

Coolant Valve

0.5 MPa **1.0 MPa** **1.6 MPa**



1 1/4 (32A) to 2 (50A) added.

IP65 compliant

For pilot valve V116

Flow rate Cv (For 0.5 MPa specification)

Variations

Series	5	10	20	30	40	70	Port size
SGC2	6.5 (5.6)						3/8 (10A), 1/2 (15A)
SGC3	11.8 (10.1)						3/4 (20A)
SGC4	18.3 (15.7)						1 (25A)
New SGC5				28 (24)			1 1/4 (32A)
New SGC6				43 (36.9)			1 1/2 (40A)
New SGC7						70 (60)	2 (50A)

Service life:

5 million cycles or more

(For the SGC2, 3, 4, based on SMC's test condition)

Power consumption:

0.35 w*/1.8 w*

* For 24 V DC

Water hammer:

Reduced by 30 %*

* Compared to current model, VNC series

* For 0.35 W type, SGC2 to 7



Series SGC



CAT.EUS70-32B-UK

Coolant Valve *Series SGC*

(For Air Operated Type)

Dry bearings
Prevents the shaft, which is a sliding part, from vibrating and helps to extend the service life of the rubber components and improves the seal performance of the main valve.

Squeeze seal
Completely shuts off the leakage of liquid coolant and increases the scraper effects. These two safety designs result in a dual advantage.

Scraper
Prevents foreign matter from entering, while the main valve is activated.

• **Choice of seal materials**
NBR, FKM

Auto switch
Able to confirm whether the valve is open/closed. Mountable on the 2 sides.
(SGC2, 3, 4 only)

• **Magnet (SGC2, 3, 4 only)**

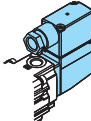
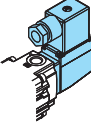
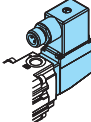
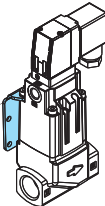
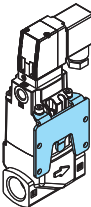
Grease channel
Prevents the loss of grease and helps to extend the service life.

For External Pilot Solenoid Type

Type	SGC2	SGC3	SGC4	SGC5	SGC6	SGC7
0.35 W type <small>Note 1)</small>	●	●	●	●	●	●
1.8 W type <small>Note 1) 2)</small>	*	*	*	●	●	●

Note 1) For DC voltage. Refer to page 7 for models with indicator light and AC voltage (apparent power VA).
Note 2) The response time is equivalent to the VNC series.
* Made to Order (See page 16.)

Variations (Common specifications for external pilot solenoid type and air operated type)

Series	Port size	Thread type	Type of actuation	Operating pressure range [MPa]	Cv	Kv [m³/h]	Electrical entry (For external pilot solenoid type)	Bracket
SGC2	3/8 (10A)	Rc G (ISO 1179-1) NPT NPTF	N.C./N.O.	0.5	4.6	3.9	<div>• Conduit terminal</div> <div></div> <div>• DIN terminal</div> <div></div> <div>• M12 connector</div> <div></div>	<div>• Bracket on the left side</div> <div></div>
				1	3.5	3		
				1.6	1.25	1.1		
	1/2 (15A)			0.5	6.5	5.6		
				1	4.8	4.1		
				1.6	2.7	2.3		
SGC3	3/4 (20A)			0.5	11.8	10.1		
				1	7.1	6.1		
				1.6	4.5	3.9		
SGC4	1 (25A)			0.5	18.3	15.7		
				1	11.0	9.4		
				1.6	7.3	6.3		
New SGC5	1 1/4 (32A)			0.5	28	24		<div>• Bracket on the right side</div> <div></div>
				1	20	17.1		
New SGC6	1 1/2 (40A)			0.5	43	36.9		
				1	30	25.7		
New SGC7	2 (50A)			0.5	70	60		
				1	48	41.1		

Reduced Coolant Blow Energy Consumption

Coolant pump

30 %

Oil hydraulic pump, etc.
50 %

Air compressor
20 %

Electric power consumption
by purpose (SMC research)

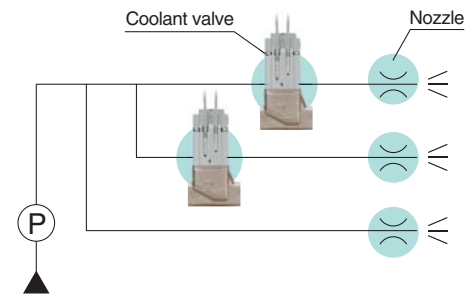
Reduced electric power for coolant pump

- Reduced number of pump units
- Pump downsized

Research has revealed that coolant pumps account for 30 % of the electric power consumption in a production facility. By reducing the energy consumption for coolant blow, it will substantially contribute to the electric reduction in the whole factory.

Improvement Example case 1

Improvement in Pressure Loss



Before improvement

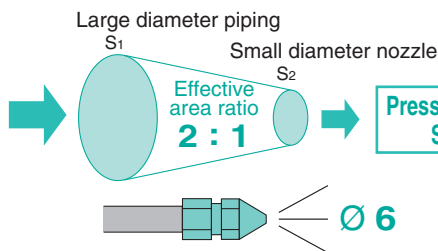


After improvement



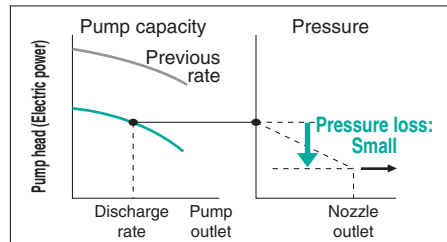
Pressure loss is improved by making the effective area ratio 2 : 1 between the upstream side and the nozzle.

- Making the effective area in the upstream side larger. (Changing to the equipment with larger effective area)
- Attaching a nozzle.



Pressure loss:
Small

Effect of Energy Saving Improvement

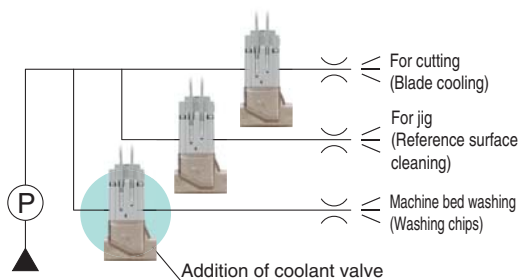


Electric power consumption

75 %
reduction

Improvement Example case 2

Intermittent Blow

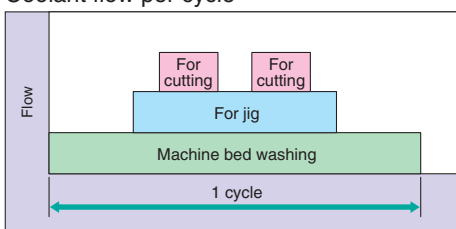


Stops machine bed-washing all the time. Machine bed washing is stopped when blowing for cutting or jig by means of a valve.

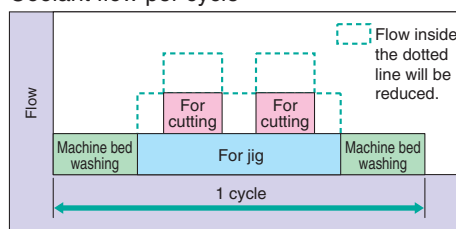
Effect of Energy Saving Improvement

Electric power consumption
20 to 50 %
reduction

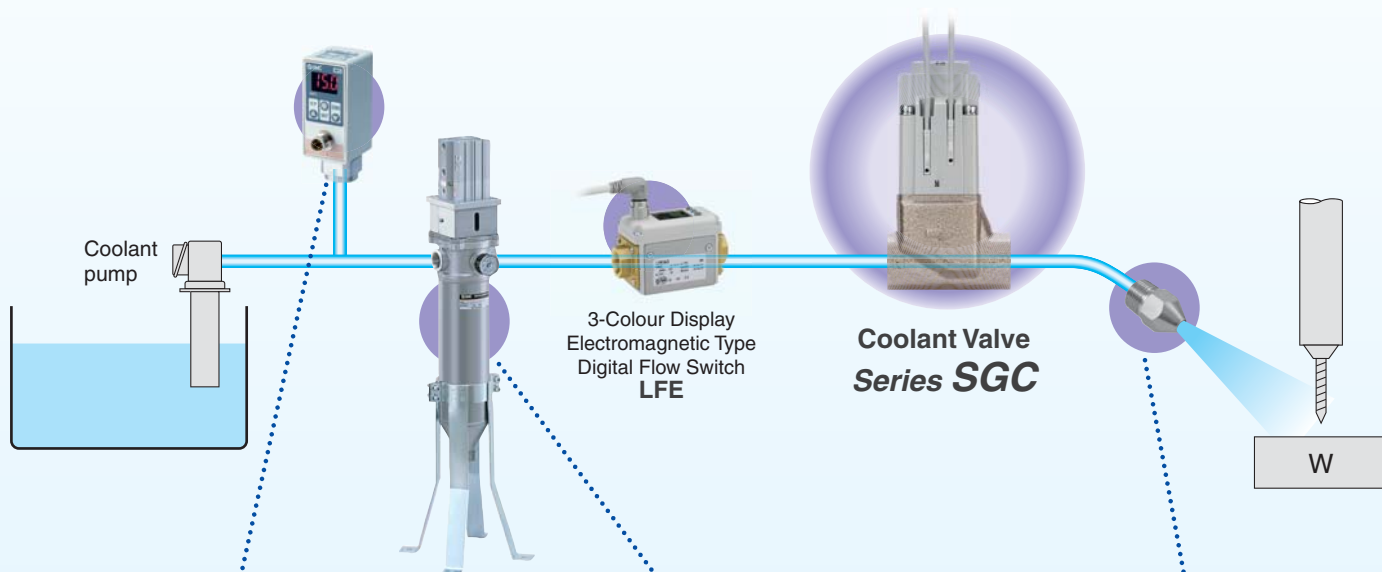
Coolant flow per cycle



Coolant flow per cycle



Coolant Blow System/ Related Equipment



Pressure Switches

Coolant line pressure control



2-Colour Display Digital Pressure Switch **ISE75/75H**

2-Colour Display Digital Pressure Switch **ISE80**



General Purpose Pressure Switch **ISG**

Filters

Coolant liquid filtration



Industrial Filter **FG**



Bag Filter **FGF**



Low Maintenance Filter **FN**

Nozzles for Blowing



Nozzles for Blowing **KN**

Energy Saving Related Materials

For details, refer to the SMC website.

<http://www.smc.eu> SMC Model Selection Software Search



Water Resistant Cylinders



For details, refer to the catalogues on www.smc.eu.



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Coolant Valve

Series SGC



How to Order



Made to Order
(For details, refer to page 16.)

External Pilot Solenoid

SGC 2 2 1 A - 05 10 Y - 1 T Z - - A - -

Air Operated

SGCA 2 2 1 A - 05 10 - - A - -

① Series

2	SGC200
3	SGC300
4	SGC400
5	SGC500
6	SGC600
7	SGC700

② Valve type

1	N.C.
2	N.O.

③ Seal material

A	NBR
B	FKM

④ Pressure range

05	0 to 0.5 MPa
10	0 to 1 MPa
16*	0 to 1.6 MPa

* Only available for series 2, 3, 4.

⑤ Thread type

—	Rc
G	G (ISO 1179-1)
N	NPT
T	NPTF

⑥ Port size

10	3/8	SGC200
15	1/2	
20	3/4	SGC300
25	1	SGC400
32	1 1/4	SGC500
40	1 1/2	SGC600
50	2	SGC700

⑦ Pilot valve

Symbol	Pilot valve	SGC2	SGC3	SGC4	SGC5	SGC6	SGC7
Y	0.35 W type (V116)	○	○	○	○	○	○
H	1.8 W type (VO307)	*	*	*	○	○	○

Note) 0.35 W type (Pilot valve V116) is a low wattage specification. The response is slower than VNC series. If the response time is a problem, use the 1.8 W type (VO307). Please note that the power consumption is 1.8 W (With indicator light: 2 W).

* SGC2/3/4-X1 (See page 16.)

⑧ Rated voltage

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

Note) Refer to page 17 when using with energization for long periods of time.

⑨ Electrical entry

T: Conduit terminal (Pilot valve V116 only) Note 2) 	D: DIN terminal (Pitch between the terminals: 11 mm) 	DO: DIN terminal without connector Note 1) 	W: M12 connector (4-pin type) Note 3) V: M12 connector (5-pin type) Note 3) 4)
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Note 1) Refer to the table (1) below for combinations with light/surge voltage suppressors.

Note 2) Not available for H (1.8 W type).

Note 3) Cable for M12 connector is not included. Order it separately after referring to the options on page 13.

Note 4) Only DC voltage is available.

⑩ Light/surge voltage suppressor

—	None
S	With surge voltage suppressor
Z	With light/surge voltage suppressor

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

⑪ Manual override

—: Non-locking push type 	D: Push-turn locking lever type
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⑫ Bracket mounting position

—: Without bracket 	B1: Bracket on the left side 	B2: Bracket on the right side
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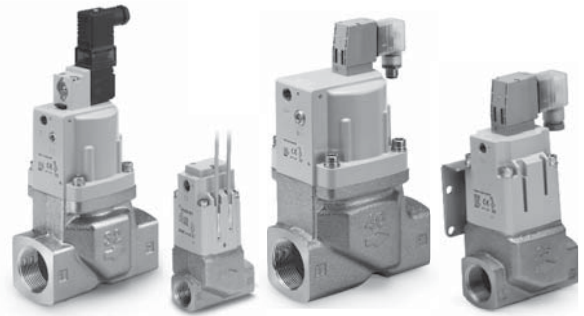
Note) Bracket cannot be attached later.

* Only available for series 2, 3, 4.

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

Pilot valve	Rated voltage	Electrical entry	Without light/surge voltage suppressor	With surge voltage suppressor	With light/surge voltage suppressor
0.35 W type (V116)	AC	T	—	●	●
		D	—	●	●
		W	—	●	●
	DC	DO	● (Note)	—	—
		T	—	—	—
		D	●	●	●
1.8 W type (VO307)	AC	W, V	—	—	—
		DO	—	—	—
		D	●	—	●
	DC	W, V	—	—	—
		DO	—	—	—
		D	●	—	●

Note) When AC voltage (V116) without DIN terminal (DO) is selected, always use a DIN connector with surge voltage suppressor as the connector.



⑬ Auto switches (for verifying whether the valve is open/closed)

—	Without auto switch (without magnet)
M	Without auto switch (with built-in magnet)
A	With auto switch Select a model, referring to the table “Applicable Auto Switches” below.
B	
C	
E	
F	
G	

* Auto switches are shipped together, (but not assembled).
* Only available for series 2, 3, 4.

⑭ Lead wire length

—	0.5 m
M	1 m
L	3 m
Z	5 m

* 0.5 m (—), 1 m (M), and 5 m (Z) for D-M9□A will be produced on receipt of order.
* Only available for series 2, 3, 4.

⑮ Number of auto switches

—	2 pcs.
S	1 pc.

* Only available for series 2, 3, 4.

Applicable Auto Switches/Refer to the **WEB catalogue** or the Best Pneumatics No. 2 catalogue for detailed auto switch specifications.

Solid State Auto Switch

Symbol	Part no.	Special function	Electrical entry	Indicator light	Wiring (Output)	Load voltage		Applicable load	
	In-line					DC			
A	D-M9N	—	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	IC circuit	Relay, PLC
B	D-M9P				3-wire (PNP)		12 V		
C	D-M9B				2-wire		—		
E	D-M9NA	Water resistant (2-colour indication)	Grommet	Yes	3-wire (NPN)	24 V	5 V, 12 V	IC circuit	Relay, PLC
F	D-M9PA				3-wire (PNP)		12 V		
G	D-M9BA				2-wire		—		

Symbol

Type of actuation	N.C.	N.O.
Air operated	SGCA□21□	SGCA□22□
External pilot solenoid	SGC□21□	SGC□22□

Characteristics

Pressure type	Model	Port size	Orifice dia. ø [mm]	Flow-rate characteristics Av x 10 ⁻⁶ m ³ /s	Cv factor converted	Weight [kg]	
						Air operated	External pilot solenoid
0.5 MPa	SGC(A)22□□-05□10	3/8	Ø 15	110	4.6	0.69 (0.74)	0.73 (0.78)
	SGC(A)22□□-05□15	1/2	Ø 15	155	6.5	0.69 (0.74)	0.73 (0.78)
	SGC(A)32□□-05□20	3/4	Ø 20	284	11.8	1.04 (1.11)	1.08 (1.15)
	SGC(A)42□□-05□25	1	Ø 25	440	18.3	1.70 (1.77)	1.74 (1.81)
	SGC(A)52□□-05□32	1 1/4	Ø 32	672	28	3.4	3.4
	SGC(A)62□□-05□40	1 1/2	Ø 40	1032	43	5.6	5.6
1.0 MPa	SGC(A)72□□-05□50	2	Ø 51	1680	70	8.4	8.4
	SGC(A)22□□-10□10	3/8	Ø 12	85	3.5	0.69 (0.74)	0.73 (0.78)
	SGC(A)22□□-10□15	1/2	Ø 12	116	4.8	0.69 (0.74)	0.73 (0.78)
	SGC(A)32□□-10□20	3/4	Ø 14	170	7.1	1.04 (1.11)	1.08 (1.15)
	SGC(A)42□□-10□25	1	Ø 17	265	11.0	1.70 (1.77)	1.74 (1.81)
	SGC(A)52□□-10□32	1 1/4	Ø 25	480	20	3.4	3.4
1.6 MPa	SGC(A)62□□-10□40	1 1/2	Ø 29	720	30	5.6	5.6
	SGC(A)72□□-10□50	2	Ø 36	1152	48	8.4	8.4
	SGC(A)22□□-16□10	3/8	Ø 9	30	1.25	0.69 (0.74)	0.73 (0.78)
	SGC(A)22□□-16□15	1/2	Ø 9	64	2.7	0.69 (0.74)	0.73 (0.78)
	SGC(A)32□□-16□20	3/4	Ø 12	109	4.5	1.04 (1.11)	1.08 (1.15)
	SGC(A)42□□-16□25	1	Ø 15	174	7.3	1.70 (1.77)	1.74 (1.81)

* (): Weight including the bracket

* Add the weight of an auto switch additionally.

Valve Specifications

Fluid	Coolant (Water cannot be used.)	
Fluid temperature	SGC□□□□A, B	–5 to 60 °C*
Ambient temperature		–5 to 50 °C
Proof pressure	SGC(A)2, SGC(A)3, SGC(A)4	2.4 MPa
	SGC(A)5, SGC(A)6, SGC(A)7	1.5 MPa
Leakage from the valve seat	20 cm ³ /min or less (Coolant pressure)	
Operating pressure range	SGC□□□□□-05	0 to 0.5 MPa
	SGC□□□□□-10	0 to 1 MPa
	SGC□□□□□-16	0 to 1.6 MPa (Series 2, 3, 4 only)
External pilot air	Pressure	SGC□□□□1 0.25 to 0.7 MPa
		SGC□□□□2 0.5 MPa type: 0.25 MPa to 0.7 MPa 1.0, 1.6 MPa type: 0.3 MPa to 0.7 MPa
	Lubrication	Not required (Use turbine oil Class 1 (ISO VG32), if lubricated.)
	Temperature	–5 to 50 °C*

* No freezing

How to Order Pilot Valves

0.35 W Type

Pilot Solenoid Valve Specifications

Pilot solenoid valve			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 fluctuation			±10 % of rated voltage*
Power consumption [W]	DC		0.35 W (With indicator light: 0.58 W)
Apparent power [VA]	AC	100 V	0.78 (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			Varistor
Indicator light			LED (Neon bulb: AC voltage with DIN terminal, M12 connector)
Enclosure			IEC60529 standard IP65, JIS C0920

* In common between 110 V AC and 115 V AC, and between 220 V AC and 230 V AC.
* For 115 V AC and 230 V AC, the allowable voltage fluctuation is -15 % to +5 % of rated voltage.

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

① ② ③

① Rated voltage

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

② Electrical entry

T	Conduit terminal
D	DIN terminal (with connector)
DO	DIN terminal (without connector)
W	M12 connector (4-pin type)
V	M12 connector (5-pin type) ^{Note)}

Note) Only DC voltage is available.

③ Light/surge voltage suppressor

—	None
S	With surge voltage suppressor
Z	With light/surge voltage suppressor

Note) Refer to the table (1) on page 5 for combinations with electrical entry.

* DOS, DOZ are not available.

* For AC voltage, only DO is available for —.

1.8 W Type

Pilot Solenoid Valve Specifications

Pilot solenoid valve		VO307(Y)-□□□1-Q	
Electrical entry		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 fluctuation		−15 % to 10 % of rated voltage	
Power consumption [W]	DC	1.8 W (With indicator light: 2 W)	
Apparent power [VA]	AC	Inrush	12.7 VA (50 Hz), 10.7 VA (60 Hz)
		Holding	7.6 VA (50 Hz), 5.4 VA (60 Hz)
Light/surge voltage suppressor	DC	Diode, LED	
	AC (50 / 60 Hz)	Varistor, LED	
Enclosure		Dustproof	

Electrical entry: DIN terminal

VO307**Y**-**5**^D_{DO}**Z**1-Q

① ② ③

Electrical entry: M12 connector

VO307**Y**-**5****D****Z**1-**W**-X352-Q

① ② ③ ④

① Voltage

—	AC
Y	DC

② Rated voltage

1	100 V AC 50 / 60 Hz
2	200 V AC 50 / 60 Hz
3	110 V AC 50 / 60 Hz
4	220 V AC 50 / 60 Hz
5	24 V DC
6	12 V DC

③ Light/surge voltage suppressor

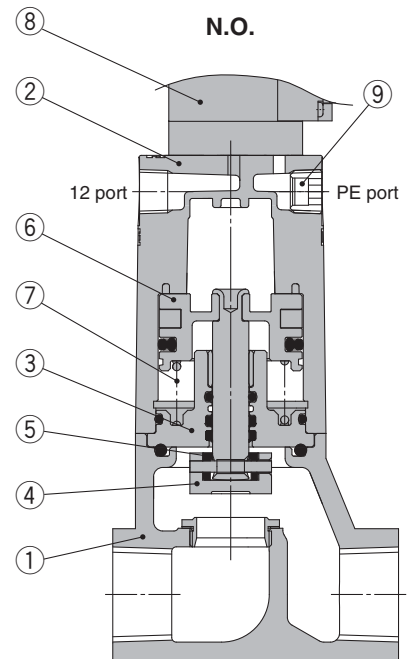
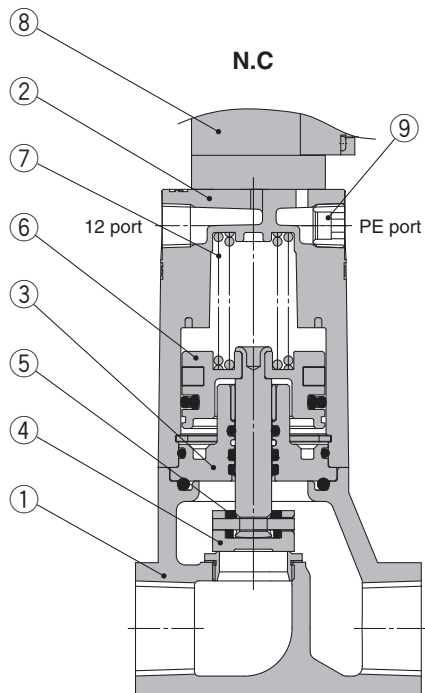
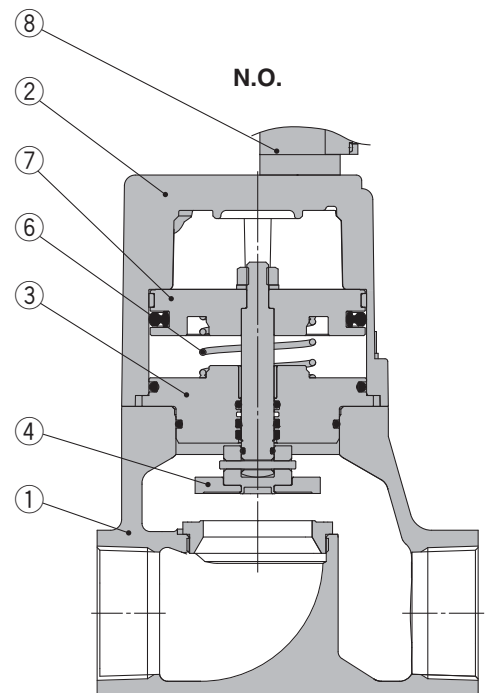
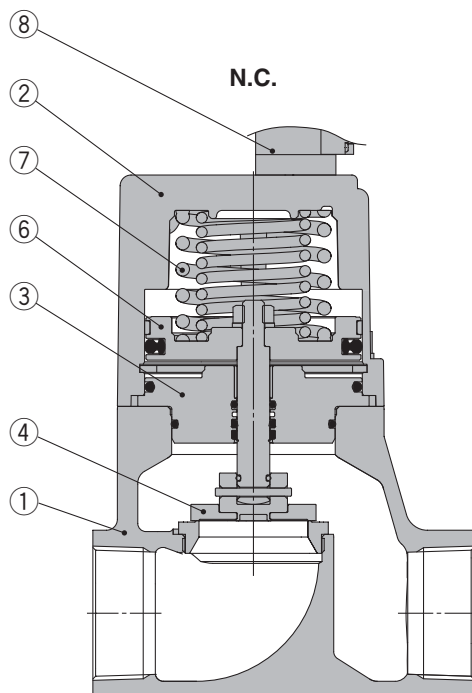
—	None
Z	With light/surge voltage suppressor

Note) Refer to the table (1) on page 5 for combinations with electrical entry.

④ Electrical entry

W	M12 connector (4-pin type)
V	M12 connector (5-pin type) ^{Note)}

Note) Only DC voltage is available.

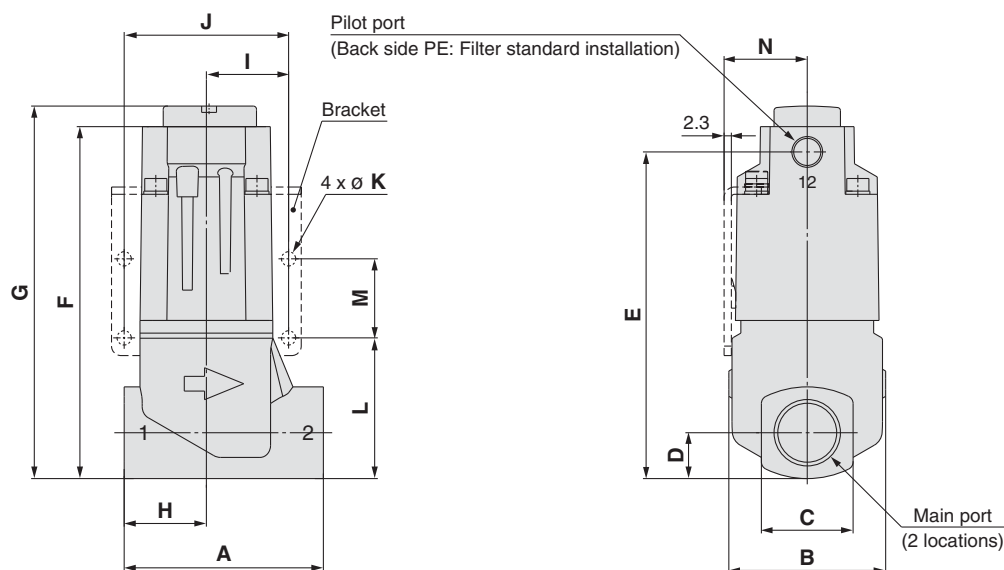
Construction**Series SGC2, 3, 4, 5****Series SGC6, 7****Component Parts**

No.	Description	Material	Note
1	Body assembly	Cast iron	Plated
2	Cover assembly	Aluminium die-casted	White
3	Plate assembly	Iron	Seal material (NBR, FKM), Plated
4	Valve body	Stainless steel	
5	Valve cover	NBR, FKM	
6	Piston assembly	Stainless steel, Aluminium	
7	Return spring	Stainless steel, Piano wire	
8	Pilot solenoid valve	—	
9	Filter	Copper	

Series SGC

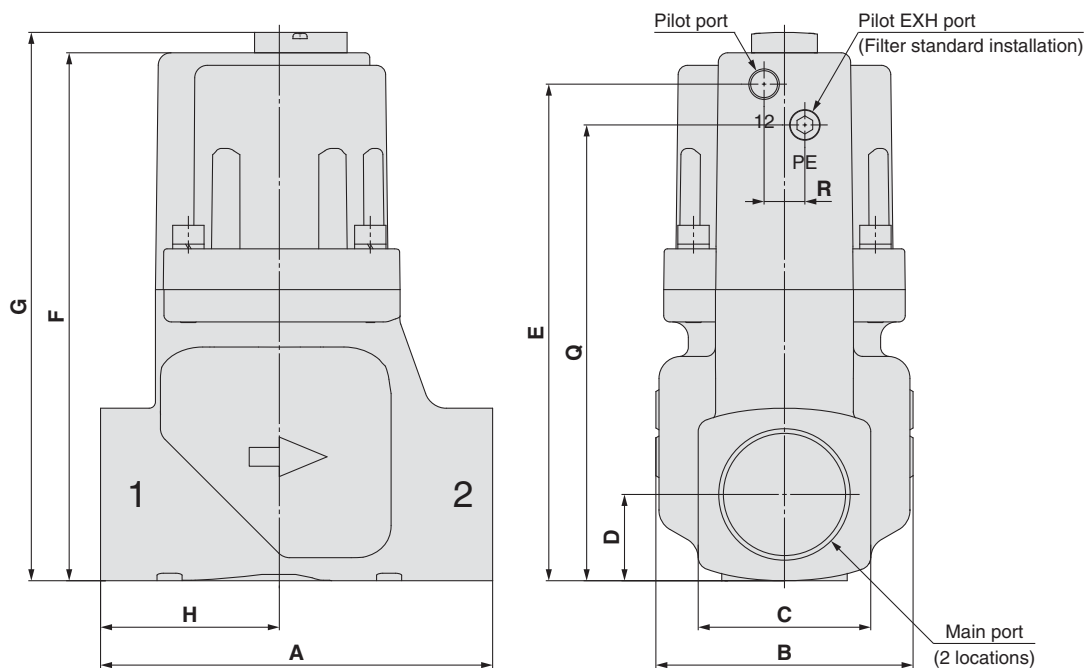
Dimensions

Air operated
Series SGC2, 3, 4



Model	Main port	Pilot port	A	B	C	D	E	F	G	H	I	J	K	L	M	N
SGCA22□□-□□10	3/8	1/8	63	49.6	29	14.5	103.3	111.3	117.8	26	26	52	4.5	44.5	25	26.3
SGCA22□□-□□15	1/2	1/8	63	49.6	29	14.5	103.3	111.3	117.8	26	26	52	4.5	44.5	25	26.3
SGCA32□□-□□20	3/4	1/8	80	59	35	17.5	112	120.5	127	35	31	62	5.5	48	30	31
SGCA42□□-□□25	1	1/8	90	74	44	22	135.9	144.5	151	40	36	72	6.5	60	35	39.5

Series SGC5, 6, 7

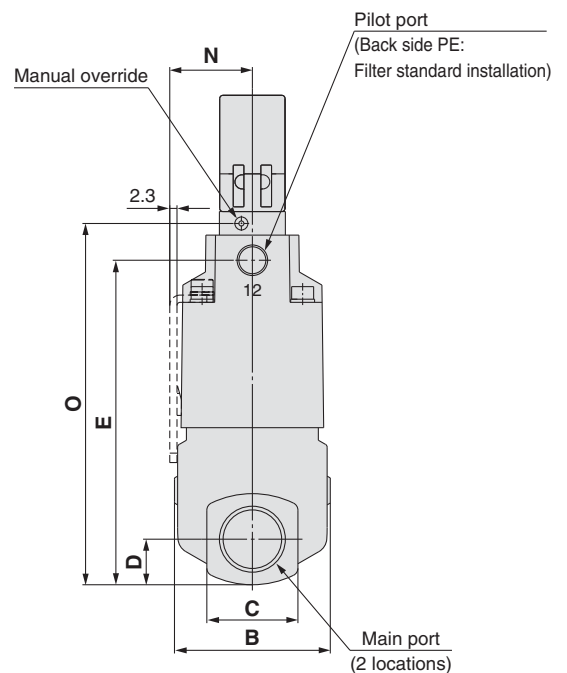
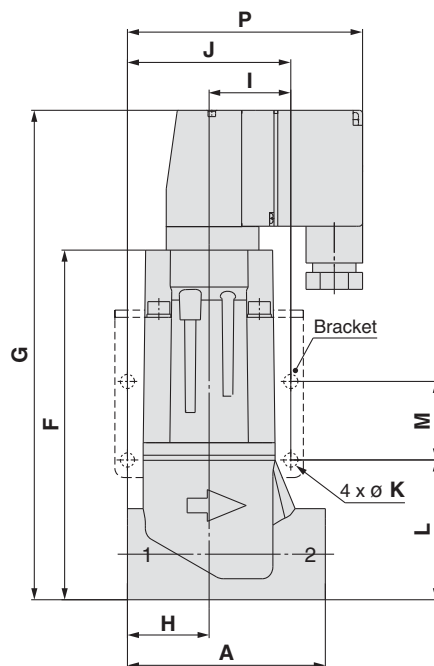


Model	Main port	Pilot port	A	B	C	D	E	F	G	H	Q	R
SGCA52□□-□□32	1 1/4	1/8	125	82	55	27.5	158.3	168.3	174.8	57	145.3	13
SGCA62□□-□□40	1 1/2	1/4	140	98	61	30.5	179.5	191.5	198	59	163.5	19
SGCA72□□-□□50	2	1/4	160	115	74	37	206	218	224.5	71	190	19

Dimensions

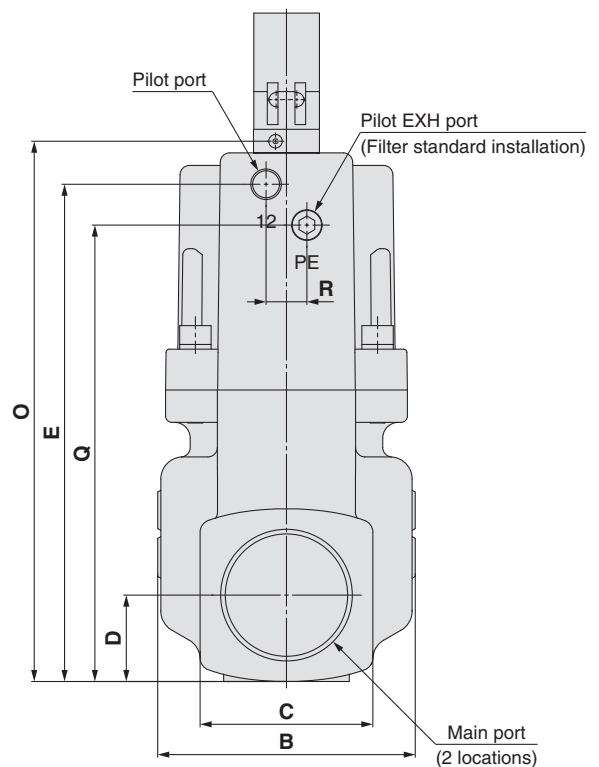
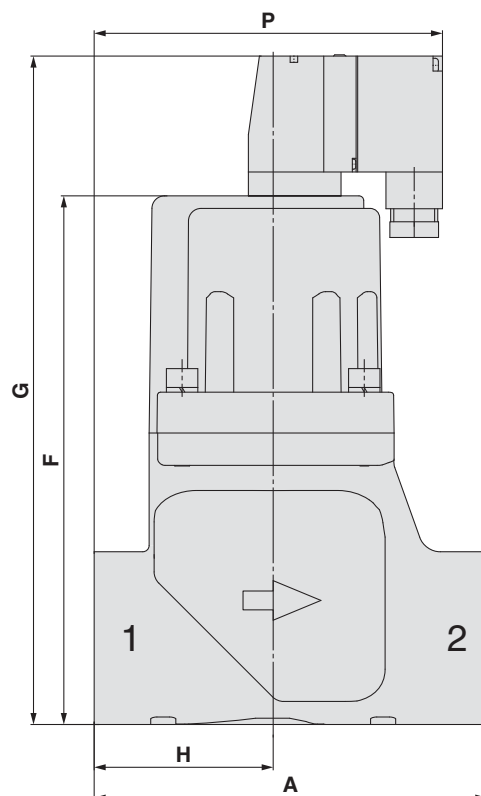
External pilot solenoid: 0.35 W type (Pilot valve V116)
(Conduit terminal)

Series SGC2, 3, 4



Model	Main port	Pilot port	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
SGC22□□-□□10	3/8	1/8	63	49.6	29	14.5	103.3	111.3	155.8	26	26	52	4.5	44.5	25	26.3	115	74.2
SGC22□□-□□15	1/2	1/8	63	49.6	29	14.5	103.3	111.3	155.8	26	26	52	4.5	44.5	25	26.3	115	74.2
SGC32□□-□□20	3/4	1/8	80	59	35	17.5	112	120.5	165	35	31	62	5.5	48	30	31	124.2	80.1
SGC42□□-□□25	1	1/8	90	74	44	22	135.9	144.5	189	40	36	72	6.5	60	35	39.5	148.2	91.1

Series SGC5, 6, 7

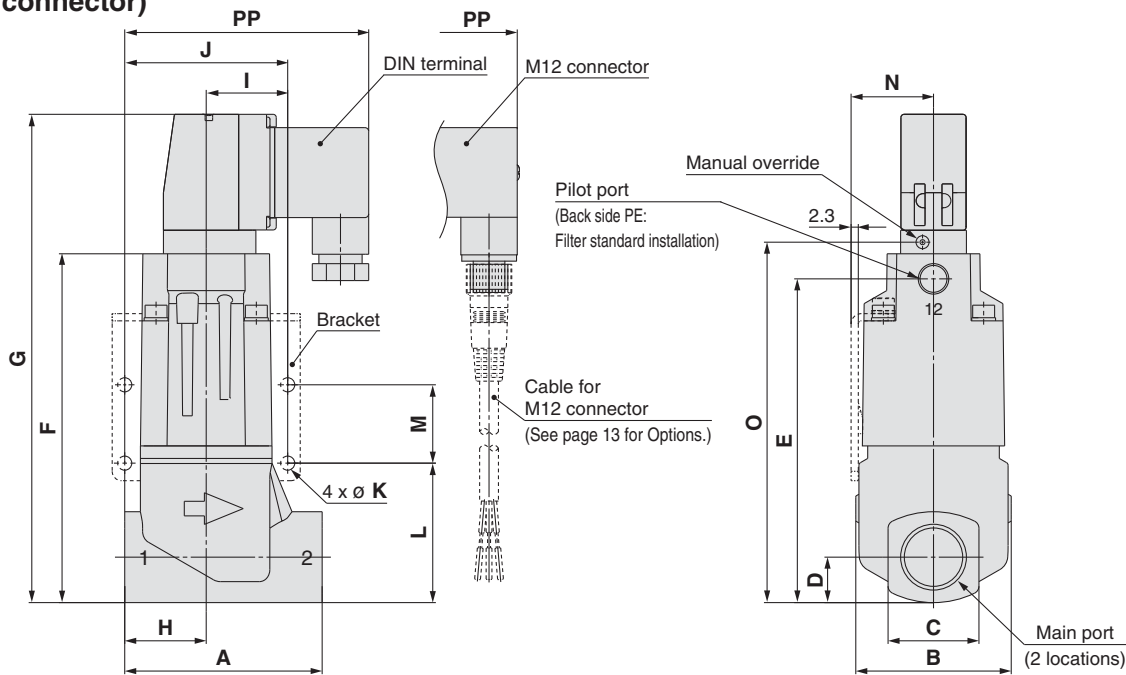


Model	Main port	Pilot port	A	B	C	D	E	F	G	H	O	P	Q	R
SGC52□□-□□32	1 1/4	1/8	125	82	55	27.5	158.3	168.3	212.8	57	172	110.9	145.3	13
SGC62□□-□□40	1 1/2	1/4	140	98	61	30.5	179.5	191.5	236	59	195.2	121.6	163.5	19
SGC72□□-□□50	2	1/4	160	115	74	37	206	218	262.5	71	221.7	143.6	190	19

Dimensions

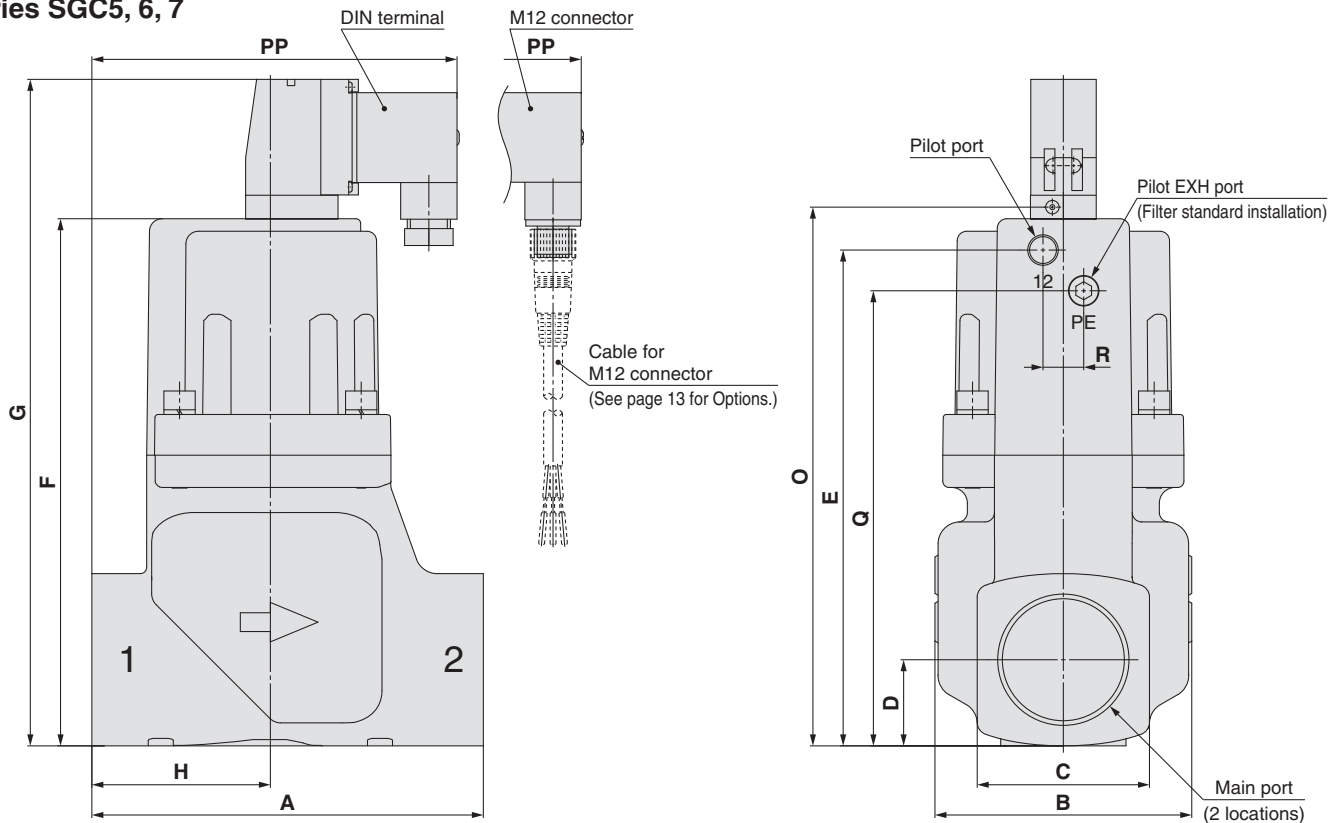
External pilot solenoid: 0.35 W type (Pilot valve V116)
(DIN terminal, M12 connector)

Series SGC2, 3, 4



Model	Main port	Pilot port	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	PP
SGC22□□-□□10	3/8	1/8	63	49.6	29	14.5	103.3	111.3	155.8	26	26	52	4.5	44.5	25	26.3	115	79.9
SGC22□□-□□15	1/2	1/8	63	49.6	29	14.5	103.3	111.3	155.8	26	26	52	4.5	44.5	25	26.3	115	79.9
SGC32□□-□□20	3/4	1/8	80	59	35	17.5	112	120.5	165	35	31	62	5.5	48	30	31	124.2	85.8
SGC42□□-□□25	1	1/8	90	74	44	22	135.9	144.5	189	40	36	72	6.5	60	35	39.5	148.2	96.8

Series SGC5, 6, 7

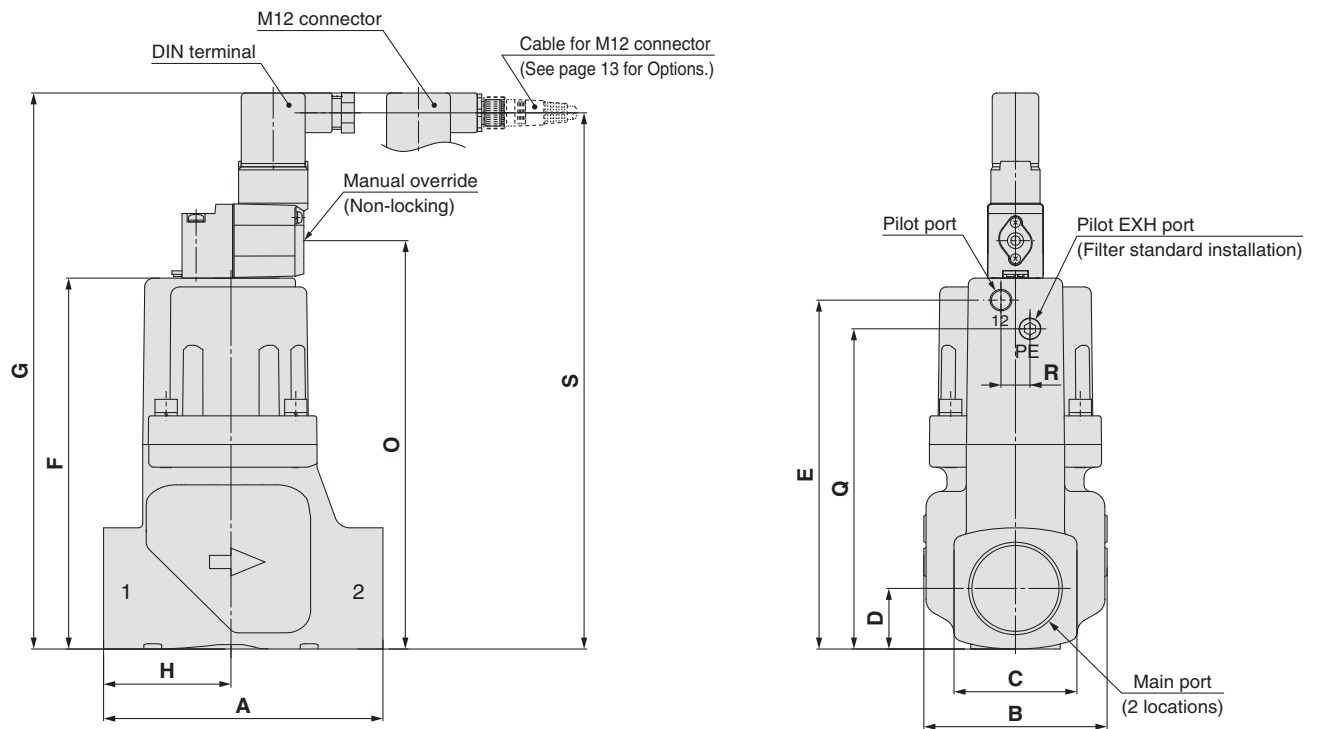


Model	Main port	Pilot port	A	B	C	D	E	F	G	H	O	PP	Q	R
SGC52□□-□□32	1 1/4	1/8	125	82	55	27.5	158.3	168.3	212.8	57	172	116.6	145.3	13
SGC62□□-□□40	1 1/2	1/4	140	98	61	30.5	179.5	191.5	236	59	195.2	127.3	163.5	19
SGC72□□-□□50	2	1/4	160	115	74	37	206	218	262.5	71	221.7	149.3	190	19

Dimensions

External pilot solenoid: 1.8 W type (Pilot valve VO307)
(DIN terminal, M12 connector)

Series SGC5, 6, 7

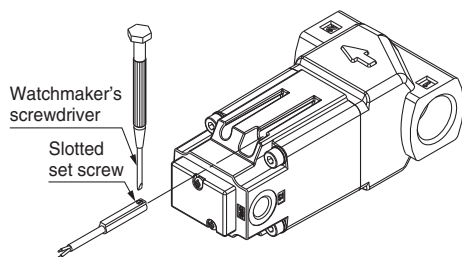


Model	Main port	Pilot port	A	B	C	D	E	F	G	H	O	Q	R	S
SGC52 □□-□□ 32H	1 1/4	1/8	125	82	55	27.5	158.3	168.3	252.3	57	185.3	145.3	13	243.3
SGC62 □□-□□ 40H	1 1/2	1/4	140	98	61	30.5	179.5	191.5	275.5	59	208.5	163.5	19	266.5
SGC72 □□-□□ 50H	2	1/4	160	115	74	37	206	218	302	71	235	190	19	293

Series SGC

How to Fix an Auto Switch

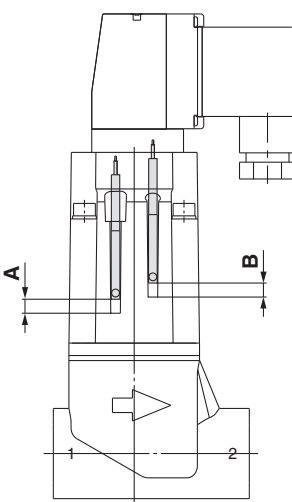
Series SGC2, 3, 4



When tightening an auto switch mounting screw, use a watchmaker's screwdriver with a handle of approximately 5 to 6 mm in diameter. Furthermore, use a tightening torque of approximately 0.05 to 0.15 N·m.

Auto Switch Proper Mounting Position

Series SGC2, 3, 4



Model		D-M9□
SGC(A)2□□□-05□10, 15	A	5
	B	5
SGC(A)2□□□-10□10, 15	A	6
	B	5
SGC(A)2□□□-16□10, 15	A	7
	B	5
SGC(A)3□□□-05□20	A	4
	B	4
SGC(A)3□□□-10□20	A	6
	B	4
SGC(A)3□□□-16□20	A	7
	B	4
SGC(A)4□□□-05□25	A	3
	B	3
SGC(A)4□□□-10□25	A	6
	B	3
SGC(A)4□□□-16□25	A	7
	B	3

* The above dimensions including a mounted auto switch are for reference only. Confirm that the auto switch works appropriately.

Options

Cable for M12 connector (Female connector with cable)

V100-200-1-4

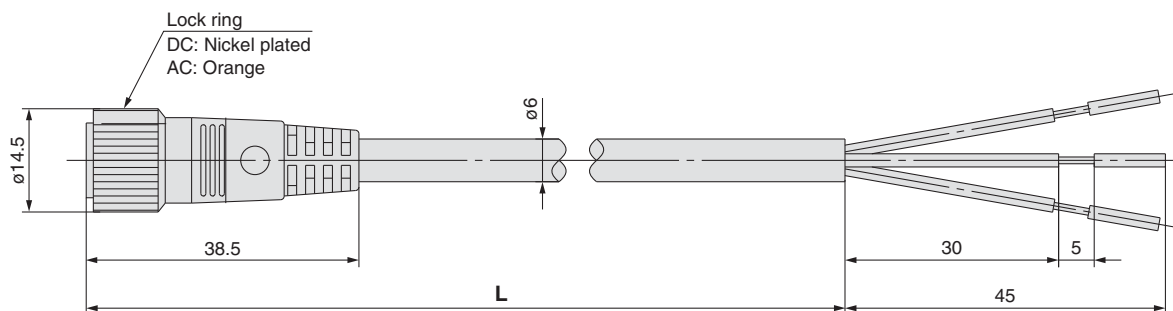
Specifications

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

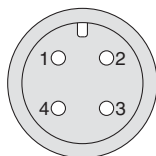
* When selecting the 5-pin type, only DC voltage is available.

Cable length [L]

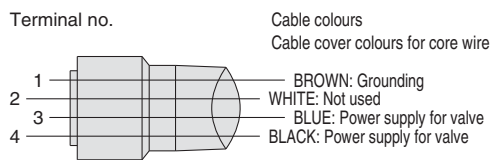
4	1000 [mm]
8	3000 [mm]
9	5000 [mm]



4-pin type

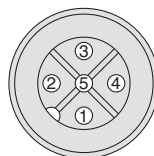


Socket pin connector pin arrangement

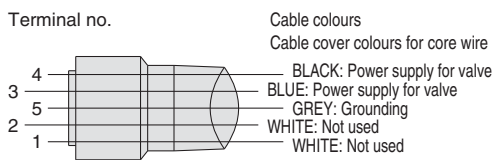


Connections

5-pin type



Socket pin connector pin arrangement



Connections

How to Order

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

For DC
SGC221A-0510Y-5WZ
V100-200-1-4

For AC
SGC221A-0510Y-1WZ
V100-200-2-4

Solid State Auto Switch Direct Mounting Style D-M9N/D-M9P/D-M9B



Refer to SMC website for the details about products conforming to the international standards.

Grommet

- 2-wire load current is reduced (2.5 to 40 mA).
- Flexibility is 1.5 times greater than the conventional model (SMC comparison).
- Using flexible cable as standard.



Caution

Precautions

Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used.

Caution

Prior to Use

For details about "Auto Switch Connection and Example", refer to "Handling Precautions for SMC Products" on SMC website.

Lead Wire Length

Lead wire length indication

(Example)

D-M9 L

● Lead wire length

—	0.5 m
M	1 m
L	3 m
Z (Note)	5 m

Note) Lead wire length of 5 m (Z) is manufactured upon receipt of order as standard for all applicable auto switches.

Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□ (With indicator light)			
Auto switch model	D-M9N	D-M9P	D-M9B
Electrical entry	In-line	In-line	In-line
Wiring type	3-wire		2-wire
Output type	NPN	PNP	—
Applicable load	IC circuit, Relay, PLC		24 V DC relay, PLC
Power supply voltage	5, 12, 24 V DC (4.5 to 28 V)		—
Current consumption	10 mA or less		—
Load voltage	28 V DC or less	—	24 V DC (10 to 28 V DC)
Load current	40 mA or less		2.5 to 40 mA
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)		4 V or less
Leakage current	100 μA or less at 24 V DC		0.8 mA or less
Indicator light	Red LED lights up when turned ON.		
Standards	CE marking, RoHS		

Oilproof Heavy-duty Lead Wire Specifications

Auto switch model		D-M9N	D-M9P	D-M9B
Sheath	Outside diameter [mm]	2.7 x 3.2 (ellipse)		
Insulator	Number of cores	3 cores (Brown/Blue/Black)		2 cores (Brown/Blue)
	Outside diameter [mm]	Ø 0.9		
Conductor	Effective area [mm ²]	0.15		
	Strand diameter [mm]	Ø 0.05		
Minimum bending radius [mm] (Reference value)		20		

Note 1) Refer to catalogues on www.smc.eu for solid state auto switch common specifications.

Note 2) Refer to catalogues on www.smc.eu for lead wire lengths.

Weight

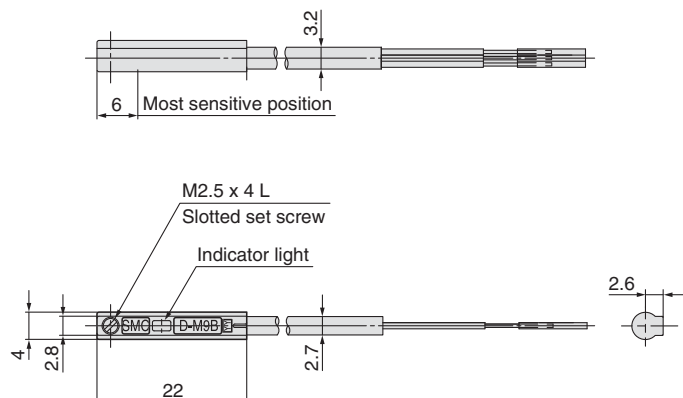
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Auto switch model		D-M9N	D-M9P	D-M9B
Lead wire length	0.5 m (—)	8	—	7
	1 m (M)	14	—	13
	3 m (L)	41	—	38
	5 m (Z)	68	—	63

Dimensions

[mm]

D-M9□



Water Resistant 2-Colour Indication Solid State Auto Switch: Direct Mounting Style D-M9NA/D-M9PA/D-M9BA



Grommet

- Water (coolant) resistant type
- 2-wire load current is reduced (2.5 to 40 mA).
- The optimum operating position can be determined by the colour of the light. (Red → Green ← Red)
- Using flexible cable as standard.



Caution

Precautions

Fix the auto switch with the existing screw installed on the auto switch body. The auto switch may be damaged if a screw other than the one supplied is used. Please consult with SMC if using coolant liquid other than water based solution.

Caution

Prior to Use

For details about "Auto Switch Connection and Example", refer to "Handling Precautions for SMC Products" on SMC website.

Lead Wire Length

Lead wire length indication

(Example)

D-M9 A L

● Lead wire length

—	0.5 m
M (Note 2)	1 m
L	3 m
Z (Note 1)	5 m

Note 1) Lead wire length of 5 m (Z) is manufactured upon receipt of order as standard for all applicable auto switches.

Note 2) Lead wire length of 1 m (M) is only available for the D-M9□. For the D-M9□A, it will be made upon request.

Auto Switch Specifications

PLC: Programmable Logic Controller

D-M9□A (With indicator light)			
Auto switch model	D-M9NA	D-M9PA	D-M9BA
Electrical entry	In-line	In-line	In-line
Wiring type	3-wire		2-wire
Output type	NPN	PNP	—
Applicable load	IC circuit, Relay, PLC		24 V DC relay, PLC
Power supply voltage	5, 12, 24 V DC (4.5 to 28 V)		—
Current consumption	10 mA or less		—
Load voltage	28 V DC or less	—	24 V DC (10 to 28 V DC)
Load current	40 mA or less		2.5 to 40 mA
Internal voltage drop	0.8 V or less at 10 mA (2 V or less at 40 mA)		4 V or less
Leakage current	100 μA or less at 24 V DC		0.8 mA or less
Indicator light	Operating position Red LED lights up. Optimum operating position Green LED lights up.		
Standards	CE marking, RoHS		

Oilproof Flexible Heavy-duty Lead Wire Specifications

Auto switch model		D-M9NA	D-M9PA	D-M9BA
Sheath	Outside diameter [mm]	2.7 x 3.2 (ellipse)		
Insulator	Number of cores	3 cores (Brown/Blue/Black)		2 cores (Brown/Blue)
	Outside diameter [mm]	Ø 0.9		
Conductor	Effective area [mm ²]	0.15		
	Strand diameter [mm]	Ø 0.05		
Minimum bending radius [mm] (Reference value)		20		

Note 1) Refer to catalogues on www.smc.eu for solid state auto switch common specifications.

Note 2) Refer to catalogues on www.smc.eu for lead wire lengths.

Weight

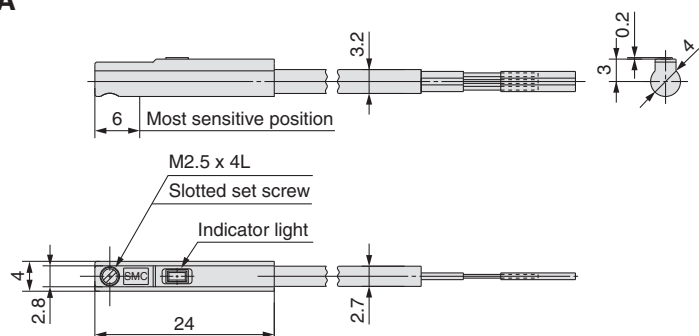
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Auto switch model		D-M9NA	D-M9PA	D-M9BA
Lead wire length	0.5 m (—)	8	—	7
	1 m (M)	14	—	13
	3 m (L)	41	—	38
	5 m (Z)	68	—	63

Dimensions

[mm]

D-M9□A



1 Pilot Valve: SF4

Symbol

-X1

Power consumption: 1.8 W

SGC 2 2 1 A - 05 G 10 - 1 T Z - B1 - A L S - X1

⑦ Pilot valve

— SF4

⑧ Rated voltage

1	100 V AC 50 / 60 Hz
2	200 V AC 50 / 60 Hz
3	110 V AC 50 / 60 Hz
4	220 V AC 50 / 60 Hz
5	24 V DC
6	12 V DC
7	240 V AC 50 / 60 Hz
9	Others

⑪ Manual override

—	Push type
B	Slotted locking type

Pilot valve: SF4

Equivalent to the standard models except for ⑦, ⑧, ⑪. See pages 5 and 6.

Pilot Solenoid Valve Specifications

Pilot solenoid valve		SF4-□□□-50-X240	
Electrical entry		Conduit terminal, DIN terminal, M12 connector	
Coil rated voltage [V]	DC	24 V, Other (Option)	
	AC (50 / 60 Hz)	100 V, 200 V, Other (Option)	
Allowable voltage fluctuation		-15 to 10 % of rated voltage	
Power consumption [W]		1.8 W (With indicator light: 2 W)	
Apparent power [VA]	AC	Inrush	5.6 VA (50 Hz) 5.0 VA (60 Hz)
		Holding	3.4 VA (50 Hz) 2.3 VA (60 Hz)
Light/surge voltage suppressor	DC	ZNR (Varistor), LED (Neon bulb for 100 V or more)	
	AC	ZNR (Varistor), Neon bulb (LED for less than 100 V)	

How to Order Pilot Valve

SF4 - 5 T Z - 50 - X240

① Rated voltage

1	100 V AC 50 / 60 Hz
2	200 V AC 50 / 60 Hz
3	110 V AC 50 / 60 Hz
4	220 V AC 50 / 60 Hz
5	24 V DC
6	12 V DC
7	240 V AC 50 / 60 Hz
9	Others

② Electrical entry

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

Note) Only DC voltage is available.

③ Light/surge voltage suppressor

—	None
S	With surge voltage suppressor
Z	With light/surge voltage suppressor

④ Manual override

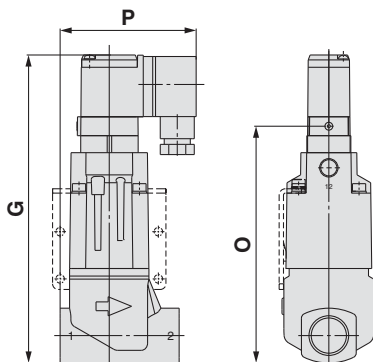
—	Push type
B	Slotted locking type

* TS, DOS, DOZ are not available.

Dimensions

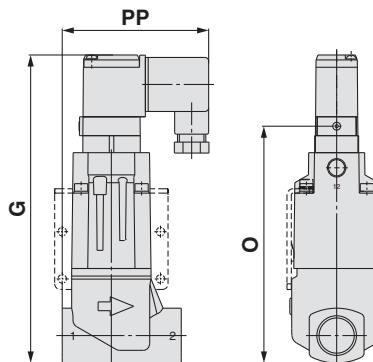
Equivalent to the standard models except the dimensions given in the diagram.

Conduit terminal



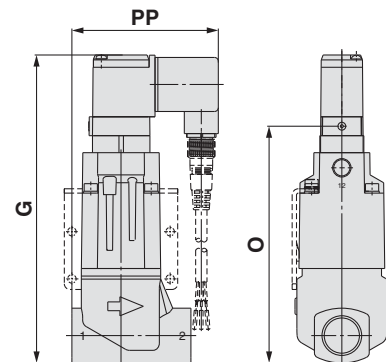
Model	Main port	G	O	P
SGC2□□□-□□10	3/8	163	125.3	72.8
SGC2□□□-□□15	1/2	163	125.3	72.8
SGC3□□□-□□20	3/4	172.2	134.5	78.7
SGC4□□□-□□25	1	196.2	158.5	89.7

DIN terminal



Model	Main port	G	O	PP
SGC2□□□-□□10	3/8	163	125.3	79.1
SGC2□□□-□□15	1/2	163	125.3	79.1
SGC3□□□-□□20	3/4	172.2	134.5	85
SGC4□□□-□□25	1	196.2	158.5	96

M12 connector



Model	Main port	G	O	PP
SGC2□□□-□□10	3/8	163	125.3	79.1
SGC2□□□-□□15	1/2	163	125.3	79.1
SGC3□□□-□□20	3/4	172.2	134.5	85
SGC4□□□-□□25	1	196.2	158.5	96



Series SGC

Specific Product Precautions 1

Be sure to read this before handling. Refer to the back cover for Safety Instructions.

For 2 Port Solenoid Valves for Fluid Control Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual on SMC website, <http://www.smc.eu>

Design

⚠ Warning

Extended periods of continuous energization

If a valve is continuously energised for long periods, 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 energised for long periods, or its daily energised state exceeds its non energised state, please use an energy saving type valve with DC voltage. Additionally, when using with AC voltage, energising for long periods of time continuously, select the air-operated valve and use the continuous duty type of the VT307 for a pilot valve.

Fluid Quality

⚠ Warning

Although the product has a scraper to prevent foreign matter from entering into the product, fluid containing fine foreign matter such as abrasive powder may cause sealing failure by the foreign matter adhering to the rod sliding part. Perform periodic maintenance or take countermeasures. Sealing failure of the rod sliding surface will allow reverse flow of the fluid in the pilot air piping, entering into the pilot valve or circuit connected to the pilot air piping, causing adverse effects such as operation failure or leakage.

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

4. When mounted in the vertical downward direction, foreign matter can remain in the plate assembly part if there is foreign matter in the coolant. For this reason, avoid mounting in the vertical downward direction as much as possible.

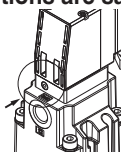
Manual Override

⚠ Warning

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

■ Non-locking push type

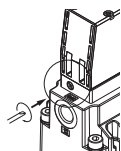
Press in the direction of the arrow.



■ Push-turn

locking slotted type [D type]

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



Manual Override

⚠ Caution

When operating the locking type D with a screwdriver, turn it gently using a flat blade watchmaker's screwdriver. [Torque: Less than 0.1 N·m]

When locking the manual override on the push-turn locking 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.

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 a malfunction or coil damage.

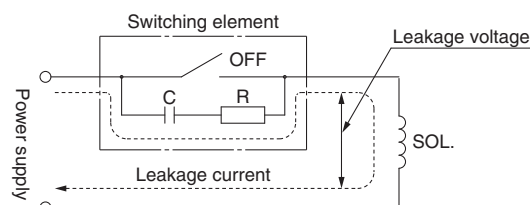
2. Check the connections.

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 circuit (surge voltage suppressor) is used for protecting a switching element because of the passing leakage voltage through the C-R circuit. The suppressor residual leakage voltage should be as follows.



DC coil

3% or less of rated voltage.

AC coil

8% or less of rated voltage. (For 0.35 W type: Pilot valve V116)

15% or less of rated voltage. (For 1.8 W type: Pilot valve VO307)

Operating Environment

⚠ Caution

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

Maintenance

⚠ Warning

Do not disassemble the product. Products which have been disassembled cannot be guaranteed. Especially, do not remove the type C retaining ring in the cover of NC valve. Piston or spring will jump out and might cause injury.



Series SGC

Specific Product Precautions 2

Be sure to read this before handling. Refer to the back cover for Safety Instructions.

For 2 Port Solenoid Valves for Fluid Control Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual on SMC website, <http://www.smc.eu>

Precautions on 0.35 W Type [Pilot Valve V116]

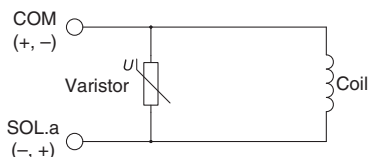
Light/Surge Voltage Suppressor

Caution

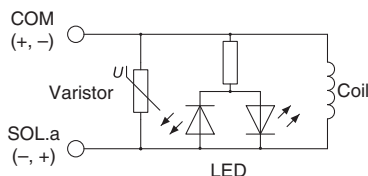
<For DC>

Conduit terminal (Non-polar type)

With surge voltage suppressor (TS)

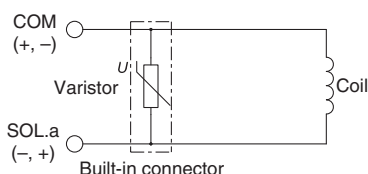


With light/surge voltage suppressor (TZ)

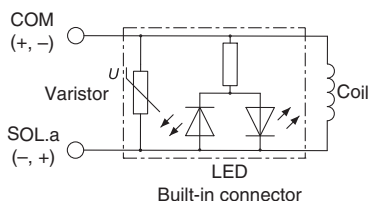


DIN terminal (Non-polar type)

With surge voltage suppressor (DS)

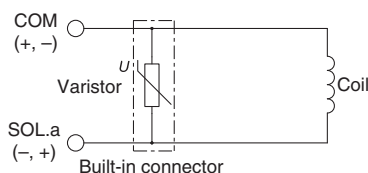


With light/surge voltage suppressor (DZ)

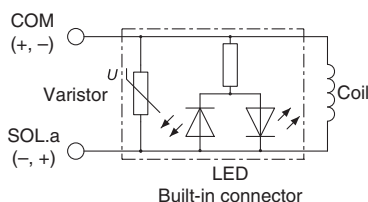


M12 connector (Non-polar type)

With surge voltage suppressor (WS/VS)



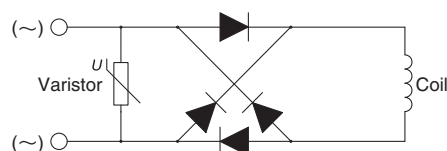
With light/surge voltage suppressor (WZ/VZ)



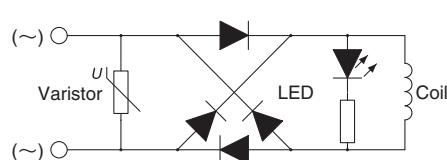
<For AC>

Conduit terminal

With surge voltage suppressor (TS)

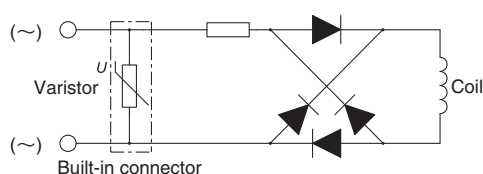


With light/surge voltage suppressor (TZ)

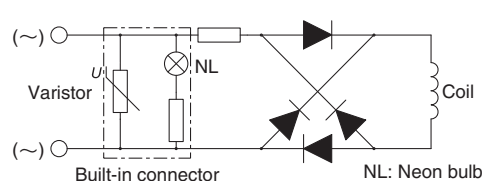


DIN terminal

With surge voltage suppressor (DS)

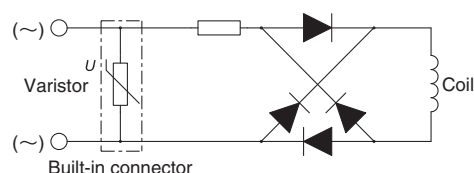


With light/surge voltage suppressor (DZ)

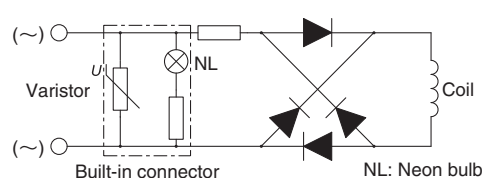


M12 connector

With surge voltage suppressor (WS)



With light/surge voltage suppressor (WZ)





Series SGC

Specific Product Precautions 3

Be sure to read this before handling. Refer to the back cover for Safety Instructions.

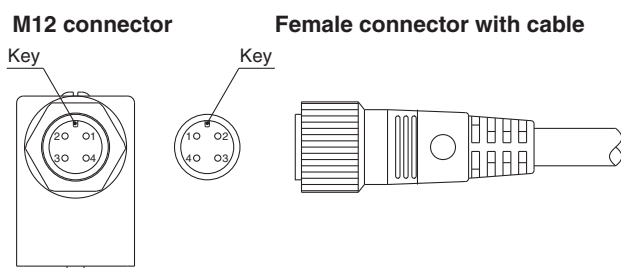
For 2 Port Solenoid Valves for Fluid Control Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual on SMC website, <http://www.smc.eu>

M12 Connector

⚠ Caution

1. M12 connector types of the pilot valve V116 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.

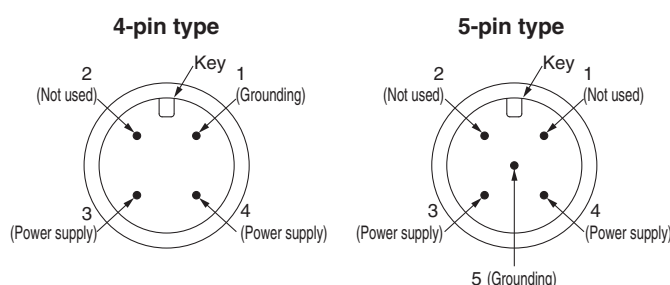
Please note that if a connector other than the one stated above is used or if the connector is not tightened enough, the IP65 standards will not be satisfied.



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.

■ Pin assignment of M12 connector on valve side



How to Use Conduit Terminal

⚠ Caution

Connection

1. Loosen the holding screw and remove the cover from the terminal block.
2. Loosen the 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, please note that using other than the supported size (Ø 4.5 to Ø 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

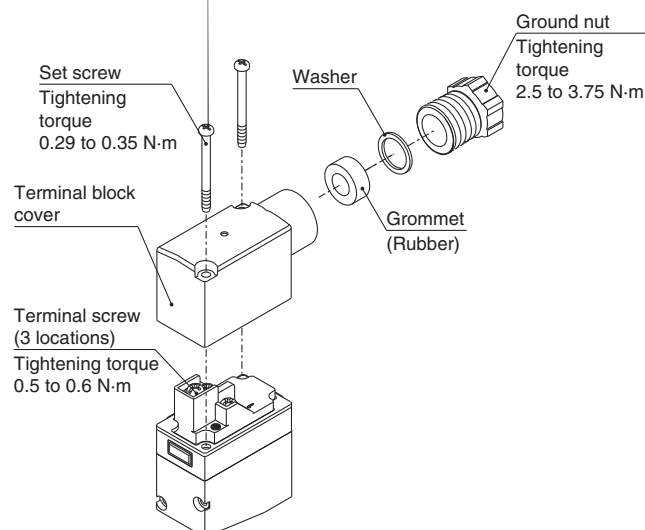
Cord O.D.: Ø 4.5 to Ø 7

(Reference) 0.5 to 1.5 mm², 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 SGC

Specific Product Precautions 4

Be sure to read this before handling. Refer to the back cover for Safety Instructions.

For 2 Port Solenoid Valves for Fluid Control Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual on SMC website, <http://www.smc.eu>

Precautions on 0.35 W Type [Pilot Valve V116]

How to Use DIN Terminal

Caution

Connection

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 blade 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 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, please note that using other than the supported size ($\varnothing 4.5$ to $\varnothing 7$) 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.: $\varnothing 4.5$ to $\varnothing 7$

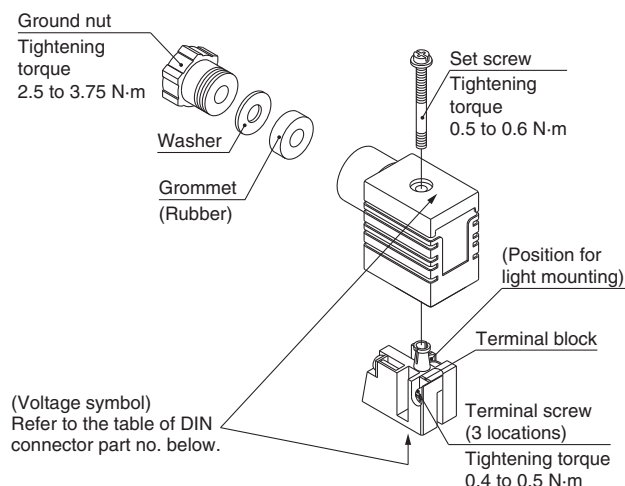
(Reference) 0.5 to 1.5 mm², 2-core or 3-core, equivalent to JIS C 3306

Applicable crimped terminals

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

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

Rod-terminals: Up to size 1.5



Caution

DIN Connector Part No.

Without light	Only DC voltage	V100-61-1
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With Surge Voltage Suppressor

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

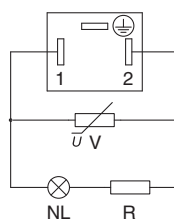
With Light/Surge Voltage Suppressor

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

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

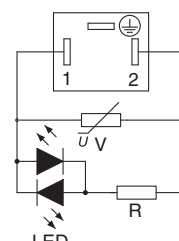
Circuit Diagram with Light/Surge Voltage Suppressor

AC circuit diagram



NL: Neon bulb, R: Resistor
V: Varistor

DC circuit diagram



LED: Emitting diode, R: Resistor
V: Varistor

Response

Caution

Pilot valve V116 is a low power consumption type. The response is slower than the VNC series. If the response time is a problem, use products below.

SGC200/300/400: Made to Order (Part number suffix “-X1”)

See page 16.

SGC500/600/700: Installed pilot valve VO307 (1.8 W type)

See page 5.



Series SGC

Specific Product Precautions 5

Be sure to read this before handling. Refer to the back cover for Safety Instructions.

For 2 Port Solenoid Valves for Fluid Control Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual on SMC website, <http://www.smc.eu>

Precautions on 1.8 W Type [Pilot Valve VO307]

How to Use DIN Terminal

Disassembly

- 1) Loosen screw ① and pull up housing ② in the direction of screw ① to remove the connector from the body (solenoid).
- 2) Pull out screw ① from housing ②.
- 3) On the bottom part of terminal block ③, there is a notch ⑨. If a small flat blade screwdriver is inserted into the gap between housing ② and terminal block ③, terminal block ③ will be removed from housing ②. (Refer to the figure below.)
- 4) Remove cable gland ④, washer ⑤ and rubber seal ⑥.

Wiring

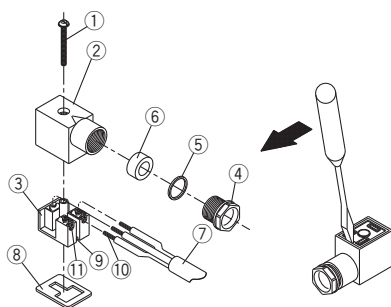
- 1) Insert cable gland ④, washer ⑤ and rubber seal ⑥ into cable ⑦ in order, and insert it into housing ②.
- 2) Loosen screws ⑪ on terminal block ③. Insert lead wires ⑩ and tighten screws ⑪ again.
Note 1) The tightening torque should be 0.5 N·m \pm 15 %.
Note 2) The applicable outside diameter of cable ⑦ is \varnothing 6 to \varnothing 8 mm.
Note 3) Round or Y-shaped crimped terminal cannot be used.

Assembly

- 1) Insert cable gland ④, washer ⑤ and rubber seal ⑥ and housing ② into cable ⑦ in order. Connect cable ⑦ to terminal block ③ and fix terminal block ③ to housing ② in place. Insert the terminal block until it makes a click sound.
- 2) Insert rubber seal ⑥ and washer ⑤ into the cable entry on housing ② in order, and tighten cable gland ④ securely.
- 3) Insert gasket ⑧ into the gap between the bottom of terminal block ③ and plug on the equipment, and insert screw ① from the top of housing ② to tighten them.
Note 1) The tightening torque should be 0.5 N·m \pm 20 %.
Note 2) The orientation of the connector can be changed by 180 degrees depending on the mounting direction of housing ② and terminal block ③.

DIN Terminal Connector

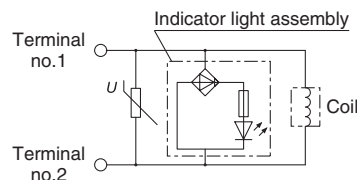
Description	Part no.
DIN connector	GM209NJ-B17 (CE-compliant)



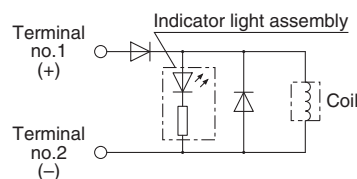
Light/Surge Voltage Suppressor

Caution

AC



DC

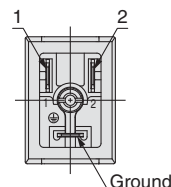


Electrical Wiring

Caution

The DIN connector terminal and conduit terminal (with indicator light/surge voltage suppressor) are wired internally as shown below. Connect each terminal to the corresponding wire of the power supply.

DIN terminal block



Terminal no.	1	2
DIN terminal	+	-




- Applicable cord O.D.
D type: \varnothing 6 to \varnothing 8

Lead Wire Colour

Voltage	Colour
100 V AC	Blue
200 V AC	Red
DC	Red (+), Black (-)
Other	Grey

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.

-  **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.

- *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.

Warning

- 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 catalogue information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- 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.
- Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
 - 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.
 - 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.
 - Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
 - Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
 - 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 catalogue.
 - An application which could have negative effects on people, property, or animals requiring special safety analysis.
 - 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.

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

- The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
- 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.
- Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalogue 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

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

Caution

- 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.

Caution

SMC products are not intended for use as instruments for legal metrology.
Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

Safety Instructions

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

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