

TC007 Process Turbidimeter

Benefits:

- Real time in-line turbidity measurement
- 0.01 – 1 000 NTU/FNU
- Reliable and robust infrared LED light source
- Precision fiber optics
- Maintenance free
- Suitable for hazardous area use
- ISO 7027 compliant

The Kemtrak TC007 is a simple to operate industrial fiber optic coupled turbidimeter for high resolution, real time, in-line concentration measurement.

The Kemtrak TC007 utilizes a high performance LED light source with robust fiber optics to ensure maintenance and drift free operation with exceptionally high precision.

Industrial grade measurement cells with scratch resistant sapphire windows, contain no electronics or moving parts making them ideal for both ordinary and hazardous area use.

A proprietary algorithm mathematically combines attenuated and scattered light to accurately report the turbidity level in the process stream. Automatic compensation for sample color and fouling of the optical windows ensures trouble free operation.

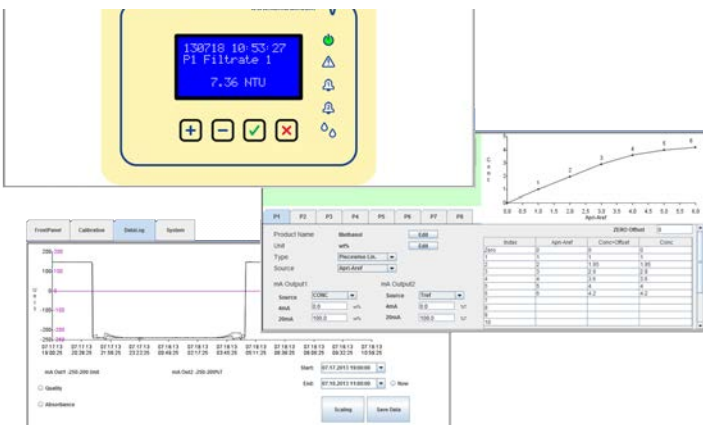


Typical Applications:

- Filtration monitoring
- Centrifuge control
- Interface detection
- Phase separation
- Leak detection and condensate carryover
- Water in fuel / Oil in water
- Quality control

Standard features include 16 linearization tables for multiple product switching, remote zeroing, automatic cell cleaning cycle and signal filtering. A free graphical internet based configuration utility is included which allows remote operation, calibration, validation and data trending.

All Kemtrak products are designed to meet the most demanding application specifications and are made from the highest quality materials to ensure exceptionally long life and the highest reliability possible.



Housing

Stainless steel EN 1.4301 (X5CrNi18-10), AISI 304 (V2A)
Captive lid screws & external mounting brackets stainless steel
244 x 215 x 105 mm (L x W x D)
IP 65 / EN 60529

Display

16 x 4 alphanumeric white on blue dot matrix LCD display
LED background illuminated
Measurement updates every second
LED 1 (green): Power on
LED 2 (red): System fault
LED 3 & 4 (orange): Alarm 1 & Alarm 2
LED 5 (blue): Clean / Hold

Operation

4 push buttons
Remote HTML/Java interface (TCP/IP connection via Ethernet port)

Software Features:

- Auto gain: Fully automatic photometer gain switching
- Auto zero: Automatically, locally or remotely activated zero
- Calibration: 16 linearization tables for concentration & mA output
- Damping: From 0 to 9999s with noise (air bubble / particle) filter
- Memory: Nonvolatile - all data retained upon power failure
- Security: Alphanumeric password protection

Data Logger

- >17000 data points (timestamp, average, max. & min.), ring buffer
- Configurable log time interval 1s to 24hr

Event Logger

- >16000 events, ring buffer
- Timestamp, alarms, zeroing, cleaning, product change, calibration & system events (power, system warning & error messages)

Automatic Cleaning Control

- Automatic cleaning sequence, triggering dedicated relay output
- Manual trigger or external trigger via digital input
- Configurable automatic cleaning interval, 15min to 2months
- Configurable cleaning duration from 0 to 9999s
- Auto-zero after clean option
- Hold value after clean (to equilibrate) 0 to 9999s

PID Controller

Control method: Pulse width modulated relay output or 0/4-20mA output
Control period: 2 - 99s
Proportional gain: 0.0000 - 999999
Integral time: 0.0000 - 999999s
Derivative time: 0.0000 - 999999s

Remote Input

- 5 x Digital input (potential free contact) for:
- Input 1-3: Product/range selection
 - Input 4: Zero, instant zero, clean or clean & Zero
 - Input 5: Hold (freeze output), data log control or light source control

Measurement Method

Attenuated light, scattered light or a combination of both using a nephelometric ratio algorithm
ISO7027:1999(E) compliant when measuring scattered light at 90°

Light Source

High performance TS AlGaAs Infrared LED lamp
Wavelength: 850nm
Typical lamp lifetime: >100000hrs

Range of Measurement

RATIO (90°) 0.01 – 1 000 FTU (0.0025 – 1 000EBC)
ATTENUATED (0°) 0 – 5 AU, 10mm OPL (0 - 0.001 %T)
BACKSCATTER (180°) 0 - 100% total suspended solids
1 FTU (formazin turbidity unit) = 1 NTU = 1 FNU
Other units of measurement available e.g. ASBC-FNU, Helms, ppm etc
* Range can be extended to 4 000 FTU using a shorter OPL

Resolution

Typically < ±0.05% of respective measuring range
For scattered light (90° RATIO) measurement:
0.01 – 10 FTU 0.01 FTU (0.0025 EBC)
10 – 100 FTU 0.1 FTU (0.025 EBC)
100 – 1000 FTU 1 FTU (0.25 EBC)

Accuracy

< ±2% of reading plus stray light

Repeatability

< ±1% of reading or 0.01 FTU, whichever is greater

Stray Light

Typically < 0.05 FTU (measurement cell / probe dependent)

mA Output

1 x selectable 0 – 20 mA / 4 - 20 mA (NAMUR, max 21.6mA)
Optional second mA output
Galvanically isolated, tested during final inspection to 500 VDC
Accuracy: < 0.1%
Resolution: 0.025%
Load: 0 – 600 Ohm

Relay Outputs

1 x 1 A 240 VAC Failsafe output (active when system is ok)
2 x 1 A 240 VAC User configurable (alarm, PID)
1 x 1 A 240 VAC Automatic cleaning control
Fuses: 4 x 1 A (type: MXT), max 100A breaking capacity
LED status indicators flash when relays are active

Fail-Safe:

Dedicated relay output, 1A 240 VAC
mA output value used to signal a system fault (NAMUR < 3.6 mA or > 21.0 mA)

Network interface (remote communications):

TCP/IP, 10Base-T and 100Base-TX Link
Connector: RJ45
Protocol:
1) HTML interface using native protocol over TCP/IP
Java® version 8 update 202 or later required
2) MODBUS server (slave) over TCP/IP (V1.1b3 compliant)
Functions: (0x03, 0x04, 0x2B/0x0E - conformity 0x01)

Operating Conditions

Ambient temperature: 0°C to +50°C (32°F to 122°F)
Transport: -20°C to +70°C (-4°F to 158°F)

Power Supply

100-240VAC, 50-60Hz, & 22 - 30VAC/VDC
Mains fuse: 1A (type MST), Max breaking capacity 35A

Power Consumption

25 VA (max.)

Certificates

CE, ISO 9001:2015

Flow Cells and Process Connections

Standard designs include DIN Flange (DIN 2633), ANSI (ASME B16.5), Tri-Clamp® (ISO 2852 & DIN 32676), Straight pipe thread (DIN ISO 228 BSP), NPT tapered pipe thread (ANSI B 1.20.1), single use barbed
Line size up to DN200 / 8"

Materials

Standard material stainless steel 316L (EN 1.4435 or EN 1.4404)
Other materials include Titanium Gr 2, Hastelloy C-276 & C-22, Monel 400 & PTFE C25 (TFMC, carbon filled Teflon®), PPSU

Window

Sapphire, UV fused silica

Surface Finish

Ra < 0.38µm (electropolishing available on hygienic measurement cells)

Elastomers

FPM (FKM/Viton®), FFKM (Chemraz®/Kalrez®, FDA), EPDM (FDA)

Operating Conditions

Ambient & process temperatures up to 275°C (527°F)
Process pressure from 10mbar to 200 bar (0,14 – 2900 psi)
Operating conditions subject to material and design in use

Fibre Optic cable

Silica core photonic fiber with Kevlar® reinforced flexible
LZSH coated stainless steel jacket
Fully-interlocked stainless steel conduit for use above 85°C (185°F)
Terminated with SMA 905 connectors.
Lengths up to 100m (328foot)

NIST-Traceability

NIST-traceable validation accessory (option)

Protection

IP66 / EN 60529



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*Kemtrak is a leading manufacturer of fiber optic measuring and automation products for the process engineering industry.
Kemtrak provides tailor made solutions to meet the needs of a wide range of industries including chemical, petrochemical & offshore,
biotech, pharmaceutical, food & beverage, pulp and paper and water & environment.
Kemtrak has trained representatives and support personnel globally and is certified according to ISO 9001:2015.*