

TC007 Industrial Turbidimeter



FEATURES

- ISO 7027 compliant
- High performance LED light source
- Real time inline measurement
- Suitable for hazardous area use
- Alarm, 4-20 mA and Modbus TCP communications
- Supports QuickCal verification & calibration

The Kemtrak TC007 is an industrial fiber optic coupled turbidimeter for high resolution, real time, inline concentration measurement. Measurement capability is from ultra clear liquids to high concentration slurries and emulsions.

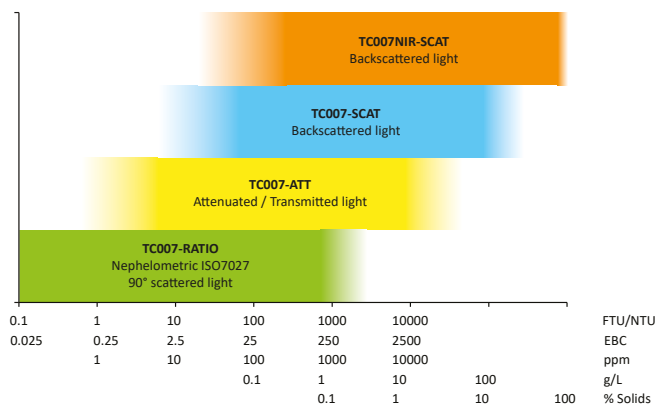
A high performance LED light source with robust fiber optics assures drift free operation with exceptionally high precision. Industrial-grade measurement cells and probes with scratch-resistant sapphire windows contain no electronics or moving parts, making them ideal for high-temperature and hazardous area use. All wetted materials are FDA compliant, assuring compatibility in sanitary processes.



For ultra precise measurement of low turbidities (0.01 – 1000 NTU) in accordance with ISO 7027, our measurement cells will compensate for sample color and fouling of the optical windows in real time to assure reliable and trouble free operation. High concentration suspended solids (exceeding 80% solids) are reliably measured by a precision backscatter probe that will not go blind at high optical densities.

QuickCal validation and calibration accessories simplify the procedure of instrument calibration and verification by removing the time-consuming and hazardous task of handling liquid standards.

Kemtrak TC007 Measurement Range



Standard features include 16 separate linearization/calibration tables for multiple product operation, remote zeroing, automatic cleaning cycle operation and advanced signal filtering. An on-board graphical internet based configuration utility allows remote operation, calibration, verification, and data trending using a standard PC.

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.

TYPICAL APPLICATIONS:

- Filtration monitoring
- Centrifuge control
- Cell & biomass density
- Crystallization control
- Phase separation
- Water clarity
- Concentration measurement
- Leak, carryover & interface detection

TC007 Industrial Turbidimeter

DISTRIBUTOR

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TECHNICAL DATA

HOUSING

Stainless steel EN 1.4301 (X5CrNi18-10), AISI 304 (V2A)
 Cam lock with double bit insert & external mounting brackets
 224 x 215 x 125 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

Menu based with 4 operator buttons
 Remote HTML/Java interface (TCP/IP connection via Ethernet port)

SOFTWARE FEATURES

Auto gain: Fully automatic signal gain controller
 Auto zero: Automatically, locally or remotely activated zero
 Calibration: 16 linearization tables for concentration & mA output
 Damping: From 0 to 9999 s 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 1 s to 24 hr

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, 15 min to 2 months
 Configurable cleaning duration from 0 to 9999 s
 Auto-zero after clean option
 Hold value during clean 0 to 9999 s
 Hold value after clean (to equilibrate) 0 to 9999 s

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 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°
 InGaAs or silicon near infrared (NIR) photodiode.
 High-performance TS AlGaAs NIR LED light source
 Wavelength range: TC007 850 nm
 TC007NIR 1440 nm
 Other wavelengths available upon request
 Typical LED lifetime: >10 years

RANGE OF MEASUREMENT

TC007-ATT 0 – 5 OD (10 mm OPL)
 0 – 100 OD (0.5 mm OPL)
 0 – 10 % solids
 0 – 10000 FTU
 TC007-RATIO 0 – 1000* FTU
 0 – 250 EBC
 TC007-SCAT 0.001% (ca. 10 FTU) – 10 % solids
 TC007NIR-SCAT 0.001 % (ca. 10 FTU) – >80 % solids
 Other measurement units include AU, ASBC-FNU, ppm etc.
 * Range can be extended to 4000 FTU using a shorter OPL

RESOLUTION

Typically $\pm 0.05\%$ of respective measuring range
 For Scattered light (90°) 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)

REPEATABILITY

$\le 1\%$ of reading or 0.01 FTU, whichever is greater

ACCURACY

$\pm 2\%$ of reading plus stray light
 Stray light typically <math>< 0.05</math> FTU

mA OUTPUT

1 x selectable 0 – 20 mA / 4 - 20 mA
 NAMUR NE43 compliant
 Galvanically isolated, 500 VDC
 Accuracy: <math>< 0.1\%</math>
 Resolution: 0.025 %
 Load: 0 – 600 Ohm
 Optional second mA output

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 100 A 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
 mA outputs compliant to NAMUR NE43

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 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

100-240 VAC, 50-60 Hz & 22 - 30 VAC/VDC, 25 VA (max.)
 Mains fuse: 1 A (type MST), Max breaking capacity 35 A

CERTIFICATES

CE & RoHS compliant

PROCESS MEASUREMENT CELL

PROCESS CONNECTION

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 hose.
 Line size up to DN200 / 8".

MATERIALS

Wetted surfaces in stainless steel EN 1.4435 or EN 1.4404 (316L). 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

Fine machine (smooth).
 Ra <math>< 0.38\ \mu\text{m}</math> (electropolished) wetted surfaces on hygienic measurement cells.

ELASTOMERS

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

OPERATING CONDITIONS

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

FIBER 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 100 m (328 foot).

PROTECTION

IP66 / EN 60529

Kemtrak is the leading manufacturer of high performance LED based industrial photometers 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.