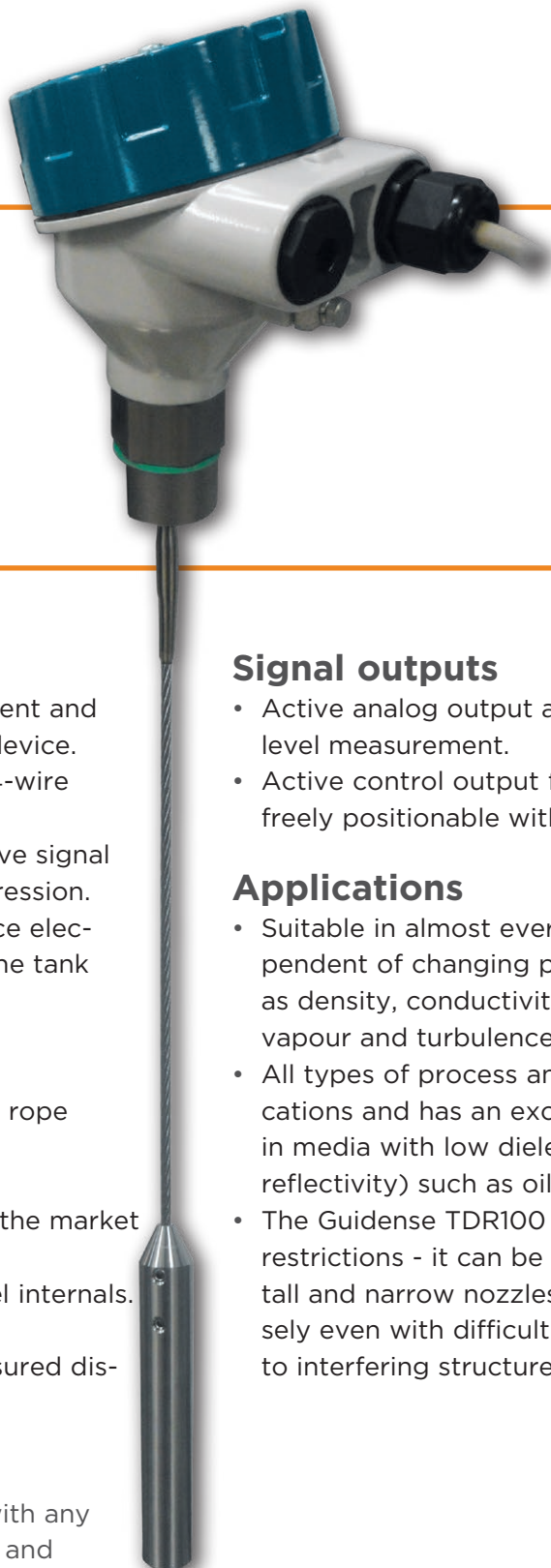


# Guidense TDR100

Continuous guided level radar with point level detection



## Advantages

- Accurate continuous level measurement and reliable point level detection in one device.
- Best reliability in the market due to 4-wire design.
- Highly robust measurement, innovative signal analysis and disturbance signal suppression.
- Complete galvanic insulation of device electronics from its inputs/outputs and the tank potential.

## Features

- 3 Probe types: single rod probe, wire rope probe and a coaxial probe.
- Measuring range: 100 to 20.000mm.
- Fastest reaction time with 0,5 sec in the market for smallest vessels / tanks.
- No influences caused by tank / vessel internals.
- Power requirements: 12 to 30VDC.
- Accuracy of  $\pm 3\text{mm}$  or 0.03% of measured distance.
- Robust IP68, NEMA6P enclosure.
- Smallest inactive areas in the market.
- The Guidense TDR100 can be used with any of the F- and D-Series level monitors and controllers.

## Signal outputs

- Active analog output according the continuous level measurement.
- Active control output for point level detection freely positionable within the measuring range.

## Applications

- Suitable in almost every liquid and solids - independent of changing process conditions, such as density, conductivity, temperature, pressure, vapour and turbulence.
- All types of process and storage tank applications and has an exceptional performance in media with low dielectric constant (i.e. low reflectivity) such as oils and hydrocarbons.
- The Guidense TDR100 has almost no installation restrictions - it can be mounted in small tanks, tall and narrow nozzles and it measures precisely even with difficult tank geometries or close to interfering structures.

## General information

### Introduction Guidense TDR100

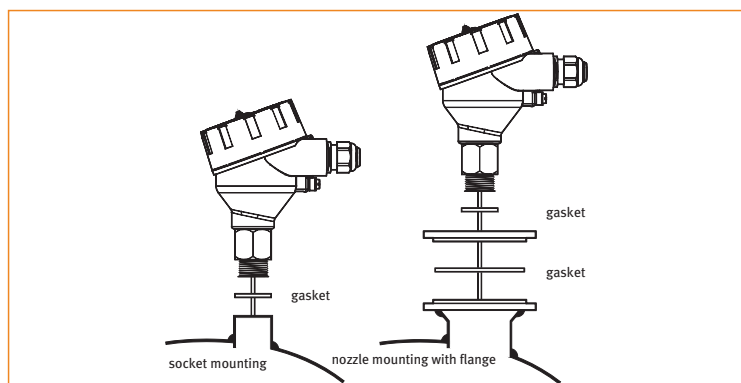
The Guidense TDR100 is a guided level radar for continuous level measurement and point level detection in liquids and solids, with active analog and control output. It is very easy to install with a 4-wire system: a set of 2 wires for the power supply and separate sets of 2 wires for each output.

### Configuration

Configuration of the Guidense TDR100 can be done directly with a set of DIP switches, a single push button and visual feedback from an LED. All settings required to get the sensor fully operational can be performed directly on the device.

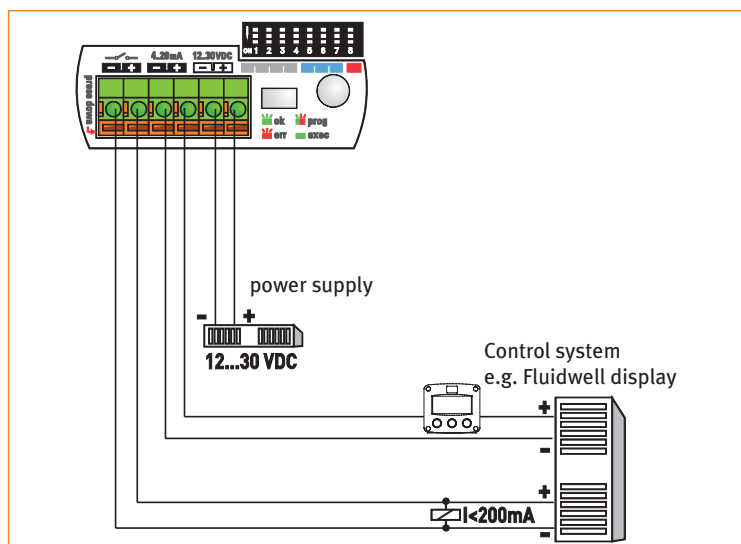
### Mechanical installation

The Guidense TDR100 is mounted vertically to the tank via its connection thread, which is screwed directly into a standard threaded tank connection, i.e. weld-in socket, or it can be screwed into a flange, which is connected to a tank nozzle.



### Electrical installation TDR100

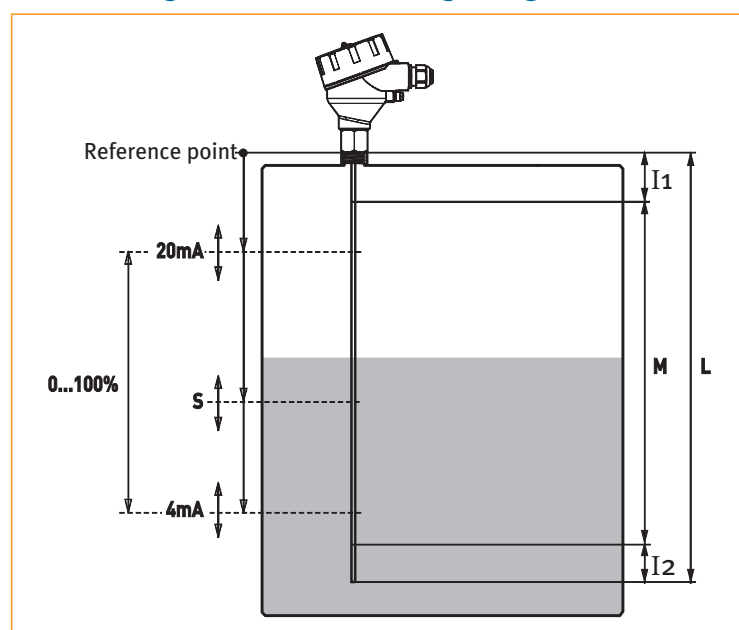
The Guidense TDR100 is a 4-wire system: a set of 2 wires for the power supply and separate sets of 2 wires for each output. The wires are connected to the sensor electronic inside the housing via a screwless, cage clamp terminal block for stranded and solid wires 0,5 - 2mm<sup>2</sup> / AWG 22 - 14.



### Probe types

To meet various application requirements, the Guidense TDR100 has three different probe types: single rod probe, wire rope probe and coaxial probe. The single rod probe is recommended for installations in liquids and in bypass chambers and stilling wells. The wire rope probe is recommended for installations in solids, tall tanks and where limited headroom is available. The coaxial probe is the ideal solution for a hassle-free 'drop-in anywhere' application; ensuring reliable measurement under almost all conditions. An extended temperature option, -200°C to +250°C, for the single rod and coaxial probe is available on request. For chemically aggressive and corrosive environments a single rod probe with PTFE coating is available on request.

### Probe length and measuring range



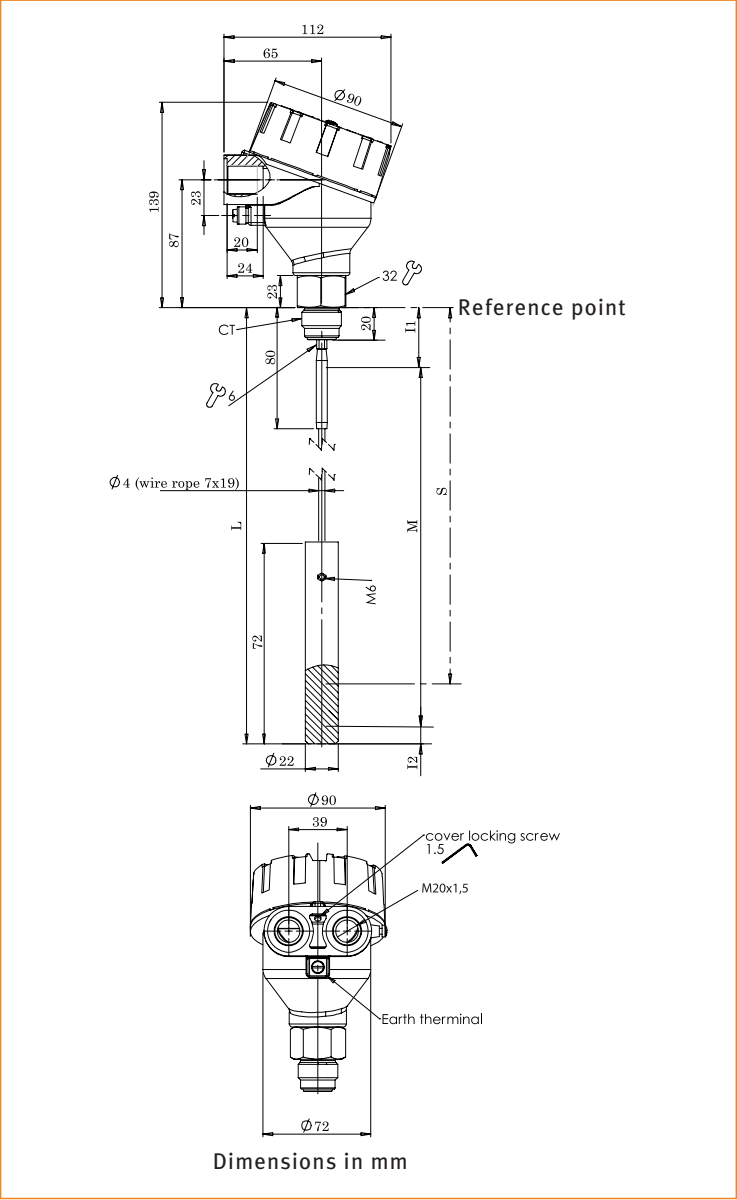
- L Probe length:
  - Single rod probe: 100 to 3.000mm.
  - Wire rope probe: 2.500 to 20.000mm.
  - Coaxial probe: 100 to 6.000mm.
- I1 Inactive area top:
  - Single rod probe  $\epsilon_r = 80$ : 50mm /  $\epsilon_r = 2$ : 80mm.
  - Wire rope probe  $\epsilon_r = 80$ : 50mm /  $\epsilon_r = 2$ : 80mm.
  - Coaxial probe  $\epsilon_r = 80$ : 30mm /  $\epsilon_r = 2$ : 50mm.
- I2 Inactive area bottom:
  - Single rod probe  $\epsilon_r = 80$ : 10mm /  $\epsilon_r = 2$ : 50mm.
  - Wire rope probe  $\epsilon_r = 80$ : 10mm /  $\epsilon_r = 2$ : 50mm.
  - Coaxial probe  $\epsilon_r = 80$ : 10mm /  $\epsilon_r = 2$ : 50mm.
- M Measuring area:  $M = L - I1 - I2$ .
- S Switch point, freely positionable within the measuring range (M) Default at 20% of [L].

### Hazardous areas

For applications with hazardous gas or dust atmospheres an ATEX flameproof enclosure with ATEX II 1/2 G Ex ia/d IIC T6 Ga/Gb approval is available on request.

Mechanical specifications	
Materials house	<ul style="list-style-type: none"> <li>Aluminium alloy EN AC-AISi9Cu3. Cover o-ring: silicone rubber.</li> <li>Stainless steel 1.4401 / 316. Cover O-ring: silicone rubber.</li> </ul>
Materials probe	Single rod probe: SS 1.4404 / 316L, PEEK. Single rod probe PTFE coated: PTFE, O-ring (request). Wire rope probe: SS 1.4401 / 316, PEEK. Coaxial probe: SS 1.4404 / 316L, PEEK, O-ring. Gasket at connection thread: Klingersil C-4400, 2mm
Protective rating IP68 / NEMA6P.	
Cable entries	M20 x 1,5.
Conn. thread	G 3/4 A or 3/4" NPT (wrench size 32mm).
Max. load	Single rod probe: Max. lateral load 6Nm. Wire rope probe: Max. tensile load 5kN. Coaxial probe: Max. lateral load 100Nm.
Diameters	Single rod probe: Ø6mm. Wire rope probe: Ø4mm / counterweight: Ø22mm. Coaxial probe: Ø17.2mm.

### Dimensions Guidense TDR100



Application specifications	
Dielectric constant	Single rod / wire rope probe: $\epsilon_r$ minimal 1,8. Coaxial probe: $\epsilon_r$ minimal 1,4.
Conductivity	No restrictions.
Density	No restrictions.
Application temperature	Single rod / wire rope probe: -40°C to +150°C. Single rod, PTFE coated: -15°C to +100°C (on request). Coaxial probe EPDM o-ring: -40°C to +130°C. Coaxial probe FKM (Viton) o-ring: -15°C to +150°C.
Extended temperature	NBR o-ring: -200°C to +250°C (on request). FKM (Viton) o-ring: -150°C to +250°C (on request).
Ambient temp. -25°C to +80°C. (storage: -40°C to +85°C).	
Application pressure	-1bar to 40bar. (single rod probe PTFE coated: 0 to 4bar, on request).
Velocity of level change	< 1.000mm/s
Interface	An oil layer of < 70mm thickness on top of water is not detected by the sensor.
Dynamic viscosity	Single rod / wire rope probe: < 5.000mPa s=5.000cP Coaxial probe: < 500mPa s = 500cP.

Electrical specifications	
Analog output	Active analog output according the continuous level measurement.
Lower value	4,0mA (span 0%) - default at 10mm above probe end.
Upper value	20,0mA (span 100%) - default at 50mm below reference point (shoulder of the connection thread).
Response time	0,5, 2 or 5 sec.
Temp. drift	< 0,2mm/K change in ambient temperature.
Load resistance	Approx. 250Ω.
Control output	Active control output for point level detection reely positionable within the measuring range.
Type	Active PNP - NC [default] or NO (short-circuit protected).
Load current	< 200mA.
Voltage HIGH	Supply voltage - 2V.
Voltage LOW	0V to 1V.
Response time	< 100ms.
Supply voltage12 to 30V DC (reverse-polarity protected).	
Current consumption	< 50mA at 24VDC.
Start-up time	< 6 sec.
Cable terminals	Stranded and solid wires 0,5 to 2mm²/AWG 22 to 14.

Measurement specifications	
Accuracy	±3mm or 0.03% of measured distance, whichever is greatest.
Repeatability	< 2mm.
Resolution	< 1mm.

## Ordering information

*Standard configuration: Guidense TDR100-BNP-DG00-HA-RW-XX-ZX-Lxxxxx.*

Ordering information: Guidense TDR100		-B _ _	-D _ _	-H _	-R _	-XX	-Z _	-L _ _ _ _
<b>Probe type</b>								
BNP	No probe attached.							
BCP	Coaxial probe, max. 6.000mm.							
BCE	Coaxial probe, with ext. application temp. max. 1.000mm (on request).							
BSR	Single rod probe, max. 3.000mm.							
BSE	Single rod probe, with ext. application temp. max. 1.000mm (on request)							
BSF	Single rod probe, PTFE coated, max. 3.000mm (on request).							
BWR	Wire rope probe with counterweight, min. 2.500mm / max. 20.000mm.							
<b>Connection thread</b>								
DG00	G 3/4 A connection thread.							
DN00	3/4" NPT connection thread.							
DP05	PTFE disk for DN50/ASME 2,5" flange - requires probe type BSF (on request).							
DP10	PTFE disk for DN100/ASME 4" flange - requires probe type BSF (on request).							
<b>Housing</b>								
HA	Aluminium (epoxy coated) / IP68 enclosure.							
HS	Stainless steel (1.4401/316) / IP68 enclosure.							
<b>O-ring material</b>								
RE	EPDM O-ring - requires probe type BCP.							
RF	FKM (Viton) O-ring - requires probe type BCP / BCE / BSE.							
RN	NBR O-ring - requires probe type BCE / BSE (on request).							
RW	Without O-ring - requires probe type BNP / BSR / BWR.							
<b>Hazardous area</b>								
XD	Explosion proof Eexd enclosure with ATEX II 1/2 G Ex ia/d IIC T6 Ga/Gb approval (on request).							
XX	Safe area only.							
<b>Accessories</b>								
ZD	Two M20 x 1,5, nylon cable glands.							
ZP	One M20 x 1,5 nylon cable glands + one M20 x 1,5 nylon screw blind plug.							
ZX	No accessories.							
<b>Length</b>								
	Coaxial probe length: 00100 up to 06.000mm.							
Lxxxxx	Single rod probe length: 00100 up to 03.000mm.							
	Wire rope probe length: 02500 up to 20.000mm incl. counterweight.							

The bold marked text contains the standard configuration.