

TF16

Dual Channel Scattered Light Sensor



- Inline real time process monitoring
- Dual channel color compensation
- Extremely low maintenance
- CIP/SIP-compatible
- Broad variety of line sizes, process connections and wetted materials
- Designed for high temperatures and pressures

The model TF16 is a precise dual channel, scattered light turbidity sensor. This sensor is designed to provide inline control solutions for a variety of industrial processes, from sanitary CIP/SIP applications to high-pressure, high-temperature industrial applications.

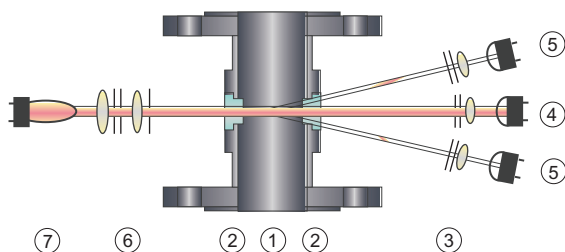
The TF16 sensor uses light in the visible (VIS) and near infrared (NIR) range from 400 to 1100 nm. A precisely defined, constant light beam penetrates the process medium. Light scattered from particles (trace suspended solids, undissolved liquids or gas bubbles) in the medium is detected by eight hermetically sealed silicon photo diodes at an angle of 11°.

Simultaneously, the unscattered light is detected as a direct beam by a reference photo diode. This unique dual channel design compensates for disturbances such as background color or color changes of the carrier medium.

The sensor can be calibrated in ppm, EBC or FTU and measures extremely low particle sizes and concentrations.

The special optical window is made from a single crystal sapphire. This provides superior resistance to all abrasive and corrosive media. The TF16 is available with a broad variety of line sizes, process connections and wetted materials and can be adapted easily to the process.

High temperature and explosion-proof options are also available.



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|------------------------|-------------------------------------|
| Type TF16 | 4 Detector (direct light) |
| 1 Sensor body | 5 Detector (scattered light) |
| 2 Windows | 6 Optics module |
| 3 Optics module | 7 Lamp |

Technical Data

Sensor TF16



Material:

measuring cell made of stainless steel
SS 316 Ti, 1.4571 (standard)

Special materials:

SS 316 L (1.4435), 1.4539, 1.4462, TFM 4215, Hastelloy® C4, Hastelloy® C22, Titanium, Tantalum, Monel® 400, Inconel® 625, PP, and others on request.

Line size:

¼" to 8", (DN 6 to DN 200)

Process connections:

ASME Flange, DIN Flange, Varivent, JIS Flange, Tri-Clamp, BBS-Clamp, Female Thread NPT, Female Thread DIN ISO 228/1 G, Sanitary Thread (DIN 11851), and others on request.

Gaskets:

Viton®, EPDM (FDA), EPDM (USP Class VI), Kalrez®, Chemraz®, Fluoraz®, Buna (NBR), Silicone, Viton®/FEP (FDA), and others on request.

Windows:

Pyrex®, Sapphire

Optical path length:

40 mm standard, others on request.

Process pressure:

10 mbar to 325 bar, (0.15 psi to 4713 psi),
depending on process connection, material and design

Process temperature:

values are only valid with appropriate material of sensor body and gaskets.
No icing on sensor!

- permanent: 0 °C to +120 °C, (+32 °F to +248 °F)
- peak (15 min/day): 0 °C to +150 °C, (+32 °F to +302 °F)

Ambient temperature:

- operation: 0 °C to +40 °C, (+32 °F to +104 °F)
(elevated or reduced ambient temperatures may require restrictions to the operating temperatures stated above!)
- transport: -20 °C to +70 °C, (-4 °F to +158 °F)

AirPurge:

connectors available as standard

Light source:

incandescent tungsten lamp: 5.0 V DC, 775 mA,
typical lamp life 3 to 5 years

Wavelengths:

400 nm - 1100 nm

Detector:

silicon photo diodes, hermetically sealed

Calibration:

basic calibration in ppm (DE), FTU, EBC

Measuring range:

any measuring range between
0 - 0.5 to 500 ppm (DE)
0 - 0.2 to 200 FTU
0 - 0.05 to 50 EBC

Resolution:

< ± 0.05 % of respective measuring range

Repeatability:

< ± 0.3 % of respective measuring range

Linearity:

specific to application, < ± 1 % with standard solution

Protection:

all optical parts protected according to NEMA 4X (IP65)

Cable lengths:

standard: 5, 10, 20, 35, 50 m, (16, 33, 66, 115, 164 ft.)
maximum: 250 m, (800 ft.)

VA-plug-protection:

special ultra-shielded cable sets,
optional rigid stainless steel connector

Certificates:

ISO 9001:2000, ATEX, FM, PED, CE, HPO

Use with C4000 Converters

Options



Measuring cells for any application

TF16-HT

high temperature model
permanent:
-20 °C to +240 °C, (-4 °F to +464 °F)
periodic 15 min/day:
-20 °C to +260 °C, (-4 °F to +500 °F)

TF16-N / TF16-HT-N

TF16-EX-N / TF16-EX-HT-N

with NIR filter for applications with light-sensitive process streams to avoid biofouling

TF16-EX / TF16-EX-HT

ATEX and FM ex-proof versions for safety and confidence in all hazardous area classification, Approval report:
DMT ATEX E176, FMG J.I. 3013884
Maximum cable length: 1000 m (3280 ft.)
(please contact us for separate data sheet)



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