

MASS FLOW CONTROLLER / METER SEC(F)-N135MGM(R)/N145MGM(R)

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1.SPECIFICATIONS

MODEL	SEC(F)-N135MGM	SEC(F)-N135MGR	SEC(F)-N145MGM	SEC(F)-N145MGR
Full scale (Flow rate converted to N2) *1)	#09: 100SLM		#10: 200SLM	
Valve Type	Normally Closed under no electricity: C Normally Open under no electricity: O			
Flow rate at fully closed control valve	Less than 2% of Setting F.S.			
Flow rate control range	2% ~ 100% of Setting F.S.			
Flow rate measuring range(SEF)	0% ~ 100% of Setting F.S.			
Accuracy *2) *3)	±1.0%S.P.(Flow rate > 35%F.S.) ±0.35%F.S.(Flow rate ≤ 35%F.S.)			
Operating temperature	5 ~ 50 (recommended temperature range: 15 ~ 45)			
Response *4)	1sec or less(All flow rate control range)			
Linearity *2)	Within ±0.5% of F.S.			
Repeatability *2)	Within ±0.2% of F.S.			
Operating pressure*5) *6)	100 ~ 300kPa(D)		200 ~ 300kPa(D)	
Operating pressure (SEF) *5)	300kPa(D) or less			
The maximum operating pressure *5)	450kPa(g)			
Pressure resistance *5)	1000kPa(g)			
External leak rate	5 × 10 ⁻¹² Pa·m ³ /s(He) or less	1 × 10 ⁻¹⁰ Pa·m ³ /s(He) or less	5 × 10 ⁻¹² Pa·m ³ /s(He) or less	1 × 10 ⁻¹⁰ Pa·m ³ /s(He) or less
Flow rate set signal *7)	0.1 ~ 5VDC/0.2 ~ 10VDC/4.32 ~ 20mA(2% ~ F.S.)			
Flow rate output signal *7)	0 ~ 5VDC/0 ~ 10VDC/4 ~ 20mA(0% ~ F.S.)			
Digital Interface	CC-Link(Ver.1.10) *8)			
Station No. setting	01 ~ 64			
Transmission speed	156k, 625k, 2.5M, 5M, 10M bit/s			
Power supply	24VDC (13 ~ 32VDC)			
Power consumption	4.5VA			
Wetted materials	316L Stainless Steel	316L Stainless Steel, Rubber	316L Stainless Steel	316L Stainless Steel, Rubber
Standard fittings	1/2inch VCR or equivalent			
Mounting orientation	Free			
Gas and Flow rate change operation on a user side	Possible			

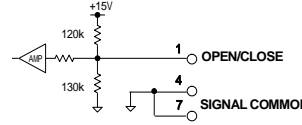
Notes: *1) SCCM and SLM denote gas flow rate in ml/min and l/min, respectively.
*2) Accuracy, linearity and repeatability are guaranteed only for calibration gas and flow rate of full scale.
*3) Temperature range in which "accuracy" is guaranteed is in accordance with SEMI: E56-0309.
*4) Response time is the time required to increase flow up to setting ±2% of full scale. Temperature range in which "response" is guaranteed is 23±2 .
*5) (d) : Differential Pressure, (g) : Gauge Pressure
*6) Operating pressure varies depending on other operating parameters.
*7) Flow rate set signal and Flow rate output signal is choices when ordering.
*8) This model is used as remote device station.
The number of occupied station is 1 station.

2.ELECTRICAL CONNECTION

Connector to be used D-subminiature 9 contact pin in connector with #4-40 UNC

Pin No.	Signal Name
1	Valve override open/close signal *1 *2
2	Analog flow rate output signal *3
3	Power supply input(13 ~ 32VDC)
4	Signal common
5	Power supply return(0VDC)
6	Analog flow rate setting signal *1 *4
7	Output signal common
8	Setting signal common
9	Valve voltage monitor(0 ~ 5.5VDC)

*2: OPEN/CLOSE CIRCUIT



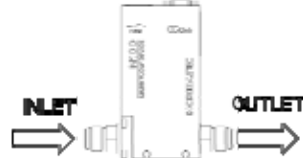
Notes:

- *1: No connection for SEF series.
- *2: 13 ~ 32VDC:OPEN,GND ~ -15VDC:CLOSE
- *3: 0 ~ 5VDC:Minimum resistance 2k , 0 ~ 10VDC:Minimum resistance 5k , 4 ~ 20mA:Maximum resistance:250
- *4: Input impedance 0 ~ 5VDC/0 ~ 10VDC: Minimum 1M , 4 ~ 20mA:250
Pin No.4 and Pin No.7 are connected inside the MFC.
Pin No.8 is connected with Pin No.4 and 7 when Flow rate output signal is 0-5VDC or 0-10VDC.
Power common (Pin No.5) and Signal common (Pin No.4, 7 and 8) are not connected inside the MFC.
Be sure to use shield cable to minimize the effect of electrical noise

Connector to be used PHOENIX CONTACT DMC 1.5/5-G1F-3.5-LR P20THR (CC-Link I/O)

Signal	Signal Name
DA	DA Signal
DB	DB Signal
DG	Digital Ground
SLD	Shielded wire
FG	FG

3.HOW TO OPERATE

- 1) Connection to Gas System
The MFC case is labeled with a flow direction arrow. Please make sure that the MFC is mounted in the corrected direction with respect to flow.

- 2) Connection to Electrical System
Electrical connection is in accordance with the electrical pin assignments table. Power requirements for direct current are:
13~32VDC, 350mA at 13VDC Rated voltage: 24VDC
- 3) Warming Up Operation
The power is to be supplied more than 30 minutes without gas flowing, as warming-up operation. Without warming-up operation, The device may cause malfunction such as the aggravation of the flow quantity precision.
- (4) Miscellaneous Functions
 - Rotary Switch (B RATE)
 - Rotary Switch (STATION NO.: 01~64)
 - Zero Adjust Switch
 - CC-Link
 - CC-Link LED

Gas inlet and outlet of the MFC fittings are 1/2inch VCR or equivalent with male screw fitting as standard. These MFCs can be mounted in any orientation, in most applications, without degradation of performance. Please make sure that process connections are as leak tight as possible. Confirm leak integrity of the installed MFC at the gas system connections using a helium mass spectrometer leak detector with sufficient sensitivity

LED	Communication status
L RUN	Solid : Running data link
SD	Solid : Sending data
RD	Solid : Receiving data
L ERR	Solid : Communication error Flash : Changing the settings of switches in the power ON

Setting	Setting range	Cable length
0	156kbps	~ 1200m
1	625kbps	~ 600m
2	2.5Mbps	~ 200m
3	5Mbps	~ 150m
4	10Mbps	~ 100m

Setting	Setting range
x10	0 ~ 6
x1	0 ~ 9

4.CAUTION AND REMINDERS

- 1) Please make sure that process piping system is as leak tight as possible. It is important to purge the entire gas line. If the purge is not sufficient, it might invite troubles such as particle generation, clogging, decrease in throughput, etc.
- 2) Please install gas filter on inlet side of MFC for eliminating particles and impurities which flow from upstream of gas line.
- 3) Preservation temperature of MFC is 0 to 80 . Please avoid the temperature out of range for preservation. Please do not dewing it, or make it to failure.
- 4) Never remove the MFC case, since there is a high voltage portion built inside the MFC. Removing the MFC case might invite to receive an electric shock, or to result in failure of the MFC.
- 5) Analog flow rate signal may be output transitionally within the range of the power supply voltage. When the analog flow rate signal is used, please take care of the input voltage resistance of the system.
- 6) Please do not turn on and off the power repeatedly in a short period. More than three(3) seconds should be kept before turning on the power again. power source should be turned on/off simultaneously. Partial power supply or signal input, and plugging/unplugging while power is supplied, may cause trouble.
- 7) When utilizing Zero-Adjust function, do not pressurize inside the DMFC. If pressurized gas is inside DMFC, the function does not work correctly. After gas flow is suspended, waiting more than 1 minute is recommended to make the sensor output steadier. It needs 30 minutes for the DMFC becoming steady after power is turned on.
- 8) Please make sure of sufficient capacity of power supply source.
- 9) Please do not apply any excessive force and pressure on the main body of the product and the cable.
- 10) The flow rate of MFC at shipment is calibrated at 25 under 1013hPa(1atm) or 0 under 1013hPa(1atm).

The following notations are used for gas flow rate units for convenience;
CCM, LM : ml/min, l/min at 25 under 1013hPa(1atm)
SCCM, SLM : ml/min, l/min at 0 under 1013hPa(1atm)

- 11) Please consult HORIBA STEC first prior to using this model with a gas other than the nameplate or calibration gas.
- 12) Please keep in mind that the control valve used in the product cannot provide positive shut-off capability.
- 13) When the control valve in the DMFC is fully open or when it's out of control, the flow rate of gas exceeds the indicated F.S. value.
- 14) Please do not search and / or run non-disclosed commands, or there is a possibility to change or ruin the important inner data, and to invite troubles having adverse effect on the product performance.
- 15) If nonvolatile memory is rewritten 100,000 times or more, a defect of operation may arise.
- 16) This is a product for industrial environments. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

*This instruction manual is subject to alteration without notice.

5.PRODUCT WARRANTY

- 1) Period:
This product is warranted for one (1) year (parts and labor) from date of shipment. Repair will be provided free of charge during this period if the products is returned to HORIBA STEC or authorized service representative with a description of the problem. HORIBA STEC is not responsible for damage due to customer neglect or improper operation of this product.
- 2) Scope:
Warranty coverage is restricted to this product only. HORIBA STEC is not responsible for damage to other components due to improper operation of this product.
- 3) Warranty:
Replacement parts are warranted for ninety (90) days or the remainder of the warranty period (whichever is longer).
- 4) HORIBA STEC is not responsible for damage due to:
 - a) Natural disasters
 - b) Miss-operation or abuse of this product
 - c) Operation or storage in an unsuitable environment
 - d) Operation outside of the rated specifications
 - e) Unauthorized alterations or retrofits to this product

Examples for out of scope of responsibility by HORIBA STEC;
*In case of use of high reaction gas, clogging due to incomplete purge or leakage, etc. in gas line.
*Contamination or clogging by dust or mist, etc.
Repair expense with/without charge is to be determined as examination and/or disassembly of the returned products.

产品中有害物质的名称及含量

Name and amount of hazardous substance used in a product

部件名称 Unit name	有害物质 Hazardous substance					
	铅 Lead (Pb)	汞 Mercury (Hg)	镉 Cadmium (Cd)	六价铬 Hexavalent chromium (Cr (VI))	多溴联苯 Polybromo- biphenyl (PBB)	多溴二苯醚 Polybromo- diphenyl ether (PBDE)
印刷电路板 Printed board	x					
箱 Case						
机械零部件 Machine parts	x					

本表格依据 SJ/T 11364 的规定编制。
This form is prepared in accordance with SJ/T 11364.
: 表示该有害物质在该部件所有均质材料中的含量均在 GB/T 26572 规定的限量要求以下。
Denotes that the amount of the hazardous substance contained in all of the homogeneous materials used in the component is below the limit on the acceptable amount stipulated in the GB/T 26572.
x: 表示该有害物质至少在该部件的某一均质材料中的含量超出 GB/T 26572 规定的限量要求。
Denotes that the amount of the hazardous substance contained in any of the homogeneous materials used in the component is above the limit on the acceptable amount stipulated in the GB/T 26572.

标记的意义
Meaning of Marking



本标记适用在中华人民共和国售电器电子产品, 标记中央的数字表示环境保护使用期限的年限。(不是表示产品质量保证期间。)
只要遵守这个产品有关的安全和使用注意事项, 从制造日开始算起在这个年限内, 不会给环境污染、人体和财产带来严重的影响。请不要随意废弃本电器电子产品。

*For questions or service please contact:

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