FORBES MARSHALL

CX2000
Oil in Water, Phenol and Hydrocarbon Analyser

Advanced Detection. Assured Protection.

CX2000 Oil in Water, Phenol and Hydrocarbon Analyser

For over 75 years, Forbes Marshall has delivered innovations that drive process efficiency, energy conservation, and environmental compliance.
Our Process Analytics division brings real-time monitoring capabilities to industries managing steam, water, and effluent systems. Our journey spans from basic loop powered transmitters to comprehensive, digitally enabled platforms.

The CX2000 Analyser continues this legacy by combining advanced UV fluorescence detection with rugged industrial reliability for the accurate monitoring of oil, phenol, and hydrocarbons in water.

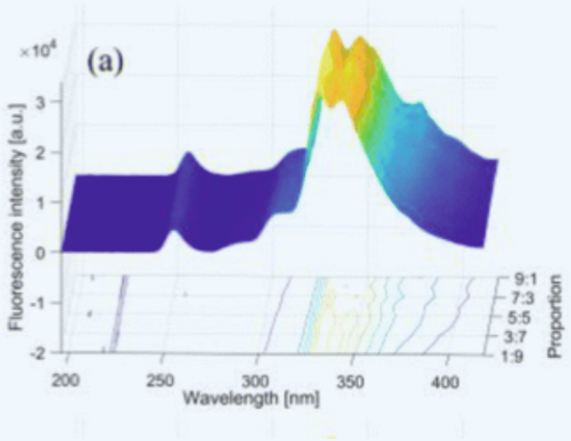
CX2000 is built on the proven technology of Ultra Violet Spectroscopy, a highly stable and interference-resistant method for detecting specific contaminants such as hydrocarbons, phenol, ammonia, nitrate, chlorophyll A, COD, and fluorescent tracers. Complementary optical techniques are employed for turbidity and colour measurement, while traditional electrodes are used for parameters like pH, conductivity, and dissolved oxygen.

The system is based on a modular design:
Mono-parameter Configuration: Ideal for targeted applications where only one critical parameter needs continuous monitoring, making it a cost-effective and compact choice.

Multi-parameter Configuration: Suitable for complex water chemistry scenarios where multiple parameters must be analysed for process compliance or environmental safety.

The CX2000 is housed in a robust IP65 polycarbonate enclosure and is engineered in accordance with **APHA 5530D (24th Edition)** standards for oil and phenol measurement ensuring accuracy, repeatability, and global compliance.

Anthracene	**42**
Benzene	**10**
Biphenyl	**20**
Chlorobenzene	**7**
Fluorobenzene	**10**
Naphtalene	**35**
Phenanthrene	**25**
Phenol	**18**
Propybenzene	**17**
Styrene	**10**
Toluene	**17**



Deliverables

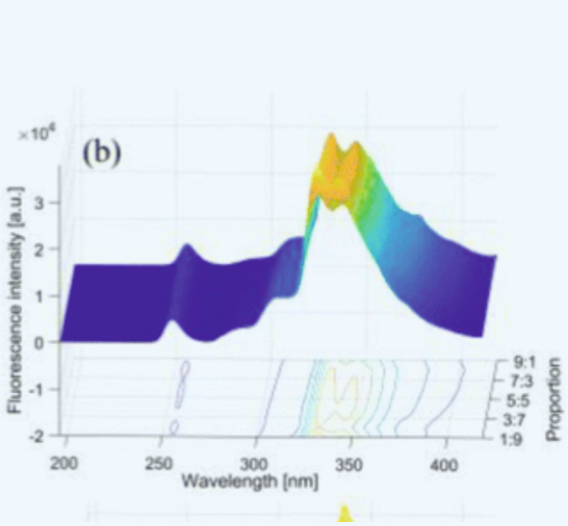
- Accurate detection of oil, phenol, and HC in industrial and environmental waters
- Fast response (<10 seconds) for realtime process action
- Plug and play installation, no external reagents required
- Remote access ready for hazardous zone applications
- Built in auto cleaning system with auto zero
- Long life, low maintenance performance

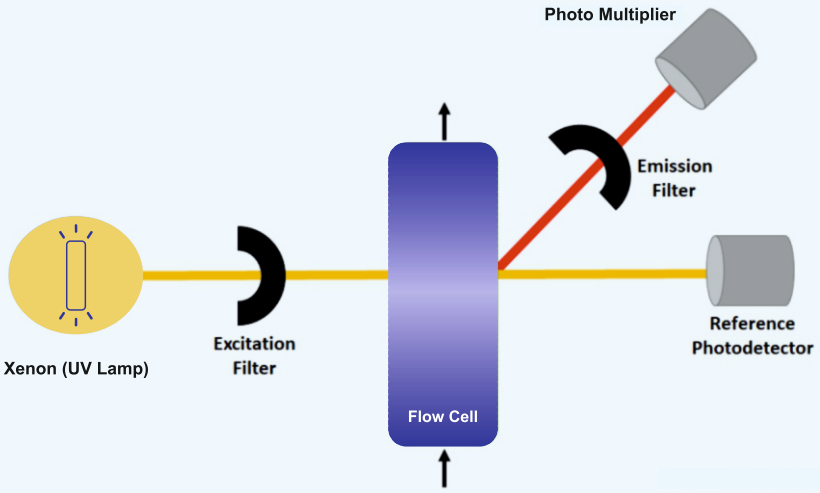
Oil in water / Phenol Measuring Principle

The measuring principle is based on florescence : when exposed to a specific wavelength (excitation), certain chemicals emit light at a longer wavelength (emission). Very few chemicals exhibit fluorescence, making this method highly selective. The emitted light is detected by a high-sensitivity photomultiplier, allowing detection of concentrations as low as a few ppb. To ensure measurement stability, a reference detector monitors the excitation light source and compensates for any variation.

Compared to probe type systems, CX2000 achieves higher sensitivity and more reliable readings due to its enclosed flow cell design, which avoids stray light interference and maintains a stable water column.

Relative fluorescence intensities for various aromatic hydrocarbons can also be referenced to identify and quantify complex mixtures effectively.





Benefits

Compliance Confidence

Ensures adherence to effluent discharge and water quality norms

Lower Lifecycle Costs

No reagents, reduced spares, and longer maintenance cycles

Early Warning System

Detects even minor leaks to prevent environmental damage

Digital Integration

Seamless data sharing with DCS/SCADA systems

Flexible Operation

Single or multi-stream monitoring with user-defined parameters

Industry Applications

CX2000 is ideal for continuous monitoring across industries and sectors:

Oil and Gas, Petrochemical

Effluent Treatment Plants:
Continuous hydrocarbon monitoring to meet environmental discharge limits

Produced Water Treatment:
Ensures compliance by accurately measuring oil-in-water levels

Storage Terminals & Depots:
Leak detection and spill prevention in containment and drainage systems

CPI and TPI Oil Separators:
Real-time detection of residual hydrocarbons to optimize separation efficiency

Leak Detection:
Detects the traces and leakages of HC/Oils in condensate and cooling water return lines for enhanced safety and efficiency

Chemical

Phenol & Hydrocarbon Leak Detection:
Monitors trace contamination and discharge in chemical process water.

Process Safety Compliance:
Maintains critical purity levels and helps prevent contamination-based incidents

Water and Wastewater

Desalination (SWRO) Intake Monitoring:
Protects membrane systems by ensuring intake water is free from oil contamination

Wastewater Monitoring:
Ensures real-time compliance with discharge norms in refinery and industrial effluents, with clog-free operation and automatic cleaning

Key Features & Functions

Various models that meet the expected discharge capacity

Optimize Production Schedule - Fast Track Project

Designed for 10^9 flashes, providing years of service at 1 minute intervals.This drastically reduces maintenance and minimises measurement drift or failures due to lamp ageing

Built-in Auto Cleaning System

Automatically injects 5% sulphuric acid into the flow cell daily. An auto zero calibration is conducted during each cycle. A 2 litre tank supports ~2 weeks of operation with alert for empty tank

Sampling Pump

Integrated peristaltic pump capable of drawing samples from open channels, reservoirs, or rivers up to 3 metres. A protective strainer prevents large solid ingress

No Filtration Required

Accepts raw water and wastewater without pre filtration. Large bore tubing and German-engineered inlet valve design avoid clogging while dual-wavelength correction compensates for turbidity and solids

UV Xenon Lamp with Extended Life

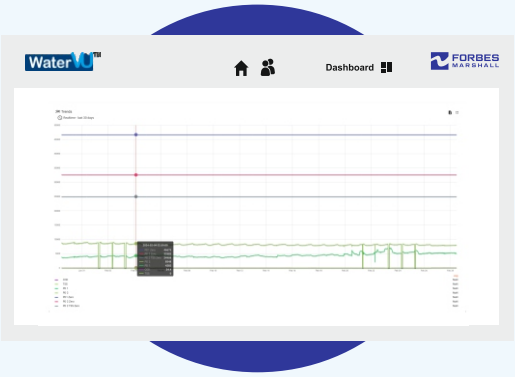
Minimal consumables: only a periodic refill of cleaning fluid. Tap water is permitted for effluent systems after validation, lowering total cost of ownership

Remote Access Option

Improves and sustains the uptime with **WaterVU™** Smart Water Management by enabling remote configuration, diagnostics, and calibration. Through advanced diagnostics and secure cloud integration, plant teams can reduce downtime, optimize maintenance cycles, and access site performance from anywhere

Hazardous Area Installation

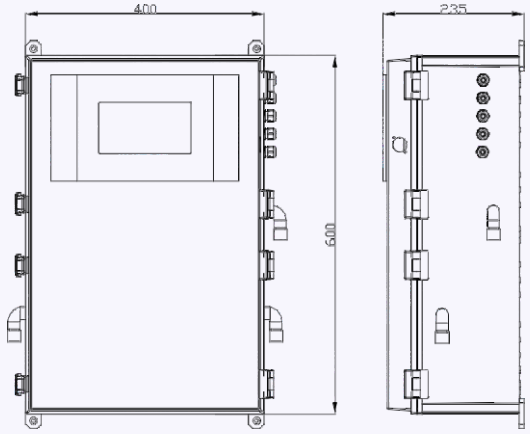
The analyser can be mounted in Exd and purge system enclosures to comply with Zone 1 & 2 Group IIC application requirements for hazardous locations



Comparative Table for Hydrocarbon Analysis

Method	UV fluorescence with close flow cell and xenon lamp CX2000	UV fluorescence with open flow cell and mercury lamp	Extraction and IR absorption	Stripping and FID
Measuring time	< 10 seconds	< 10 seconds	> 5 minutes	> 5 minutes
Sensitivity	High	Medium	High	Medium
Use of dangerous solvent (CCL4, freon)	No	No	Yes	Yes
Use of flammable gas	No	No	No	No
Air supply	No	Yes	No	No
Influence of molecular weight	No	No	No	No
Detection of total hydrocarbons	No, aromatics only	No, aromatics only	Yes	Yes
Periodic change of lamp or parts	No	Yes	Yes	Yes
Simple hydraulic system	Yes	No Flow control	No (Extraction type)	No (Extraction type)
Maintenance	Very low	Medium	High	High
Filtering	No need	Inevitable to avoid clogging of the calibrated hole	Inevitable on waste water	Inevitable on waste water
Automatic cleaning system	Yes	No, impossible Require manufacturer's specialist for cleaning	Mostly manual	Mostly manual
Operating cost	Low	Medium	High	High
Size	Compact	Big	Big	Big
Weight	14 kg approx.	> 30 kg	> 30 kg	> 30 kg
Transportable by car or passenger plane	Yes	No	No	No
Installation time	Few minutes	Tens of minutes	Hours	Hours

Panel Dimensions



Dimensions – 400x235x600mm
Protection - IP65 Polycarbonate

Specifications

1.0 General					
1.1 Series	CX 2000 series Oil in Water, Phenol, Hydrocarbon				
1.2 Channels	Upto 4 Channels				
1.3 Method	UV Fluorescence : OIW, Phenol				
1.4 Range	**Model**	**CX2000-6012**	**CX2000-6022**	**CX2000-6032**	**CX2000-6042**
	Oil	0-10 ppm	0-100 ppm	0-1000 ppm	0-1500 ppm
	Phenol	0-1 ppm	0-10 ppm	0-100 ppm	0-15 ppm
	HC	0-10 ppm	0-100 ppm	0-1000 ppm	0-1500 ppm
1.5 Calibration	Manual / Auto zero calibration				
1.6 Operation cycle	Continuous or batch type				
1.7 Cleaning	Automatic built in cleaning function. User programmable				
1.8 Graphical analysis	Graphical trend analysis, time based 15 min : day/week/month (3 months trend)				
1.9 Interferance	Independent of flow and pressure variations				
2.0 Sample conditions					
2.1 Temperature	+5 to +80 Deg. C				
2.2 Pressure	0.3 - 2 bar				
2.3 Flow rate	5 -10 LPH				
3.0 Analyzer					
3.1 Type	Advanced microprocessor based system				
3.2 Accuracy	+/- 2 to 5% of FS of Std. Solution, +/- 2% of FS on DM Water				
3.3 Display type	7” TFT color display with backlit, resolution 800 X 480 pixel, resistive touch				
3.4 Response time	Less than 10 seconds				
3.5 Measuring cycle	Programmable / normally 3-5 mins				
3.6 Analog output	0 to 4-20mADC Isolated per channel				
3.7 Enclosure protection	IP65 Polycarbonate, Corrosion resistant				
3.8 Relay outputs	Dry contact alarms for high and high set points, monitor failure, microprocessor failure				
3.9 Power supply	100 - 230VAC, 50/60Hz, 150 VA				
3.10 Temp limits	0 - 50 Deg C				
3.11 Digital output	RS 485 Modbus				
3.12 Ambient temperature	0 - 50 Deg C				
3.13 Certification	EMI, EMC test, TUV/NABL certified				

Order Code

Model Code/ Series: CX2000-SERIES
Model Name: OIL IN WATER/PHENOL/HC ANALYSER

Series	RANGE	Parameters	Special
CX2000	**6012**	**1000-0000**	**00**
	6022		
	6032		
	6042		
	6052*		

	Parameter	Special	MODEL	OIL	PHENOL	HC
1	OIW	**01- 1 CHANNEL** (110-230VAC)	6012	10	1	10
2	PHENOL	**02- 2 CHANNEL** (110-230VAC)	6022	100	10	100
3	HC	**03- 3 CHANNEL** (110-230VAC)	6032	1000	100	1000
4	TOC*	**04- 4 CHANNEL** (110-230VAC)	6042	1500	150	1500
5		**21- 1 CHANNEL** (24V DC)	6052*	XXXX	XXXX	XXXX
6		**22- 2 CHANNEL** (24V DC)				
7		**23- 3 CHANNEL** (24V DC)				
8		**24- 4 CHANNEL** (24V DC)				

* Consult Factory

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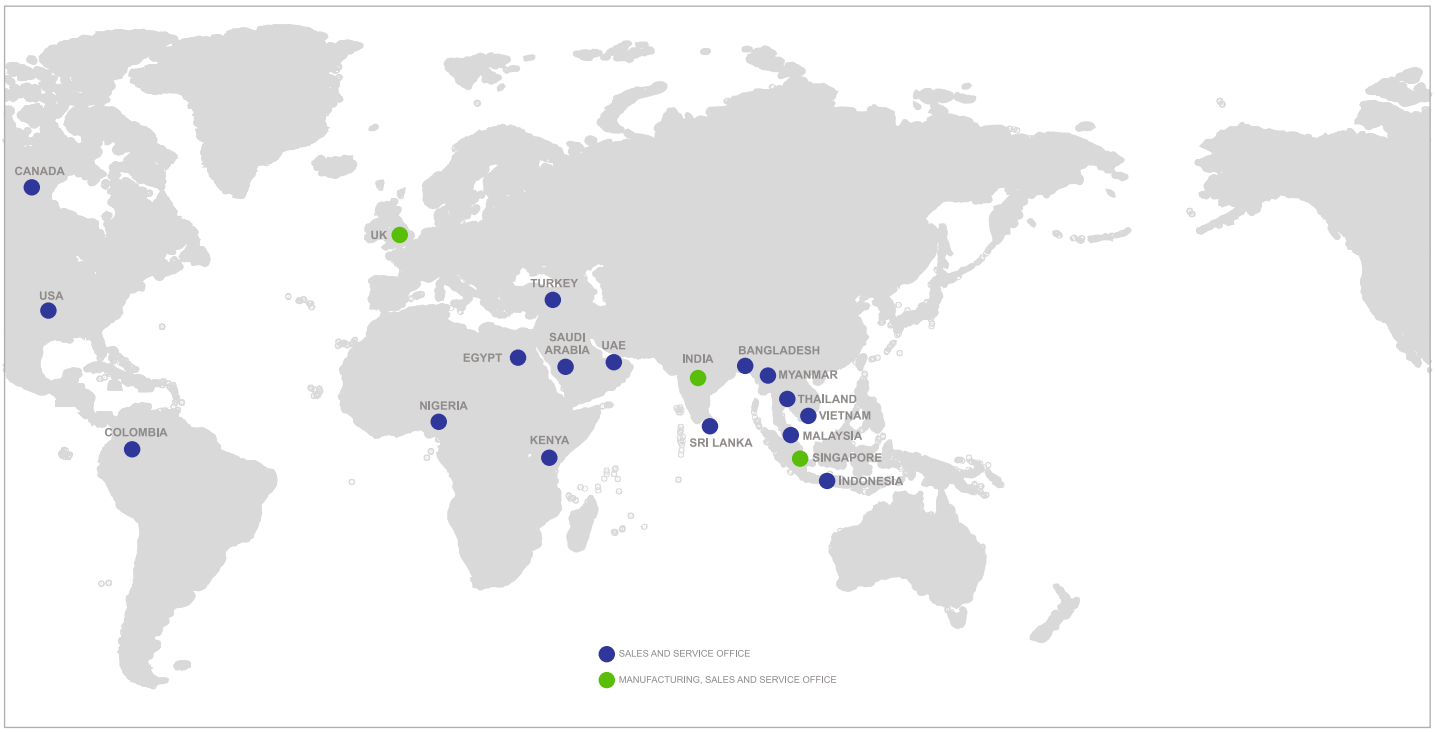

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