



DIN 4754



IEC 61508

SIL



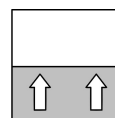
RoHS III
COMPLIANT



Data sheet

NK10

Fill Level Limiter



1 Product and functional description

1.1 Delivery scope

- NK10 according to specification (see order code)
- Operating Manual
- Safety manual for SIL version

1.2 Use in safety-related systems (SIL)

The unit can be used in safety-related systems.

For use in safety-related systems according to 'Functional Safety' (SIL), the correct function of the safety function must be proven. The necessary key figures, safety instructions, assembly and maintenance instructions can be found in the Safety Manual (SHB).

The safety manual is available for download at www.fischermesstechnik.de.



1.3 Function diagram

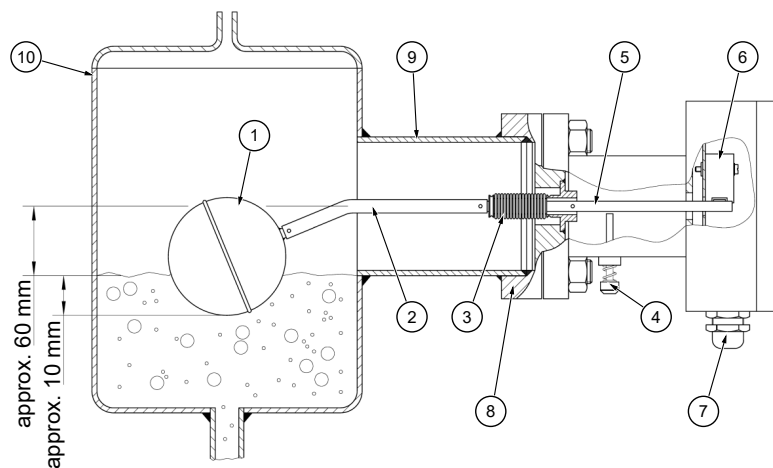


Fig. 1: Function diagram

1 Swimmer	2 Swimmer rod
3 Metal bellows	4 Test button
5 Switch lever	6 Micro-switch S1
7 Cable screw connection	8 Flange and counter-flange
9 Welding socket	10 Tank

1.4 Design and mode of operation

The swim system of the fill level limiter is contained in the fluid-filled reservoir (expansion tank). The swimming motions generated by changes in the fill level are transmitted directly to the micro-switch S1 by a swimmer rod sealed in a stainless-steel bellows. The fulcrum of the swimmer rod is located outside of the pressure chamber.

There is also a test button outside the pressure chamber with which a function check as per DIN 4754-3 can be run without lowering the fill level. When pressed, the body of the swimmer is moved against its buoyancy.

The factory default switching point of micro-switch S1 is set so that it switches when the swimmer rod is horizontal. The optional warning switch S2 switches approx. 2.5 mm before S1.

The fill level height at which switching is triggered depends on the density of the heat carrier. The lowest density at which a secure function is guaranteed is 0.6 kg/dm³.

When the medium has a density of 1.0 kg/dm³, the switching level is approx. 60mm below the middle of the flange or socket.

2 Technical data

2.1 General

Please also observe the order code here.

2.2 Application conditions

Ambient temperature	-10 to +70°C
Storage temperature	-20 to +85 °C
Max. temperature of medium	Depends on model
Spec. minimum density of the medium	$\rho = 0.6 \text{ kg/dm}^3$
Installation position	horizontal
Type of protection	IP 55 acc. to DIN EN 60529

Version	Max. operating pressure	Max. temperature of medium
NK10 1 ...	20 bar	400°C
NK10 2 ...	20 bar	400°C
NK10 3 ...	10 bar	350°C
NK10 4 ...	16 bar	400°C
NK10 5 ...	16 bar	400°C
NK10 6 ...	20 bar	400°C
NK10 7 ...	20 bar	400°C
NK10 A ...	10 bar	350°C
NK10 B ...	20 bar	400°C
NK10 F ...	20 bar	400°C
NK10 G ...	20 bar	400°C
NK10 H ...	20 bar	400°C
NK10 K ...	6.5 bar	400°C
NK10 M ...	16 bar	400°C
NK10 N ...	16 bar	400°C
NK10 P ...	16 bar	400°C

2.3 Switch contacts

Maximum load data at ohmic load.

250 V AC	6A
250 V DC	250 mA

2.4 Measurement accuracy

Switch hysteresis	approx. 6 mm
Switching point differential between S1 and S2 ⁽⁺⁾	max. 30 mm
Switching point differential on the medium surface	dependent on medium density

⁽⁺⁾ only for two micro-switches

2.5 Directives and certificates

Directives	DIN standards applied
Pressure Equipment Directive 2014/68/EU	DIN EN 12516-2:2022-08
Low-Voltage Directive 2014/35/EU	DIN EN 61010-1:2020-03
RoHS Directive 2011/65/EU	DIN EN IEC 63000:2019-05

Further technical specifications applied ^{*)}	
Heat transfer systems	DIN 4754-3:2015-03

Examination	Certificate no.
EC type examination (Module B) in accordance with the Pressure Equipment Directive	0045/202/1403/P/01261/22/D/001(00)
DNV type examination	TAA000020S
DIN CERTCO acc. to 4754-3	10F001
Functional safety pursuant to EN 61508 ^{*)}	968/V 1298.00/22

^{*)} Only for devices with the order code for SIL (optional information).

^{**)} Not published in the EU Official Journal.

2.6 Construction design

Swimmer system	Stainless steel 1.4571
Metal bellows	Stainless steel 1.4571
Flange / counter-flange ^(*)	Stainless steel 1.0425 (P265GH) or 1.4571
Welded socket	St.35.8 [1.0345 (P235GH)]
Screws / nuts ^(x)	NK104 ... Nut made of C35E (1.1181) and stud made of 1.7709
	NK105 ... screws only made of 1.7218

^(*) Please note the material information in the dimensional drawings.

^(x) Only for version with welding connection

2.6.1 Dimensional drawings

All dimensions in mm unless otherwise stated

2.6.1.1 Version with welding connection

Version	Flange material		A	B	C [Ø]	D [square]	e
NK104	1.0425	P265GH	213	359	82.5	77.8 x 77.8	107
NK105	1.0425	P265GH	250	396	88.9	90.0 x 90.0	105

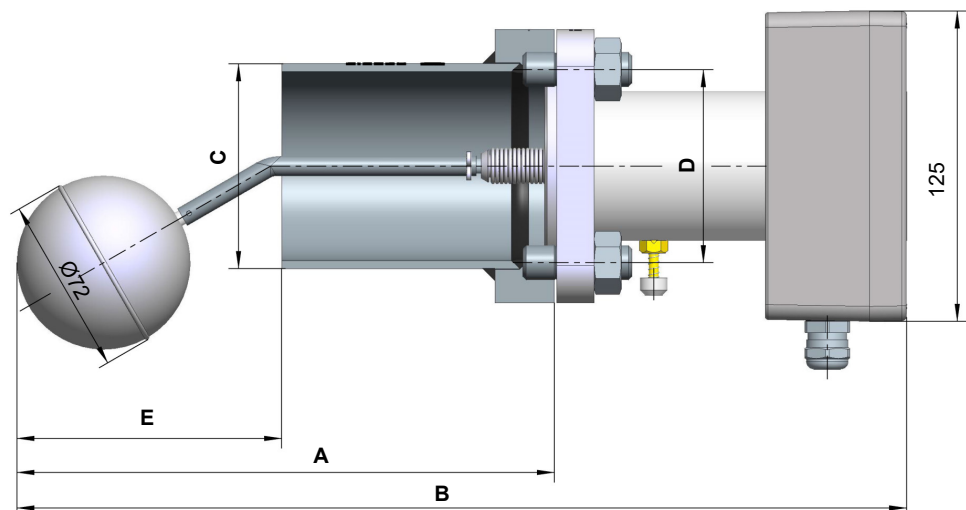


Fig. 2: Dimensional picture NK104 NK105

2.6.1.2 Flange DIN EN 1092-1 Type B1

Version	Flange material		Port	D [Ø]	LK [Ø]	B	b	d [Ø]	No. of holes
NK102	1.0425	P265GH	DN80 PN40	200	160	24	22	18	8
NK10G	1.4571	---	DN80 PN40	200	160	24	22	18	8

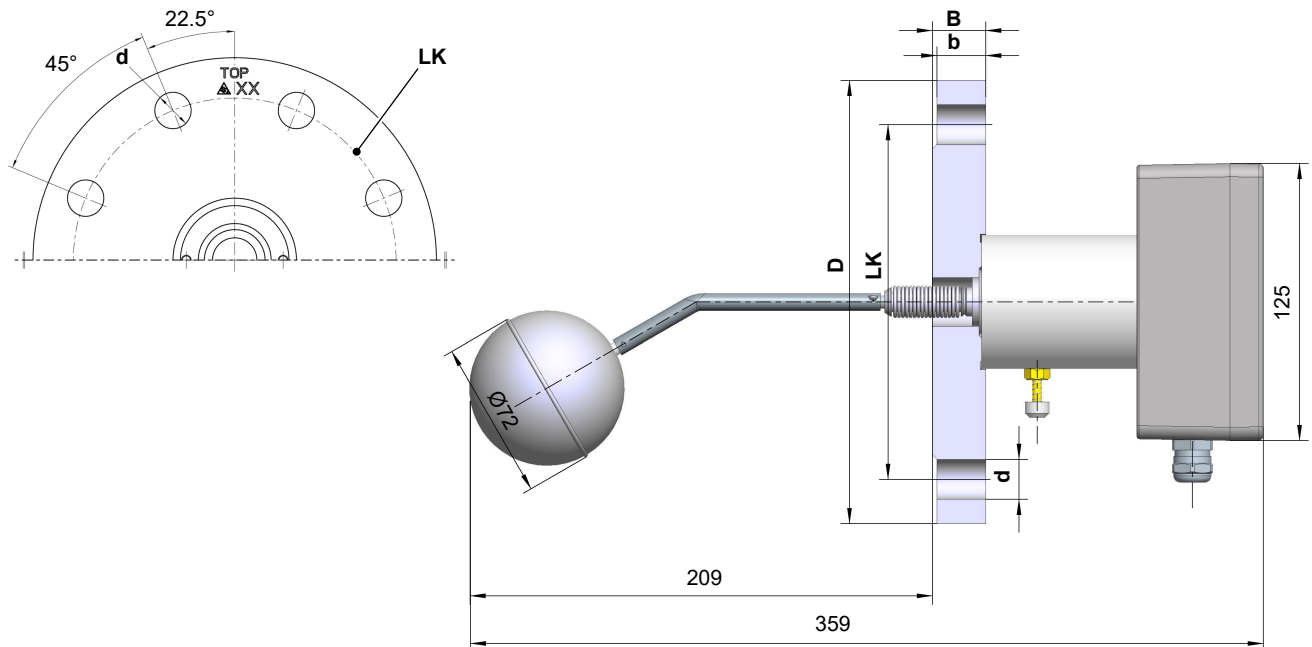


Fig. 3: Dimensional picture NK102 NK10G

Version	Flange material		Port	A	D [Ø]	LK [Ø]	B	b	d [Ø]	No. of holes
NK101	1.0425	P265GH	DN65 PN40	230	185	145	22	20	18	8
NK103	1.0425	P265GH	DN65 PN16	234	185	145	18	16	18	4
NK107	1.4571	---	DN65 PN40	230	185	145	22	20	18	8

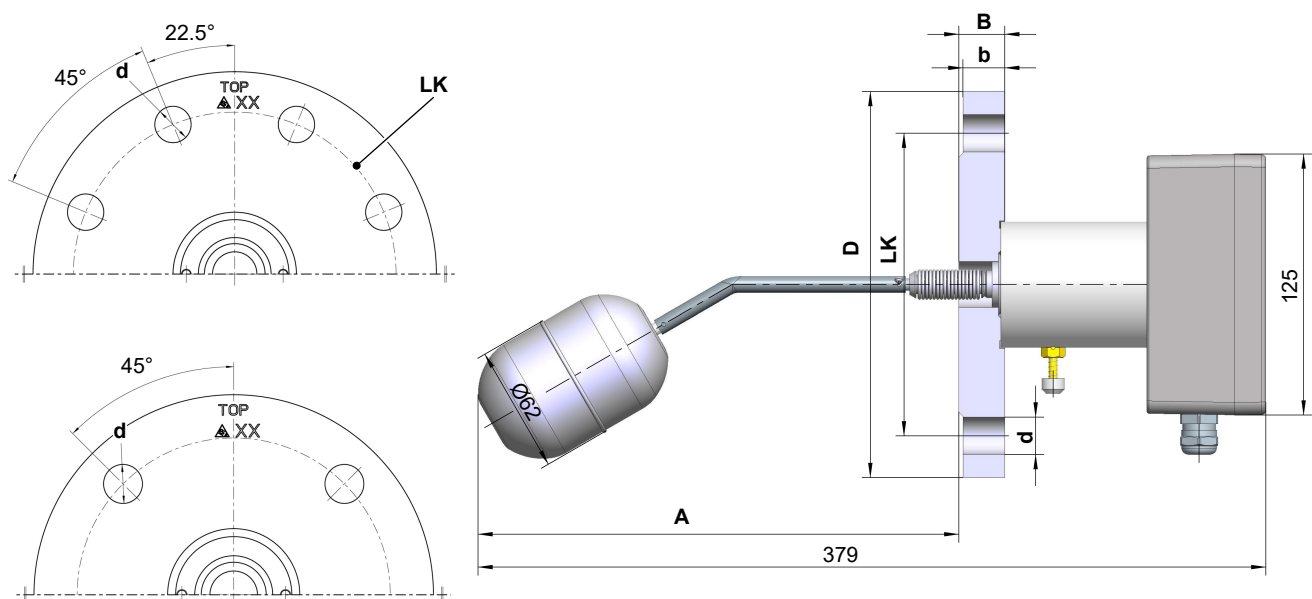


Fig. 4: Dimensional picture NK101 NK103 NK107

2.6.1.3 Flange DIN EN 1092-1 Type C

Version	Flange material	Port	D [Ø]	LK [Ø]	B	b	d [Ø]	No. of holes
NK10F	1.0425 P265GH	DN80 PN40	200	160	24	19.5	18	8

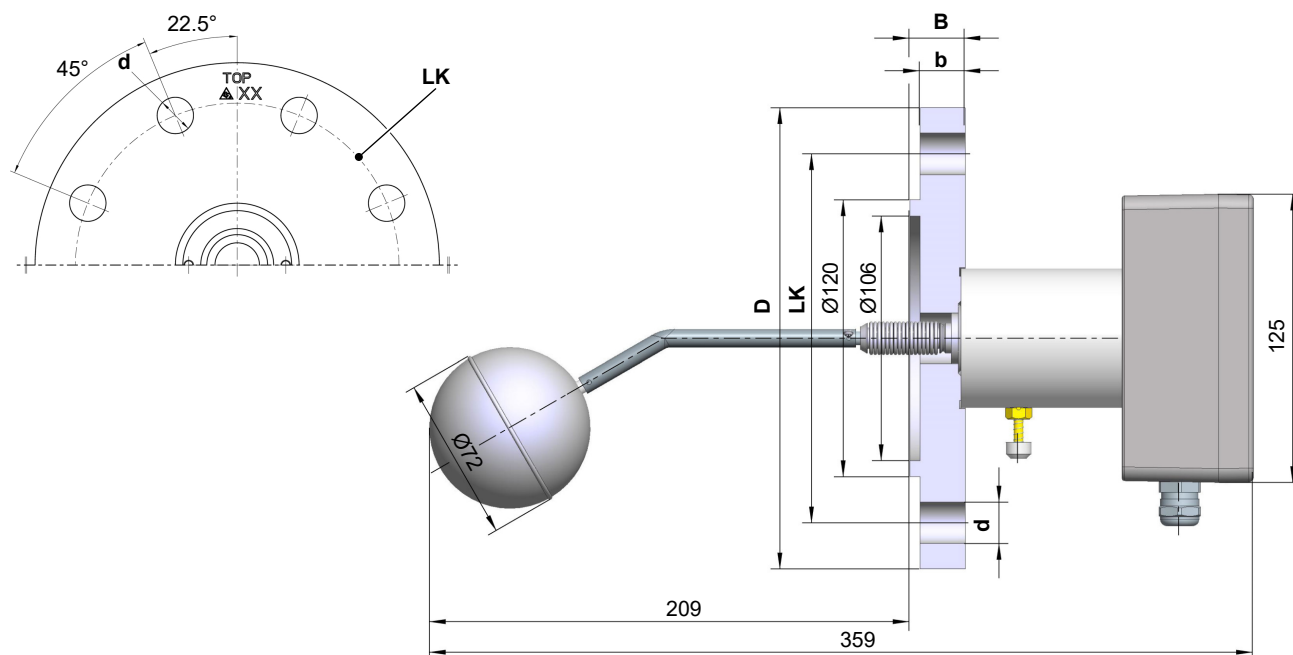


Fig. 5: Dimensional picture NK10F

Version	Flange material	Port	A	D [Ø]	LK [Ø]	B	b	d [Ø]	No. of holes
NK106	1.0425 P265GH	DN65 PN40	230	185	145	22	17.5	18	8
NK10A	1.0425 P265GH	DN65 PN16	234	185	145	18	13.5	18	4

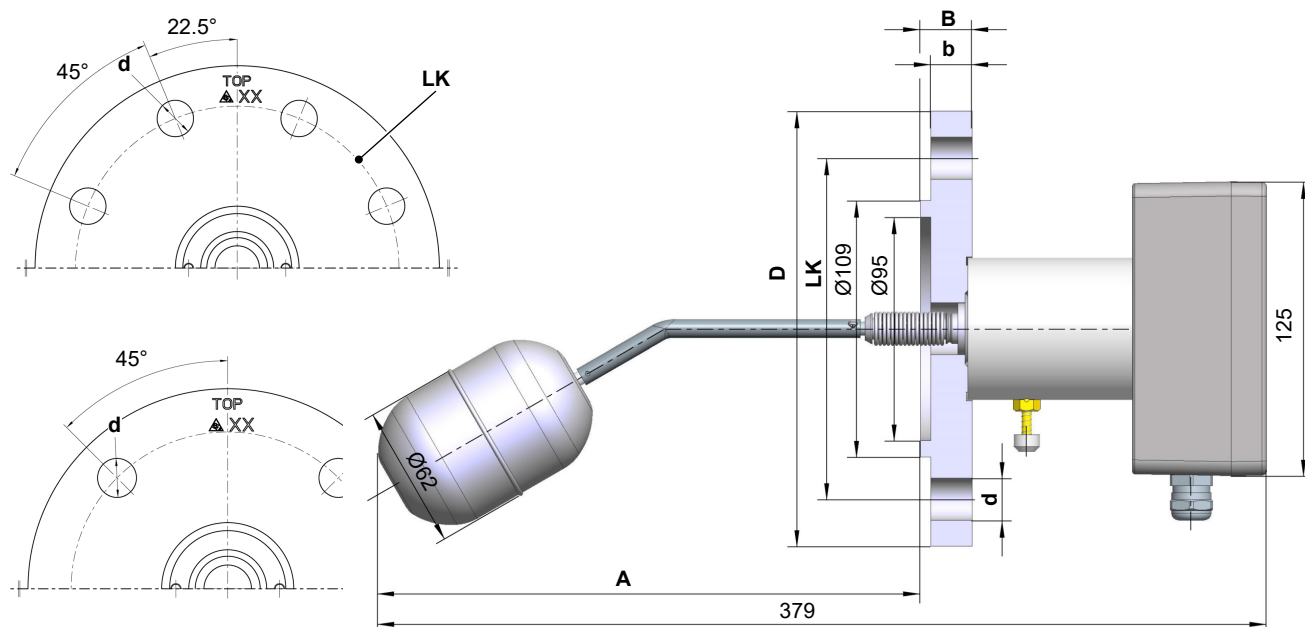


Fig. 6: Dimensional picture NK106 NK10A

2.6.1.4 Flange DIN EN 1092-1 Type G

Version	Flange material	Port	D [Ø]	LK [Ø]	B	b	d [Ø]	No. of holes
NK10H	1.4571 ---	DN80 PN40	200	160	24	22	18	8

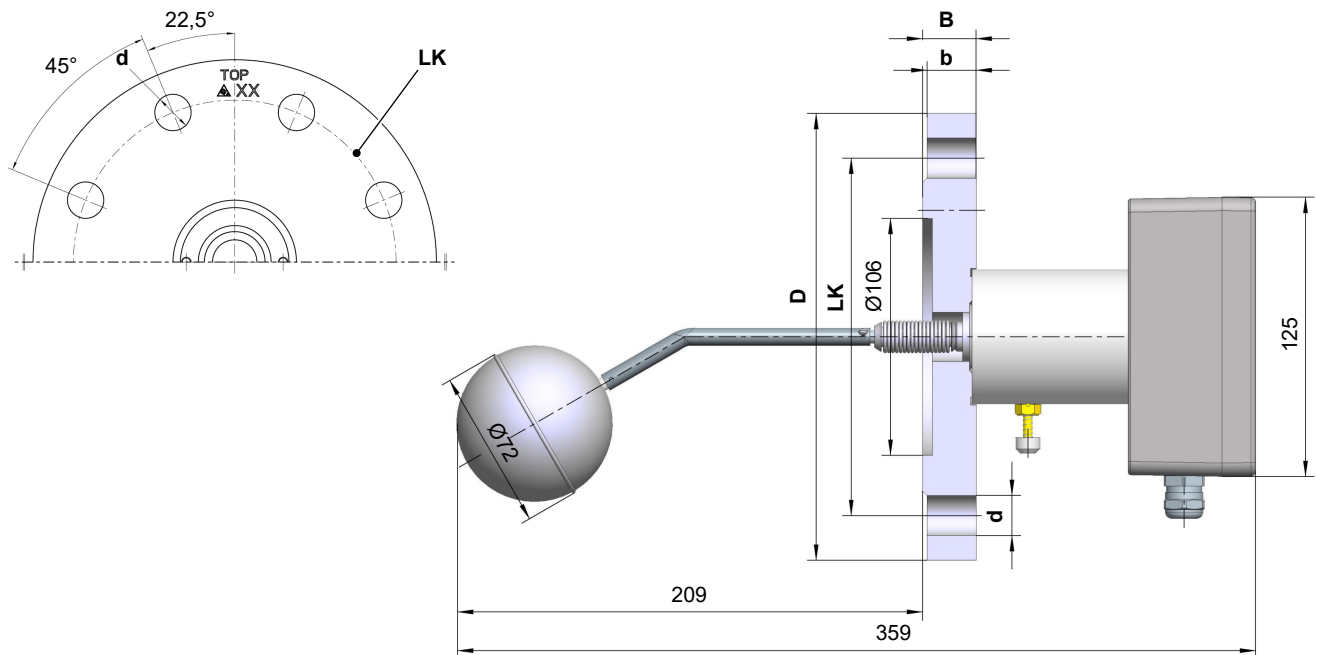


Fig. 7: Dimensional picture NK10H

2.6.1.5 Flange DIN EN 1092-1 Type D

Version	Flange material	Port	D [Ø]	LK [Ø]	B	b	d [Ø]	No. of holes
NK10B	1.0425 P265GH	DN65 PN40	185	145	22	20	18	8

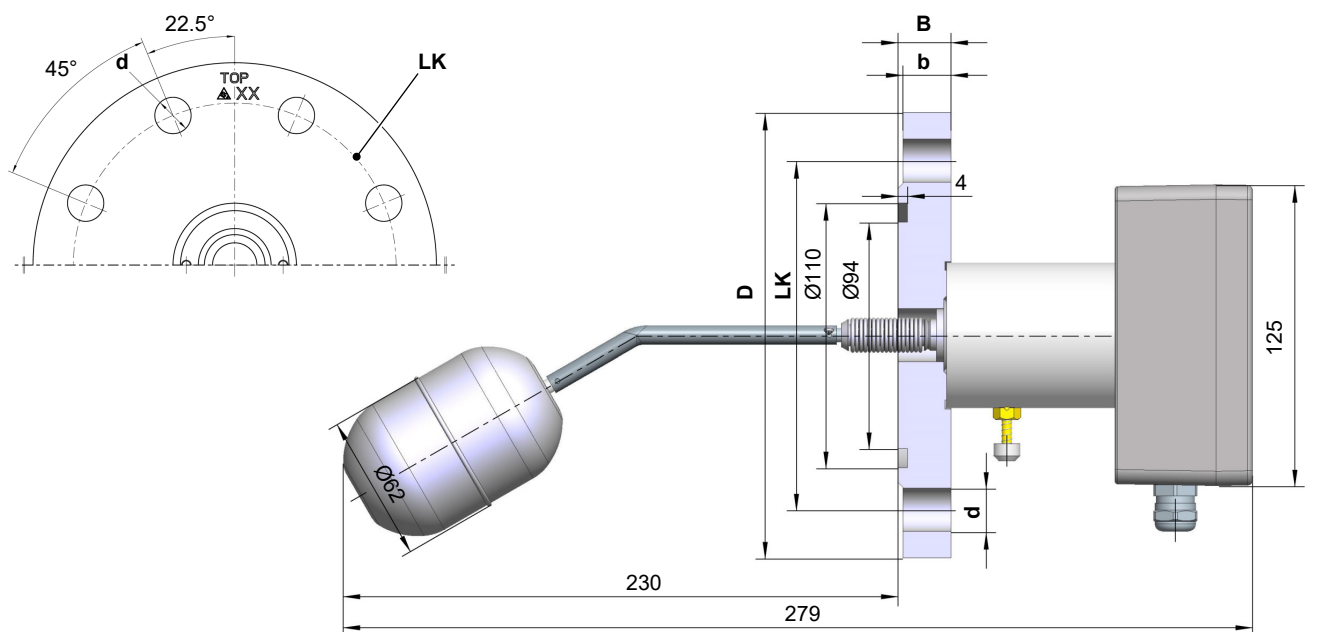


Fig. 8: Dimensional picture NK10B

2.6.1.6 Flange ANSI B16.5

Version	Flange material	Port	A	D [Ø]	LK [Ø]	B	b	d [Ø]	No. of holes
NK10K	1.0425 P265GH	3" 150 lbs	209	192.5	152.4	24	22.8	19.1	4
NK10N	1.0425 P265GH	3" 300 lbs	204	209.5	168.1	28.4	26.8	22.3	8
NK10P	1.0425 P265GH	4" 300 lbs	201	254	200.1	31.7	30.1	22.3	8

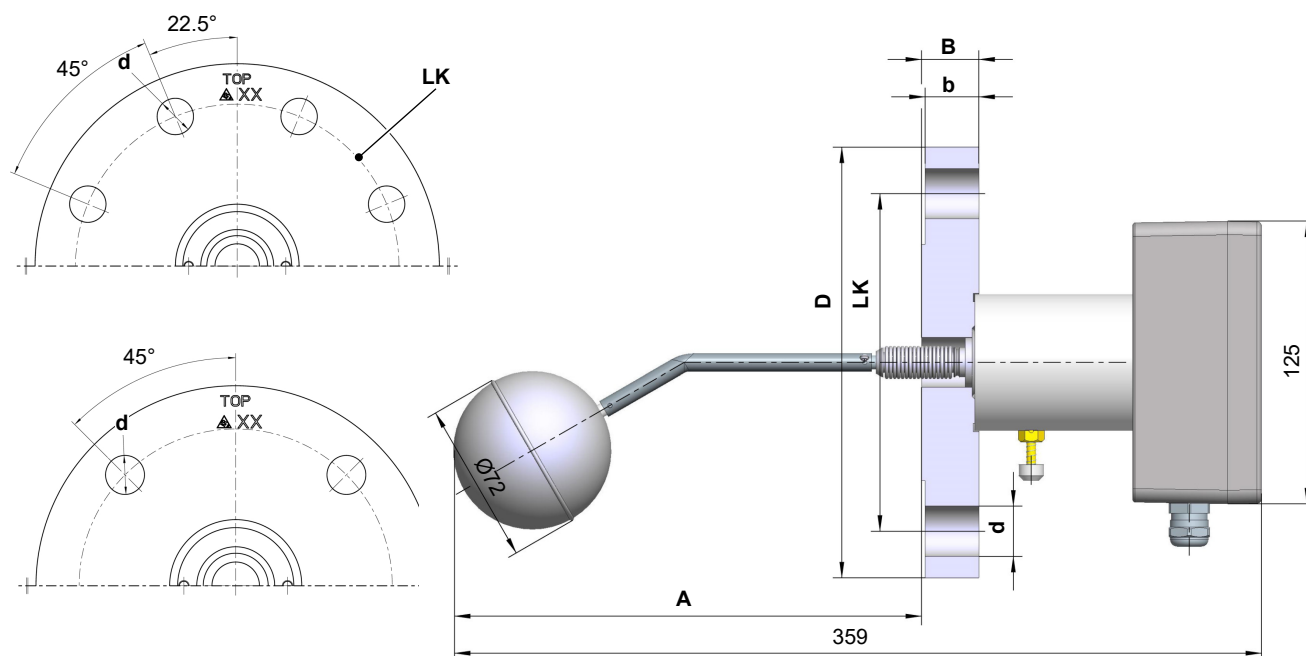


Fig. 9: Dimensional picture NK10K NK10N NK10P

Version	Flange material	Port	A	D [Ø]	LK [Ø]	B	b	d [Ø]	No. of holes
NK10M	1.0425 P265GH	2.5" 300 lbs	227	190.5	149.3	25.4	23.8	22.3	8

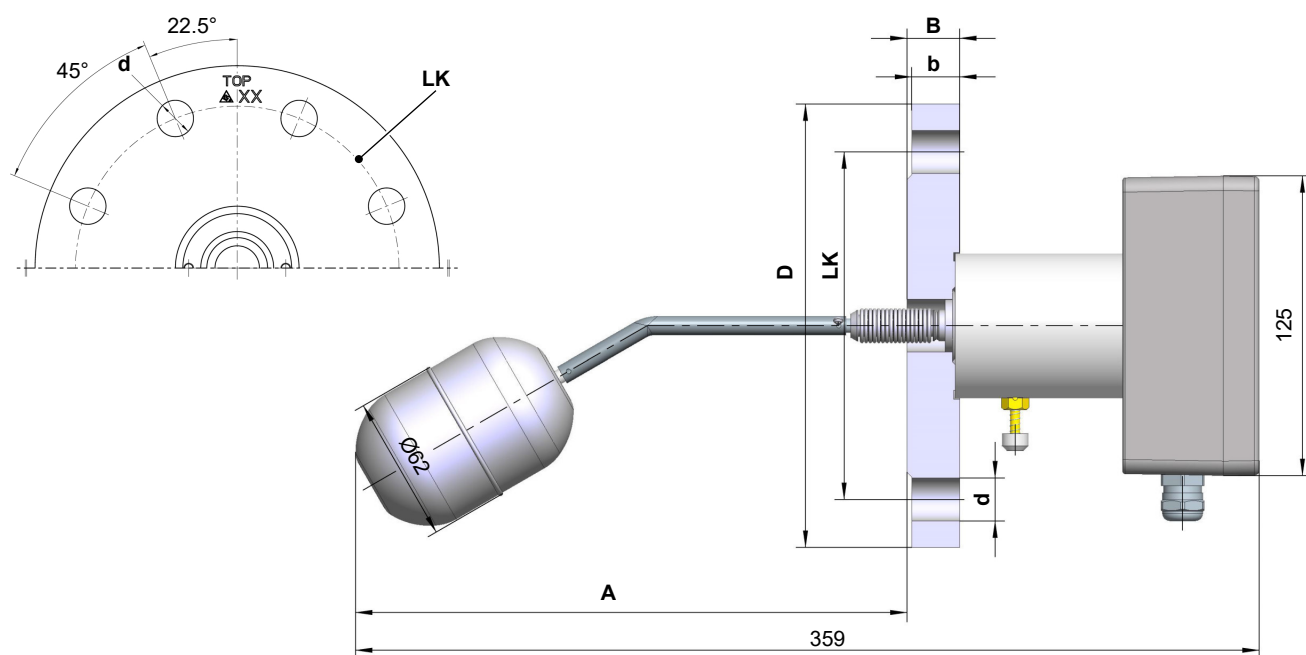
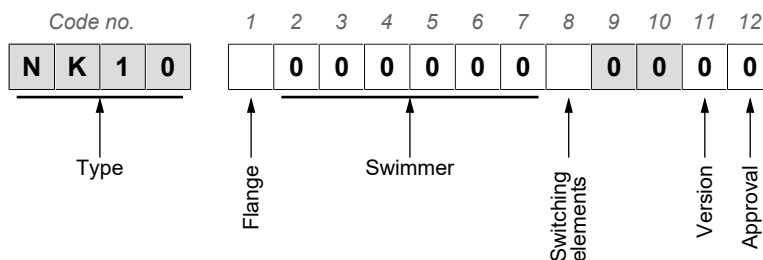


Fig. 10: Dimensional picture NK10M

3 Order Codes



[1]	Flange	material			
1	DIN EN 1092-1 Form B1	DN 65 PN40	1.0425	P265GH	
2	DIN EN 1092-1 Form B1	DN 80 PN40	1.0425	P265GH	
3	DIN EN 1092-1 Form B1	DN 65 PN16	1.0425	P265GH	
7	DIN EN 1092-1 Form B1	DN 65 PN40	1.4571	---	
g	DIN EN 1092-1 Form B1	DN 80 PN40	1.4571	---	
6	DIN EN 1092-1 Form C	DN 65 PN40	1.0425	P265GH	
A	DIN EN 1092-1 Form C	DN 65 PN16	1.0425	P265GH	
F	DIN EN 1092-1 Form C	DN 80 PN40	1.0425	P265GH	
B	DIN EN 1092-1 Form D	DN 65 PN40	1.0425	P265GH	
h	DIN EN 1092-1 Form G	DN 80 PN40	1.4571	---	

K	ANSI B16.5	3" 150 lbs	1.0425	P265GH	
C	ANSI B16.5	2.5" 300 lbs	1.0425	P265GH	
N	ANSI B16.5	3" 300 lbs	1.0425	P265GH	
P	ANSI B16.5	4" 300 lbs	1.0425	P265GH	

4	Welding connection	82.5 mm (S80)
5	Welding connection	88.9 mm (S90)

[2-7]	Swimmer
000000	Standard swimmer
#####	Special design on request

[8]	Switching Elements
1	1 micro-switch
2	2 micro-switch

[11]	Version
0	Standard
S	SIL

[12]	Approval
0	Standard unit with switching contacts (built-in microswitches)

3.1 Information about the document

This document contains all technical data about the device. Great care was taken when compiling the texts and illustrations. nevertheless, errors cannot be ruled out.

Subject to technical amendments.

Notes

Notes

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