Frequently Asked Questions

MTL

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How does water activity compare to PPM?

(A_w) Water Activity		(PPM) Parts Per Million
Dissolved water is the best indicator to moisture problems	↔	
Measurement of water in a dissolved state in reference to the saturation point	↔	Absolute measurement of water in the dissolved, emulsified and free water state
A_w is dependent on oil temperature and condition	↔	PPM is not temperature dependant
A_w responds to both water quantity and temperature	↔	PPM does not respond to temperature change
A_w is best used for monitoring in service oils	↔	PPM is best suited for monitoring incoing oil for consistency
A_w alerts the operator to emulsified and free water	↔	PPM does not give any indication to the state of the water
Unit of measure: % RH (Percent Relative Humidity	↔	Unit of meaure: PPM (Parts per Million)

Water activity has proven to be a more useful tool for monitoring in service oil since real time feedback is provided on the gearbox/reservoirs internal conditions. PPM is best suited for inspecting incoming oil for consistency and quality control.

Are temperature and moisture related? What's this relation?

Yes, temperature and moisture are related. An increase in temperature will cause the moisture sensor to display a lower reading and a lower temperature will cause a higher moisture reading. The moisture sensor measures water activity (similar to relative humidity in air) this means the sensor is measuring the water content of the oil in reference to the oils saturation point. The saturation point of oil changes with temperature, this is why it is recommended that all moisture readings are taken at operating temperature of the equipment.

Does the sensor measure dissolved and free water?

No, the sensor only measures dissolved water which is reflected as (0% - 99%). Once 99% has been reached the oil is saturated and free water is formed. The sensor provides information on the proximity of producing free water.

What is the 'normal' or 'average' measurement for moisture in healthy oil?

When the oil is at operating temperature a moisture measurement up to 50% is considered normal and should indicate to the operator a healthy system.

Does the use of the MTL replace the need for outside oil analysis?

No, the MTL is designed to be used as an early warning system to alert the operator to sample instead of waiting for a fixed interval to sample. The sample must be sent to a laboratory for analysis.

How important is it to have head/air space vented?

The level reading could be incorrect due to a pressurized or non vented headspace. Note: Some desiccant breathers have a built in check valves. These check valves can hold 1-2 psi headspace pressure before venting to the atmosphere..

What is the battery life of the MTL?

6-8 hours of continuous use. The sensor is programmed to time out after 60 seconds of use to save the battery.

How does the moisture/temperature sensor work?

The sensor contains a thin polymer film, this film absorbs or releases moisture so that it's moisture content matches the surrounding medium. The polymer film is contacting an electrode. The capacitance of the electrode changes with the moisture content of the polymer film. The sensor converts the capacitance to water activity (A_W) and displays the measurement as a percent.

How does the level sensor work?

The level sensor is a pressure differential sensor and measures the oil directly above the sensor, it subtracts the atmospheric pressure (if vented externally) or the headspace pressure (if vented to headspace). The pressure is converted to inches of oil using an average specific gravity of oil number and a formula.

What is the operating range of the sensors?

Sensor	Minimum Temperature	Maximum Temperature	Max Pressure
MTL	0˚C (32˚F)	85˚C (185˚F)	16 kPa (2.3 PSI)

Sensor	Minimum	Maximum
Moisture	1% RH	99% RH

*Note: %RH- percent relative humidity

What conditions or situations could damage the sensors?

The sensors may be damaged if they are used outside of their specified operating limits.

Moisture Sensor - Operating the moisture sensor outside of its measurement range will not cause damage. At full capacity (99-100%) the sensor will take 48-72 for the sensor to return to calibration (±2% RH).

Temperature Sensor - The temperature sensor is designed to operate from -40ºC to 125ºC, temperatures outside of this range are considered damaging. Operating the sensor outside of this range can cause a loss of accuracy or total sensor failure.

Level Sensor - The level sensor works by measuring differences in pressure. Exceeding the maximum specified pressure (16 kPa or ~ 2.3 PSI) will damage the sensor. There are different sensors available depending on the height of fluid being measured (0”- 99”). The level sensor has an operating range from 0ºC to 85ºC.

How accurate are the sensors?

Sensor	
Level	± 4%
Temperature	± 0.3ºC
Moisture	± 2% RH

*Note: %RH- percent of relative humidity

How do I check the sensors functionality?

Level sensor - Use a measuring tape or a ruler and measure from the centre point of the sensor to the fluid level (Use a dipstick to confirm the fluid level). The sensors reading should match the measurement from the measuring tape / ruler. Note: the sensor measures the fluid directly above the sensor (vertical distance). Confirm the measuring tape/ruler is oriented in this fashion.

Moisture - Take moisture measurement at machine start up (cold oil) and take a second measurement at operating temperature. Compare the two readings to confirm the sensor is trending. The moisture reading normally will drop as the capacity of the hot oil to hold dissolved water increases.

Temperature - To confirm the thermometer’s calibration the temperature must be checked at the high and low limits of the device. Compare to other calibrated devices (or contact Checkfluid.)

For any other questions not answered here please give us a call at (866)-652-8728 or e-mail info@checkfluid.com