

IE250A

IP66 Rated, Elastomer Sealed, Digital Mass Flow Meter
Flow Rates Up to 250 SLM



The IE250A is a general purpose, elastomer sealed, MFM well suited for use in harsh environments where resistance to liquid, or dust, 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 measurement of full scale flow rates from 250 sccm to 250 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
- IP66 rated for use in harsh environments with potential liquid and dust ingress.
- 16 micro-inch 316L surface finish enables MFM use for high purity applications
- Wide choice of digital Profibus®, PROFINET® or analog (0 to 5 VDC or 4 to 20 mA) I/O



Key Benefits

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

Specifications

Performance

Full Scale Range (N ₂ equivalent)	100 to 250 slm
Maximum Inlet Pressure	150 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	±0.5% 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	<0.03% of Reading/psi or less
Warm-up Time (to within 0.2% of Full Scale of steady state performance)	1 hour
Operating Temperature Range (Ambient)	10°C to 50°C
Storage Humidity	0 to 95% relative humidity, non-condensing
Storage Temperature	-20° to 65°C (-4° to 149° F)

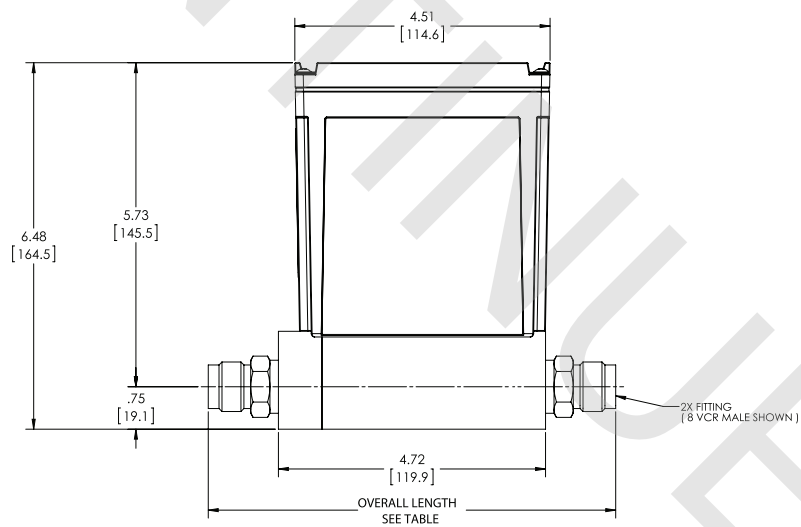
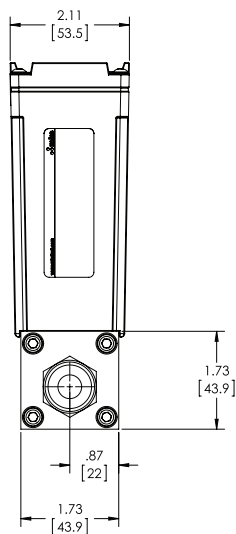
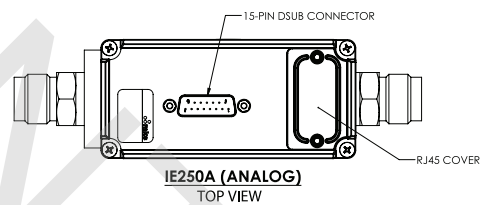
Mechanical

Fittings (compatible with)	8 VCO® male, ½" NPT female, ½" Compression, 8 VCR® male, 12 mm Swagelok, ⅜" Swagelok, W-seal, ½" Compression Long, 8 VCR Male Long, 8 VCO Male Long
Leak Integrity	External (scc/sec He) <1 x 10 ⁻⁹
Wetted Materials	316L S.S.
Seal Options	<ul style="list-style-type: none"> • Viton® • Buna • Neoprene® • EPDM • Viton (USP Class VI Compliant)
Surface Finish	16μ inch average Ra
Weight	<3.4 lbs (1.54 kg)
Enclosure Rating	IP66

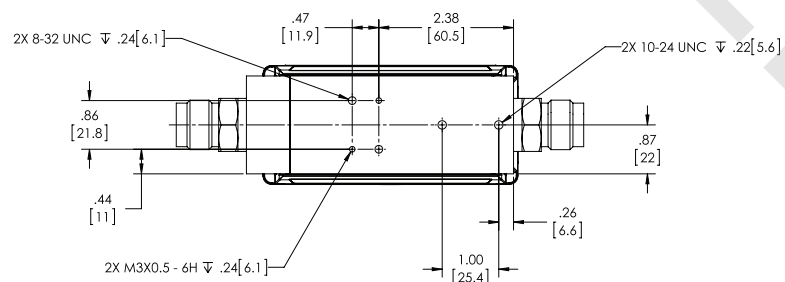
Electrical Analog I/O

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"> • 15 pin Type "D" male • 15 pin Type "D" male
Compliance	CE

Digital I/O	Profibus®	PROFINET®
Input Power Required	+15 to +24 VDC (< 2 watts)	+24 VDC (< 3 watts)
Connector	<ul style="list-style-type: none"> 9 pin Type D male (power) 9 pin Type D female (comm.) 	2 x RJ-45 (comm.) male, M8 male, 5 pin (power)
Data Rate Switch/Selection	<ul style="list-style-type: none"> No switch Set data rate via Profibus 	No switch
Comm. Rate(s)	9.6 Kbps to 12 Mbps	100 Mbps
MAC ID Switches/Addresses	2 switches, 10 positions	N/A
Network Size	Up to 99 nodes	N/A
Visual Indicators	<ul style="list-style-type: none"> LED Comm (green/red) LED Error (green/red) 	<ul style="list-style-type: none"> LED Maint (amber) LED BUS Fault (red) LED Ready (green) LED Sys Fault (red)
Compliance	CE	CE



Fitting Code	Fitting Name	Overall Length
D	8 VCO Male	6.78"
M	½" NPT Female	7.36"
S	½" Compression	6.35"
T	8 VCR Male	7.20"
H	9/16-18 UNF	6.22"
W	½" Compression Long	8.25"
L	8 VCR Male Long	8.63"
J	¾" Compression	6.34"
F	12mm Compression	6.34"
Q	8 VCO Male Long	8.31"



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

Ordering Information

Ordering Code Example: IE250A013255TBV3020				Code	Configuration
Model					
MFM High Flow Mass Flow Meter (multi-gas, multi-range)				IE250A	IE250A
Gas*					
Name	Code	Formula	Min/Max Full Scale (slm)		
Helium	001	He	140 to 350	001	013
Argon	004	Ar	140 to 250	004	
Hydrogen	007	H ₂	100 to 250	007	
Air	008	Air	100 to 250	008	
Nitrogen	013	N ₂	100 to 250	013	
Flow Range Full Scale**					
250 slm (250,000 sccm)				255	255
Fittings (compatible with)					
12 mm Swagelok				F	T
3/8" Swagelok				J	
1/2" tube compression				S	
1/2" Compression Long				W	
1/2" NPT female				M	
8 VCR Male				T	
8 VCO Male				D	
8 VCR Male Long				L	
8 VCO Male Long				Q	
W-Seal				H	
Connector (Power & Control I/O)					
Profibus® (1480 Compatible)				4	B
Profibus (1179B Compatible)				3	
PROFINET				9	
15 pin D (Analog 0 to 5 VDC I/O)				B	
15 pin D (4 to 20 mA I/O)				H	
Seal Material					
Viton				V	V
Buna				B	
Neoprene				N	
EPDM				E	
Viton (USP Class VI Compliant)				W	
Valve/Device Type					
Mass Flow Meter				3	3
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.

** 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: 255 is 2.5 x 10⁵ sccm or 250 slm; 105 is 1.0 x 10⁵ sccm or 100 slm