

ANALEX^{rs}

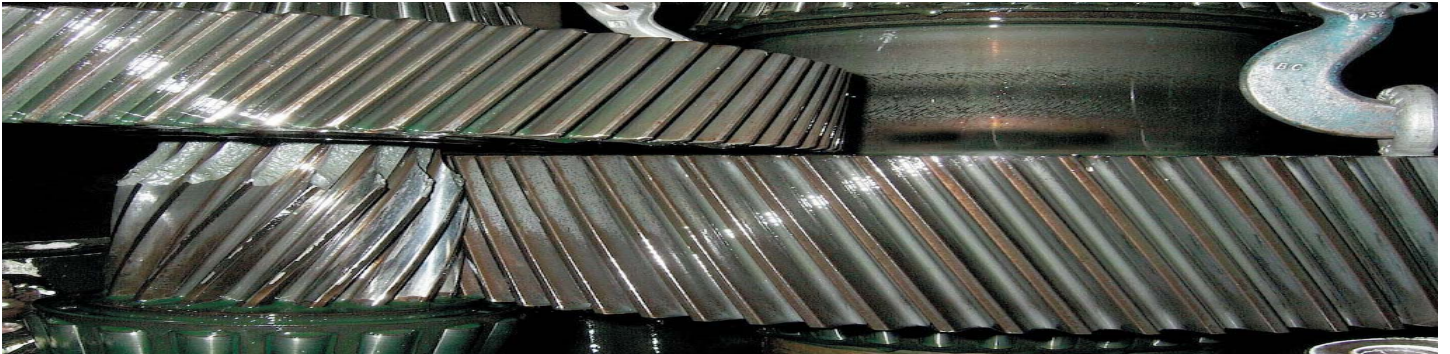
Online Sensors



Remote Sensors - the online link between your machines and ultimate reliability

ANALEXrs

Online Sensors



Monitor machine wear
Cut costs
Extend oil life
Avoid critical failure

The requirement for on-line machinery and oil condition monitoring is becoming evermore apparent as maintenance costs increase and production capacity and equipment performance is maximised. Brought to you by a company that has been delivering low-cost, robust field instrumentation to the lubricants and fuels market for over fifteen years the ANALEXrs range of instruments has been designed to accomplish the three primary objectives of oil analysis:

- Ensure lubricant condition
- Control contamination
- Detect and analyse wear debris

While temperature, pressure and vibration sensors all have their part to play in a condition monitoring package, early detection of changes in oil and lubricant condition and regular, consistent monitoring of wear metal debris in rotating plant provide greater insight into the actual condition of vital machinery and equipment. Real-time monitoring of the root cause lubricant and machine failure will allow you to take immediate action on the first indication of change. Suitable for use with slow, medium and high speed diesel engines, gas turbines, gearboxes, compressors, generators, vehicles and other oil filled plant, these sensors help to increase productivity, reduce costs and improve profitability. Use the ANALEXrs range of online sensors to put your oil analysis laboratory on your doorstep.

The ANALEXrs range of sensors includes Oil Condition, Moisture, Total Ferrous Wear Debris and Particle Content. The sensors can be purchased separately, or as part of a suite. Online Sensors:

- Can be used in Remote Locations where continuous monitoring is not always possible by engineers.
- Monitor the presence of wear debris materials that signal a changing wear rate and hence the need for intervention.
- Monitors the presence of contaminants and moisture that may cause change in the oil condition.
- Rugged design and suitable for nearly all applications.
- Multiple outputs, the ANALEXrs sensors can be easily incorporated into your existing condition monitoring and operating control systems.

Benefits

- Proactively monitor critical fluids allowing early maintenance intervention to prevent failure.
- Control the wear rate to ensure longer service life.
- Increase the surveillance level of the machine between oil samples.
- Low cost of purchase and ownership.
- Minimal annual servicing costs.
- Minimal installation costs.



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Online Sensor Suite



A combination of the ANALEXrs sensor range, the 'sensor suite' has been developed to offer real-time monitoring on critical plant such as a wind turbine gearbox. Using its own piston pump the sensor suite makes frequent inspections of remote oil and machine health a feasible option. The risk of sampling error is eliminated and data from the sensors can be streamed via any network system, allowing remote monitoring and increasingly effective maintenance planning.

Designed for mounting into the lubrication system of a machine, the suite reports metallic ferrous wear debris, oil condition, and the moisture content of the oil. Housed in a robust box it includes the Total Ferrous Sensor (Piston Version), Moisture Sensor and Oil Condition Sensor

Technical Specifications

| | |
|--|---|
| Ambient Operating Temperature: | 0 to 70°C (32 - 158°F) |
| Ambient Operating Temperature Heated Version: | -20°C to 70°C (-4 - 158°F) |
| Analogue Communication Interfaces: | 4-20mA |
| Detection: | 0-2000 parts per million [ppm] Un-combined ferrous debris by weight, Oil Quality Units – Index Scale, 0-100% Relative Humidity, -20 – 120°C Temperature |
| Digital Communication Interfaces: | RS232, RS485, CAN Bus, Wireless LAN 802.11b |
| Fluid Compatibility: | Petroleum, synthetic oils – not ester based. |
| IP Rating: | IP65 |
| Max. System Fluid Pressure: | 10 Bar (145psi) |
| Max. Fluid Viscosity: | 350 cst |
| Permitted Fluid Temperatures: | 10 to 70°C (50 – 158°F) |
| Power consumption : | 0.8 A |
| Power Input: | 18 – 30V DC |
| Weight: | 15kg (33lbs) |

Ordering Information

| Product Code | Description |
|--------------|-----------------------|
| FG-K16521-KW | Standard Sensor Suite |
| FG-K16567-KW | Heated Sensor Suite |



Financial Benefits Example: Wind Turbine Gearbox

As wind turbines become larger and more complex, the power produced from them increases but so can the maintenance costs. There have been many well publicised failure events which have been very costly to the owners, manufacturers and to the general perception of wind as a renewable energy source. One such event was the failure of all 30 2MW turbines installed at Scroby sands in the UK. All failures occurred within one year of installation. Using data provided from a gearbox manufacturer, the total cost of removing, overhauling and reinstalling a gear box can be up to €450,000*. This can be due to the turbines inaccessibility, crane rental, man hours used and loss of earnings on the turbine. If sensor equipment detects a potentially serious problem before it becomes too advanced and the repair could happen without the need for a crane then the repair bill could be a fraction of this cost. If a sensor detected oil contamination such as water in the oil or oxidation which could lead to a serious failure then the turbine could be saved by just replacing the oil this could be a €450,000 saving.

* Data taken from "the industrial gearbox life cycle and the total cost of ownership" by Gary Bills – Hansen Transmissions – BGA Gears 2006 Seminar

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Oil Condition Sensors



The ANALEXrs Oil Condition Sensor goes beyond the normal protection systems; it monitors the root cause of lubricant and machine failure. ANALEXrs puts you in control. You know exactly when to change the oil based on condition, not on historical schedules.

Today's lubricants are better quality than ever before. Sticking to old service schedules is expensive, and extending oil service life isn't guesswork. Whilst lubricants perform better, you know they are still at risk from changing operating and environmental conditions. That's why your oil analysis service includes an oil condition feedback. It helps you detect when your oil may no longer be fit for service, possibly even pinpointing a contaminant or machine fault as the cause.

The ANALEXrs Oil Condition Sensor goes beyond the normal hand-held field go/no-go units to offer permanent mounting. Providing both a check on water ingress and oxidation levels, now you can monitor real-time, and take immediate action on the first indication of change before any harm is done to the machine or the oil. The ANALEXrs oil condition Sensor can be mounted within almost any lubrication system on any type of machine. The sensor detects changes caused by water and acid levels, using a combination of proven dielectric sensing, combined with smart algorithms to provide a trend.

Whether it's to check on the health of the lubricant, or an alert of changing contaminant ingress, the ANALEXrs Oil Condition Sensor provides instant information, complementing your existing laboratory oil analysis programme, and helping you make informed maintenance planning decisions.

Technical Specifications

| | |
|-----------------------------|--|
| Ambient Temperature: | -20 to 70°C (-4 to 158°F) |
| Analogue Outputs: | 4-20mA |
| Digital Outputs: | CAN, RS232 |
| Connections: | 1/2" BSP male thread |
| Detection: | Oil Condition (Oil Quality Units) |
| Fluid Compatibility: | Petroleum and synthetic oils |
| Fluid Temperature: | -20 to 130°C (-4 to 266°F) |
| Max Fluid Pressure: | 10 Bar (145) psi |
| Options: | Variable sensor head reach, Power supply, Stand alone display unit, Cable termination options by special request |
| Power Supply: | 15-30 VDC |
| Protection: | IP67 |
| Range: | 0-100 Oil Q Units |
| Repeatability: | 4% |
| Weight: | 250g (9 oz) |

Ordering Information

| Product Code | Description |
|--------------|---|
| FG-K16203-KW | Standard Reach, Analogue Output |
| FG-K14492-KW | Long Reach, Analogue Output |
| FG-K16330-KW | Standard Reach, Analogue & Digital Output |
| FG-K16340-KW | Long Reach, Analogue & Digital Output |
| FG-K16318-KW | Evaluation Pack Standard Reach, Dual Outputs, includes case, power supply and display |
| FG-K16327-KW | Evaluation Pack Long Reach, Dual Outputs, includes case, power supply and display |

High integrity sealing, using standard automotive techniques.

Internal processing power offers wide interface options.

Stainless steel housing - rugged and long life performance

Widely used 1/2" BSP thread - quick and easy installation to a wide range of machinery

Gold oil sensing contact - long life and sensitivity



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Moisture Sensors



The ANALEXrs Moisture sensor goes beyond the normal water screening tests to tell you exactly how dry your oil is. You know that the more severe the moisture ingress problem, the greater the potential risk. You can ensure that your oil is always below the saturation point before free and emulsified water starts to form. And take immediate action on the first indication of change.

You probably already know that free and emulsified water cause problems. But, did you know that water can increase the oxidation rate of your lubricant by more than ten times? That's why your oil analysis service includes a water-screening test. But were you aware that bearings could lose 75% of their potential service life due to water before the oil even begins to start to look cloudy? Even in its dissolved state the water is at work, attacking the base stock, the additive package, and the machine. Plus, water can carry organisms with it that could disable your critical hydraulic systems.

Providing a % Relative Humidity (RH) and temperature values, now you can monitor real-time, the ANALEXrs Moisture sensor can be mounted within any lubrication system on any type of machine. Moisture sensors need not be in the fluid to be effective and are also of use in the headspace of a piece of machinery. The sensor measures the oils percentage Relative Humidity, resulting from the dissolved water within the lubricant, using a combination of proven thin film capacitance sensors, combined with smart algorithms to provide a temperature and % RH value.

Whether it's to check on the health of the machine, or an alert of changing moisture ingress rates, the ANALEXrs Moisture sensor provides instant information, complementing your existing laboratory oil analysis programme, and helping you make informed maintenance planning decisions.

Technical Specifications

| | |
|-------------------------------|---|
| Accuracy Saturation: | +/-2 % |
| Accuracy Temperature: | +/-1 °C |
| Alarm Defaults: | Saturation: on at 65% (open), off at 60% (closed) |
| Analogue Outputs: | 4-20mA for % Saturation, 4-20mA for temperature of oil, open collector for alarm. |
| Calibration: | ISO/IEC 17025, NIST & NPL Traceable |
| Connection Method: | By multicore screened cable |
| Digital Inputs : | RS232, CAN |
| Digital Outputs : | CAN, RS232 |
| Fluid Compatibility: | Petroleum and synthetic oils |
| Material: | 304 Stainless Steel |
| Max Oil Pressure: | 10 bar (145psi) |
| Oil Temperature Range: | -40 to 100 °C (-40 - 212°F) |
| Power Supply : | 12-30 Vdc <1w |
| Sealing on enclosure: | IP67 |
| Weight: | 0.3 Kg |

Ordering Information

| Product Code | Description |
|--------------|---|
| FG-K16947-KW | Standard Reach - Analogue Output |
| FG-K16950-KW | Long Reach - Analogue Output |
| FG-K16946-KW | Digital - Standard Reach, Digital Output |
| FG-K16949-KW | Digital - Long Reach, Digital Output |
| FG-K16948-KW | Evaluation Pack Standard Reach, Dual Outputs, includes case, power supply and display |
| FG-K16951-KW | Evaluation Pack Long Reach, Dual Outputs, includes case, power supply and display |

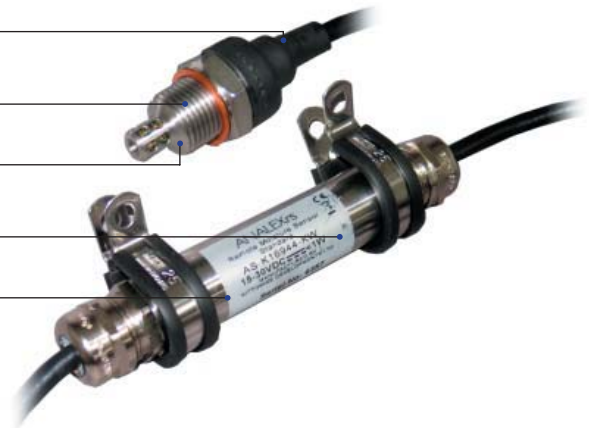
High integrity sealing, using standard automotive techniques.

Widely used 1/2" BSP thread - quick and easy installation to a wide range of machinery

High pressure resistant glass to metal hermetic seal

Stainless steel housing - rugged and long life performance

Smart sensor with internal processing power offers wide range of interface options



ANALEXrs

Total Ferrous Debris Sensors



The ANALEXrs range of Total Ferrous Debris Sensors place you in complete control of your maintenance. Whether it's to check on the health of the machine, or an alert of changing wear patterns, the Total Ferro Debris Sensor provides instant information, complementing your existing oil analysis programme, and helping you make informed maintenance planning decisions.

Machines give telltale indicators of potential problems. Any change in the wear pattern is going to result in changes in the ferrous density. The ANALEXrs Total Ferro Debris Sensor goes beyond the normal chip detectors and magnetic plugs. Providing a ppm value, you can monitor real-time and take immediate action on the first indication of change.

The ANALEXrs Total Ferro Debris Sensor can be mounted within almost any lubrication system on any type of machine. The sensor measures ferrous density, resulting from the wear debris within the lubricant, using a combination of proven magnetometry, combined with smart algorithms to provide data in Parts Per Million (ppm). With the digital and analogue outputs, airblast and piston options the total ferrous sensors can be easily integrated into your existing condition monitoring and operating control systems.

Technical Specifications

| | |
|-----------------------------|--|
| Ambient temperature: | -20 to 65°C (-4 to 149°F) |
| Analogue Output: | Opto isolated 4-20mA |
| Communications: | CAN, RS232, RS485, (802.11b WLAN) |
| Connections: | Piston 1/8" BSP, Air Blast & Non Zeroing Option 3/8" BSP |
| Detection: | Total Ferrous Wear Debris |
| Fluid Compatibility: | Petroleum, synthetic oils and water/oil |
| Fluid Temperature: | -20 to 65°C (-4 to 149°F) |
| Max. Fluid Pressure: | 10 Bar (145psi) |
| Options: | Stand alone unit, Unit with automatic air blast zeroing, Unit with automatic piston zeroing, Display/Alarm box, 802.11b WLAN interface |
| Power Supply: | 18-30 VDC |
| Protection: | IP65 |
| Range: | 0-2000 ppm Uncombined Ferrous Debris |
| Weight: | 2.2kg (4.85lb) |
| Fluid Viscosity: | 350cst (Piston Version & Non Zeroing Option) 500cst (Air Blast Version) |

Ordering Information

| Product Code | Description |
|--------------|---|
| FG-K16120-KW | Air Blast Version |
| FG-K16344-KW | Piston Version |
| FG-K16353-KW | Evaluation Kit Air Blast Version, includes case, power supply and display |
| FG-K16354-KW | Evaluation Kit Piston Version, includes case, power supply and display |
| FG-K16590-KW | Non Zeroing Option |

Air blast or piston versions available for use in a multitude of applications

Robust cast iron enclosure providing strength and magnetic shielding

Sealed to IP65 suitable for industrial use

Reference coil for controlled temperature stability

LED display providing a visual indication of sensor status

Wide range of interface options due to variety of industry standard outputs



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Particle Content Sensors



The ANALEXrs Particle Content Sensor goes beyond the normal wear debris sensors to offer even greater size resolution. Providing a debris count for both ferrous and non-ferrous metals, now you can monitor how dirty your oil is, real-time.

It's no secret that particles cause wear. It is imperative to know, not just the number of particles which pass through your system, but also the size. Using the ANALEXrs Particle Content sensor allows you to now you can monitor real-time. And take immediate action on the first indication of change. It goes beyond the normal protection systems; it prevents failure, not just catastrophic failure.

The ANALEXrs Particle Content Sensor can be mounted within almost any lubrication system on any type of machine. The sensor measures ferrous and non-ferrous metals, resulting from the wear debris within the lubricant, using a combination of proven inductive coil technology, combined with smart algorithms to provide a particle size distribution count. And that puts you in control. You know that the more severe the wear problem, the more that the machine produces larger wear debris particulate.

With its digital and analogue outputs, it can be easily integrated into your existing Condition Monitoring and operating control systems. ANALEXrs puts you in control. Whether it's to check on the health of the machine, or an alert of changing wear patterns, the ANALEXrs Particle Content sensor provides instant information, complementing your existing laboratory oil analysis programme, and helping you make informed maintenance planning decisions.

Technical Specifications

| | |
|-----------------------------|--|
| Ambient Temperature: | -20 to 65°C (-4 to 149°F) |
| Analogue Outputs: | Opto isolated 4-20mA |
| Communications: | CAN, RS232, RS485 |
| Connections: | 3/8" BSPP female |
| Detection: | Ferrous and Non Ferrous Metallic Wear Particles |
| Output: | Simultaneous quantification of metallurgical composition and size category of particles in a fluid |
| Fluid Compatibility: | Petroleum, synthetic oils and water |
| Fluid Temperature: | -20 to 65°C (-4 to 149°F) |
| Max Fluid Pressure: | 10 Bar (145psi) |
| Power Supply: | 18-30 VDC |
| Protection: | IP65 |
| Weight: | 1.4kg (3.1lb) |

Ordering Information

| Product Code | Description |
|--------------|---|
| FG-K16121-KW | Metallic Particle Sensor, |
| FG-K16355-KW | Metallic Particle Sensor Evaluation Pack, includes case, power supply and display |

3/8" BSP connections for quick and easy installation

Sealed to IP65 suitable for industrial use

Robust cast iron enclosure providing strength and magnetic shielding

LED display providing a visual indication of sensor status

Wide range of interface options due to variety of industry standard outputs



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