Technical Information
TI 316e00
51508355

Solids Content Sensor
7540 SRH-T/E

Solids Content Sensor for High Concentrations using the Backscatter-Light Method

The SRH-T/E sensor is used for optical solids content measurement in turbid water for up to 150 g solid matter/l.

Applications

- Solids content measurement of suspended matter in sewage treatment plants:
  Primary sludge, digested sludge, thickened sludge,
  inflow to centrifuge / press
- Industrial quality control

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

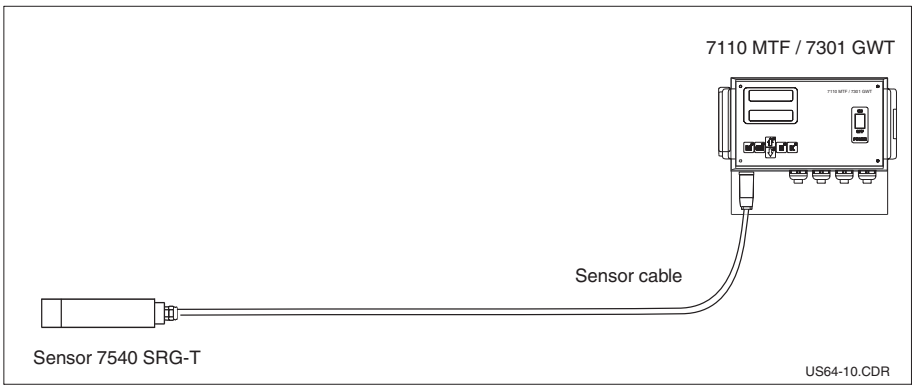
ISO 9001

Measuring system

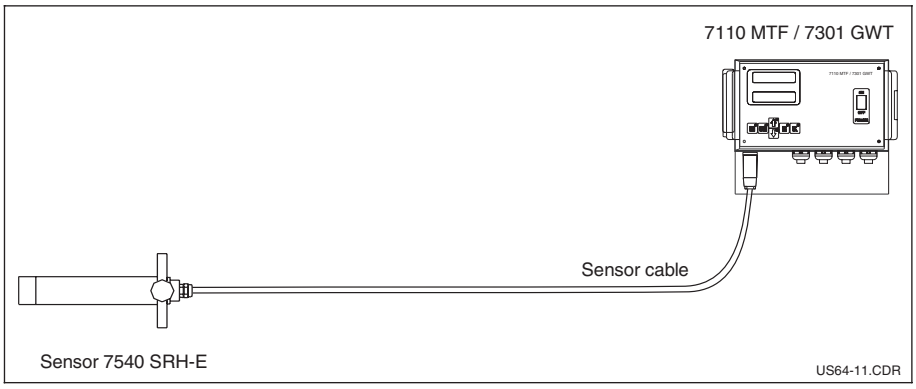
The complete measuring system
- Turbidity measuring transmitter 7110 MTF or 7301 GWT
- Solids content sensor 7540 SRH

Example of an complete measuring system

7110 MTF or 7301 GWT with 7540 SRH-T



Measuring system 7110 MTF or 7301 GWT with 7540 SRH-E



Measuring princple

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 can compensate for detector soiling and the ageing of optical modules.

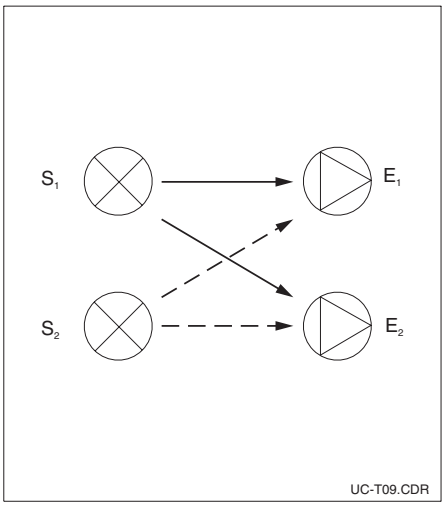
Backscattered light method
The particles contained in the measuring medium reduce the intensity of the transmitted light exponentially to the path length and concentration.

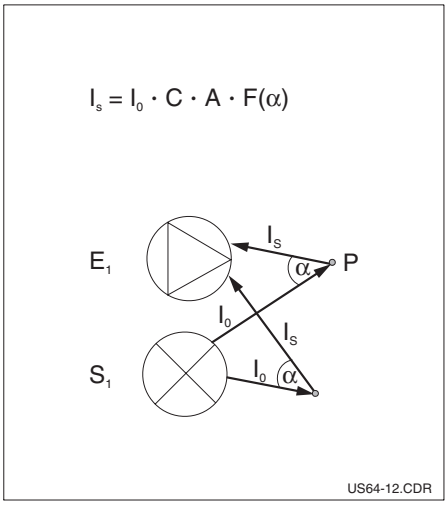
The turbidity of the medium is determined with the amount of backscattered light. The transmitted infra-red light beam is scattered by the particles in the medium. The backscatter created is measured by the scattered light receivers which are arranged next to the light sources. The measured scattered 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
S = Transmitter
E = Receiver

right:
Principle of the back-scattered-light method

I_0 = Intensität des ausgesendeten Lichts
I_S = Intensität des Streulichts
A = Geometrischer Faktor
C = Konzentration
f(α)= Winkelabhängigkeit
P = Partikel

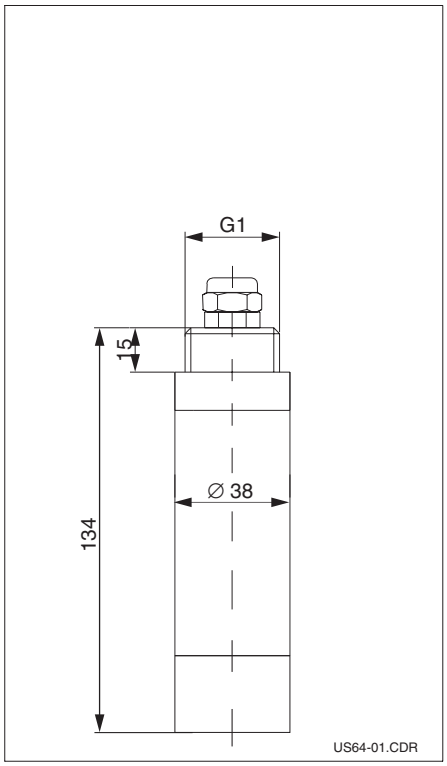


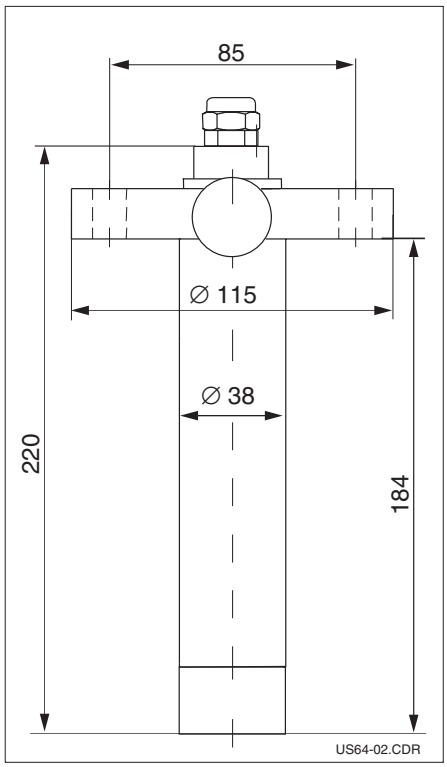


Calibration

Each sensor is subjected to careful calibration at the factory. One customer calibration can also be saved. For the calibration of solids content measurement, such as sludge, refer to the concentration determined by a reference method (dry substance).

Dimensions



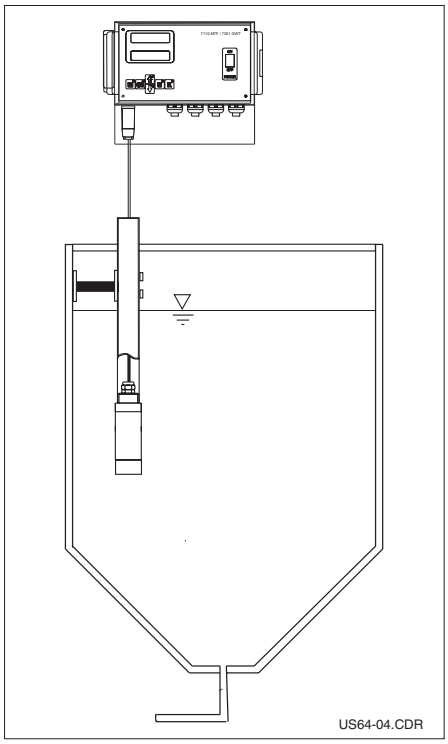


Dimensions 7540 SRH

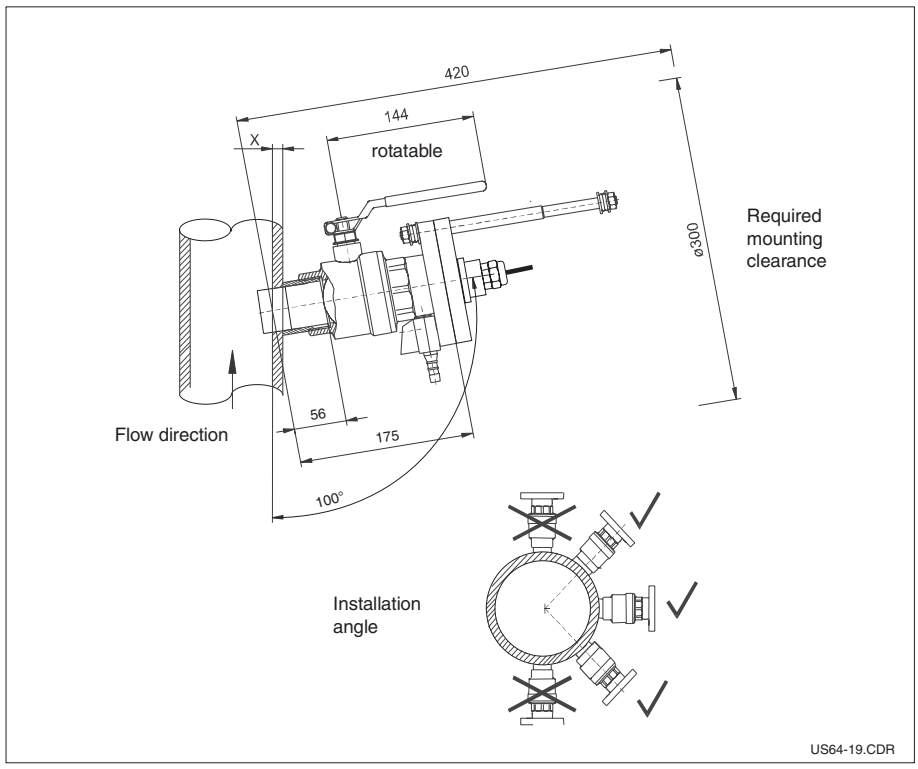
left:
7540 SRH Immersion type

right:
7540 SRH Installation type

Installation



Installation example
7540 SRH
Tank installation of
Immersion type



Installation example
7540 SRH
Immersion type

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

Note:

- We recommend the use of an immersion tube with 180° thread for the 7540 SRH immersion type.
- Installing the sensor in pipelines or close to a wall can lead to back-scattering and therefore to signal increase.

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
- ❏ Immersion tube 1 m
  Material: stainless steel SS 316 Ti
  Order No. 51506000
- ❏ Immersion tube 2 m
  Material: stainless steel SS 316 Ti
  Order No. 51505994
- ❏ Immersion tube 3 m
  Material: stainles steel SS 316 Ti
  Order No. 51505995

Technical data

General specifications

Manufacturer	ISI Europa
Product designation	Solids content sensor 7540 SRH

Mechanical data

Dimensions (L x Ø)		134 × 38 Ø mm 220 × 38 Ø mm
Weight	Immersion type Installation type	approx. 1kg approx. 3kg

Materials

Sensor body	Stainless steel SS 316 Ti
Sight glass	Epoxy resin
O-rings	Viton®

Turbidity measurement

Measuring principle	Backscatter light method
Optical components	Light source: 2 LEDs, detectors: 2 photodiodes
Measuring light	Infrared light at 880nm (absorption maximum)
Measuring range	10 ... 150g solid matter/l, dependent on sludge type
Accuracy	< 1% of measuring range end value
Reference	Using four-beam pulsed light method
Factory calibration	SiO_2
Cable lengths T version E version	13m 1m + 10m extension cable

Operating conditions

Operating temperature	0 ... +50°C
Operating pressure	max. 6 bar
Ingress protection	IP 68

Supplementary documentation

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

Subject to modifications.

Ordering information

❏ 7540 SRH-T	with frequency output	51503623
❏ 7545 SRH-T	with analog output	51505900
❏ 7540 SRH-E	with frequency output	51503657
❏ 7545 SRH-E	with analog output	51503659
❏ 7540 SRH-E-SP	with frequency output and integrated rinse nozzle	51505658
❏ 7545 SRH-E-SP	with analog output and integrated rinse nozzle	51505993

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