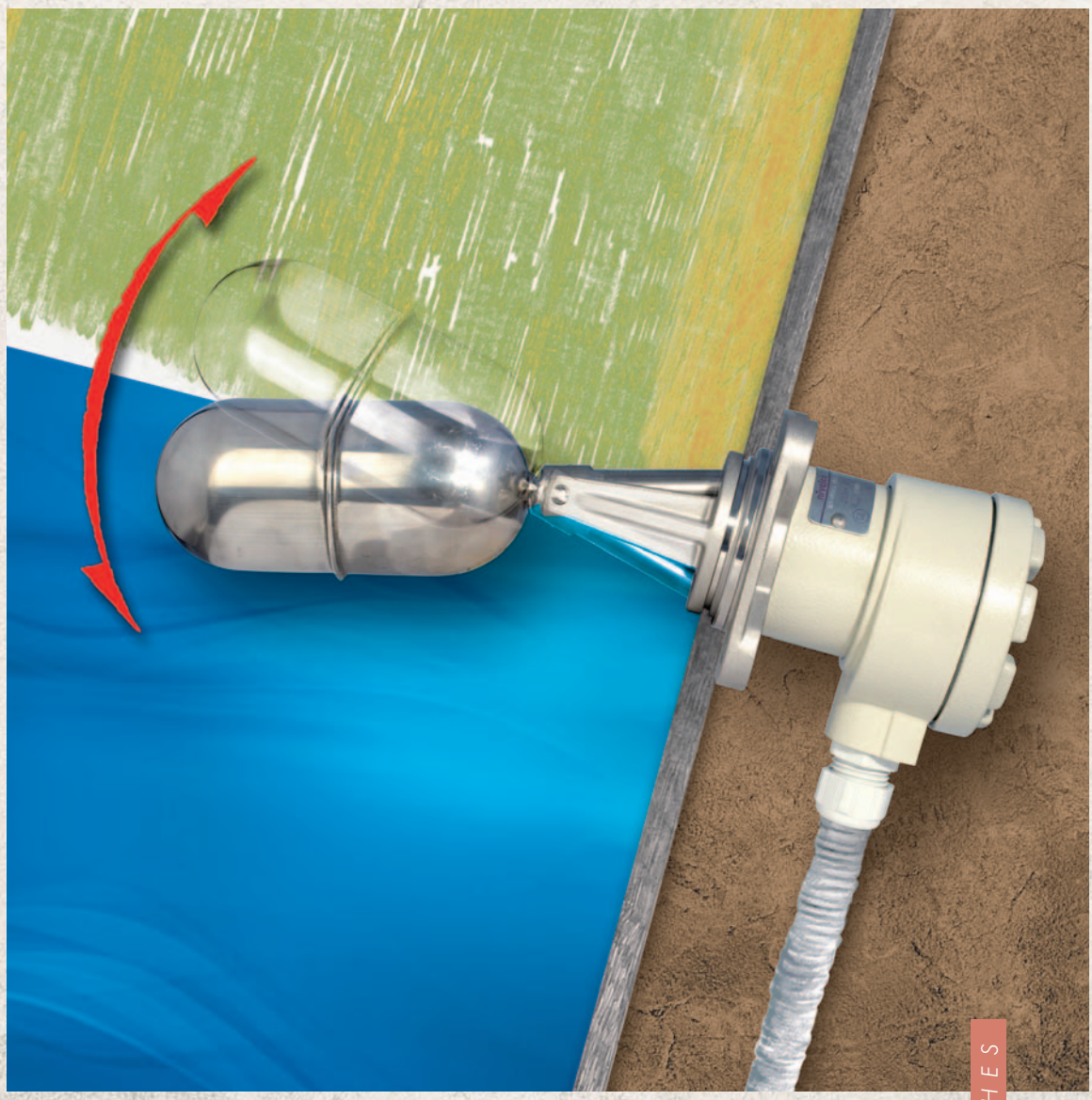
NIVOMAG

MAGNETIC LEVEL SWITCHES



OUR PROFESSION IS YOUR LEVEL

LEVEL SWITCHES

NIVOMAG MAGNETIC LEVEL SWITCHES

FEATURES

- *Magnetic coupling between the switch and the float*
- *Operation w/o external power supply*
- *Side or top mounted versions*
- *Underwater housing*
- *Fixed or variable hysteresis*
- *Max. 250°C medium temperature*
- *Explosion proof version*
- *SIL1*

APPLICATIONS

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

GENERAL DESCRIPTION

NIVOMAG MK-200 series magnetic float level switches are used for point level detection and level control of liquids in all types of vessels..
Measurement principal: a non contact coupling system is realised by the permanent magnet of the float placed in the tank that can activate the microswitch situated in the housing mounted on the outside.
The great variety of both the top and side mounted versions makes it easy to install the switch in any tank at any location. For the simplest level switching you can select models with fixed hysteresis, while for level control application we offer Nivomag switches with adjustable hysteresis. Models with rubber or silicon sleeves can be applied for contaminated liquids. You can fit the Nivomag switch with an **MMK** type tester, to check the switching function even when the liquid levels aren't changing.

MODEL SELECTION

To assist in the selection of the correct model the following tables and diagrams are provided. When selecting a model due consideration must be given to liquid density, mounting position and process connection and to determine if there is a need for adjustable or fixed hysteresis or a rubber sleeve.

Minimum liquid density (kg/dm³)				
Arm length (mm) / Float Ø (mm)	0, 100	200	300	1000-3000
52	0,7	0,8	0,85	–
64	0,7	0,8	0,8	–
124	–	–	–	0,7

Features	Type		
	MK-21	MK-22	MK-23
Fixed hysteresis	■		
Adjustable hysteresis		■	■
Straight arm	■	■	■
L or Z arm	■		
Side mounted	■	■	
Top mounted	■		■
Submersible	■	■	■
Rubber protection sleeve	■		
Flanged proc. connection	■	■	■ *
Threaded proc. connection	■		
Ex version	■	■	■
Tester	■	■	

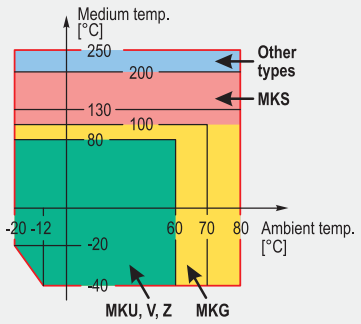
** Special flange required*

SUPPLEMENTARY DATA

Temperature specification for Ex versions

Temperature classes					
Class	T6	T5	T4	T3	T2
Max. medium 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

Temperature diagram:



TECHNICAL DATA

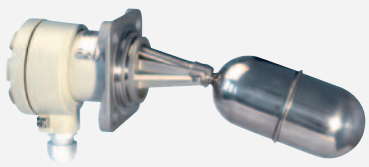
General data		Cylindrical float (side and top mounting)				Ball float (top mounting)
		MKA-21 MKU-21	MKA-22	MKG-21 MKV-21	MKS-21 MKZ-21	MKA-23
Nominal pressure		2,5 MPa (25 bar) [**MKU:** 0,2/2,5 MPa (2 bar/25 bar)]				1,6 MPa (16 bar)
Medium temperature		see temperature diagram				
Ambient temperature		–20°C…+80°C, , Ex version: see temperature specification for Ex version table				
Liquid density		min. 0,7–0,85 kg/dm^3, see table				
Switch hysteresis		Fixed	Adjustable	Fixed	Fixed	Adjustable
Protrusion length		see arm length table				
Material of wetted parts		Stainless steel (1.4571, 1.3960, 1,4404), and **MKG:** rubber, **MKS:** silicone				
Housing material		Paint coated aluminium				
Switch action		1 micro-switch with 1 closing and 1 opening contact (NO and NC) *				
Switch rating	Standard	250 V AC12 10 A; 220 V DC13 0,6 A				
	Ex version	250 V AC12 2,5 A; 220 V DC13 0,3 A				
Electrical connection		M20x1,5 cable gland, terminal (**MKU, MKV, MKZ** integrated cable NSSHöu-J 5x1,5 mm^2, Ø15 mm) **				
Ingress protection		IP65 (**MKU, MKV, MKZ** IP68 up to 20 m underwater)				
Electrical protection		Class I.				
Safety integrity level		SIL1				
Ex marking		ATEX ⟨Ex⟩ II2 G EEx dme IIC T2…T6				
Mass		≈ 1,8 – 3,5 kg				

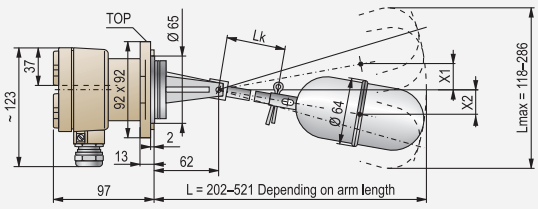
** NO and NC terminals should be connected to equipotential circuits*
*** Cable length should be specified when ordered*

MODELS

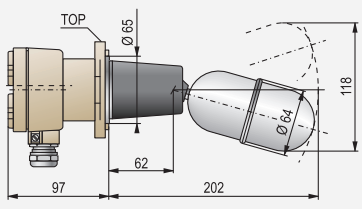
Models with fixed hysteresis

Side mounting





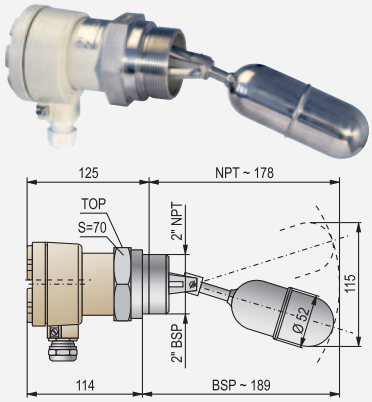
With rubber sleeve



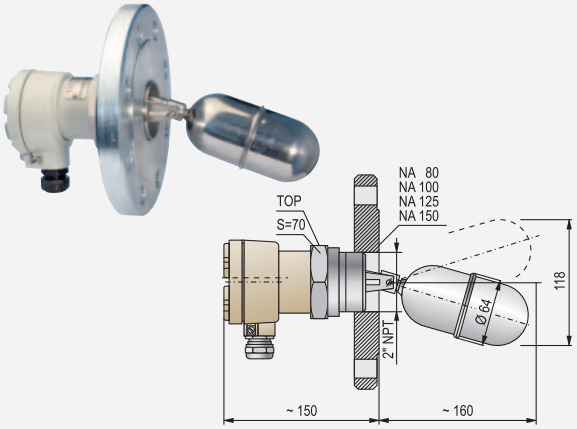
MODELS

Models with fixed hysteresis

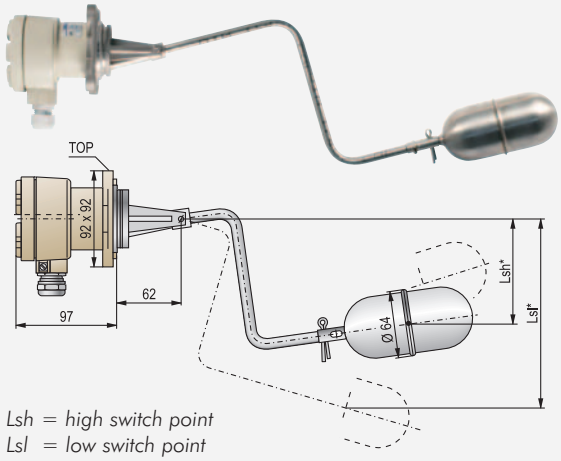
Threaded process connection



Flanged process connection

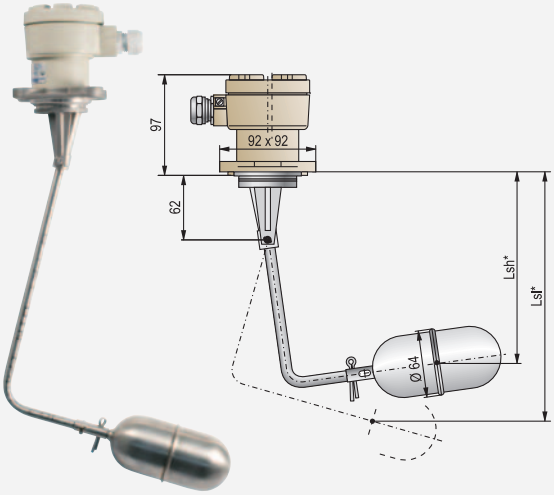


Side mounting, „Z" arm



Lsh = high switch point
Lsl = low switch point
** only one of the values can be specifie*

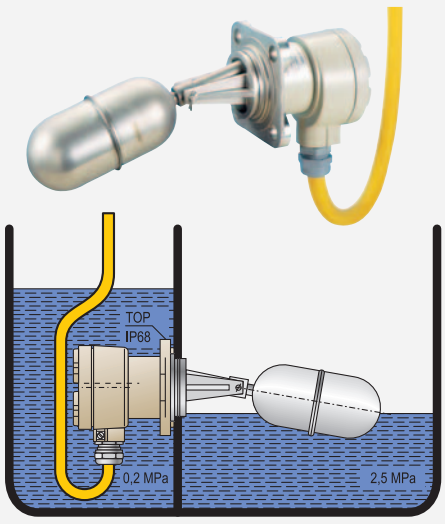
Top mounting, „L" arm



Type: MK-21	Switching points for models with fixed hysteresis and straight arm			
Lk = arm length	0	100	200	300
L = protrusion length	202	321	421	521
Lmax = maximum displacement	118	180	234	286
X1 = high switch point	12	30	46	62
X2 = low switch point	12	30	46	62

Note: values for water @20°C Tolerance: ±5 mm

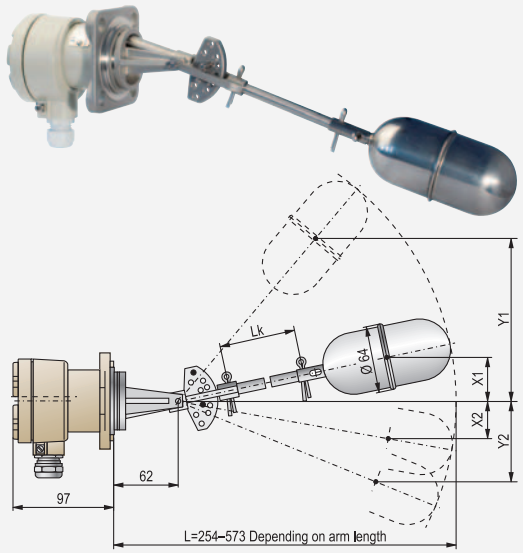
Submersible construction



MODELS

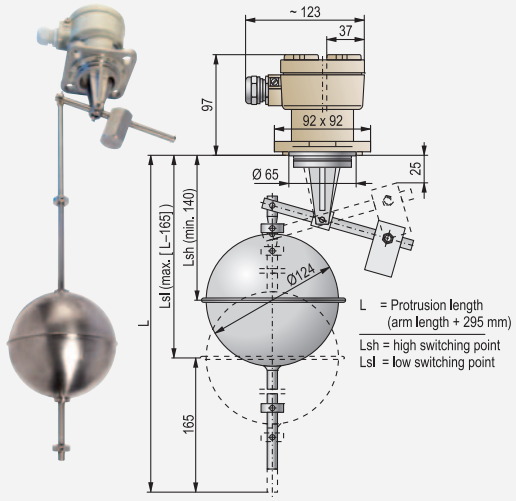
Models with fixed hysteresis

Side mounting



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

Top mounting



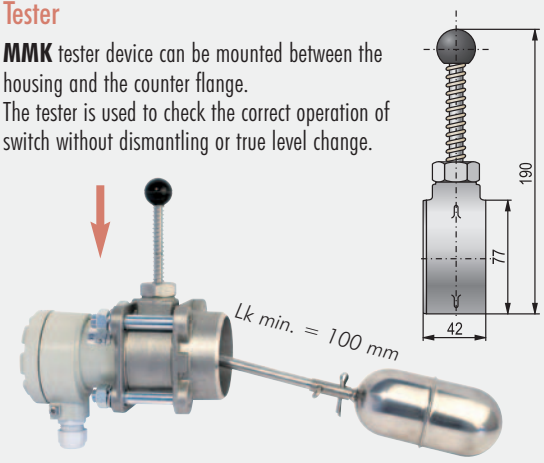
The hysteresis can be adjusted by positioning the rings on the rod. By positioning the counterweight the different rod lengths can be compensated.

Type: MK-22	Switching points for models with adjustable hysteresis, and side mounting			
Lk = arm length	0	100	200	300
L = protrusion length	254	373	473	573
X1 = minimum switching point	28	55	78	100
X2 = minimum switching point	28	55	78	100
Y1 = maximum switching point	100	193	270	350
Y2 = maximum switching point	100	193	270	350

Note: values for water @20°C Tolerance: ±5 mm

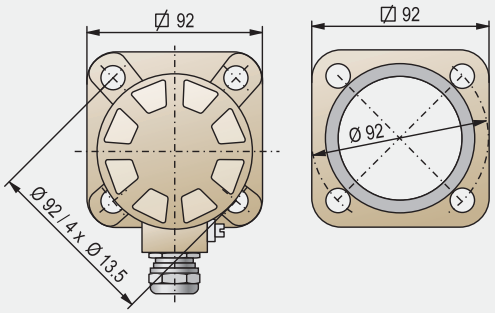
Tester

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.



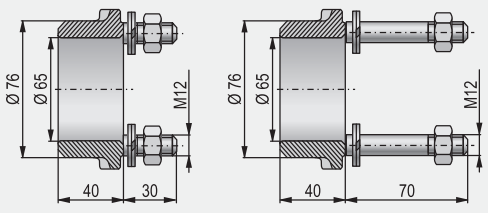
ACCESSORIES

Mounting points on the housing



Counterflange

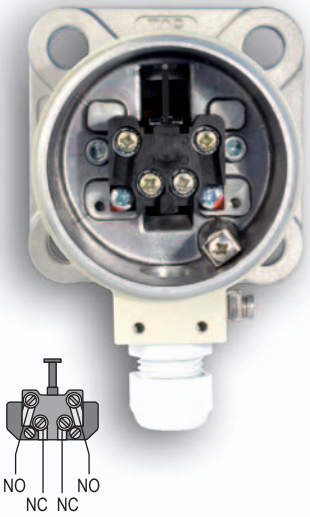
The counter flange is to be welded to the tank.
Screws are connected to the housing.



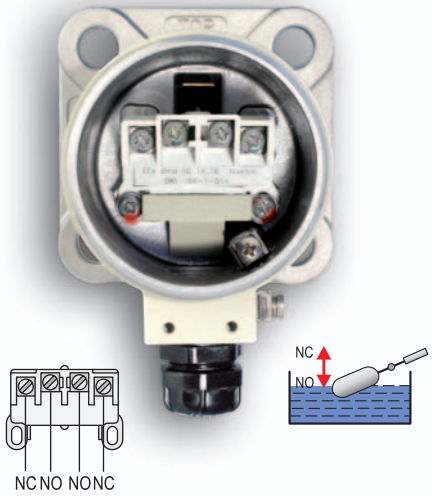
Counter flange Counter flange for the tester

WIRING

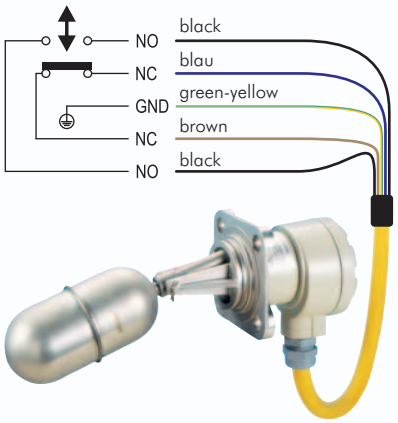
Standard version



Ex version



Submersible version Cable assignment



ORDER CODES (NOT ALL COMBINATIONS AVAILABLE)

NIVOMAG magnetic level switches

NIVOMAG MK ■ –2 ■ ■ –■ *

Type	Code
Standard	A
Standard + Rubber sleeve [2]	G
Standard + Silicon rubber sleeve [2]	S
Submersible [3]	U
Submersible + Rubber sleeve [2, 3]	V
Submersible + Silicon rubber sleeve [2, 3]	Z

Switch	Code
Fixed hysteresis	1
Adjustable hysteresis	2
Adjustable hysteresis Ball float	3

Process connection	Code
⍁ 92 flange PN 25	0
DN 80 PN 25 / mild steel	1
DN 100 PN 25 / mild steel	2
DN 125 PN 25 / mild steel	3
DN 150 PN 25 / mild steel	4
DN 80 PN 25 / 1.4571	5
DN 100 PN 25 / 1.4571	6
DN 125 PN 25 / 1.4571	7
DN 150 PN 25 / 1.4571	8
2" BSP	B
2" NPT	N

Code		Arm length MK-21, 22	Arm length MK-23	Code	
Standard version	0	0 mm	1000 mm	1	Standard version
	1	100 mm	2000 mm	2	
	2	200 mm	3000 mm	3	
	3	300 mm	1000 mm	5	Ex version
	4	Z or L arm [4]	2000 mm	6	
Ex version	9	0 mm	3000 mm	7	
	5	100 mm			
	6	200 mm			
	7	300 mm			
	8	Z or L arm [4]			

1 The order code of an Ex version should end in 'Ex'
2 Not available in Ex version
3 Cable length should be specified when ordered
4 Switching point should be specified when ordered

ACCESSORIES

Counterflange

NIVOMAG MFF–1 ■ ■

Material	Code
Mild steel	1
DIN 1.4409 St. st.	2

Process connection	Code
⍁ 92 PN 25	0
⍁ 92 PN 25 for tester	1

Tester

NIVOMAG MMK–1 ■ 0

Material	Code
Mild steel	1
DIN 1.4409 St. st.	2

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