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Flow Monitors Inc.

High Pressure Coolant Sensor Manifold MSM Series
For Deep Hole Drilling, Reaming, and Machining

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Modular Sensor Manifold MSM Series

High Pressure Coolant Flow Monitoring

TYPICAL APPLICATIONS

Deep Hole Drilling	Miscellaneous Machining
Grinding	Multiple Spindles
Milling	Reaming

Features

- **Fast response reduces tool breakage**
- **Eliminates downtime**
- **Rugged Compact Manifold Design (combine up to 6 flow sensors)**
- **Easy to install, operate, and maintain**
- **Two Programmable Set Points (open collectors) per unit**
- **LED Set Point Alarm Indicators**
- **Integral or Remote Digital LCD Rate Indicators**
- **Type 4 Enclosure, Weatherproof**
- **Process Connections: SAE, BSPP, ISO 6149**
- **Standard Operating Pressure to 1000 PSIG (69 BAR). Optional 2000 PSIG (138 BAR)**
- **Easy, quick field wiring — standard with 5-pin micro style connectors and cable**
- **Output of 4-20mA**
- **Subplate mounting design allows fast meter change-out due to tool changes**

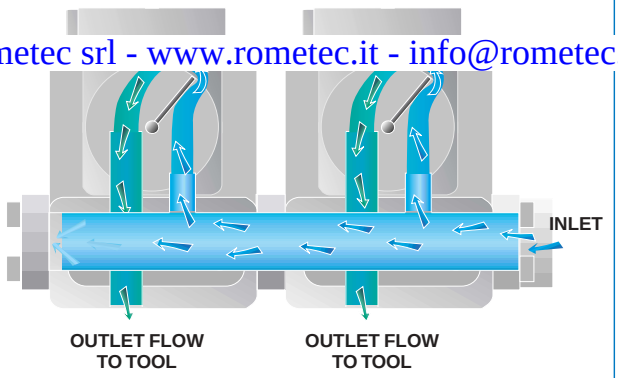
General Description

Universal offers a reliable flow metering system for machining coolant that is backed by extensive field experience. The shock absorbing design reliably withstands typical flow and pressure surges. The response is fast enough to save tools. Flow set-points are quickly adjustable through the meter display. If a tool change necessitates a new meter, UFM's new manifold mounted design cuts downtime and spares. Up to six monitors per manifold can be assembled to minimize space while simplifying piping, hosing, and wiring layouts. Linear 4-20mA transmitted signals and open collector outputs are pin connected.

This truly modular Sensor Manifold allows easy replacement and maintenance of the flow metering unit without disturbing the piping. When tooling changes require flow monitor changes, it is now very simple. A tie-rod system holds the manifold sections together, with O-ring seal between each section. Each manifold section has its own flow monitor that is attached using four bolts. To change the flow monitor, simply remove the bolts, and replace the unit.

The flow monitor offers an integral LCD display with optional remote. Display is shown in liters or gallons per minute. Additionally, two open collector outputs are available for configuration of high and low flow alarms. These are set using membrane switches, and have two integral LEDs that show when the flow reaches the preset levels. The full-complement of electronic options offer a range of local and remote control strategies.

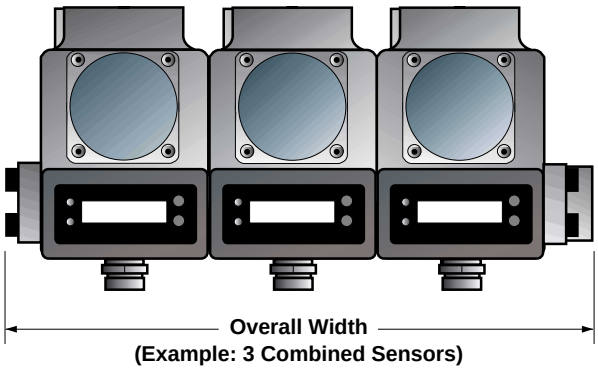
The simplicity of this mechanical design provides ease of maintenance, quick replacement, simple capacity modifications, use and stocking of common components, thus reducing inventory of spares and associated costs dramatically.



HOW IT WORKS:
Fluid enters a common manifold and then is divided through separate metering chambers (up to 6 destinations). Each separate flow has it's own linear 4-20mA signal, digital display, and 2 programmable alarm points.

Dimensions of MSM Series

Approximate in inches

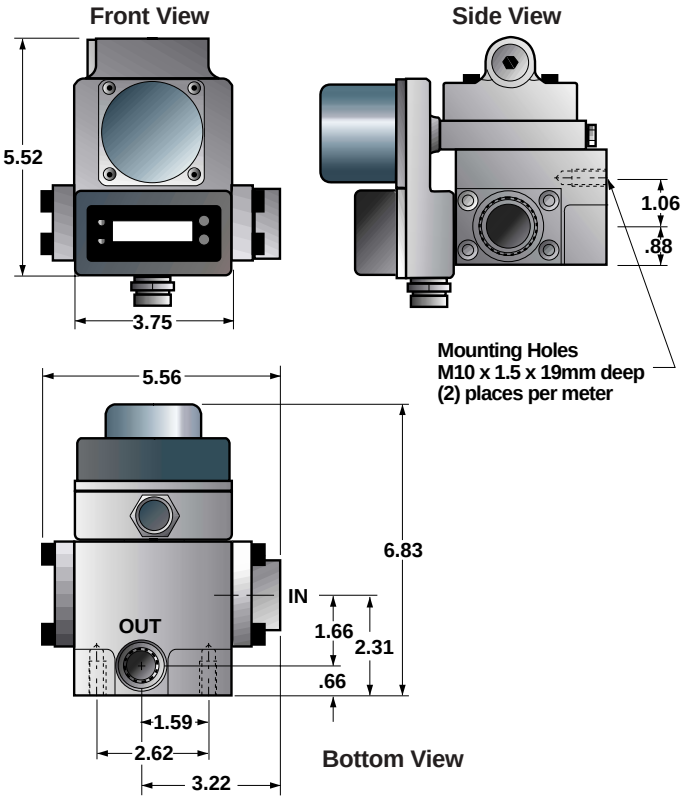


No. of Sensors	1	2	3	4	5	6
Overall Width	5.56	9.31	13.06	16.81	20.56	24.31

Specifications

Maximum Fluid Temperature ..... 200°F (93°C)
Maximum Ambient Temperature ..... 175°F (80°C)
Maximum Operating Pressure ..... 1000 PSIG (69 BAR)
..... (Optional 2000 PSIG, consult factory)
Signal Output (Flow Rate) 4-20mA
Response Time ..... 250 milliseconds response to 100% of flow
..... Output clamped at 21mA
Alarm Outputs ..... 2 Opto-Isolated Open Collector Transistor Outputs
..... Maximum load is 50mA at 30 VDC
LED Indicators ..... 2 LED alarm output status indicators
Display LCD ..... 4 1/2 Digit LCD, 0.375" high
Input Power ..... 24 VDC Loop Powered (2-wire transmitter)
Unit of Measure ..... Flow rate in GPM or LPM
Mounting ..... Remote mounting of display and transmitter (optional)
Set Points ..... High and low setpoints displayed and adjusted on LCD
Ratings ..... Enclosure, TYPE 4
Readout Accuracy ..... ±5% of F.S.
Approvals ..... CSA and CE for heavy industrial applications

MSM Meter with integral LCD

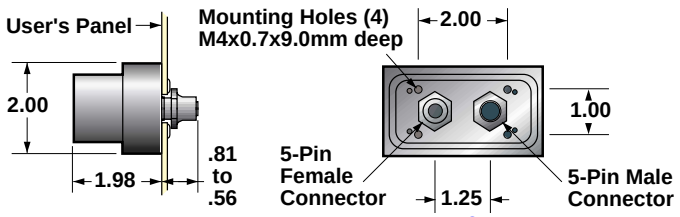


Theoretical Tool Flows

Hole Size In Tool (Inches)	250 PSI (GPM)	500 PSI (GPM)	1000 PSI (GPM)
.055 ID x 12	.065	0.82	1.2
.055 ID x 24	0.50	0.65	0.85
.065 ID x 12	0.82	1.2	1.3
.065 ID x 24	0.8	1.0	1.2
.092 ID x 12	1.2	2.8	4.0
.092 ID x 24	1.0	1.5	3.0
.115 ID x 12	3.0	4.5	6.0
.115 ID x 24	2.0	3.0	4.75
.120 ID x 12	4.0	5.8	7.5
.120 ID x 24	3.0	4.1	6.0
.181 ID x 12	12.6	17.0	20.5
.181 ID x 24	10.0	13.0	17.5

Above chart for various hydraulic conditions

Remote Transmitter / LCD Readout



How To Order MSM Series

Select the appropriate symbols to build a model code:

Example: MSM-N S F 10GPM-B-32V1.0-GTLI-CC

SERIES

Modular Sensor Manifold Meter & Transmitter Only = **MSM**
(To order without a manifold, omit the "MSM" portion of the model code)

Meter Only = **No Symbol**
(To order without a manifold and transmitter, omit the "MSM" portion of the model code and select "GP" under CONTROL BOX selection)

MATERIALS OF CONSTRUCTION

Housing Material
Cast Iron Nickel Plated = **N**

Internals
Stainless Steel = **S**

Seal Material
Viton = **F**

Maximum Flow Rate

5 GPM	= **5GPM**
10 GPM	= **10GPM**
20 GPM	= **20GPM**
20 LPM	= **20LPM**
40 LPM	= **40LPM**
75 LPM	= **75LPM**

CONNECTIONS (Electrical)

CC = Conduit Connection
No Symbol = Pin Connection

CONTROL BOX

GTLI = Integral Transmitter w/LCD (with or without Manifold)
GPLR = Remote Transmitter w/LCD (with or without Manifold)
GP = No Transmitter (UT-PM-DTLCD)

FLUID CHARACTERISTICS

32V1.0 = 32 SUS and 1.0 Specific Gravity

PORT

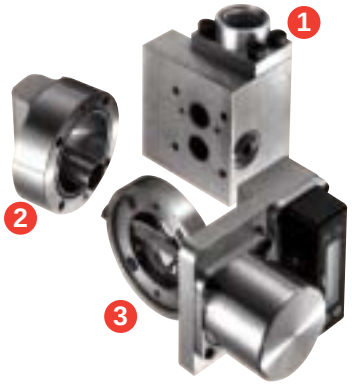
	Description	Inlet	Outlet
T =	SAE	J1926-16	J1926-1-8
B =	BSPP	ISO-1179-1	ISO-1179-1
I =	ISO6149	M33X2	M18X1.5

Available Accessories - How To Order

Remote 4-20mA two wire transmitter with LCD display and field adjustable open collector alarms = Model UT-PM-DTLCD

Single MSM Meter with remote LCD transmitter.

Three MSM Meters with integral LCD.



Exploded unit shows design simplicity. 1) Manifold. 2) Cover. 3) MSM Meter with integral LCD and transmitter.

UNIVERSAL UFM

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