



IE250A

IP66 RATED, ELASTOMER SEALED, DIGITAL MASS FLOW CONTROLLER, FLOW RATES UP TO 250 SLM

The IE250A is a general purpose, elastomer sealed MFC well suited for use in harsh environments where resistance to liquid or dust ingress are critical. The IE250A meets these requirements with its IP66 rated enclosure design. The IE250A incorporates the latest in digital flow control electronics along with a well proven, patented thermal sensor and mechanical design for Full Scale flow rates from 100 to 250 slm, N₂ equivalent. This MFC is available with either analog or digital I/O. The digital control electronics utilize the latest in MKS control algorithms provide fast and repeatable response to set point.

Settling times of 1 to 2 seconds and set point accuracies below 1% of set point outperform those of other typical high flow MFCs. Precise control is maintained down to 2% of the IE250A configured Full Scale flow range. The multi-gas/multi-range capability, along with tight performance specifications for accuracy, control range, and transient response allow users to minimize inventory of high flow MFC part numbers.

The multi-gas/multi-range feature (along with other custom controls) is accessed through the MFCs embedded diagnostic interface, which 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 response, and store operating data for offline analysis.

Features & Benefits

Improved Performance

- 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

Flow Solutions

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Performance

Full Scale Flow Ranges (N₂ equivalent) Maximum Inlet Pressure

Normal Operating Pressure Differential (with atmospheric pressure at the MFC outlet) Burst Pressure Control Range Typical Accuracy

Repeatability

Resolution Temperature Coefficients Zero Span Inlet Pressure Coefficient Typical Controller Settling Time Warm-up Time Operating Temperature Range (Ambient) Storage Humidity Storage Temperature

Mechanical

Fittings (compatible with)

Leak Integrity

External (scc/sec He) Through closed valve

Wetted Materials

Standard Seal Options Surface Finish Weight Enclosure Rating

Electrical Analog I/O

Input Power Required Flow Input/Output Signal Voltage (0 to 5 VDC) Current (4 to 20 mA) Compliance 100 to 250 slm150 psig (cannot exceed pressure differential requirement across MFC)30 to 55 psid (dependent on fitting type)

1500 psig 2% to 100% of F.S. (range on mech.) ± 1% of set point for > 20% to 100% F.S. ± 0.25% of F.S. for 5% to 20% F.S. ± 0.5% of Reading 0.1% of Reading

< 0.05% of F.S./°C < 0.08% of Rdg./°C < 0.03% of Rdg./psi or less 1 to 2 seconds typical above 10% F.S. @ 50 psi one (1) hour 10°C to 50°C 0 to 95% relative humidity, non-condensing -20° to 65°C (-4° to 149° F)

8 VCO[®] male, ½" NPT female, ½" Compression, 8 VCR[®] male, 12 mm Swagelok, ³/₈" Swagelok, W-seal, ½" Compression Long, 8 VCR Male Long, 8 VCO Male Long

< 1 x 10^{.9} < 1.0% F.S. at 40 psia to vac (<500 mTorr) (To assure no flow-through, a separate positive shut-off valve is required.)

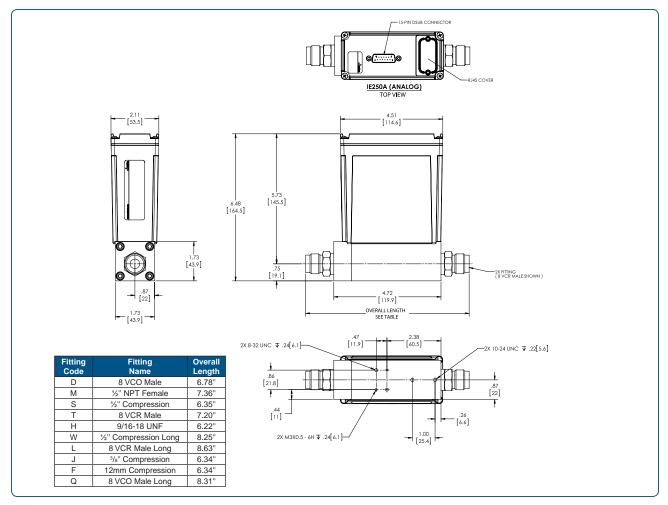
316 S.S., 17-7 S.S., Elgiloy[®], 430FR Viton[®] (Class VI), EPDM (Class VI) 16 μinch average Ra less than 4.5 lbs. (2.05 kg) IP66

+15 to +24 VDC @ (< 4 watts)

15-pin Type "D" male 15-pin Type "D" male 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: IE250A013255T4R0020	Code	Configuration
MFC High Flow Mass Flow Controller (multi-gas, multi-range)	IE250A	IE250A
Gas*		
For example:		
001 = Helium = He	001	
004 = Argon = Ar	004	013
007 = Hydrogen = H ₂	007	
$013 = \text{Nitrogen} = N_2^2$	013	
Flow Range Full Scale**		
250 slm (250,000 sccm)	255	255
Fittings (compatible with)		
12 mm Swagelok	F	
³ /8" Swagelok	J	
1/2" tube compression	S	
1/2" Compression Long	W	
1/2" NPT female	M	т
8 VCR Male	Т	
8 VCO Male	D	
8 VCR Male Long	L	
8 VCO Male Long	Q	
W-Seal	Н	
Connector (Power & Control I/O)		
Profibus®	4	
15 pin D (Analog 0 to 5 VDC I/O)	В	4
15 pin D (4 to 20 mA I/O)	Н	
Seal Materials		
EPDM (FDA Compliant)	R	R
Viton (FDA Compliant)	W	ĸ
Valve/Device Type		
Normally Closed	0	0
Mass Flow Meter	3	0
Reserved for MKS Future Use		
Standard	0	0
Firmware		
Unless otherwise specified, MKS will ship firmware revision current to date	20	20

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

Gas Table				
Gas Name*	Semi Gas Code	Gas Formula	Min - Max FS (slm)	
Helium	001	He	140 to 350	
Argon	004	Ar	140 to 250	
Hydrogen	007	H ₂	100 to 250	
Air	008	Air	100 to 250	
Nitrogen	013	N ₂	100 to 250	

** 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.

255 is 2.5 x 10⁵ sccm or 250 slm

105 is 1.0 x 105 sccm or 100 slm



Example flow rate code:

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