

Oil in Water Analyzer

Introduction

Monitoring of the oil content in water streams from oil production and refining facilities is critical for meeting the stringent environmental regulations on waste oil being returned to waterways throughout the world. The current trend in regulation is to further reduce the oil content of produced water streams, which dictates that oil producers and refiners implement improved monitoring methods on waste water generated in order to stay below regulatory levels and avoid costly fines and cleanup expenses. Fortunately, the oil content of produced wastewater streams can be monitored using fluorescence whenever aromatic molecular species are present. CST's Oil in Water Analyzer is the perfect solution for continuous, real-time monitoring.

Features

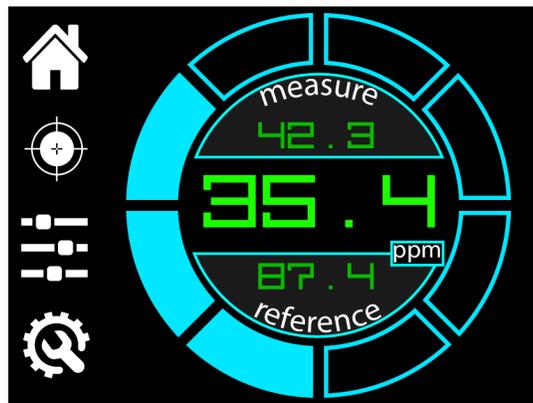
- ◇ Continuously and accurately measures the presence of oil in water using UV fluorescence.
- ◇ The all-inclusive Oil in Water Analyzer comes preassembled with a PX2+ photometer attached to a front surface fluorescence probe via fiber optic cables.
- ◇ The analyzer is less susceptible to noise due to bubbles, reabsorption, and turbidity in the sample.
- ◇ The fluorescence probe can easily be removed, cleaned, and re-installed if required.
- ◇ Easy to use software with a digital touch display allows users to view data and calibrate.
- ◇ Standard data outputs include MODBUS, 4-20mA, and USB to CST Software.
- ◇ High reliability with a typical light source lifetime of 10 years.
- ◇ Low cost of ownership with no routine maintenance.

Applications

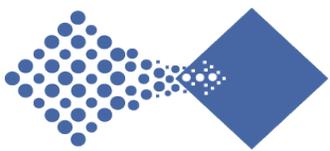
- ◇ Wastewater Treatment
- ◇ Refinery Run-off
- ◇ Steam Condensate
- ◇ Ballast Water Discharge
- ◇ Boiler Feed-water
- ◇ Cooling Tower Water



PX2+ with Front Surface Fluorescence Probe



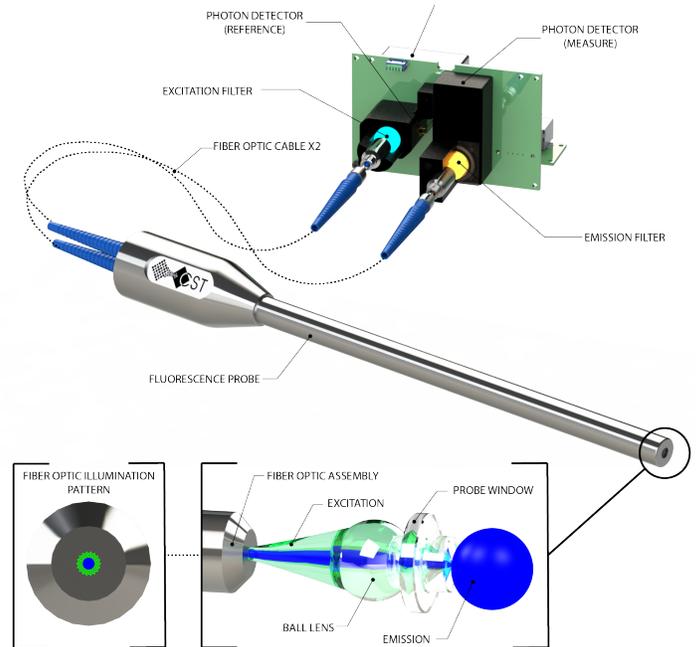
PX2+ Capacitive Touch LCD



Theory of Operation

CST's Oil in Water Analyzer contains a PX2+ UV photometer that uses optical filters to provide specific excitation/emission wavelength ranges chosen to coincide with oil fluorescence. Fluorescence occurs when a molecule absorbs light energy at one wavelength and re-emits light at another, typically longer, wavelength. The wavelength where the maximum absorption occurs is called the excitation wavelength, and the wavelength where the maximum emission occurs is called the emission wavelength.

The Front Surface Fluorescence Probe is the key component to the Oil in Water Analyzer. The xenon flash lamp within the PX2+ provides excitation light energy to the probe tip via a fiber optic cable. The ball lens, located at the sensing surface of the probe, focuses this energy through the sapphire probe window. The light is then absorbed by the oil in the water sample which creates emission energy. This emission energy is transmitted back to the PX2+ by another fiber optic cable and is directed to the measure detector where the oil concentration signal is detected. The Oil in Water Analyzer is less susceptible to the inner-filter effect and to bubbles or suspended solids because of its front surface probe design.



Covered under US Patent # 7,382,458

Technical Specifications

General	
Measurement Principle	UV Fluorescence
Light Source	Xenon Flash Lamp
Detector	PMT and Silicon Photodiode
Fiber Optic Cables	(2) 2 meter, 600 micron core
Sample Introduction	In-situ or Extractive
Calibration	Analyzer is calibrated with customer sample; measurement normalized by setting full scale sample every 1-2 months.
Range	0-3000ppm
Accuracy	± 1% of full scale
Repeatability	± 0.5% of full scale
Response Time	1 second
Power Requirement	24VDC nominal (12-48VDC), 8.5 watts max
Dimensions of Photometer	5" H x 5.8" W x 2.8" D
Weight of Photometer	3.5 lbs. (1.6 kg)
Enclosure	NEMA4X anodized aluminum

Front Surface Fluorescence Probe	
Wetted Materials	316SS Body, Sapphire Window, and Viton Seal
Temperature Rating	0-400°F
Pressure Rating	2,000 psi
Insertion Length	8.66" (220mm)

Communications	
Outputs	4-20mA, RS-485 (MODBUS), or USB-B
Alarms	Contact closure (60VDC, 0.75 A max)
Display	3.2" capacitive touch LCD

*All information provided in this datasheet is subject to further application engineering based on customer sample.