



Catálogo



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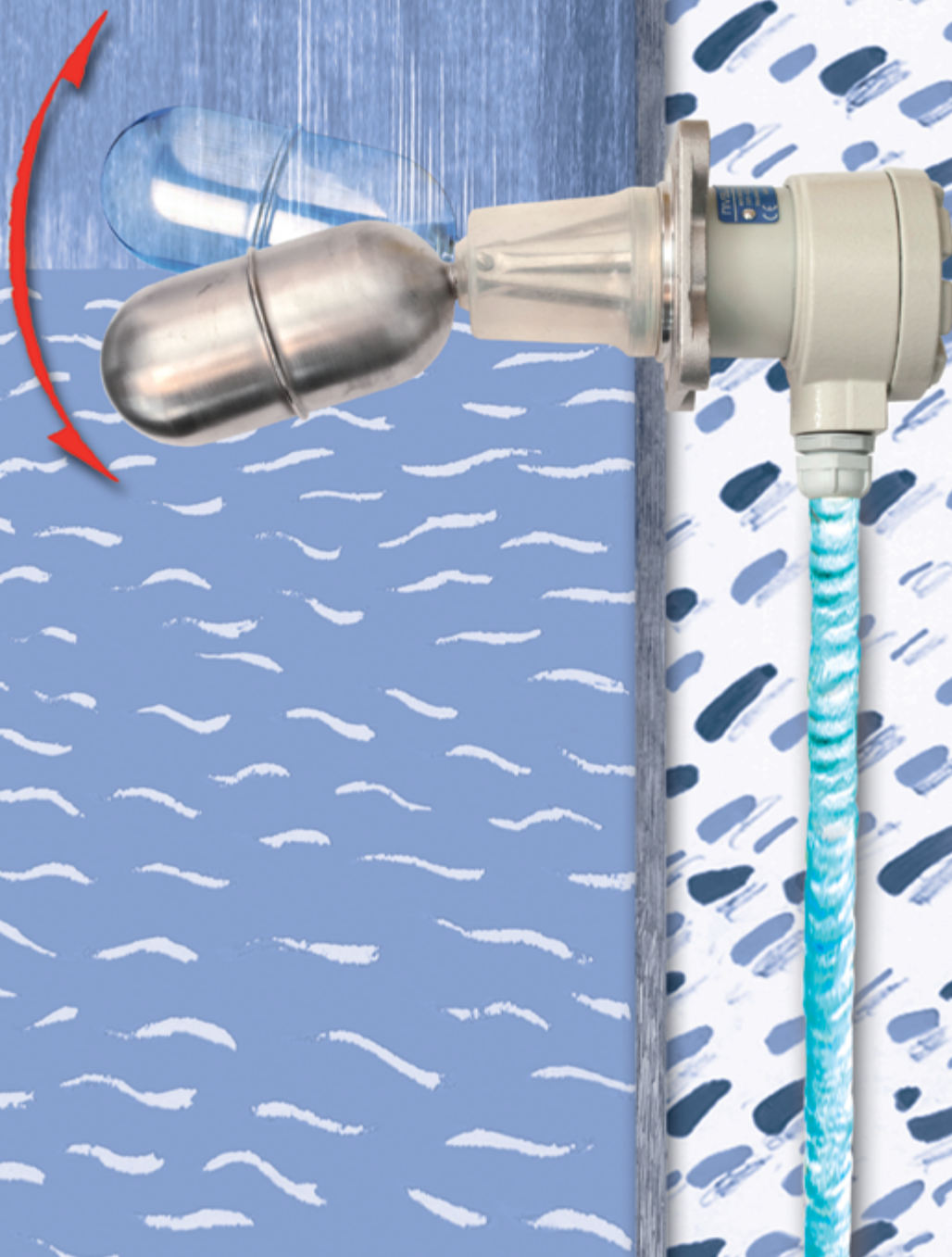
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NIVOMAG

MAGNETIC COUPLING LEVEL SWITCHES



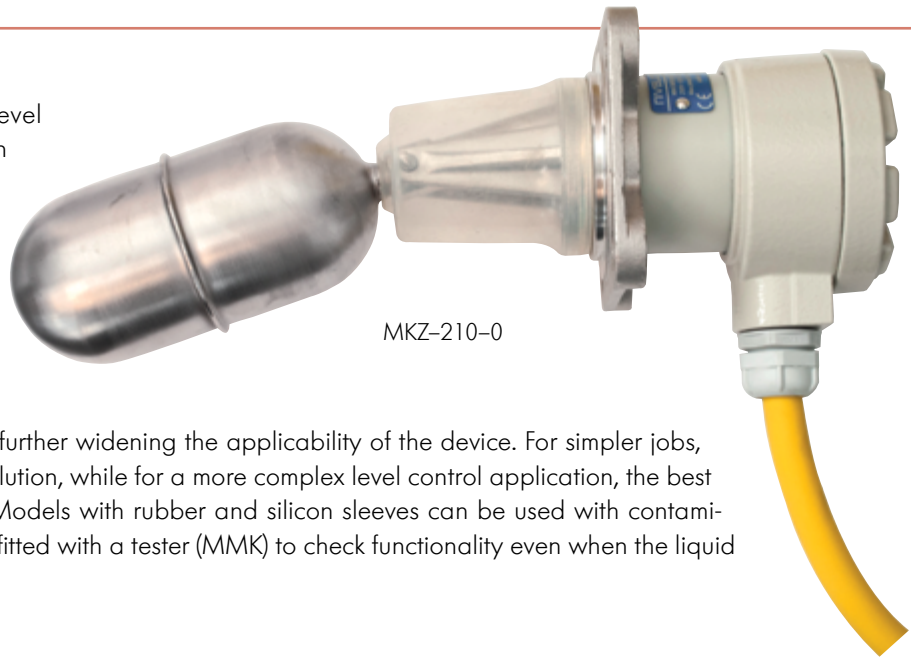
NIVELCO

LEVEL SWITCHES

The NIVOMAG MK-200 magnetic float level switches are used for point-level detection and level control of liquids in all types of containers.

OPERATING PRINCIPLE

The float's magnet activates the output switch via a non-contact coupling system. The device is available in numerous side and top-mounted versions, further widening the applicability of the device. For simpler jobs, fixed hysteresis models offer an affordable solution, while for a more complex level control application, the best choice is the adjustable hysteresis variants. Models with rubber and silicon sleeves can be used with contaminated liquids. The NIVOMAG switch can be fitted with a tester (MMK) to check functionality even when the liquid levels are not changing.



MKZ-210-0

FEATURES

- Magnetic coupling between switch and float
- Operation w/o external power supply
- Side and top mounted versions
- Submersible version
- Fixed or variable hysteresis
- NIFLANGE weldable stainless steel flange variants
- Aluminum or stainless steel housing
- Variants with 2x microswitches
- Up to +250 °C (+482 °F) process temperature
- Flame-proof version
- IP65 / IP68

VARIANTS

The following tables and diagrams help select the appropriate model for the job. When selecting a model, liquid density, mounting position, process connection, and the need for adjustable or fixed hysteresis or a rubber sleeve must be considered.

| Additional technical data | | | | |
|---------------------------|--|----------------|----------------|-----------------------|
| Arm length | 0...100 mm (0...4") | 200 mm (7.85") | 300 mm (11.8") | 1...3 m (3.3...10 ft) |
| Maximum float Ø | Minimum liquid density (kg/dm ³) | | | |
| 52 mm (2") | 0.7 | 0.8 | 0.85 | - |
| 64 mm (2½") | | | 0.8 | - |
| 124 mm (5") | - | - | - | 0.7 |

APPLICATIONS

- Overflow protection
- Level controls
- Supplementary fail-safe switch if combined with other devices
- Water tanks, feedwater tanks
- Fuel tanks
- Power plants

CERTIFICATES

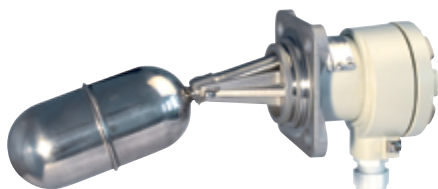
- ATEX (Ex db eb mb G)
- IEC Ex (Ex db eb mb G)
- INMETRO (Ex db eb mb G)
- DNV
- Bureau Veritas (BV)
- SIL 1 (Safety Integrity Level)

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

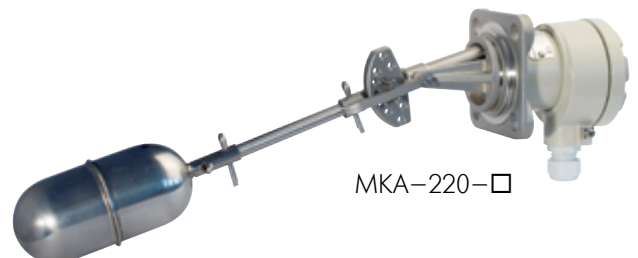
⁽¹⁾ With "L" lever.

⁽²⁾ Only with 92 x 92 flange.

⁽³⁾ Only with special counter flange.



MKA-210-□



MKA-220-□

TECHNICAL DATA

| | | Cylindrical float (side and top mounting) | | | Ball float (top mounting) |
|---|------------|--|------------------------------|--|----------------------------------|
| | | MKA-□1□-□ | MKA-□2□-□ | MKU/MKV/MKZ-□1□-□ | MKS / MKG-□1□-□ |
| Nominal pressure | | 25 bar (363 psi) [MKU, MKV, MKZ: 2 / 25 bar (29 psi / 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 temperature specification for Ex version table | | | |
| Liquid density | | Minimum 0.7...0.85 kg/dm ³ , see "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 (7.95...20.5") ⁽¹⁾ | 1265...3265 mm (4.15...10.7 ft) |
| Material of wetted parts | | Stainless steel ((1.4571, 1.3960, 1.4404 [316Ti, 316LN, 316L]); MKG, MKV: rubber (NBR); MKS, MKZ: silicone | | | |
| Housing material | | Painted aluminum or stainless steel | | | |
| Microswitch | | 1 or 2 microswitch with closing and opening contact (NO, 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 | | M20x1.5 cable gland, cable diameter: Ø6...12 mm (Ø0.24...0.47") (Ex version: Ø10...14 mm [Ø0.39... 0.55"]), wire cross section: 5x 0.75...2.5 mm ² (5 x AWG18...14) (MKU, MKV, MKZ: integrated cable NSSHöu-J 5x 1.5 mm ² , Ø14mm [AWG16, Ø0.6"]) ⁽³⁾ | | | |
| Ingress protection | | IP65 (MKU, MKV, MKZ: IP68, up to 20 m [65.6 ft] water column) | | | |
| Electrical protection | | Class I | | | |
| Safety integrity level | | SIL 1 | | | |
| 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 | | | | |
| 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").

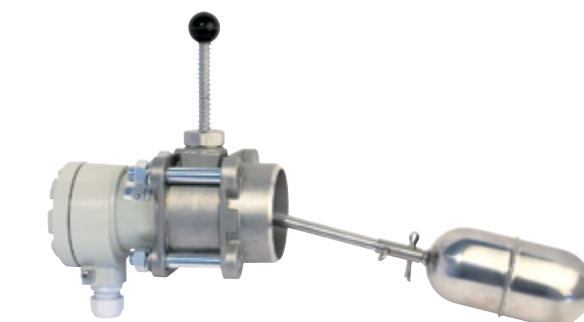
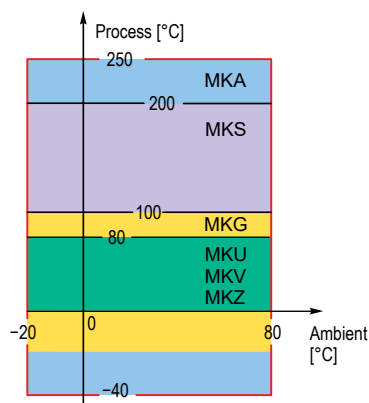
⁽²⁾ NO and NC terminals must be connected to an equipotential circuit.

⁽³⁾ Cable length must be specified when ordered.

Ex INFORMATION

Temperature specification for Ex variants

| Temperature classes | | T6 | T5 | T4 | T3 | T2 |
|---------------------------|---------------|---------------------------------|---------------------------------|----------------------------------|----------------------------------|----------------------------------|
| Ambient temperature range | | -20...+70 °C (-4...+158 °F) | | -20...+80 °C (-4...+158 °F) | | |
| Process temperature range | MKA | -40...+80 °C (-40...+176 °F) | -40...+95 °C (-40...+203 °F) | -40...+130 °C (-40...+266 °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) | | |

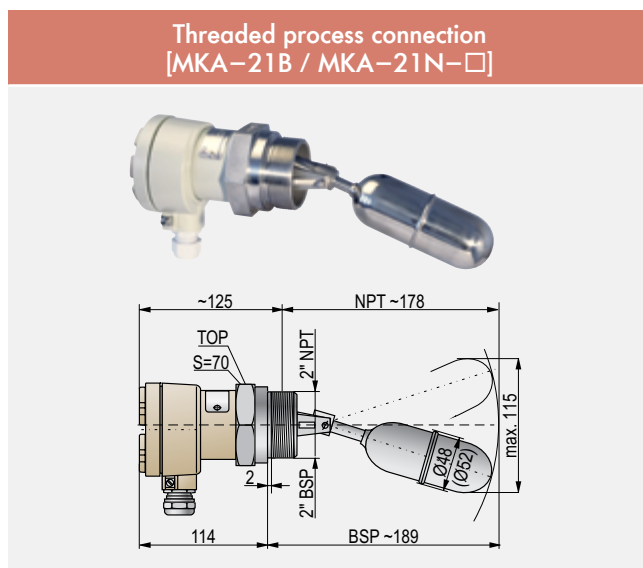
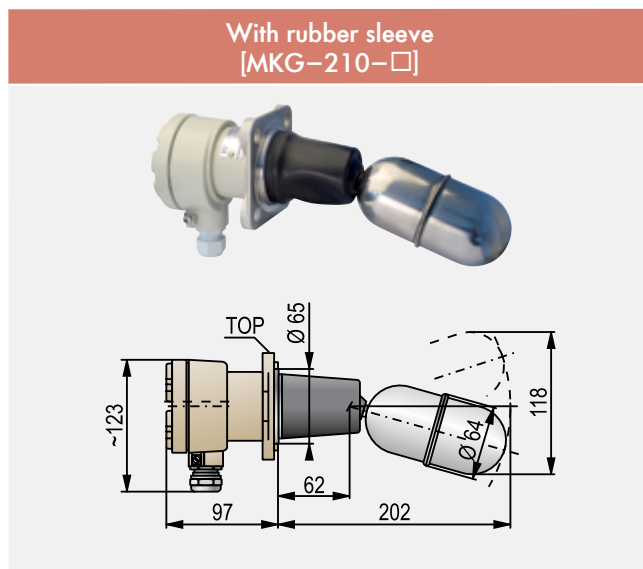
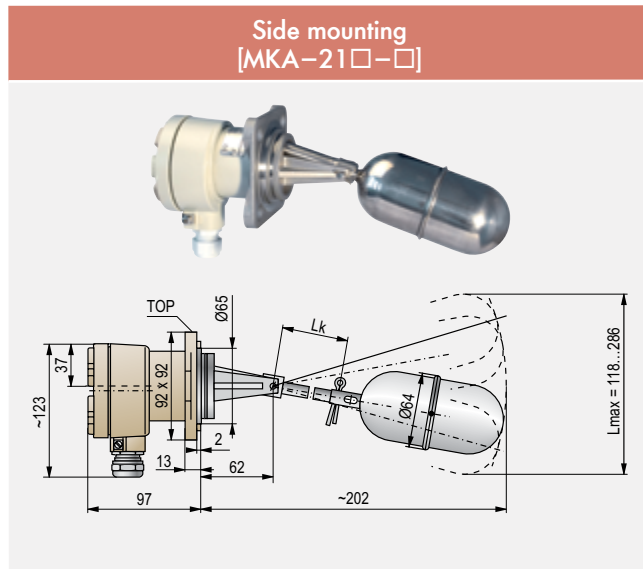


MKA-210-□ + MMK-1□0 (tester) + MFF-1□1 (counter flange)



VARIANTS

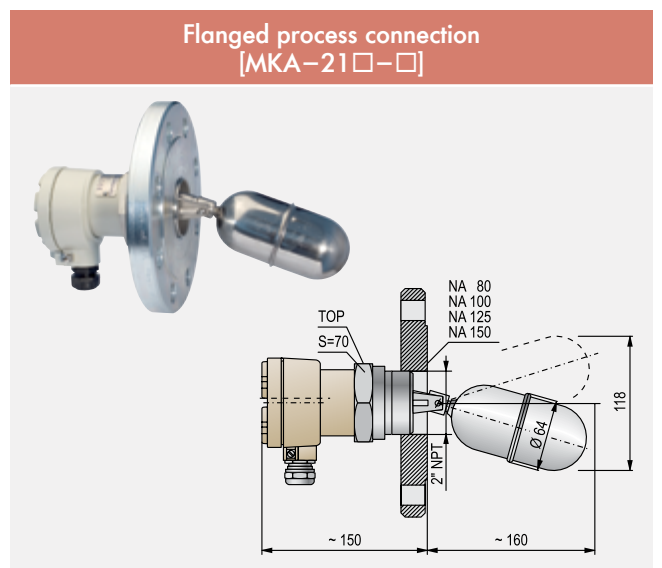
Devices with fixed hysteresis



Switching points (mm [inch]) for models with fixed hysteresis and straight arm [MK□-21□]

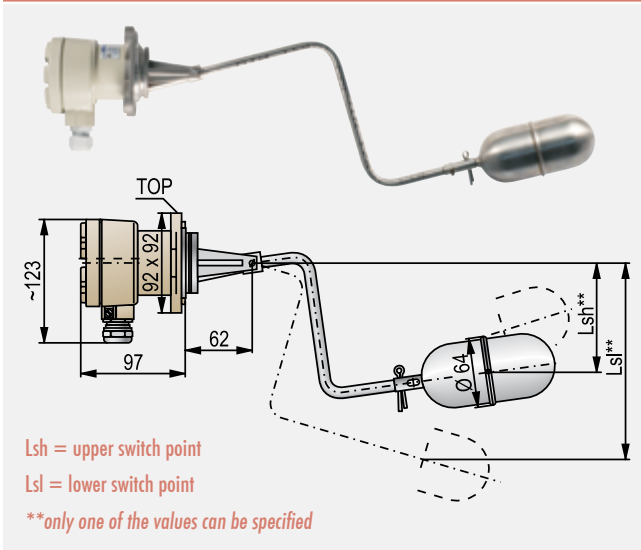
| | | | | |
|-----------------------------|----------------|-----------------|-----------------|-----------------|
| Lk = arm length | 0 | 100 [3.93"] | 200 [7.87"] | 300 [11.8"] |
| L = insertion length | 202 [7.95"] | 321 [12.63"] | 421 [16.57"] | 521 [20.51"] |
| Lmax = maximum displacement | 118 [4.65"] | 180 [7.08"] | 234 [9.21"] | 286 [11.25"] |
| X1 = upper switch point | 12 [0.47"] | 30 [1.18"] | 46 [1.81"] | 62 [2.44"] |
| X2 = lower switch point | 12 [0.47"] | 30 [1.18"] | 46 [1.81"] | 62 [2.44"] |

Note: values for water @ +20 °C (+68 °F)

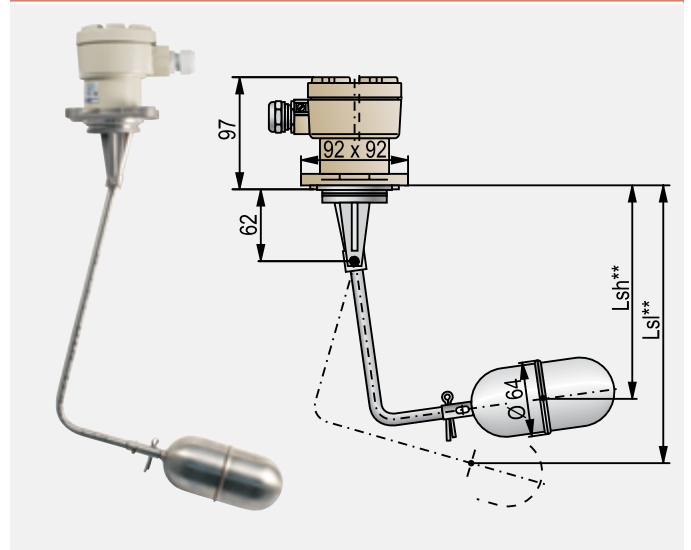


Devices with fixed hysteresis

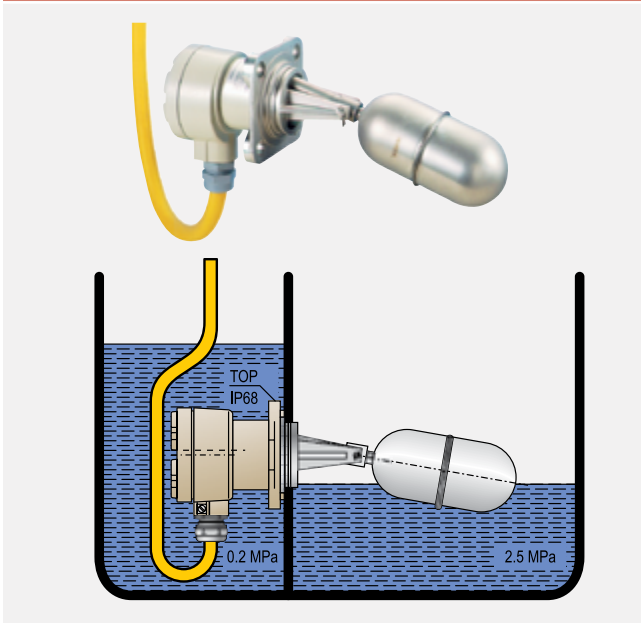
Side mounting, "Z" arm
[MKA-210-4]



Top mounting, "L" arm
[MKA-210-4]



Submersible construction
[MKU-210-□]



VARIANTS

Devices with adjustable hysteresis

Side mounting
[MKA-22□-□]

The hysteresis can be adjusted between the maximum and minimum values of the range by changing the position of the pins.

Top mounting
[MKA-23□-□]

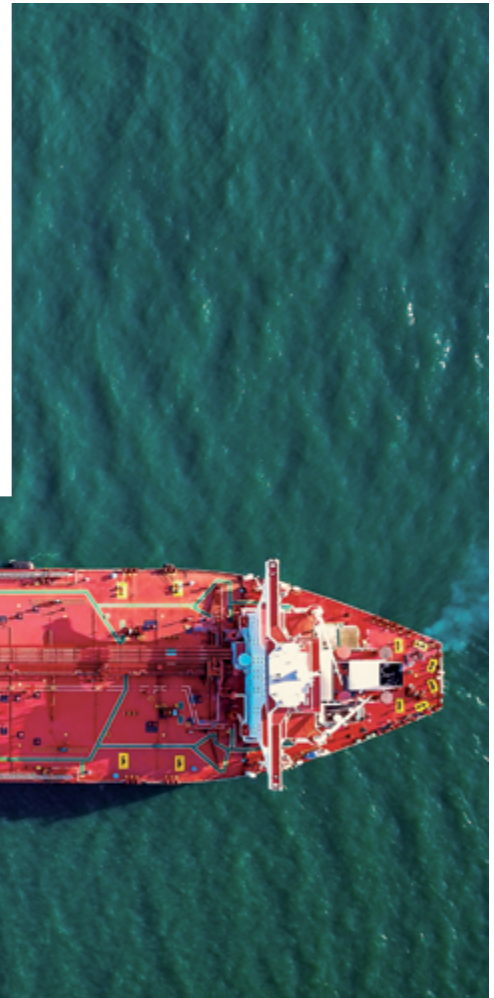
The hysteresis can be adjusted by positioning the rings on the rod. By positioning the counterweight, the different rod lengths can be compensated.

L_{min} = rod length + 70 mm (+2.75"). L_{sh} = high switching point.
 L_{sl} = low switching point

Switching points (mm [inch]) for models with adjustable hysteresis, and side mounting [MK□-22□]

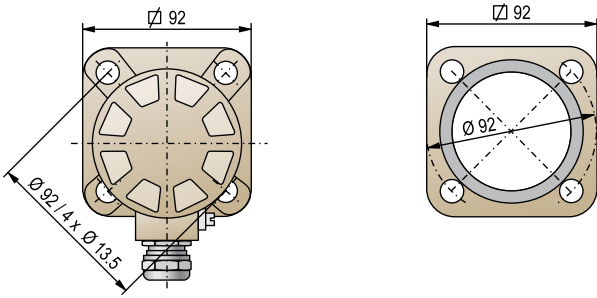
| | | | | |
|---------------------------------|----------------|-----------------|-----------------|-----------------|
| L_k = arm length | 0 | 100 [3.93"] | 200 [7.87"] | 300 [11.8"] |
| L = insertion length | 254 [10"] | 373 [14.68"] | 473 [18.62"] | 573 [22.56"] |
| X_1 = minimal switching point | 28 [1.1"] | 55 [2.16"] | 78 [3.07"] | 100 [3.93"] |
| X_2 = minimal switching point | 28 [1.1"] | 55 [2.16"] | 78 [3.07"] | 100 [3.93"] |
| Y_1 = maximal switching point | 100 [3.93"] | 193 [7.6"] | 270 [10.63"] | 350 [13.78"] |
| Y_2 = maximal switching point | 100 [3.93"] | 193 [7.6"] | 270 [10.63"] | 350 [13.78"] |

Note: values for water @ +20 °C (+68 °F)



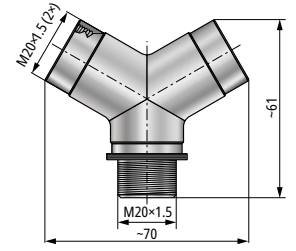
ACCESSORIES

Mounting points on the housing



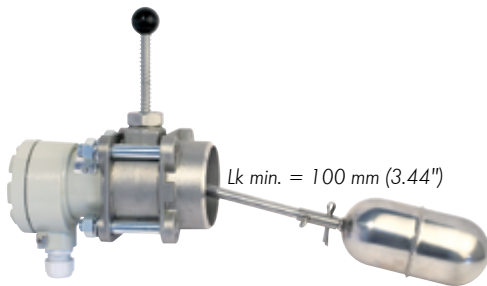
Gland adapter

This Y-adapter is designed for multiple cable entries and has an M20×1.5 connector size for non-Ex devices.

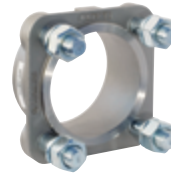
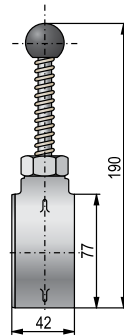


Tester

MMK tester device can be mounted between the housing and the counter flange. The tester is used to check the correct operation of switch without dismantling or true level change.



MKA-210-□ + MMK-1□0 (tester)
+ MFF-1□1 (counter flange)



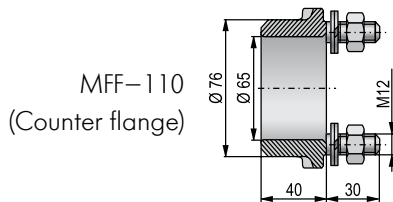
MFF-110
(counter flange)



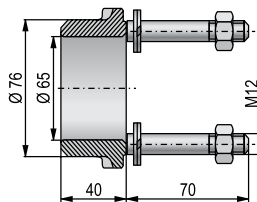
MFF-111 (counter flange)
+ MMK-120 (tester)

Counter flange

The counter flange is to be welded to the tank. Screws are connected to the housing.



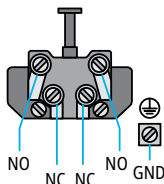
MFF-110
(Counter flange)



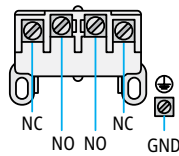
MFF-111
(Counter flange for tester)

WIRING

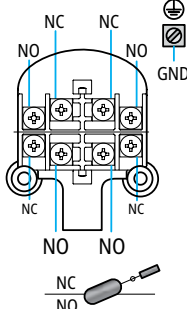
Standard units 1-switch version



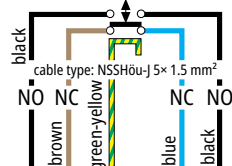
Ex version



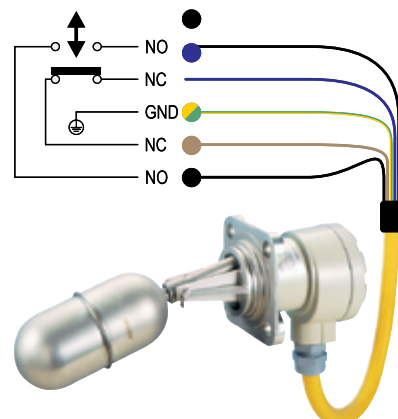
2-switch version



Cables for submersible versions



Submersible variant – cable assignment



ORDER CODES (NOT ALL COMBINATIONS AVAILABLE)

NIVOMAG – Magnetic Coupling Level Switches

NIVOMAG MK-1 (1)

| Type | Code |
|---|------|
| Standard | A |
| With rubber protective sleeve | G |
| With silicone protective sleeve | S |
| Underwater (IP68) | U |
| Underwater (IP68) + rubber protective sleeve | V |
| Underwater (IP68) + silicon protective sleeve | Z |

| Process connection | Code |
|--|------------------|
| Ø 92 × 92, PN square flange | 0 |
| 2" BSP | B ⁽²⁾ |
| 2" NPT | N ⁽²⁾ |
| DIN DN80, PN40 / 25 / 16 / 10 (carbon steel) | 1 ⁽²⁾ |
| DIN DN100, PN40 / 25 (carbon steel) | 2 ⁽²⁾ |
| DIN DN80, PN40 / 25 / 16 / 10 (1.4571 stainless steel) | 5 ⁽²⁾ |
| DIN DN100, PN40 / 25 (1.4571 stainless steel) | 6 ⁽²⁾ |

| Code | Arm length | | Code |
|------------------|------------|------------------------------|------|
| | MK-21, 22 | MK-23 | |
| Standard variant | 0 | 0 mm | 1 |
| | 1 | 100 mm | 2 |
| | 2 | 200 mm | 3 |
| | 3 | 300 mm | 5 |
| Ex variant | 4 | "Z" / "L" arm ⁽³⁾ | 6 |
| | 9 | 0 mm | 7 |
| | 5 | 100 mm | |
| | 6 | 200 mm | |
| | 7 | 300 mm | |
| | 8 | "Z" / "L" arm ⁽³⁾ | |

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

(1) Ex versions are marked "Ex" right after the type designation on the label.
 (2) Not available with protection sleeve.
 (3) Switching point must be specified in text of the order.
 (4) Ex version under licence.

ACCESSORIES

Counter flange

MFF-1

| Material | Code | Version | Code |
|--------------------------|------|-------------------------------|------|
| Steel (1.7218) | 1 | Standard | 0 |
| Stainless steel (1.4409) | 2 | For units with MMK-1□0 tester | 1 |

Tester

MMK-1□0

| Material | Code |
|--------------------------|------|
| Steel (1.7218) | 1 |
| Stainless steel (1.4409) | 2 |

Gland adapter

MAY-122-

| Type | Code |
|----------------|------|
| Without gland | 0 |
| Plastic glands | 1 |
| Metal glands | 2 |

- MKA-210-0M-200-00 Ø64 mm stainless steel (1.4404) ball float (for min. 0.7...0.8 kg/dm³ liquids)
- MKA-218-0M-000-02 Ø52 mm stainless steel (1.4404) ball float (for min. 0.7...0.85 kg/dm³ liquids)
- MKA-230-0M-100-00 Ø124 mm stainless steel (1.4404) ball float (for min. 0.7 kg/dm³ liquids)
- MKA-210-0M-900-00 Ø50 mm titanium float (for min. 0.4 kg/dm³ liquids)
- MKA-140-0M-000-01 Oil resistant rubber sleeve
- MKA-150-0M-000-01 Silicon protection sleeve
- 4guo74x2epdmy EPDM O-ring (cover seal)
- 4gu2x76klinge REINZ AFM34 flat gasket for 92×92 connection
- 4gu2colklinge REINZ AFM34 flat gasket for 2" connection
- MKA-110-1M-000-01 100 mm arm extension
- MKA-110-2M-000-01 200 mm arm extension
- MKA-110-3M-000-01 300 mm arm extension
- 4cesa2x10kaa4 Split pin, 2×10 mm
- 4cesa5x25kaa4 Split pin, 5×25 mm
- MKA-110-1M-000-02 Tubular sleeve
- MKA-120-0M-000-02 Hysteresis adjusting piece
- MKA-120-0M-000-04 Tilting fork
- MKA-220-0M-000-07 Tilt pin, long
- MKA-120-0M-000-03 Adjuster pin
- MKA-210-9M-100-00 Microswitch Ex
- 4we83140nancy Microswitch non-Ex

NIVOMAG
 – Configuration &
 Request for Quote

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