

DCP007-NIR

Process Photometer

Benefits:

- High performance NIR LED light photometer
- Dual wavelength drift free operation
- Maintenance free measurement cell
- Light source & wavelength easy to change
- Modbus TCP Ethernet data communication

The Kemtrak DCP007-NIR process analyzer is a high performance fiber optic coupled near-infrared (NIR) photometer for high resolution, real time, in-line concentration measurement.

The Kemtrak DCP007-NIR utilizes high performance long life LED light sources to ensure outstanding performance and reliability. Industrial grade maintenance free measurement cells with scratch resistant sapphire windows, contain no electronics or moving parts making them ideal for both ordinary and hazardous area use. A validation & calibration accessory traceable to NIST standards is available to assure measurement confidence while saving valuable time and resources.



Integrated NIST validation accessory

The analyzer is connected to the measurement cell using robust industrial fiber optic cables that protect the sensitive electronic and optical components from process temperatures and vibrations which ensures drift and trouble free operation.

Two versions of the Kemtrak DCP007-NIR photometer are available:

- **NIR-N (850 – 1550 nm)** for measurement of 0 - 100% water and solvent gradients.
- **NIR-L (850 – 2000 nm)** for trace water and hydrocarbon detection. This model incorporates multiple stage peltier cooled and temperature regulated photodiodes and NIR LED light source for the very best in stability and performance.



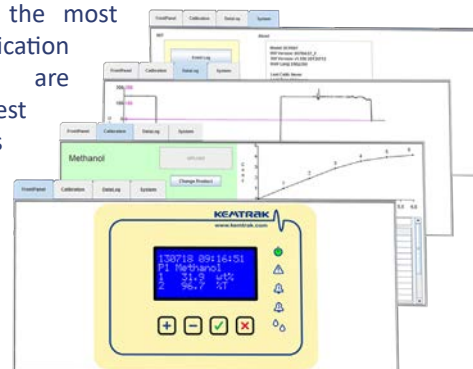
Typical Applications:

- Water / solvent mixtures (ppm - 100%)
- Alcohol concentration
- Solvent gradient monitoring
- Solvent recovery
- Polymer reaction end point
- Caustic (NaOH) in water

Dual wavelength operation automatically compensates for sample turbidity and/or fouling of the optical windows. For applications that are susceptible to sample temperature variations an optional temperature sensor input is available to provide temperature compensation through a built in algorithm feature.

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 0/4-20 mA 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

Temperature Input

mA or 3-wire PT100
Range: -20 to 200°C (-4 to 392°F)
Resolution: 0.07°C (0.126°F)
Temperature sensor not included

Light Source & Detector

High performance NIR light emitting diode (LED)
with InGaAs 2-stage peltier TE cooled photodiode (NIR-L)

Wavelength range - NIR-N: 850 - 1550 nm
NIR-L: 850 - 2000 nm
Full Width-Half Maximum (FWHM): 15 nm
Central Wavelength (CWL) Accuracy: ±1nm
Typical lamp lifetime: >20000 hrs

Note: Measurement wavelengths must be factory installed.

Photometric Range

0.000 - 5.0 AU @ 1450 nm, 10mm OPL
0.000 - 4.0 AU @ 1900 nm, 10mm OPL

Photometric Accuracy

±0.001 AU @ 1 AU

Photometric Noise

±0.0001 AU @ 1 AU, 1450 nm
±0.0005 AU @ 1 AU, 1900 nm

Linearity

±0.5% of respective measuring range

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 1A 240VAC Failsafe output (active when system is ok)
2 x 1A 240VAC User configurable (alarm, PID)
1 x 1A 240VAC Automatic cleaning control
Fuses: 4 x 1A (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

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

Power Consumption

25VA (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 10 mbar 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 100 m (328foot)

NIST-Traceability

NIST-traceable validation accessory (option)

Protection

IP66 / EN 60529

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Distributor

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