



TRACER[®]_{VM} FLOWMETER with USER INTERFACE

General Description

Tracer_{VM} Flowmeter with User Interface measures liquid flow rate and temperature while providing a selectable analog voltage and programmable switch. Tracer_{VM} Flowmeter with User Interface displays Reynolds Number, calculates BTU's per minute and incorporates FCI (Fluid Characteristic Indicator) in support of Scientific CoolingSM principles.

Vortex sensor technology is highly accurate and repeatable without moving parts. Flow reading is direction specific. Refer to the arrow on the body for correct flow direction for installation.

Separate analog outputs facilitate data collection of temperature and flow rates. The voltage outputs are user-selectable using on-screen menus: 0.5 to 3.5/4.1 Volts, 0 to 5 Volts or 0 to 10 Volts.

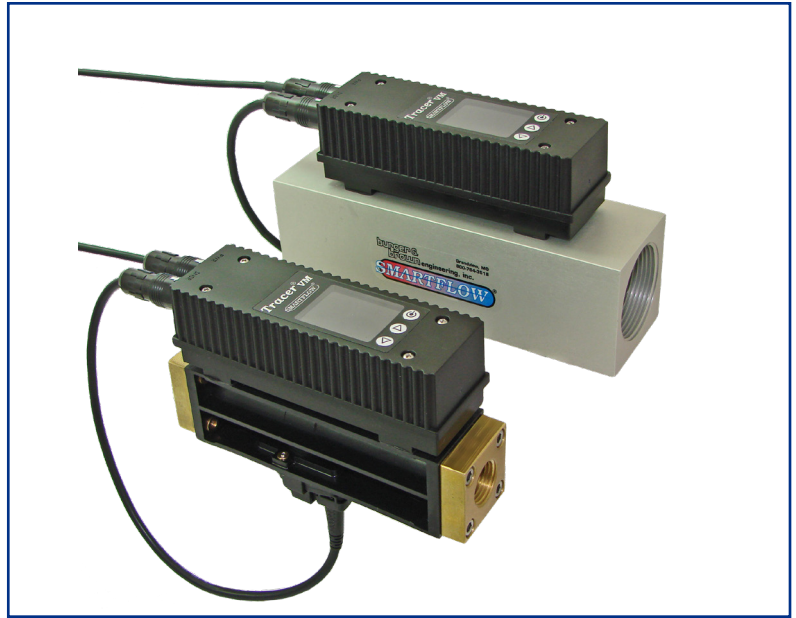
FCI helps optimize systemic water usage. "TF" on the digital display signifies the presence of Turbulent Flow, or optimum cooling water efficiency. 0, 10, 20 or 30% glycol mix is supported in Turbulent Flow calculations.

SPDT switch is programmable for one to four set points: low flow, high flow, low temperature, high temperature or turbulent flow condition. Set points may be turned on or off in any combination to signify an alarm state.

Totalizer function provides volume display from a user-selected start point. (Maximum value is approximately 42,949,000 liters or 11,338,000 gallons.)

New Reynolds Number Display provides instant Turbulent Flow information based on water temperature, flow rate, cooling line diameter and glycol content. See page 4 for Turbulent Flow and Value Curve information.

8 to 28VDC Power Source is required to supply the flowmeter. Sealed push-buttons configure the flowmeter and switching operations through user-friendly menus.



Applications

Tracer flowmeter is suitable for use in industrial water applications such as: injection mold cooling, die cast cooling, filter condition indication and more.

Tracer_{VM} Flowmeter with User Interface is ideally suited for connection to data acquisition systems. These systems give plastics injection molders real-time statistical process control.

Annual calibration is recommended for best results. Flow sensor and user interface electronics are paired and must be used together once calibration is complete.

Remote User Interface

User Interface may be mounted up to 2.9M (9.5ft) away from the Tracer_{VM} Base Model (sensor and flow body without display). Use the "R" designator in the model number for a completely new unit or order a stand-alone Remote User Interface to use with an existing Base Model.

Add User Interface to Existing Base Model

Tracer_{VM} Base model without User Interface can be upgraded. User interface electronics installation, initial setup and calibration are performed at the factory. See page 4 for ordering information.

**bunger &
brown
engineering, inc.**

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*Design and specifications are subject to
change without notice.*

Specifications

Flow Ranges and Accuracy		
Body Size	Range (LPM)	Range (GPM)
3/8" & 1/2"	1 to 15	.3 to 4
3/8" & 1/2"	2 to 40	.5 to 10.6
3/4" & 1"	5 to 100	1.3 to 26.4
1" & 1-1/2"	10 to 200	2.6 to 52.8

Flow Accuracy..... $\pm 1.5\%$ of Full Scale
Temperature Range..... 0°C to 120°C
(32°F to 248°F)

Temperature Accuracy $\pm 0.5^{\circ}\text{C}$

Operating Pressure 10.3 bar max.
(150 psi max.)

Power

Power Supply 8 to 28 VDC (external)

Switch Rating 30 VDC/30VAC

Flow and Temp Signals 0 to 5 or 0 to 10 VDC

Materials

Sensing Element

.....Silicone-Based MEMS Sensor

Seal (sensor to housing)..... EPDM

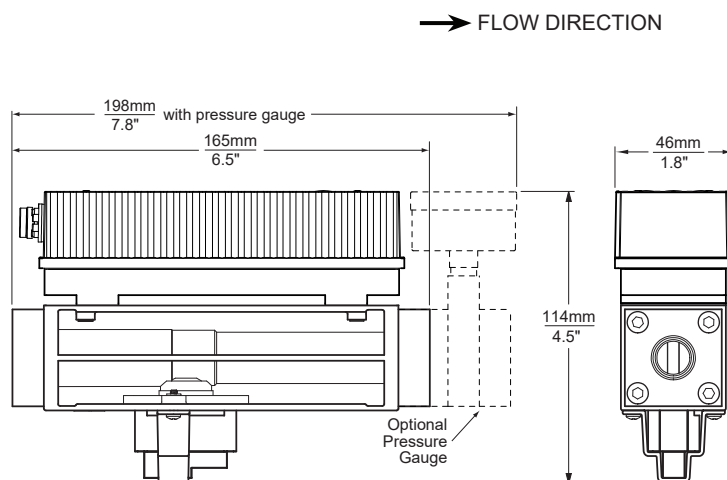
Insert PPA 40 GF

3/8" & 1/2" Body Size Glass-Filled Nylon

Flow Body with
Brass or Nylon End Caps

3/4" thru 1-1/2" Body Size...Anodized Aluminum
or Stainless Steel Flow Body

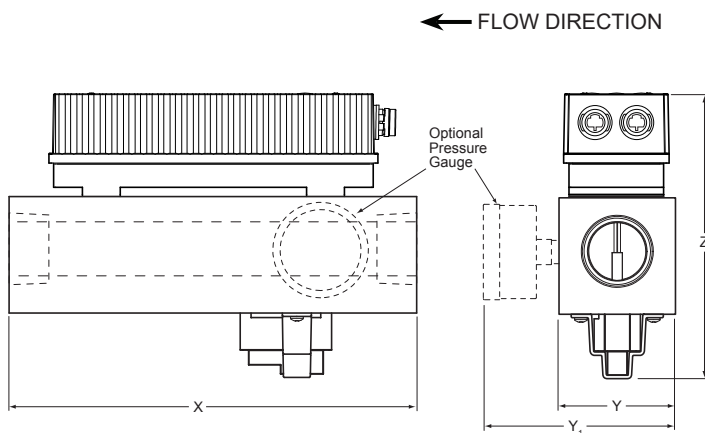
3/8" or 1/2" Body Sizes (Nylon or Brass End Caps)



3/4" thru 1-1/2" Body Sizes

Aluminum or Stainless Steel

(pressure gauge not available with AL body)



Dimensions (mm/inches)				
Body Size	X	Y	Y₁	Z
3/4", 5 to 100 LPM	178/7.0	45.7/1.8	77/3.1	117/4.6
1", 5 to 100 LPM	178/7.0	45.7/1.8	77/3.1	117/4.6
1", 10 to 200 LPM	178/7.0	51/2.0	84/3.3	122/4.8
1-1/2", 10 to 200 LPM	198/7.8	58/2.3	90/3.6	130/5.1

Directives

Flow sensors are in conformity with these Council directives on the approximation of the laws of the EC member states:

- Low Voltage Directive (2006/95/ED)
Standards used: EN 61010-1:2001
- EMC Directive (2004/108/EC)
Standards used: EN 61326-1:2006 and

61326-2-3:2006

Smartflow Vortex flow sensors fall under Article 3, 3 of PED Directive 97/23/EEC and are therefore not required to be CE-marked according to this directive.

SMARTFLOW[®] Tracer[®] VM Flowmeter with User Interface

Model Number

VM 3 - B - 15H - L - P1Q					
Body Size				Options	
3/8"NPT	3	B or N	15H 40H	P1	30 psi Pressure Gauge
3/8"BSPP	3B			P2	60 psi Pressure Gauge
1/2"NPT	4			P3	100 psi Pressure Gauge
1/2"BSPP	4B			P4	160 psi Pressure Gauge
3/4"NPT	6	AL or SS	100H	(Pressure gauges not available with AL body material)	
3/4"BSPP	6B				
1"NPT	8	AL or SS	100H 200H	Q	Delta-Q® Precision Flow Regulator (use with VM3 or VM4 only)
1"BSPP	8B				
1-1/2"NPT	12	AL or SS	200H	User Interface	
1-1/2"BSPP	12B				
				R	Remote (display housing on mounting plate w cable connection to flow body)
Body Material			Flow Range		
Glass-Filled Nylon with Brass End Caps Nylon End Caps (3/8" and 1/2" only)	B N		15H	1 to 15 LPM (.3 to 4 GPM)	
			40H	2 to 40 LPM (.5 to 10.6 GPM)	
Anodized Aluminum Stainless Steel (3/4" and larger only)	AL SS		100H	5 to 100 LPM (1.3 to 26.4 GPM)	
			200H	10 to 200 LPM (2.6 to 52.8 GPM)	

How To Order	
Two part numbers are required for each order.	
1. Choose the model number from the page.	
2. Choose cable per below	
EFM-CBL-OPC..... (standard, e	

User Interface

- L Local (display housing attached to flow body, standard)
R Remote (display housing on mounting plate with 2.9(M) cable connection to flow body)

How To Order

Two part numbers are required to order.

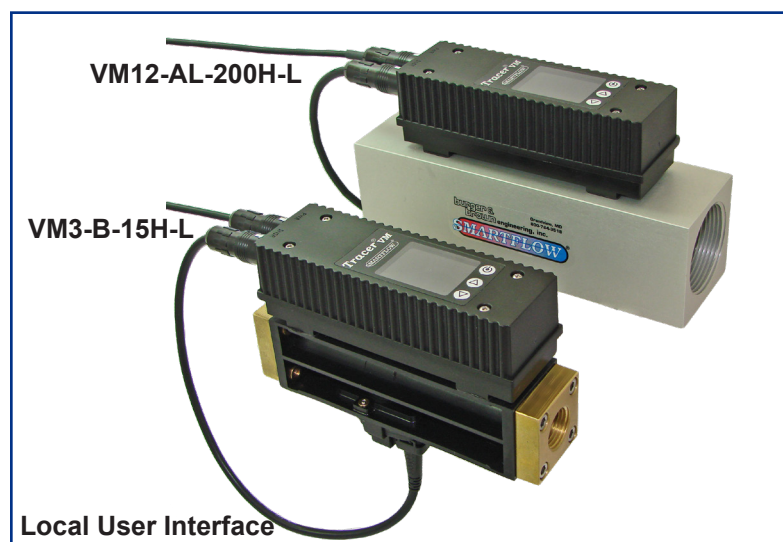
1. Choose the model number from this page.

2. Choose cable per below:

EFM-CBL-OPC.....Loose leads (standard, ends stripped)

CBL-VMI-WWA 120VAC power supply wall adapter

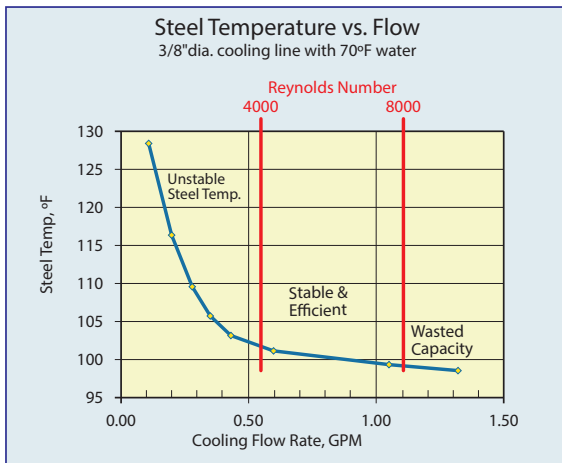
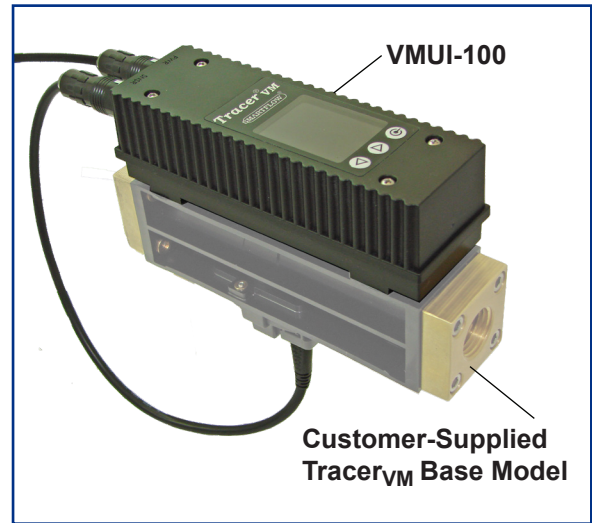
EFM-CBL-OPC-O..... Cylindrical connectors for use with RJG IA1 module



Add User Interface to Existing Tracer_{VM} Base Model

User Interface can be added at the factory to customer-supplied Tracer_{VM} without local display. Two part numbers are required.

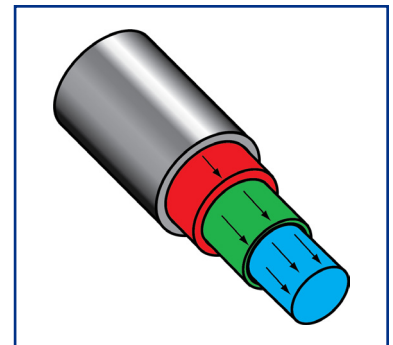
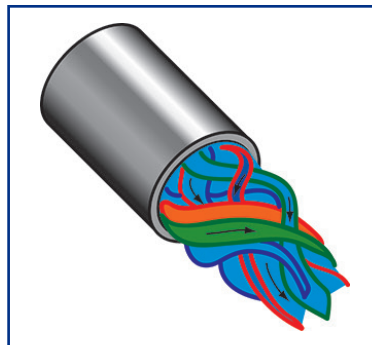
1. Contact the factory for RMA number.
2. Local Interface, order part number: **VMUI-100**
-or-
Remote Interface, order part number: **VMUI-100-R**
3. Choose cable per below:
EFM-CBL-OPC Loose leads
(standard, ends stripped)
CBL-VMI-WWA 120VAC power
supply wall adapter
EFM-CBL-OPC-O Cylindrical
connectors for use with
RJG IA1 module



Turbulent Flow Basics

Turbulent water flow is much more efficient at removing heat in a cooling system than water flowing under laminar conditions. Once turbulent flow is achieved, increasing the flow rate does not significantly improve the cooling rate of the system. In molding applications, many mold operators try to maximize the flow of water through their cooling systems to ensure turbulent flow. Doing so increases energy costs for pumping more water than necessary through the system. This practice may also limit the amount of cooling water available for cooling additional molds on the same cooling system circuit. By insuring turbulent flow using FCI Technology, less water can be used in the molding process, saving precious resources.

Try our on-line Turbulent Flow Calculator:
www.SMARTFLOW-USA.com/turbulent-flow-rate-calculator



burrer & brown engineering, inc.

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