

# Technical Data for **MXM** Gas Mixers

Standard specifications. Consult Alicat for available options.



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

TECHNICAL	
Mixing type	Dynamic mass flow using high-speed $\Delta P$ -based Alicat MFCs, controlled by a proprietary MixModule™ pressure-sensing device
Compatible gases <sup>1,2</sup>	49 selectable gas types including user-configurable pre-mixes [see compatible gas table]
Mix accuracy	As accurate as $\pm 0.6\%$ of the targeted mix percentage
Available MFCs & full scale flow ranges (per channel)	MXM-ES-TK: 2–6 MFCs, 0–100 SCCM to 0–100 SLPM models (and any models inbetween) MXM-ES-MINI: 2–6 MFCs, 0–10 SCCM to 0–10 SLPM models (and any models inbetween) MXM-ES-SA & MXM-ES-RM: 2–10 MFCs, 0–0.5 SCCM to 0–12000 SLPM models (and any models inbetween)
Minimum recommended flow rates (by full scale range)	0–0.5 SCCM to 0–50 SCCM MFCs: consult with Alicat 0–100 SCCM to 0–5 SLPM MFCs: 50 SCCM 0–10 SLPM to 0–100 SLPM MFCs: 1% of full scale 0–250 to 0–12000 SLPM MFCs: 2% of full scale
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 50–12000 SLPM full scale MFCs: $\pm 0.8\%$ of reading and $\pm 0.2\%$ of full scale.
Repeatability ( $2\sigma$ ) for individual channels	100 SCCM–20 SLPM full scale MFCs: $\pm(0.1\%$ of reading + $0.02\%$ of full scale) 50–12000SLPM 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; dependent on MFC model, flow rate, gas species, and back-pressure (proprietary match-tuning procedure performed on all MFCs according to application parameters)

<sup>1</sup> MXM can track up to 10 total gas types, regardless of pure or premixed

<sup>2</sup> Corrosive gases are not available for use with the MXM-ES-MINI (Turnkey Mini)

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 <sup>3</sup>	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% (worst-case with 6 MCP medium-flow units) 2–10 channel remote form-factor systems: 20A @24VDC, with all 10 channels driven 100% (worst-case with 10 MCRH dual-valve high-flow units)
Display	10.1" IPS QLED capacitive multi-touch hardened glass panel 1280 × 720 resolution, 500 cd/m <sup>2</sup> 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, receiving cylinders, ballast tanks 7-button Color TFT Service Interface Box w/ cable Integrated purge system (Turnkey Benchtop form-factor only)

<sup>3</sup> Various PC style AC power cables available for most international markets

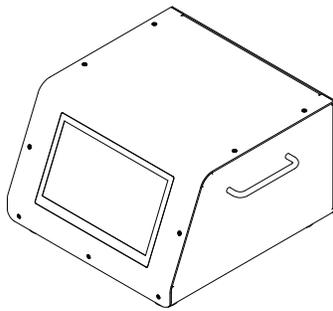
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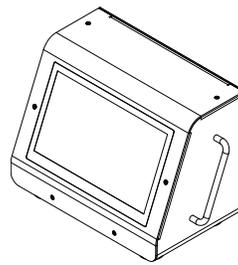


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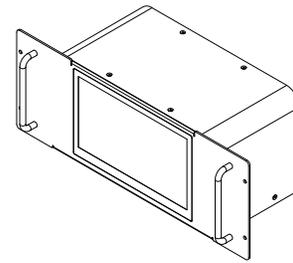
## Representative Examples



MXM-ES-TK

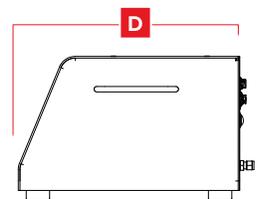
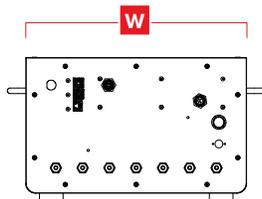
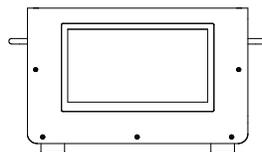
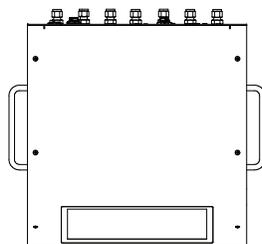


MXM-ES-SA and MXM-ES-MINI

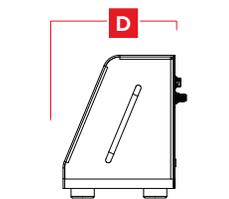
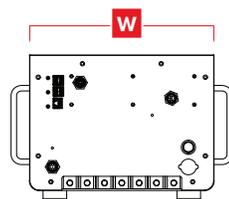
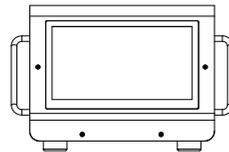
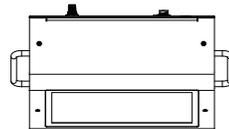


MXM-ES-RM

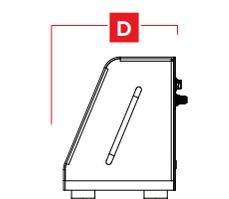
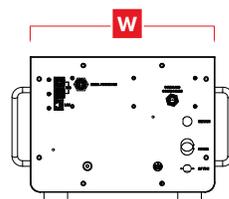
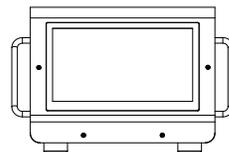
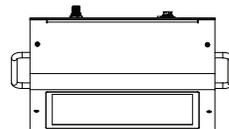
### Benchtop Turnkey



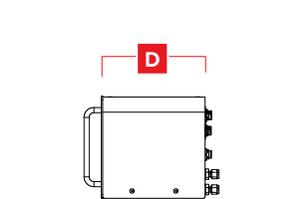
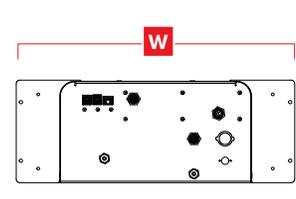
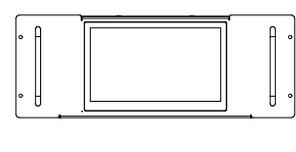
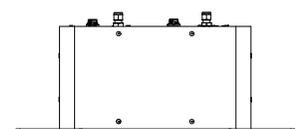
### Mini Turnkey



### Benchtop Remote



### Rackmount Remote



Form-factor	DIMENSIONS <sup>4</sup>			WEIGHT <sup>5</sup>
	Height	Width	Depth	
Benchtop Turnkey (MXM-ES-TK)	9.20"	14.00"	14.20"	≈ 46.0 lb
	233.7 mm	355.6 mm	360.7 mm	≈ 20.9 kg
Benchtop Turnkey Mini (MXM-ES-MINI) Benchtop Remote (MXM-ES-SA)	9.21"	11.77"	7.43"	≈ 17.5 lb
	233.9 mm	299.0 mm	188.7 mm	≈ 7.9 kg
Rackmount Remote (MXM-ES-RM)	7.00"	19.00"	7.11"	≈ 18.5 lb
	177.8 mm	482.6 mm	180.5 mm	≈ 8.4 kg

<sup>4</sup> Does not include handles or fittings

<sup>5</sup> Total weight values for all systems will vary depending on MFC configuration; Turnkey values are with fully loaded and largest MFCs

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

<sup>6</sup> Corrosive gases are not available for use with the MXM-ES-MINI (Turnkey Mini)