

Small flow sensor  
 Small flow sensor extremely small flow type  
 Indicator type/analog output type

# FSM-H Series (air/nitrogen gas)

● Flow rate range: 0.25 to 5, 0.5 to 10, 2.5 to 50, 50 to 100m<sup>3</sup> /min.



## Indicator type specifications

Descriptions	Indicator type			
	FSM-H-N/P-005ML	FSM-H-N/P-010ML	FSM-H-N/P-050ML	FSM-H-N/P-100ML
Flow rate range m <sup>3</sup> /min. <sup>Note 1</sup>	0.25 to 5	0.5 to 10	2.5 to 50	5 to 100
Working conditions	Working fluid Clean air (JIS B 8392-1. 1. 1 to 5. 6. 2), compressed air (JIS B 8392-1. 1. 1 to 1. 6. 2) <sup>Note 2</sup> , N <sub>2</sub> gas <sup>Note 3</sup>			
	Max. working pressure MPa 1.0			
	Min. working pressure MPa -0.09			
	Withstanding pressure MPa 1.5			
	Ambient temperature/humidity 0 to 50°C, 90%RH or less			
	Working fluid temperature °C 0 to 50 (with no dew condensation)			
Precision	Linearity (display/analog output) ±3% F.S. or less (0.1MPa, 25°C, flow rate range 5 to 100%F.S.)			
	Pressure characteristics ±3% F.S. or less (-0.09 to 1.0MPa, where 0.1MPa is reference)			
	Temperature characteristics ±0.2%F.S./°C or less (15 to 35°C, where 25°C is reference)			
	Repeatability ±0.5%F.S. or less			
Responsiveness		50ms or less <sup>Note 5</sup>		
Indicator	Type of display Flow display (3.5-digit 7-segment display, orange), run and switch output display (orange)			
	Display min. unit <sup>Note 6</sup>		0.01mL/min. <sup>Note 1</sup>	0.1mL/min. <sup>Note 1</sup>
Output type		Switch output 2 points (NPN or PNP open collector output, 30 VDC and 50 mA or less, voltage drop of 2.4 V or less, PLC- and relay-compatible) Analog output 1 point (1 to 5V voltage output, connected load impedance 50KΩ and over)		
Power voltage		12/24 VDC (10.8 to 26.4V)		
Current consumption		60mA or less		
Lead wire		φ3.7 0.2mm <sup>2</sup> x 5 conductor 1m		
Functions		Flow display, flow display peak hold, switch output, analog output		
Installation	Installation attitude Horizontal or vertical			
	Strait piping section Not required			
Protective structure		IEC standards IP40		
Protective circuit <sup>Note 4</sup>		Power supply reverse connection protection, switch output reverse connection protection, switch output load short-circuit protection		
EMC directive		EN55011, EN61000-6-2, EN1000-4-2/3/4/6/8		

## Indicator type weight

Unit: g

Model no.	FSM-N/P-005	FSM-N/P-010	FSM-N/P-050	FSM-N/P-100
Port size (body material)				
6A Rc1/8 (stainless steel)	150	150	150	150
6G G1/8 (stainless steel)				

## Analog output type weight

Unit: g

Model no.	FSM-A-005	FSM-A-010	FSM-A-050	FSM-A-100
Port size (body material)				
6A Rc1/8 (stainless steel)	140	140	140	140
6G G1/8 (stainless steel)				

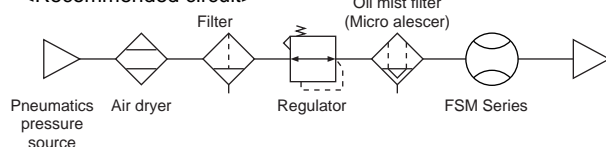
### Analog output type specifications (without display)

Descriptions		Analog output type			
		FSM-H-A-005ML	FSM-H-A-010ML	FSM-H-A-050ML	FSM-H-A-100ML
Flow rate range	mℓ /min. <small>Note 1</small>	0.25 to 5	0.5 to 10	2.5 to 50	5 to 100
Working conditions	Working fluid	Clean air (JIS B 8392-1. 1. 1 to 5. 6. 2), compressed air (JIS B 8392-1. 1. 1 to 1. 6. 2) <small>Note 2</small> , N <sub>2</sub> gas <small>Note 3</small>			
	Max. working pressure	MPa 1.0			
	Min. working pressure	MPa -0.09			
	Withstanding pressure	MPa 1.5			
	Ambient temperature/humidity	0 to 50°C and 90%RH or less			
Precision	Working fluid temperature	°C 0 to 50 (with no dew condensation)			
	Linearity (analog output)	±3% F.S. or less (0.1MPa, 25°C, flow rate range 5 to 100%F.S.)			
	Pressure characteristics	±3% F.S. or less (-0.09 to 1.0MPa, where 0.1MPa is reference)			
	Temperature characteristics	±0.2%F.S./°C or less (15 to 35°C, where 25°C is reference)			
Repeatability		±0.5%F.S. or less			
Responsiveness		50ms or less <small>Note 5</small>			
Type of display		Power display (green)			
Output type		Analog output 1 point (1 to 5V voltage output, connected load impedance 50KΩ and over)			
Power voltage		12/24 VDC (10.8 to 26.4V)			
Current consumption		50mA or less			
Lead wire		φ 3.7 0.2mm <sup>2</sup> x 3 conductor 1m			
Functions		Analog output			
Protective circuit <small>Note 4</small>		Power supply reverse connection protection			
Installation	Installation attitude	Horizontal or vertical			
	Strait piping section	Not required			
Protective structure		IEC standards IP40			
EMC directive		EN55011, EN61000-6-2, EN1000-4-2/3/4/6/8			

Note 1: Converted to volumetric flow at 20°C 1 barometric pressure (101kPa)

Note 2: When using compressed air, use clean air that complies to JIS B 8392-1:2003 Class 1.1.1 to 1.6.2. Compressed air from the compressor contains drainage (water, oxidized oil, foreign matter, etc.). Install a filter (filtration: 5 μm), air dryer (minimum pressure dew point: 10°C or less), and oil mist filter (maximum oil concentration: 0.1 mg/m<sup>3</sup>) on the primary side of this product to maintain product functions.

#### <Recommended circuit>



#### <Recommended component>

Air filter: F Series  
Oil mist filter: M Series

Note 3: Consult with CKD when using gas other than air or N<sub>2</sub>.

Note 4: This product's protection circuit is effective only for specific misconnections and load short-circuits. It does not provide protection for all misconnections.

Note 5: Response time varies depending on the piping conditions.

Note 6: This indicates the minimum display for the flow, and does not guarantee display accuracy.

### Separate indicator specifications (analog output type dedicated)

Model no.		Separate indicator			
Descriptions		FSM-H-D N/P-005ML	FSM-H-D N/P-010ML	FSM-H-D N/P-050ML	FSM-H-D N/P-100ML
Available analog output type model no.		FSM-H-A-005ML	FSM-H-A-010ML	FSM-H-A-050ML	FSM-H-A-100ML
Indicator	Type of display	Flow display (3.5-digit 7-segment display, orange), run and switch output display (orange)			
	Display min. unit <small>Note 6</small>	0.01mℓ/min. <small>Note 1</small>		0.1mℓ/min. <small>Note 1</small>	
Output		Switch output 2 points (NPN or PNP open collector output, 30 VDC and 50 mA or less, voltage drop of 2.4 V or less, PLC- and relay-compatible) Analog output 1 point (1-5V voltage output, connected load impedance 50KΩ and over)			
Power voltage		12/24 VDC (10.8 to 26.4V)			
Current consumption		50mA or less (only indicator)			
Lead wire		φ 3.7 0.2mm <sup>2</sup> x 5 conductor (1m)			
Functions		Flow display, flow display peak hold, switch output, analog output			
Ambient temperature/humidity		0 to 50°C, 85%RH or less (no dew)			
Protective structure		IEC standards IP40			
EMC directive		EN55011, EN61000-6-2, EN1000-4-2/3/4/6/8			
Weight	g	Approx. 70 (including lead wire 1m)			

Refrigerating type dryer  
 Desiccant type dryer  
 High polymer membrane dryer  
 Air filter  
 Auto. drain / others  
 F.R.L. (Module unit)  
 F.R.L. (Separate)  
 Compact F.R.  
 Precise regulator  
 F.R.L. (Related products)  
 Clean F.R.  
 Electro pneumatic regulator  
 Air booster  
 Speed control valve  
 Silencer  
 Check valve / others  
 Joint / tube  
 Vacuum filter  
 Vacuum regulator  
 Suction plate  
 Magnetic spring buffer  
 Mechanical pressure SW  
 Electronic pressure SW  
 Contact / close contact cont. SW  
 Air sensor  
 Pressure SW for coolant  
 Small flow sensor  
 Small flow controller  
 Flow sensor for air  
 Flow sensor for water  
 Total air system  
 Total air system (Gamma)  
 Ending  
 Small Extremely small flow type Flow sensor

## How to order

**FSM-H** - **N** - **005ML** - **6A** - **K**

**A** Output type

**B** Flow rate range

**C** Port size

**D** Option

<Example of model number>

**FSM-H-N-005ML-6A-K**

Model: FSM indicator type

- A** Switch output type : NPN output
- B** Flow rate range : 0.25 to 5m ℓ/min.
- C** Port size : Rc1/8 (stainless steel body)
- D** Option : With company certification

● Separate indicator (analog output type dedicated)

**FSM** - **H** - **D** **N** - **010ML**

Model no.

**A** Switch output type

**B** Flow rate range

● Bracket for separate indicator

**PPD3** - **KL-D**

**A** Bracket kit

Symbol	Descriptions
<b>A Output type</b>	
<b>A</b>	Analog output 1 point
<b>N</b>	NPN output 2 points, analog output 1 point
<b>P</b>	PNP output 2 points, analog output 1 point

<b>B Flow rate range</b>	
<b>005ML</b>	0.25 to 5m ℓ/min.
<b>010ML</b>	0.5 to 10m ℓ/min.
<b>050ML</b>	2.5 to 50m ℓ/min.
<b>100ML</b>	5 to 100m ℓ/min.

<b>C Port size</b>	
<b>6A</b>	Rc1/8 (stainless steel body)
<b>6G</b>	G1/8 (stainless steel body)

\* Refer to page 1285 for model No. and dimensions of bracket (optional).

<b>D Option</b>	
<b>Blank</b>	None
<b>K</b>	With company certification
<b>T (Note 1)</b>	With traceability certificate

Note 1) Proof of traceability, inspection results, and traceability system diagram are included.

Symbol	Descriptions
<b>A Output type</b>	
<b>N</b>	NPN output 2 points, analog output 1 point
<b>P</b>	PNP output 2 points, analog output 1 point

<b>B Flow rate range</b>	
<b>005ML</b>	0.25 to 5m ℓ/min.
<b>010ML</b>	0.5 to 10m ℓ/min.
<b>050ML</b>	2.5 to 50m ℓ/min.
<b>100ML</b>	5 to 100m ℓ/min.

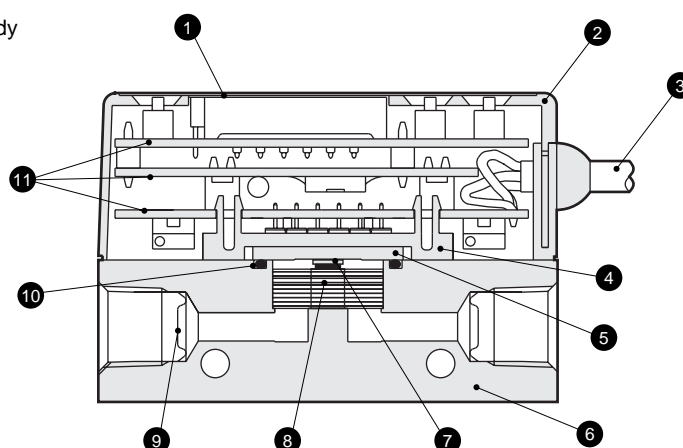
\* Refer to pages 1314 to 1321 for the operation and dimensions, etc.,

Symbol	Descriptions
<b>A Bracket kit</b>	
<b>KL-D</b>	Single foot bracket (L type)
<b>KD-D</b>	Both sides foot bracket (parallel)
<b>KHS-D</b>	Panel mount bracket set with cover
<b>KC</b>	Operation protective cover

\* Refer to pages 1314 to 1315 for dimensions and size of bracket.

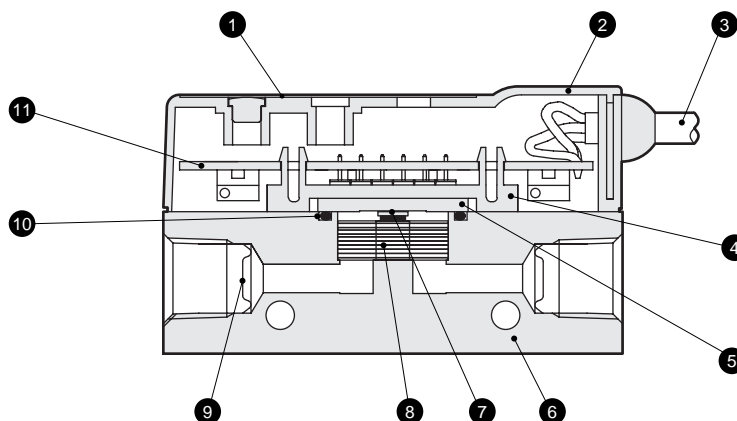
### Internal structure and parts list

- FSM-H-N/P-\*-\*  
Indicator type stainless steel body



No.	Parts name	Material	No.	Parts name	Material
1	Front seat	Polyester film	7	Sensor chip	Silicone
2	Case	ABS resin	8	Rectifier	Stainless steel
3	Lead wire with holder (5 - conductor)	ABS resin/polyvinyl chloride	9	Port filter	Stainless steel
4	Module holder	Polyamide resin	10	Sensor gasket	Fluoro rubber
5	Sensor circuit board	Alumina	11	Electron circuit board	
6	Stainless steel body	Stainless steel			

- FSM-H-A-\*-\*  
Analog type stainless steel body



No.	Parts name	Material	No.	Parts name	Material
1	Front seat	Polyester film	7	Sensor chip	Silicone
2	Case	ABS resin	8	Rectifier	Stainless steel
3	Lead wire with holder (3 - conductor)	ABS resin/polyvinyl chloride	9	Port filter	Stainless steel
4	Module holder	Polyamide resin	10	Sensor gasket	Fluoro rubber
5	Sensor circuit board	Alumina	11	Electron circuit board	
6	Stainless steel body	Stainless steel			

- Separate indicator FSM-H-D-\*-\*

Refer to Page 1314 for internal structure of a separate indicator.

Refrigerating type dryer  
Desiccant type dryer  
High polymer membrane dryer  
Air filter  
Auto. drain / others  
F.R.L. (Module unit)  
F.R.L. (Separate)  
Compact F.R.  
Precise regulator  
F.R.L. (Related products)  
Clean F.R.  
Electro pneumatic regulator  
Air booster  
Speed control valve  
Silencer  
Check valve / others  
Joint / tube  
Vacuum filter  
Vacuum regulator  
Suction plate  
Magnetic spring buffer  
Mechanical pressure SW  
Electronic pressure SW  
Contact / close contact cont. SW  
Air sensor  
Pressure SW for coolant  
Small flow sensor  
Small flow controller  
Flow sensor for air  
Flow sensor for water  
Total air system  
Total air system (Gamma)

Ending  
Small Extremely small flow type  
Flow sensor