

AGAR CORPORATION

Process Measurement & Control



MPFM SERIES

Multiphase Flow Meter (Oil/Water/Gas)

The AGAR MPFM is a low-cost multiphase meter that continues the long tradition of excellent multiphase meters provided by Agar for over 15 years. The AGAR MPFM combines advanced coriolis technology with traditional flow-measurement devices to achieve superior accuracy in the entire gas void fraction (GVF) range; 0-100%, including the wet gas regime from 95-100%. It is a low-cost, compact multiphase flow meter that can accurately measure oil, water, and gas flow rates without separation. The AGAR oil/water monitor is capable of measuring water cuts from 0-100% and is not affected by changing salinities.

The AGAR MPFM eliminates the need for expensive, secondary equipment such as phase separators, valves, and pumps for flow measurement. It is fully self-contained and compact for use in rugged field conditions and can easily be trailer-mounted for portable service.



*MPFM Compact
Standard In-Line*

MPFM SERIES ADVANTAGES:

- Gas void fraction 0-100%
- Water-cut 0-100%
- Not affected by flow regimes
- High accuracy, real-time flow measurement
- High and low viscosities
- No nuclear (radioactive) sources
- Compact, portable, and easy to transport and install
- Wet gas application



MPFM Series Features

THE STANDARD MPFM CONFIGURATION IS COMPRISED OF FOUR PRIMARY SUBSYSTEMS:

- The **mass flow and density measurement** is based on Agar's proprietary coriolis design and other ancillary sensors. Engineering advances allow Agar to utilize these sensors at extended operating multiphase flow ranges. The density data is fed into the AGAR Data Analysis System (DAS), which determines the net GVF.
- The **Agar Dual Venturi Meter** is used to measure momentum of the multiphase in extreme conditions where the flow is not homogeneous. This measurement with the Agar coriolis provide the net liquid flow rate and net gas flow rate.
- The **AGAR Water-Cut Meter** is used to measure water content accurately over the full range of 0-100% in both oil and water-continuous phases. Accuracy is not affected by changes in velocity, salinity, pH, viscosity, temperature, or density. Water-cut data is fed into the DAS and used to determine the individual oil and water flow rates from the net liquid flow rate.
- The **AGAR Data Analysis System (DAS)** performs on-line analysis of data acquired from the above subsystems to determine the oil, water, gas, and total fluid flow rates. It supports standard black oil models for the PVT calculations that convert the flow from process conditions to standard conditions. It can also support multiple customer specific PVT models or equations.

Optional subsystems are available for extreme high gas and/or low liquid flow ranges.



Compact MPFM Installation, South Texas

MPFM General Specifications



PERFORMANCE:

Gas Void Fraction	0 to 100%
Water cut	0 to 100%
Flow Regimes	All: (e.g. Bubbly, Wavy, Slug, Annular, etc.)
Pressure	Standard: Up to ANSI 1500# (higher pressures are optional)
Ambient Temperature	-4°F to 140°F (-20°C to 60°C) Optional Low Temp -40°F to 140°F (-40°C to 60°C)
Process Temperature	Standard Model 32°F to 212°F (0°C to 100°C) High Temperature Model 32°F to 450°F (0°C to 232°C) Extreme High Temperature model 32°F to 572°F (0°C to 300°C)
Liquid Viscosity	Low Viscosity Model: 0.1-100 cP High Viscosity Model: 0.1-2000 cP
Salinity	0 to 30% NaCl by weight (up to saturation)
Sand/Particulate	Up to 2% by volume and less than 1mm particle size
Max. Pressure Drop	Less than 15 psi (1 bar)
Wetted Parts	Standard: 316 Stainless Steel; Hastelloy, and other materials available on special order; According to ASME B31.1 and B31.3. PEEK; Ceramics Isolators; NACE compliant

MPFM General Specifications

PREFERRED INSTALLATION: Vertical upward flow

ELECTRICAL:

Power Supply: 24 VDC, 110 & 220 VAC

Power Requirements: 50 Watts for the basic option

SAFETY CERTIFICATIONS:

ATEX - Zone 1 Ex d -20°C<Ta<60°C

UL/C-UL - Class 1, Division 1, Group C&D

ROSTECHNADZOR (Russia, CIS), GOST-R, Metrology Pattern Approval

DATA COMMUNICATION: (STANDARD AND OPTIONAL)

Standard: 5 x 4-20 mA (oil flow rate, water flow rate, gas flow rate, temperature, pressure)

Standard: 3 x Pulses 0-5V square shape (oil flow rate, water flow rate, gas flow rate)











Standard: Modicon Modbus: RS-232/422/485 ASCII or RTU mode, Modbus TCP

Standard: Ethernet HTML user interface

Optional: Cellular modem and/or WiFi communication

The AGAR MPFM is a multiphase flow metering tool for field and well optimization, capable of handling all flow regimes.

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