Speed Controller with Indicator New

RoHS

Numerical indication of handle rotation for flow rate reduces flow setting time and setting errors!

Indicator window

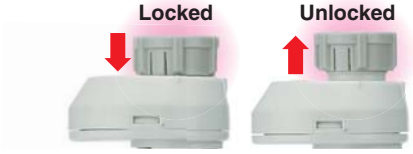
Size 1		Size 2 or larger	
Indicator window	Number of needle rotations	Indicator window	Number of needle rotations
1	1	1	1
2 ⋮	2 ⋮	2 ⋮	2 ⋮
8	8	10	10

Two indicator window directions available

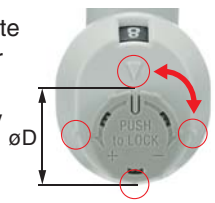
Indicator direction: 0° Indicator direction: 180°

Larger push-lock type handle

Easy to lock



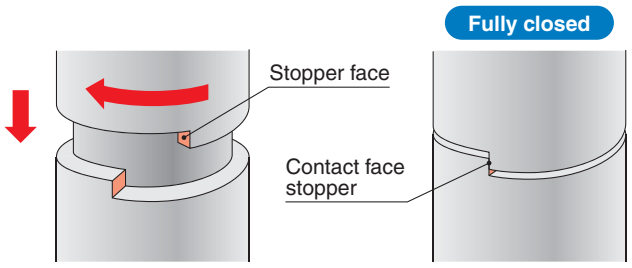
Easy to operate with the larger handle and marking every 90° mark



Body size	øD (mm)
1	9.4
2	12 (Port size 1/8) 13 (Port size 1/4)
3	16.6
4	18.8

Contact face stopper clarifies the zero flow point for easier flow setting.

Stable handle position when fully closed (no flow rate) onto the contact face stopper (rotating stopper). Small variations in flow rate depending on the number of handle rotations

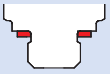


Series AS-FS

SMC

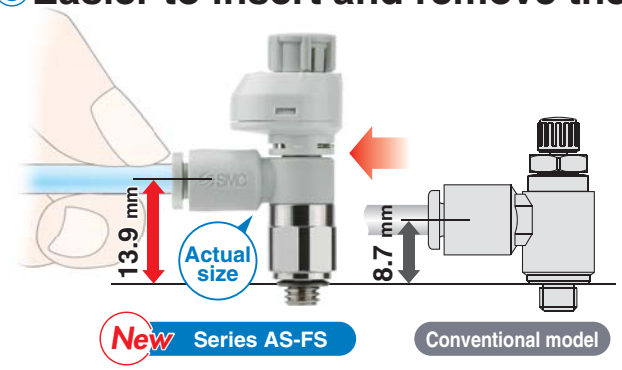
CAT.ES20-229A

Series Variations

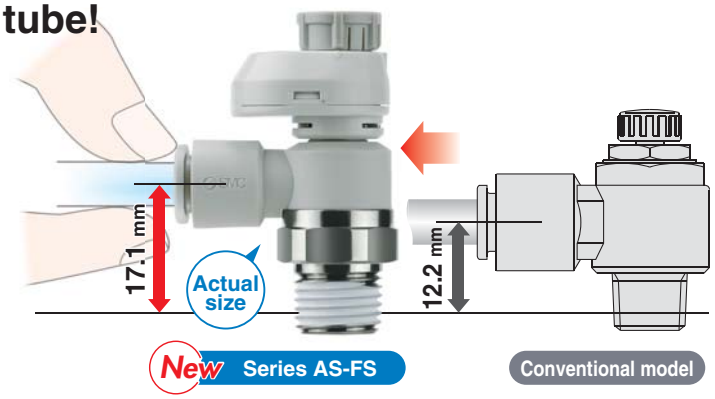
	Seal method	Body size	Port size		Applicable tubing O.D.													Applicable tubing material
					Metric size								Inch size					
					2	3.2	4	6	8	10	12	16	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"	
	Gasket seal 	1	M5 x 0.8		●	●	●	●					●	●	●				Nylon (Series T, TIA) Soft nylon (Series TS, TISA) Polyurethane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

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

Easier to insert and remove the tube!

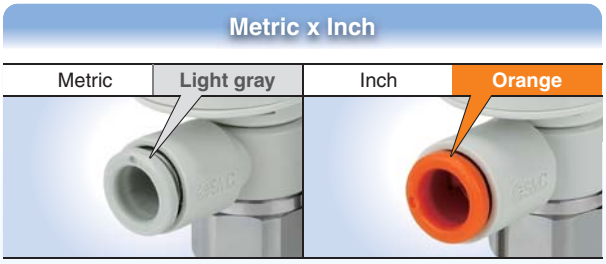


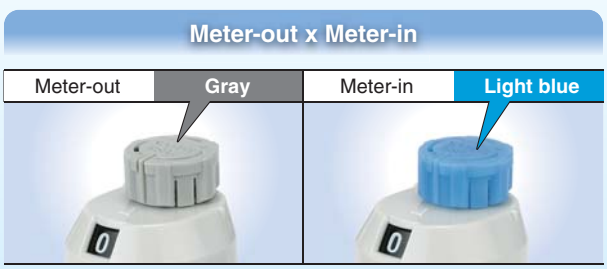
Tubing diameter	Thread	Part no.	Part no.
ø4	M5	AS12□1FS-M5-04A	AS12□1F-M5-04



Tubing diameter	Thread	Part no.	Part no.
ø6	1/4	AS22□1FS-02-06SA	AS22□1F-02-06

Easy identification of product type





Electroless nickel plating type is standardized.

Speed Controller with Indicator
Elbow Type
Series AS-FS

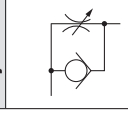
RoHS

Model

Elbow type	Port size		Seal method	Applicable tubing O.D.														Note 3) Max. number of rotations
				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□1FS-M5	M5 x 0.8		Gasket seal	●	●	●	●					●	●	●				8
AS12□1FS-U10/32	10-32UNF			●	●	●	●					●	●	●				
AS22□1FS-□01	R NPT	1/8	Note 1) Sealant		●	●	●	●	●			●	●	●	●			10
AS22□1FS-□02		1/4			●	●	●	●	●			●	●	●	●	●		
AS32□1FS-□03		3/8					●	●	●	●				●	●	●		
AS42□1FS-□04		1/2							●	●	●					●	●	

Note 1) Non-sealant type can be selected as a standard option.
Note 2) Only polyurethane tubing is applicable for ø2.
Note 3) There are differences in actual rate as by the indicator window over the maximum number of rotations depending on the individual product.

Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Symbol		

Specifications

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, FEP, PFA

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

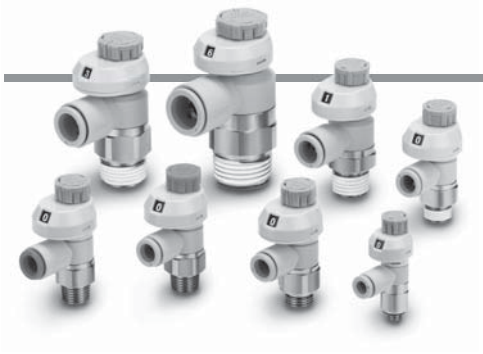
⚠ Caution

Be sure to read before handling. Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (SMC website) for Flow Control Equipment Precautions.

Flow Rate and Sonic Conductance

Model		AS12□1FS-M5		AS22□1FS-01			AS22□1FS-02				AS32□1FS-03			AS42□1FS-04	
Tubing O.D.	Metric size	ø2	ø3.2 ø4 ø6	ø3.2	ø4	ø6 ø8 ø10	ø3.2	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"	ø1/8"	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	0.7	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	0.6	0.9	1.3		2.1	2.4	3.3	4.4	4.9
b values: Critical pressure ratio	Free flow	0.3	0.4	0.2		0.3	0.3		0.4		0.4		0.3	0.3	
	Controlled flow	0.2		0.2		0.3	0.3				0.3			0.3	

Note 1) 10-32UNF has the same specification as M5.
Note 2) C and b values are for controlled flow with the needle fully open and free flow 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). Metric size and inch size types can be visually identified by color of the release button.
Metric size: Light gray
Inch size: Orange
Note 2) Use ø1/8" tube.

Port size

M5	M5 x 0.8
U10/32	10-32UNF

Body size

1	M5 x 0.8 10-32UNF

Body size 1 AS 1 2 0 1F S □ – M5 – 06

Body size 2/3/4 AS 2 2 0 1F S □ – □ 01 – 06 S

Body size

2	1/8, 1/4
3	3/8
4	1/2

Elbow

With indicator

Control type Note)

0	Meter-out
1	Meter-in

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

Indicator direction

Nil	0°	
1	180°	

Note) Orientation of indicator direction is fixed when manufacturing, and cannot be changed by the user.

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" tube.

Port size

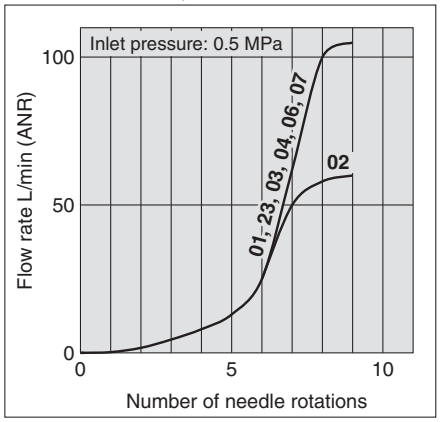
01	1/8
02	1/4
03	3/8
04	1/2

Thread type

Nil	R
N	NPT

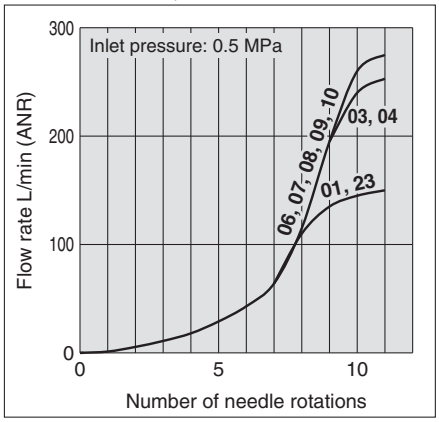
Needle Valve/Flow-rate Characteristics

AS1201FS-M5, AS1211FS-M5

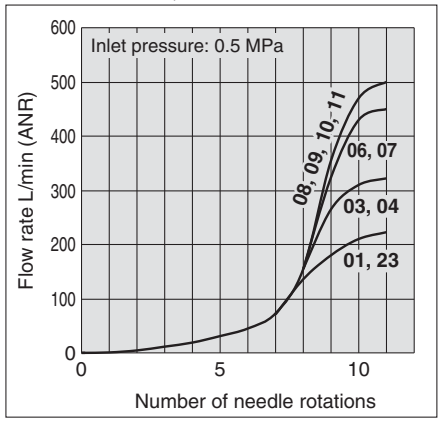


Note) -U10/32 has the same specification as M5.

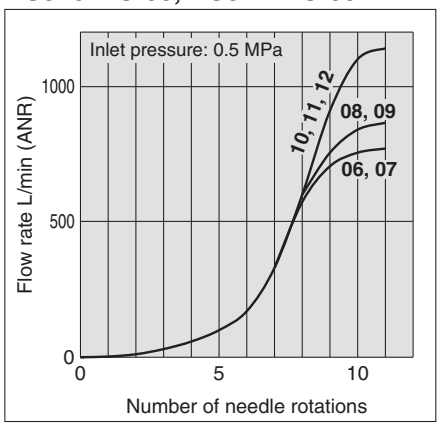
AS2201FS-01, AS2211FS-01



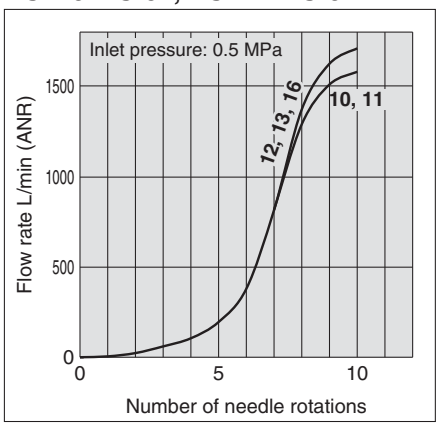
AS2201FS-02, AS2211FS-02



AS3201FS-03, AS3211FS-03



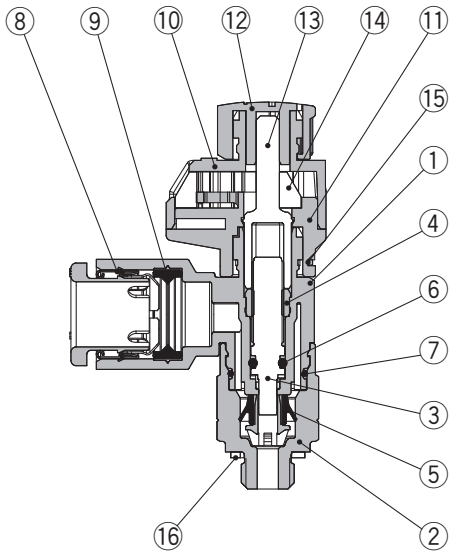
AS4201FS-04, AS4211FS-04



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

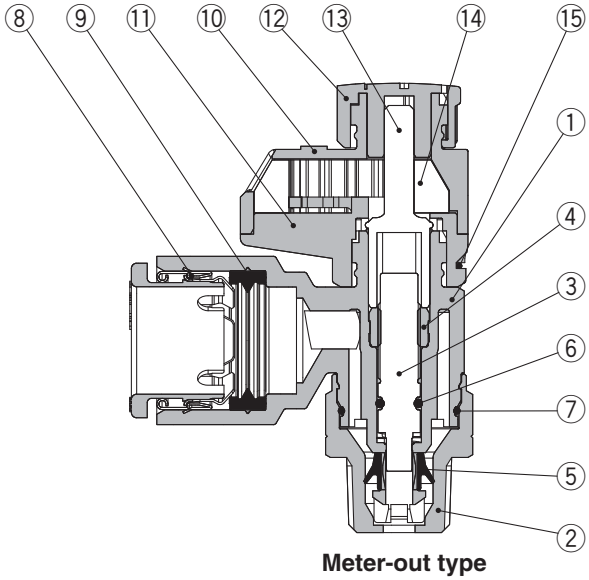
Construction

Seal method: Gasket seal
Thread type: M5, 10-32UNF



Meter-out type

Seal method: Sealant
Thread type: R, NPT



Meter-out type

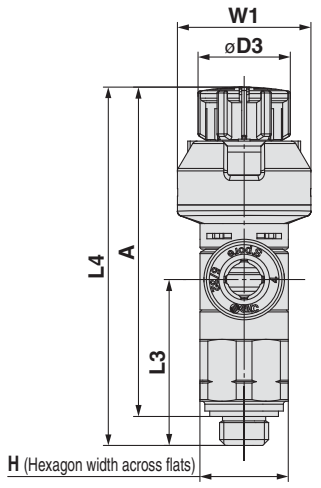
Component Parts

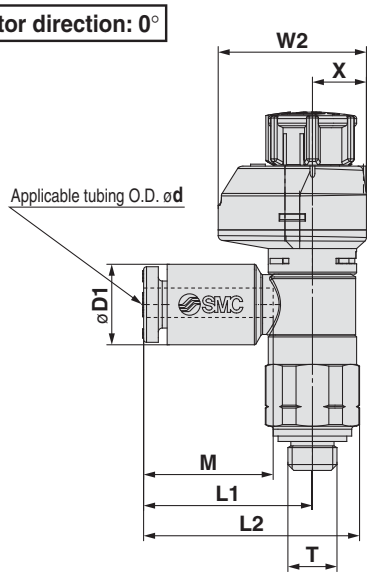
No.	Description	Material	Note
1	**Body A**	PBT	
2	**Body B**	Brass	Electroless nickel plating
3	**Needle**	PBT	
4	**Needle guide**	Steel wire	Zinc chromated
5	**U seal**	HNBR	
6	**O-ring**	NBR	
7	**O-ring**	NBR	
8	**Cassette**	—	
9	**Seal**	NBR	
10	**Bonnet A**	POM	
11	**Bonnet B**	POM	
12	**Handle**	POM	
13	**Gear**	PPS	
14	**Indicator gear**	POM	
15	**Clip**	Steel wire	
16	**Gasket**	NBR/Stainless steel	

Dimensions

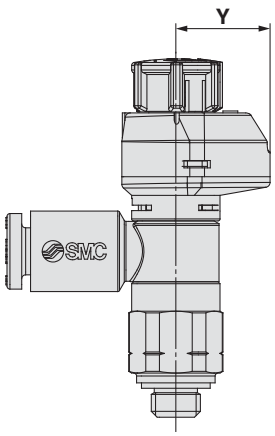
Seal method: Gasket seal
Thread type: M5, 10-32UNF

Indicator direction: 0°





Indicator direction: 180°



Metric Size

(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	W1	W2	X	Y	Weight (g)
									Unlocked	Locked	Unlocked	Locked						
AS12□1FS-M5-02	2	M5 x 0.8 10/32UNF	9	5.8	9.4	15.8	20.6	16.9	39	36.5	35	33.5	11.9	13.6	15.1	5.5	9.6	7
AS12□1FS-U10/32-02																		
AS12□1FS-M5-23	3.2			7.2		17.2	22						13.3					
AS12□1FS-U10/32-23																		
AS12□1FS-M5-04	4			8.2														
AS12□1FS-U10/32-04																		
AS12□1FS-M5-06	6			10.4		18.6	23.4	16.5										8
AS12□1FS-U10/32-06																		

Note 1) Reference dimensions
Note 2) Reference dimensions of threads after installation

Inch Size

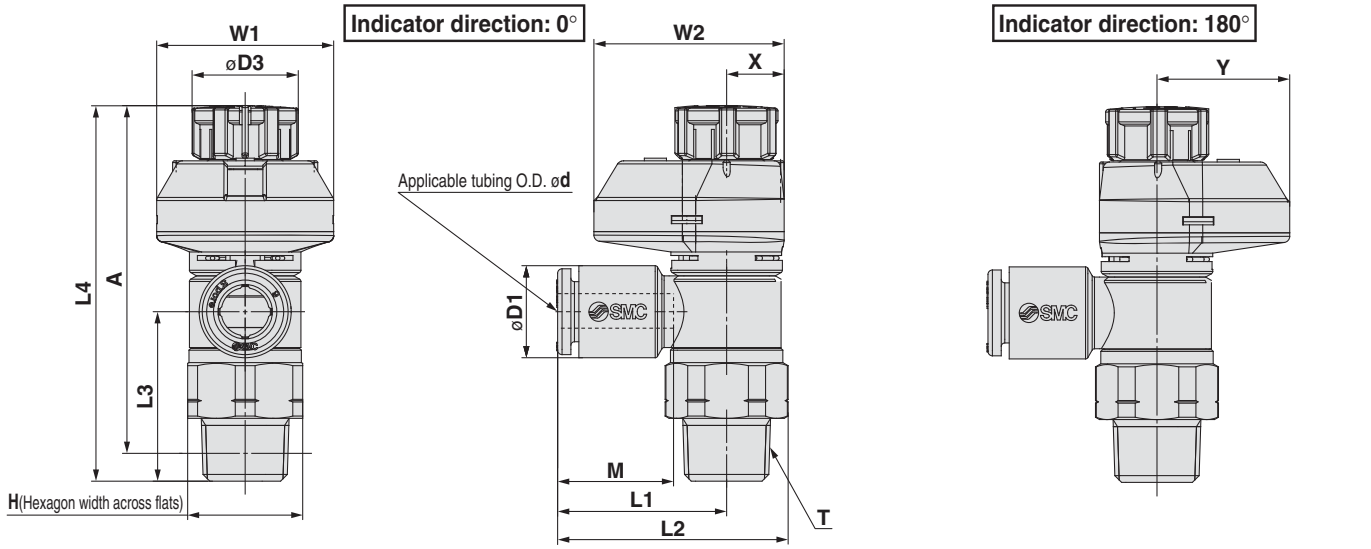
(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	W1	W2	X	Y	Weight (g)
									Unlocked	Locked	Unlocked	Locked						
AS12□1FS-M5-01	1/8"	M5 x 0.8 10/32UNF	9	7.2	9.4	17.2	22	16.9	39.0	36.5	35	33.5	13.3	13.6	15.1	5.5	9.6	7
AS12□1FS-U10/32-01																		
AS12□1FS-M5-03	5/32"			8.2														
AS12□1FS-U10/32-03																		
AS12□1FS-M5-07	1/4"			11.2		18.6	23.4	16.5										8
AS12□1FS-U10/32-07																		

Note 1) Reference dimensions
Note 2) Reference dimensions of threads after installation

Dimensions

Seal method: Sealant
Thread type: R, NPT



Metric Size (mm)

Model	d	T (R, NPT)	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	W1	W2	X	Y	Weight (g)
									Unlocked	Locked	Unlocked	Locked						
AS22□1FS-01-23 (S)	3.2	1/8	13 (12.7)	7.2	12	19.1	26.1 (26)	19.1	43.9	42.4	40.8	39.3	13.3	20	21.5	6.5	15	13 (13)
AS22□1FS-01-04 (S)	4			8.2														
AS22□1FS-01-06 (S)	6			10.4														14 (13)
AS22□1FS-01-08 (S)	8			13.2		22.4	29.4 (29.3)						14.2					15 (14)
AS22□1FS-01-10 (S)	10			15.9		25.3	32.3 (32.2)						15.6					16 (15)
AS22□1FS-02-23 (S)	3.2	1/4	17 (17.5)	7.2	13	20.9	30 (30.3)	22.6	49.7	48.3	44.2	42.8	13.3	21.5	24	7.8	16.2	23 (24)
AS22□1FS-02-04 (S)	4			8.2														
AS22□1FS-02-06 (S)	6			10.4		23.4	32.5 (32.8)											
AS22□1FS-02-08 (S)	8			13.2		23.9	33 (33.3)						14.2					24 (25)
AS22□1FS-02-10 (S)	10			15.9		26.9	36 (36.3)						15.6					25 (26)
AS32□1FS-03-06 (S)	6	3/8	19	10.4	16.6	21.8	32.1	28.7	55.4	54	50.2	48.8	13.3	24.5	28.5	9.3	19.2	38 (39)
AS32□1FS-03-08 (S)	8			13.2		22.7	33						14.2					
AS32□1FS-03-10 (S)	10			15.9		26.7	37	28					15.6					29 (40)
AS32□1FS-03-12 (S)	12			18.5		29.7	40	26.8					17					41 (42)
AS42□1FS-04-10 (S)	10	1/2	24 (23.8)	15.9	18.8	27.4	40.3 (40.2)	36.2	64.1	62.5	57	55.4	15.6	26	29	10	19	62 (61)
AS42□1FS-04-12 (S)	12			18.5		30.8	43.7 (43.6)	35.1					17					64 (63)
AS42□1FS-04-16 (S)	16			23.8		34.8	47.7 (47.6)	32.7					20.6					68 (67)

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

Inch Size (mm)

Model	d	T (R, NPT)	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	W1	W2	X	Y	Weight (g)
									Unlocked	Locked	Unlocked	Locked						
AS22□1FS-01-01 (S)	1/8"	1/8	13 (12.7)	7.2	12	19.1	26.1 (26)	19.1	43.8	42.4	40.7	39.3	13.3	20	21.5	6.5	15	13 (13)
AS22□1FS-01-03 (S)	5/32"			8.2														
AS22□1FS-01-07 (S)	1/4"			11.2		20.8	27.8 (27.7)											14 (13)
AS22□1FS-01-09 (S)	5/16"			13.2		22.4	29.4 (29.3)						14.2					15 (14)
AS22□1FS-02-01 (S)	1/8"	1/4	17 (17.5)	7.2	13	20.9	30 (30.3)	22.6	49.7	48.3	44.2	42.8	13.3	21.5	24	7.8	16.2	23 (24)
AS22□1FS-02-03 (S)	5/32"			8.2														
AS22□1FS-02-07 (S)	1/4"			11.2		23.4	32.5 (32.8)											24 (24)
AS22□1FS-02-09 (S)	5/16"			13.2		23.9	33 (33.3)						14.2					24 (25)
AS22□1FS-02-11 (S)	3/8"			15.5		26.4	35.5 (35.8)						15.6					25 (26)
AS32□1FS-03-07 (S)	1/4"	3/8	19	11.2	16.6	21.8	32.1	28.7	55.4	54	50.2	48.8	13.3	24.5	28.5	9.3	19.2	38 (39)
AS32□1FS-03-09 (S)	5/16"			13.2		22.7	33						14.2					
AS32□1FS-03-11 (S)	3/8"			15.5		26.7	37	28.2					15.6					39 (40)
AS42□1FS-04-11 (S)	3/8"	1/2	24 (23.8)	15.5	18.8	27.4	40.3 (40.2)	36.2	64.1	62.5	57	55.4	15.6	26	29	10	19	62 (61)
AS42□1FS-04-13 (S)	1/2"			19.3		30.9	43.8 (43.7)	34.7					17					64 (63)

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

Series AS-FS
Specific Product Precautions 1

Be sure to read before handling.
Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (SMC website) 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.
The speed controller's controlled flow values are with the needle fully open and free flow with the needle fully closed.

6. Check if 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, confirm that 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.

Locked Unlocked

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

8. Adjust the speed by opening the needle slowly from the fully closed state.

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. Refer to the Fittings & Tubing Precautions of Best Pneumatics No. 6 for handling One-touch fittings.

11. Tubing O.D. ø2

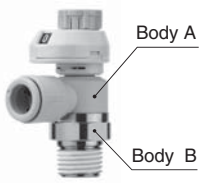
Tubing other than that from SMC cannot be used, because it may result in inability to connect the tube, air leakage after connecting the tube or disconnection of the tube.

12. To install/remove the product, use an appropriate wrench to tighten/loosen at the supplied nut on body B.

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-FS
Specific Product Precautions 2

Be sure to read before handling.
Refer to back cover for Safety Instructions, "Handling Precautions for SMC Products" (SMC website) for Flow Control Equipment Precautions.

Mounting

⚠ Caution

1. Tightening of M5 and 10-32UNF threads

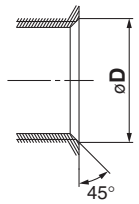
First, tighten it by hand, then give it an additional 1/6 turn to 1/4 turn with a wrench. A reference value for the tightening torque is 1 to 1.5 N·m.

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.

2-1. Chamfer dimension for female thread of the connection thread M5, 10-32UNF

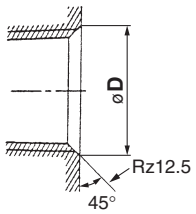
Confirming to ISO 16030 (air pressure fluid dynamics – connection – ports and stud ends), the chamfer dimensions shown below are recommended.

By chamfering as shown in the following table, machining of threads is easier and effective for burr prevention.



Connection thread size	Chamfer dimension ø**D** (Recommended value) mm
M3	3.1 to 3.4
M5	5.1 to 5.4
10-32UNF	5.0 to 5.3

2-2. Chamfer dimension of R and NPT thread with sealant



Connection thread size	Chamfer dimension ø**D** (Recommended value)	
	Rc	NPT, NPTF
1/8	10.2 to 10.4	10.5 to 10.7
1/4	13.6 to 13.8	14.1 to 14.3
3/8	17.1 to 17.3	17.4 to 17.6
1/2	21.4 to 21.6	21.7 to 21.9

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 torque N·m
M5	0.05
1/8	0.07
1/4	0.16
3/8	0.2
1/2	0.4

4. Actuator speed needs to be checked each time the setting is changed.

Individual product difference due to tolerance of the components, individual actuator difference, operating conditions, temperature, etc. may cause a large variation in the actuator speed, and for this reason, the final actuator speed needs to be checked every time the setting is changed.

5. Force for lifting the handle is specified as shown in the table below.

Larger lifting force than specified in the table below will cause removal of the handle, flow rate not according to the flow-rate characteristics curve, incorrect flow indication with the indicator or damage to the product.

Port size	Handle lifting force
M5 10-32/UNF	1 to 1.5 N
1/8, 1/4, 3/8, 1/2	3.5 to 4 N

6. Do not rotate the product by the indicator part.

Use a wrench for mounting.
Otherwise, it may cause damage to the product.

Piping Threads with Sealant

⚠ Caution

1. First, tighten the fitting by hand, then tighten it a further two or three turns with a wrench. For a tightening torque guide, see the table below.

Connection thread size (R, NPT)	Tightening torque N·m
1/8	3 to 5
1/4	8 to 12
3/8	15 to 20
1/2	20 to 25

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 pipe 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. Use R external threads with Rc internal threads and NPT external threads with NPT internal threads.

Piping

⚠ Caution

1. Refer to the Fittings & Tubing Precautions of Best Pneumatics No. 6 for handling One-touch fittings.

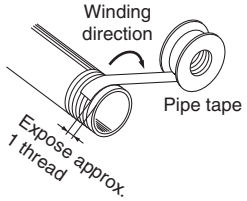
2. Preparation before piping

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, whichever is first.*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

Akihabara UDX 15F,
4-14-1, Sotokanda, Chiyoda-ku, Tokyo 101-0021, JAPAN
Phone: 03-5207-8249 Fax: 03-5298-5362
http://www.smcworld.com

Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

D-G

1st printing RT printing RT 8600SZ Printed in Japan.