

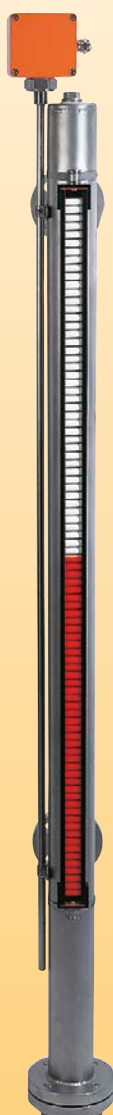


Bypass Level Indicators ATEX or GL Approval



measuring
•
monitoring
•
analysing

NBK -ATEX,-GL
-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. PN320
- Temperature:
 - 40 ... +400 °C (ceramic rollers)
 - 20 ... +100 °C (POM rollers)
 - 104 ... +200 °C (ball display)
 - 60 ... +100 °C (NBK-31, -32, -33)
- Viscosity: max. 200 mm²/s standard (option: 460 mm²/s, only NBK-03)
- Connection:
 - DIN flange DN 15... DN 50
 - ASME flange ½" ... 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

KOBOLD companies worldwide:

ARGENTINA, AUSTRALIA, AUSTRIA, BELGIUM, BULGARIA, CANADA, CHILE, CHINA, COLOMBIA, CZECHIA, EGYPT, FRANCE, GERMANY, GREAT BRITAIN, HUNGARY, INDIA, INDONESIA, ITALY, MALAYSIA, MEXICO, NETHERLANDS, PERU, POLAND, REPUBLIC OF KOREA, ROMANIA, SINGAPORE, SPAIN, SWITZERLAND, TAIWAN, THAILAND, TUNISIA, TURKEY, USA, VIETNAM

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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:

ATEX version

The bypass level indicators are supplied with ATEX approval. Limit contacts and an immersible magnetic probe (reed contact chain) with ATEX approval are available for level measurement and monitoring. The electrical components have their own ATEX-certification.

ATEX approval:


Bypass-level indicator:  II 2G Ex mb IIC T5/T6 Gb

Limit contact NBK-RA:  II 2D Ex mb IIIC IP67 T 105°C Db
Reed contact

resistance chain:

 II 1GD Ex ia IIC T6 Ga

 II 1/2G Exd IIC T6 Ga/Gb

 II 1/2D Ex tb IIIC T85°C Da/Db

GL version

In the pressure on stages PN 16 (NBK-03) and PN 40 (NBK-06) the bypass level indicators are available with GL approval (Germanischer Lloyd).

Certificate-No. GL: 79 786-95 HH

Magnetic roller/ball indicator

As the float passes by, the red/white rollers/balls 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 immersible magnetic probe (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.)

Limit contacts

One or more immersible 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 EN1092-1 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:	-40 ... +400 °C (ceramic rollers) -20 ... +100 °C (POM rollers) -104 ... +200 °C (ball display) -60 ... +100 °C (NBK-31, -32, -33)
Viscosity:	max. 200 mm ² /s standard (Option: up to max. 460 mm ² /s for NBK-03)
Max. meas. length:	up to 5500 mm single-part; longer two-part or multipart (not for GL-Approval)

Overall length: see dimension drawing

Roller display model RP (max. length 5500 mm)

Material roller:	POM
Display glass:	PMMA
Carrier frame material:	aluminium, black anodised
Operat. temperature:	-20 ... 100 °C
Protection:	IP54
Approval:	ATEX and GL

Roller display model RK (max. length 5500 mm)

Material roller:	Ceramic
Display glass:	borosilicate glass
Carrier frame material:	aluminium, black anodised
Operat. temperature:	-40 ... 400 °C
Protection:	IP54
Approval:	ATEX

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

Material ball:	PA
Sight tube:	PMMA
Sealing plug:	aluminium
Seal:	NBR
Ball support rail:	aluminium, black anodised
Carrier frame:	stainless steel 1.4301



Technical Details (continuation)

Scale: PVC,
stainless steel 1.4301 (option MV)
Medium temperature: -20... +80 °C
Ambient temperature: -20... +80 °C
Protection: IP66

Ball display model KM

(max. length 3 800 mm one-piece)*

Material ball: PA - high temperature strength
Sight tube: PC
Sealing plug: aluminium
Seal: FKM
Ball support rail: aluminium, black anodised
Carrier frame: stainless steel 1.4301
Scale: PVC,
stainless steel 1.4301 (option MV)
Medium temperature: -60... +120 °C
Ambient temperature: -20... +80 °C
Protection: IP66

Ball display model KF

(max. length 3 800 mm one-piece)*

Filling: silicone oil
Material ball: PA - high temperature strength
Sight tube: PC
Sealing plug: stainless steel 1.4571
Seal: FKM
Ball support rail: aluminium, black anodised
Carrier frame: stainless steel 1.4301
Scale: Hart-PVC,
stainless steel 1.4301 (option MV)
Medium temperature: -104... +120 °C
Ambient temperature: -20... +80 °C
Protection: IP66

Ball display model KG (max. length 3 000 mm one-piece)*

Material ball: PA - high temperature strength
Sight tube: borosilicate glass
Sealing plug: stainless steel 1.4571
Seal: FKM
Ball support rail: aluminium, black anodised
Carrier frame: stainless steel 1.4301
Scale: stainless steel 1.4301
Medium temperature: -20... +200 °C
Ambient temperature: -20... +200 °C
Protection: IP66

* In case of multi port design, a display length from 32 mm is not readable

ATEX approval

ATEX limit contact, model NBK-RA

Contact operation: bistable changeover contact encapsulated
Switching hysteresis: approximately 15 mm
Max. switch. capacity: 45 VA, 230 V_{AC/DC}, 0.6 A

Temperature class: T5/T6
Max. ambient temp.: 70 °C / 85 °C
Connection: 3 m PVC-cable
Housing: metallic, cast
(GD-ZN Al 4 Cu1)
Protection: IP67
ATEX marking: II 2G Ex mb IIC T5/T6 Gb
 II 2D Ex mb IIIC IP67 T 105 °C Db

Limit contacts high temperature, model NBK-RT200 in conjunction with an external, intrinsically safe Isolated Switch Amplifier as »Simple Apparatus«

Contact operation: bistable changeover contact
Switching hysteresis: approx. 15 mm
max. switching capacity: 80 VA; 250 V_{AC/DC}, 1 A
Resistance: < 20 mΩ
Medium temperature: max. 200 °C
Ambient temperature: max. 145 °C
Housing: Aluminium pressure-cast,
terminal connection
Protection: IP65

Limit contact high temperature model NBK-RV200NO in conjunction with an external, intrinsically safe Isolated Switch Amplifier as »Simple Apparatus«

Sensor type: contact
Switching function: N/O, bistable
Medium temperature: -104... +200 °C
Ambient temperature: -40... +70 °C
max. operating voltage
U_{max}: 30 V_{AC/DC}
Max. load current I_{max}: 100 mA
Max. switch capacity
P_{max}: 1.2 W
Housing: Aluminium pressure-cast,
terminal connection
Electrical connection: cable gland M20×1.5 (PVC)
Protection housing: IP65

Attention should be paid, that none of the three parameters U_{max}, I_{max} and P_{max} are allowed to be exceeded!

Limit contact model NBK-RV200NC in conjunction with an external, intrinsically safe Isolated Switch Amplifier as »Simple Apparatus«

Sensor type: contact
Switching function: N/C, bistable
Other data: as for NBK-RV200NO

Technical Details (continuation)

Limit contact model NBK-RN200NO in conjunction with an external, intrinsically safe Isolated NAMUR Switch Amplifier as »Simple Apparatus«

Sensor type: NAMUR
Switching function: N/O, bistable
max. operating voltage

U_{max} : 15 V_{DC}
Other data: as for NBK-RV200NO


Limit contact model NBK-RN200NC in conjunction with an external, intrinsically safe Isolated NAMUR Switch Amplifier as »Simple Apparatus«

Sensor type: NAMUR
Switching function: N/C, bistable
max. operating voltage

U_{max} : 15 V_{DC}
Other data: as for NBK-RV200NO

ATEX reed contact resistor chain model: ...2....

In protection type intrinsically safe Ex ia IIC only for connection to a certified intrinsically safe current loop with the following maximum values:

Total resistance: 0.7 ... 7 kΩ
Max. voltage: $U_i = 24$ V
Max. capacity: $P_i = 1.2$ W
Temperature class: T6
Resolution: 10 mm
Housing: Aluminium pressure-cast
Protection: IP 65
ATEX marking:  II 1GD Ex ia IIC T6 Ga

ATEX immersible reed contact resistor chain options E/R/B only in connection with an external intrinsically safe power supply

Option E

Transmitter model: 5333D

Common specifications:

Power supply: 8.0 ... 35 V_{DC}
Communication interface: Loop Link 5905
Linear resistance input: 0 ... 10 kΩ

Current Output:

Signal range: 4 ... 20 mA
Min. signal range: 16 mA
Updating time: 135 ms
Load resistance: $\leq (V_{supply} - 8V) / 0.023$ [Ω]

Sensor error detection:

Programmable: 3.5 ... 23 mA
NAMUR NE43 upscale: 23 mA (factory default)
NAMUR NE43
Downscale: 3.5 mA
Data for intrinsically

safe current circuit: see instruction manual

U_i : 28 V_{DC}
 I_i : 120 mA_{DC}
 P_i : 0.84 W
 L_i : 10 μH
 C_i : 1.0 nF

ATEX approval transmitter:

KEMA 03ATEX1535:  II 1G Ex ia IIC T4 or T6
 II 1D Ex iaD

Max. ambient temp. for T1...T4: 85 °C
Max. ambient temp. for T5 and T6: 60 °C
Applicable in zone: 0, 1, 2, 20, 21 or 22
Medium temperature: -40 ... +120 °C (with option N up to 250 °C)
Ambient temperature: -40 ... +80 °C
Resolution: 10 mm
Housing: Aluminium pressure-cast
Protection: IP 66

Option R

Transmitter model: 5337D

Common specifications:

Power supply: 8.0 ... 35 V_{DC}
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: $\leq (V_{supply} - 8V) / 0.023$ [Ω]

Sensor error detection:

Programmable: 3.5 ... 23 mA
23 mA (factory default)

Data for intrinsically safe current circuit: see instruction manual

ATEX approval transmitter:

KEMA 03 ATEX 1537:  II 1G Ex ia IIC T6 or T4 Ga
 II 1D Ex ia IIC Da

Max. ambient temp. for T1...T4: 85 °C
Max. ambient temp. for T5 or T6: 60 °C
Applicable in zone: 0, 1, 2, 20, 21 or 22
Medium temperature: -40 ... +120 °C (with option N up to +250 °C)
Ambient temperature: -40 ... +80 °C
Resolution: 10 mm
Housing: Aluminium pressure-cast
Protection: IP 66



Technical Details (continuation)

Option B

Transmitter model: 5350B

Common specifications:

Power supply: 9...32 V_{DC}
 Consumption: < 11 mA
 Isolation voltage, test / operation: 1.5 kV_{AC} / 50 V_{AC}
 Signal / noise ratio: min. 60 dB
 Response time (programmable): 1...60 s
 Updating time: < 400 ms
 Dimensions: Ø 44 x 20.2 mm
 Linear resistance input: 0...10 kΩ

Output:

Foundation™ Fieldbus® connection:

Foundation™
 Fieldbus® version: ITK 4.6
 Foundation™
 Fieldbus® capability: Basic or LAS
 Foundation™
 Fieldb. function blocks: 2 analogue and 1 PID

Profibus® PA connection:

Profibus® PA
 protocol standard: EN 50170 vol. 2
 Profibus® PA
 function blocks: 2 analogue
 Data for intrinsically safe current circuit: see instruction manual

ATEX approval transmitter:

KEMA 02ATEX1318: II 1 G Ex ia IIC T4...T6 or II 2 (1) G Ex ib [ia] IIC T4...T6 II 1 D Ex iaD
 Applicable in zone: 0, 1, 2, 20, 21 or 22
 Medium temperature: -40...+120 °C (with option N up to +250 °C)
 Ambient temperature: -40...+80 °C
 Resolution: 10 mm
 Housing: Aluminium pressure-cast
 Protection: IP66

Option 4

Total resistance: 0.7...7 kΩ
 Max. voltage: U: 24 V_{DC}
 Max. capacity: 125 mW
 Temperature class: T6
 Resolution: 10 mm
 Housing: Aluminium pressure-cast
 Protection: IP65
 Explosion proof version: II 1/2G Ex d IIC T6 Ga/Gb

Option L

Transmitter model: 5333D

Common specifications:

Power supply: 8.0...35 V_{DC}
 Communication interface: Loop Link 5905
 Linear resistance input: 0...10 kΩ
Current Output:
 Signal range: 4...20 mA
 Min. signal range: 16 mA
 Updating time: 135 ms
 Load resistance: ≤ (V_{supply} - 8V) / 0.023 [Ω]

Sensor error detection:

Programmable: 3.5...23 mA
 NAMUR NE43 upscale: 23 mA (factory default)
 NAMUR NE43
 downscale: 3.5 mA

LED or LCD display (options LE/LC):

Power supply: loop powered
 Voltage: LED 3.3 V at 4 mA
 3.7 V at 20 mA
 LCD max. 2.5 V
 Medium temperature: -40...+120 °C (with option N up to 250 °C)
 Ambient temperature: -40...+80 °C
 Resolution: 10 mm
 Housing: Aluminium pressure-cast
 Protection: IP66



Technical Details (continuation)

Option K

Transmitter model: 5337D

Common specifications:

Power supply: 8.0...35 V_{DC}
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: $\leq (V_{\text{supply}} - 8) / 0.023 [\Omega]$

Sensor error detection:

Programmable: 3.5...23 mA
23 mA (factory default)

LED or LCD display (Options KE/KC):

Power supply: Loop powered
Voltage drop: LED 3.3 V at 4 mA
3.7 V at 20 mA
LCD max. 2.5V
Medium temperature: -40...+120 °C (with option N up to 250 °C)
Ambient temperature: -40...+80 °C
Resolution: 10 mm
Housing: Aluminium pressure-cast
Protection: IP66

Option N

Transmitter model: 5350A

Common specifications:

Power supply: 9...32 V_{DC}
Consumption: <11 mA
Isolation voltage, test / operation: 1.5 kV_{AC} / 50 V_{AC}
Signal / noise ratio: min. 60 dB
Response time (programmable): 1...60 s

Updating time: <400 ms
Dimensions: Ø 44 x 20.2 mm
Linear resistance input: 0...10 kΩ

Output:



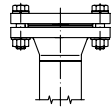
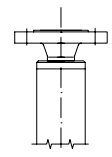
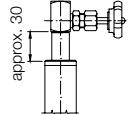

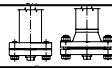
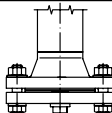
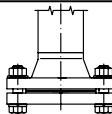
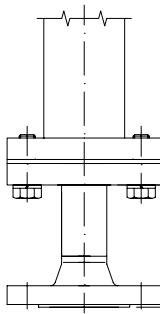
Foundation™ Fieldbus® connection:

Foundation™
Fieldbus® version: ITK 4.6
Foundation™
Fieldbus® capability: Basic or LAS
Foundation™
Fieldb. function blocks: 2 analogue and 1 PID

Profibus® PA connection:

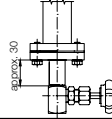
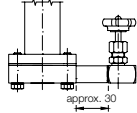
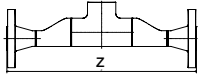


Profibus® PA
protocol standard: EN 50170 vol. 2
Profibus® PA
function blocks: 2 analogue
Medium temperature: -40...+120 °C (with option N up to 250 °C)
Ambient temperature: -40...+80 °C
Resolution: 10 mm
Housing: Aluminium pressure-cast
Protection: IP66

Options for NBK with ATEX or GL approval

Code	Description	Sketch/picture	Availability
Top bypass tube connections			
V0	Without vent plug		NBK-03/06/07* NBK-10/31/32/33 standard
VG	With vent plug G 1/2		NBK-10 NBK-03/06/07, standard*
VF ¹⁾	Flange connection DN50 (pressure rating as process flange)		NBK-03/06/07/10*
VA ¹⁾	Flange connection 2" ASME (pressure rating as process flange)		NBK-03/06/07/10*
V4	Vent flange DN15, stainless steel 1.4571 (pressure rating as process flange)		NBK-03/06
V5	Vent flange DN20, stainless steel 1.4571 (pressure rating as process flange)		NBK-03/06
V6	Vent flange DN25, stainless steel 1.4571 (pressure rating as process flange)		NBK-03/06
V7	Vent flange 1/2" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		NBK-03/06
V8	Vent flange 3/4" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		NBK-03/06
V9	Vent flange 1" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		NBK-03/06
V2	Vent valve NAD-MMN15, 1/2" NPT, stainless steel 316Ti, max. temp.: +120°C		
V3	Vent valve NAD-MMR15, G 1/2, stainless steel 1.4571, max. temp.: +120°C	NBK-03/06 (not for GL approval)	
¹⁾ Not possible with transmitter options E/R/B			
Bottom bypass tube connections			
D0	Without drain plug		NBK-03/06/07 ²⁾ NBK-10/31/32/33 standard
DG	With drain plug G 1/2	NBK-03/06  NBK-07/10	NBK-10 NBK-03/06/07, standard ²⁾
DF	Flange connection DN50 (pressure rating as process flange), with drain plug G1/2		NBK-03/06
DA	Flange connection 2" ASME (pressure rating as process flange), with drain plug 1/2" NPT		NBK-03/06
DC	Flange connection DN50 (pressure rating as process flange), without drain plug		NBK-03/06/07 ²⁾
DD	Flange connection 2" ASME (pressure rating as process flange), without drain plug		NBK-03/06/07 ²⁾
EF	Drain flange DN15, stainless steel 1.4571 (pressure rating as process flange)		NBK-03/06
E5	Drain flange DN20, stainless steel 1.4571 (pressure rating as process flange)		NBK-03/06
E6	Drain flange DN25, stainless steel 1.4571 (pressure rating as process flange)		NBK-03/06
E7	Drain flange 1/2" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		NBK-03/06
E8	Drain flange 3/4" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		NBK-03/06
E9	Drain flange 1" ASME, stainless steel 1.4571 (316Ti) (pressure rating as process flange)		NBK-03/06

²⁾ GL-Approval only for NBK-03/06

Options (continuation)

Code	Description	Sketch/picture	Availability
F1	Drain valve NAD-MMR15, G½, stainless steel 1.4571, max. temp.: +120°C		NBK-03/06 (not for GL approval)
F2	Drain valve NAD-MMN15, ½" NPT, stainless steel 316Ti, max. temp.: +120°C		NBK-03/06 (not for GL approval)
DS	Drain socket DN15	see sketch	NBK-03
D2	Drain valve NAD-MMN15, ½" NPT, horizontally mounted, stainless steel 1.4571 (316Ti), max. temp.: +120°C		NBK-03/06 (not for GL approval)
D3	Drain valve NAD-MMR15, G ½, horizontally mounted, stainless steel 1.4571 (316Ti), max. temp.: +120°C		NBK-03/06 (not for GL approval)
RF ⁴⁾	Dead space free version DN25, stainless steel 1.4571 (pressure rating as process flange)		NBK-06
RA ⁴⁾	Dead space free version 1" ASME, stainless steel 31.4571 (316Ti) (pressure rating as process flange)		NBK-03/06
Process connection options			
ST	1 x process connection side, 1 process connection vertical on top	see sketch	NBK-03/06/07/10 ³⁾
TS	1 x process connection side, 1 process connection vertical at bottom	see sketch	NBK-03/06/07/10 ³⁾
TT	2 x process connection vertical, up to DN25 or 1" ASME	see sketch	NBK-03/06/07/10 ³⁾
Scales			
(Ball displays are always delivered with scales, see technical data/ sketch for resolution)			
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 (not for GL approval)
M1	Measuring scale, medium temperature -40°C ... +400°C, engraved scale made of aluminium	see sketch	NBK-03/06/07/10/31/32/33 (not for GL approval)
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 (not for GL approval)
Thermal screening			
N	Thermal screening for sensor	see sketch	NBK-03/06/07/10/31/32/33 (not for GL approval)
Electrical Outputs			
MU ⁵⁾	Option with connection box at bottom, for easy access to connection box		NBK-03/06/07/10
MS ⁵⁾	Option and connection box at 100 mm distance, max. medium temperature = +300°C (Thermal screening option N mandatory with this option)		NBK-03/06/07/10
Display options			
LE	Aluminium die-cast housing, LED digital display, connection box at bottom (only in combination with transmitter option L)		NBK-03/06/07/10
LC	Aluminium die-cast housing, LCD digital display, connection box at bottom (only in combination with transmitter option L)	as LE, however with LCD display	NBK-03/06/07/10
KE	Aluminium die-cast housing, LED digital display, connection box at bottom (only in combination with transmitter option K)		NBK-03/06/07/10
KC	Aluminium die-cast housing, LCD digital display, connection box at bottom (only in combination with transmitter option K)	as KE, however with LCD display	NBK-03/06/07/10

³⁾ GL-Approval only for NBK-03/06

⁴⁾ On request

⁵⁾ Only in addition with optional sensor/transmitter



Options (continuation)

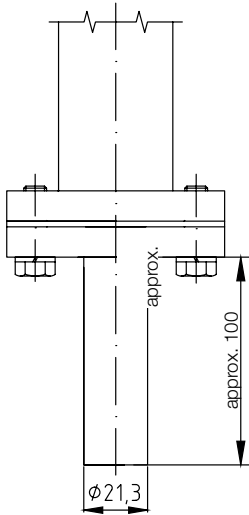
Code	Description	Sketch/picture	Availability
Additional options			
A	Connection flange for 2-part version (not possible with sensor), split roller display and scale possible.	see sketch	NBK-03/06/07/10 (not for GL approval)
HL	Retaining plate, centric between process connections, necessary from L > 5000 mm (alternative option HF)	see sketch	NBK-03/06/07/10/31/32/33
HF	Retaining flange, centric between process connections, necessary from L > 5000 mm (alternative option HL)	see sketch	NBK-03/06/07/10/31/32/33
Tests / certificates			
P	Radiographic examination DIN 54 111 T1 (only for V-seam)	-	NBK-03/06/07/10/31/32/33
Q	Dye penetration test DIN EN 571-1	-	NBK-03/06/07/10/31/32/33
X	Pressure test with water 1.5 x PN	-	NBK-03/06/07/10/31/32/33
Z	Material certificate 3.1 acc. to EN 10204	-	NBK-03/06/07/10/31/32/33
MR	Material acc. to NACE MR 0103/ISO15156 (MR0175), Declaration of conformance	-	NBK-03/06/07/10/31/32/33
WV	Positive Material Identification (PMI)	-	NBK-03/06/07/10/31/32/33
SF	Oil and fat free	-	NBK-03/06/07/10/31/32/33

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

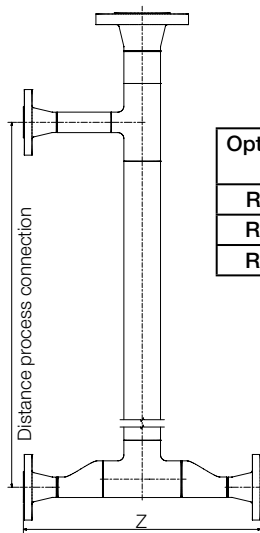


Sketches of selected options

Option DS

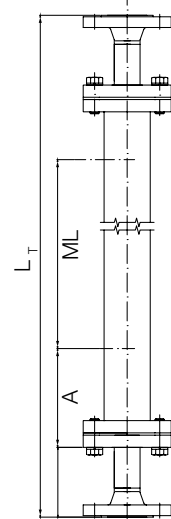


Option RF/RA

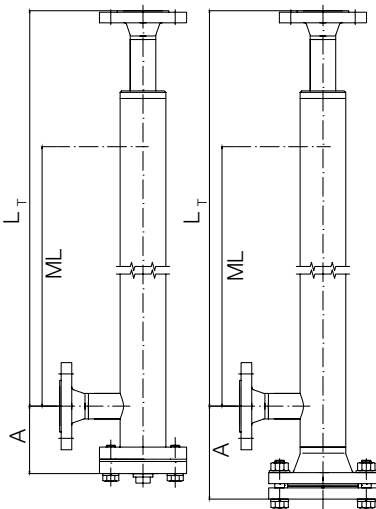


Option	Process connection below	Dimension Z
RF	V-flange DN25 PN40	approx. 360
RA	V-flange CI 150 1"	approx. 390
RA	V-flange CI 300 1"	approx. 405

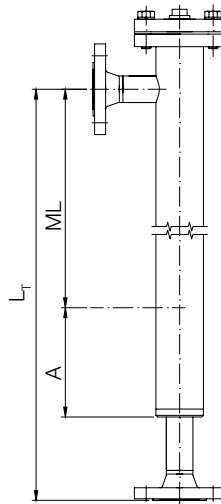
Option TT



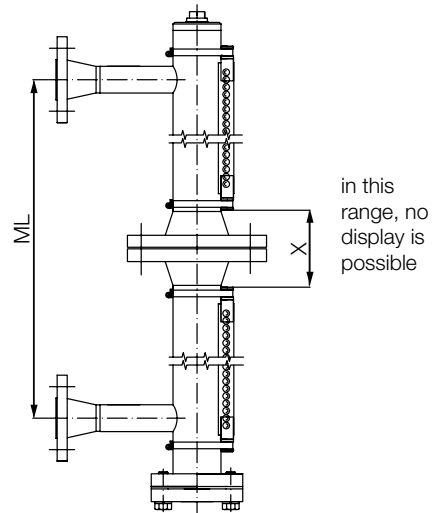
Option ST



Option TS

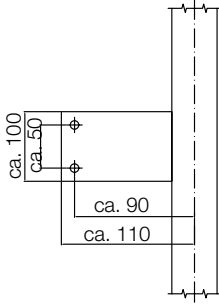


Option A

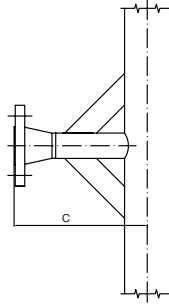


Model	Dimension X
NBK-03	92
NBK-06	98
NBK-07	127
NBK-10	139

Option HL
(centred to dimens. L)

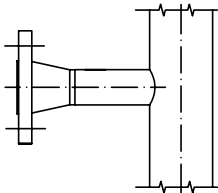


Option HF
(centred to dimens. L)

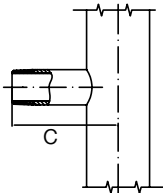


Options process connection

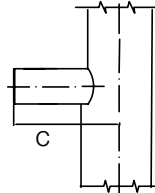
Option F/A



Option R/N

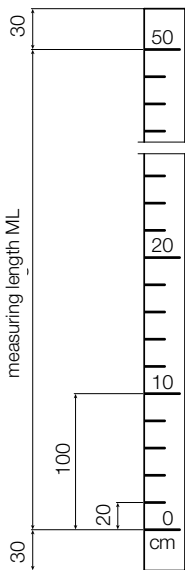


Option S



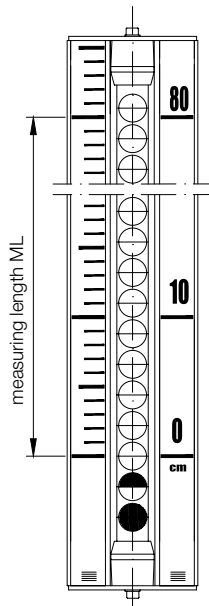
Measuring scale, aluminium

- Option M1 - engraved scale
- Option M2 - polyester foil



Measuring scale screen print st. steel carrier

(standard scope of supply with ball display)



Float models (closed design)

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

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



ATEX version

Order Details (Example: **NBK-03 F15 00 1 A 0**)

Model	Rated pressure	Conne- ction	Nominal size	Roller/ ball indicator	Sensor/ Transmitter	Medium density float	Options
NBK-03...	PN 16/Class 150	F = DIN-flange A = ASME-flange R³⁾ = R-male thread N³⁾ = NPT-male thread S⁴⁾ = welding-nipple	15 = DN 15, 1/2" 20 = DN 20, 3/4" 25 = DN 25, 1" 32 = DN 32, 1 1/4" 40 = DN 40, 1 1/2" 50 = DN 50, 2" XX = special-connection ⁷⁾	00 = without roller RP = POM roller RK = ceramic roller KP¹⁾ = ball display with Plexi-glas [®] -sight tube	1 = without electrical attached parts ATEX II 1G / 2G D 2²⁾ = with reed contact chain II 1GD Exia IIC T6 E²⁾ = immersible magnetic probe (reed chain)/ 4 - 20 mA, 2-wire, ATEX Exia R²⁾ = immersible magnetic probe (reed chain)/ 4 - 20 mA, HART [®] , 2-wire, ATEX Exia B²⁾ = immersible magnetic probe (reed chain)/ Profibus [®] PA Foundation [™] Fieldbus [®] , ATEX Exia 4²⁾ = with reed contact chain ATEX II 1/2G Exd IIC T6 Ga/Gb L²⁾ = immersible magnetic probe (reed chain)/ 4 - 20 mA, 2-wire, ATEX Exd K²⁾ = immersible magnetic probe (reed chain)/ 4 - 20 mA, HART [®] , 2-wire, ATEX Exd N²⁾ = immersible magnetic probe (reed chain)/ Profibus [®] PA Foundation [™] Fieldbus [®] , ATEX Exd	A = 1.0 kg/dm ³ , titan for viscosity up to 200 cP B⁶⁾ = 0.90 kg/dm ³ , titan for viscosity up to 200 cP C = 0.80 kg/dm ³ , titan for viscosity up to 200 cP D = 0.70 kg/dm ³ , titan for viscosity up to 200 cP E = 0.60 kg/dm ³ , titan for viscosity up to 200 cP F⁶⁾ = 0.54 kg/dm ³ , titan for viscosity up to 200 cP V⁵⁾ = 1.0 kg/dm ³ , stainless steel for viscosity up to 460 mm ² /s W⁵⁾ = 0.8 kg/dm ³ , stainless steel for viscosity up to 460 mm ² /s Y = special density, titan (specify in clear text) H = high pressure float, CF340 viscosity up to 200 cP (medium S. G.: ≥ 0,8; specify in clear text writing)	0 = 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... ¹⁾	PN 160/Class 900	F = DIN-flange A = ASME-flange	15 = DN 15, 1/2" 20 = DN 20, 3/4" ⁸⁾ 25 = DN 25, 1"	KM¹⁾ = ball display with Makrolon [®] -sight tube KF¹⁾ = like KM but with oil filling KG¹⁾ = ball display with borosilicate sight tube	4²⁾ = with reed contact chain ATEX II 1/2G Exd IIC T6 Ga/Gb L²⁾ = immersible magnetic probe (reed chain)/ 4 - 20 mA, 2-wire, ATEX Exd K²⁾ = immersible magnetic probe (reed chain)/ 4 - 20 mA, HART [®] , 2-wire, ATEX Exd N²⁾ = immersible magnetic probe (reed chain)/ Profibus [®] PA Foundation [™] Fieldbus [®] , ATEX Exd	A = 1.0 kg/dm ³ , titan for viscosity up to 200 cP B⁶⁾ = 0.90 kg/dm ³ , titan for viscosity up to 200 cP C = 0.80 kg/dm ³ , titan for viscosity up to 200 cP D = 0.70 kg/dm ³ , titan for viscosity up to 200 cP E = 0.60 kg/dm ³ , titan for viscosity up to 200 cP F⁶⁾ = 0.54 kg/dm ³ , titan for viscosity up to 200 cP V⁵⁾ = 1.0 kg/dm ³ , stainless steel for viscosity up to 460 mm ² /s W⁵⁾ = 0.8 kg/dm ³ , stainless steel for viscosity up to 460 mm ² /s Y = special density, titan (specify in clear text) H = high pressure float, CF340 viscosity up to 200 cP (medium S. G.: ≥ 0,8; specify in clear text writing)	0 = without options or options as in list and description (see separate options list)
NBK-32... ¹⁾	PN 250/Class 1500						
NBK-33... ¹⁾	PN 320						
NBK-RA	ATEX limit contact, encapsulated, Ex II2G EEx m II T6/T5						
NBK-RT200	limit contact high-temperature max. 200 °C; "Simple Apparatus", zone 1						
NBK-RV200NO	limit contact, bistable, N/O, max. +200 °C (suitable for vessels with strong vibrations); "Simple Apparatus", zone 1						
NBK-RV200NC	limit contact, bistable, N/C, max. +200 °C (suitable for vessels with strong vibrations); "Simple Apparatus", zone 1						
NBK-RN200NO	limit contact, bistable, NAMUR, N/O, max. +200 °C (suitable for vessels with strong vibrations); "Simple Apparatus", zone 1						
NBK-RN200NC	limit contact, bistable, NAMUR, N/C, max. +200 °C (suitable for vessels with strong vibrations); "Simple Apparatus", zone 1						

¹⁾ In preparation

²⁾ See separate ATEX certification of model MM-...



GL version

Order Details (Example: **NBK-03 F15 00 5 A 0**)

Model	Nominal pressure	Connection	Nominal size	Roller / ball indicator	Sensor / Transmitter	Medium density float	Options
NBK-03...	PN 16 / Class 150	F = DIN-flange A = ASME-flange R = R-thread N = NPT-thread	15 = DN 15, 1/2" 20 = DN 20, 3/4" 25 = DN 25, 1" 32 = DN 32, 1 1/4"	00 = without RP = POM-roller	5 = without electrical attached parts	A = 1.0 kg/dm ³ , Titan B = 0.90 kg/dm ³ , Titan C = 0.80 kg/dm ³ , Titan D = 0.70 kg/dm ³ , Titan E = 0.60 kg/dm ³ , Titan F⁶⁾ = 0.54 kg/dm ³ , Titan V = 1.0 kg/dm ³ , stainless steel for viscosity up to 460 mm ² /s W⁹⁾ = 0.8 kg/dm ³ , stainless steel for viscosity up to 460 mm ² /s Y = special density, Titan (specify in clear text)	0 = without options or options as in list and description (see separate options list)
NBK-06...	PN 40 / Class 300						

³⁾ Only possible with nominal diameter code 15/20/25/32 (female thread on request)

⁴⁾ Only possible with NBK-03/06 and nominal size code 15/20/25/32

⁵⁾ Only possible with NBK-03

⁶⁾ Not possible with NBK-10

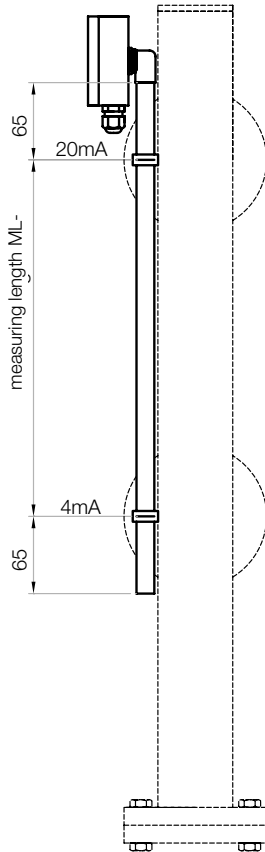
⁷⁾ Please specify in clear text

⁹⁾ Only possible for connection A, ASME

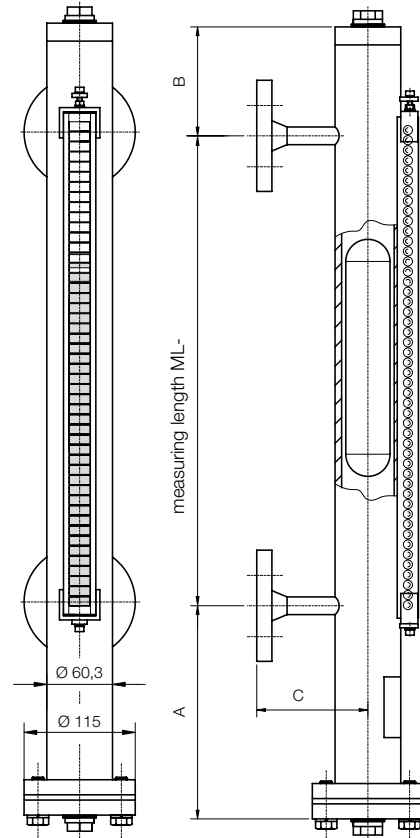
Measuring length L, density and temperature please specify in clear text!

Dimensions [mm]

NBK-ATEX version reed chain Model 2



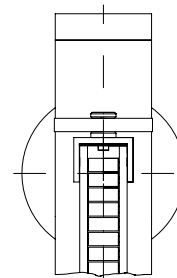
NBK-GL version



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



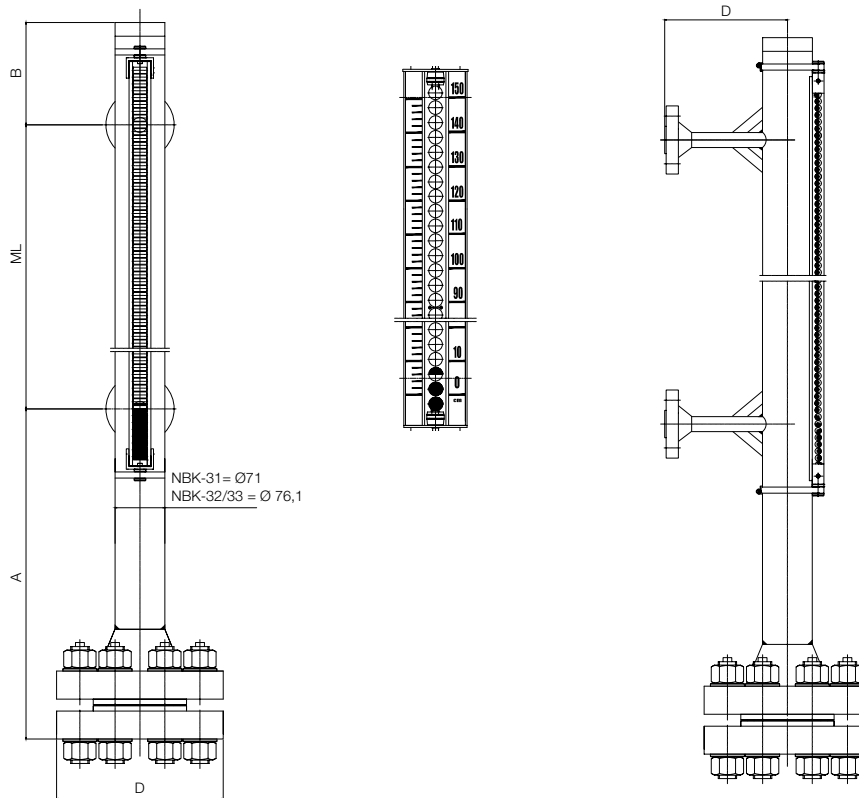
Clearance dimension A [mm]

Model	Rated pressure	Medium density					
		0.54 [kg/dm ³]	0.6 [kg/dm ³]	0.7 [kg/dm ³]	0.8 [kg/dm ³]	0.9 [kg/dm ³]	1 [kg/dm ³]
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 roller/ball indicator



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 up to +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.

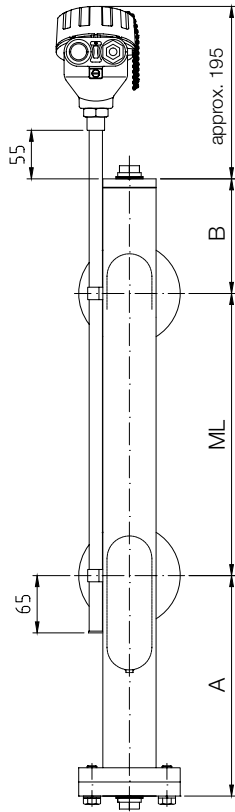
At intermediate temperatures e.g. 120 °C, a linear interpolation is to be carried out between 2 following creep resistance values, e.g. of 100 °C and 150 °C.

The pressure/temperature assignment is valid for the following flange models with sizes up to DN100 used by KOBOLD.

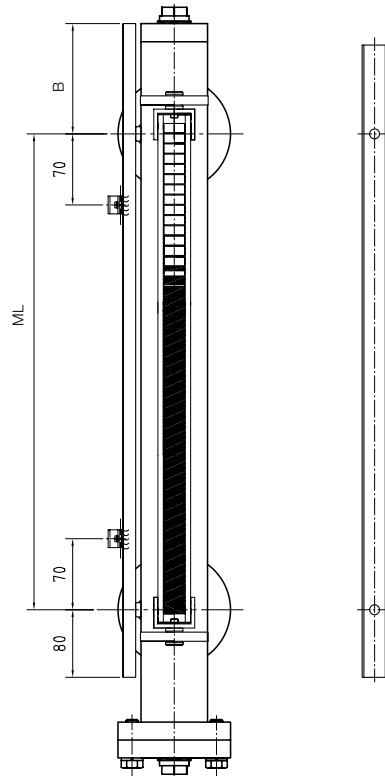
Model No. and nomination: 05 Blind flange, 11 Welding neck flange



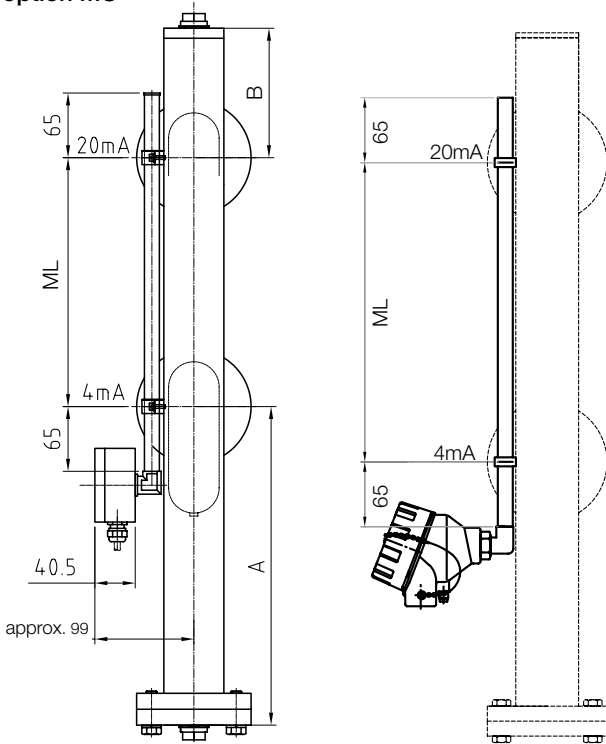
NBK-... with transmitter options E/R/B/4/L/K/N
(not possible with options VA/VF)



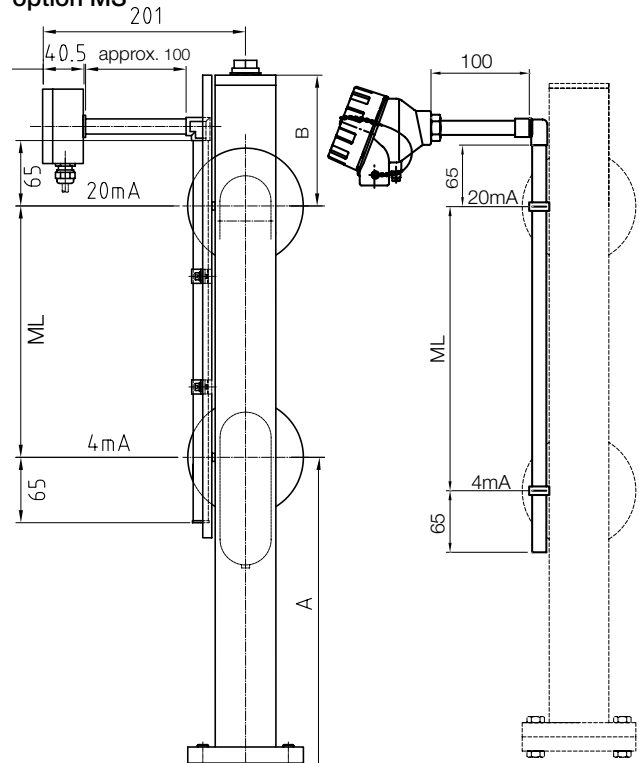
NBK-... with thermal screen option N



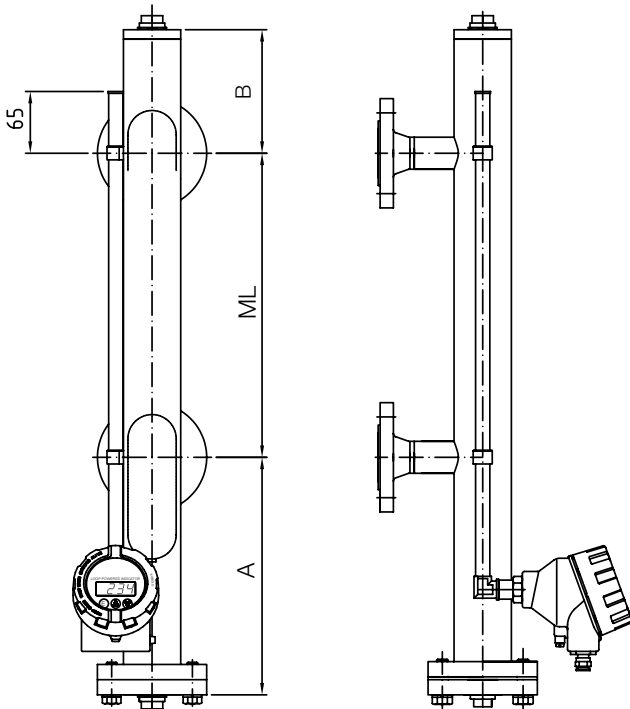
NBK-... with transmitter options 2/E/R/B/4/L/K/N and option MU



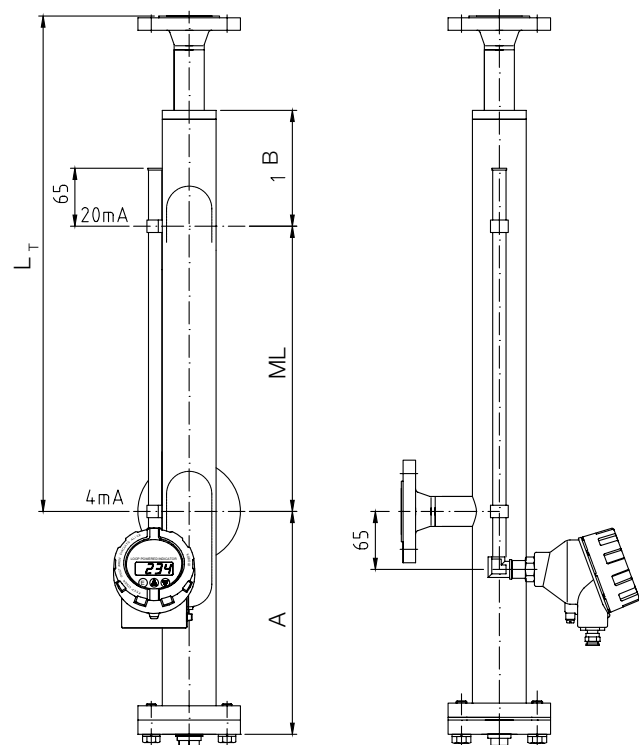
NBK-... with transmitter options 2/E/R/B/4/L/K/N and option MS



NBK-... with transmitter options E/R/L/K/ and display options LE/KE or LC/KC

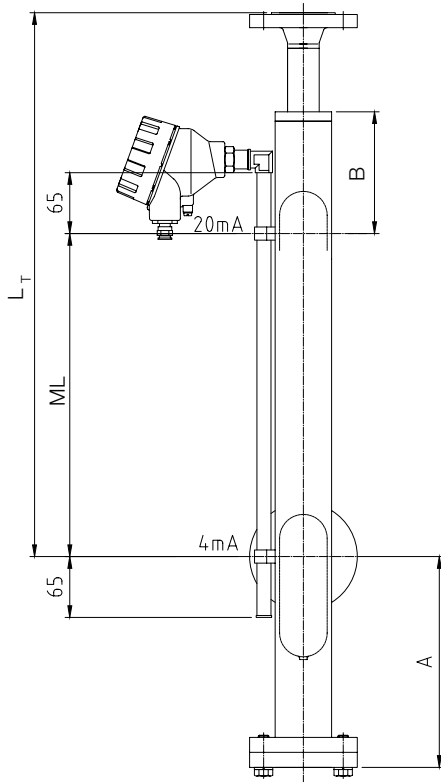


NBK-... with transmitter options E/R/L/K/ and display options LE/KE or LC/KC and option ST

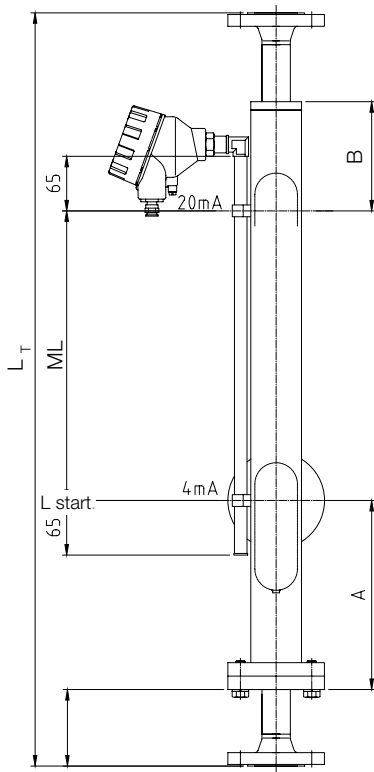




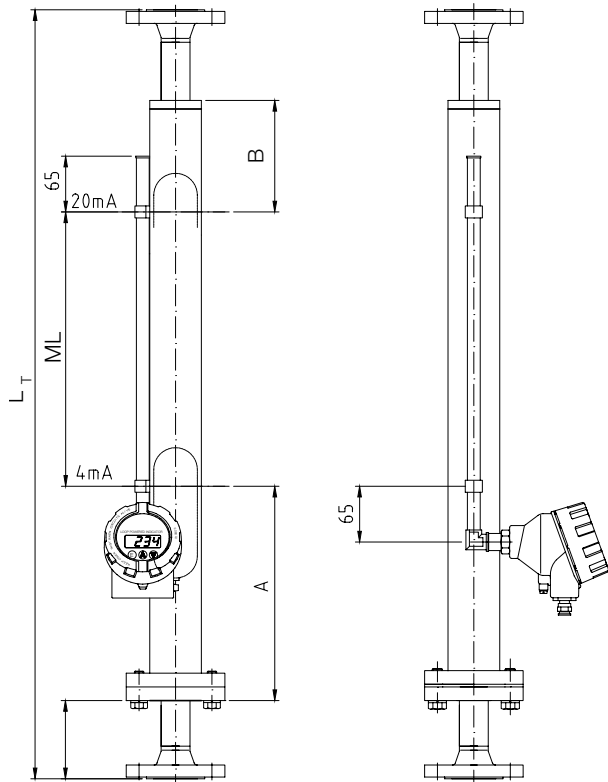
NBK-... with transmitter
model E/R/B/L/K/N option ST



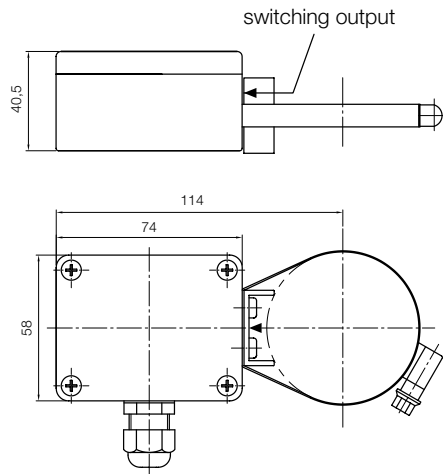
NBK-... with transmitter
model E/R/B/L/K/N option TT



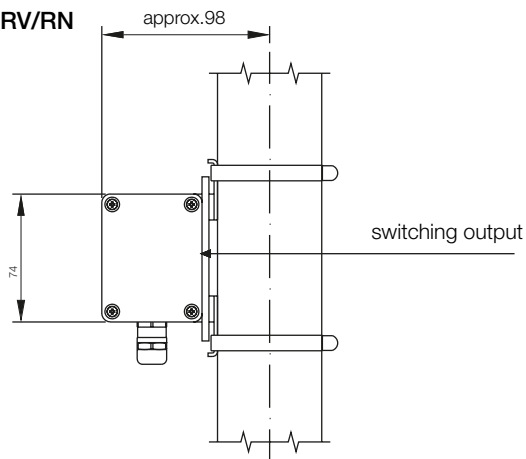
NBK-... with transmitter display options
LE/KE or LC/KC and option TT



NBK-RT200



NBK-RV/RN



NBK-RA

