

Turbidity / Optical Density

Versatile Measurement for Multiple Industries and Applications

Turbidity is defined as the absence of clarity in a liquid due to suspended particles in the liquid. The measurement of turbidity is not a measure of liquid clarity, but instead measures how these suspended particles scatter light. Turbidity measurement is important in many applications because it can indicate the desired outcome of a process or can detect factors that are detrimental to a process or system.

Turbidity Sensors

Mettler-Toledo Ingold offers several types of turbidity sensors that are optimized for specific measurement ranges and different applications. The InPro 8050, 8100 and 8200 series turbidity sensors utilize backscattered light technology through advanced fiber optics providing linear measurement for medium to high levels of turbidity. The sensors have a compact 12 mm design, durable construction of polysulfone, stainless steel or hastelloy®, and require virtually no maintenance. Adaptation of the InPro 8050, 8100 and 8200 sensors into a process is effortless and they can be mounted at any angle via direct connection or utilizing one of Mettler-Toledo Ingold's various housings.

The new InPro 8400 and InPro 8500 sensors have an adaptable flow through design and utilize forward and 90° side scattering technology respectively. These technologies provide an optimum measuring range for low to medium turbidity levels and provide precise results. The InPro 8400 forward scattering sensors are ideal for detection of larger particles $\geq 0.3 \mu\text{m}$ and with the simultaneous measurement of forward and direct light allows for compensation of color. The InPro 8500 sensors provide additional trend information on the size composition of undissolved particles. The magnitude of the 90° and 12° ratio turbidity indicates if more colloidal or larger particles are present.

Turbidity Transmitters

The Trb 8300 series turbidity transmitters are the most versatile and cost effective turbidity transmitters on the inline market today. The Trb 8300 transmitter works with the InPro backscattered light sensors and the new Trb 8300 F/S transmitter was designed to work in conjunction with the

new InPro 8400 and InPro 8500 series sensors. These transmitters offer three different calibration types that optimize measurement accuracy which includes a multipoint calibration which allows a two to five point calibration. Three independent parameter sets are available for easy switching between measurement units or calibration types. The transmitter has an RS232 interface that is used to update the system software quickly and efficiently.

Turbidity Housings

Housing options are available for simple interface of the InPro 8100 and 8200 series sensors into a process. These housings help maintain low maintenance and minimum downtime of your process by allowing easy removal of the turbidity sensor. The housings are designed for strict CIP (Clean In Place) applications and have an advanced ergonomic design for easy installation and use.

Markets:

Biotech

Pharmaceutical

Chemical Processing

Petrochemical

Food and Beverage

Brewing

Applications:

- Fermentation
- Biomass Growth (cell density)
- Crystallization
- Phase Separation
- Water in Oil
- Filter Breakthrough
- Activated Sludge
- Post Filtration of Beer
- Wastewater

A clear solution for the entire measuring loop.

Transmitters

Process safety and reliability by using the METTLER TOLEDO Trb 8300 transmitter series:

- three independent parameter sets with remote access via discrete input contacts
- menu password protection on two levels
- four 0/4 ... 20 mA galvanically isolated outputs according to NAMUR NE43 guidelines
- RS232 interface for data transfer of configurations and software updating
- compliant with CE, UL and CSA.



Sensors

Outstanding advantages of METTLER TOLEDO turbidity sensors:

InPro 8050, 8100 and 8200

- compact sensor design
- versatile application coverage
- easy installation and reduced maintenance



InPro 8400 and 8500

- flow through design
- high accuracy at low levels
- factory calibration



CaliCap

Trouble-free, off-line calibration of InPro 8050, 8100 and 8200 sensors through:

- no interfering light reflectance from beaker walls during off-line calibration procedures
- 2-point dry check of system performance



Housings

Outstanding advantages of METTLER TOLEDO sensor housings for InPro 8100 and 8200 sensors at a glance:

- stationary and retractable versions are easy to mount and install, with a wide range of different process connections
- low maintenance and minimum downtime of your process
- retractable housings allow sensor access for maintenance or replacement without process interruption
- meet the most rigorous reliability and sterility requirements
- designed for CIP (Cleaning-in-Place) applications
- enhanced safety features, with protection against any accidental release of medium.

