

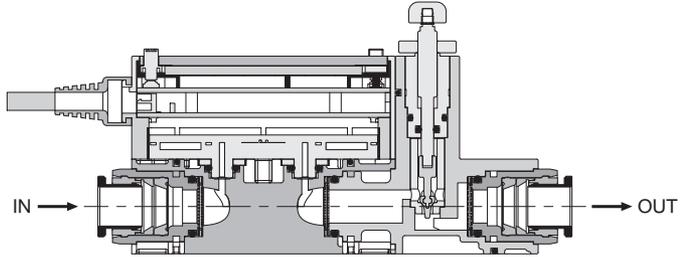
FC-R series - Speed controllable flow switch

Order expression

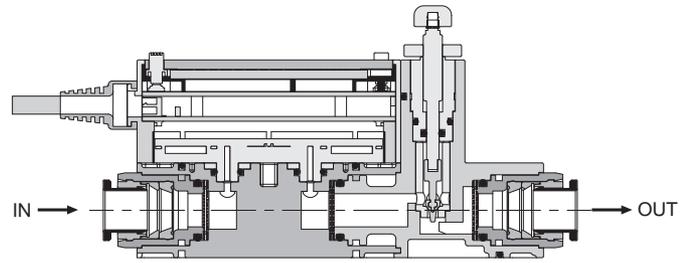
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Internal structure



FCSR



FCMR

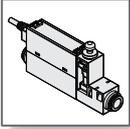
How to order

FC	S	R	020	C04	V	N	B	3			
Model	With needle valve	Flow rate	Port size	Monitor output	Switch output	Bracket	Cable connector				
FC series Digital speed regulation flow switch	Code	Type		V	N	Code	Type	FCSR	FCMR	None	No
	S Small flow rate	R With needle valve		0.5-4.5V	N NPN output	None	—	No		1	1m
	M Medium Flow rate				P PNP output	B	Flat	●	●	3	3m
						L	L type	●	●		

Model	Code	Flow range
FCSR	005	500mL/min
	020	2L/min
	100	10L/min
	200	20L/min
FCMR	500	50L/min
	101	100L/min
	201	200L/min

Code	Port size	FCSR				FCMR		
C04	Ø4	005	020	100	200	500	101	201
C06	Ø6	●	●	●	●	●	●	●
C08	Ø8	-	-	-	-	●	●	●

Cable type: FC-1L
 Cable type: FC-3L



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Operation specification

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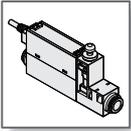
Seperateable flow switch specification

Item		FCSR				FCMR		
Flow rate		500mL/min	2L/min	10L/min	20L/min	50L/min	100L/min	200L/min
Port size		Ø4, Ø6, Ø8				Ø6, Ø8	Ø8	
Flow unit Note: 1	Display	2 COLOR						
	Displayable range	0~500 mL/min	0~2 L/min	0~10 L/min	0~20 L/min	0~50 L/min	0~100 L/min	0~200 L/min
	Min. display unit	1mL/min	0.01L/min		0.1L/min			1L/min
Accumulated pulse flow function	Displayable range	9999999mL	99999.99L		999999.9L			9999999L
	Min. display unit	1mL	0.01L		0.1L			1L
Power	Voltage type	DC12~24V(10.8~26.4V)						
	Current type	DC24V(21.6~26.4V)						
Current consumption>Note: 5		50mA or less						
Response time		50mA or less						
Environment Note: 2	Min. operating pressure	-0.9 kgf/cm ²						
	Max. operating pressure	7 kgf/cm ²						
	Proof pressure	10 kgf/cm ²						
	Temperature and humidity	0~50°C, 90%RH or less						
	Temperature	0~50°C						
Accuracy Note: 3	Operating range	3~100%F.S.						
	Linearity	±3%F.S. within (The secondary-side atmosphere)						
	Pressure	±5%F.S. within						
	Temperature	±0.2%F.S./°C within (15~35°C, 25°C base)						
	Repeatability	±1%F.S. within						
Output type	Analog output	Output voltage: 1~5V, Min. load impedance: 50kΩ						
	Switch output	2NPN open collector output (Max. loading current: 50mA, Max. supply voltage: DC 24V) 2PNP open collector output						
Wiring		Φ3.5AWG26 X 5 Core						
Enclosure		IP40						
Circuit protection Note: 6		Reverse power connection protection, Output reverse connection protection						
Weight	FCSR	87g						
	FCMR	87g						



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

- When applying compressed air, please 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 an air dryer (minimum pressure dew point: 10°C or colder), and oil mist filter (maximum oil concentration: 0.1 mg/m³) on the primary side of this product to maintain product functions.
- Please collaborate the product within specification requested. The environment condition: 25+/- 3 °C, voltage output DC 24V +/- 0.1V. F.S. indicates the actual portion of flow rate.
- Analog output is with load impedance 1kΩ. When the connection to load impedance is low, the output value differentiation will increase. Please do make sure the connection of load impedance difference before use.
- Current for 24 VDC connection with no load connected. Consumed current varies with the load connection.
- This product's protection circuit is effective only for specific misconnections and load short-circuits. It does not provide protection for all misconnections.



FC-R series - Speed controllable flow switch

Working principle / Internal circuit and load wiring diagram

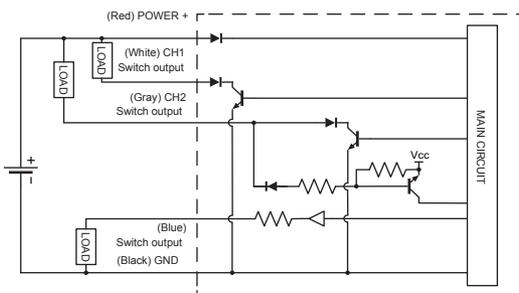
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Working principle

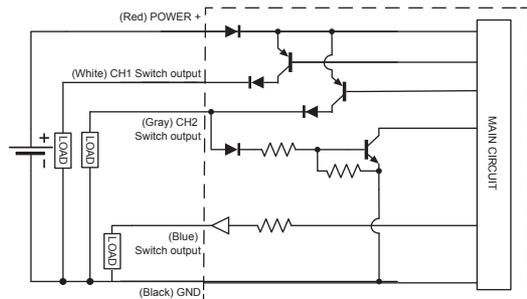
The sensing chips on FC series are made by silicon semiconductor process. Thermal isolation technology used on sensor chip and sensor substrate, contained into a tiny space, can speed up the reaction and agility, due to heat distribution equally. The internal sensing design is that 2 sensing chips clipping a heater. When heater has been started, the heat area is evenly distributed around the heater (at which no fluid flows). When fluid flows through the sensor and the fluid steady, the temperature becomes asymmetry. Lower temperature can be measured at the upper part of the heater; meanwhile higher at bottom. The temperature forms the resistance difference on the temperature sensor. The variation of flow rate is proportional to the resistance difference. FC series flow switch measures fluid flow rate by this working principle.



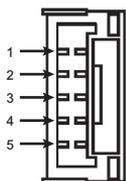
FC Series - NPN Output



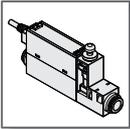
FC Series - PNP Output



FC Series-Wire connector



PIN	Wire color	Content
01	RED	Power + (Voltage output: 12 ~ 24V, current output: 24V)
02	WHITE	CH1(switch output 1: max50mA)
03	GRAY	CH2(switch output 2: max50mA or external input)
04	BLUE	Voltage output: 1.5V Load impedance: 50kΩ above Current output: 4-20mA Load impedance: below 300 Ω
05	BLACK	Power - (GND)



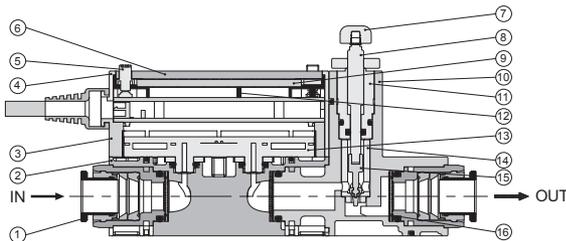
FC-R series - Speed controllable flow switch

Component parts / Material List

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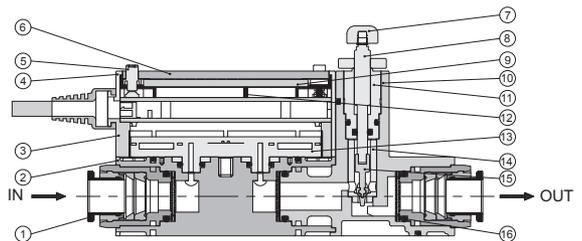
Component parts

► FCSR

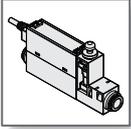


No.	Description	Material
01	Fitting assembly	Aluminum alloy, Plastic
02	Main body	Plastic
03	Cover of sensor module	Plastic
04	Cover	Plastic
05	Bottom	Rubber
06	Acrylic display panel	Acrylic
07	Adjusting bolt	Aluminum alloy, Plastic
08	Adjusting rod	Copper
09	LCD	—
10	Body	Plastic
11	The body	Copper
12	LCD support bracket	Plastic
13	Flow sensor module	—
14	The body (fasten accessory)	Copper
15	The body (cone shapping rubberized)	Copper, Plastic
16	Fairing board	Stanless steel

► FCMR



No.	Description	Material
01	Fitting assembly	Aluminum alloy, Plastic
02	Main body	Plastic
03	Cover of sensor module	Plastic
04	Cover	Plastic
05	Bottom	Rubber
06	Acrylic display panel	Acrylic
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08	Adjusting rod	Copper
09	LCD	—
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11	The body	Copper
12	LCD support bracket	Plastic
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Precautions

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CAUTION

For your safe use of this product, be sure to read before using the product Precautions.

- When designing and assembling equipment using our products, it is necessary to ensure the safety of the equipment, such as mechanical structure, air pressure, control circuits and electrical systems, and fulfill the obligation of safe use of the equipment.
- To use our products safely, please be aware of that the product's selection, usage, operation and regulation are important. In order to ensure the safety of the device, strictly observe the warnings and cautions.
- In order to ensure the safety of the device, please strictly comply with the warnings and cautions.
- Furthermore, please check the device safety before assembly and operation.



WARNING

This product is designed and manufactured as a device and component for general industrial machinery, Therefore, the operator must have the appropriate expertise and experience.

- Please use this product within the specifications of the product.
- This product can not be used outside the original specifications. In addition, this product must not be modified and reprocessed.
- Meanwhile, the scope of the present product is used as a device and a general industrial components. Therefore, it is not suitable for outdoor use and under the following conditions and in the environment :
 1. When using this product, it will directly contact with atomic energy, railway, aviation, ships, vehicles, medical equipment, food and beverage, entertainment equipment, emergency circuit breaking circuit. Stamping machinery, brake circuits, safety devices, etc., need to consider and ensure its safety purposes.
 2. Used in the impact on people and property, especially in the use of safety requirements.
(If the use of special circumstances, please consult the company. However, please develop a safety precaution to avoid danger in the event of a malfunction)
- Please confirm the safety of all the systems related to this product before mechanical assembly, inspection and maintenance of the equipment, etc.
- Even if the machine stops, there will still be high pressure, high temperature and charged situation, be sure to take note.
- When inspecting or refurbishing the machine, be sure to cut off the energy sources such as the air source, the water source and the power of the corresponding equipment, and eliminate the compressed air in the system. Pay attention to water leakage or power leakage.
- When using air compressor machinery and equipment for start-up or restart, take precautions such as preventing flight and ensure the safety of the system before proceeding.
- In the use of this product, the product failure may lead to major accidents in the use, be sure to set the self-protection components.

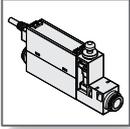
Be sure to follow the warnings and cautions noted in the datasheet to prevent accidents.

DANGER	Indicates a dangerous situation that could result in death or serious injury if performed incorrectly.
WARNING	Indicates a dangerous situation that could result in death or serious injury if performed incorrectly.
CAUTION	Indicates that, in the event of an incorrect operation, there is a risk of minor injuries or property damage.

* Even matters in the Caution can have significant consequences depending on the circumstances. Are an important part of the above, be sure to follow the implementation.

Disclaimers

1. The Company is not responsible for any loss of production, loss of profits, personal injury, delay in costs and any incidental, consequential damages, costs and damages arising out of the use or failure of the product.
2. The Company does not take all responsibility for the following matters.
3. Due to natural disasters, non-the product caused by fire, the third party or the customer caused by fault or negligence caused by the loss.
4. When using this product on your company's machines, your company's machines may have avoided the loss of functionality and construction that is generally expected in the industry.
5. Losses caused by actions other than those specified in our catalog or the instruction manual, as well as installation, installation, adjustment, maintenance, etc.
6. Product's malfunction losses caused by disapproved remodel, software or inappropriate assembly.

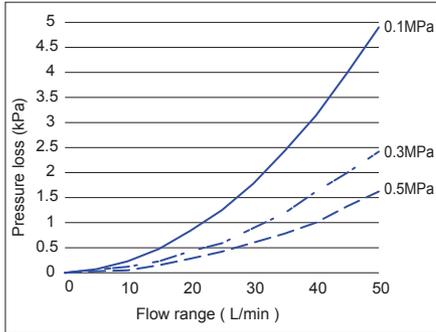


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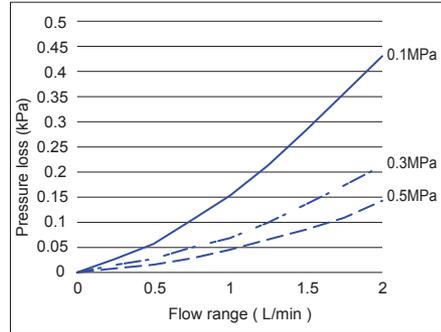
Pressure loss characteristic

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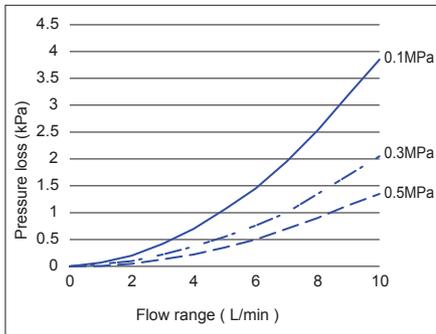
FCSR-005



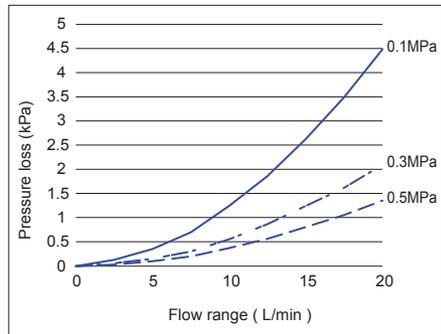
FCSR-020



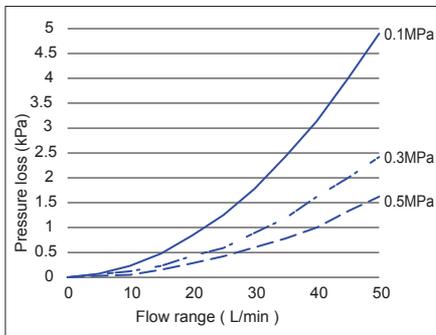
FCSR-100



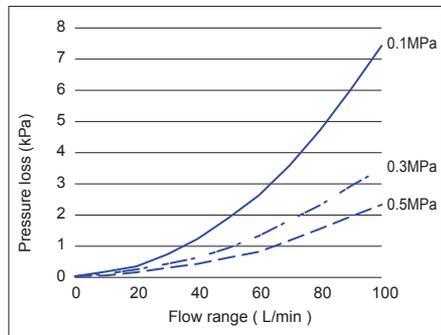
FCSR-200



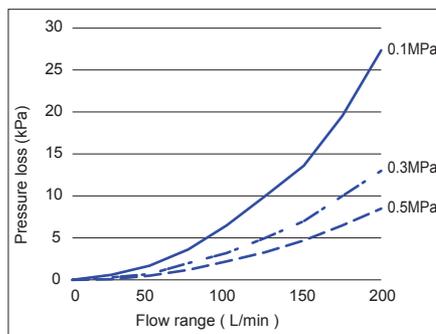
FCMR-500

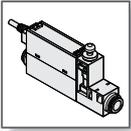


FCMR-101



FCMR-201





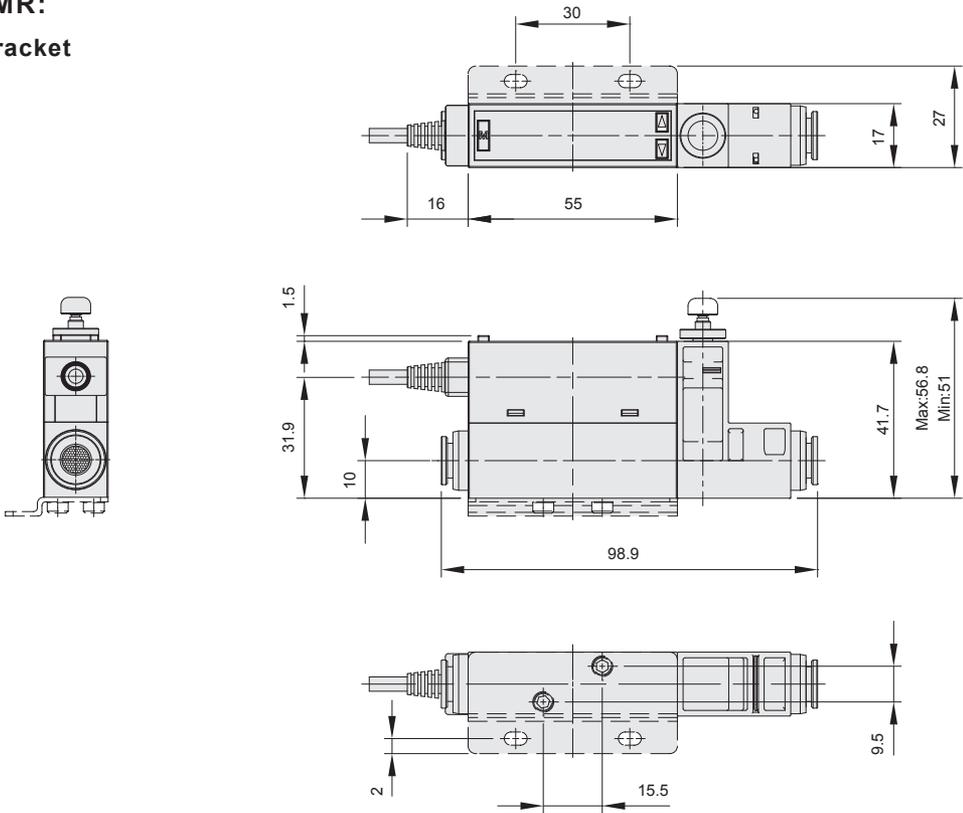
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External dimensions

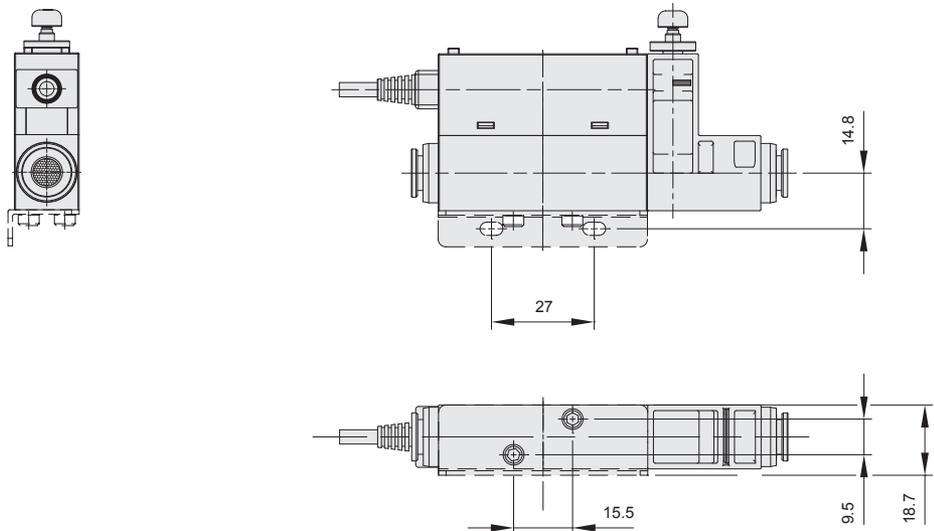
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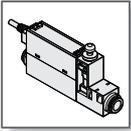
FCSR/FCMR:

○ L type bracket



○ Flat bracket





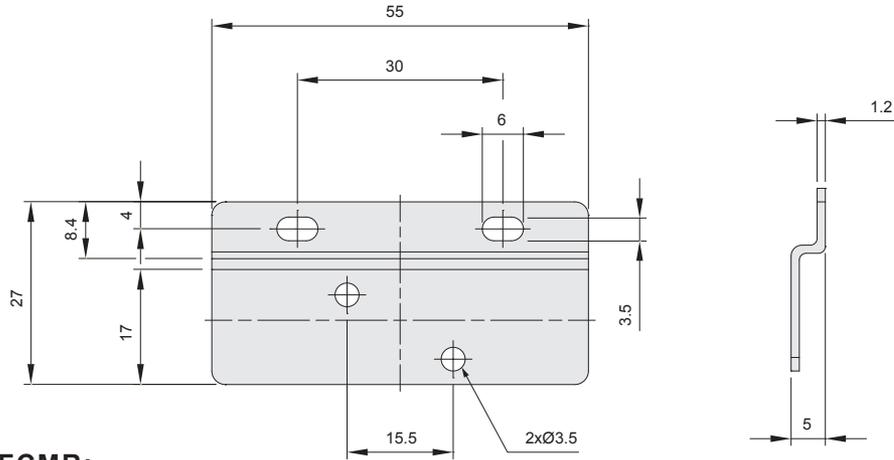
FC-R series - Speed controllable flow switch

External dimensions

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FCSR/FCMR:

○ L type bracket



FCSR/FCMR:

○ Flat bracket

