MIRMORAX

Continuous in-line and online Oil-in-Water analyzing

OPERATING PRINCIPLE

The Mirmorax Oil-in-Water analyzer is based on an ultrasonic measurement technique in which individual acoustic echoes are characterized using advanced signal processing.

A highly focused acoustic signal is transmitted directly into the produced water flow. The reflection and absorption of the signal provides a wide range of accurate measurements. In the focal region, individual solids, oil droplets and gas bubbles will reflect the acoustic energy and each reflected signal will hold particle specific information. Based on a large number of direct measurements, the monitor calculates mean particle size for oil and sand. The size distributions, and also the number of particles are used to calculate corresponding concentration values. Important process information as salinity and temperature are measured and and presented in the Oil-in-Water graphical user interface. The analyzer performs self-diagnosing and auto calibration.

MODEL FEATURES

The new Mirmorax Oil-in-Water analyzer is 3rd generation ultrasonic analyzer. Model LR2500 is specially developed to manage the lower range, 0-2500 ppm of oil and particles with highest accuracy and at the same time deliver classification of particles and size distribution. This is especially suitable for discharge and water treatment applications, where knowledge on this is essential for reducing ppm levels and optimizing the separation process.

The analyzer can be provided with an automatic cleaning system to ensure clean ultrasonic transducer and reflector at all time. This is recommended for concentrations above 100 ppm, and alsp for black oil.

DESIGN

The Mirmorax Oil-in-Water analyzer consists of a Probe, which have an insertion design and a high performance signal processing and communication electronics, SPCE. Cable length can be adjusted on request. The SPCE comes in both safe area (19” rack module) and an EX classification Zone 1 area version.

FACTS

Key features for the Mirmorax Oil-in-Water analyzer are:

- Accurate and high resolution real-time measurements
- Simultaneous detection of oil, solids and gas
- Provides particle size, D50 distribution, and concentration
- Temperature measurements of process water
- Salinity Measurements of the process water
- In-line design, “one size fits all”
- Reliable and robust
- Low maintenance

OPTIONS

- Automatic cleaning system
- Local display with screen selection
- EX Area Electronics option
- Remotely control and data access
- Retraction mechanism under pressure, up to 30 bar, available to enable insertion and extraction during operation
- Field Watch software for local data storage

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SPECIFICATIONS

PRIMARY OUTPUT PARAMETERS:			
Size distributions for oil and solids [µm]	Median particle diameter for oil and solids, D50 [µm]	Mass based concentration for oil and solids [mg/l]	Volume concentration [ppm]
Volume based concentration [ppm]	Temperature of process flow [°C]	Salinity of water [g/l]	

SYSTEM PERFORMANCE AND CHARACTERISTICS

Concentration range: Oil: 0 – 2500 ppm* Solids: 0 – 2500 ppm*	**Repeatability:** 99% relative	**Operating pressure:** 200 bar g	**Operating temperature:** Min 0°C, max. 90°C (120°C non ATEX)
Ambient temperature: -20°C to +50°C	**Salinity:** 0 – 350g/l NaCl	**Flow velocity:** 0,2 – 3,6 m/s	**Particle size range:** > 2 – 3 micrometer
Reynolds no.: < 5000	*Max. Concentration range dependent on particle size range		

INTERFACE DETAILS – ELECTRICAL

STANDARD		OPTIONS AVAILABLE	
Power supply: 18 – 36 VDC	**Power consumption:** Normal 29W Max 70W at start-up	**Power supply:** Within VAC 90 – 264	**Power consumption:** Maximum 36W
Serial communication: RS485	**Protocol:** Modbus RTU	**Serial communication:** 4-20mA/HART/Ethernet	**Protocol:** CanBus FieldBus

INTERFACE DETAILS – MECHANICAL

STANDARD		OPTIONS AVAILABLE	
Connection type to pipe: • 2” 150 lbs. weldoflange (or spool piece) • Suitable for any pipe size >3”	**Probe:** • Materials: Titanium TiGr2H or SS316 • Hazardous area classification: Zone 1 II 2 G Ex d IIB T5/T4 Gb (ATEX & IECEx) • Weather protection: IP66, IEC 60529 • Weight: 18 kg / 20 kg	**Connection type to pipe:** • 2” 300 lbs. weldoflange (or spool piece) • 2” 1500 lbs. weldoflange (or spool piece) • By-pass solution for pipe size 1–2”	**Probe:** • Materials: other materials on request • Weight: 20 kg

SIGNAL PROCESSING AND COMMUNICATION ELECTRONICS, SPCE

STANDARD		OPTIONS AVAILABLE	
Safe area: • 19” rack, height 4U • Material: Coated steel • Weight: 10 kg	**EEx area:** • Size: 584,5*400*250 mm (H,W,D) • Material: SS316 • Weather protection: IP66 • Weight: 65 kg • Hazardous area classification: Zone 1 II 2 G, EEx d e IIB T3	**Safe area:** • Other sizes on request • LCD Touch Display	**EEx area:** • Other sizes on request • Material: Aliminium • LCD Touch Display

AUTOMATIC CLEANING SYSTEM

OPTION 1 EX	OPTION 2 SAFE AREA
• Material: SS316 • Weight: 36 kg • Process pressure range: 0–60 bar (Option: 60 – 250 bar)	• Material: Various • Weight: From 10 kg • Process pressure range: 0-10 bar