

Fine Solenoid Valve SF Series

2.6 to 10.5 gpm
3045 psi

Features

The function of two valves in one

A two-speed controller provides smooth speed adjustment from low speed to high, and from high-speed to low.

Quiet starts and stops

A low-speed startup and stop feature makes startups and stops smooth and soft.

Separate control of forward and back cylinder movement
There are five volume settings for highspeed flow rate and acceleration/-deceleration times that can be independently adjusted SOL.a and SOL.b (ON side, OFF side).

- Handling
- 1 Valve differential pressure
Volume adjustment becomes sensitive when P→A (B) and B(A)→T differential pressure is large. Maintain the pressure differential so it is no greater than 500 psi.
- 2 Low-speed flow rate
The spool may not move if the low-speed flow rate is below the minimum. Use this valve only within the allowable minimum low-speed flow rate range.
- 3 Deceleration circuit
 - Use a C5** spool for the deceleration circuit. Deceleration is difficult with the C6S** spool.
 - When large deceleration is required or for a system that uses a vertical cylinder, equip an external drain type counter balance valve. See the illustration below.
- 4 Pilot check circuit
 - For a circuit with a pilot check valve, knocking may occur in the pilot check valve due to large load inertia and circuit pressure loss. In cases like this, use an external drain type pilot check valve. See the illustration below.

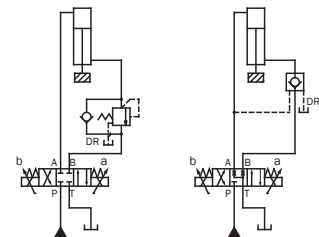
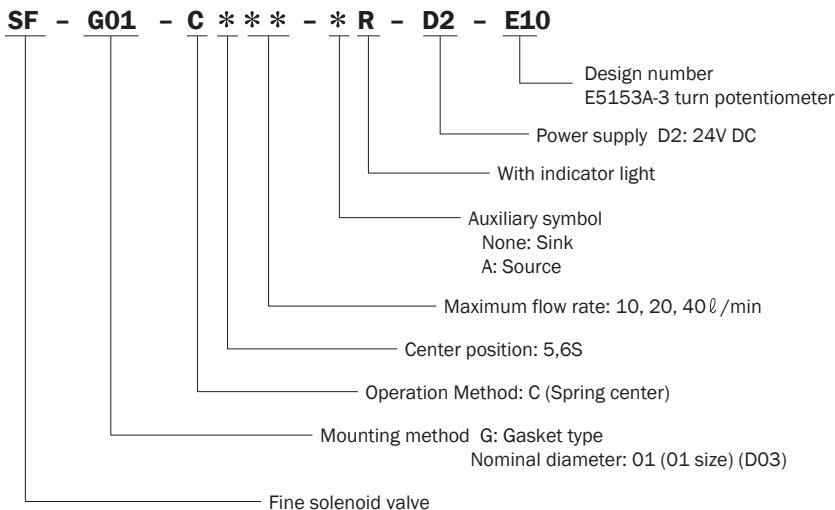
Specifications

Item	Model No.	SF-G01 -C*10-D2-10	SF-G01 -C*20-D2-10	SF-G01 -C*40-D2-10
Valve Maximum Operating Pressure psi		3045		
Maximum Flow Rate ℓ (gpm)		10 (2.6)	20 (5.2)	40 (10.5)
High-speed Flow Rate gpm		1.3 to 2.6	2.6 to 5.2	5.2 to 10.5
Low-speed Flow Rate gpm		.13 to 1.0	.52 to 2.1	1.0 to 4.2
Maximum Allowable Back Pressure psi		1000		
Acceleration/Deceleration Time Adjustment Range SEC		0.1 to 2		
Hysteresis (Note 2)		7%		
Repeatability (Note 2)		3%		
Power Supply Voltage V		D2: 24V DC regulated DC power supply		
Maximum Power Consumption W		36W		
Operating Environment	Dust Resistance/Water Resistance Rank	IP63 (Dust-tight, Rain-proof)		
	Ambient Temperature	41 to 122° F		
	Operating Fluid	Temperature Range	41 to 140° F	
		Viscosity Range	15 to 300centistokes	
Mounting bolt	Filtration	10 microns or less		
	Size x Length	10-24 x 1 3/4		
	Tightening Torque	3.6 to 5 ft lbs		

- Note) 1.The above high-speed and low-speed flow rates are obtained with a differential pressure (PA, PB) of 145 psi. The flow rates depend on differential pressure.
2.Hysteresis and repeatability values are those at maximum flow rate.
3.For mounting bolts, use Grade 8 or equivalent.
4.Mounting bolts are not included.

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 Tell: 021-55882749
 Tell: 021-33488178
 Fax: 021-33488105

Understanding Model Numbers



When large brake pressure is required (Use an external drain type counter valve.)

When there is the possibility of pilot check valve knocking (Use an external drain type pilot check valve.)

Environmental conditions

- 5 The IC circuit board is located inside the central control box, so care must be exercised concerning water-resistance and ambient temperature.
 - Water: Cover the box so there is no direct splashing with water.
 - Ambient Temperature: Use in an area where the temperature is 41 to 122° F
 - 6 Operating Fluid
 - Always keep the operating fluid clean. Allowable contamination is class NAS11 or less.
 - Use oil-based hydraulic operating fluid.
 - Contact your agent when you want to use fire-resistant hydraulic fluid.
- (Continued on following page)

7 Note the following points to optimize operation.
 (1) Control fluid temperature when using this valve. Since the valve perform restrictor valve control on all processes, temperature differential changes flow volume and acceleration/deceleration time. The recommended temperature range is 86 to 140° F.

(2) During the positioning operation following deceleration, make sure that sufficient low-speed running is provided following deceleration

before stopping operation. If low-speed operation time is too short can cause stopping during deceleration and shock problems due to fluctuation in load, etc.

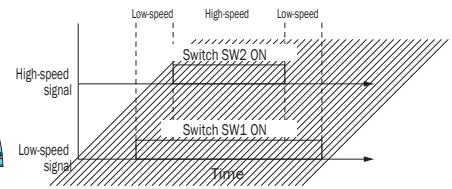
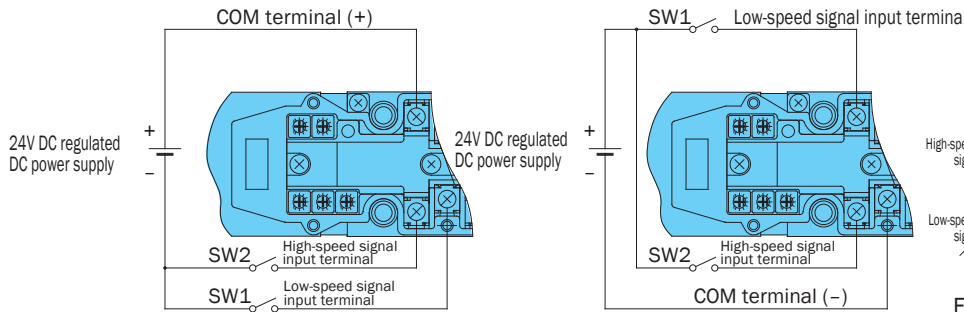
Spool Type and JIS Symbols

Spool Type	C5**	C6S**
JIS Symbol		

Cross-sectional Drawing

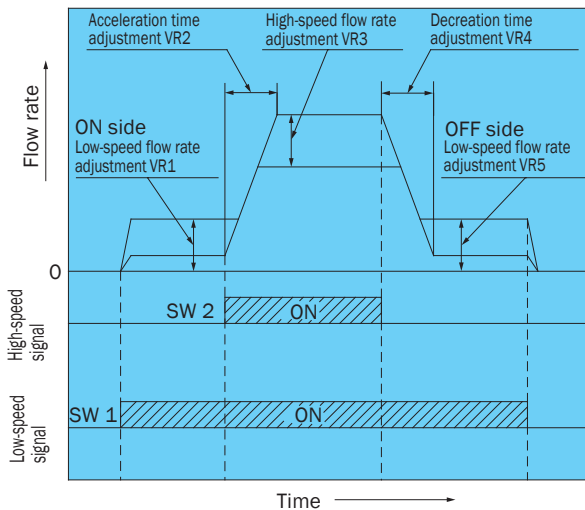
• Sink Type (Auxiliary Symbol: None)
 Switches on load and power supply minus side

• Source Type (Auxiliary Symbol: A)
 Switches on load and power supply plus side



Adjustment Elements

Control Pattern



Electrical Control Precautions

- Do not introduce a high-speed signal prior to a low-speed signal. Make sure the two signals are introduced simultaneously or that the low-speed signal is introduced first.
- (1) Repeatedly introducing the high-speed signal first in a source type configuration can damage the IC board.
- (2) The valve will not operate on the high-speed signal only.
- The following adjustments in the range of VR1 through VR5 can be made independently for SOL.a and SOL.b. You can make adjustments for the best conditions for forward and back operations when considering the cylinder operations.
- Adjustment volume is arranged in from VR1 through VR5 in clockwise (rightward) rotation sequence when viewed from the coil side.
- The following are the factory default volume settings.

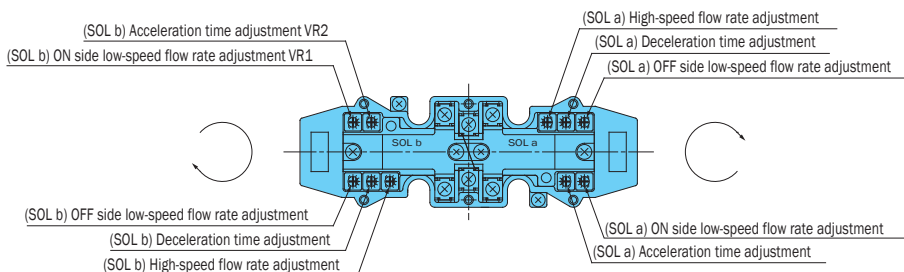
- VR1 . 2 . 4 . 5
- Minimum setting
- VR3 --- Maximum setting

All Adjustment VRs

Maximum is clockwise (rightward) rotation.

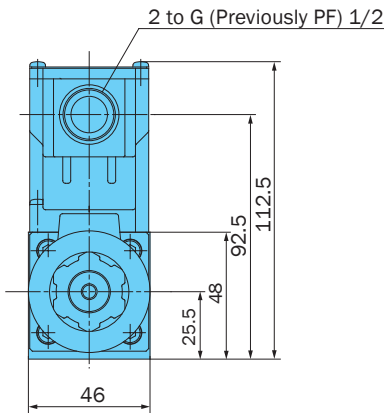
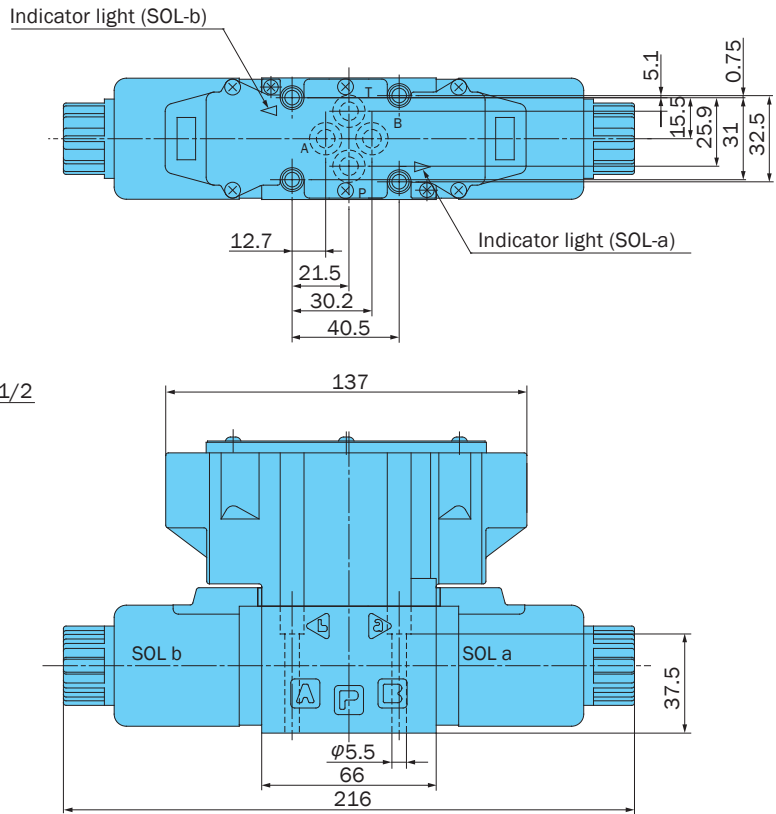


- The volume rotation angle is 270°. Contact your agent about a three-rotation type adjustor for fine adjustment.



Installation Dimension Drawings

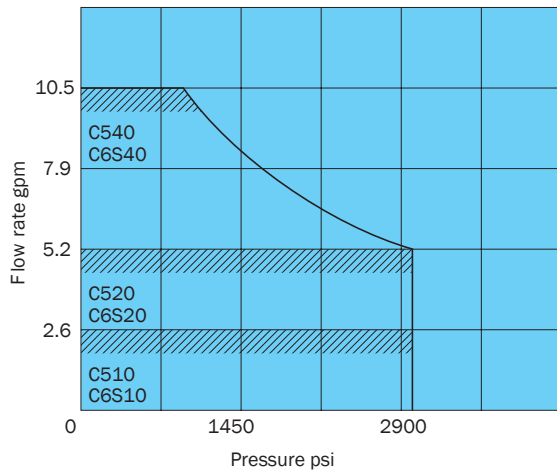
SF-G01-C***-(A)R-D2-E10



Performance Curves

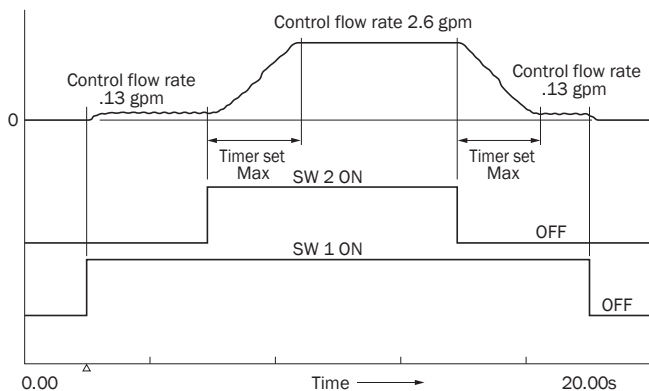
Hydraulic Operating Fluid Viscosity 32 centistokes

Pressure - Flow Rate Characteristics

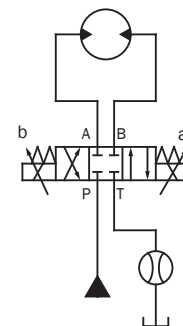


- Use the valve within the allowable flow rate range shown by the graph to the right.
- There are no operational problems within the allowable flow rate range, even when one-pass is used.

Control Waveform Example

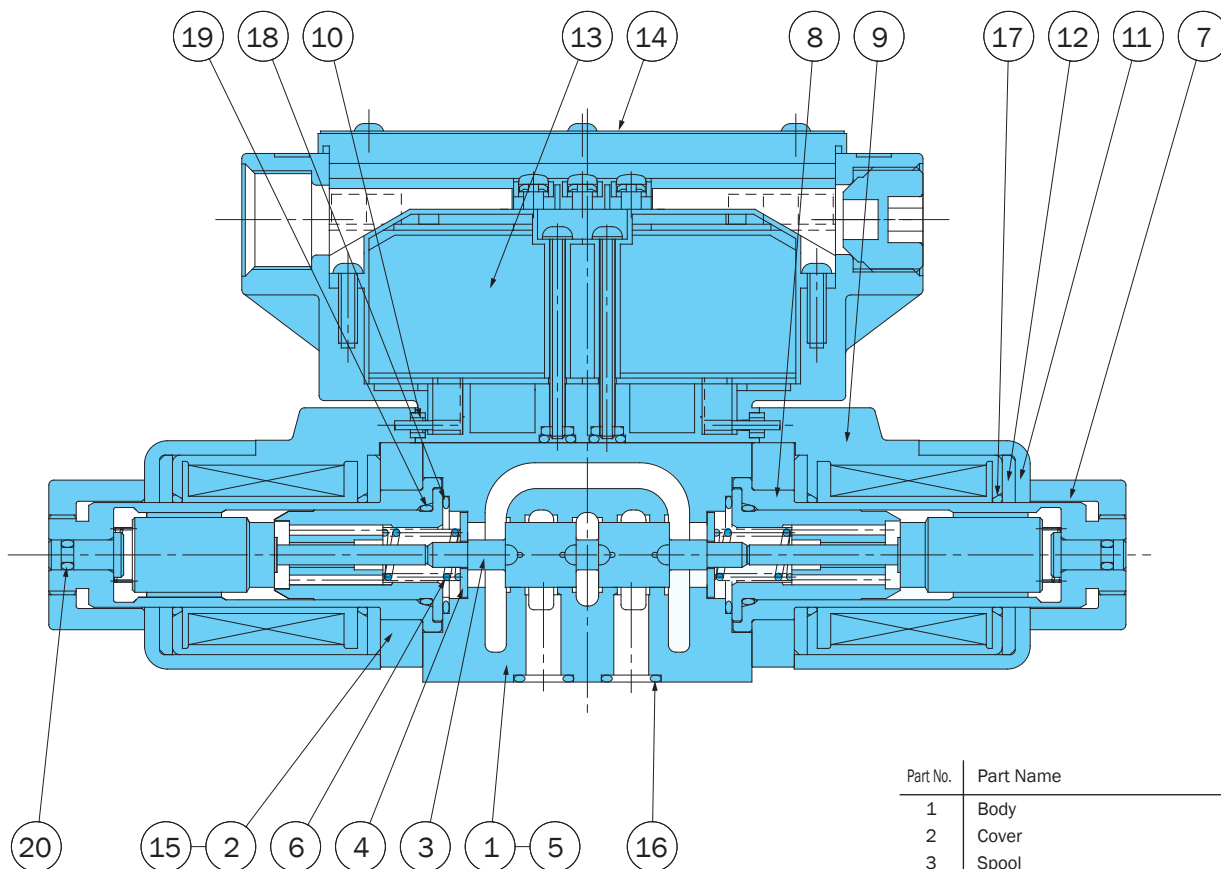


- Valve: SF-G01-C510-R-D2-E10
- Supply Pressure: 3000 psi
- Hydraulic Circuit



Cross-sectional Drawing

SF-G01-C***-(A)R-D2-E10



Part No.	Part Name
1	Body
2	Cover
3	Spool
4	Retainer
5	Spacer
6	Spring
7	Nut
8	Solenoid guide
9	Solenoid coil
10	Packing B
11	Coil case
12	Coil yoke
13	Central terminal box kit
14	Nameplate
15	Hexagon Socket Head Bolt
16	O-ring
17	O-ring
18	O-ring
19	O-ring
20	O-ring

Seal Part List (Kit Model Number EFS)

Part No.	Part Name	Type/Part Number	Qty
16	O-ring	AS568-012(Hs90)	4
17	O-ring	AS568-019	4
18	O-ring	AS568-019(Hs90)	2
19	O-ring	AS568-017(Hs90)	2
20	O-ring	P3 Note2	2

Note: 1.O-ring 1B-** refers to JIS B 2401-1B-**. 2.Special flurorubber is used (Part Number: RO-P3-VS).

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Solenoid Valves