

Premium Optical Process Measurement



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ABOUT KEMTRAK

Founded 2006, Kemtrak is the industry leader in high performance LED based industrial photometers.

The Kemtrak 007 analyzer platform is a state of the art industrial analyzer designed to accurately measure and report specific properties of liquids and gases in-line and in real time. Based upon either absorbance, light scatter or fluorescence, Kemtrak photometers are widely deployed throughout industry in many different applications to measure process parameters such as color, concentration, turbidity and solids concentration.

Low optical power and long lifetime result in dependable products with the highest performance and lowest cost of ownership available.

Kemtrak is located in Stockholm, Sweden. Kemtrak products are distributed globally with sales in over 30 countries.

A motivated team of skilled engineers are available for support no matter where you are in the world.

- High quality instrumentation for industrial liquid and gas concentration measurement
- Real-time, in-line
- State of the art with exceptional performance
- Low cost of ownership:
 - No / ultra-low maintenance
 - Long life LED light sources
 - Robust and reliable
- Application experience and know-how
- Global sales and support
- ISO 9001:2015 Quality System





Biotech & Pharmaceutical

- Dual wavelength UV-VIS-NIR absorption
- Low power mercury free UV LED light
- Zero dead volume hygienic cells
- Traditional & single use technology
- Verification accessory (NIST traceable)

Absorbance

For concentration measurement and chromatography peak detection, the Kemtrak DCP007 can be deployed in both fixed installations and with single use technology. Kemtrak analyzers provide deep absorbance measurements (up to OD 200) and do not require calibration for absorption measurement.

For protein detection and fractionation, the DCP007-UV uses cold, low power, UV LED light sources to prevent heat shocked protein (HSP) issues and minimize product loss through denaturing. Solid state light sources provide long, drift-free operation with additional savings in maintenance costs.

The Kemtrak DCP007-NIR is used for accurate solvent-water concentration measurements and trace moisture (water) in pure solvents.

Turbidity

The Kemtrak TC007 is a highly sensitive turbidimeter that measures from 0.01 to 1000 NTU.

Hygienic measurement cells are fiber optically coupled to the analyzer. No electrical components and a zero dead volume design assures cells can be thoroughly and reliably sterilized.

Recommended for centrifuge optimization, filtration breakthrough, purification and separation processes.

Typical Applications

- Protein detection and concentration
- Chromatographic fractionation
- Ultra and nano-filtration
- Centrifuge control
- Gradient control
- Fermentation and cell culture biomass

Biomass

The Kemtrak NBP007 is used to monitor, control and optimize cell growth in culture and fermentation processes. The sensing element is a Ø12mm PG13.5 "pH style" or TriClamp immersion probe that integrates with any bioreactor.



Zero dead volume TriClamp
with verification accessory, NIST
traceable filters & remote panel.



Zero dead volume disposable cell in
click and lock hygienic holder.

The hygienic fiber optic probe is designed for CIP and SIP procedures and measures dense cultures up to OD 600. Software features include a robust bubble rejection algorithm for operation in dense cultures with aggressive agitation and aeration.

Low Cost of Ownership

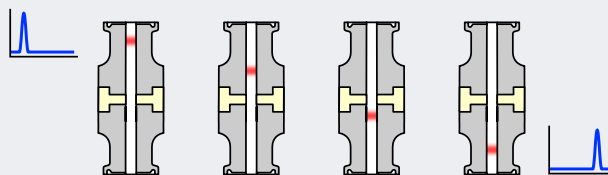
Kemtrak Analyzers

- Environmentally friendly UV-LEDs have a 3-5 year lifetime
- Drift free operation
- No need to continually recalibrate - native units are absorption (AU)

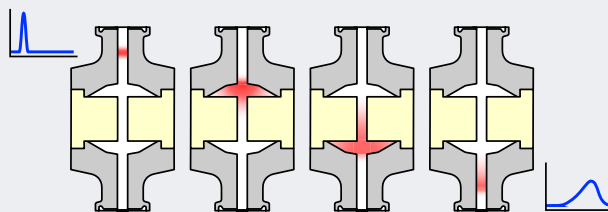
Other Analyzers

- Older technology UV analyzers use mercury vapor lamps with a 3-6 month lifetime
- Regular recalibration required as mercury vapor lamps continuously drift
- Costly handling and disposal procedures required for toxic mercury

Measurement Cell Design: Effect of Dead Volume



Kemtrak hygienic zero dead volume measurement cell.



Other measurement cells with dead volume. Dead volume causes detection peak broadening, resulting in valuable product loss plus risk of product cross-contamination and ineffective sterilization.



Semiconductor

- Precision process control
- Real time in-line measurement
- Ultra pure PTFE / PVDF flow cell
- Zero maintenance
- Verification Accessory

Concentration

Kemtrak analyzers are manufactured to precisely measure contamination and chemical concentration in both process (blending, clean, etch, CMP) and cleanroom environments.

Semiconductor manufacturing uses solvents for degreasing components and the shrinkage of residual resins, alkalis to oxidize the semiconductor and acids to remove the oxides. Measure from highly concentrated (%) to trace (ppm) concentrations in a wide range of chemicals:

- Isopropanol and other alcohols
- Acetone
- Trichloroethylene
- Hydrogen peroxide
- Hydrofluoric, phosphoric and other acids
- Trace moisture / water in solvents

Chemical concentration is measured in real-time to provide immediate feedback if the chemical is out of specification. Alarms can be configured

to control and increase bath life. Concentration is determined using UV-VIS-NIR light from a high performance long life LED light source. Measurement cells have sapphire windows and are manufactured in stainless steel, ultra pure PTFE or PVDF to withstand highly corrosive chemicals.

Typical Applications

- Monitor incoming chemical purity
- H_2O_2 concentration in CMP slurries
- Wet-etch and wafer cleaning control
- Optimize bath life of post-etch residue removers and solvents in wet stripping systems
- Wastewater color
- Nanoparticle pollution monitoring

Turbidity

Turbidity is an essential measurement parameter for assuring purity of incoming chemicals, process optimization and for environmental monitoring of wastewater.



Food and Beverage

- Real time in-line measurement
- Zero maintenance
- Sanitary probes and cells
- High temperature continuous operation

Concentration

Kemtrak analyzers are used for automated monitoring and controlling of CIP cleaning chemicals such as sodium hypochlorite or chlorine dioxide. Precise monitoring of the CIP process results in increased productivity while assuring product quality.

Kemtrak DCP007-NIR photometers are recommended for accurately monitoring distillation processes. Alcohol can be measured from trace (ppm) to 100% concentration.

Color

The Kemtrak DCP007 photometer can measure the following standard color scales:

- ICUMSA
- Platinum Cobalt / APHA / Hazen
- Gardner
- EBC
- Others

Real time color measurement improves product consistency and enhances process control to save energy and decrease operating costs.

Suspended Solids

The Kemtrak NBP007 analyzer will reliably detect product interfaces (e.g. product to product, CIP to product), at any concentration and with high resolution. Optimized product interface detection reduces product wastage and associated waste treatment costs. Product set-up times can be significantly reduced and product quality can be improved resulting in increased profitability.

Typical Applications

- Color monitoring
- CIP monitoring and control e.g. NaOCl, ClO₂
- Interface detection
- Filtration monitoring and centrifuge / separator control
- Distillation control / alcohol concentration
- Shear force damage detection



Chemical & Petrochemical

- No drift
- Exceptionally low maintenance
- Zone 1 hazardous areas (EExD)
- Up to 275°C continuous operation
- Extensive range of process connections

The Kemtrak 007 analyzer platform is ideally suited for in-line monitoring in a wide range of applications throughout petrochemical and chemical plants. Accurate and drift free measurement is assured by utilizing robust fiber optics, highly stable long life LED light sources and built in detection circuitry compensating for background effects such as fouling and turbidity.

Color

Kemtrak color analyzers can measure standard color scales to give precise real time color scores:

- ASTM D 1500
- ASTM D 156 (Saybolt color)
- Pt/Co (Hazen, APHA) and many others

In-line color can improve product quality, improve process control and reduce wastage and rework.

Referenced measurement provides real color measurement in processes with background turbidity and compensates for window fouling.

Concentration

Accurately and continuously measure from highly concentrated down to trace (ppm) levels of chemicals in liquids and gases. UV-VIS-NIR wavelength capability and process compatible materials allow use in a wide range of chemicals:

- Chlorinated compounds
- Halogens
- Organic solvents
- Metal ions

Measure water content in percent or ppm trace levels in a wide range of solvents.

Fluorescence

The Kemtrak FL007 measures ppb levels of aromatic hydrocarbons in water. Ideal for leak detection in cooling water or condensate and for environmental monitoring.



Typical Applications

- Oil-in water
- Leak detection e.g. heat exchangers, pumps, boilers, product and waste streams
- Mixture concentration
- Reaction control
- Interface detection
- Product color for quality control
- Color change e.g. rust, sulfur, product cross-contamination
- In-line turbidity for filtration monitoring
- Solids concentration monitoring and control
- Solvent-water mixture control
- Trace water contamination of solvents



EExD enclosure with four push-buttons for complete control in zone 1 environments.



Pulp & Paper

- Drift free measurement
- Long-life LED light source
- Corrosion resistant measurement cells
- Multiple wavelength technology for fouling and bubble compensation

Typical Applications

- Chlorine dioxide liquid and gas
- Calcium carbonate slurry concentration
- Lignin concentration
- Effluent water monitoring
- White liquor filtration

Concentration

Chlorine dioxide (ClO_2) has strong UV absorption and can be accurately and continuously measured in all liquid and gas streams.

- ClO_2 solutions up to 20 g/l
- Ultra low detection - 10 ppb liquid or 1 ppm (2.3 mg.Nm^{-3}) gas

The Kemtrak DCP007 process photometer is used to optimize the reaction efficiency of ClO_2 generation, improve the control of vent-gas scrubbers to reduce atmospheric emissions and for monitoring the final concentration of ClO_2 sent to the bleaching plant. Robust corrosion resistant titanium measurement cells with sapphire windows and double o-ring sealing ensure a maintenance free operation.

Suspended Solids

Increased control in the use of mineral additives such as calcium carbonate is critical to optimize the paper making process, reduce waste and increase product quality & profitability. The Kemtrak NBP007 backscatter photometer accurately measures precipitated and ground calcium carbonate slurries at any concentration, in-line and in real time.

Fluorescence

Lignin is a natural phenolic biopolymer which fluoresces when exposed to UV light.

- Measure lignin concentration directly in black liquor
- Control delignification process
- Recovery boiler optimization

The Kemtrak FL007 is a continuous in-line analyzer that quantitatively measures lignin in a process stream.



Water & Environment

- Robust and reliable
- Real time in-line measurement
- Exceptionally low maintenance
- Verification Accessory

Color

The Kemtrak DCP007 is an industrial photometer designed to accurately measure the color of liquids. Real time measurement results are displayed in units of PCU (Platinum-Cobalt color units), Hazen or APHA.

The Platinum-Cobalt color scale is used to evaluate pollution levels in wastewater and for drinking water quality control and regulation. The Platinum-Cobalt color scale is also used to measure and control the concentration of iron in groundwater and automate filtration.

UV Absorption

UV absorption measurement in raw water and after flocculation / sedimentation serves as an indicator of the purification performance of the treatment stage.

Measurement of the spectral absorption coefficient SAC 254 is done using a Kemtrak DCP007 and can be correlated to DOC, COD and TOC, simplifying the measurement of organics in potable and wastewater treatment processes.

DOC measurement downstream of activated carbon filtration provides valuable information on the saturation of the activated carbon, allowing regeneration to take place in a timely fashion.

Typical Applications

- Oil in water detection
- Color monitoring - platinum cobalt
- Chlorine (ClO₂) measurement
- DOC (SAC 254)
- Leak detection
- Suspended solids

Fluorescence

The Kemtrak FL007 measures ppb levels of oil in water, continuously and in real time.

Mineral oils rich in aromatic content will fluoresce when illuminated with ultraviolet light. The intensity of this fluorescence is dependent upon the polyaromatic hydrocarbon (PAH) content of the oil.

Our products

Kemtrak manufactures high performance industrial process photometric, fluorescence and turbidity analyzers. Simple to use and zero maintenance.



DCP007 Photometer

- High performance UV-VIS-NIR absorbance photometer
- Real time in-line measurement
- Dual wavelength drift free operation
- Light source and wavelength easy to change
- Modbus TCP Ethernet communication

Standard features include 16 linearization tables for multiple product switching, remote zeroing, automatic cell cleaning cycle and signal filtering.

A built-in graphical Internet based interface allows remote operation, calibration, verification and data trending using a web browser. Modbus over TCP/IP is standard with optional Profibus.



Integrated calibration and verification accessory.

The Kemtrak 007 analyzer platform is ideally suited for in-line monitoring in a broad range of industrial applications. Utilizing robust fiber optics, highly stable long life LED light sources and built in detection circuitry to compensate for background effects such as fouling and turbidity, accurate and drift free measurement is assured.

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 calibration and verification accessory using filters traceable to NIST standards is available to assure measurement confidence while saving valuable time and resources.

The DCP007 simultaneously measures at two fixed wavelengths. If desired, the second wavelength can also be used to compensate for sample turbidity and/or fouling of the optical windows.

Applications

- Protein and API
- Color Scales
 - Platinum Cobalt / APHA / Hazen
 - ASTM D-1500
 - Saybolt / ASTM D-156
- Chemical concentration - ppm, mg/L, g/L, %
 - Chlorine Dioxide, Hypochlorite, Chlorine
 - Metal ions e.g. iron, copper, chromium
 - Aromatics and hydrocarbons
- Leak, carryover and interface detection
- Trace water / Moisture
- Solvent / Alcohol
- UV and Optical Density - AU, OD



TC007 Turbidimeter

- 0.01 – 1 000 NTU/FTU/FNU
- ISO 7027 compliant
- Maintenance free
- Compensation for fouling and color
- Suitable for hazardous area use

The Kemtrak TC007 is a simple to operate industrial fiber optic 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.

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 assures a trouble free operation.

In-line measurement cells with scratch resistant sapphire windows have no electronics or moving parts making the instrument suitable for a wide range of process environments.

Applications

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



NBP007 Backscatter Photometer

- 0.001% (10 NTU) - >60% suspended solids
- DN25/1" TriClamp or Ø 12 mm PG 13.5 immersion probe
- Up to 200°C (392°F) continuous operation

The Kemtrak NBP007 is a high resolution back-scatter photometer that revolutionizes the measurement of high concentration suspended solids.

Traditional turbidity based optical measurement instruments lack resolution and stop working at ca.1% suspended solids due to the high optical density. This limitation is overcome with the NBP007.

By knowing exactly what is happening at all times, process changes that result in substantial cost savings can be quickly implemented.

Applications

- Concentration measurement
- Interface detection
- Cell and biomass density
- Crystallization control
- Control and optimize CIP cycles
- Product differentiation and identification

Our products

Kemtrak manufactures high performance industrial process photometric, fluorescence and turbidity analyzers. Simple to use and zero maintenance.



Kemtrak FLP007 with Ø12 mm PG 13.5 "pH style" immersion probe.

FL007 Fluorescence Photometer

- Simultaneous UV fluorescence and turbidity
- Real time in-line measurement
- Hygienic Ø12 mm PG 13.5 immersion probe
- Calibration for 16 different oil types
- Suitable for hazardous area use
- Alarms, 4-20mA and Modbus communication

The Kemtrak FL007 is a fiber optic probe based oil in water monitor. State-of-the-art combined fluorescence and turbidity measurement assures reliable continuous monitoring of oil and hydrocarbon contamination in water.

Mineral oils rich in aromatic content will fluoresce when illuminated with ultraviolet light. The intensity of this fluorescence is dependent upon the polyaromatic hydrocarbon (PAH) content of the oil. Typical oils that fluoresce include fuel oil, crude oil, hydraulic oil and transformer oil.

Each oil has its own unique fluorescence intensity resulting from its specific PAH content. The combined fluorescence from both dissolved and dispersed oil in water can be measured and correlated to the oil content.

Entrained gas and solids present in the process stream will not fluoresce and therefore do not affect the measurement.

Non-mineral oils or hydrocarbons low in aromatic content may not fluoresce. However hydrocarbons and oils with a low water solubility will result in a turbid solution that can easily be detected using the turbidity measurement, instantly informing the operator of the presence of oil in the process stream resulting in a high measurement confidence.

The immersion probe has the same dimensions as industry standard Ø12 mm PG 13.5 pH sensors allowing a range of standard fittings and retractable probe holders to be used.

Applications

- Trace oil in water
- Leak detection
- Cooling water and condensate return
- Drinking water
- Wastewater monitoring
- Environmental safeguard



Measurement Cells and Probes

- Zero maintenance
- Fiber optic / no electronics
- No internal dead volume
- Hygienic electropolished finish
- FDA certified materials
- Calibration and Verification accessory
- Disposable PPSU cells
- Up to 275°C (527°F) continuous operation

Kemtrak optical measurement cells and probes provide a physical window to the flowing

process. Connect absorbance, transmission, scatter or fluorescence instrumentation to enable real time monitoring.

Measurement cells and probes are fiber optic coupled and have no electrical components, moving parts or sources of heat. Condensation on the optical surfaces is not an issue and they are well suited for hazardous area operation.

All Kemtrak products are manufactured from the highest quality materials and are designed to the most demanding specifications to ensure long life and the highest reliability.



QuickCal turbidity calibration.

Calibration and Verification

- Liquid Standards - Formazine, ASTM Color, Hazen
- QuickCal sealed turbidity standards
- Calibration and verification accessories

Kemtrak calibration and verification accessories provide measurement confidence with trouble free verification while saving time and valuable resources.

A standard cuvette holder allows traceable verification filters or liquid

standards to be placed directly in the optical measurement circuit without the need to open and contaminate the process line.

Certified liquid reference standards are ideal for routine calibration, verification and ensuring good inter-laboratory or inter-instrument correlation.

Liquid calibration standards.



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