

1 CMOSens® EM1 Mass Flow Meter Performance

Table 1: Specifications of EM1 Mass Flow Meter – low flow ranges.

All data unless otherwise noted apply for calibration conditions: 20°C, N₂, 1013 mbar absolute pressure, horizontal mounting position, straight inlet fitting (length min. 5 x Ø)

Specification	Condition	Value		Unit
Range				
Model Number		EM1NH...	EM1NL...	
Flow Range ¹		0-0.05	0 – 0.5	l _n /min
Performance				
Accuracy ^{2,3}	2.5 - 100% FS ⁴		3.0	% m.v. ⁵
	<2.5 % FS		0.075	% m.v.
	10 - 100% FS	5.0		% m.v.
	<10 % FS	0.5		% FS
Repeatability	2.5 - 100% FS		0.3	% m.v.
	<2.5 % FS		0.02	% FS
	10 - 100% FS	0.5		% m.v.
	<10 % FS	0.05		% FS
Offset		<0.5	< 0.1	% FS
Standard Calibration Gas ⁶		N ₂		
Dynamic Range		≥ 1:100		
Operating Temperature Ambient/Gas		0 – 50 / 32 – 122		°C / °F
Temp. Coeff. Zero		0.01		%FS / °C
Temp. Coeff. Span		0.1		% m.v. / °C
Position Sensitivity correction	<5% FS	0.1		% FS
Pressure Coefficient		0.15% / bar – 0.01 % / psi		
Pressure Drop at Full Flow ⁷	straight inlet	<2 / 0.029	2 / 0.029	mbar / psi

¹ Other ranges for volume applications on request

² Including Offset, Non-Linearity, Hysteresis

³ Better accuracy available on request

⁴ In % of full scale (FS)

⁵ In % of measured value (m.v.) = of rate = of reading

⁶ Other gases for volume applications on request

⁷ All data for 1'013 mbar, 1 bar = 100 000 Pa = 401.9 inch H₂O = 14.5 psi. Lower pressure drop available for volume applications on request.

Table 2: Specifications of EM1 Mass Flow Meter – medium and high flow ranges.

All data unless otherwise noted apply for calibration conditions: 20°C, N2, 1013 mbar absolute pressure, horizontal mounting position, straight inlet fitting (length min. 5 x Ø)

Specification	Condition	Value		Unit
Range				
Model Number		EM1NR...	EM1NV...	
Flow Range ¹		0 – 20	0 – 200	l _n /min
Performance				
Accuracy ^{2,3}	1 - 100% FS ⁴	3	5	% m.v. ⁵
	<1 % FS	0.03	0.05	% FS
Repeatability	10-100% FS	0.3	0.5	% m.v.
	<10% FS	0.02	0.02	% FS
Offset		< 0.03	< 0.03	% FS
Standard Calibration Gas ⁶		Air		
Dynamic Range		≥ 1:100		
Operating Temperature Ambient/Gas		0 – 50 / 32 – 122		°C / °F
Temp. Coeff. Zero		0.01		%FS / °C
Temp. Coeff. Span		0.1		% m.v. / °C
Position Sensitivity correction	<5% FS	0.1		% FS
Pressure Coefficient		0.15% / bar – 0.01 % / psi		
Pressure Drop at Full Flow ⁷	straight inlet	20 / 0.29	100 / 1.45	mbar / psi

Table 3: Additional Specifications of EM1 Mass Flow Meter – all flow ranges.

Specification	Condition	Value		Unit
Temperature Sensor (measured media)				
Dynamic Range		0 – 60 / 32 – 140		°C / °F
Resolution		0.1		K
Accuracy		2		K
Electrical				
Output		RS 232 / SPI		
Supply Voltage		+ 7 – + 18		VDC
Electrical Connector		Molex		
Mechanical				
Length		13.6 / 5.35		cm / inch
Width		4.4 / 1.73		cm / inch
Height		8.18 / 3.2		cm / inch
Weight (straight / angle connector)		165 / 105		g
Mechanical Connector		G 3/8		inch
Maximum Operating Pressure ⁸		8 / 116		bar / psi
Burst Pressure		40 / 580		bar / psi
Leak-Integrity		1 x 10 e-4		mbar l/s He
Material				
Wetted Materials		Si, Si ₃ N ₄ , SiO _x , Gold, Viton®, Epoxy, Glob Top, Polycarbonate		

¹ Other ranges for volume applications on request

² Including Offset, Non-Linearity, Hysteresis

³ Better accuracy available on request

⁴ In % of full scale (FS)

⁵ In % of measured value (m.v.) = of rate = of reading

⁶ Other gases for volume applications on request

⁷ All data for 1'013 mbar, 1 bar = 100 000 Pa = 401.9 inch H₂O = 14.5 psi. Lower pressure drop available for volume applications on request.

⁸ 12.0 bar / 174 psi for short time operation, higher values for volume applications on request