

Clean Speed Controller
with One-touch Fitting

Series AS-FPQ/AS-FPG

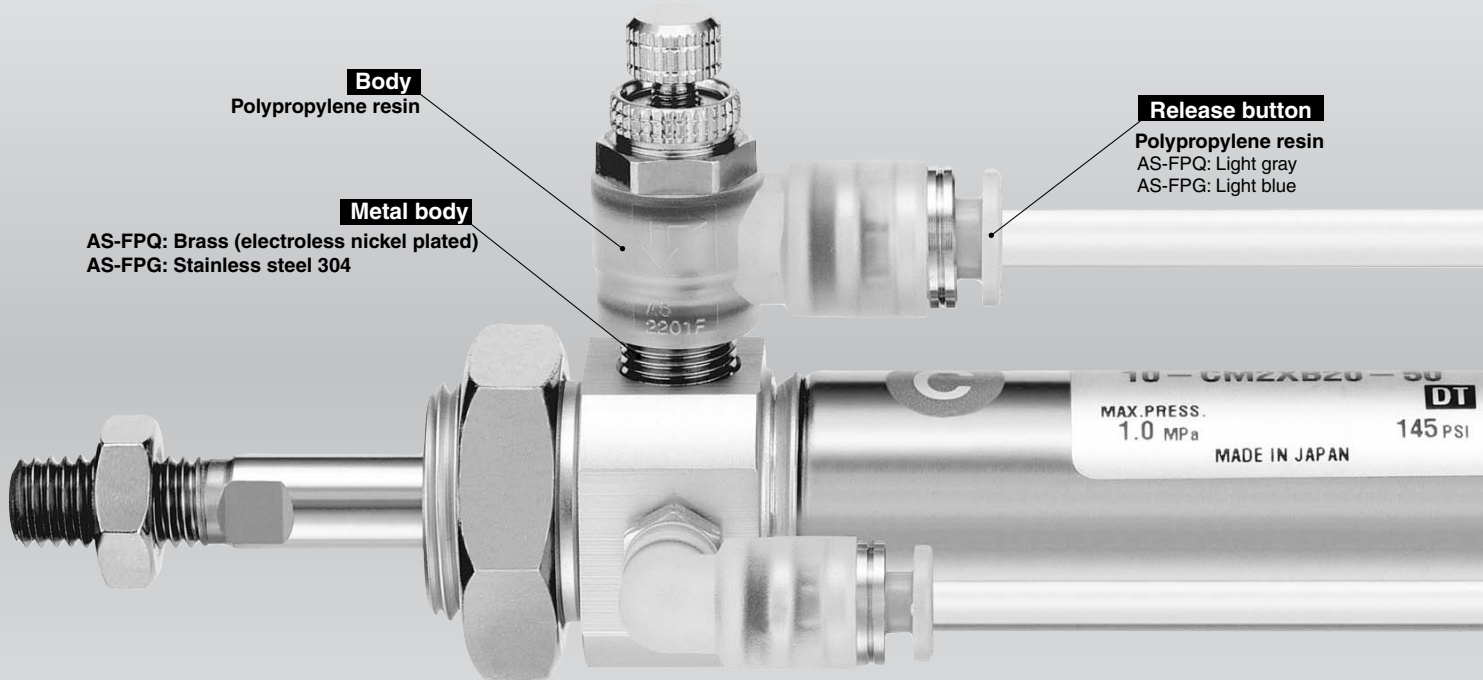


*Speed controllers
for clean room use*

- AS
- ASP
- ASN
- AQ
- ASV
- AK
- ASS
- ASR
- ASF

**AS-FPQ: Brass (electroless nickel plated) and
AS-FPG: Stainless steel 304 are now available as a series.**

Low particulate generating speed controllers designed for use in clean rooms



Clean Speed Controller with One-touch Fitting

Series AS-FPQ/FPG



Series AS-FPQ
Brass (electroless nickel plated)



Series AS-FPG
Stainless steel 304

Elbow type	Port size	Applicable tube O.D. (mm)					Applicable cylinder bore size (mm)
		4	6	8	10	12	
AS12□1FP□-M5	M5 x 0.8	●	●	●	●	●	6, 10, 16, 20
AS22□1FP□-01	R 1/8	●	●	●	●	●	20, 25, 32
AS22□1FP□-02	R 1/4	●	●	●	●	●	20, 25, 32, 40
AS32□1FP□-03	R 3/8	●	●	●	●	●	40, 50, 63
AS42□1FP□-04	R 1/2	●	●	●	●	●	63, 80, 100

Low particulate generation

Clean performance

AS-FPQ
Resin: PP
Metal: Brass (electroless nickel plated)

AS-FPG
Resin: PP
Metal: Stainless steel 304

10-AS-F
Resin: PBT, POM
Metal: Brass (electroless nickel plated)

10-AS-FG
Resin: PBT, POM
Metal: Stainless steel 303

Environmental resistance

Excellent

Clean Speed Controller with One-touch Fitting

Series AS-FPQ/FPG

Elbow Type

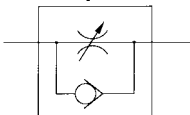
AS-FPQ/Brass (electroless nickel plated)
Release button color: Light gray



AS-FPG/Stainless steel 304
Release button color: Light blue



JIS symbol



Flow direction symbols on body

	Meter-out type	Meter-in type
Symbol		
JIS symbol		

Model

Elbow type	Port size	Applicable tubing O.D. (mm)					Applicable cylinder bore size (mm)
		4	6	8	10	12	
AS12□1FP□-M5	M5 x 0.8	●	●				6, 10, 16, 20
AS22□1FP□-01	R 1/8	●	●	●			20, 25, 32
AS22□1FP□-02	R 1/4	●	●	●	●		20, 25, 32, 40
AS32□1FP□-03	R 3/8		●	●	●	●	40, 50, 63
AS42□1FP□-04	R 1/2				●	●	63, 80, 100

Specifications

Particulate generation grade	Grade 1 Note 1)
Proof pressure	1.5MPa
Maximum operating pressure	1MPa
Minimum operating pressure	0.1MPa
Ambient and fluid temperature	-5 to 60°C (with no freezing)
Number of needle rotations	10 rotations (8 rotations Note 2))

Note 1) Refer to particulate generation grade classifications.
Note 2) For AS12□1FP□

Flow Rate and Effective Area

Model		AS12□1FP□-M5		AS22□1FP□-01		AS22□1FP□-02			AS32□1FP□-03		AS42□1FP□-04	
Tubing O.D.	Metric sizes	ø4	ø4	ø6	ø4	ø6	ø8	ø6	ø8	ø10	ø10	ø12
			ø6		ø8			ø10			ø12	
Controlled (free) flow	Flow rate l/min (ANR)	100	180	230	260	390	460	660	790	920	1580	1710
	Effective area mm ²	1.5	2.7	3.5	4	6	7	10	12	14	24	26

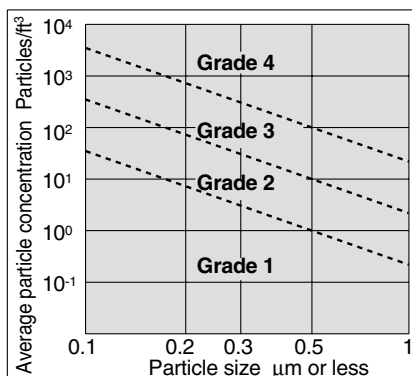
Note) Flow rate values are at a pressure of 0.5MPa, and temperature of 20°C.

Recommended Applicable Tubing

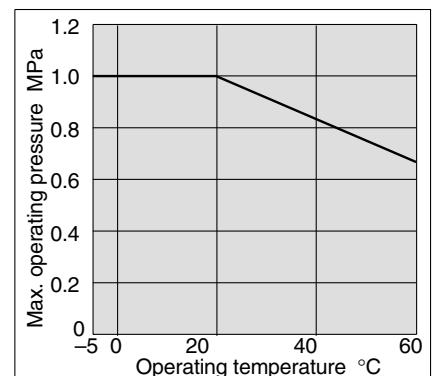
Tubing material	Clean series polyurethane tubing: Series 10
Tubing O.D.	ø4, ø6, ø8, ø10, ø12

Polyurethane tubing: Series TU, Nylon tubing: Series T and Soft nylon tubing: Series TS can also be used. However, the degree of clean performance will decline.

Particulate Generation Grade Classifications

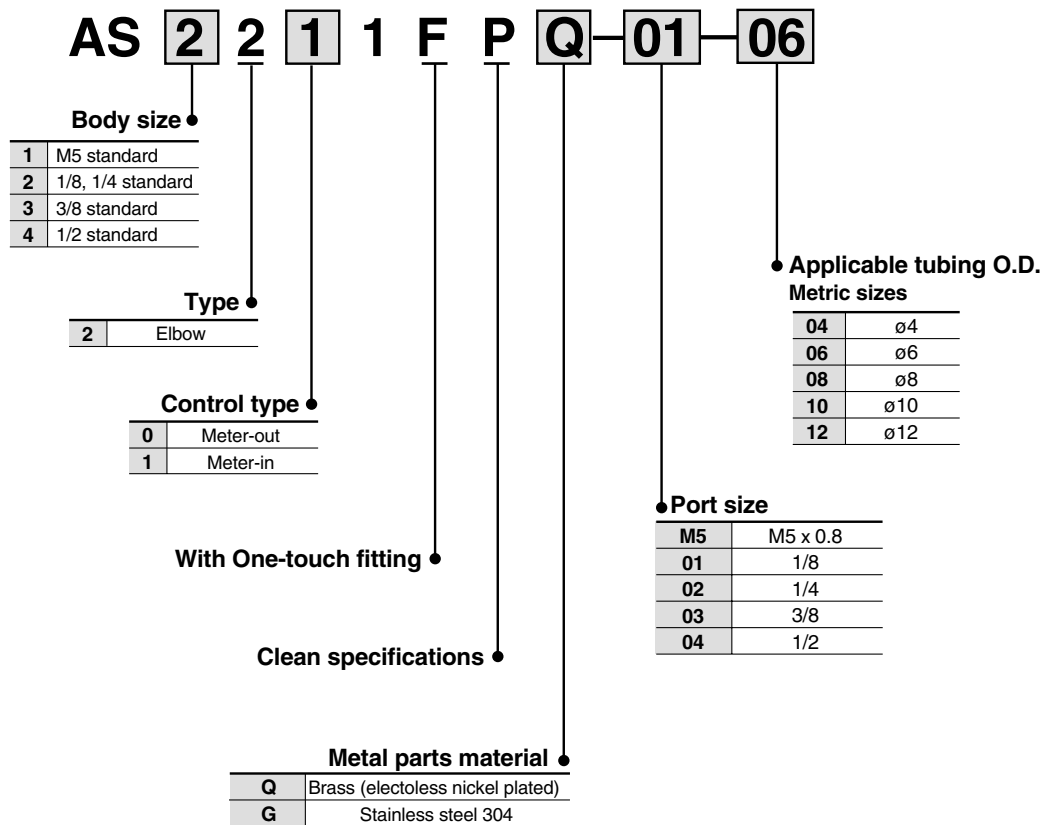


Relation between Operating Temp. and Max. Operating Pressure



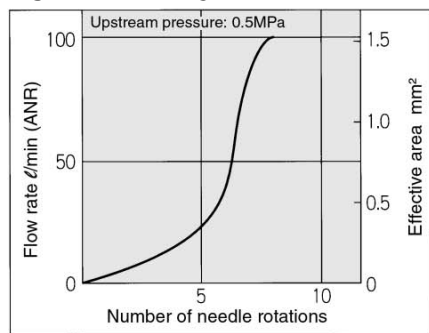
Series AS-FPQ/FPG

How to Order

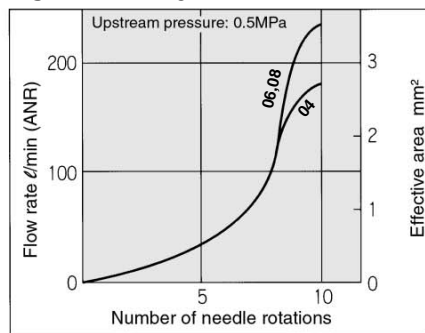


Needle Valve/Flow Characteristics

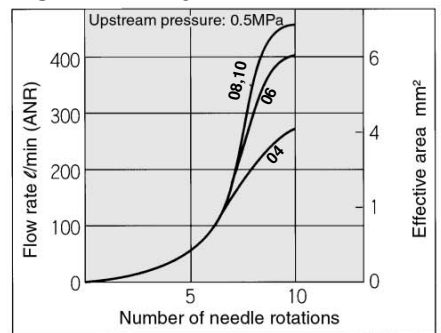
AS12□1FP□-M5



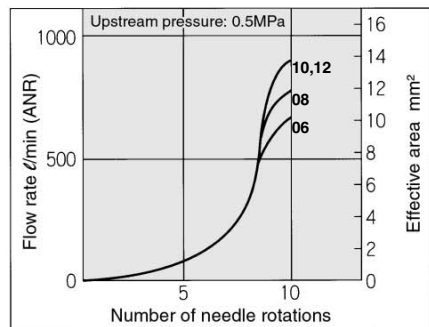
AS22□1FP□-01



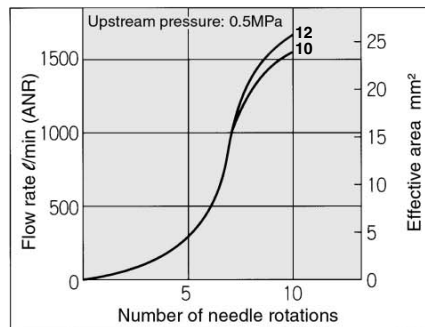
AS22□1FP□-02



AS32□1FP□-03



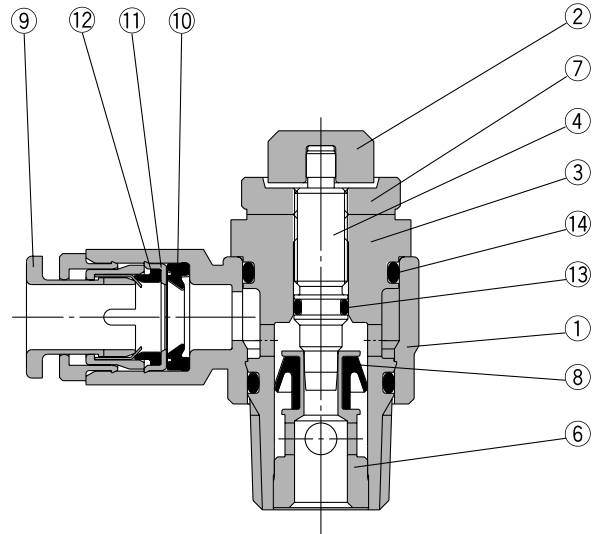
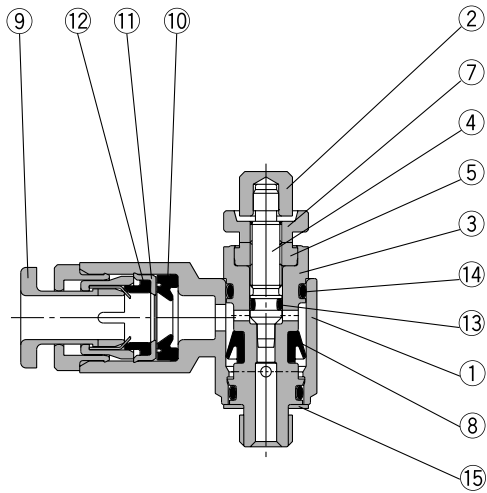
AS42□1FP□-04



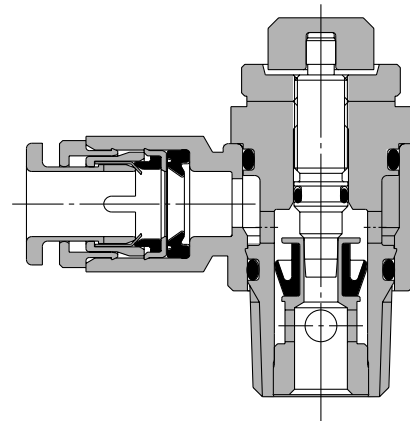
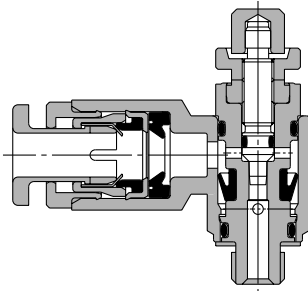
Clean Speed Controller with One-touch Fitting Series AS-FPQ/FPG

Construction

Meter-out type M5 type



Meter-in type M5 type



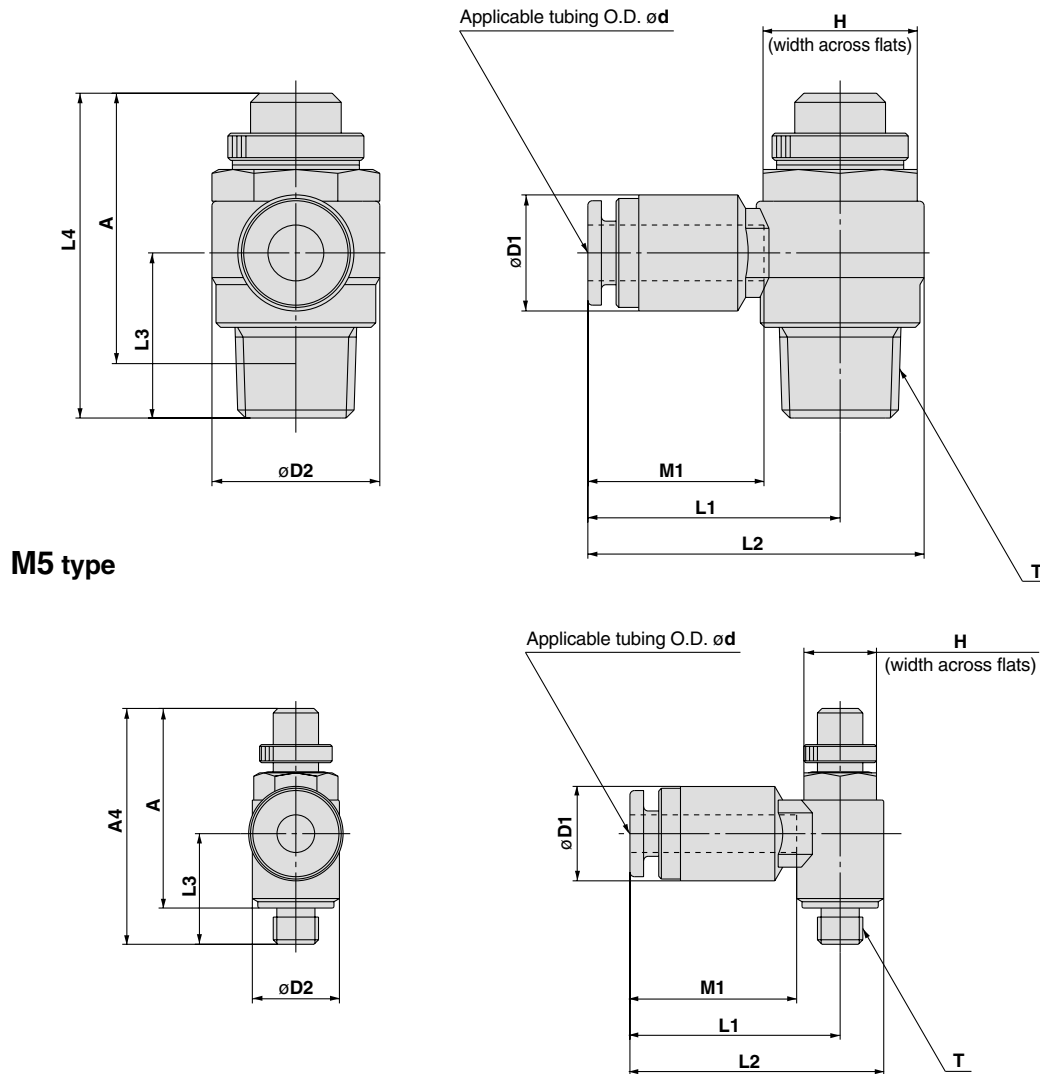
- AS
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Component Parts

No.	Description	AS□□□1FPQ		AS□□□1FPG	
		Material	Note	Material	Note
①	Body A	Polypropylene resin		Polypropylene resin	
②	Knob	Brass	Electroless nickel plated	Stainless steel 304	
③	Body B	Brass	Electroless nickel plated	Stainless steel 304	
④	Needle	Brass	Electroless nickel plated	Stainless steel 304	
⑤	Needle guide	Brass	Electroless nickel plated	Stainless steel 304	
⑥	Seat ring	Brass	Electroless nickel plated	Stainless steel 304	
⑦	Lock nut	Brass	Electroless nickel plated	Stainless steel 304	
⑧	U seal	HNBR		HNBR	
⑨	Cassette	Polypropylene resin Stainless steel 304, Brass	Brass parts are electroless nickel plated	Polypropylene resin Stainless steel 304	
⑩	Seal	NBR		NBR	
⑪	Stopper	Stainless steel 304		Stainless steel 304	
⑫	Cushion	NBR		NBR	
⑬	O-ring	NBR		NBR	
⑭	O-ring	NBR		NBR	
⑮	Gasket	NBR, Stainless steel 304		NBR, Stainless steel 304	

Series AS-FPQ/FPG

Dimensions



Model	Tubing O.D. d	T	H	D1	D2	L1	L2	L3	L4		A ^{Note 1)}		M1	Weight (g) ^{Note 2)}	
									Max.	Min.	Max.	Min.		1*	2*
AS12□1FP□-M5-04	4	M5 x 0.8	8	10.4	9.6	23.2	28	12.2	28.3	25.5	25	22.2	18.4	7	7
AS12□1FP□-M5-06	6			12.8		29	19.4						8	8	
AS22□1FP□-01-04	4	R 1/8	12	10.4	14.2	25.3	32.4	14.3	36.4	31.4	32.4	27.4	18.4	17	17
AS22□1FP□-01-06	6			12.8		33.4	19.4						18	18	
AS22□1FP□-01-08	8			15.2		35.6	21.9						20	20	
AS22□1FP□-02-04	4	R 1/4	17	10.4	18.5	27.8	37	18.2	40.8	35.8	34.8	29.8	18.4	33	33
AS22□1FP□-02-06	6			27.8		37	19.4						33	33	
AS22□1FP□-02-08	8			15.2		39.6	21.9						35	35	
AS22□1FP□-02-10	10			18.5		47.5	23.8	38					38		
				20											
AS32□1FP□-03-06	6	R 3/8	19	12.8	23	30.4	41.9	20.9	46.9	41.9	40.6	35.6	19.4	59	55
AS32□1FP□-03-08	8			15.2		44.4	21.9						61	57	
AS32□1FP□-03-10	10			18.5		46.1	23.8	63					59		
AS32□1FP□-03-12	12			20.9		47.3	25	65					61		
AS42□1FP□-04-10	10	R 1/2	24	18.5	28.6	36.6	50.9	25.4	55.6	50.6	47.4	42.4	23.8	107	100
AS42□1FP□-04-12	12			20.9		52.5	25						109	102	

Note 1) Reference dimension for threads after installation

Note 2) 1* is the weight for type AS□2□1FPQ (brass + electroless nickel plated), 2* is the weight for type AS□2□1FPG (Stainless steel 304).



Specific Product Precautions 1

Be sure to read before handling.

Selection

⚠ Warning

1. Confirm the specifications.

The products appearing in this catalog are designed for use only in compressed air systems.

Do not use outside the specified ranges of pressure, temperature, etc., as this may cause damage or malfunction. (Refer to specifications.)

Please consult with SMC if fluids other than compressed air are to be used.

2. This product cannot be used as a stop valve requiring zero air leakage.

A certain amount of leakage is allowed in the product's specifications.

Handling

⚠ Caution

1. Store away from direct sunlight at 40°C or less.
2. Open the inner package of the double packaging in a clean room or other clean environment.

Installation and Adjustment

⚠ Warning

1. Allow space for maintenance.

Allow the space necessary for maintenance and inspections

2. Tighten screws with the proper tightening torque.

When mounting the product, tighten screws with the recommended torque.

3. Install and remove by tightening or loosening the hexagon wrench flats on Body B with a suitable wrench.

Damage may occur if any other part is used. Adjustment of the position after mounting should be performed by turning Body A by hand.

4. Confirm that the lock nut is not loose.

If the lock nut is loose, there may be dangerous changes in actuator speed.

5. The number of opening and closing rotations of the needle valve should be adjusted within the range of the specifications.

Since it has a pull-out stop mechanism, it will not rotate past the limit. Confirm the number of rotations for the product being used, as excessive turning of the needle will cause damage.

6. Mount after confirming the direction of flow.

Mounting backwards is dangerous, because the speed adjustment needle will not work and the actuator may lurch suddenly.

7. To adjust the speed, start with the needle in the completely closed position, and then adjust by opening gradually.

When the needle valve is opening, the actuator may lurch suddenly creating a dangerous situation.

Moreover, the needle valve is closed by turning clockwise, and opened by turning counterclockwise. Therefore, the actuator speed is reduced by turning clockwise and increased by turning counterclockwise.

Installation and Adjustment

⚠ Caution

1. Before mounting confirm the model and size, etc. Also confirm that there are no scratches, nicks or cracks in the product.
2. When tubing is connected, consider factors such as changes in the tubing length due to pressure, and allow sufficient leeway.
3. Mount so that fittings and tubing are not subjected to twisting, pulling or moment loads. This can cause damage to fittings and flattening, bursting or disconnection of tubing, etc.

Piping

⚠ Caution

1. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

2. Be sure to wrap pipe tape around the taper threads. Using without pipe tape can cause air leakage.

3. Wrapping of pipe tape

When screwing together pipes, fittings, etc., be certain that chips from the pipe threads and sealant material do not get inside the piping.

Further, when pipe tape is used, leave 1.5 to 2 thread ridges exposed at the end of the threads.

Tightening Torque

⚠ Caution

1. The proper tightening torque for pipe fittings is as shown in the table. As a rule, they should be tightened 2 to 3 turns with a tool after first tightening by hand.

Furthermore, over-tightening can cause air leakage due to broken threads and deformation of the gasket, etc. Under-tightening can cause loose threads and air leakage, etc.

Male thread	Proper tightening torque N·m	Width across flats mm	Nominal size of adjustable angle wrench mm
M5	1/6 turn after hand tightening	8	100
1/8	7 to 9	12	150
1/4	12 to 14	17	200
3/8	22 to 24	19	200
1/2	28 to 30	24	200

Lock Nut Tightening Torque

⚠ Caution

1. The proper tightening torque for the hexagon lock nut is as shown in the table. As a rule, it should be tightened an additional 15 to 30° with a tool after first tightening by hand. Be careful not to cause damage by over tightening.

Body size	Proper tightening torque N·m
M5	0.3
1/8	1
1/4	1.5
3/8	4
1/2	10

AS

ASP

ASN

AQ

ASV

AK

ASS

ASR

ASF



Specific Product Precautions 2

Be sure to read before handling.

Installation and Removal of Tubing

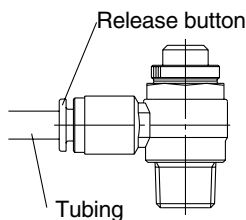
Caution

1. Installation of tubing

- 1) Using tube cutters TK-1, 2 or 3, take a tube having no flaws on its periphery and cut it off at a right angle. Do not use pinchers, nippers or scissors, etc. The tubing might be cut diagonally or flattened, making installation impossible or causing problems such as disconnection and leakage.
- 2) Hold the tube and push it in slowly, inserting it securely all the way into the fitting.
- 3) After inserting the tubing, pull on it lightly to confirm that it will not come out. If it is not installed securely all the way into the fitting, problems such as leakage or disconnection of the tubing can occur.

2. Removal of tubing

- 1) Push in the release button sufficiently, pressing the collar evenly around its circumference.
- 2) Pull out the tubing while holding down the release button so that it does not pop out. If the release button is not pressed down sufficiently, there will be increased bite on the tubing and it will become more difficult to pull it out.
- 3) When the removed tubing is to be used again, first cut off the section of the tubing which has been chewed.
Using the chewed portion of the tube as it is can cause problems such as leakage or difficulty in removing the tubing.



Operating Environment

Warning

1. Do not use in environments or locations where there is a danger of the speed controller being adversely affected.
Refer to page 15-17-5 regarding speed controller materials.
2. Provide shade in locations which receive direct sunlight.
3. Do not operate in locations where vibration or impact occurs.
4. Provide shielding in locations near heat sources.
When there are heat sources in the surrounding area, the product's temperature may rise due to radiated heat and exceed its operating temperature range. Block off the heat with a cover, etc.
5. Do not use in locations where static electric charges will be a problem. Please consult with SMC regarding use in this kind of environment.
6. Do not use in locations where spatter occurs.
There is a danger of spatter causing a fire. Please consult with SMC regarding use in this kind of environment.

Maintenance

Warning

1. Maintenance work

Compressed air can be dangerous if handled improperly. Element replacement and other maintenance, etc., should be performed by personnel having sufficient knowledge and experience pertaining to pneumatic equipment, while also adhering to the product specifications.

2. Pre-maintenance checks

When the product is to be removed, be sure to shut off the supply pressure, release compressed air in the pipelines and confirm an atmospheric release condition before proceeding.

3. Post-maintenance checks

After mounting, repair or renovation, supply compressed air and perform suitable function and leak tests. If an audible leak is detected or equipment does not operate properly, stop operation and confirm that mounting is correct.

4. Disassembly and modification is prohibited.

Do not disassemble or modify the main unit.

Precautions on Use of Other Tubing Brands

Caution

1. When using tubing brands other than SMC, confirm that the tubing outside diameter tolerances satisfy the following specifications.

- | | |
|------------------------|-----------------------------|
| 1) Polyurethane tubing | Max. +0.15mm
Max. -0.2mm |
| 2) Nylon tubing | Max. \pm 0.1mm |
| 3) Soft nylon tubing | Max. \pm 0.1mm |

Do not use tubing if the outside diameter tolerance is not satisfied. It may not be possible to connect the tubing, or air leakage or disconnection may occur after connection.