

Gas Mixing

Accurate Mix of Oxygen, Carbon Dioxide and Nitrogen

Technology

DASGIP's gas mixing modules supply an independently blended gas mixture of up to 4 input gasses. Air, oxygen, carbon dioxide and nitrogen can be individually combined to provide optimal gas supply for cell culture and microbial application.

The MX4/4 model supplies four vessels with up to 250 sL/h suiting laboratory scale demands.

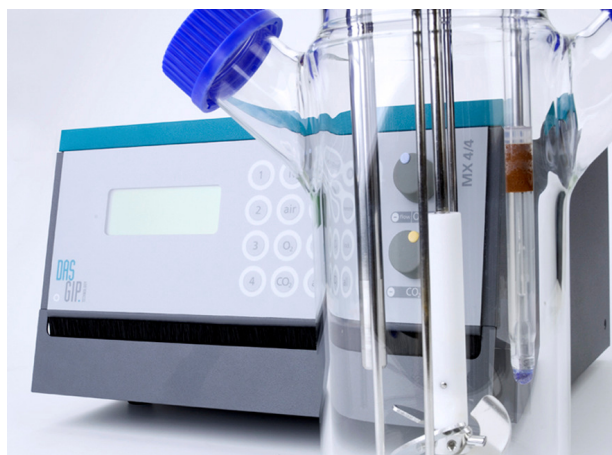
The MX4/1 model suits pilot scale by providing one vessel with flow rates up 30 sL/min. Mass flow controllers with individual set-points at each outlet guarantee an outstanding accurate blend of gases and an individual control of oxygen and carbon dioxide concentration in each vessel. DASGIP's gas mixing modules are part of DASGIP advanced gassing solutions which are summed up in the table below.

Application

■ Cell Culture and Microbiology

The MX4/4 and MX4/1 are suitable for all applications requiring an individual and accurate mixture of gases at benchtop and pilot scale.

They cover requirements of slowly growing cell culture as well as of fast prospering organisms. Users can define their input gasses: When artificial air or











other predefined mixtures are required users can easily adjust their gassing module to the specific composition. With the MX4/4, head space as well as submerged gassing is possible thanks to the MX-Splitter.

■ System Integration and Stand Alone Solution

All DASGIP modules are tried and tested components of the DASGIP Parallel Bioreactor Systems for microbiology and cell culture.

One or more modules can also be operated as stand-alone systems.

	System	Input	Output	Mixing	Precision	Scale
Gas Mixing	 MX4/4	① ② ③ ④	① ② ③ ④	✓✓✓	★★★	 0-250 sL/h
	 MX4/1	① ② ③ ④	①	✓✓✓	★★ ★★	 0-20 sL/min
Gas Supply	 RX2/4	① ②	① ② ③ ④	✓	★	 0-75 sL/h (0-380 sL/h)
	 MF4	① ② ③ ④	① ② ③ ④	--	★★ ★★	 0-20 sL/min

DASGIP Gassing Solutions

Gas Mixing

Accurate Mix of Oxygen, Carbon Dioxide and Nitrogen

The DASGIP EasyAccess Software for automatic data logging is included. Digital and analog* interfaces allow perfect integration into 3rd party systems.

■ Laboratory, Production and Quality Assurance

Whether used in laboratories, in production or as part of quality assurance - the MX modules easily exceed highest demands.

DASGIP systems directly address important industry programs such as the FDA's 'Quality by Design' approach and PAT initiative.

Benefits

DASGIP's gas mixing modules boost precise individual control and high process automation at the same time. For instance, integration into the DASGIP system allows automated control of dissolved oxygen or pH via carbon dioxide. Integrated pressure control (MX4/4) and optional external pressure sensors (MX4/1) allow safe operations of bags and glass vessels. Further features such as check valves against backflow of liquids assure safe and efficient processes in R&D and production.

*The PC and the analog interface are optional.

Technical Data

	Common Features	MX 4/4	MX 4/1
Module			
Dimensions (WxDxH)	300 x 320 x 190 mm	✓	✓
Ambient Conditions	5°C to 40°C; max. 80% rH; no outdoor use	✓	✓
Power Supply	115 to 230 V _{AC} , 50-60 Hz	✓	✓
Weight in kg		12	9
Digital Interfaces	RS232/RS485	✓	✓
Gas Inlet			
Connectors	Push in 6 mm Air, N ₂ , O ₂ , CO ₂	✓	✓
Integrated pressure regulation	Min. 0.2 bar, max 2 bar	✓	
Outlet			
Count		4	1
Flow rates	Mass flow controlled	MX4/4: 0.5–50; MX4/4H: 0.5–250 sL/h	1 – 30 sL/min
Connectors	Push in	4 mm	6 mm
Accuracy		3%	1.5%

	Common Features	MX 4/4	MX 4/1
Set Points			
O ₂ concentration	For every outlet	4	1
CO ₂ concentration	For every outlet	4	1
Mass flow	Integrated, electronically for each outlet	4	1
System Integration			
Analog Interface	0-10 V _{DC}	Option	✓
Comm. Protocol	DTP	✓	✓
Software			
Programming	DASGIP EasyAccess	✓	✓
Control & Data Logging	ActiveX, COM, .Net	✓	✓
Programming Library	For VB, C++, .Net and others	✓	✓
Interface	MS Excel®, National Instruments Lab View®	✓	✓

Modules MX4/4 – MX4/1

Quality System certified by DQS ■ DIN EN ISO 9001 ■ Reg.-No. 63431