

# PYREOS

SUNSTAR传感与控制 <http://www.sensor-ic.com/> TEL:0755-83376549 FAX:0755-83376549

## Industrial Oil Condition Monitoring Reliable & Affordable

**Pyreos enables reliable and robust, cost-effective continuous oil condition monitoring suitable for use in harsh environments**

### Key Benefits

24/7 oil condition information

Minimise asset down-time

Reduce maintenance costs

Save on oil changes

### Measurement Principles

Infra-red(IR) spectroscopy accurately determines the concentration of all molecules in an oil sample. Each molecule absorbs IR energy at specific wavelengths creating a unique molecular "fingerprint". During oil aging, oil oxidation reactions take place at the molecular level, driven by oxygen and heat, which are observable from the IR absorptions. Similarly, the presence of impurities in the oil, or the consumption of antifoam or anti-wear additives and antioxidants are detected by changes in the IR spectrum.

Pyreos has taken this laboratory oil analytical technique and crafted a solution with no moving parts, that is suitable for use in harsh environments, and takes just seconds to record the oil condition data. The oil sensor is typically operated in the bypass flow and the oil flows through an optical cell where the IR spectrum

is measured and analysed, and key oil condition parameters are calculated based on proprietary mathematical models and oil calibration file data. All major oil types have been successfully analysed in this way.

### Key Oil Parameters Detected

#### **Base oil oxidation**

**TAN** – total acid number

**TBN** – total base number

Nitration

Sulfation

#### **Oil contamination**

Water, foreign oils, solvents, glycol, soot, dissolved gases

#### **Oil Additive depletion**

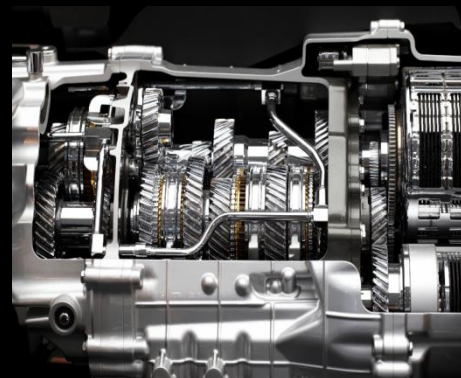
Zn, Mo, Ph, Ca, Mg, Ba, Na have been detected in specific oils

### Hardware & Installation

Our solid-state, oil analyser can be easily integrated into existing monitoring systems and can be designed to withstand high and low pressure oil feeds. Solutions are available for extreme temperature and vibrational environments. Typically minimal maintenance is required thereafter, with auto-calibration and self-test cycles, ensuring the best possible accuracy of information at all times. Oil calibration files can be created by Pyreos for *any* specific oil, and can be electronically uploaded to the analyser at any time.

## Online/ Inline Oil Condition Monitoring System

## Mid-IR Spectroscopy Oil Analyser Robust & Reliable



*Imagine the possibilities*

# Product Specification

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Dimensions	Approx. 10 x 9 x 8 cm for IR oil analyser Solutions can be configured to a customer's requirements
IR Spectral Range	5.5-11 $\mu\text{m}$ (1808 $\text{cm}^{-1}$ – 909 $\text{cm}^{-1}$ ) <b>OR</b> 2.5-5 $\mu\text{m}$ (4000 $\text{cm}^{-1}$ – 2000 $\text{cm}^{-1}$ ) available 2 or 4 additional out of range IR measurements available
Communication	Ethernet, CAN open, USB, are standard Others available by request - RS232, RS485, wireless, etc. Encrypted data communication available (AES 256 bit)
Extension Port Interface	25 pin D-sub connector allows custom interfaces like trigger, GPIOs, I <sup>2</sup> C, UART, and SPI.
Operating Voltage	15 -33 Volt DC, 3 Watt
Oil Flow Cell	Designed for each customer with typically 100 $\mu\text{m}$ spacers (15 – 250 $\mu\text{m}$ available), demountable , typical withstanding 20 bar oil pressure (others available)
Product Versions	<b>Industrial</b> - Housed to withstand each customers environment i.e. vibration , temperature ranges , salt-water or atmospheric environment <b>Test system</b> – Standard oil analyser with standard industrial fittings for attachment to test systems
Software Modules	<b>Standard:</b> Control analyser & acquires IR data, <b>Automation:</b> Build automated inspection routines & sequences for continuous oil condition monitoring <b>Predictor:</b> Interprets captured data to pre-loaded oil calibration files , enables pre-set alarm levels <b>Chemometric :</b> Optional module to enable customers to create calibration data files of their own



Detect early signs of oil aging or contamination

Lower maintenance costs

Keep assets working with reduced down-time

Works with any oil type



Image supplied by Oelcheck

## Custom Designed Solution

Our core technology is a universal solution for lubricating oil condition monitoring. To provide our customers with this solution it needs to be easily customised to your own industrial requirements. We have designed our manufacturing supply chain to enable this. You can move smoothly from proof of principle oil tests with our scientists, to our team installing test systems with your engineers, to a full scale world-wide deployment with our after-care support.

## Easy Proof of Principle

Pyreos can typically create oil calibration files for any industrial oil. If our oil library does not have your oil, we can quickly create a calibration file with you, using a small number of customer supplied oil samples from fresh oil to end of life oil. We will typically prove the effectiveness of our oil analyser solution to a customer for one specific oil as a simple proof of principle.

**Contact us to get started!**



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