



**DESCRIPTION** The TDR-2000 provides continuous, non-mechanical level measurement, utilizing guided wave radar technology. The TDR-2000 is particularly suited for measuring the level of solids, granules, and powders, as well as a wide range of liquids. For many applications, the TDR-2000 is an economical and superior alternative to capacitance, ultrasonic, and plumb bob technologies.

**HOW IT WORKS** The TDR-2000 two-wire guided microwave level transmitter uses the TDR (Time Domain Reflectometry) principle. The instrument sends low power nanosecond-wide pulses along an electrically conductive rod, cable, or coaxial probe with a known propagation speed (the speed of light). As the pulse reaches the surface of the medium (altered dielectric constant  $\epsilon_r$ ), a part of it is reflected back to the electronic module. The efficiency of the reflected signal depends on the dielectric constant ( $\epsilon_r$ ) difference of the mediums. The reflected pulse is detected as an electrical voltage signal and is then processed by the electronics. Level distance is directly proportional to the flight time of the pulse. The measured level data is converted to 4-20mA current and HART<sup>®</sup> signals and is displayed on the LCD display. From the level data, further derived measuring values can be calculated such as volume and mass. The TDR-2000 is unaffected by the other properties of the medium as well as that of the space above it.

## FEATURES AND BENEFITS

### Flexibility for a wide range of applications

- Suitable for a broad range of tank sizes, geometries, and internal constructions
- Ideal for dirty service applications

### Accurate and reliable level measurement across a range of dynamic process conditions

- Insensitive to changes in dielectric, pressure, conductivity, vacuum, humidity, dust, viscosity, vapor, foam, pH, bulk density, temperature, or turbulence
- Unaffected by filling or emptying conditions such as dust, noise, and material movement

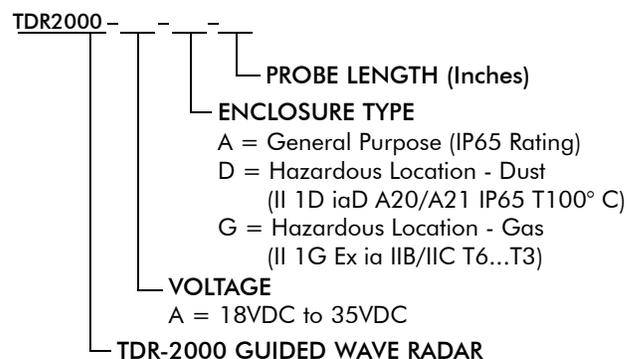
### Easy Installation

- Simple to install in new tanks or retrofit existing tanks
- Can be installed while tank is in service
- Does not require special configuration to compensate for environmental or structural conditions

### Low Maintenance

- Factory calibrated and configured
- Transmitter design minimizes maintenance requirements

## HOW TO ORDER



## SPECIFICATIONS

### FUNCTIONAL

Operating Power	24 VDC (18 to 35 VDC)
Operating Temperature	-22° to 131° F (-30° to 55° C)
Operating Pressure	232 psi
Accuracy	Cable length < 33 ft. (10 m); accuracy is ± 0.8" (20 mm)
	Cable length > 33 ft. (10 m); accuracy is ± 0.20% of length
Dielectric Constant	> 2.1
Output	4-20mA, HART® Communication

### PERFORMANCE

Measuring Range	Flexible Probe: Max of 79 ft (24.0 m)
	Deadband Top: 15.8" (40 cm) if $\epsilon_r < 10$ ; 11.8" (30 cm) if $\epsilon_r > 10$
	Deadband Bottom: 14.2" (36 cm)
	Counter Weight Diameter: 1.575" (4 cm); length 10.2" (26 cm)
Repeatability	0.04" (1 mm)

### PHYSICAL

Process Connection	1½" MNPT
Probe Materials	Flexible 316 SS Cable
Enclosure Materials	Aluminum with white epoxy coating
Gasket Materials	Buna N
Shipping Weight	3.3 lb. (1.5 kg) without Probe

### APPROVALS

	ATEX, CE
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