

# AGAR CORPORATION

## Process Measurement & Control



### OW 200 Series Watercut Monitors

#### *Liquid/Liquid Concentration*

Agar's OW-200 series is a second-generation design, microwave based liquid/liquid analyzer developed by Agar Corporation after introducing the first 0-100% water cut monitor to the market in 1985.

The OW 200 Series watercut monitors, consisting of the OW-201 and the OW-202 monitors, utilize a microwave transmitter (2.45 Gigahertz) to measure bulk dielectric properties of the flow stream. They measure hydrocarbon/water mixtures over the full range of 0-100%, regardless of the continuous phase. Unlike other microwave, density or capacitance based instruments; Agar's Oil/Watercut Monitors are the only devices in which the accuracy of the measurement is not affected by changes in salinity, density, viscosity, temperature or velocity of the components being analyzed. In addition, the high frequency signal will maintain accuracy in the presence of process coatings that would be detrimental to optical instruments.

#### **APPLICATIONS:**

- Crude Oil and finished pipeline monitoring
- Oil in wastewater
- Glycol and water
- Aqueous / organic measurement



OW 201 Series

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## OW-201 Series

In-line sizes: 2", 3" and 4"  
Water cut ranges: 0 - 100%

### Description

The AGAR OW-201 is a flow through oil/water monitor spool piece designed for service in line sizes up to 4" and water cut ranges 0-100%.

Using microwave technology to measure liquid-in-liquid concentrations, the AGAR OW-201 measures hydrocarbon/water mixtures over the full range of 0-100%, regardless of which liquid is the continuous phase.

A high temperature version of the OW-201, capable of process temperatures of 450 F (232 C), has been developed for thermal projects in Canada.



The fluid should be degassed with the sensor installed in a vertical section with ascending flow at a point where the fluids are well mixed to ensure proper measurement.

### OW-201 System Features:

- OW-201 sensor and Data Analysis System (DAS) with microwave measurement electronics housed in the same enclosure
- Display and serial communication which can be remotely located from the sensor up to 3000 feet away
- OW-201 sensor with flanged spool assembly that houses the microwave transmitting and receiving antennas
- Integrally mounted measurement electronics which are supplied in an explosion proof enclosure, and provide the intrinsically safe microwave signal outputs/inputs to the antennas
- OWMWin software and a null modem cable used to calibrate the device
- DAS enclosure that can be mounted up to 5' from the sensor

The DAS is also a flow computer that can provide net oil, net water and flow rates when flow meter input is supplied.

## OW-202 Insertion Type



### Description

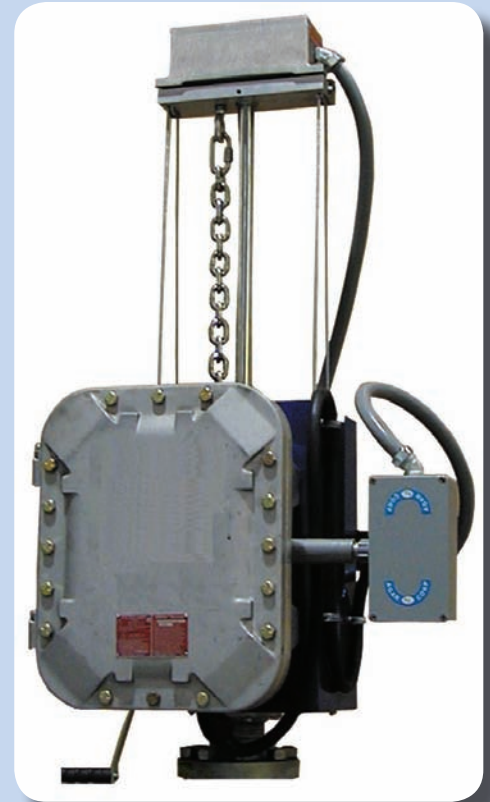
The AGAR OW-202 is an insertion type oil/water monitor designed for service in line sizes 6" and above and water cut ranges of 0-100%. This watercut monitor measures liquid-in-liquid concentrations using microwave absorption technology.

Sizes 6" and above for 0-100% water cut ranges

### OW-202 System Features:

- The OW-202 system consists of an insertion-style probe, the microwave measurement electronics, and a Data Analysis System (DAS) that can be remotely mounted up to 5 feet from the field sensor.
- The OW-202 probe is an insertion type assembly, mounted perpendicular to the flow in a vertical section with ascending flow at a point where the fluids are well mixed 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. After installation, the OW-202 probe is inserted through the valve and nozzle into the flow line. The seal-housing and optional insertion mechanism allows for insertion, removal, and adjustment of the probe while the line is in service and under pressure.

OW-202 Insertion Monitor



- The device is calibrated with OWM/WIN software on a laptop computer and a null modem cable. The software is also used for troubleshooting, viewing reading trends, and retrieving historical data.
- The system has a combination of explosion proof type enclosures and intrinsically safe electronics that provide microwave signal outputs/inputs to the antennas. The display and serial communication port can be located up to 3000' from the DAS. The DAS is also a flow computer that can provide net oil, net water and flow rates when a flow meter input is supplied. The data is transmitted with 4-20mA signals and Modbus.

## PHYSICAL DIMENSIONS

| Model      | Flange Size | Flange-to Flange Length** |
|------------|-------------|---------------------------|
| OW-201/202 | 2" (22mm)   | 27.0"                     |
|            | 3" (75mm)   | 27.75"                    |
|            | 4" (102mm)  | 27.75"                    |

\*\* Typical dimensions 600# Flanges. Contact factory for details.

## MEASUREMENT CAPABILITIES & ACCURACY

| Model      | Range*    | Accuracy Absolute | Reapeatability Absolute |
|------------|-----------|-------------------|-------------------------|
| OW-201/202 | 0 to 100% | ±1%               | ±0.2%                   |

\* Water Concentration. Contact Factory For Additional Range Options

## PROCESS CONDITIONS

|                         |  |
|-------------------------|--|
| Ambient Temperature     | -4°F to 158°F (-20°C to 70°C)<br>Optional Low Temp -40°F to 158°F (-40°C to 70°C)                  |
| Process Temperature     | Standard Model 32°F to 212°F (0°C to 100°C)<br>High Temperature Model 32°F to 450°F (0°C to 232°C) |
| Salinity                | 0 to 30%   |
| Maximum Pressure Rating | 1500# Flange Rating  |
| Wetted Parts            | Carbon or Stainless Steel; Graphite; PEEK; Kalrez  |

## POWER SUPPLY

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

Power Requirements: 30 Watts (100/240 VAC) or 30 Watts (12/24 VDC)

## SAFETY CERTIFICATION

ATEX:  II 2(1)G EEx d [ia] IIB T4

UL/C-UL: Class1, Division 1, Group 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-232/422/485 Full Duplex Protocol: Standard N/C - ASCII or Modicon Modbus.

Density input for low range correction

### OPTIONS:

If customer's flow meter input provided, Net Oil, Net Water, and Flow Rates are calculated.

Outputs: 2 - Analog: 1-5 VDC, 2-10 VDC, HART, 4-20 mA with galvanic isolation or intrinsically safe barrier  
3 - Pulse: SPST relay or opto-isolated AC/DC switch output  
1 - Relay: 1 (SPST relay or opto-isolated AC/DC switch output)

User Communication: Modem, RS-422

Remote mounting of display, serial communication port

Remote DAS Mounting (5' from sensor)

Power Supply

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 resulting 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 the most accurate measurement.

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ER No. 4967: SL0010 Rev -