

Operating Instructions for Bypass Level Indicator

Model: NBK-ATEX



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2. Note

Please read these operating instructions before unpacking and setting the unit into operation. Follow the instructions precisely as described herein.

The instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

The devices are only to be used, maintained and serviced by persons familiar with these operating instructions and in accordance with local regulations applying to Health & Safety and prevention of accidents.

When used in machines, the measuring unit should be used only when the machines fulfil the EC-guidelines.

Classification according to Pressure Equipment Directive 2014/68/EU NBK-03 to NBK-33

Category assignment for dangerous media (from diagram 1)								
	Density [kg/dm ³]	PN [bar]	Category	ML [mm]	Category	ML [mm]	Category	ML [mm]
NBK-03	1,0	16	← Cat. II →	4711	← Cat. III →	6000	- / -	
	0,9/0,8/0,7/ 0,6/0,54			4600		6000	- / -	
NBK-06	1,0	40		1698		6000	← Cat. IV →	∞
	0,9/0,8/0,7			1588		6000		∞
NBK-07	1,0	63		1060		6000		∞
	0,9/0,8/0,7			950		6000		∞
NBK-10	1,0	100		577		4084		∞
	0,9/0,8			467		3974		∞
NBK-31	1,0	160				≤2090		5600
	0,9					≤2020		5600
	0,8			≤1900	5400			
NBK-32	1,0	250		≤1180	5600			
	0,9			≤1110	5600			
	0,8			≤985	5400			
NBK-33	1,0	320		≤1040	5600			
	0,9			≤970	5500			
	0,8			≤830	5400			

ATTENTION! If the calculated bypass length is exactly within the range limit, then the stricter test method must be used

NBK-03 to -33 ATEX

Classification according to Pressure Equipment Directive 2014/68/EU NBK-03 to NBK-33

Category assignment for not dangerous media (from diagram 2)												
	Density [kg/dm ³]	PN [bar]	Kategorie	ML [mm]	Category	ML [mm]	Category	ML [mm]	Category	ML [mm]		
NBK-03	1,0	16	← Cat. I →	4711	← Cat. II →	6000	← Cat. III →	6000	- / -			
	0,9/0,8/0,7/ 0,6/0,54			4600		6000		6000	- / -			
NBK-06	1,0	40		1698		6000		6000	- / -			
	0,9/0,8/0,7			1588		6000		6000	- / -			
NBK-07	1,0	63		1060		6000		6000	∞			
	0,9/0,8/0,7			950		6000		6000	∞			
NBK-10	1,0	100		577		4084		6000	∞			
	0,9/0,8			467		3974		6000	∞			
NBK-31	1,0	160						≤2090	← Cat. IV →	5600	- / -	
	0,9							≤2020		5600	- / -	
	0,8				≤1900	5400	- / -					
NBK-32	1,0	250			≤1180	4410	5600					
	0,9				≤1110	4340	5600					
	0,8				≤985	4220	5400					
NBK-33	1,0	320			≤1040	4090	5600					
	0,9				≤970	4010	5500					
	0,8				≤830	3870	5400					

ATTENTION! If the calculated bypass length is exactly within the range limit, then the stricter test method must be used

3. Instrument Inspection

Instruments are inspected before shipping and sent out in perfect condition. Should damage to a device be visible, we recommend a thorough inspection of the delivery packaging. In case of damage, please inform your parcel service / forwarding agent immediately, since they are responsible for damages during transit.

Scope of delivery:

The standard delivery includes:

- Bypass Level Indicator model: NBK-...

4. Regulation Use

Any use of the Bypass level Indicator, model: NBK, which exceeds the manufacturer's specification, may invalidate its warranty. Therefore, any resulting damage is not the responsibility of the manufacturer. The user assumes all risk for such usage.

The NBK Bypass Level Indicator is used for continuous measurement, indication, and monitoring of liquids in tanks, vessels, reservoirs, basins etc. The indication occurs via a magnetically coupled roller indicator.

4.1 Bypass Measuring Tube System

The bypass tube is attached at the side of the vessel with a connecting flange or a threaded pipe. The installation position is always vertical. The NBK should only be used for liquids with the medium density specified on the nameplate. Otherwise the indication will deviate (float too high or submerged).

Vessel inner pressure and medium temperature should not exceed the specified maximum values, as this can lead to the destruction and malfunction of the bypass system. It is imperative that the materials used are compatible with the liquid being measured.

Proper operation is also impaired by:

- high degree of soiling
- suspended solids
- crystallisation
- ferrite particles

4.2 Electrical Limit Switches (option)

The optional electrical limit switches serve to signal a preset level.

For ATEX: NBK-RA: Bistable changeover contact as encapsulated proximity switch fitted in metallic cast housing with 3 m connection cable.

4.3 Reed Contact Resistance Chain (ATEX: options ...2/...E/...R/...B/...4/...L/...K/...N)

The optional reed contact resistance chain (model: MM..., see separate EC-Type Examination Certificate LOM14ATEX2075X) converts the liquid level to a resistance value. It serves to electrically transfer the level value. An optional available transmitter converts the resistance value into a standard signal (e.g. 4-20 mA).

Please pay attention to the maximum medium and ambient temperatures.

5. Operating Principle

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 or a monitoring device fitted outside the tube. The following indication and monitoring devices are available:

Magnetic roller indicator

As the float passes by, the red/white* rollers/balls are rotated in succession by 180° around their own axes. The rollers/balls change from white to red as the level rises and from red to white as the level falls. The advantage of ball displays 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 supply fails.

* ceramic rollers in orange/beige

Transmitter

To remotely transmit the level a transmitter with an immersible magnetic probe (chain of resistors) or a magnetostrictive transducer can be mounted outside the bypass tube. The contacts of a reed contact chain are connected or disconnected via the float movement in a non-contacting manner. Depending on the level the number of connected resistors changes and as a consequence the output of the total resistor value. A continuous standard signal of 4 to 20 mA is generated by means of a fitted transmitter. This standard signal can then be displayed on analogue or digital indicating devices.

Limit contacts

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

ATEX-version only NBK-03...NBK-10

The bypass level indicators are ATEX approved. For level evaluation, limit switches and a magnetic submersible probe (reed contact chain) with ATEX approval are offered. The electrical add-on parts have their own ATEX approval.

NBK-03 to -33 ATEX

ATEX approval:

Bypass-level indicator:

⊕ II 1/2G Ex h IIC T4...T1 Ga/Gb
-20 °C ≤ T_a ≤ +80 °C

or

⊕ II 1G/2D Ex h IIC/IIIC
T4...T1/T130 °C...445 °C Ga/Db
-20 °C ≤ T_a ≤ +80 °C

or

⊕ II 1/3G Ex h IIC T4...T1 Ga/Gc
-20 °C ≤ T_a ≤ +80 °C

or

⊕ II 1G/3D Ex h IIC/IIIC
T4...T1/T130 °C...445 °C Ga/Dc
-20 °C ≤ T_a ≤ +80 °C

Limit contact NBK-RA:

⊕ II 2D Ex mb IIIC IP67 T 105 °C Db

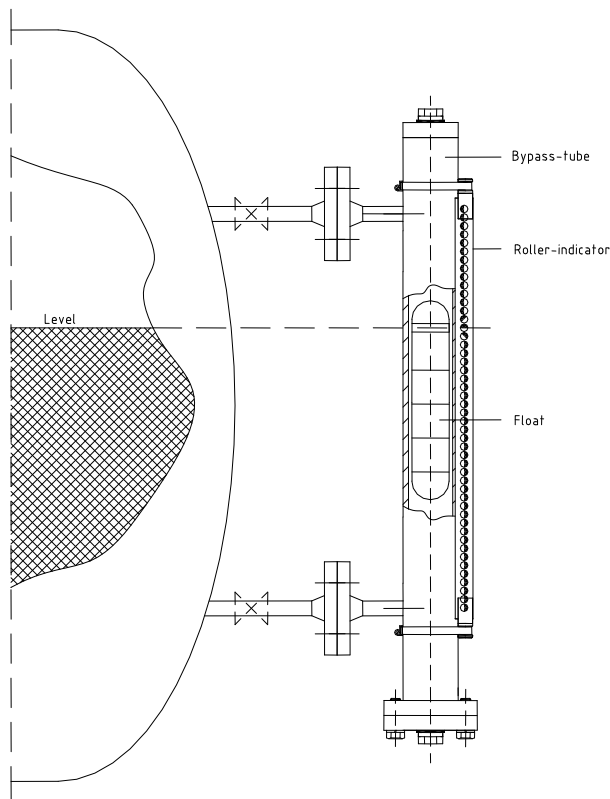
Reed Contact Resistance Chain:

⊕ II 1GD Ex ia IIC T6 Ga

⊕ II 1/2G Exd II C T6 Ga/Gb

⊕ II 1/2D Ex tb IIIC T85 °C Da/Db

6. Mechanical Connection

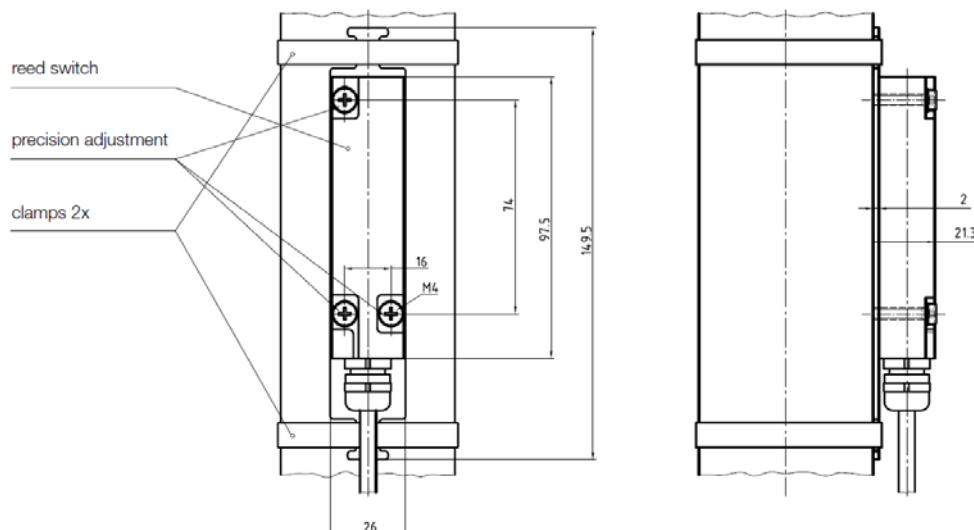


Remove the bottom flange from the bypass tube, and insert the cylindrical float in the NBK bypass tube with the designation "TOP" upturned. Reposition the gasket and close the bottom flange again; firmly tighten with screws.

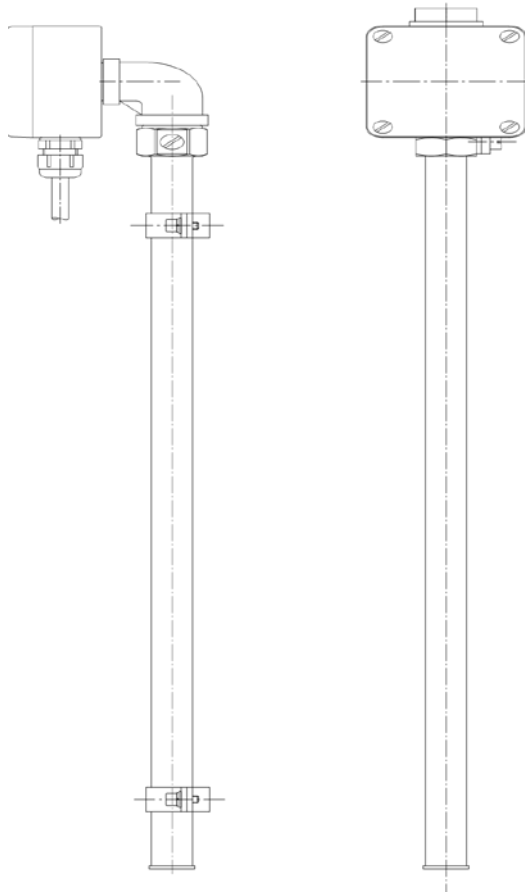
Mount the bypass tube to the vessel to be monitored via the process connection and seal with an appropriate device. Normally it is sufficient to fix the complete NBK with both process connections. However the NBK should be subjected to constant shock or strong vibrations it is recommended that the instrument is secured with rubber-damped tube clips. No welding is allowed on the bypass tube.

Mount and tighten the **magnetic roller indicator** - if not already mounted - on the bypass tube with the two provided ribbon clamps.

Mount and tighten the **reed switch** - if available - on the bypass tube at the opposite side of the roller indicator with the provided ribbon clamps (ex contact: two ribbon clamps). The height of the switch contacts may be selected at will. The cable connection must point downwards. The switch must be attached close to the bypass tube. The switching function of the switch is impaired by an enlarged air gap.



NBK-03 to -33 ATEX



Mount and tighten the **remote sensor** - if available and not already mounted - on the bypass tube with the ribbon clamps. The remote sensor must fully cover both process connections. The cable terminal box is situated at the top.

7. Electrical Connection

7.1 Limit contacts NBK-RA



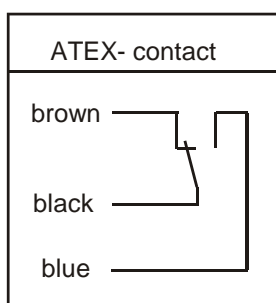
Attention!
Observe the allowed electrical ratings for the limit switch.

Maximum values	NBK-RA
	ATEX-contact
Switching capacity:	45 W/VA
Switching current:	0,6 A
Switching voltage:	230 V _{AC/DC}

Install the switch (if available) according to the diagram and connect it to the electrical controller.

When switching inductive loads, such as contactors, relays, etc., electrical limit values should not, also temporarily, be exceeded by e.g. voltage peaks. The use of a contact protection relay is recommended to avoid overloading the reed contacts.

Valid regulations for hazardous areas and regulations for installation (DIN/VDE 0165) should be observed when installing the NBK level indicator in zone 1 or 2 hazardous areas (no combustible liquids).



NBK-RA

Note to NBK-RA:

Protect the circuit of the limit contact with a fuse. This fuse must tolerate the permitted nominal current of the switching contact and must have a deactivating ability according to the possible short circuit current of the power system at the place of installation. The contact is activated by the North Pole of a magnet and deactivated by its South Pole.

NBK-03 to -33 ATEX

7.2 Wiring Diagram

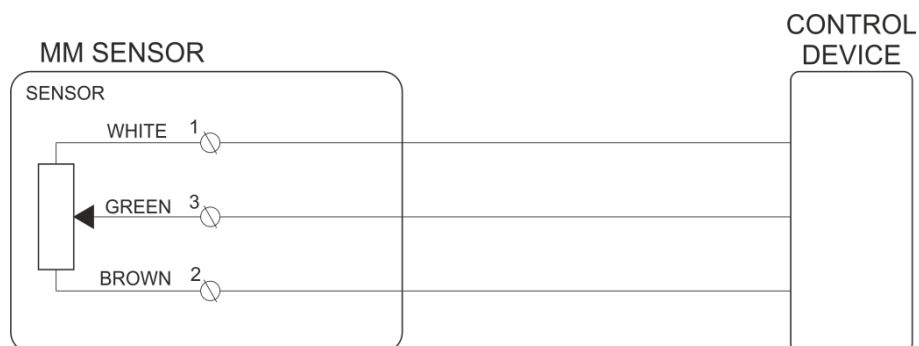
- Ensure that the electrical supply lines are powerless.
- To avoid faults caused by electrical fields from other circuits, the cables should not be installed adjacent to other high voltage power lines.
- Unscrew cover and run supply lines through cable gland.
- Connect the remote sensor to the electronics according to the following table.

7.2.1 Reed Contact Chain Resistor Output (ATEX options ...2/...4)

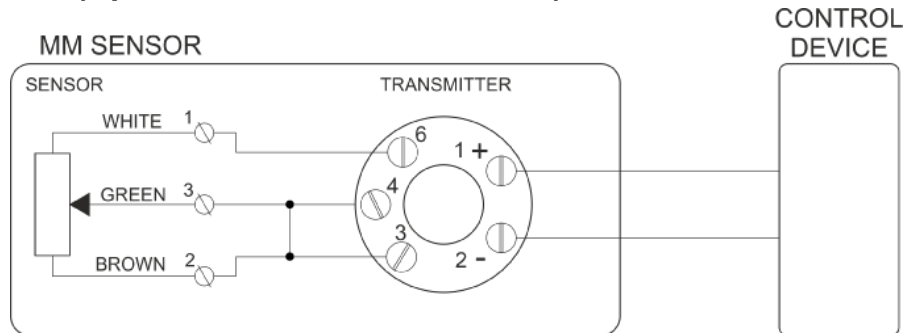
	Resistance value increases proportionally with level increase.	Resistance value decreases proportionally with level increase.	Signal
Internal*	White	Brown	Green
Models with box	Clamp 1	Clamp 2	Clamp 3



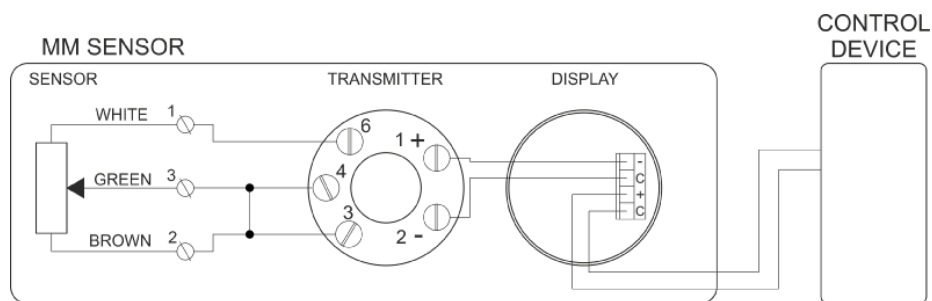
***Please note: The colours of internal cables are for internal connections only and therefore are only visible in transmitters with terminal connection box**



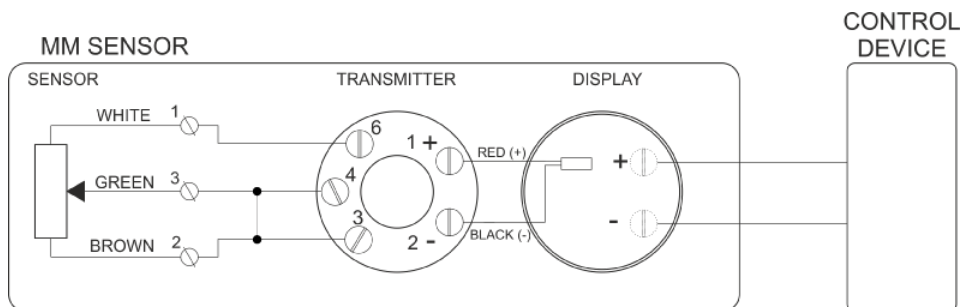
7.2.2 Reed Contact Chain TRANSMITTER Output (Options ...E/...R/...B/...L/...K/...N)



7.2.3 Reed Contact Chain TRANSMITTER Output with display LED display (option ...L/...K + option LE or KE)



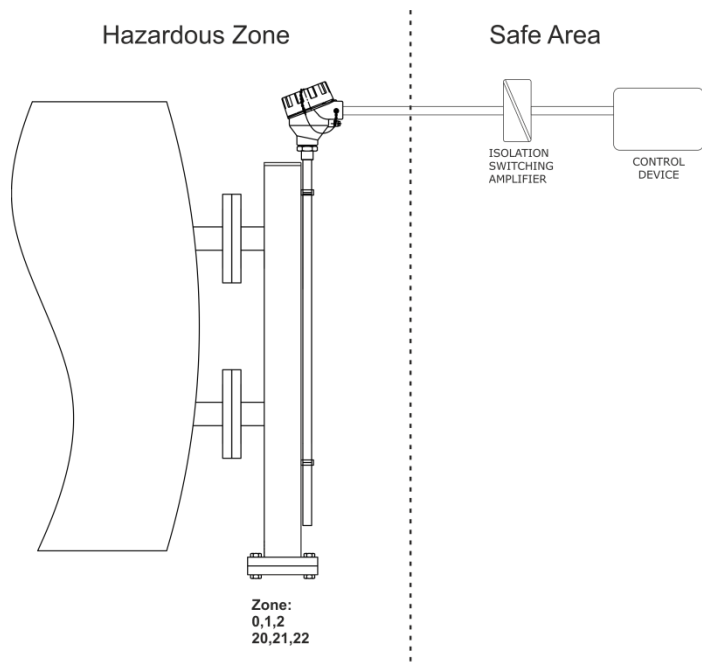
LCD display (option ...L/...K +option LC or KC)



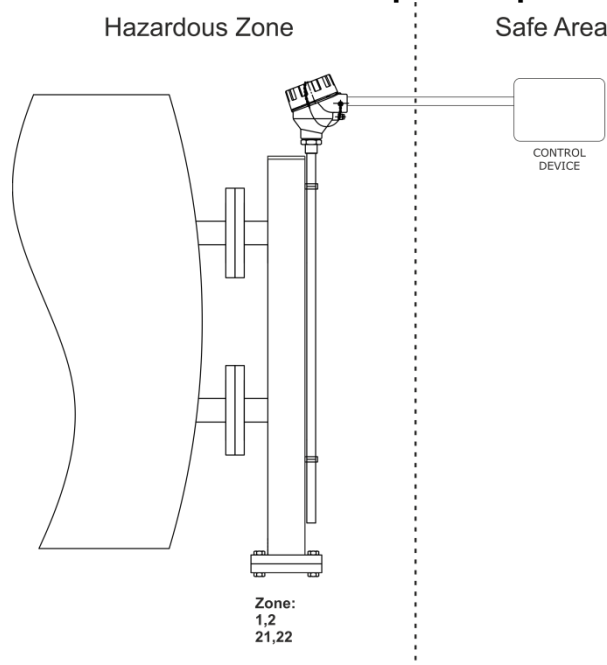
(ii) For programming instructions of different transmitter models please consult separate instruction manuals of respective transmitters.

NBK-03 to -33 ATEX

Electrical connection in intrinsically safe mode Ex ia



Electrical connection in explosion-proof safe mode Ex d



7.3 Safety Instructions

7.3.1 Area of validity

These safety instructions apply to **MM...E** Series of magnetic level switch for use in explosion-proof atmospheres conforming to **CE** certificate **LOM 06ATEX2054 X** and **MM...F** Series conforming to **CE** certificate **LOM 14ATEX2075 X**

7.3.2 Guidelines

These safety instructions must be applied to the **MM...E** and **MM...F** Series used in gas explosion hazard environments.

It is necessary to follow carefully the instructions from the hazardous areas where the **MM...E** or **MM...F** will be installed, as well as, the safety instructions included in this manual and the safety regulations of the ATEX certificate (see appendix).

In models with transmitter and/or display, the intrinsically safe specific parameters are:

Ci total: Ci (sensor) + Ci (transmitter) + Ci (display)

Li total: Li (sensor) + Li (transmitter) + Li (display)

It must be considered the minimum value of Pi , li and Ui , in all components used in the assembly.

Temperature class and/or surface temperature relates only to a device operated at ambient temperature. On installation, the actual temperature class for process operation has to be determined.

Inlet bushing and cable glands must conform to the certification for their type in accordance with the directive.

The use in zone 0 of heads made of aluminium should be restricted to locations where the risk of ignition due to mechanical impact is not probable.

Verify that all data written on the label of the device matches the data required for the installation.

Verify that there is no mechanical stress or deformation due to installation in the tank.

Remove power supply and verify that no explosion risk is present before opening the housing cover and check that the cover is correctly mounted before applying power to the instruments **MM...F** Series.

The installation of instruments in hazardous areas must be exclusively done by trained staff.

7.3.3 Protection against ESD (Electro Static Discharges)

Instruments with plastic parts that can produce Electro Static Discharges, have a label for it.

It is important to follow some rules to avoid ESD:

- Avoid rubbing the device.
- Never clean the device in dry.
- Do not install the device near material airflows or near steam outlets.

7.3.4 Chemical resistance

Ensure that the device construction materials have chemical resistance sufficient to prevent mechanical deformations that may affect the device. The responsibility for suitability and intended use lies solely with the operator.

7.3.5 Maintenance and repairs

The instrument does not require maintenance or servicing. By measuring substances, which tend to deposit and contamination, cleaning may be necessary.

Repairs must be only carried out by Kobold Mesura (manufacturer).

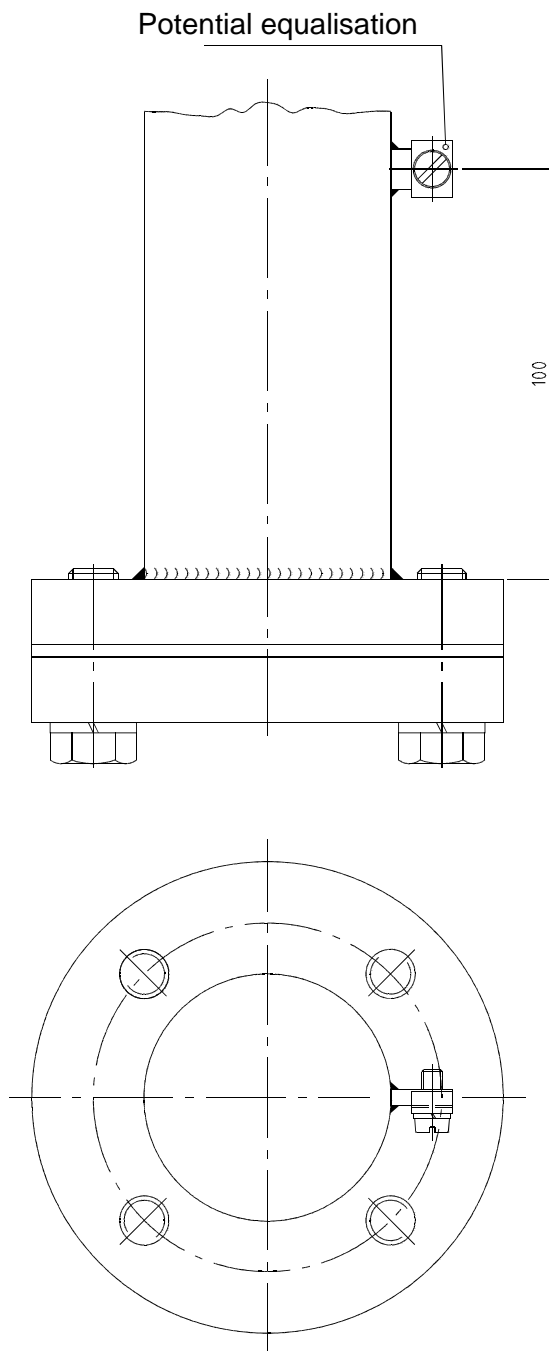
7.3.6 Storage

Measuring instruments should be protected against humidity and dust.

Storage temperature: -5...+55 °C

7.4 Ground connection for ATEX models

The bypass has to be integrated into the potential equalisation system of the installation. This can be carried out through the earth terminal which is shown in the following drawing:



8. Commissioning

Because of the setting behaviour of seals, all screw connections must be retightened.

Fill vessel and switch on electrical controller, if available. If there are gate valves between bypass process connection and tank, first slowly open the upper valve (pressure equalisation) and then the lower valve (liquid side). If vent and drain valves have been installed, close them before filling.

The liquid that now enters the bypass tube raises the float until the level between tank and bypass tube is balanced. The roller indicator indicates the liquid level.

Commissioning electrical reed switches NBK-RA

Function of switches

All switches have three connection poles (black (2), blue (1) and brown (3)).

The black wire (2) is the common pole for both switching functions (N/C and N/O contact).

The float must pass the switch once in both directions so that the switching function is in line with the terminal connection diagram and table below.

These instructions are often ignored when an alarm lamp is connected directly with the result that the alarm lamp incorrectly indicates a fault.

When the switch has been passed, it is ready for operation and requires no maintenance.

	black (2) / blue (1)	black (2) / brown (3)
float above	open	closed
float below	closed	open

Hysteresis

Hysteresis is the difference between contact closing and opening points. A hysteresis of approximately 15 mm float travel is achieved by factory tuning of the float magnet and contact strength.

9. Trouble Shooting

Error: The tank is full but there is no indication

- Check that both flanges (process connection), top and bottom, are open to the vessel, and that the bypass tube fills with liquid.
- Check that there is a float in the system.
- When the float is installed, check whether it is being blocked by foreign objects or dirt deposits.

Error: The tank is full but the indication is too low.

- Check that the density of the liquid is the same as the density given on the nameplate.
- Check that the float has been correctly installed with the marking "TOP" upturned.
- Check if dirt deposits in the bypass tube are blocking the float.

10. Maintenance

The drain plug should be opened occasionally, to wash out any deposits in case the liquid to be measured contains dirt particles, which could settle in the bypass tube.

If crust formation or crystallisation has taken place, the tank must be emptied or shut off; the lower cover flange must then be removed. The float should then be taken carefully out of the bypass. The bypass tube can now be mechanically cleaned.

The inspection window for the roller indication is made of high-quality plexiglass (glass for high-temperature display). It should be cleaned with a suitable cleaning agent.

The indicator requires no further maintenance.

11. Technical Information

Process Connection:	flange DIN EN 1092-1, type 11, form B, DN 15, DN 20, DN 25, DN 32 DN 40, DN 50, Flange ASME B 16.5 RF-2009 ½", ¾", 1", 1¼", 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
Operating temperature:	-40 °C...+400 °C (ceramic rollers) -20...+120 °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. measuring length:	up to 5500 mm: single-part, longer two-part or multipart
Overall length:	see dimension drawing

Roller display RP (max. length 5500 mm)

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

Roller display RK (max. length 5500 mm)

Material roller:	Ceramic
Display glass:	Borosilicate glass
Carrier frame material:	Aluminium, black anodised
Operat. temperature:	-40 °C...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
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 3800 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 3800 mm one-piece)*

Filling:	silicone oil
Material ball:	PA – high temperature
Sight tube:	PC
Sealing plug:	Stainless steel, 1.4571
Seal:	FKM
Ball support rail:	Aluminium, black anodised
Carrier frame:	Stainless steel 1.4301
Scale:	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 3000 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

NBK-03 to -33 ATEX

ATEX approval

ATEX limit contact, model NBK-RA

Contact operation:	bistable changeover contact encapsulated
Switching hysteresis:	approximately 15 mm
Max. switching capacity:	45 VA; 230 V _{AC/DC} ; 0.6 A
Temperature class:	T5 / T6
Max. ambient temperature:	70 °C / 85 °C
Connection:	3 m PVC cable
Housing:	metallic, cast (GD-ZN Al 4 Cu1)
Protection:	IP 67
ATEX marking:	 II 2G Ex mb IIC T5/T6 Gb
	 II 2D Ex mb IIIC IP67 T105°C Db

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 k Ω
Max. voltage:	U _I = 24 V
Max. capacity:	P _i = 1.2 W
Temperature class:	T6
Resolution:	10 mm
Housing:	Aluminium pressure cast
Protection:	IP65
ATEX marking:	Ex II 1GD Ex ia IIC T6 Ga

ATEX immersible reed contact resistor chain options E/R/B only in connection with 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:	$\leq(V_{\text{supply}}-8)/0.023$ [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 temperature for T1...T4:	85 °C
Max. ambient temperature for T5 and T6:	60 °C
Application in zone:	0, 1, 2, 20, 21 or 22
Medium temperature:	-40 °C...+120 °C (with option N up to 250 °C)
Ambient temperature:	-40 °C...+80 °C
Resolution:	10 mm
Housing:	Aluminium pressure-cast
Protection:	IP66

Option R

Transmitter model:	5337D
Common specifications:	
Power supply:	8...35 V _{DC}
Communication interface:	Loop Link 5905A & HART®
Linear resistance input:	0...7 kΩ

NBK-03 to -33 ATEX

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)


Data for intrinsically safe current circuit:

see instruction manual

ATEX approval transmitter:

KEMA 03ATEX1537:

 II 1G Ex ia IIC T6 or T4 Ga

 II 1D Ex ia IIIC Da

Max. ambient temperature for T1...T4:

85 °C

Max. ambient temperature for T5 and T6:

60 °C

Applicable in zone:

0, 1, 2, 20, 21 or 22

Medium temperature:

-40 °C...+120 °C (with option N up to +250 °C)

Ambient temperature:

-40 °C...+80 °C

Resolution:

10 mm

Housing:

Aluminium pressure-cast

Protection:

IP66

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: ø44x20.2 mm
Linear resistance input: 0...10 kΩ

Output:




Foundation™ Fieldbus Connection:

Foundation™
Fieldbus version: ITK 4.6
Foundation™
Fieldbus capability: Basic or LAS
Foundation™
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
Data for intrinsically
safe current circuit: see instruction manual

ATEX approval transmitter:

KEMA 03ATEX1318:  II 1G Ex ia IIC
T4...T6 or
 II 2 (1) G Ex ib [ia] IIC
T4...T6 or
 II 1 D Ex iaD
Applicable in zone: 0, 1, 2, 20 or 21
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 1/2 G Ex d IIC T6 Ga/Gb

NBK-03 to -33 ATEX

Option L

Transmitter model: 5333D

Common specifications:

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

Current output:

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

Option K

Transmitter model: 5337D

Common specifications:

Power supply: 8.0...35 V_{DC}
Communication interface: Loop Link 5905A & HART®
Linear resistance input: 0...7 k Ω

Current output:

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

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. 2.5 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:	IP 66

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:	ø44x20.2 mm
Linear resistance input:	0...10 kΩ

Output:**Foundation™ Fieldbus connection:**



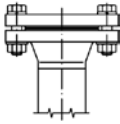
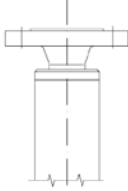
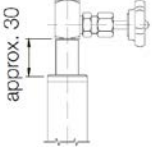

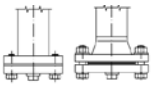
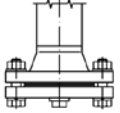
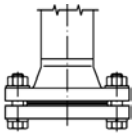
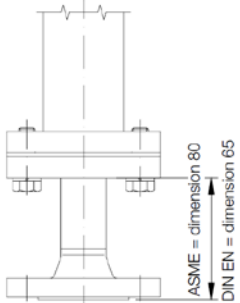
Foundation™ Fieldbus version:	ITK 4.6
Foundation™ Fieldbus Capability:	Basic or LAS
Foundation™ Fieldbus Function blocks:	2 analogue and 1 PID

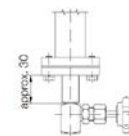
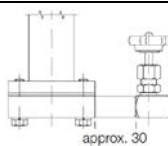
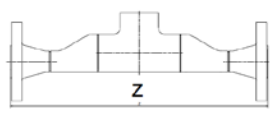


Profibus® PA connection:

Profibus® PA protocol standard:	EN 50170 vol. 2
Profibus® PA function blocks:	2 analogue
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

NBK-03 to -33 ATEX

12. Options

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 ½		NBK-10 NBK-03/06/07, standard
VF ¹⁾	Flange connection DN50 (pressure rating as process flange)		NBK-03/06/07/10 ²⁾
VA ¹⁾	Flange connection 2" ASME (pressure rating as process flange)		NBK-03/06/07/10 ²⁾
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 ½" ASME, stainless steel 1.4571 (316 Ti) (pressure rating as process flange)		NBK-03/06
V8	Vent flange ¾" ASME, stainless steel 1.4571 (316 Ti) (pressure rating as process flange)		NBK-03/06
V9	Vent flange 1" ASME, stainless steel 1.4571 (316 Ti) (pressure rating as process flange)		NBK-03/06
V2	Vent valve NAD-MMN15, ½" NPT, stainless steel 1.4571 (316 Ti), max. temp.: +120 °C		NBK-03/06
V3	Vent valve NAD-MMR15, G ½, stainless steel 1.4571, max. temp.: +120 °C		NBK-03/06
¹⁾ not possible with transmitter options E/R/B			
Bottom bypass tube connections			
D0	Without drain plug		NBK-03/06/07 NBK-10/31/32/33 standard
DG	With drain plug G ½	NBK-03/06  NBK-07/10	NBK-10 NBK-03/06/07, standard
DF	Flange connection DN50 (pressure rating as process flange), with drain plug G ½		NBK-03/06
DA	Flange connection 2" ASME (pressure rating as process flange), with drain plug ½ "NPT		NBK-03/06
DC	Flange connection DN50 (pressure rating as process flange), without drain plug		NBK-03/06/07
DD	Flange connection 2" ASME (pressure rating as process flange), without drain plug		NBK-03/06/07
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 ½" ASME, stainless steel 1.4571 (316 Ti) (pressure rating as process flange)		NBK-03/06
E8	Drain flange ¾" ASME, stainless steel 1.4571 (316 Ti) (pressure rating as process flange)		NBK-03/06
E9	Drain flange 1" ASME, stainless steel 1.4571 (316 Ti) (pressure rating as process flange)		NBK-03/06

Code	Description	Sketch/picture	Availability
F1	Drain valve NAD-MMR15, G ½, stainless steel 1.4571, max. temp.: +120 °C		NBK-03/06
F2	Drain valve NAD-MMN15, ½" NPT, stainless steel 1.4571 (316 Ti), max. temp.: +120 °C		NBK-03/06
DS	Drain socket DN15	see sketch	NBK-03
D2	Drain valve NAD-MMN15, ½" NPT, horizontally mounted, stainless steel 1.4571 (316 Ti), max. temp.: +120 °C		NBK-03/06
D3	Drain valve NAD-MMR15, G ½, horizontally mounted, stainless steel 1.4571 (316 Ti), max. temp.: +120 °C		NBK-03/06
RF ¹⁾	Dead space free version DN25, stainless steel 1.4571 (pressure rating as process flange)		NBK-06
RA ¹⁾	Dead space free version 1" ASME, stainless steel 1.4571 (316 Ti), (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
TS	1 x process connection side, 1 process connection vertical at bottom	see sketch	NBK-03/06/07/10
TT	2 x process connection vertical, up to DN25 or 1" ASME	see sketch	NBK-03/06/07/10
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
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
Thermal screening			
N	Thermal screening for sensor	see sketch	NBK-03/06/07/10/31/32/33
Electrical outputs			
MU ²⁾	Option with connection box at bottom, for easy access to connection box		NBK-03/06/07/10
MS ²⁾	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 AE, 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 AE, however with LCD display	NBK-03/06/07/10

¹⁾ On request

²⁾ Only in addition with optional sensor/transmitter

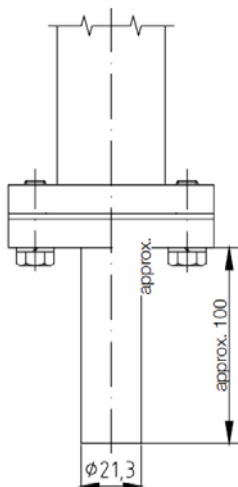
NBK-03 to -33 ATEX

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
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 certification 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

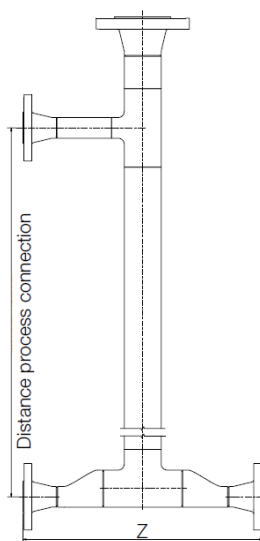
Note: Please pay attention to max. permissible temperature limits of individual components.

Sketches of selected options

Option DS

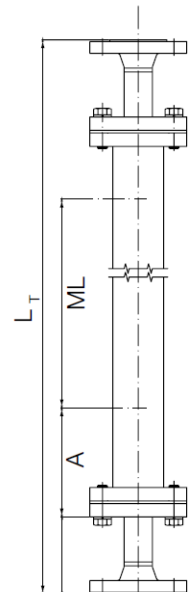


Option RF/RA

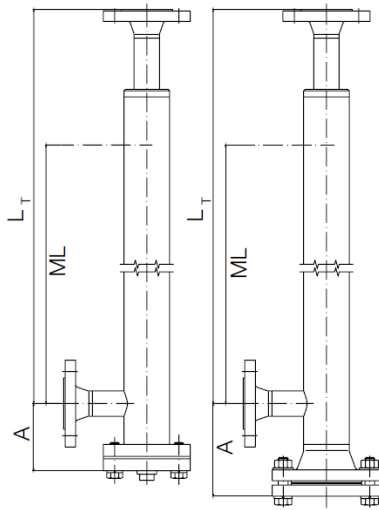


Option	Process Connection below	Dimension Z
RF	V-flange DN25 PN40	approx. 360
RA	V-flange CI 150 1"	approx. 390
RA	V-flange CI 300 1"	approx. 405

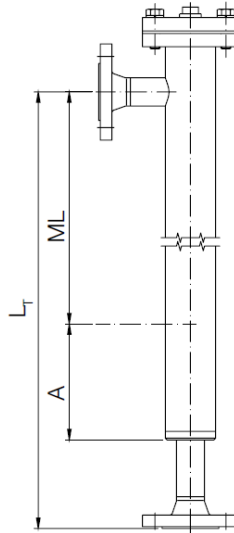
Option TT



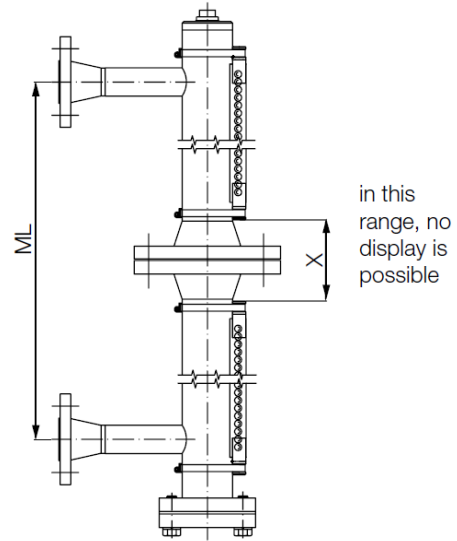
Option ST



Option TS

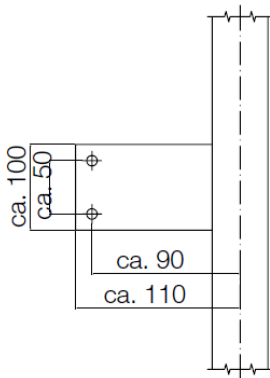


Option A

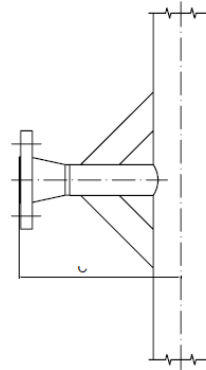


Model	Dimension X
NBK-03	92
NBK-06	98
NBK-07	127
NBK-10	139

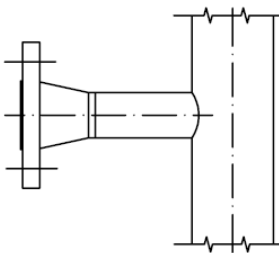
**Option HL
(centred to dimens.)**



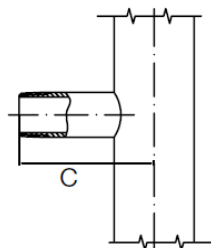
**Option HF
(centred to dimens. L)**



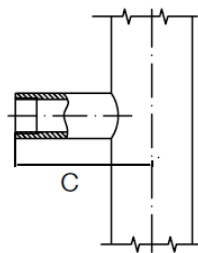
**Options process connection
Option F/A**



Option R/N

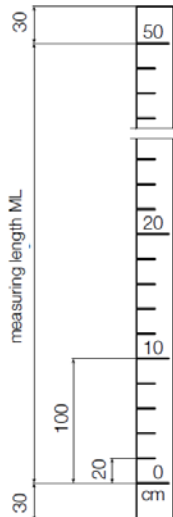


Option S

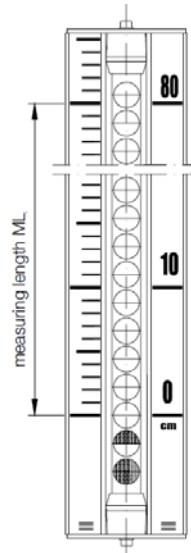


NBK-03 to -33 ATEX

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

13. Order Codes

ATEX-version only NBK-03...NBK-10

Order Details (Example: NBK-03 F15 00 1 A0)

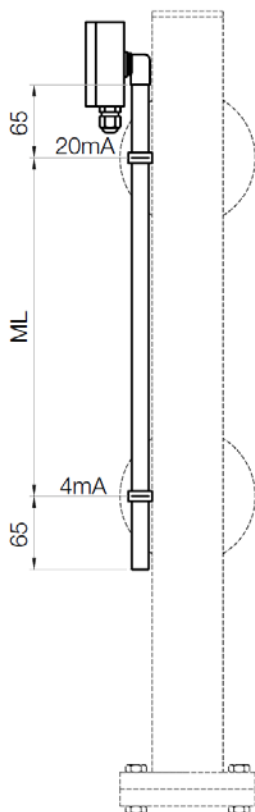
Model	Rated pressure	Connection	Nominal size	Roller/ ball indicator	Sensor/ Transmitter	Medium density float	Options
NBK-03	PN16/Class 150	F=DIN flange A=ASME- flange R=R male thread N=NPT male thread S=welding- nipple	15=DN15, 1/2" 20=DN20, 3/4" 25=DN25, 1" 32=DN32, 1 1/4" 40=DN40, 1 1/2" 50=DN50, 2" XX=special connection	00= without RP= PP-roller RK= ceramic- roller KP = ball display with Plexiglas®- sight tube KM = ball display with Makrolon®- sight tube KF = like KM but with oil filling KG = ball display with borosilicate sight tube	1 = without electrical attached parts ATEX - II 1G / 2G D 2* = with reed contact chain II 1GD Exia IIC T6 E = with immersible magnetic probe (reed chain)/4...20 mA, 2- wire, ATEX Exia R* = immersible magnetic probe (reed chain)/ 4...20 mA, HART®, 2-wire, ATEX Exia B = immersible magnetic probe (reed chain) / Profibus® PA Foundation™ Fieldbus, ATEX Exia 4* = with reed contact chain ATEX II 1/2G Exd IIC T6 Ga/Gb L* = immersible magnetic probe (reed chain) / 4...20 mA, 2-wire, ATEX Exd K* = immersible magnetic probe (reed chain) / 4...20 mA, HART®, 2-wire, ATEX Exd N* = immersible magnetic probe (reed chain) / Profibus® PA Foundation™ Fieldbus, ATEX Exd	A = 1.0 kg/dm ³ , titan for viscosity up to 200 cP B = 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 F = 0.54kg/dm ³ , titan for viscosity up to 200 cP V = 1.0 kg/dm ³ , stainless steel for viscosity up to 460mm ² /s W = 0.8 kg/dm ³ , stainless steel for viscosity up to 460mm 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	PN40/Class 300						
NBK-07	PN63/Class 400						
NBK-10	PN100/Class 600						
NBK-31	PN160/Class 900	F = DIN flange	15 = DN15, 1/2"				
NBK-32	PN250/Class 1500	A = ASME flange	20 = DN20, 3/4" 25 = DN25, 1"				
NBK-33	PN320						
NBK-RA	ATEX limit contact, encapsulated, Ex II2G EEx m II T6 / T5						

* See separate ATEX certification of model MM-...

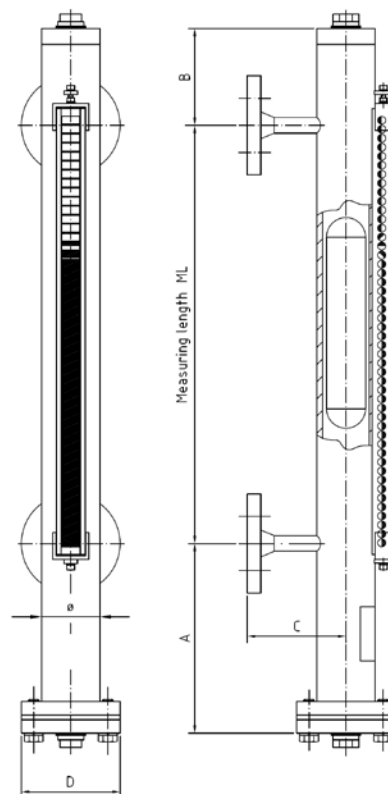
NBK-03 to -33 ATEX

14. Dimensions

**NBK-ATEX-version
reed chain Model 2**



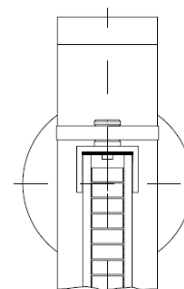
NBK



Dimension NBK

Model	Rated pressure	ø	Dimensions [mm]		
			B	C	D
NBK-03...	PN16/Class 150	60.3	130	110	115
NBK-06...	PN40/Class 300		130	110	115
NBK-07...	PN63/Class 400		130	150	180
NBK-10...	PN100/Class 600		130	150	195
NBK-31...	PN 160/Class 900	71	150	180	245
NBK-32...	PN 250/Class 1500	76.1	150	180	245
NBK-33...	PN 320		170	210	265

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



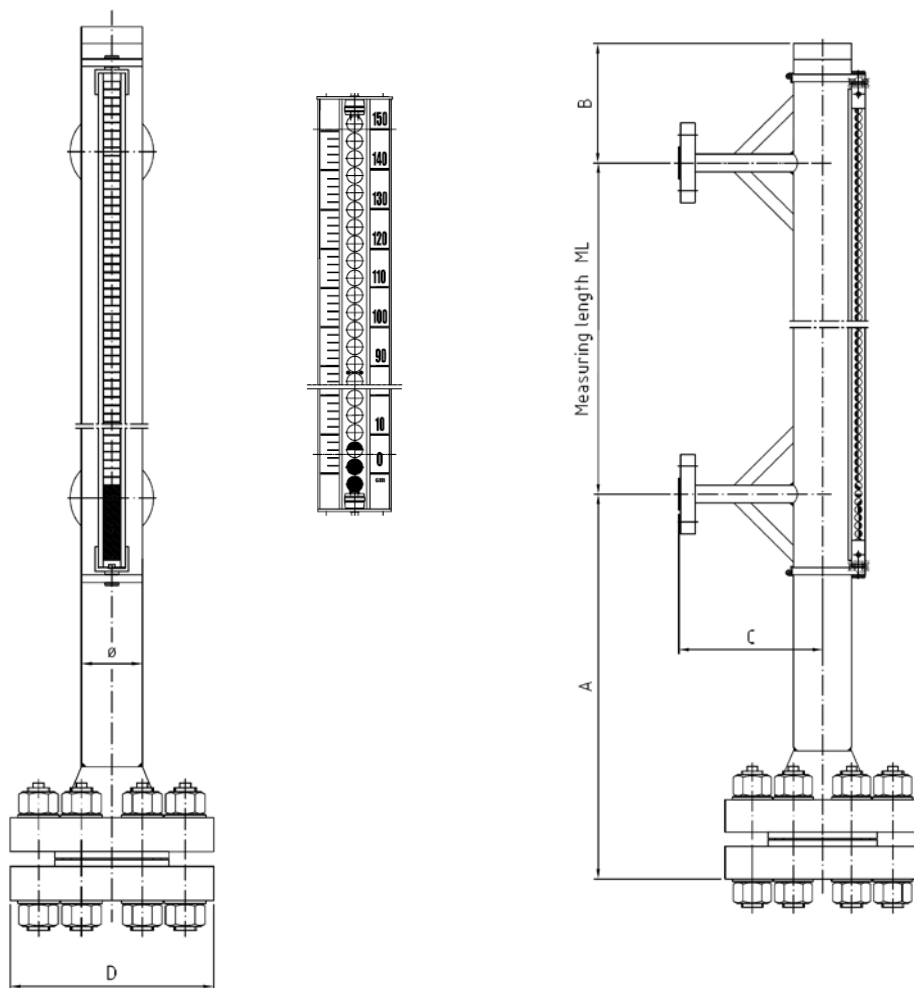
Clearance dimension A [mm]

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...	PN16/Class 150	320	320	320	320	320	210
NBK-06...	PN40/Class 300	410	410	320	320	320	210
NBK-07...	PN63/Class 400	410	410	320	320	320	210
NBK-10...	PN100/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 (15EO)	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 (15EO) was calculated with help of creep resistance values of 100 000 h acc. to EN-Material Norms considering the safety value.

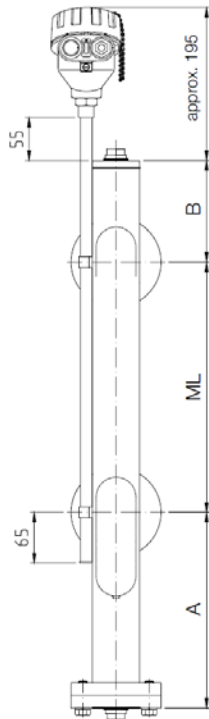
At intermediate temperatures e.g. 120 °C, a linear interpolation is to be carried out between 2 following creep resistance values, e.g. of 100 °C and 150 °C.

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

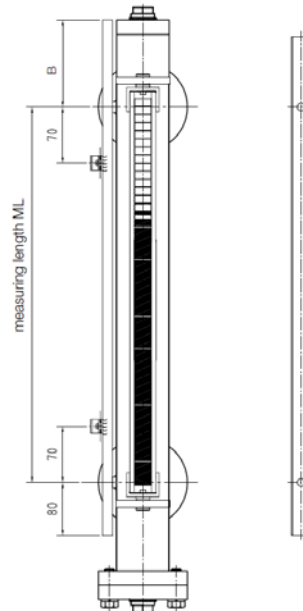
Model No. and nomination: 05 Blind flange, 11 Welding neck flange

NBK-03 to -33 ATEX

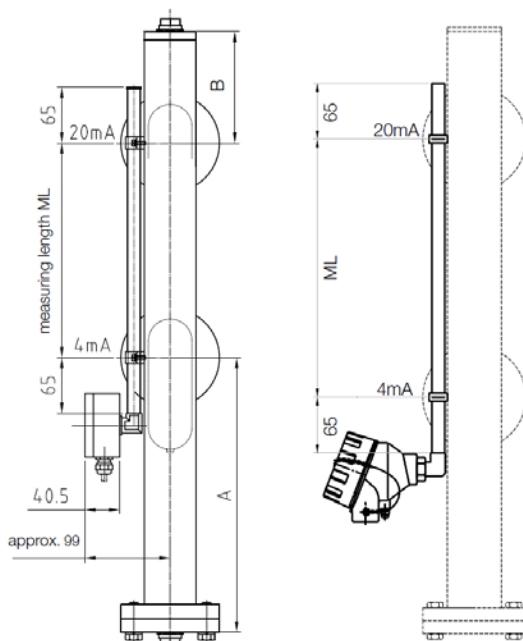
**NBK-...with transmitter options
E/R/B/4/L/K/N
(not possible with options VA/VF)**



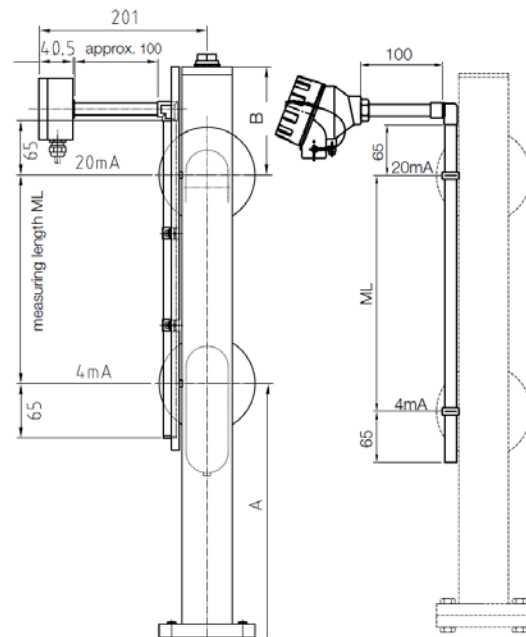
NBK-...with thermal screen option N



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

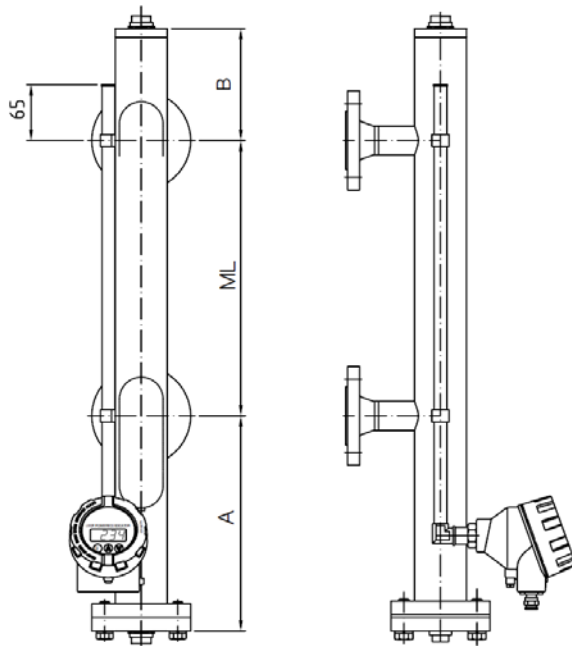


**NBK-... with transmitter
options 2/E/R/B/4/L/K/N
and option MS**

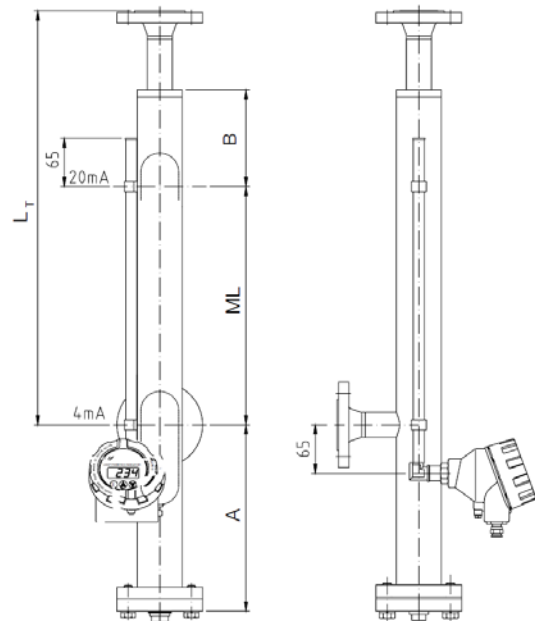


NBK-03 to -33 ATEX

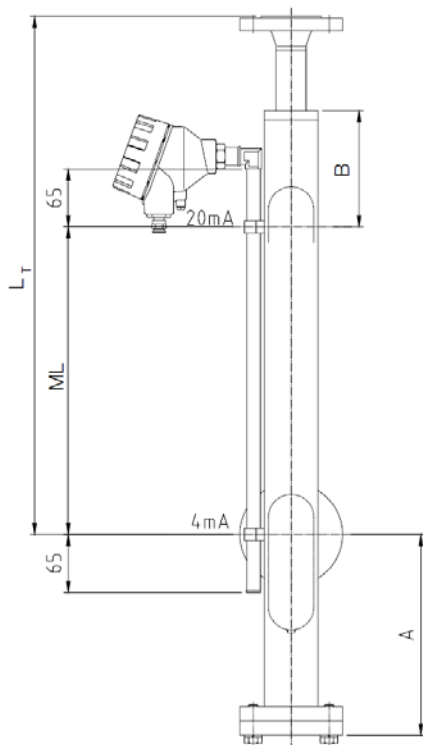
**NBK...with transmitter options
E/R/L/K and display options**



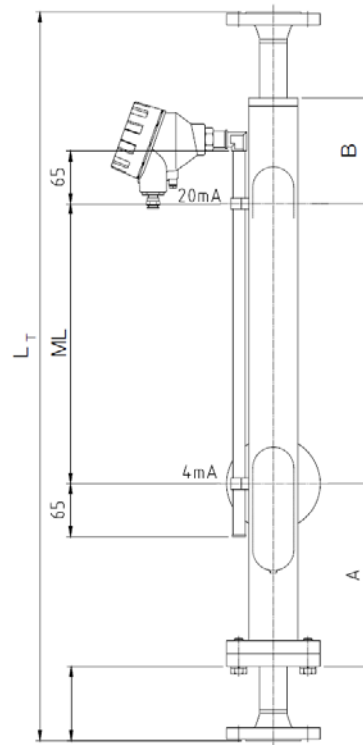
**NBK...with transmitter options
E/R/L/K and display LE/KE or LC/KC
option LE/KE or LC/KC and option S**



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

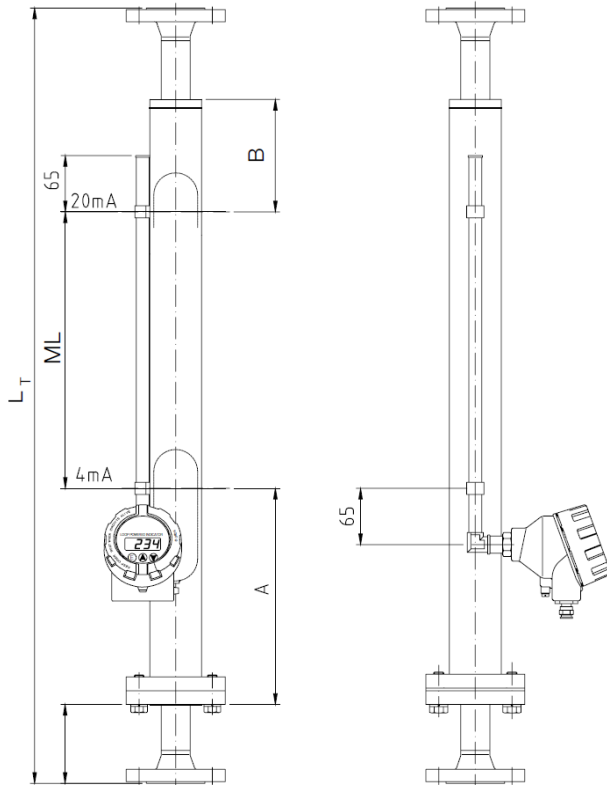


**NBK... with transmitter model
E/R/B/L/K/N option TT**

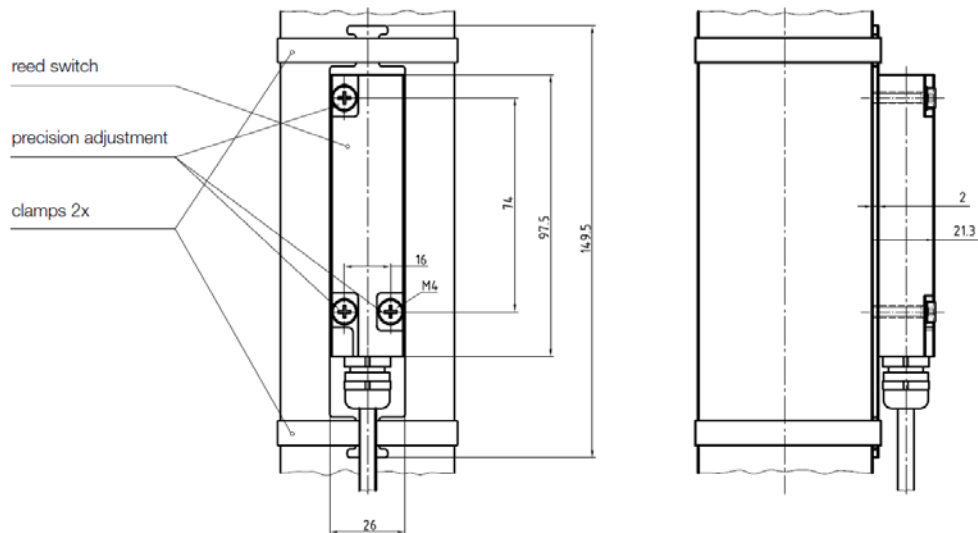


NBK-03 to -33 ATEX

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



NBK-RA



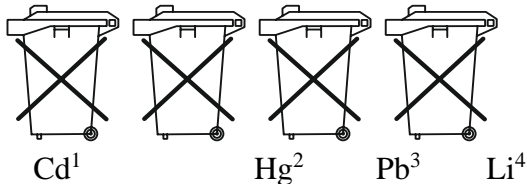
15. Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

Batteries

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment



16. EC Declaration of Conformance

We, KOBOLD Messring GmbH, Hofheim-Ts, Germany, declare that the bypass level indicators fulfil the following standards:

Model	Pressure stage	Category as per PED	EC type examination certificate
NBK-03	PN 16	III	88 254-12 HH
NBK-06	PN 40	III	88 254-12 HH
NBK-07	PN 63	III	88 254-12 HH
NBK-10	PN 100	IV	88 254-12 HH
NBK-31	PN 160	IV	PED-B-171
NBK-32	PN 250	IV	PED-B-171
NBK-33	PN 320	IV	PED-B-171

The limit contacts **NBK-R**, **NBK-RT** for bypass level indicators are in conformity with the standards noted below:

DIN EN 61010-1:2011-07

Safety requirements for electrical measuring, control and laboratory instruments - Part 1: General requirements

EN 60529:2014-09

Degrees of protection provided by enclosures (IP Code)

The bypass level indicator with remote sensor

model NBK-...2/...E/...R/...B/...4/...L/...K/...N

to which this declaration relates is in conformity with the standards noted below:

EN 61326-1:2013-07

Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements

EN 60529:2014-09

Degrees of protection provided by enclosures (IP Code)

Also, the following EC guidelines are fulfilled:

2014/30/EU EMC Directive
2014/35/EU Low Voltage Directive
2011/65/EU RoHS (category 9)

2014/68/EU PED

- Category III (IV) Diagram 1, vessel, group 1 dangerous fluids
- Module D, marking CE0575
- Notified body: DNV GL
- Certificate No. PEDD000000R



H. Peters
General Manager



M. Wenzel
Proxy Holder

Hofheim, 27 June 2019

NBK-03 to -33 ATEX

EU-Konformitätserklärung zur Bestätigung der Übereinstimmung mit der Richtlinie 2014/34/EU

Der Hersteller

EU-Declaration of conformity with the Directive 2014/34/EU

The manufacturer

KOBOLD Messring GmbH, Nordring 22-24, DE 65719 Hofheim am Taunus

erklärt hiermit in alleiniger Verantwortung, dass die nachfolgende Maschine oder Baugruppe

hereby declares under sole responsibility, that the machinery or the subassembly described below

Bezeichnung:

Description:

Gerät	Druckstufe	Kategorie nach PED	EG-Baumusterprüfbescheinigung	
NBK-01	PN 16	III	43 629-02 HH	
NBK-03	PN 16	III	43 629-02 HH	
NBK-06	PN 40	III	43 630-02 HH	
NBK-07	PN 63	III	43 626-02 HH	
NBK-10	PN 100	IV	42 627-02 HH	
NBK-31	PN 160	IV	PED-B-171	
NBK-32	PN 250	IV	PED-B-171	
NBK-33	PN 320	IV	PED-B-171	
Typ	Oberlänge	p max [bar]	Medium ungefährlich (Diagr. 2)	Medium gefährlich (Diagr. 1)
NBK-04	≤ 645	16	Art.3, Para.3	Art.3, Para.3
NBK-04	≤ 1270	16	Art.3, Para.3	I
NBK-04	≤ 4230	16	I	II

Fertigungs-Nummer lt. Lieferpapieren

Serial number see shipping documents

Kennzeichnung / Marking E II 1/2G Ex h IIC T4.. T1 Ga/Gb or E II 1G/2D Ex h IIC/IIIC T4.. T1 / T100 °C.. T445°C Ga/Db or E II 1/3G Ex h IIC T4.. T1 Ga/Gc or E II 1G/3D Ex h IIC/IIIC T4.. T1 / T100 °C.. T445°C Ga/Dc

mit den Bestimmungen folgender harmonisierter Normen der Europäischen Union übereinstimmt:

conforms with the provisions of the following harmonized standards in the version of the European Union:

- EN ISO 80079-36:2016 Explosionsfähige Atmosphären – Teil 36: Nicht-elektrische Geräte für den Einsatz in explosionsfähigen Atmosphären - Grundlagen und Anforderungen
- EN ISO 80079-37:2016 Explosionsfähige Atmosphären – Teil 37: Nicht-elektrische Geräte für den Einsatz in explosionsfähigen Atmosphären - Schutz durch konstruktive Sicherheit "c", Zündquellenüberwachung "b", Flüssigkeitskapselung "k"
- EN 61010-1:2010 Sicherheitsbestimmungen für elektrisch Mess-, Steuer-, Regel- und Laborgeräte – Teil 1: Allgemeine Anforderungen
- EN 60529:1991 + A1:2000 Schutzarten durch Gehäuse (IP-Code)
- EN 61326-1:2006 Elektrische Mess-, Steuer-, Regel- und Laborgeräte – EMV-Anforderungen; Teil 1: Allgemeine Anforderungen
- Störfestigkeit für ein industrielles Umfeld
- Geräte der Klasse B

- EN ISO 80079-36:2016 Explosive atmospheres - Part 36: Non-electrical equipment for use in explosive atmospheres - Basic method and requirements
- EN ISO 80079-37:2016 Explosive atmospheres - Part 37: Non-electrical equipment for use in explosive atmospheres - Non electrical type of protection constructional safety "c", control of ignition source "b", liquid immersion "h"
- EN 61010-1:2010 Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1: General requirements
- EN 60529:1991 + A1:2000 Degrees of protection provided by enclosures (IP Code)
- EN 61326-1:2006 Electrical equipment for measurement, control and laboratory use - EMC requirements - Part 1: General requirements
- electromagnetic immunity for industrial environment
- equipment of class B

Ebenfalls mit folgenden Europäischen und Nationalen Normen und technischen Vorschriften übereinstimmt:

Also, conforms with the following European and National Standards and technical provisions in the version:

- Technische Regeln für Betriebssicherheit (TRBS) 2153, Vermeidung von Zündgefahren infolge elektrostatischer Aufladungen

- Technical rules for the operational safety (TBRS) 2153, Avoidance of ignition hazards as consequence of electrostatic charging

Die vorgenannten Baugruppen stimmen mit dem Modell überein, das die EG-Baumusterprüfbescheinigung mit der Nummer BVS 09 ATEX E 102 der benannten Stelle 0158 DEKRA EXAM, Bochum, Deutschland erhalten hat.

The equipment complies with the model, which has obtained an "EC" type certificate, number BVS 09 ATEX E 102 issued by the notified body 0158 DEKRA EXAM, Bochum, Germany.

Ausgefertigt in Hofheim am 20. Mai 2018

done at Hofheim on May, 20th 2018

Name der Unterzeichner / Name of signatory




Harald Peters

Geschäftsführer/ CEO

Manfred Wenzel

Prokurist/ procurator


Unterschriftet für und im Namen der / Signed for and on behalf of KOBOLD Messring GmbH

Unterschrift / signature

KEEX68180522 KOB NBK V2.odt

17. Certificates

17.1 NBK-EXAM



TRANSLATION

1st Supplement to the EC-Type Examination Certificate

**Equipment or Protective System intended for use in potentially explosive atmospheres
Directive 2014/34/EU**

Number of Type Examination Certificate Supplement: **BVS 04 ATEX H 042 X N1**

Equipment: Bypass level indicators, types NBK -03, -04, -06, -07, -10, -31, -32 and -33

Manufacturer: KOBOLD Messring GmbH

Address: Nordring 22-24
65719 Hofheim/Taunus, Germany

The design and construction of this equipment and any acceptable variation thereto are specified in the appendix to this supplement.

The certification body of DEKRA EXAM GmbH, Notified Body No. 0158 according to Article 17 of Directive 2014/34/EU of the European Parliament and the Council, dated 26 February 2014, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in the confidential reports no. BVS PP 1100/019/04 and BVS PP 1100/019/04 N1.





The Essential Health and Safety Requirements have been assured by compliance with:

EN ISO 80079-36:2016 EN ISO 80079-37:2016 IEC/TS 60079-32-1:2013

If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the appendix to this supplement.

This supplement to the EC-Type Examination Certificate relates only to the design, examination and tests of the specified product. Further requirements of the Directive apply to the manufacturing process and supply of this product. These are not covered by this supplement.

The marking of the product shall include the certificate reference no (3) and the following:

 II 1/2G Ex h IIC T4...T1 Ga/Gb -20°C ≤ T _a ≤ +80°C	or	 II 1/3G Ex h IIC T4...T1 Ga/Gc -20°C ≤ T _a ≤ +80°C
or		
 II 1G/2D Ex h IIC/IIIC T4...T1/T130°C...445°C Ga/Db -20°C ≤ T _a ≤ +80°C	or	 II 1G/3D Ex h IIC/IIIC T4...T1/T130°C...445°C Ga/Dc -20°C ≤ T _a ≤ +80°C

DEKRA EXAM GmbH
Bochum, Germany, dated 2018-07-24

signed: Koch

Certifier

signed: Dr Hübner

Approver





13 Appendix to
14 1st Supplement to the EC-Type Examination Certificate

BVS 04 ATEX H 042 X

15 Description of Product

15.1 Subject and Type

Bypass level indicator of types NBK -03, -04, -06, -07, -10, -31, -32 and 33

15.2 Description

The bypass level indicators of types NBK -03, -04, -06, -07, 10, -31, -32 and -33 are used for continuous measurement, display and monitoring of liquid levels in tanks, vessels, basins, vats etc. The bypass tube is attached to the side wall of the vessel. According to the law of communicating tubes, the fill level in the bypass tube will equal the fill level in the vessel. Inside the bypass tube a float equipped with embedded circular magnets follows the fill level of the liquid and transfers this level contactless to a display installed outside the tube (roller display).

Overall, the equipment consists of a vertically mounted tube, a float (with a magnet inside) that moves freely inside the tube and a roller display attached to the outside of the tube. The float is lifted by the liquid inside the tube. The magnetic field causes the rollers of the roller display to rotate, indicating the fill level of the vessel. The measuring length can be up to 6500 mm. The tube consists of stainless steel, the float can be made of stainless steel or titanium.

All conductive components of the bypass level indicators are conductively interconnected due to permanent metallic contact. The maximum surface temperature depends on the temperature of the medium for which the bypass level indicators are used. The inside of the bypass level indicators complies with the requirements of equipment category 1 G; their outside complies with the requirements of equipment categories 2 GD or 3 GD.

Optionally, the bypass level indicators can be equipped with electric transmitters, attached on the outside, for remote sensing of the fill level and with electric limit contacts for sensing limit levels. Those are not subject of this EU-type examination.

Additionally, the bypass level indicators are also supposed to comply with the requirements of Directive 2014/68/EU where this applies if they are intended for use in overpressure areas. The test of sufficient pressure resistance is not subject of this EU-type examination; where required, a separate EU-type examination according to Directive 2014/68/EU has to be carried out.

15.3 Parameters

Bypass tube

Measuring length: max. 5.5 m (two-part if above)

Process connection: DIN flange DN15...DN100

ANSI flange ½" ..6"

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)

Seal: NBK-03, -06, -07 flat gasket < 200 °C: PTFE;
> 200 °C: Klinger SIL®

NBK-10: reinforced graphite

NBK-31/32/33: RTJ-seal

Nominal pressure: maximal PN 320

Viscosity: maximum 200 mm²/s standard)
(optional: 460 mm²/s, NBK-03 only)



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DEKRA EXAM GmbH, Dinnendahlstr. 9, 44809 Bochum, Germany
phone +49 234.3696-105, fax +49.234.3696-110, email: zs-exam@dekra.com



Roller display RP (max. length 5500 mm)

Roller material: POM
 Display glass: PMMA
 Carrier frame material: aluminium, black, anodised
 Medium temperature: -20 °C... 120 °C
 Ambient temperature: -20 °C... 80 °C
 Degrees of protection: IP 54

Roller display RK (max. length 5500 mm)

Roller material: ceramic
 Display glass: borosilicate glass
 Carrier material: aluminium, black, anodised
 Medium temperature: -20 °C... 400 °C
 Ambient temperature: -20 °C... 80 °C
 Degrees of protection: IP 54

15.4 Description of the Supplement

The bypass fill level displays are supplemented by the types NBK -31, -32 and -33. The magnetic roller displays mounted outside the tube of types RK and RP are supplemented by the ball indicating displays of types KP, KM, KF, KG:

Ball indicating display KP (max. length 3800 mm, single-part)

Ball material: PA
 Sight tube: PMMA
 Sealing plug: aluminium
 Seal: NBR
 Ball support rail: aluminium, black, anodised
 Carrier frame: stainless steel 1.4301
 Scale: PVC (stainless steel 1.4301 optional)
 Medium temperature: -20 °C... 80 °C
 Ambient temperature: -20 °C... 80 °C
 Degrees of protection: IP 66

Ball indicating display KM (max. length 3800 mm, single-part)

Ball material: PA
 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 optional)
 Medium temperature: -60 °C... 120 °C
 Ambient temperature: -20 °C... 80 °C
 Degrees of protection: IP 66

Ball indicating display KF (max. length 3800 mm, single-part)

Fill liquid: silicone oil
 Ball material: PA
 Sight tube: PC
 Sealing plug: stainless steel
 Seal: FKM
 Ball support rail: aluminium, black, anodised
 Carrier frame: stainless steel 1.4301
 Scale: PVC (stainless steel 1.4301 optional)
 Medium temperature: -104 °C... 120 °C
 Ambient temperature: -20 °C... 80 °C
 Degrees of protection: IP 66





Ball indicating display KG (max. length 3000 mm, single-part)

Ball material:	PA
Sight tube:	borosilicate glass
Sealing plug:	stainless steel
Seal:	FKM
Ball support rail:	aluminium, black, anodised
Carrier frame:	stainless steel 1.4301
Scale	stainless steel 1.4301
Medium temperature:	-20 °C...200 °C
Ambient temperature:	-20 °C...80 °C
Degrees of protection:	IP 66

16 Test and Assessment Reports

PP BVS PP 1100/019/04, as of 30.07.2004
PP BVS PP 1100/019/04 N1, as of 24.07.2018

17 Special Conditions for Safe Use

The bypass level indicators have to be integrated into the equipotential bonding by earthing; here, the resistance to earth has to be of a value of $< 10^6 \Omega$.

The maximum surface temperature of the bypass level indicators depends on the temperature of the medium for which the bypass level indicators are used.

The ignition temperature of the individual dusts intended for use must be at least 1.5 times the value of the maximum surface temperature of bypass level indicators. The smouldering temperature of the individual dusts intended for use must be at least 75 K above the maximum surface temperature of the bypass level indicators. The dust accumulated shall only reach a layer thickness of 5 mm maximum. Where dust layers of > 5 mm thickness are formed, the safety distance between the minimum ignition temperature of the settled dusts and maximum surface temperature of the equipment must be increased taking e.g. the requirements of EN 60079-14 in its valid edition into account.

The highest medium temperature permitted for the gases, vapours and mists to be used shall not exceed the following:

- at bypass level indicators with EPL Ga: 80 % of the maximum medium temperature according to the temperature class marked;
- at bypass level indicators with EPL Gb and EPL Gc the limit of the temperature class minus 5 K for temperature classes T4 and T3, and minus 10 K at temperature classes T2 and T1.

The bypass level indicators shall not be used with substances that are susceptible to ignition or explosion caused by sparks or friction (e.g. according to class 4.1 ADR); neither shall they be used in hybrid mixtures.

During operation no potential ignition sources (e.g. smouldering or burning particles, smouldering nests or foreign particles) shall enter the bypass level indicators.

If the bypass level indicators are to be used in hazardous areas, any apparatus it is operated in conjunction with have to be suitable for this purpose and supplied according to Directive 2014/34/EU. If the bypass level indicator is assembled with apparatus that have not been subject of this EU-type examination (e.g. the electric limit contacts), a separate risk assessment with regard to additional ignition hazards has to be carried out.

The bypass level indicators shall not be coated by the end user.

Additionally, the bypass level indicators are also supposed to comply with the requirements of Directive 2014/68/EU where this applies if they are intended for use in overpressure areas. The test of sufficient pressure resistance is not subject of this EU-Type Examination Certification; where required, a separate EU-type examination according to Directive 2014/68/EU has to be carried out.

18 Essential Health and Safety Requirements

The Essential Health and Safety Requirements covered by the standards listed under item 9.



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19 Drawings and Documents

The drawings and documents are listed in the test and assessment report.

In the case of arbitration only the German wording shall be valid and binding.

44809 Bochum, Germany, dated 29.08.2018
18EXAM 10375

DEKRA EXAM GmbH

Certifier

Approver



Page 5 of 5 of BVS 04 ATEX H 042 X N1
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phone +49.234.3696-105, fax +49.234.3696-110, email: zs-exam@dekra.com



TRANSLATION



EC-Type Examination Certificate

(1)

(2)

- Directive 94/9/EC -
Equipment and protective systems intended for use
in potentially explosive atmospheres

(3)

BVS 04 ATEX H 042

(4)

Equipment: Level indicators NBK

(5)

Manufacturer: Kobold Messring GmbH

(6)

Address: Nordring 22
D – 65719 Hofheim

(7) The design and construction of this equipment and any acceptable variation thereto are specified in the schedule to this type examination certificate.



(8) The certification body of EXAM BBG Prüf- und Zertifizier GmbH certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in the test and assessment report BVS PP 1100/019/04 EG.

(9) The Essential Health and Safety Requirements are assured by compliance with:
DIN EN 1127-1:1997-10, Potentially explosive atmosphere, Explosion protection, Part 1: Basic principles and methodology,
DIN EN 13463-1:2002-04, Non-electrical equipment for use in potentially explosive areas, Part 1: Basic principles and requirements and
DIN EN 13463-1 Correction 1:2003-06, Corrections of DIN EN 13463-1:2002-04

(10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

(11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate.

(12) The marking of the equipment shall include the following:

 II 1 G / 2 GD respectively  II 1 G / 3 GD

EXAM BBG Prüf- und Zertifizier GmbH

Bochum, dated 2 August 2004

Signed: Migenda

Certification body

Signed: Dr. Hesener

Special services unit

TRANSLATION



BBG Prüf- und Zertifizier GmbH

(13)

Appendix to

(14)

EC-Type Examination Certificate

BVS 04 ATEX H 042

(15) 15.1 Subject and Type

Level indicators NBK Type -03, -04, -06, -07, -10

15.2 Description

The level indicators NBK Type -03, -04, -06, -07, -10 are employed to continually measure, indicate and monitor the level of liquids in containers. They are flanged to the outside of the container to be monitored. The level indicators can also be employed in connection with combustible, non-conductive liquids.

Essentially, the equipment consists of a vertically positioned pipe, of a floater that holds a magnet and that can move freely within the pipe, and of a roll indicator that is attached to the pipe's outside. The floater is lifted by the liquid within the pipe. Due to the magnetic field, the rolls of the roll indicator are turned. Thus, they indicate the container's liquid level. The measuring section can be up to 6500 mm long. The level indicators can also be equipped with limit switches attached to the equipment's outside. They, too, respond to the floater's magnetic field. The pipe is made of stainless steel; the floater can either be made of stainless steel or of titanium. The level indicators can be operated at an excess pressure of up to 100 bar.

The interior of the level indicators NBK Type -03, -04, -06, -07, -10 corresponds to the requirements of Category 1 G. The equipment's outside corresponds to the requirements of Category 2 GD or of Category 3 GD.

(16) Test and Assessment Report

BVS PP 1100/019/04 EG, as of 30 July 2004

(17) Special Conditions for Safe Use

The level indicators NBK Type -03, -04, -06, -07, -10 have to be equipped with a potential equalisation, so that a resistance to earth of $< 10^6 \Omega$ is guaranteed.

Non-conductive coatings, stickers, etc. of a thickness of $> 0,2$ mm and of a surface of more than 20 cm^2 may not be applied to the level indicators NBK Type -03, -04, -06, -07, -10.

All electrical devices employed in connection with the level indicators NBK Type -03, -04, -06, -07, -10 have to be, depending on their points of installation, of the same equipment category as the level indicators.

Page 2 of 3 of BVS 04 ATEX H 042

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Dinnendahlstraße 9, D – 44809 Bochum, Phone +49 (0) 201 172-3947, Fax +49 (0) 201 172-3948

NBK-03 to -33 ATEX

TRANSLATION



BBG Prüf- und Zertifizier GmbH

We confirm the correctness of the translation from the German original.
In the case of arbitration only the German wording shall be valid and binding.

D – 44809 Bochum, 10 August 2004
1100/019/04 BVS-Fr

EXAM Prüf- und Zertifizier GmbH

Oligen da

certification body

W. H. W.

Special services unit

Page 3 of 3 of BVS 04 ATEX H 042
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17.2 Transmitter LOM



LABORATORIO OFICIAL J. M. MADARIAGA



(1) EC-TYPE EXAMINATION CERTIFICATE SUPPLEMENT

(2) Equipment or protective system intended for use in potentially explosive atmospheres
 Directive 94/9/EC

(3) Supplement nr. 3 to EC-Type Examination Certificate number **LOM 06ATEX2054 X**

(4) Equipment or protection system
 - Level detectors
 - Types MIL... EX, RFS... EX, M... E0 y MM... E

(5) Manufacturer **Kobold Mesura S.L.U.**

(6) Address
 Avda. Conflent 68, nave 15
 08915 Badalona (Barcelona)
 SPAIN

(7) Test report nr.: **LOM 14.120 CP**

(8) Variations included in this certificate

- To include a new series called MM... E.

MM... E	├── Float material
	├── Process connection / head
	└── Output / transmitter

This new series is manufactured with intrinsically safe type of protection. It is based on a chain resistances and contact type "reed" driven by the magnetic field of the float, with potentiometric measurement.

The output signal can be direct, or using the loop signal converters for 4-20 mA, HART or PROFIBUS / FIELDBUS, intrinsically safe using certified transmitter modules.

Used transmitters

Type	Certificate	Manufacturer
5333D	KEMA 03ATEX1535	PR electronics A/S
5335D, 5337D	KEMA 03ATEX1537	
5350B	KEMA 02ATEX1318	

Also it cans include a display type CombView DFON 5XX from Baumer A/S with certificate TUV 13ATEX113124 X.

The input parameters of the intrinsically safe type of protection will be the same as those indicated in the transmitter modules. For the version with direct connection the input parameter is $P_i: 1.2 W$

2. It is restricted to the use of group II for gases and marking is updated for all the variants MIL... EX, RFS... EX, M... E0 and MM... E.

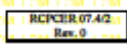
3. Assessment update to the standards EN 60079-0:2012 and EN 60079-11:2012.

(9) Changes in marking

II IGD - Ex in IIC T6 Ga
 -20 °C ≤ Ta ≤ +60 °C

This supplement must be an inseparable part together with the base certificate LOM 06ATEX2054 X. This Certificate is a translation from the original in Spanish. The LOM liability applies only on the Spanish text.

(This document may only be reproduced in its entirety and without any change) Page 1/2



UNIVERSIDAD POLITÉCNICA DE MADRID
 ENSAYOS E INVESTIGACIONES DE MATERIALES Y EQUIPOS PARA ATMÓSFERAS EXPLOSIVAS Y MINERÍA
 (Real Decreto 334/1992 de 3 de Abril - BOE 1992-04-29)



Eric Kandel, I - 28906 GETAFE (MADRID) - ☎ (34) 91 4421366 - 📠 (34) 91 4419933 - ✉ lom@lom.upm.es



LABORATORIO OFICIAL J. M. MADARIAGA

(3) Supplement nr. 3 to EC-Type Examination Certificate number **LOM 06ATEX2054 X**

(10) Changes in the special conditions for a safe use

- Attention should be paid to electrostatic risk of head and parts of the sensor / float made of plastic materials.
- The use in zone 0 of heads made of aluminium should be restricted to locations where the risk of ignition due to mechanical impact is not likely.

(11) Descriptive documents

	Rev.	Date
- Technical description n°:	DT0602	- 2014-05
- Drawings n.°:	DT0596	- 2013-12
	DT0598	- 2014-03
	PE0234	0 2014-02-11
	DT0615	- 2014-04-11

Getafe, 2014-06-23

Carlos Fernández Ramón
Responsible of the Certification Committee



LABORATORIO OFICIAL J. M. MADARIAGA



Los certificados del LOM son emitidos con firma digital para asegurar la autenticidad del firmante. Es posible comprobar su validez pulsando sobre la firma. LOM certificates are issued with digital signature to ensure the authenticity of the signer. It is possible to check its validity clicking on the signature

(1)	EC-TYPE EXAMINATION CERTIFICATE	
(2)	Equipment or protective system intended for use in potentially explosive atmospheres Directive 94/9/EC	
(3)	EC-Type Examination Certificate nr. LOM 14ATEX2075 X	
(4)	Equipment or protection system	Magnetic level sensors Types M**.***F
(5)	Manufacturer	KOBOLD MESURA, S.L.U.
(6)	Address	Avda. Conflent, 68. Nave 15 08915 Badalona (Barcelona) SPAIN
(7)	This equipment or protective system and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.	
(8)	Laboratorio Oficial J.M. Madariaga (LOM), notified body number 0163 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament of 23 March 1994, certifies that this equipment or protective system has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive. The examination and test results are recorded in confidential report nr. LOM 14.477 VP	
(9)	Compliance with the Essential Health and Safety Requirements has been assured by compliance with:	
	Standards	EN 60079-0:2012 EN 60079-1:2007 EN 60079-26:2007 EN 60079-31:2009
(10)	If the sign X is placed after the certificate number, it indicates that the equipment or protective system is subject to special conditions for safe use specified in the schedule to this certificate.	
(11)	This EC-Type Examination Certificate relates only to the design and construction of this specified equipment or protective system in accordance with the Directive 94/9/EC. Further requirements of the Directive apply to the manufacture and supply of this equipment or protective system. These are not covered by this certificate.	
(12)	The marking of the equipment or protective system shall include the following:	
		II 1/2 G Ex d IIC T1..T6 Ga/Gb II 2D Ex t IIIC T410..T85 °C Db
		Getafe, 2015-07-28
		Carlos Fernández Ramón Head of Certification Committee

This Certificate is a translation from the original in Spanish. The LOM liability applies only on the Spanish text

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Page 1/3



UNIVERSIDAD POLITÉCNICA DE MADRID
ENSAYOS E INVESTIGACIONES DE MATERIALES Y EQUIPOS PARA ATMÓSFERAS EXPLOSIVAS Y MINERÍA
(Real Decreto 334/1992 de 3 de Abril - BOE 1992-04-29)



Eric Kandel, 1 - 28906 GETAFE (MADRID) • (34) 91 4421366 • (34) 91 4419933 • lom@lom.upm.es



LABORATORIO OFICIAL J. M. MADARIAGA

(A1) SCHEDULE

(A2) EC-Type Examination Certificate nr. : LOM 14ATEX2075 X

(A3) Description of equipment or protective system

Magnetic level sensors series M***,***F, MM-***F and MS*,****F consist of a float containing a magnet and sliding on the outside of a stainless steel tube, said tube containing in its interior switches type "reed" actuated by the magnet. They are designed for level measurement of liquids in containers. The electrical connections are made in a head which have flameproof and protection by enclosure type of protection.

Three variants of heads are used

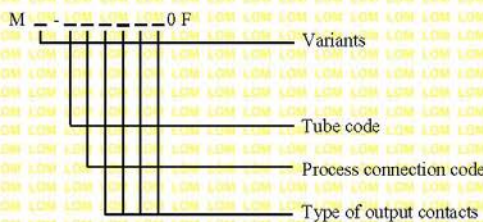
- Type TTE* with component certificate CESI 08 ATEX 029U
Maximum service temperature 95 °C and 100 °C
- Type XD-A* with component certificate FTZU 03 ATEX 0074U
Maximum service temperature 100 °C, 150 °C y 200 °C
- Type XD-A*win with component certificate FTZU 03 ATEX 0074U
Enclosure with window glass when the equipment incorporates a display
Maximum service temperature 85 °C

Variants M***,***F y MS*,****F consist in direct contact outputs working at 230 V / 1 A / 60 VA.

Variants M** - ***F have to head straight tube provided to connect on top of the containers.

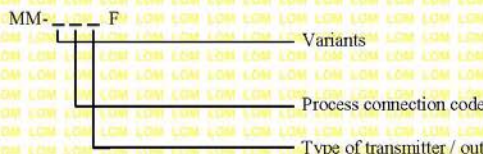
Variants MS*,****F have an elbow pipe with connection head expected to connect on the side of the containers.

Type codification:



The MM-***F variants have resistive output, or transmitter in the head with analog output 4-20 mA or digital communication.

Type codification:



The sensors are designed for process temperature up to 400 °C, but the temperature of the head shall not exceed the indicated for this head.

The process connection is made using standardized threaded or flanged.

Ambient temperature: -20 °C ≤ Ta ≤ +60 °C

The temperature class and surface temperature of the equipment depends on the process temperature:

Process temperature	≤ 80 °C	≤ 95 °C	≤ 130 °C	≤ 195 °C	≤ 290 °C	≤ 400
Temperature class	T6	T5	T4	T3	T2	T1
Surface temperature	T85 °C	T100 °C	T135 °C	T200 °C	T300 °C	T410 °C



LABORATORIO OFICIAL J. M. MADARIAGA

(A1) **SCHEDULE**

(A2) **EC-Type Examination Certificate nr.: LOM 14ATEX2075 X**

(A3) **Description of equipment or protective system (continued)**

Marking



II 1/2 G Ex d IIC T* Ga/Gb
II 2D Ex t III C T* °C Db

T* according process temperature

(A4) **Test report nr.: LOM 14.477 VP**

(A5) **Special conditions for safe use**

- The maximum temperature in the enclosure head depends on the process temperature and may not exceed the maximum service temperature indicated for the junction box
- The tube must be mechanically protected or in locations with low risk of impact.
- When the container inside is a zone 0 a degree of protection of at least IP67 must be ensured in the process connection.

(A6) **Individual tests**

Overpressure tests required on the head enclosures.

(A7) **Essential Health and Safety Requirements**

Explosion safe requirements are covered by application of the standards indicated in the first page of this certificate.

(A8) **Descriptive documents**

	Rev.	Date
- Technical description n°:	DT0603	3 2015-07
	DT0611	- 2014-03
	DT0612	- 2014-03
	DT0618	- 2014-07
	DT0619	- 2014-09-10
	DT0620	- 2014-10
	IN0028	- 2014-09-15
- Drawings n°:	DT0613R2	2 2015-07
	PM1186R0	0 2014-09-23

NBK-03 to -33 ATEX

17.3 Limit contact RA (excerpt)



elobau GmbH & Co. KG
Zeppelinstraße 44
D-88299 Leutkirch
+49-7561-970-0 / www.elobau.de

EU-Konformitätserklärung

EU- Declaration of Conformity

Hiermit erklären wir, dass das nachfolgend aufgeführte Produkt aufgrund der Konzipierung und Bauart den Sicherheits- und Gesundheitsanforderungen der unten genannten EU-Richtlinien entspricht.

Hereby we officially validate that the below listed component comply with the requirements of the following European Directive because of their design and construction:

Bezeichnung des Bauteils: Name of component:	Flachscharter, Rohrscharter PA, Rohrscharter VA Surface mount switch, cylindrical proximity switch PA, cylindrical proximity switch VA
Beschreibung des Bauteils: Description of component:	magnetisch betätigter Endscharter für den EX-Bereich magnetically actuated explosion proof limit switch
elobau Artikel-Nr.: elobau item no.:	610 * 620 * 650 *
Einschlägige EG-Richtlinien: Relevant EC-Directives:	ATEX Richtlinie 2014/34/EU ATEX Directive 2014/34/EU
angewandte harmonisierte Normen:	EN 60079-0:2012 Allgemeine Anforderungen EN 60079-11:2012 Eigensicherheit „I“ EN 60079-18:2009 Vergusskapselung „m“ EN 60079-26:2007 Betriebsmittel mit Geräteschutzniveau (EPL) Ga
Name und Anschrift benannte Stelle:	TÜV SÜD Product Service GmbH, Ridlerstr. 65, 80339 München Kennnummer 0123
technisches Aktenzeichen: notified body / technical file number:	BVS 03 ATEX E 126 X, 1. + 2. + 3. Nachtrag
Änderungsindex: Modification index:	G
Leutkirch, den 20.04.2016	 Hans-Joachim Gehrs CE-Beauftragte / EC authorized Representative Dokumentation-Bevollmächtigte / Documentation Representative

998H0014K0001

Ex-relevante Aspekte:

Beachten Sie vor Verwendung der Sensoren die Betriebsanleitung die Betriebsanleitung "Näherungsschalter Serie 6."

Zertifikat Nr. BVS 03 ATEX E 126 X
CE 0123

Ausführung: II 2G EEx m II T6/T5
II 2D IP67 T105°C

- Die Sensoren dürfen in Kategorie 2 (Zone 1 o. 2) eingebaut und durch Fachleute in Betrieb genommen werden.

X - Hinweise auf besondere Bedingungen für die sichere Anwendung, auf welche in der Baumusterprüfbescheinigung (Betriebsanleitung) hingewiesen wird.

In dem Stromkreis des Endschalters muss eine an die Nennspannung des Schaltkontaktes angepasste Sicherung vorhanden sein, mit einem Abschaltvermögen, das mindestens dem prospektiven Kurzschlussstrom des versorgenden Netzes am Einsatzort entspricht.

- Der Sensor muss im Betrieb elektrostatisch geerdet sein.

- Ausführung mit verstärkter Isolation.

Typen-Nummer
610 0...0 01

- Kondenspezifisch Kabel d Messring (RS 50-55AW)
- Kabel 1- PIC
- Ex-Ausführung M vergussgekapselt mit Potentialklemme
- Kontaktort

Temp.-Klassen/ Ex-Ausführung	Temperaturbereiche
T5	-25°C ... +85°C
T6	-25°C ... +70°C
T8	-25°C ... +85°C

Typen-Nummer	Kontakt art	Gleichstrom (V/A/M)	Wechselstrom (V/A/M)	Schutzart
610030...0	C	230V/1/60	230V/1/60	IP 67

Verwendung: Vergussgekapselte Ausführung

Allgemeintoleranz	Polerisierung	Maßstab 1:1	Gewicht
DIN ISO 2768 v	ISO 8015	Werkstoff	GD-ZnAl4Cu1
DIN ISO 2768-ML			(Z410)
Do-Tun	Nome	Benennung	
Berch. 08.05.07	relms	Flachschoalter	
Depf. 13.07.07	rlha	RL94/9EG (ATEX) - m	
Zust.	Änderung	Do-Tun	Nome

Zust. Status: Freigabe

elobau®
88316 isny
Ers. für: 610030N1001
K11

Für diese Zeichnung behalten wir uns alle Rechte vor. Sie darf ohne unsere Zustimmung weder vervielfältigt, noch an Dritte zugänglich gemacht werden.

Änderungen nur nach Rücksprache mit Ex-Beauftragten
Ursprungszeichnung 6100...0-KEx1
nicht maßstabgetreu



Translation

(1) EC-Type Examination Certificate

- (2) - Directive 94/9/EC -
Equipment and protective systems intended for use
in potentially explosive atmospheres

(3) **BVS 03 ATEX E 126 X**

- (4) **Equipment:** Proximity switch type 6** ** ** ** ** ** ** ** ** ** ** ** **
(5) **Manufacturer:** Elobau Elektrobauelemente GmbH & Co. KG
(6) **Address:** D - 88316 Isny/Allgäu

- (7) The design and construction of this equipment and any acceptable variation thereto are specified in the schedule to this type examination certificate.
- (8) The certification body of Deutsche Montan Technologie GmbH, notified body no. 0158 in accordance with Article 9 of the Directive 94/9/EC of the European Parliament and the Council of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres, given in Annex II to the Directive.
The examination and test results are recorded in the test and assessment report BVS PP 03.2287 EG.
- (9) The Essential Health and Safety Requirements are assured by compliance with:
EN 50014:1997+A1-A2 General requirements EN 50020:2002 Intrinsic safety 'I'
EN 50028:1987 Encapsulation 'm' EN 50284:1999 Equipment Group II Category 1G
EN 50281-1-1:1998 +A1 Dust explosion protection
- (10) If the sign "X" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.
- (11) This EC-Type Examination Certificate relates only to the design, examination and tests of the specified equipment in accordance to Directive 94/9/EC.
Further requirements of the Directive apply to the manufacturing process and supply of this equipment. These are not covered by this certificate
- (12) The marking of the equipment shall include the following:

II 1G EEx ia IIB / IIC T5 / T6 or **II 1/2G EEx ia IIC T5 / T6**
II 2G EEx ia IIC T5 / T6 or **II 2G EEx m II T5 / T6**
II 2D IP67 / IP 68 T105°C Allocation see tables in 15.1.2

Deutsche Montan Technologie GmbH

Bochum, dated 16. December 2003

Signed: Dr. Jockers

Signed: Schumann

Certification body

Special services unit

Page 1 of 16 to BVS03 ATEX E 126 X
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Dinnendahlstrasse 9 44809 Bochum Germany Phone +49 201 172-3947 Fax +49 201 172-3948
(until 31.05.2003: Deutsche Montan Technologie GmbH Am Technologiepark 1 45307 Essen)



Translation

2nd Supplement

(Supplement in accordance with Directive 94/9/EC Annex III number 6)

to the EC-Type Examination Certificate BVS 03 ATEX E 126 X

Equipment: Proximity switch type type 6** *** ** *_**

Manufacturer: elobau GmbH & Co. KG

Address: 88299 Leutkirch, Germany

Description

The proximity switch can be modified according to the descriptive documents as mentioned in the pertinent test and assessment report

Type code 6***** - **
6ab c de f g h ij - kl

Position "g" in the type code is enhanced as follows

- g type of interconnection cable: *)
- 1 = cable Boflex W (PVC grey) 2 x 0.75 / 3 x 0.75 / 4 x 0.75
 - 2 = cable SIHSI (Silicon red) 2 x 0.75 / 3 x 0.75
 - 3 = cable BOY11Y (PUR black) 2 x 0.75 / 3 x 0.75
 - 4 = cable LIYCYW (PVC screened) 2 x 0.75 / 3 x 0.75 / 4 x 0.5
 - 5 = cable SXCS (Silicon screened) 2 x 0.75 / 3 x 0.75
 - 6 = cable LIFY11Y (PUR black) 3 x 0.25
 - 7 = cable LIYYW (PVC grey) 3 x 0.25
 - U = cable Y-UL 2517 (PVC grey) 3 x 0.75 / 4 x 0.75
 - L = cable HK-SO-Li911Y-OZ-HF 4x 0.75 (grey) 4 x 0.75 unscreened

*) intrinsically safe models optionally fitted with blue coloured cable coating or marked with blue coloured tube

The Essential Health and Safety Requirements of the previous and of the modified equipment are assured by compliance with:

- EN 60079-0:2006 General requirements
- EN 60079-11:2007 Intrinsic safety 'i'
- EN 60079-18:2004 Encapsulation 'm'
- EN 60079-26:2007 Equipment with equipment protection level (EPL) Ga
- EN 61241-11:2006 Protection by IS
- EN 61241-18:2004 Encapsulation 'mD'

Page 1 of 17 to BVS 03 ATEX E 126 / N2

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DEKRA EXAM GmbH Dinnendahlstrasse 9 44809 Bochum Germany Phone +49 234/3696-105 Fax +49 234/3696-110 E-mail zs-exam@dekra.com

NBK-03 to -33 ATEX



The marking of the equipment shall include the following:

II 2G Ex ia IIC T5/T6 Gb
II 1/2G Ex ia IIC T5/T6 Ga/Gb
Ex **II 1G Ex ia IIB / IIC T5/ T6 Ga** or **II 1D Ex ia IIC IP6* T105°C Da**
II 2G Ex mb IIC T5/T6 Gb
II 2D Ex mb IIC IP67 T105°C Db or **II 2D Ex ib IIC IP67 T105°C Db**
II 2D Ex mb IIC IP68 T105°C Db or **II 2D Ex ib IIC IP68 T105°C Db**

Parameters

- 1 Proximity switches operated non intrinsically safe
No change
- 2 Proximity switches operated intrinsically safe
- 2.1 Proximity switches of type series 610 0** I/K*0 **.*

Type	610 010 **0**.*	610 030 **0**.*	610 040 **0**.*	610 045 **0**.*
Voltage U_i	AC/DC 60 V	AC/DC 60 V	AC/DC 60 V	AC/DC 60 V
Current I_i	3 A	1 A	1 A	0.6 A
Power P_i	500 mW *)	500 mW *)	500 mW *)	500 mW *)
effective internal capacitance C_i	see 2.7	see 2.7	see 2.7	see 2.7
effective internal inductance L_i	see 2.7	see 2.7	see 2.7	see 2.7
Temperature class	T6 / T5	T6 / T5	T6 / T5	T6 / T5
max. ambient-temperature	70 °C / 85 °C	70 °C / 85 °C	70 °C / 85 °C	70 °C / 85 °C

*) refers to 1G (EPL Ga), 1/2G (EPL Ga/Gb and) 1D (EPL Da) application;
not relevant for 2G or 2D (EPL Gb, Db) application