

Specification

Model	SEC-Z714SMG *1 / SEC-Z717SMG *2			SEC-Z724SMG *1 / SEC-Z727SMG *2
Full-scale flow rate (N ₂ conversion flow rate)	MR.MG number #01 : 30 SCCM	MR.MG number #02 : 100 SCCM #03 : 300 SCCM #04 : 1 SLM #05 : 3 SLM	MR.MG number #06 : 10 SLM	MR.MG number #07 : 30 SLM #08 : 50 SLM
Flow rate accuracy *3 *4	≤ ±1.0 %S.P. (5 %F.S. ≤ Flow rate ≤ 100 %F.S.) ≤ ±0.05 %F.S. (0.5 %F.S. ≤ Flow rate < 5 %F.S.)			
Linearity *3	≤ ±0.5 %F.S.			
Repeatability *3 *5	≤ ±0.15 %S.P. (5 %F.S. ≤ Flow rate ≤ 100 %F.S.) ≤ ±0.0075 % F.S. (0.5 %F.S. ≤ Flow rate < 5 %F.S.)			
Zero point temperature effect *6	≤ ±0.01 %F.S./°C			
Span temperature effect *6	≤ ±0.05 %F.S./°C			
Zero point output stability *7	≤ ±0.3 %F.S./year			
Flow rate control range *8	0.5-100 %F.S. Auto close function : ≤ 0.25 %F.S.			
Step-up flow response time *9	450±30 ms (0 %F.S. → 5 %F.S. < Flow rate ≤ 100 %F.S.) ≤ 600 ms (0 %F.S. → 2 %F.S. ≤ Flow rate ≤ 5 %F.S.) ≤ 1 s (0 %F.S. → 0.5 %F.S. ≤ Flow rate < 2 %F.S.)			
Step down flow response time *9	450±30 ms (100 %F.S. → 10 %F.S. ≤ Flow rate ≤ 80 %F.S.) ≤ 2 s (100 %F.S. → 0.5 %F.S. ≤ Flow rate ≤ 10 %F.S.) ≤ 200 ms (100 %F.S. → 0 %F.S. (Valve closed))			
Flow response time adjustment (Tunable Response) *9 *10	Tunable range : 300 ms ≤ Time ≤ 1000 ms (0.3 s ≤ Time ≤ 1 s) Adjustment accuracy : User specified time ±50 ms (±0.05 s)			
Supply pressure condition	≤ 450 kPa (G)			
Operating differential pressure	max	400 kPa (D)		
	min	100 kPa (D) (Supply pressure < 150 kPa (A)) 50 kPa (D) (Supply pressure ≥ 150 kPa (A))	100 kPa (D)	200 kPa (D)
Proof pressure	1 MPa (G)			
Flow rate at fully closed control valve *11	≤ 0.1 %F.S.			(N.C.valve) ≤ 0.2 %F.S. (N.O.valve) ≤ 0.5 %F.S.
Pressure transient sensitivity *12	≤ ±(1.5 %F.S. + 1.5 %S.P.)	≤ ±1.0 %F.S.		
Pressure measurement accuracy	≤ ±3.5 kPa (Measurement range : 0-700 kPa (A))			
Operating temperature *13	15-60 °C			
Temperature measurement accuracy	≤ ±2 °C (Measurement range : 15-60 °C)			
Leak integrity	≤ 5 × 10 ⁻¹² Pa · m ³ /s (He)			
Valve type	Normally closed : N.C. Normally open : N.O.			
Wetted materials	SUS316 L, Ni-alloy, PFA (Bin#01-#04)			
Fitting	1/4 inch VCR equivalent fitting-to-fitting dimension 124 mm 1.125 inch C-Seal Port-to-port dimension 92 mm 1.125 inch W-Seal Port-to-port dimension 92 mm			
Communication interface	M12 (5 pin) male connector DeviceNet™ protocol *1 RJ45 connector × 2 EtherCAT® protocol *2			
Service communication port	φ2.5 port Dedicated RS-485 communication			
Power supply	M12 (5 pin) male connector 24 VDC, 7.5 VA (682mA at 11 V) *1 *14 M8 (5 pin) male connector 24 VDC ±4 V, 7.5 VA *2			
Weight	1.3 kg *1 1.1 kg *2			
Mounting orientation	Free			
Warm-up operation time	≥ 60 minutes			
Storage temperature	0-80 °C (Non condensing)			
Multi-gas, multi-range Function	Standard installation			

*1: DeviceNet™ communication model

*2: EtherCAT® communication model

*3: Value applicable to a calibration gas(N₂) or the gas types measured with our benchmark equipment.

*4: Flow rate accuracy with the ambient temperature at 23±2°C (in compliance with SEMI E56-0309).

*5: Complies with "repeatability" as defined by SEMI E56-0309.

*6: Temperature effect for the range of temperatures between 15°C and 60°C when 23°C constitutes the benchmark.

*7: Zero point output stability in compliance with SEMI E69-0298.

*8: If the full-scale value for the flow rate is changed with the multi-range function, 100% of the revised full-scale value will constitute the upper limit of the flow-rate control range.

*9: The response time is defined as the time that it takes for the product's flow rate output to reach 98% of the amount of the change set for the flow rate.

For any change in flow rate control to 0% F.S. (valve closed), the response time is defined as the time it takes for the product's flow rate output to reach 0.5% F.S.

*10: The value in our conditions as based on the use of a calibration gas (N₂). *11: Flow rate when the control valve is fully closed and a calibration gas (N₂) is supplied at 450 kPa (G).

*12: Flow rate variation amount where a 2psi pressure change (in compliance with SEMI F64-0701) occurs in a 1second period when flow rate control is applied between 5% F.S. and 100% F.S. in our conditions as based on the use of a calibration gas (N₂).

*13: The product's temperature output constitutes the benchmark. The product's temperature may rise higher than the environmental temperature if a source of heat exists in the vicinity of the product or if multiple units of the product have been installed in close proximity to each other.

*14: Use power supply and cable applicable for ODVA.

- In notation of pressure unit, (D) shows differential pressure, (G) shows gauge pressure, (A) shows absolute pressure.
- SCCM, SLM are symbols representing the gas flow rate (ml/min, l/min, at 0°C 101.3kPa).

Model	SEC-Z737SMG		SEC-Z747SMG
Full-scale flow rate (N ₂ conversion flow rate)	MR.MG number #09 : 100 SLM	MR.MG number #9.5 : 100 SLM	MR.MG number #10 : 200 SLM
Flow rate accuracy *1 *2	≤ ±1.0 %S.P. (35 %F.S. ≤ Flow rate ≤ 100 %F.S.) ≤ ±0.35 %F.S. (2 %F.S. ≤ Flow rate < 35 %F.S.)		
Linearity *1	≤ ±0.5 %F.S.		
Repeatability *1 *3	≤ ±0.2 %F.S.		
Zero point temperature effect *4	≤ ±0.01 %F.S./°C		
Span temperature effect *4	≤ ±0.05 %F.S./°C		
Zero point output stability *5	≤ ±0.3 %F.S./year		
Flow rate control range *6	2-100 %F.S. Auto close function : ≤ 1.5 %F.S.		
Step-up flow response time *7	≤ 600 ms (0 %F.S. → 2 %F.S. ≤ Flow rate ≤ 100 %F.S.)		
Step down flow response time *7	≤ 600 ms (100 %F.S. → 10 %F.S. < Flow rate ≤ 80 %F.S.) ≤ 2 s (100 %F.S. → 2 %F.S. ≤ Flow rate ≤ 10 %F.S.) ≤ 200 ms (100 %F.S. → 0 %F.S. (Valve closed))		
Flow response time adjustment (Tunable Response)	No function		
Supply pressure condition	100-450 kPa (G) (Ambient temperature 15-50 °C) 150-450 kPa (G) (Ambient temperature 50-60 °C)	200-450 kPa (G) (Ambient temperature 15-50 °C) 250-450 kPa (G) (Ambient temperature 50-60 °C)	
Operating differential pressure	max 350 kPa (D)		
	min 100 kPa (D) (Ambient temperature 15-50 °C) 150 kPa (D) (Ambient temperature 50-60 °C)	200 kPa (D) (Ambient temperature 15-50 °C) 250 kPa (D) (Ambient temperature 50-60 °C)	
Proof pressure	1MPa (G)		
Flow rate at fully closed control valve *8	≤ 2 % of set full scale		
Pressure transient sensitivity *9	≤ ±(1.0 %F.S.+1.0 %S.P.)		
Pressure measurement accuracy	≤ ±3.5 kPa (Measurement range : 0-700 kPa(A))		
Operating temperature *10	15-60 °C		
Temperature measurement accuracy	≤ ±2 °C (Measurement range : 15-60 °C)		
Leak integrity	≤ 5 × 10 ⁻¹² Pa · m ³ /s (He)		
Valve type	Normally closed : N.C. Normally open : N.O.		
Wetted materials	SUS316L, Ni-alloy		
Fitting	1/2 inch VCR equivalent fitting-to-fitting dimension 150.4 mm 1.5 inch C-Seal Port-to-port dimension 92mm		
Communication interface	RJ45 connector×2 EtherCAT®protocol		
Service communication port	φ2.5 port Dedicated RS-485 communication		
Power supply	M8 (5 pin) male connector 24 VDC ±4 V, 7.5 VA		
Weight	1.6 kg		
Mounting orientation	Free		
Warm-up operation time	≥ 60 minutes		
Storage temperature	0-80 °C (Non condensing)		
Multi-gas, multi-range Function	Standard installation	Standard installation *11	Standard installation

*1: Value applicable to a calibration gas(N₂) or the gas types measured with our benchmark equipment.

*2: Flow rate accuracy with the ambient temperature at 23±2°C (in compliance with SEMI E56-0309).

*3: Complies with "repeatability" as defined by SEMI E56-0309.

*4: Temperature effect for the range of temperatures between 15°C and 60°C when 23°C constitutes the benchmark.

*5: Zero point output stability in compliance with SEMI E69-0298.

*6: If the full-scale value for the flow rate is changed with the multi-range function, 100% of the revised full-scale value will constitute the upper limit of the flow-rate control range.

*7: The response time is defined as the time that it takes for the product's flow rate output to reach 98% of the amount of the change set for the flow rate.

For any change in flow rate control to 0% F.S. (valve closed), the response time is defined as the time it takes for the product's flow rate output to reach 0.5% F.S.

*8: Flow rate when the control valve is fully closed and a calibration gas (N₂) is supplied at 450 kPa (G).

*9: Flow rate variation amount where a 2psi pressure change (in compliance with SEMI F64-0701) occurs in a 1second period when flow rate control is applied between 5% F.S. and 100% F.S. in our conditions as based on the use of a calibration gas (N₂).

*10: The product's temperature output constitutes the benchmark. The product's temperature may rise higher than the environmental temperature if a source of heat exists in the vicinity of the product or if multiple units of the product have been installed in close proximity to each other.

*11: Contact us for more information about compatible gas types.

● In notation of pressure unit, (D) shows differential pressure, (G) shows gauge pressure, (A) shows absolute pressure.

● SCCM, SLM are symbols representing the gas flow rate (ml/min, l/min, at 0°C 101.3kPa).