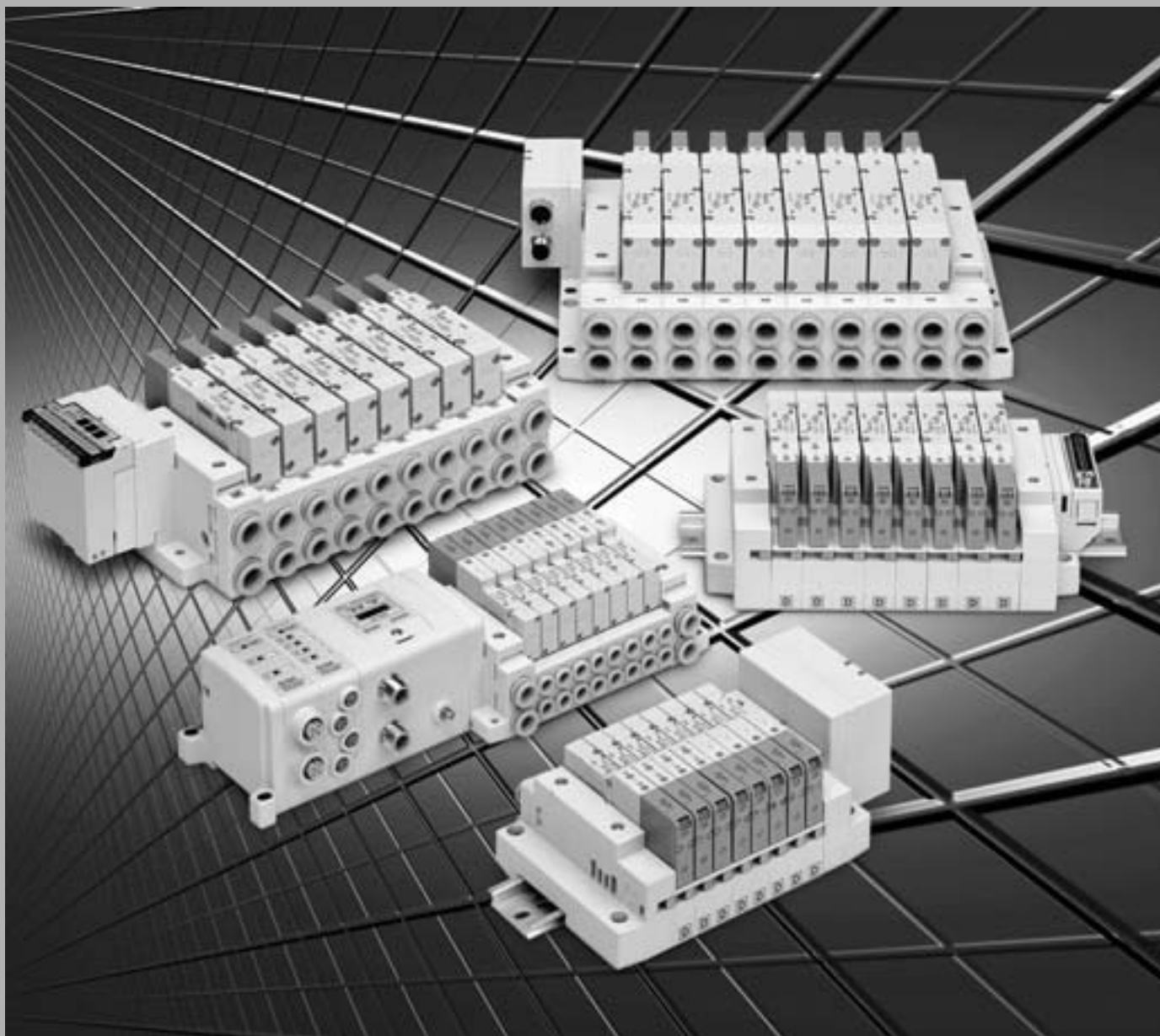


# 5 Port Solenoid Valve

Series *SV1000/2000/3000/4000*

Rubber Seal



- SJ
- SY
- SV**
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

***New Concept* Connector Type Manifold**

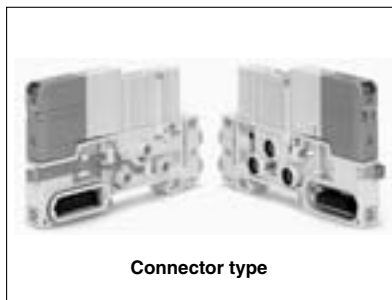
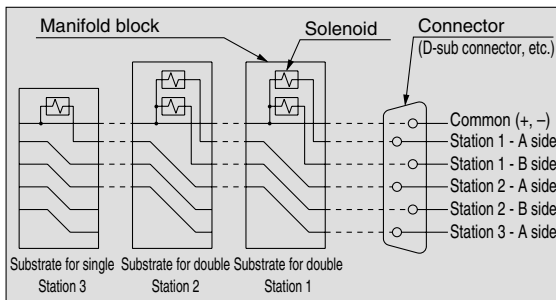
# New Concept Connector Type Manifold Series SV1000/2000/3000/4000

- The use of multi-pin connectors to replace wiring inside manifold blocks provides flexibility when adding stations or changing manifold configuration.

Series SV employs a multi-connector instead of the conventional lead wires for internal. By connecting each block with a connector, changes to manifold stations are greatly simplified.

## Connector wiring diagram

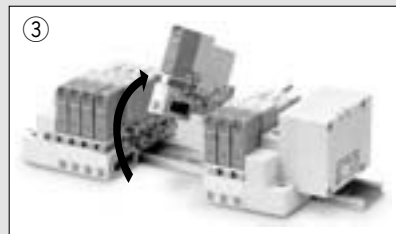
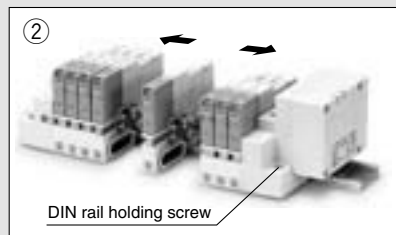
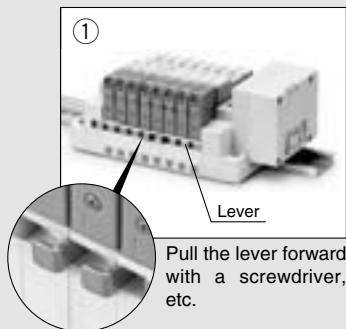
For both serial and parallel wiring, additional manifold blocks are sequentially assigned pins on the connector. This makes it completely unnecessary to disassemble the connector unit.



**Service life of 50 million cycles or more**  
(Based on SMC life test conditions)

## ■ Cassette base type manifold (For SV1000/2000)

Cassette base type manifolds offer the ultimate in flexibility. Manifold sections can be added using a simple release mechanism.

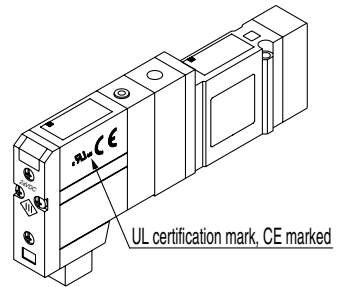


- A relay output module control of devices up

## ■ Tie-rod base manifold (For SV1000/2000/3000/4000)

Conventional tie-rod base type manifolds are also available. 34 pins connector allows up to 16 stations with double solenoids. (Refer to the tie-rod base manifold exploded view on page 430.)

■ The standard product is CE-compliant and UL-standard.



■ Series EX500: Gateway system, serial transmission system

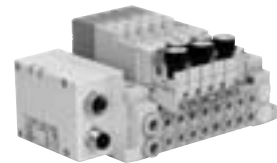
- IP67 compliant (Gateway unit and input manifold are compliant with IP65.)
- No. of input/output point: 128 points (Output 64 points, Input 64 points)
- Controls up to 4 branches with 32 I/O per branch
- A single cable from the gateway provides both signal and power for each branch, eliminating the need for separate power connections for each manifold.

■ Series EX250: Integrated type (for I/O), serial transmission system

- IP67 compliant (compliant with IP40.)
- No. of input/output point: 64 points (Output 32 points, Input 32 points)
- Double solenoid allows up to 16 stations (up to 32 solenoids).

■ Interface regulator Series SV1000, 2000, 3000, 4000

- P port regulation, A port regulation and B port regulation are selectable, depending on an application. Able to set the pressure arbitrarily for each station of the manifold just by inserting between manifold base and valve.



■ Increased moisture and dust resistance.

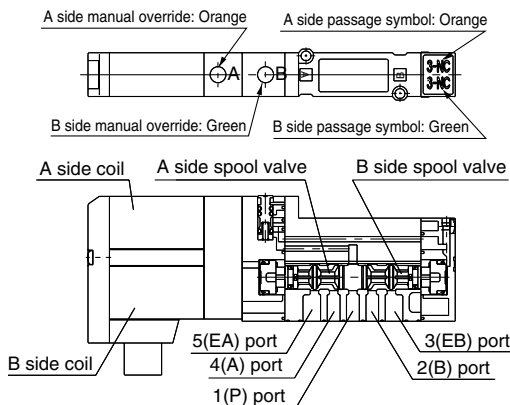
- Enclosure against foreign matters and water is conforming to IP67 \*. Can be used in an atmosphere where the valve or manifold is exposed by water, etc. directly. (\* Based on IEC60529) (Refer to the catalog contents for details, as some types of connectors do not meet these standards.)

■ 4 position dual 3 port valves available for Series SV1000/2000

- Two 3 port valves built into a single valve body.
- A and B ports can be individually controlled.
- Three combinations are available: [N.C./N.C.], [N.O./N.O.], and [N.C./N.O.].
- Mixed mounting with 5 port valves is also possible.
- Labels are attached to indicate A and B side functions, using the same color as the manual override.

Power consumption: 0.6 W (Current: 25 mA, 24 VDC)

is available for to 110 VAC, 3 A.



Model	A side	B side	JIS Symbol
SV <sub>2</sub> <sup>1</sup> A00	N.C. valve	N.C. valve	
SV <sub>2</sub> <sup>1</sup> B00	N.O. valve	N.O. valve	
SV <sub>2</sub> <sup>1</sup> C00	N.C. valve	N.O. valve	

\* External pilot specifications is not available for 4 position dual 3 port valves.

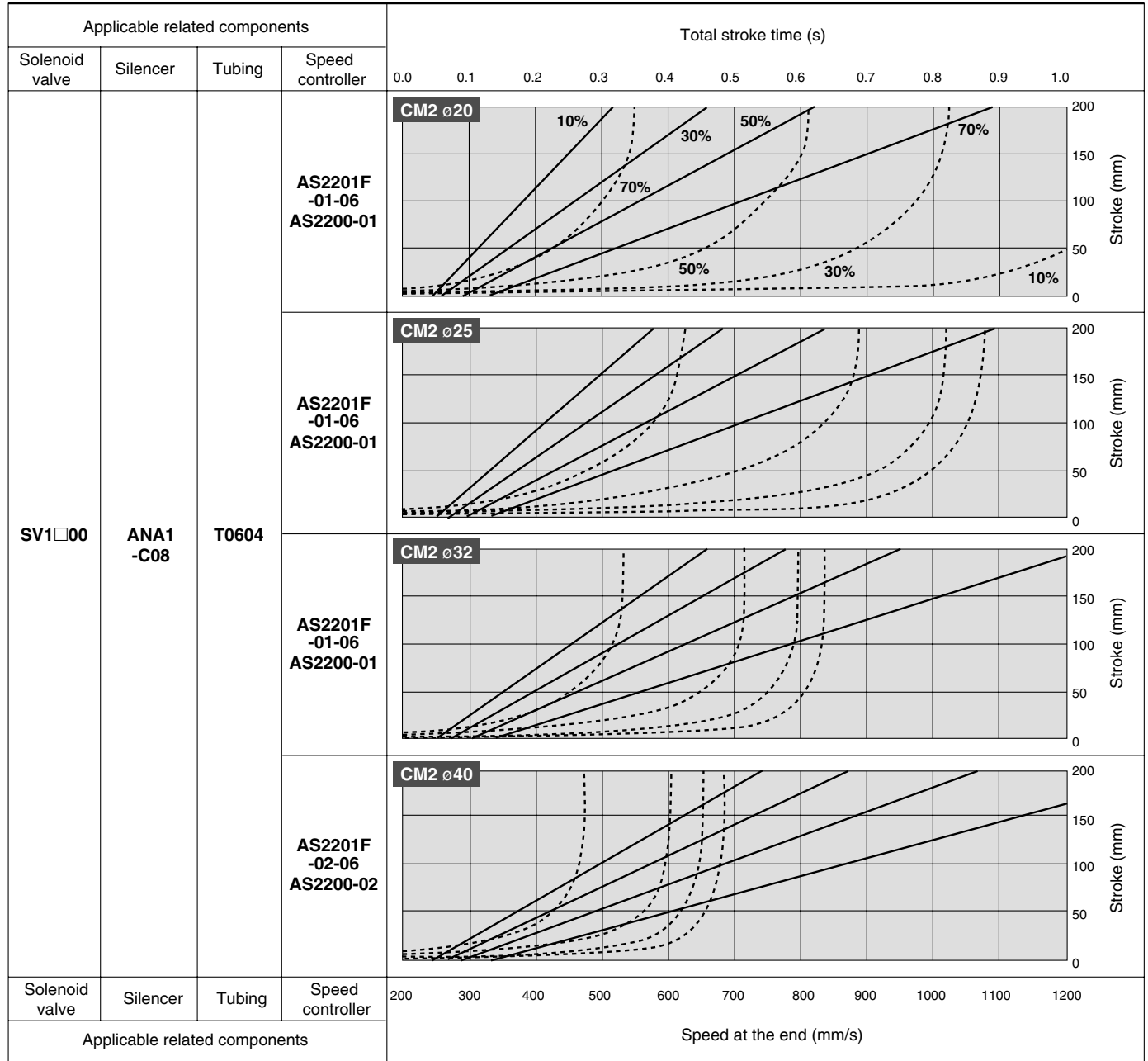
- SJ
- SY
- SV**
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Air Cylinders Drive System

## Full Stroke Time and Speed at the End

### Series SV1000

Applicable bore size:  $\varnothing 20$ ,  $\varnothing 25$ ,  $\varnothing 32$ ,  $\varnothing 40$



For details regarding different conditions, make determinations after using the SMC Model Selection Program - Pneumatic Cylinder Drive Systems.

#### How to Read the Graph

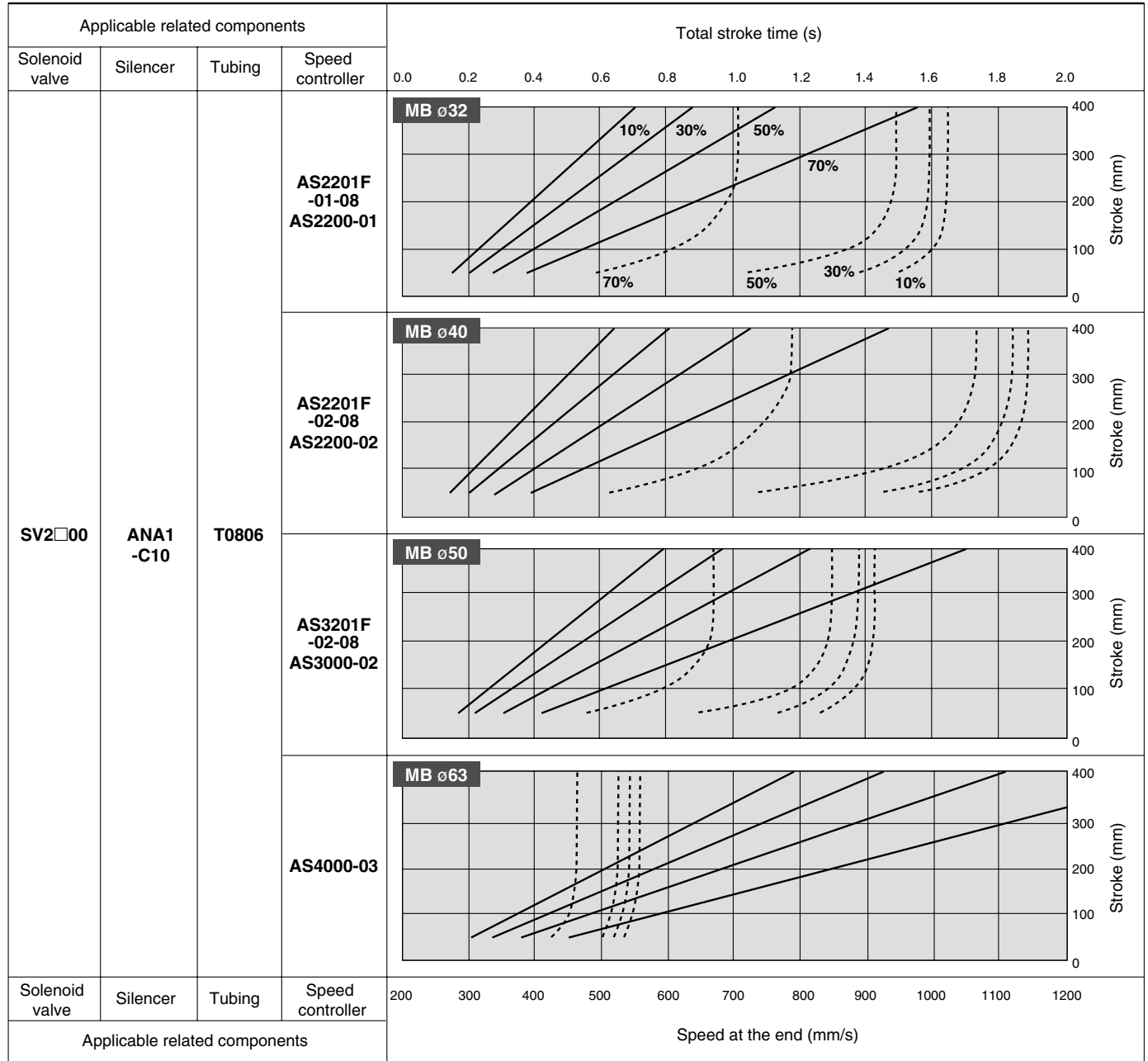
These graphs show the total stroke time and speed at the end when a cylinder drive system is composed of the ideal components. The graphs above indicate the total stroke time and speed at the end with respect to various load ratios and strokes for each cylinder bore size.

#### Common Conditions

Inlet pressure	0.5 MPa
Piping length	SV1000: 1 m, SV2000/3000: 2 m, SV4000: 3 m
Cylinder direction	Vertical upward
Speed controller	Meter-out, Directly connected to cylinder, Needle fully open
Load ratio	{(Load weight x 9.8) / Theoretical output} x 100%

# Series SV2000

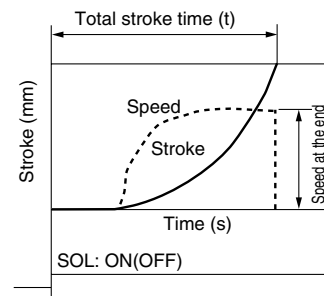
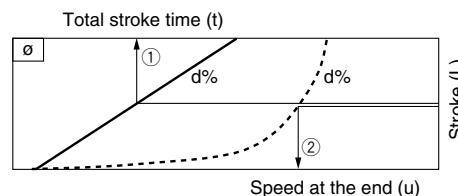
Applicable bore size:  $\varnothing 32$ ,  $\varnothing 40$ ,  $\varnothing 50$ ,  $\varnothing 63$



For details regarding different conditions, make determinations after using the SMC Model Selection Program - Pneumatic Cylinder Drive Systems.

### Example

Go to the chart for the bore size cylinder you are using ( $\varnothing$ ). To find the total stroke time ( $t$ ), follow arrow (1) from your stroke length ( $L$ ) to the solid line representing the load ratio ( $d\%$ ) for the application then up to the total stroke time ( $t$ ). To find the ending cylinder speed ( $u$ ), follow arrow (2) from your stroke length ( $L$ ) to the dotted line representing the load ratio ( $d\%$ ) then down to the ending cylinder speed ( $u$ ).



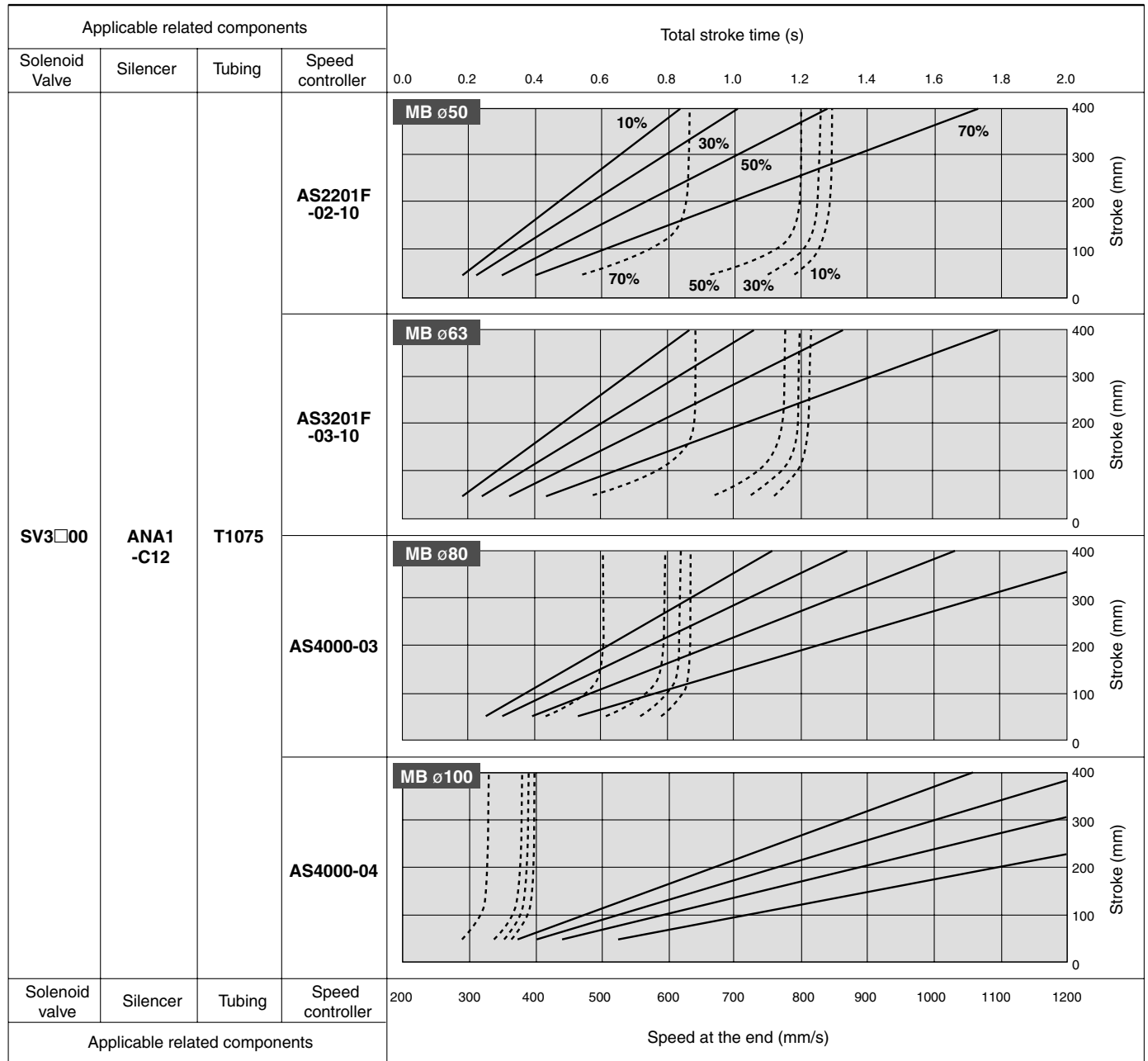
- SJ
- SY
- SV**
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# Air Cylinders Drive System

## Full Stroke Time and Speed at the End

### Series SV3000

Applicable bore size:  $\varnothing 50$ ,  $\varnothing 63$ ,  $\varnothing 80$ ,  $\varnothing 100$



For details regarding different conditions, make determinations after using the SMC Model Selection Program - Pneumatic Cylinder Drive Systems.

#### How to Read the Graph

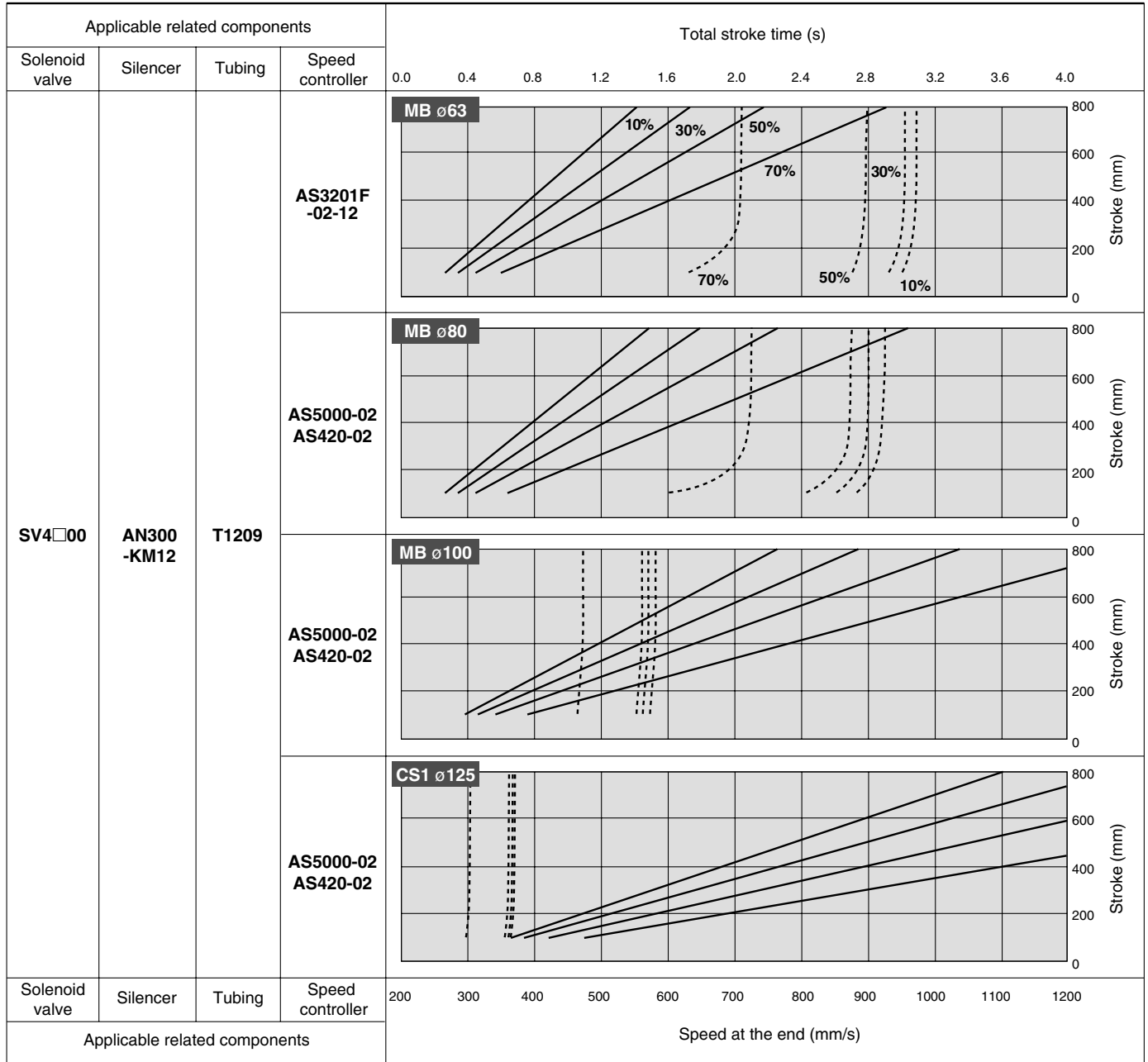
These graphs show the total stroke time and speed at the end when a cylinder drive system is composed of the ideal components. The graphs above indicate the total stroke time and speed at the end with respect to various load ratios and strokes for each cylinder bore size.

#### Common Conditions

Inlet pressure	0.5 MPa
Piping length	SV1000: 1 m, SV2000/3000: 2 m, SV4000: 3 m
Cylinder direction	Vertical upward
Speed controller	Meter-out, Directly connected to cylinder, Needle fully open
Load ratio	{(Load weight x 9.8) Theoretical output} x 100%

# Series SV4000

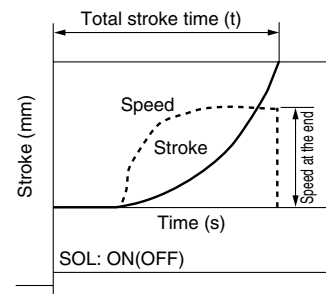
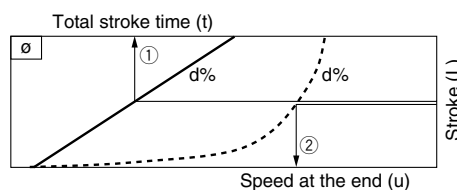
Applicable bore size:  $\varnothing 63, \varnothing 80, \varnothing 100, \varnothing 125$



For details regarding different conditions, make determinations after using the SMC Model Selection Program - Pneumatic Cylinder Drive Systems.

### Example

Go to the chart for the bore size cylinder you are using ( $\varnothing$ ). To find the total stroke time (t), follow arrow (1) from your stroke length (L) to the solid line representing the load ratio (d%) for the application then up to the total stroke time (t). To find the ending cylinder speed (u), follow arrow (2) from your stroke length (L) to the dotted line representing the load ratio (d%) then down to the ending cylinder speed (u).

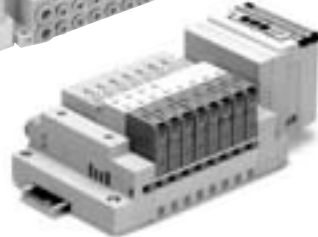
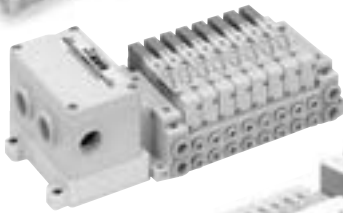
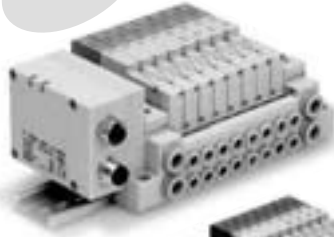


- SJ
- SY
- SV**
- SYJ
- SZ
- VP4
- S0700
- VQ
- VQ4
- VQ5
- VQC
- VQZ
- SQ
- VFS
- VFR
- VQ7

# INDEX

## Series SV Manifold Variations

### Serial Wiring



**Valve Manifold Common Specifications** P. 352

Manifold specifications

**EX500 Gateway System Serial Transmission System** P. 355

IP67 compliant

Applicable series **Cassette base manifold SV1000/SV2000**  
**Tie-rod base manifold SV1000/SV2000/SV3000/SV4000**

- Number of output points: 16 points
- Connected to the EX500GW unit

**EX250 Integrated Type (for I/O) Serial Transmission System** P. 365

IP67 (partly IP40) compliant

Applicable series **Tie-rod base manifold SV1000/SV2000/SV3000**

- Number of input/output points: Each 32 points

**EX126 Integrated Type (for Output) Serial Transmission System** P. 371

IP67 compliant

Applicable series **Tie-rod base manifold SV1000/SV2000/SV3000**

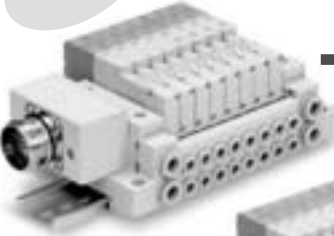
- Number of output points: 16 points

**EX120 Integrated Type (for Output) Serial Transmission System** P. 377

Applicable series **Cassette base manifold SV1000/SV2000**  
**Tie-rod base manifold SV1000/SV2000/SV3000/SV4000**

- Number of output points: 16 points

### Parallel Wiring



**For Circular Connector** P. 387

IP67 compliant

Applicable series **Cassette base manifold SV1000/SV2000**  
**Tie-rod base manifold SV1000/SV2000/SV3000/SV4000**

- Number of connectors: 26 pins

**D-sub Connector** P. 397

Applicable series **Cassette base manifold SV1000/SV2000**  
**Tie-rod base manifold SV1000/SV2000/SV3000/SV4000**

- Number of connectors: 25 pins
- MIL-C-24308
- Conforming to JIS-X-5101

**Flat Ribbon Cable Connector** P. 407

Applicable series **Cassette base manifold SV1000/SV2000**  
**Tie-rod base manifold SV1000/SV2000/SV3000/SV4000**

- Number of connectors: 26, 20, 10 pins
- With strain relief
- Conforming to MIL-C-83503

**Flat Ribbon Cable PC Wiring** P. 410

Applicable series **Cassette base manifold SV1000/SV2000**  
**Tie-rod base manifold SV1000/SV2000/SV3000/SV4000**

- Number of connectors: 20 pins
- Conforming to MIL-C-83503

**Manifold exploded view/Manifold option** P. 426

**Single Valve/Sub-plate [IP67 compliant]** P. 440

IP67 compliant

Applicable series **SV1000/SV2000/SV3000/SV4000**

- With waterproof M12 connector

**Made to Order Specifications** P. 448



SJ

SY

SV

SYJ

SZ

VP4

S0700

VQ

VQ4

VQ5

VQC

VQZ

SQ

VFS

VFR

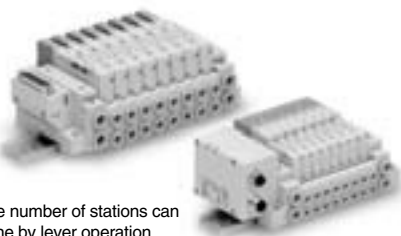
VQ7



# Valve Manifold Common Specifications Series SV



## Cassette base manifold



- Changing the number of stations can be easily done by lever operation.

## Manifold Specifications

Applicable series		SV1000	SV2000
<b>Manifold type</b>		Stacking type cassette base manifold	
<b>1 (P: SUP), 3/5 (E: EXH) type</b>		Common SUP, EXH	
<b>Valve stations (maximum)</b>		18 stations	20 stations
<b>Max. number of solenoids</b>		18 points	26 points
<b>Port size</b>	<b>1(P), 3/5(E) port</b>	C8, N9	C10, N11
	<b>4(A), 2(B) port</b>	C3, C4, C6 N1, N3, N7	C4, C6, C8 N3, N7, N9

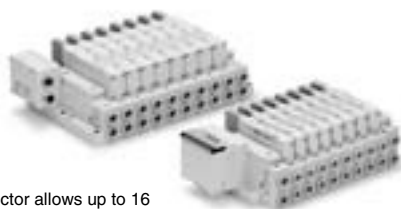
## Flow Characteristics

Model	Port size		Flow characteristics					
	1, 5, 3 (P,EA,EB)	4, 2 (A,B)	1→4/2 (P→A/B)			4/2→3/5 (A/B→E)		
			C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv
SS5V1-16	C8	C6	0.89	0.22	0.22	0.98	0.21	0.23
SS5V2-16	C10	C8	2.3	0.28	0.50	2.7	0.18	0.56



Note) The value is for manifold base with 5 stations and individually operated 2 position type.

## Tie-rod base manifold



- 34 pins connector allows up to 16 stations with double solenoids.

## Manifold Specifications

Applicable series		SV1000	SV2000	SV3000	SV4000
<b>Manifold type</b>		Tie-rod base manifold			
<b>1 (P: SUP), 3/5 (E: EXH) type</b>		Common SUP, EXH			
<b>Valve stations (maximum)</b>		20 stations			
<b>Max. number of solenoids</b>		32 points			
<b>Port size</b>	<b>1(P), 3/5(E) port</b>	C8, N9	C10, N11	C12, N11	C12, N11,03
	<b>4(A), 2(B) port</b>	C3, C4, C6 N1, N3, N7	C4, C6, C8 N3, N7, N9	C6, C8, C10 N7, N9, N11	C8, C10, C12 N9, N11, 02, 03

## Flow Characteristics

Model	Port size		Flow characteristics					
	1, 5, 3 (P,EA,EB)	4, 2 (A,B)	1→4/2 (P→A/B)			4/2→3/5 (A/B→E)		
			C [dm <sup>3</sup> /(s·bar)]	b	Cv	C [dm <sup>3</sup> /(s·bar)]	b	Cv
SS5V1-10	C8	C6	0.98	0.26	0.24	1.1	0.35	0.28
SS5V2-10	C10	C8	2.1	0.20	0.46	2.4	0.18	0.48
SS5V3-10	C12	C10	4.2	0.22	0.91	4.3	0.21	0.93
SS5V4-10	C12	C12	6.2	0.19	1.3	7.0	0.18	1.6




Note) The value is for manifold base with 5 stations and individually operated 2 position type.

## Enclosure of Manifold Variations (Common for cassette base and tie-rod base)

Series	Enclosure (Based on IEC60529)
EX500 Gateway System Serial Transmission System	IP67 *
EX250 Integrated Type (for I/O) Serial Transmission System	IP67 (partly IP40)
EX126 Integrated Type (for output) Serial Transmission System	IP67
EX120 Integrated Type (for output) Serial Transmission System	IP20
Circular connector	IP67
D-sub connector	Dusttight (IP40)
Flat ribbon cable	Dusttight (IP40)

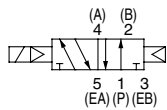
\* Enclosure of a gateway unit and input manifold is IP65.

**Series SV Solenoid Valve Specifications**

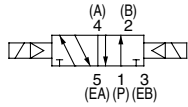
 **Made to Order Specifications**  
(For details, refer to page 448.)

**JIS Symbol**

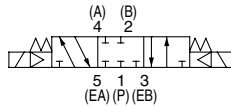
2 position single solenoid



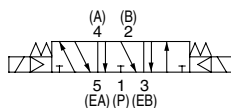
2 position double solenoid



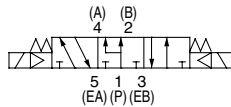
3 position closed center



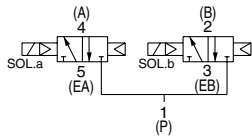
3 position exhaust center



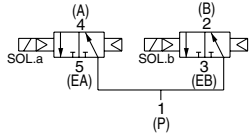
3 position pressure center



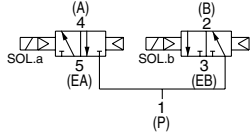
4 position dual 3 port valve: N.C./N.C.




4 position dual 3 port valve: N.O./N.O.



4 position dual 3 port valve: N.C./N.O.



<b>Fluid</b>		Air
<b>Internal pilot Operating pressure range (MPa)</b>	2 position single	0.15 to 0.7
	4 position dual 3 port valve	0.1 to 0.7
<b>External pilot Operating pressure range (MPa)</b>	2 position double	0.1 to 0.7
	3 position	0.2 to 0.7
<b>Ambient and fluid temperature (°C)</b>		-10 to 50 (No freezing. Refer to page 5.)
<b>Max. operating frequency (Hz)</b>	2 position single, double	5
	4 position dual 3 port valve	3
	3 position	3
<b>Manual override</b>		Non-locking push type Push-turn locking slotted type
<b>Pilot exhaust method</b>	Internal pilot	Common exhaust type for main and pilot valve
	External pilot	Pilot valve individual exhaust
<b>Lubrication</b>		Not required
<b>Mounting orientation</b>		Unrestricted
<b>Impact/Vibration resistance (ms<sup>2</sup>)</b>		150/30
<b>Enclosure</b>		IP67 (Based on IEC60529)
<b>Coil rated voltage</b>		24 VDC, 12 VDC
<b>Allowable voltage fluctuation</b>		±10% of rated voltage
<b>Power consumption</b>		0.6 (With indicator light: 0.65)
<b>Surge voltage suppressor</b>		Zener diode
<b>Indicator light</b>		LED

 Note) Impact resistance: No malfunction occurred when it is tested with a drop tester in the axial direction and at the right angles to the main valve and armature in both energized and de-energized 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 energized and de-energized states in the axial direction and at the right angles to the main valve and armature. (Values at the initial period)


**Response Time**

Type of actuation	Response time (ms) (at the pressure of 0.5 MPa)			
	SV1000	SV2000	SV3000	SV4000
2 position single	11 or less	25 or less	28 or less	40 or less
2 position double	10 or less	17 or less	26 or less	40 or less
3 position	18 or less	29 or less	32 or less	82 or less
4 position dual 3 port valve	15 or less	33 or less	—	—

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

**Mass**

Series	Type of actuation	Mass (g)
SV1000	Single solenoid	66
	Double solenoid	71
	3 position	73
	4 position dual 3 port	71
SV2000	Single solenoid	74
	Double solenoid	78
	3 position	83
	4 position dual 3 port	78
SV3000	Single solenoid	99
	Double solenoid	102
	3 position	110
SV4000	Single solenoid	186
	Double solenoid	190
	3 position	211

 Note) Mass of solenoid valve only.

SJ  
SY  
SV  
SYJ  
SZ  
VP4  
S0700  
VQ  
VQ4  
VQ5  
VQC  
VQZ  
SQ  
VFS  
VFR  
VQ7