

## AGAR OW-202 - INSERTION TYPE WATERCUT METER - LIQUID/LIQUID CONCENTRATION MONITOR

### Description

The AGAR OW-202 is an insertion type oil/water monitor designed for service in line sizes 4" and above. This watercut monitor measures liquid-in-liquid concentrations using microwave technology. Typical applications include hydrocarbon/water measurement, alcohol content in beverages, and other organic and inorganic mixtures.

The OW-202 series is the second generation design, microwave based liquid/liquid analyzer developed by Agar Corporation. Our first 0-100% oil/water monitor to the process, refining and petroleum production industries was introduced over ten years ago.

The sensor utilizes a microwave transmitter operating at 2.45 Gigahertz, and two receivers to measure bulk electrical properties of the liquid mixture. These properties are analyzed and translated into volumetric concentrations.

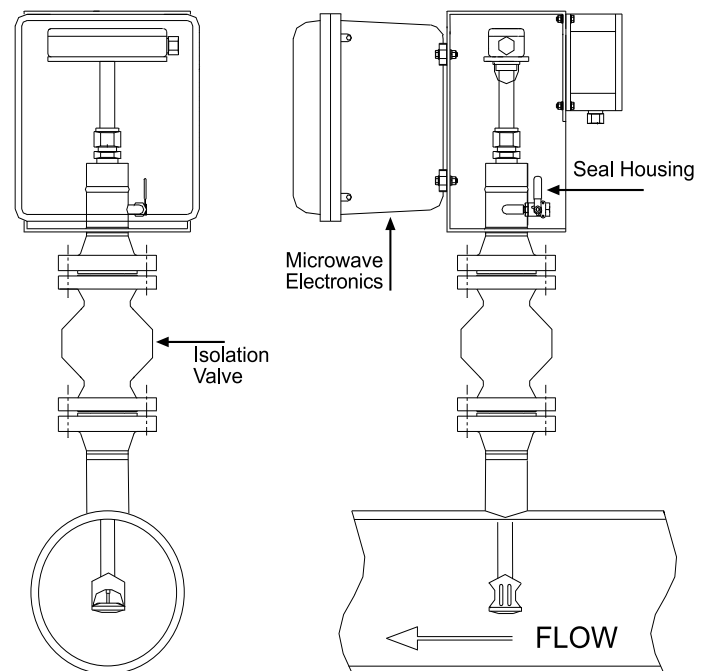
The AGAR OW-202 measures hydrocarbon/water mixtures over the full range of 0-100%, regardless of which liquid is the continuous phase. The accuracy of the measurement is not affected by the salinity, density, viscosity, temperature or velocity of the components being analyzed.

### System Configuration

The OW-202 system consists of a primary insertion-type probe, a microwave measurement electronics, and a Data Analysis System (DAS) which can be remotely located from the field sensor.

The OW-202 probe is an insertion type assembly, which is mounted perpendicular to the flow line. Installation at a point where the fluids are well mixed is required to ensure proper measurement. Common installation requires a 3" full port isolation valve connected directly to the nozzle on the flow line.

The Agar patented "seal-housing" connects to the isolation valve (see drawing). After installation, the OW-202 probe is inserted through the valve and nozzle into the flow line. The seal-housing allows for insertion, removal, and adjustment of the probe while the line is in service and under pressure.



**OW-202 Typical Installation**

The OW-202 probe head houses the microwave transmitting and receiving antennas, which connect to the microwave electronics via the probe shaft and the junction box. All mounted enclosures are explosion proof type, and provide the intrinsically safe microwave signal outputs/inputs to the antennas. The OW-202 sensor is suitable for operation in Zone 1 hazardous areas and has the area classification EEx d [ia] IIB T4 / Class 1, Division 1, Group C&D.

The DAS is also a flow computer which can provide net oil, net water and flow rates when flow meter input is supplied. Options for the DAS include a regular desktop PC or an industrial computer. The industrial computer is available housed inside a weather proof or an explosion proof enclosure for mounting in appropriate areas. The data from the sensor is transmitted to the DAS via an RS-422 communication channel. The distance between the OW-202 probe and the DAS can be up to 3000 ft.

## MEASUREMENT CAPABILITIES AND ACCURACY

Model	Range*	Accuracy Absolute	Repeatability Percent of Span
OW-202-100	0 to 100%	-1%	-0.1

\* Water Concentration. Contact Factory For Additional Range Options.

## PROCESS CONDITIONS

Ambient Temperature:	-4°F to 140°F (-20°C to 60°C) (Optional -40°F/C)
Process Temperature:	Standard Model 60°F to 200°F (15°C to 93°C) Optional High-Temp 60°F to 450°F (15°C to 232°C)
Salinity:	0 to 20% by weight (conductivity of up to 18 Si/m)
Wetted Parts:	Carbon or Stainless Steel; Teflon; Ceramic, Elastomer or Peek
Design Pressure:	

ANSI CLASS	PSIG*	BARS
150#	275	20
300#	720	50
600#	1440	100
900#	2160	150
1500#	3600	200

\*Carbon steel at 100°F.  
Contact factory for details.

## POWER SUPPLY

100/240 VAC, 50 or 60 Hz, or 12/24 VDC

Power Requirements: 34 Watts (100/240 VAC) , 24 Watts (12/24 VDC)

## SAFETY CERTIFICATION

CENELEC - EEx ia IIC T6

UL/C-UL - Class 1, Division 1, Groups C & D, T4

## DATA OUTPUT/INPUT

### STANDARD:

- Output Data: Oil/water concentration, error status, and temperature standard.
- Input Data: Flow; 1 pulse (0-5 to 0-30 V <2KHz) or 1 analog (4-20 mA)
- User Communication: RS-232, Protocol: Standard N/C - ASCII or Modicon Modbus.

### OPTIONS:

- Hand held terminal with digital display.
- If customer's flow meter input provided, Net Oil, Net Water, and Flow Rates are calculated.
- Salinity by weight.
- Outputs:
 

2 - Analog:	1-5 VDC, 2-10 VDC or 4-20 mA
3 - Pulse:	SPST relay or opto-isolated AC/DC switch output
1 - Relay Trip:	1 (SPST relay or opto-isolated AC/DC switch output)
- User Communication : Modem, RS-422, Hand Held Terminal

The Agar Oil/Water Monitor measures percent water through measurement of certain electrical properties of the hydrocarbon/water mixture. There are other constituents in such oil/water mixtures (such as sulfur, iron sulfide/oxide, etc.) that absorb electromagnetic energy at a rate that is equal to or even greater than that of water. When these interfering constituents are present and their content varies, the resultant change in composition of the oil/water mixture can cause a baseline shift in the energy absorption. The shift will be seen as variations in the measured percent water. This shift can be corrected with automatic instrumentation/algorithm (e.g., densitometer or sulfur analyzer) input or by manual adjustment of the OW-201's zero setting. In either case, prior knowledge of the interfering parameters and their variation will allow for most accurate measurement.