

Technical Data for IS-Max **ISMCS-Series** Mass Flow Controllers

0.5 sccm full scale through 250 SLPM full scale

Standard specifications. Consult Alicat for available options.



+1 (888) 290-6060
alicat.com/ismc

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 22.0078X
North America	Class I, Div 1, Groups A-D T4, Ex ia Class I, Zone 0, AEx\Ex ia IIC T4 Ga T _{amb} -20°C to +70°C	DEKRA 23CAUS40-127215

SENSOR AND CONTROL PERFORMANCE	
Mass flow accuracy ^{1,2}	Standard accuracy: $\pm 0.8\%$ of reading and $\pm 0.2\%$ of full scale High accuracy: $\pm 0.4\%$ of reading and $\pm 0.2\%$ of full scale (≥ 5 sccm)
Flow repeatability (2 σ)	$\pm 0.2\%$ of full scale
Pressure accuracy	$\pm 0.5\%$ of full scale
Steady state control range	1 – 100% of full scale (100:1 turndown ratio)
Operating pressure	11.5 – 160 PSIA
Pressure sensitivity	Mass flow zero and span shift: $\pm 0.08\%$ of reading + 0.02% of full scale per atm from tare pressure
Temperature sensitivity	Mass flow zero and span shift: $\pm 0.02\%$ of full scale per °C from 25 °C
Temperature accuracy	± 0.75 °C
Relative humidity accuracy ³	$\pm 1.8\%$ RH at +23 °C (0% RH to 90% RH)
Relative humidity temperature sensitivity ³	0.05% RH/°C (0 °C to +60 °C)
Operating temperature range ⁴	-20 – 70 °C (ambient and gas)
Valve function	Normally closed
Totalizer volume uncertainty	$\pm 0.1\%$ of reading in additional uncertainty
Sensor response time	< 1 ms
Typical control response time	Flow rate dependent and user-adjustable. As fast as (T63): 0.5 – 5 sccm: 100 – 4000 ms 10 sccm – 20 SLPM: 30 – 4000 ms 50 – 100 SLPM: 30 – 150 ms
Typical indication response time	0.5 – 5 sccm: 100 – 4000 ms 10 sccm – 20 SLPM: < 10 ms 50 – 100 SLPM: 65 – 255 ms
Typical warm-up time	< 1 s

¹ Stated accuracy is after tare (for mass flow), under equilibrium conditions, includes repeatability and linearity.

² High accuracy mass flow readings only available on devices with a full scale range ≥ 5 SCCM

³ Relative humidity sensor is an optional feature; accuracy statement valid from 0-50° C, $\leq 90\%$ RH.

⁴ Low-temp FFKM required below -10 °C

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MECHANICAL	
Wetted materials ^{5,6}	316L / 303 / 430FR stainless steel, FFKM
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]

⁵ P07 valve configuration adds brass to wetted materials.

⁶ Alternative elastomer materials available, consult Alicat.

POWER AND COMMUNICATIONS	
Digital input and output options	RS-232 or RS-485 (both options work with the Alicat ASCII command and control language AND the Modbus RTU industrial protocol)
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	$\pm 0.1\%$ 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-MANUAL-IS-SAFEINSTALLATION

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™	Up to 128 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.

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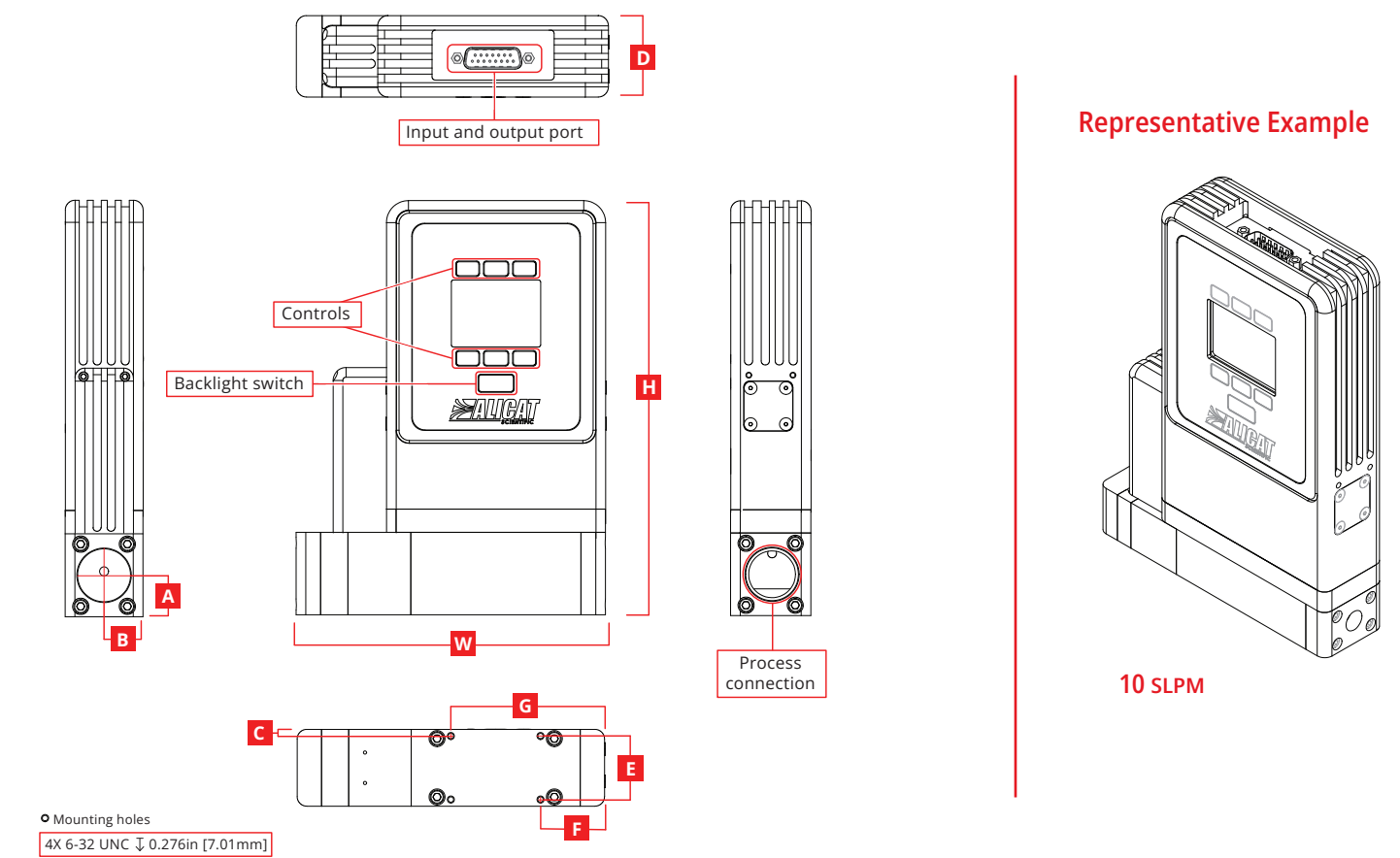
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RANGE-SPECIFIC TECHNICAL DATA			
Full scale flow	Part numbers	Pressure drop at full scale ⁶	Recommended process connections ⁷
0.5 – 5 sccm	ISMCS-AA, ISMCS-BA, ISMCS-EA, ISMCS-FA	1.0 PSID	M5 x 0.8mm
10 sccm	ISMCS-GA	1.5 PSID	M5 x 0.8mm
20 sccm	ISMCS-IA	2.0 PSID	M5 x 0.8mm
50 sccm	ISMCS-LA	1.0 PSID	M5 x 0.8mm
100 sccm – 1 SLPM	ISMCS-NA, ISMCS-OA, ISMCS-QA, ISMCS-BB	1.5 PSID	1/8" NPT female
2 SLPM	ISMCS-EB	2.5 PSID	1/8" NPT female
5 SLPM	ISMCS-FB	2.5 PSID	1/4" NPT female
10 SLPM	ISMCS-GB	6.0 PSID	1/4" NPT female
20 SLPM	ISMCS-IB	12.0 PSID	1/4" NPT female
50 SLPM	ISMCS-LB	6.0 PSID	1/4" NPT female
100 SLPM	ISMCS-NB	17.1 PSID	1/4" NPT female
250 SLPM	ISMCS-PB	81.9 PSID	1/2" NPT female

⁶ When venting air to atmosphere and valve circuit powered by the Eaton 9493-PS-C11 at an ambient temperature of ~ 30°C
⁷ Consult Alicat for available connection options, such as: compression, BSPP, SAE, or Swagelok®-compatible (VCO® and VCR®).



DIMENSIONS										WEIGHT
Full scale flow	Width	Depth	Height	A	B	C	E	F	G	
0.5 sccm – 30 SLPM	5.75"	1.50"	8.00"	0.50"	0.75"	0.15"	1.35"	1.25"	3.00"	≈ 5.0 lb
	146.1 mm	38.1 mm	203.2 mm	12.7 mm	19.1 mm	3.9 mm	34.2 mm	31.8 mm	76.2 mm	≈ 2.3 kg
50 – 250 SLPM	6.00"	1.50"	8.60"	0.80"	0.75"	0.15"	1.35"	1.25"	3.00"	≈ 6.0 lb
	152.4 mm	38.1 mm	218.44 mm	20.3 mm	19.1 mm	3.9 mm	34.2 mm	31.8 mm	76.2 mm	≈ 2.7 kg