TDR-1000
GUIDED WAVE RADAR
Quick Start Guide

INSTALLATION, OPERATION & MAINTENANCE MANUAL

SAFETY INFORMATION

Before installing the TDR-1000 model, please read these instructions and familiarize yourself with the requirements and functions. If any questions or problems arise during the installation, please contact Bindicator® Applications at 1-800-778-9242.

The TDR-1000 model must only be installed and operated as described in this operating instruction. Please note that other action can cause damage for which Bindicator® does not take responsibility. If the model is not installed correctly or used in approved applications, dangers may arise such as product overflow.

Ensure that all personnel installing, wiring, and calibrating this device are suitably qualified.

Observe all local and national electrical codes for the wiring of this device.

The TDR-1000 level gauge is designed solely for measuring the distance, level and volume of liquids, solids and particulate materials.

Special codes and regulations apply to its use in hazardous areas.

Responsibility as to suitability and intended use of these level gauges rests solely with the user.

Improper installation and operation of our level gauges may lead to loss of warranty.

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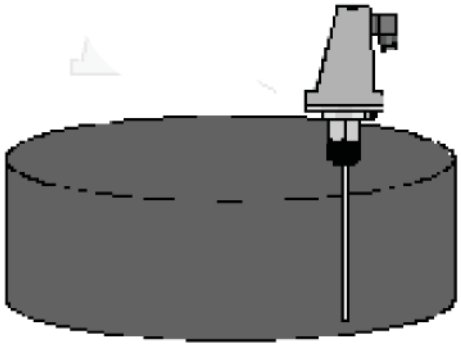
1.0 RANGE OF USE

The TDR-1000 level gauging system is a 2 wire transmitter, designed to measure the distance, level and volume of liquids, slurries, solids and particulate materials. It can be operated on storage and process tanks.

2.0 Description

The measuring system consists of the sensor and the signal converter. The compact signal converter contains the TDR measuring circuit and the entire signal processing system, including the provision of a standardized output signal (4 - 20 mA or digital interface).

Converter Connection
1.5 MNPT; electrical 1" G (grommet open lead) Connection with Pressure tight Signal feed through



3.0 Measured variable (distance, level, volume)

The primary measured variable is the distance between the tank mounting flange and a reflecting surface (surface of the product measured). The output represents the difference between the primary measured variable and the length of the sensor.

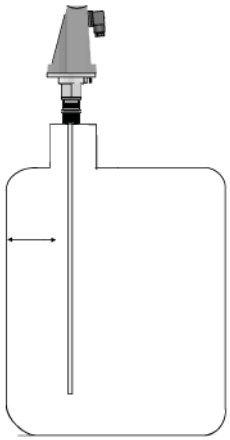
3.1 Measuring range (to 78 ft)

The measuring range will depend on the sensor length, the reflection properties of the tanks contents, the installation position, and the presence of any interfering reflection

4.0 Mounting, please refer to the following guidelines:

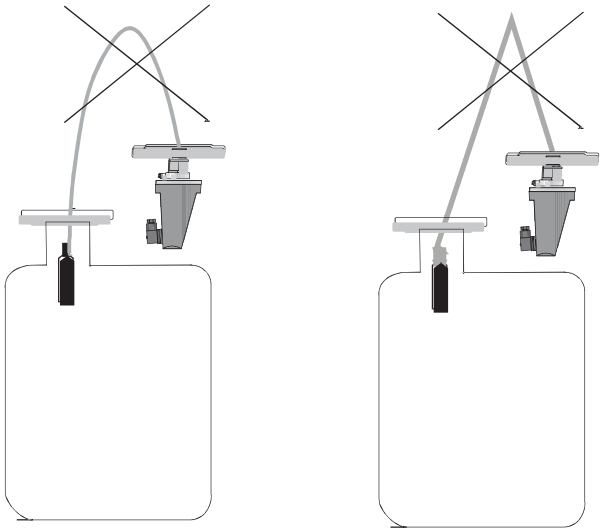
ENSURE THE SENSOR LENGTH DOES NOT EXCEED THE INTERNAL DEPTH OF THE SILO, TANK OR VESSEL.

Single cable
12" Min

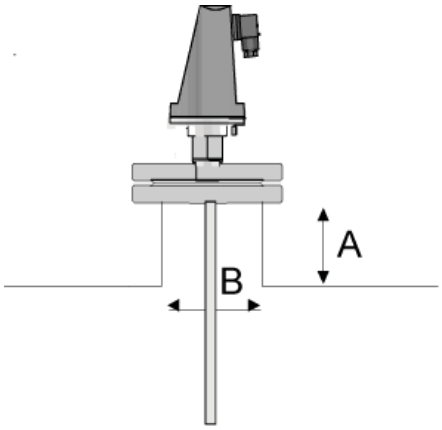


4.1 Excessive bending of the cable

BE CAREFUL NOT TO BEND OR KINK CABLES TOO MUCH



4.2 Mounting on a nozzle

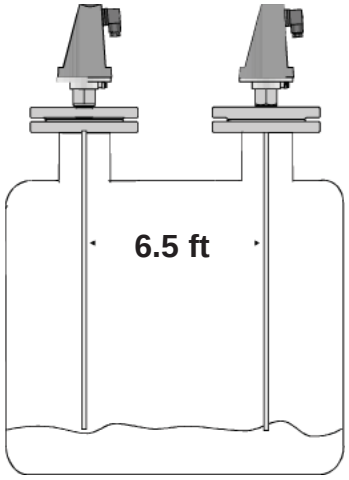


Avoid nozzle size higher than 5.9", especially when B < 3.1".

Try to ensure A does not exceed B.

4.3 Interference between two TDR-1000

There must be at least 6.5ft between devices if installed in the same vessel.



5.0 Electrical connection

The electrical connection for the power supply is made in the terminal compartment of the signal converter - 18-35VDC.

In case of installation in hazardous areas, only certified intrinsically safe equipment may be connected to the TDR-1000.

1. Connector:

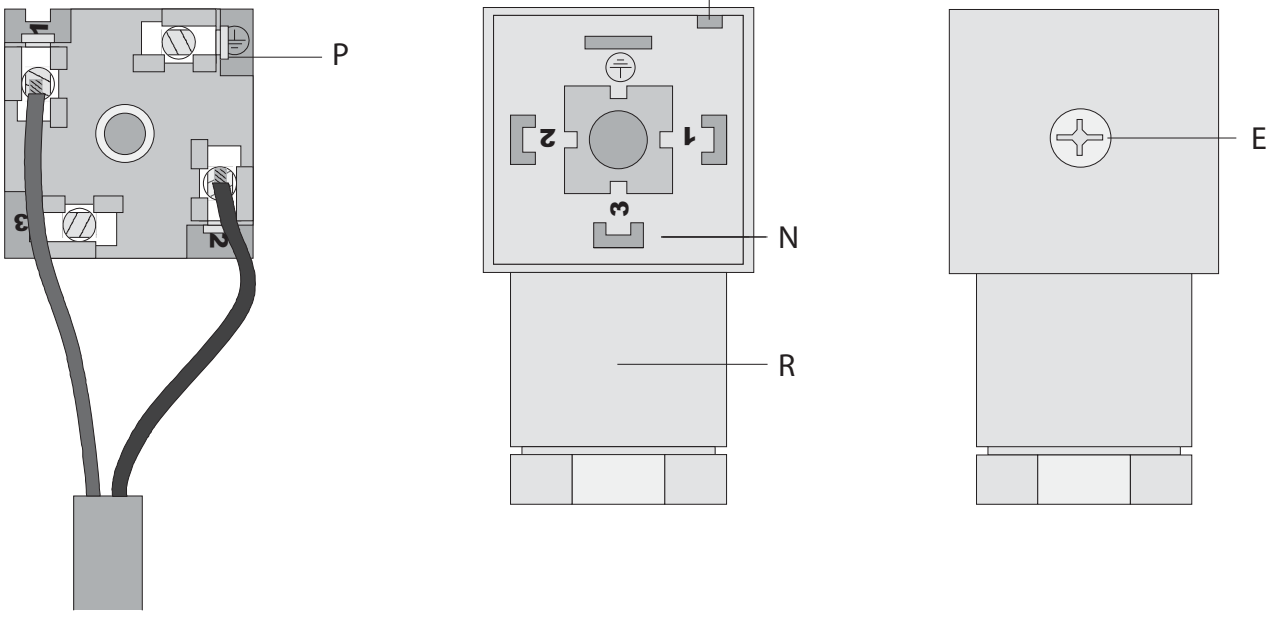
Terminals:	3 poles + ground. Wire cross-section max 0.059m^2 (1.5 mm^2) ≈(AWG 16).
p**Cable entries:**	M25x1.5 (PG11). Standard cable gland: cable clamping area = 0.315 - 0.39 in (8-10 mm). IP65
Signal cable shielding:	No shielding needed.

Power supply:

1. Remove the screw **P** and lift off the connector from the signal converter.
2. Put a screwdriver in **F** and separate **N** from **R**.
3. Connect the current loop to terminal 1 and 2 (there's no polarity to respect). Use ferrules to protect cable ends. The terminal 3 and **E** remain non-connected.
4. Re-assemble **N** and **R**.
5. Put the seal in place, connect **R** to the signal converter tighten and screw **P**.

The terminal **E** is not connected with the signal connector housing or with the flange system of the instrument.

For standard and Ex applications only the intrinsically safe 2-wire loop must be connected to the terminals 1 and 2. The terminal **E** as well as terminal 3 remains non-connected.



6.0 Technical Specifications

Function:	Level, distance and volume measurement of liquids and solids.
Measuring Range:	Flexible probe: to 78ft Deadband: Top: 15.8in Dieletric < 10 11.8in Dieletric > 10 Deadband: Bottom: 14.25in Counter Weight Diameter.: 1.575in; length 10.25in (Weight is tapped with 1/2" - 13 to allow tethering or anchoring)
Accuracy:	+/- 0.6in
Repeatability:	0.04in
Dielectric Constant:	> 2.3
Probe Materials:	Flexible cable 316SS
Operating Pressure:	232 psi
Flange Temperature:	-22° to 194°F
Electronics Temperature:	-22° to 131°F
Connection:	1.5" MNPT
Protection Category:	IP66; Nema 4X
Power Supply:	24VDC (18 to 35VDC)
Output:	4/20mA current loop into max. of 750 Ohms
Communication:	HART protocol
Approvals:	CE
Weight:	Without probe 4.4lbs (2Kgs)
Materials of Construction:	Housing: Aluminium with white epoxy coating Cable and Weight: 316 SS Gaskets: Buna N

Electrical Connection

M16 CONNECTOR	
Terminals:	Max wire size 16AWG (1.5mm)
Cable Entries:	1 x M16 x 1.5 (with standard cable gland: cable clamping area =0.137 - 0.315in(3.5-8mm)).

Electrical Signal Output

Electrical Connection:	Two wire
Power Supply:	18 to 35 VDC
Current Output:	4/20mA

Environment

Ambient Temperature:	-22° to 131°F
Protection Category to EN 60529 / IEC 529:	IP66, Nema 4X

7.0 Programmed Information

CHECK LIST PARAMETERS TDR-1000 to:_____ **Date:**_____
Device No. _____ **Comm. No.**_____
Location_____
Contact person _____ **Telephone**_____
Remarks: _____

_____
Menu item_____ **Changed on**_____

Fct. Configuration parameters (customer)

1.1.1 Tank height	:	:
1.1.2 Dead zone	:	:
1.1.3 Time constant	:	:
1.1.6 Probe length	:	:
1.2.4 Length unit	:	:
1.2.6.1 Unit name	:	:
1.2.6.2 Unit factor	:	:
1.2.5 Volume unit	:	:
1.3.1 Current output, function	:	:
1.3.2 Current output, range/error	:	:
1.3.3 Min. scale for current	:	:
1.3.4 Max. scale for current	:	:
1.3.5 Error delay	:	:
1.4.4 Tag name	:	:
1.5.1 Detection delay	:	:
1.6.2 Address	:	:
Threshold	:	:

Fct. Configuration parameters (factory)

1.1.1 Probe type	:	:
1.1.2 Offset of measure	:	:
1.1.3 Application type	:	:
1.1.4 Dielectric	:	:
2.1 Set value of electronic offset	:	:
2.4 Electronic Calspeed	:	:
2.5 Mechanic Calspeed	:	:
2.6 Reference frequency	:	:

Fct. Strap table configuration (20 points)

Point	**0 Level** _____	**Volume** _____
Point	**1 Level** _____	**Volume** _____
Point	**2 Level** _____	**Volume** _____
Point	**3 Level** _____	**Volume** _____
Point	**4 Level** _____	**Volume** _____
Point	**5 Level** _____	**Volume** _____
Point	**6 Level** _____	**Volume** _____
Point	**7 Level** _____	**Volume** _____
Point	**8 Level** _____	**Volume** _____
Point	**9 Level** _____	**Volume** _____
Point	**10 Level**_____	**Volume** _____
Point	**11 Level**_____	**Volume** _____
Point	**12 Level**_____	**Volume** _____
Point	**13 Level**_____	**Volume** _____
Point	**14 Level**_____	**Volume** _____
Point	**15 Level**_____	**Volume** _____
Point	**16 Level**_____	**Volume** _____
Point	**17 Level**_____	**Volume** _____
Point	**18 Level**_____	**Volume** _____
Point	**19 Level**_____	**Volume** _____

Notes

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