

Speed controller inline with push-in fitting

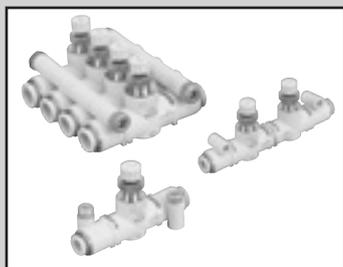
SCL2 Series

In-out speed controller inline with push-in fitting

SCD2 Series

● Port size: $\phi 1.8/\phi 4/\phi 6/\phi 8/\phi 10/\phi 12$

JIS symbol



Structure and material restriction

	Structure/treatment	Material restriction			Model No.
P7 Series	Dust generation preventing				— P70
	Dust generation preventing	Copper-based materials prohibited	Silicon-based materials prohibited	Halogen-based materials prohibited (fluorine, chlorine, bromine)	— P74

Specifications

● Speed controller inline SCL2

Model No.	SCL2-04			SCL2-06	SCL2-08		SCL2-10				
Applicable tube O.D.	mm	$\phi 1.8$	$\phi 1.8/\phi 4$	$\phi 4$	$\phi 6$	$\phi 6$	$\phi 8$	$\phi 8$	$\phi 10$	$\phi 12$	
Working fluid		Compressed air									
Max. working pressure	MPa	0.7			1.0						
Min. working pressure	MPa				0.1						
Proof pressure	MPa	1.05			1.5						
Fluid temperature	°C	5 to 60 (no freezing *3)									
Ambient temperature	°C	0 to 60 (no freezing)									
Weight	g	13	12	11.5	16	32	33	53	57	59	
Dial indicator value		12 (15)									
Free flow	Flow rate ℓ/min (ANR)	(13)			130	300	400	550	900	1100	1200
	Effective cross-sectional area mm^2	(0.2)			1.9	4.5	6	8	13.5	16.5	18
Controlled flow	Flow rate ℓ/min (ANR)	(10)			130 (13)	300 (13)	400	550	900	1100	1200
	Effective cross-sectional area mm^2	(0.15)			1.9 (0.2)	4.5 (0.2)	6	8	13.5	16.5	18

● In-out speed control valve inline SCD2

Model No.	SCD2-04			SCD2-06	SCD2-08		SCD2-10			
Applicable tube O.D.	mm	$\phi 1.8$	$\phi 1.8/\phi 4$	$\phi 4$	$\phi 6$	$\phi 6$	$\phi 8$	$\phi 8$	$\phi 10$	$\phi 12$
Working fluid		Compressed air								
Max. working pressure	MPa	0.7			1.0					
Min. working pressure	MPa				0.1					
Proof pressure	MPa	1.05			1.5					
Fluid temperature	°C	5 to 60 (no freezing *3)								
Ambient temperature	°C	0 to 60 (no freezing)								
Weight	g	23	22	21.5	29	63	64	108	112	114
Dial indicator value		12 (15)								
Flow rate	ℓ/min (ANR)	(10)	(10)	100 (13)	250 (13)	330	400	750	850	900
Effective cross-sectional area	mm^2	(0.15)	(0.15)	1.5 (0.2)	3.7 (0.2)	5	6	11	12.5	13

*1: Flow rate is the atmospheric pressure conversion at 0.5 MPa.

*2: Values in () are for the fine speed type.

*3: Freezing could occur by adiabatic expansion depending on air quality (dew point).

How to order

- Speed controller inline



- In-out speed control valve inline



Model No.

A Body size

B Applicable tube O.D.

Refer to the following tables for combinations of **A**, **B**, **C**.

C Flow characteristics

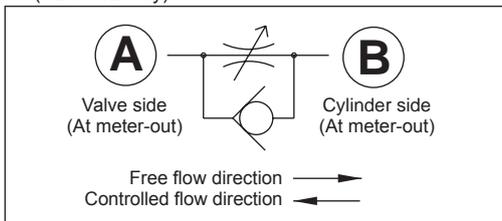
D Clean room specifications

Code	Content	
A Body Size		
04	M5 thread equivalent	
06	1/8 thread equivalent	
08	1/4 thread equivalent	
10	3/8 thread equivalent	
B Applicable tube O.D.		
H22	ø1.8	
H42	Side A: ø4, Side B: ø1.8	
H24 *1	Side A: ø1.8, Side B: ø4	
H44	ø4	
H66	ø6	
H88	ø8	
H1010	ø10	
H1212	ø12	
C Flow characteristics		
Blank	Standard	
F	Fine speed	
D Clean room specifications		
	Structure	Material restriction
P70	Dust generation preventing	-
P74	Dust generation preventing	Copper-based/silicon-based/halogen-based materials (fluorine, chlorine, bromine) are prohibited

⚠ Precautions for model No. selection

*1: H24 is not available for SCD2.
Select H42 instead.

B Illustration of combination of applicable tube O.D. (H24/H42 only)



Combinations of **A**, **B**, **C**

		A Body size			
		04	06	08	10
B Applicable tube O.D.	H22	○			
	H42	○			
	H24 *1	○			
	H44	○●			
	H66		●○	●	
	H88			●	●
	H1010				●
H1212				●	

- **C** Flow characteristics "standard"
- **C** Flow characteristics "fine speed"

Not available.

SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
STM
STG
STR2
MRL2
GRC
Cylinder Switch
MN3E
MN4E
4GA/B
M4GA/B
MN4GA/B
F.R.(module unit)
Clean F.R
Precision R
Press gauge
Diff. press gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for air blow
Ending

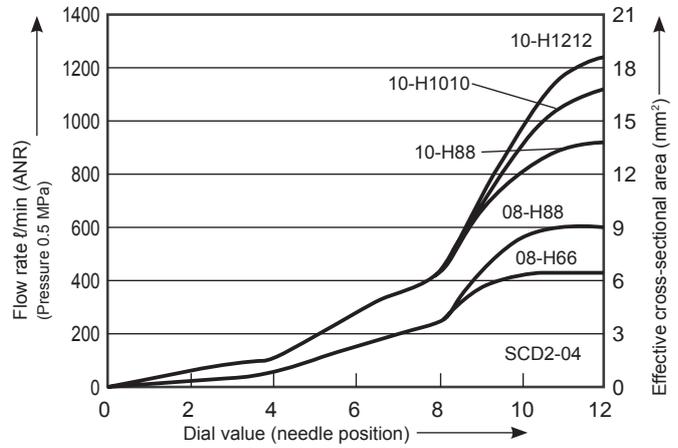
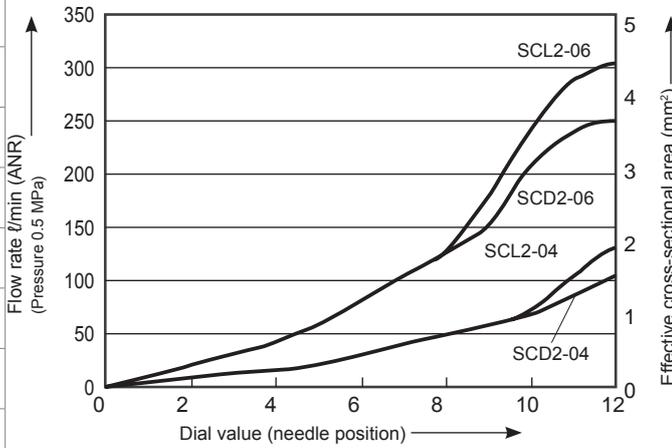
SCL2/SCD2 Series

Flow characteristics

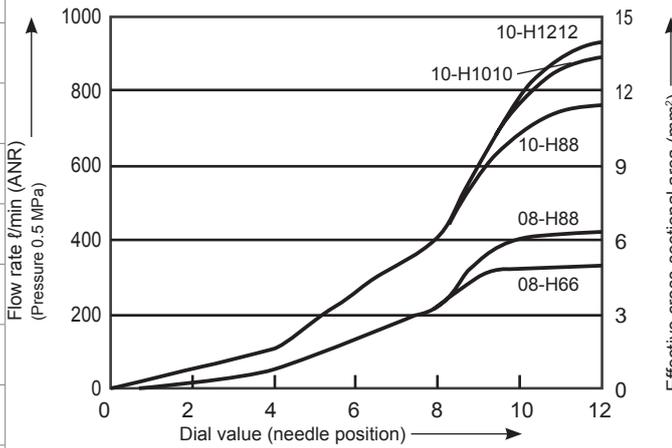
● Standard

• SCL2-04, SCD2-04

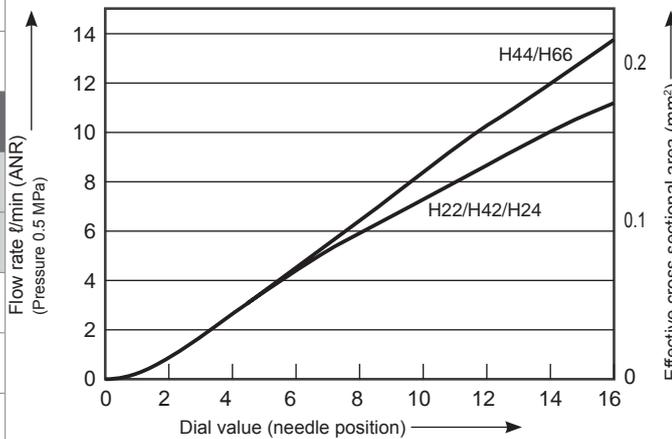
• SCL2-08, SCD2-10



• SCD2-08, SCD2-10



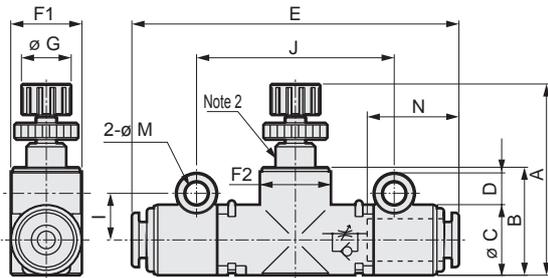
● Fine speed



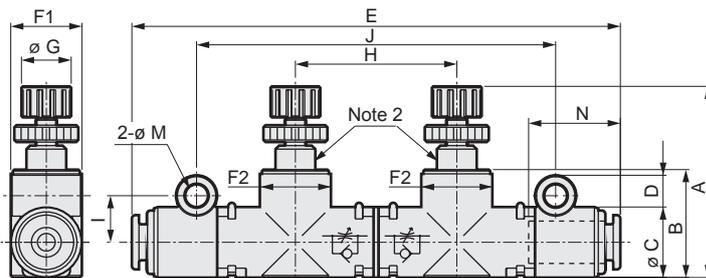
Dimensions



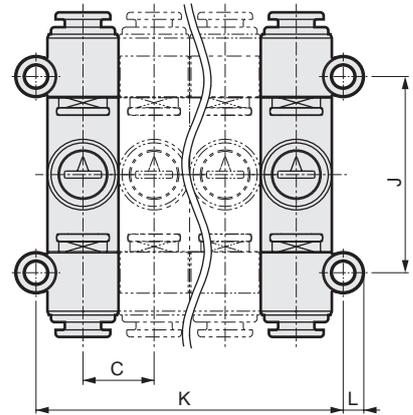
● SCL2 Series



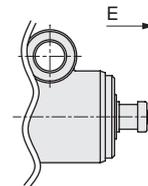
● SCD2 Series



● Installation spacing dimensions for manifolds



● Outline drawing of outer tubing connection diameter $\phi 1.8$ fitting



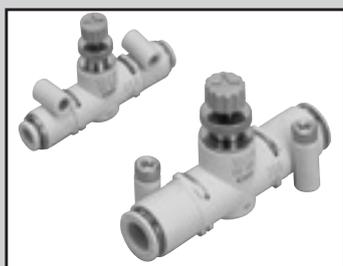
Model No.	Piping size O.D.	A		B	C	D	E	F1	F2	G	H	I	J	K	L	M (Mounting hole)	N (tube insert length)
		MIN	MAX														
SCL2-04-H22-P7* Note 1	$\phi 1.8$						50.8										-
SCL2-04-H42-P7* Note 1	$\phi 4/\phi 1.8$	27.1	31.6	15.3	10	4.5	48.4	10	10.6	7	-	6.6	27.8	$10 \times n + 3.2$	2.9	3.3	12.9/-
SCL2-04-H24-P7* Note 1	$\phi 1.8/\phi 4$						48.4										-12.9
SCL2-04-H44-P7*	$\phi 4$						46										12.9
SCL2-06-H66-P7*	$\phi 6$	28.8	33.3	17.7	12	5.6	49.4	12	12.2	7	-	8.1	30.8	$12 \times n + 4.2$	3.5	4.3	13.7
SCL2-08-H66-P7*	$\phi 6$	38	44.5	22.9	15	5.6	64	15	15.5	11	-	9.5	41	$15 \times n + 4$	3.6		18
SCL2-08-H88-P7*	$\phi 8$						66.5										19
SCL2-10-H88-P7*	$\phi 8$	44	50.5	29.7	20	5.1	71	20	20.5	11	-	11.5	47	$20 \times n + 3$	3.6		19
SCL2-10-H1010-P7*	$\phi 10$						75									21	
SCL2-10-H1212-P7*	$\phi 12$				20.4	4.9	79							22			
SCD2-04-H22-P7* Note 1	$\phi 1.8$						73.5										-
SCD2-04-H42-P7* Note 1	$\phi 4/\phi 1.8$	27.1	31.6	15.3	10	4.5	71.1	10	10.6	7	22.7	6.6	50.5	$10 \times n + 3.2$	2.9	3.3	12.9/-
SCD2-04-H44-P7*	$\phi 4$						68.7										12.9
SCD2-06-H66-P7*	$\phi 6$						28.8										33.3
SCD2-08-H66-P7*	$\phi 6$	38	44.5	22.9	15	5.6	97.5	15	15.5	11	34	9.5	75	$15 \times n + 4$	3.6	18	
SCD2-08-H88-P7*	$\phi 8$						100									19	
SCD2-10-H88-P7*	$\phi 8$	44	50.5	29.7	20	5.1	111	20	20.5	11	40.5	11.5	87.5	$20 \times n + 3$	3.6	19	
SCD2-10-H1010-P7*	$\phi 10$						115									21	
SCD2-10-H1212-P7*	$\phi 12$				20.4	4.9	119							22			

Note 1: Connection tubing is a fitting dedicated to fiber tube.

Note 2: There is a slit at this location on the fine speed type.

Note 3: F1 and F2 dimensions are oval.

SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
STM
STG
STR2
MRL2
GRC
Cylinder Switch
MN3E MN4E
4GA/B
M4GA/B
MN4GA/B
F.R. (module unit)
Clean F.R
Precision R
Press gauge Diff. press gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for air blow
Ending



Needle valve, inline with push-in fitting

SCL2-N Series

JIS symbol



Structure and material restriction

	Structure/treatment	Material restriction			Model No.
P7 Series	Dust generation preventing				P70
	Dust generation preventing	Copper-based materials prohibited	Silicon-based materials prohibited	Halogen-based materials prohibited (fluorine, chlorine, bromine)	P74
P8 Series	Oil prohibited				P80

Specifications

Model No.	SCL2-N-04		SCL2-08		SCL2-10	
Applicable tube O.D.	mm	ø4	ø6	ø6	ø8	
Working fluid	Compressed air/N ₂ gas					
Max. working pressure	MPa	1.0				
Negative pressure	kPa	-100 kPa				
Proof pressure	MPa	1.5				
Fluid temperature	°C	5 to 60 (no freezing *)				
Ambient temperature	°C	0 to 60 (no freezing)				
Weight	g	11.5	16	32	33	
Dial rotations		12 (15 rotation for the flow rate type 010)				

*: Freezing could occur by adiabatic expansion depending on air quality (dew point).

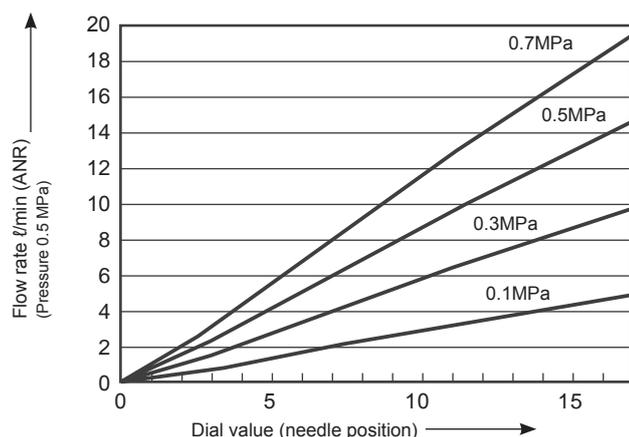
Flow characteristics

Flow rate code	010	050	150	300
Max. flow rate (at 0.5 MPa) ℓ/min (ANR)	13	50	150	300
Effective cross-sectional area mm ²	0.2	0.7	2.2	4.5

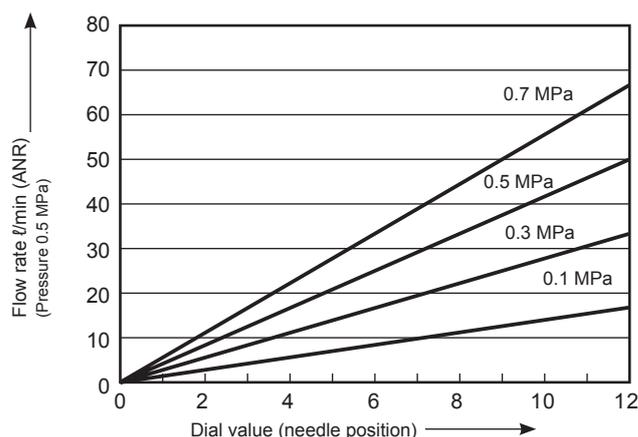
Note: The flow is atmospheric pressure conversion at pressure 0.5 MPa.

Flow characteristics

• Flow rate "010"



• Flow rate "050"



How to order



Model No.

A Body size

B Applicable tube O.D.

Refer to the table below for the body size and applicable tube O.D. combination.

C Flow rate

Combination of body size, applicable tube O.D., and flow rate

Flow rate C		A Body size		B Applicable tube O.D.	
		04-H44	06-H66	08-H66	08-H88
010		●	●		
050		●	●		
150			●		
300				●	●

Not available.

D Clean room specifications *1

Code	Content	
A Body Size		
04	M5 thread equivalent	
06	1/8 thread equivalent	
08	1/4 thread equivalent	
B Applicable tube O.D.		
H44	ø4	
H66	ø6	
H88	ø8	
C Flow characteristics		
	Max. flow rate (at 0.5 MPa) l/min (ANR)	Effective cross-sectional area mm ²
010	13	0.2
050	50	0.7
150	150	2.2
300	300	4.5
D Clean room specifications		
	Structure/treatment	Material restriction
P70	Dust generation preventing	-
P74	Dust generation preventing	Copper-based/silicon-based/halogen-based materials (fluorine, chlorine, bromine) are prohibited
P80	Oil prohibited	-

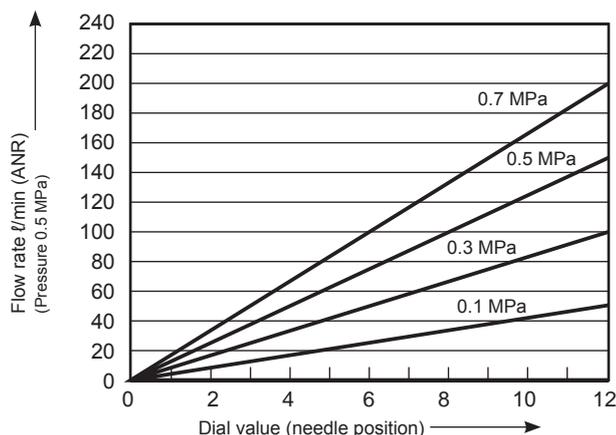
*1: P80 Series

- Metal material..... Brass + electroless nickeling
- Sealant material Nitrile rubber (NBR)
 - Without grease..... Grease is not used as this is oil-prohibited specifications.

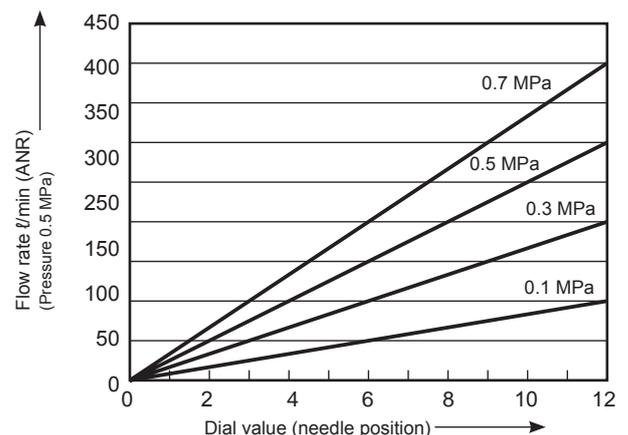
For this reason, it is same product as P84 Series. Specify in P80 Series when placing an order.

Flow characteristics

• Flow rate "150"



• Flow rate "300"



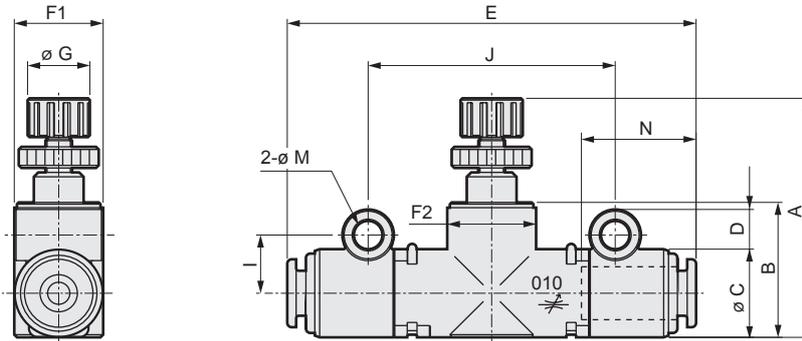
- SCPD3
- SCM
- SSD2
- MDC2
- SMG
- LCM
- LCR
- LCG
- LCX
- STM
- STG
- STR2
- MRL2
- GRC
- Cylinder Switch
- MN3E
- MN4E
- 4GA/B
- M4GA/B
- MN4GA/B
- F.R.(module unit)
- Clean F.R
- Precision R
- Press gauge
- Diff. press gauge
- Electro-pneumatic R
- Speed controller
- Auxiliary valve
- Fitting/tube
- Clean air unit
- Pressure sensor
- Flow rate sensor
- Valve for air blow
- Ending

SCL2-N Series

Dimensions



● SCL2-N Series



Model No.	Piping size O.D.	A		B	C	D	E	F1	F2	G	I	J	K	L	M (Mounting hole)	N (tube insert length)
		MIN	MAX													
SCL2-N-04-H44-***-P**	ø4	27.1	31.6	15.3	10	4.5	46	10	10.6	7	6.6	27.8	10 × n + 3.2	2.9	3.3	12.9
SCL2-N-06-H66-***-P**	ø6	28.8	33.3	17.7	12	5.6	49.4	12	12.2	7	8.1	30.8	12 × n + 4.2	3.5	4.3	13.7
SCL2-N-08-H66-***-P**	ø6	38	44.5	22.9	15	5.6	64	15	15.5	11	9.5	41	15 × n + 4	3.8		18
SCL2-N-08-H88-***-P**	ø8															66.5

* F1 and F2 dimensions are oval.

* Can be distinguished from a speed controller with the color of the knob.
 Speed controller ... White knob
 Needle valve Gray knob

* The fitting push ring is blue for option P80 (oil-prohibited specifications).

- SCPD3
- SCM
- SSD2
- MDC2
- SMG
- LCM
- LCR
- LCG
- LCX
- STM
- STG
- STR2
- MRL2
- GRC
- Cylinder switch
- MN3E
MN4E
- 4GA/B
- M4GA/B
- MN4GA/B
- F.R (module unit)
- Clean F.R
- Precision R
- Press gauge
Diff. press gauge
- Electro-pneumatic R
- Speed controller
- Auxiliary valve
- Fitting/tube
- Clean air unit
- Pressure sensor
- Flow rate sensor
- Valve for air blow
- Ending

Design & selection

⚠ CAUTION

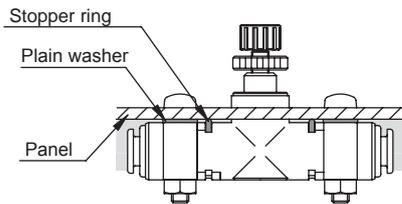
- Do not use this valve in circuits where ozone is generated intentionally. Ozone resistance is sufficient for naturally generated ambient ozone. Packing deteriorates if ozone levels are high.

- This valve cannot be used as a stop valve that has no leakage. Slight leakage is allowed in product specifications.
- Not all of the needle valve's resin parts are flameresistant.
- The flow path in the needle valve is not completely free of dust generation. A final clean filter should be used in circuits where dust generation could be a problem.

Mounting / Installation / adjustment

⚠ CAUTION

- Rotate the mounting hole section at no pressurized state.
- When installing on a panel, the stopper ring interferes with the panel, so insert a flat washer between the mounting hole and panel.



- Tighten bolts in mounting holes within the torque below.

Model No.	Tightening torque
SCL (D) 2-04	0.5 N·m
SCL (D) 2-06/08/10	0.8 N·m

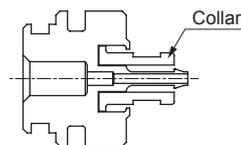
- As tubing may be dislocated due to product oscillation or torsion, fix the product with bolts or Insulok ties, etc., when piping.
- Do not turn the dial with force when fully opening or closing the dial (0.05 N·m or less). Do not use the lock nut to adjust the needle. Otherwise this could cause needle galling or damage.
- Tightening the lock nut excessively can cause problems. Do not use a torque higher than what is indicated in the following table.

Model No.	Tightening torque
SCL (D) 2-04/06	0.2 N·m
SCL (D) 2-08/10	0.3 N·m

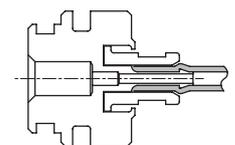
- The adjustment knob of "P80 (oil-prohibited specifications)" option may be slightly hard to turn.

- There is no direction for needle valve piping.
- Connect fiber tube (1.8 diameter fitting) as follows ((1) to (5)):

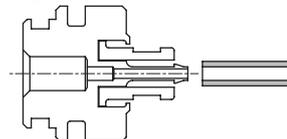
(1) Set the collar at the very back.



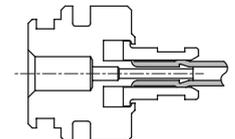
(4) Insert fiber tube to the last position.



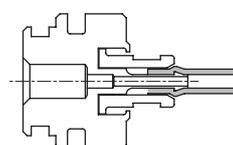
(2) Cut the end of fiber tube at a right angle.



(5) Pull the collar forward to lock it.



(3) Pass the collar through, and confirm that the fiber tube is correctly inserted while carrying out the work.



SCPD3
SCM
SSD2
MDC2
SMG
LCM
LCR
LCG
LCX
STM
STG
STR2
MRL2
GRC
Cylinder Switch
MN3E MN4E
4GA/B
M4GA/B
MN4GA/B
F.R.(module unit)
Clean F.R
Precision R
Press gauge Diff. press gauge
Electro-pneumatic R
Speed controller
Auxiliary valve
Fitting/tube
Clean air unit
Pressure sensor
Flow rate sensor
Valve for air blow
Ending

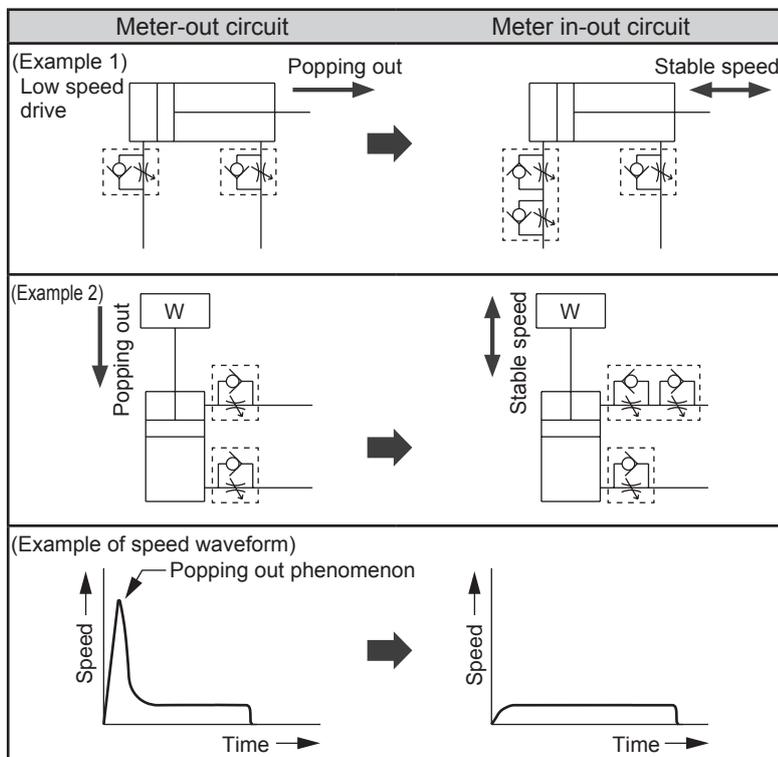
Example of in-out speed controller

1 Speed is stabilized by controlling with an in-out speed controller.

(Example 1) In low-speed control with a single rod cylinder, the cylinder pops out immediately after the PUSH side operates if a meter-out circuit is used.

(Example 2) At vertical mounting, the cylinder pops out immediately after actuation because of the load's weight.

Speed is stabilized by using a meter in-out circuit.



(Cause of popping out phenomenon)

When using the meter-out circuit, flow on the exhaust side is restricted, so both sides reach the same pressure immediately after the valve is switched.

The thrust equivalent to the difference in the piston's pressurized area or the thrust equivalent to the load's weight causes popping out.

When the piston moves, exhaust pressure rises, speed decelerates, and the set speed is reached.

If popping out is caused by this phenomenon, fluctuation in sudden thrust is suppressed by restricting the flow on the supply side, and popping out is resolved.

2 Danger can be prevented by suppressing popping out at beginning of movement after residual pressure is released.

3 Reciprocating speed control is possible with a single acting cylinder.