

# Suspended Solids and Turbidity Sensors



## Features

- Immersion and hygienic sensor options
- Radiometric signal processing compensates for changes in optical properties of the emitters and detectors due to ageing and surface coating
- Hygienic sensors have industry standard 3" Triclamp/Triclover connections

Quadbeam sensors incorporate engineering improvements to eliminate water ingress and also withstand the rapid temperature cycling (from 10°C to 80°C) which occurs during CIP cleaning cycles. By design, Quadbeam sensors automatically compensate for component ageing, sensor fouling and daylight interference.

The Quadbeam™ alternating light principle is based on a fundamental method of suspended solids measurement by shining a light of known intensity a fixed distance through a medium at a photocell detector. Suspended solids in the medium attenuate some of the light. The detector current gives a measure of the attenuation that corresponds to suspended solids and turbidity measurement.

The Quadbeam alternating light principle compensates for variations in light intensity and detector sensitivity by using two detectors and two light sources switched on and off alternatively.

The sensors are available with different sensitivity levels and measuring ranges by changing the distances between the light sources and detectors. Sensors with shorter path lengths can measure higher concentrations and have larger measuring ranges where sensors with longer path lengths are more sensitive to small changes in suspended solids concentration.

The S series of suspended solids sensors are available as immersion or hygienic style sensors. The immersion sensors are designed for continuous on-line monitoring of suspended Solids in industrial and municipal water and waste water treatment plants, mining and refining operations.

**Applications include:**

- Effluent monitoring in clarifier overflow weirs
- Final effluent monitoring
- Mixed liquor suspended solids (MLSS)
- Product loss monitors in milk processing plants
- Return activated sludge (RAS)
- Sludge blanket detection
- White water solids concentration

The hygienic style sensors are designed for installation directly into food product lines where CIP cleaning is used. The one piece Polypropylene construction with a surface finish of better than 0.9µm Ra eliminates bacteria traps. The sensors have an industry standard triclover connection.

**Applications include:**

- Milk fat measurement in the dairy industry
- Percentage solids measurement in fruit and vegetable juices
- Product breakthrough on plate heat exchangers
- Solids content in whey

The Quadbeam optical systems use two pairs of infrared light emitting diodes and photo detectors which are pulsed in sequence. Radiometric signal processing compensates for changes in optical properties of the emitters and detectors due to ageing and surface coating.

High temperature immersion and hygienic versions of the S series of suspended solids sensors are available. These sensors are manufactured from PVDF with a maximum working temperature of 105°C.

The T30 sensor is a new generation of Quadbeam Turbidity process sensors, which combine both light attenuation and 90 degree scattered light measurements in a radiometric sensor with digital communication.

This technique vastly increases the sensitivity compared to sensors using just light attenuation. The T30 is designed to meet the international standards for turbidity measurement ISO 27027.

The T30 sensor has two emitters and two detectors, set at exactly 90 degrees to each other. As each emitter is pulsed in sequence it produces two detector currents, one from the detector opposite the emitter (attenuation) and the other from the detector at 90 degrees to the emitter (scattered light). Signals from each detector are fed into the microprocessor which calculates the value of Turbidity from the ratio of the two emitter/detector pairs.

A built in cleaner is standard with the immersion version of the T30.

High pressure air with optional biocide is the recommended method of cleaning.

The stainless steel support rods are designed to lift the sensor fingers above the floor of the drain and to protect the sensor fingers from impact.

**Applications include:**

- Monitoring of clarifier overflow weirs.
- Final outlet of effluent from DAF plants.
- Raw water inlet measurements in water treatment plants.
- Surface water monitoring.
- Solids loading in rivers and streams.
- Product breakthrough on plate heat exchangers.
- Percentage solids in fruit and vegetables juices

The T30 sensor is available as an immersion or Hygienic style sensor.

## Specification

### S series sensors

Measuring range:

#### Immersion sensors

##### S10/S10HT

0-25g/l in normal activated sludge  
4% maximum of coal dust

##### S20/S20HT

0-10g/l in normal activated sludge

##### S40/S40HT

0-2.5g/l in normal activated sludge

#### Hygienic sensors

##### S10/S10HT

0-40% of milk fat

##### S20/S20HT

0-20% of milk fat

##### S40/S40HT

0-1.5% of milk fat

Accuracy:

±2% of reading

Repeatability:

±1% of reading

Temperature:

0-85°C operating range

#### HT sensors

105°C maximum working temperature

#### Body style:

Immersion style body, 1.25" NPT thread

S10-2HY hygienic style body,

2" Triclover fitting

S10-3HY hygienic style body,

3" Triclover fitting

S20-3HY hygienic style body,

3" Triclover fitting

S40-3HY hygienic style body,

3" Triclover fitting

Body material:

Polypropylene

#### HT sensors

PVDF

#### Connection cable immersion sensor

Supplied with an integral 10 meter connection cable as standard with tag ends (Other lengths available on request)

#### Hygienic sensor

Supplied with an integral 1 meter connection cable and CA connector as standard (Other lengths available on request)  
Extension cables to suit are available

### T series sensors

Measuring range:

0-50 through to 0-1000 FNU/FTU/NTU

Accuracy:

±2% of reading

Repeatability:

±1% of reading

Temperature:

0-85°C operating range

Body style:

Immersion style body, 1.25" NPT

Thread

Hygienic style body, 3" Triclover fitting

Body material:

Polypropylene

Connection cable

Supplied with an integral 10 meter connection cable as standard with tag ends (Other lengths available on request)

## Order Codes

### Immersion suspended solids and turbidity sensors

Type No	Part No	Description
S10-IMM	1901	Series 10 sensor with 10 meter cable & tag ends. S10-IMM-880-PP-10-NC
S10HT-IMM	1902	Series 10 high temperature sensor with 10 meter cable & tag ends. Rated to 105°C. S10HT-IMM-880-PVDF-10-NC
S20-IMM	1903	Series 20 sensor with 10 meter cable & tag ends. S20-IMM-880-PP-10-NC
S20HT-IMM	1904	Series 20 high sensor with 10 meter cable & tag ends. Rated to 105°C. S20HT-IMM-880-PVDF-10-NC
S40-IMM	1905	Series 40 sensor with 10 meter cable & tag ends. S40-IMM-880-PP-10-NC
T30-IMM	1906	Series 30 Turbidity sensor with 10 meter cable & tag ends. T30-IMM-880-PP-10-NC

### Hygienic suspended solids & turbidity sensors

Type No	Part No	Description
S10-3HY	1907	Series 10 sensor with 1 meter cable & Amphenol connector, 3" triclamp flange. S10-3HY-880-PP-1-CA
S10HT-3HY	1908	Series 10 high temperature sensor with 1 meter cable & Amphenol connector, 3" triclamp flange. Rated to 105°C. S10HT-3HY-880-PVDF-1-CA
S20-3HY	1909	Series 20 sensor with 1 meter cable & Amphenol connector, 3" triclamp flange. S20-3HY-880-PP-1-CA
S20HT-3HY	1910	Series 20 high temperature sensor with 1 meter cable & Amphenol connector, 3" triclamp flange. Rated to 105°C. S20HT-3HY-880-PVDF-1-CA
S40-3HY	1911	Series 40 sensor with 1 meter cable & Amphenol connector, 3" triclamp flange. S40-3HY-880-PP-1-CA
T30-3HY	1912	Series 30 turbidity sensor with 10 meter cable & tag ends, 3" triclamp flange. T30-3HY-880-PP-10-NC

### Suspended solids and turbidity accessories

Type No	Part No	Description
Dip Holder	6097	600mm PVC dip holder for immersion type suspended solids sensor
Dip Holder	6098	1200mm PVC dip holder for immersion type suspended solids sensor
Dip Holder	6099	2000mm PVC dip holder for immersion type suspended solids sensor
CA-10-NC	1913	10 meter extension cable for use with series 10, 20 & 40 hygienic style sensors.
	1914	Sensor extension cable (price per meter)
		S20 immersion sensor cleaning head assembly



These products comply with current European Directives

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