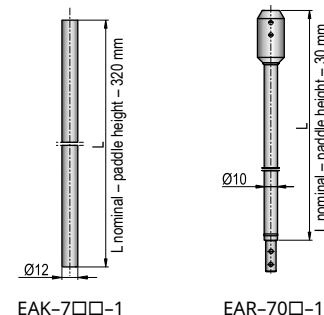
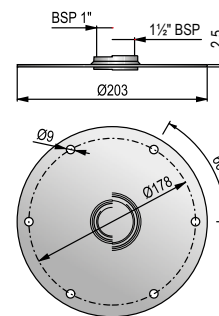
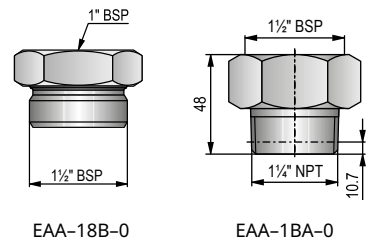
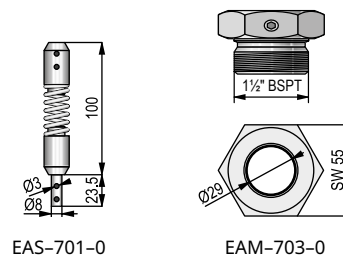
**Rigid pipe for extension cable version**

**E A K – 7 □ □ – 1**

nn 0.1...3 m Ø12x1; 1.4571; sold by the 0.1 m  
nn = 01...30 : 0.1...3 m

**Accessories**

E A S – 7 0 1 – 0	Flexible Coupling / 1.4571
E A W – 7 0 1 – 0	Weight / 1.4571
EAM-704-0M-000-03	Mounting plate seal
4cesp3x20ykoj	Mounting sleeve



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LEVEL SWITCHES