

On-line Monitoring of Water in Organic Liquids

The measurement of water in organic liquids is a common non-dispersive infrared (NDIR) application. Water has strong fundamental absorption bands in the infrared (IR) region and weaker overtone bands in the near infrared (NIR) region. A low ppm water measurement such as 0-100 ppm in ethylene dichloride (EDC) is made in the fundamental IR region. Higher ppm measurements such as 0-2000 ppm and 0- high % water measurements are made in the NIR region.

Measurement Requirement

The on-line measurement of water is critical for many chemical processes. The measurement of water in organic liquids provides on-line verification of product quality. The measurement of trace levels of water is required for chlorinated organic streams to protect the reactors from corrosion. Water measurements are susceptible to changes in sample temperature. The IPS-4 features a temperature compensation algorithm to compensate for changes in sample temperature.

AMETEK Solution

AMETEK Process Instruments has developed the IPS-4 NDIR Process Spectrophotometer that is based on the field-proven IPS-4 UV-Vis platform. The IPS-4 NDIR is an optical filter spectrophotometer that operates in both of the NIR and IR spectral regions. The use of multiple optical filters in the IPS-4 NDIR allows for the capability to measure multiple components. The IPS-4 NDIR analyzer features an integrated sample conditioning system that simplifies installation and allows for easy maintenance of the analyzer. The analyzer is easy to use to use and can be installed outdoors in wash down conditions and harsh environments.

The use of multiple optical filters in the IPS-4 NDIR allows for the capability to measure multiple components and provide reference wavelengths. Unlike traditional dual beam infrared analyzers, this single beam device does not require reflective cells and the use of measuring and reference filters minimizes any source variation or signal loss errors to enable a very robust process measurement.



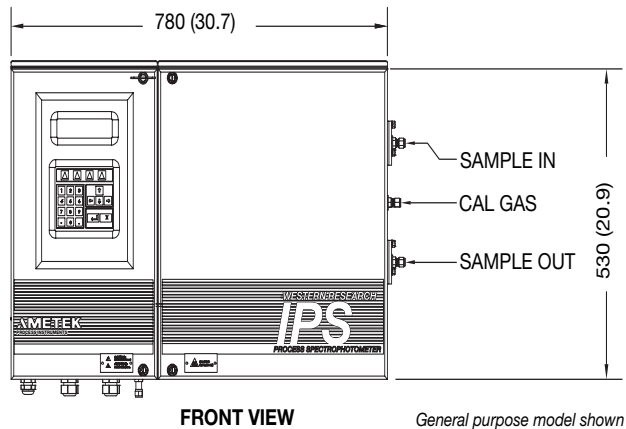
IPS-4 NDIR Process Spectrophotometer

Water in Organic Liquids - Typical Applications

Process	Measurement Range
Gasoline blending	0-5% in ethanol
Ethylene Glycol (EG)	0-2000 ppm in EG
Vinyl Chloride (VCM)	0-100 ppm in ethylene dichloride (EDC)
Acetic acid production	0-1500 ppm in acetic acid
Nylon	0-400 ppm in dimethyl acetamide (DMAC)
Polycarbonate	0-1% in phenol
Solvent recycle	0-2% in acetone

AMETEK IPS-4 NDIR Features

- ▶ Robust multiwave/single beam technique
- ▶ Modular integrated spectrophotometer system for NDIR applications
- ▶ Easy to use multi-language vacuum fluorescent display
- ▶ Auto Zero and Auto Calibration capability
- ▶ Optional heated sample cell enclosure available for operation up to 150°C
- ▶ MODBUS RTU communications protocol
- ▶ Temperature and pressure compensation
- ▶ Corrosion-resistant NEMA-4X, IP65 indoor/outdoor housing



IPS-4 NDIR Applications

The IPS-4 NDIR can be used for both liquid and gas phase measurements. Additional applications that can be measured with the IPS-4 NDIR are presented in the table below:

Measured Components	Sample Phase
Sodium hydroxide in acid gas scrubber	liquid
Water vapor	vapor
Methane, CO, CO ₂	vapor
Acetylene in ethylene	vapor
Methanol in water	liquid
Ethylene in vinyl chloride	vapor

Process Instruments Expertise

The IPS-4 NDIR is backed by AMETEK Process Instrument's well-established international Sales and Service networks. It is a product that you can count on from a company that you know and trust. AMETEK's application expertise in chemical processes and handling of toxic and corrosive samples is your assurance that the IPS-4 NDIR will meet your water measurement needs. Contact your local AMETEK office or representative for more information.



455 Corporate Blvd., Newark, DE USA 19702
Ph. 302-456-4400, Fax 302-456-4444
www.ametekpi.com



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One of a family of innovative process analyzer solutions from AMETEK Process Instruments.
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SALES AND MANUFACTURING:

USA - Pennsylvania
150 Freeport Road, Pittsburgh PA 15238 • Tel: +1-412-828-9040, Fax: +1-412-826-0399

USA - Oklahoma
2001 N. Indianwood Ave., Broken Arrow OK 74012 • Tel: +1-918-250-7200, Fax: +1-918-459-0165

CANADA - Alberta
2876 Sunridge Way N.E., Calgary, AB T1Y 7H9 • Tel: +1-403-235-8400, Fax: +1-403-248-3550

WORLDWIDE SALES AND SERVICE LOCATIONS:

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