

CONTAMINATION MONITORS

AS 1000 Series

Aqua Sensor



Description

The Aqua Sensor AS 1000 is a fluid sensor for detecting water in hydraulic and lubrication fluid, especially designed as OEM sensor for fluid condition monitoring.

The sensor measures the water content relative to the saturation concentration (saturation point) and outputs the saturation level (0 to 100%) as a 4 - 20 mA signal. A reading of 0% would indicate fluid that is free of water, while a reading of 100% would indicate a fluid that is saturated with water.

The AS 1000 can be used to simultaneously determine the temperature of the oil and output it as a 4 to 20 mA signal as well.

In so doing, the AS 1000 enables hydraulic and lubrication fluids to be monitored accurately, continuously and on-line.

Water in Oil

It is almost certain that there is water present in hydraulic and lubrication systems. These systems should be operated without the presence of free or emulsified water. The most common sources of water entering a system are ambient humidity, "splash" from process water, and new oil. Water contamination will accelerate the aging process of the oil resulting in oil oxidization, additive depletion, reduced lubrication, corrosion and damaged components. Most of these costly problems can be avoided by monitoring the water content of the operating fluids.

Sometimes the water content is difficult to determine, but with the HYDAC Aqua Sensor, determining the amount of water is easy! The most practical method for monitoring water content in oil is as a percent of the saturation level. Different oils are capable of dissolving varying amounts of water, therefore they have varying water saturation curves. The curve (below) is an example of the typical relationship of water saturation level versus fluid temperature in hydraulic and lubrication oils. By looking at the example graph it can be seen that this fluid is capable of holding more water, or has a higher saturation level, as the temperature increases.

Applications

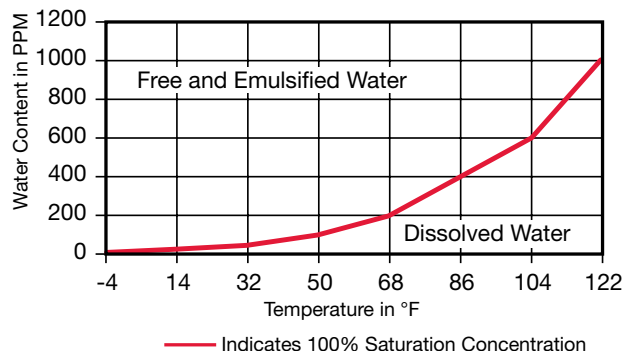
- Hydraulic systems that are sensitive to water
- Gear boxes
- Molding machines
- Turbines
- Transferrers

Technical Specifications

Input Data	
Measuring range (<i>temperature</i>)	-13 to 212°F (-25 to 100°C)
Measuring range (<i>saturation level</i>)	0 to 100%
Operating pressure	max. 725 psi (40 bar)
Burst pressure	> 9000 psi (620 bar)
Parts in contact with fluid	Stainless steel, FPM seal, ceramic with evaporated metal
Output Data - Humidity Measurement	
Output level (<i>saturation level</i>)	4 to 20 mA
Calibrated accuracy	≤ ± 2% FS max.
Accuracy in media measurements	≤ ± 3% FS typ.
Pressure dependent	+ 0.02% FS / bar
Output Data - Temperature Measurement	
Output signal (<i>temperature</i>)	4 to 20 mA or 2-10V
Accuracy	≤ ± 2% FS max.
Nominal temperature range (<i>measuring saturation level</i>)	32° to 194°F (0° to 90°C)
Ambient temperature range	-40° to 212°F (-40° to 100°C)
Viscosity range	32 to 23175 SUS (1 to 5000 cSt)
Flow velocity	< 16 ft/sec (4.88 m/sec)
Permissible fluids	Fluids based on mineral oil and synthetic and natural esters
CE mark	EN 50081-1, EN 50081-2, EN 50082-1, EN 61000-6-2
Type of Protection acc. DIN 40050	IP67
Other Data	
Supply voltage	12 to 32 V DC
Residual ripple	≤ 5%
Thread connection	G 3/8 BSPP male thread
Torque rating	approx. 18 ft/lbs (24.4 Nm)
Electrical connection Pin 1: +Ub Pin 2: Signal saturation level Pin 3: 0V / GND Pin 4: Signal temperature Pin 5: not connected	M12x1.5 pole (DIN VDE 0627)
Reverse polarity protection of the supply voltage, excess voltage, override and short circuit protection	Standard
Weight	approx. 5 oz (142 g)

Note: FS (Full Scale) = relative to the full measuring range

Example of a Hydraulic Oil Saturation Curve



AS = Aqua Sensor

1 = Saturation level 0 to 100%; Temperature -13°F to 212°F (-25°C to 100°C)

0 = Mineral oils

1 = Phosphate esters (HFD-R)

0 = G 3/8A DIN 3852

8 = Plug M12x1, 5-pole (*connector not included*)

C = Saturation level 4 to 20 mA (0 to 100%), Temperature 4 to 20 mA -13°F to 212°F (-25°C to 100°C)

000 = Standard

Technical drawing of a 1/2" NPT x 1/2" NPT SW 27 adapter. The drawing shows a side view of the adapter with various dimensions in inches and millimeters. Key features include a 1/2" NPT male thread on the left, a 1/2" NPT female thread on the right, and a central section with a hexagonal base and a flange. Dimensions include overall length (2.18" / 55.3 mm), thread lengths (0.47" / 12 mm), and flange thickness (0.10" / 2.5 mm). The central section has a diameter of 0.47" (12 mm) and a length of 1.18" (30 mm). The right thread has an outer diameter of 1.06" (27 mm) and a length of 2.64" (67.1 mm). The hexagonal base has a width of 0.86" (21.9 mm) and a height of 1.16" (29.5 mm). The thread on the right is labeled 'G 3/8 (BSPP)' and 'SW 27'.

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