

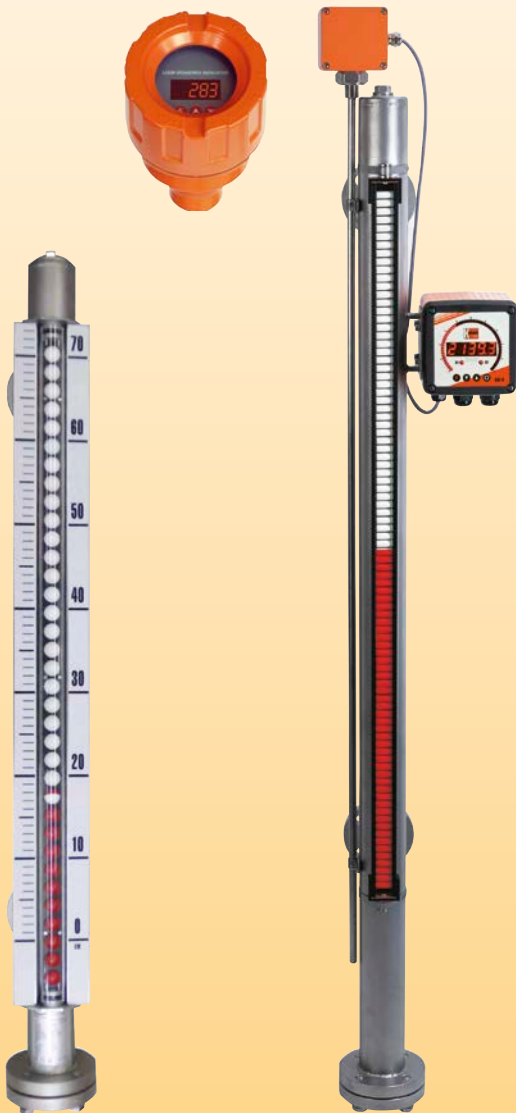


## Bypass Level Indicators



measuring  
•  
monitoring  
•  
analysing

NBK-03/-06/-07/-10/  
-31/-32/-33



- Measuring length:  
single-part max. 5 500 mm  
over 5 500 mm two-part or multipart
- Pressure: max. PN 320
- Temperature:  
-40 °C ... +400 °C (ceramic rollers)  
0 °C ... +120 °C (PP-rollers)  
-104 °C ... +200 °C; (ball display)  
-60 °C ... +100 °C; (high pressure)
- Viscosity: max. 200 mm<sup>2</sup>/s standard  
(Option: 460 mm<sup>2</sup>/s, only NBK-03)
- Connection:  
DIN flange DN 15 ... DN 50  
ANSI flange 1/2" ... 2"  
R and NPT threads  
welding nipple DN 15 ... DN 32
- Material: stainless steel 1.4571
- Insensitive magnet roller or  
ball display without auxiliary energy
- Limit contacts
- Analogue output, HART®,  
Profibus® PA,  
Foundation™ Fieldbus®



N2

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## Description

Kobold bypass level indicators are used for continuous measurement, display and monitoring of liquid levels. The bypass tube is attached onto the side wall of the vessel.

According to the law of communicating tubes the level in the bypass tube equals the level in the vessel. A float with embedded circular magnets in the bypass tube follows the liquid level and transfers it in a non-contacting manner to a display fitted outside the tube or to a monitoring device.

The following indication and monitoring devices are available:

### Magnetic roller indicator

As the float passes by, the red/white rollers are rotated in succession by 180° around their own axes. The rollers change from white to red as the level rises and from red to white as the level falls. The advantage of ball display is the higher protection category, good visibility of 180° and higher vibration resistance with filled version. The level in a tank or a mixer is continuously displayed as a red column, even when the power fails.

### Transmitter

To remotely transmit the level a transmitter with a chain of resistors or a magnetostrictive transducer can be mounted outside the bypass tube. A continuous standard signal of 4...20 mA is generated by means of a fitted transmitter. This standard signal can then be displayed on analogue or digital indicating devices. Optionally, HART®, Profibus®-PA or Foundation™ Fieldbus® communication protocols are possible.

### Universal indicating unit

A universal indicating unit of type series ADI can be mounted on the bypass to display and evaluate the standard signal (4...20 mA) generated by the transmitter.

### Limit contacts

One or more reed contacts for limit-value acquisition or also for level control can be secured to the bypass tube.

### Applications

- Storage tanks
- Tanks on ships
- Agitator vessel
- Water tanks

## Technical Details

Process connection:	flange DIN EN 1092-1 type 11, forme B DN 15, DN 20, DN 25, DN 32, DN 40, DN 50, flange ASME B 16.5 RF-2009 ½", ¾", 1", 1¼", 1½", 2" R-thread DIN EN 10226-1 ½", ¾", 1", 1¼" NPT ANSI/ASME B1.20.1 ½", ¾", 1", 1¼"
Bypass tube:	Ø 60.3 mm, 1.4571 (NBK-03/.../10) Ø 71.0 mm, 1.4571 (NBK-31) Ø 76.1 mm, 1.4571 (NBK-32/33)
NBK-03/06/07:	flat gasket: <200 °C; PTFE, ≥200 °C, Klinger SIL®
NBK-10:	reinforced graphite
NBK-31/32/33:	RTJ-seal
Operating pressure:	PN 16/40/63/100/160/250/320
Operat. temperature:	0 ... +120 °C (PP-rollers) -40 ... +400 °C (ceramic rollers) -104 ... +200 °C (ball display)
(With NBK-31/32/33, the operating temperature is restricted up to -60 °C...+100 °C)	
Viscosity:	max. 200 mm <sup>2</sup> /s standard (Option: up to max. 460 mm <sup>2</sup> /s for NBK-03)
max. meas. length:	to 5500 mm single-part; longer two-part or multipart
Overall length:	see dimension drawing
ATEX- and GL-approval:	see separate description

### Roller display RP (max. length 5500 mm)

Material roller:	polypropylene
Display glass:	Plexiglas®
Carrier frame material:	aluminium, brown anodised
Operat. temperature:	0 ... 120 °C
Protection:	IP 54

### Roller display RK (max. length 5500 mm)

Material roller:	ceramic
Display glass:	borosilicate glass
Carrier frame material:	aluminium, brown anodised
Operat. temperature:	-40 ... 400 °C
Protection:	IP 54



**Ball display model KP (max. L = 3800 mm one-piece)**

Material ball:	Ultramid®
Sight tube:	Plexiglas®
Sealing plug:	aluminium
Seal:	perbunan
Ball support rail:	aluminium, brown anodised
Carrier frame:	stainless steel 1.4301
Scale:	Hard-PVC, stainless steel 1.4301 (Option MV)
Operat. temperature:	-20 ... +80 °C
Protection:	IP 66

**Ball display model KM (max. L = 3800 mm one-piece)**

Material ball:	Ultramid® B
Sight tube:	Makrolon®
Sealing plug:	aluminium
Seal:	FPM
Ball support rail:	aluminium, brown anodised
Carrier frame:	stainless steel 1.4301
Scale:	Hard-PVC, stainless steel 1.4301 (Option MV)
Operat. temperature:	-60 ... +120 °C
Protection:	IP 66

**Ball display model KF (max. L = 3800 mm one-piece)**

Filling:	silicone oil
Material ball:	Ultramid® B
Sight tube:	Makrolon®
Sealing plug:	stainless steel 1.4301
Seal:	FPM
Ball support rail:	aluminium, brown anodised
Carrier frame:	stainless steel 1.4301
Scale:	Hard-PVC, stainless steel 1.4301 (Option MV)
Operat. temperature:	-105 ... +120 °C
Protection:	IP 66

**Ball display model KG (max. L = 3000 mm one-piece)**

Material ball:	Ultramid® B
Sight tube:	borosilicate glass
Sealing plug:	stainless steel 1.4301
Seal:	FPM
Ball support rail:	aluminium, brown anodised
Carrier frame:	stainless steel 1.4301
Scale:	stainless steel 1.4301
Operat. temperature:	-20 ... +200 °C
Protection:	IP 66

\* In case of multi-part design, a display (ball) length of 32 mm is not readable

**Technical Details additional Features**

**Limit contacts, model NBK-R**

Contact operation:	bistable changeover contact
Switching hysteresis:	approx. 15 mm
max. switching capacity:	60 W/VA, 230 V <sub>AC/DC</sub> , 1 A
Resistance:	100 mΩ
Medium temperature:	-40 ... +100 °C
Ambient temperature:	-40 ... +75 °C
Connection:	3 m PVC-cable
Housing:	polycarbonate
Protection:	IP 67

**Limit contact high temperature, model NBK-RT200/NBK-RT400**

Contact operation:	bistable changeover contact
Switching hysteresis:	approx. 15 mm
max. switching capacity:	80 VA, 250 V <sub>AC/DC</sub> , 1 A
Resistance:	<20 mΩ
Medium temperature:	-40 ... +200 °C/400 °C
Ambient temperature:	-40 ... +145 °C/350 °C
Housing:	aluminium pressure-cast, terminal connection
Cable entry	M16 x 1.5, brass nickel-plated
Protection:	IP 65

**Limit contact model NBK-RV200NO**

Sensor type:	reed contact
Switching pattern:	normally open, bistable
Switching hysteresis:	approx. 7 mm
Medium temperature:	-104 ... +200 °C
Ambient temperature:	-40 ... +70 °C
max. housing temperature:	+80 °C
max. operating voltage U <sub>max</sub> :	400 V <sub>DC</sub> / 250 V <sub>AC</sub>
max. load current I <sub>max</sub> :	0.5 A
max. switching power P <sub>max</sub> :	5 W
Housing:	aluminium pressure-cast, terminal connection
Electrical connection:	cable gland M20x1.5 (PVC)
Protection:	IP 65

Take into account that none of the three parameters U<sub>max</sub>, I<sub>max</sub>, P<sub>max</sub> may be exceeded!

**Limit contact model NBK-RV200NC**

Sensor type:	reed contact
Switching pattern:	normally closed, bistable
Other parameters:	exactly as for NBK-RV200NO

**Limit contact model NBK-RN200NO**

Sensor type: NAMUR contact  
 Switching pattern: normally open, bistable  
 max. operating voltage  
 $U_{max}$ : 15 V<sub>DC</sub>  
 $R_{on}$ : 1 k $\Omega$   
 $R_{off}$ : 11 k $\Omega$   
 Other parameters: exactly as for NBK-RV200NO

**Limit contact model NBK-RN200NC**

Sensor type: NAMUR contact  
 Switching pattern: normally closed, bistable  
 Other parameters: exactly as for NBK-RV200NO

**Reed contact resistor chain model: ...W...**

Total resistance: 0.7 ... 7 k $\Omega$   
 Meas. circuit voltage: max. 24 V<sub>DC</sub>  
 Measuring current: max. 0.1 A  
 max. length: 5500 mm  
 Medium temperature: -40 ... +200 °C,  
 -40 ... +400 °C with thermal  
 screening (option N)  
 Ambient temperature: max. 130 °C  
 Resolution: 10 mm  
 Housing: aluminium pressure-cast  
 Protection: IP65

**Reed contact resistor chain with 2-wire transmitter model: ...M**

Output: 4 ... 20 mA  
 Supply voltage: 16 ... 32 V<sub>DC</sub>  
 max. length: 5500 mm  
 Load resistance:  $(V_{supply} - 9 V) / 0.02 A [\Omega]$   
 Medium temperature: -40 ... +120 °C  
 Ambient temperature: -20 ... +80 °C  
 Resolution: 10 mm  
 Housing: aluminium pressure-cast  
 Protection: IP65

**Reed contact resistor chain with 2-wire transmitter: 4 ... 20 mA Option MS**

Like model: ... M ... however with 100 mm thermal stand-off of connection head incl. thermal screening  
 Medium temperature: -40 ... +300 °C

**Reed contact resistor chain with 2-wire transmitter: 4 ... 20 mA Option MK**

Like model: ... M ... however with 5000 mm silicone cable between connection box/bypass, incl. thermal screening  
 Medium temperature: -40 °C ... +400 °C

**Magnetostrictive sensor with 4-wire transmitter: 4 ... 20 mA model: ...T...**

Output: 4 ... 20 mA  
 Supply voltage: 24 V<sub>DC</sub>, max. 150 mA  
 Load: max. 500  $\Omega$   
 max. length: 4000 mm  
 Medium temperature: -40 ... +120 °C  
 Ambient temperature: -20 ... +80 °C  
 Accuracy:  $\pm 1$  mm  
 Housing: aluminium pressure-cast  
 Protection: IP65

**Reed contact resistor chain with 2-wire transmitter: 4 ... 20 mA model A (only with display options AE or AC)**

**Transmitter model: 5333D**

**Common specifications:**

Power supply: 8.0 ... 35 V<sub>DC</sub>  
 Communication interface: Loop Link  
 Linear resistance input: 0 ... 10 k $\Omega$   
**Current output:**  
 Signal range: 4 ... 20 mA  
 Min. signal range: 16 mA  
 Updating time: 135 ms  
 Load resistance:  $\leq (V_{supply} - 8 V) / 0.023 [\Omega]$

**Sensor error detection:**

Programmable: 3.5 ... 23 mA (23 mA factory default)  
 Medium temperature: -40 ... +120 °C (with option N up to +250 °C)  
 Ambient temperature: -20 ... +80 °C  
 Resolution: 10 mm  
 Housing: aluminium pressure-cast  
 Cable entry: M 20 x 1.5  
 Protection: IP65

**LED or LCD display (options AE/AC):**

Power supply: loop powered  
 Voltage: LED 3.3 V at 4 mA  
 3.7 V at 20 mA  
 LCD max. 2.5 V

**Reed contact resistor chain with 2-wire transmitter:  
4 ... 20 mA HART® model H and display options  
HE or HC**

Transmitter model: 5337D

**Common specifications:**

Power supply: 8.0 ... 35 V<sub>DC</sub>  
Communication interface: Loop Link 5905A and HART®  
Linear resistance input: 0 ... 7 kΩ

**Current output:**

Signal range: 4 ... 20 mA  
Min. signal range: 16 mA  
Updating time: 440 ms  
Load resistance:  $\leq (V_{\text{supply}} - 8V) / 0.023 [\Omega]$

**Sensor error detection:**

Programmable: 3.5 ... 23 mA  
(23 mA factory default)  
Medium temperature: -40 ... +120 °C (with option N up to +250 °C)  
Ambient temperature: -20 ... +80 °C  
Resolution: 10 mm  
Housing: aluminium pressure-cast  
Cable entry: M 20 x 1.5  
Protection: IP 66

**LED or LCD display (Options HE/HC):**

Power supply: Loop powered  
Voltage drop: LED 3.3 V at 4 mA  
3.7 V at 20 mA  
LCD max. 2.5V

**Reed contact resistor chain with transmitter:  
Model F (Profibus®-PA, Foundation™ Fieldbus®)**

Transmitter model: 5350A

**Common specifications:**

Supply voltage: 9 ... 32 V<sub>DC</sub>  
Consumption: < 11 m  
Isolation voltage, test / operation: 1.5 kV<sub>AC</sub> / 50 V<sub>AC</sub>  
Signal / noise ratio: min. 60 dB  
Response time (programmable): 1 ... 0 s  
Updating time: < 400 ms  
Dimension: Ø 44 x 20.2 mm  
Linear resistance input: 0 ... 10 kΩ

**Output:**

**Foundation™ Fieldbus® connection:**

Foundation™  
Fieldbus® Version: ITK 4.51  
Foundation™  
Fieldbus® capability: basic or LAS  
Foundation™  
Fieldbus® function blocks: 2 analogue and 1 PID

**Profibus® PA connection:**

Profibus® PA  
protocol standard: EN 50170 vol. 2  
Profibus® PA  
function blocks: 2 analogue  
Profibus® PA  
address (at delivery): 126  
Medium temperature: -40 ... +120 °C  
(with option N up to +250 °C)  
Ambient temperature: -20 ... +80 °C  
Resolution: 10 mm  
Housing: aluminium pressure-cast  
Cable entry: M 20 x 1.5  
Protection: IP 66



**Options**

Code	Description	Sketch/picture	Availability
<b>Top bypass tube connections</b>			
V0	Without vent plug		for <b>NBK-03/06/07</b> , Standard for <b>NBK-10/31/32/33</b>
VG	With vent plug G 1/2		for <b>NBK-10</b> , Standard for <b>NBK-03/06/07</b>
VF <sup>1) 3)</sup>	Flange connection DN50 (pressure rating as process flange)		<b>NBK-03/06/07/10</b>
VA <sup>1) 3)</sup>	Flange connection 2" ASME (pressure rating as process flange)		<b>NBK-03/06/07/10</b>
V4 <sup>3)</sup>	Vent flange DN15, stainless steel 1.4571 (pressure rating as process flange)		<b>NBK-03/06</b>
V5 <sup>3)</sup>	Vent flange DN20, stainless steel 1.4571 (pressure rating as process flange)		<b>NBK-03/06</b>
V6 <sup>3)</sup>	Vent flange DN25, stainless steel 1.4571 (pressure rating as process flange)		<b>NBK-03/06</b>
V7 <sup>3)</sup>	Vent flange 1/2" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		<b>NBK-03/06</b>
V8 <sup>3)</sup>	Vent flange 3/4" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		<b>NBK-03/06</b>
V9 <sup>3)</sup>	Vent flange 1" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		<b>NBK-03/06</b>
V2	vent valve NAD-MMN15, 1/2" NPT, stainless steel 316Ti, max. temperature: +120 °C		<b>NBK-03/06</b>
V3	Vent valve NAD-MMR15, G 1/2, stainless steel 1.4571, max. temperature: +120 °C		<b>NBK-03/06</b>
<b>Bottom bypass tube connections</b>			
D0	Without drain plug		for <b>NBK-03/06/07</b> Standard for <b>NBK-10/31 ... 33</b>
DG	With drain plug G 1/2	NBK-03/06  NBK-07/10	for <b>NBK-10</b> Standard for <b>NBK-03/06/07</b>
DF	Flange connection DN50 (pressure rating as process flange), with drain plug G 1/2		<b>NBK-03/06</b>
DA	Flange connection 2" ASME (pressure rating as process flange), with drain plug 1/2" NPT		<b>NBK-03/06</b>
DC	Flange connection DN50 (pressure rating as process flange), without drain plug		<b>NBK-03/06/07</b>
DD	Flange connection 2" ASME (pressure rating as process flange), without drain plug		<b>NBK-03/06/07</b>
EF	Drain flange DN15, stainless steel 1.4571 (pressure rating as process flange)		<b>NBK-03/06</b>
E5	Drain flange DN20, stainless steel 1.4571 (pressure rating as process flange)		<b>NBK-03/06</b>
E6	Drain flange DN25, stainless steel 1.4571 (pressure rating as process flange)		<b>NBK-03/06</b>
E7	Drain flange 1/2" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		<b>NBK-03/06</b>
E8	Drain flange 3/4" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		<b>NBK-03/06</b>
E9	Drain flange 1" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		<b>NBK-03/06</b>







Code	Description	Sketch/picture	Availability
F1	Drain valve NAD-MMR15, G 1/2, stainless steel 1.4571, max. temperature: +120 °C		NBK-03/06
F2	Drain valve NAD-MMN15, 1/2" NPT, stainless steel 1.4571 (316Ti), max. temperature: +120 °C		NBK-03/06
DS	Drain socket DN15	see sketch	NBK-03/06
D2	Drain valve NAD-MMN15, 1/2" NPT, horizontally mounted, stainless steel 1.4571 (316Ti), max. temperature: +120 °C		NBK-03/06
D3	Drain valve NAD-MMR15, G 1/2, horizontally mounted, stainless steel 1.4571 (316Ti), max. temperature: +120 °C		NBK-03/06
RF	Dead space free version DN25, stainless steel 1.4571 (pressure rating as process flange)		NBK-06
RA	Dead space free version 1" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		NBK-03/06
<b>Process connection options</b>			
ST <sup>3)</sup>	1 x process connection side, 1 process connection vertical on top	see sketch	NBK-03/06/07/10
TS <sup>3)</sup>	1 x process connection side, 1 process connection vertical at bottom	see sketch	NBK-03/06/07/10
TT <sup>3)</sup>	2 x process connection vertical, up to DN25 or 1" ASME	see sketch	NBK-03/06/07/10
<b>Scales</b>			
<b>(Ball displays are always delivered with scales, see technical data/ sketch for resolution)</b>			
MV	Scale made of stainless steel 1.4301 (only with ball display model KP/KM/KF, standard with model KG)	see sketch	NBK-03/06/07/10/31/32/33
M1	Measuring scale, medium temperature -40 °C ... +400 °C, engraved scale made of aluminium	see sketch	NBK-03/06/07/10/31/32/33
M2	Measuring scale, medium temperature -40 °C ... +150 °C, scale backing made of aluminium with polyester foil	see sketch	NBK-03/06/07/10/31/32/33
<b>Thermal screening</b>			
N	Thermal screening for sensor	see sketch	NBK-03/06/07/10/31/32/33
<b>Heating jacket</b>			
L1	Connection for heating jacket DN15/PN16 Form B1 DIN-EN 1092-1	see sketch	NBK-03/06/07/10
L2	Connection for heating jacket DN20/PN16 Form B1 DIN-EN 1092-1		NBK-03/06/07/10
L3	Connection for heating jacket DN25/PN16 Form B1 DIN-EN 1092-1		NBK-03/06/07/10
L4	Connection for heating jacket DN32/PN16 Form B1 DIN-EN 1092-1		NBK-03/06/07/10
LA	Connection for heating jacket 1/2" Class 150 RF ASME B16.5-2003 (Class 300 flanges on request)		NBK-03/06/07/10
LB	Connection for heating jacket 3/4" Class 150 RF ASME B16.5-2003 (Class 300 flanges on request)		NBK-03/06/07/10
LC	Connection for heating jacket 1" Class 150 RF ASME B16.5-2003 (Class 300 flanges on request)		NBK-03/06/07/10
LD	Connection for heating jacket 1 1/4" Class 150 RF ASME B16.5-2003 (Class 300 flanges on request)		NBK-03/06/07/10



**Bypass Level Indicators** Model NBK-03/-06/-07/-10/-31/-32/-33

Code	Description	Sketch/picture	Availability
<b>Electrical Outputs</b>			
<b>MU</b>	Option M with connection box at bottom, for easy access to connection box		<b>NBK-03/06/07/10/31/32/33</b>
<b>MS</b>	Option M and connection box at 100 mm distance, max. medium temperature = + 300 °C (Thermal screening option N mandatory with this option)		<b>NBK-03/06/07/10/31/32/33</b>
<b>MK</b>	Option M and connection box 5000 mm silicone cable, max. medium temperature = + 400 °C (Thermal screening option N mandatory with this option)		<b>NBK-03/06/07/10/31/32/33</b>
<b>Display options</b>			
<b>AE</b>	Aluminium die-cast housing, LED digital display, connection box at bottom (only in combination with transmitter option A)		NBK-03/06/07/10/31/32/33
<b>AC</b>	Aluminium die-cast housing, LCD digital display, connection box at bottom (only in combination with transmitter option A)	as AE, however with LCD display	NBK-03/06/07/10/31/32/33
<b>HE</b>	Aluminium die-cast housing, LED digital display, connection box at bottom (only in combination with transmitter option H)		NBK-03/06/07/10/31/32/33
<b>HC</b>	Aluminium die-cast housing, LCD digital display, connection box at bottom (only in combination with transmitter option H)	as HE, however with LCD display	NBK-03/06/07/10/31/32/33
<b>C<sup>2)</sup></b>	Indicating unit ADI-1 with bargraph and digital display, rugged aluminium housing, mounted at bypass tube, for description see data sheet ADI-1	see cover page / sketch	NBK-03/06/07/10/31/32/33
<b>Additional options</b>			
<b>A</b>	Connection flange for 2-part version (not possible with sensor), split roller display and scale possible	see sketch	NBK-03/06/07/10
<b>HL</b>	Retaining plate, centric between process connections, necessary from L > 5000 mm (alternative option HF)	see sketch	NBK-03/06/07/10/31/32/33
<b>HF</b>	Retaining flange, centric between process connections, necessary from L > 5000 mm (alternative option HL)	see sketch	NBK-03/06/07/10/31/32/33
<b>K</b>	Armaflex-insulation (heat co-efficient 0.025 kcal/m °C, up to 105 °C)	-	NBK-03/06/07/10
<b>Tests / certificates</b>			
<b>P</b>	Radiographic examination DIN 54 111 T1	-	NBK-03/06/07/10/31/32/33
<b>Q</b>	Dye penetration test DIN EN 571-1	-	NBK-03/06/07/10/31/32/33
<b>X</b>	Pressure test with water 1.5 x PN	-	NBK-03/06/07/10/31/32/33
<b>Z</b>	3.1 Inspection certificate acc. EN 10204	-	NBK-03/06/07/10/31/32/33
<b>MR</b>	Material acc. to NACE MR 0103/ISO15156 (MR0175), declaration of conformance	-	NBK-03/06/07/10/31/32/33
<b>WV</b>	Positive Material Identification (PMI)	-	NBK-03/06/07/10/31/32/33
<b>SF</b>	Oil and fat free	-	NBK-03/06/07/10/31/32/33

<sup>1)</sup> Not possible with transmitter options H/F

<sup>2)</sup> Only possible with option T (magnetostrictive sensor or option M (reed chain with transmitter)

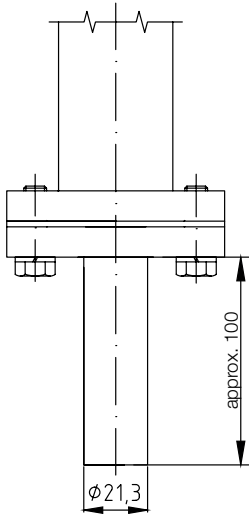
<sup>3)</sup> Not possible with option T

**Note:** Please pay attention to max. permissible temperature limits of individual components

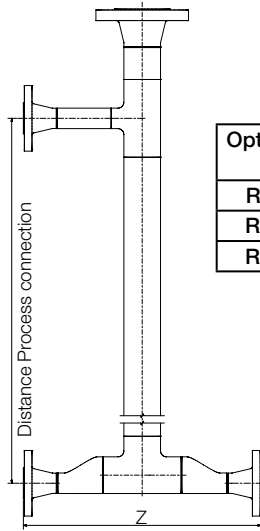


Sketches of selected options

Option DS

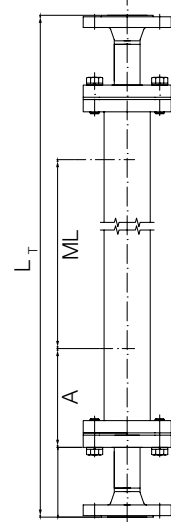


Option RF/RA

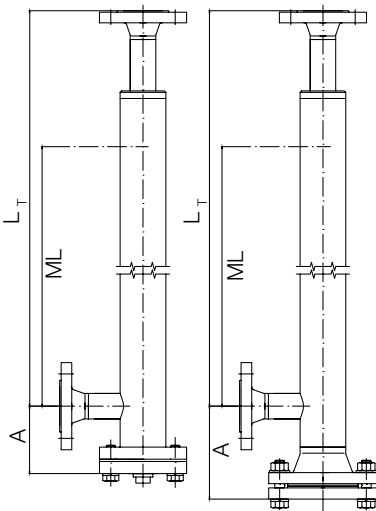


Option	Process connection below	Dimension Z
RF	V-flange DN25 PN40	approx. 360
RA	V-flange CI 150 1"	approx. 390
RA	V-flange CI 300 1"	approx. 405

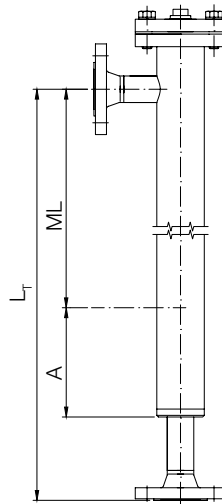
Option TT



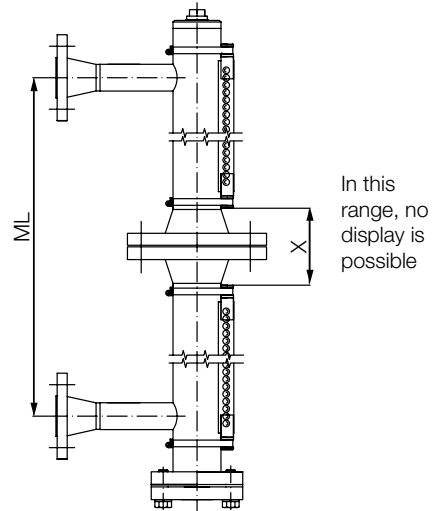
Option ST



Option TS

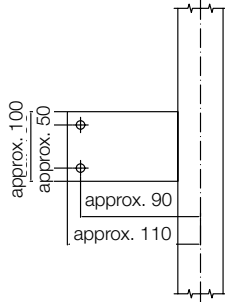


Option A

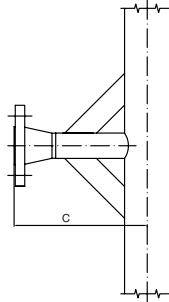


Model	Dimension X
NBK-03	92
NBK-06	98
NBK-07	127
NBK-10	139

**Option HL**  
(centred to dimens. L)

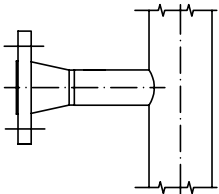


**Option HF**  
(centred to dimens. L)

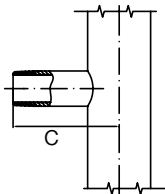


**Options process connection**

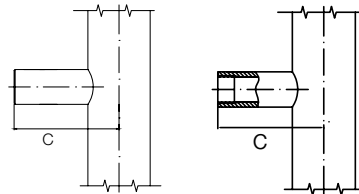
**Option F/A**



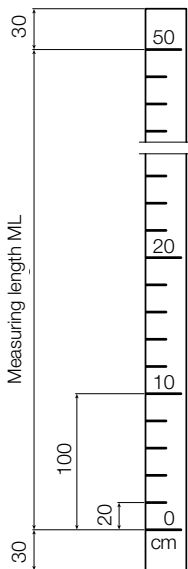
**Option R/N**



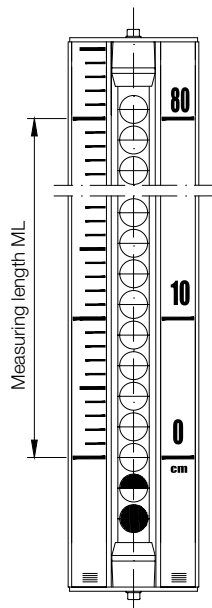
**Option S**



**Measuring scale, aluminium**  
**Option M1 - engraved scale**  
**Option M2 - polyester foil**



**Measuring scale screen print, stainless steel carrier**  
(standard scope of supply with ball display)



**Float models (closed design)**

Model	Min. density [kg/dm <sup>3</sup> ]	Material
A	1.0	titanium
B	0.9	titanium
C	0.8	titanium
D	0.7	titanium
E	0.6	titanium
F*	0.54	titanium
V	1.0	stainless steel
W	0.8	stainless steel
H	0.8	CF340
Interface float	min. density difference = 150 kg/dm <sup>3</sup> (indicate both densities)	titanium

\*Option N not possible. Not for NBK-10, special float for special medium densities (taring) or reduced length A on request.



Order Details (Example: NBK-03 F15 00 0 A)

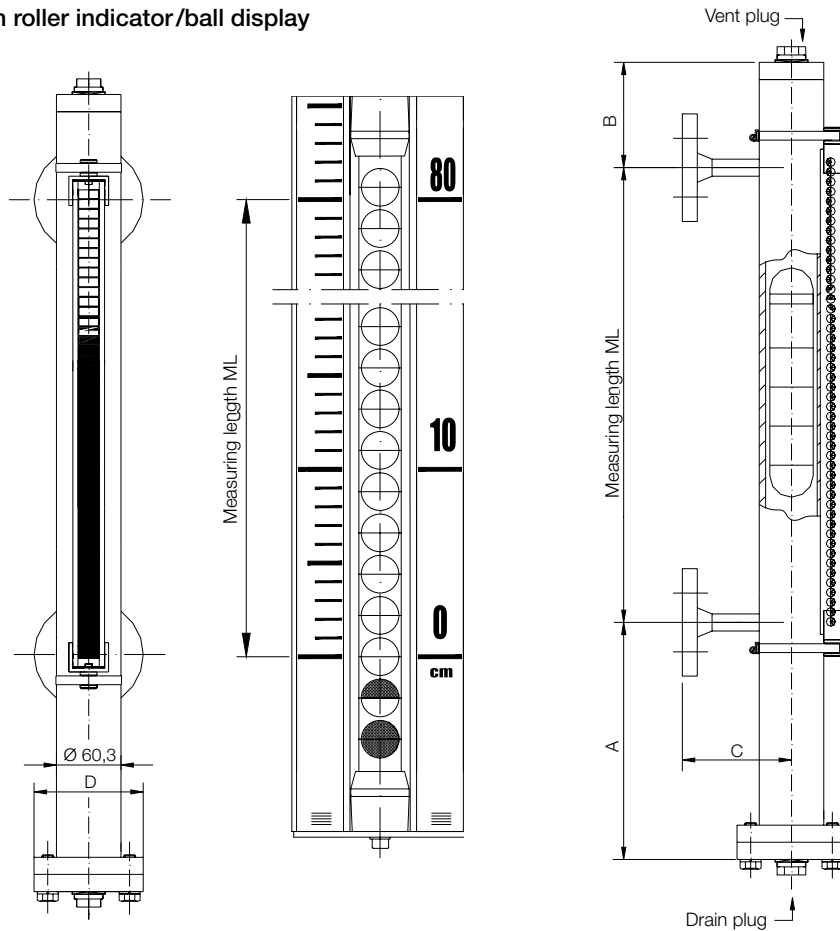
Model	Rated pressure	Connection	Nominal size	Roller/ ball indicator	Sensor/ Transmitter	Medium density float	Options
NBK-03...	PN 16/ Class 150	<b>F</b> = DIN-flange <b>A</b> = ASME-flange <b>R</b> <sup>3)</sup> = R-male thread <b>N</b> <sup>3)</sup> = NPT-male thread <b>S</b> <sup>4)</sup> = welding-nipple	<b>15</b> = DN 15, ½" <b>20</b> = DN 20, ¾" <b>25</b> = DN 25, 1" <b>32</b> = DN 32, 1 ¼" <b>40</b> = DN 40, 1 ½" <b>50</b> = DN 50, 2" <b>XX</b> = special connection <sup>8)</sup>	<b>00</b> = without <b>RP</b> = PP-roller <b>RK</b> = ceramic roller <b>KP</b> = ball display with Plexiglas <sup>®</sup> sight tube <b>KM</b> = ball display with Makrolon <sup>®</sup> sight tube <b>KF</b> = as KM however with oil filling <b>KG</b> = ball display with borosilicate sight tube	<b>0</b> = without transmitter <b>T</b> = magnetostrictive probe/ 4...20 mA, 4-wire <b>W</b> = reed chain/without transmitter <b>M</b> = reed chain/ 4...20 mA, 2-wire <b>A</b> <sup>9)</sup> = reed chain/ 4...20 mA, 2-wire <b>H</b> = reed chain/ 4...20 mA, HART <sup>®</sup> , 2-wire <b>F</b> = reed chain/ Profibus <sup>®</sup> PA Foundation <sup>™</sup> Fieldbus	<b>A</b> = 1.0 kg/dm <sup>3</sup> , titanium for viscosity up to 200 cP <b>B</b> = 0.90 kg/dm <sup>3</sup> , titanium for viscosity up to 200 cP <b>C</b> = 0.80 kg/dm <sup>3</sup> , titanium for viscosity up to 200 cP <b>D</b> = 0.70 kg/dm <sup>3</sup> , titanium for viscosity up to 200 cP <b>E</b> = 0.60 kg/dm <sup>3</sup> , titanium for viscosity up to 200 cP <b>F</b> <sup>6)</sup> = 0.54 kg/dm <sup>3</sup> , titanium for viscosity up to 200 cP <b>V</b> <sup>5)</sup> = 1.0 kg/dm <sup>3</sup> , stainless steel for viscosity up to 460 mm <sup>2</sup> /s <b>W</b> <sup>5)</sup> = 0.8 kg/dm <sup>3</sup> , stainless steel for viscosity up to 460 mm <sup>2</sup> /s <b>Y</b> = special density, titanium (specify in clear text)	<b>0</b> = without options or options as in list and description (see separate options list)
NBK-06...	PN 40/ Class 300						
NBK-07...	PN 63/ Class 400						
NBK-10...	PN 100/ Class 600						
NBK-31	PN 160/ Class 900	<b>F</b> = DIN flange	<b>15</b> = DN 15, ½"			<b>H</b> = high pressure floater, CF340 viscosity up to 200 cP (medium S.G.: ≥ 0.8; specify in clear text)	
NBK-32	PN 250/ Class 1500		<b>20</b> = ¾" <sup>7)</sup>				
NBK-33	PN 320	<b>A</b> = ASME flange	<b>25</b> = DN 25, 1"				
NBK-R	standard limit contact (bistable change-over contact)						
NBK-RT200	limit contact high-temperature max. 200 °C						
NBK-RT400	limit contact high-temperature max. 400 °C						
NBK-RV200NO	limit contact, bistable, N/O, max. +200 °C (suitable for vessels with strong vibrations)						
NBK-RV200NC	limit contact, bistable, N/C, max. +200 °C (suitable for vessels with strong vibrations)						
NBK-RN200NO	limit contact, bistable, NAMUR, N/O, max. +200 °C (suitable for vessels with strong vibrations)						
NBK-RN200NC	limit contact, bistable, NAMUR, N/C, max. +200 °C (suitable for vessels with strong vibrations)						

<sup>3)</sup> Only possible with nominal diameter code 15/20/25/32 (female thread on request)    <sup>4)</sup> Only possible with NBK-03/06 and nominal size code 15/20/25/32  
<sup>5)</sup> Only possible with NBK-03    <sup>6)</sup> Not possible with NBK-10    <sup>7)</sup> Only possible for connection A, ASME    <sup>8)</sup> Specify in clear text  
<sup>9)</sup> Only with options AE and AC

Measuring length L, density and temperature please specify in clear text!

**Dimensions [mm]**

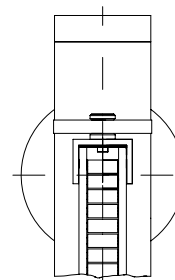
NBK-03/06/07/10 with roller indicator/ball display



**Dimension NBK**

Model	Rated pressure	Dimensions [mm]		
		B	C	D
NBK-03...	PN 16 / Class 150	130	110	115
NBK-06...	PN 40 / Class 300	130	110	115
NBK-07...	PN 63 / Class 400	130	150	180
NBK-10...	PN 100 / Class 600	130	150	195
NBK-31...	PN 160 / Class 900	150	180	245
NBK-32...	PN 250 / Class 1500	150	180	245
NBK-33...	PN 320	170	210	265

NBK-10/-31/-32/-33 always without vent plug and without drain plug

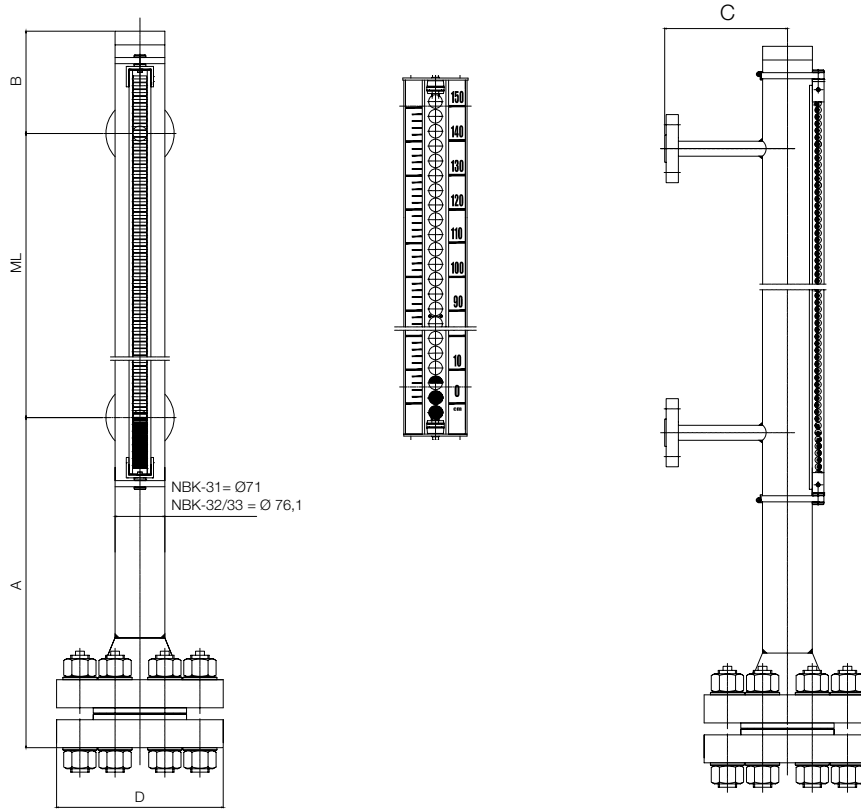


**Clearance dimension A [mm]**

Model	Rated pressure	Medium density						
		0.54 [kg/dm³]	0.6 [kg/dm³]	0.7 [kg/dm³]	0.8 [kg/dm³]	0.9 [kg/dm³]	1 [kg/dm³]	
NBK-03...	PN 16 / Class 150	320	320	320	320	320	210	
NBK-06...	PN 40 / Class 300	410	410	320	320	320	210	
NBK-07...	PN 63 / Class 400	410	410	320	320	320	210	
NBK-10...	PN 100 / Class 600	-	700*	410**	320	320	210	
NBK-31...	PN 160 / Class 900	-	-	-	540	415	345	
NBK-32...	PN 250 / Class 1500	-	-	-	540	415	345	
NBK-33...	PN 320	-	-	-	595	460	385	

\* 800 for units with thermal screening; \*\*450 for units with thermal screening

NBK-31/32/33 with roller indicator /ball display



Pressure-/temperature-assignment for flange made of stainless steel

DIN EN 1092-1:2008-09 (extract)										
PN	Material	Maximum allowable temperature TS in °C								
		RT	100	150	200	250	300	350	400	
		Maximum allowable pressure PS in bar								
6	1.4571 (15E0)	6.0	6.0	5.8	5.6	5.3	5.0	4.8	4.6	
16		16.0	16.0	15.6	14.9	14.1	13.3	12.8	12.4	
40		40.0	40.0	39.2	37.3	35.4	33.3	32.1	31.2	
63		63.0	63.0	61.8	58.8	55.8	52.5	50.7	49.2	
100		100.0	100.0	98.0	93.3	88.5	83.3	80.4	78.0	
160		160.0	160.0							
250		250.0	250.0							
320		320.0	320.0							

Remarks:

RT = -10 °C... +50 °C

TS = maximum allowable temperature in °C, temperature which is defined by pressure equipment manufacturer, for which the pressure equipment is designed

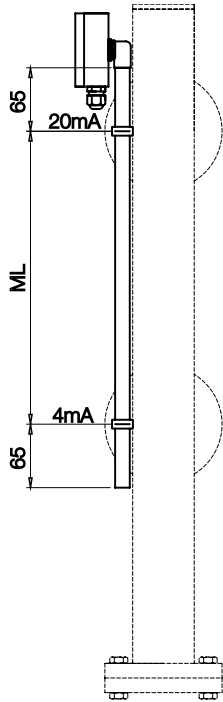
PS = maximum allowable pressure, pressure which is defined by pressure equipment manufacturer, for which the plant is designed. 1.4571 (15E0) was calculated with help of creep resistance values of 100000 h acc. to EN-Material Norms considering the safety value.

At intermediate temperatures e.g. 120 °C, a linear interpolation is to be carried out between 2 following creep resistance values, e.g. of 100 °C and 150 °C.

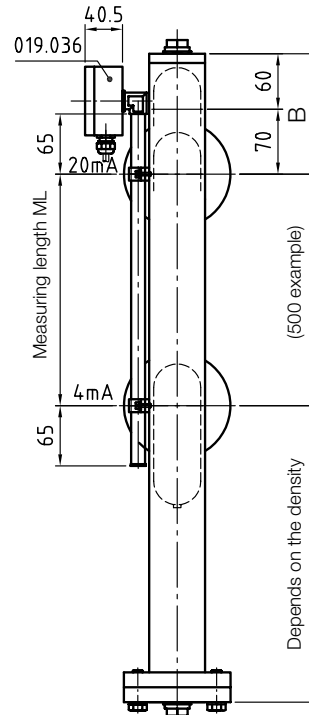
The pressure/temperature assignment is valid for the following flange models with sizes up to DN 100 used by KOBOLD.

Model No. and nomination: 05 Blind flange, 11 Welding neck flange

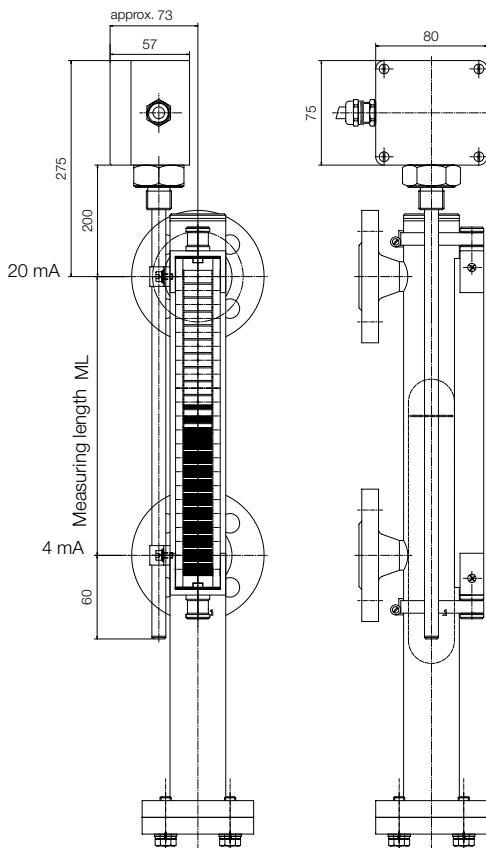
NBK... with reed chain model W



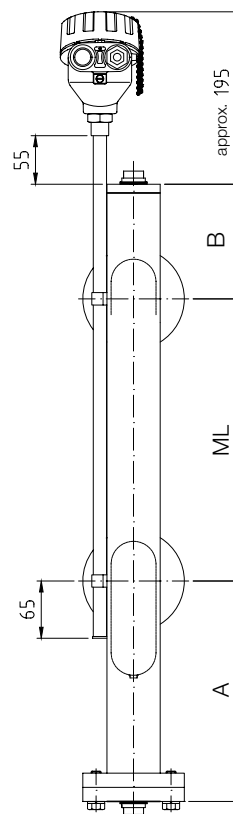
NBK... with transmitter model M



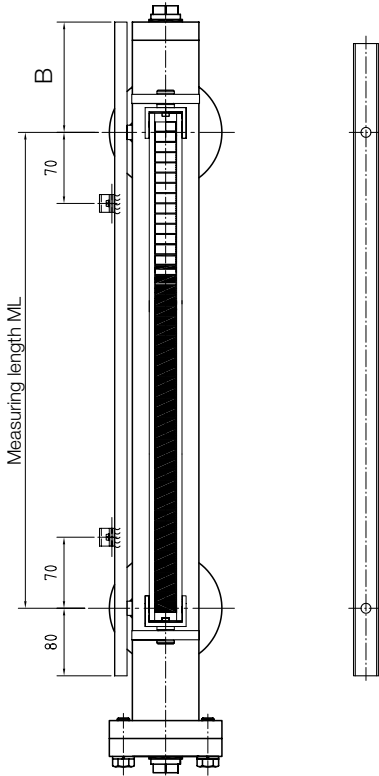
NBK... with transmitter model T



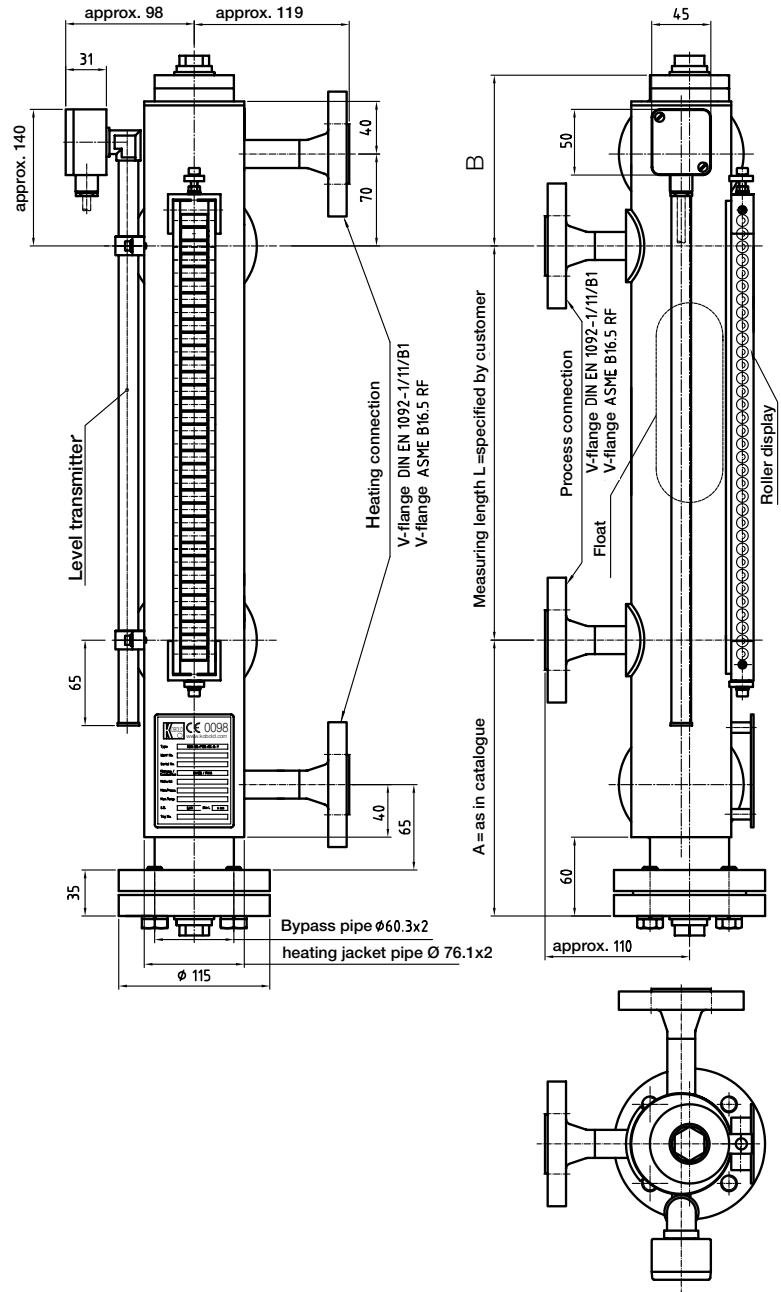
NBK... with transmitter options H/F (not possible with options VA/VF)



NBK-... with thermal screen option N

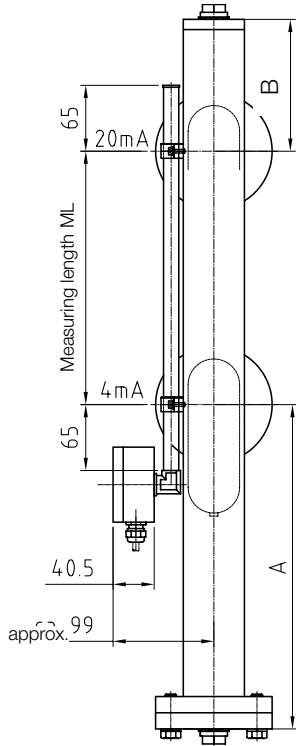


NBK-... with heating jacket option LX

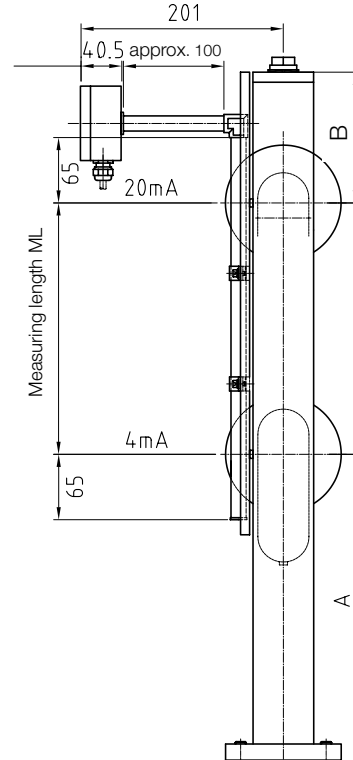




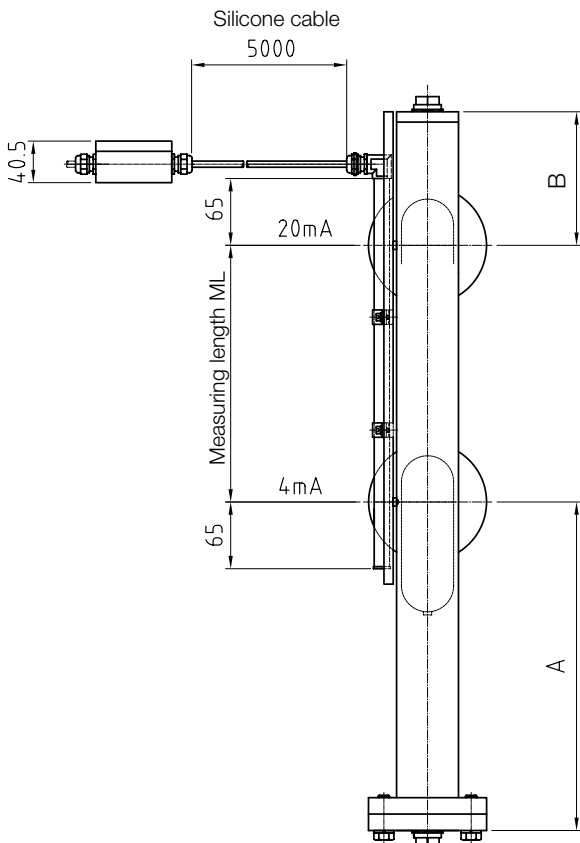
NBK-... with transmitter option MU



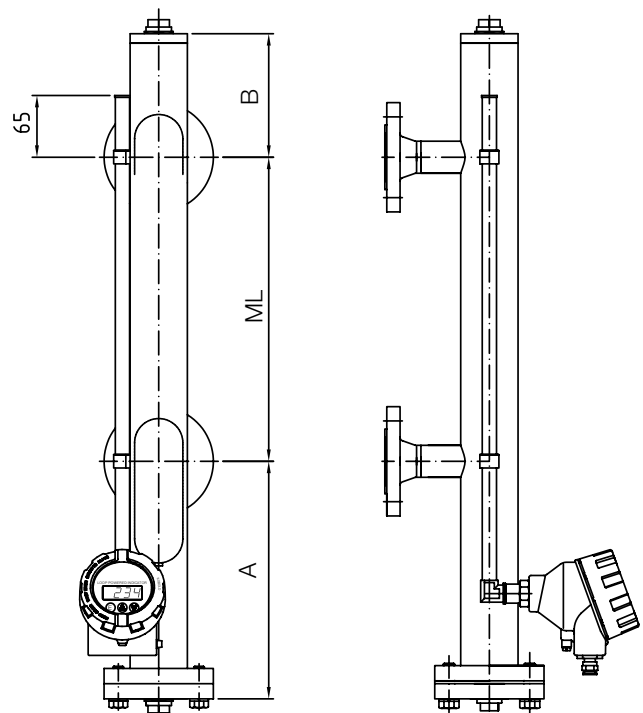
NBK-... with transmitter option MS



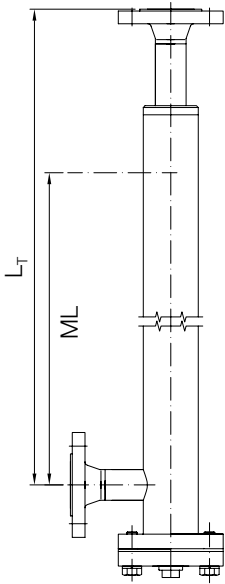
NBK-... with transmitter option MK



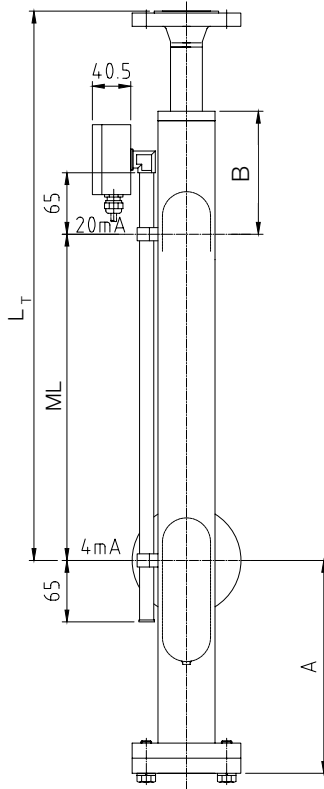
NBK-... with transmitter display options AE/HE or AC/HC



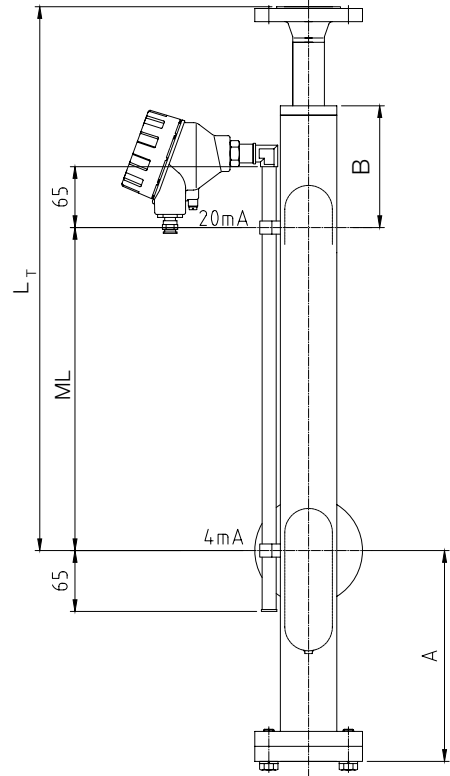
Process connection option ST



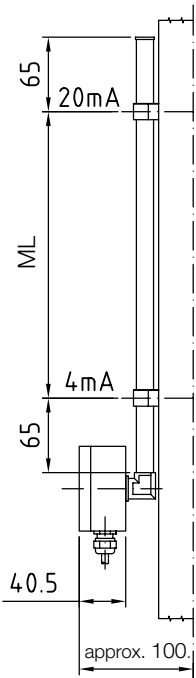
NBK... with transmitter model M option ST



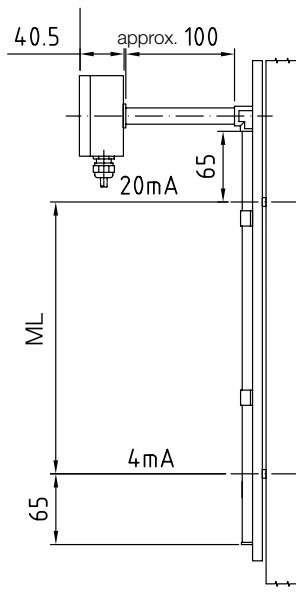
NBK... with transmitter model H/F option ST



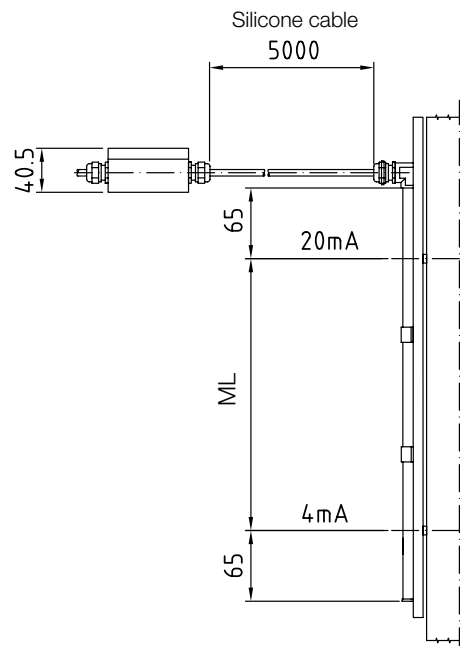
NBK... with transmitter options MU and ST



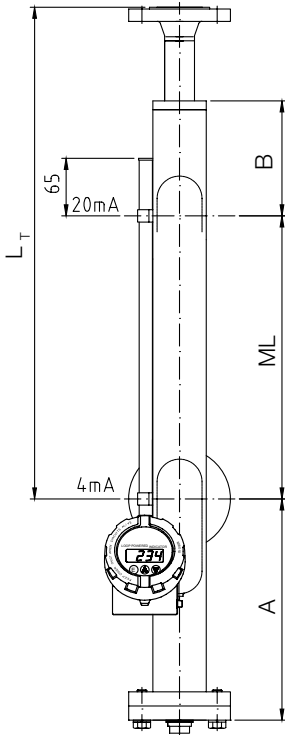
NBK... with transmitter options MS and ST



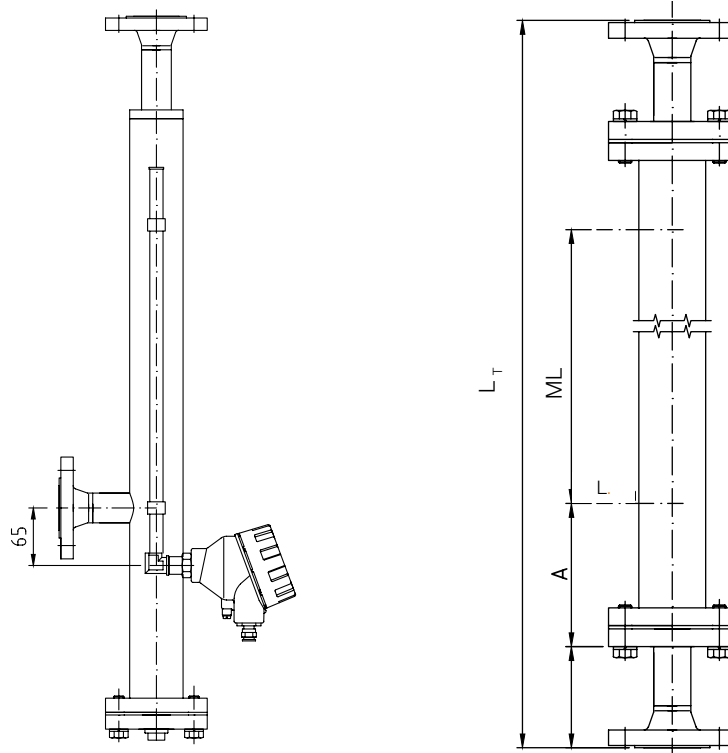
NBK... with transmitter options MK and ST



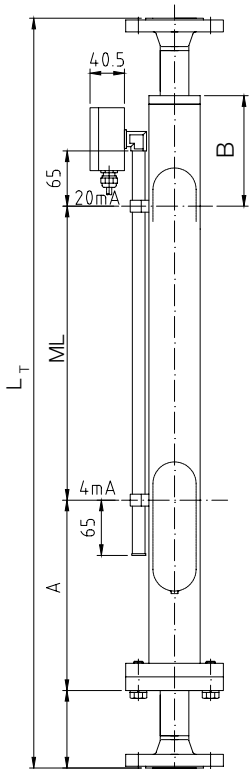
NBK... with transmitter  
display options AE/HE or AC/HC and option ST



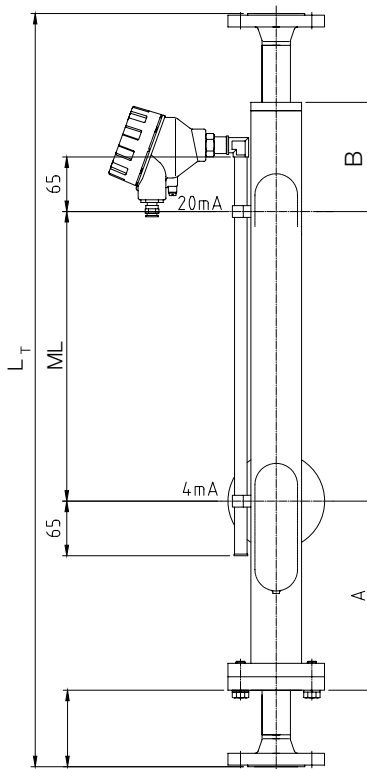
Process connection  
option TT



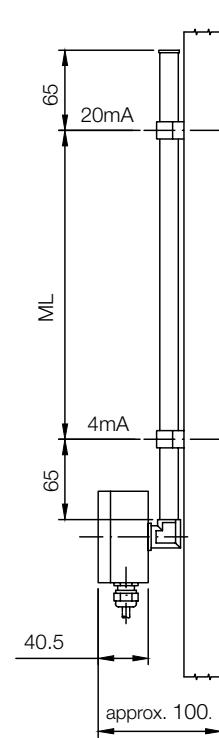
NBK... with transmitter  
model M option TT



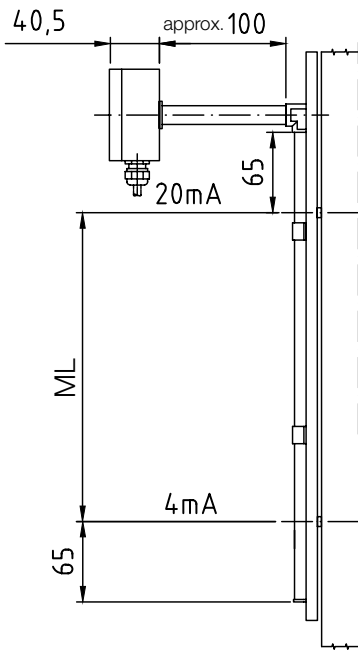
NBK... with transmitter  
model H/F option TT



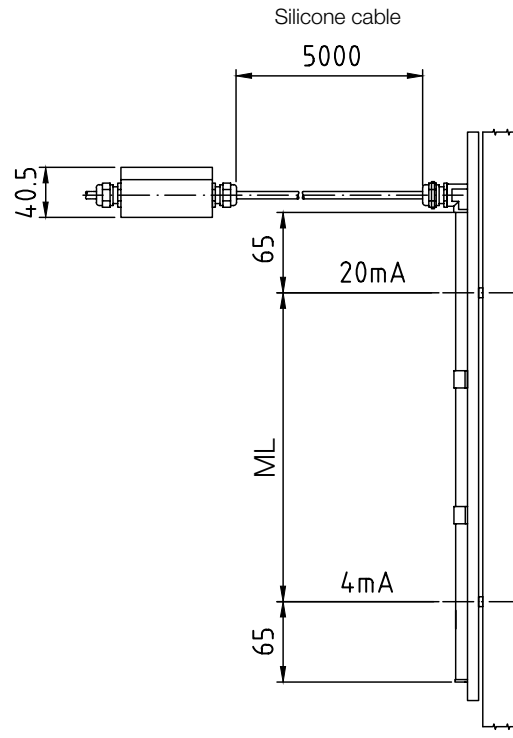
NBK... with transmitter  
options MU and TT



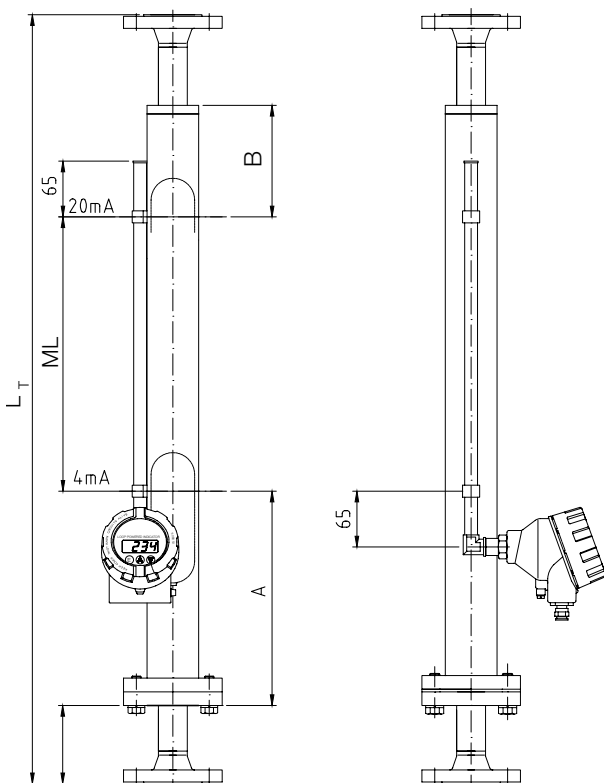
NBK... with transmitter options MS and TT



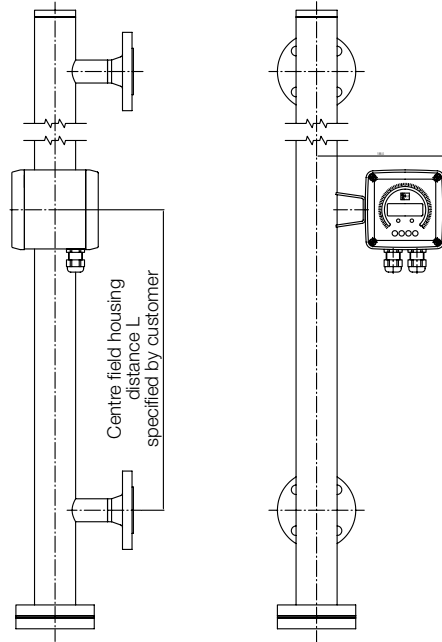
NBK... with transmitter options MK and TT



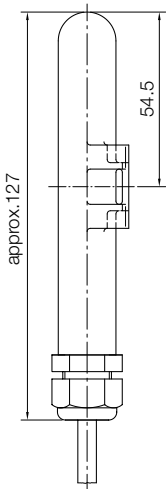
NBK... with transmitter display options AE/HE or AC/HC and option TT



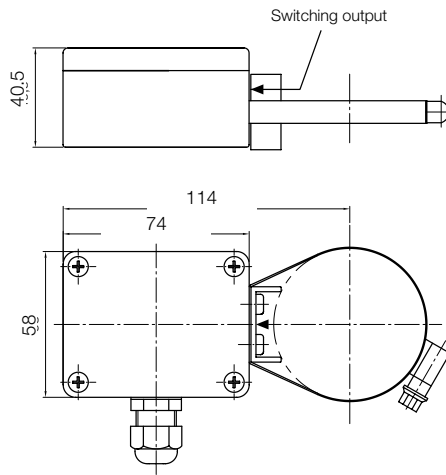
NBK-... with indicating unit ADI-1, option C



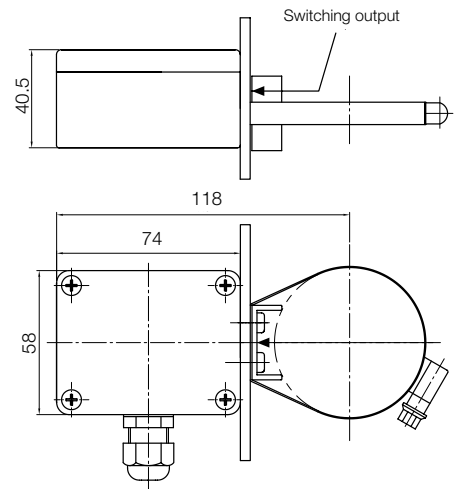
NBK-R



NBK-RT200



NBK-RT400



NBK-RV/RN

