Technical Information
TI 315e00
51508357

# *Turbidity Sensor 7530 SSN-T/E*

## Turbidity Sensor for Low Concentrations using the 90° Scattered Light Method

The 7530 SSN sensor is used for optical turbidity measurement in pure and process water for up to 1000 FNU.

### Applications

- Filtrate monitoring
- Purity contol of boiler feed water
- Condensate monitoring
- In-process monitoring of industrial water
- Industrial quality control
- River water
- Effluent of wastewater treatment plants

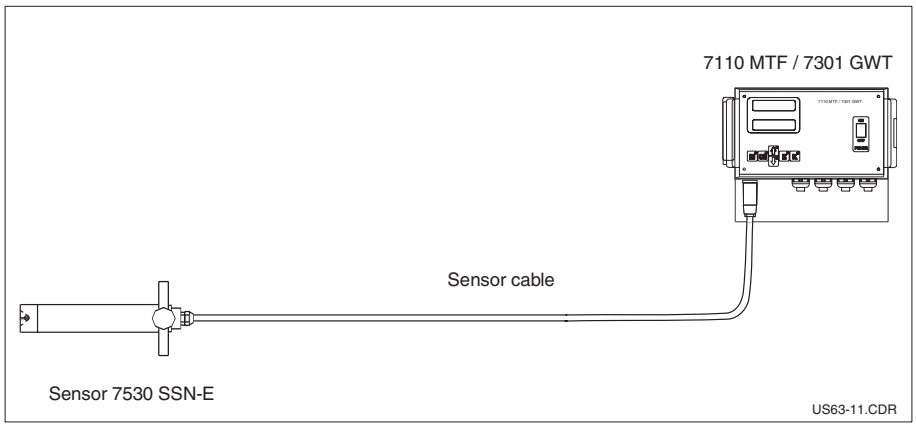
### Features and benefits

- Reliable concentration measurement using optical measuring process
- Four-beam pulsed light method for compensation of sensor soiling and ageing of optical components
- Stainless steel sensor body
- No mechanically moving parts
- Measured value preprocessing in sensor resulting in low signal transmission sensitivity

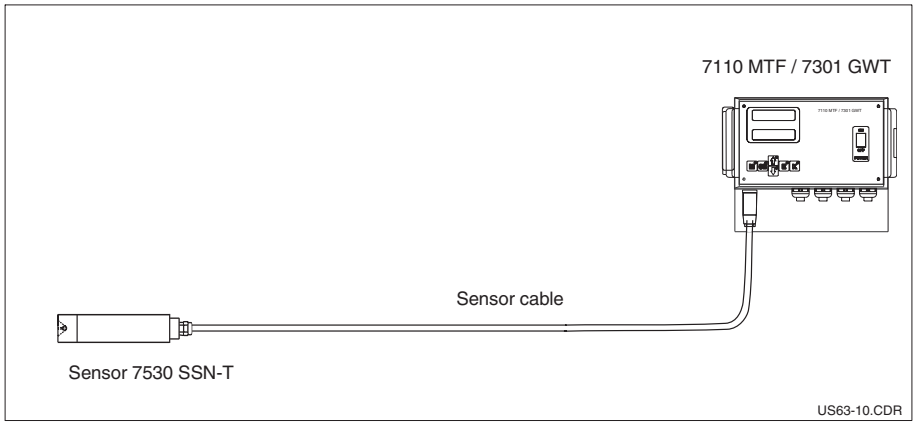
ISO 9001

# Measuring system

The complete measuring system consists of:
- Turbidity transmitter
  7110 MTF or 7301 GWT
- Turbidity sensor 7530 SSN




Measuring system
7110 MTF or 7301 GWT
with 7530 SSN-E




Measuring system
7110 MTF or 7301 GWT
with 7530 SSN-T

# Measuring principle

**Turbidity measurement**
By turbidity we mean the scattered component of a light beam which is diverted away from its original course by optically denser particles in the medium e.g. solid matter particles.

**Four-beam pulsed light method**
This method is based on two light sources and two photoreceivers. Long-life LEDs ( at least 20,000 operating hours) are used as monochromatic light sources.

To eliminate interference from extraneous light sources, the LEDs are pulsed at a rate of several kHz.

Two measuring signals are detected at the two photoreceivers with every light pulse. The four measuring signals are compared logarithmically with each other and converted into a ratio. This compensates for detector soiling and the ageing of optical modules.

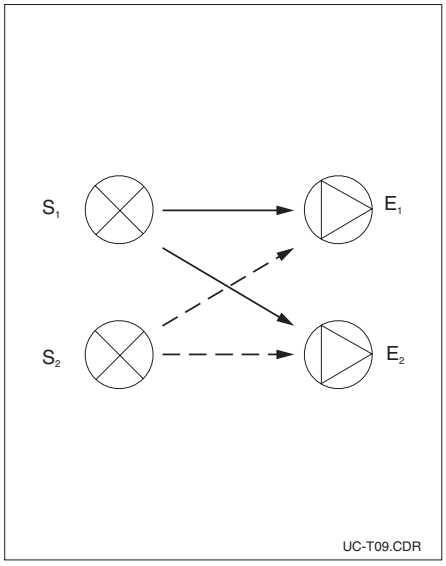
**90° scattered light method**
Measurements are made using the standardised 90 scattered light method in accordance with ISO 7027 / EN 27027. The measuring method is based on the Tyndall effect.

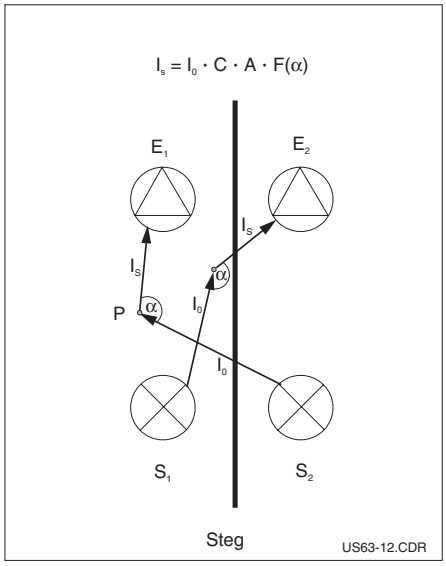
The turbidity of the medium is determined from the amount of scattered light. The transmitted infra-red light beam is scattered by the particles in the medium. The scattered beams are measured by scattered light receivers which are fixed at an angle of 90 to the transmitted light. The measured scattered light signals are converted to frequency signals. The frequency signals are assigned to corresponding turbidity units and solid matter concentrations, and appear in the display.

*left:*
Principle of measured light transmission
S = Transmitter
E = Receiver

*right:*
Principle of 90 scattered beam measuremend

$I_0$ = Intensity of transmitted light
$I_S$ = Intensity of scattered light
A = Geometrical factor
C = Concentration
f(α)= Angle correlation
P = Particle

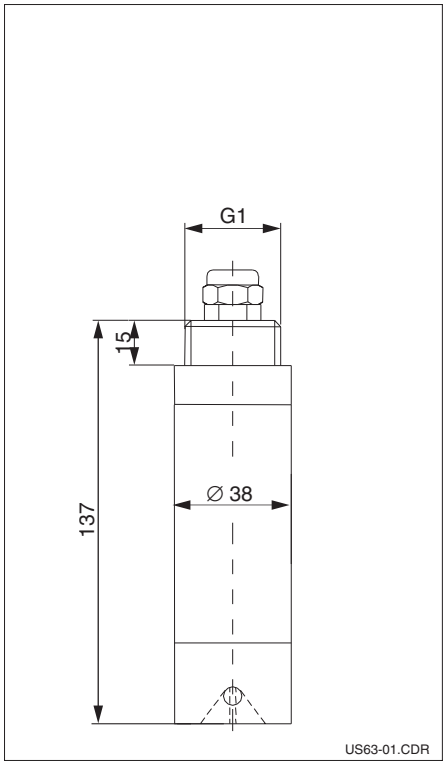


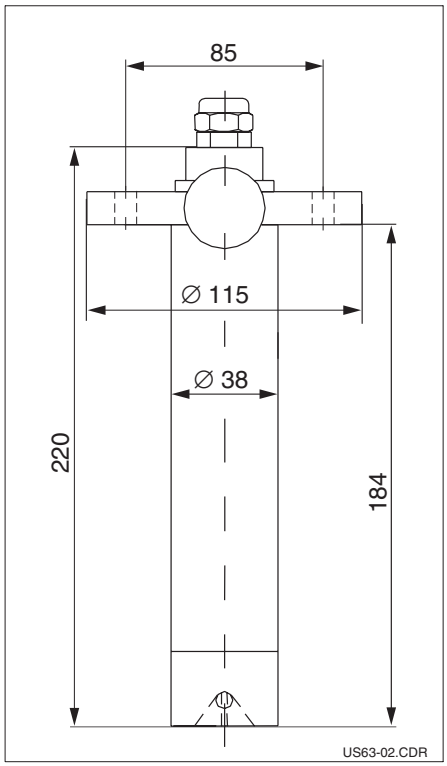




# Calibration

Each sensor is subjected to careful calibration at the factory. One customer calibration can also be saved.

# Dimensions



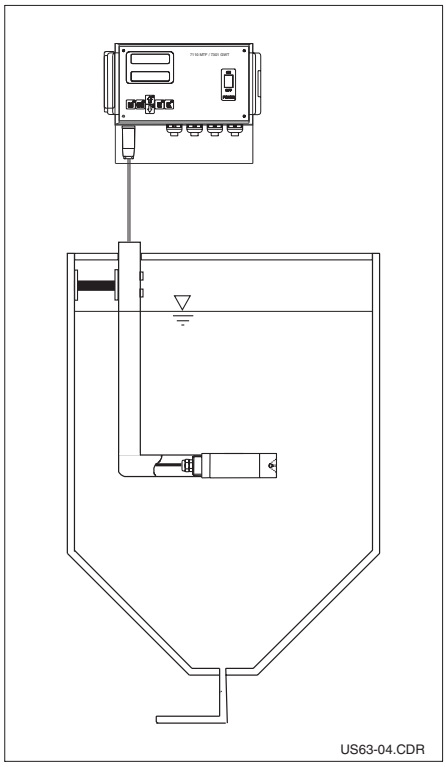



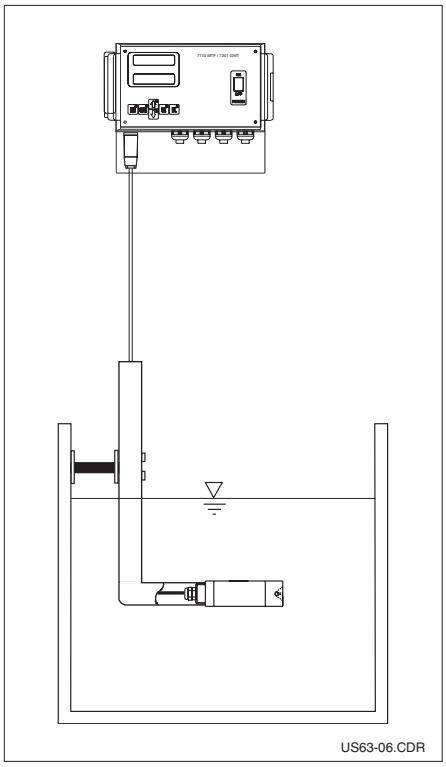

Dimensions 7530 SSN

*left:*
immersion type

*right:*
Installation type

# Installation




Installation examples for sensor 7530 SSN immersion type

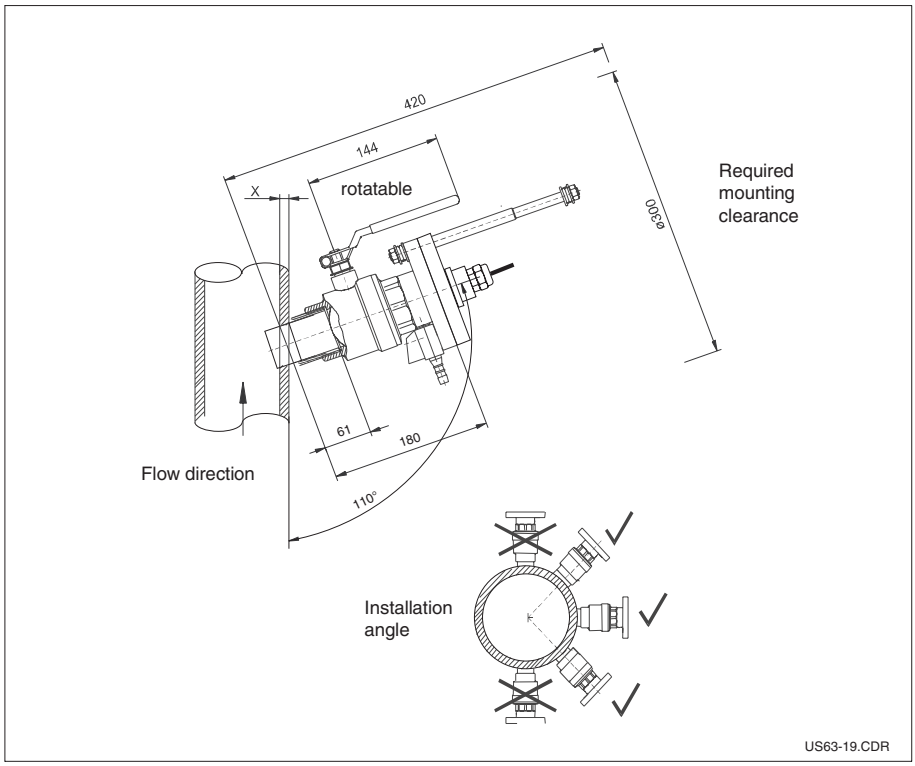
*left:*
Tank installation with immersion tube 90°

*right:*
Channel installation with basin mounting and immersion tube with 90° angle

**Note:**

- We recommend the use of an immersion tube with 90° angle for the 7530 SSN immersion type.
- Installing the sensor in pipelines or close to a wall can lead to back-scattering and therefore to signal increase.

# Installation




Installation example of 7530 SSN sensor
Installation version

Pipe installation with ball valve built-in assembly (Accessories)

# Accessories

- ❏ Ball valve built-in assembly
  for sensor extension under process conditions
  DN 40 with safety lock
  Material: stainless steel SS 316 Ti,
  O-rings made of Viton®
  Order No.: 51503660

- ❏ Sensor fixing bracket for basin mounting
  Material: stainless steel SS 316 Ti,
  Order No.: 51503581

- ❏ Sensor rinsing tool for SSN-T
  Material: stainless steel SS 316 Ti
  Order No.: 51503863

- ❏ Immersion tube 2 m
  Material: stainless steel SS 316 Ti
  Order No. 51505996

- ❏ Immersion tube 3 m
  Material: stainless steel SS 316 Ti
  Order No. 51505997

# Technical data

**General date**

| | |
|---|---|
| Manufacturer | ISI Europa |
| Product designaton | Turbidity sensor 7530 SSN |

**Mechanical date**

| | | |
|---|---|---|
| Dimensions (L x Ø) | Installation type<br>Immersion type | 220 × Ø 38 mm<br>137 x Ø 38 mm |
| Weight | Installation type<br>Immersion type | ca. 3 kg<br>ca. 1 kg |

**Materials**

| | |
|---|---|
| Sensor body | Stainless steel SS 316 Ti |
| Sight glass | Polyoxymethylen (POM), Araldit® glue |
| O-rings | Viton® |

**Turbidity measurement**

| | |
|---|---|
| Measuring principle | 90° scattered light method |
| Optical components | Light source: 2 LED´s, Detector: 2 photodiodes |
| Measuring light | Infrared light at 880 nm (absorption maximum) |
| Measuring range | 2,0 ... 1000 FNU |
| Accuracy | < 1% of mesuring range end value |
| Reference | Using for-beam pulsed light method |
| Factory calibration | Formazine standard |
| Cable lenghts T version<br>E version | 13 m<br>1m + 10m extension cable |

**Operating conditions**

| | |
|---|---|
| Operating temperature | 0 ... +50 °C |
| Operating pressure | max. 6 bar |
| Ingres protection | IP 68 |

**Supplementary documentation**

| | |
|---|---|
| Technical Information 7110 MTF | Order No.: 51508353 |
| Technical Information 7301 GWT | Order No.: 51508491 |

Subject to modifications.

# Ordering information

| | | |
|---|---|---|
| ❏ 7530 SSN-T | with frequency output | 51503616 |
| ❏ 7535 SSN-T | with analog output | 51503617 |
| ❏ 7530 SSN-E | with frequency output | 51503640 |
| ❏ 7535 SSN-E | with analog output | 51503641 |

**ISI Europa**
P. O. Box 10 01 54
D-70826 Gerlingen
Tel. +49-71 56-2 09-2 18
Fax +49-71 56-2 65 71

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