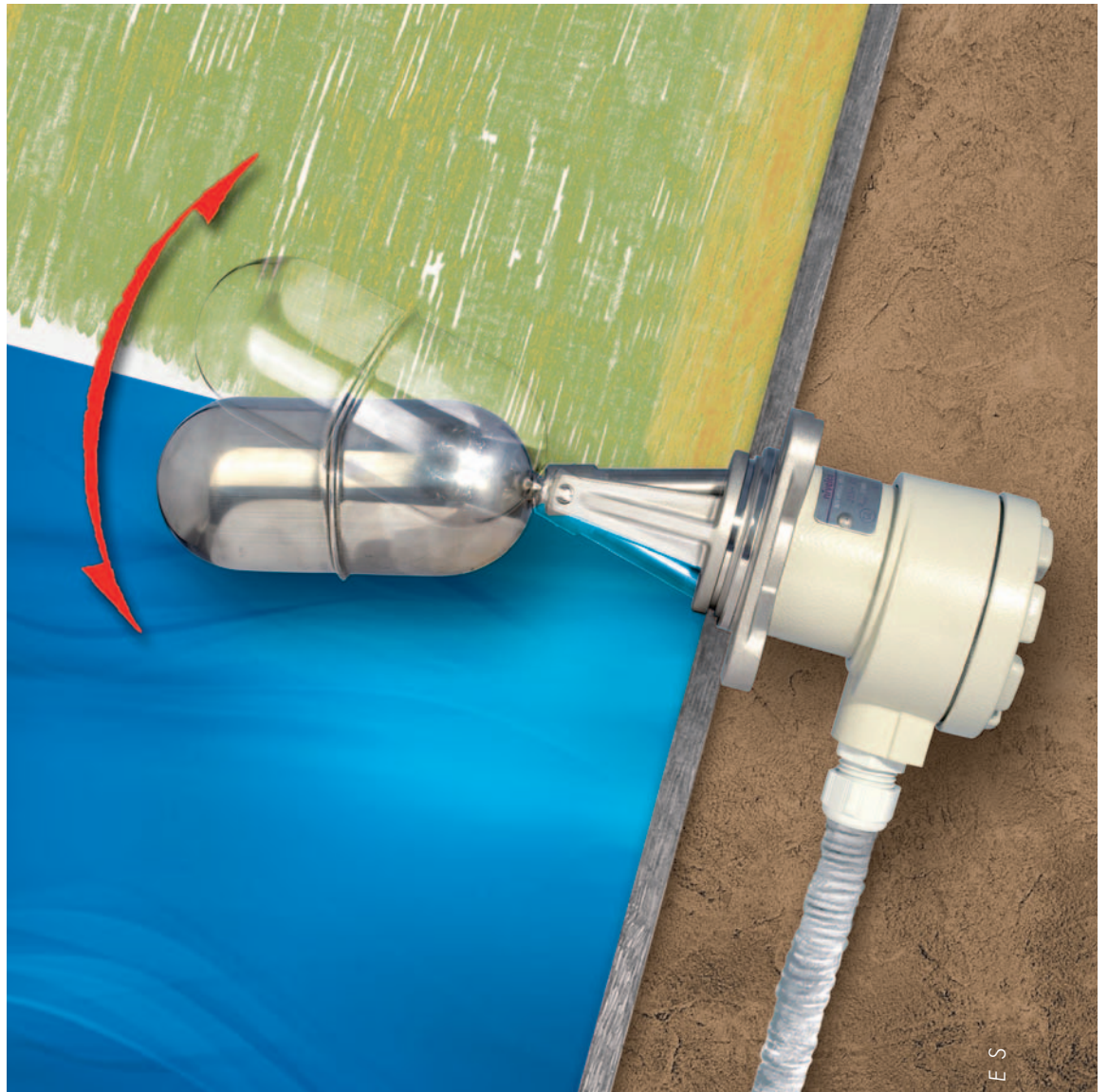


NIVOMAG

MAGNETIC LEVEL SWITCHES



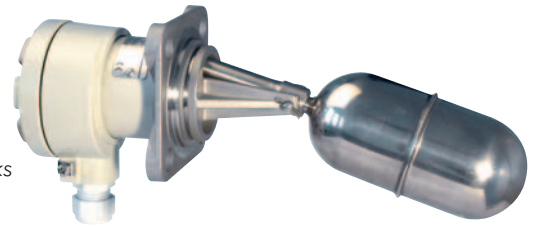
NIVOMAG MAGNETIC LEVEL SWITCHES

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/dm ³)				
Arm length (mm)	Type			
	0, 100	200	300	1000-3000
Float Ø (mm)				
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	■	■	

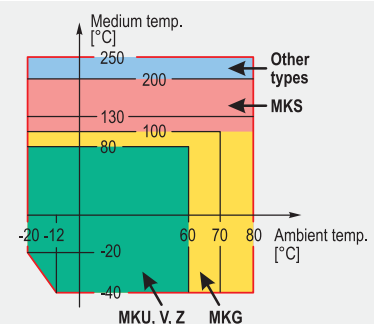
* Special flange required

SUPPLEMENTARY DATA


Temperature specification for Ex versions

Class	Temperature classes				
	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  II2 G EEx dme IIC T2...T6				
Mass	≈ 1,8 – 3,5 kg				

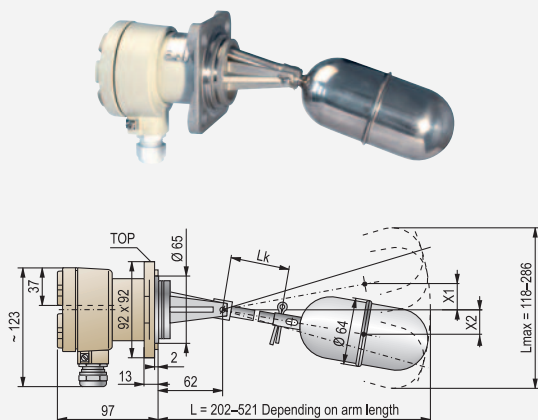
* NO and NC terminals should be connected to equipotential circuits

** Cable length should be specified when ordered

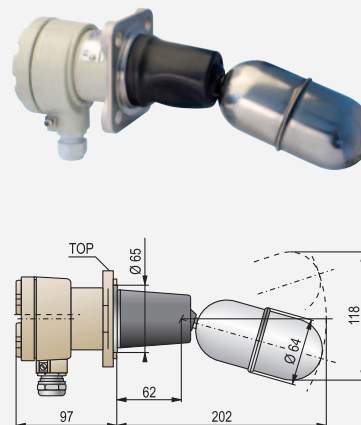
MODELS

Models with fixed hysteresis

Side mounting



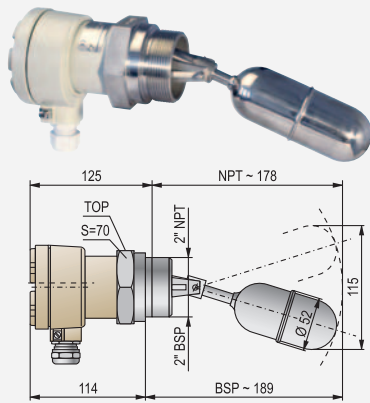
With rubber sleeve



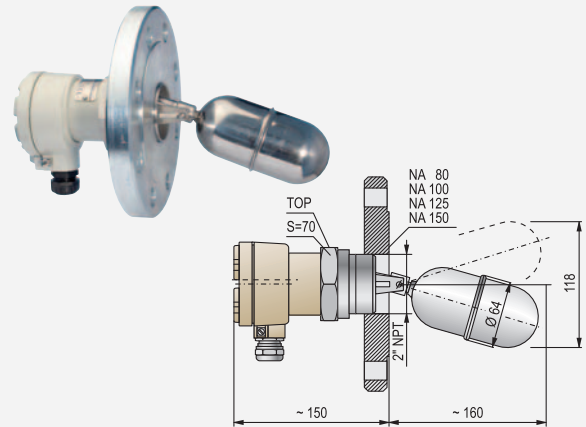
MODELS

Models with fixed hysteresis

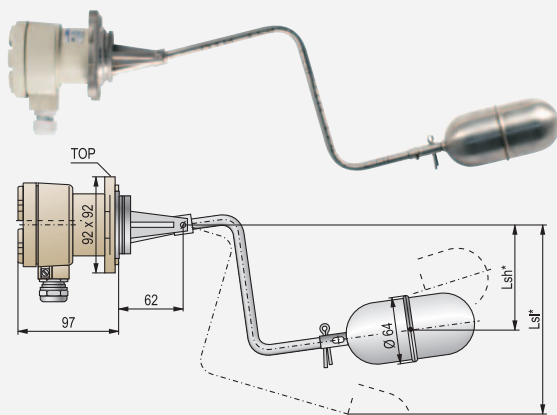
Threaded process connection



Flanged process connection



Side mounting, „Z” arm

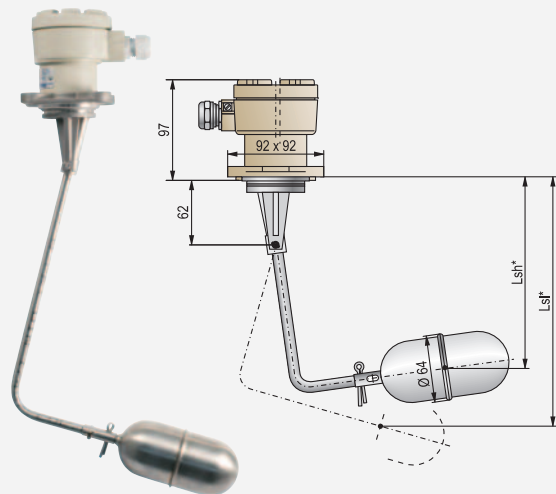


Lsh = high switch point

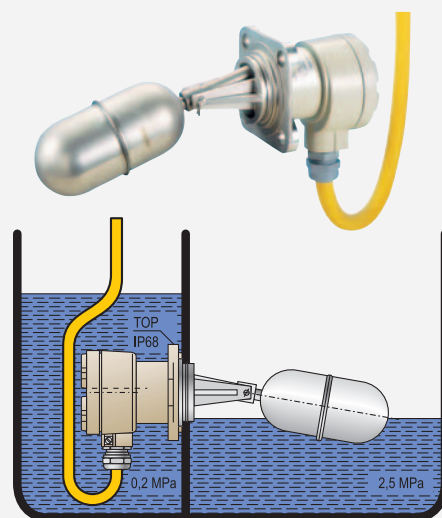
Lsl = low switch point

* only one of the values can be specific

Top mounting, „L” arm



Submersible construction



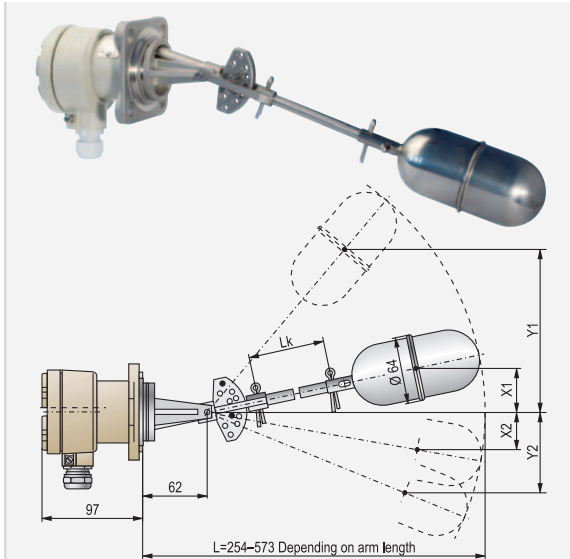
Type: MK-21	Switching points for models with fixed hysteresis and straight arm			
Lk = arm length	0	100	200	300
L = protrusion length	202	321	421	521
Lmax = maximum displacement	118	180	234	286
X1 = high switch point	12	30	46	62
X2 = low switch point	12	30	46	62

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

MODELS

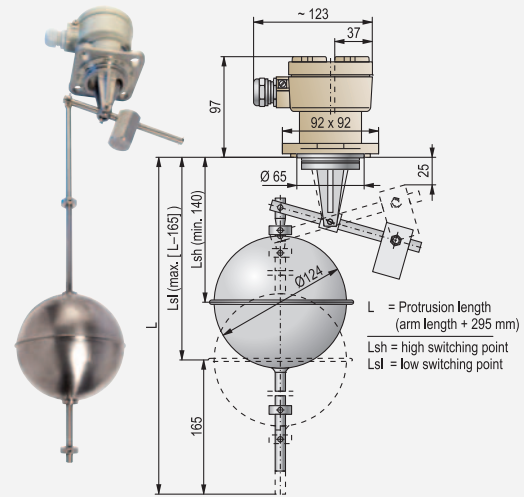
Models with fixed hysteresis

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



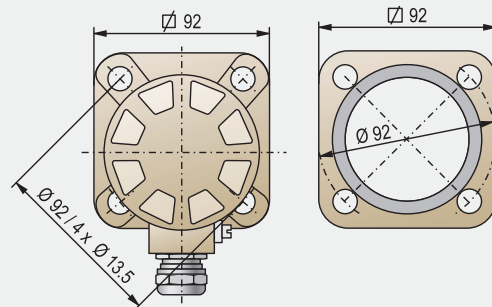
The hysteresis can be adjusted by positioning the rings on the rod. By positioning the counterweight the different rod lengths can be compensated.

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

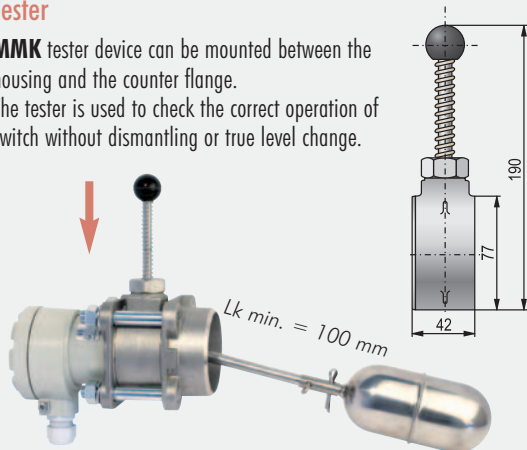
ACCESSORIES

Mounting points on the housing



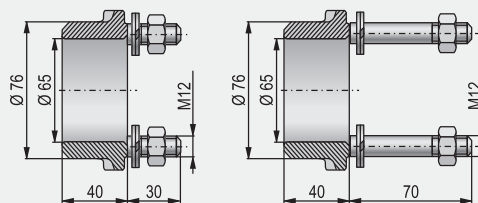
Tester

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.



Counterflange

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

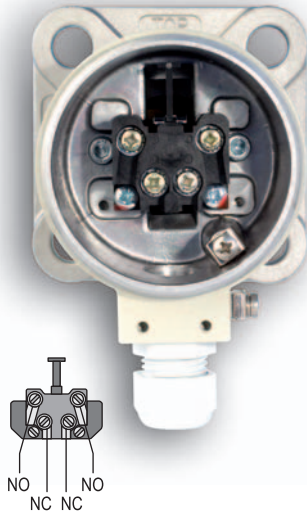


Counter flange

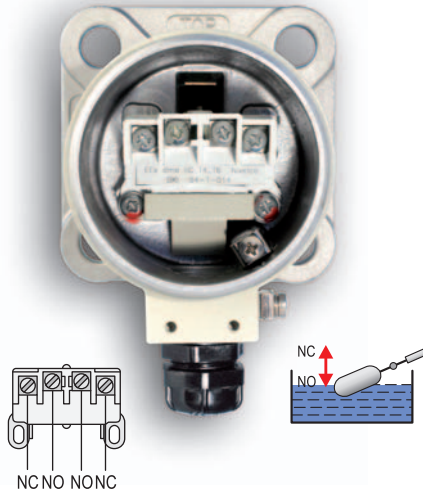
Counter flange for the tester

WIRING

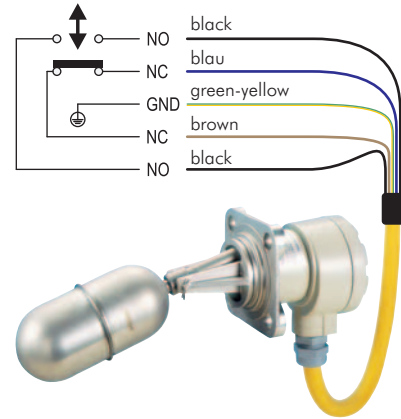
Standard version



Ex version



Submersible version
Cable assignment



ORDER CODES (NOT ALL COMBINATIONS AVAILABLE)

NIVOMAG magnetic level switches

NIVOMAG MK ■ - 2 ■ ■ - ■ *

Type	Code	Process connection	Code	Code	Arm length		Code
					MK-21, 22	MK-23	
Standard	A	∅ 92 flange PN 25	0	Standard version	0 mm	1000 mm	1
Standard + Rubber sleeve 2	G	DN 80 PN 25 / mild steel	1		100 mm	2000 mm	2
Standard + Silicon rubber sleeve 2	S	DN 100 PN 25 / mild steel	2		200 mm	3000 mm	3
Submersible 3	U	DN 125 PN 25 / mild steel	3		300 mm	1000 mm	5
Submersible + Rubber sleeve 2, 3	V	DN 80 PN 25 / 1.4571	5		Z or L arm 4	2000 mm	6
Submersible + Silicon rubber sleeve 2, 3	Z	DN 100 PN 25 / 1.4571	6		0 mm	3000 mm	7
		DN 125 PN 25 / 1.4571	7	Ex version	100 mm		
		DN 150 PN 25 / 1.4571	8		200 mm		
		2" BSP	B		300 mm		
		2" NPT	N	8	Z or L arm 4		
Switch	Code						
Fixed hysteresis	1						
Adjustable hysteresis	2						
Adjustable hysteresis Ball float	3						

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	Process connection	Code
Mild steel	1	∅ 92 PN 25	0
DIN 1.4409 St. st.	2	∅ 92 PN 25 for tester	1

Tester

NIVOMAG MMK-1 ■ 0

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