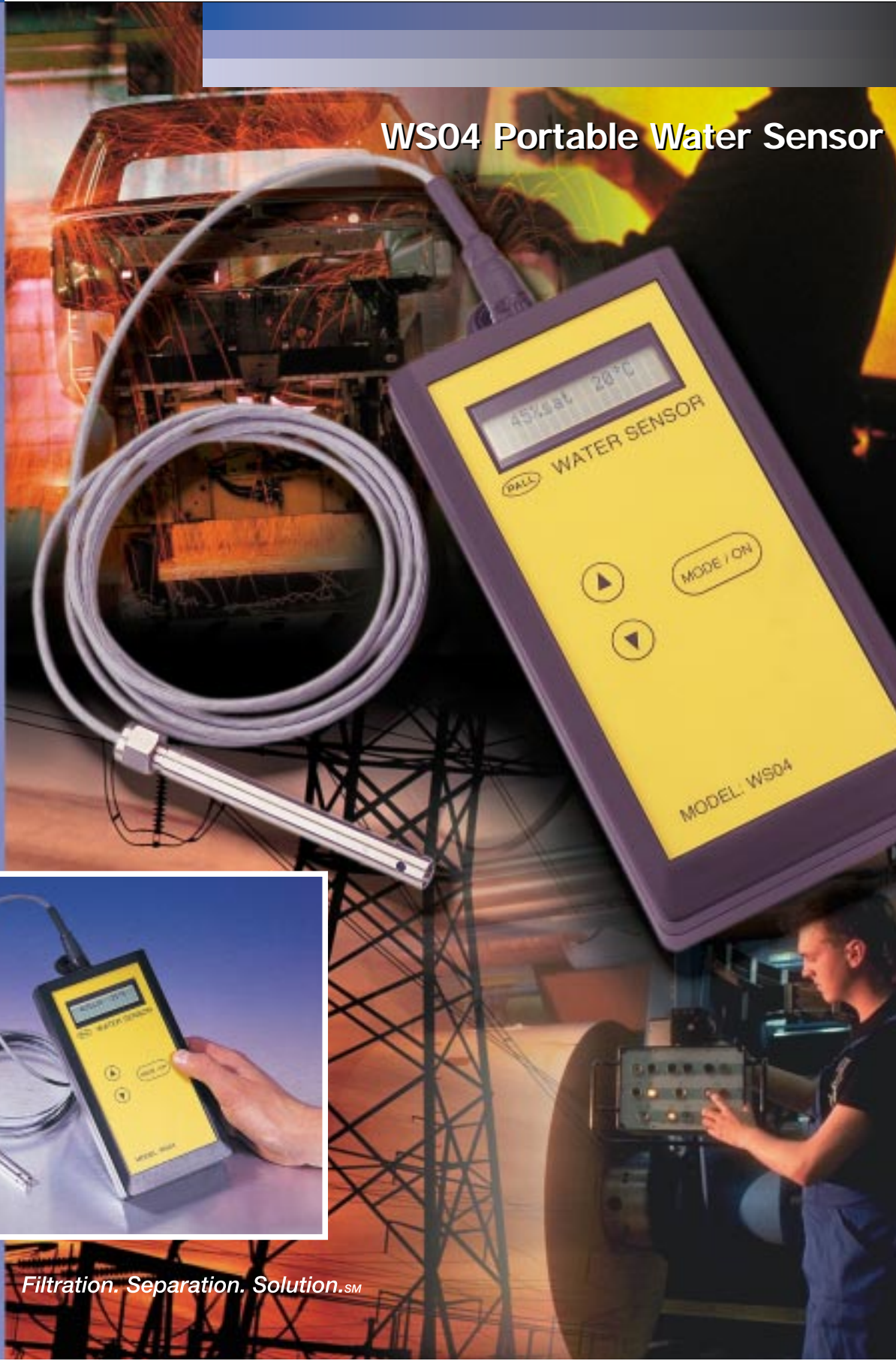


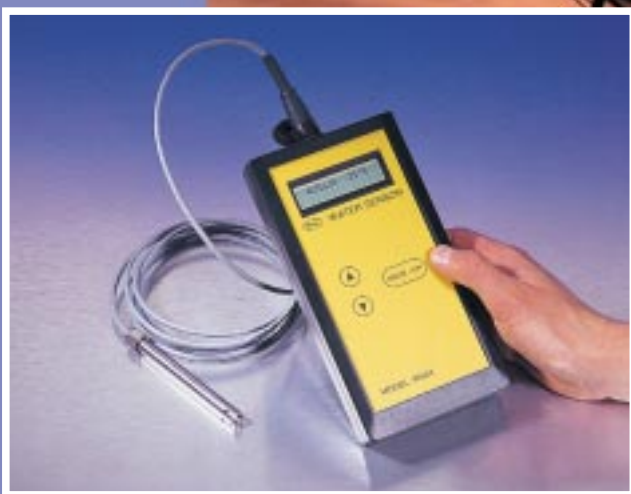


Machinery and Equipment

WS04 Portable Water Sensor



Fluid
Conditioning
Monitor



Filtration. Separation. Solution.SM

WS04 Portable Water Sensor

Features and Benefits

- Measures percent water saturation level and temperature of fluids
- Includes high visibility LCD display
- Monitors fluid condition of operating equipment
- Fully portable, battery powered sensor and display, suitable for use in all operating environments

Avoid Costly Problems

Water contamination in fluids can cause numerous problems such as additive depletion, oil oxidation, corrosion, reduced lubricating film thickness, accelerated component wear rates, microbial growth, and reduction of dielectric strength. These problems can be averted with periodic monitoring so that timely action can be implemented.

The Pall Water Sensor measures and displays the relative water saturation of the fluid. It can be used as a monitor to indicate the water

content of the fluid, providing the customer with meaningful information on which to base their service and maintenance procedures.

Six foot (two meter) probe cable (optional cable extensions available)

Continuous LCD readout of % saturation and temperature

9 VDC battery compartment

Rugged IP66 enclosure



High accuracy, fast response sensor.

LCD contrast controls (+ or -)

Switch for operation and selecting temperature mode (°F or °C), display contrast and battery power level

Where possible, oils should be operated without the presence of free or emulsified water. The **Pall** Water Sensor is designed to detect water in solution within the fluid. If an oil is cloudy due to high water contamination, the **Pall** Water Sensor will display 100% saturation until steps are taken to bring the water content below the saturation point.

Pall manufactures a range of fluid purifiers specifically for this purpose (contact Pall for details).

Simple Operation

Based on user selection, the LCD displays % saturation and temperature, in either °F or °C. At 90% saturation and above, the LCD display will flash, drawing attention to the elevated water contamination level.

Other user selection features include the ▲ and ▼ buttons to adjust LCD contrast and an on-screen battery level/low battery alarm display.

Ease of Installation

The probe is positioned so that the sensor tip is fully immersed in the system fluid. This could be through an opening in the reservoir cover or in a representative sample of the system fluid. Installation can also be achieved by direct connection into a fluid line via the supplied 1/4" NPT or 3/8" BSSP fitting.

Analysis takes only a few minutes thus avoiding delays awaiting results of any laboratory investigation performed on the fluid sample.

Flexible use

Compact, lightweight and portable, the **Pall** Water Sensor can be used in any number of locations and is supplied with a robust carrying case to store the unit safely when in transit or not in use. Simple instructions for use are included.

WS04 Portable Water Sensor

Benefits of Expressing Percentage Saturation

Applications

- Hydraulic Fluids

- Lubricating Fluids

- Dielectric Fluids

- Fuel Oils



Measuring Water

The industry standard practice has been to report water content as a percentage of the total volume or in parts per million (PPM). Most fluids can tolerate a certain degree of contamination in the form of water, but at what level is it considered excessive?

200 PPM of water in a phosphate ester based oil would be excellent. However, the same amount would be catastrophic in an insulating oil.

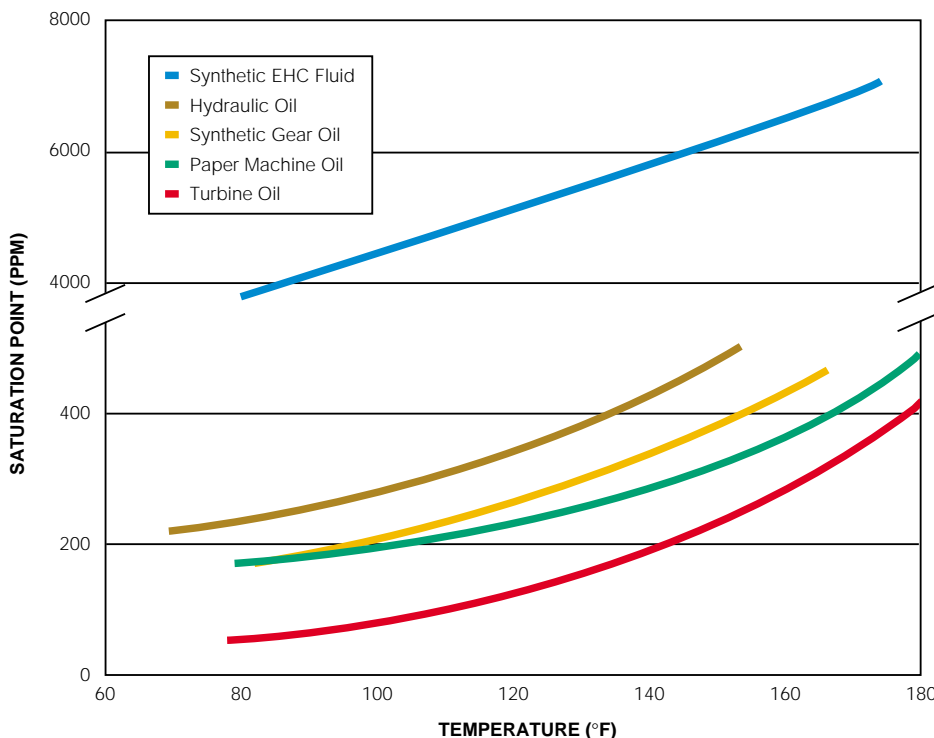
The difference between what is acceptable for one fluid and not another relates to the fluid's saturation point (how much water it can absorb before a phase separation takes place, and free water is formed). This is similar to measuring percent relative humidity in air where the actual moisture content (PPM) in the air is less meaningful than it's relative humidity.

For this reason, the more practical method for reporting water content in fluids is simply as a percentage of the saturation value.

In order to compare the moisture content in fluids (% saturation to PPM) one would have to know the fluid's condition and saturation vs. temperature characteristics. The saturation point versus temperature for typical new oils is shown in Fig. 1.

If the saturation vs. temperature characteristics of a fluid are available, then % saturation can be converted to PPM by multiplying the Water Sensor readout at a specific temperature by the saturation point (PPM) at that temperature.

Fig. 1 Water saturation points for typical fluids



Example: If the WS04 Water Sensor is used with the above paper machine oil and reads 70% saturation at 100°F, the equivalent parts per million would be 140 ppm (70% saturation x 200 ppm—the saturation point at 100°F).



WS04 Portable Water Sensor Specifications

Dimensions:	8" H x 4" W x 1.8" D 203 mm H x 102 mm W x 45 mm D
Power supply:	9VDC battery (PP3/MN1604)
Temperature:	0°F to 185°F (0°C to 85°C)
Fluid compatibility:	Petroleum and synthetic oils (hydraulic, lubricating, dielectric, kerosine, etc.) Note: The Pall Water Sensor must not be used to determine water concentrations in water bearing fluids.
Pressure:	150psi (10 bar) max operating
Probe:	3/8" O.D. stainless steel
Probe cable:	6 ft. (2m)
Enclosure:	IP 66
Accuracy:	+/- 2% (including hysteresis, linearity and repeatability) Based on calibration per ASTM E104-85.
Weight:	1 lb. (0.5 kg)

Ordering information

Model	Description
WS04B04	Water sensor with probe and 1/4" NPT fitting
WS04C06	Water sensor with probe and 3/8" BSP fitting

Accessories

Model	Description
WSX-1	10' (3m) probe extension cable with connectors
WSX-2	20' (6m) probe extension cable with connectors
WS-PC06	Spare probe assembly (3/8" BSPP)
WS-PB04	Spare probe assembly (1/4" NPT)



Machinery and Equipment

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The information provided in this literature was reviewed for accuracy at the time of publication. Product data may be subject to change without notice. For current information consult your local Pall distributor or contact Pall Corporation directly.