

Digital Flow Switch in rotor system, Coming on the stage with varied innovative types

- In addition to the conventional main unit specifications, stainless steel body is added in the high flow rate specification.
- In addition to power relay output heightening contact point capacity, open collector output specification is added.
- Performance of noise resistance is improved.

Note) Prediction function adopted in DFS2 is not adopted in this DFS3 Series.



Specifications

Flow rate specification	Low flow rate	Medium flow rate			High flow rate	
Type	Resin body	Resin body (Standard)	Metal body	Stainless steel body	Metal body	Stainless steel body
Detection method	Magnetic proximity/ Iron proximity	Magnetic proximity/ Iron proximity	Magnetic proximity			
Machine model	DFS3-1002/5002	DFS3-1000/5000	DFS3-1200	DFS3-1500	DFS3-2000	DFS3-2500
Main unit material	Polyacetal (including glass)	Polyacetal (including glass)	BC6(Nickeling)	S C S 14	BC6(Nickeling)	S C S 14
Fluid	Water					
Ports size	Rc3/8				Rc3/4	
Pressure range	0~0.7MPa					
Proof test pressure	1MPa					
Ambient temperature	0~+50°C (Not condensing)					
Fluid temperature	0~+70°C (Not freezing)					
Flow rate range	0.2~2.5 ℓ /min	Flow rate range A : 0.5~5 ℓ /min, Flow rate range B : 2.5~25 ℓ /min			12~120 ℓ /min	
Reading precision	±20%fs	±5%fs				
Hysteresis	5% or under				7% or under	
Alarm output response time	About 500ms					
Fitting direction	Free					
Flowing direction	Both ways					
Output point number	1c contact points Relay output x 1 point or open collector output x 2 points (OUT-HIGH,, OUT-LOW 1 in each)					
Rated power supply	DC24V or AC100V					

Note) • Be sure to use within the flow rate range.

- Numerals in the table are the values in case fluid is service water (20°C).
- Flow rate range is changed according to fluid viscosity.

Electric specifications/ common

Power supply voltage	DC24V	AC100V
Allowable voltage range	±10% Max. absolute rating DC30V	±10%
Consumed power	700mW or under	3VA or under
Cable	VCTF 8-core 0.3mm ² 1m	Power supply: VCTF 3-core 0.5mm ² 1m Signal: VCTF 5-core 0.5mm ² 1m
Frequency output	Method	Photo-coupler output
	Max. allowable voltage	DC50V
	Load current	4mA or under (Output residual voltage 0.5V or under)

Output specifications/ Open collector output

System	Photo-couplerX2 (OUT-HIGH/OUT-LOW) OUT-HIGH: ON when flow rate is the set value or above OUR-LOW: ON when flow rate is the set value or under
Max. allowable voltage	DC50V
Load current	10mA (Output residual voltage 0.8V or under)

Output specifications/ Relay output

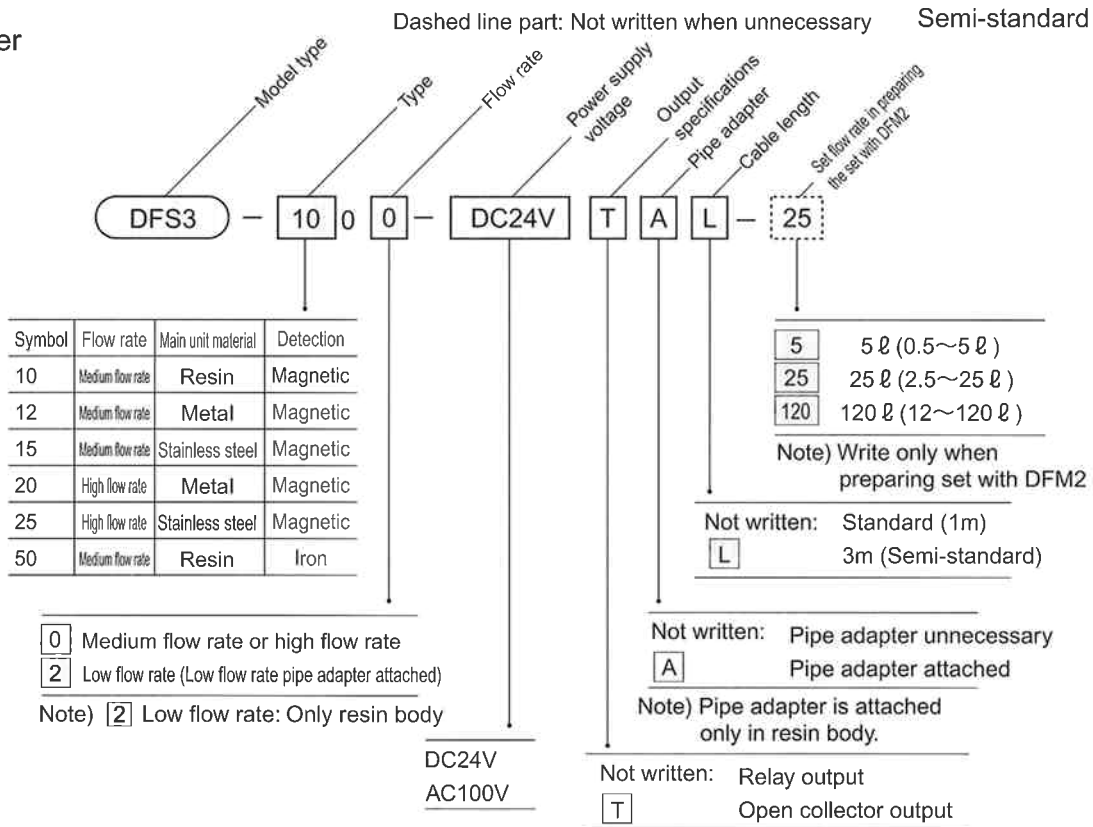
Contact point structure	1cX1 (Driving relay when flow rate is the set value or under.)
Rated control capacity (in resistance load)	DC30V 5A/AC250V 5A
Max. allowable power (in resistance load)	150W (DC) / 1250VA (AC)
Max. allowable voltage	DC125V/AC300V
Max. carrying current	5A
Min. adaptable load	DC5V 10mA
Insulation resistance between contact points Withstand voltage between contact points	1000MΩ or above by DC500 insulation resistance tester AC1000V/Minute
Electric life time	100,000 times or more (Rated load, Switching frequency 30 times/ Minute)

Structure Table

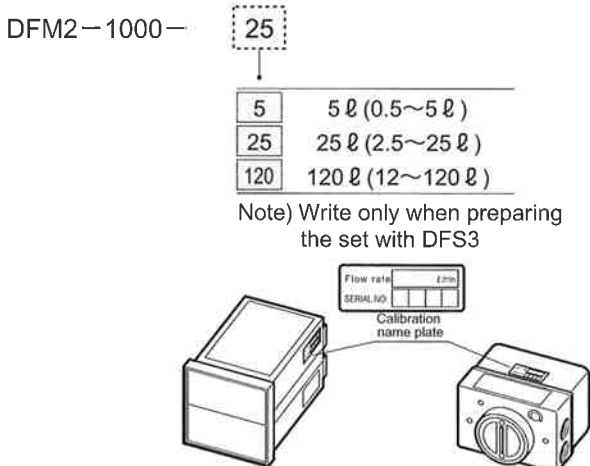
Model type	Type		Power supply		Cable length	
			AC100V	DC24V	1m	3m
DFS3-1000	Resin body (Medium flow rate)	Magnetic proximity type	○	○	○	△
DFS3-5000		Iron proximity type				
DFS3-1002	Resin body (Low flow rate)	Magnetic proximity type	△	△	△	△
DFS3-5002		Iron proximity type				
DFS3-1200	Metal body (Medium flow rate)	Magnetic proximity type	△	○	○	△
DFS3-1500	Stainless steel body (Medium flow rate)	Magnetic proximity type	△	○	○	△
DFS3-2000	Metal body (High flow rate)	Magnetic proximity type	△	○	○	△
DFS3-2500	Stainless steel body (High flow rate)	Magnetic proximity type	△	○	○	△

○ : Standard △ : Semi-standard

How to order



Digital flow meter DFM2



For resin body type in DFS3-1000, 5000

- Pipe adapter set
 (for preventing cracking of the port of DFS3-1000, 5000)
 Model code: DF-AP
 Set contents: Pipe adapter (Material: Copper alloy / C3604B) : 2 units
 O-ring for seal (P-10A): 2 units
- Low flow rate pipe adapter set
 (Set converting DFS3-1000 or 5000 medium flow rate type to low flow rate specifications)
 Model code: DF-FW2
 Set contents: Pipe adapter (Material: copper alloy/C3604B): 1 unit
 Low flow rate pipe adapter (Material: Copper alloy/ C3604B): 1 unit
 Low flow rate nozzle (Material: Copper alloy/ B06): 1 unit
 O-ring for seal (P-10A): 2 units
 O-ring for nozzle (1AS-6): 1 unit
 Note) As for DFS3-1200, 1500, please contact with the manufacturer.

How to set flow rate

■ In case of setting with flow meter

- (1) Reduce flow rate in the pipe to the set flow rate.
- (2) Then, rotate the flow rate setting trimmer on the flow switch front side with minus (-) driver, to the point where LED is just switched from Green to Red.

■ In case of setting without flow meter

The below table is used when approx. set flow rate is determined without flow meter.

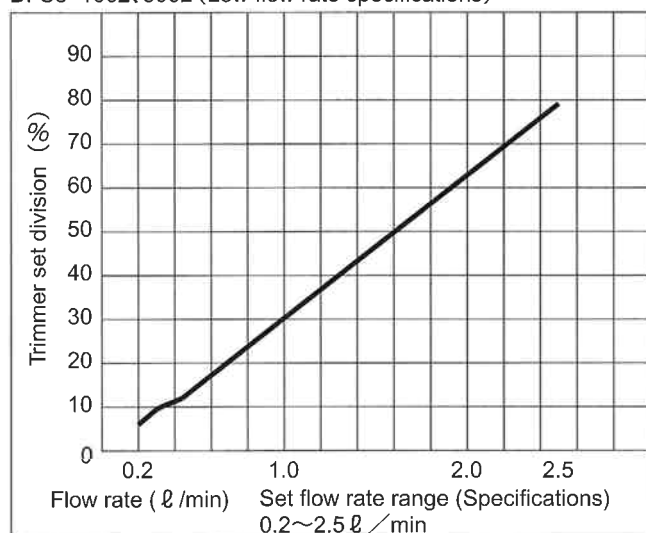
Example: In case alarm is to be output at flow rate approx. 10 ℓ / min. or under, by using DFS3-1000

The intersection of the set flow rate 10 ℓ / min and the line of the flow rate range B is made A.

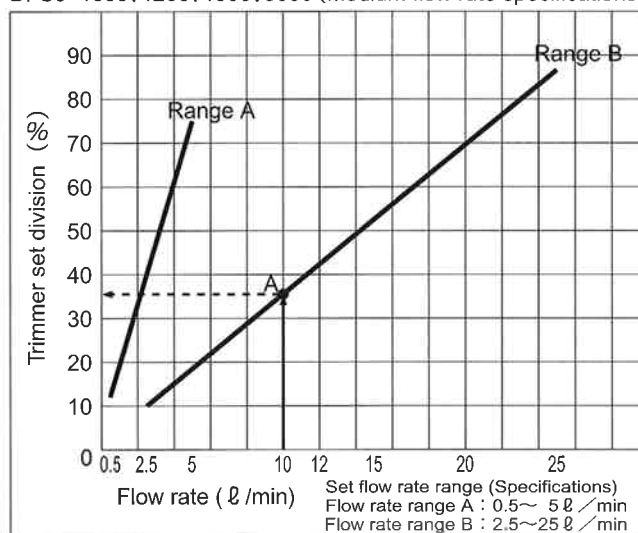
The set percent at A point is read as 35%. By matching the flow switch trimmer to 35%, alarm is output when flow rate is approx. 10 ℓ / min or under.

Trimmer set division - Flow rate property graph (Fluid: Service water 20°C)

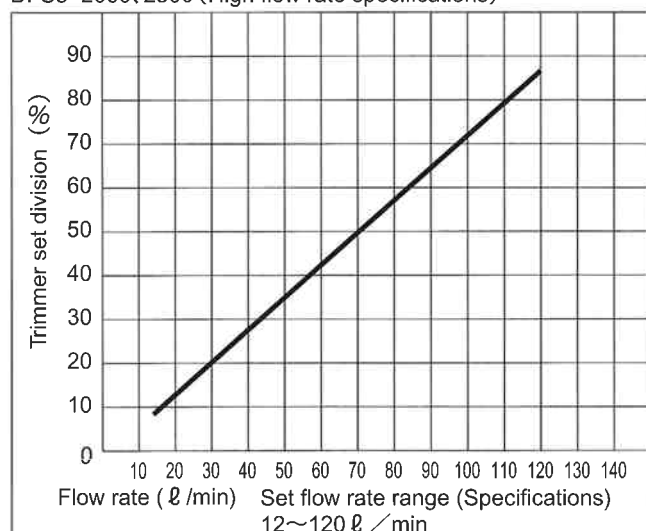
DFS3-1002, 5002 (Low flow rate specifications)



DFS3-1000, 1200, 1500, 5000 (Medium flow rate specifications)

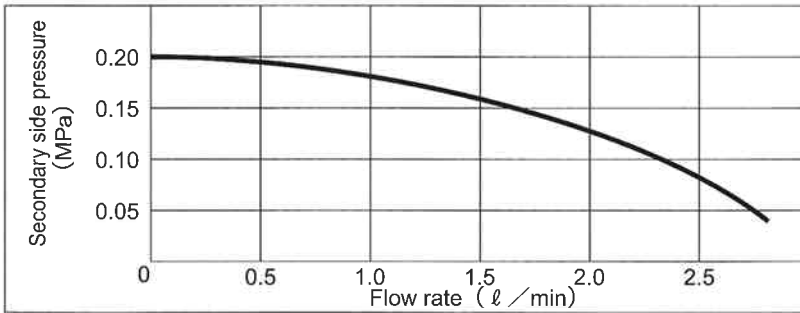


DFS3-2000, 2500 (High flow rate specifications)

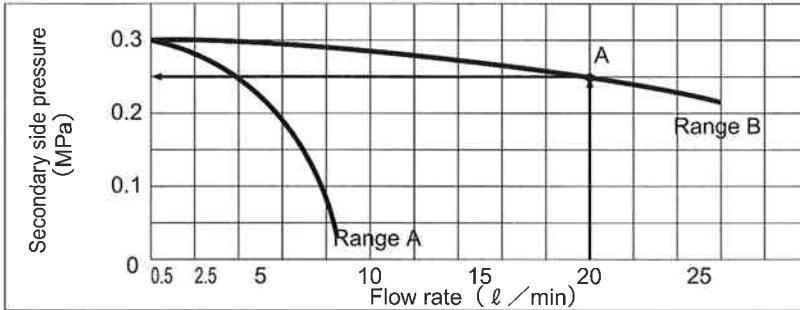


Flow Rate - Pressure Loss Property Graph (Fluid: Service water 20°C)

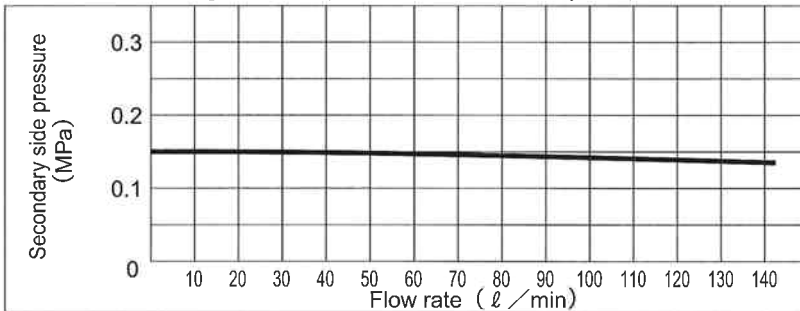
DFS3-1002·5002(Low flow rate specifications) Primary side pressure : 0.2MPa



DFS3-1000·1200·1500·5000(Medium flow rate specifications) Primary side pressure : 0.3MPa



DFS3-2000·2500(High flow rate specifications) Primary side pressure : 0.15MPa



How to read the graphs

The left Flow Rate - Pressure Loss Property Graph is used to obtain pressure loss of the Digital Flow Switch DFS3 Series.

Ex.: How much is pressure loss when 20 l / min water is flown by DFS3-1000,1200,1500, 5000 flow rate range?

Answer: The intersection of flow rate 20 l / min and flow rate curve is made A. Read the secondary side pressure value at the A point.

Here;

$$\text{(Pressure loss)} = \text{(Primary side pressure)} - \text{(Secondary side pressure)}$$

Therefore;

Pressure loss = 0.3MPa - 0.25MPa = 0.05MPa
 Consequently, in flowing 20 l / min water, pressure difference at the front and back of the flow switch is 0.05MPa.

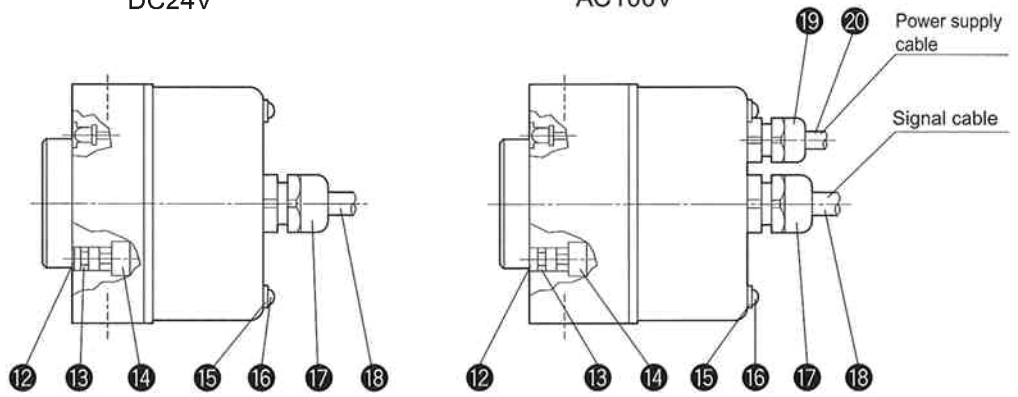
This shows that the primary side pressure (pump discharging pressure) must be above 0.05MPa or more, but, actually, pump discharging pressure is determined by obtaining pressure loss of the whole pipes.

Note) Properties are changed according to the viscosity and temperature of the fluid to be used.

DFS3—1000 • 1200 • 1500 • 5000

DC24V

AC100V

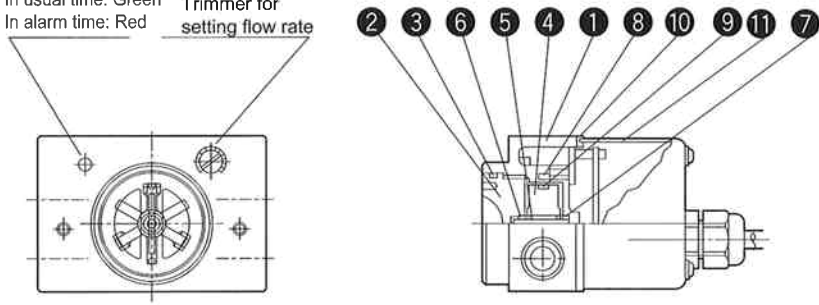


DFS3

DFS3—1500

2-lamp type LED
In usual time: Green
In alarm time: Red

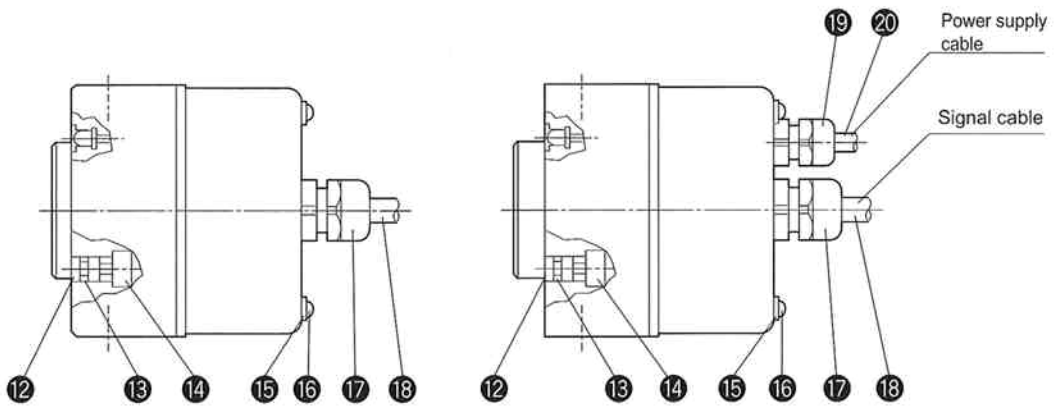
Trimmer for setting flow rate



DFS3—2000 • 2500

DC24V

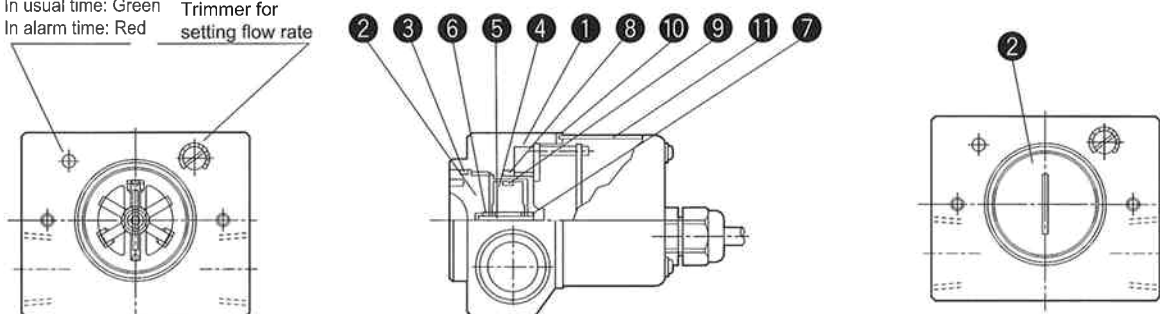
AC100V



2-lamp type LED
In usual time: Green
In alarm time: Red

Trimmer for setting flow rate

DFS3—2500



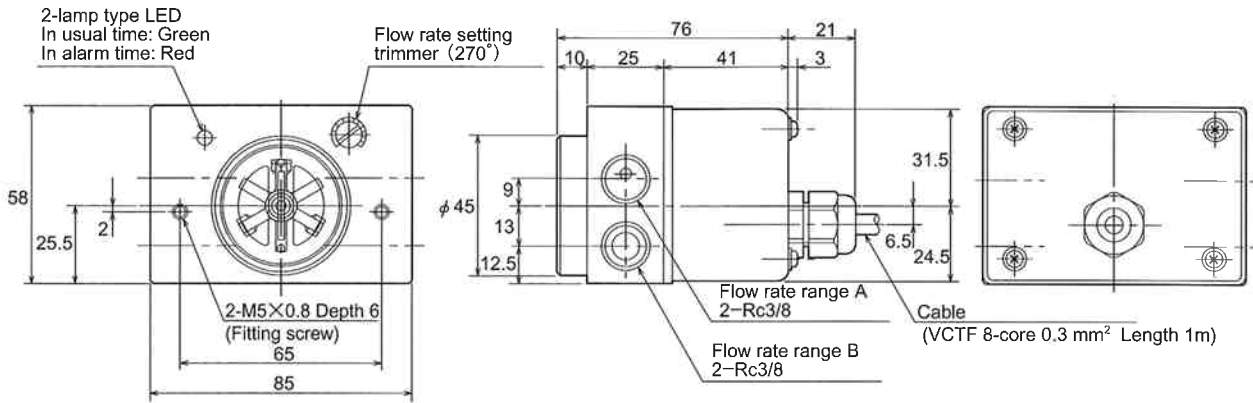
Parts Table of wetted surface parts

No	Parts Name	Description				
		DFS3-1000-5000	DFS3-1200	DFS3-1500	DFS3-2000	DFS3-2500
①	Main unit	Polyacetal (including glass)	Bronze casting (Nickeling)	Stainless steel:SCS14	Bronze casting (Nickeling)	Stainless steel:SCS14
②	Rotor cap	Polyether sulfon		Stainless steel:SUS316	Polyether sulfon	Stainless steel:SUS316
③	Rotor cap gasket	Nitrile rubber		ETFE	Nitrile rubber	ETFE
④	Rotor	Polyacetal		ETFE	Polyacetal	ETFE
⑤	Rotor pin	Alumina ceramics				
⑥	Rotor cap bearing	Alumina ceramics				
⑦	Rotor bearing	Alumina ceramics				

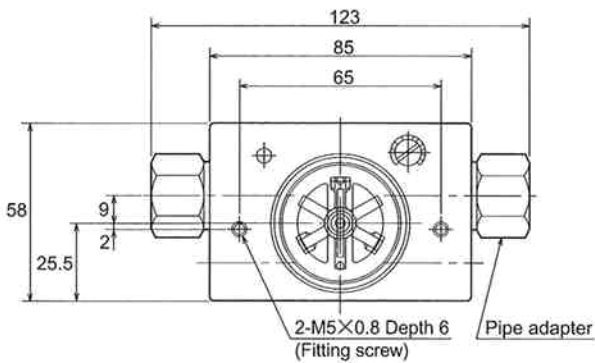
Parts Table

No	Parts Name	Material	No	Parts Name	Material
⑧	Hole IC (Magnetic proximity type)	—	⑭	Trimmer	—
	High-frequency oscillation type switch (Iron proximity type)	—	⑮	Screw gasket	—
⑨	Magnet (Magnetic proximity type)	—	⑯	Screw	—
	Iron piece (Iron proximity type)	—	⑰	Cable gland	—
⑩	Cover gasket	Nitrile rubber	⑱	Cable gland	VCTF 1m
⑪	Cover	Cold rolled steel	⑲	Cable gland	—
⑫	Trimmer cap	Synthetic resin	⑳	Cable gland	VCTF 1m
⑬	Trimmer cap gasket	Nitrile rubber			

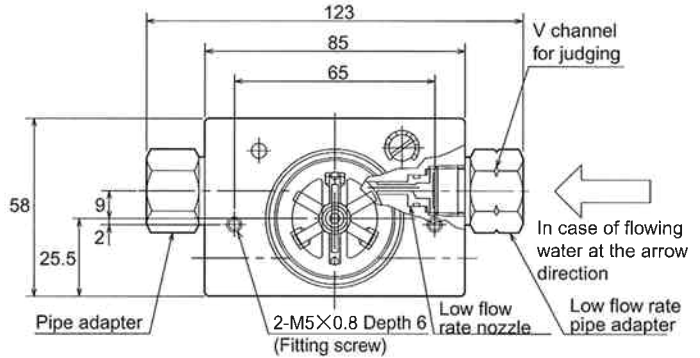
DFS3-1000·1200·1500·5000-DC24V※



Dimensions in fitting pipe adapter set (DF-AP)
DFS3-1000·5000-DC24V※A※



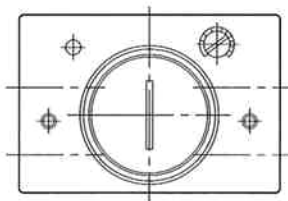
Dimensions in fitting low flow rate pipe adapter set
DFS3-1002·5002-DC24V



Note) Appearance differs, but outside dimensions are the same as those in the above drawing.

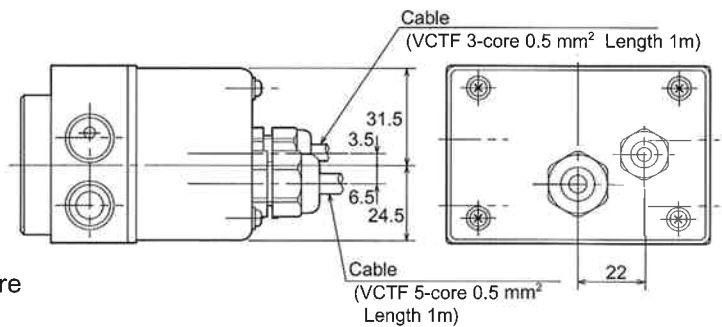
Note) In low flow rate specifications, flow rate range A is used.

DFS3-1500-DC24V

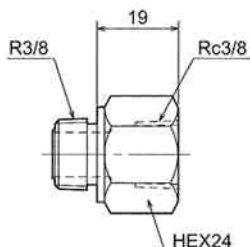


Note) Appearance differs, but outside dimensions are the same as those in the above drawing.

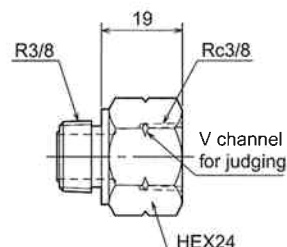
DFS3-1000·1200·1500·5000-AC100V



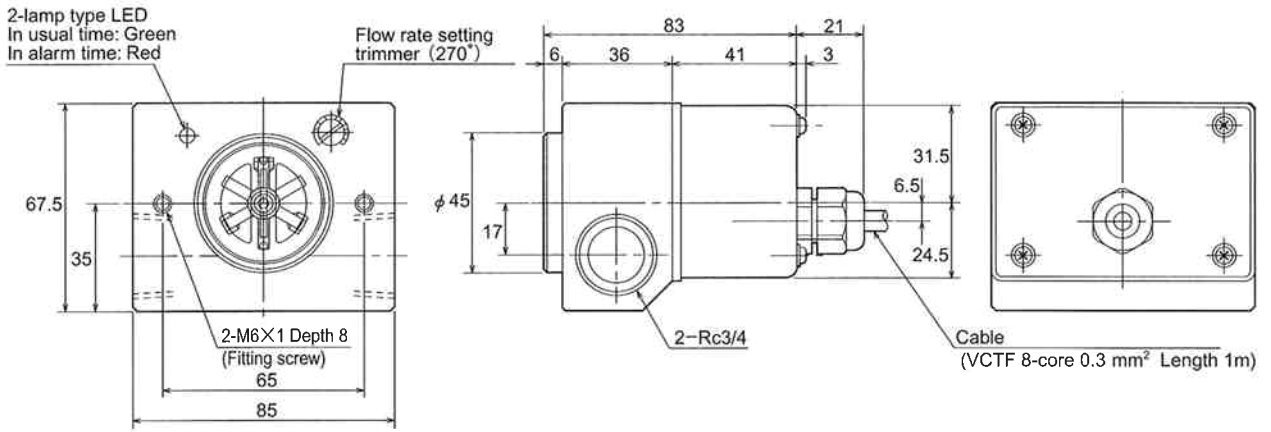
Pipe adapter (Relating parts)



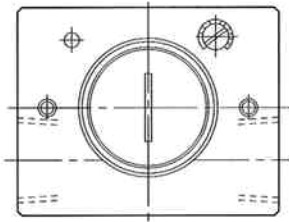
Low flow rate adapter (Relating parts)



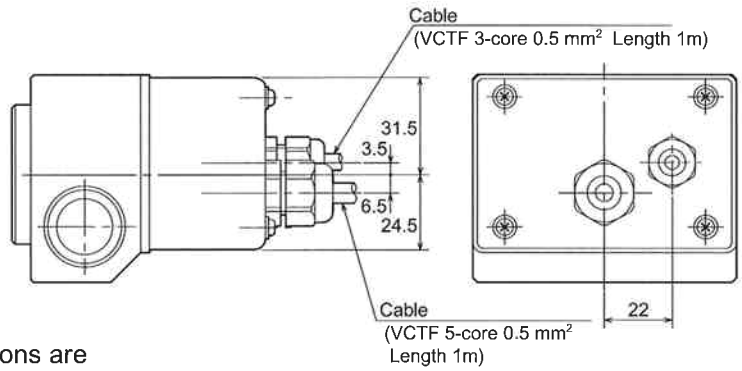
DFS3-2000-2500-DC24V※



DFS3-2500-DC24V※



DFS3-2000-2500-AC100V※



Note) Appearance differs, but outside dimensions are the same as those in the above drawing.