

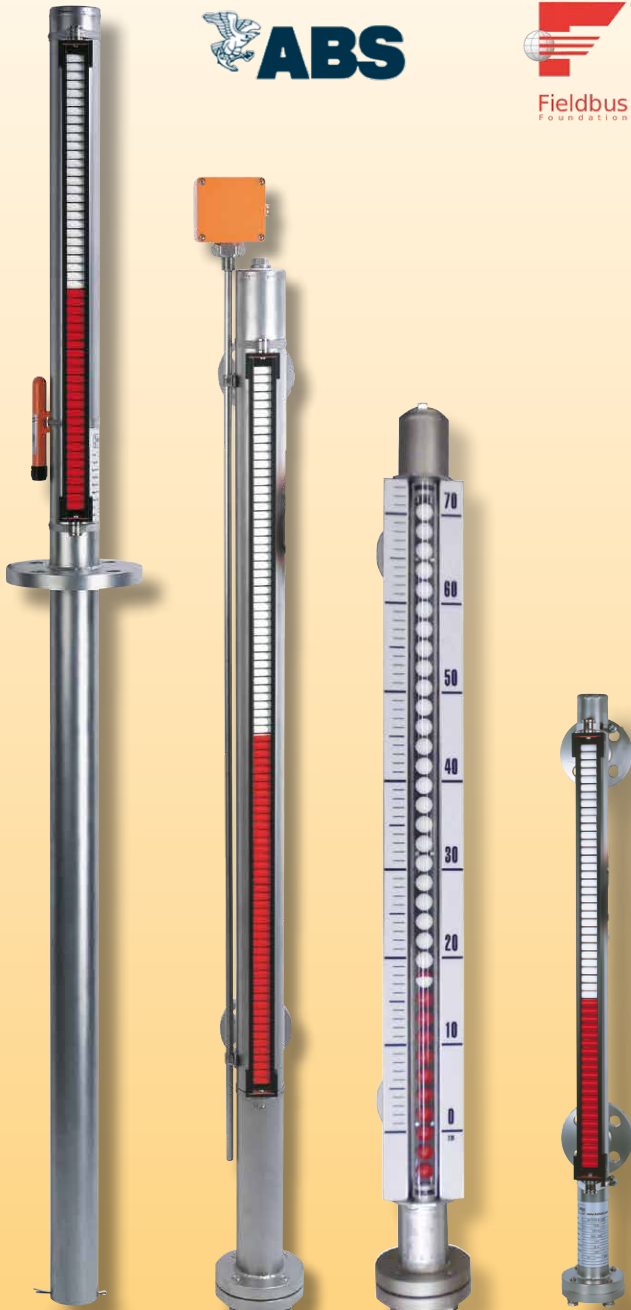
NBK

BYPASS LEVEL INDICATORS

Standard, Mini, and Tank Top Models



measuring
•
monitoring
•
analyzing



- Rugged, Economical Design
- Magnetically Coupled Magnet Roller or Ball Indication Displays
- Material: 316-Ti Stainless Steel
- NPT Thread or ANSI Flange Connections
- Optional Switches
- Analog Output, HART[®], Profibus-PA[®], Foundation[™] Fieldbus, & Digital Display Options
- Max. Viscosity: 200 cPs



KOBOLD companies worldwide:

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

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Model:
NBK
NBK-04
NBK-M
LIT081
REV: 11-2016



Example Application: Combined Heat and Power Cogeneration Plant

CHP, or cogeneration plants, produce both electric and thermal energy from a single process. Diverse fuel sources are used, such as natural gas, biomass, coal, or process waste. Traditional power plants create steam, but it is treated as a waste product and is not utilized. CHP plants capitalize on the byproduct and use it to generate heating and cooling services. CHP plants are up to 30% more efficient and account for 8% of the US generating capacity. An executive order was recently signed that will increase the amount of CHP power generated in the US. Our client needed to replace leaking sight glasses that were also suffering from unacceptable corrosion. The incinerator area, where they are needed, is extremely dusty as the fuel can be anything from wood, paper, soiled medical products, etc. KOBOLD NBKs, with their high visibility roller indication, were able to solve all the visibility problems. The stainless steel build ensures that rust and breakage will not plague the installation in the future.



Example Application: Oxygen Generation Systems for Military Submarines

KOBOLD has a long tradition of supplying instrumentation for the construction of underwater breathing air systems for military submarines. The most recent designs use eight different KOBOLD instruments, including the NBK. The complex systems are designed to perform several different tasks. First, water is broken down into oxygen and hydrogen. The oxygen is then consumed by the crew and carbon dioxide is produced as a resulting waste product. The carbon dioxide is then forced into reaction with the waste hydrogen from the first step of the process to create an aqueous solution that can either be stored onboard or discharged overboard. Automating this complex process and protecting the lives of the crew involves many separate aspects of process control: conductivity measurement to ensure the integrity of the water entering the process, flowmeters to monitor correct flow amounts for both the water and the subsequent gases in the process, pressure gauges and sensors, temperature sensors, and of course NBKs to monitor the levels in various holding tanks and reactor vessels. Because we offer an exceptionally broad line of instrumentation, we were one of the few companies able to provide all the required instrumentation and to prove a long history of rugged service for the instrumentation in question.

Example Application: Steam and Condensate Systems in the Paper Industry

Papermaking dates back to 8 BCE in China, where it was manually made out of materials like fishing nets, mulberry, rags, and hemp waste. In the 3rd century, paper became more widespread, but it wasn't until the 8th century when the process was revolutionized and something resembling commercial production was born in the Middle East. Truly modern industrialized paper production did not begin until the 19th century in Europe and wood pulp became the standard material base. Today's mills are not a far cry from the original process. Pulp is refined and mixed with water. The resulting slurry is distributed onto a moving screen where it is drained, pressed, dried, and rolled into sheets. Our customer builds custom steam and condensate systems that are used in the paper making process. They had previously used glass sight tubes which suffered leaks and fractures and did not offer good long term visibility. All of these limitations were overcome by switching to KOBOLD NBKs with magnetic indicators, a rugged build, and high visibility level indication.





NBK Series Description

Handbuilt in the US, KOBOLD bypass level indicators are used for continuous measurement, display, and monitoring of liquid levels. The bypass tube is attached to the side wall of the tank. According to the laws of hydrostatic pressure, the level in the bypass tube will equal the level in the tank. A float, with embedded circular magnets, is located in the bypass tube and follows the liquid level, transferring the level in a non-contacting manner to a display attached to the outside of the bypass tube or to a sensing device.

The following indication and sensing devices are available:

Magnetic Roller Indicator

As the float passes by, the red/white rollers are rotated in succession by 180° around their own axes. The rollers change from white to red as the level rises and from red to white as the level falls. The advantage of a ball display is the higher protection category, good visibility of 180° and higher vibration resistance with the 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 bypass tube. A continuous standard signal of 4-20 mA is generated by means of a fitted transmitter. This standard signal can then be displayed on analog or digital indicating devices. HART®, Profibus®-PA, or Foundation™ Fieldbus communication protocols are available as options.

Universal Indicating Unit

A universal indicating unit, series ADI-1, can be mounted on the bypass 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 bypass tube.

Standard NBK Technical Overview*

Process Connection:	Flange ASME B 16.5 RF-2009 ½", ¾", 1", 1-¼", 1-½", 2" NPT ANSI/ASME B1.20.1 ½", ¾", 1", 1-¼"
Bypass Tube:	Ø 2.374", 316-Ti SS (NBK-03/.../10) Ø 2.8", 316-Ti SS (NBK-31/32)

Standard NBK Technical Overview Continued*

NBK-03/06/07:	Flat Gasket: <390 °F; PTFE, ≥390 °F, Klinger SIL®
NBK-10:	Reinforced Graphite
NBK-31/32:	RTJ-seal
Operating Pressure:	ANSI 150/300/400/600/900/1500 PN 16/40/63/100/160/250/320
Operat. Temperature:	32...250 °F (PP-Rollers) -40...750 °F (Ceramic Rollers) -155...390 °F (Ball Display) (With NBK-31/32, the Operating Temperature is Restricted to 212 °F)
Viscosity:	Max. 200 mm ² /s Standard (Option: Up to Max. 460 mm ² /s for NBK-03)
Max. Meas. Length:	18' (Over 18', Two-part or Multi-part)

NBK-M Mini Indicator Technical Overview*

Max. Pressure	
Threaded Fitting:	580 PSIG
Flanged Fitting:	Per ANSI B16.5 for the Specified Flange Rating, up to 580 PSIG
Wetted Materials	
Byp. Pipe, Fittings:	316-Ti Stainless Steel
Float:	Titanium
Seals:	NBR (-4...390 °F)(Standard) FKM, Silicone, PTFE, FFKM (Optional)
Rollers:	Polypropylene or Ceramic (Model Based) IP54
Max. Liquid Viscosity:	200 Centistokes
Allowable Liquid S.G.	
Float Type "8":	0.78...0.95
Float Type "1":	Water, Liquid with S.G. > 0.95
Max. Meas. Length:	9.8 ft.

NBK-04 Tank Top Indicator Technical Overview*

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:	2" ANSI Flange or 2-1/2" ANSI Flange
Operating Pressure:	230 PSIG
Operat. Temperature:	-58...248 °F
Viscosity:	Max. 200 cPs
Measuring Length:	23.62"...157.4"

* For full technical specifications, please refer to model datasheet



Bypass Level Indicators Model NBK

Standard NBK Model Overview: This table serves as a model overview. To build an NBK part number, please refer to our NBK datasheet and application guide. Please note that choices of some options will exclude other options. Our experienced engineers are also available to assist you in building a complete part number.



Standard NBK Models
Rated Pressures
Class 150 (PN 16) / Class 300 (PN 40) / Class 400 (PN 63) / Class 600 (PN 100) / Class 900 (PN 160) / Class 1500 (PN 250)
Connections
ASME Flange / DIN Flange / NPT Male Thread / R Male Thread / Welding Nipple
Nominal Size
1/2" (DN15) / 3/4" (DN20) / 1" (DN25) / 1-1/4" (DN32) / 1-1/2" (DN40) / 2" (DN50) / Special Connections
Roller/Ball Indicator
without / PP Roller / Ceramic Roller / Ball Display with Plexiglass Sight Tube / Ball Display with Makralon® Sight Tube (with or without Filling) / Ball Display with Borosilicate Sight Tube
Sensor/Transmitter
without Transmitter / Magneto-strictive Probe, 4-20 mA, 4-wire / Reed Chain, without Transmitter / Reed Chain, 4-20 mA, 2-wire / Reed Chain, 4-20 mA, 2-wire / Reed Chain, 4-20 mA, HART®, 2-wire / Reed Chain, Profibus PA®, Foundation Fieldbus®
Media Density Float
1.0 kg/dm ³ (to 200 cP) / 0.90 kg/dm ³ (to 200 cP) / 0.80 kg/dm ³ (to 200 cP) / 0.70 kg/dm ³ (to 200 cP) / 0.60 kg/dm ³ (to 200 cP) / 0.54 kg/dm ³ (to 200 cP) / 1.0 kg/dm ³ (to 460 mm ² /s) / 0.8 kg/dm ³ (to 460 mm ² /s) / High Pressure Float CF340 (to 200 cP, Media S.G. Greater than or Equal to 0.8)
Standard NBK Options
Limit Contacts
Standard Bistable SPDT / High Temp. to 390 °F / High Temp. to 750 °F / Bistable, N/O, Max. 390 °F / Bistable, N/C, Max. 390 °F / Bistable, NAMUR, N/O, Max. 390 °F / Bistable, NAMUR, N/C, Max. 390 °F
Top Bypass Tube Connections
with or without Vent Plug / DIN or ASME Flange Connection / ASME Vent Flange / NPT Vent Valve
Bottom Bypass Tube Connections
with or without Drain Plug / ASME Flange Connection with or without Drain Plug / ASME Drain Flanges / NPT Drain Valves
Process Connections
1 x Process Connection Side, Vertical Top or Bottom / 2 x Process Connection Vertical, up to DN25 or 1" ASME
Scales
Aluminum Laser Etched Scale (to 300 °F) / Aluminum Engraved Scale (to 750 °F) / 304 SS Scale
Thermal Screening
Heat Shield for Sensor
Heating Jacket
Connection for Heating Jacket: 1/2", 3/4", 1", or 1-1/4" Class 150 RF ASME (Class 300 on Request)
Electrical Output
Bottom Connection Box / Connection Box and Heat Shield at 4" Distance (Max. Temp. 570 °F) / Connection Box and Heat Shield with 16.4' Silicone Cable (Max. Temp. 750 °F)
Display Options
Aluminum Die-cast Housing with LED or LCD Digital Display with Connection Box at Bottom / ADI-1 Indication Unit with Bargraph and Digital Display, Aluminum Housing, Mounted at Bypass Tube
Additional Options
Connection Flange for 2-part Models / Retaining Plate / Retaining Flange / Armaflex Insulation
Tests/Certificates
Radiographic Examination / Dye Penetration Test / Water Pressure Test / 3.1 Inspection Certificate / NACE Declaration of Conformance / Positive Material Identification / Oil and Fat Free



Bypass Level Indicators Model NBK

NBK-04 Model Overview: This table serves as a model overview. To build an NBK-04 part number, please refer to our NBK-04 datasheet and application guide. Please note that choices of some options will exclude other options.



NBK-04 Tank Top Mount Models	
Connection Type	
2" or 2-1/2" ASME Flange	
Indicator Type	
without / PP Rollers / Ball Display with Plexiglas® Sight Tube / Ball Display with Makrolon® Sight Tube (with or without Oil Filling) / Ball Display with Borosilicate Sight Tube	
Output Transmitter Type	
without / Reed Chain / Reed Chain, 4-20 mA, 2-wire / Magnetostrictive Probe, 4-20 mA, 4-wire / Reed Chain, 4-20 mA, HART® / Reed Chain, Profibus® PA, Foundation™ Fieldbus	
Media Density per Measuring Length	
Please see NBK-04 Datasheet for Complete Information and Specific Gravity versus Measuring Length Graphs	
NBK-04 Options	
Limit Contacts	
Standard Bistable SPDT / High Temp. to 248 °F / Bistable, N/O, Max. 248 °F / Bistable, N/C, Max. 248 °F / Bistable, NAMUR, N/O, Max. 248 °F / Bistable, NAMUR, N/C, Max. 248 °F	
Scales	
Aluminum Laser Etched Scale (to 250 °F) / Aluminum Engraved Scale (to 250 °F) / 304 SS Scale	
Electrical Outputs	
Connection Box at Bottom	
Display Options	
Aluminum Die-cast Housing with LED or LCD Digital Display with Connection Box at Bottom / ADI-1 Indication Unit with Bargraph and Digital Display, Aluminum Housing, Mounted at Bypass Tube	
Tests/Certificates	
Radiographic Examination / Dye Penetration Test / Water Pressure Test / 3.1 Inspection Certificate / NACE Declaration of Conformance / Positive Material Identification / Oil and Fat Free	

NBK-M Model Overview: This table serves as a model overview. To build an NBK-M part number, please refer to our NBK-M datasheet and application guide. Please note that choices of some options will exclude other options.



NBK-M Mini Models	
Flange Rating	
No Flange (Threaded Fitting) / ANSI Class 150 or 300	
Fitting Type	
ANSI Flange / NPT Thread	
Fitting Size	
1/2" / 3/4" / 1"	
Roller Indicator	
None / Polypropylene (250 °F) / Ceramic (390 °F)	
Transmitter	
None / Resistive, 4-20 mA / Magnetostrictive, 4-20 mA / Resistive, 0-5 Kohm Output	
Float S.G.	
Between 0.78 and 0.95 / Greater than 0.95	
NBK-M Options	
Limit Contacts	
Standard SPDT (Max. 212 °F) / High Temperature SPDT Contact (Max. 390 °F)	
Others	
Vent Plugs / Drain Plugs / Drain Flanges / Upper Clean-out Flange / Drain Valves / Top and Bottom Flush Connections / FKM, Silicone, PTFE, FFKM Bottom Flange Seals / Engraved Scale / Laser Etched Scale / Digital and Bargraph Display / Radiographic Weld Testing / Hydrostatic Testing at 1.5 x Nominal Pressure	