



### SL Series (Wiring System: Central Terminal Box) Lower Power Solenoid Valve

30 ℓ /min  
7MPa

### Features

- ① Very long life  
The movable iron core of the wet type solenoid is immersed in oil, which keeps it lubricated and cushions it from impact and vibration, ensuring very long life.
- ② Low switching noise  
The wet-type solenoid valve provides very low core switching noise, for quiet operation.
- ③ Low power consumption type.  
The low power for the AC solenoid 9.6 W (60 Hz), DC solenoid 10 W contribute to energy conservation.
- ④ Easy connections  
A special wiring box provides a COM port and indicator light as standard for simple wiring and maintenance.
- ⑤ Easy coil replacement  
A plug-in type coil enables one-touch coil replacement.
- ⑥ Wide-ranging backward compatibility makes it simple to replace previous valve models with this one. Combining this valve with a modular valve contributes to the compact configuration of the overall device.
- ⑦ Global support  
Meets overseas safety standards (CE, UL, and CSA). It can be safely used anywhere in the world. Contact your agent for certified products.

### Specifications

JIS Symbol	Operation symbol	Maximum flow rate (ℓ /min)
	-A5-	30
	-H5-	
	-A3X-	
	-H3X-	
	-E3X-	
	-C1-	
	-C2-	

JIS Symbol	Operation symbol	Maximum flow rate (ℓ /min)
	-C4-	30
	-C5-	
	-C6-	
	-C9-	
	-C6S-	
	-C7Y-	15

Solenoid Type		AC Solenoid		DC Solenoid	
		C1	C2	Built-in Rectifier E1	D2
Maximum Working Pressure	P.A.B. Ports	7MPa (71kgf/cm <sup>2</sup> )			
Maximum Allowable Backpressure	T Port	7MPa (71kgf/cm <sup>2</sup> )			
Changeover Frequency (per minute)		24		120	240
Standard	Indicator light	R			
Options	Surgeless	G		—	G
	With manual push-button	N			
Mass (kg)	Quick Return	—		Q	—
	Double Solenoid	1.5		2.0	
Recommended	Single Solenoid	1.2		1.5	
	Ambient Temperature	-20 to 70°C			
	Viscosity Range	15 to 300mm <sup>2</sup> /s {cSt}			
	Viscosity Index	90 or greater			
Filtration		25 microns or less			
Mounting bolt		Hex bolt with hole of 12T hardness M5 × 45 4 each			
Tightening Torque		5 to 7N·m {51 to 71kgf·cm}			

Note) Mounting bolts are not included.

● Handling

- 1 In order to realize the full benefits of the wet type solenoid valve, configure piping so oil is constantly supplied to the T(R) port. Never use a stopper plug in the T(R) port.
- 2 Ensure that surge pressure in excess of the maximum allowable back pressure does not reach the T port.
- 3 Note that the maximum flow rate is limited when used as a four-way valve, or by blocking ports for use as a two-way valve or one-way valve.
- 4 Always keep the operating fluid clean. (contamination level: 12 or lower)

- 5 When using petroleum type operating fluid, use JIS K 2213 Class 1 or Class 2, or equivalent.
- 6 Use the SS series solenoid valve when using fire resistant hydraulic operating fluid.
- 7 Use this valve only within the allowable voltage range.
- 8 Do not allow the AC solenoid to become charged until you install the coil into the valve.
- 9 Maintaining a switching position under high pressure for a long period can cause abnormal operation due to hydraulic lockup. Contact your agent when you need to maintain a switching position for a long

period.

- 10 When using a detent type (3X), use constant energization in order to securely maintain the switching position.
- 11 Note that manual pin operating pressure changes in accordance with tank line back pressure.
- 12 Use the following table for specification when a sub plate is required.

Model No.	Pipe Diameter	Maximum flow rate (ℓ/min)	Weight (kg)
MSA-01X-10	1/4	20	1.2
MSA-01Y-10	3/8	40	

● Solenoid Assembly Specifications

Solenoid Type	AC Solenoid						DC Solenoid	
	C1			C2			Built-in Rectifier	
Power Supply Type	C1			C2			E1	D2
Voltage (V)	AC100		AC110	AC200		AC220	AC100	DC24
Cycles (Hz)	50	60	60	50	60	60	50/60	—
Solenoid Coil Type	EL64-C1			EL64-C2			ELC64-E1-1A	ELC64-D2-1A
Drive Current (A)	1.30	1.10	1.30	0.65	0.55	0.65	0.11	0.42
Holding Current (A)	0.30	0.24	0.28	0.15	0.12	0.14		
Holding Power (W)	12.0	9.6	12.2	12.0	9.6	12.2	10	10
Allowable Voltage Range	80 to 110	90 to 120		160 to 220	180 to 240		90 to 110	21.6 to 26.4
Allowable Pressure (MPa(kg/cm <sup>2</sup> ))	7 {71}							
Insulator Resistance (MΩ)	100 or greater (500 V)							

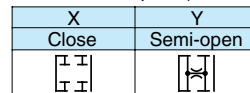
- Note) 1.A DC solenoid surge absorption circuit is effective in preventing misoperation in sensitive relays and IC circuits. (Applicable for power supply display D<sup>o</sup>, option: G)
- 2.A DC solenoid RAC type (power supply E1) greatly increases the life of the contacts by eliminating contact arc without changing circuit sequence on an AC line, 50/60Hz can be used.

## Understanding Model Numbers

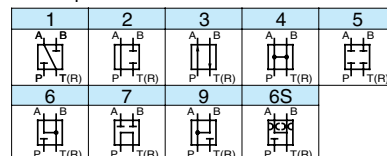
SL - G 01 - A 3 X - ※ R - C2 - 31

- Design Number
- Power supply  
C: AC (50/60 Hz) C1 = AC100 V C2 = AC200 V  
D: For DC D2 = DC24V  
E: AC (Built-in rectifier; 50/60Hz) E1 = AC100V
- With indicator light
- Auxiliary symbol (Can be combined in alphabetic sequence.)  
G: Surgeless type (Power supply C※ D2 Applicable)  
N: With manual push-button  
Q: Quick return type (Available with power supply E1)

Transition flow path (\*3\*, C7\* only)

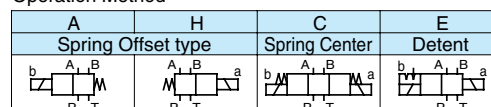


Center position



Note 1. P is pressure port, A and B are connection ports to cylinder. T (R) shows the connection port to the tank.

Operation Method



Nominal Diameter: 01 size

Mounting method: Gasket type

Machine type: SL Series wet magnetic switching valve.

## Options

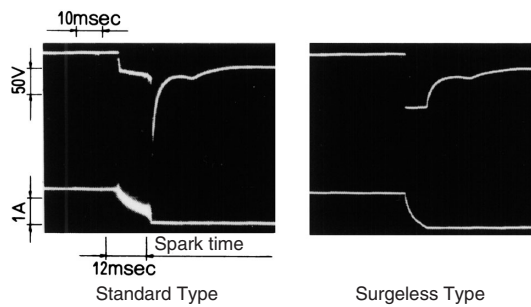
(Auxiliary Symbol)

### Surgeless type (Auxiliary Symbol: G)

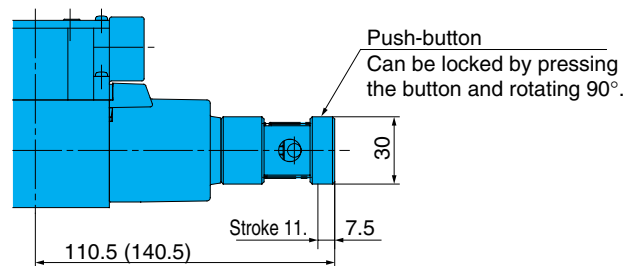
The surge pressure waveforms when the DC solenoid valve power supply is opened and closed by a relay are shown at the bottom of this block.

A built-in surge absorber element eliminates sparking and surge pressure.

- Features
- Surge voltage is inhibited.
  - Sparking at relay contact points is eliminated.

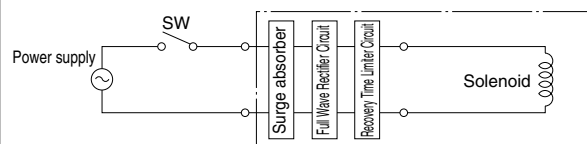


### Manual push-button type (Auxiliary symbol: N)



Note)  
Dimensions for the DC solenoid valve are in parenthesis.

### Quick Return Type (Auxiliary Symbol: Q)



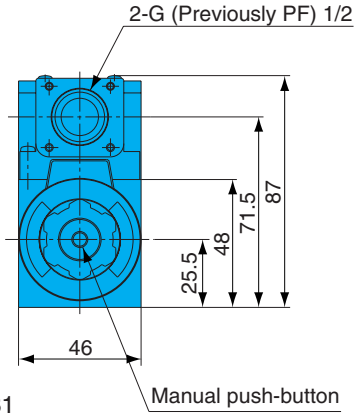
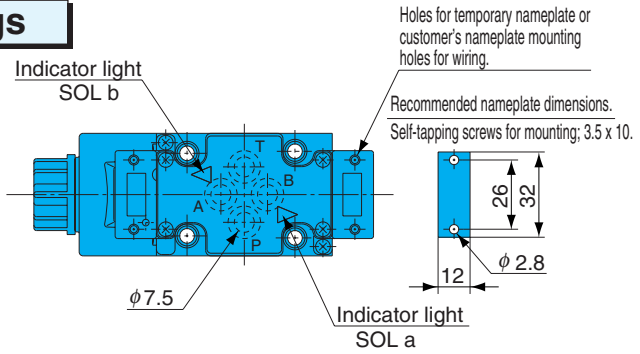
#### Handling

- 1 This type is used in the case of power supply type E1 (with built-in rectifier) to shorten the spring return time. This also applies to D2.
- 2 The quick return mechanism is built-in.

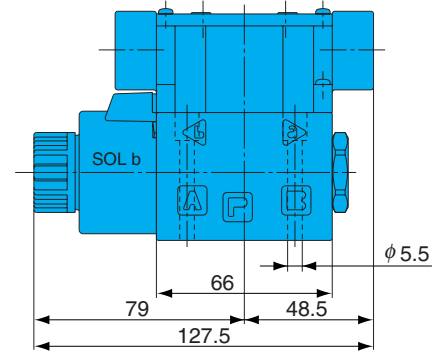
# Installation Dimension Drawings

AC Solenoid  
 SL-G01-A\*\*-R-C\*-31  
 SL-G01-H\*\*-R-C\*-31

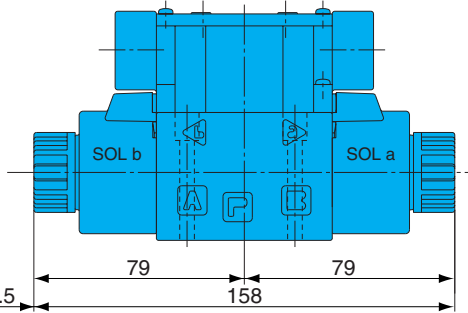
Note) The SL-G01-H\*\*-R\*\*-31 solenoid, is attached to the opposite side (SOL a) as shown in the diagram.



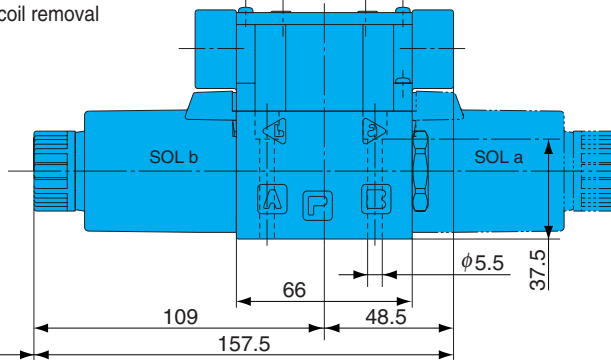
SL-G01-C\*\*-R-C\*-31  
 SL-G01-E\*\*-R-C\*-31



DC Solenoid and Rectifier  
 SL-G01-A\*\*-R-D/E\*-31  
 SL-G01-H\*\*-R-D/E\*-31  
 SL-G01-C\*\*-R-D/E\*-31  
 SL-G01-E\*\*-R-D/E\*-31



Space required for coil removal

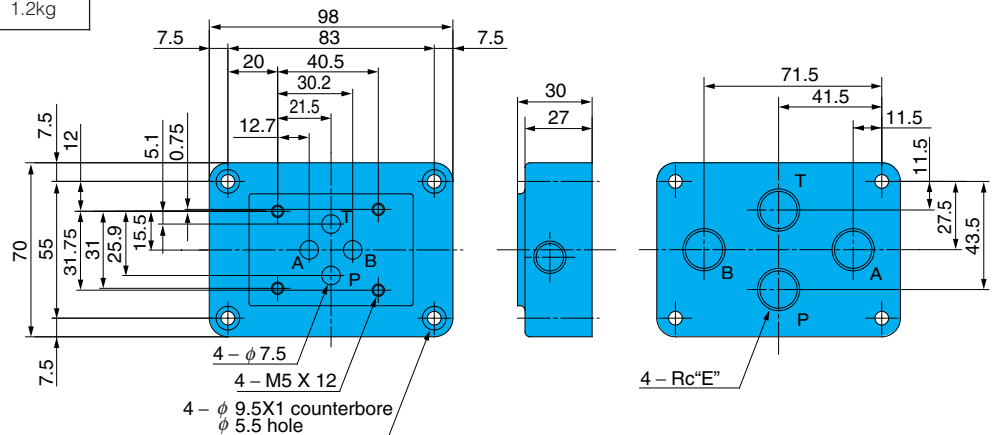


Space required for coil removal

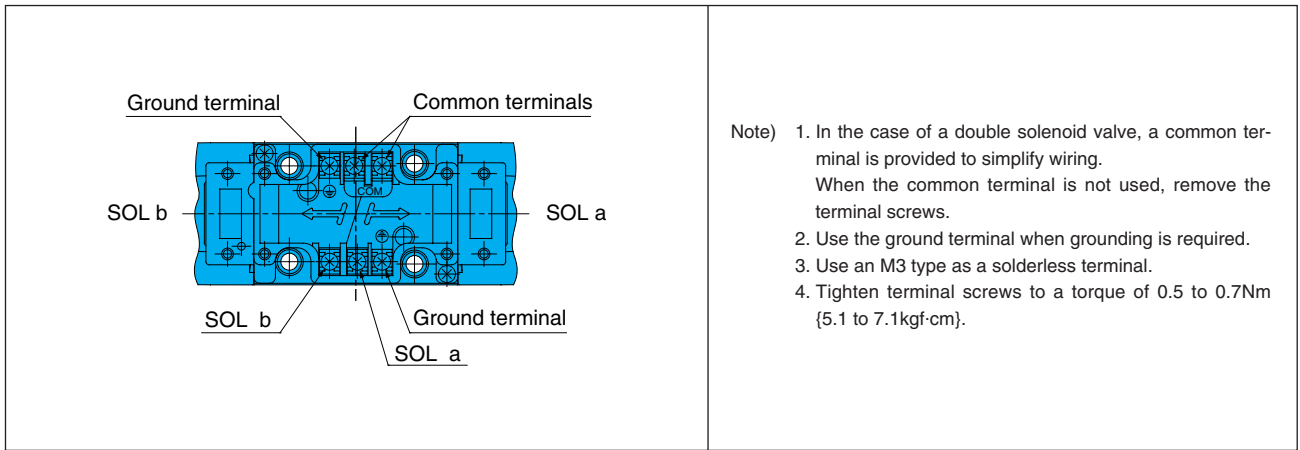
For sub plate SL-G01

Model No.	E	Mass
MSA-01X-10	1/4	1.2kg
MSA-01Y-10	3/8	1.2kg

Gasket Surface Dimensions  
 (ISO 4401-03-02-0-94  
 JIS B 8355 D-03-02-0-94)



## Wiring Diagram



- Note)
1. In the case of a double solenoid valve, a common terminal is provided to simplify wiring. When the common terminal is not used, remove the terminal screws.
  2. Use the ground terminal when grounding is required.
  3. Use an M3 type as a solderless terminal.
  4. Tighten terminal screws to a torque of 0.5 to 0.7Nm {5.1 to 7.1kgf-cm}.

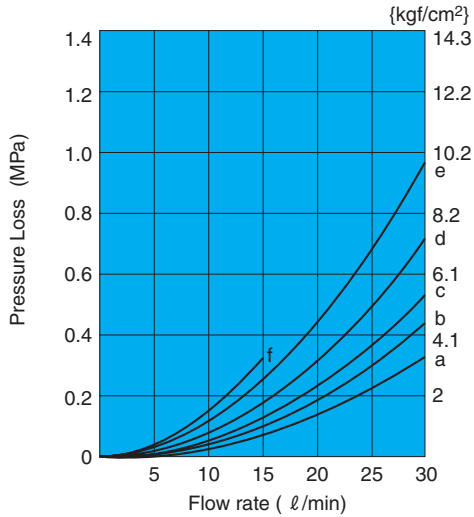
## Electrical Circuit Diagram

Type	Model No.	Electrical Circuits
AC Solenoid	SL-G01-***-R-C*-31	
AC Solenoid Surgeless type	SL-G01-***-GR-C*-31	
Built-in Rectifier	SL-G01-***-R-E*-31	
DC Solenoid	SL-G01-***-R-D*-31	
DC Solenoid Surgeless Type	SL-G01-***-GR-D*-31	
Built-in Rectifier Quick Return Type	SL-G01-***-QR-E*-31	See page E-4 for more information.

# Performance Curves

Hydraulic Operating Fluid Viscosity 20 mm<sup>2</sup>/s {cSt}

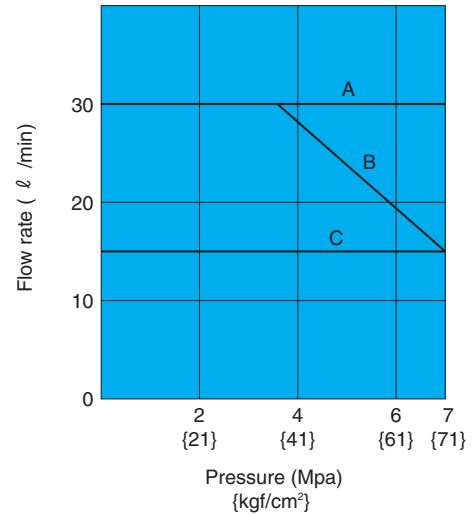
## Pressure Loss Characteristics



Flow Path	P→A	P→B	A→T	B→T	P→T
A5	—	c	c	—	—
H5	c	—	—	c	—
A3X, H3X, E3X	b	b	e	e	—
C1	c	c	a	c	—
C2	a	c	e	c	—
C4	a	a	c	c	d
C5, C6S	c	c	c	c	—
C6	c	c	a	a	—
C7Y	f	f	e	e	d
C9	a	a	e	e	—

## Pressure – Flow Volume Allowable Value

Operation symbol	Operation Example	Symbol 1	Symbol 2	Symbol 3
A5	A	—	B	—
H5		B	—	—
A3X, H3X, E3X C1, C2, C4, C5 C6, C9, C6S		B	B	—
C7Y		C	C	C



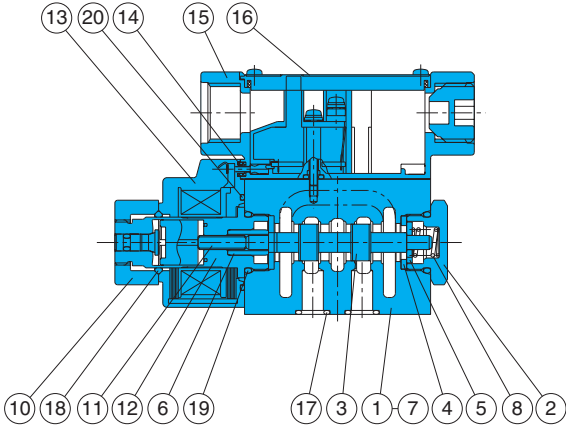
## Switching Response Time

Model No.	Response Time (sec)		Measurement Conditions
	Solenoid ON	Spring Return	
SL-G01-**-R-C*-31	0.010 to 0.020	0.010 to 0.020	7MPa {71kgf/cm <sup>2</sup> }
SL-G01-**-R-E1-31	0.055 to 0.080	0.150 to 0.185	20 l/min
SL-G01-**-G)R-D2-31	0.055 to 0.080	0.025 to 0.035	40mm <sup>2</sup> /s {cSt}

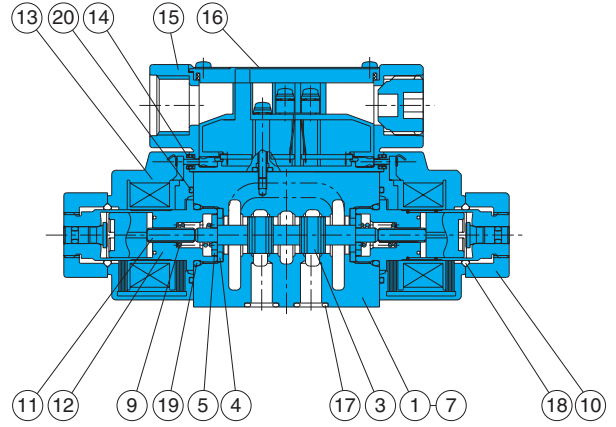
Note) 1. The switching response time changes slightly with operating conditions (pressure, flow rate, viscosity, etc.)  
 2. In the case of power supply type E1 (with built-in rectifier), the spring return time using Quick Return (option symbol: Q) is the same as D2.

# Cross-sectional Drawing

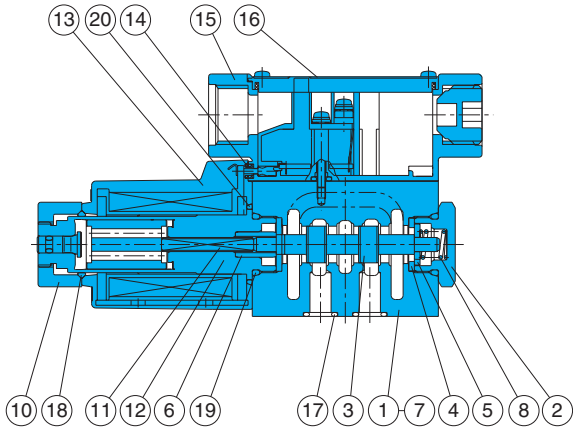
SL-G01-A\*\*-R-C\*-31



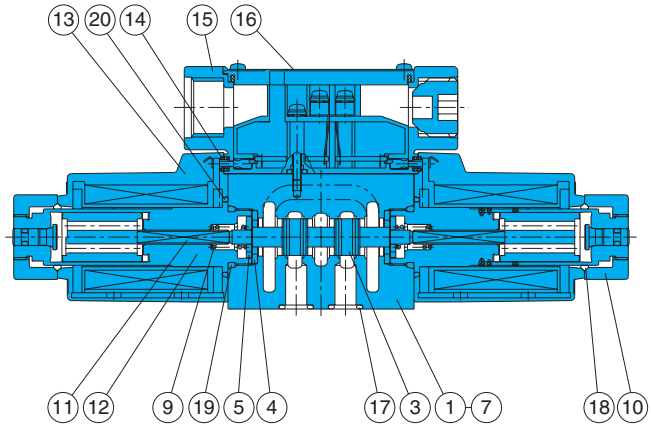
SL-G01-C\*\*-R-C\*-31



SL-G01-A\*\*-R-D/E\*-31



SL-G01-C\*\*-R-D/E\*-31



## List of Sealing Parts

Part No.	Part Name	Type/Part Number		Q'ty	
		DC SOL	AC SOL	Single Solenoid	Double Solenoid
17	O-ring	AS568-012(Hs90)		4	4
18	O-ring	1A-P20	1A-P18	1	2
19	O-ring	1B-P18		2	2
20	O-ring	S-25	AS568-025(Hs70)	1	2

Note) O-ring 1A/1B-\*\* indicates JIS B2401-1A/1B\*\*. AS568 is SAE standard.

Part No.	Part Name	Part No.	Part Name
1	Body	11	Rod
2	Plug	12	Solenoid guide
3	Spool	13	Solenoid coil
4	Retainer A	14	Packing
5	Retainer B	15	Terminal box kit
6	Retainer C	16	Nameplate
7	Spacer	17	O-ring
8	Spring A	18	O-ring
9	Spring C	19	O-ring
10	Nut	20	O-ring

