

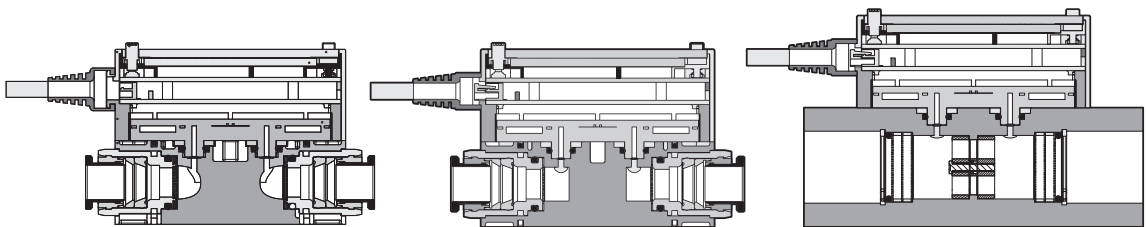
FC series - Flow switch

Order expression

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Internal structure



FCS

FCM

FCH

How to order

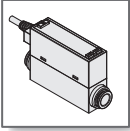
FC series Flow switch

FC S 020 C04 V N B 3

Model Flow rate Port size Output signal Switch output Bracket Cable connector

Model	Code	Flow range	Port size	Current type	Switch output	Code	Type	FCS	FCM	FCH	None	No
FCS	005	500mL/min	C04	V	N PNP output	None	-	No			1	1m
	020	2L/min				B	Flat	●	●	-	3	3m
	100	10L/min				L	L type	●	●	●		
FCM	200	20L/min	C06	V	P PNP output	None	-	No				
	500	50L/min				C08	Ø8	-	-	-	●	●
FCH	101	100L/min	P04	V	N PNP output	None	-	No				
	201	200L/min				C08	Ø8	-	-	-	●	●
FCH	501	500L/min	P04	V	N PNP output	None	-	No				
	102	1000L/min				C08	Ø8	-	-	-	●	●

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



FC series - Flow switch

Operation specification

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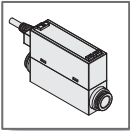
Specification

Item		FCS				FCM			FCH	
Flow rate		500mL/min	2L/min	10L/min	20L/min	50L/min	100L/min	200L/min	500L/min	1000L/min
Port size		Ø4, Ø6				Ø6, Ø8	Ø8		Rc1/2	
Flow unit	Display	2 color LCD								
	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	0~500 L/min	0~1000 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	DC24V(±10%)								
Current consumption		50mA or less								
Response time		50ms or less								
Environment	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	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: 0.5~4.5V, Output impedance: 50kΩ								
	Switch output	2NPN open collector output 2PNP open collector output (Max. loading current: 50mA, Max. supply voltage: DC 24V)								
Wiring		Ø3.5AWG26 X 5 Core								
Enclosure		IP40								
Circuit protection		Reverse power connection protection, Output reverse connection protection								
Weight	FCS	59g								
	FCM	59g								
	FCH	138g								



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 Series - Flow Switch

Working principle / Internal circuit and load wiring diagram

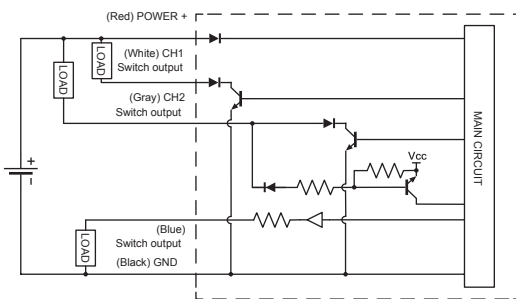
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Working principle

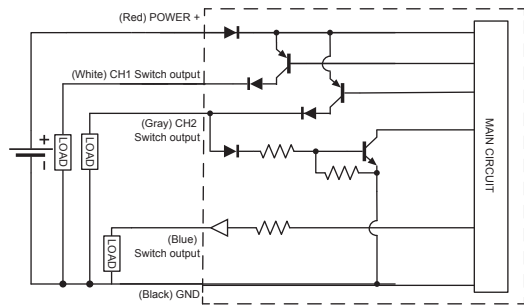
The sensing chips on FC series are made by silicon semiconductor process. Thermal isolation technology used on sensor chip and sensor substrate, contained into a tiny space, can speed up the reaction and agility, due to heat distribution equally. The internal sensing design is that 2 sensing chips clipping 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.



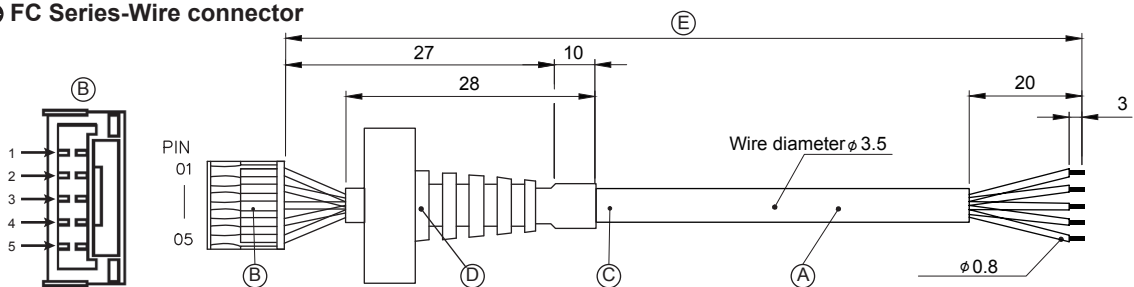
FC Series - NPN Output



FC Series - PNP Output



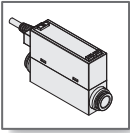
FC Series-Wire connector



PIN	Wire color	Content
01	RED	Power+ (24V)
02	WHITE	CH1(switch output 1: max: 50mA)
03	GRAY	CH2(switch output 2: max:50mA)
04	BLUE	Voltage output: 0.5-4.5V Load impedance 50kΩ above
05	BLACK	Power - (GND)

No.	Content
(A)	Wire: Inside (AWG28/5 line), Skin: Light grey (CNU09002)
(B)	5PIN Connector
(C)	Heat shrink tubing (black)
(D)	FC SERIES connector anti-folding sleeve
(E)	Wire lenth: L=1000mm±50 or L=3000mm±50 (Depand on parts number)

Ordering expression		E
FC SERIES Wire connector/RED, WHITE, GRAY, BLUE, BLACK/1000mm	FC-1L	1000mm±50
FC SERIES Wire connector/RED, WHITE, GRAY, BLUE, BLACK/3000mm	FC-3L	3000mm±50



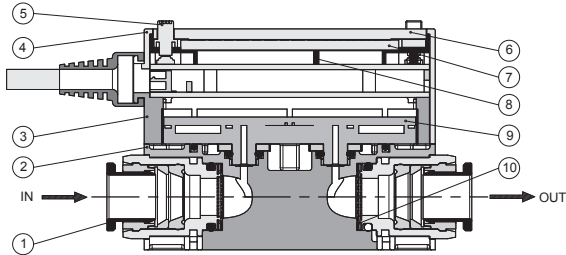
FC Series - Flow Switch

Component parts / Material List

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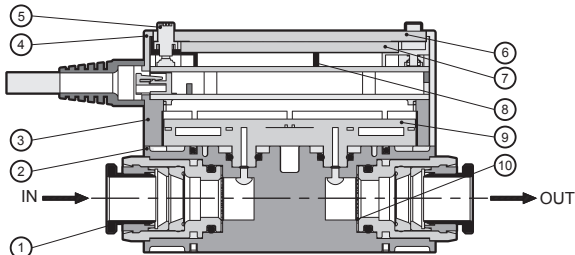
Component parts

► FCS



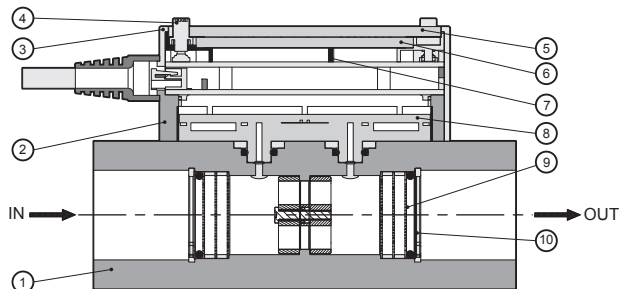
No.	Description	Material
01	Fitting assembly	Aluminum alloy
02	Main body	Stainless steel
03	Cover of sensor module	Aluminum alloy
04	Cover	Aluminum alloy
05	Bottom	—
06	Acrylic display panel	Acrylic
07	LCD	LCD
08	LCD Support frame	Plastic
09	Flow sensor module	—
10	Fairing board	Rubber

► FCM

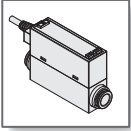


No.	Description	Material
01	Fitting assembly	Aluminum alloy
02	Main body	Stainless steel
03	Cover of sensor module	Aluminum alloy
04	Cover	Aluminum alloy
05	Bottom	—
06	Acrylic display panel	Acrylic
07	LCD	LCD
08	LCD Support frame	Plastic
09	Flow sensor module	—
10	Fairing board	Rubber

► FCH



No.	Description	Material
01	Main body	Stainless steel
02	Cover of sensor module	Aluminum alloy
03	Cover	Aluminum alloy
04	Bottom	—
05	Acrylic display panel	Acrylic
06	LCD	LCD
07	LCD Support frame	Plastic
08	Flow sensor module	—
09	Fairing board	Rubber
10	O-ring	Stainless steel



FC Series - Flow Switch

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.

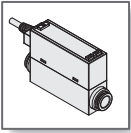
Be sure to follow the warnings and cautions noted in the datasheet to prevent accidents.

	Indicates a dangerous situation that could result in death or serious injury if performed incorrectly.
	Indicates a dangerous situation that could result in death or serious injury if performed incorrectly.
	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.



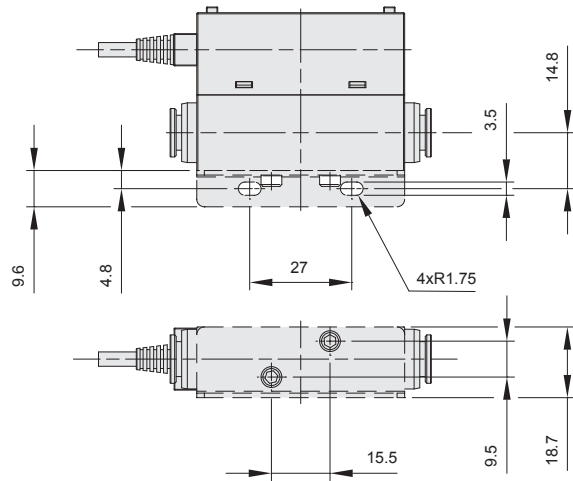
FC series - Flow switch

External dimensions

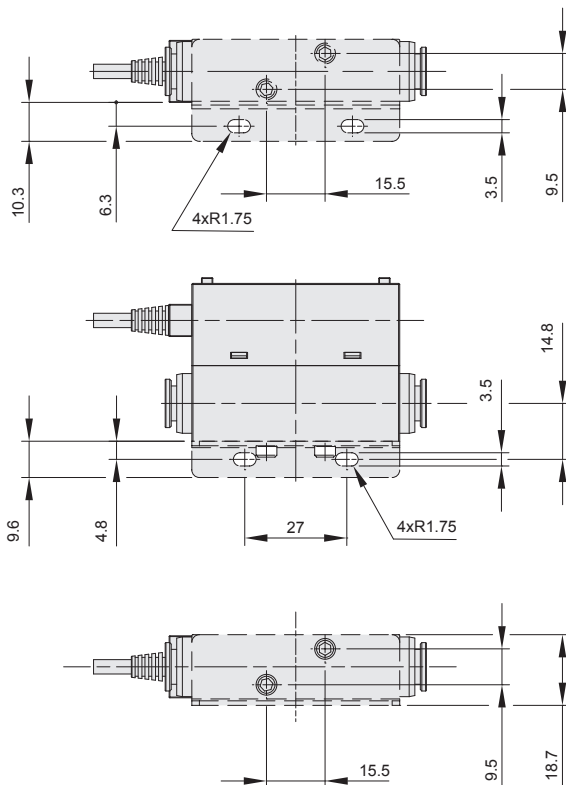
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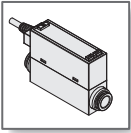
FCS/FCM:

○ Flat bracket



○ L type bracket





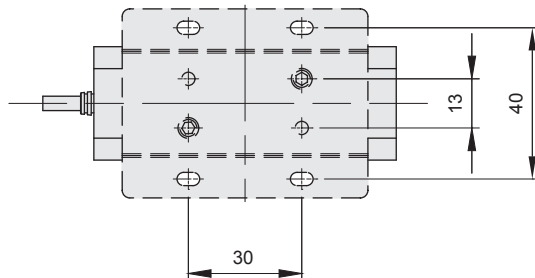
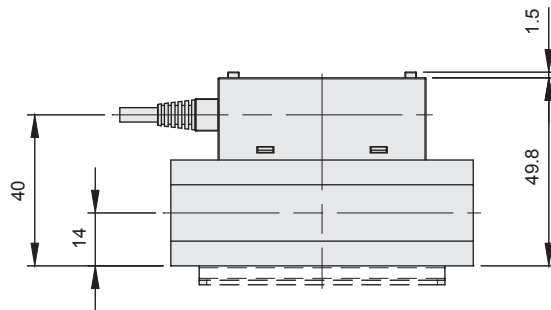
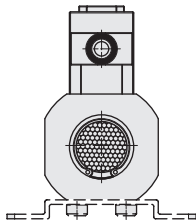
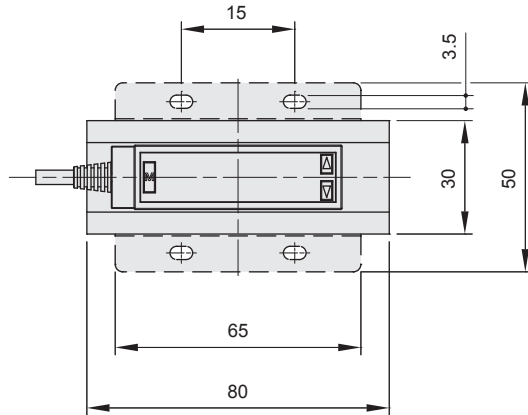
FC series - Flow switch

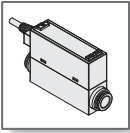
External dimensions

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FCH:

○ L type bracket





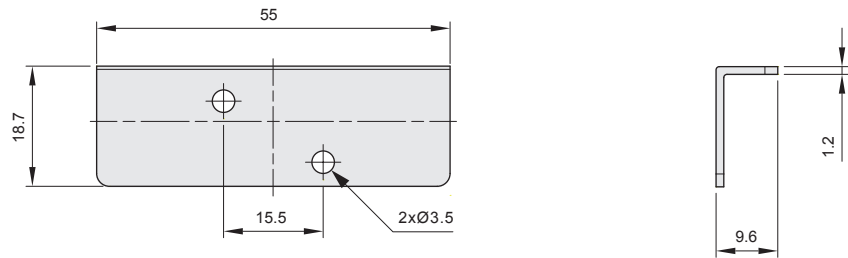
FC series - Flow switch

External dimensions

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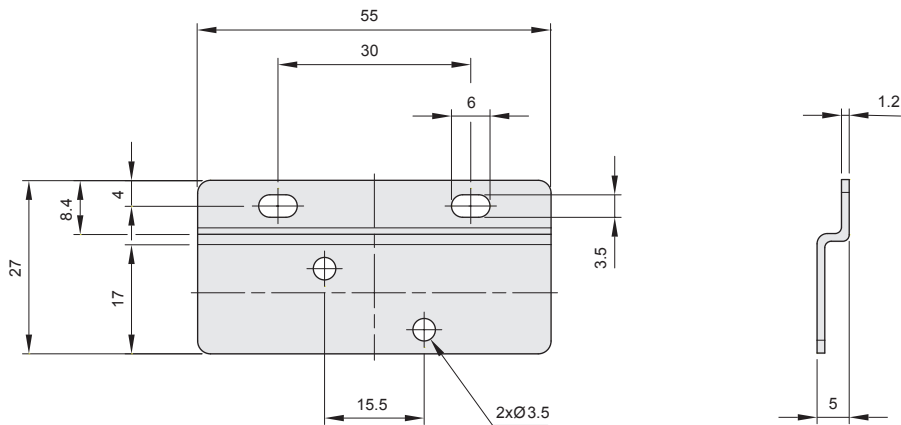
FCS/FCM:

○ Flat bracket



FCS/FCM:

○ L type bracket



FCH:

○ L type bracket

