

TF16-EX

Dual Channel Scattered Light Sensor



- Inline real time process monitoring
- Designed for high temperatures, high pressures and hazardous locations
- Explosion-proof instrument comply to EN/FM directives
- Dual channel color compensation
- Extremely low maintenance
- CIP/SIP-compatible

The model TF16-EX is a precise dual channel, scattered light turbidity sensor. This sensor provides inline control solutions for a variety of industrial processes and is designed especially for hazardous environments.

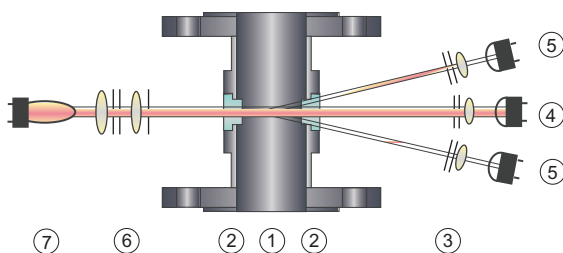
The modular sensor consists of a flameproof stainless steel lamp housing and an intrinsically safe detector module. The appropriate converter can be located either in a safe area or in a flameproof or pressurized enclosure directly in the hazardous location.

The TF16-EX uses light in the VIS and NIR range from 400 to 1100 nm. A precisely defined, constant light beam penetrates the process medium and will be scattered by particles (trace suspended solids, undissolved liquids or gas bubbles) in the medium.

The scattered light is detected by photo diodes at an angle of 11° and the unscattered light is detected simultaneously 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.

A special optical sapphire window provides superior resistance to all abrasive and corrosive media. The TF16-EX is available with a broad variety of line sizes, process connections and wetted materials.



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

Technical Data



Sensor TF16-EX

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, 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

Temperature specification:

elevated or reduced ambient temperatures may require restrictions to the operating temperatures.

ambient temperature:

-30 °C to +40 °C, (-22 °F to +104 °F) for T4 (+135 °C/+275 °F)

process temperature:

-30 °C to +120 °C, (-22 °F to +248 °F)

periodic 15 min/day (no hazardous environment):

-30 °C to +150 °C, (-22 °F to +392 °F)

periodic 30 min/day (no hazardous environment):

-30 °C to +140 °C, (-22 °F to +284 °F)

during transport:

-30 °C to +70 °C, (-22 °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:

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 specification:

fixed cable connection 2 m, both side

0 - 400 m, (0 - 1312 ft.) appr. IIC T6/T5 (Groups A,B,C,D)

401 - 1000 m, (1313 - 3280 ft) appr. IIB T6/T5 (Groups C,D)

Hazardous locations:

II 2G EEx ia IIC/IIB T6/T5

Class I, Div. 1, Groups A, B, C, D

Approval report:

DMT ATEX E176

FMG J.I. 3013884

Certificates:

ISO9001:2000, ATEX, FM, PED, CE, HPO

Use with C4000 Converters

Options



Measuring cells for any application

TF16-EX-HT

high temperature ex-proof model
perman.:

-30 °C to +240 °C, (-22 °F to +464 °F)

periodic 15 min/day:

-30 °C to +260 °C, (-22 °F to +500 °F)

periodic 30 min/day:

-30 °C to +250 °C, (-22 °F to +482 °F)

TF16-EX-N

ex-proof model equipped with NIR filter to
avoid biofouling for demanding applications

TF16-EX-HT-N

high temperature ex-proof model equipped
with NIR filter for demanding applications