

NIVOMAG

MAGNETIC COUPLING LEVEL SWITCH

User's Manual



Manufacturer:

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Thank you for purchasing a NIVELCO product.

1. APPLICATION

The **NIVOMAG MK□-2□□-□** series magnetic float level switches are designed for level point detection of a wide range of liquids and are suitable for use in various industries including chemical, pharmaceutical, and more. These level switches can be easily installed horizontally or vertically in tanks. A permanent magnet operated by a float's movement will activate another magnet inside the switching enclosure. This second magnet operates a special switch. So the float movement is transferred to the potted switch through separated magnetic coupling ensuring the requirements of the wet process and Ex application. The cable is connected via a gland (maximum wire cross-section: 2.5 mm² [AWG13]).



Level switches are available in both standard and explosion-proof versions, with explosion protection provided by a resin-filled microswitch. The unit switches at approximately $\pm 10^\circ$ to the centerline of the installation, with a maximum deflection of approximately $\pm 16^\circ$. Design considerations must be made to ensure correct operation, taking into account the specified parameters. If the conditions of use change, various accessories can be ordered to adjust the standard unit's functionality and switching parameters. For the **MKA-23□-□** type with vertical float and adjustable switch differential, different rod lengths can be accommodated by adjusting the counterweight to the correct position. The switching points can be set by adjusting the sliding rings on the rod. It is recommended to tie up the end of the rod to a length of 40 mm (1.57") for safe operation in wave or flowing media. During installation, ensure there is free movement of the toggle, with a minimum clearance of 120 mm (4.7") from the center of the installation and at least 27 mm (1.06") from the seal face. The optional counter flange (MFF) tester (MMK) is not suitable for this type.

The **MMK-□□□-□** tester is specifically designed for checking switching capability without mechanically disturbing the system, and is only compatible with 92 × 92 mm (3.6" × 3.6") square flange versions.

2. TECHNICAL DATA

2.1 General

		Horizontal float			Vertical float	
		MKA-□1□-□	MKA-□2□-□	MKU, MKV, MKZ-□1□-□	MKS, MKG-□1□-□	MK□-□3□-□
Nominal pressure		25 bar (363 psi) [MKU, MKV, MKZ: 2/25 bar (29/363 psi)]				16 bar (232 psi)
Process temperature		-40...+250 °C (-40...+482 °F)		0...+80 °C (32...+176 °F)	MKS: 0...+200 °C (32...+392 °F) MKG: 0...+100 °C (32...+212 °F)	-40...+250 °C (-40...+482 °F)
		Ex variant: see Temperature specification table				
Ambient temperature		-20...+80 °C (-4...+176 °F), Ex variant: see "2.4.1 Temperature specification for Ex version" table				
Liquid density		Minimum 0.7...0.85 kg/dm³ (S.G.), see "2.3 Additional technical data" table				
Switching differential		Fixed	Adjustable	Fixed ⁽¹⁾		Adjustable
Insertion length		202...521 mm (7.95...20.5")	254...573 mm (10...22.5")	202...521 mm ⁽¹⁾ (7.95...20.5") ⁽¹⁾		1265...3265 mm (4.15...10.7 ft)
Material of wetted parts		Stainless steel (1.4571 [316Ti equivalent], 1.3960 [316LN equivalent], 1.4404 [316L equivalent]); MKG, MKV: rubber (NBR); MKS, MKZ: silicone				
Housing material		Painted aluminum or stainless steel				
Microswitch		1 or 2 microswitches with closing and opening contact (NO and NC) ⁽²⁾				
Switch rating	Standard	250 V 10 A AC12; 220 V 0.6 A DC13				
	Ex variant	250 V 2.5 A AC12; 220 V 0.3 A DC13				
Electrical connection		M20×1.5 cable gland, cable diameter: Ø6...12 mm (Ø0.24...0.47") ⁽³⁾ (Ex version: Ø10...14 mm [Ø0.39...0.55"]), wire cross section: 5×0.75...2.5 mm² [18...14AWG] (MKU, MKV, MKZ: integrated cable NSSHöu-J 5×1.5 mm² [16AWG], Ø14mm [Ø0.6"]) ⁽⁴⁾				
Ingress protection		IP65 (MKU, MKV, MKZ: IP68 [NEMA 6P equivalent], up to 20 m [65.6 ft] water column)				
Electrical protection		Class I				
Safety Integrity Level		SIL 1				
Weight		~1.8...3.5 kg (~3.95...7.7 lb)				

⁽¹⁾ MKU type is also available with adjustable switching differential. In this case, the extension length is 254...573 mm (10"...22.56").

⁽²⁾ NO and NC terminals must be connected to an equipotential circuit. ⁽³⁾ For explosion-proof version, see chapter 2.4.

⁽⁴⁾ Cable length must be specified when ordered.

2.2 Accessories

- User's Manual
- Warranty Card
- EU Declaration of Conformity
- Cable glands (type dependent)

2.3 Additional technical data

Arm length	0...100 mm (0...3.94")	200 mm (7.87")	300 mm (11.81")	1000...3000 mm (3.28...9.84 ft)
Float Ø max.	Minimum Liquid density (Specific gravity)			
52 mm (2")	0.7 kg/dm³ (43.7 lb/ft³)	0.8 kg/dm³ (49.9 lb/ft³)	0.85 kg/dm³ (53.1 lb/ft³)	-
64 mm (2.52")			0.8 kg/dm³ (49.9 lb/ft³)	
124 mm (4.88")	-			0.7 kg/dm³ (43.7 lb/ft³)

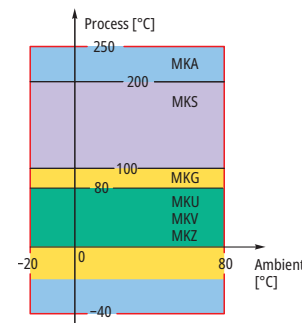
2.4 Explosion Protection, Designation, Limit Values

Ex marking	ATEX	II 1/2 G Ex db eb mb IIC T6...T2 Ga/Gb
	IEC Ex	Ex db eb mb IIC T6...T2 Ga/Gb
	INMETRO	Ex db eb mb IIC T6...T2 Ga/Gb
Reference document number	ATEX	mka2100m0600h_10
	IEC Ex	mka210en1811h-b
	INMETRO	mka2100p0600h_11
Ex power supply	For AC power supply: $U_0 \leq 250$ V, $I_0 \leq 2.5$ A. For DC power supply: $U_0 \leq 220$ V, $I_0 \leq 0.3$ A	
Process and ambient temperature	See "2.4.1 Temperature specification for Ex variants" table	
Cable entry	M20×1.5 cable glands with "Ex e" protection	
Cable outer diameter	Ø10...14 mm (Ø0.39...0.55")	
Electrical connection	Wire cross section: 5× 0.75...2.5 mm ² (AWG18...14)	

2.4.1 Temperature specification for Ex version

Temperature classes		T6	T5	T4	T3	T2
Ambient temperature range		-20...+70 °C (-4...+158 °F)	-20...+80 °C (-4...+176 °F)			
Process temperature range	MKA	-40...+80 °C (-40...+176 °F)	-40...+95 °C (-40...+203 °F)	-40...+130 °C (-40...+166 °F)	-40...+200 °C (-40...+392 °F)	-40...+250 °C (-40...+482 °F)
	MKS				-40...+200 °C (-40...+392 °F)	
	MKG	-20...+80 °C (-4...+176 °F)	-20...+95 °C (-4...+203 °F)			
	MKU, MKV, MKZ	-20...+70 °C (-4...+158 °F)	-20...+80 °C (-4...+176 °F)			

2.5 Temperature diagram



2.6 Order code (Not all combinations are available.)

MK□-□1□-□ with fixed switch differential

NIVOMAG M K □ — □ 1 □ — □ *

Version	Code
Standard	A
With rubber protective sleeve	G
With silicon protective sleeve	S
Submersible (IP68 (NEMA 6P equivalent)) ⁽¹⁾	U
Submersible (IP68 (NEMA 6P equivalent)) ⁽¹⁾ , with rubber protective sleeve	V
Submersible (IP68 (NEMA 6P equivalent)) ⁽¹⁾ , with silicone protective sleeve	Z

Housing / Output	Code
Aluminum / 1× SPDT	2
Aluminum / 2× SPDT ⁽²⁾	5
Stainless steel / 1× SPDT	4
Stainless steel / 2× SPDT ⁽²⁾	6

Process connection	Code
92 × 92 mm (3.6" × 3.6"), PN square flange	0
2" BSP ⁽³⁾	B
2" NPT ⁽³⁾	N
DIN DN80, PN40 / 25 / 16 / 10 steel ⁽³⁾	1
DIN DN100, PN40 / 25 steel ⁽³⁾	2
DIN DN80, PN40 / 25 / 16 / 10, 1.4571 (316Ti equivalent) stainless steel ⁽³⁾	5
DIN DN100, PN40 / 25, 1.4571 (316Ti equivalent) stainless steel ⁽³⁾	6

⁽¹⁾ Cable length must be specified in the text of the order.

⁽²⁾ Ex version under license.

⁽³⁾ Not available with a protection sleeve.

⁽⁴⁾ The type of the lever profile ("L" / "Z") and the upper (Lsh).

The lower (Lsl) switching point must be specified in the text of the order.

Protrusion / Lever length / Ex	Code
Standard version	
202 mm / 0 mm (8" [7.4" for MKA-21B, 7" for MKA-21N])	0
321 mm / 100 mm (12.6" / 3.9")	1
421 mm / 200 mm (16.6" / 7.9")	2
521 mm / 300 mm (20.5" / 11.8")	3
"L" / "Z" lever ⁽⁴⁾	4
Ex db eb mb G version	
202 mm / 0 mm (8" [7.4" for MKA-21B, 7" for MKA-21N])	9
321 mm / 100 mm (321 / 3.9")	5
421 mm / 200 mm (16.6" / 7.9")	6
521 mm / 300 mm (20.5" / 11.8")	7
"L" / "Z" lever ⁽⁴⁾	8

MK□-□2□-□ with adjustable switch differential

NIVOMAG M K □ — □ 2 □ — □ *

Version	Code
Standard	A
Submersible (IP68 NEMA 6P equivalent) ⁽¹⁾	U

Housing / Output	Code
Aluminum / 1× SPDT	2
Aluminum / 2× SPDT ⁽²⁾	5
Stainless steel / 1× SPDT	4
Stainless steel / 2× SPDT ⁽²⁾	6

Process connection	Code
92 × 92 mm (3.6" × 3.6"), PN square flange	0
DIN DN80, PN40 / 25 / 16 / 10 steel	1
DIN DN100, PN40 / 25 steel	2
DIN DN80, PN40 / 25 / 16 / 10, 1.4571 (316Ti equivalent) stainless steel	5
DIN DN100, PN40 / 25, 1.4571 (316Ti equivalent) stainless steel	6

⁽¹⁾ Cable length must be specified in the text of the order.

⁽²⁾ Ex version under license.

⁽³⁾ The type of the lever profile ("L" / "Z") and the upper (Lsh).

The lower (Lsl) switching point must be specified in the text of the order. With the adjustable switch differential option, the switching points can be shifted.

Protrusion / Lever length / Ex	Code
Standard version	
254 mm / 0 mm (10" / 0")	0
373 mm / 100 mm (14.7" / 3.9")	1
473 mm / 200 mm (18.6" / 7.9")	2
573 mm / 300 mm (20.5" / 11.8")	3
"L" / "Z" lever ⁽⁵⁾	4
Ex db eb mb G version	
254 mm / 0 mm (10" / 0")	9
373 mm / 100 mm (14.7" / 3.9")	5
473 mm / 200 mm (18.6" / 7.9")	6
573 mm / 300 mm (20.5" / 11.8")	7
"L" / "Z" lever ⁽⁵⁾	8

*For explosion-proof devices, the data plate shows the article number followed by "Ex".

MK□-□30-□ with adjustable switch differential, side-mounted

NIVOMAG M K A — □ 3 0 — □ *

Version	Code
Standard	A
Submersible (IP68 NEMA 6P equivalent) ⁽¹⁾	U

Housing / Output	Code
Aluminum / 1× SPDT	2
Aluminum / 2× SPDT ⁽²⁾	5
Stainless steel / 1× SPDT	4
Stainless steel / 2× SPDT ⁽²⁾	6

Process connection	Code
92 × 92 mm (3.6" × 3.6"), PN square flange	0

Protrusion / Lever length / Ex	Code
Standard version	
1265 mm / 1000 mm (4.15 ft / 3.3 ft)	1
2265 mm / 2000 mm (7.4 ft / 6.6 ft)	2
3265 mm / 3000 mm (10.7 ft / 9.8 ft)	3
Ex db eb mb G version	
1265 mm / 1000 mm (4.15 ft / 3.3 ft)	5
2265 mm / 2000 mm (7.4 ft / 6.6 ft)	6
3265 mm / 3000 mm (10.7 ft / 9.8 ft)	7

*For explosion-proof devices, the article number is followed by "Ex" on the data plate.

⁽¹⁾ Cable length must be specified in the order text. ⁽²⁾ Ex version under licence.

Counter flange

NIVOMAG M F F — 1 □ □ — 0

Material	Code
Steel 1.7218 (4130 equivalent)	1
Stainless steel 1.4409 (316L equivalent)	2

Process connection	Code
Standard	0
For units with MMK-1□0 tester	1

Tester

NIVOMAG M M K — 1 □ 0 — 0

Material	Code
Steel 1.7218 (4130 equivalent)	1
Stainless steel 1.4409 (316L equivalent)	2

Gland adapter

NIVOMAG M A Y — 1 2 2 — □

Type	Code
Without gland	0
Plastic glands	1
Metal glands	2

2.7 Available parts, components (See chapter 2.9)

	MK□-□1□	MK□-□2□	MK□-□3□
Fixed switching differential	■	—	—
Adjustable switching differential	—	■	■
Straight lever	■	■	■
"L" or "Z" lever	■	■	—
Side mounted	■	■	—
Top mounted	■ ⁽²⁾	■ ⁽²⁾	■
Submersible	■	■	■
Protective Rubber Sleeve	■	—	—
Flanged process connection	■	■	■ ⁽³⁾
Threaded process connection	■	—	—
Ex variant	■	■	■
Tester	■	■ ⁽⁴⁾	—

⁽²⁾ With "L" lever. ⁽³⁾ Only with 92 × 92 mm (3.6" × 3.6") square flange. ⁽⁴⁾ Only with special counter flange.

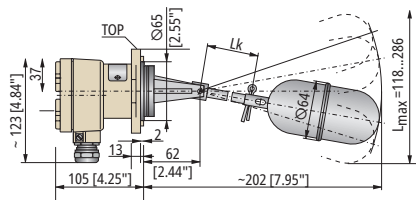
2.8 Dimensions

Always specify the desired switching points from the seal surface of the device.

Standard device, suitable for horizontal installation		
Standard device with 92 × 92 mm (3.6" × 3.6") square flange (MKA-210-0, MKA-210-9 Ex)	Standard device with threaded connection (MKA-21B-0, MKA-21N-0, MKA-21B-0 Ex, MKA-21N-0 Ex)	Submersible device with 92 × 92 mm (3.6" × 3.6") square flange (MKU-210-0, MKU-210-9 Ex)
Extension arm 100...300 mm (3.94...11.81")		
"Z" lever		
"L" lever (for vertical installation)		
Adjustable switch differential Rubber protective sleeve		Adjustable switch differential Rubber protective sleeve
Device with adjustable switch differential (MKA-220-0, MKA-220-9 Ex)	Submersible device with 92 × 92 mm (3.6" × 3.6") square flange and rubber protective sleeve (MKG / MKS / MKV / MKZ-210-0 MKG / MKS / MKV / MKZ-210-9 Ex)	Standard device with threaded connection and flange (MKA-211...8-0, MKA-211...8-9 Ex)
It is also available with a JIS or ASME B16.5 flange of the same classification as specified in Table 2.6 (Ordering Code).		
Extension arm 100...300 mm (3.94...11.81")		
"Z" lever		
"L" lever (for vertical installation)		
Adjustable switch differential		Adjustable switch differential

Standard device, suitable for horizontal installation

Standard device with 92 × 92 mm (3.6" × 3.6") square flange (MKA-510-0)

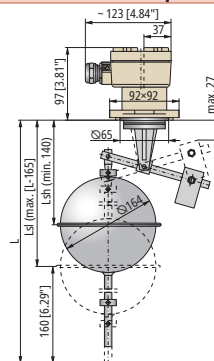


Available
parts,
accessories

Adjustable switch differential
Rubber protective sleeve

Vertical installation

Vertically mounted device with 92 × 92 mm (3.6" × 3.6") square flange (MKA-230-1, MKA-230-5 Ex)

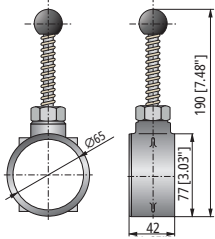
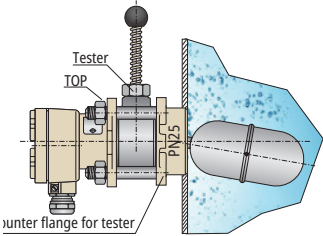
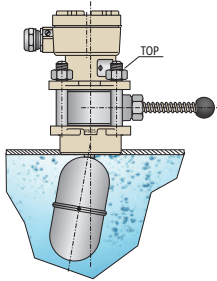
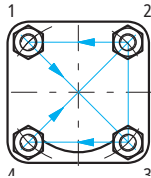


Determining the switching level:

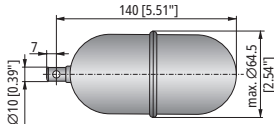
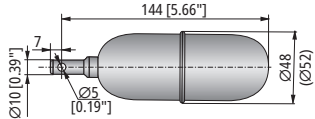
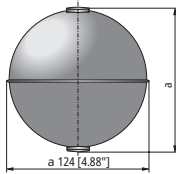
- Always specify from the seal surface
- Upper switching point (min): 140 mm (5.51")
- Lower switching point: Rod length – 60 mm (2.36")
- Rod length required for lower switching point: Lower switching level + 60 mm (2.36")

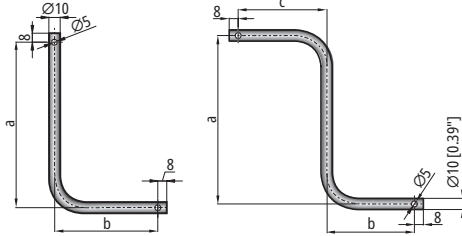
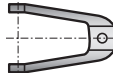
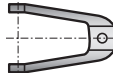
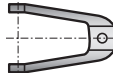
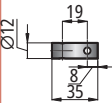
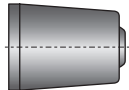
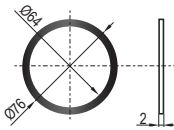
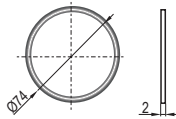
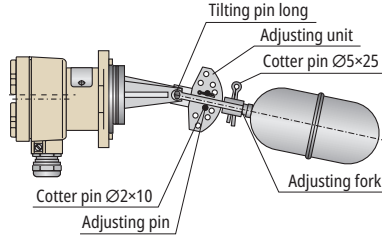
2.9 Available accessories

Flanges		Gland adapter		
Counter flange	Counter flange for MMK tester	Without gland	With plastic glands	With metal glands
MFF-110-0 (1.7218 [4130 eq.]) MFF-120-0 (1.4409 [316L eq.])	MFF-111-0 (1.7218 [4130 eq.]) MFF-121-0 (1.4409 [316L eq.])	MAY-122-0	MAY-122-1	MAY-122-2
To create a mounting surface for devices with a 92 × 92 mm (3.6" × 3.6") square flange		Y-adapter for multiple cable entry, with M20 × 1.5 connector size, for non-Ex devices		
Extended stud bolt length for use with a tester				

Tester MMK-110-0 (1.7218), MMK-120-0 (1.4409)	Installing the tester		
 — Applicable for in-service monitoring of devices with a 92 × 92 mm (3.6" × 3.6") square flange. — Not suitable for use with a rubber protective sleeve.	Horizontal installation 	Vertical installation 	Be sure that the gaskets are in place and the clamp bolts are tightened evenly. 

2.10 Available parts, components

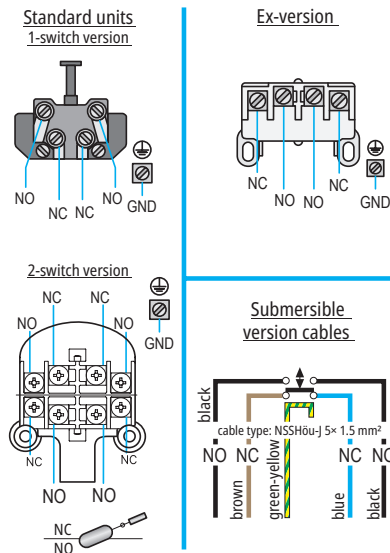
Float Ø64 mm (Ø2.52") MKA-210-0M-200-00	Float Ø48 mm (Ø52 mm) (Ø1.889" [Ø2.05"]) MKA-21B-0M-000-02	Float Ø124 mm (Ø4.88") MKA-230-0M-100-00
		

Extension arm		"L" / "Z" lever MKA-210-4M-000-01		Components for adjustable switch differential																	
				<table><tr><th>Component</th><th>Component name / number</th></tr><tr><td></td><td>Adjusting unit MKA-120-0M-000-02</td></tr><tr><td></td><td>Adjusting fork MKA-120-0M-000-04</td></tr><tr><td></td><td>Tilting pin long MKA-220-0M-000-07</td></tr><tr><td></td><td>Adjusting pin MKA-120-0M-000-03</td></tr><tr><td></td><td>Cotter pin Ø5 × 25 mm (Ø0.2 × 0.98") 4cesa5x25koa4</td></tr><tr><td></td><td>Cotter pin Ø2 × 10 mm (Ø0.079 × 0.39") 4cesa2x10koa4</td></tr></table>		Component	Component name / number		Adjusting unit MKA-120-0M-000-02		Adjusting fork MKA-120-0M-000-04		Tilting pin long MKA-220-0M-000-07		Adjusting pin MKA-120-0M-000-03		Cotter pin Ø5 × 25 mm (Ø0.2 × 0.98") 4cesa5x25koa4		Cotter pin Ø2 × 10 mm (Ø0.079 × 0.39") 4cesa2x10koa4		
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	Cotter pin Ø2 × 10 mm (Ø0.079 × 0.39") 4cesa2x10koa4																				
<table><tr><th>A</th><th>Order code</th></tr><tr><td>100 mm (3.94")</td><td>MKA-110-1M-000-01</td></tr><tr><td>200 mm (7.87")</td><td>MKA-110-2M-000-01</td></tr><tr><td>300 mm (11.81")</td><td>MKA-110-3M-000-01</td></tr></table>		A	Order code	100 mm (3.94")	MKA-110-1M-000-01	200 mm (7.87")	MKA-110-2M-000-01	300 mm (11.81")	MKA-110-3M-000-01	When ordering, specify the type and corresponding dimensions (a-b, a-b-c) or upper and lower switching points.											
A	Order code																				
100 mm (3.94")	MKA-110-1M-000-01																				
200 mm (7.87")	MKA-110-2M-000-01																				
300 mm (11.81")	MKA-110-3M-000-01																				
Components for mounting																					
 Mounting sleeve (MKA-110-1M-000-02)		 2× Cotter pin Ø5 × 25 mm (Ø0.2 × 0.98") 4cesa5x25koa4																			
Rubber protective sleeve		Seals		Installation of components																	
 <table><tr><th>Material</th><th>Order code</th></tr><tr><td>NBR</td><td>MKA-140-0M-000-01</td></tr><tr><td>Silicone</td><td>MKA-150-0M-000-01</td></tr></table> Not for use with threaded connections, adjustable switch differential, or vertical floats.		Material	Order code	NBR	MKA-140-0M-000-01	Silicone	MKA-150-0M-000-01	Flat seal  <table><tr><th>Material</th><th>Order code</th></tr><tr><td>REINZ AFM34</td><td>4gu2x76klinge</td></tr></table> Connector seal for 92 × 92 mm (3.6" × 3.6") square flange devices and testers.		Material	Order code	REINZ AFM34	4gu2x76klinge	O-ring (Cover seal)  <table><tr><th>Material</th><th>Order code</th></tr><tr><td>EPDM</td><td>4guo74x2epdmy</td></tr></table>		Material	Order code	EPDM	4guo74x2epdmy		
Material	Order code																				
NBR	MKA-140-0M-000-01																				
Silicone	MKA-150-0M-000-01																				
Material	Order code																				
REINZ AFM34	4gu2x76klinge																				
Material	Order code																				
EPDM	4guo74x2epdmy																				

3. MOUNTING

Installation must follow the specifications outlined in the provided drawings and tables for the requested application. Before mounting, ensure sufficient space for the float to move freely. For horizontal installation, the seal face must be vertical and the position of the fixing screws must follow the specifications. The "TOP" marking on the unit must always be at the top. For vertical installation, the seal face must be horizontal. Slightly different applications are possible, but this will change the connection points of the unit, which must be taken into account during installation. For the vertical floating version (MKA-230), the seal surface must be horizontal. Failure to observe this during installation may result in unstable operation or switching failure.

4. WIRING



5. CONDITIONS FOR Ex APPLICATION

Connect the device to the EP network earth via its GND screw. Protect the NIVOMAG MK float switch against overload with a 2.5 A "T"-marked circuit breaker.

If installed in an overvoltage-prone location, provide at least Class II overvoltage protection.

Connect the NIVOMAG MK float switch to the local EP circuit using 4 mm² (AWG 12) copper wire.

6. MAINTENANCE, REPAIR

The device does not require regular maintenance. The warranty terms are detailed in the warranty card. For repairs, the user must clean and disinfect the device, neutralize any chemical residues, and complete the [Returned Equipment Handling Form](#), which is available for download on our website. On the form, the user must declare the defect, provide the reason for return, and confirm that the device is clean and free of hazardous substances.

7. STORAGE CONDITIONS

Ambient temperature: -25...+80 °C (-13...+176 °F)

Relative humidity: max. 98%

mka210en26h13

March 2026

*Information is accurate to the best of NIVELCO's knowledge.
We reserve the right to change specifications at any time.*