TF16-N

2-Channel Scattered light 11°

inline control



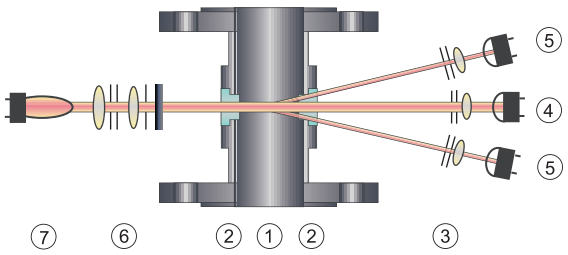
- **Inline real-time process monitoring**
- **Extremely low maintenance**
- **CIP/SIP-compatible**
- **Broad variety of line sizes, process connections and wetted materials**
- **Designed for high temperatures and pressures**

The model TF16-N is a precise 2-Channel, Scattered light 11° turbidimeter. 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-N uses light in the Near Infrared (NIR) from 730 to 970 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 photodiodes at an angle of 11°.
Simultaneously, the unscattered light is detected by a reference photodiode.

This unique dual channel design compensates for disturbances of the carrier medium.
The sensor can be calibrated in ppm, EBC or FTU and measures extremely low particle sizes and concentrations. Additionally high particle concentrations can be monitored color independent at the direct light detector.

The special optical window is made from a single crystal sapphire. This provides superior resistance to all abrasive and corrosive media.
The TF16-N 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 flameproof options are also available.



Type TF16-N

1 Sensor body
2 Windows
3 Optics module
4 Detector (direct light)
5 Detector (scattered light)
6 Optics module with NIR filter
7 Lamp

Technical Data

Sensor TF16-N

Materials:
sensor body 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, others on request.

Line size:
¼“ to 8“ (DN 6 to DN 200)

Process connections:
Flange ASME, Flange DIN, Varivent, Flange JIS, Clamp L14 AM7 (Tri-Clamp), BBS-Clamp, Clamp DIN 11864, Female Thread NPT, Female Thread DIN ISO 228/1 G, Sanitary Thread (DIN 11851), others on request

Window gaskets:
Silicone (FDA), Viton® (FDA), EPDM (FDA, USP Class VI), Kalrez® 4079, Viton®/FEP (FDA), Fluoraz® 797, Kalrez® 1050LF, Kalrez® 6375, Chemraz® 505, Chemraz® 513, Buna® (FDA), Kalrez® 6230 (FDA, USP Class VI), others on request.

Windows:
Pyrex® (Borosilikatglas), Sapphire, Sapphire Biotech

Optical path length:
40 mm standard

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

Ambient temperature:
- operation: 0 - 40 °C (+32 - 104 °F)

(elevated or reduced ambient temperatures may require restrictions to the operating temperatures stated above!)
- transport: -20 - 70 °C (-4 - 158 °F)

Airpurge:
connection M5: standard through window ring / backside

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

Wavelengths range:
730 nm - 970 nm

Detector:
silicon photodiodes, hermetically sealed

Calibration:
basic calibration in ppm (DE), FTU, EBC

Measuring range:
any measuring range between

Scattered light:	NIR-Absorption:
0-0.5 to 500 ppm (DE)	0-50 to 2000 ppm (DE)
0-0.2 to 200 FTU	0-20 to 800 FTU
0-0.05 to 50 EBC	0-5 to 200 EBC
0-0.5 to 5 CU	

Resolution:
< ± 0.05 % of respective measuring range

Repeatability:
< ± 0.3 % of respective measuring range

Linearity:
specific to application, < ± 1 % with standard solution

Type of protection:
all optical parts protected according to IP65

Cable connection:
with plastic connector or SS plug protector
length cable set:
2, 3, 5, 10, 15, 20, .., 100 m (7, 10, 16, 33, 49, 66, .., 328 ft.)
cable sets length > 100 m (328 ft.) on request

Certificates:
ISO 9001:2000, ATEX, FM, PED, CE, HP0

Use with C4000 converter!

Options:

EX (EN-D)
Ex-proof version for safety and confidence in all hazardous area classification accor. ATEX (EN-D)
Approval: DMT ATEX E 176

EX (FM-D)
Ex-proof version for safety and confidence in all hazardous area classification accor. FM (FM-D)
Approval: FMG J. I. 3013884

HT
high temperature version
permanent:
-30 - 240 °C (-22 - 464 °F)
peak (15 min/day):
-30 - 260 °C (-22 - 500 °F)

PV
Airpurge-connection M5:
backside (for Varivent) or through window ring

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