

# 3 MPa / 7 MPa

## High Pressure Coolant Valve

Corresponding to high speed grinding and long drilling processes

Coolant valve for high pressure coolant liquid (up to 3 MPa/7 MPa) that is ideal for lubrication, dust blowing and cooling.

Service life: **3** million cycles

(Based on SMC's test condition)

Power consumption: **0.35** W

(24 VDC)

(With light/surge voltage suppressor: 0.58 W)

Water hammer: Reduced by **20%**

(2-port)

(Compared to existing model, VNH series)

3-port dual pressure type is standardized.

(See applications 1 and 2.)

Flow-rate characteristics (2-port)

Pressure	Av x 10 <sup>-6</sup> [m <sup>2</sup> ]
7 MPa	42 (1.8) to 155 (6.5)

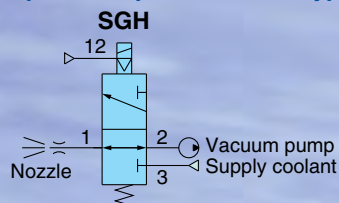
( ): Cv factor



Application example

### Example 1

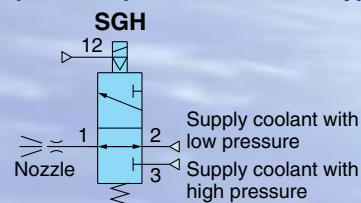
3-port dual pressure, N.C. type



Fluid leakage can be avoided.

### Example 2

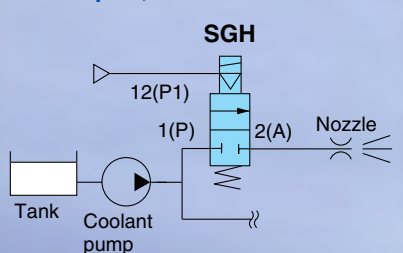
3-port dual pressure, Selector type



Coolant can be supplied at different pressures.

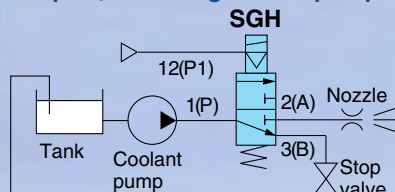
### Example 3

2-port, Nozzle ON/OFF



### Example 4

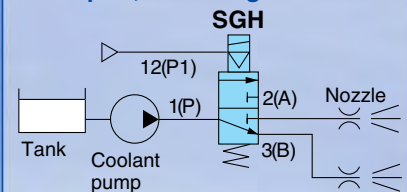
3-port, Reducing load to pump



For reducing load to pump, coolant liquid is returned from B port to tank each time.

### Example 5

3-port, Switching nozzles

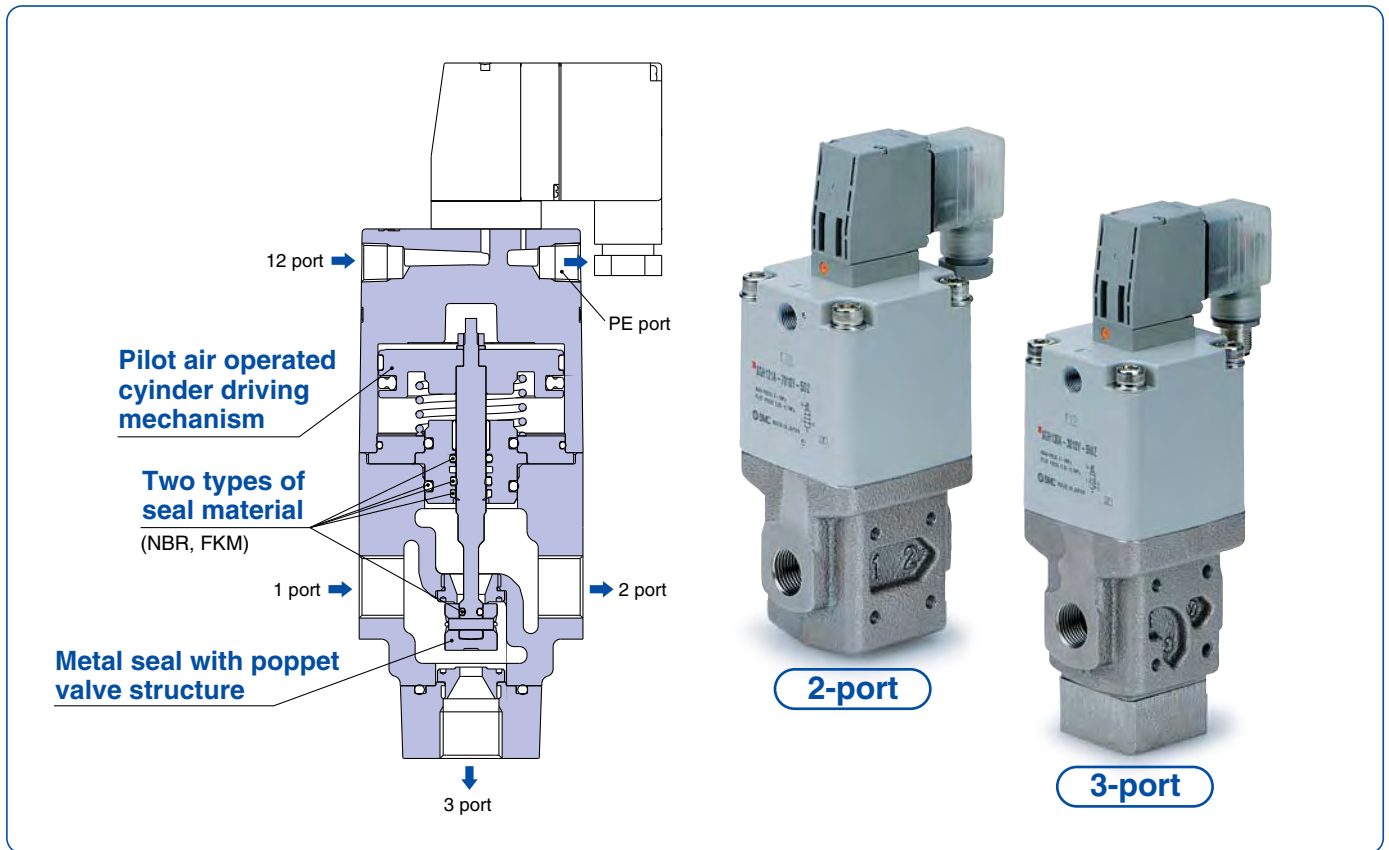


Switching nozzles on supplying coolant liquid. Possible to use as a 2-port valve by plugging the 3(B) port.

Series **SGH**



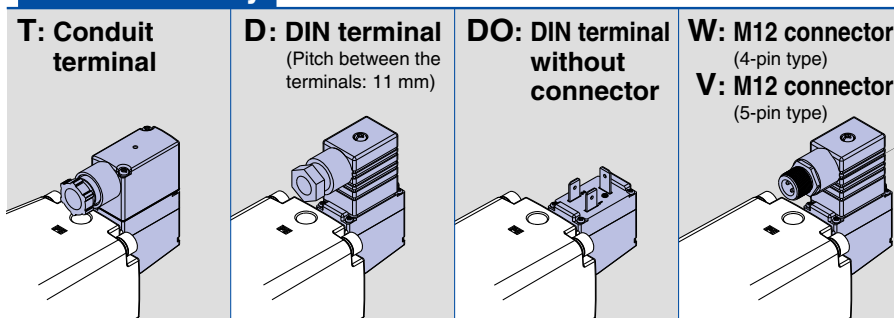
CAT.ES70-37A



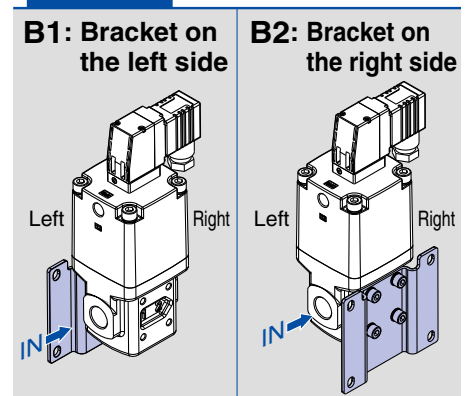
### Variations

Port	Pressure specifications	Model	Port size	Orifice diameter $\phi$ [mm]		Flow-rate characteristics $Av \times 10^{-6}$ [m <sup>2</sup> ] ( ) : Cv		Rated voltage
				1→2	1→3	1→2	1→3	
2-port	7 MPa	SGH(A)12□□-70□10	3/8	$\phi 7.5$	—	42 (1.8)	—	100 VAC 50/60 Hz 200 VAC 50/60 Hz 110 VAC [115 VAC] 50/60 Hz 220 VAC [230 VAC] 50/60 Hz 24 VDC 12 VDC
		SGH(A)22□□-70□15	1/2	$\phi 9.4$	—	65 (2.7)	—	
		SGH(A)32□□-70□20	3/4	$\phi 12.4$	—	112 (4.7)	—	
		SGH(A)42□□-70□25	1	$\phi 15.4$	—	155 (6.5)	—	
3-port	3 MPa	SGH(A)13□□-30□10	3/8	$\phi 11$	$\phi 9.4$	50 (2.1)	56 (2.3)	
		SGH(A)23□□-30□15	1/2		$\phi 10.5$	55 (2.3)	73 (3.0)	
		SGH(A)33□□-30□20	3/4	$\phi 15$	$\phi 12$	90 (3.8)	92 (3.8)	
		SGH(A)43□□-30□25	1	$\phi 17$	$\phi 15.2$	135 (5.6)	140 (5.8)	
	7 MPa	SGH(A)13□□-70□10	3/8	$\phi 7.5$	$\phi 6$	26 (1.1)	23 (1.0)	
		SGH(A)23□□-70□15	1/2	$\phi 10.1$	$\phi 7.6$	45 (1.9)	49 (2.0)	
		SGH(A)33□□-70□20	3/4	$\phi 12.8$	$\phi 10$	78 (3.3)	65 (2.7)	
		SGH(A)43□□-70□25	1	$\phi 15.4$	$\phi 11.5$	102 (4.3)	84 (3.5)	

### Electrical entry



### Bracket



# Coolant Valve

# Series *SGH*



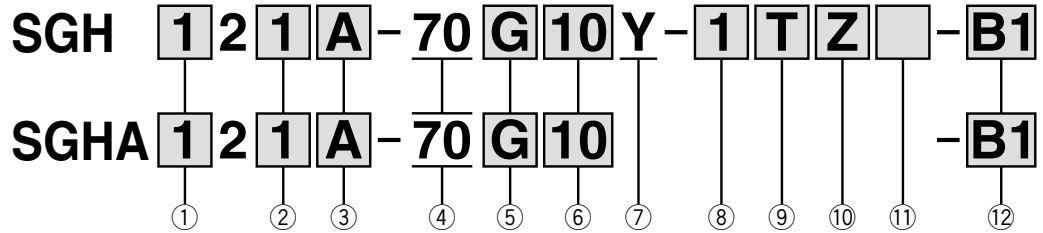
External pilot solenoid



Air operated

## How to Order 2-Port Type

Note) Filter is installed on PE port as standard.



① Series	② Valve type	③ Seal material	④ Pressure range	⑤ Thread type		⑥ Port size		
1 SGH100	1 N.C.	A NBR	70 Pressure range 0 to 7 MPa	Nil	Rc	10	3/8	SGH100
2 SGH200	2 N.O.	B FKM		G	G (ISO1179-1)	15	1/2	SGH200
3 SGH300				N	NPT	20	3/4	SGH300
4 SGH400				T	NPTF	25	1	SGH400

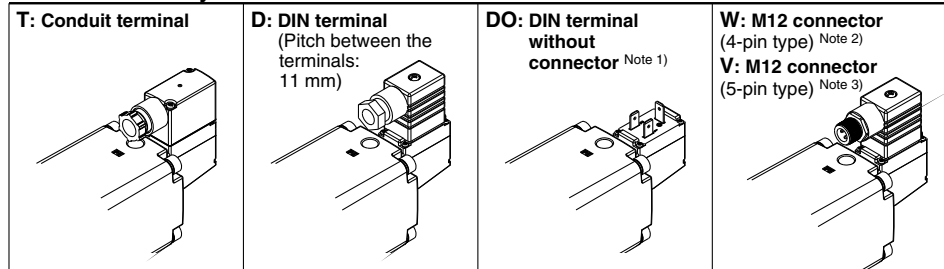
### ⑦ Pilot valve

Y V116

### ⑧ Rated voltage

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	110 VAC [115 VAC] 50/60 Hz
4	220 VAC [230 VAC] 50/60 Hz
5	24 VDC
6	12 VDC

### ⑨ Electrical entry



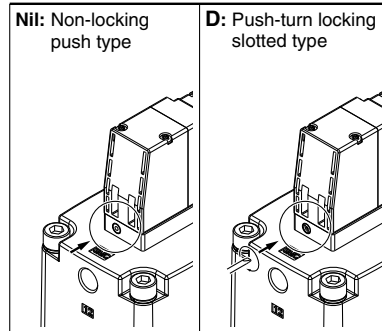
Note 1) Refer to the below table (1) for combinations with light/surge voltage suppressors.  
 Note 2) Cable is not included. Order it separately after referring to the options on page 12.  
 Note 3) Only DC voltage is available.

### ⑩ Light/surge voltage suppressor

Nil	None
S	With surge voltage suppressor (Non-polar)
Z	With light/surge voltage suppressor (Non-polar)

Note) Refer to the below table (1) for combinations with electrical entry.  
 \* DOS, DOZ are not available.  
 \* For AC specifications, Nil is only set for electrical entry DO.

### ⑪ Manual override



### ⑫ Bracket

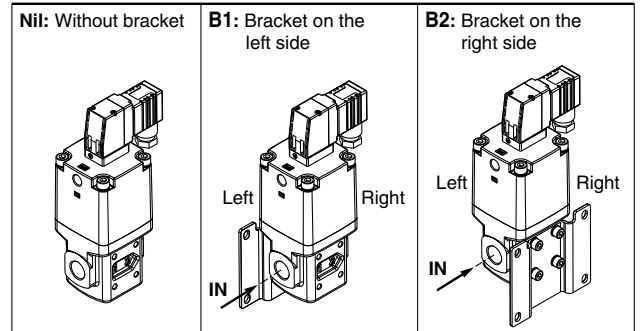


Table (1) Electrical Entry / Light/Surge Voltage Suppressor

Rated voltage	Electrical entry	Without light/surge voltage suppressor	With surge voltage suppressor	With light/surge voltage suppressor
		Nil	S	Z
AC	T	—	●	●
	D	—	●	●
	W	—	●	●
	DO	● Note)	—	—
DC	T	—	●	●
	D	●	●	●
	W	●	●	●
	DO	●	—	—

Note) If an AC specification without DIN terminal (DO) is selected, always use a DIN connector with surge voltage suppressor as the connector.

## Options

(For details, refer to page 12.)

### Cable for M12 connector

V100-200-1-4

Specifications		Cable length (L)		
4-pin type	1	DC	4	1000 [mm]
	2	AC	8	3000 [mm]
5-pin type	3	DC	9	5000 [mm]

\* When selecting the 5-pin type, only DC voltage is available.

# Series SGH



## How to Order 3-Port Type

Note) Filter is installed on PE port as standard.

**External pilot solenoid**

**SGH 1 3 0 A - 30 G 10 Y - 1 T Z - B1**

**Air operated**

**SGHA 1 3 0 A - 30 G 10 - B1**

① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩ ⑪ ⑫

### ① Series

1	SGH100
2	SGH200
3	SGH300
4	SGH400

### ② Valve type

0	3-port
3	3-port dual pressure type

### ③ Seal material

A	NBR
B	FKM

### ④ Pressure range

30	Pressure range 0 to 3 MPa
70	Pressure range 0 to 7 MPa

### ⑤ Thread type

Nil	Rc
G	G (ISO1179-1)
N	NPT
T	NPTF

### ⑥ Port size

10	3/8	SGH100
15	1/2	SGH200
20	3/4	SGH300
25	1	SGH400

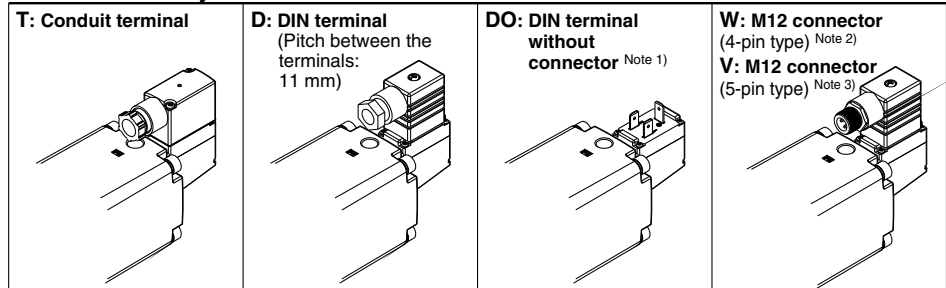
### ⑦ Pilot valve

Y	V116
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### ⑧ Rated voltage

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	110 VAC [115 VAC] 50/60 Hz
4	220 VAC [230 VAC] 50/60 Hz
5	24 VDC
6	12 VDC

### ⑨ Electrical entry



Note 1) Refer to the below table (1) for combinations with light/surge voltage suppressors.  
 Note 2) Cable is not included. Order it separately after referring to the options on page 12.  
 Note 3) Only DC voltage is available.

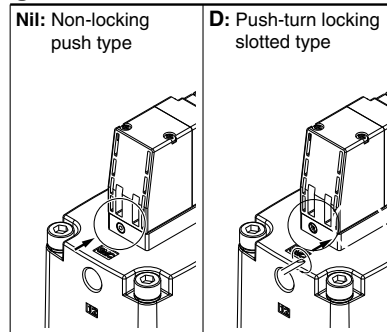
### ⑩ Light/surge voltage suppressor

Nil	None
S	With surge voltage suppressor (Non-polar)
Z	With light/surge voltage suppressor (Non-polar)

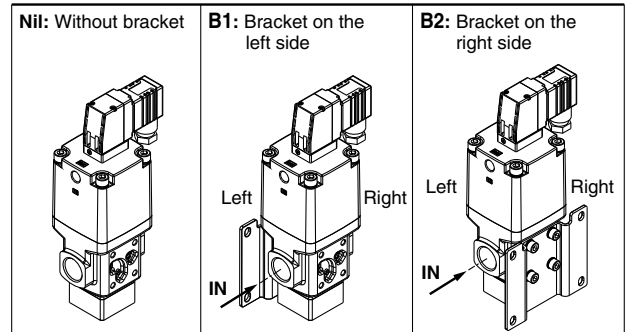
Note) Refer to the below table (1) for combinations with electrical entry.

\* DOS, DOZ are not available.  
 \* For AC specifications, Nil is only set for electrical entry DO.

### ⑪ Manual override



### ⑫ Bracket



**Table (1) Electrical Entry / Light/Surge Voltage Suppressor**

Rated voltage	Electrical entry	Without light/surge voltage suppressor	With surge voltage suppressor	With light/surge voltage suppressor
		Nil	S	Z
AC	T	—	●	●
	D	—	●	●
	W	—	●	●
	DO	● Note)	—	—
DC	T	—	●	●
	D	●	●	●
	W	●	●	●
	DO	●	—	—

Note) If an AC specification without DIN terminal (DO) is selected, always use a DIN connector with surge voltage suppressor as the connector.

## Options

(For details, refer to page 12.)

### Cable for M12 connector

**V100-200-1-4**

#### Specifications

4-pin type	1	DC
	2	AC
5-pin type	3	DC

\* When selecting the 5-pin type, only DC voltage is available.

#### Cable length (L)

4	1000 [mm]
8	3000 [mm]
9	5000 [mm]

## Flow-rate Characteristics

Port	Pressure specifications	Model	Port size	Orifice diameter $\phi$ [mm]		Flow-rate characteristics $Av \times 10^{-6}$ [m <sup>2</sup> ] ( ): Cv		Weight [kg]	
				1→2	1→3	1→2	1→3	Without bracket	With bracket
2-port	7 MPa	SGH(A)12□□-70□10	3/8	$\phi 7.5$	—	42 (1.8)	—	1.4	1.5
		SGH(A)22□□-70□15	1/2	$\phi 9.4$	—	65 (2.7)	—	2.4	2.6
		SGH(A)32□□-70□20	3/4	$\phi 12.4$	—	112 (4.7)	—	4.7	5.3
		SGH(A)42□□-70□25	1	$\phi 15.4$	—	155 (6.5)	—	6.6	7.2
3-port	3 MPa	SGH(A)13□□-30□10	3/8	$\phi 11$	$\phi 9.4$	50 (2.1)	56 (2.3)	1.6	1.7
		SGH(A)23□□-30□15	1/2		$\phi 10.5$	55 (2.3)	73 (3.0)	1.6	1.7
		SGH(A)33□□-30□20	3/4	$\phi 15$	$\phi 12$	90 (3.8)	92 (3.8)	2.6	2.8
		SGH(A)43□□-30□25	1	$\phi 17$	$\phi 15.2$	135 (5.6)	140 (5.8)	4.8	5.4
	7 MPa	SGH(A)13□□-70□10	3/8	$\phi 7.5$	$\phi 6$	26 (1.1)	23 (1.0)	1.6	1.7
		SGH(A)23□□-70□15	1/2	$\phi 10.1$	$\phi 7.6$	45 (1.9)	49 (2.0)	2.6	2.8
		SGH(A)33□□-70□20	3/4	$\phi 12.8$	$\phi 10$	78 (3.3)	65 (2.7)	4.8	5.4
		SGH(A)43□□-70□25	1	$\phi 15.4$	$\phi 11.5$	102 (4.3)	84 (3.5)	6.4	7.0

## Valve Specifications

Fluid	Coolant	
Fluid temperature	-10 to 60°C*	
Ambient temperature	-10 to 50°C*	
Proof pressure	SGH(A)□□□□-30	4.5 MPa
	SGH(A)□□□□-70	10.5 MPa
Leakage from the valve seat	20 cm <sup>3</sup> /min or less (Coolant pressure)	
Operating pressure range	SGH(A)□□□□-30	0 to 3 MPa
	SGH(A)□□□□-70	0 to 7 MPa
Pilot air	Pressure	0.25 to 0.7 MPa
	Lubrication	Not required (Use turbine oil Class 1 (ISO VG32), if lubricated.)
	Temperature	-10 to 50°C*

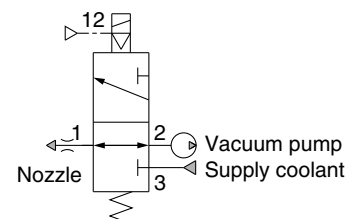
\* No freezing

## JIS Symbol

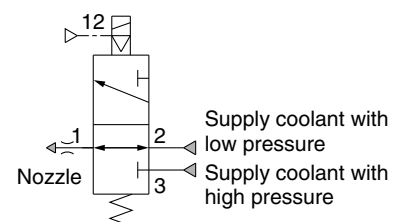
Valve type Type of actuation	2-port		3-port	3-port dual pressure type
	N.C.	N.O.		
Air operated type				
External pilot solenoid type				

## 3-Port Dual Pressure Type

① Application example, N.C. type



② Application example, Selector type



## How to Order Pilot Valve

V116-**5****T****Z**-1

①      ②      ③

### ① Rated voltage

1	100 VAC 50/60 Hz
2	200 VAC 50/60 Hz
3	110 VAC [115 VAC] 50/60 Hz
4	220 VAC [230 VAC] 50/60 Hz
5	24 VDC
6	12 VDC

### ② Electrical entry

<b>T</b>	Conduit terminal
<b>D</b>	DIN terminal (with connector)
<b>DO</b>	DIN terminal (without connector)
<b>W</b>	M12 connector (4-pin type)
<b>V</b>	M12 connector (5-pin type) <small>Note)</small>

Note) Only DC voltage is available.

### ③ Light/surge voltage suppressor

<b>Nil</b>	None
<b>S</b>	With surge voltage suppressor (Non-polar)
<b>Z</b>	With light/surge voltage suppressor (Non-polar)

Note) Refer to the table (1) on pages 1 and 2 for combinations with electrical entry.

\* DOS, DOZ are not available.

\* For AC specifications, Nil is only set for electrical entry DO.

## Pilot Valve Specifications

Pilot valve specifications		V116-□□□-1	
Electrical entry		Conduit terminal, DIN terminal, M12 connector	
Coil rated voltage V	DC	12 V, 24 V	
	AC (50/60 Hz)	100 V, 110 V, 200 V, 220 V	
Allowable voltage range		±10% of rated voltage*	
Power consumption W	DC	0.35 W (With indicator light: 0.58 W)	
	AC	100 V	0.78 W (With indicator light: 0.87)
110 V [115 V]		0.86 (With indicator light: 0.97) [0.94 (With indicator light: 1.07)]	
200 V		1.15 (With indicator light: 1.30)	
220 V [230 V]		1.27 (With indicator light: 1.46) [1.39 (With indicator light: 1.60)]	
Surge voltage suppressor		ZNR (Varistor)	
Indicator light		LED (Neon bulb when AC with DIN terminal and M12 connector)	
Enclosure		IEC60529 standard IP65, JIS C0920	

\* In common between 110 VAC and 115 VAC, and between 220 VAC and 230 VAC.

\* For 115 VAC and 230 VAC, the allowable voltage range is -15% to +5% of rated voltage.

## Bracket Part No.

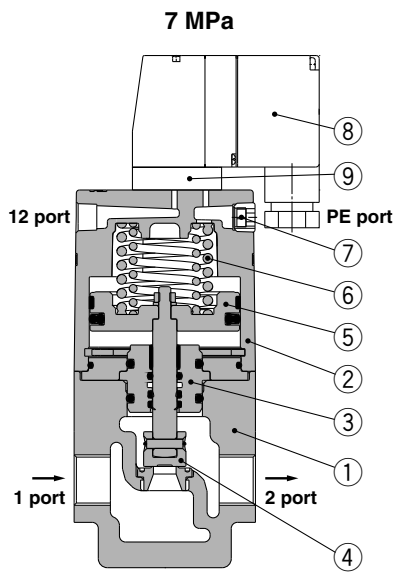
Series	Port	Pressure specifications	Part no.
SGH100	2-port	7 MPa	SGH1-16-1A
	3-port	3 MPa	
		7 MPa	
SGH200	2-port	7 MPa	SGH2-16-1A
	3-port	3 MPa	SGH1-16-1A
		7 MPa	SGH2-16-1A
		7 MPa	SGH3-16-1A
SGH300	2-port	7 MPa	SGH3-16-1A
	3-port	3 MPa	SGH2-16-1A
		7 MPa	SGH3-16-1A
SGH400	2-port	7 MPa	SGH4-16-1A
	3-port	3 MPa	SGH3-16-1A
		7 MPa	SGH4-16-1A

## Filter Part No.

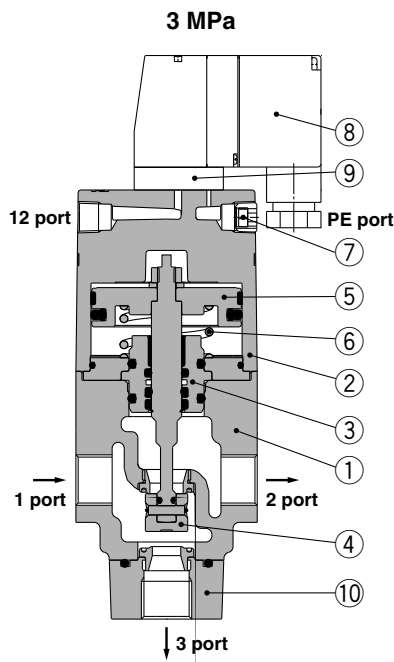
Series	Pressure specifications	Thread type	
		Nil/G	N/T
SGH100	3 MPa	EBKX-W4005	EBKY-D8006
	7 MPa		
SGH200	3 MPa		
	7 MPa		
SGH300	3 MPa	EBKX-Z2003	EBKY-D8007
	7 MPa		
SGH400	3 MPa		
	7 MPa		

## Construction

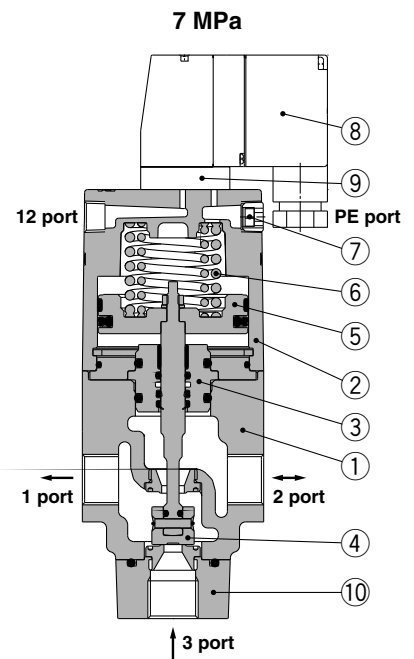
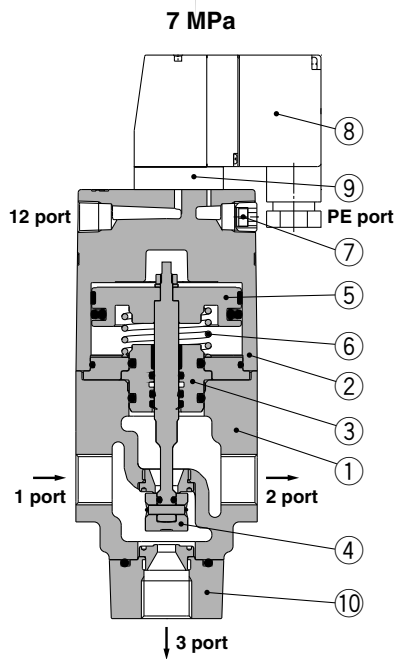
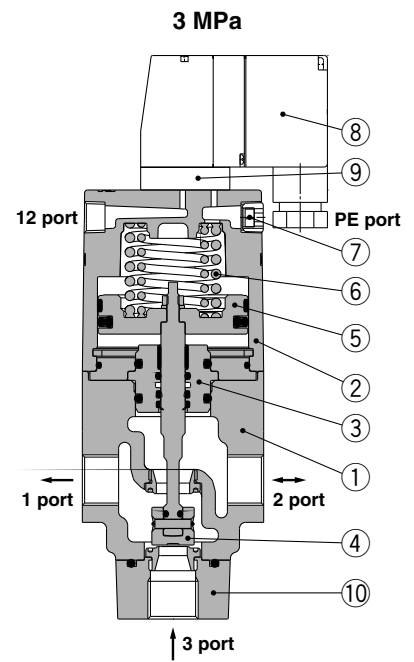
### 2-port valve (N.C.)



### 3-port valve



### 3-port valve (Dual pressure type)



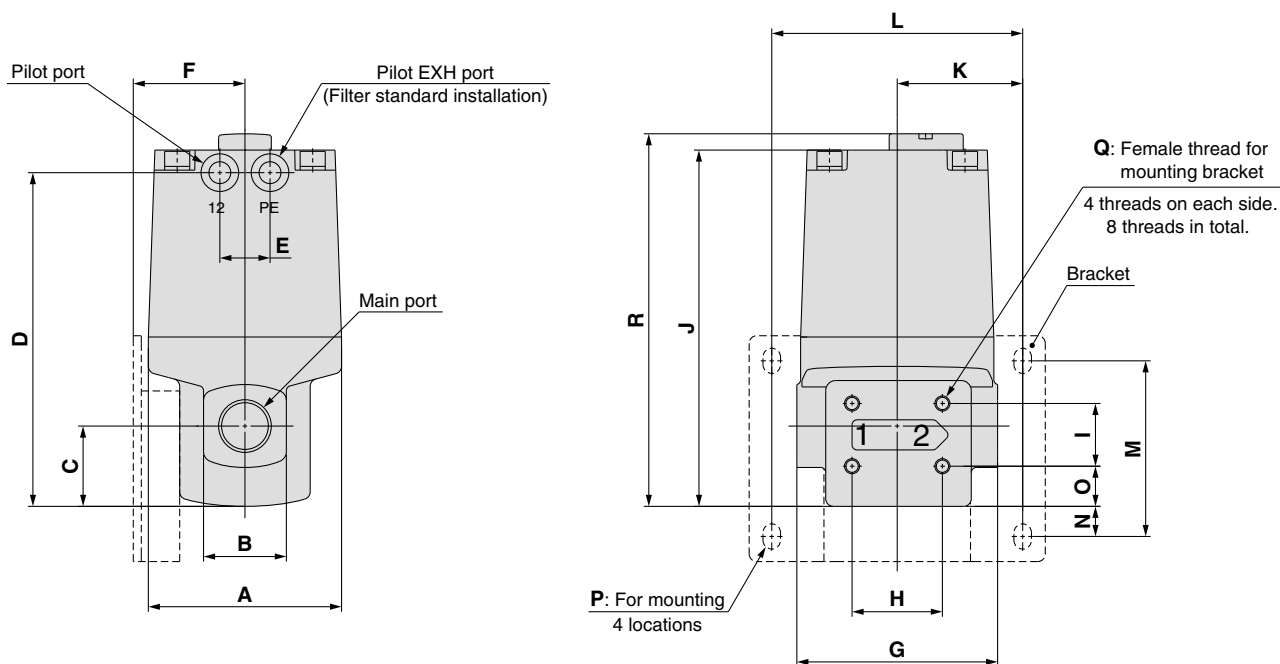
### Component Parts

No.	Description	Material	Note
1	Body assembly	Cast iron	Plated
2	Cover	Aluminum die-casted	White
3	Plate assembly	Iron	Valve component, NBR, FKM
4	Valve body	Stainless steel	—
5	Piston assembly	Stainless steel, Aluminum	—
6	Return spring	Stainless steel	—
7	Filter	BC	Replaceable part (Refer to page 4.)
8	Pilot solenoid valve	—	Replaceable part (Refer to page 4.)
9	Adapter plate assembly	—	—
10	Undercover assembly	Cast iron	Plated, only for 3-port valve
—	Bracket	Iron	Replaceable part (Refer to page 4.)

# Series SGH

## Dimensions: 2-Port, 7 MPa

Air operated type

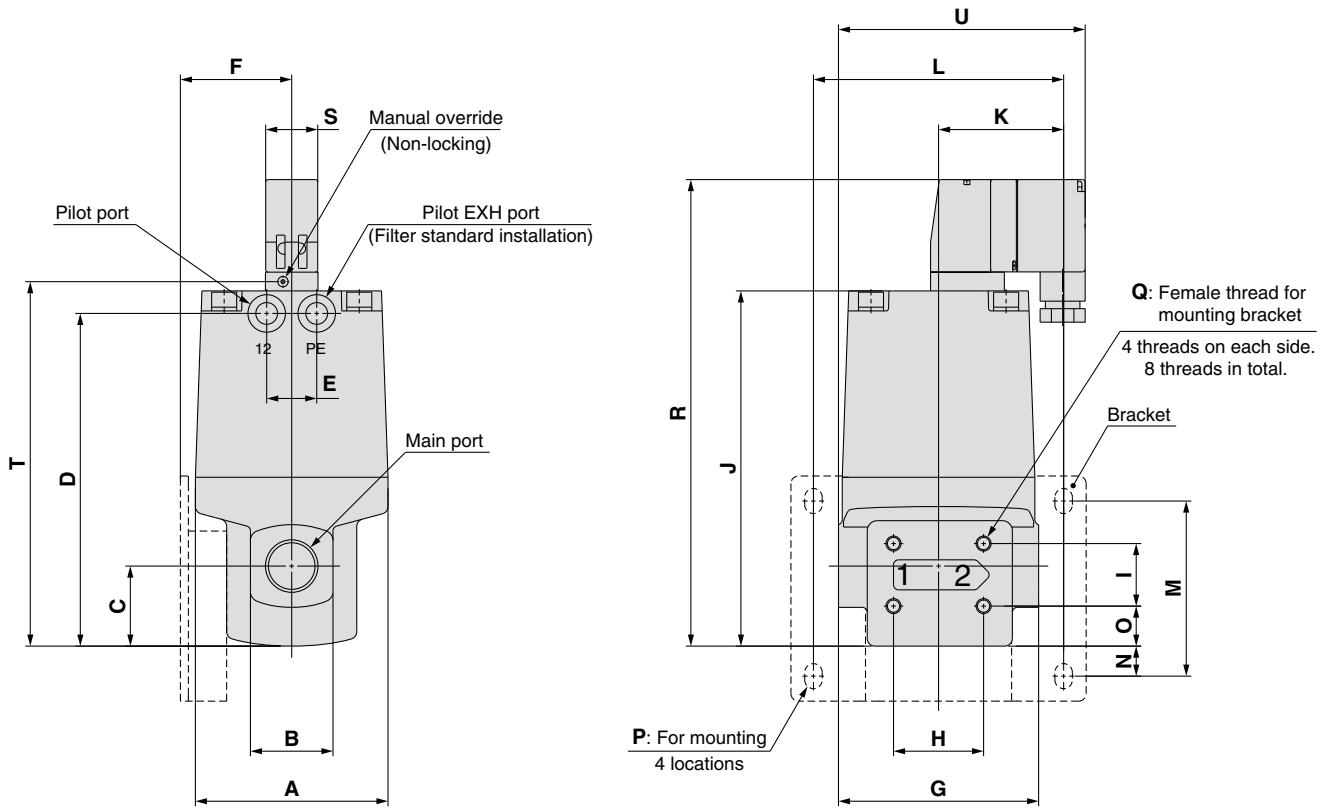


### Air Operated Type

Model	Main port	Pilot port	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
SGHA12□-7010	2 x 3/8	1/8	60	28	29	116	—	34	60	24	29	125	37.5	75	62	10.5	16
SGHA22□-7015	2 x 1/2	1/8	77	33	32	133	20	44.5	80	36	25	142	50	100	70	12	16
SGHA321-7020	2 x 3/4	1/4	96	43	39	157	24	60.5	100	49	34	169	63	126	92	20.5	19
SGHA322-7020	2 x 3/4	1/4	96	43	39	142	24	60.5	100	49	34	154	63	126	92	20.5	19
SGHA421-7025	2 x 1	1/4	113	48	43	173	24	66.5	115	56	38	185	70.5	141	109	31.3	19
SGHA422-7025	2 x 1	1/4	113	48	43	149	24	66.5	115	56	38	161	70.5	141	109	31.3	19

Model	P	Q	R
SGHA12□-7010	For M5	M5	131.5
SGHA22□-7015	For M6	M6	148.5
SGHA321-7020	For M8	M8	175.5
SGHA322-7020	For M8	M8	160.5
SGHA421-7025	For M8	M8	191.5
SGHA422-7025	For M8	M8	167.5

## External pilot solenoid type



\* Drawing indicates conduit terminal type.

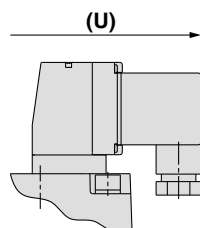
### External Pilot Solenoid Type (Conduit terminal)

Model	Main port	Pilot port	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
SGH12□-7010	2 x 3/8	1/8	60	28	29	116	—	34	60	24	29	125	37.5	75	62	10.5	16
SGH22□-7015	2 x 1/2	1/8	77	33	32	133	20	44.5	80	36	25	142	50	100	70	12	16
SGH321-7020	2 x 3/4	1/4	96	43	39	157	24	60.5	100	49	34	169	63	126	92	20.5	19
SGH322-7020	2 x 3/4	1/4	96	43	39	142	24	60.5	100	49	34	154	63	126	92	20.5	19
SGH421-7025	2 x 1	1/4	113	48	43	173	24	66.5	115	56	38	185	70.5	141	109	31.3	19
SGH422-7025	2 x 1	1/4	113	48	43	149	24	66.5	115	56	38	161	70.5	141	109	31.3	19

Model	P	Q	R	S	T	U
SGH12□-7010	For M5	M5	169.5	20.8	128.7	81.1
SGH22□-7015	For M6	M6	186.5	20.8	145.7	98.6
SGH321-7020	For M8	M8	213.5	20.8	172.7	117.6
SGH322-7020	For M8	M8	198.5	20.8	157.7	117.6
SGH421-7025	For M8	M8	229.5	20.8	188.7	133.6
SGH422-7025	For M8	M8	205.5	20.8	164.7	133.6

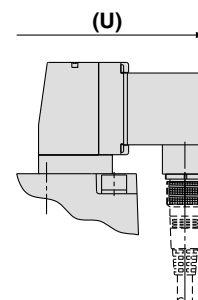
### External Pilot Solenoid Type (DIN terminal)

Model	U
SGH12□-7010	86.8
SGH22□-7015	104.3
SGH321-7020	123.3
SGH322-7020	123.3
SGH421-7025	139.3
SGH422-7025	139.3



### External Pilot Solenoid Type (M12 connector)

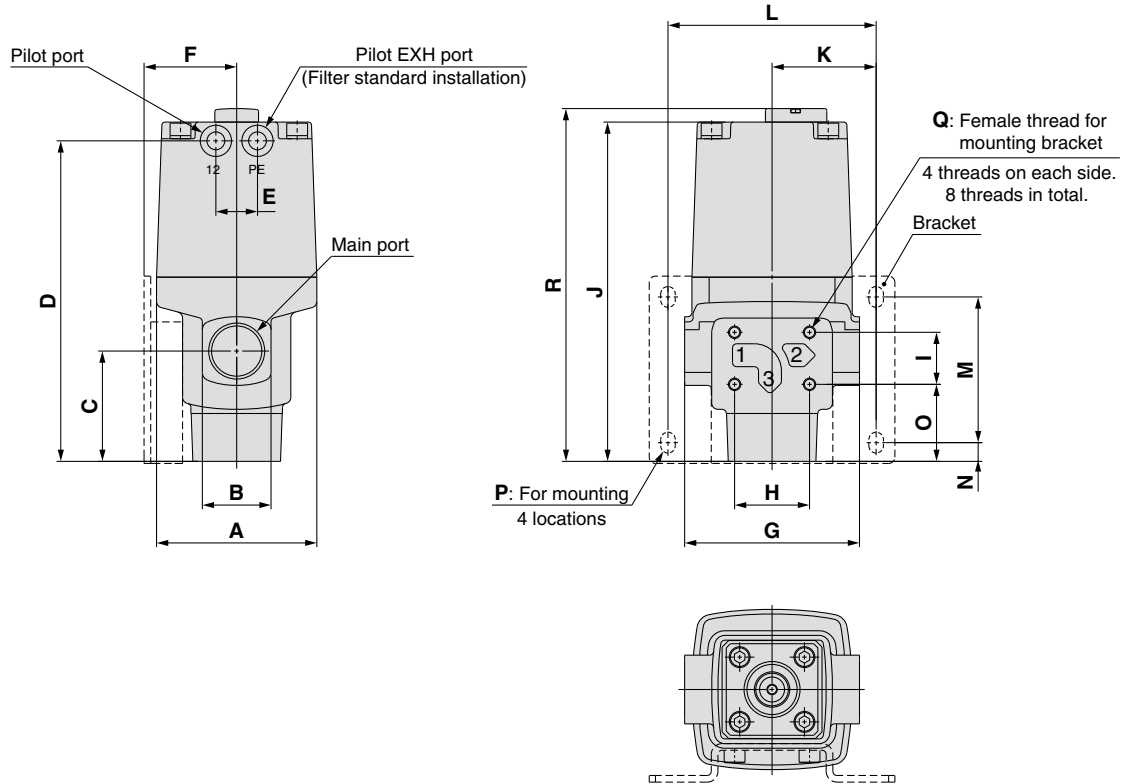
Model	U
SGH12□-7010	86.8
SGH22□-7015	104.3
SGH321-7020	123.3
SGH322-7020	123.3
SGH421-7025	139.3
SGH422-7025	139.3



# Series SGH

## Dimensions: 3-Port, 3 MPa/7 MPa

Air operated type

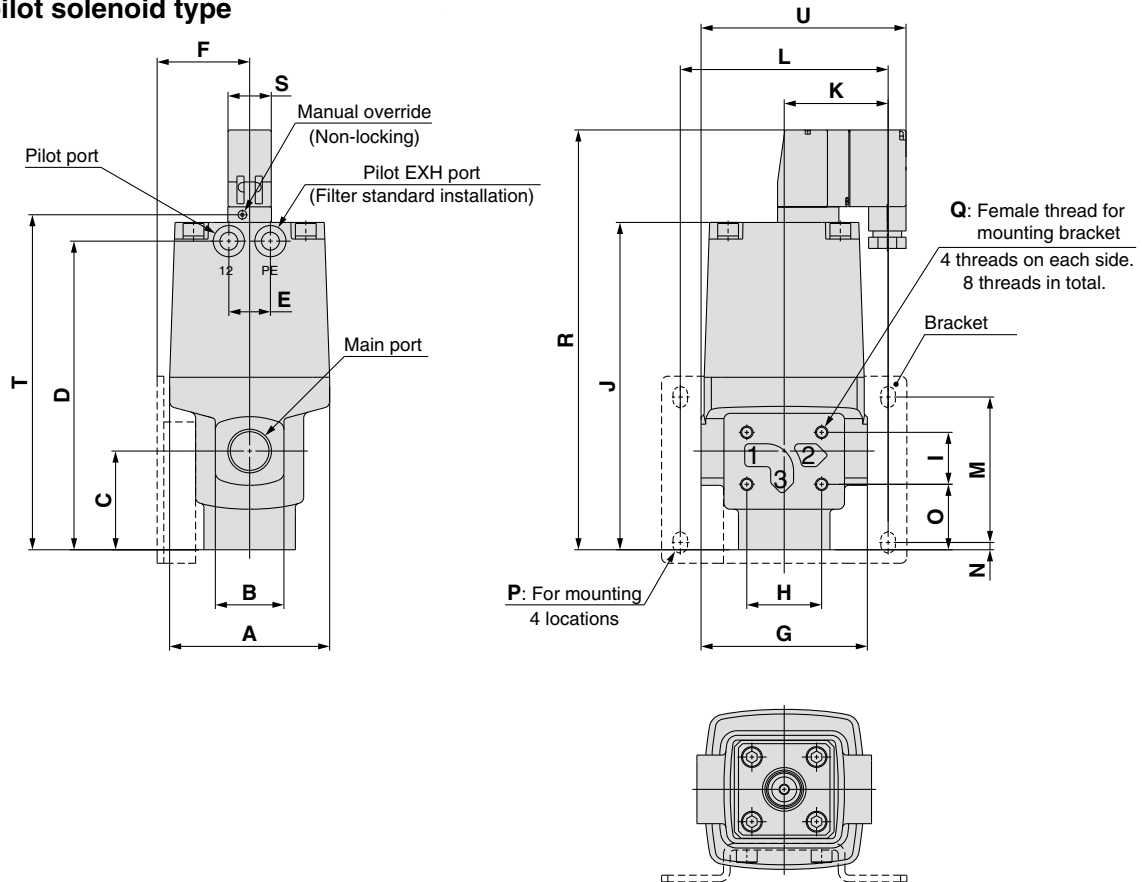


### Air Operated Type

Model	Main port	Pilot port	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
SGHA130-□□10	3 x 3/8	1/8	60	28	46	133	—	34	60	24	29	142	37.5	75	62	6.5	33
SGHA230-3015	3 x 1/2	1/8	60	28	48	135	—	34	65	24	29	144	37.5	75	62	8.5	35
SGHA230-7015	3 x 1/2	1/8	77	33	49	150	20	44.5	80	36	25	159	50	100	70	5	33
SGHA330-3020	3 x 3/4	1/8	77	33	53	154	20	44.5	84	36	25	163	50	100	70	9	37
SGHA330-7020	3 x 3/4	1/4	96	43	60	163	24	60.5	100	49	34	175	63	126	92	0.5	40
SGHA430-3025	3 x 1	1/4	96	43	64.5	167.5	24	60.5	104	49	34	179.5	63	126	92	5	44.5
SGHA430-7025	3 x 1	1/4	113	48	65.5	171.5	24	66.5	115	56	38	183.5	70.5	141	109	—	41.5

Model	P	Q	R
SGHA130-□□10	For M5	M5	148.5
SGHA230-3015	For M5	M5	150.5
SGHA230-7015	For M6	M6	165.5
SGHA330-3020	For M6	M6	169.5
SGHA330-7020	For M8	M8	181.5
SGHA430-3025	For M8	M8	186
SGHA430-7025	For M8	M8	190

## External pilot solenoid type



\* Drawing indicates conduit terminal type.

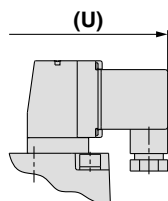
### External Pilot Solenoid Type (Conduit terminal)

Model	Main port	Pilot port	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
SGH130-□□10	3 x 3/8	1/8	60	28	46	133	—	34	60	24	29	142	37.5	75	62	6.5	33
SGH230-3015	3 x 1/2	1/8	60	28	48	135	—	34	65	24	29	144	37.5	75	62	8.5	35
SGH230-7015	3 x 1/2	1/8	77	33	49	150	20	44.5	80	36	25	159	50	100	70	5	33
SGH330-3020	3 x 3/4	1/8	77	33	53	154	20	44.5	84	36	25	163	50	100	70	9	37
SGH330-7020	3 x 3/4	1/4	96	43	60	163	24	60.5	100	49	34	175	63	126	92	0.5	40
SGH430-3025	3 x 1	1/4	96	43	64.5	167.5	24	60.5	104	49	34	179.5	63	126	92	5	44.5
SGH430-7025	3 x 1	1/4	113	48	65.5	171.5	24	66.5	115	56	38	183.5	70.5	141	109	—	41.5

Model	P	Q	R	S	T	U
SGH130-□□10	For M5	M5	186.5	20.8	145.7	81.1
SGH230-3015	For M5	M5	188.5	20.8	147.7	83.6
SGH230-7015	For M6	M6	203.5	20.8	162.7	98.6
SGH330-3020	For M6	M6	207.5	20.8	166.7	100.6
SGH330-7020	For M8	M8	219.5	20.8	178.7	117.6
SGH430-3025	For M8	M8	224	20.8	183.2	119.6
SGH430-7025	For M8	M8	228	20.8	187.2	133.6

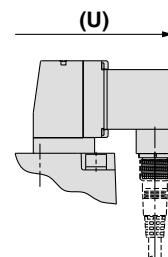
### External Pilot Solenoid Type (DIN terminal)

Model	U
SGH130-□□10	86.8
SGH230-3015	89.3
SGH230-7015	104.3
SGH330-3020	106.3
SGH330-7020	123.3
SGH430-3025	125.3
SGH430-7025	139.3



### External Pilot Solenoid Type (M12 connector)

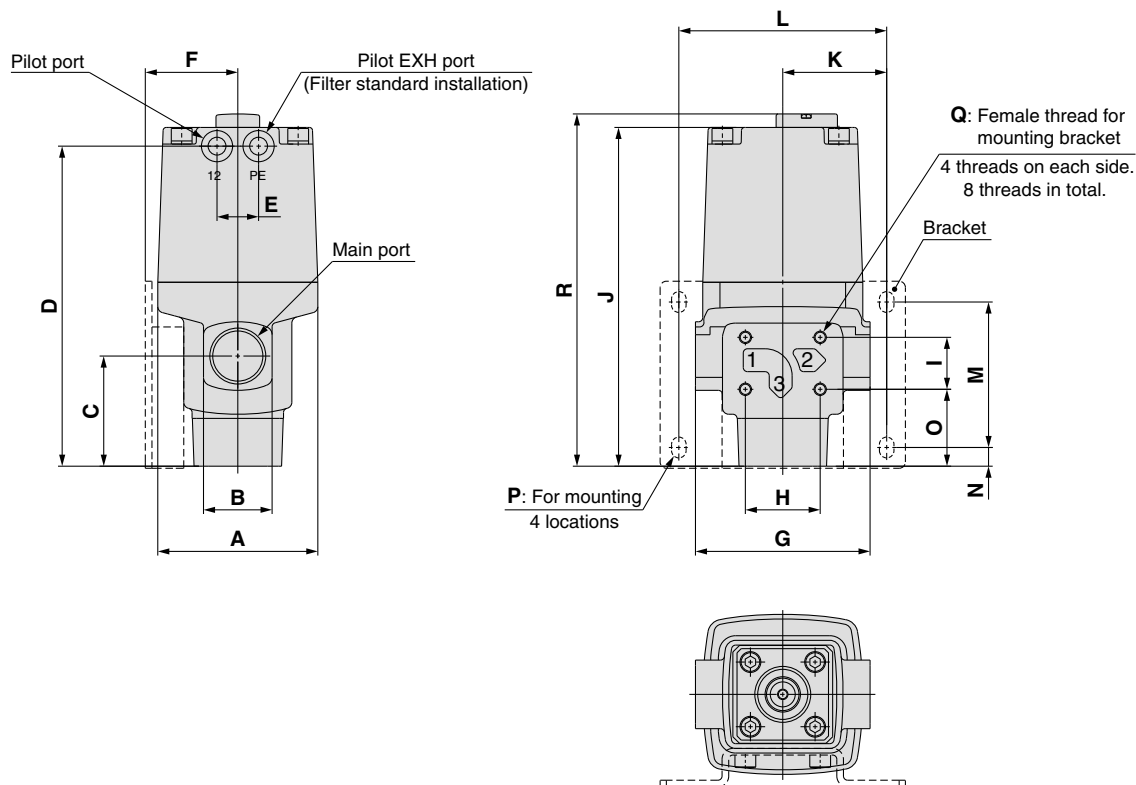
Model	U
SGH130-□□10	86.8
SGH230-3015	89.3
SGH230-7015	104.3
SGH330-3020	106.3
SGH330-7020	123.3
SGH430-3025	125.3
SGH430-7025	139.3



# Series SGH

## Dimensions: 3-Port, 3 MPa/7 MPa, Dual Pressure Type

Air operated type

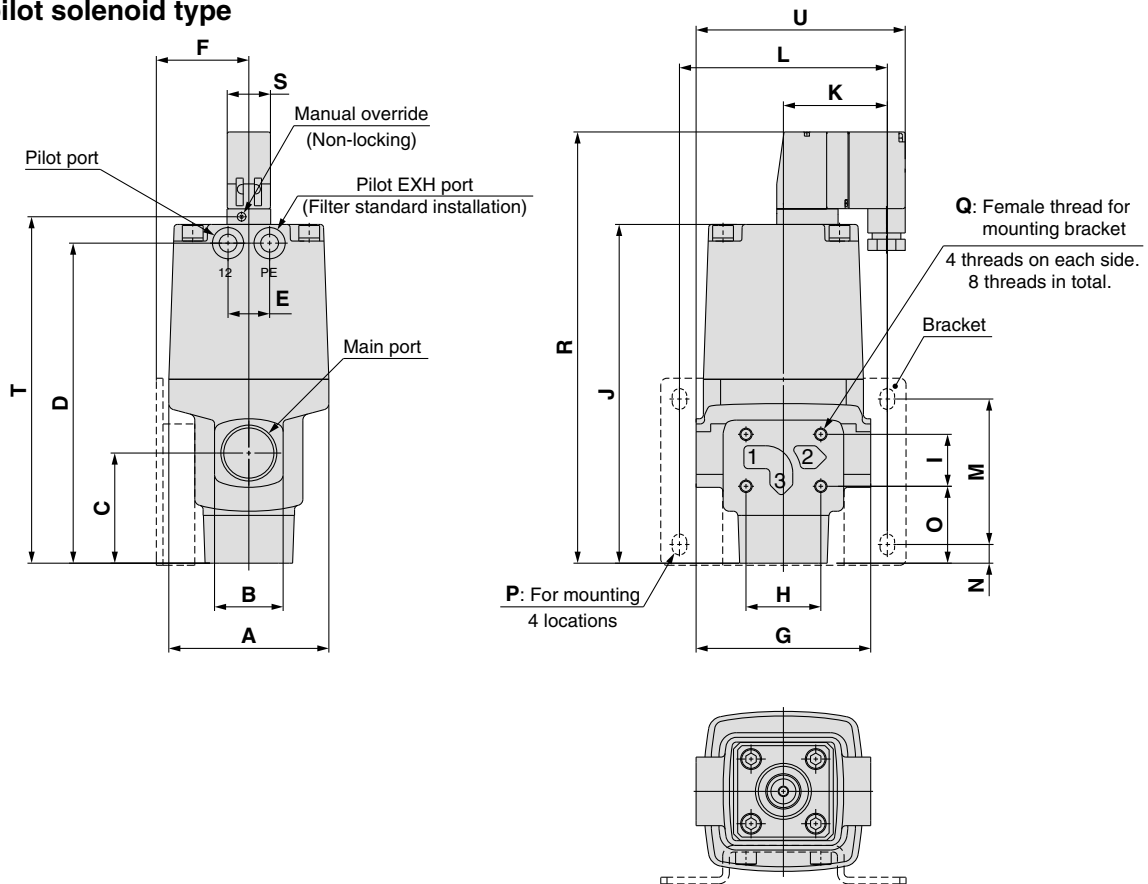


### Air Operated Type

Model	Main port	Pilot port	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
SGHA133-□□10	3 x 3/8	1/8	60	28	46	133	—	34	60	24	29	142	37.5	75	62	6.5	33
SGHA233-3015	3 x 1/2	1/8	60	28	48	135	—	34	65	24	29	144	37.5	75	62	8.5	35
SGHA233-7015	3 x 1/2	1/8	77	33	49	150	20	44.5	80	36	25	159	50	100	70	5	33
SGHA333-3020	3 x 3/4	1/8	77	33	53	154	20	44.5	84	36	25	163	50	100	70	9	37
SGHA333-7020	3 x 3/4	1/4	96	43	60	178	24	60.5	100	49	34	190	63	126	92	0.5	40
SGHA433-3025	3 x 1	1/4	96	43	64.5	182.5	24	60.5	104	49	34	194.5	63	126	92	5	44.5
SGHA433-7025	3 x 1	1/4	113	48	65.5	195.5	24	66.5	115	56	38	207.5	70.5	141	109	—	41.5

Model	P	Q	R
SGHA133-□□10	For M5	M5	148.5
SGHA233-3015	For M5	M5	150.5
SGHA233-7015	For M6	M6	165.5
SGHA333-3020	For M6	M6	169.5
SGHA333-7020	For M8	M8	196.5
SGHA433-3025	For M8	M8	201
SGHA433-7025	For M8	M8	214

## External pilot solenoid type



\* Drawing indicates conduit terminal type.

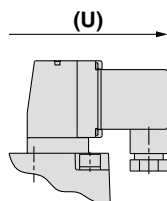
### External Pilot Solenoid Type (Conduit terminal)

Model	Main port	Pilot port	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
SGH133-□□10	3 x 3/8	1/8	60	28	46	133	—	34	60	24	29	142	37.5	75	62	6.5	33
SGH233-3015	3 x 1/2	1/8	60	28	48	135	—	34	65	24	29	144	37.5	75	62	8.5	35
SGH233-7015	3 x 1/2	1/8	77	33	49	150	20	44.5	80	36	25	159	50	100	70	5	33
SGH333-3020	3 x 3/4	1/8	77	33	53	154	20	44.5	84	36	25	163	50	100	70	9	37
SGH333-7020	3 x 3/4	1/4	96	43	60	178	24	60.5	100	49	34	190	63	126	92	0.5	40
SGH433-3025	3 x 1	1/4	96	43	64.5	182.5	24	60.5	104	49	34	194.5	63	126	92	5	44.5
SGH433-7025	3 x 1	1/4	113	48	65.5	195.5	24	66.5	115	56	38	207.5	70.5	141	109	—	41.5

Model	P	Q	R	S	T	U
SGH133-□□10	For M5	M5	186.5	20.8	145.7	81.1
SGH233-3015	For M5	M5	188.5	20.8	147.7	83.6
SGH233-7015	For M6	M6	203.5	20.8	162.7	98.6
SGH333-3020	For M6	M6	207.5	20.8	166.7	100.6
SGH333-7020	For M8	M8	234.5	20.8	193.7	117.6
SGH433-3025	For M8	M8	239	20.8	198.2	119.6
SGH433-7025	For M8	M8	252	20.8	211.2	133.6

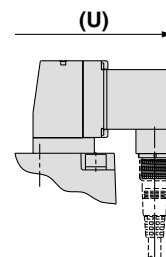
### External Pilot Solenoid Type DIN terminal (DIN terminal)

Model	U
SGH133-□□10	86.8
SGH233-3015	89.3
SGH233-7015	104.3
SGH333-3020	106.3
SGH333-7020	123.3
SGH433-3025	125.3
SGH433-7025	139.3



### External Pilot Solenoid Type M12 connector (M12 connector)

Model	U
SGH133-□□10	86.8
SGH233-3015	89.3
SGH233-7015	104.3
SGH333-3020	106.3
SGH333-7020	123.3
SGH433-3025	125.3
SGH433-7025	139.3



# Series SGH

## Options

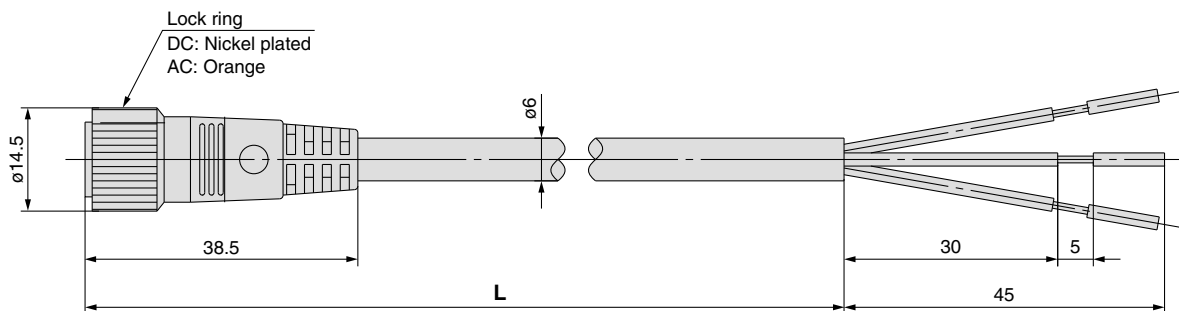
Cable for M12 connector (Female connector with cable)

V100-200-**1**-**4**

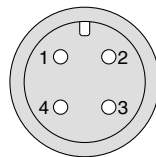
Specifications		
4-pin type	1	DC
	2	AC
5-pin type	3	DC

\* When selecting the 5-pin type, only DC voltage is available.

Cable length (L)	
4	1000 [mm]
8	3000 [mm]
9	5000 [mm]

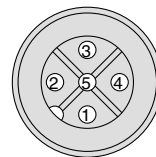


■ 4-pin type

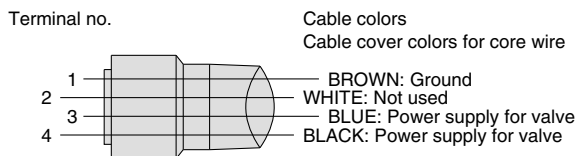


Socket pin connector  
pin arrangement

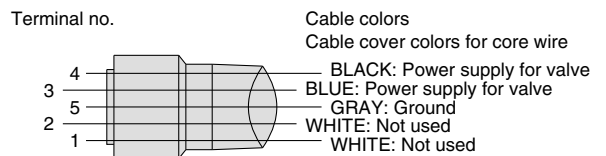
■ 5-pin type



Socket pin connector  
pin arrangement



Connections



Connections

## How to Order

Include the part number of the female connector with cable together with the part number for the solenoid valve.  
Example) In case of lead wire length, 1000 mm

### ■ W: M12 connector (4-pin type)

- DC
  - SGH221A-7015Y-5WZ
  - V100-200-1-4
- AC
  - SGH221A-7015Y-1WZ
  - V100-200-2-4

### ■ V: M12 connector (5-pin type)

- SGH221A-7015Y-5VZ
- V100-200-3-4

\* When selecting the 5-pin type, only DC voltage is available.

Made to Order

# Common for 2-Port and 3-Port

Connector entry direction **SGH** **1**<sup>2</sup>**3** **1** **A** - **70** **G** **10** **Y** - **1** **T** **Z** **□** - **B1** - **□**

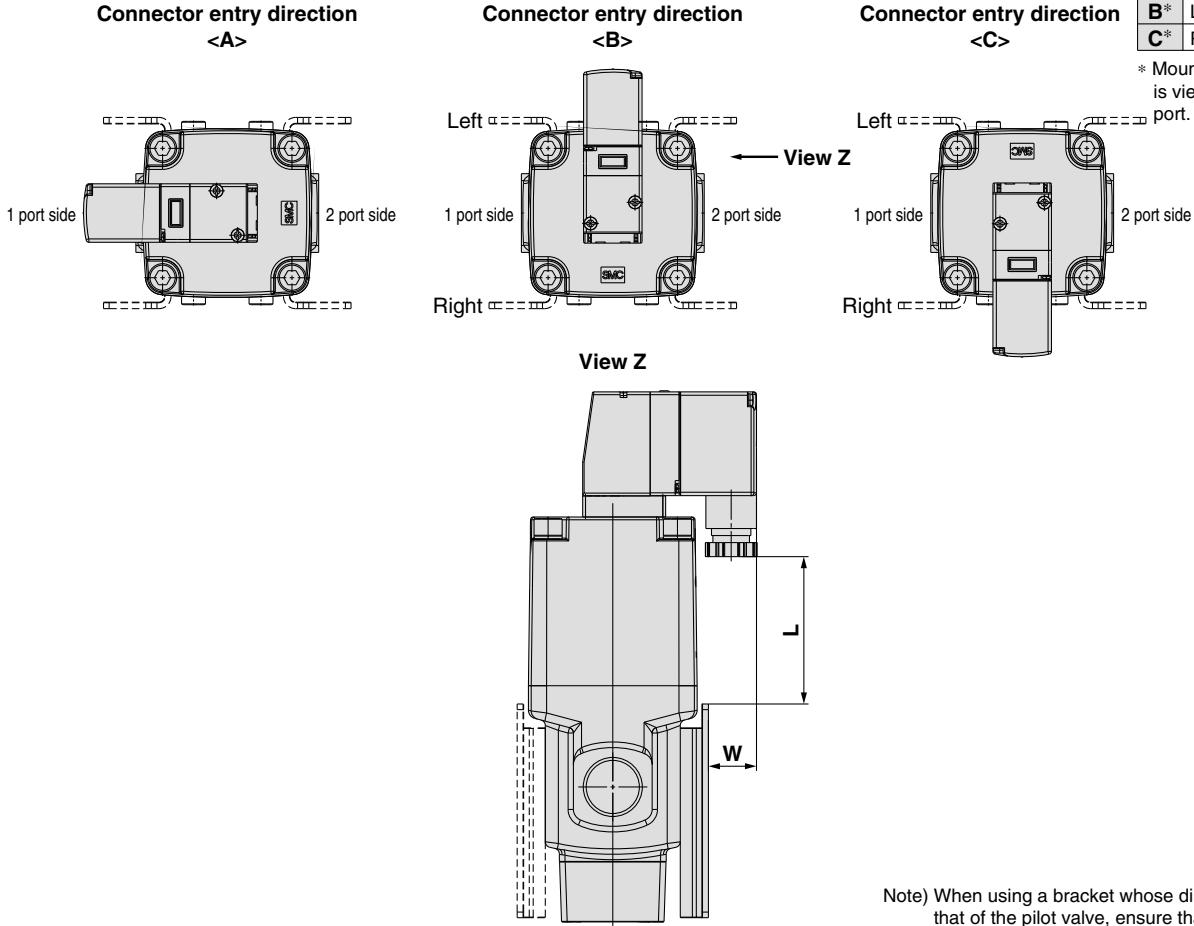
①      ②      ③      ④      ⑤      ⑥      ⑦      ⑧      ⑨      ⑩      ⑪      ⑫

① to ⑫ are the same as standard. Refer to page 1 and page 2.

Connector entry direction <sup>Note)</sup>

<b>A</b>	1 port side
<b>B*</b>	Left side mounting
<b>C*</b>	Right side mounting

\* Mounting direction (R or L) is viewed from the inlet (1) port.



Note) When using a bracket whose direction is the same as that of the pilot valve, ensure that the installation surface does not get in the way of the pilot valve.




Series	Product specifications			T: Conduit terminal		D/DO: DIN terminal		W/V: M12 connector	
				L	W	L	W	L	W
SGH100	2-port	7 MPa	N.C. N.O.	52	17	56	22	54	22
	3-port	3 MPa 7 MPa							
	3-port dual pressure type	3 MPa 7 MPa							
SGH200	2-port	7 MPa	N.C. N.O.	59	14	63	19	61	19
	3-port	3 MPa		52	17	56	22	54	22
		7 MPa		59	14	63	19	61	19
	3-port dual pressure type	3 MPa		52	17	56	22	54	22
		7 MPa		59	14	63	19	61	19
SGH300	2-port	7 MPa	N.C. N.O.	71	7	75	12	73	12
	3-port	3 MPa		59	14	63	19	61	19
		7 MPa		56	7	60	12	58	12
	3-port dual pressure type	3 MPa		59	14	63	19	61	19
		7 MPa		71	7	75	12	73	12
	SGH400	2-port	7 MPa	N.C. N.O.	79	9	83	15	81
3-port		3 MPa		56	7	60	12	58	12
		7 MPa							
3-port dual pressure type		3 MPa		55	9	59	15	57	15
		7 MPa		79	9	83	15	81	15



# Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution,**” “**Warning**” or “**Danger.**” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)\*1), and other safety regulations.

- \*1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
- ISO 4413: Hydraulic fluid power – General rules relating to systems.
- IEC 60204-1: Safety of machinery – Electrical equipment of machines. (Part 1: General requirements)
- ISO 10218-1: Manipulating industrial robots - Safety.
- etc.

-  **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger :** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

## Warning

### **1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**

Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

### **2. Only personnel with appropriate training should operate machinery and equipment.**

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

### **3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

### **4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.



# Safety Instructions

## Caution

### 1. The product is provided for use in manufacturing industries.

The product herein described is basically provided for peaceful use in manufacturing industries.

If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.

If anything is unclear, contact your nearest sales branch.

## Limited warranty and Disclaimer/Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”. Read and accept them before using the product.

### Limited warranty and Disclaimer

#### 1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.\*2)

Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.

#### 2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.

This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.

#### 3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

##### \*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.

Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

### Compliance Requirements

#### 1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.

#### 2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.



# Series SGH

## Specific Product Precautions 1

Be sure to read before handling.

Refer to back pages 1 and 2 for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 2 Port Solenoid Valves for Fluid Control Precautions.

### Design

#### Warning

1. Cannot be used as an emergency shutdown valve, etc.

The valves presented in this catalog are not designed for safety applications such as an emergency shutdown valve. If the valves are used in this type of system, other reliable safety assurance measures should also be adopted.

2. Extended periods of continuous energization

If a valve is continuously energized for long periods of time, heat generation of the coil may result in reduced performance and shorter service life. This may also have an adverse effect on the peripheral equipment in proximity. Should a valve be continuously energized for long periods of time, or its daily energized state exceeds its non-energized state, please use a valve with DC specifications. Additionally, when using with AC, energizing for long periods of time continuously, select the air-operated valve and use the continuous duty type of the VT307 for a pilot valve.

3. This solenoid valve cannot be used for explosion proof applications.

4. Liquid seals

In cases with a flowing liquid, provide a by-pass valve in the system to prevent the liquid from entering the liquid seal circuit.

5. Operation at low temperature

- The valve can be used in an ambient temperature up to  $-10^{\circ}\text{C}$ . However, take measures to prevent freezing or solidification of impurities, etc.
- When using valves for water application in cold climates, take appropriate countermeasures to prevent the water from freezing in tubing after cutting the water supply from the pump, by draining the water, etc. When warming by a heater, etc., be careful not to expose the coil portion to a heater. Installation of a dryer, heat retaining of the body is recommended to prevent a freezing condition in which the dew point temperature is high and the ambient temperature is low, and the high flow runs.

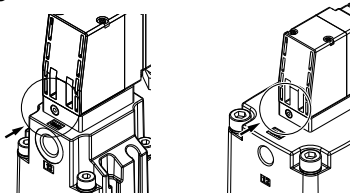
### Manual Override

#### Warning

Since connected equipment will be actuated when the manual override is operated, first confirm that conditions are safe.

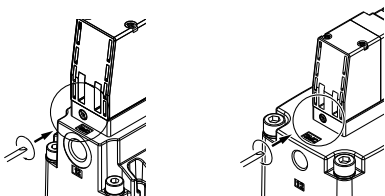
- Non-locking push type

Press in the direction of the arrow.



- Push-turn locking slotted type [D type]

While pressing, turn in the direction of the arrow ( $90^{\circ}$  clockwise). If it is not turned, it can be operated the same way as the non-locking type.



### Manual Override

#### Caution

When operating the push-turn locking slotted type (D) with a screwdriver, turn it gently using a flat head watchmaker's screwdriver. [Torque: Less than  $0.1\text{ N}\cdot\text{m}$ ]

When locking the manual override on the push-turn locking slotted type (D), be sure to push it down before turning. Turning without first pushing it down can cause damage to the manual override and trouble such as air leakage, etc.

### Mounting

#### Warning

1. Do not apply external force to the coil section.

When tightening is performed, apply a wrench or other tool to the outside of the piping connection parts.

2. Do not warm the coil assembly with a heat insulator, etc.

Use tape, heaters, etc., for freeze prevention on the piping and body only. They can cause the coil to burn out.

3. Secure with brackets, except in the case of steel piping and copper fittings.

4. Avoid sources of vibration, or adjust the arm from the body to the minimum length so that resonance will not occur.

5. Avoid mounting the valve vertically facing downwards, otherwise, foreign matter in the coolant will accumulate in the plate assembly which may shorten the product's life.

### Wiring

#### Caution

1. Applied voltage

When electric power is connected to a solenoid valve, be careful to apply the proper voltage. Improper voltage may cause malfunction or coil damage.

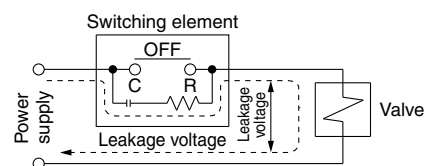
2. Confirm the connections.

After completing the wiring, confirm that the connections are correct.

### Leakage Voltage

#### Caution

Take note that the leakage voltage will increase when a resistor is used in parallel with switching element or a C-R element (surge voltage suppressor) is used for protecting a switching device because of the passing leakage voltage through the C-R element. The suppressor residual leakage voltage should be as follows.



DC coil

3% or less of the rated voltage

AC coil

8% or less of the rated voltage



# Series SGH Specific Product Precautions 2

Be sure to read before handling.

Refer to back pages 1 and 2 for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 2 Port Solenoid Valves for Fluid Control Precautions.

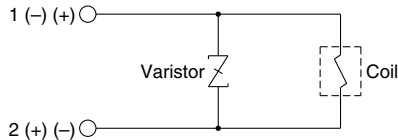
## Light/Surge Voltage Suppressor

### ⚠ Caution

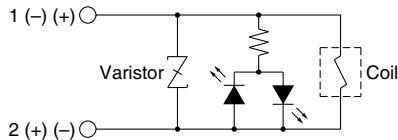
<DC>

Conduit terminal (Non-polar)

Surge voltage suppressor (TS)

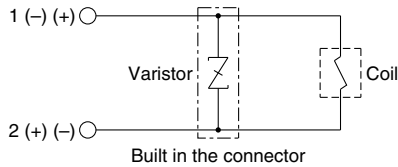


Light/surge voltage suppressor (TZ)

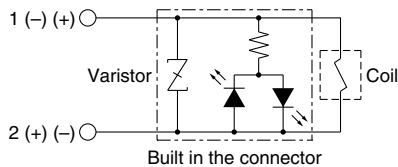


DIN terminal (Non-polar)

Surge voltage suppressor (DS)

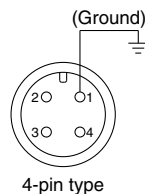
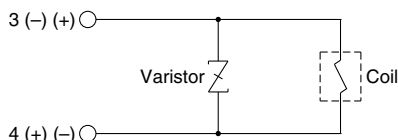


Light/surge voltage suppressor (DZ)

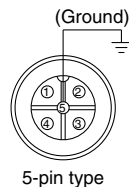
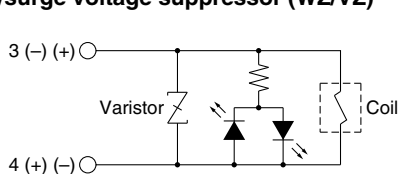


M12 connector (Non-polar)

Surge voltage suppressor (WS/VS)



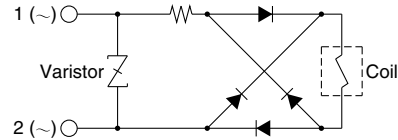
Light/surge voltage suppressor (WZ/VZ)



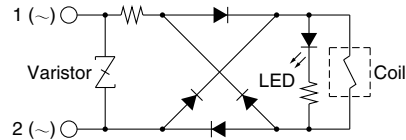
<AC>

Conduit terminal

Surge voltage suppressor (TS)

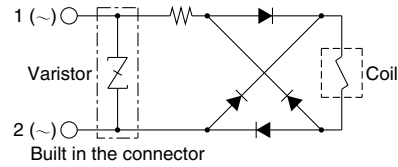


Light/surge voltage suppressor (TZ)

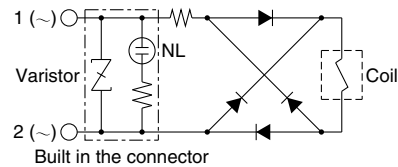


DIN terminal

Surge voltage suppressor (DS)

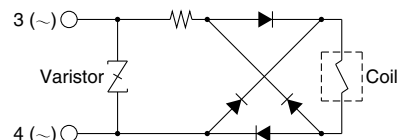


Light/surge voltage suppressor (DZ)

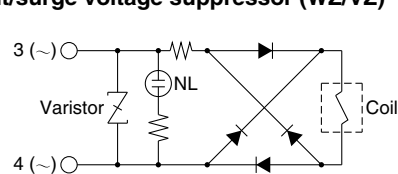


M12 connector

Surge voltage suppressor (WS/VS)



Light/surge voltage suppressor (WZ/VZ)





## Series SGH

# Specific Product Precautions 3

Be sure to read before handling.

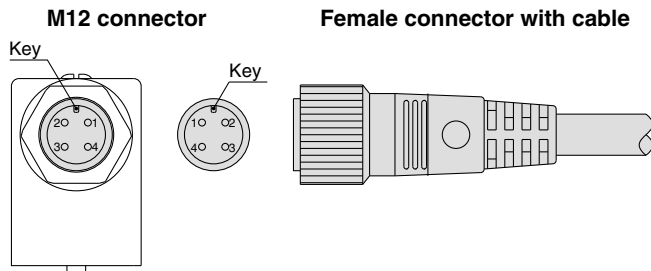
Refer to back pages 1 and 2 for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 2 Port Solenoid Valves for Fluid Control Precautions.

### M12 Connector

#### ⚠ Caution

1. M12 connector types have an IP65 (enclosure) rating, offering protection from dust and water. However, please note: these products are not intended for use in water.
2. Do not use a tool to mount the connector, as this may cause damage. Only tighten by hand. (0.4 to 0.6 N·m)
3. The excessive stress on the cable connector will not be able to satisfy the IP65 rating. Please use caution and do not apply a stress of 30 N or greater.

Take note that if a connector other than the one stated above is used or if the connector is not tight enough, the IP65 rating will not be satisfied.



Note) For connecting a female connector with cable, adjust the connector key to the M12 connector key in the valve side since there is an orientation. Be careful not to squeeze it in the wrong direction, as problems such as pin damage may occur.

### How to Use Conduit Terminal

#### ⚠ Caution

##### Connection procedure

1. Loosen the holding screw and remove the cover from the terminal block.
2. Loosen the terminal screw in the terminal block. Insert the lead core wires or crimped terminals to the terminals, and secure the wires by re-tightening the terminal screw.
3. Secure the cord by fastening the ground nut.

When making connections, take note that using other than the supported size ( $\phi 4.5$  to  $\phi 7$ ) heavy-duty cord will not satisfy IP65 (enclosure) standards. Also, be sure to tighten the ground nut and holding screw within their specified torque ranges.

##### Compatible cable

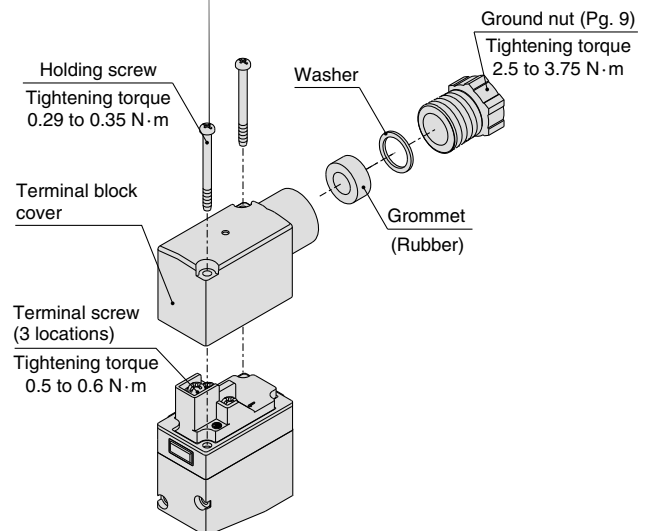
Cord O.D.:  $\phi 4.5$  to  $\phi 7$

(Reference) 0.5 to 1.5 mm<sup>2</sup>, 2-core or 3-core, equivalent to JIS C 3306

##### Applicable crimped terminals

O-terminals: Equivalent to R1.25-3 defined in the JIS C2805

Y-terminals: Equivalent to 1.25-3 manufactured by J.S.T. Mfg. Co., Ltd.





# Series SGH

## Specific Product Precautions 4

Be sure to read before handling.

Refer to back pages 1 and 2 for Safety Instructions, "Handling Precautions for SMC Products" (M-E03-3) for 2 Port Solenoid Valves for Fluid Control Precautions.

### How to Use DIN Terminal

#### Caution

##### Connection procedure

1. Loosen the holding screw and pull the connector out of the solenoid valve terminal block.
2. After removing the holding screw, insert a flat head screwdriver, etc. into the notch on the bottom of the terminal block and pry it open, separating the terminal block and the housing.
3. Loosen the terminal screw (slotted screws) in the terminal block. Insert the lead core wires or crimped terminals to the terminals according to the connection method, and secure the wires by re-tightening the terminal screw.
4. Secure the cord by fastening the ground nut.

When making connections, take note that using other than the supported size ( $\phi 4.5$  to  $\phi 7$ ) heavy-duty cord will not satisfy IP65 (enclosure) standards. Also, be sure to tighten the ground nut and holding screw within their specified torque ranges.

##### Changing the entry direction

After separating the terminal block and housing, the cord entry can be changed by attaching the housing in the opposite direction 180°.

\* Be careful not to damage the element, etc. with the cord's lead wires.

Plug in and pull out the connector vertically without tilting to one side.

##### Compatible cable

Cord O.D.:  $\phi 4.5$  to  $\phi 7$

(Reference) 0.5 to 1.5 mm<sup>2</sup>, 2-core or 3-core, equivalent to JIS C 3306

##### Applicable crimped terminals

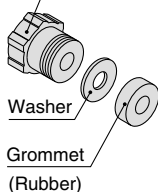
O-terminals: Up to R1.25-4M defined in the JIS C2805

Y-terminals: Up to R1.25-3L manufactured by J.S.T. Mfg. Co., Ltd.

Rod-terminals: Up to size 1.5

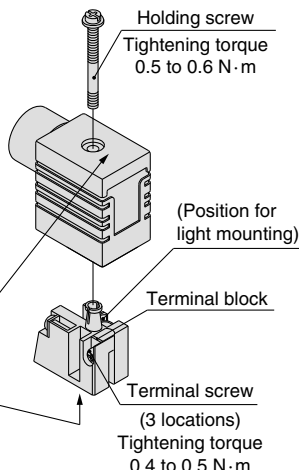
Ground nut (Pg. 9)

Tightening torque  
2.5 to 3.75 N·m



Holding screw

Tightening torque  
0.5 to 0.6 N·m



(Rating symbol)  
Refer to the table of DIN  
connector part number.

### DIN Terminal Connector Part No.

#### DIN Connector Part No.

Without light	DC only	V100-61-1
---------------	---------	-----------

#### With Surge Voltage Suppressor

Rated voltage	Rating symbol	Part no.
24 VDC	DC 24 VS	V100-61-5-05
12 VDC	DC 12 VS	V100-61-5-06
100 VAC	100/110 VS	V100-61-4-01
200 VAC	200/220 VS	V100-61-4-02
110 VAC	100/110 VS	V100-61-4-01
220 VAC	200/220 VS	V100-61-4-02
240 VAC	240 VS	V100-61-4-07

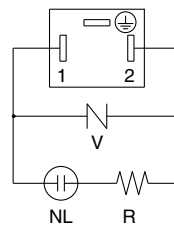
#### With Light/Surge Voltage Suppressor

Rated voltage	Rating symbol	Part no.
24 VDC	DC 24 VZ	V100-61-3-05
12 VDC	DC 12 VZ	V100-61-3-06
100 VAC	100/110 VZ	V100-61-2-01
200 VAC	200/220 VZ	V100-61-2-02
110 VAC	100/110 VZ	V100-61-2-01
220 VAC	200/220 VZ	V100-61-2-02
240 VAC	240 VZ	V100-61-2-07

\* If an AC specification without DIN terminal (DO) is selected, use a DIN connector with surge voltage suppressor as the connector.

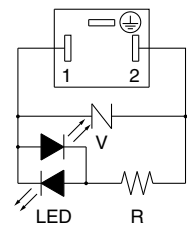
### Circuit Diagram with Light/Surge Voltage Suppressor

#### AC circuit diagram



NL: Neon light, R: Resistor  
V: Varistor

#### DC circuit diagram



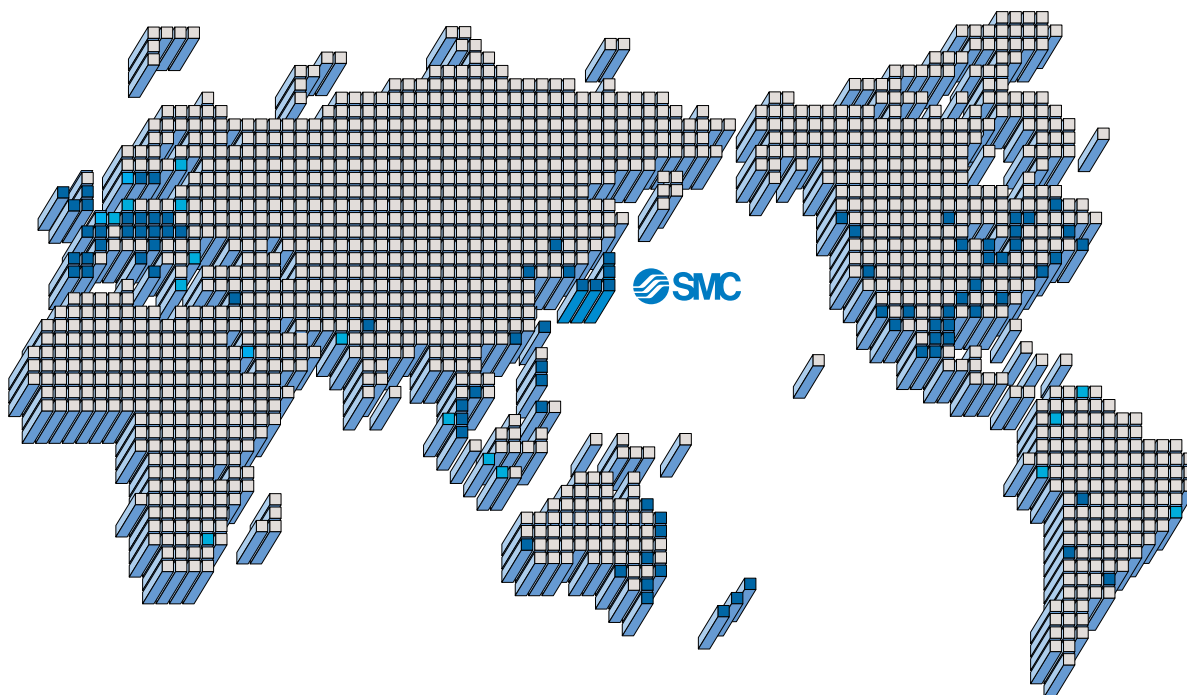
LED: Light emitting diode, R: Resistor  
V: Varistor

### Operating Environment

#### Caution

Products with IP65 enclosure (based on IEC60529) are protected against dust and water, however, these products cannot be used in water.

# SMC'S GLOBAL MANUFACTURING, DISTRIBUTION AND SERVICE NETWORK



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### Safety Instructions

Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

## SMC Corporation

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