

Speed controller Line type with push-in fitting

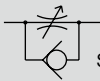
SCL2 Series

In/out speed controller Inline with push-in fitting

SCD2 Series

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

JIS symbol



SCL2 Series



SCD2 Series



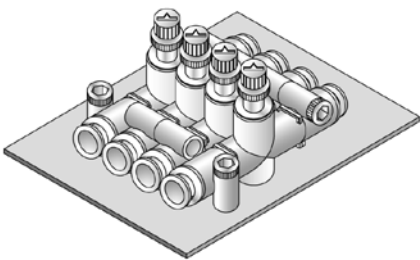
Overview

- The SCL2 Series is an inline speed controller useful for remote or centralized actuator control.
- The SCD2 Series is an integrated metering in/out speed controller that controls both air intake and exhaust flow rates. Depending on the circuit, the actuator can be prevented from popping out, speed can be stabilized and the reciprocating single acting cylinder speed can be controlled.

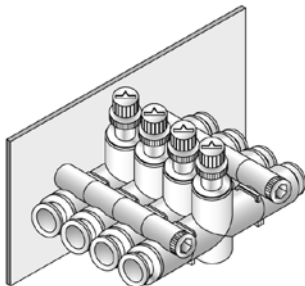
Features

Unrestricted mounting

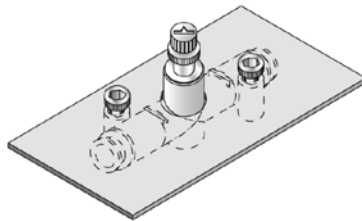
The installation area rotates by 360°, enabling mounting and installation method to be from base, side, or panel. Mounting brackets are not required.



Example of base mounting



Example of wall mounting



Example of panel mounting

Wide range of choices

Fiber tubing specifications and large bore have been added to the diverse lineup, expanding the size of compatible tubing to $\varnothing 1.8$ to $\varnothing 12$ diameter.

Large flow rate with compact

The max. flow rate achieved even with a compact body extends the selection range for cylinder size and speed control.

Fine speed available

Simple speed control for low and fine speed areas as well as small bore size cylinders.

Push-in connection

Push-in fittings simplify tubing connections.

Standard ozone-resistant materials

Ozone-resistant materials are used as standard for check packing to prevent deterioration of product.

Standard flame-resistant resin: UL94 Standard V-0 or equivalent



Refer to page 733 for SCL2/SCD2 Series Safety Precautions.

Specifications

● Speed controller Line type SCL2

Model No.		SCL2-04			SCL2-06	SCL2-08		SCL2-10			
Compatible tube O.D.		mm	ø1.8	ø1.8/ø4	ø4	ø6	ø6	ø8	ø8	ø10	ø12
Working fluid			Compressed air								
Max. working pressure		MPa	0.7 (≈100 psi, 7 bar)			1.0 (≈150 psi, 10 bar)					
Min. working pressure		MPa	0.1 (≈15 psi, 1 bar)								
Proof pressure		MPa	1.05 (≈150 psi, 10.5 bar)			1.5 (≈220 psi, 15 bar)					
Fluid temperature		°C	5 (41°F) to 60 (140°F) (no freezing. *3)								
Ambient temperature		°C	0 (32°F) to 60 (140°F) (no freezing)								
Weight		g	13	12	11.5	16	32	33	53	57	59
Dial value (needle position)			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 controller Inline SCD2

Model No.		SCD2-04			SCD2-06	SCD2-08		SCD2-10		
Compatible tube O.D.	mm	ø1.8	ø1.8/ø4	ø4	ø6	ø6	ø8	ø8	ø10	ø12
Working fluid		Compressed air								
Max. working pressure	MPa	0.7 (≈100 psi, 7 bar)			1.0 (≈150 psi, 10 bar)					
Min. working pressure	MPa	0.1 (≈15 psi, 1 bar)								
Proof pressure	MPa	1.05 (≈150 psi, 10.5 bar)			1.5 (≈220 psi, 15 bar)					
Fluid temperature	°C	5 (41°F) to 60 (140°F) (no freezing. *3)								
Ambient temperature	°C	0 (32°F) to 60 (140°F) (no freezing)								
Weight	g	23	22	21.5	29	63	64	108	112	114
Dial value (needle position)		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 [] indicate fine speed.

*3: Freezing may occur due to adiabatic expansion depending on the air quality (dew point).

Clean-room specifications (Catalog No. CB-033SA)

● Anti-dust generation structure for use in cleanrooms

SCL2- - **P7***

Specifications for rechargeable battery (Catalog No. CC-1226A)

● Structure compatible with rechargeable battery manufacturing process

SCL2- - **P4**
SCD2-

F.R.L.
F.R.
F (Filtr)
R (Reg)
L (Lub)
Drain
Separ
Mech
Press SW
Res press
exh valve
SlowStart
Anti-bac/Bac-
remove Filtr
Film
Resist FR
Oil-ProhR
Med
Press FR
No Cu/
PTFE FRL
Outdrs FRL
Adapter
Joiner
Press
Gauge
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneuR
AirBoost
Speed Ctrl
Silncr
CheckV/
other
Fit/Tube
Nozzle
Air Unit
PrecsCompn
Electro
Press SW
ContactSW
AirSens
PresSW
Cool
Air Flo
Sens/Ctrl
WaterRISens
TotAirSys
(Total Air)
TotAirSys
(Gamma)
Gas
generator
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg
etc
Ending

SCL2/SCD2 Series

F.R.L.
F.R.
F (Filtr)
R (Reg)
L (Lub)
Drain Separ
Mech Press SW
Res press exh valve
SlowStart
Anti-bac/Bac-
remove Filt
Film Resist FR
Oil-Prohr
Med Press FR
No Cu/ PTFE FRL
Outdrs FRL
Adapter Joiner
Press Gauge
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneR
AirBoost
Speed Ctrl
Silncr
CheckV/ other
Fit/Tube
Nozzle
Air Unit
PrecsCompn
Electro Press SW
ContactSW
AirSens
PresSW Cool
Air Flo Sens/Ctrl
WaterRtSens
TotAirSys (Total Air)
TotAirSys (Gamma)
Gas generator
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg etc
Ending

How to order

● Speed controller Line type

SCL2 - 04 - H44 -

● In/out speed controller Inline

SCD2 - 04 - H44 -

Model No.

A Body size

B Compatible tube O.D.

Refer to the table at right for body size, compatible tube O.D. and flow characteristic combinations.

⚠ Precautions for model No. selection

*1 : H24 cannot be selected for SCD2. Select H42 instead.

*2 : There is no push-in fitting compatible with Item **B** Compatible tube O.D. $\phi 1.8$. Refer to page 894 for line types with $\phi 1.8$ diameter push-in fittings.

C Flow characteristics

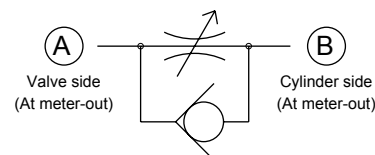
Code	Description
A Body size	
04	M5 thread equivalent
06	1/8 thread equivalent
08	1/4 thread equivalent
10	3/8 thread equivalent
B Compatible tube O.D.	
H22	$\phi 1.8$
H42	Side A: $\phi 4$ Side B: $\phi 1.8$
H24 (*1)	Side A: $\phi 1.8$ Side B: $\phi 4$
H44	$\phi 4$
H66	$\phi 6$
H88	$\phi 8$
H1010	$\phi 10$
H1212	$\phi 12$
C Flow characteristics	
Blank	Standard
F	Fine speed

Combination of body size, compatible tube O.D. and flow characteristics

		A Body size			
		04	06	08	10
B Compatible tube O.D.	H22	$\phi 1.8$			
	H42	$\phi 4/\phi 1.8$			
	H24 (*1)	$\phi 1.8/\phi 4$			
	H44				
	H66				
	H88				
	H1010				
	H1212				

● Flow characteristics "standard"
○ Flow characteristics "fine speed"
■ Not available

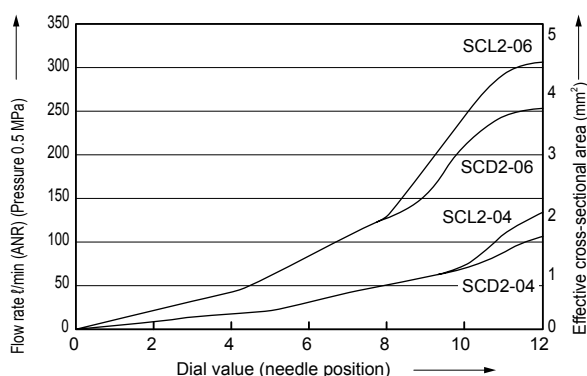
● Illustration of combination of compatible tube O.D. (H24/H42 only)



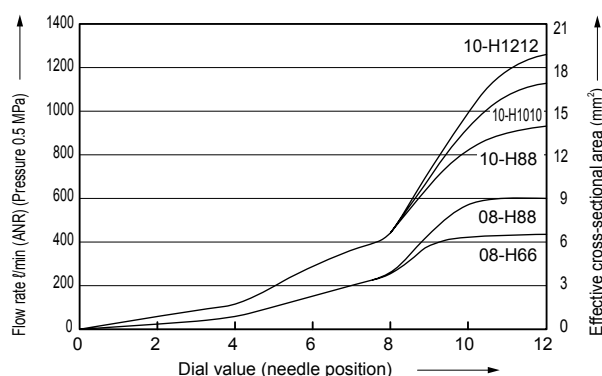
Free flow direction
Controlled flow direction

Flow characteristics

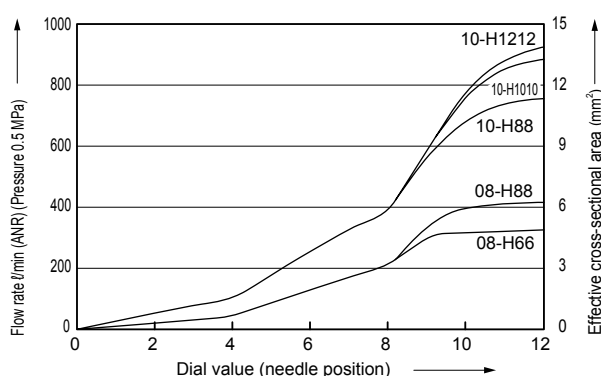
● Standard SCL2-04, SCL2-06, SCD2-04, SCD2-06



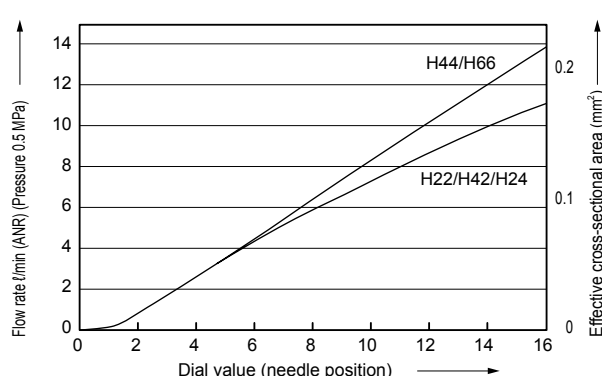
● Standard SCL2-08, SCL2-10



● Standard SCD2-08, SCD2-10



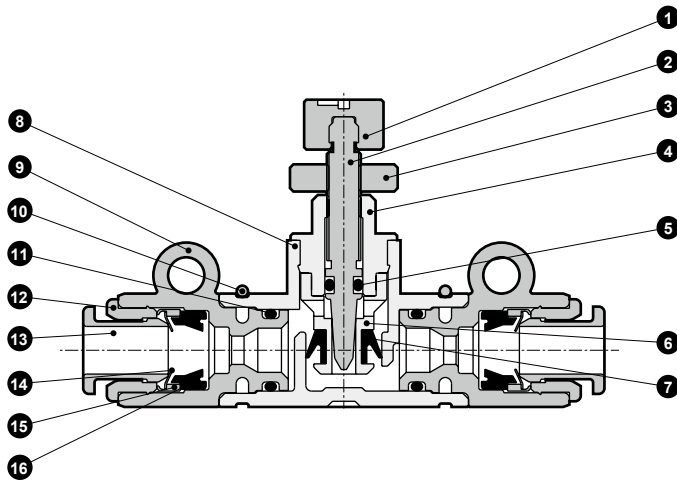
● Fine speed



SCL2/SCD2 Series

Internal structure/external dimensions

Internal structure and parts list



No.	Part name	Material
1	Knob	Polybutylene terephthalate
2	Needle	Copper alloy
3	Lock nut	Copper alloy
4	Guide ring	Copper alloy
5	O-ring	Nitrile rubber
6	Check bracket	Copper alloy
7	Check packing	Hydrogenated nitrile rubber
8	Body	Polybutylene terephthalate
9	Fitting case	Polybutylene terephthalate
10	Stopper ring	Stainless steel
11	O-ring	Nitrile rubber
12	Outer ring	Copper alloy
13	Push ring	Polybutylene terephthalate
14	Chuck	Stainless steel
15	Holder	Copper alloy or polyetherimide
16	Packing	Nitrile rubber

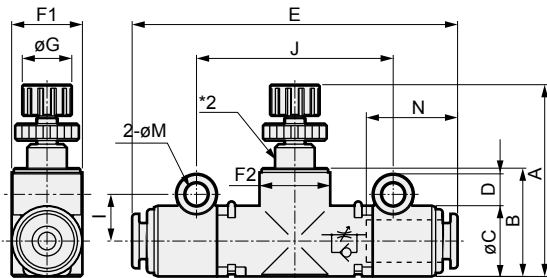
*1 All the copper alloy parts have electroless nickel plating.

*2 All resin parts are flame-resistant. (equivalent to UL94 standards V-0)
Excluding compatible tube O.D. $\phi 1.8$.

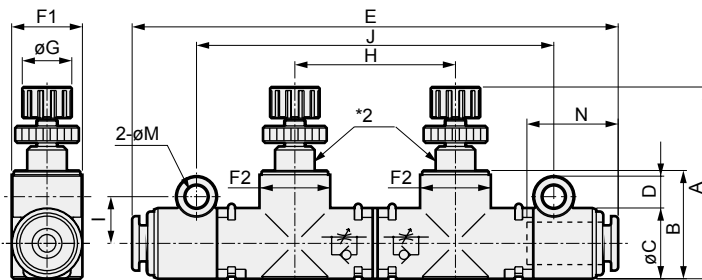
Dimensions



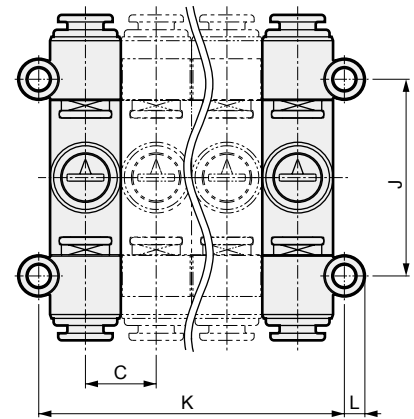
● SCL2 Series



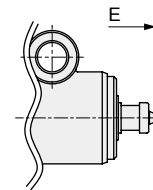
● SCD2 Series



● Mounting pitch dimension for manifold



● Outline drawing of fitting for connected tube outer diameter $\phi 1.8$



Model No.	Connected tube outer diameter	A		B	C	D	E	F1	F2	G	H	I	J	K	L	M (Mounting hole diameter)	N (tube insert length)	
		MIN	MAX															
SCL2-04-H22 *1	ø1.8	27.1	31.6	15.3	10	4.5	50.8	10	10.6	7	-	6.6	27.8	10×n+3.2	2.9	3.3	-	
SCL2-04-H42 *1	ø4/ø1.8						48.4										12.9/-	
SCL2-04-H24 *1	ø1.8/ø4						48.4										-/12.9	
SCL2-04-H44	ø4						46										12.9	
SCL2-06-H66	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	
SCL2-08-H66	ø6	38	44.5	22.9	15	5.6	64	15	15.5	11	-	9.5	41	15×n+4	3.6		18	
SCL2-08-H88	ø8						66.5										19	
SCL2-10-H88	ø8	44	50.5	29.7	20	5.1	71	20	20.5	11	-	11.5	47	20×n+3	21			
SCL2-10-H1010	ø10						75										22	
SCL2-10-H1212	ø12				20.4	4.9	79							20.4×n+3				
SCD2-04-H22 *1	ø1.8	27.1	31.6	15.3	10	4.5	73.5	10	10.6	7	22.7	6.6	50.5	10×n+3.2	2.9		3.3	-
SCD2-04-H42 *1	ø4/ø1.8						71.1											12.9/-
SCD2-04-H44	ø4						68.7									12.9		
SCD2-06-H66	ø6	28.8	33.3	17.7	12	5.6	73.9	12	12.2	7	24.5	8.1	55.3	12×n+4.2	3.5	4.3	13.7	
SCD2-08-H66	ø6	38	44.5	22.9	15	5.6	97.5	15	15.5	11	34	9.5	75	15×n+4	3.6		18	
SCD2-08-H88	ø8						100										19	
SCD2-10-H88	ø8	44	50.5	29.7	20	5.1	111	20	20.5	11	40.5	11.5	87.5	20×n+3	21			
SCD2-10-H1010	ø10						115										22	
SCD2-10-H1212	ø12				20.4	4.9	119							20.4×n+3				

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

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

*3: F1 and F2 dimensions are oval.

F.R.L.
F.R.
F (Filtr)
R (Reg)
L (Lub)
Drain
Separ
Mech
Press SW
Res press
exh valve
SlowStart
Anti-bac/Bac-
remove Filt
Film
Resist FR
Oil-ProhR
Med
Press FR
No Cu/
PTFE FRL
Outdrs FRL
Adapter
Joiner
Press
Gauge
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneur
AirBoost
Speed Ctrl
Silncr
CheckV/
other
Fit/Tube
Nozzle
Air Unit
PrecsCompn
Electro
Press SW
ContactSW
AirSens
PresSW
Cool
Air Flo
Sens/Ctrl
WaterRtSens
TotAirSys
(Total Air)
TotAirSys
(Gamma)
Gas
generator
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg
etc
Ending



Needle valve Line type with push-in fitting

SCL2-N Series

● Port size: $\varnothing 4/\varnothing 6/\varnothing 8$

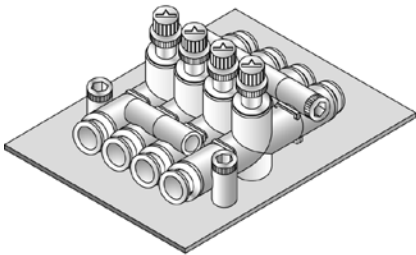
JIS symbol



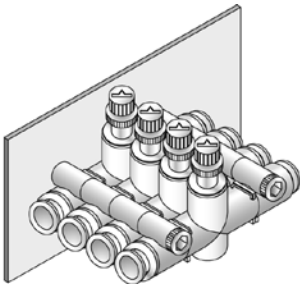
Features

Unrestricted mounting

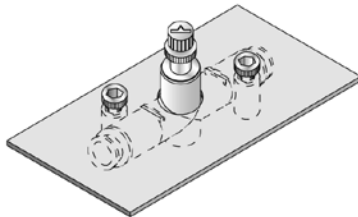
The installation area rotates by 360°, enabling mounting and installation method to be from base, side, or panel. Mounting bracket is not required.



Example of base mounting



Example of wall mounting



Example of panel mounting

Low-evaporation grease

This series is suitable for oil-sensitive environments and systems. This product is also compatible with oil-free clean packaging “oil-prohibited specifications.”

Linear flow characteristics

A flat dedicated needle for flow adjustment is used.

Specifiable flow size

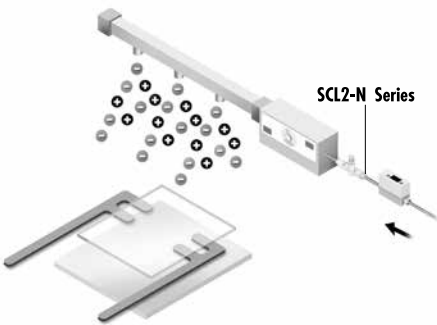
Four flow rate sizes of 13/50/150 and 300 l/min . at 0.5 MPa are available to enable precise flow rate adjustment.

Push-in connection

Push-in fittings simplify tubing connection.

Standard flame-resistant resin: UL94 Standard V-0 or equivalent

SCL2-N Series applications



- Flow characteristics of ionizer purge gas
- Air blow in clean room
- N2 purge circuit
- Adjustment of workpiece unloading blow rate for disk former
- Flow rate control at tension control

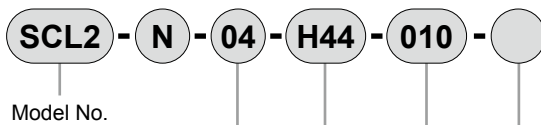
Specifications

Model No.	SCL2-N-04	SCL2-N-06	SCL2-N-08
Compatible tube O.D. mm	ø4	ø6	ø6 ø8
Working fluid	Compressed air/N ₂ gas		
Max. working pressure MPa	1.0 (≈150 psi, 10 bar)		
Negative pressure kPa	-100 (≈-15 psi, -1 bar)		
Proof pressure MPa	1.5 (≈220 psi, 15 bar)		
Fluid temperature °C	5 (41°F) to 60 (140°F) (no freezing. Note)		
Ambient temperature °C	0 (32°F) to 60 (140°F) (no freezing)		
Weight g	11.5	16	32 33
Dial value (needle position)	12 (15 rotations for flow rate 010)		

Note: Freezing may occur due to adiabatic expansion depending on the air quality (dew point).

How to order

● Needle valve Line type



Refer to the table at right for the body size, compatible tube O.D. and flow combinations.

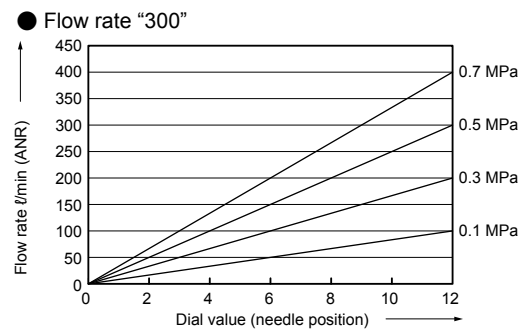
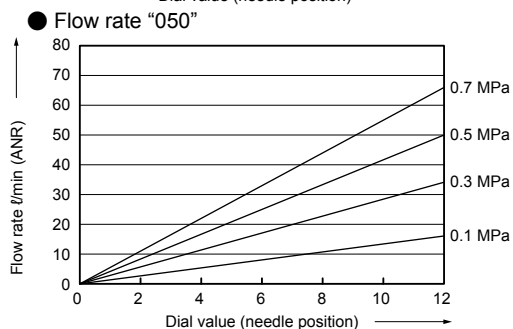
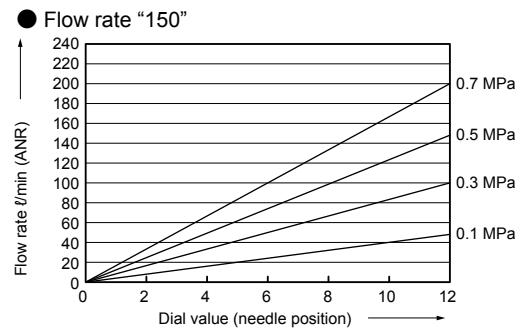
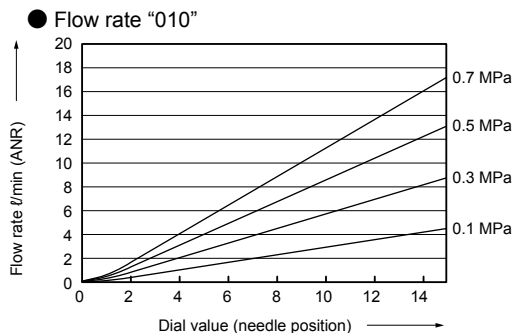
Code	Description
A Body size	
04	M5 thread equivalent
06	1/8 thread equivalent
08	1/4 thread equivalent
B Compatible tube O.D.	
H44	ø4
H66	ø6
H88	ø8
C Flow rate	
010	Refer to flow characteristics
050	graph and specifications
150	
300	
D Option	
Blank	Standard specifications
P80	Oil-prohibited specifications

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

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

■ Not available

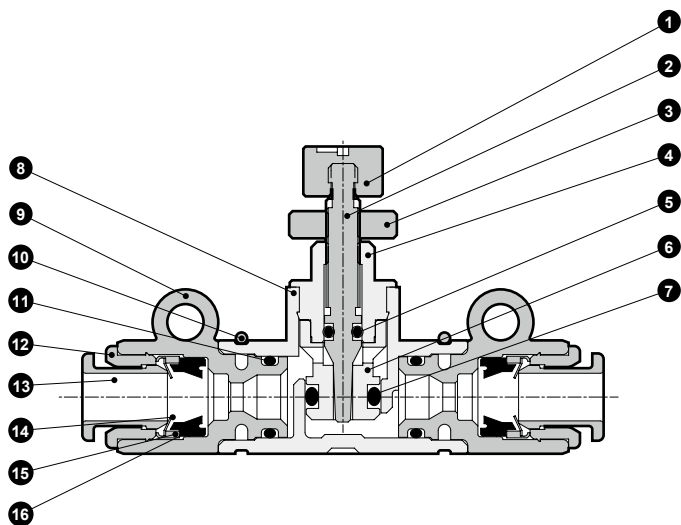
Flow characteristics



SCL2-N Series

F.R.L. Internal structure and parts list

F.R.
F (Filtr)
R (Reg)
L (Lub)
Drain
Separ
Mech
Press SW
Res press
exh valve
SlowStart
Anti-bac/Bac-
remove Filt
Film
Resist FR
Oil-ProhR
Med
Press FR
No Cu/
PTFE FRL
Outdrs FRL
Adapter
Joiner
Press
Gauge
CompFRL
LgFRL
PrecsR
VacF/R
Clean FR
ElecPneR
AirBoost
Speed Ctrl
Silncr
CheckV/
other
Fit/Tube
Nozzle
Air Unit
PrecsCompn
Electro
Press SW
ContactSW
AirSens
PresSW
Cool
Air Flo
Sens/Ctrl
WaterRtSens
TotAirSys
(Total Air)
TotAirSys
(Gamma)
Gas
generator
RefrDry
DesicDry
HiPolymDry
MainFiltr
Dischrg
etc
Ending



No.	Part name	Material
1	Knob	Polybutylene terephthalate
2	Needle	Copper alloy
3	Lock nut	Copper alloy
4	Guide ring	Copper alloy
5	O-ring	Nitrile rubber
6	Check bracket	Copper alloy
7	O-ring	Nitrile rubber
8	Body	Polybutylene terephthalate
9	Fitting case	Polybutylene terephthalate
10	Stopper ring	Stainless steel
11	O-ring	Nitrile rubber
12	Outer ring	Copper alloy
13	Push ring	Polybutylene terephthalate or polyacetal
14	Chuck	Stainless steel
15	Holder	Copper alloy or polyetherimide
16	Packing	Nitrile rubber (hydrogenated nitrile rubber) *2

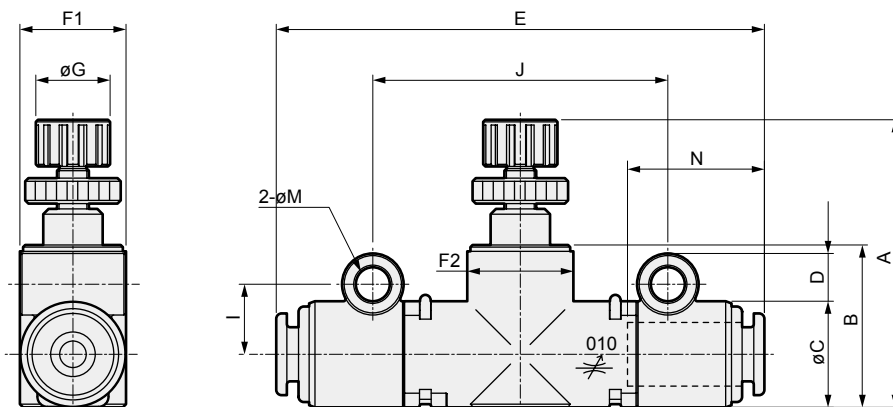
*1 All the copper alloy parts have electroless nickel plating.

*2 (): When P80 is selected

Dimensions



● SCL2-N Series



Model No.	Connected tube outer diameter	A		B	C	D	E	F1	F2	G	I	J	K	L	M (Mounting hole diameter)	N (tube insert length)
		MIN	MAX													
SCL2-N-04-H44	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	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		13.7
SCL2-N-08-H66	ø6	38	44.5	22.9	15	5.6	64	15	15.5	11	9.5	41	15×n+4	3.8	4.3	18
SCL2-N-08-H88	ø8						66.5									19

Note: 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).