

Speed Controller with One-touch Fitting/Elbow Type

Reduces labor time!

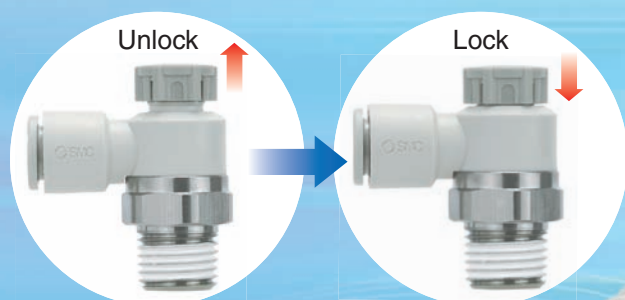
New

RoHS

Easy to use

Push-lock type

- Easy to lock



Larger handle

Body size	ØD (mm)
1	9
2	11.6 (Port size 1/8) 12.6 (Port size 1/4)
3	15.6
4	17.6

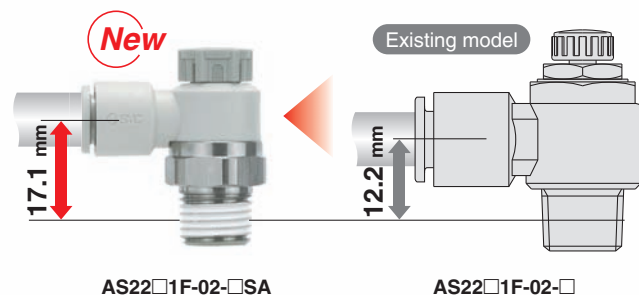


Improved tube insertion/removal



* Tube pulling out strength is ensured to be equivalent to existing model.

More space beneath the tube. Easier installation/removal of the tube.



AS22□1F-02-□SA

AS22□1F-02-□

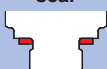


Series AS



CAT.ES20-220A

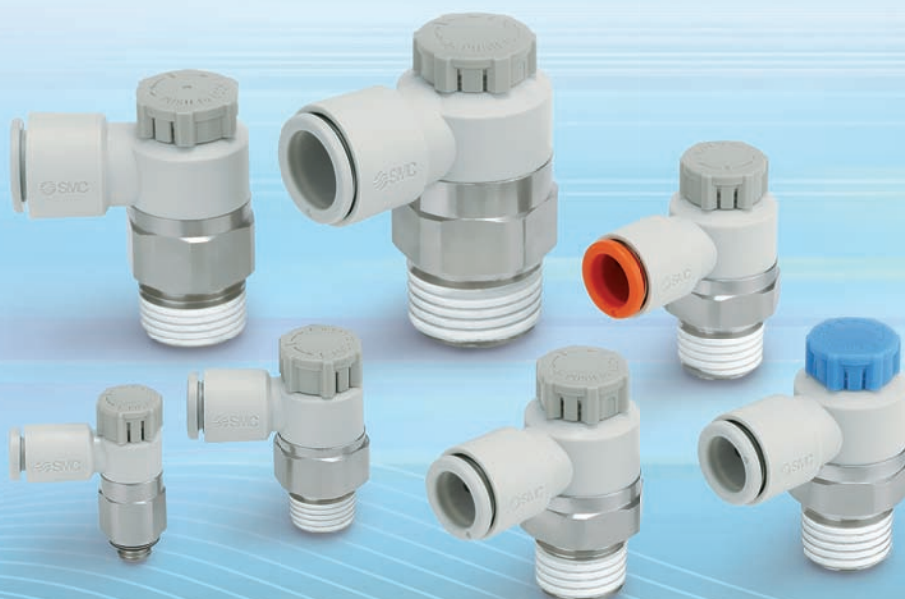
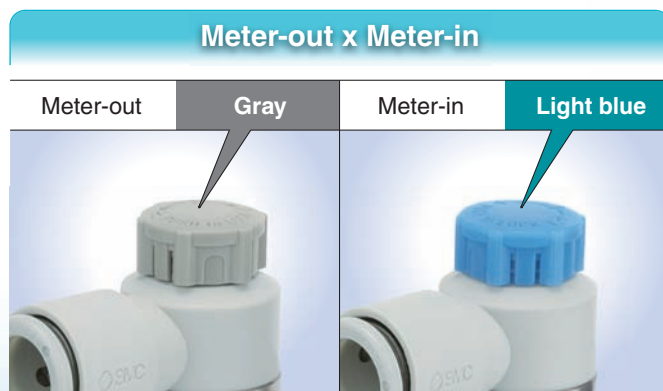
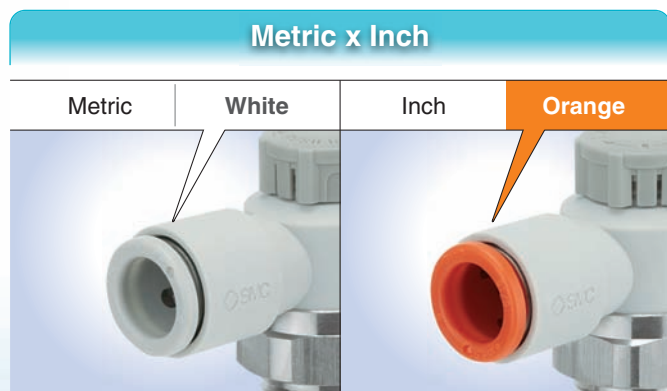
Series Variations

	Body size	Port size	Seal method	Applicable tubing O.D.														Applicable tubing material
				Metric size								Inch size						
				2	3.2	4	6	8	10	12	16	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"	
	1	M5 x 0.8	Gasket seal 	●	●	●	●						●	●	●			Nylon (Series T, TIA) Soft nylon (Series TS, TLS) Polyurethane (Series T, TIU)
		10-32 UNF		●	●	●	●						●	●	●			
	2	R, NPT	1/8	Sealant *1 		●	●	●	●	●			●	●	●	●		
	1/4				●	●	●	●	●			●	●	●	●	●		
	3/8						●	●	●	●				●	●	●		
	1/2								●	●	● 					●	●	

*1 Non-sealant type can be selected as a standard option.

◎Electroless nickel plated type is standard.

Easy identification of product type



Speed Controller with One-touch Fitting Elbow Type Series AS

RoHS

Model

Model	Port size		Seal method	Applicable tubing O.D.													
				Metric size							Inch size						
				2 Note 2)	3.2	4	6	8	10	12	16	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"
AS12□1F-M5	M5 x 0.8		Gasket seal	●	●	●	●					●	●	●			
AS12□1F-U10/32	10-32 UNF			●	●	●	●					●	●	●			
AS22□1F-□01	R NPT	1/8	Sealant Note 1)		●	●	●	●	●			●	●	●	●		
AS22□1F-□02		1/4			●	●	●	●	●			●	●	●	●	●	
AS32□1F-□03		3/8					●	●	●	●				●	●	●	
AS42□1F-□04		1/2							●	●	●					●	●

Note 1) Non-sealant type can be selected as a standard option.

Note 2) Only polyurethane tubing is applicable for ø2.

Specifications

Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Indication symbol		

Fluid	Air
Proof pressure	1.5 MPa
Max. operating pressure	1 MPa
Min. operating pressure	0.1 MPa
Ambient and fluid temperature	-5 to 60°C (No freezing)
Applicable tubing material	Nylon, Soft nylon, Polyurethane Note)

Note) Use caution at the max. operating pressure when using soft nylon or polyurethane tubing.
(Refer to Best Pneumatics No. 6 for details.)

Caution

Be sure to read before handling.
Refer to back cover for Safety
Instructions and "Handling
Precautions for SMC Products"
(M-E03-3) for Flow Control
Equipment Precautions.

Flow Rate and Sonic Conductance

Model		AS12□1F-M5		AS22□1F-01			AS22□1F-02			AS32□1F-03			AS42□1F-04	
Tubing O.D.	Metric size	ø2	ø3.2 ø4 ø6	ø3.2	ø4	ø6 ø8 ø10	ø4	ø6	ø8 ø10	ø6	ø8	ø10 ø12	ø10	ø12 ø16
	Inch size	—	ø1/8" ø1/4" ø5/32"	ø1/8"	ø5/32"	ø1/4" ø5/16"	ø5/32"	—	ø1/4" ø5/16" ø3/8"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
C values: Sonic conductance dm³/(s·bar)	Free flow	0.2	0.3	0.4	0.6	0.6	1.0	1.3	1.5	1.6	1.7	2.5	4.4	4.8
	Controlled flow	0.2	0.3	0.4	0.7	0.8	0.9	1.3		2.1	2.4	3.3	4.4	4.9
b values: Critical pressure ratio	Free flow	0.3		0.2		0.3	0.3	0.4		0.4		0.3	0.3	
	Controlled flow	0.2	0.4	0.2		0.3	0.3			0.3			0.3	

Note 1) 10-32 UNF has the same specification as M5.

Note 2) C values and b values for controlled flow direction are with the needle fully open, the values for free flow direction are with the needle fully closed.

How to Order



Applicable tubing O.D. ^{Note 1)}

Metric size		Inch size	
02	ø2	01	ø1/8"
23	ø3.2 ^{Note 2)}	03	ø5/32"
04	ø4	07	ø1/4"
06	ø6		

Note 1) For selecting applicable tubing O.D., refer to Series Variations (Features 1). For metric size and inch size types can be visually identified by color of the release button.

Metric size: White
Inch size: Orange

Note 2) Use ø1/8" tubing.

Port size

M5	M5 x 0.8
U10/32	10-32 UNF

Body size 1

AS 1 2 0 1 F - M5 - 06 A

Body size 2/3/4

AS 2 2 0 1 F - 01 - 06 S A

Body size

1	M5 x 0.8 10-32 UNF
2	1/8, 1/4
3	3/8
4	1/2

Thread type

Nil	R
N	NPT

Port size

01	1/8
02	1/4
03	3/8
04	1/2

Elbow

Control type ^{Note)}

0	Meter-out
1	Meter-in

Note) For meter-out and meter-in types can be visually identified by color of the handle.
Meter-out: Gray
Meter-in: Light blue

Push-lock type

Seal method

Nil	Without sealant
S	With sealant

Applicable tubing O.D. ^{Note 1)}

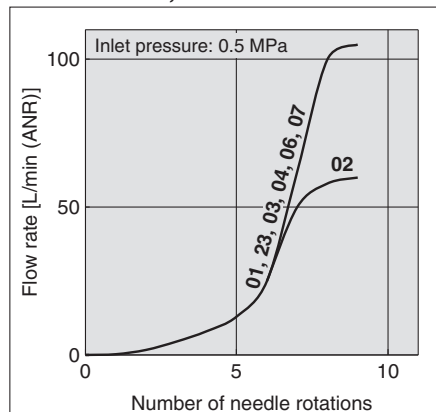
Metric size		Inch size	
23	ø3.2 ^{Note 2)}	01	ø1/8"
04	ø4	03	ø5/32"
06	ø6	07	ø1/4"
08	ø8	09	ø5/16"
10	ø10	11	ø3/8"
12	ø12	13	ø1/2"
16	ø16		

Note 1) For selecting applicable tubing O.D., refer to Series Variations (Features 1).

Note 2) Use ø1/8" tubing.

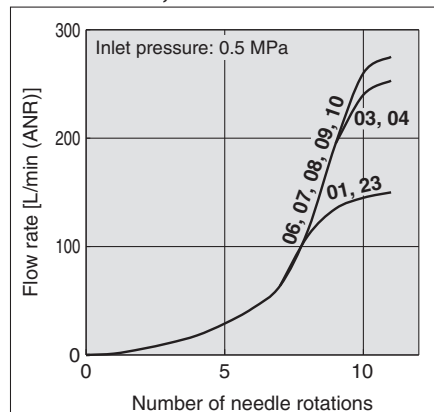
Needle Valve/Flow-rate Characteristics

AS1201F-M5, AS1211F-M5

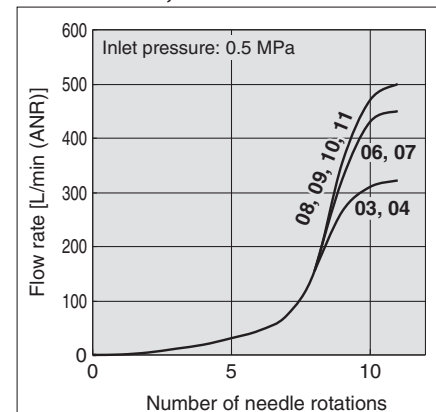


Note) -U10/32 has the same specification as M5.

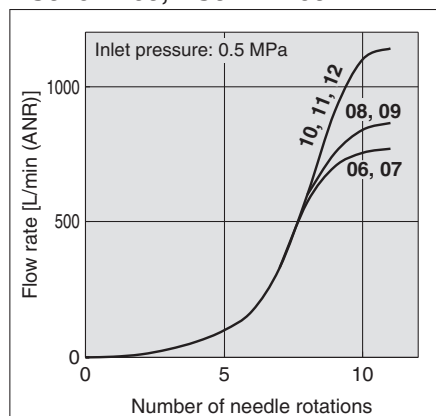
AS2201F-01, AS2211F-01



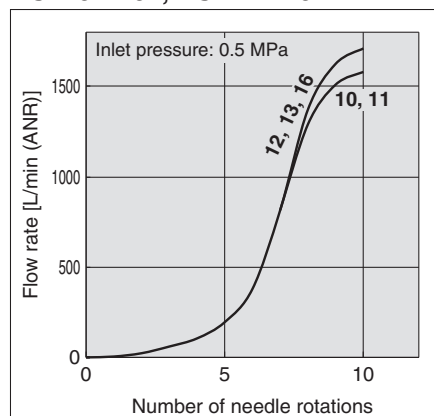
AS2201F-02, AS2211F-02



AS3201F-03, AS3211F-03



AS4201F-04, AS4211F-04



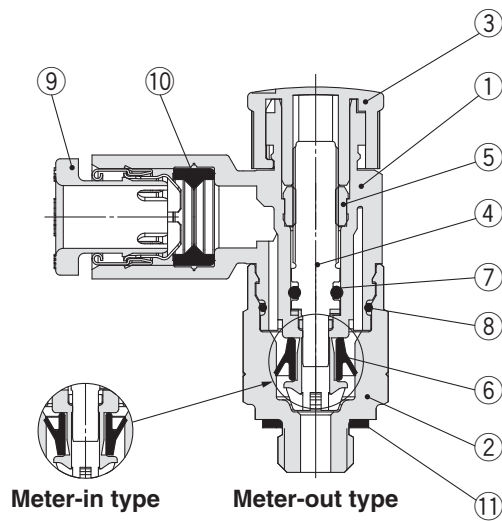
Note) The numbers above the flow-rate characteristic curves in the charts show the tubing diameter as defined by the product number.

Series AS

Construction

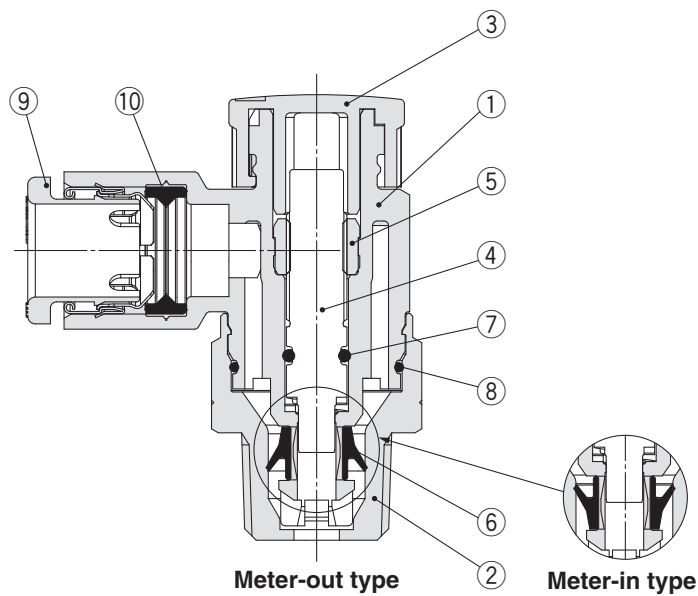
Seal method: Gasket seal

Thread type: M5, 10-32 UNF



Seal method: Sealant

Thread type: R, NPT



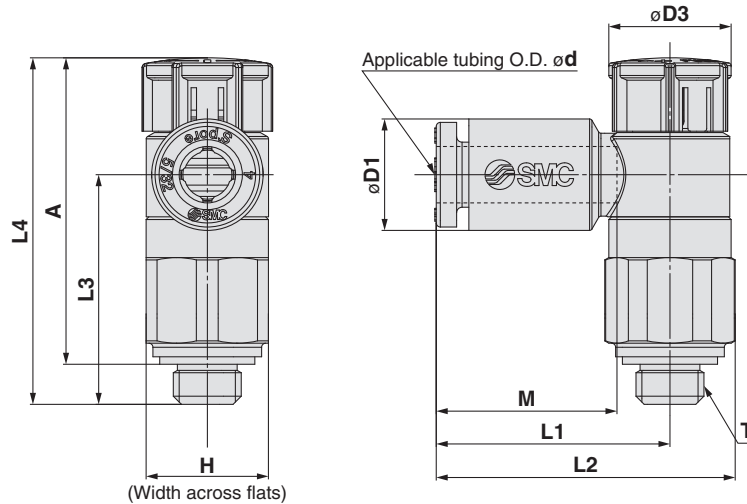
Component Parts

No.	Description	Material	Note
1	Body A	PBT	
2	Body B	Brass	Electroless nickel plated
3	Handle	POM	
4	Needle	PBT	
5	Needle guide	Steel wire	Zinc chromated
6	U-seal	HNBR	
7	O-ring	NBR	
8	O-ring	NBR	
9	Cassette	—	
10	Seal	NBR	
11	Gasket	NBR/Stainless steel	

Dimensions

Seal method: Gasket seal

Thread type: M5, 10-32 UNF



Metric size

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight (g)							
									Unlock	Lock	Unlock	Lock									
AS12□1F-M5-02A	2	M5 x 0.8 10-32 UNF	9	5.8	9	15.8	20.6	16.9	26.5	25.4	23.5	22.4	11.9	5							
AS12□1F-U10/32-02A																					
AS12□1F-M5-23A	3.2			7.2																	
AS12□1F-U10/32-23A																					
AS12□1F-M5-04A	4			8.2																	
AS12□1F-U10/32-04A																					
AS12□1F-M5-06A	6			10.4																	
AS12□1F-U10/32-06A																					6

Note 1) Reference dimensions

Note 2) Reference dimensions after installation of thread

Inch size

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight (g)
									Unlock	Lock	Unlock	Lock		
AS12□1F-M5-01A	1/8"	M5 x 0.8 10-32 UNF	9	7.2	9	17.2	22	16.9	26.5	25.4	23.5	22.4	13.3	5
AS12□1F-U10/32-01A				8.2										
AS12□1F-M5-03A	5/32"			11.2										
AS12□1F-U10/32-03A														
AS12□1F-M5-07A	1/4"													
AS12□1F-U10/32-07A														

Note 1) Reference dimensions

Note 2) Reference dimensions after installation of thread

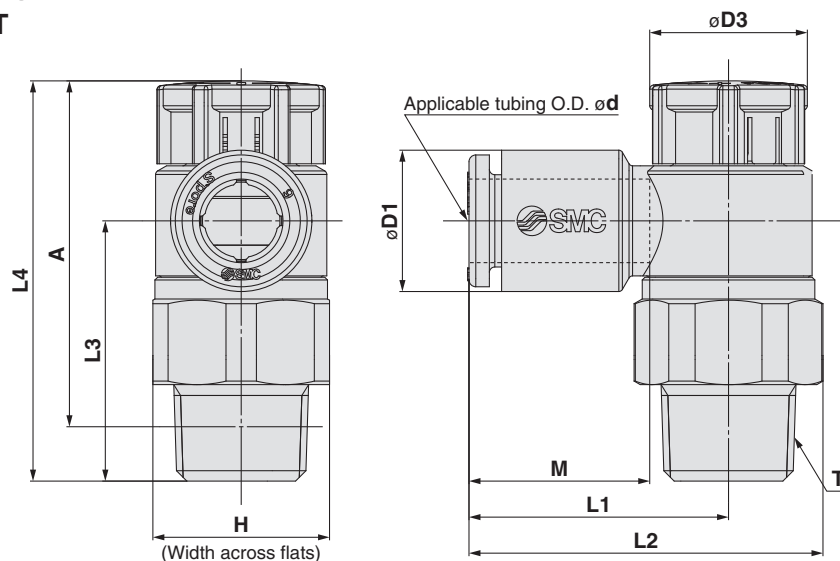
Series AS

Thread type: R, NPT

Dimensions

Seal method: Sealant

Thread type: R, NPT



Metric size

(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight (g)
									Unlock	Lock	Unlock	Lock		
AS22□1F-01-23(S)A	3.2	1/8	13 (12.7)	7.2	11.6	19.1	26.1 (26)	19.1	30.6	29.2	27.5	26.1	13.3	9 (9)
AS22□1F-01-04(S)A	4			8.2										10 (9)
AS22□1F-01-06(S)A	6			10.4										11 (10)
AS22□1F-01-08(S)A	8			13.2										12 (11)
AS22□1F-01-10(S)A	10			15.9										
AS22□1F-02-23(S)A	3.2	1/4	17 (17.5)	7.2	12.6	20.9	30 (30.3)	22.6	36.6	35	31.1	29.5	13.3	18 (19)
AS22□1F-02-04(S)A	4			8.2										
AS22□1F-02-06(S)A	6			10.4										19 (20)
AS22□1F-02-08(S)A	8			13.2										20 (21)
AS22□1F-02-10(S)A	10			15.9										
AS32□1F-03-06(S)A	6	3/8	19	10.4	15.6	21.8	32.1	28.7	42.3	40.7	37.1	35.5	13.3	31 (32)
AS32□1F-03-08(S)A	8			13.2										
AS32□1F-03-10(S)A	10			15.9										32 (33)
AS32□1F-03-12(S)A	12			18.5										34 (35)
AS42□1F-04-10(S)A	10			15.9										
AS42□1F-04-12(S)A	12	1/2	24 (23.8)	18.5	17.6	30.8	43.7 (43.6)	35.1	50.8	49.2	43.7	42.1	15.6	54 (53)
AS42□1F-04-16(S)A	16			23.8		34.8	47.7 (47.6)	32.7					17	56 (55)
													20.6	60 (59)

Note 1) Reference dimensions Note 2) Reference dimensions after installation of thread Note 3) The values in () are the dimensions of NPT thread.

Inch size

(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight (g)
									Unlock	Lock	Unlock	Lock		
AS22□1F-01-01(S)A	1/8"	1/8	13 (12.7)	7.2	11.6	19.1	26.1 (26)	19.1	30.6	29.2	27.5	26.1	13.3	9 (9)
AS22□1F-01-03(S)A	5/32"			8.2										10 (9)
AS22□1F-01-07(S)A	1/4"			11.2										11 (10)
AS22□1F-01-09(S)A	5/16"			13.2										
AS22□1F-02-01(S)A	1/8"	1/4	17 (17.5)	7.2	12.6	20.9	30 (30.3)	22.6	36.6	35	31.1	29.5	13.3	18 (19)
AS22□1F-02-03(S)A	5/32"			8.2										
AS22□1F-02-07(S)A	1/4"			11.2										19 (19)
AS22□1F-02-09(S)A	5/16"			13.2										20 (21)
AS22□1F-02-11(S)A	3/8"			15.5										
AS32□1F-03-07(S)A	1/4"	3/8	19	11.2	15.6	21.8	32.1	28.7	42.3	40.7	37.1	35.5	13.3	31 (32)
AS32□1F-03-09(S)A	5/16"			13.2										
AS32□1F-03-11(S)A	3/8"			15.5										32 (33)
AS42□1F-04-11(S)A	3/8"			15.5										
AS42□1F-04-13(S)A	1/2"	1/2	24 (23.8)	19.3	17.6	30.9	43.8 (43.7)	34.7	50.8	49.2	43.7	42.1	17	56 (55)

Note 1) Reference dimensions Note 2) Reference dimensions after installation of thread Note 3) The values in () are the dimensions of NPT thread.



Series AS

Specific Product Precautions 1

Be sure to read this before handling.

Refer to back cover for Safety Instructions and “Handling Precautions for SMC Products” (M-E03-3) for Flow Control Equipment Precautions.

Design/Selection

Warning

1. Check the specifications.

The products in this catalog are designed to be used in compressed air systems (including vacuum) only.

If the products are used in an environment where pressure or temperature is out of the specified range, damage and/or malfunction may result. Do not use under such conditions. (Refer to the specifications.)

Please contact SMC when using a fluid other than compressed air (including vacuum).

We do not guarantee against any damage if the product is used outside of the specification range.

2. The products in this catalog are not designed for the use as stop valve with zero air leakage.

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

Tightening the needle to reduce leakage to zero may result in equipment damage.

3. Do not disassemble the product or make any modifications, including additional machining.

It may cause human injury and/or an accident.

4. The flow-rate characteristics for each product are representative values.

The flow-rate characteristics are characteristics of each individual product. Actual values may differ depending on the piping, circuitry, pressure conditions, etc.

5. Sonic conductance (C) and critical pressure ratio (b) values for products are representative values.

For controlled flow direction values the needle is fully open. For free flow direction values the needle is fully closed.

6. Check if that PTFE can be used in application.

PTFE powder (Polytetrafluoroethylene resin) is included in the seal material for piping taper thread of male thread type. Confirm that the use of it will not cause any adverse effect on the system.

Please contact SMC if the Material Safety Data Sheet (MSDS) is required.

Mounting

Warning

1. Operation manual

Install the products and operate them only after reading the operation manual carefully and understanding its contents. Also, keep the manual where it can be referred to as necessary.

2. Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance.

3. Tighten threads with the proper tightening torque.

When installing the products, follow the listed proper torque.

Mounting

Warning

4. After pushing the handle down to lock, check it is locked.

It should not be possible to rotate the handle to the right or to the left. If the handle is pulled with force, it may break. Do not pull the handle with excessive force.



Lock



Unlock

5. Check the degree of rotation of the needle valve.

The products in this catalog are retainer type so that the needle is not removed completely. Over rotation will cause damage.

6. Do not use tools such as pliers to rotate the handle.

It can cause idle rotation of the handle or damage.

7. Verify the air flow direction.

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

8. Adjust the needle by opening the needle slowly after having closed it completely.

Loose needle valves may cause unexpected sudden actuator lurching.

When a needle valve is turned clockwise, it is closed and actuator speed decreases. When a needle valve is turned counterclockwise, it is open and actuator speed increases.

9. Do not apply excessive force or shock to the body or fittings with an impact tool.

It can cause damage or air leakage.

10. This product has One-touch fittings, refer to the Fittings & Tubing Precautions of Best Pneumatics No. 6.

11. Tubing O.D. $\varnothing 2$

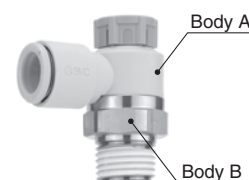
Tubing other than that from SMC cannot be used, because it may result in inability to connect the tube, air leakage after connecting the tube or disconnection of the tube.

12. To install/remove the flow control equipment, use an appropriate wrench to tighten/loosen at the supplied nut are on body B, and as close to the thread as possible.

Do not apply torque at other points as the product may be damaged. Rotate body A manually for positioning after installation.

13. Do not use body A for applications involving continuous rotation.

Body A and the fitting section may be damaged.





Series AS

Specific Product Precautions 2

Be sure to read this before handling.

Refer to back cover for Safety Instructions and “Handling Precautions for SMC Products” (M-E03-3) for Flow Control Equipment Precautions.

Mounting

⚠ Caution

1. Tightening of M5 and 10-32 UNF threads

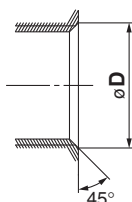
First, tighten it by hand, then give it an additional 1/6 turn to 1/4 turn with a wrench. A reference value for the tightening torque is 1 to 1.5 N·m.

Note) Excessive tightening may damage the thread portion or deform the gasket and cause air leakage.

If the screw is too shallowly screwed in, it may come loose or air may leak.

2. Chamfer dimension for female thread of the connection thread M5, 10-32 UNF

Confirming to ISO 16030 (air pressure fluid dynamics – connection – ports and stud ends), the chamfer dimensions shown below are recommended.



Female thread size	Chamfer dimension 0.5D (Recommended value)
M5	5.1 to 5.4
10-32 UNF	5.0 to 5.3

3. This product has a stopper for fully close in rotating direction. Excess torque may break the stopper. Table below shows the maximum allowable torque of the handle.

Body size	Maximum allowable adjusting torque (N·m)
M5	0.05
1/8	0.07
1/4	0.16
3/8	0.2
1/2	0.4

Piping Threads with Sealant

⚠ Caution

1. The proper tightening torques of the fittings are as shown in the table below. As a guide, tighten by hand, then turn it two or three turns with a wrench. Check the dimensions of each product for the hexagon width across flats.

Connection thread size	Proper tightening torque (N·m)
NPT, R1/8	7 to 9
NPT, R1/4	12 to 14
NPT, R3/8	22 to 24
NPT, R1/2	28 to 30

2. If the fitting is tightened with excessive torque, a large amount of sealant will seep out. Remove the excess sealant.

3. Insufficient tightening may loosen the threads, or cause air leakage.

4. Reuse

- 1) Normally, fittings with a sealant can be reused 2 to 3 times.
- 2) To prevent air leakage through the sealant, remove any loose sealant stuck to the fitting by blowing air over the threaded portion.
- 3) If the sealant no longer provides effective sealing, wrap sealing tape over the sealant before reusing. Do not use the sealant in any form other than a tape type.

5. Once the fitting has been tightened, backing it out to its original position often causes the sealant to become defective. Air leakage will occur.

6. R threaded studs with Rc threaded ports and use NPT threaded studs with NPT threaded ports.

Piping

⚠ Caution

1. This product has One-touch fittings, refer to the Fittings & Tubing Precautions of Best Pneumatics No. 6.

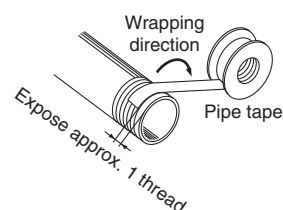
2. Preparation before piping

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.

3. Wrapping of pipe tape

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

Also, when the pipe tape is used, leave approx. 1 thread ridges exposed at the end of the threads.



Safety Instructions

These safety instructions are intended to prevent hazardous situations and/or equipment damage. These instructions indicate the level of potential hazard with the labels of “**Caution**,” “**Warning**” or “**Danger**.” They are all important notes for safety and must be followed in addition to International Standards (ISO/IEC)*1), and other safety regulations.

-  **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

- *1) ISO 4414: Pneumatic fluid power – General rules relating to systems.
ISO 4413: Hydraulic fluid power – General rules relating to systems.
IEC 60204-1: Safety of machinery – Electrical equipment of machines.
(Part 1: General requirements)
ISO 10218-1: Manipulating industrial robots – Safety.
etc.

Warning

- 1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.**
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.
- 2. Only personnel with appropriate training should operate machinery and equipment.**
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.
- 3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.**
 1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
 2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
 3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.
- 4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.**
 1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
 2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
 3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
 4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

- 1. The product is provided for use in manufacturing industries.**
The product herein described is basically provided for peaceful use in manufacturing industries.
If considering using the product in other industries, consult SMC beforehand and exchange specifications or a contract if necessary.
If anything is unclear, contact your nearest sales branch.

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following “Limited warranty and Disclaimer” and “Compliance Requirements”.

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.
***2) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

1. The use of SMC products with production equipment for the manufacture of weapons of mass destruction (WMD) or any other weapon is strictly prohibited.
2. The exports of SMC products or technology from one country to another are governed by the relevant security laws and regulations of the countries involved in the transaction. Prior to the shipment of a SMC product to another country, assure that all local rules governing that export are known and followed.

 **Safety Instructions** Be sure to read “Handling Precautions for SMC Products” (M-E03-3) before using.

SMC Corporation

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D-SZ

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