



WaterSCAN

Continuous Online Total Water and Soot Monitor

A new era in asset protection

Kittiwake WaterSCAN

WaterSCAN delivers continuous, online warning of water ingress and soot build-up in oils at all stages of their service life. The effect of water ingress in an oil system can be rapid and catastrophic. Kittiwake WaterSCAN removes the risks associated with periodic offline testing and potential human error.

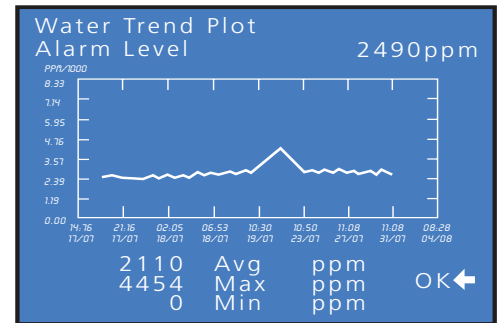
- Measures the total concentration of water in oil, not just the dissolved water.
- Provides a direct readout of soot content (in % Wt).
- Works in the real world, where oils can exhibit varying degrees of oxidation and/or contain high levels of soot as a by-product of combustion.
- Robust, waterproof housing and temperature stable circuitry ensures that WaterSCAN can deliver accurate, repeatable and reliable real time data in the harshest of conditions.



Benefits

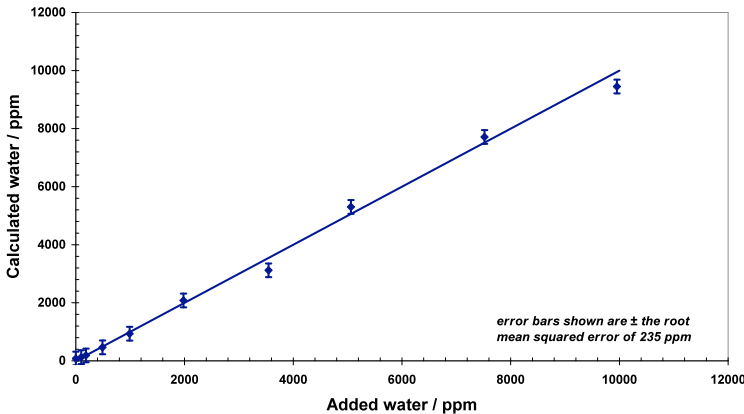
WaterSCAN has been developed to provide a highly accurate and reliable online, continuous measurement of both total water (free and dissolved) and soot content of mineral based lubrication oils in machinery.

- Increase Up-Time** – Earliest warning of water ingress or soot build-up.
- Optimize Oil/Filter Change Intervals** – Schedule maintenance according to oil filter condition and/or centrifuge efficiency.
- Rapid Integration** – Simple installation and flexible communications.
- High Accuracy** - Laboratory accuracy from a rugged on-line monitor.



Utilising high precision infrared measurement techniques, WaterSCAN continuously determines water and soot levels, allowing accurate, remote monitoring of both parameters for the instant indication of low level water ingress or combustion problems.

Increasing water levels in machinery lubricating oil may be due to a number of factors (e.g. damaged seals, faulty breathers etc.) and an early indication of these is beneficial in tracing the root cause, allowing corrective action to be taken before any permanent damage can occur.



WaterSCAN is supplied calibrated for a generic mineral oil to a measurement accuracy of $\pm 5\%$. An increased accuracy of $\pm 2\%$ can be achieved by calibration to a particular, specific oil. Kittiwake can provide oil specific calibration files on receipt of oil samples and these can be readily uploaded to the unit via a USB flash drive. Up to six sets of oil specific calibration parameters can be stored in the unit for easy changeover between oil or equipment types.

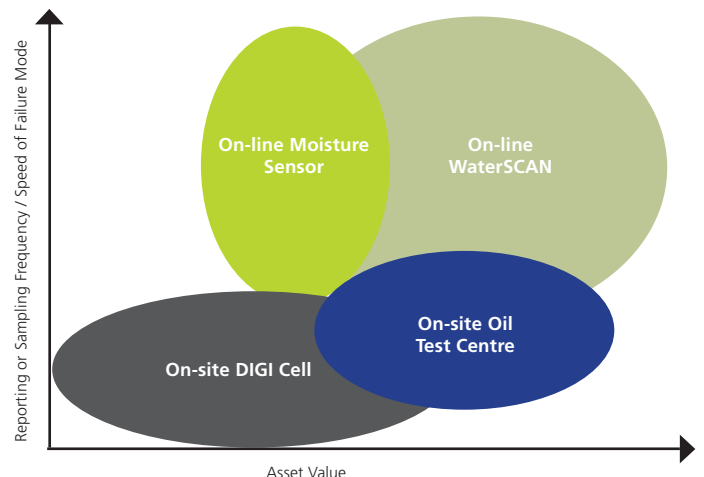
User definable alarm levels for both water and soot can be set to trigger warning systems as an alert to the first signs of issues arising.

Non-volatile memory is used to store measured data within the device for a period of one year. This can be downloaded via a USB memory stick for further offline analysis, interpretation or charting. An on screen graphing option is available in the menu to give an instant graphical view of recent measurements.

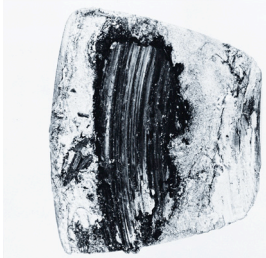
In addition, two industry standard 4-20mA analogue outputs are available for remote monitoring or logging of water and soot levels.

Slow failure modes (such as faulty tank breathers that may allow a gradual ingress of water) can be detected before damage occurs by traditional methods such as lab analysis or using Kittiwake's Online Moisture Sensor that measures dissolved water within the oil. However, rapid failures, such as faulty seals require an online approach to give immediate warning and to ensure that catastrophic damage is avoided. WaterSCAN provides an instant alert to these issues, irrespective of the water state within the oil, as well as also providing the continual monitoring benefits that online sensors provide.

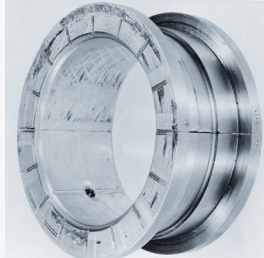
Which Kittiwake sensor for my application?



Kittiwake WaterSCAN



Mitchell block for a marine thrust bearing damaged by gross salt water contamination due to seal failure.



Turbine bearing damaged by water ingress

"WaterSCAN has shown to give us an excellent early indication of any issues with seals, allowing us to change them as soon as a problem arises, saving potentially thousands in damage to the gearbox and associated unplanned downtime"
Chris Smith, Chief Engineer

Direct read out of soot level is provided, allowing combustion processes to be monitored for early signs of issues. Again, a user definable alarm level is available to customise the unit for a particular application.

Ideally suited to both new build and retrofit applications, WaterSCAN is easily fitted by on-board crew or plant maintenance staff. Mains

power and a connection to the post-filtered main oil line are all that is required. With pre-installation work completed to requirements, fitting and commissioning can be achieved in just a couple of hours. This can usually be undertaken by the ship's crew following the detailed installation information provided.

WaterSCAN is also suitable for remote power plant applications where it is often impractical to take regular samples for lab analysis, allowing remote monitoring and scheduling of service/repair visits only when necessary.



A typical marine installation

| Product Code | Description |
|--------------|------------------------------|
| FG-K17353-KW | WaterSCAN Monitor - Complete |

Specifications

| Detection Limits | |
|---------------------|------------------|
| Soot Content (% Wt) | Water Max* (PPM) |
| 0 | 10,000 |
| 0.25 | 5,000 |
| 0.5 | N/A |

* Water Max is the upper detection limit as a function of soot contamination

| Accuracy | | | |
|--------------------------------|------------|---|-------------------------|
| | | Specific Oil Calibration | Generic Oil Calibration |
| Water: | Accuracy | ± 2% | ± 5% |
| | Resolution | 100PPM | 100PPM |
| Soot: | Accuracy | ± 10% | ± 10% |
| | Resolution | 0.005% Wt | 0.005%Wt |
| Communications: | | USB download/upload as standard (CAN, Modbus & TCP/IP optional) | |
| Analogue Outputs: | | 2 x 4-20mA | |
| Alarms: | | Programmable alarm levels for water and soot | |
| Supply Voltage: | | 100 to 240V AC 50/60Hz | |
| Fluid Pressure: | | 2-10 Bar (29-145 psi) | |
| Ambient operating temperature: | | 5 to 55°C | |

Related Kittiwake Products:

DIGI Cell/Oil Test Centre

AS-K13890-KW DIGI Cell (Combined H₂O/TBN)
FG-K1-120-KW-A Oil Test Center (H₂O/TBN/Insolubles)

Moisture Sensor

FG-K16946-KW Moisture Sensor Standard Reach - Digital Output
FG-K16947-KW Moisture Sensor Standard Reach - Analogue Output

Oil Condition sensor

FG-K16330-KW Oil Condition Sensor Standard Reach - Digital output
FG-K16203-KW Oil Condition Sensor Standard Reach - Analogue output

Metallic Particle Sensor

FG-K16121-KW Metallic Particle Sensor



Oil Condition Sensor

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