

# IM100A

## IP66, Metal-Sealed, Digital Mass Flow Meter



The IM100A is a general purpose, metal-sealed, MFM well suited for use in harsh environments where resistance to liquid, or dust, are critical. The IM100A meets these requirements with its IP66 rated enclosure design. The IM100A incorporates the latest in digital flow control electronics along with a well proven, patented thermal sensor and mechanical design for measurement of Full Scale flow rates from 100 sccm to 100 SLM. This MFM is available with either analog or digital I/O. The digital control electronics utilize the latest in MKS control algorithms providing accurate, and repeatable, flow measurement.

The multi-gas/multi-range capability, along with tight performance specifications for accuracy, allow users to minimize inventory of high flow MFM part numbers.

The multi-gas/multi-range feature (along with other custom controls) is accessed through the MFM embedded diagnostic interface, that requires no special software or hardware to operate. A standard Ethernet cable and JAVA-enabled HTML browser, widely available, are all the tools needed. The critical gas parameters for typical high flow rate gases are already stored on the device. Configuring the device is simply a matter of selecting the gas from a drop down menu and specifying the desired full scale flow range. The diagnostic interface also allows the user to perform routine device health checks, plot flow, and store operating data for off-line analysis.

### Product Features

- Embedded user interface provides the ability to
  - Easily change device range and user gas reducing inventory requirements
  - Monitor device functionality and collect performance data in-situ
  - Adjust flow calibration for chamber-to-chamber and tool-to-tool process matching
- 10µ inch electropolished 316L surface finish enables MFM use for high purity applications
- Compact 3 inch footprint with high flow 4 VCR fittings allows the user to increase system flow rate without the need to modify gas lines
- IP66 rated enclosure provides protection against ingress of water and dust present in harsh environments

US Patent No 5461913.



### Key Benefits

- Patented thermal sensor design provides exceptional zero stability
- Percent of set point accuracy (calibration gas) enables precise process control

## Specifications

### Performance

Full Scale Flow Ranges (N <sub>2</sub> equivalent)	50,000 - 100,000 sccm
Maximum Inlet Pressure	500 psi
Proof Pressure	1000 psig
Burst Pressure	1500 psig
Measurement Range	0.1% to 100% of Full Scale (range on mech.)
Typical Accuracy (with N <sub>2</sub> calibration gas)	±1% of Reading
Repeatability	±0.3% of Reading
Resolution	0.1% of Full Scale
Temperature Coefficients	Zero Span <ul style="list-style-type: none"> <li>• &lt;0.05% of Full Scale/°C</li> <li>• &lt;0.08% of Reading/°C</li> </ul>
Inlet Pressure Coefficient	
Warm-up Time (to within 0.2% of Full Scale of steady state performance)	30 minutes
Operating Temperature Range (Ambient)	10°C to 50°C
Storage Humidity	0 to 95% Relative Humidity, non-condensing
Storage Temperature	-20° to 80°C (-4° to 149° F)

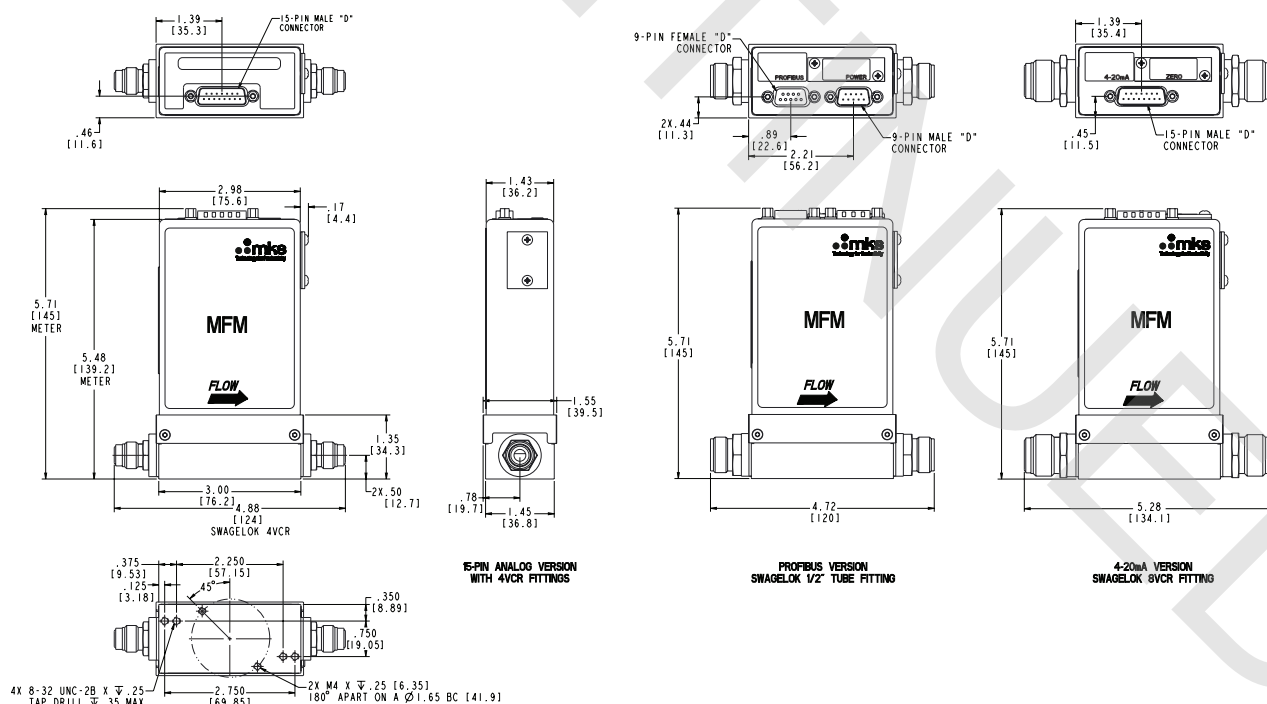
### Mechanical

Fittings (compatible with)	Swagelok® 4 VCR® high flow male, Swagelok 8 VCR male, 1/2" Swagelok, 10mm Swagelok, KF-16
Leak Integrity	External (scc/sec He)
	<1 x 10 <sup>-10</sup>
Wetted Materials	Standard
	316L S.S. VAR (equivalent to 316 S.S. SCQ for semiconductor quality), 316 S.S.
Surface Finish	10μ inch average Ra
Weight	<2.5 lbs (1.1 kg)
Enclosure Rating	IP66

### Electrical Analog I/O

Input Power Required	+15 to +24 VDC @ (<2 watts)
Flow Input/Output Signal	Voltage (0 to 5 VDC) Current (4 to 20 mA)
	<ul style="list-style-type: none"> <li>• 15 pin Type "D" male, 9 pin Type "D" male</li> <li>• 15 pin Type "D" male</li> </ul>
Compliance	CE

Digital I/O	Profibus®
Input Power Required	+15 to +24 VDC (<2 watts)
Connector	<ul style="list-style-type: none"> <li>9 pin Type D male (power)</li> <li>9 pin Type D female (comm.)</li> </ul>
Data Rate Switch/Selection	<ul style="list-style-type: none"> <li>No switch</li> <li>Set data rate via Profibus</li> </ul>
Comm. Rate(s)	9.6 Kbps to 12 Mbps
MAC ID Switches/Addresses	2 switches, 10 positions
Network Size	Up to 99 nodes
Visual Indicators	<ul style="list-style-type: none"> <li>LED Comm (green/red)</li> <li>LED Error (green/red)</li> </ul>
Compliance	CE



Dimensional Drawings - Unless otherwise specified, dimensions are nominal values in inches (mm referenced).

## Ordering Information

Ordering Code Example: IM100A013105TH30020	Code	Configuration
Model		
MFM Mass Flow Meter IM100A	IM100A	IM100A
Gas (per Semi Standard E52-0703)		
013 = Nitrogen = N <sub>2</sub> 029 = Ammonia = NH <sub>3</sub> 110 = Sulfur Hexafluoride = SF <sub>6</sub>	013 029 110	013
Flow Range Full Scale*		
50000 sccm 75000 sccm 100000 sccm	504 754 105	105
Fittings (compatible with)		
10mm Swagelok 12mm Swagelok 1/2" Swagelok 3/8" Swagelok Swagelok 4 VCR male (high flow) Swagelok 8 VCR male Swagelok 8 VCO male (Consult Factory) KF-16	P F K J R T D U	T
Connector		
Profibus (1480 Compatible) Profibus (1179B Compatible) Analog 0 to 5 VDC (15 pin D connector) Analog 4 to 20 mA (15 pin D connector)	4 3 B H	H
Valve/Device Type		
No Valve/Mass Flow Meter	30	30
Reserved		
Reserved	0	0
Firmware		
Unless otherwise specified, MKS will ship firmware revision current to date.	20	20

\* The Full Scale flow rate is designated by a 3 digit number. The first two digits represent the significant digits of the Full Scale flow rate separated by a decimal point. The third digit is the exponent of the power of ten. Example Flow Rate Code:

254 is  $2.5 \times 10^4$  or 25000 sccm

153 is  $1.5 \times 10^3$  or 1500 sccm

605 is  $6.0 \times 10^5$  or 60000 sccm