

Level Indicator for Tank-Top Mounting



measuring
•
monitoring
•
analyzing

NBK-04



- Max. Measuring Length: 13'
- $p_{\max}$: 230 PSI
- $t_{\max}$: 250 °F
- Max. Viscosity: 200 cPs
- Connection: ASME B16.5
Flange 2", 2-1/2", 3" or 4"
- Material: 316-Ti Stainless Steel
- Roller Display / Ball Display
- Limit Contacts
- Analog Outputs



KOBOLD companies worldwide:

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Description

KOBOLD NBK-04 level indicators are used for continuous measurement, display, and monitoring of liquid levels. The measuring/indicating tube is mounted to the top of a tank. According to the laws of hydrostatic pressure, the level displayed on the indicating tube will follow the level in the tank. A float with an attached guide rod and circular magnet, is located within the measuring tube and follows the liquid level, transferring the level in a non-contacting manner via the guide rod and magnet to a display, transmitter, or switch attached to the outside of the indicating tube.

The following indication and sensing devices are available:

Magnetic Roller Indicator

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

Transmitter

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

Universal Indicating Unit

A universal indicating unit, series ADI-1, can be mounted on the indicating tube to display and evaluate the standard signal (4 ... 20 mA) generated by the transmitter.

Limit Contacts

One or more reed contacts, for point level sensing or for level control, can be mounted to the indicating tube.

Applications

- Storage Tanks
- Tanks on Ships
- Agitator Vessel
- Water Tanks

Technical Details

Over-Head Tube:	Ø 2.374"
Tank Tube:	Ø 2.374" or Ø 2.996"
Material:	316-Ti Stainless Steel
Initial Measurement:	10.7" from End of Tank Tube
Float:	Titanium
Connecting Rod:	Rod or Tube in Titanium or 316-Ti SS (Depending on Media Density and Measuring Length)
Flange Nominal Size:	ASME B16.5 2", 2-1/2", 3", 4" Class 150
Operating Pressure:	230 PSIG
Operat. Temperature:	-4...248 °F (POM Rollers) -155...248 °F (Ball Display)
Viscosity:	Max. 200 cPs
Measuring Length:	23.62" ... 157.4"
Total Length:	See Dimensional Drawing
ATEX Approval:	See Separate Description

Roller Display RP	(Max. Continuous Length 13')
Roller Material:	POM
Display Glass:	Plexiglas®
Carrier Frame:	Aluminum, Anodized
Operat. Temperature:	-4...248 °F
Protection:	IP 54

Ball Display - Model KP	(Max. Continuous Length 12.4')
Ball Material:	Ultramid™
Sight Tube:	Plexiglas®
Sealing Plug:	Aluminum
Seal:	NBR
Ball Support Rail:	Aluminum, Anodized
Carrier Frame:	304 Stainless Steel
Scale:	Hard-PVC, 304 Stainless Steel (Option MV)
Operat. Temperature:	-4...176 °F
Ambient Temperature:	-4...176 °F
Protection:	IP 66

Ball Display - Model KM	(Max. Continuous Length 12.4')
Ball Material:	Ultramid B®
Sight Tube:	Makrolon®
Sealing Plug:	Aluminum
Seal:	FKM
Ball Support Rail:	Aluminum, Anodized
Carrier Frame:	304 Stainless Steel
Scale:	Hard-PVC, 304 Stainless Steel (Option MV)
Operat. Temperature:	-76...248 °F
Ambient Temperature:	-4...176 °F
Protection:	IP 66

**Ball Display - Option KF** (Max. Continuous Length 12.4")

Filling:	Silicone Oil
Ball Material:	Ultramid B®
Sight Tube:	Makrolon®
Sealing Plug:	304 Stainless Steel
Seal:	FKM
Ball Support Rail:	Aluminum, Anodized
Carrier Frame:	304 Stainless Steel
Scale:	Hard-PVC, 304 Stainless Steel (Option MV)
Operat. Temperature:	-155...248 °F
Ambient Temperature:	-4...176 °F
Protection:	IP 66

Ball Display - Option KG (Max. Continuous Length 9.8")

Material Ball:	Ultramid B®
Sight Tube:	Borosilicate Glass
Sealing Plug:	304 Stainless Steel
Seal:	FKM
Ball Support Rail:	Aluminum, Anodized
Carrier Frame:	304 Stainless Steel
Scale:	304 Stainless Steel
Operat. Temperature:	-4...248 °F
Ambient Temperature:	-4...248 °F
Protection:	IP 66

* In case of multi-part design, a display (ball) length of 1.3" is not readable

Limit Contacts - Model NBK-R

Contact Operation:	Bistable SPDT Contact
Switching Hysteresis:	Approx. 15 mm
Max. Switch Capacity:	60 W/VA, 230 V _{AC/DC} , 1 A
Resistance:	100 mΩ
Media Temperature:	-40...212 °F
Ambient Temperature:	-40...167 °F
Connection:	9.8' PVC-cable
Housing:	Polycarbonate
Protection:	IP 67

Limit Contact High Temperature - Model NBK-RT200

Contact Operation:	Bistable SPDT Contact
Switching Hysteresis:	Approx. 15 mm
Max. Switching Capacity:	80 VA, 250 V _{AC/DC} , 1 A
Resistance:	<20 mΩ
Media Temperature:	-40...248 °F
Ambient Temperature:	-40...293 °F
Housing:	Aluminum Pressure-cast, Terminal Connection
Cable Entry:	M16 x 1.5, Brass Nickel-plated
Protection:	IP 65

Limit Contact - Model NBK-RV200NO

Sensor Type:	Reed Contact
Switching Pattern:	Normally Open, Bistable
Switching Hysteresis:	Approx. 7 mm
Media Temperature:	-58...248 °F
Ambient Temperature:	-40...158 °F
Max. Housing Temperature:	176 °F
Max. Operating Voltage U_{max}:	400 V _{DC} / 250 V _{AC}
Max. Load Current I_{max}:	0.5 A
Max. Switching Power P_{max}:	5 W
Housing:	Aluminum Pressure-cast, Terminal Connection
Protection:	IP 65

Limit Contact - Model NBK-RV200NC

Sensor Type:	Reed Contact
Switching Pattern:	Normally Closed, Bistable
Other Parameters:	Same as NBK-RV200NO

Limit Contact - Model NBK-RN200NO

Sensor Type:	NAMUR Contact
Switching Pattern:	Normally Open, Bistable
Max. Operating Voltage U_{max}:	15 V _{DC}
R_{on}:	1 kΩ
R_{off}:	11 kΩ
Other Parameters:	Same as NBK-RV200NO

Limit Contact - Model NBK-RN200NC

Sensor Type:	NAMUR Contact
Switching Pattern:	Normally Closed, Bistable
Other Parameters:	Same as NBK-RV200NO

Reed Contact Resistor Chain - Option ..W..

Total Resistance:	0.7 ... 7 kΩ
Meas. Circuit Volt.:	Max. 24 V _{DC}
Measuring Current:	Max. 0.1 A
Max. Length:	13'
Media Temperature:	-40...248 °F
Ambient Temp.:	Max. 266 °F
Resolution:	0.4" (ML < 6.5') 0.8" (ML ≥ 6.5')
Housing:	Aluminum Pressure-cast
Cable Gland:	M16x1.5
Protection:	IP 65

Reed Contact Resistor Chain with 2-Wire Transmitter - Option ..M

Output:	4 ... 20 mA
Supply Voltage:	16 ... 32 V _{DC}
Max. Length:	13.1'
Load:	(V _{Vers} - 9 V) / 0.02 A [Ω]
Media Temperature:	-40 ... 248 °F
Ambient Temp.:	-4 ... 176 °F
Resolution:	0.4" (ML < 6.5')
	0.8" (ML ≥ 6.5')
Housing:	Aluminum Pressure-Cast
Protection:	IP 65

Magnetostrictive Sensor with 4-Wire Transmitter, 4 ... 20 mA - Option ..T.

Output:	4 ... 20 mA
Supply Voltage:	24 V _{DC} , Max. 150 mA
Load:	Max. 500 Ω
Max. Length:	13.1'
Media Temperature:	-40 ... 248 °F
Ambient Temperature:	-4 ... 176 °F
Accuracy:	±1 mm
Housing:	Aluminum Pressure-Cast
Protection:	IP 65

Reed Contact Resistor Chain with 2-Wire Transmitter, 4 ... 20 mA - Option A (Only with Display Options AE or AC)

Transmitter Model:	5333D
Common Specifications:	
Power Supply:	8.0 ... 35 V _{DC}
Communication Interface:	Loop Link
Linear Resist. Input:	0 ... 10 kΩ
Current Output	
Signal Range:	4 ... 20 mA
Min. Signal Range:	16 mA
Updating Time:	135 ms
Load Resistance:	≤ (V _{supply} - 8) / 0.023 [Ω]
Sensor Error Detection	
Programmable:	3.5 ... 23 mA
Media Temperature:	-40 ... 248 °F
Ambient Temperature:	-4 ... 176 °F
Resolution:	0.4" (ML < 6.5')
	0.8" (ML ≥ 6.5')
Housing:	Aluminum Pressure-cast
Cable Entry:	M 20 x 1.5
Protection:	IP 66
LED or LCD Display (Options AE/AC):	
Power Supply:	Loop-powered
Voltage:	LED 3.3 V at 4 mA
	3.7 V at 20 mA
	LCD max. 2.5 V

Reed Contact Resistor Chain with 2-Wire Transmitter, 4 ... 20 mA, HART® - Option H and Display Options HE or HC

Transmitter Model:	5337D
Common Specifications:	
Power Supply:	8.0 ... 35 V _{DC}
Communication Interface:	Loop Link 5905A and HART®

Linear Resist. Input:	0 ... 7 kΩ
Current Output	
Signal Range:	4 ... 20 mA
Min. Signal Range:	16 mA
Updating Time:	440 ms
Load Resistance:	≤ (V _{supply} - 8) / 0.023 [Ω]
Sensor Error Detection	
Programmable:	3.5 ... 23 mA
Media Temperature:	-40 ... 248 °F
Ambient Temperature:	-4 ... 176 °F
Resolution:	0.4" (ML < 6.5')
	0.8" (ML ≥ 6.5')
Housing:	Aluminum Pressure-cast
Cable Entry:	M 20 x 1.5
Protection:	IP 66
LED or LCD Display (Options HE/HC):	
Power Supply:	Loop-powered
Voltage Drop:	LED 3.3 V at 4 mA
	3.7 V at 20 mA
	LCD max. 2.5 V

Reed Contact Resistor Chain with Transmitter, - Option F (PROFIBUS®-PA, FOUNDATION™ Fieldbus)

Transmitter Model:	5350A
Common Specifications:	
Supply Voltage:	9 ... 32 V _{DC}
Consumption:	< 11 m
Isolation Voltage, Test / Operation:	1.5 kV _{AC} / 50 V _{AC}
Signal / Noise Ratio:	Min. 60 dB
Response Time (Programmable):	1 ... 0 s
Updating Time:	< 400 ms
Dimension:	Ø 44 x 20.2 mm
Linear Resistance Input:	0 ... 10 kΩ
Output:	
FOUNDATION™ Fieldbus Connection:	
FOUNDATION™ Fieldbus Version:	ITK 4.51
FOUNDATION™ Fieldbus Capability:	Basic or LAS
FOUNDATION™ Fieldbus Func. Blocks:	2 Analog and 1 PID
PROFIBUS® PA Connection:	
PROFIBUS® PA Protocol Standard:	EN 50170 vol. 2
PROFIBUS® PA Function Blocks:	2 Analog
PROFIBUS® PA Address (at Delivery):	126
Media Temperature:	-40 ... 248 °F
Ambient Temperature:	-4 ... 176 °F
Resolution:	0.4" (ML < 6.5')
	0.8" (ML ≥ 6.5')
Housing:	Aluminum Pressure-cast
Cable Entry:	M 20 x 1.5
Protection:	IP 66

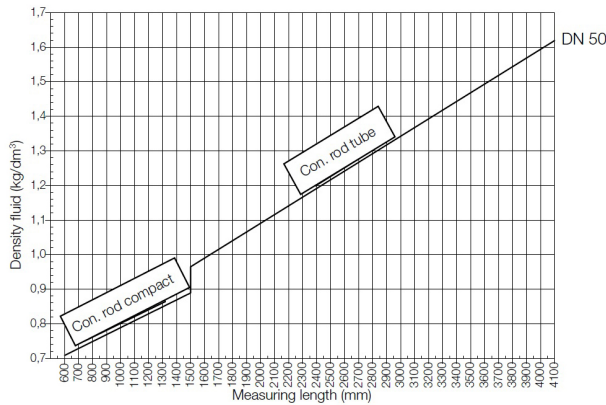
Order Details (Example: NBK-04 F50 00 0 8) (continued on page 6)

Model	Connection Type	Indicator Type	Output Transmitter Type	Media Density per Meas. Length
NBK-04..	..A50.. = ASME Flange 2" ..A80.. = ASME Flange 3" ..A1H.. = ASME Flange 4"	..00.. = without ..RP.. = POM Roller Indication ..KP.. = Ball Display with Plexiglas® Sight Tube ..KM.. = Ball Display with Makrolon® Sight Tube	..0.. = without ..W.. = Reed Chain ..M.. = Reed Chain/4...20 mA, 2-wire ..T.. = Magnetostrictive Probe/ 4...20 mA, 4-wire	..8 = See Diagram 8 ..6 = See Diagram 6
	..A65.. = ASME Flange 2-½" ..A1H.. = ASME Flange 4"	..KF.. = as KM but with Oil Filling ..KG.. = Ball Display with Borosilicate Sight Tube	..A¹).. = Reed Chain/ 4...20 mA, 2-wire ..H.. = Reed Chain/ 4...20 mA, HART® ..F.. = Reed Chain/ Profibus® PA Fieldbus® FOUNDATION™	..4 = See Diagram 4
Accessory Switches (to be ordered separately)				
NBK-R	Standard limit contact (Bistable SPDT Contact)			
NBK-RT200	High temperature limit contact (Bistable SPDT contact), max temperature 248°F			
NBK-RV200NO	High vibration limit contact (Bistable N/O contact), max temperature 248°F			
NBK-RV200NC	High vibration limit contact (Bistable N/C contact), max temperature 248°F			
NBK-RN200NO	High vibration limit contact (Bistable NAMUR N/O contact), max temperature 248°F			
NBK-RN200NC	High vibration limit contact (Bistable NAMUR N/C contact), max temperature 248°F			

¹) Only with Options AE or AC

NBK-04...8:

Diagram 8*

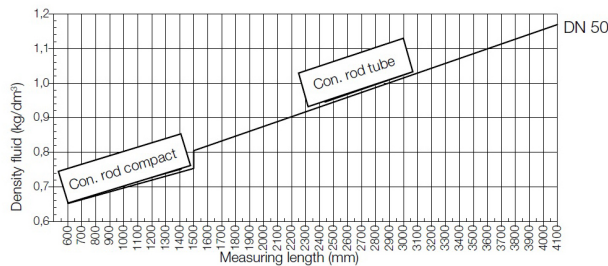


NBK-04...8

Float: Titanium
Connection Rod: 316-Ti Stainless Steel
Process Connection: ASME Flange, 2", 3", 4"
Overhead/Tank Tube: Ø 2.374", Continuous
Min. Media Density: 0.71 kg/dm³ at ML = 23.62"

NBK-04...6:

Diagram 6*

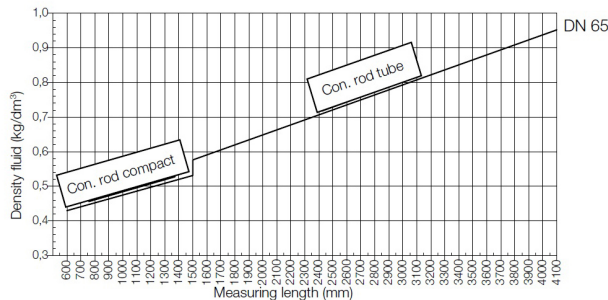


NBK-04...6

Float: Titanium
Connection Rod: Titanium
Process Connection: ASME Flange, 2", 3", 4"
Overhead/Tank Tube: Ø 2.374", Continuous
Min. Media Density: 0.65 kg/dm³ at ML = 23.62"

NBK-04...4:

Diagram 4*



NBK-04...4

Float: Titanium
Connection Rod: 316-Ti Stainless Steel
Process Connection: ASME Flange, 2½", 4"
Overhead/Tank Tube: Ø 2.374", Ø 2.996"
Min. Media Density: 0.43 kg/dm³ at ML = 23.62"

* Valid specific gravity per length combinations are located above the line.

***Additional Information Required for Order:**

To ensure proper operation, this product requires a completed application guide form to be submitted with any order. Please refer to the end of this datasheet in order to obtain the correct form. You can also contact your KOBOLD representative for this form.

Options

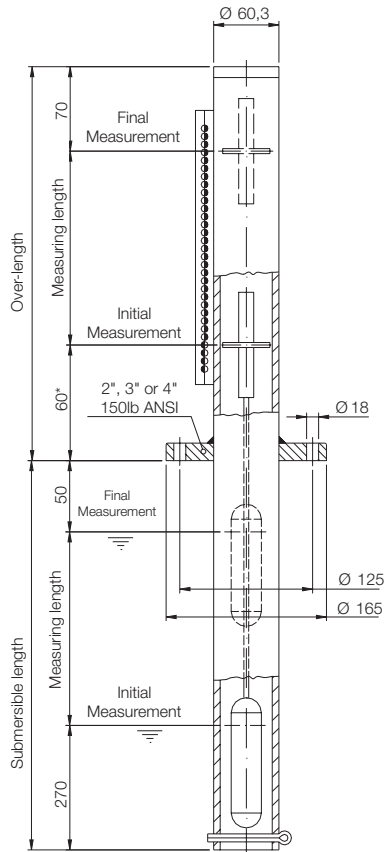
Code	Description	Diagram/Picture
Scales		
(Ball displays are always delivered with scales, see technical data / sketch for resolution)		
MV	Scale Made of 304 Stainless Steel (Only with Ball Display Models KP/KM/KF as it's Standard with Model KG)	See Sketch Page 8
M1	Measuring Scale, Media Temperature -40...250 °F, Engraved Scale Made of Aluminum	See Sketch Page 8
M2	Measuring Scale, Media Temperature -40...250 °F, Scale Backing Made of Laser-etched Aluminum	 See Sketch Page 8
Electrical Outputs		
MU	Option M with Connection Box at Bottom, for Easy Access to Connection Box	See Sketch Page 10
Display Options		
AE	Aluminum Die-cast Housing, LED Digital Display, Connection Box at Bottom (only in Combination with Transmitter Option A)	
AC	Aluminum Die-cast Housing, LCD Digital Display, Connection Box at Bottom (only in Combination with Transmitter Option A)	Same as AE, however with LCD Display
HE	Aluminum Die-cast Housing, LED Digital Display, Connection Box at Bottom (only in Combination with Transmitter Option H)	
HC	Aluminum Die-cast Housing, LCD Digital Display, Connection Box at Bottom (only in Combination with Transmitter Option H)	Same as HE, however with LCD Display
C¹⁾	Indicating Unit ADI-1V00W2F0 with Bargraph and Digital Display, Rugged Aluminum Housing, Mounted on Indicating Tube	See Sketch Page 10
Tests/Certificates		
P	Radiographic Examination DIN 54 111 T1	
Q	Dye Penetration Test DIN EN 571-1	
X	Pressure Test with Water 1.5 x PN	
Z	3.1 Sketch Acc. EN 10204	
MR	Material Acc. to NACE MR 0103/ISO15156 (MR0175), Declaration of Conformance	
WV	Positive Material Identification (PMI)	
SF	Oil and Fat Free	

¹⁾ only possible with option T (magnetostrictive sensor or option M (reed chain with transmitter)

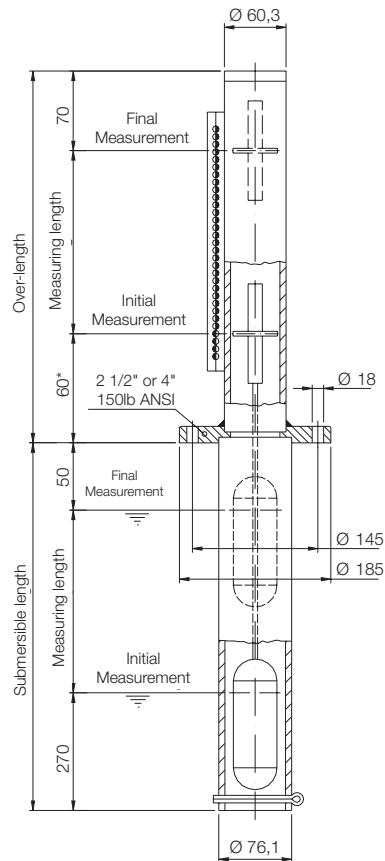
Note: Please pay attention to max. permissible temperature limits of individual components

Dimensions (mm)

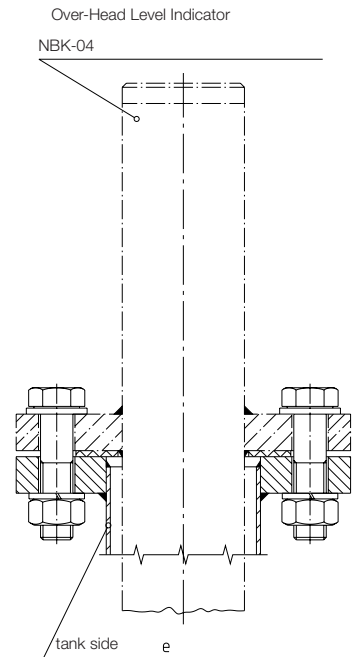
NBK-04..8/6



NBK-04..4



Required Size of the Mounting Tube of the Tank Side



Ø NBK-04 Tube	Minimum-Ø of the Mounting of the Tank Side
Ø 76.1 mm	Ø 88.9 mm x 2
Ø 60.3 mm	Ø 76.1 mm x 2

* In case of using a transmitter:

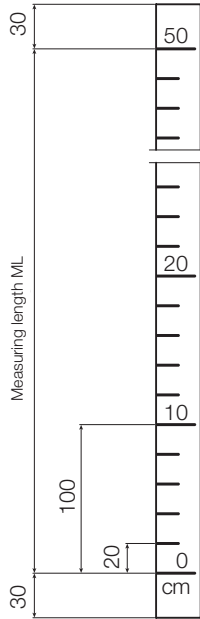
Dimension = 100/130/200 mm depending on transmitter model

Dimension = 130 mm in case of using a ball display

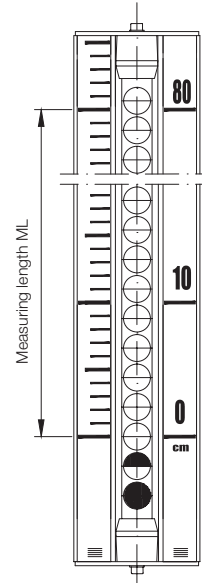
Submersible length = measuring length + 320 mm

Measuring length = submersible length - 320 mm

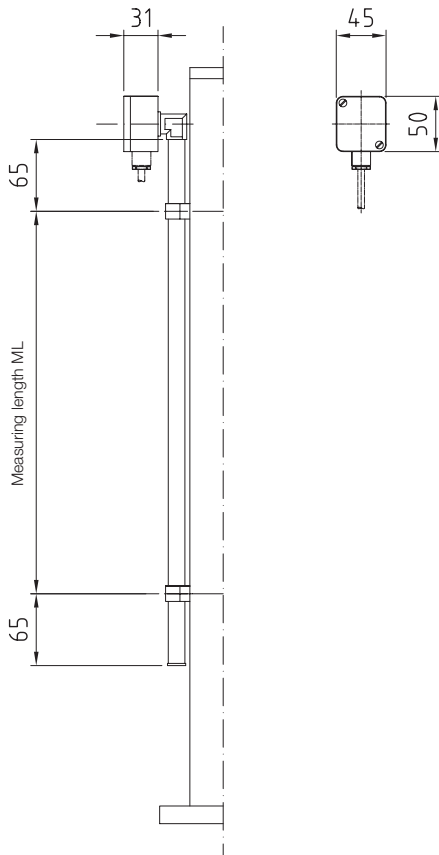
Measuring Scale, Aluminum
Option M1 - Engraved Scale
Option M2 - Polyester Foil



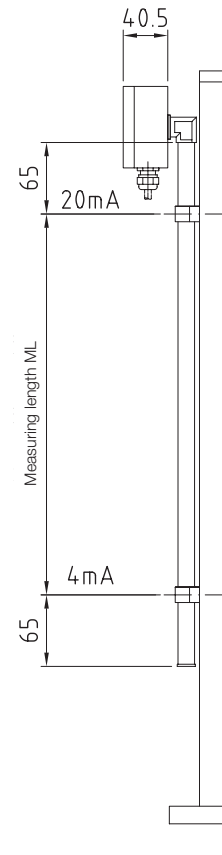
Measuring Scale on Stainless Steel Carrier
Scale from Hard PVC or Print on 304 SS
(Standard Scale with Ball Display)



NBK-04.. with Reed Chain Model W

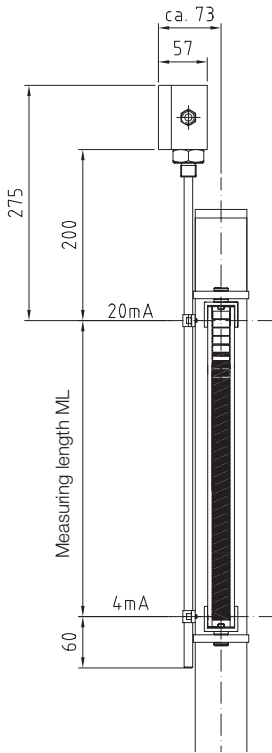


NBK-04.. with Transmitter Model M

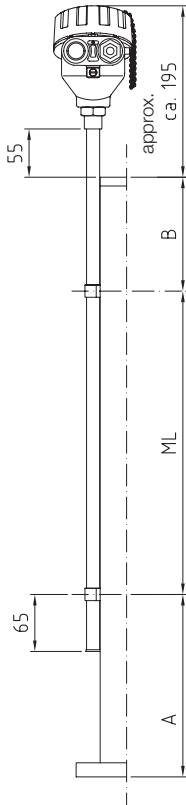




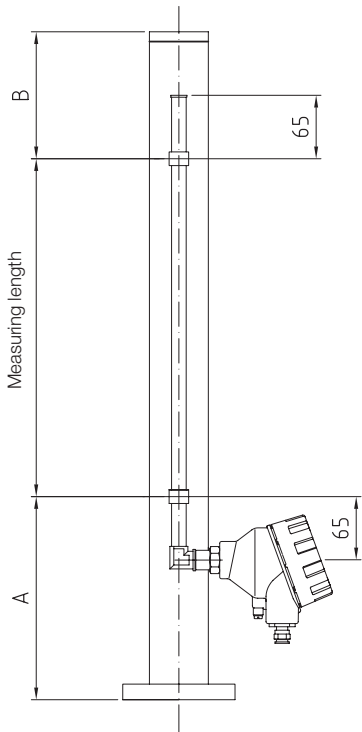
NBK-04.. with Transmitter Model T



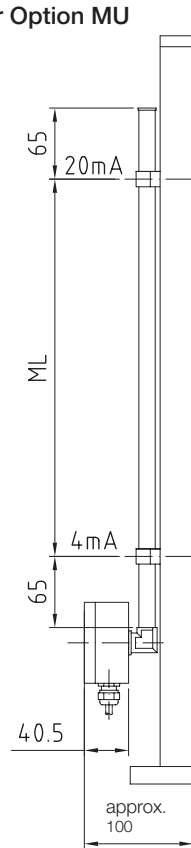
NBK-04.. with Transmitter Options H/F



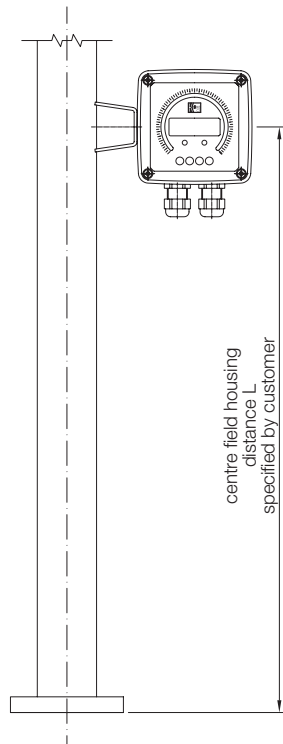
NBK-04.. with Transmitter Display Options AE/HE or AC/HC



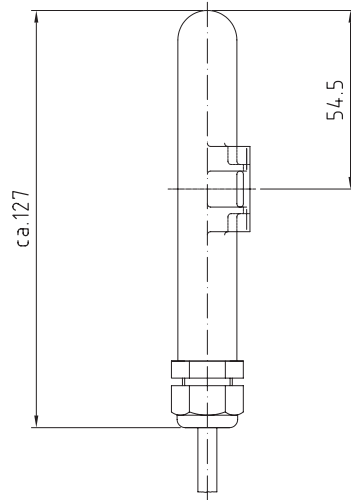
NBK-04.. with Transmitter Option MU



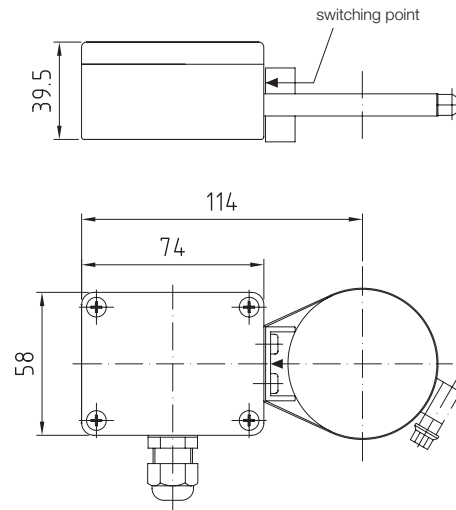
NBK-04...with Indicating Unit ADI-1V..2F, Option C



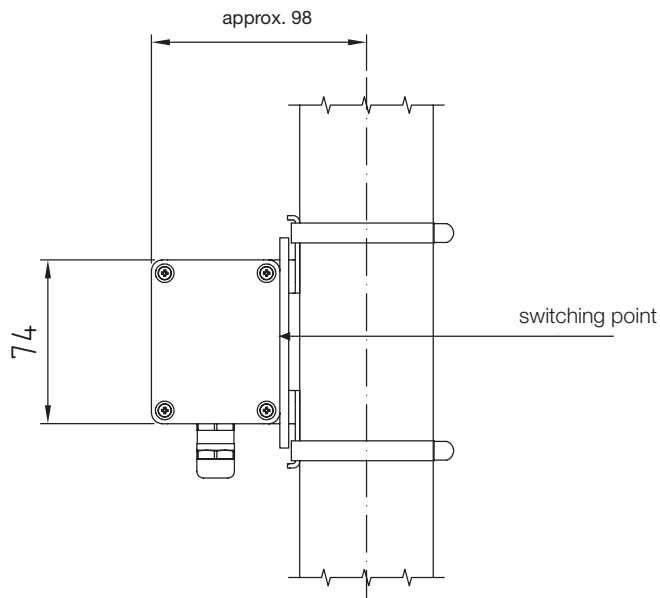
NBK-R



NBK-RT200



NBK-RV/RN





NBK-04 Application Guide

Rev 09/09/2025

General Information

Contact Name: _____

Date: _____

Company Name: _____

Part Number: _____

Phone: _____

Number of Pieces Required: _____

Email: _____

Quote Number (if already quoted): _____

This has not been quoted yet and pricing is required.

Design Conditions

1. Pressure: Normal: _____ PSIG Maximum: _____ PSIG

2. Temperature: Normal: _____ °F Maximum: _____ °F

3. Liquid Type: _____

4. Liquid Specific Gravity at Normal Operating Temp: _____ Maximum Temp: _____

5. Liquid Viscosity at Normal Operating Temperature: _____

Mounting Configuration

1. Measuring Length "M": _____ Inches cm (see datasheet for further dimensional information))

2. Fitting Size: 2" 2-1/2" 3" 4"

3. Fitting Type: 150 LB ANSI Flange Other: _____

Options - Indicator

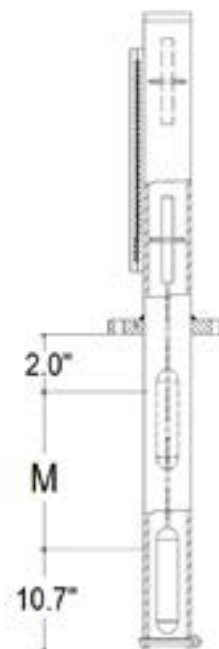
POM Roller (250 °F Max - Option "RP")

Ball Display with Plexiglass Sight Tube (Max 175 °F - Option "KP")

Ball Display with Makrolon® Sight Tube (Max. 250 °F - Option "KM")

Ball Display with Makrolon® Sight Tube with Oil Filling (Max 250 °F - Option "KF")

Ball Display with Borosilicate Glass Sight Tube (Max 390 °F - Option "KG")



Options - Transmitter

Reed Chain with 4...20 mA, 2-wire (Option "M")

Reed Chain with 0.7...7 kΩ (Option "W")

Reed Chain with 4...20 mA, 2-wire with HART® (Option "H")

Reed Chain with PROFIBUS® PA FOUNDATION FIELDBUS (Option "F")

Magnetostrictive Probe with 4...20 mA, 4-wire (Option "T")

Guided Wave Radar (Model NGM)

Transmitter Location

Top Mount Housing (Default)

OR

Bottom Mount Housing (Option "MU")

Left Side (Default)

OR

Right Side

Option - Switches

NBK-R (Max 212 °F) Qty:_____

NBK-RV200NO (Max 390 °F) Qty:_____

NBK-NBK-RV200NC (Max 390 °F) Qty:_____

NBK-RN200NO (Max 390 °F) Qty:_____

NBK-RN200NC (Max 390 °F) Qty:_____

NBK-RS1UXX (Max. Temp. 248 °F)

XX = 03 (3m Cable)

XX = 06 (6m Cable)

XX = 10 (10m Cable)

NBK-RH1UXX (Max. Temp. 662 °F)

XX = 03 (3m Cable)

XX = 06 (6m Cable)

XX = 10 (10m Cable)

Options - Scales (ball indicators are always delivered with scales - specify units: inches or cm, & mounting: left or right side of the indicating rollers)

Laser Etched Aluminum (-40...300 °F Media Temp) - Option "M2"

Specify: inches cm

Engraved Aluminum (-40...750 °F Media Temp) - Option "M1"

Specify: Left Right (default)

Scale made of 304 Stainless Steel (only with ball display option KP/KM/KF, standard on KG) - Option "MV"

Options - Display

Aluminum Housing with LED Display, Bottom Connection (only with Transmitter Option "A") - Option "AE"

Aluminum Housing with LCD Display, Bottom Connection (only with Transmitter Option "A") - Option "AC"

Aluminum Housing with LED Display, Bottom Connection (only with Transmitter Option "H") - Option "HE"

Aluminum Housing with LCD Display, Bottom Connection (only with Transmitter Option "H") - Option "HC"

Tests/Certificates

Pressure Test with Water (1.5x Flange Class Rating) - Option "X"

3.1 Inspection Certificate per EN 10204 - Option "Z"

Oil and Grease Free - Option "SF"

Other Options / Custom Configurations / Special Requirements

NBK Purchasing Process

In order to provide you with the correct and most cost-effective NBK, our technical team at KOBOLD will partner with you in building your NBK. NBKs are highly customizable, have critical nuances that are easy to overlook, and are built to order. After submission of this form, one of our engineers will contact you to schedule a consultation. If you are a distributor or reseller, please consider including any end-users in that consultation who will be part of the design and installation. This will shorten the purchasing process and ensure that nothing is overlooked along the various stakeholders in the supply chain. If you require immediate assistance or have any questions, please contact our engineering team at 412-788-2830. Please email this form to info@koboldusa.com.