

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

1. APPLICATION

The NIVOMAG MK-200 series magnetic float level switches are used for level point detection of liquids in all type of vessels.

Operation without external power, side or top mounting, wide temperature ranges, various process connections, stainless steel wetted parts and Ex versions make it applicable in the industrial chemistry, pharmacy, petrol industry etc. Permanent magnet operated by the movement of a float will activate an other magnet inside the switching enclosure. This second magnet operates a special switch. So the movement of float is transferred to the potted switch through separated magnetic coupling ensuring the requirements of the wet process and Ex application. Special balancing construction and various accessories (see figures of DIMENSIONS) give wide range of possibility of the installation.

2. TECHNICAL DATA

2.1 GENERAL SPECIFICATION

| TYPE | HORIZONTAL FLOAT | | | | VERTICAL FLOAT |
|--------------------------|--|--------------|--------------|----------------|----------------|
| | MK□-21□-□ | MK□-22□-□ | MKG-2□□-□ | MKS-2□□-□ | MK□-23□-□ |
| Nominal Pressure max. | 2.5 MPa (MKU: 0.2 MPa / 2.5 MPa) | | | | 1.6 MPa |
| Liquid temperature | see temperature diagram | 0°C to 100°C | 0°C to 200°C | s. temp.diagr. | |
| Ambient temperature | -20 °C ... +80 °C, Ex version see table below | | | | |
| Liquid density | min 0.7 kg/dm ³ ... 0.85 kg/dm ³ see table | | | | |
| Switch differential | Fixed | Adjustable | Fixed | Fixed | Adjustable |
| Protrusion length | See figures below | | | | |
| Material of vetted parts | SS316Ti (MKG: rubber MKS silicon rubber) | | | | |
| Housing material | Paint coated aluminium | | | | |
| Switch action | 1 micro-switch with 1 closing and 1 opening contact (NO and NC) | | | | |
| Switch rating | 250 V AC12 10 A; 220 V DC13 0.6 A – Ex:250V AC12 2.5A; 220V DC13 0.3 A | | | | |
| Electrical connection | 1 x Pg 16 or M20 x 1.5 for cable diameter 6 to 15 mm* with 5 x 2.5 mm ² wire cross section (MKU: integrated cable) | | | | |
| Mechanical protection | IP 65 (MKU: IP 68 max 20 m water depth) | | | | |
| Electrical protection | Class I. | | | | |
| Ex protection mark | Ⓔ II 1/2 G Ex d e mb IIC T6 ... T2 Ga/Gb | | | | |
| Weight (approx) | 2.5 kg | | | | |

* depending on type of cable gland

2.2 SPECIAL DATA

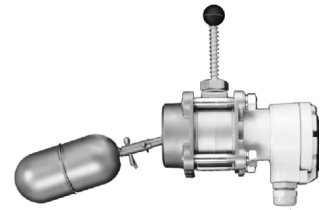
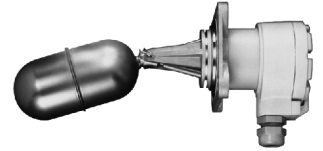
| CLASS | TEMPERATURE | | | | |
|---------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| | T6 | T5 | T4 | T3 | T2 |
| Liquid temperature | +80 °C | +95 °C | +130 °C | +200 °C | +250 °C |
| Ambient temperature | -20 °C ... +60 °C | -20 °C ... +70 °C | -20 °C ... +80 °C | -20 °C ... +80 °C | -20 °C ... +80 °C |

NIVELCO

NIVOMAG

MAGNETING FLOATING
LEVEL SWITCHES

USER'S MANUAL



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 Phone: (36-1) 889-0100 ■ Fax: (36-1) 889-0200
 E-mail: sales@nivelco.com ■ www.nivelco.com

2.3. ACCESSORIES

– User's Manual, Warranty Card, Declaration of conformity

2.4 ORDER CODE

NIVOMAG M K □ - 2 / 3 □ - □ Ex

| VERSION | CODE |
|--------------------------------|------|
| Normal | A |
| Normal + rubber cup | G |
| Normal + silicon rubber cup | S |
| Under water | U |
| Under water + rubber cup | V |
| Under water + silicon rub. cup | Z |

| FUNCTION | CODE |
|--------------------------------------|------|
| Constant hysteresis | 1 |
| Adjustable hysteresis | 2 |
| Adjustable hysteresis vertical float | 3 |

| PROCESS CONNECTION | CODE |
|------------------------|------|
| 92 x 92 flange | 0 |
| DN 80 PN 25 C steel | 1 |
| DN 100 PN 25 C steel | 2 |
| DN 125 PN 25 C steel | 3 |
| DN 150 PN 25 C steel | 4 |
| DN 80 PN 25 SS 316 Ti | 5 |
| DN 100 PN 25 SS 316 Ti | 6 |
| DN 125 PN 25 SS 316 Ti | 7 |
| DN 150 PN 25 SS 316 Ti | 8 |
| 2" BSP | B |
| 2" NPT | N |

| ARM. LENGTH | CODE | |
|-------------|--------|------------|
| | Normal | Ex version |
| 0 mm | 0 | 9 |
| 100 mm | 1 | 5 |
| 200 mm | 2 | 6 |
| 300 mm | 3 | 7 |
| Z or L arm | 4 | 8 |

COUNTER FLANGE

NIVOMAG M F F - 1 □ - 0

| MATERIAL | CODE |
|-----------|------|
| C steel | 1 |
| SS 316 Ti | 2 |

| PROC. CONNECT. | CODE |
|--|------|
| 92 x 92 PN 25 | 0 |
| 92 x 92 PN 25 for tester | 1 |
| 92 x 92 PN 25 Counter fl. spec. | 2 |
| 92 x 92 PN 25 Counter flange spec.for tester | 3 |

TESTER

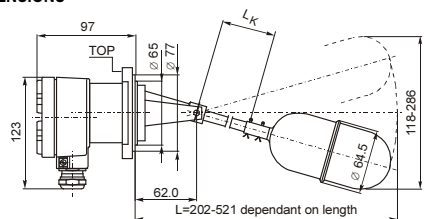
NIVOMAG M M K - 1 □ 0 - 0

| MATERIAL | CODE |
|-----------|------|
| C steel | 1 |
| SS 316 Ti | 2 |

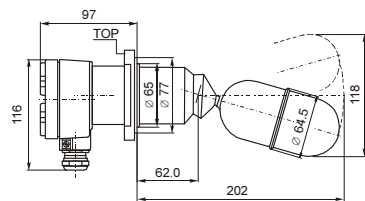
MK-23

| ARM. LENGTH | CODE | |
|-------------|------|----------|
| | Norm | Ex vers. |
| 1000 mm | 1 | 5 |
| 2000 mm | 2 | 6 |
| 3000 mm | 3 | 7 |

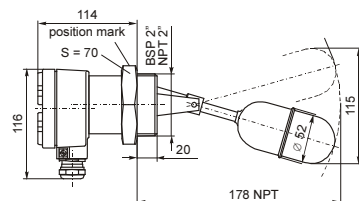
2.5 DIMENSIONS



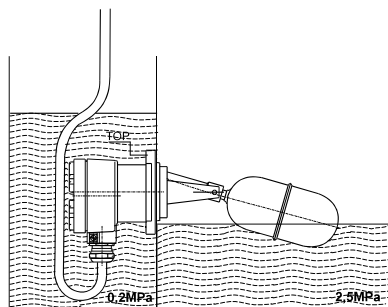
MKA-210-0
Fixed switch differential according to the arm length



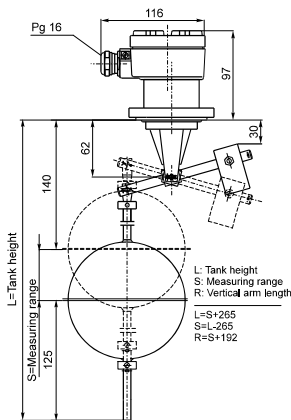
MKG 210-□, MKS 210-□
Fixed switch differential, with protection sleeve only non Ex versions



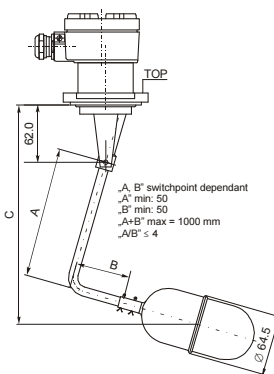
MKA-21B
Fixed switch differential, with 2" process connection



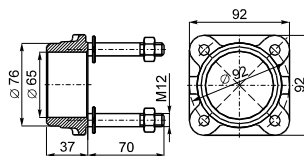
MKU-210
Fixed switch differential, for underwater application



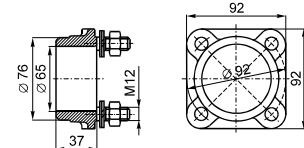
MKA-230
Adjustable switch differential, vertical mounting



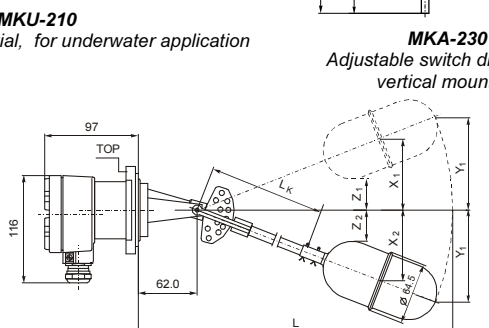
MKA-210-4
Adjustable switch differential, vertical mounting



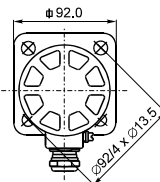
MFF-111, 121 Counter flange for MMK tester



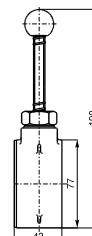
MFF-110, 120 Square counter flange



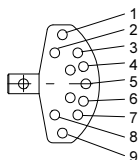
MKA-220 Adjustable switch differential, vertical mounting



Rectangular connection flange



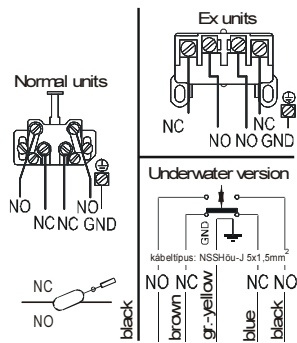
MMK-110, 120 Tester



3. INSTALLATION

Installation according to the requested application may carry out on the basis of drawings and tables. The balance of the arms with differential length is provided by the counter weight shifted to the proper point at the vertical type MKA-230. Hysteresis switching points will be adjusted on the vertical stick with fixing rings. Function of the switch may be tested without dismantle of the instrument by the installed MMK tester. Minimal length of the arm is not shorter than 100 mm in that case.

4. ELECTRICAL CONNECTION



5. SPECIAL CONDITIONS FOR SAFE USE

- Ambient and medium temperature see 2.2.
- For installation of version NIVOMAG MKU-2□□□ Ex (with integrated cable) a suitable junction box shall be used.
- The NIVOMAG MK float switch has to be connected to local EP circuit.

| | | MKA-220 ⁻⁰ -9 Ex L _k =0 L=268 | | | | | MKA-220 ⁻¹ -5 Ex L _k =100 L=350 | | | | | MKA-220 ⁻² -6 Ex L _k =200 L=450 | | | | | MKA-220 ⁻³ -7 Ex L _k =300 L=550 | | | | |
|------|----------------|--|--------|----------------------------------|----------------------------------|----------------|--|--------|----------------------------------|----------------------------------|----------------|--|--------|----------------------------------|----------------------------------|----------------|--|--------|----------------------------------|----------------------------------|--|
| Pos. | X ₁ | X ₂ | Diff S | Y ₁ (Z ₁) | Y ₂ (Z ₂) | X ₁ | X ₂ | Diff S | Y ₁ (Z ₂) | Y ₂ (Z ₂) | X ₁ | X ₂ | Diff S | Y ₁ (Z ₃) | Y ₂ (Z ₂) | X ₁ | X ₂ | Diff S | Y ₁ (Z ₄) | Y ₂ (Z ₂) | |
| 1-4 | +87 | +20 | 67 | 131 | (13) | +129 | +30 | 99 | 194 | (19) | +171 | +40 | 131 | 256 | (25) | 213 | +50 | 163 | 319 | (51) | |
| 1-5 | +87 | +12 | 75 | 131 | 44 | +129 | +18 | 111 | 194 | 87 | +171 | +24 | 147 | 256 | 36 | 213 | +30 | 183 | 319 | 45 | |
| 1-6 | +87 | -20 | 97 | 131 | 53 | +129 | -30 | 159 | 194 | 44 | +171 | -40 | 201 | 256 | 58 | 213 | -50 | 263 | 319 | 72 | |
| 1-7 | +87 | -42 | 129 | 131 | 84 | +129 | -62 | 191 | 194 | 92 | +171 | -82 | 253 | 256 | 121 | 213 | -102 | 315 | 319 | 151 | |
| 1-8 | +87 | -65 | 152 | 131 | 123 | +129 | -96 | 225 | 194 | 142 | +171 | -127 | 298 | 256 | 187 | 213 | -158 | 371 | 319 | 233 | |
| 1-9 | +87 | -89 | 176 | 131 | 131 | +129 | -132 | 261 | 194 | 194 | +171 | -175 | 316 | 256 | 256 | 213 | -218 | 431 | 319 | 319 | |
| 2-5 | +80 | +12 | 68 | 123 | 44 | +118 | +18 | 100 | 182 | 27 | +156 | +24 | 132 | 240 | 36 | 194 | +30 | 164 | 299 | 45 | |
| 2-6 | +80 | -20 | 100 | 123 | 53 | +118 | -30 | 148 | 182 | 44 | +156 | -40 | 196 | 240 | 58 | 194 | -50 | 244 | 299 | 72 | |
| 2-7 | +80 | -42 | 122 | 123 | 84 | +118 | -62 | 180 | 182 | 92 | +156 | -82 | 238 | 240 | 121 | 194 | -102 | 296 | 299 | 151 | |
| 2-8 | +80 | -65 | 145 | 123 | 123 | +118 | -96 | 214 | 182 | 142 | +156 | +127 | 283 | 240 | 187 | 194 | -158 | 352 | 299 | 233 | |
| 2-9 | +80 | -89 | 169 | 123 | 131 | +118 | -132 | 250 | 182 | 194 | +156 | -175 | 339 | 240 | 256 | 194 | -218 | 402 | 299 | 319 | |
| 3-5 | +47 | +12 | 35 | 84 | 44 | +70 | +18 | 52 | 104 | 27 | +93 | +24 | 69 | 137 | 36 | +116 | +30 | 86 | 171 | 45 | |
| 3-6 | +47 | -20 | 67 | 84 | 53 | +70 | -30 | 100 | 104 | 44 | +93 | -40 | 133 | 137 | 58 | +116 | -50 | 66 | 171 | 72 | |
| 3-7 | +47 | -42 | 89 | 84 | 84 | +70 | -62 | 132 | 104 | 92 | +93 | -82 | 175 | 137 | 121 | +116 | -102 | 218 | 171 | 151 | |
| 3-8 | +47 | -65 | 112 | 84 | 123 | +70 | -96 | 166 | 104 | 142 | +93 | -127 | 220 | 137 | 187 | +116 | -158 | 274 | 171 | 233 | |
| 3-9 | +47 | -83 | 136 | 84 | 131 | +70 | -132 | 201 | 104 | 194 | +93 | -175 | 268 | 137 | 256 | +116 | -218 | 334 | 171 | 319 | |
| 4-6 | +20 | -20 | 40 | 53 | 53 | +30 | -30 | 60 | 78 | 44 | +40 | -40 | 80 | 103 | 58 | +50 | -50 | 100 | 128 | 72 | |
| 4-7 | +20 | -42 | 62 | 53 | 84 | +30 | -62 | 92 | 78 | 92 | +40 | -82 | 122 | 103 | 121 | +50 | -102 | 152 | 128 | 151 | |
| 4-8 | +20 | -65 | 85 | 53 | 123 | +30 | -96 | 126 | 78 | 142 | +40 | -127 | 167 | 103 | 187 | +50 | -158 | 208 | 128 | 233 | |
| 4-9 | +20 | -89 | 109 | 53 | 131 | +30 | -132 | 162 | 78 | 194 | +40 | -175 | 215 | 103 | 256 | +50 | -218 | 268 | 128 | 319 | |
| 5-7 | -12 | -42 | 30 | 44 | 84 | -18 | -62 | 44 | 65 | 92 | -24 | -82 | 106 | 86 | 121 | -30 | -102 | 72 | 107 | 151 | |
| 5-8 | -12 | -65 | 53 | 44 | 123 | -18 | -96 | 78 | 65 | 142 | -24 | -127 | 151 | 86 | 187 | -30 | -158 | 128 | 107 | 233 | |
| 5-9 | -12 | -89 | 72 | 44 | 131 | -18 | -132 | 115 | 65 | 194 | -24 | -175 | 189 | 86 | 256 | -30 | -218 | 188 | 107 | 319 | |
| 6-9 | -20 | -89 | 69 | 13 | 131 | -30 | -132 | 102 | 13 | 194 | -40 | -175 | 215 | 23 | 256 | -50 | -218 | 168 | 31 | 319 | |

- The NIVOMAG MK float switch has to be protected against overload with a "T" marked 2.5 A circuit breaker
- For T_{amb} > 60 °C a suitable cable shall be used.

7. STORAGE CONDITIONS

Environmental temperature range: 25°C to +80°C Relative humidity: max. 98 %

8. WARRANTY

NIVELCO provides warranty of 3 (three) years in compliance with details described in the Warranty Card.

mka2100a0600h_10
April, 2016

Technical specification may be changed without notice.