

5 Port Solenoid Valve

Series SY3000/5000/7000/9000

Base Mounted

Single Unit



Refer to www.smcworld.com for details of products compatible with overseas standards.

How to Order

SY **5** **2** 40 **5** **L** **-Q**

Series

3	SY3000
5	SY5000
7	SY7000
9	SY9000

Type of actuation

1	2 position single
2	2 position double
3	3 position closed center
4	3 position exhaust center
5	3 position pressure center

Pilot type

-	Internal pilot
R	External pilot

Coil specifications

-	Standard
T	With power saving circuit (24, 12 VDC only)

* Power saving circuit is not available in the case of D, DO or W□ type.

Rated voltage

For DC	
5	24 VDC
6	12 VDC
V	6 VDC
S	5 VDC
R	3 VDC

For AC (50/60 Hz)

1	100 VAC
2	200 VAC
3	110 VAC [115 VAC]
4	220 VAC [230 VAC]

* DC specifications of type D and DO is only available with 12 and 24 VDC.
* AC specification is only available with D, DO type.

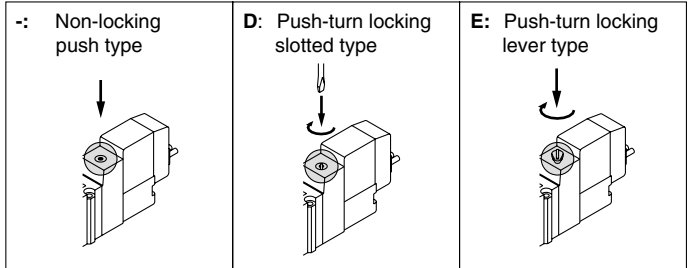
Port size

Symbol	Port size	Applicable series
-	Without sub-plate	
01	1/8 With sub-plate	SY3000
02	1/4 With sub-plate	SY5000 SY7000
03	3/8 With sub-plate	SY7000 SY9000
04	1/2 With sub-plate	SY9000

Thread type

-	Rc
F	G
N	NPT
T	NPTF

Manual override



(Light/surge voltage suppressor)

Electrical entry for G, H, L, M, W

-	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z	With light/surge voltage suppressor
R	With surge voltage suppressor (Non-polar type)
U	With light/surge voltage suppressor (Non-polar type)

* Power saving circuit is only available in the "Z" type.

Electrical entry for D (Except SY3000)

-	Without light/surge voltage suppressor
S	With surge voltage suppressor (Non-polar type)
Z	With light/surge voltage suppressor (Non-polar type)

* DOZ is not available.
* For AC voltage valves there is no "S" option. It is already built-in to the rectifier circuit.

Electrical entry

24, 12, 6, 5, 3 VDC				24, 12 VDC/ 100, 110, 200, 220 VAC	24, 12, 6, 5, 3 VDC
Grommet	L plug connector	M plug connector		DIN terminal	M8 connector *
<p>G: Lead wire length 300 mm</p>	<p>L: With lead wire (Length 300 mm)</p>	<p>M: With lead wire (Length 300 mm)</p>	<p>MN: Without lead wire</p>	<p>(Except SY3000) D: With connector</p>	<p>W□: Without connector cable</p>
<p>H: Lead wire length 600 mm</p>	<p>LN: Without lead wire</p>	<p>LO: Without connector</p>	<p>MO: Without connector</p>	<p>DO: Without connector</p>	<p>W□: With connector cable (Note 1)</p>

* LN, MN type: with 2 sockets.
* For DIN terminal of SY3000 series, refer to back page 10.

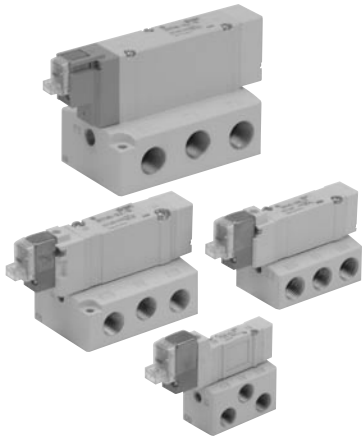
* DIN terminal type "Y" which conforms to EN-175301-803C (former DIN43650C) is also available. For details, refer to page 210.

* For connector cable of M8 connector, refer to back page 12.
* Connector M8 type "WA" conforming to IEC 60947-5-2 standard, is also available. For details, see page 211.

Note 1) Enter the cable length symbols in □. Please be sure to fill in the blank referring to back page 13.

SY3000/5000/7000/9000 Base Mounted

Specifications



Made to Order

(For details, refer to pages 199 through to 213.)

Series		SY3000	SY5000	SY7000	SY9000
Fluid		Air			
Internal pilot Operating pressure range(MPa)	2 position single	0.15 to 0.7			
	2 position double	0.1 to 0.7			
	3 position	0.2 to 0.7			
External pilot Operating pressure range(MPa)	Operating pressure range		-100 kPa to 0.7		
	Pilot pressure range	2 position single	0.25 to 0.7		
		2 position double	0.25 to 0.7		
		3 position	0.25 to 0.7		
Ambient and fluid temperature (°C)		-10 to 50 (No freezing. Refer to back page 3.)			
Max. operating frequency (Hz)	2 Position single, Double	10	5	5	5
	3 position	3	3	3	3
Manual override (Manual operation)		Non-locking push type, Push-turn locking slotted type, Push-turn locking lever type			
Pilot exhaust method	Internal pilot	Common exhaust type for main and pilot valve			
	External pilot	Pilot valve individual exhaust			
Lubrication		Not required			
Mounting orientation		Unrestricted			
Impact/Vibration resistance (m/s ²) ^{Note)}		150/30			
Enclosure		Dust proof (* DIN terminal and M8 connector: IP65)			



* Based on IEC60529)

Note) Impact resistance: No malfunction occurred when it is tested in the axial direction and at the right angles to the main valve and armature in both energised and de-energised states every once for each condition. (Values at the initial period)

Vibration resistance: No malfunction occurred in a one-sweep test between 45 and 2000 Hz. Test was performed at both energised and de-energised states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)

Response Time



Note) Based on dynamic performance test, JIS B 8375-1981. (Coil temperature: 20°C, at rated voltage)

SY3000

Type of actuation	Response time (ms) (at the pressure of 0.5 MPa)		
	Without light/surge voltage suppressor	With light/surge voltage suppressor	
		Type S, Z	Type R, U
2 position single	12 or less	15 or less	12 or less
2 position double	10 or less	13 or less	10 or less
3 position	15 or less	20 or less	16 or less

SY5000

Type of actuation	Response time (ms) (at the pressure of 0.5 MPa)		
	Without light/surge voltage suppressor	With light/surge voltage suppressor	
		Type S, Z	Type R, U
2 position single	19 or less	26 or less	19 or less
2 position double	18 or less	22 or less	18 or less
3 position	32 or less	38 or less	32 or less

SY7000

Type of actuation	Response time (ms) (at the pressure of 0.5 MPa)		
	Without light/surge voltage suppressor	With light/surge voltage suppressor	
		Type S, Z	Type R, U
2 position single	31 or less	38 or less	33 or less
2 position double	27 or less	30 or less	28 or less
3 position	50 or less	56 or less	50 or less

SY9000

Type of actuation	Response time (ms) (at the pressure of 0.5 MPa)		
	Without light/surge voltage suppressor	With light/surge voltage suppressor	
		Type S, Z	Type R, U
2 position single	35 or less	41 or less	35 or less
2 position double	35 or less	41 or less	35 or less
3 position	62 or less	64 or less	62 or less

Solenoid Specifications

Electrical entry	Grommet (G), (H) L plug connector (L) M plug connector (M)		DIN terminal (D) M8 connector (W)
	G, H, L, M, W		D
Coil rated voltage (V)	DC	24, 12, 6, 5, 3	24, 12
	AC 50/60 Hz	100, 110	200, 220
Allowable voltage fluctuation (%)	±10% of rated voltage *		
Power consumption (W)	DC	Standard	0.35 (With indicator light: 0.4 DIN terminal with indicator light: 0.45)
		With power saving circuit	0.1 (With indicator light only)
Apparent power (VA) *	AC	100 V	-
		110 V	-
		[115 V]	0.78 (With indicator light: 0.87)
		200 V	0.86 (With indicator light: 0.97)
		[230 V]	[0.94 (With indicator light: 1.07)]
Surge voltage suppressor	Diode (Varistor is for DIN terminal and Non-polar type.)		
	Indicator light LED (AC of DIN connector is neon light.)		



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

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

* S, Z and T type (with power saving circuit) should be used within the following allowable voltage fluctuation range due to a voltage drop caused by the internal circuit.

S and Z type: 24 VDC: -7% to +10%

12 VDC: -4% to +10%

T type: 24 VDC: -8% to +10%

12 VDC: -6% to +10%

Base Mounted

Flow Characteristics/Weight

Series SY3000

Valve model	Type of actuation		Port size	Flow characteristics ^{Note 1)}								Weight (g) ^{Note 2)}		
				1 → 4/2 (P → A/B)				4/2 → 5/3 (A/B → EA/EB)				Grommet	L plug connector, M plug connector	W M8 connector
				C (dm ³ /(s·bar))	b	Cv	Q _l /(min(ANR))	C (dm ³ /(s·bar))	b	Cv	Q _l /(min(ANR))			
SY3□40-□-01	2 position	Single	1/8	1.0	0.30	0.24	254	1.1	0.30	0.26	280	84 [50]	85 [53]	89 [57]
		Double		0.77	0.28	0.18	193	0.85	0.30	0.19	216			
	3 position	Closed center		0.73	0.31	0.18	187	1.1 (0.55)	0.26 (0.52)	0.24 (0.16)	273 (164)	104 [69]	109 [74]	117 [82]
		Exhaust center		1.2 (0.51)	0.24 (0.45)	0.29 (0.14)	294 (144)	0.89	0.47	0.24	255			

Note 1) []: denotes the normal position. Note 2) []: denotes without sub-plate.
 * These values have been calculated according to ISO6358 and represent the flow rate measured in standard conditions at an upstream pressure of 0.6 MPa (relative pressure) and a differential pressure of 0.1MPa.

Series SY5000

Valve model	Type of actuation		Port size	Flow characteristics ^{Note 1)}								Weight (g) ^{Note 2)}			
				1 → 4/2 (P → A/B)				4/2 → 5/3 (A/B → EA/EB)				Grommet	L plug connector, M plug connector	DIN terminal	W M8 connector
				C (dm ³ /(s·bar))	b	Cv	Q _l /(min(ANR))	C (dm ³ /(s·bar))	b	Cv	Q _l /(min(ANR))				
SY5□40-□-02	2 position	Single	1/4	2.4	0.41	0.64	658	2.8	0.29	0.66	707	121 [58]	123 [61]	154 [92]	127 [65]
		Double		1.8	0.47	0.50	516	1.8	0.40	0.47	490				
	3 position	Closed center		1.4	0.55	0.44	430	3.0 (1.2)	0.33 (0.48)	0.72 (0.37)	778 (347)	144 [82]	150 [87]	192 [129]	158 [95]
		Exhaust center		3.3 (0.84)	0.36 (0.60)	0.85 (0.28)	873 (270)	1.8	0.40	0.48	490				

Note 1) []: denotes the normal position. Note 2) []: denotes without sub-plate.
 * These values have been calculated according to ISO6358 and represent the flow rate measured in standard conditions at an upstream pressure of 0.6 MPa (relative pressure) and a differential pressure of 0.1MPa.

Series SY7000

Valve model	Type of actuation		Port size	Flow characteristics ^{Note 1)}								Weight (g) ^{Note 2)}			
				1 → 4/2 (P → A/B)				4/2 → 5/3 (A/B → EA/EB)				Grommet	L plug connector, M plug connector	DIN terminal	W M8 connector
				C (dm ³ /(s·bar))	b	Cv	Q _l /(min(ANR))	C (dm ³ /(s·bar))	b	Cv	Q _l /(min(ANR))				
SY7□40-□-02	2 position	Single	1/4	4.1	0.41	1.1	1123	4.1	0.29	1.0	1036	218 [89]	221 [92]	242 [113]	225 [96]
		Double		3.0	0.43	0.80	834	2.6	0.41	0.72	712				
	3 position	Closed center		2.6	0.42	0.71	718	4.7 (1.7)	0.35 (0.48)	1.1 (0.49)	1235 (492)	239 [110]	245 [116]	287 [158]	253 [124]
		Exhaust center		5.3 (2.3)	0.39 (0.49)	1.3 (0.65)	1431 (670)	2.2	0.49	0.63	641				
SY7□40-□-03	2 position	Single	3/8	4.9	0.29	1.2	1238	4.5	0.27	1.1	1123	218 [89]	221 [92]	242 [113]	225 [96]
		Double		3.0	0.40	0.80	816	2.6	0.45	0.73	734				
	3 position	Closed center		2.6	0.42	0.71	718	4.8 (1.7)	0.35 (0.48)	1.1 (0.49)	1261 (492)	239 [110]	245 [116]	287 [158]	253 [124]
		Exhaust center		5.3 (2.3)	0.31 (0.51)	1.3 (0.64)	1356 (682)	2.3	0.45	0.66	649				

Note 1) []: denotes the normal position. Note 2) []: denotes without sub-plate.
 * These values have been calculated according to ISO6358 and represent the flow rate measured in standard conditions at an upstream pressure of 0.6 MPa (relative pressure) and a differential pressure of 0.1MPa.

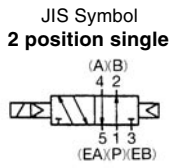
Series SY9000

Valve model	Type of actuation		Port size	Flow characteristics ^{Note 1)}								Weight (g) ^{Note 2)}			
				1 → 4/2 (P → A/B)				4/2 → 5/3 (A/B → EA/EB)				Grommet	L plug connector, M plug connector	DIN terminal	W M8 connector
				C (dm ³ /(s·bar))	b	Cv	Q _l /(min(ANR))	C (dm ³ /(s·bar))	b	Cv	Q _l /(min(ANR))				
SY9□40-□-03	2 position	Single	3/8	7.9	0.34	2.0	2062	9.6	0.43	2.6	2670	469 [172]	472 [175]	493 [196]	476 [179]
		Double		7.5	0.33	1.8	1944	7.3	0.30	1.7	1856				
	3 position	Closed center		7.2	0.34	1.7	1879	13 (4.0)	0.23 (0.41)	2.8 (0.95)	3168 (1096)	512 [215]	518 [221]	560 [263]	526 [229]
		Exhaust center		12 (3.3)	0.26 (0.41)	2.8 (0.84)	2977 (904)	6.7	0.40	1.9	1823				
SY9□40-□-04	2 position	Single	1/2	8.0	0.48	2.2	2313	10	0.29	2.5	2527	448 [172]	453 [175]	472	457 [179]
		Double		7.6	0.32	1.8	1957	7.3	0.32	1.8	1880				
	3 position	Closed center		7.3	0.42	2.0	2015	13 (4.7)	0.32 (0.54)	3.6 (1.5)	3348 (1430)	491 [215]	497 [221]	539	505 [229]
		Exhaust center		12 (3.3)	0.33 (0.51)	3.3 (0.94)	3111 (978)	7.4	0.33	1.9	1918				

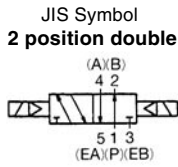
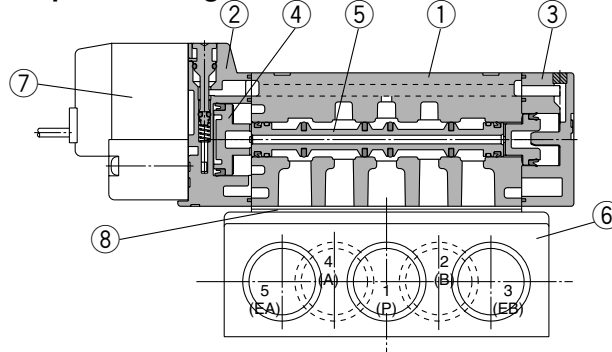
Note 1) []: denotes the normal position. Note 2) []: denotes without sub-plate.
 * These values have been calculated according to ISO6358 and represent the flow rate measured in standard conditions at an upstream pressure of 0.6 MPa (relative pressure) and a differential pressure of 0.1MPa.

Construction

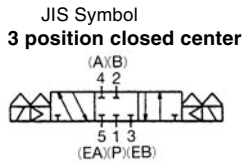
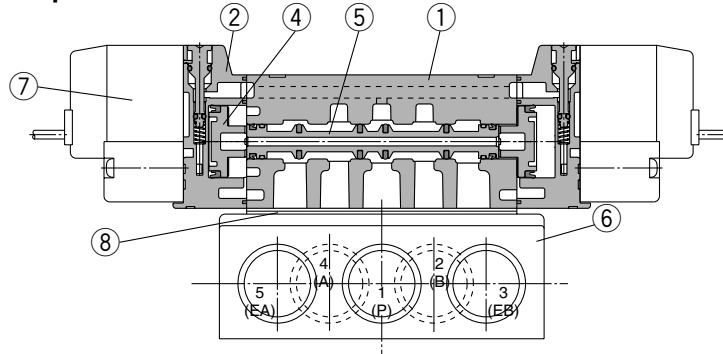
Series SY



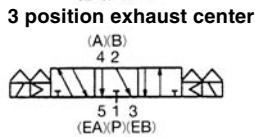
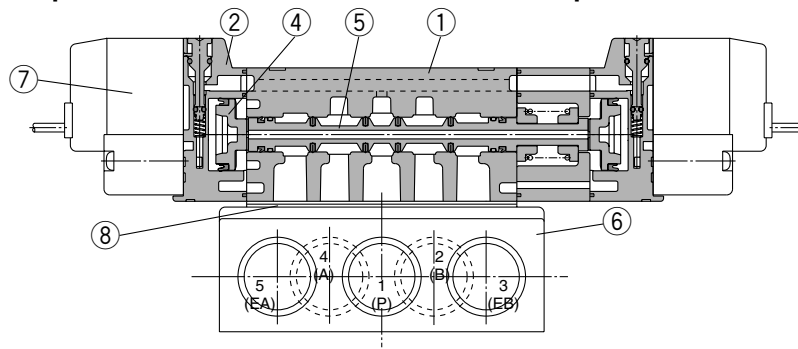
2 position single



2 position double



3 position closed center / exhaust center / pressure center



3 position pressure center



(This figure shows a closed center type.)

Component Parts

No.	Description	Material	Note
1	Body	Aluminum die-casted (SY3000: Zinc die-casted)	White
2	Adapter plate	Resin	White (SY9000: Gray)
3	End plate	Resin	White
4	Piston	Resin	-
5	Spool valve assembly	Aluminum, HNBR	-

Replacement Parts

No.	Description	Part No.				Note
		SY3□40	SY5□40	SY7□40	SY9□40	
6	Sub-plate	SY3000-27-1* ¹ -Q	SY5000-27-1* ¹ -Q	1/4: SY7000-27-1* ¹ -Q 3/8: SY7000-27-2* ¹ -Q	3/8: SY9000-27-1* ¹ -Q 1/2: SY9000-27-2* ¹ -Q	Aluminum die-casted
7	Pilot valve assembly	Refer to "How to Order Pilot Valve Assembly" on page 23.				
8	Gasket	SY3000-11-25	SY5000-11-15	SY7000-11-11	SY9000-11-2	H-NBR
-	Round head combination screw	SY3000-23-4 (M2 x 21)	M3 x 26	M4 x 31	SY9000-18-2 (M3 x 42)	For valve mounting (Matt nickel plated)

* Thread type

Caution

Mounting screw
tightening torques

M2: 0.16 N·m

M3: 0.8 N·m

M4: 1.4 N·m

Base Mounted

How to Order Pilot Valve Assembly

V111 5 G

Coil specifications

-	Standard
T	With power saving circuit (24 VDC, 12 VDC only)

* Power saving circuit is not available in the case of D, DO or W type.

Rated voltage

5	24 VDC
6	12 VDC
V	6 VDC
S	5 VDC
R	3 VDC

Light/surge voltage suppressor

-	Without light/surge voltage suppressor
S	With surge voltage suppressor
Z	With light/surge voltage suppressor
R	With surge voltage suppressor (Non-polar type)
U	With light/surge voltage suppressor (Non-polar type)

* Power saving circuit is only available in the "Z" type.

Electrical entry

G	Grommet, 300 mm lead wire	
H	Grommet, 600 mm lead wire	
L	L plug connector	With lead wire
LN		Without lead wire
LO		Without connector
M	M plug connector	With lead wire
MN		Without lead wire
MO		Without connector
WO	M8	Without connector cable
W <input type="checkbox"/>	connector	With connector cable ^{Note 1)}

* For connector cable of M8 connector, refer to back page 12.

Note 1) Enter the cable length symbols in . Please be sure to fill in the blank referring to back page 13.

How to Order Connector Assembly for L/M Plug Connector

For DC: SY100-30-4A

Without lead wire: SY100-30-A

Only connector and sockets (x 2 pcs.)

Lead wire length

-	300 mm
6	600 mm
10	1000 mm
15	1500 mm
20	2000 mm
25	2500 mm
30	3000 mm
50	5000 mm

■ DIN terminal type

V115 5 D

Rated voltage

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

* DC specifications of type D and DO is only available with 12 and 24 VDC.

Light/surge voltage suppressor

-	Without light/surge voltage suppressor
S	With surge voltage suppressor (Non-polar type)
Z	With light/surge voltage suppressor (Non-polar type)

* DOZ is not available.
* For AC voltage valves there is no "S" option. It is already built-in to the rectifier circuit.

Electrical entry

D	DIN	With connector
DO	terminal	Without connector

Note) Do not replace V111 (G, H, L, M) to V115 (DIN terminal) and vice versa when replacing pilot valve assembly only.

How to Order M8 Connector Cable

■ Straight type

V100-49-1

Cable length

1	300 mm
2	500 mm
3	1000 mm
4	2000 mm
7	5000 mm

How to Order Interface Regulator

Series SY3000

ARBY3000-05-P-2

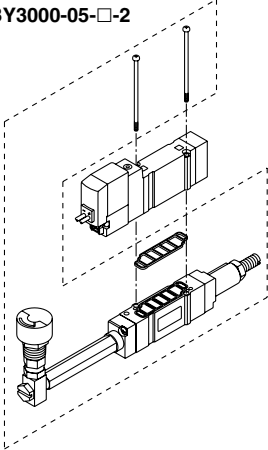
Pressure gauge connection port

05	Pressure gauge (G15-10-01)
M1	Plug (M-5P)

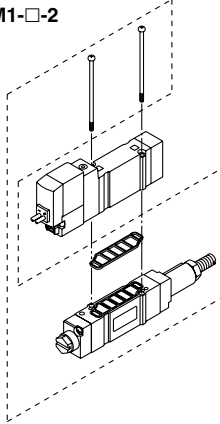
Regulating port

P	P port
A1	A port (P controlled type, A port regulation)
B1	B port (P controlled type, B port regulation)

ARBY3000-05-□-2



ARBY3000-M1-□-2



Series SY5000

ARBY5000-00-P-2

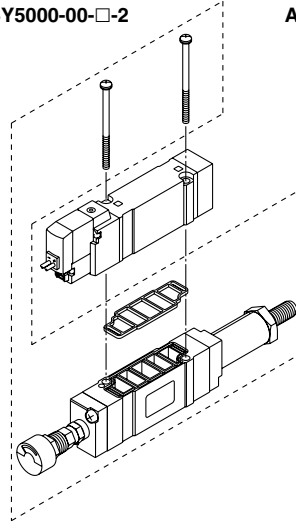
Pressure gauge connection port

00	Pressure gauge (G15-10-01)
M1	Plug (M-5P)

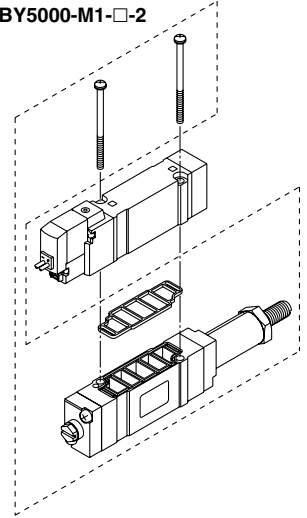
Regulating port

P	P port
A1	A port (P controlled type, A port regulation)
B1	B port (P controlled type, B port regulation)

ARBY5000-00-□-2



ARBY5000-M1-□-2



Series SY7000

ARBY7000-00-P-2

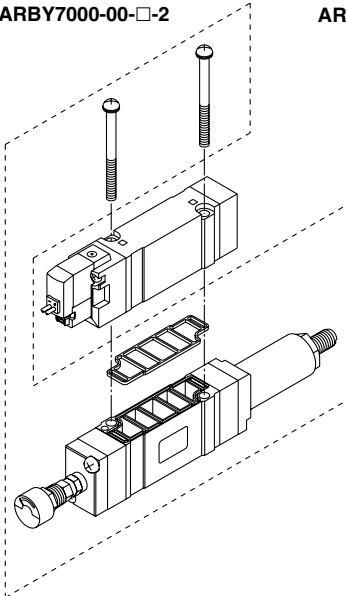
Pressure gauge connection port

00	Pressure gauge (G15-10-01)
M1	Plug (M-5P)

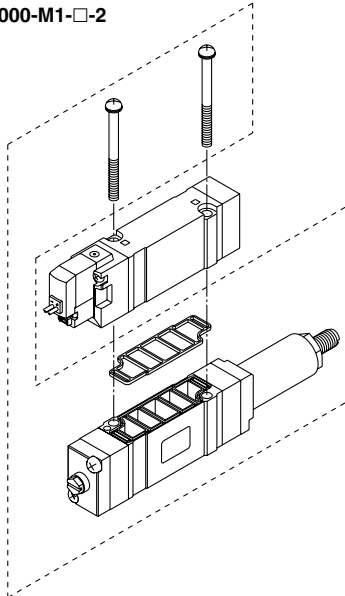
Regulating port

P	P port
A1	A port (P controlled type, A port regulation)
B1	B port (P controlled type, B port regulation)

ARBY7000-00-□-2



ARBY7000-M1-□-2



Accessory

Series	Round head combination screw	Gasket
ARBY3000	SY3000-23-10 (M2 x 36)	SX3000-57-4
ARBY5000	M3 x 48.5, Matt nickel plated	SX5000-57-6
ARBY7000	M4 x 57, Matt nickel plated	SX7000-57-4

⚠ Caution

Mounting screw
tightening torques

M2: 0.16 N·m

M3: 0.8 N·m

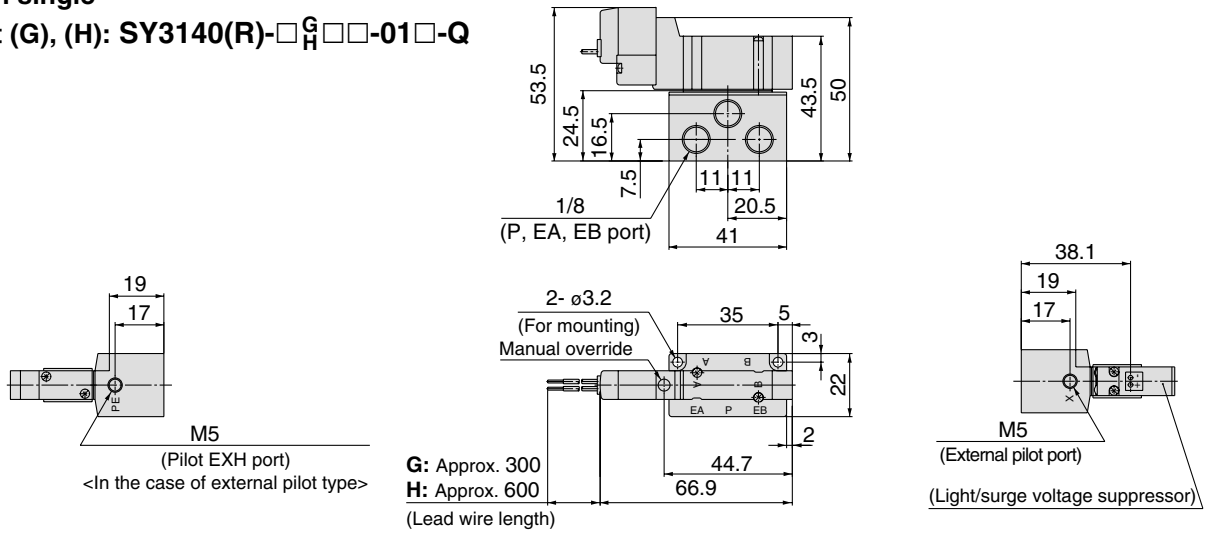
M4: 1.4 N·m

Base Mounted

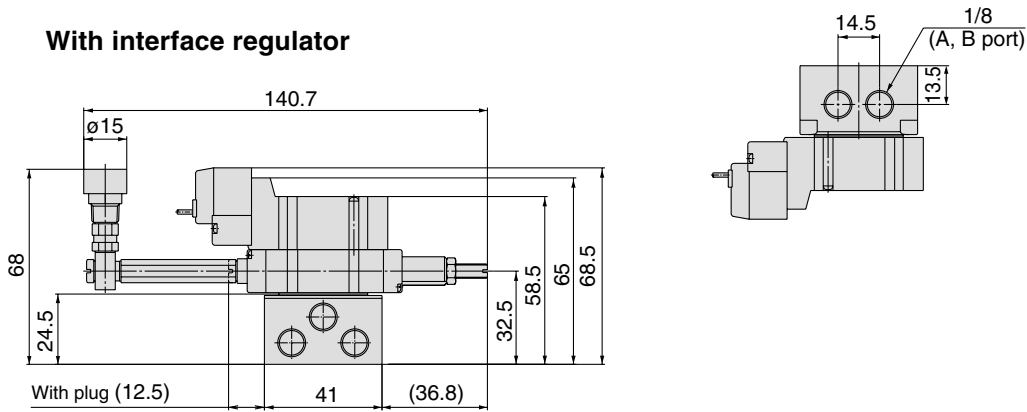
Dimensions: Series SY3000

2 position single

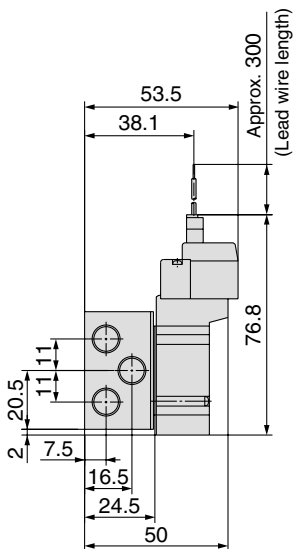
Grommet (G), (H): SY3140(R)-□^G□□-01□-Q



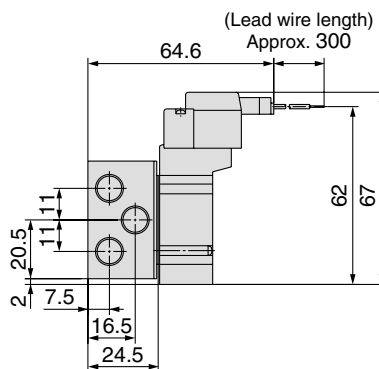
With interface regulator



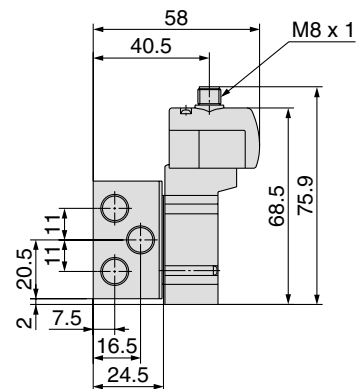
L plug connector (L):
SY3140(R)-□L□□-01□-Q



M plug connector (M):
SY3140(R)-□M□□-01□-Q



M8 connector (WO):
SY3140(R)-□WO□□-01□-Q



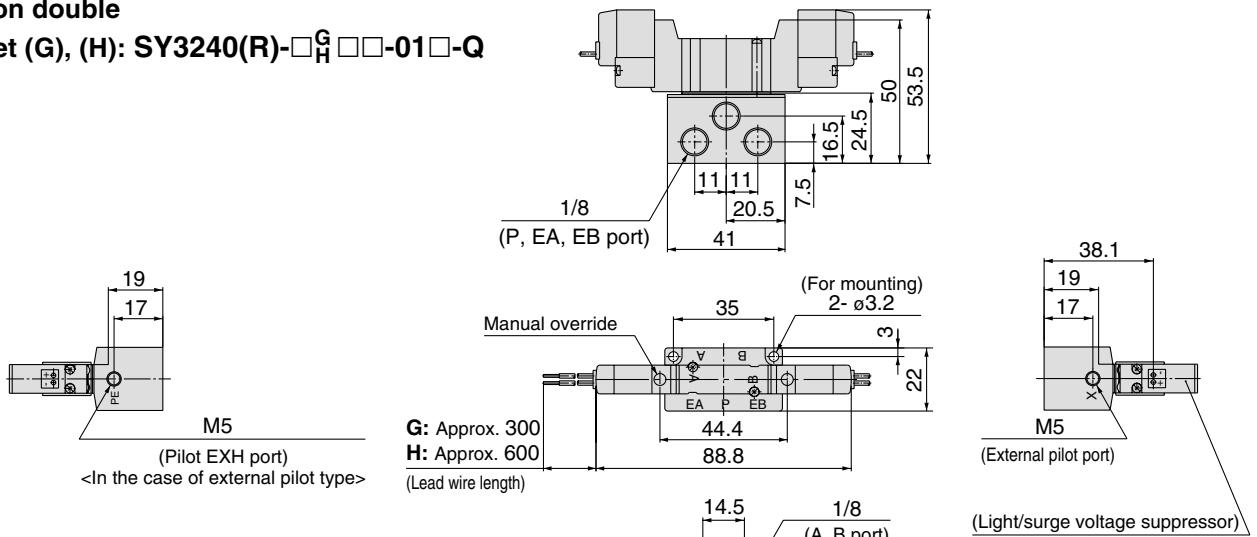
Note) Refer to back page 12 for dimensions of connector types.

SY3000/5000/7000/9000 Base Mounted

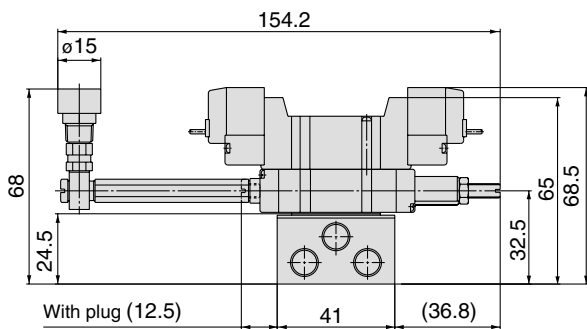
Dimensions: Series SY3000

2 position double

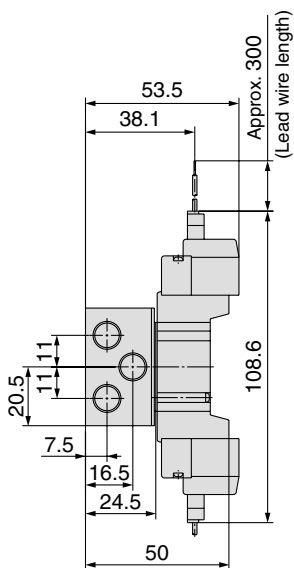
Grommet (G), (H): SY3240(R)-□^G_H□□-01□-Q



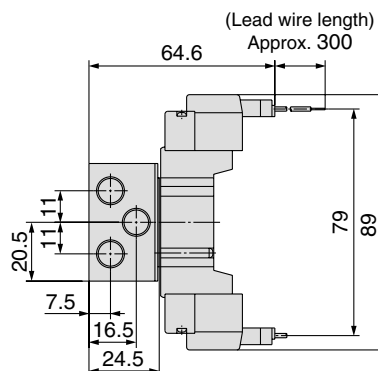
With interface regulator



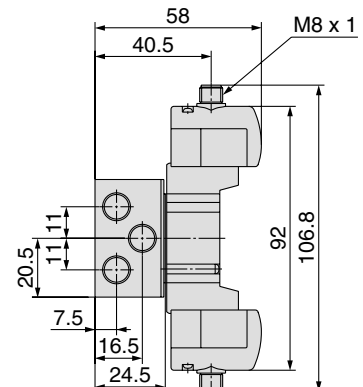
L plug connector (L):
SY3240(R)-□L□□-01□-Q



M plug connector (M):
SY3240(R)-□M□□-01□-Q



M8 connector (WO):
SY3240(R)-□WO□□-01□-Q



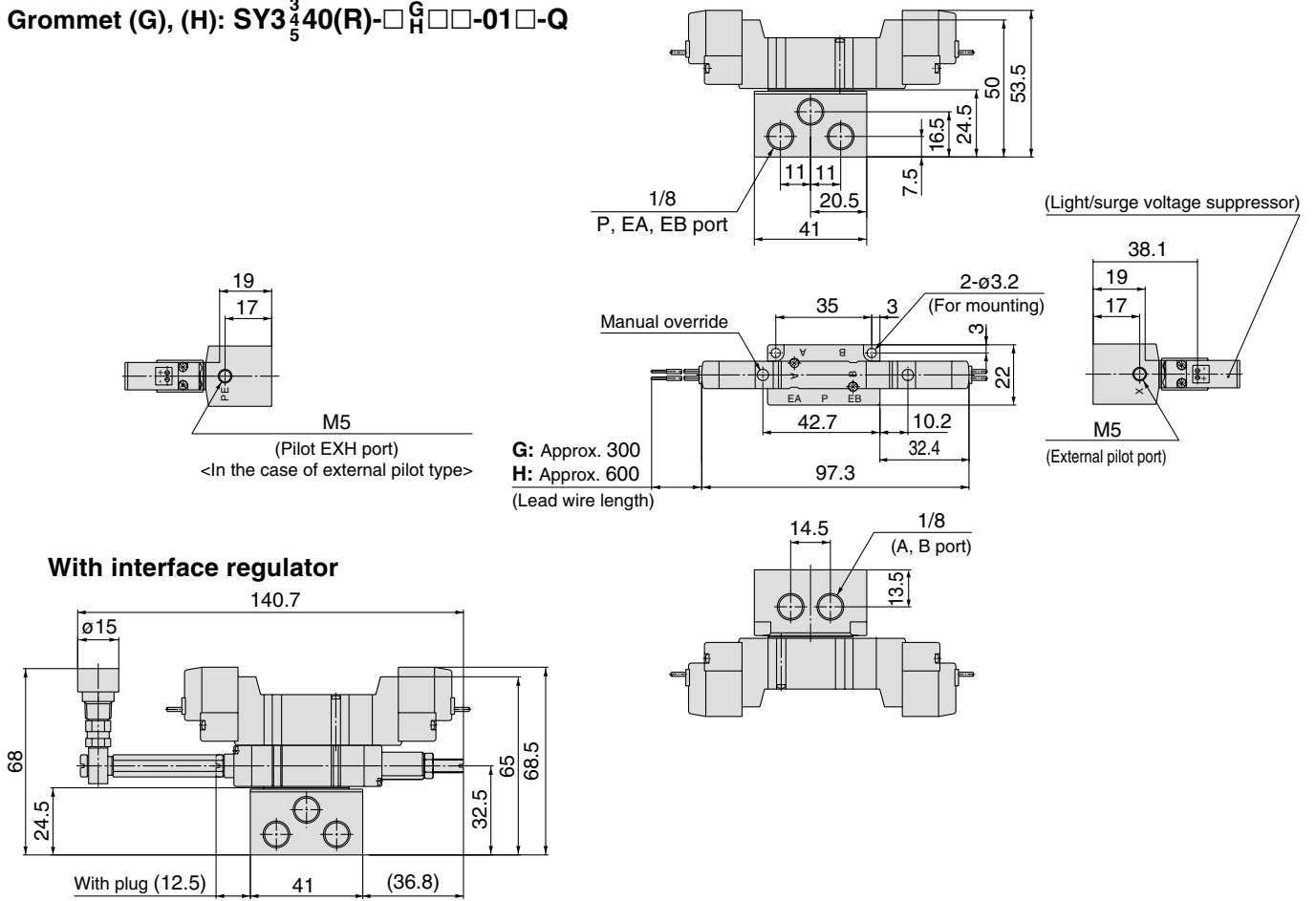
Note) Refer to back page 12 for dimensions of connector types.

Base Mounted

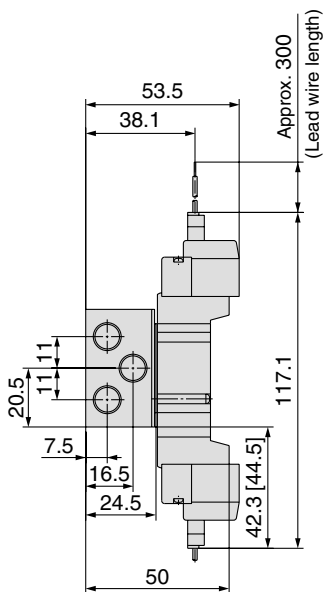
Dimensions: Series SY3000

3 position closed center / exhaust center / pressure center

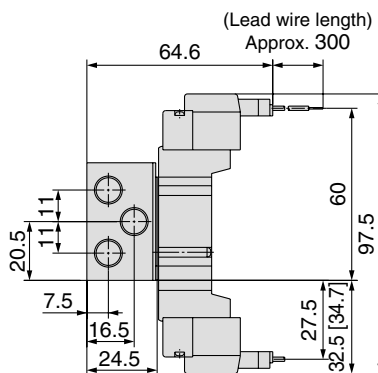
Grommet (G), (H): SY3³/₅40(R)-□^G□□-01□-Q



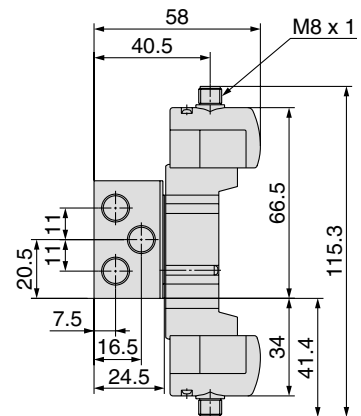
L plug connector (L):
SY3³/₅40(R)-□L□□-01□-Q



M plug connector (M):
SY3³/₅40(R)-□M□□-01□-Q



M8 connector (WO):
SY3³/₅40(R)-□WO□□-01□-Q



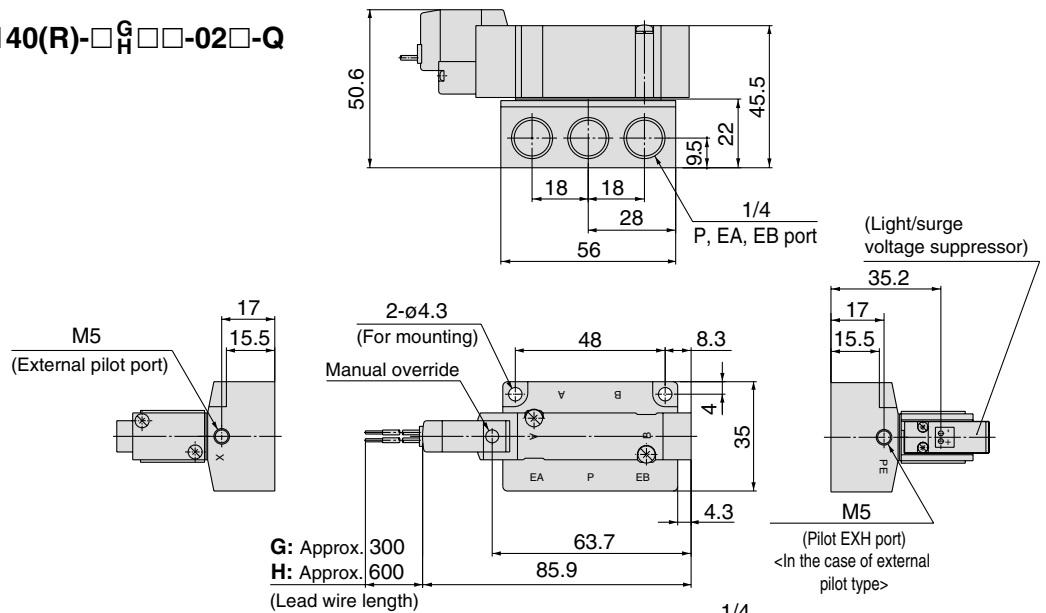
Note) Refer to back page 12 for dimensions of connector types.

SY3000/5000/7000/9000 Base Mounted

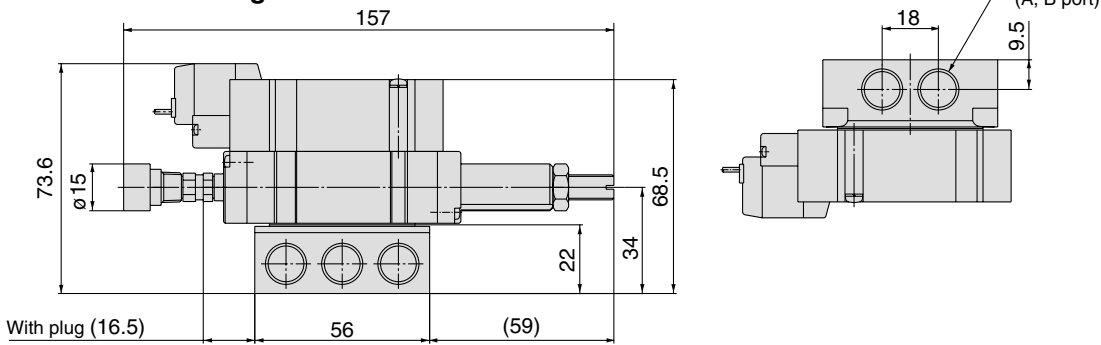
Dimensions: Series SY5000

2 position single

Grommet (G), (H): SY5140(R)-□^G_H□□-02□-Q



With interface regulator

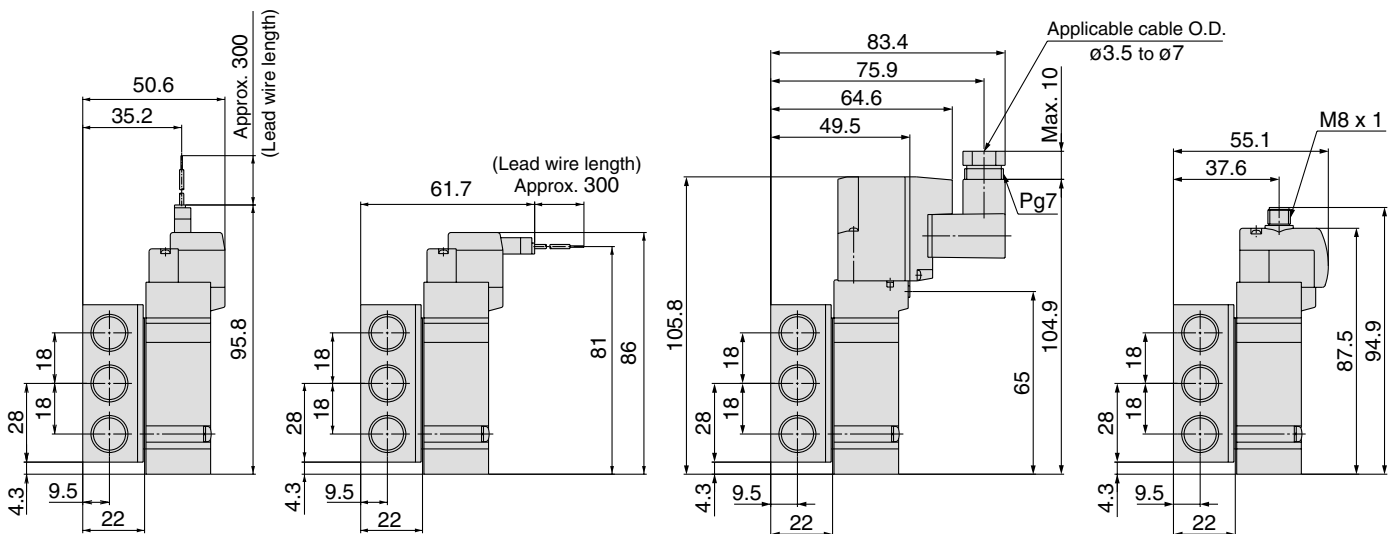


L plug connector (L):
SY5140(R)-□L□□-02□-Q

M plug connector (M):
SY5140(R)-□M□□-02□-Q

DIN terminal (D):
SY5140(R)-□D□□-02□-Q

M8 connector (WO):
SY5140(R)-□WO□□-02□-Q



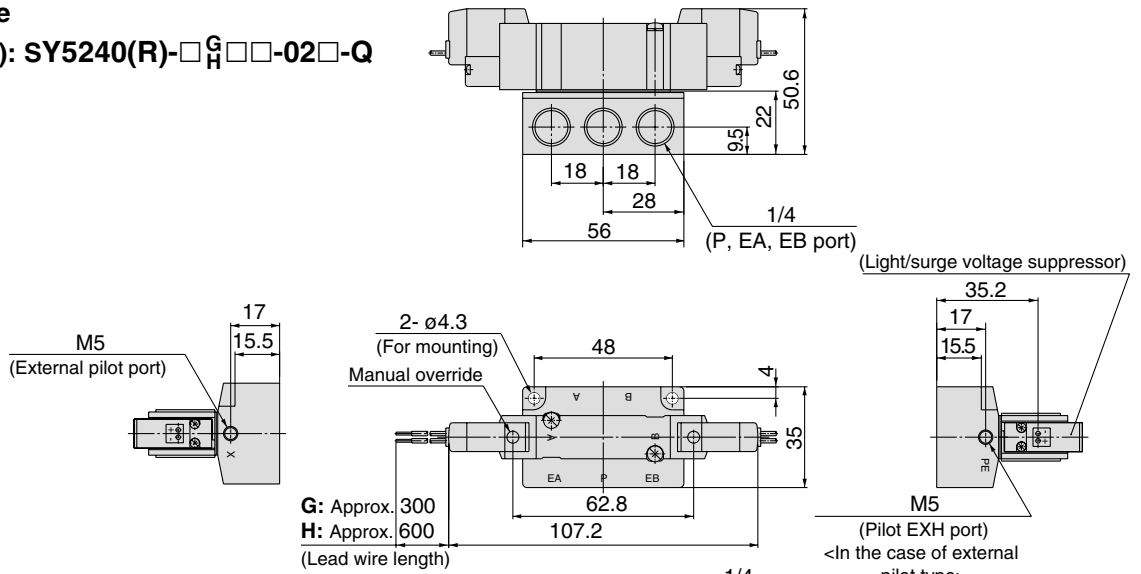
Note) Refer to back page 12 for dimensions of connector types.

Base Mounted

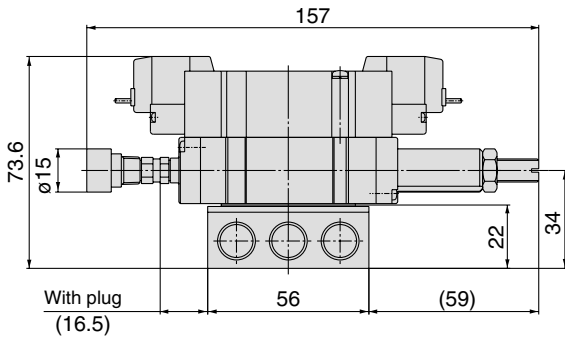
Dimensions: Series SY5000

2 position double

Grommet (G), (H): SY5240(R)-□^G□□-02□-Q



With interface regulator

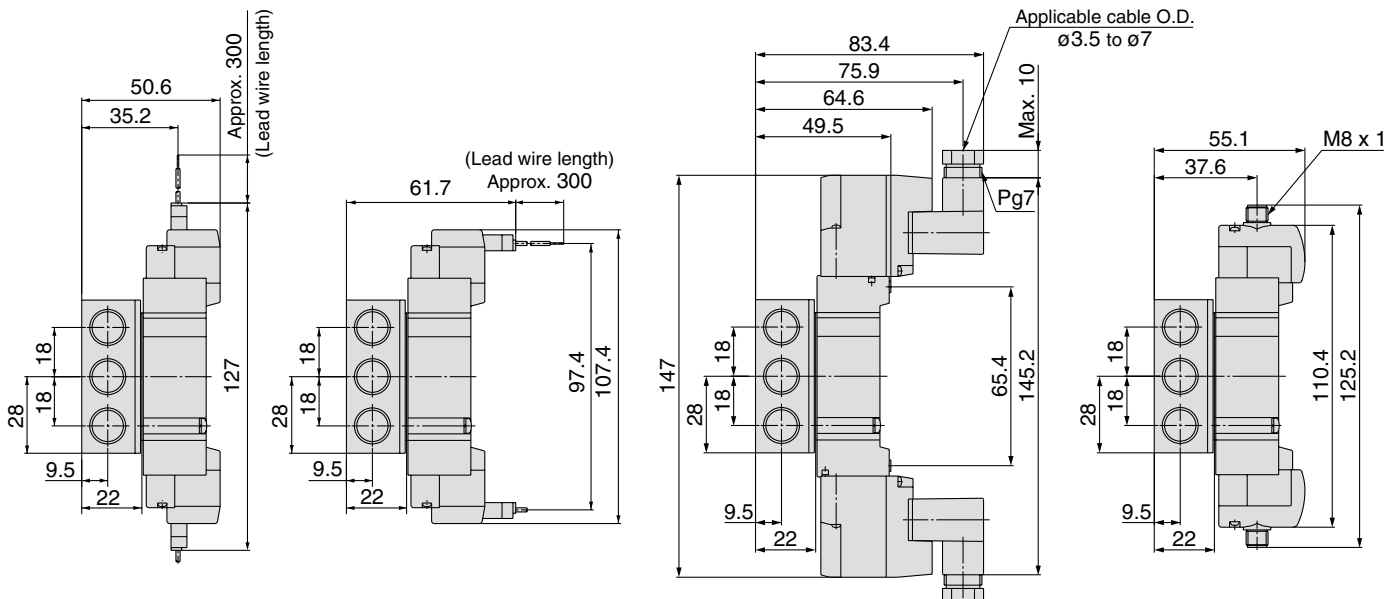


L plug connector (L): SY5240(R)-□L□□-02□-Q

M plug connector (M): SY5240(R)-□M□□-02□-Q

DIN terminal (D): SY5240(R)-□D□□-02□-Q

M8 connector (WO): SY5240(R)-□WO□□-02□-Q



Note) Refer to back page 12 for dimensions of connector types.