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mks

IM250A

INDUSTRIAL MASS FLOW CONTROLLER, IP66 RATED, MULTI-GAS/MULTI-RANGE, FLOW RATES UP TO 250 SLM

The IM250A mass flow controller, is a metal-sealed, multi-gas/multi-range MFC designed for use in harsh environments where resistance to liquid or dust ingress are essential. Applications include Biotech, Pharmaceutical, Food and Beverage where “hosedown” may be required in addition to industrial glass production where moisture and dust are present. With its IP66 rated enclosure, the IM250A meets these stringent requirements of these aggressive environments.

The IM250A is capable of being ranged from 100 to 250 slm Nitrogen Full Scale flow with a single device. This broad range is enabled by the IM250A’s unique control valve design, which provides for rapid set point response while maintaining closed conductance leak rates - well below other typical high flow MFCs.

The performance capabilities of the IM250A - fast settling time (< 2 seconds) and 1% of set point accuracy - exceed those of other typical high flow MFCs. Precise control is maintained down to 2% of the IM250A’s configured Full Scale. This performance, combined with the multi-gas/multi-range capability, extends the user’s ability to minimize high flow MFC inventory requirements.

Utilization of the multi-gas/multi-range feature is made simple through the device’s embedded software and standard Ethernet interface that requires no special software or hardware to operate, only a standard web browser and a PC. Already stored on the device are critical gas parameters for typical high flow rate gases. It’s simply a matter of selecting the gas and specifying the Full Scale flow range to configure the device. This interface also allows the user to perform device diagnostics, plot flow and store data for offline analysis.

Features & Benefits

Improved Performance

- IP66 rated enclosure provides protection against ingress of water and dust present in harsh environments
- Fast response to set point change reduces flow stabilization time for short process steps, enhancing process throughput
- Tightly controlled flow accuracy of process gas enables improved process matching
- Reduced inlet pressure (pressure drop) requirement simplifies gas supply regulation from a single source

Reduces Overall Costs

- Reduces MFC inventory through its multi-gas/multi-range capability
- Accurate flow control over a wide dynamic range, even when down ranged, reduces need for an additional low range MFC

Easy to Integrate and Operate

- Device configuration and diagnostics made simple through standard Ethernet interface
- Uses a standard web browser with no special software required

Patents Pending

Flow Solutions

WWW.MKSINST.COM

Performance

Full Scale Flow Ranges *(N_2 equivalent)*	100 to 250 slm
Maximum Inlet Pressure	150 psig (cannot exceed pressure differential requirement across MFC)
Normal Operating Pressure Differential *(with atmospheric pressure at the MFC outlet)*	25 to 45 psid
Proof Pressure	1000 psig
Burst Pressure	1500 psig
Control Range	2% to 100% of F.S. (range on mech.)
Typical Accuracy	± 1% of set point for > 20% to 100% F.S. ± 0.2% of F.S. for 2% to 20% F.S.
Repeatability	± 0.3% of Reading
Resolution	0.1% of Reading
Temperature Coefficients	
Zero	< 0.05% of F.S./°C
Span	< 0.08% of Rdg./°C
Inlet Pressure Coefficient	< 0.02% of Rdg./psi
Typical Controller Settling Time *(per SEMI Guideline E-17-0600)*	< 3 sec typical above 10% F.S. @ 50 psi
Warm-up Time *(to within 0.2% of F.S. of steady state performance)*	< 30 min
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)
Temperature Display	0 to 85°C
Temperature Readout Units	°C
Temperature Accuracy	± 2°C
Temperature Resolution	0.1°C

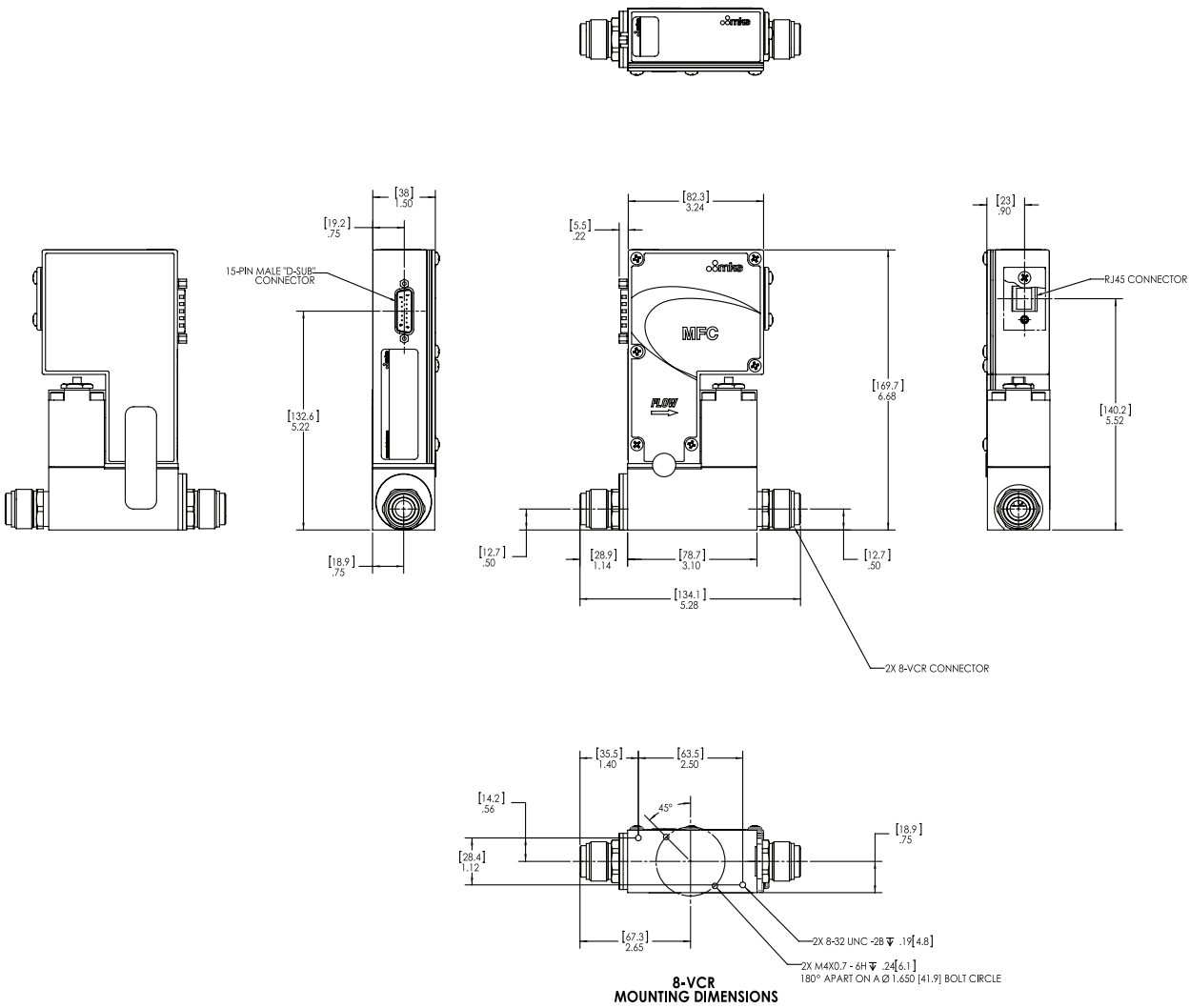
Mechanical

Fittings *(compatible with)*	Swagelok® 8 VCR®
Leak Integrity	
External (scc/sec He)	< 1 x 10^{-10}
Through closed valve	< 1.0% of configured F.S. at 40 psia to vac (<500 mTorr) (To assure no flow-through, a separate positive shut-off valve is required.)
Wetted Materials	
Standard	316L S.S. VAR (equivalent to 316 S.S. SCQ for semiconductor quality), 316 S.S., Elgiloy, 430FR, Buna-N, nickel, polyimide
Surface Finish	10 µinch average Ra
Weight	less than 3.6 lbs. (1.64 kg)
Enclosure Rating	IP66

Electrical Analog I/O

Input Power Required	+15 to +24 VDC @ (< 8 watts)
Flow Input/Output Signal	
Voltage (0 to 5 VDC)	15-pin Type “D” male
Current (4 to 20 mA)	15-pin Type “D” male
Compliance	CE

Dimensional Drawing



Dimensional Drawing

Note: Unless specified, dimensions are nominal values in inches (mm referenced).
**(See manual for additional I/O and fitting types)*

Ordering Information

Ordering Code Example: IM250A013255TBM010	Code	Configuration
MFC High Flow Mass Flow Controller (multigas, multi-range)	IM250A	IM250A
Gas*		
For example: 001 = Helium = He 004 = Argon = Ar 007 = Hydrogen = H_2 013 = Nitrogen = N_2	 001 004 007 013	013
Flow Range Full Scale**		
100 slm (100,000 sccm) 150 slm (150,000 sccm) 200 slm (200,000 sccm) 250 slm (250,000 sccm)	105 155 205 255	255
Fittings *(compatible with)*		
Swagelok 8 VCR	T	T
Connector (Power & Control I/O)		
15 pin D (Analog 0 to 5 VDC I/O) 15 pin D (4 to 20 mA I/O)	B G	B
Valve		
Normally Closed	M	M
Reserved for MKS Future Use		
Standard	0	0
Firmware		
Unless otherwise specified, MKS will ship firmware revision current to date Alpha characters designates prerelease product versions	10	10

* For gases not listed in the standard products gas table, please contact the MKS applications department for assistance.

** 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:
55 is 2.5 x 10^5 sccm or 250 slm
105 is 1.0 x 10^5 sccm or 100 slm

Gas Table 1.5

Gas Name*	Semi Gas Code	Gas Formula	Min - Max FS (slm)
Helium	001	He	140-350
Neon	002	Ne	138-345
Argon	004	Ar	090-222
Hydrogen	007	H_2	100-250
Nitrogen	013	N_2	100-250
Arsine	035	AsH_3	032-080
Germane	043	GeH_4	033-083
Tetrafluoromethane	063	CF_4	031-077
Sulfer Hexafluoride	110	SF_6	016-040
Octafluorocyclobutane (R-c318)	129	C_4F_8	009-023

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