

Argus[®] Process

Oil in Water monitor for high pressure applications

Argus Process monitors Oil in Water concentrations at high pressure and / or high temperature locations in the water treatment process, establishing a new range of applications for online OiW monitors. Oil & Gas operators are able to manage the process with real time OiW data from single or multiple measurement points throughout the water treatment process.

Key benefits of Argus Process:

- Improves **performance** of produced water treatment systems
- Increases **throughput** where oil production is bottlenecked by the water treatment system
- Minimises OiW levels, achieving mandated HS&E targets for **reductions in OiW**
- Reduces operational **costs** (use of chemicals, maintenance, etc.)

High Pressure High Temperature (HPHT) OiW monitoring

With its in-line probe, the unique Argus technology design facilitates measurements at higher pressures and temperatures, enabling measurements throughout the water treatment process. Argus OiW monitors can be used for downstream separators, hydrocyclones, degassers and other process equipment, monitoring different stages of the process and providing the operator with unique process performance control.

Multipoint OiW monitors

With the Argus design, several in-line probes can be connected to the same central control unit in a multipoint OiW monitoring system, resulting in significant cost reductions. The control unit can be located in a hazardous area (handling maximum 2 measurement points) or a safe area (handling maximum 12 measurement points), with a maximum distance from the control unit to each measurement point of 100 meters.

The first multipoint OiW monitoring system was delivered in 2007.

The Argus[®] technology

ProAnalysis delivers unique high-end technology for Oil in Water (OiW) monitoring. The Argus range of online OiW monitors has been developed in close cooperation with major Oil & Gas operators in the North Sea, and provides accurate and reliable OiW concentrations online and real time, with the following main features:

- **Robust** measurement principle: Fluorescence
- **In-line** probe (retractable): No bypass loop required
- Automated ultrasound-based **self-cleaning**: Eliminates in-line probe contamination
- **Maintenance-free***: Eliminates high maintenance associated with bypass systems
- **Low installation costs**: Simple installation through a single flange

* Annual service agreement is a prerequisite to ensure maintenance-free operation.

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Technical specification

There are two versions of Argus Process – **Argus Process** and **Argus Process MP** (MultiPoint). Argus Process can control up to 2 independent probes (measuring points) whereas Argus Process MP can control up to 12 independent probes.

Measurement

Description	
Measurement principle	(Laser-Induced) Fluorescence
Sensor probe configuration	Inline
Number of measuring points per instrument / system	1 - 2 (standard). Additional measuring points (up to 12) available upon request
Measurement range (min. / max.)	0 – 10...1000 mg/l. For extended range (> 1000 mg/l), contact ProAnalysis
Measurement accuracy	< ± 10 %. Note 1
Repeatability within measurement range	≤ 5 %. Note 1
Sampling frequency	Max. 1 sample per second (configurable)

Operational conditions

Description	
Min. / max. process temperature	5 / 120 °C
Min. / max. ambient temperature	-10 / 60 °C. Note 2
Design pressure	70 barg
Max. operating pressure	70 barg
Max. pressure under probe insertion / retraction	70 barg
Pressure rating	API 150# - 600#
Pipe dimension	≥ 4" / DN100
Flow velocity	< 10 m/s

Physical data

Description	
Main components, Argus Process	1. Enclosure in appropriate material (316SS/Al/GRP) 2. Inline probe with retraction tool 3. Special armoured fibre/ultrasound cables between enclosure and inline probe (max. length 100 m)
Enclosure	Hazardous zone (Ex): Typical size 500 x 800 x 400 (w x h x d, in mm) Typical weight 100 kg Safe zone (non-Ex): 19" rack mounted
Process connection	Probe installed directly into the process line via a retraction tool and isolation valve(s). Valve requirements: Full bore ball valve(s). Available standard dimensions and pressure classes: 2" (DN50), 150# RF - 600# RTJ ANSI B16.5
Connection flange orientation	0 – 360°
Probe insertion length	Insertion length maximum 780 mm from underneath retraction tool flange. Probe is recommended inserted within central 1/3 of pipe i.d.
Standard probe length	1200 mm
Required length for probe installation and maintenance	A free length of 1800 mm measured backwards from flange surface on retraction tool should be available for probe installation and maintenance.
Material, probe and retraction tool	Wetted parts: 22Cr Duplex (UNS S31803), titanium gr. 5 Non-wetted parts: 316SS
Weight, probe and retraction tool	Typical 27 kg

Calibration

Description	
Calibration requirement	Yes. Calibration intervals will depend on specific application and operator and / or authority requirements and regulations.
Extent of calibration automation	Standard field calibration may involve manual sampling and analysis of water samples over the appropriate measurement range. Calculated calibration factors are implemented via the instrument user interface Argus Manager.

Certification

Description	
Instrument is certified in accordance with:	1. 97/23/EC for pressure equipment, module: B1+F
	2. 94/9/EC ATEX, EEx de [ia] IIB T6 (Zone 1)
	3. IEC 60825-1:2007/EN 60825-1:2007 Class 1M (laser safety)
	4. CSA / US certification (pending)

Automatic cleaning of inline probe

Description	
Cleaning technology (patent pending)	Ultrasound – no manual cleaning required
Cleaning intervals	Configurable

Electrical interface

Description	
Supply voltage	220 – 240 VAC, 50/60 Hz (110 VAC available on request)
Power consumption (max. 2 measuring points)	Less than 100 W (average)

Instrument interface

Description	
Serial	Modbus RS-422 or RS-485 hard wire RS-485 can also be delivered for fibre cable
Ethernet	Ethernet fibre cable (standard) or hard wire (optional)
Analogue (EExi)	4 - 20 mA HART (optional)

Notes:

1. Accuracy and repeatability figures given refer to measurements of stable fluorescent objects (liquids or solids).
2. For ambient temperatures ≥ 40 °C, instrument air is required.

Disclaimer: All specifications are subject to change without notice in line with ProAnalysis' quality policy.