Technical Data for IS-Max ISMCW-Series Mass Flow Controllers

0.5 SCCM full scale through 50 SLPM full scale

Standard specifications. Consult Alicat foravailable options.

ALICAT SCIENTIFIC
+1 (888) 290-6060
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CERTIFICATIONS	MARKING	CERTIFICATE
ATEX	Ⓔx 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 – 30 SLPM	40 – 50 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:** ± 0.75% of reading or ± 0.1% of full scale, whichever is greater **High accuracy:** ± 0.6% 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		
Pressure accuracy[2]	**Above 1 atm:** ± 0.75% of reading **Below 1 atm:** ± 0.1 PSIA		
Steady state control range	0.5 – 100% of full scale (200:1 turndown ratio)		
Operating pressure	60 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 calibration conditions
Temperature sensitivity	**Mass flow zero and span shift:** ± 0.03% of full scale per °C from 25 °C	**Mass flow zero shift:** ± 0.03% 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:** ± 0.03% 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	-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	127 ms, user adjustable		
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 and under 500 SLPM.

4 Relative humidity sensor is an optional feature.

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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 80 PSIA common mode pressure. Damage possible by rapid pressure change above 15 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 ↧ 0.276" [7.01 mm]

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-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™	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.

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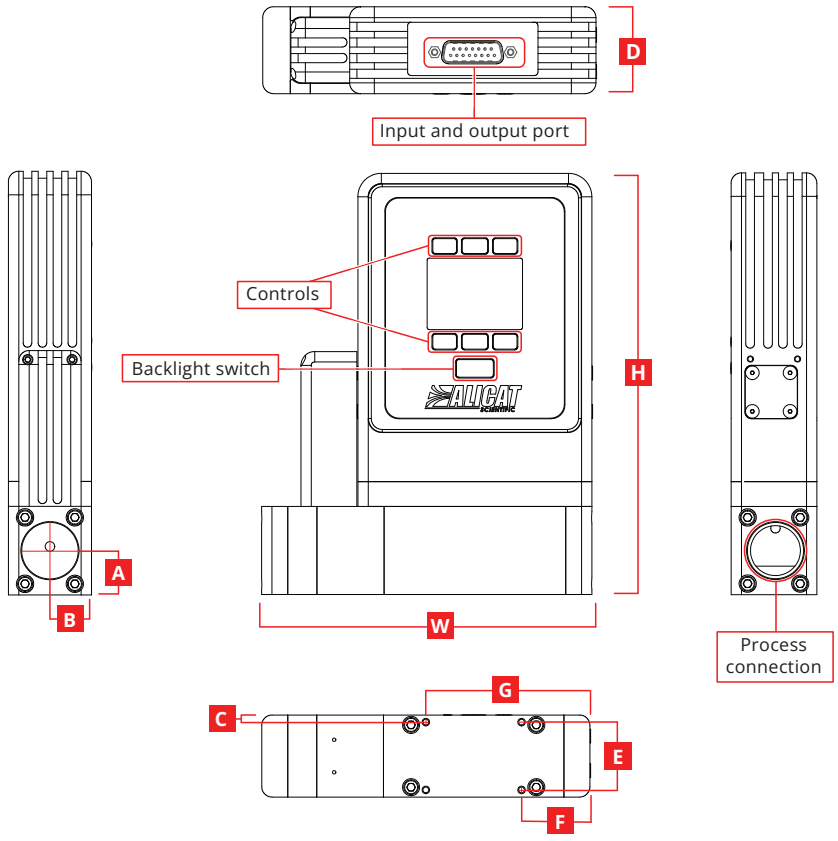
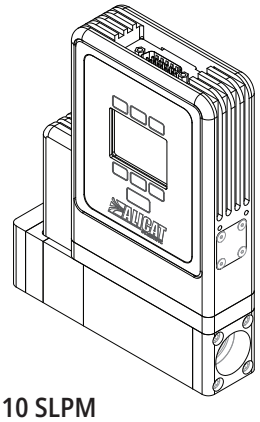
RANGE-SPECIFIC TECHNICAL DATA		
Full scale flow	**Pressure drop at full scale when venting air to atmosphere**	**Default process connections[5]**
0.5–50 SCCM	0.7 PSID	M5 x 0.8mm
100 SCCM	0.7 PSID	⅛" NPT female
200 SCCM –1 SLPM	0.8 PSID	⅛" NPT female
2–5 SLPM	0.2 PSID	⅛" NPT female
10 SLPM	0.3 PSID	⅛" NPT female
20 SLPM	0.9 PSID	⅛" NPT female
40 SLPM	2.7 PSID	⅛" NPT female
50 SLPM	4.2 PSID	¼" NPT female

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



Representative Example



10 SLPM

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"	0.15"	1.35"	1.25"	3.00"	≈ 5.0 lb
	146.1 mm	38.1 mm	179.1 mm	12.7 mm	19.1 mm	3.9 mm	34.2 mm	31.8 mm	76.2 mm	≈ 2.3 kg
40 – 50 SLPM	6.00"	1.50"	7.65"	0.80"	0.75"	0.15"	1.35"	1.25"	3.00"	≈ 6.0 lb
	152.4 mm	38.1 mm	194.3 mm	20.3 mm	19.1 mm	3.9 mm	34.2 mm	31.8 mm	76.2 mm	≈ 2.7 kg

Ex Document. Any revisions must be submitted for review and approval by an Ex Appointee.