Read all instructions thoroughly

INSTRUCTIONS

FLOW SWITCH

Type ＦＱＳ

SAGinoMIYA

A. Failure to read and follow all instructions carefully before installing or operating this water regulating valve could cause personal injury and/or property damage. Save these instructions for future use.

NOTE FOR SAFETY

⚠ Warning

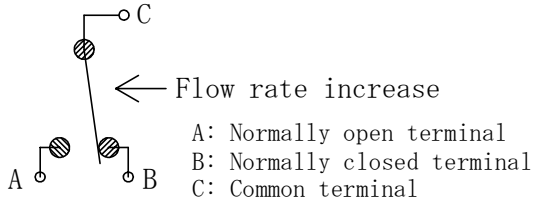
- ●Never remove the cover when power is applied. This can result in electric shock.
- ●Connect wiring after turning off power. This can result in electric shock.
- ●Do not sprinkle water over the microswitch. This can result in electric shock.
- ●Do not connect a load exceeding the electric rating. This can result in bad contacts.
- ●Do not turn screws other than the operating value setting screw.
  Incorrect operations or water leakage can occur.
- ●Install the switch so that the arrow indication and the fluid flow match.
  The switch does not work if fluid flows in the opposite direction.
  In addition, paddles can be damaged.
- ●Use fluid that does not corrode the liquid contacting material. In addition, use fluid in liquid form. Gas or liquid mixed with gas causes unstable operations.
- ●Connect the switch to ground. Do not connect the grounding wire to a gas pipe, water pipe, lightning rod or the grounding wire of a telephone line.
  If the grounding is not appropriate, this can result in electric shock.
- ●Use fluid with flow velocity of 2m/s or less. In addition, avoid strong pulsating fluid and vibration. Paddle can be damaged.

B. SPECIFICATIONS

●Specification table

Model	Structure	Liquid contacting materials	Ambient humidity
FQS-0	Non-water proof	Copper alloys	80%RH or less
FQS-U			
FQS-W	Drip proof		95%RH or less
FQS-M		Bronze,stainless steel	
FQS-T		Stainless steel(O-ring NBR)	

- ●Maximum operating pressure　0.98 MPa
- ●Allowable fluid temperature　5 to 80 ℃　(FQS-030GQ9: 5 to 100℃)
- ●Endurance operations　100,000 operations
- ●Mounting screw　R1(MPT) or NPT(option)
- ●Ambient temperature　-25 to +80 ℃　(FQS-030GQ9: -25 to 50℃)
- ●Contact structure　Single-pole double-throw



C. Electrical ratings

Unit: A

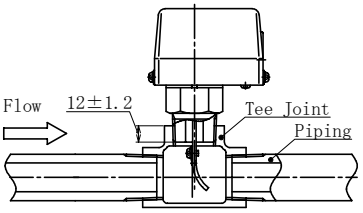
Type name, symbol	Voltage	Resistive load	Lamp load	Motor load
Standard (G)	125V AC	15	1.5	5
	250V AC	15	1.25	3
	30V DC	6	1.5	5
	125V DC	0.5	0.5	0.05
DC high load type (D)	125V DC	10	1.5	5
	250V DC	3	1.5	2

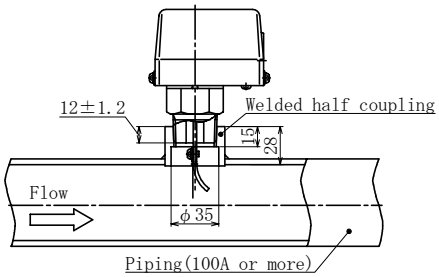
Type name, symbol	Voltage	Minimum applicable load	Maximum current load
Small load type (K)	24V DC	0.01	0.1
	100V AC	0.01	0.1

Type name, symbol	Voltage	Full load amp.	Locked rotor amp.	Non-inductive amp.	Note
FQS-U (G)	125V AC	3.5	21	15	UL listed
	250V AC	2.5	15	15	

D. INSTALLATION METHOD

- Provide a straight pipe section of more than 5 times the piping diameter in front and back of the flow switch. This is used to prevent hunting due to turbulent flow.
- Basically install the switch in horizontal piping with the cover facing upward but it can be installed in vertical piping.
  However, in the case of a vertical pipe installation, the operating value may change about 20% compared to the horizontal pipe installation.
- For piping of the flow switch, use a commercially available Tee joint (conforming to JIS B 2301).
  If the available Tee joint cannot be installed, you can use a welded half coupling.

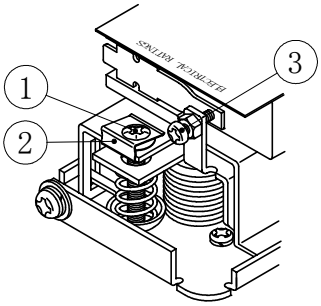




- When installing the flow switch to piping, the depth of the flow switch screwed in shall be 12±1.2mm.
- For wiring, follow the instructions written on the insulation plate of the microswitch.

E. OPERATING VALUE SETTING

- When the operating value is not specified, the flow switch is shipped with the operating value set around the minimum flow rate.
- When you turn the flow adjusting screw ① clockwise, the operating point goes up.
  When you turn it counterclockwise, the operating point goes down.
  But if you turn the screw counterclockwise too much, the operation becomes unstable and if you turn it further, the setting screw breaks off.
- If you have changed the setting value, make sure to operate the paddles and check the operation of the microswitch.
- Never remove the metal fitting ② because this is used to prevent the flow adjusting screw ① from loosening.
- The adjusting screw ③ is exclusively used by our service personnel.
  Do not use this screw for adjustment.
- When setting the operating value, refer to either decreasing flow setting value or increasing flow setting value.



F. OPERATION ADJUSTMENT RANGE TABLE

Piping	Paddle combination	Adjustment range MIN	Adjustment range MAX	flow velocity of 2m/s	Note
25A (1B)	1	18	45	72	・This table is based on the operating point for decreasing flow. Decreasing flow setting value means the flow switch operates when the flow rate decreases. Increasing flow setting value means the flow switch operates when the flow rate increases. ・Differential value (difference between the decreasing flow operating value and the increasing flow operating value) is not determined specifically. The guideline value is as follows: Less than 50L/min: About 10L/min From 50L/min to less than 100L/min: About 15L/min 100L/min or more: About 20% of the setting value ・This table is based on the condition when the depth screwed in the Tee joint is 12±1.2mm. ・Paddle size is in the following order: 1<2<3 ・When the setting value is not specified, the attached paddle 1 can be used for 40A or less, 1+2 for 65A or less and 1+2+3 for 80A or more. ・When more than two paddles is attached, you can change the flow rate adjustment range by removing the paddles one by one in order of the longer paddle first. ・To install the paddles, install the paddle 1 first then stack the paddle 2 and then the paddle 3. ・Please make a flow rate gap between operating point and normal flow rate so as to avoid hunting. Generally, we recommend operating point should be half of normal flow rate or less.
32A (1 ¼ B)	1	43	100	120	
40A (1 ½ B)	1	63	135	163	
50A (2B)	1+2	50	150	264	
	1	151	220		
65A (2 ½ B)	1+2	105	355	432	
	1	356	360		
80A (3B)	1+2+3	100	225	612	
	1+2	226	480		
	1	481	510		
100A (4B)	1+2+3	200	385	1044	
	1+2	386	820		
	1	821	870		
125A (5B)	1+2+3	350	594	1613	
	1+2	595	1265		
	1	1266	1342		
150A (6B)	1+2+3	530	836	2268	
	1+2	837	1780		
	1	1781	1890		

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To Customers Using Saginomiya's Product

CONSENT RELATED TO DISCLAIMERS

We, SAGINOMIYA SEISAKUSHO, INC., (hereinafter referred to as "Saginomiya"), truly appreciate your choosing Saginomiya's product (hereinafter referred to as this "Product").
When this Product is used, this document as provided below shall be applicable except to the extent that there is anything to the contrary in any applicable estimate, agreement, catalogue, specification, etc.

● CONFIRMATION OF OPERATION

All customers using this Product (hereinafter referred to as "Customers") are requested to, after properly installing this Product, test the operation of this Product to confirm that all the systems in connection with this Product fully function.
In order to prevent the occurrence of bodily injury, fire accidents, serious damage, etc., in connection with the Customers' machinery or equipment due to improper installation of this Product, Saginomiya kindly requests the Customers to take the necessary safety measures by preparing safe designs such as a fail-safe design (*1) and a fire spread prevention design, as well as to make the proper adjustments for product reliability necessary for fault-tolerance (*2).

(*1) Fail-safe design: Design to ensure safety in the event of any mechanical failure
(*2) Fault-tolerance: Utilization of redundancy technology

Periodic Inspection of this Product
Be sure to confirm the proper operation of this Product and keep records of such operation at least once a year.

Saginomiya shall be held harmless and be indemnified by the Customers from any damages incurred due to the Customers failing to conduct the above operational procedures, provided, however, that, this shall not apply if the damages which the Customers incurred due to the defect of this Product caused by Saginomiya.

● RESTRICTIONS OF USE

This Product is designed and manufactured for the purpose of using them for cooling and heating and refrigerating appliances and air conditioning equipment or various industrial equipment, but is not designed and manufactured for the purpose of using this Product for any instrument or system related to human life or health purposes.
Therefore, the use of this Product in fields related to items (1) through (3) below is not intended whatsoever.
Saginomiya shall be held harmless and be indemnified from any and all damages incurred by use of this Product under item (3).

(1) In any field related to nuclear power and radiation;
(2) In any field related to space or seafloor equipment;
(3) In any equipment or device requiring a high degree of reliance on such equipment or device with respect to which it is reasonably foreseeable that failure or malfunction of the equipment or device would either directly or indirectly cause serious damage to human life, health or property;

Also, when using this Product under the fields related to items (1) through (10), (except for item (3), in relation to which this Product must never be used), please be sure to notify Saginomiya's contact desk in charge of sales and obtain Saginomiya's prior written approval for such use.

Saginomiya shall be held harmless and be indemnified from any and all damages incurred by use of this Product in relation to these fields if the Customers do not notify Saginomiya's contact desk and obtain Saginomiya's prior written approval.

(4) Heating, cooling and air conditioning equipment that uses flammable and/or toxic refrigerants, or various industrial equipment that uses flammable and/or toxic fluids;
(5) Transportation device (railroad, aviation, ship or vessel, vehicle equipment, etc.);
(6) Disaster-prevention or crime-prevention device;
(7) Facility or application directly related to medical equipment, burning appliances, electro thermal equipment, amusement rides and devices, facilities/applications associated directly with billing;
(8) Equipment requiring high reliance on supply systems such as electricity, gas, water, etc., in large-scale communication system, or in transportation or air traffic control system;
(9) Facilities that are to comply with regulations of governmental / public agencies or specific industries or
(10) Other machineries or equipment equivalent to those set forth in the above items (4) to (9) which require for high reliability and safety.

It is recommended to replace this Product within 5 to 10 years of delivery if no other duration of use is provided in the applicable specifications or instruction manual because the conditions and environment of use also have an impact on this Product.

● SCOPE OF WARRANTY

SAGINOMIYA WILL PROVIDE THE CUSTOMERS WITH REPLACEMENT OR REPAIRED THIS PRODUCT DELIVERED, FREE OF COST, ONLY WITHIN ONE YEAR OF DELIVERY TO THE CUSTOMER, IF FAILURE OCCURS IN THE CUSTOMERS' EQUIPMENT USING THIS PRODUCT DUE TO A DEFECT OF THIS PRODUCT; PROVIDED, HOWEVER, THAT IN ANY EVENT THE RATIO OF THE AMOUNT THAT SAGINOMIYA BEARS FOR THE DAMAGES INCURRED BY THE FAILURE OF THIS PRODUCT OR CUSTOMERS' EQUIPMENT SHALL NOT EXCEED THE PRICE OF THIS PRODUCT WE DELIVERED. IN ADDITION, SAGINOMIYA SHALL BE HELD HARMLESS AND BE INDEMNIFIED FROM ANY AND ALL DAMAGES INCURRED WHEN THE FAILURE OF THE CUSTOMERS' EQUIPMENT OCCURRED DUE TO ANY CAUSE SET FORTH BELOW.

(1) WHEN CAUSED BY INAPPROPRIATE HANDLING OR USE OF THIS PRODUCT BY THE CUSTOMERS (SUCH AS NOT COMPLYING WITH THE CONDITIONS, ENVIRONMENTAL SPECIFICATIONS OR CAUTIONS INDICATED IN ANY APPLICABLE CATALOGUE, SPECIFICATIONS, INSTRUCTION MANUAL, ETC.);
(2) WHEN FAILURE OCCURRED DUE TO ANY REASON OTHER THAN THIS PRODUCT;
(3) WHEN CAUSED BY MODIFICATION OR REPAIR OF THIS PRODUCT MADE BY ANYONE OTHER THAN SAGINOMIYA OR DESIGNEE OF SAGINOMIYA;
(4) WHEN CAUSED BY THE USE OF THIS PRODUCT IN VIOLATION OF THE ABOVE "RESTRICTIONS OF USE" OR "CONFIRMATION OF OPERATION";
(5) WHEN SUCH FAILURE WAS NOT REASONABLY FORESEEABLE AT THE TIME OF SAGINOMIYA'S SHIPMENT; OR
(6) BY ANY OTHER CAUSE NOT ATTRIBUTABLE TO SAGINOMIYA, SUCH AS AN ACT OF GOD, DISASTER, OR ACT OF ANY THIRD PARTY.

PLEASE NOTE THAT THE CUSTOMERS WILL NOT BE ENTITLED TO ANY OF THE ABOVE WARRANTY IF THE CUSTOMERS PURCHASED THIS PRODUCT FROM INTERNET AUCTION, ETC.