

IM50A

IP66, Digital Mass Flow Meter



The IM50A, a general purpose, metal sealed Mass Flow Meter (MFM), is well suited for harsh environments where resistance to liquid, or dust, is critical. The IM50A meets these requirements due to its IP66 enclosure design.

The IM50A supports a wide variety of applications requiring flow metering from 5 sccm to 50 slm Full Scale, N₂ equivalent. The IM50A Meter incorporates the latest in digital flow meter electronics along with a well proven, patented thermal sensor and mechanical design.

The IM50A digitally calibrated MFM is available with either analog or digital I/O. The digital electronics utilize the latest MKS algorithms providing multi-gas/multi-range

measurement capability. Included is a digital calibration that yields 1% of Reading accuracy on the calibration gas. All IM50As include Modbus as an available secondary I/O.

The IM50A utilizes the standard 3-inch footprint most often used by MFMs in the 5 sccm to 50 slm flow rate range. The IM50A metal sealed MFM, with its all-metal 316 stainless steel body, is well suited for use in high purity process applications.

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
- 10μ inch electropolished 316L surface finish enables MFM use for high purity applications
- Choice of digital (Profibus) or analog (0 to 5 VDC or 4 to 20 mA) I/O
- IP66 rated enclosure provides protection against ingress of water and dust present in harsh environments



Key Benefits

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

Specifications

Performance

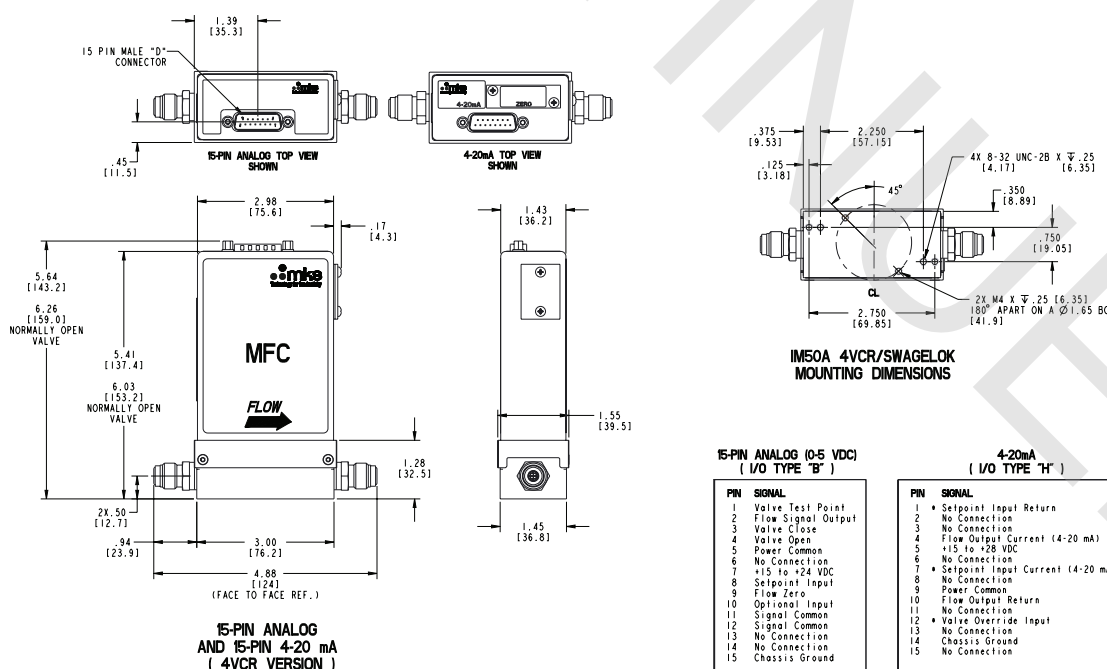
Full Scale Flow Ranges (N ₂ equivalent)	5 - 50000 sccm
Maximum Inlet Pressure	500 psi
Proof Pressure	1000 psig
Burst Pressure	1500 psig
Measurement Range	0.1% to 100% of Full Scale (range on mech.)
Typical Accuracy (with N ₂ calibration gas)	±1% of Reading
Repeatability	±0.3% of Reading
Resolution	0.1% of Full Scale
Temperature Coefficients	Zero Span <ul style="list-style-type: none"> • <0.05% of Full Scale/°C • <0.08% of Reading/°C
Inlet Pressure Coefficient	<0.02% of Reading/psi
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 176° F)

Mechanical

Fittings (compatible with)	Swagelok® 4 VCR® male, 1/4" Swagelok compression seal, surface mount, Swagelok 8 VCR male, 1/8" Swagelok, 1/2" Swagelok, 6 mm Swagelok, 8 mm Swagelok, KF16, 3/8" Swagelok, 12mm Swagelok, 2 VCR male
Leak Integrity	External (scc/sec He) <1 x 10 ⁻¹⁰
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 (electropolished)
Weight	<2.5 lbs (1.1kg)
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"> • 15 pin Type "D" male, 9 pin Type "D" male • 15 pin Type "D" male
Compliance	CE	
Digital I/O		
Input Power Required	+15 to +24 VDC (<2 watts)	
Connector	<ul style="list-style-type: none"> • 9 pin Type D male (power) • 9 pin Type D female (comm.) 	
Data Rate Switch/Selection	<ul style="list-style-type: none"> • No switch • Set data rate via Profibus 	
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"> • LED Comm (green/red) • LED Error (green/red) 	
Compliance	CE	



Dimensional Drawing — Analog 15 pin D for either 0 to 5 VDC or 4 to 20 mA I/O shown above with VCR fittings*

*(See manual for additional I/O and fitting types)

Note: Unless specified, dimensions are nominal values in inches (mm referenced).

Ordering Information

Ordering Code Example: IM50A013502RB3020	Code	Configuration
Model		
MFM Mass Flow Meter IM50A	IM50A	IM50A
Gas (per Semi Standard E52-0703)		
013 = Nitrogen = N ₂ 029 = Ammonia = NH ₃ 110 = Sulfur Hexafluoride = SF ₆	013 029 110	013
Flow Range Full Scale*		
5 sccm 10 sccm 20 sccm 50 sccm 100 sccm 200 sccm 500 sccm 1000 sccm 2000 sccm 5000 sccm 10000 sccm 20000 sccm 30000 sccm 50000 sccm	500 101 201 501 102 202 502 103 203 503 104 204 304 504	502
Fittings (compatible with)		
6 mm Swagelok 8 mm Swagelok 10 mm Swagelok 12 mm Swagelok 1/8" Swagelok (for 1000 sccm N ₂ equivalent or below) 1/4" Swagelok 1/2" Swagelok 3/8" Swagelok Swagelok 4 VCR male Swagelok 8 VCR male C-seal surface mount as per SEMI 2787.1 W-seal surface mount as per SEMI 2787.3F KF16 Swagelok 2 VCR (for 1000 sccm N ₂ equivalent or below)	M E P F A S K J R T C H U B	R
Connector		
Profibus (180 Compatible) Profibus (179B Compatible) Analog 0 to 5 VDC (15 pin D connector) Analog 4 to 20 mA (15 pin D connector) Analog 0 to 5 VDC (15 pin D Connector), Brooks (Consult Factory) Analog 0 to 5 VDC (15 pin D Connector), Celerity (Consult Factory)	4 3 B H E U	B
Valve/Device Type		
No Valve/Mass Flow Meter	30	30
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 2.5×10^4 or 25000 sccm 153 is 1.5×10^3 or 1500 sccm 601 is 6.0×10^1 or 60 sccm