

Technical Data for the MXM Gas Mixers

Standard specifications. Consult Fusion Flow Technologies for available options.



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TECHNICAL	
Mixing Type	Differential pressure-based Alicat mass flow controllers, with proprietary MixModule™ master control unit
Compatible Gases	49 selectable pure gases and user-configurable pre-mixed gases of up to 5 gases [see gas table]
Mix Accuracy	As accurate as $\pm 0.6\%$ of the targeted mix percentage
Available Full Scale Flow Ranges (per channel)	2–6 MFC turn-key form-factor systems: 100 SCCM–100 SLPM 2–10 MFC remote form-factor systems: 100 SCCM–5000 SLPM
Minimum Allowed Flow Rate for any MFC	100SCCM–5 SLPM MFCs: 50 SCCM 5SLPM–100SLPM MFCs: 1% of full scale 100–5000 SLPM MFCs: 2% of full scale (remote form-factors only)
Accuracy at Calibration Conditions for Individual Channels	100 SCCM–20 SLPM full scale MFCs: $\pm 0.6\%$ of reading or $\pm 0.1\%$ of full scale, whichever is greater 50–5000 SLPM full scale MFCs: $\pm 0.8\%$ of reading and $\pm 0.2\%$ of full scale.
Repeatability (2σ) for Individual Channels	100 SCCM–20 SLPM full scale MFCs: $\pm(0.1\%$ of reading + 0.02% of full scale) 50–5000SLPM full scale MFCs: $\pm(0.2\%$ of reading + 0.02% of full scale)
Typical Control Response Time for Individual Channels	As fast as 25 ms; flow rate, gas species, and back-pressure dependent, proprietary, matched-tuning procedure performed on each MFC according to application parameters

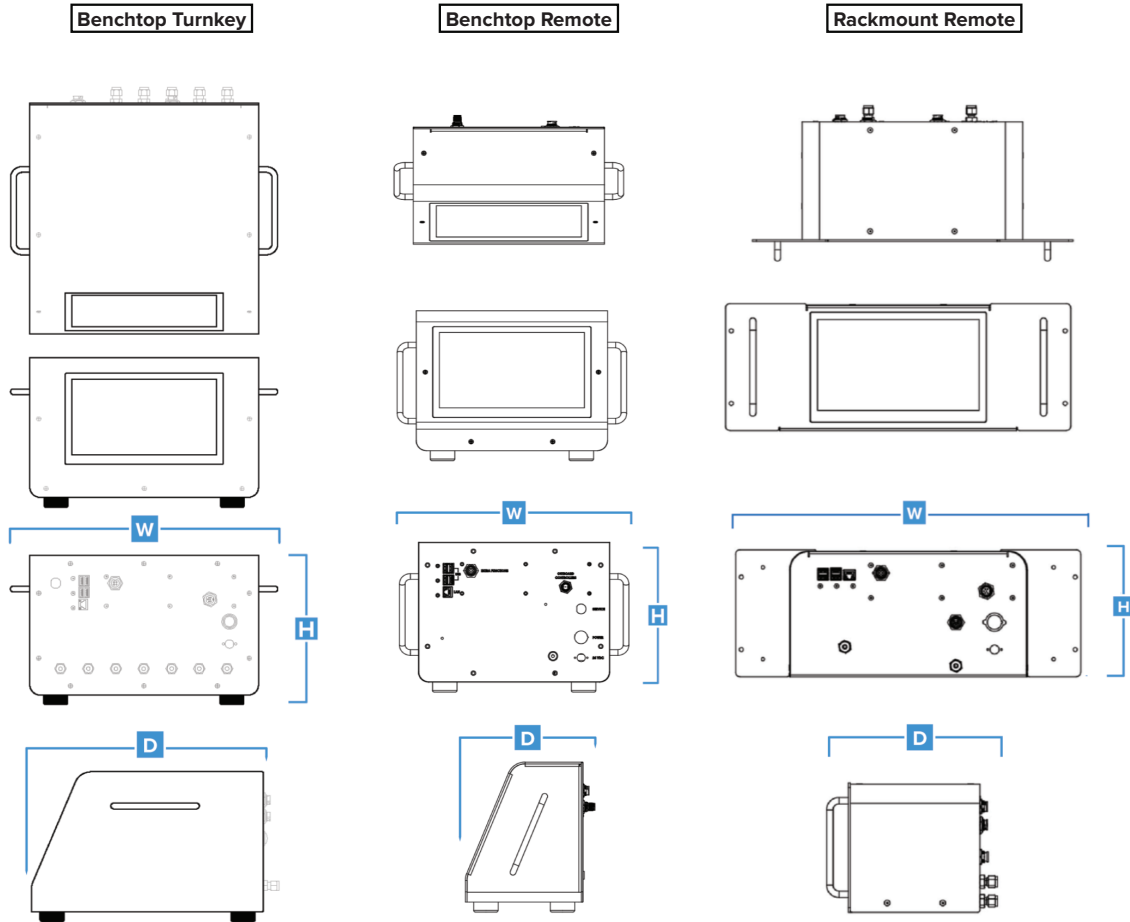
MECHANICAL	
Maximum Inlet Pressure	145 PSIG (10 barG) for standard systems
Temperature Operating Range	-10 to +60 °C (+14 to +140 °F) for gas and ambient conditions
Gas Connections	Turnkey form-factor: $\frac{1}{8}$ " and $\frac{3}{8}$ " compression tube bulkhead fittings on rear panel Remote form-factors: $\frac{1}{8}$ " compression tube bulkhead fittings on rear panel, with various NPT, SAE, VCR®, VCO®, BSPP options available for all loose MFCs
Housing Construction	Turnkey benchtop and remote benchtop form-factors: powder coated cold-rolled steel upper shell, 304 stainless steel base, and hard anodized and laser engraved aluminium back panel Rackmount remote form-factor: powder coated cold-rolled steel base and 304 stainless steel upper shell

POWER AND COMMUNICATION	
Rear-mounted Chassis Power Supply	Input: 110–230 VAC 50–60 Hz Output: 24 VDC, 3.75A
Optional World-wide Power Supply ¹	Input: 110–230 VAC 50–60 Hz Output: 24 VDC, 6.7A
Maximum Possible Power Consumption	2–6 channel turnkey form-factor systems: 1.56A @24VDC, with all 6 channels driven 100% 2–10 channel remote form-factor systems: 20A @24VDC, with all 10 channels driven 100% (assuming all dual-valve MCRH controllers)
Display	10.1" IPS QLED capacitive multi-touch hardened glass panel 1280 × 720 resolution, 500 cd/m ² brightness, 170° viewing angle
Processor and Storage	64-bit quad-core ARM processor 14 GB of user-accessible onboard data storage
Physical Connections	2 × USB 2.0 2 × USB 3.0 1 × RJ45 Gigabit Ethernet
Automation and Integration	Extensive network IOT integration with MQTT communication Export of all gas mixer data to .CSV files, MySQL, PostGRES, MSSQL, or Microsoft Azure cloud Integrated scripting, scheduling, and event handling system
Included Accessories	4 conductor extra functions cable (EMO, 24 VDC alarm output, analog alarm input) 6 conductor umbilical cable and BB9-I breakout box (remote form-factors only) Microfiber screen wipe
Optional Components	USB Digital I/O box (4 in/4 out) USB Analog I/O box (4 in/2 out) Integrated speed of sound binary gas analyzer Static mixing tubes 7-button Color TFT Service Interface Box w/ cable

¹ Various PC style AC power cables available for most international markets

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DIMENSIONS ²				WEIGHT
Form-factor	Height	Width	Depth	
Benchtop Turnkey	9.200 in	14.000 in	14.200 in	≈ 46.0 lb
	233.68 mm	355.60 mm	360.68 mm	≈ 20.9 kg
Benchtop Remote	9.21"	11.77"	7.43"	≈ 17.2 lb
	234.01 mm	299.01 mm	188.70 mm	≈ 7.8 kg
Rackmount Remote	7.000 in	19.000 in	7.105 in	≈ 18.5 lb
	177.80 mm	482.60 mm	180.47 mm	≈ 8.4 kg

² Does not include handles or fittings

COMPATIBLE GASES			
Acetylene (C ₂ H ₂)	Methane (CH ₄)	Carbonyl sulfide (COS)	R-32 Difluoromethane (CH ₂ F ₂)
Air	Neon (Ne)	Chlorine (Cl ₂)	R-115 Chloropentafluoroethane (C ₂ ClF ₅)
Argon (Ar)	Nitrogen (N ₂)	Dimethylether (CH ₃ OCH ₃)	R-116 Hexafluoroethane (C ₂ F ₆)
i-Butane (i-C ₄ H ₁₀)	Nitrous oxide (N ₂ O)	Hydrogen sulfide (H ₂ S)	R-124 Chlorotetrafluoroethane (C ₂ HClF ₄)
n-Butane (n-C ₄ H ₁₀)	Oxygen (O ₂)	Nitrogen trifluoride (NF ₃)	R-125 Pentafluoroethane (C ₂ HF ₅)
Carbon dioxide (CO ₂)	Propane (C ₃ H ₈)	Nitric oxide (NO)	R-134A Tetrafluoroethane (CH ₂ FCF ₃)
Carbon monoxide (CO)	Sulfur hexafluoride (SF ₆)	Propylene (C ₃ H ₆)	R-142B Chlorodifluoroethane (CH ₃ CClF ₂)
Deuterium (D ₂)	Xenon (Xe)	Silane (SiH ₄)	R-143A Trifluoroethane (C ₂ H ₃ F ₃)
Ethane (C ₂ H ₆)	Ammonia (NH ₃)	Sulfur dioxide (SO ₂)	R-152A Difluoroethane (C ₂ H ₄ F ₂)
Ethylene/Ethene (C ₂ H ₄)	Butylene (1-Butene)	R-11 Trichlorofluoromethane (CCl ₃ F)	RC-318 Octafluorocyclobutane (C ₄ F ₈)
Helium (He)	Cis-Butene (cis-2-Butene)	R-14 Tetrafluoromethane (CF ₄)	
Hydrogen (H ₂)	Iso-Butene	R-22 Difluoromonochloromethane (CHClF ₂)	
Krypton (Kr)	Trans-Butene	R-23 Trifluoromethane (CHF ₃)	