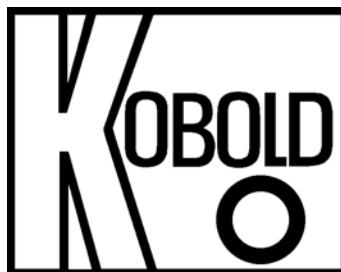


Service Manual
for
Deep Well Level Probe
Type: NTB



1. Instructions

Please read this service manual carefully before unpacking and placing the unit in operation. Follow the instructions precisely as described herein.

These devices may only be installed, used and maintained by skilled personnel who are familiar with this service manual and will observe any applicable regulations regarding industrial safety and accident prevention.

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3. Application

The NTB deep well probe is used for hydrostatic measurement of liquid levels in wells, basins or other vented, non-pressurized vessels. Due to its small mechanical dimensions, it is very easy to install and in particular, suitable for protection of submerged pumps in deep wells.

4. Operating Principle

The NTB deep well probe consists of a measuring cell, 2-wire transducer, and a special cable with a capillary tube. The housing consists of a 316 Stainless Steel body with a pressure sensitive membrane, which is mechanically protected by means of a plastic cap. The level signal is derived from the pressure difference of water column (via probe) and the atmospheric pressure, which is coupled to the probe via capillary tube. This pressure-difference is converted into a 4 - 20 mA analog signal by means of a ceramic measuring cell and built-in electronics.

5. Delivery Inspection

These devices are checked before shipment and sent out in perfect condition. Should the damage to a device be visible, we recommend a thorough inspection of the delivery packing. In case of damage, please inform your parcel service/ forwarding agent immediately, as they are responsible for damage that occurs during transit.

Scope of delivery:

Standard scope of delivery applies:

- Deep-well probe with connection cable
- Instruction manual

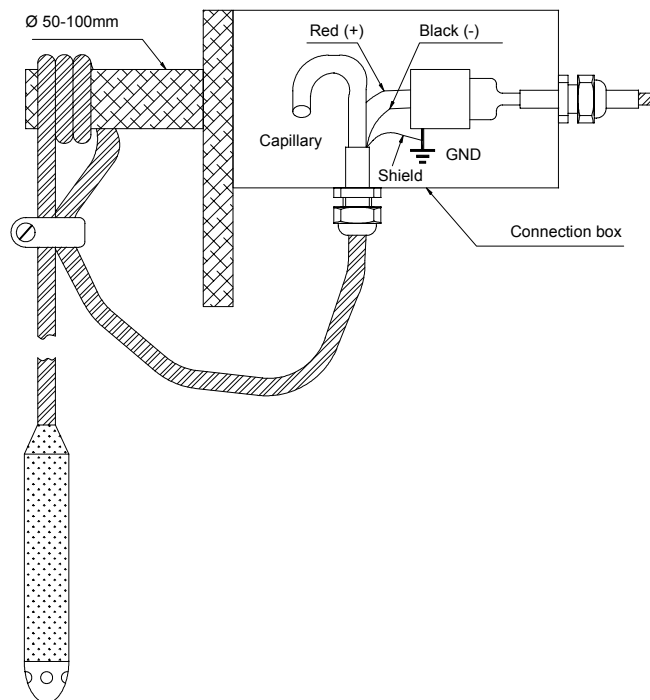
6. Mechanical Connection

The immersion probe is submerged up to the deepest point into the well or basin. This is because only the water column above the sensor is measured.

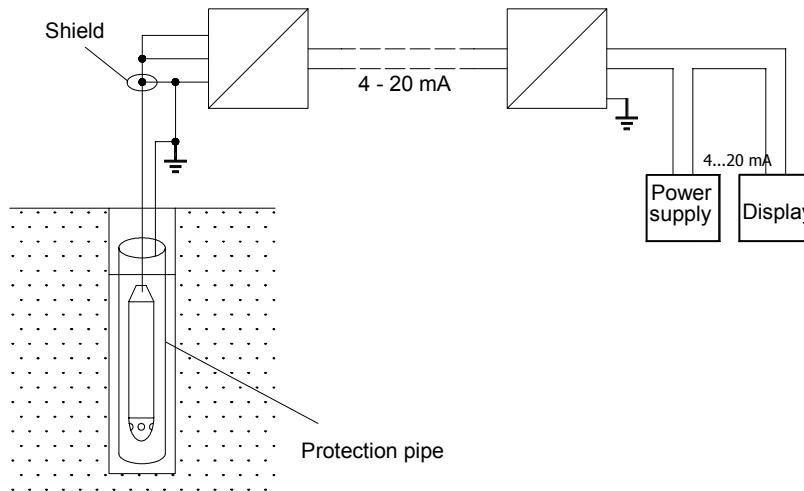
Be careful while immersing the probe, since otherwise damage to membrane may result.

Fasten the cable in such a way so that the probe hangs freely and the capillary and supply pipe are not squeezed together. To anchor it properly, wind the tube three to four times around a pipe having a diameter from 50 to 100 mm and secure the cable ends with a cable clamp or tie strap. The cable end should be prepared according to the following diagram:

Moisture must not be allowed to enter the capillary.

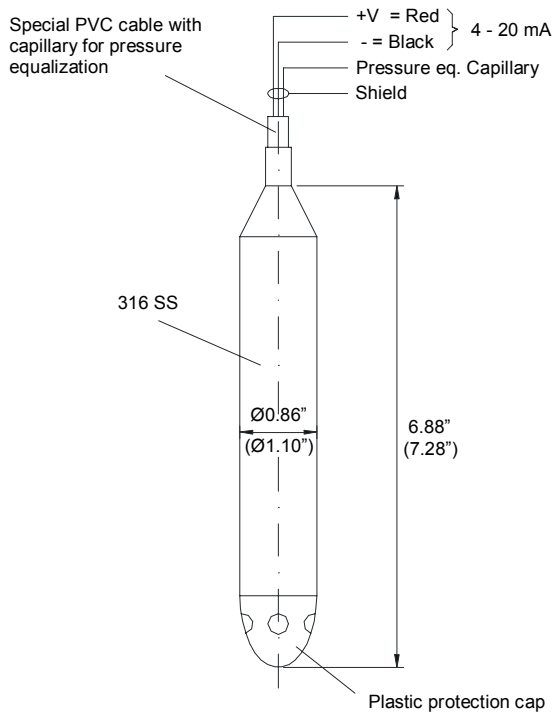


To protect sensor against pressure disturbances, the immersion probe may be placed inside a pipe or stilling well.



7. Electrical Connection

The sensor should be connected according to the following diagram:



8. Specifications

Hydrostatic Sensor

Measuring range:	NTB-1 0 - 20 m water column NTB-2 0 - 200 m water column
Over-loading:	Max. 100%
Output signal:	4 - 20 mA, 2-wire
Accuracy:	±0.5% of full scale
Effect of ambient temperature:	±0.05% per 50°F
Offset error:	±0.1 mA
Input Voltage:	9 - 30 V DC
Max. Load:	$RL = \frac{V - 9}{0.02} [\Omega]$ V= Input Voltage
Over-voltage protection:	30 V / 600 W / 1 ms
Protection class:	IP 68 (NEMA 6P)
Ambient temperature:	-10°C...+60°C
Material of probe:	316 SS
Cable material:	Polyurethane
Dimensions of probe:	Ø 0.86" x 6.88" up to 20 m WC (NTB-1) Ø 1.10" x 7.28" for > 50 m WC (NTB-2)
Cable size:	Ø 7 mm

9. Maintenance

Where the measured medium is not contaminated, NTB sensors are maintenance-free. If debris forms on the internal membrane and needs to be cleaned, be sure to not use any hard tools or abrasive cleaning agents. If the unit is damaged, repair is possible only by returning the unit to Kobold. For further assistance, please contact Kobold @ 412-788-2830.

10. Warnings

CAUTION !

PLEASE READ THE FOLLOWING WARNINGS BEFORE ATTEMPTING INSTALLATION OF YOUR NEW DEVICE. FAILURE TO HEED THE INFORMATION HEREIN MAY RESULT IN EQUIPMENT FAILURE AND POSSIBLE SUBSEQUENT PERSONAL INJURY.

- **User's Responsibility for Safety:** KOBOLD manufactures a wide range of process sensors and technologies. While each of these technologies are designed to operate in a wide variety of applications, it is the user's responsibility to select a technology that is appropriate for the application, to install it properly, to perform tests of the installed system, and to maintain all components. The failure to do so could result in property damage or serious injury.
- **Proper Installation and Handling:** This is a precision device, and may be damaged if dropped or otherwise subjected to abnormal forces during installation and removal.
- **Wiring and Electrical:** Section 8, Specifications, and Section 7, Electrical Connection, provide the voltage and current limitations and the wiring for the various sensor types. The sensor electrical ratings should never be exceeded. Electrical wiring of the sensor should always be performed in accordance with all applicable national, state and local codes.
- **Temperature and Pressure:** Section 8, Specifications, provides the temperature and pressure limits for each model. Operation outside these limitations will cause damage to the unit and can potentially cause personal injury. Fluid should never be allowed to freeze inside the sensor.
- **Material Compatibility:** Make sure that the model that you have selected is chemically compatible with the application liquids.
- **Flammable, Explosive and Hazardous Applications:** The NTB series is not an intrinsically safe or explosion proof design. They should not be used in installations in which an intrinsically safe or explosion proof design is required.
- **Make a Fail-safe System:** Design a fail-safe system that accommodates the possibility of switch or power failure. In critical applications, KOBOLD recommends the use of redundant backup systems and alarms in addition to the primary system.