# Goldline Td 6

A practical guide to goldline td 6, covering the reader intent, the relationship to goldline td 6, key evaluation criteria, common risks, and the information the intended project audience should confirm before taking the next step.

Main topic: Main Page
https://www.level-meters.com/

In the landscape of industrial automation, precise level measurement is a cornerstone of operational efficiency, safety, and inventory management. The Goldline TD 6 series represents a specialized class of ultrasonic level transmitters designed to meet the rigorous demands of various process industries. As a non-contact measurement solution, it leverages acoustic technology to provide real-time data on liquid and solid levels without the wear and tear associated with mechanical sensors. This guide explores the engineering principles, technical specifications, and practical application considerations for the Goldline TD 6, serving as a reference for engineers and procurement professionals.

## Understanding the Measurement Principle

The Goldline TD 6 operates on the Time-of-Flight (ToF) principle using ultrasonic waves. This method is inherently robust because it does not require physical contact with the medium being measured, which is particularly advantageous when dealing with corrosive, viscous, or ultrapure fluids.

## The Acoustic Cycle

At the heart of the Goldline TD 6 is a piezoelectric transducer. When energized, this transducer vibrates at a specific frequency, emitting a burst of ultrasonic sound waves toward the target material. These waves travel through the air gap (the ullage) in the tank or vessel.

## Reflection and Detection

Once the sound waves strike the surface of the medium, they are reflected back toward the sensor. The transducer then switches to a receiving mode to detect the returning echo. The onboard electronics measure the exact duration between the emission of the pulse and the reception of the echo.

## Calculation of Distance

The distance (D) between the sensor face and the material surface is calculated using the formula:

$D = (c \times t) / 2$

Where:

c is the speed of sound in the medium (typically air, approximately 343 m/s at 20°C).

t is the total elapsed time for the round trip.

Since the total height of the tank (H) is a known constant programmed during commissioning, the device determines the actual level (L) by subtracting the measured distance from the total height ($L = H - D$).

## Technical Specifications and Features

The Goldline TD 6 is engineered for versatility. While specific configurations vary based on the application, the series generally adheres to the following technical benchmarks:

Measurement Range: Typically spans from 0.25 meters up to 15 meters, depending on the transducer frequency.

Accuracy: Standard accuracy is ±0.25% of the full scale, ensuring high precision for inventory control.

Output Signals: Standard 4-20mA analog output, often supplemented by digital protocols such as HART, RS485 (Modbus), or relay outputs for alarm functions.

Power Supply: Available in 24V DC (two-wire or four-wire) and 220V AC configurations.

Operating Temperature: Generally rated for environments between -20°C and +60°C.

Ingress Protection: IP66 or IP67 ratings are standard, with IP68 options available for submersion-prone areas.

Material Compatibility: Transducer faces are often constructed from PVDF (Polyvinylidene fluoride) or PP (Polypropylene) to resist chemical attack.

## Practical Selection Criteria

Choosing the correct Goldline TD 6 model requires an analysis of the process environment. The following table provides a comparison of criteria to evaluate when selecting between ultrasonic technology and alternative methods available on the Main Page.

| Feature | Goldline TD 6 (Ultrasonic) | Radar Level Meter | Hydrostatic Transmitter |
|---|---|---|---|
| Contact Type | Non-contact | Non-contact | Contact (Submerged) |
| Media Type | Liquids and some solids | Liquids and solids | Liquids only |
| Pressure Limits | Atmospheric (typically) | High pressure possible | Depth-dependent |
| Vapor Sensitivity | High (affects sound speed) | Low | None |
| Cost Profile | Cost-effective | Premium | Moderate |
| Maintenance | Low (no moving parts) | Minimal | Periodic cleaning required |
| Installation | Top-mounted | Top-mounted | Side or bottom-mounted |

## Installation Considerations

Proper installation is critical to the performance of the Goldline TD 6. Because ultrasonic waves propagate in a cone-shaped beam, several physical factors must be managed to avoid signal interference.

## 1. The Dead Zone (Blocking Distance)

Every ultrasonic sensor has a "dead zone" immediately below the transducer face (typically 0.25m to 0.5m). Within this zone, the sensor cannot accurately process the returning echo because the transducer is still vibrating from the emission. It is vital to mount the sensor high enough so that the maximum liquid level never enters this dead zone.

## 2. Beam Angle and Obstructions

The ultrasonic beam spreads as it travels. Engineers must ensure that the path of the beam is clear of internal tank structures such as ladders, heating coils, or agitators. If the beam hits these objects, it will create a "false echo," leading to incorrect level readings. The Goldline TD 6 features advanced software for "false echo suppression," which allows the user to program the device to ignore static reflections from fixed internal structures.

## 3. Orientation

The sensor must be mounted perpendicular to the surface of the medium. If the sensor is tilted, the sound waves may reflect away from the transducer rather than back toward it, resulting in signal loss (the "Echo Lost" error). For solid materials that form a conical pile, an adjustable flange may be required to align the sensor with the slope of the material.

## 4. Avoiding the Fill Stream

Never install the sensor directly above the tank's inlet. The turbulence and falling material from the fill stream will scatter the ultrasonic signal and create significant noise in the data.

## Limitations and Environmental Factors

While the Goldline TD 6 is a robust instrument, certain environmental conditions can impede its accuracy. Understanding these limitations is essential for successful deployment.

Temperature Gradients: The speed of sound changes with air temperature (approximately 0.17% per degree Celsius). The Goldline TD 6 includes an integrated temperature sensor to compensate for this, but significant temperature layers within a tall silo can still introduce minor errors.

Heavy Foam: Thick, dense foam on the surface of a liquid acts as an acoustic absorber. In such cases, the ultrasonic pulse may be absorbed rather than reflected, leading to signal failure. If heavy foam is present, a radar or hydrostatic sensor might be more appropriate.

Vacuum Conditions: Sound requires a medium (air or gas) to travel. Therefore, the Goldline TD 6 cannot function in a vacuum.

High Dust Environments: While ultrasonic sensors can handle moderate dust, extremely high concentrations of airborne particulates in solid silos can attenuate the signal. High-power transducers or radar-based solutions are often preferred for cement or flour silos.

## Maintenance and Troubleshooting

Due to its non-contact nature, the Goldline TD 6 requires very little maintenance. However, periodic checks ensure long-term reliability.

Transducer Cleaning: In applications involving condensation or splashing, the transducer face should be wiped periodically with a soft cloth and mild detergent. Avoid abrasive cleaners that could scratch the acoustic surface.

Cable Integrity: Ensure that cable glands are tightened and that there is no moisture ingress into the electronics housing. Use a drip loop in the wiring to prevent rainwater from following the cable into the unit.

Diagnostic Codes: Most Goldline TD 6 units provide diagnostic codes. A "Loss of Echo" (LOE) signal often indicates that the medium has entered the dead zone, the surface is too turbulent, or the sensor has become misaligned.

## Frequently Asked Questions (FAQs)

Q: Can the Goldline TD 6 be used in pressurized tanks?

A: Ultrasonic sensors are generally designed for atmospheric pressure. High pressure changes the density of the air, which significantly alters the speed of sound and can lead to inaccurate readings or physical damage to the transducer seal.

Q: Is the device suitable for measuring acids?

A: Yes, provided the transducer face is made of a resistant material like PVDF. Always check the chemical compatibility chart for your specific medium before installation.

Q: How do I calibrate the device for a non-linear tank (e.g., a horizontal cylindrical tank)?

A: The Goldline TD 6 usually includes a linearization function or a volume look-up table. By inputting the tank dimensions and geometry, the device can convert the measured level into a volume output (liters, cubic meters, or gallons).

Q: What is the maximum distance the signal can travel to a PLC?

A: Using a standard 4-20mA current loop, the signal can typically be transmitted up to 1,000 meters depending on the wire gauge and external electromagnetic interference. For longer distances or digital integration, RS485 or HART protocols are recommended.

## Conclusion

The Goldline TD 6 is a reliable and cost-effective solution for a wide array of industrial level measurement tasks. By understanding the physics of ultrasonic propagation and adhering to strict installation guidelines, facilities can achieve high-precision monitoring of their assets. For those requiring specialized configurations or alternative technologies such as radar or magnetic gauges, further technical documentation and product variants can be explored on the Main Page. Selecting the right instrument involves balancing the physical properties of the medium with the environmental constraints of the site, ensuring that the chosen sensor provides actionable data for years to come.