

Technical Data for IS-Max Mass Flow Controllers

0.5 sccm full scale through 250 SLPM full scale

Standard specifications. Consult Alicat for our high-pressure, media-isolated (caustic gas resistant), and low pressure drop versions.



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CERTIFICATIONS	MARKING	CERTIFICATE
ATEX	II 1G Ex ia IIC T4 Ga T _{amb} -20 °C to +70 °C	DEKRA 22ATEX0075X
IECEX	Ex ia IIC T4 Ga T _{amb} -20 °C to +70 °C	IECEX DEK 22.0078 X

SENSOR AND CONTROL PERFORMANCE ¹			
RANGE	0.5 – 5 SCCM	10 SCCM – 20 SLPM	50 – 250 SLPM
Mass flow accuracy ^{2,3}	Standard accuracy: ± 0.8% of reading and ± 0.2% of full scale High accuracy: ± 0.4% of reading and ± 0.2% of full scale	Standard accuracy: ± 0.6% of reading or ± 0.1% of full scale, whichever is greater High accuracy: ± 0.5% of reading or ± 0.1% of full scale, whichever is greater	Standard accuracy: ± 0.8% of reading and ± 0.2% of full scale High accuracy: ± 0.4% of reading and ± 0.2% of full scale
Flow repeatability (2σ)	± 0.2% of reading and ± 0.02% of full scale	± 0.1% of reading and ± 0.02% of full scale	± 0.2% of reading and ± 0.02% of full scale
Pressure accuracy ²	Above 1 atm: ± 0.5% of reading Below 1 atm: ± 0.07 PSIA		
Steady state control range	0.01 – 100% of full scale (10,000:1 turndown ratio)		
Operating pressure	11.5 – 160 PSIA		
Pressure sensitivity	Mass flow zero and span shift: ± (0.08% of reading + 0.02%) of full scale per atm from calibration conditions	Mass flow zero shift: ± 0.01% of full scale per atm from tare pressure Mass flow span shift: ± 0.1% of reading per atm from calibration conditions	Mass flow zero and span shift: ± (0.08% of reading + 0.02%) of full scale per atm from tare pressure
Temperature sensitivity	Mass flow zero and span shift: ± 0.02% of full scale per °C from 25 °C	Mass flow zero shift: ± 0.01% of full scale per °C from tare temperature Mass flow span shift: ± 0.01% of reading per °C from 25 °C	Mass flow zero and span shift: ± 0.02% of full scale per °C from 25 °C
Temperature accuracy	± 0.75 °C		
Relative humidity accuracy ⁴	± 1.8 % RH at +23 °C (0 % RH to 90% RH)		
Relative humidity temperature sensitivity ⁴	0.05% RH/°C (0 °C to +60 °C)		
Operating temperature range ⁵	-20 – 70 °C (ambient and gas)		
Valve function	Normally closed		
Totalizer volume uncertainty	± 0.1% of reading in additional uncertainty		
Sensor response time	< 1 ms		
Typical control response time	As fast as 30 ms (T63), flow rate dependent, user-adjustable		
Typical indication response time	< 10 ms, flow rate dependent		
Typical warm-up time	< 1 s		

¹ Flow rate and pressure drop vary depending on process gas.

² Stated accuracy is after tare (for mass flow), under equilibrium conditions, includes repeatability and linearity.

³ High accuracy mass flow readings only available on devices with a full scale range over 5 SCCM.

⁴ Relative humidity sensor is an optional feature.

⁵ FFKM in ISMCS units is rated for greater than -10 °C, for low-temp FFKM options contact the factory.

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MECHANICAL	
Wetted materials	302, 303, 304, 316L, and 430FR stainless steel; FFKM, alumina ceramic, brass, glass, gold, heat-cured epoxy, heat-cured silicone rubber, polyamide, silicon
Maximum pressure	Damage possible above 200 PSIA common mode pressure. Damage possible by rapid pressure change above 75 psi differential pressure.
Relative humidity range	0 – 95%, non-condensing
Ingress protection	IP66 rating Dust-tight and protected against strong jets of water
Mounting orientation sensitivity	None
Mounting holes	4× 6-32 UNC threaded \downarrow 0.276" [7.01 mm]
Process connections ⁶	0.5 – 50 sccm: M5 x 0.8mm female 100 sccm – 30 SLPM: 1/8" NPT female 50 – 100 SLPM: 1/4" NPT female 250 SLPM: 1/2" NPT female

⁶ Consult Alicat for available connection options, such as: compression, face seal, push-to-connect, BSPP, SAE, or Swagelok®-compatible (VCO® and VCR®).

POWER AND COMMUNICATIONS	
Digital input and output options	RS-232 Serial and Modbus RTU, RS-485 Serial and Modbus RTU
Digital data update rate	40 Hz at 19200 baud
Analog input and output options	4 – 20 mA
Analog data update rate	1 kHz
Analog signal accuracy	± 0.1% of full scale additional uncertainty
Interactive display	Monochrome LCD with integrated touchpad and backlight; simultaneously displays mass flow, volumetric flow, temperature, setpoint, valve drive %, gauge pressure, and absolute pressure
Display update rate	10 Hz
Electrical connection options	DB-15
Power requirements	See DOC-IS-CONTROLDWG

FEATURES	
STP reference conditions	25°C and 1 atm (default), user-configurable
NTP reference conditions	0°C and 1 atm (default), user-configurable
Gas Select™ ⁷	98 user-selectable gases stored internally. Each gas optimized to match NIST's REFPROP 10 gas property calculations across the operating temperature and pressure ranges for highest accuracy.
COMPOSER™	20 user-definable gas mixes. Each mix may have up to 5 gases with 0.01% composition resolution.
Multivariate process measurements	Volumetric flow, mass flow, absolute pressure, gauge pressure, barometric pressure, temperature, totalizer Optional: relative humidity
Autotune	Automatically improve the control performance of the valve and tune the control parameters of the device for your application
Totalizer and batch dispensing	Measure the total accumulated mass of a particular gas (or gas mixture) that has flowed in a process. The totalizer function in controllers can also be used to dispense batches of set amounts of gas.

⁷ IMSCS-series includes 130 user-selectable gases.

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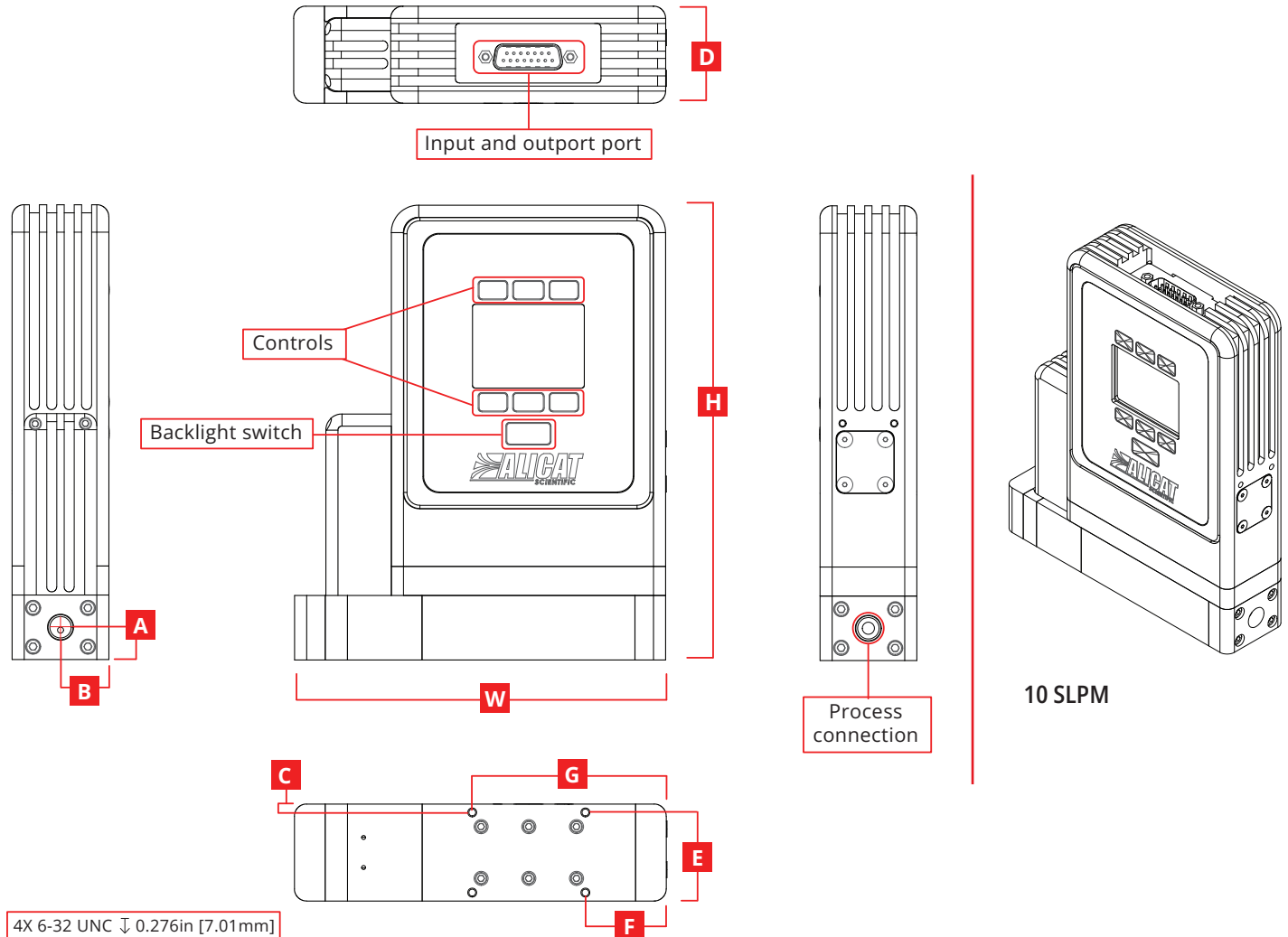
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Representative Example



DIMENSIONS										WEIGHT
Full scale flow	Width	Depth	Height	A	B	C	E	F	G	
0.5 SCCM – 30 SLPM	5.75"	1.50"	7.05"	0.50"	0.75"	0.13"	1.37"	1.25"	3.00"	≈ 5.0 lb
	146.1 mm	38.1 mm	179.1 mm	12.7 mm	19.1 mm	3.3 mm	34.8 mm	31.8 mm	76.2 mm	≈ 2.3 kg
50 – 250 SLPM	6.00"	1.50"	7.65"	0.80"	0.75"	0.13"	1.37"	1.25"	3.00"	≈ 6.0 lb
	152.4 mm	38.1 mm	194.3 mm	20.3 mm	19.1 mm	3.3 mm	34.8 mm	31.8 mm	76.2 mm	≈ 2.7 kg