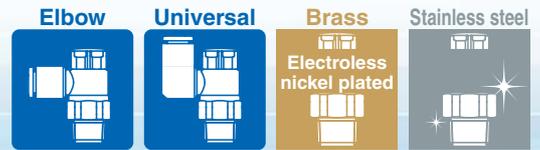


# Speed Controller with One-touch Fitting

## Reduces labour time!

RoHS **New**



Easy to use

**Push-lock type**

• Easy to lock



**Larger knob**

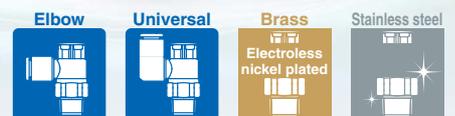
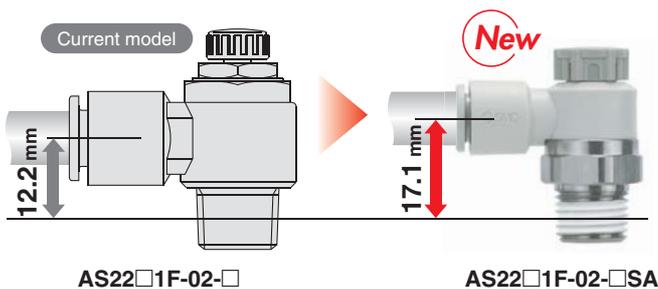
Body size	Ø D [mm]
1	9.4
2	12 (Port size 1/8) 13 (Port size 1/4)
3	16.6
4	18.8



**Improved tube insertion/removal**



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



	Elbow	Universal	Brass Electroless nickel plated	Stainless steel
Sealant/Gasket seal M/UNF/R/NPT	P.5	P.5	P.5	P.14
Face seal R/NPT/G	P.29	P.29	P.29	P.14
Gasket seal Uni	P.37	P.37	P.37	

\* Only G thread

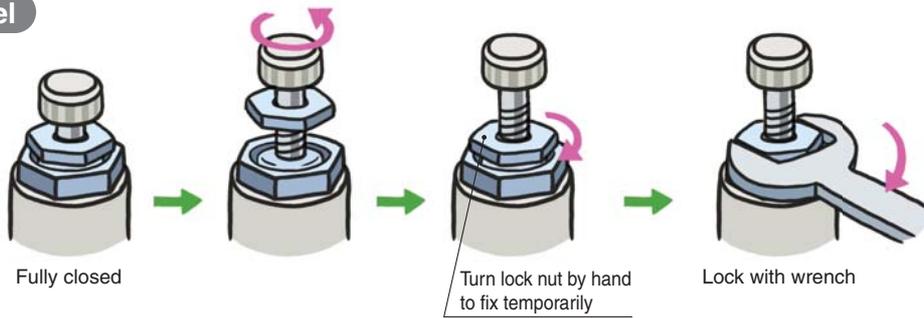
# Series AS



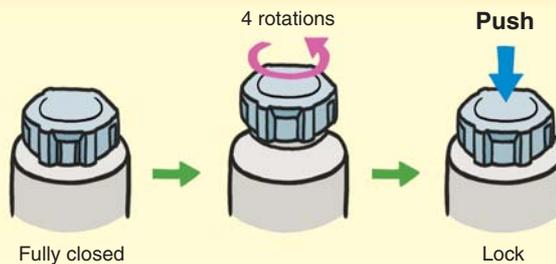
CAT.EUS20-220Dd-UK

## Easy tool-less one push-lock

### Current model

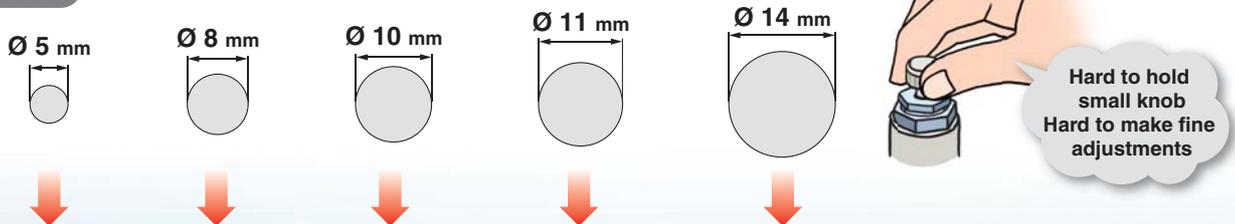


### Push-lock type



## Easy to turn large knob

### Current model



### Push-lock type

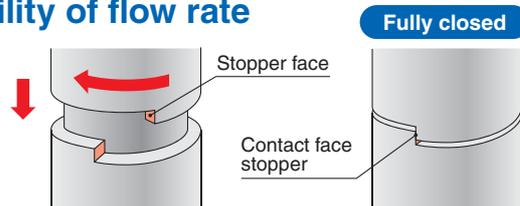


## Flow rate reproducibility



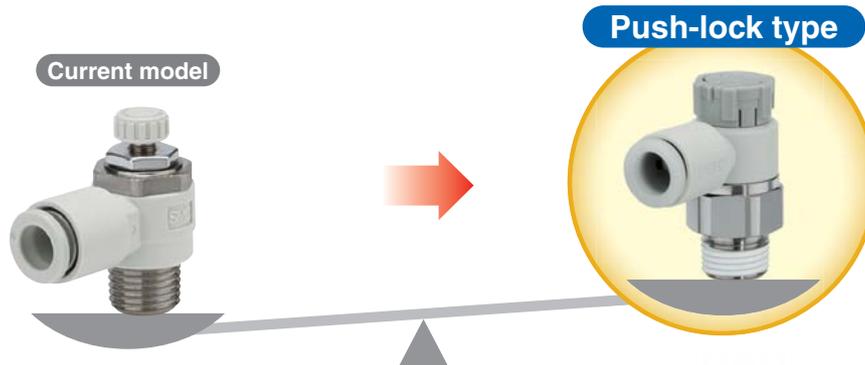
### Improved reproducibility of flow rate

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



## Lightweight

Weight  
Up to approx.  
**50 % lighter**

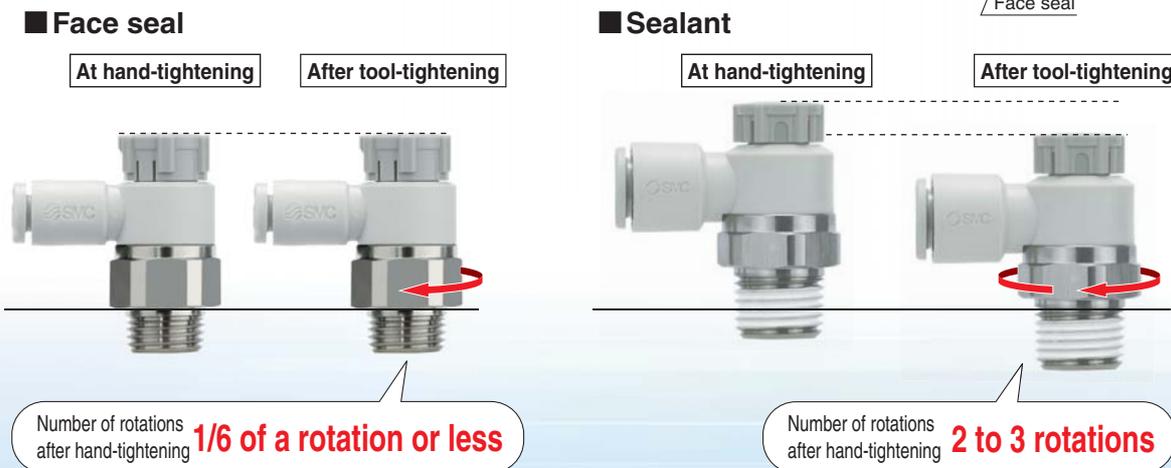


Tubing O.D.	Thread	Part no.	Weight
Ø 6	1/4	AS22□1F-02-06	<b>32 g</b>
Ø 12	1/2	AS42□1F-04-12	<b>101 g</b>

Tubing O.D.	Thread	Part no.	Weight
Ø 6	1/4	AS22□1F-02-06A	<b>18 g</b>
Ø 12	1/2	AS42□1F-04-12A	<b>56 g</b>

## New Face seal adopted for threading

- Improved installability (Reduced tool-tightening after hand-tightening)



- Prevention of sealant residue/protrusion

Current sealant type leaves residue and protrudes out from the threading when installing, making it necessary to clear away the residue using an air blower or similar. However, no residue is created when using a face seal.

- Re-piping is possible.

### Face seal

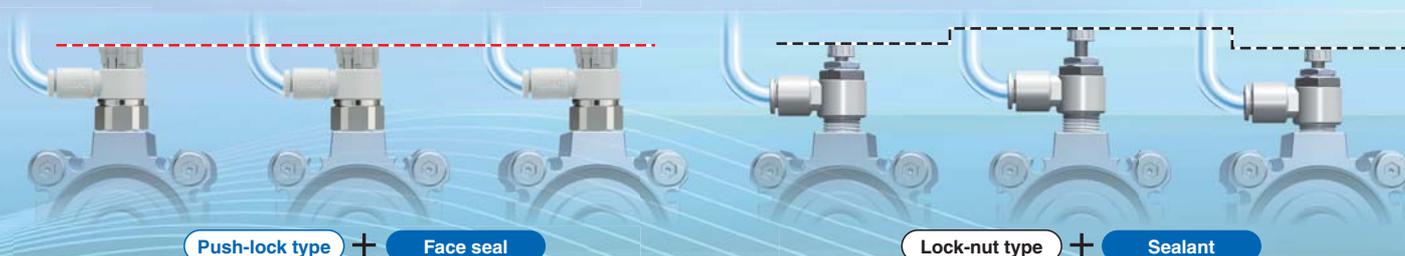
Repeated re-piping some 6 to 10 times is possible due to use of elastic sealant on seating.

### Sealant

Sealant tape is necessary because sealant becomes separated with repeated installation.

## Uniform height

Uneven heights due to thread and needle variations





# Push-lock Series Variations

Refer to the **WEB catalogue** on [www.smc.eu](http://www.smc.eu) for details.



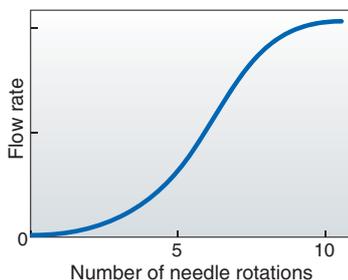
## Speed Controller with Indicator / Series AS-FS

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

### Indicator window



Numerical indication of knob rotation



### Body size 1

Indicator window	Number of needle rotations
1	1
2	2
⋮	⋮
8	8

### Body size 2 or larger

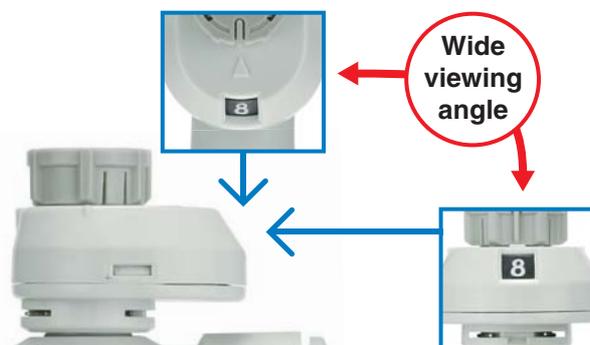
Indicator window	Number of needle rotations
1	1
2	2
⋮	⋮
10	10

### Two indicator window directions available



Indicator direction: 0°

Indicator direction: 180°



Body size	Port size	Applicable tubing O.D.	
		Metric size	Inch size
1 to 4	M5 to 1/2	Ø 2 to Ø 16	Ø 1/8" to Ø 1/2"



# Speed Controller with One-touch Fitting Elbow Type/Universal Type

## Series AS



### Model

Model		Port size	Seal method	Applicable tubing O.D.															
Elbow type	Universal type			Metric size						Inch size									
				2 <sup>Note 2)</sup>	3.2	4	6	8	10	12	16	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"		
AS12□1F-M5□	AS13□1F-M5□	M5 x 0.8	Gasket seal	● <sup>Note 3)</sup>	●	●	●					●	●	●					
AS12□1F-U10/32□	AS13□1F-U10/32□	10-32UNF		● <sup>Note 3)</sup>	●	●	●						●	●	●				
AS22□1F-□01	AS23□1F-□01	R NPT	Sealant <sup>Note 1)</sup>		●	●	●	●	● <sup>Note 3)</sup>			●	●	●	●				
AS22□1F-□02	AS23□1F-□02			1/8		● <sup>Note 3)</sup>	●	●	●	●			● <sup>Note 3)</sup>	●	●	●	●		
AS32□1F-□02	AS33□1F-□02			1/4				●	●	●	●				●	●	●	●	
AS32□1F-□03	AS33□1F-□03			1/4				●	●	●	●					●	●	●	
AS32□1F-□04	AS43□1F-□04			3/8				●	●	●	●					●	●	●	
				1/2						●	●	● <sup>Note 3)</sup>						●	●

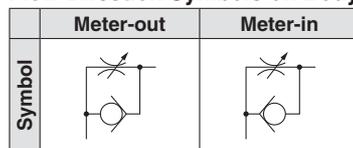
Note 1) "Without sealant" type can be selected as a standard option.

Note 2) Only polyurethane tubing is applicable for Ø 2.

Note 3) Universal type is not available.

### Specifications

#### Flow Direction Symbols on Body



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 <sup>Note)</sup> , FEP, PFA

Note) Use caution at the max. operating pressure when using soft nylon or polyurethane tubing. (Refer to the WEB catalogue for details.)

### Flow Rate and Sonic Conductance

#### ⚠ Caution

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For Flow Control Equipment Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual.

Model		AS12□1F-M5□ AS13□1F-M5□		AS22□1F-□01 <sup>Note 3)</sup> AS23□1F-□01 <sup>Note 3)</sup>			AS22□1F-□02 AS23□1F-□02			AS32□1F AS33□1F			AS42□1F AS43□1F		
Tubing O.D.	Metric size	Ø 2	Ø 3.2 Ø 4 Ø 6	Ø 3.2	Ø 4	Ø 6 Ø 8 Ø 10	Ø 3.2	Ø 4	Ø 6	Ø 8 Ø 10	Ø 6	Ø 8	Ø 10 Ø 12	Ø 10	Ø 12 Ø 16
	Inch size	—	Ø 1/8" Ø 1/4" Ø 5/32"	Ø 1/8"	Ø 5/32"	Ø 1/4" Ø 5/16"	Ø 1/8"	Ø 5/32"	—	Ø 1/4" Ø 5/16" Ø 3/8"	Ø 1/4"	Ø 5/16"	Ø 3/8"	Ø 3/8"	Ø 1/2"
C values: Sonic conductance dm <sup>3</sup> /(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	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	
	Controlled flow	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	

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

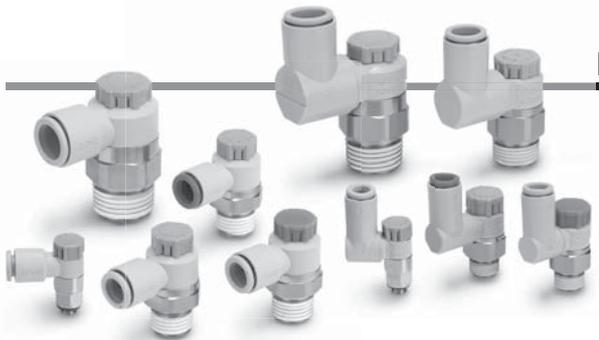
Note 2) C and b values are for controlled flow with the needle fully open and free flow with the needle fully closed.

Note 3) The same specifications also apply to the AS-FG series (stainless steel type).

# Speed Controller with One-touch Fitting *Series AS*



## How to Order



### Applicable tubing O.D. <sup>Note 1)</sup>

Metric size		Inch size	
02	Ø 2	01	Ø 1/8"
23	Ø 3.2 <sup>Note 2)</sup>	03	Ø 5/32"
04	Ø 4	07	Ø 1/4"
06	Ø 6		

Note 1) For selecting applicable tubing O.D., refer to the "Model" on page 5. Metric size and inch size types can be visually identified by colour of the release button.

Metric size: Light grey  
Inch size: Orange

Note 2) Use Ø 1/8" tube.

### Width across flats (H)

E	8 mm
—	9 mm

### Body size

1	M5 x 0.8 10-32UNF
---	----------------------

### Port size

M5	M5 x 0.8
U10/32	10-32UNF

Body size 1

AS 1 2 0 1 F - M5 E - 06 A -

Body size 2/3/4

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

### Body size

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

### Type

2	Elbow
3	Universal

### Control type <sup>Note)</sup>

0	Meter-out
1	Meter-in

Note) Meter-out and meter-in types can be visually identified by colour of the knob.  
Meter-out: Grey  
Meter-in: Light blue

### Thread type

—	R
N	NPT

### Port size

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

• **Made to Order**  
Refer to page 13 for details.

• **Push-lock type**

### Seal method

—	Without sealant
S	With sealant

### Applicable tubing O.D. <sup>Note 1)</sup>

Metric size		Inch size	
23	Ø 3.2 <sup>Note 2)</sup>	01	Ø 1/8"
04	Ø 4	03	Ø 5/32"
06	Ø 6	07	Ø 1/4"
08	Ø 8	09	Ø 5/16"
10	Ø 10	11	Ø 3/8"
12	Ø 12	13	Ø 1/2"
16	Ø 16		

Note 1) For selecting applicable tubing O.D., refer to the "Model" on page 5.

Note 2) Use Ø 1/8" tube.

Sealant/Gasket seal  
AS-FG

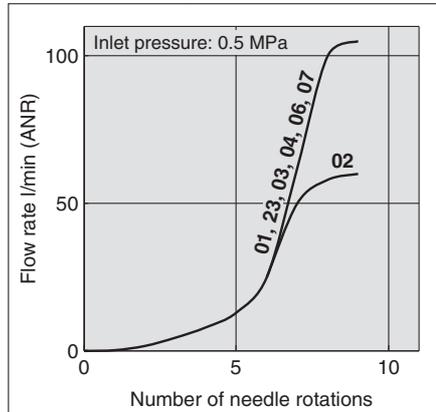
Face seal

Gasket seal  
Uni-AS

# Series AS

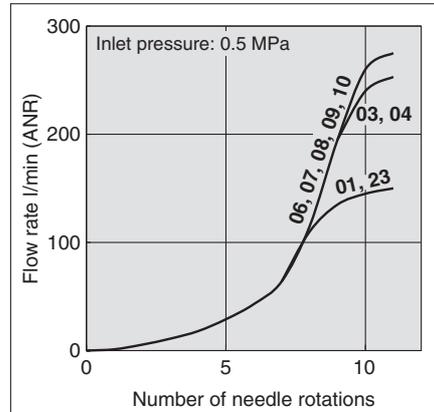
## Needle Valve/Flow-rate Characteristics

AS1201F-M5□, AS1211F-M5□  
AS1301F-M5□, AS1311F-M5□

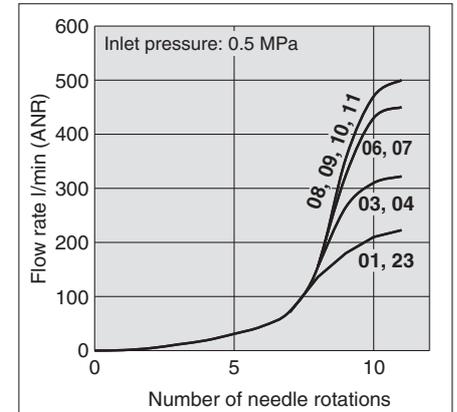


Note) -U10/32 has the same specification as M5.

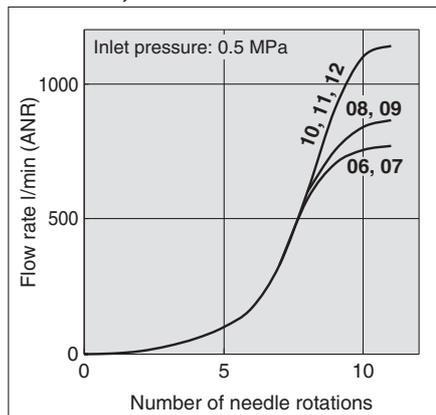
AS2201F-01, AS2211F-01  
AS2301F-01, AS2311F-01



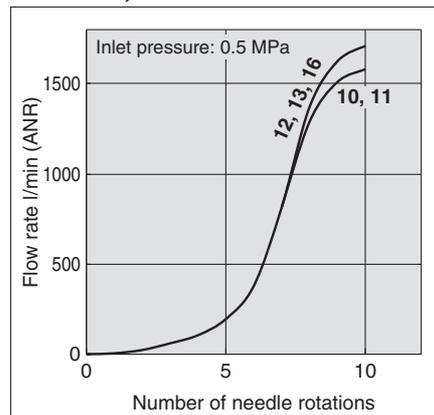
AS2201F-02, AS2211F-02  
AS2301F-02, AS2311F-02



AS3201F, AS3211F  
AS3301F, AS3311F



AS4201F, AS4211F  
AS4301F, AS4311F

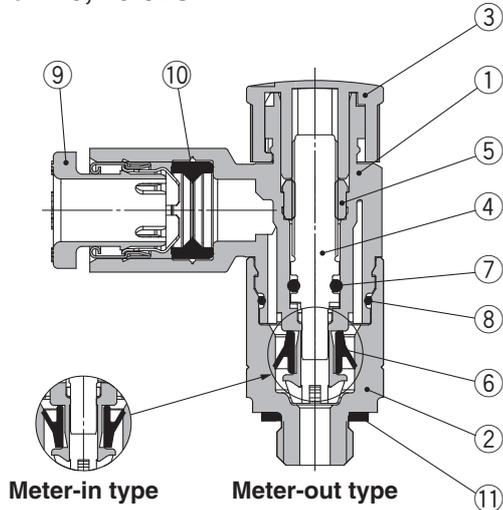


Note) The numbers above the flow-rate characteristic curves in the charts show the applicable tubing outside diameter as defined by the product number.

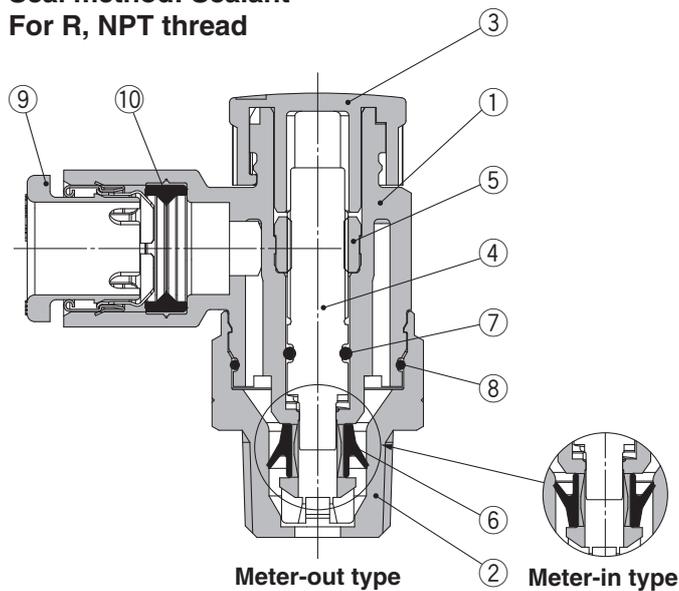
**Construction**

**Elbow type**

Seal method: Gasket seal  
For M5, 10-32UNF



Seal method: Sealant  
For R, NPT thread

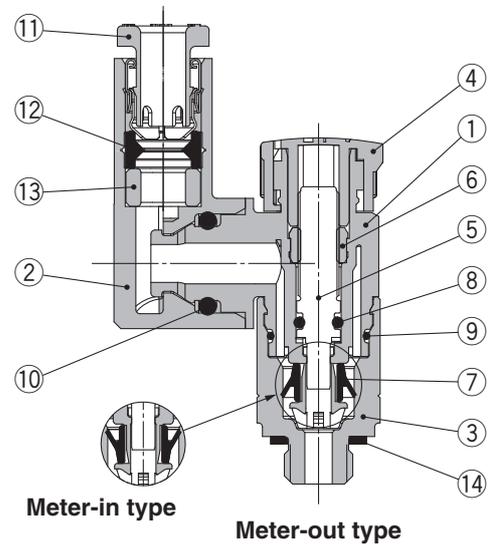


**Component Parts**

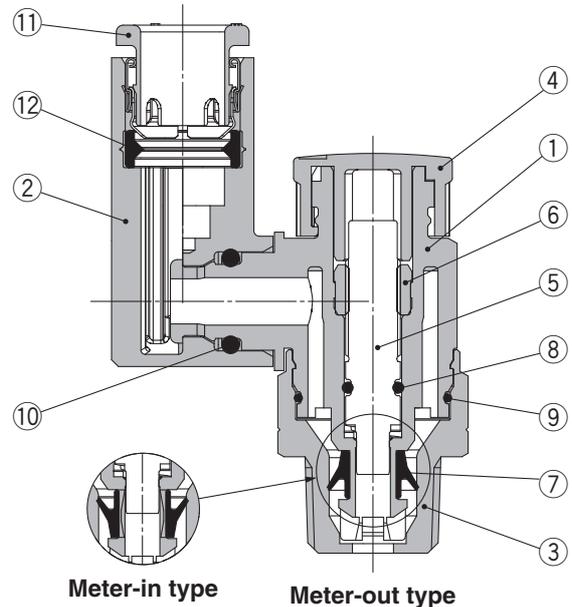
No.	Description	Material	Note
1	Body A	PBT	
2	Body B	Brass	Electroless nickel plating
3	Knob	POM	
4	Needle	PBT	
5	Needle guide	Brass	Electroless nickel plating
6	U-seal	HNBR	
7	O-ring	NBR	
8	O-ring	NBR	
9	Cassette	—	
10	Seal	NBR	
11	Gasket	NBR/Stainless steel	

**Universal type**

Seal method: Gasket seal  
For M5, 10-32UNF



Seal method: Sealant  
For R, NPT thread



**Component Parts**

No.	Description	Material	Note
1	Body A	PBT	
2	Elbow body	PBT	
3	Body B	Brass	Electroless nickel plating
4	Knob	POM	
5	Needle	PBT	
6	Needle guide	Brass	Electroless nickel plating
7	U-seal	HNBR	
8	O-ring	NBR	
9	O-ring	NBR	
10	O-ring	NBR	
11	Cassette	—	
12	Seal	NBR	
13	Spacer <sup>Note)</sup>	PBT	
14	Gasket	NBR/Stainless steel	

Note) Spacer is included only for the applicable tubing O.D.  $\varnothing$  3.2 and  $\varnothing$  1/8".

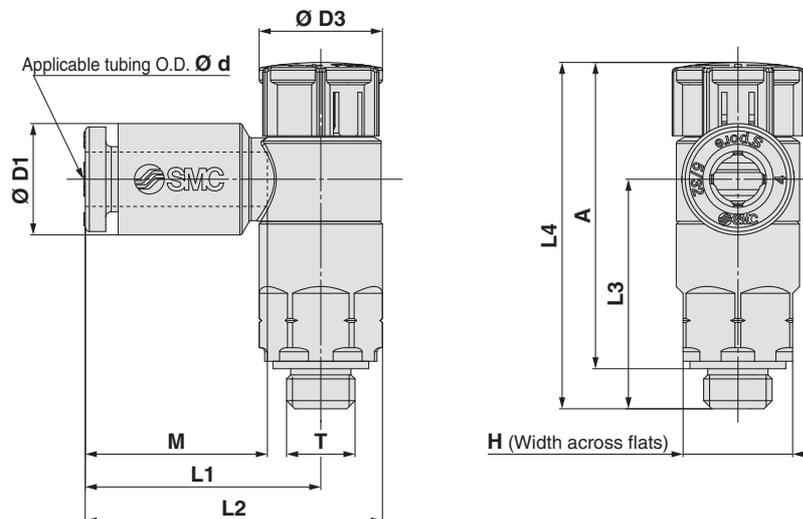
Sealant/Gasket seal  
**AS-FG**  
**AS**

Face seal

Gasket seal  
**Uni-AS**

## Dimensions/ Elbow type

Seal method: Gasket seal  
For M5, 10-32UNF



### Metric Size

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight [g]
									Unlocked	Locked	Unlocked	Locked		
AS12□1F-M5E-02A	2	M5 x 0.8 10/32UNF	8 (9)	5.8	9.4 (9.4)	15.8	20.3 (20.6)	16.9	26.5	25.4	23.5	22.4	11.9	5
AS12□1F-U10/32E-02A														
AS12□1F-M5E-23A	3.2			7.2		17.2	21.7 (22)							
AS12□1F-U10/32E-23A														
AS12□1F-M5E-04A	4			8.2		18.6	23.1 (23.4)							
AS12□1F-U10/32E-04A														
AS12□1F-M5E-06A	6	10.4												
AS12□1F-U10/32E-06A														

Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

Note 3) ( ) indicates value when "width across flats: 9 mm" is selected

### Inch Size

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight [g]
									Unlocked	Locked	Unlocked	Locked		
AS12□1F-M5E-01A	1/8"	M5 x 0.8 10/32UNF	8 (9)	7.2	9.4 (9.4)	17.2	21.7 (22)	16.9	26.5	25.4	23.5	22.4	13.3	5
AS12□1F-U10/32E-01A														
AS12□1F-M5E-03A	5/32"			8.2		18.6	23.1 (23.4)							
AS12□1F-U10/32E-03A														
AS12□1F-M5E-07A	1/4"			11.2										
AS12□1F-U10/32E-07A														

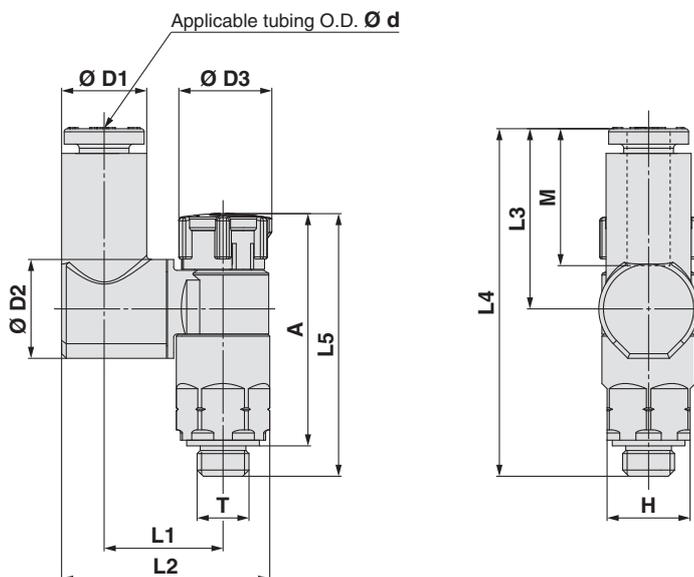
Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

Note 3) ( ) indicates value when "width across flats: 9 mm" is selected

Dimensions/ **Universal type**

Seal method: Gasket seal  
For M5, 10-32UNF



Sealant/Gasket seal  
**AS-FG**

Face seal

Gasket seal  
**Uni-AS**

**Metric Size**

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 <sup>Note 1)</sup>		A <sup>Note 2)</sup>		M	Weight [g]
											Unlocked	Locked	Unlocked	Locked		
AS13□1F-M5E-23A	3.2	M5 x 0.8 10/32UNF	8 (9)	7.2	9.6	9.4 (9.4)	11.6	19.4 (19.7)	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1F-U10/32E-23A				8.2				19.8 (20.1)								
AS13□1F-M5E-04A	4	M5 x 0.8 10/32UNF	8 (9)	8.2	9.6	9.4 (9.4)	11.5	19.8 (20.1)	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1F-U10/32E-04A				10.4				20.9 (21.7)								
AS13□1F-M5E-06A	6	M5 x 0.8 10/32UNF	8 (9)	10.4	9.6	9.4 (9.4)	11.5	20.9 (21.7)	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1F-U10/32E-06A				11.2				21.3 (21.6)								

Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

Note 3) ( ) indicates value when "width across flats: 9 mm" is selected

**Inch Size**

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 <sup>Note 1)</sup>		A <sup>Note 2)</sup>		M	Weight [g]
											Unlocked	Locked	Unlocked	Locked		
AS13□1F-M5E-01A	1/8"	M5 x 0.8 10/32UNF	8 (9)	7.2	9.6	9.4 (9.4)	11.6	19.4 (19.7)	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1F-U10/32E-01A				8.2				19.8 (20.1)								
AS13□1F-M5E-03A	5/32"	M5 x 0.8 10/32UNF	8 (9)	8.2	9.6	9.4 (9.4)	11.5	19.8 (20.1)	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1F-U10/32E-03A				11.2				21.3 (21.6)								
AS13□1F-M5E-07A	1/4"	M5 x 0.8 10/32UNF	8 (9)	11.2	9.6	9.4 (9.4)	11.5	21.3 (21.6)	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1F-U10/32E-07A				11.2				21.3 (21.6)								

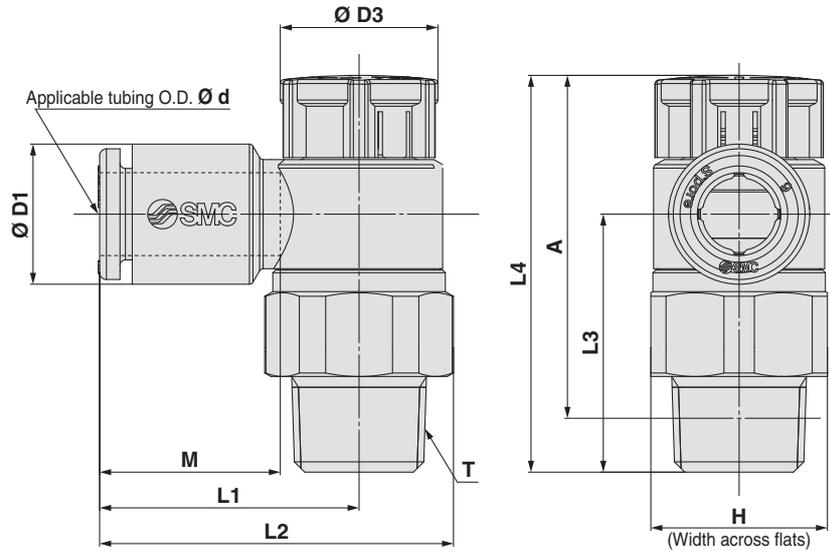
Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

Note 3) ( ) indicates value when "width across flats: 9 mm" is selected

## Dimensions/ Elbow type

Seal method: Sealant  
For R, NPT thread



### Metric Size

Model	d	T	H	D1	D3	L1	L2	L3	L4 <sup>Note 1)</sup>		A <sup>Note 2)</sup>		M	Weight [g]
									Unlocked	Locked	Unlocked	Locked		
AS22□1F-01-23(S)A	3.2	1/8	13 (12.7)	7.2	12	19.1	26.2	19.1	30.6	29.2	27.5	26.1	13.3	9 (9)
AS22□1F-01-04(S)A	4			10 (9)										
AS22□1F-01-06(S)A	6			10 (9)										
AS22□1F-01-08(S)A	8			11 (10)										
AS22□1F-01-10(S)A	10			12 (11)										
AS22□1F-02-23(S)A	3.2	1/4	17 (17.5)	7.2	13	20.9	30.2 (30.3)	22.6	36.6	35	31.1	29.5	13.3	18 (19)
AS22□1F-02-04(S)A	4			32 (31)										
AS22□1F-02-06(S)A	6			32 (31)										
AS22□1F-02-08(S)A	8			33 (32)										
AS22□1F-02-10(S)A	10			33 (32)										
AS32□1F-02-06(S)A	6	1/4	19	10.4	16.6	21.8	32.1	36.4	50	48.4	44.5	42.9	13.3	40 (40)
AS32□1F-02-08(S)A	8			33										
AS32□1F-02-10(S)A	10			37										
AS32□1F-02-12(S)A	12			35.7										
				40										
AS32□1F-03-06(S)A	6	3/8	19	10.4	16.6	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			33										
AS32□1F-03-10(S)A	10			37										
AS32□1F-03-12(S)A	12			28										
				26.8										
AS42□1F-04-10(S)A	10	1/2	24 (23.8)	15.9	18.8	27.4	40.3 (40.2)	36.2	50.8	49.2	43.7	42.1	15.6	54 (53)
AS42□1F-04-12(S)A	12			35.1										
AS42□1F-04-16(S)A	16			32.7										

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

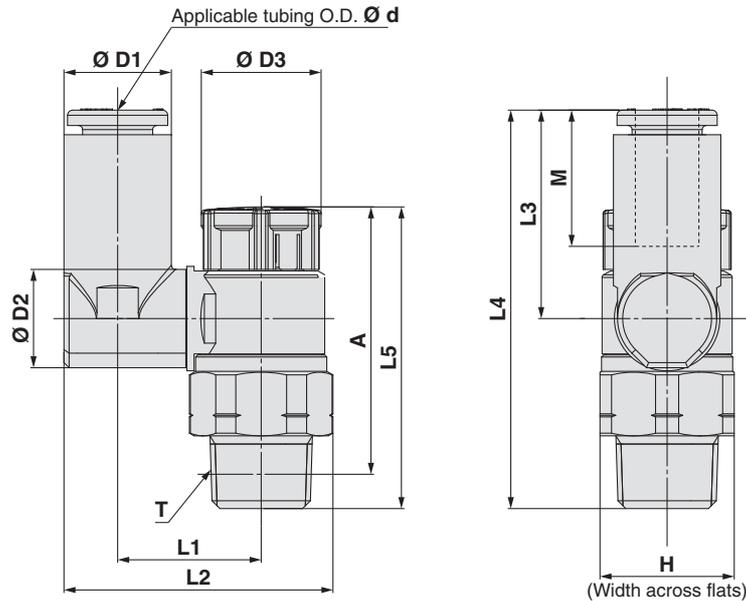
### Inch Size

Model	d	T	H	D1	D3	L1	L2	L3	L4 <sup>Note 1)</sup>		A <sup>Note 2)</sup>		M	Weight [g]
									Unlocked	Locked	Unlocked	Locked		
AS22□1F-01-01(S)A	1/8"	1/8	13 (12.7)	7.2	12	19.1	26.2	19.1	30.6	29.2	27.5	26.1	13.3	9 (9)
AS22□1F-01-03(S)A	5/32"			10 (9)										
AS22□1F-01-07(S)A	1/4"			10 (9)										
AS22□1F-01-09(S)A	5/16"			11 (10)										
AS22□1F-02-01(S)A	1/8"	1/4	17 (17.5)	7.2	13	20.9	30.2 (30.3)	22.6	36.6	35	31.1	29.5	13.3	18 (19)
AS22□1F-02-03(S)A	5/32"			32 (31)										
AS22□1F-02-07(S)A	1/4"			32 (31)										
AS22□1F-02-09(S)A	5/16"			33 (32)										
AS22□1F-02-11(S)A	3/8"			33 (32)										
AS32□1F-02-07(S)A	1/4"	1/4	19	11.2	16.6	21.8	32.1	36.4	50	48.4	44.5	42.9	13.3	40 (40)
AS32□1F-02-09(S)A	5/16"			33										
AS32□1F-02-11(S)A	3/8"			37										
AS32□1F-03-07(S)A	1/4"	3/8	19	11.2	16.6	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"			33										
AS32□1F-03-11(S)A	3/8"			37										
AS42□1F-04-11(S)A	3/8"	1/2	24 (23.8)	15.5	18.8	27.4	40.3 (40.2)	36.2	50.8	49.2	43.7	42.1	15.6	54 (53)
AS42□1F-04-13(S)A	1/2"			19.3										

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

Dimensions/ **Universal type**

Seal method: Sealant  
For R, NPT thread



Sealant/Gasket seal  
**AS-FG**

Face seal

Gasket seal  
**Uni-AS**

Metric Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 Note 1)		A Note 2)		M	Weight [g]
											Unlocked	Locked	Unlocked	Locked		
AS23□1F-01-23(S)A	3.2	1/8	13 (12.7)	7.2	9.6	12	13.3	24	17.5	36	30.6	29.2	27.5	26.1	13.3	10 (10)
AS23□1F-01-04(S)A	4			8.2			13.9	25.1								11 (11)
AS23□1F-01-06(S)A	6			10.4			16.4	26.2								12 (12)
AS23□1F-01-08(S)A	8			13.2			16.4	30.1								20.4
AS23□1F-02-04(S)A	4	1/4	17 (17.5)	8.2	12.9	13	16.5	29.9 (30)	17.5	40.1	36.6	35	31.1	29.5	13.3	19 (20)
AS23□1F-02-06(S)A	6			11.2			19	33.8 (33.9)	21.4	43.9					13.3	21 (22)
AS23□1F-02-08(S)A	8			13.2			19	34.9 (35)	23.5	46					14.2	22 (22)
AS23□1F-02-10(S)A	10			15.9			20.9	38.1 (38.2)	24.7	47.3					15.6	23 (24)
AS33□1F-02-06(S)A	6	1/4	19	11.2	12.9	16.6	20.2	36	21.4	57.8	50	48.4	44.5	42.9	13.3	42 (42)
AS33□1F-02-08(S)A	8			13.2			37.1	23.5	59.9	14.2					43 (43)	
AS33□1F-02-10(S)A	10			15.9			41.2	26.1	62.5	15.6					46 (46)	
AS33□1F-02-12(S)A	12			18.5			42.5	28.3	64.7	17					48 (48)	
AS33□1F-03-06(S)A	6	3/8	19	11.2	12.9	16.6	20.2	36	21.4	50.1	42.3	40.7	37.1	35.5	13.3	34 (35)
AS33□1F-03-08(S)A	8			13.2			37.1	23.5	52.2	14.2					35 (36)	
AS33□1F-03-10(S)A	10			15.9			41.2	26.1	54.8	15.6					38 (39)	
AS33□1F-03-12(S)A	12			18.5			42.5	28.3	57	17					40 (41)	
AS43□1F-04-10(S)A	10	1/2	24 (23.8)	15.9	17.4	18.8	25.6	46.4 (46.3)	26.1	61.2	50.8	49.2	43.7	42.1	15.6	61 (59)
AS43□1F-04-12(S)A	12			18.5			26.2	48.3 (48.2)	28.3	63.4					17	64 (63)

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

Inch Size

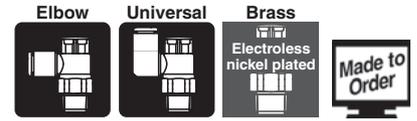
Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 Note 1)		A Note 2)		M	Weight [g]		
											Unlocked	Locked	Unlocked	Locked				
AS23□1F-01-01(S)A	1/8"	1/8	13 (12.7)	7.2	9.6	12	13.3	24	17.5	36	30.6	29.2	27.5	26.1	13.3	10 (10)		
AS23□1F-01-03(S)A	5/32"			8.2			13.9	25.1								11 (11)		
AS23□1F-01-07(S)A	1/4"			11.2			16.4	29.1								20.2	38.7	12 (12)
AS23□1F-01-09(S)A	5/16"			13.2			16.4	30.1								21.5	40	14.2
AS23□1F-02-03(S)A	5/32"	1/4	17 (17.5)	8.2	12.9	13	16.5	29.9 (30)	17.5	40.1	36.6	35	31.1	29.5	13.3	19 (20)		
AS23□1F-02-07(S)A	1/4"			11.2			19	33.8 (33.9)	21.4	43.9					13.3	21 (22)		
AS23□1F-02-09(S)A	5/16"			13.2			19	34.9 (35)	23.5	46					14.2	22 (22)		
AS23□1F-02-11(S)A	3/8"			15.9			20.9	38.1 (38.2)	24.7	47.3					15.6	23 (24)		
AS33□1F-02-07(S)A	1/4"	3/8	19	11.2	12.9	16.6	20.2	36	21.4	57.8	50	48.4	44.5	42.9	13.3	42 (42)		
AS33□1F-02-09(S)A	5/16"			13.2			37.1	23.5	59.9	14.2					43 (43)			
AS33□1F-02-11(S)A	3/8"			15.9			41.2	26.1	62.5	15.6					46 (46)			
AS33□1F-03-07(S)A	1/4"			18.5			42.5	28.3	64.7	17					48 (48)			
AS33□1F-03-09(S)A	5/16"	3/8	19	11.2	12.9	16.6	20.2	36	21.4	50.1	42.3	40.7	37.1	35.5	13.3	34 (35)		
AS33□1F-03-11(S)A	3/8"			13.2			37.1	23.5	52.2	14.2					35 (36)			
AS33□1F-03-13(S)A	3/8"			15.9			41.2	26.1	54.8	15.6					38 (39)			
AS43□1F-04-11(S)A	3/8"			1/2			24 (23.8)	15.9	17.4	18.8					25.6	46.4 (46.3)	26.1	61.2
AS43□1F-04-13(S)A	1/2"	18.5	26.2		48.3 (48.2)	28.3		63.4			17	64 (63)						

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

# Series AS

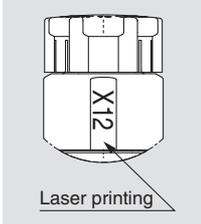
## Made to Order

Please contact SMC for detailed dimensions, specifications and delivery.



### 1 Lubricant: Vaseline

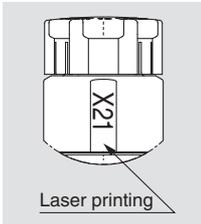
-X12



Example) AS2201F-01-04SA-X12

### 2 Grease-free (Seal: Fluorine-coated) + Restrictor (Without check valve)

-X21



Example) AS2201F-01-04SA-X21

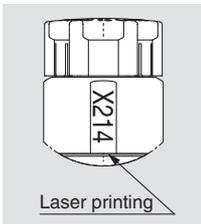
Note 1) Not particle-free

Note 2) The restrictor is only compatible with the part number of the meter-out type.

Note 3) Only the needle and O-ring are fluorine-coated.

### 3 Restrictor (Without check valve)

-X214

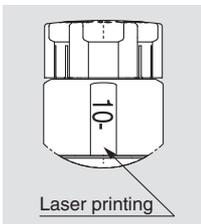


Example) AS2201F-01-04SA-X214

Note) The restrictor is only compatible with the part number of the meter-out type.

### 4 Clean Series

10-



Example) 10-AS2201F-01-04SA

Note 1) Fluorine grease is used.

Note 2) The particulate generation grade is 3.

Note 3) Excluding G thread type.

# Speed Controller with One-touch Fitting Stainless Steel Type Elbow Type/Universal Type Series AS-FG



## Model

Model		Port size	Seal method	Applicable tubing O.D.																
Elbow type	Universal type			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□1FG-M5	AS13□1FG-M5	M5 x 0.8	Gasket seal	● Note 3)	●	●	●						●	●	●					
AS12□1FG-U10/32	AS13□1FG-U10/32	10-32UNF		● Note 3)	●	●	●							●	●	●				
AS22□1FG-□01	AS23□1FG-□01	R NPT	Sealant Note 1)		●	●	●	●	● Note 3)				●	●	●	●				
AS22□1FG-□02	AS23□1FG-□02			1/8		● Note 3)	●	●	●	●				● Note 3)	●	●	●	●		
AS32□1FG-□02	AS33□1FG-□02			1/4			●	●	●	●	●					●	●	●		
AS32□1FG-□03	AS33□1FG-□03			1/4				●	●	●	●						●	●	●	
AS42□1FG-□04	AS43□1FG-□04			3/8				●	●	●	●						●	●	●	
AS42□1FG-□04	AS43□1FG-□04			1/2						●	●	● Note 3)						●	●	
AS22□1FG-G01	AS23□1FG-G01	G	Face seal		●	●	●	●	● Note 3)											
AS22□1FG-G02	AS23□1FG-G02			1/8		● Note 3)	●	●	●	●										
AS32□1FG-G02	AS33□1FG-G02			1/4			●	●	●	●	●									
AS32□1FG-G03	AS33□1FG-G03			1/4				●	●	●	●									
AS32□1FG-G03	AS33□1FG-G03			3/8				●	●	●	●									
AS42□1FG-G04	AS43□1FG-G04			1/2						●	●	● Note 3)								

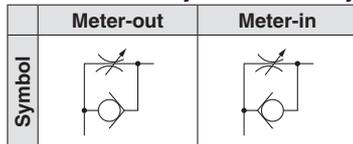
Note 1) "Without sealant" type can be selected as a standard option.

Note 2) Only polyurethane tubing is applicable for Ø 2.

Note 3) Universal type is not available.

## Specifications

### Flow Direction Symbols on Body



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 <sup>Note)</sup> , FEP, PFA

Note) Use caution at the max. operating pressure when using soft nylon or polyurethane tubing. (Refer to the WEB catalogue for details.)

## Caution

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For Flow Control Equipment Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual.

## Flow Rate and Sonic Conductance

Model	AS12□1FG-M5 AS13□1FG-M5		AS22□1FG-□01 AS23□1FG-□01			AS22□1FG-□02 AS23□1FG-□02			AS32□1FG AS33□1FG			AS42□1FG AS43□1FG		
	Metric size	Ø 2	Ø 3.2	Ø 4	Ø 6	Ø 8	Ø 10	Ø 3.2	Ø 4	Ø 6	Ø 8	Ø 10	Ø 12	Ø 16
Tubing O.D.	Inch size	—	Ø 1/8"	Ø 1/4"	Ø 1/2"	Ø 1/4"	Ø 5/16"	Ø 1/8"	Ø 5/32"	—	Ø 1/4"	Ø 5/16"	Ø 3/8"	Ø 1/2"
			Ø 1/4"	Ø 5/32"	Ø 1/2"	Ø 5/16"	Ø 3/8"				Ø 3/8"	Ø 1/2"		
C values: Sonic conductance dm <sup>3</sup> /(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
	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	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3
	Controlled flow	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

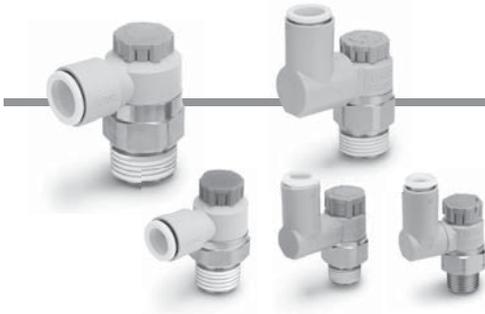
Note 1) 10-32UNF has the same specification as M5.

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

# Series AS-FG



## How to Order



### Applicable tubing O.D. <sup>Note 1)</sup>

Metric size		Inch size	
02	Ø 2	01	Ø 1/8"
23	Ø 3.2 <sup>Note 2)</sup>	03	Ø 5/32"
04	Ø 4	07	Ø 1/4"
06	Ø 6		

Note 1) For selecting applicable tubing O.D., refer to the "Model" on page 14. The colour of the release button is white (metric, inch).  
 Note 2) Use Ø 1/8" tube.

**Body size**

1	M5 x 0.8 10-32UNF
---	----------------------

**Port size**

M5	M5 x 0.8
U10/32	10-32UNF

**Body size 1**

AS 1 2 0 1 FG - M5 - 06 A -

**Body size 2/3/4**

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

**Body size**

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

**Type**

2	Elbow
3	Universal

**Control type <sup>Note)</sup>**

0	Meter-out
1	Meter-in

Note) Meter-out and meter-in types can be visually identified by colour of the knob.  
 Meter-out: Grey  
 Meter-in: Light blue

### Stainless steel type (Stainless steel 303)

Note 1) The material can be visually identified by colour of the release button.  
 Stainless steel type: White  
 Note 2) White is also used for inch size.

**Thread type**

-	R
N	NPT
G	G

**Made to Order**  
 Refer to page 25 for details.

**Push-lock type**

### Seal method

-	Without sealant
S	With sealant

Note) Face seal method is used for the G thread type.  
 Select "-/Without sealant."  
 Example) AS2201FG-G01-06A

### Applicable tubing O.D. <sup>Note 1)</sup>

Metric size		Inch size <sup>Note 3)</sup>	
23	Ø 3.2 <sup>Note 2)</sup>	01	Ø 1/8"
04	Ø 4	03	Ø 5/32"
06	Ø 6	07	Ø 1/4"
08	Ø 8	09	Ø 5/16"
10	Ø 10	11	Ø 3/8"
12	Ø 12	13	Ø 1/2"
16	Ø 16		

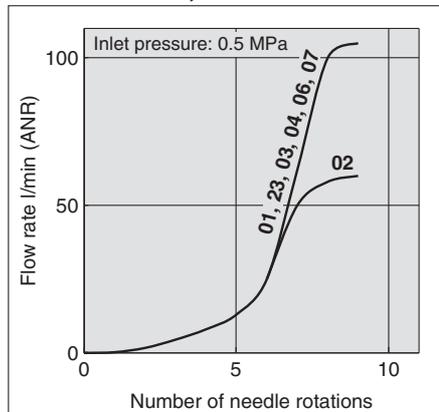
Note 1) For selecting applicable tubing O.D., refer to the "Model" on page 14. The colour of the release button is white (metric, inch).  
 Note 2) Use Ø 1/8" tube.  
 Note 3) Only the metric size is available for the G thread type.

### Port size

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

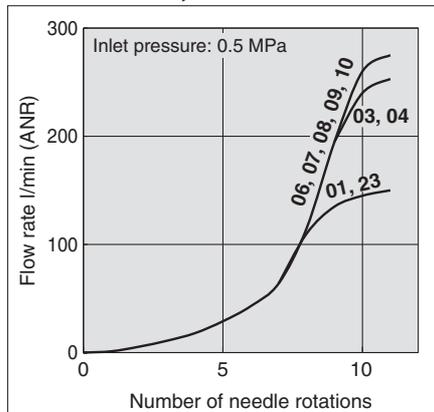
**Needle Valve/Flow-rate Characteristics**

**AS1201FG-M5, AS1211FG-M5  
 AS1301FG-M5, AS1311FG-M5**

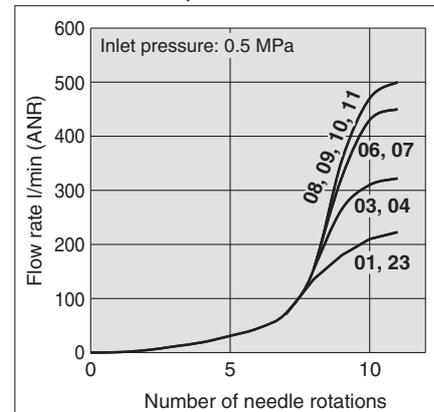


Note) -U10/32 has the same specification as M5.

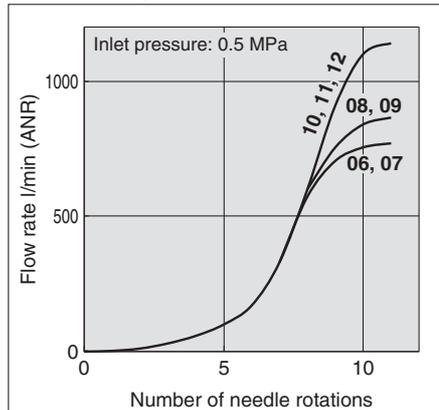
**AS2201FG-01, AS2211FG-01  
 AS2301FG-01, AS2311FG-01**



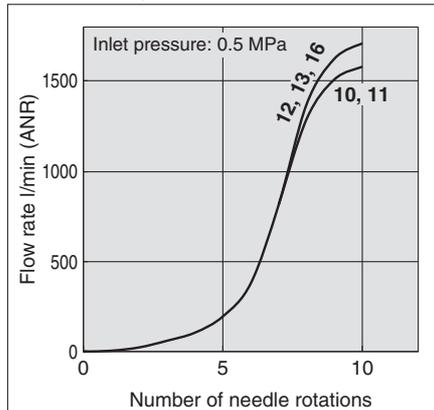
**AS2201FG-02, AS2211FG-02  
 AS2301FG-02, AS2311FG-02**



**AS3201FG, AS3211FG  
 AS3301FG, AS3311FG**



**AS4201FG, AS4211FG  
 AS4301FG, AS4311FG**



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

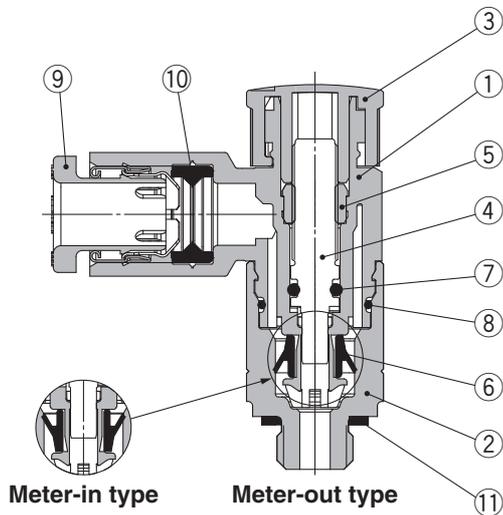
Sealant/Gasket seal	<b>AS</b>
Face seal	<b>AS-FG</b>
Gasket seal	<b>Uni-AS</b>

# Series AS-FG

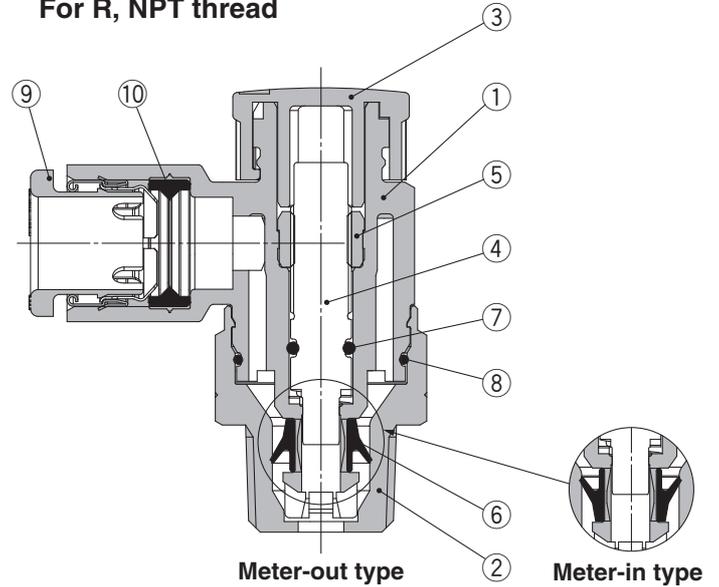
## Construction

### Elbow type

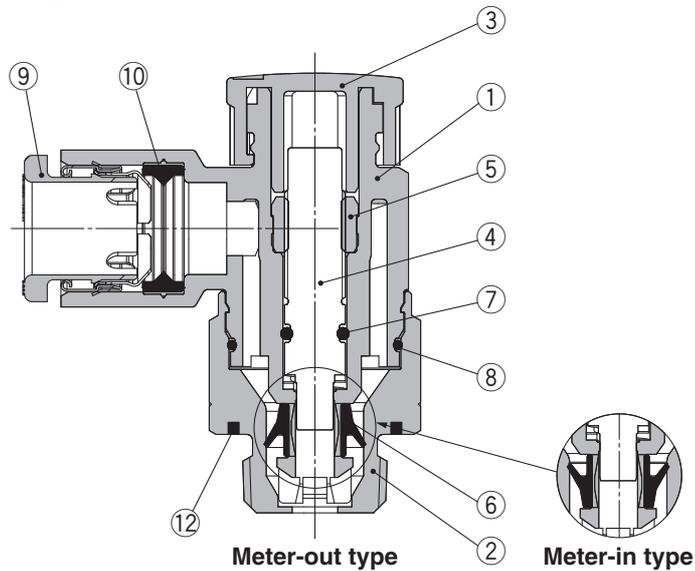
Seal method: Gasket seal  
For M5, 10-32UNF



Seal method: Sealant  
For R, NPT thread



Seal method: Face seal  
For G thread



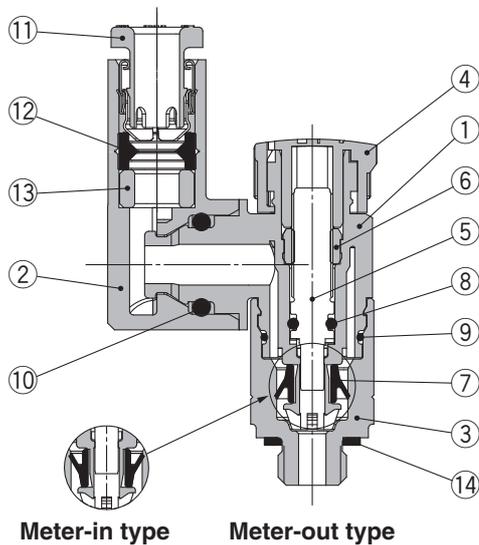
### Component Parts

No.	Description	Material	Note
1	Body A	PBT	
2	Body B	Stainless steel	
3	Knob	POM	
4	Needle	PBT	
5	Needle guide	Stainless steel	
6	U-seal	HNBR	
7	O-ring	NBR	
8	O-ring	NBR	
9	Cassette	—	
10	Seal	NBR	
11	Gasket	NBR/Stainless steel	
12	Seal	NBR	

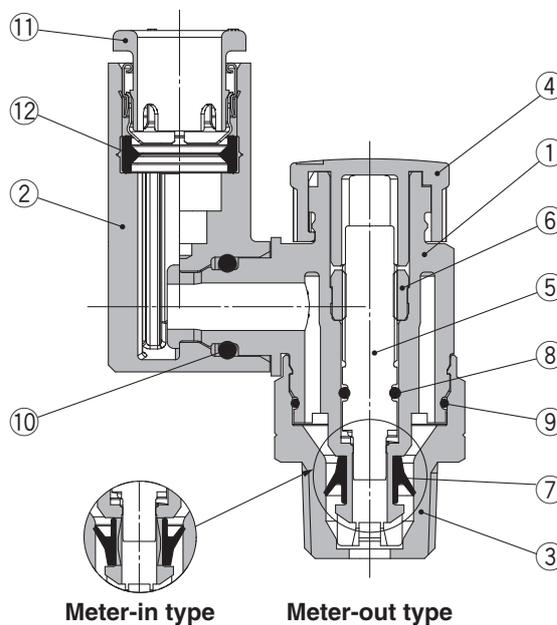
## Construction

### Universal type

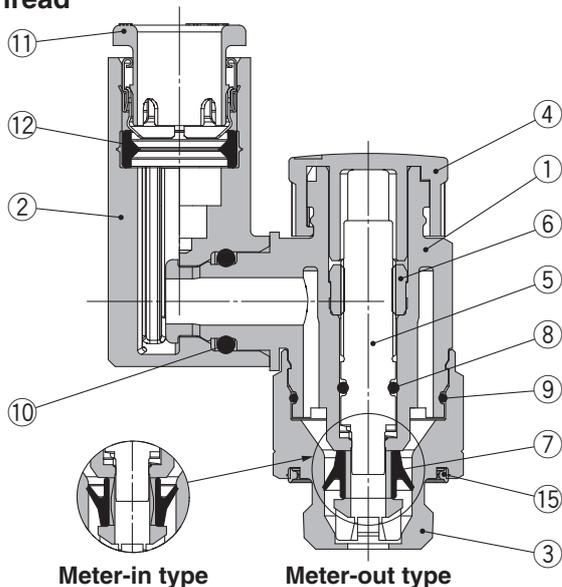
Seal method: Gasket seal  
For M5, 10-32UNF



Seal method: Sealant  
For R, NPT thread



Seal method: Face seal  
For G thread



Sealant/Gasket seal  
**AS-FG**  
**AS**

Face seal

Gasket seal  
**Uni-AS**

### Component Parts

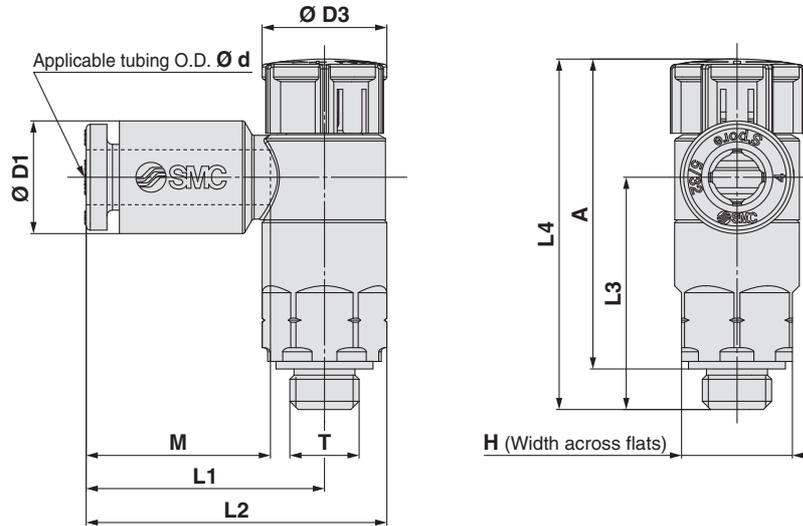
No.	Description	Material	Note
1	Body A	PBT	
2	Elbow body	PBT	
3	Body B	Stainless steel	
4	Knob	POM	
5	Needle	PBT	
6	Needle guide	Stainless steel	
7	U-seal	HNBR	
8	O-ring	NBR	
9	O-ring	NBR	
10	O-ring	NBR	
11	Cassette	—	
12	Seal	NBR	
13	Spacer <sup>Note)</sup>	PBT	
14	Gasket	NBR/Stainless steel	
15	Seal	NBR	

Note) Spacer is included only for the applicable tubing O.D.  $\varnothing$  3.2 and  $\varnothing$  1/8".

# Series AS-FG For M5, 10-32UNF

## Dimensions/ Elbow type

Seal method: Gasket seal  
For M5, 10-32UNF



### Metric Size

Model	d	T	H	D1	D3	L1	L2	L3	L4 <small>Note 1)</small>		A <small>Note 2)</small>		M	Weight [g]	
									Unlocked	Locked	Unlocked	Locked			
AS12□1FG-M5-02A	2	M5 x 0.8 10/32UNF	8	5.8	9.4	15.8	20.3	16.9	26.5	25.4	23.5	22.4	11.9	5	
AS12□1FG-U10/32-02A				7.2		17.2	21.7								
AS12□1FG-M5-23A	3.2			8.2		18.6	23.1								16.5
AS12□1FG-U10/32-23A				10.4		18.6	23.1								16.5
AS12□1FG-M5-04A	4			10.4		18.6	23.1								16.5
AS12□1FG-U10/32-04A				10.4		18.6	23.1								16.5
AS12□1FG-M5-06A	6	10.4	18.6	23.1	16.5										
AS12□1FG-U10/32-06A		10.4	18.6	23.1	16.5										

Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

### Inch Size

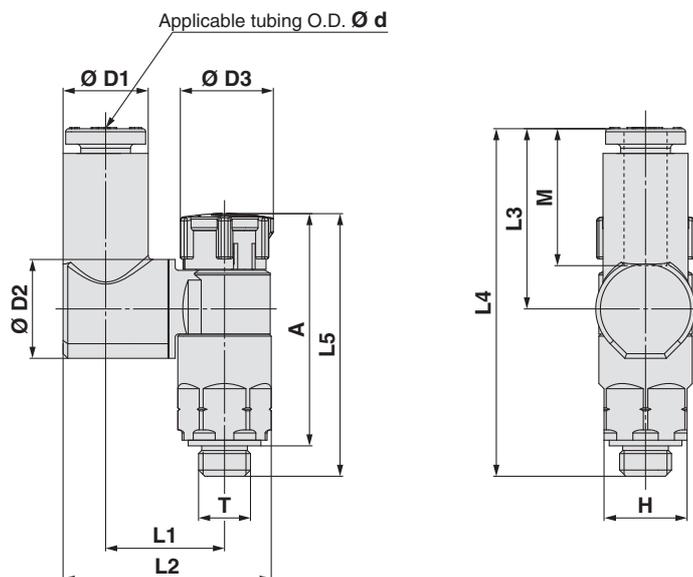
Model	d	T	H	D1	D3	L1	L2	L3	L4 <small>Note 1)</small>		A <small>Note 2)</small>		M	Weight [g]	
									Unlocked	Locked	Unlocked	Locked			
AS12□1FG-M5-01A	1/8"	M5 x 0.8 10/32UNF	8	7.2	9.4	17.2	21.7	16.9	26.5	25.4	23.5	22.4	13.3	5	
AS12□1FG-U10/32-01A				8.2		18.6	23.1								16.5
AS12□1FG-M5-03A	5/32"			11.2		18.6	23.1								16.5
AS12□1FG-U10/32-03A				11.2		18.6	23.1								16.5
AS12□1FG-M5-07A	1/4"			11.2		18.6	23.1								16.5
AS12□1FG-U10/32-07A				11.2		18.6	23.1								16.5

Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

Dimensions/ **Universal type**

Seal method: Gasket seal  
For M5, 10-32UNF



Sealant/Gasket seal  
**AS-FG**  
**AS**

Face seal

Gasket seal  
**Uni-AS**

**Metric Size**

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 Note 1)		A Note 2)		M	Weight [g]
											Unlocked	Locked	Unlocked	Locked		
AS13□1FG-M5-23A	3.2	M5 x 0.8 10/32UNF	8	7.2	9.6	9.4	11.6	19.7	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1FG-U10/32-23A				8.2												
AS13□1FG-M5-04A	4	M5 x 0.8 10/32UNF	8	8.2	9.6	9.4	11.5	20.1	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1FG-U10/32-04A				10.4												
AS13□1FG-M5-06A	6	M5 x 0.8 10/32UNF	8	10.4	9.6	9.4	11.5	21.2	20.4	36.6	26.5	25.4	23.5	22.4	13.3	6
AS13□1FG-U10/32-06A				11.5												

Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

**Inch Size**

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 Note 1)		A Note 2)		M	Weight [g]
											Unlocked	Locked	Unlocked	Locked		
AS13□1FG-M5-01A	1/8"	M5 x 0.8 10/32UNF	8	7.2	9.6	9.4	11.6	19.7	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1FG-U10/32-01A				8.2												
AS13□1FG-M5-03A	5/32"	M5 x 0.8 10/32UNF	8	8.2	9.6	9.4	11.5	20.1	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1FG-U10/32-03A				11.2												
AS13□1FG-M5-07A	1/4"	M5 x 0.8 10/32UNF	8	11.2	9.6	9.4	11.5	21.6	20.2	36.5	26.5	25.4	23.5	22.4	13.3	6
AS13□1FG-U10/32-07A				11.5												

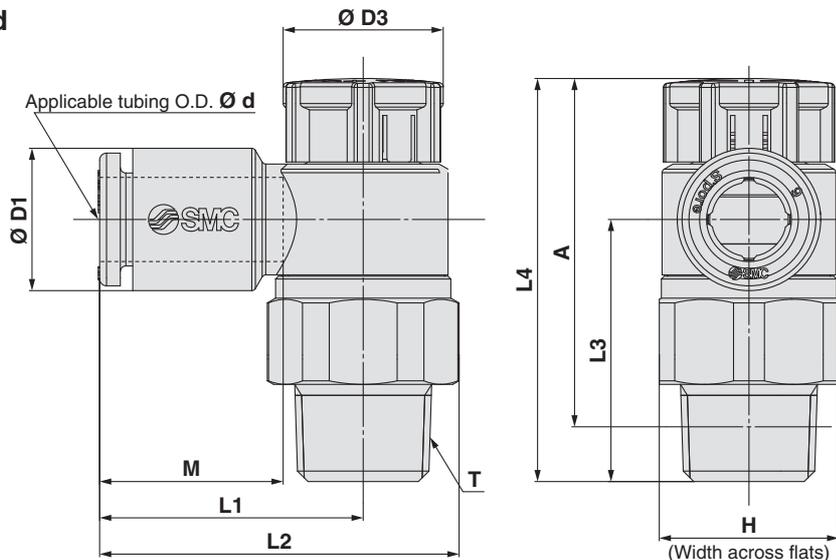
Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

# Series AS-FG For R, NPT thread

## Dimensions/ Elbow type

Seal method: Sealant  
For R, NPT thread



### Metric Size

Model	d	T	H	D1	D3	L1	L2	L3	L4 <sup>Note 1)</sup>		A <sup>Note 1)</sup>		M	Weight [g]		
									Unlocked	Locked	Unlocked	Locked				
AS22□1FG-01-23(S)A	3.2	1/8	13 (12.7)	7.2	12	19.1	26.2	19.1	30.6	29.2	27.5	26.1	13.3	9 (9)		
AS22□1FG-01-04(S)A	4			10.4										22.4	29.5	10 (9)
AS22□1FG-01-06(S)A	6			13.2										25.3	32.4	11 (10)
AS22□1FG-01-10(S)A	10			15.9										25.3	32.4	12 (11)
AS22□1FG-02-23(S)A	3.2	1/4	17 (17.5)	7.2	13	20.9	30.2 (30.3)	22.6	36.6	35	31.1	29.5	13.3	17 (18)		
AS22□1FG-02-04(S)A	4			8.2										23.4	32.7 (32.8)	18 (19)
AS22□1FG-02-06(S)A	6			10.4										23.9	33.2 (33.3)	19 (20)
AS22□1FG-02-08(S)A	8			13.2										26.9	36.2 (36.3)	20 (20)
AS22□1FG-02-10(S)A	10			15.9										26.9	36.2 (36.3)	21 (20)
AS32□1FG-02-06(S)A	6	1/4	19	10.4	16.6	21.8	32.1	36.4	50	48.4	44.5	42.9	13.3	40 (40)		
AS32□1FG-02-08(S)A	8			13.2		22.7	33							41 (41)		
AS32□1FG-02-10(S)A	10			15.9		26.7	37							42 (42)		
AS32□1FG-02-12(S)A	12			18.5		29.7	40							43 (43)		
AS32□1FG-03-06(S)A	6	3/8	19	10.4	16.6	21.8	32.1	28.7	42.3	40.7	37.1	35.5	13.3	29 (30)		
AS32□1FG-03-08(S)A	8			13.2		22.7	33							30 (31)		
AS32□1FG-03-10(S)A	10			15.9		26.7	37							31 (31)		
AS32□1FG-03-12(S)A	12			18.5		29.7	40							32 (33)		
AS42□1FG-04-10(S)A	10	1/2	24 (23.8)	15.9	18.8	27.4	40.3 (40.2)	36.2	50.8	49.2	43.7	42.1	15.6	52 (51)		
AS42□1FG-04-12(S)A	12			18.5		30.8	43.7 (43.6)							53 (53)		
AS42□1FG-04-16(S)A	16			23.8		34.8	47.7 (47.6)							57 (57)		

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

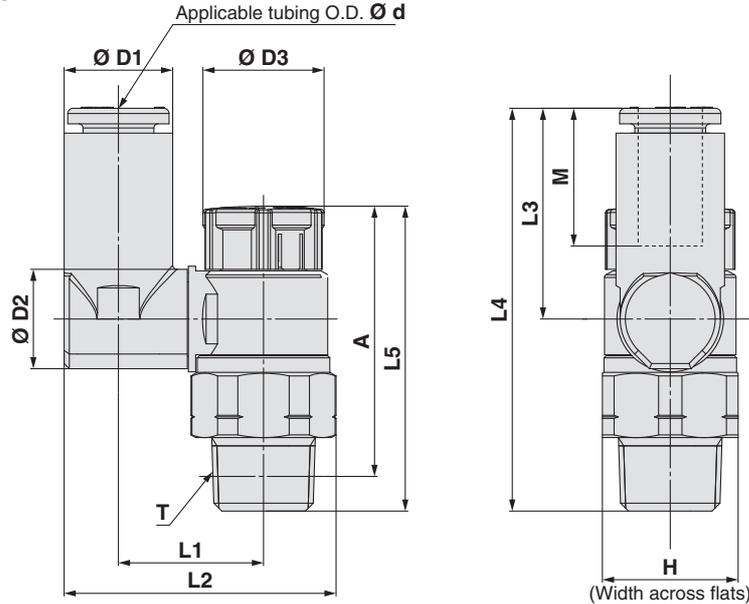
### Inch Size

Model	d	T	H	D1	D3	L1	L2	L3	L4 <sup>Note 1)</sup>		A <sup>Note 2)</sup>		M	Weight [g]		
									Unlocked	Locked	Unlocked	Locked				
AS22□1FG-01-01(S)A	1/8"	1/8	13 (12.7)	7.2	12	19.1	26.2	19.1	30.6	29.2	27.5	26.1	13.3	9 (9)		
AS22□1FG-01-03(S)A	5/32"			11.2										20.8	27.9	10 (9)
AS22□1FG-01-07(S)A	1/4"			13.2										22.4	29.5	11 (10)
AS22□1FG-01-09(S)A	5/16"			13.2										22.4	29.5	11 (10)
AS22□1FG-02-01(S)A	1/8"	1/4	17 (17.5)	7.2	13	20.9	30.2 (30.3)	22.6	36.6	35	31.1	29.5	13.3	17 (18)		
AS22□1FG-02-03(S)A	5/32"			8.2										23.4	32.7 (32.8)	18 (18)
AS22□1FG-02-07(S)A	1/4"			11.2										23.9	33.2 (33.3)	19 (19)
AS22□1FG-02-09(S)A	5/16"			13.2										26.9	36.2 (36.3)	20 (20)
AS22□1FG-02-11(S)A	3/8"			15.5										26.9	36.2 (36.3)	21 (20)
AS32□1FG-02-07(S)A	1/4"	1/4	19	11.2	16.6	21.8	32.1	36.4	50	48.4	44.5	42.9	13.3	40 (40)		
AS32□1FG-02-09(S)A	5/16"			13.2		22.7	33							41 (41)		
AS32□1FG-02-11(S)A	3/8"			15.5		26.7	37							42 (42)		
AS32□1FG-03-07(S)A	1/4"	3/8	19	11.2	16.6	21.8	32.1	28.7	42.3	40.7	37.1	35.5	13.3	29 (30)		
AS32□1FG-03-09(S)A	5/16"			13.2		22.7	33							30 (31)		
AS32□1FG-03-11(S)A	3/8"			15.5		26.7	37							31 (31)		
AS42□1FG-04-11(S)A	3/8"	1/2	24 (23.8)	15.5	18.8	27.4	40.3 (40.2)	36.2	50.8	49.2	43.7	42.1	15.6	52 (51)		
AS42□1FG-04-13(S)A	1/2"			19.3		30.9	43.8 (43.7)							53 (53)		

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

Dimensions/ Universal type

Seal method: Sealant  
For R, NPT thread



Sealant/Gasket seal  
AS-FG

Face seal

Gasket seal  
Uni-AS

Metric Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 Note 1)		A Note 2)		M	Weight [g]	
											Unlocked	Locked	Unlocked	Locked			
AS23□1FG-01-23(S)A	3.2	1/8	13 (12.7)	7.2	9.6	12	13.3	24	17.5	36	30.6	29.2	27.5	26.1	13.3	10 (9)	
AS23□1FG-01-04(S)A	4			8.2			13.9	25.1								10 (10)	
AS23□1FG-01-06(S)A	6			10.4			26.2	20.4								38.8	12 (11)
AS23□1FG-01-08(S)A	8			13.2			30.1	21.5								40	14.2
AS23□1FG-02-04(S)A	4	1/4	17 (17.5)	8.2	12.9	13	16.5	29.9 (30)	17.5	40.1	36.6	35	31.1	29.5	13.3	18 (19)	
AS23□1FG-02-06(S)A	6			11.2			33.8 (33.9)	21.4								43.9	20 (21)
AS23□1FG-02-08(S)A	8			13.2			34.9 (35)	23.5								46	21 (22)
AS23□1FG-02-10(S)A	10			15.9			38.1 (38.2)	24.7								47.3	23 (23)
AS33□1FG-02-06(S)A	6	1/4	19	11.2	12.9	16.6	20.2	36	21.4	57.8	50	48.4	44.5	42.9	13.3	42 (42)	
AS33□1FG-02-08(S)A	8			13.2			37.1	23.5								59.9	43 (43)
AS33□1FG-02-10(S)A	10			15.9			41.2	26.1								62.5	46 (46)
AS33□1FG-02-12(S)A	12			18.5			42.5	28.3								64.7	48 (48)
AS33□1FG-03-06(S)A	6	3/8	19	11.2	12.9	16.6	20.2	36	21.4	50.1	42.3	40.7	37.1	35.5	13.3	32 (33)	
AS33□1FG-03-08(S)A	8			13.2			37.1	23.5								52.2	33 (34)
AS33□1FG-03-10(S)A	10			15.9			41.2	26.1								54.8	37 (38)
AS33□1FG-03-12(S)A	12			18.5			42.5	28.3								57	38 (39)
AS43□1FG-04-10(S)A	10	1/2	24 (23.8)	15.9	17.4	18.8	25.6	46.4 (46.3)	26.1	61.2	50.8	49.2	43.7	42.1	15.6	58 (57)	
AS43□1FG-04-12(S)A	12			18.5			21	26.2								48.3 (48.2)	28.3

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

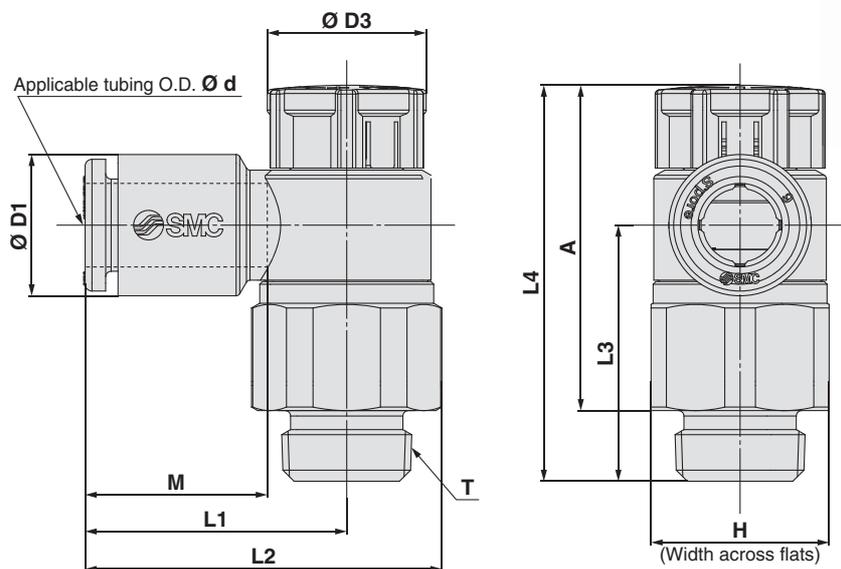
Inch Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 Note 1)		A Note 2)		M	Weight [g]	
											Unlocked	Locked	Unlocked	Locked			
AS23□1FG-01-01(S)A	1/8"	1/8	13 (12.7)	7.2	9.6	12	13.3	24	17.5	36	30.6	29.2	27.5	26.1	13.3	10 (9)	
AS23□1FG-01-03(S)A	5/32"			8.2			13.9	25.1								10 (10)	
AS23□1FG-01-07(S)A	1/4"			11.2			29.1	20.2								38.7	11 (10)
AS23□1FG-01-09(S)A	5/16"			13.2			30.1	21.5								40	12 (11)
AS23□1FG-02-03(S)A	5/32"	1/4	17 (17.5)	8.2	12.9	13	16.5	29.9 (30)	17.5	40.1	36.6	35	31.1	29.5	13.3	18 (19)	
AS23□1FG-02-07(S)A	1/4"			11.2			33.8 (33.9)	21.4								43.9	20 (21)
AS23□1FG-02-09(S)A	5/16"			13.2			34.9 (35)	23.5								46	21 (22)
AS23□1FG-02-11(S)A	3/8"			15.9			38.1 (38.2)	24.7								47.3	23 (23)
AS33□1FG-02-07(S)A	1/4"	3/8	19	11.2	12.9	16.6	20.2	36	21.4	57.8	50	48.4	44.5	42.9	13.3	42 (42)	
AS33□1FG-02-09(S)A	5/16"			13.2			37.1	23.5								59.9	43 (43)
AS33□1FG-02-11(S)A	3/8"			15.9			41.2	26.1								62.5	46 (46)
AS33□1FG-03-07(S)A	1/4"			18.5			42.5	28.3								64.7	48 (48)
AS33□1FG-03-09(S)A	5/16"	3/8	19	11.2	12.9	16.6	20.2	36	21.4	50.1	42.3	40.7	37.1	35.5	13.3	32 (33)	
AS33□1FG-03-09(S)A	5/16"			13.2			37.1	23.5								52.2	33 (34)
AS33□1FG-03-11(S)A	3/8"			15.9			41.2	26.1								54.8	37 (38)
AS33□1FG-03-11(S)A	3/8"			18.5			42.5	28.3								57	38 (39)
AS43□1FG-04-11(S)A	3/8"	1/2	24 (23.8)	15.9	17.4	18.8	25.6	46.4 (46.3)	26.1	61.2	50.8	49.2	43.7	42.1	15.6	58 (57)	
AS43□1FG-04-13(S)A	1/2"			18.5			21	26.2								48.3 (48.2)	28.3

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

## Dimensions/ Elbow type

Seal method: Face seal  
For G thread



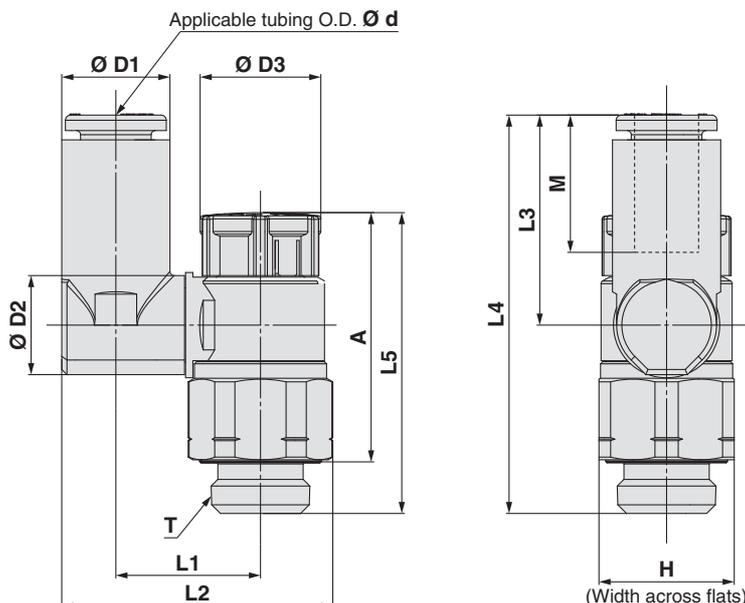
### Metric Size

[mm]

Model	d	T	H	D1	D3	L1	L2	L3	L4		A		M	Weight [g]
									Unlocked	Locked	Unlocked	Locked		
AS22□1FG-G01-23A	3.2	1/8	13	7.2	12	19.1	26.2	18.8	30.3	28.9	24.8	23.4	13.3	10
AS22□1FG-G01-04A	4			8.2										
AS22□1FG-G01-06A	6			10.4										
AS22□1FG-G01-08A	8			13.2										
AS22□1FG-G01-10A	10	15.9	25.3	32.4										
AS22□1FG-G02-23A	3.2	1/4	17	7.2	13	20.9	30.2	22.6	36.6	35	30.1	28.5	13.3	20
AS22□1FG-G02-04A	4			8.2										
AS22□1FG-G02-06A	6			10.4										
AS22□1FG-G02-08A	8			13.2										
AS22□1FG-G02-10A	10	15.9	26.9	36.2										
AS32□1FG-G02-06A	6	1/4	21	10.4	16.6	21.8	33	36.4	50	48.4	43.5	41.9	13.3	50
AS32□1FG-G02-08A	8			13.2										
AS32□1FG-G02-10A	10			15.9										
AS32□1FG-G02-12A	12			18.5										
AS32□1FG-G03-06A	6	3/8	21	10.4	16.6	21.8	33	28.7	42.3	40.7	34.8	33.2	13.3	37
AS32□1FG-G03-08A	8			13.2										
AS32□1FG-G03-10A	10			15.9										
AS32□1FG-G03-12A	12			18.5										
AS42□1FG-G04-10A	10	1/2	27	15.9	18.8	27.4	41.8	36.2	50.8	49.2	41.8	40.2	15.6	69
AS42□1FG-G04-12A	12			18.5										
AS42□1FG-G04-16A	16			23.8										
				34.8										

**Dimensions/ Universal type**

Seal method: Face seal  
For G thread



**Metric Size**

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5		A		M	Weight [g]
											Unlocked	Locked	Unlocked	Locked		
AS23□1FG-G01-23A	3.2	1/8	13	7.2	9.6	12	13.3	24.0	17.5	35.7	30.3	28.9	24.8	23.4	13.3	10
AS23□1FG-G01-04A	4			8.2			25.1	10								
AS23□1FG-G01-06A	6			10.4			26.2	20.4	38.5	11						
AS23□1FG-G01-08A	8			13.2			10.2	16.4	30.1	21.5						39.7
AS23□1FG-G02-04A	4	1/4	17	8.2	12.9	13	16.5	29.9	17.5	40.1	36.6	35	30.1	28.5	13.3	21
AS23□1FG-G02-06A	6			10.4			33.8	21.4	43.9	23						
AS23□1FG-G02-08A	8			13.2			34.9	23.5	46.0	24						
AS23□1FG-G02-10A	10			15.9			38.1	24.7	47.3	25						
AS33□1FG-G02-06A	6	1/4	21	10.4	12.9	16.6	20.2	36.6	21.4	57.8	50	48.4	43.5	41.9	13.3	51
AS33□1FG-G02-08A	8			13.2			38.0	23.5	59.9	52						
AS33□1FG-G02-10A	10			15.9			42.2	26.1	58.0	55						
AS33□1FG-G02-12A	12			18.5			43.5	28.3	59.9	57						
AS33□1FG-G03-06A	6	3/8	21	10.4	12.9	16.6	20.2	36.6	21.4	50.1	42.3	40.7	34.8	33.2	13.3	40
AS33□1FG-G03-08A	8			13.2			38.0	23.5	52.2	41						
AS33□1FG-G03-10A	10			15.9			42.2	26.1	50.3	44						
AS33□1FG-G03-12A	12			18.5			43.5	28.3	52.2	46						
AS43□1FG-G04-10A	10	1/2	27	15.9	17.4	18.8	25.6	47.9	26.1	61.2	50.8	49.2	41.8	40.2	15.6	75
AS43□1FG-G04-12A	12			18.5	21		26.2	49.8	28.3	63.4						79

Sealant/Gasket seal AS-FG AS

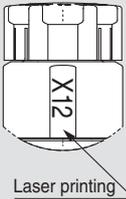
Face seal

Gasket seal Uni-AS



## 1 Lubricant: Vaseline

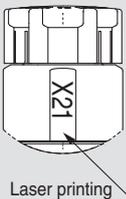
**-X12**



Example) AS2201FG-01-04SA-X12

## 2 Grease-free (Seal: Fluorine-coated) + Restrictor (Without check valve)

**-X21**



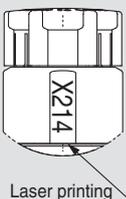
Example) AS2201FG-01-04SA-X21

Note 1) Not particle-free

Note 2) The restrictor is only compatible with the part number of the meter-out type.

## 3 Restrictor (Without check valve)

**-X214**

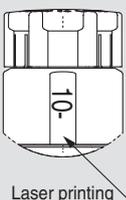


Example) AS2201FG-01-04SA-X214

Note) The restrictor is only compatible with the part number of the meter-out type.

## 4 Clean Series

**10-**



Example) 10-AS2201FG-01-04SA

Note 1) Fluorine grease is used.

Note 2) The particulate generation grade is 3.

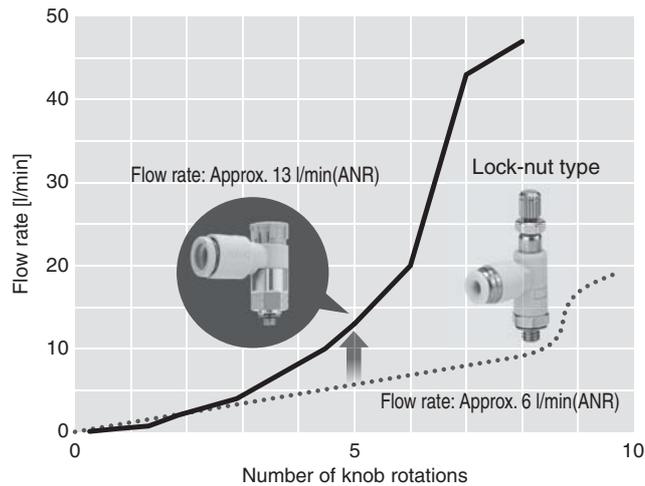
Note 3) Excluding G thread type.

# Speed Controller with One-touch Fitting Elbow Type for M3

## Series AS12□1F-M3-□A-X790



### ● Flow rate doubled



### ● Thread material: Stainless steel

#### Two of the applicable actuators

Compact Cylinder JCQ Series  
Ø 12, Ø 16

Compact Guide Cylinder JMGP Series  
Ø 12, Ø 16



#### ⚠ Caution

The flow rate and overall length are different from those of the current lock-nut type speed controller. Please be careful when replacing the lock-nut type controllers.

### Model

Model	Port size	Seal method	Applicable tubing O.D.					
			Metric size				Inch size	
			2*1	3.2	4	6	1/8"	5/32"
AS12□1F-M3-□A-X790	M3 x 0.5	Gasket seal	●	●	●	●	●	●

\*1: Only polyurethane tubing is applicable for Ø 2.

### Flow Direction Symbols on Body

	Meter-out	Meter-in
Symbol		

### ⚠ Caution

Be sure to read this before handling products. For safety instructions and flow control equipment precautions, refer to the "Handling Precautions for SMC Products" and the "Operation Manual" on the SMC website: <http://www.smc.eu>

### 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*1, FEP, PFA

\*1: Use caution at the max. operating pressure when using soft nylon or polyurethane tubing. (Refer to the catalogue on [www.smc.eu](http://www.smc.eu))

### Flow Rate and Sonic Conductance

Model		AS12□1F-M3-□
Tubing O.D.	Metric size	Ø 2, Ø 3.2 Ø 4, Ø 6
C values: Sonic conductance dm <sup>3</sup> /(s·bar)	Free flow	0.07
	Controlled flow	0.07
b values: Critical pressure ratio	Free flow	0.3
	Controlled flow	0.2

\*: C and b values are for controlled flow with the needle fully open and free flow with the needle fully closed.

Sealant/Gasket seal  
AS-FG AS

Face seal

Gasket seal  
Uni-AS

# AS12□1F-M3-□A-X790

For M3



## How to Order

Body size 1

AS 1 2 0 1 F - M3 - 06 A - X790

Body size

1	M3 x 0.5
---	----------

Type

2	Elbow
---	-------

Control type\*1

0	Meter-out
1	Meter-in

\*1: Meter-out and meter-in types can be visually identified by the colour of the knob.  
Meter-out: Grey  
Meter-in: Light blue

Port size

M3	M3 x 0.5
----	----------

Push-lock type

Applicable tubing O.D.\*1

Metric size	Inch size
02	Ø 2
23	Ø 3.2*2
04	Ø 4
06	Ø 6

\*1: For selecting applicable tubing O.D., refer to the model on the cover page.

Metric size and inch size types can be visually identified by the colour of the release button.

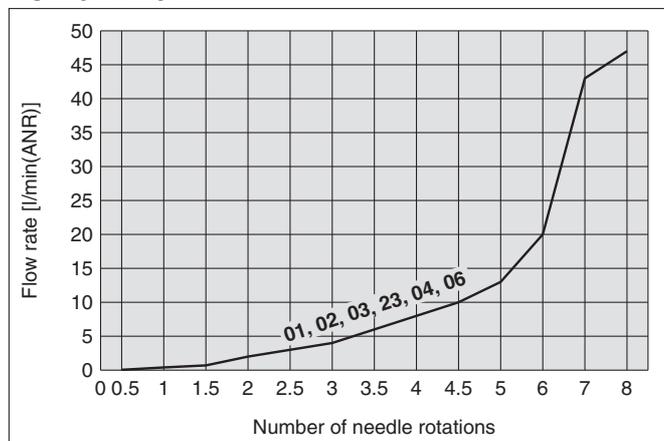
Metric size: Light grey

Inch size: Orange

\*2: Use Ø 1/8" tubing.

## Needle Valve/Flow Rate Characteristics

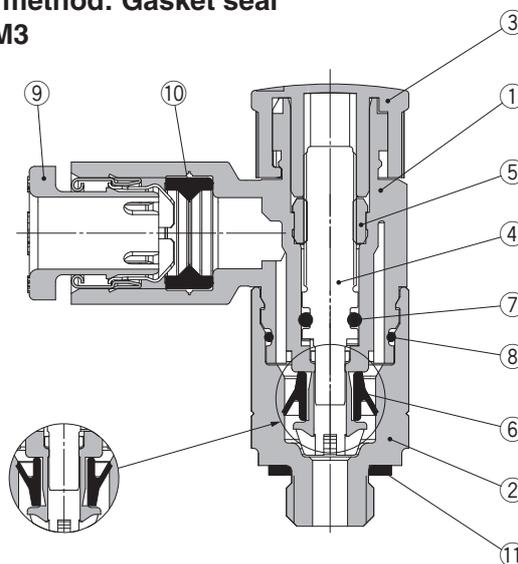
AS1201F-M3-□



\*: The numbers above the flow rate characteristic curves in the chart show the applicable tubing outside diameter as defined by the product number.

## Construction

Seal method: Gasket seal  
For M3



Meter-in type

Meter-out type

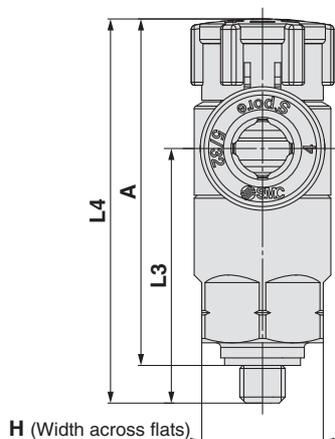
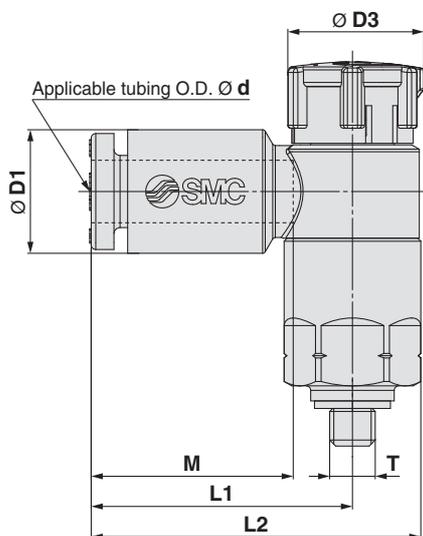
## Component Parts

No.	Description	Material	Note
1	Body A	PBT	
2	Body B	Stainless steel	
3	Knob	POM	
4	Needle	PBT	
5	Needle guide	Brass	Electroless nickel plating
6	U-seal	HNBR	
7	O-ring	NBR	
8	O-ring	NBR	
9	Cassette	—	
10	Seal	NBR	
11	Gasket	NBR/Stainless steel	IN-233-497-1

For M3

## Dimensions

Seal method: Gasket seal  
For M3



Sealant/Gasket seal  
**AS-FG**

Face seal

Gasket seal  
**Uni-AS**

## Metric Size/Inch Size

Model	d	T	H	D1	D3	L1	L2	L3	L4*1		A*2		M	Weight [g]	
									Unlocked	Locked	Unlocked	Locked			
AS12□1F-M3-02A-X790	2	M3 x 0.5	8	5.8	9.4	15.8	20.3	16.9	26.5	25.4	23.5	22.4	11.9	5	
AS12□1F-M3-23A-X790	3.2			7.2		17.2	21.7								
AS12□1F-M3-04A-X790	4			8.2		18.6	23.1								16.5
AS12□1F-M3-06A-X790	6			10.4		17.2	21.7								16.9
AS12□1F-M3-01A-X790	1/8"			7.2		17.2	21.7								16.9
AS12□1F-M3-03A-X790	5/32"			8.2		17.2	21.7								16.9

\*1: Reference dimensions

\*2: Reference dimensions of threads after installation

# Speed Controller with One-touch Fitting

Face Seal

## Elbow Type/Universal Type

# Series AS



\* Only G thread

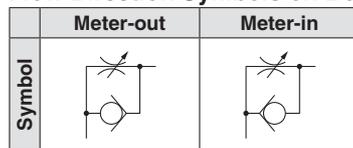
### Model

Model		Port size	Seal method	Applicable tubing O.D.															
Elbow type	Universal type			Metric size						Inch size									
				3.2	4	6	8	10	12	16	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"			
AS22□1F-G01	AS23□1F-G01	G	Face seal	●	●	●	●	● (Note)											
AS22□1F-G02	AS23□1F-G02			1/8	● (Note)	●	●	●	●										
AS32□1F-G02	AS33□1F-G02			1/4			●	●	●	●									
AS32□1F-G03	AS33□1F-G03			3/8			●	●	●	●									
AS42□1F-G04	AS43□1F-G04			1/2					●	●	● (Note)								
AS22□1F-01-□PA	—	R NPT	Face seal	1/8	●	●	●	●	●			●	●	●	●				
AS22□1F-02-□PA	—			1/4	●	●	●	●	●			●	●	●	●	●	●		
AS32□1F-03-□PA	—			3/8			●	●	●	●				●	●	●	●		
AS42□1F-04-□PA	—			1/2					●	●						●	●	●	

Note) Universal type is not available.

### Specifications

#### Flow Direction Symbols on Body



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), FEP, PFA

Note) Use caution at the max. operating pressure when using soft nylon or polyurethane tubing. (Refer to the WEB catalogue for details.)

### Flow Rate and Sonic Conductance

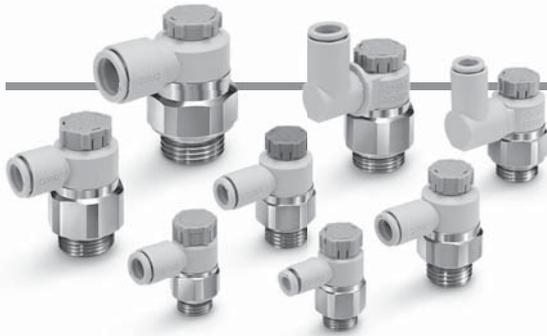
#### Caution

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For Flow Control Equipment Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual.

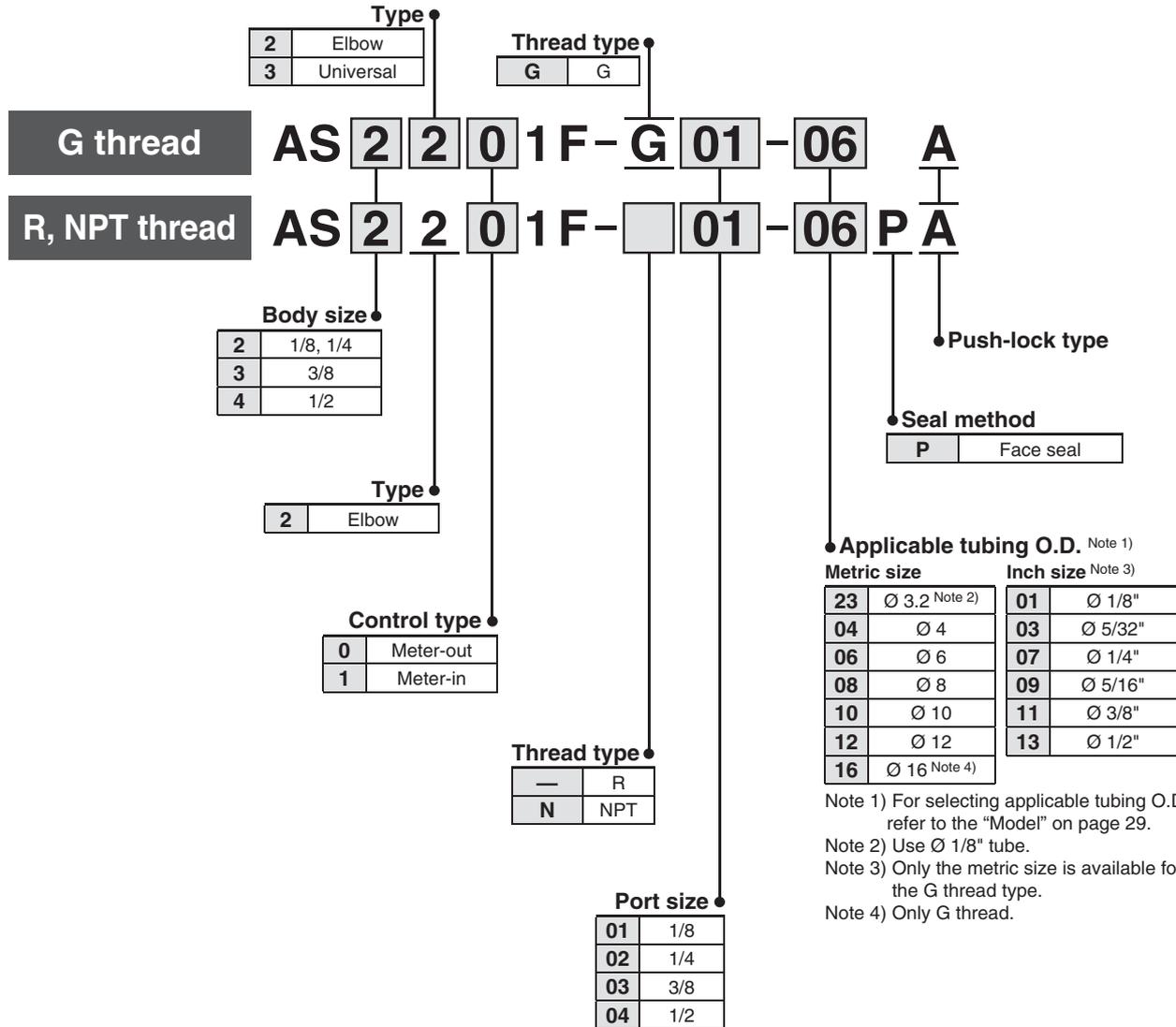
Model		AS2□□1F-G01 AS22□1F-01-□PA			AS2□□1F-G02 AS22□1F-02-□PA			AS3□□1F-G02/03 AS32□1F-03-□PA			AS4□□1F-G04 AS42□1F-04-□PA		
Tubing O.D.	Metric size	Ø 3.2	Ø 4	Ø 6 Ø 8 Ø 10	Ø 3.2	Ø 4	Ø 6	Ø 8 Ø 10	Ø 6	Ø 8	Ø 10 Ø 12	Ø 10	Ø 12 Ø 16
	Note 2) Inch size	Ø 1/8"	Ø 5/32"	Ø 1/4" Ø 5/16"	Ø 1/8"	Ø 5/32"	—	Ø 1/4" Ø 5/16" Ø 3/8"	Ø 1/4"	Ø 5/16"	Ø 3/8"	Ø 3/8"	Ø 1/2"
C values: Sonic conductance dm <sup>3</sup> /(s·bar)	Free flow	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	0.4	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	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.3	
	Controlled flow	0.2	0.3	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.3		

Note 1) C and b values are for controlled flow with the needle fully open and free flow with the needle fully closed.

Note 2) G thread is not available.



How to Order



Sealant/Gasket seal  
AS-FG  
AS

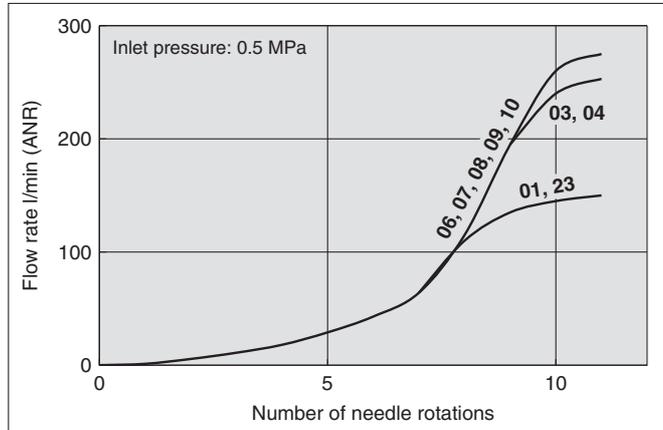
Face seal

Gasket seal  
Uni-AS

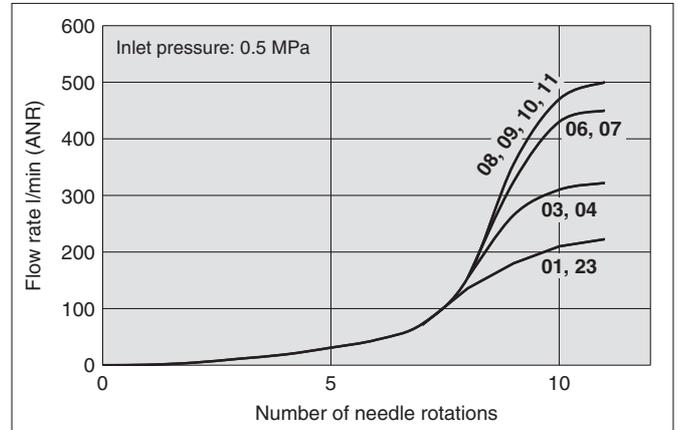
# Series AS

## Needle Valve/Flow-rate Characteristics

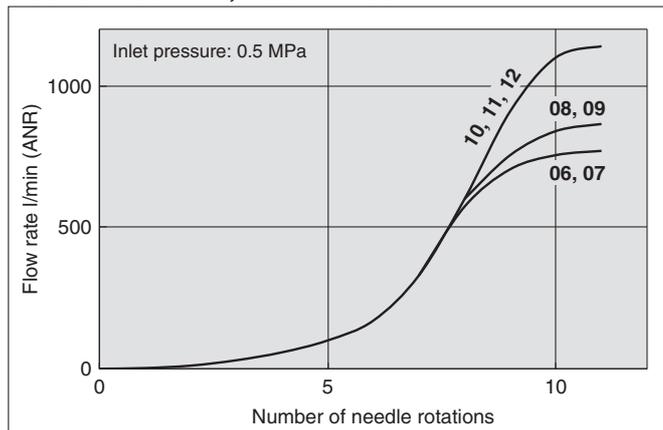
AS2201F-G01-□, AS2211F-G01-□  
 AS2301F-G01-□, AS2311F-G01-□  
 AS2201F-01-□PA, AS2211F-01-□PA



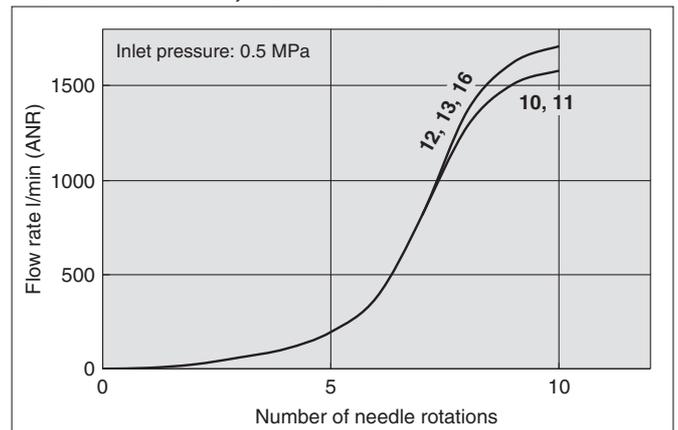
AS2201F-G02-□, AS2211F-G02-□  
 AS2301F-G02-□, AS2311F-G02-□  
 AS2201F-02-□PA, AS2211F-02-□PA



AS3201F-G02/03-□, AS3211F-G02/03-□  
 AS3301F-G02/03-□, AS3311F-G02/03-□  
 AS3201F-03-□PA, AS3211F-03-□PA



AS4201F-G04-□, AS4211F-G04-□  
 AS4301F-G04-□, AS4311F-G04-□  
 AS4201F-04-□PA, AS4211F-04-□PA

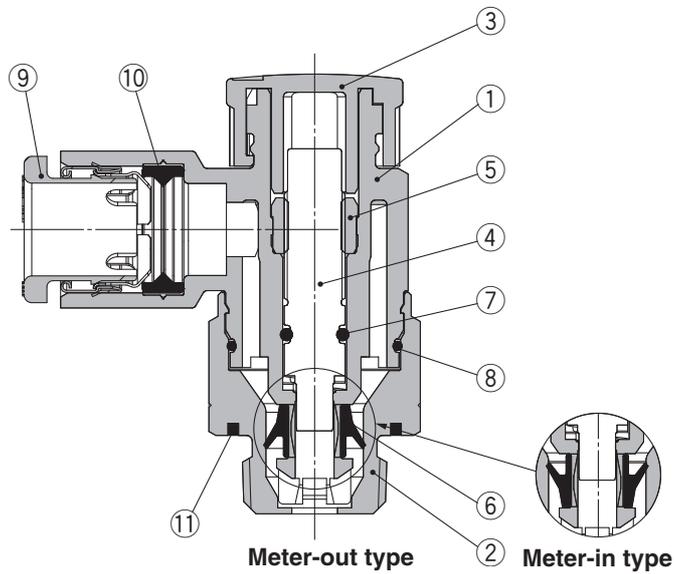


Note) The numbers above the flow-rate characteristic curves in the charts show the applicable tubing outside diameter as defined by the product number.

Construction

Elbow type

Seal method: Face seal  
For G, R, NPT thread

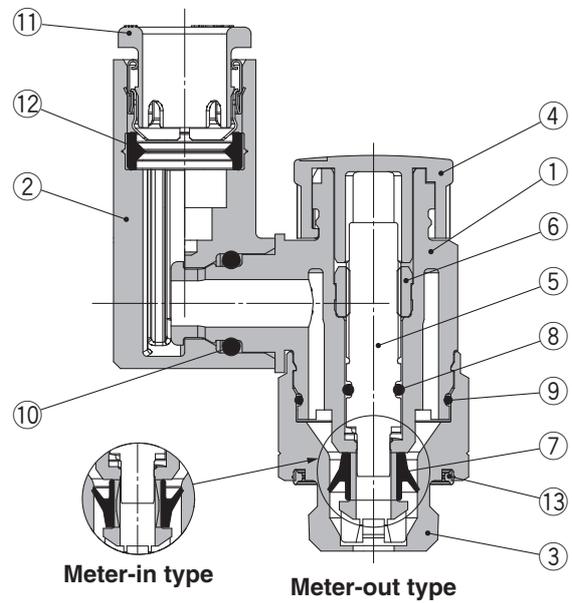


Component Parts

No.	Description	Material	Note
1	Body A	PBT	
2	Body B	Brass	Electroless nickel plating
3	Knob	POM	
4	Needle	PBT	
5	Needle guide	Brass	Electroless nickel plating
6	U-seal	HNBR	
7	O-ring	NBR	
8	O-ring	NBR	
9	Cassette	—	
10	Seal	NBR	
11	Seal	NBR	

Universal type

Seal method: Face seal  
For G thread



Component Parts

No.	Description	Material	Note
1	Body A	PBT	
2	Elbow body	PBT	
3	Body B	Stainless steel	
4	Knob	POM	
5	Needle	PBT	
6	Needle guide	Stainless steel	
7	U-seal	HNBR	
8	O-ring	NBR	
9	O-ring	NBR	
10	O-ring	NBR	
11	Cassette	—	
12	Seal	NBR	
13	Seal	NBR	

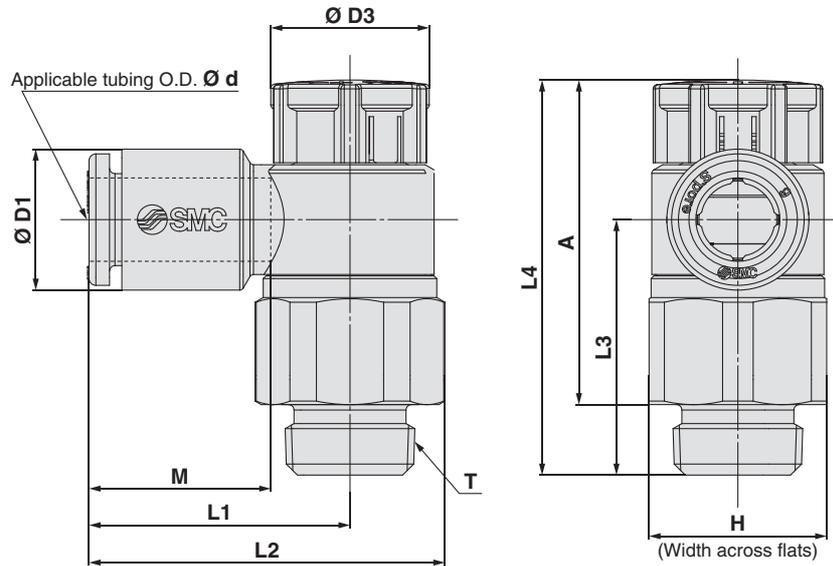
Sealant/Gasket seal  
AS-FG AS

Face seal

Gasket seal  
Uni-AS

## Dimensions/ Elbow type

Seal method: Face seal  
For G thread



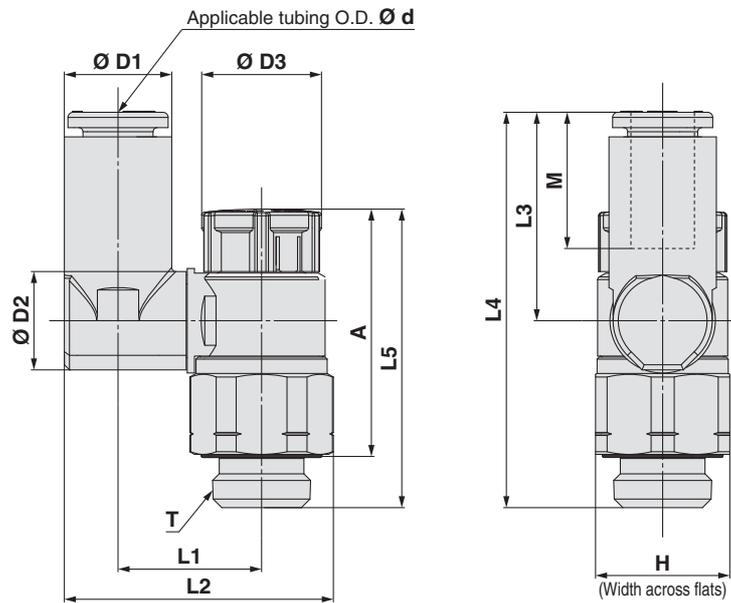
### Metric Size

[mm]

Model	d	T	H	D1	D3	L1	L2	L3	L4		A		M	Weight [g]
									Unlocked	Locked	Unlocked	Locked		
AS22□1F-G01-23A	3.2	1/8	13	7.2	12	19.1	26.2	18.8	30.3	28.9	24.8	23.4	13.3	10
AS22□1F-G01-04A	4			8.2										
AS22□1F-G01-06A	6			10.4										
AS22□1F-G01-08A	8			13.2										
AS22□1F-G01-10A	10	15.9	25.3	32.4										
AS22□1F-G02-23A	3.2	1/4	17	7.2	13	20.9	30.2	22.6	36.6	35	30.1	28.5	13.3	21
AS22□1F-G02-04A	4			8.2										
AS22□1F-G02-06A	6			10.4										
AS22□1F-G02-08A	8			13.2										
AS22□1F-G02-10A	10	15.9	26.9	36.2										
AS32□1F-G02-06A	6	1/4	21	10.4	16.6	21.8	33	36.4	50	48.4	43.5	41.9	13.3	50
AS32□1F-G02-08A	8			13.2										
AS32□1F-G02-10A	10			15.9										
AS32□1F-G02-12A	12			18.5										
AS32□1F-G03-06A	6	3/8	21	10.4	16.6	21.8	33	28.7	42.3	40.7	34.8	33.2	13.3	38
AS32□1F-G03-08A	8			13.2										
AS32□1F-G03-10A	10			15.9										
AS32□1F-G03-12A	12			18.5										
AS42□1F-G04-10A	10	1/2	27	15.9	18.8	27.4	41.8	36.2	50.8	49.2	41.8	40.2	15.6	72
AS42□1F-G04-12A	12			18.5										
AS42□1F-G04-16A	16			23.8										
				34.8										

Dimensions/ **Universal type**

Seal method: Face seal  
For G thread



Metric Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5		A		M	Weight [g]
											Unlocked	Locked	Unlocked	Locked		
AS23□1F-G01-23A	3.2	1/8	13	7.2	9.6	12	13.3	24.0	17.5	35.7	30.3	28.9	24.8	23.4	13.3	10
AS23□1F-G01-04A	4			8.2			25.1	11								
AS23□1F-G01-06A	6			10.4			26.2	11								
AS23□1F-G01-08A	8			13.2			10.2	16.4								30.1
AS23□1F-G02-04A	4	1/4	17	8.2	12.9	13	16.5	29.9	17.5	40.1	36.6	35	30.1	28.5	13.3	22
AS23□1F-G02-06A	6			10.4			33.8	21.4	43.9	24						
AS23□1F-G02-08A	8			13.2			34.9	23.5	46.0	14.2						25
AS23□1F-G02-10A	10			15.9			20.9	38.1	24.7	47.3						15.6
AS33□1F-G02-06A	6	1/4	21	10.4	12.9	16.6	20.2	36.6	21.4	57.8	50	48.4	43.5	41.9	13.3	51
AS33□1F-G02-08A	8			13.2			38.0	23.5	59.9	14.2						52
AS33□1F-G02-10A	10			15.9			42.2	26.1	58.0	15.6						55
AS33□1F-G02-12A	12			18.5			23	43.5	28.3	59.9						17
AS33□1F-G03-06A	6	3/8	21	10.4	12.9	16.6	20.2	36.6	21.4	50.1	42.3	40.7	34.8	33.2	13.3	41
AS33□1F-G03-08A	8			13.2			38.0	23.5	52.2	14.2						42
AS33□1F-G03-10A	10			15.9			42.2	26.1	50.3	15.6						46
AS33□1F-G03-12A	12			18.5			23	43.5	28.3	52.2						17
AS43□1F-G04-10A	10	1/2	27	15.9	17.4	18.8	25.6	47.9	26.1	61.2	50.8	49.2	41.8	40.2	15.6	78
AS43□1F-G04-12A	12			18.5	21		26.2	49.8	28.3	63.4						17

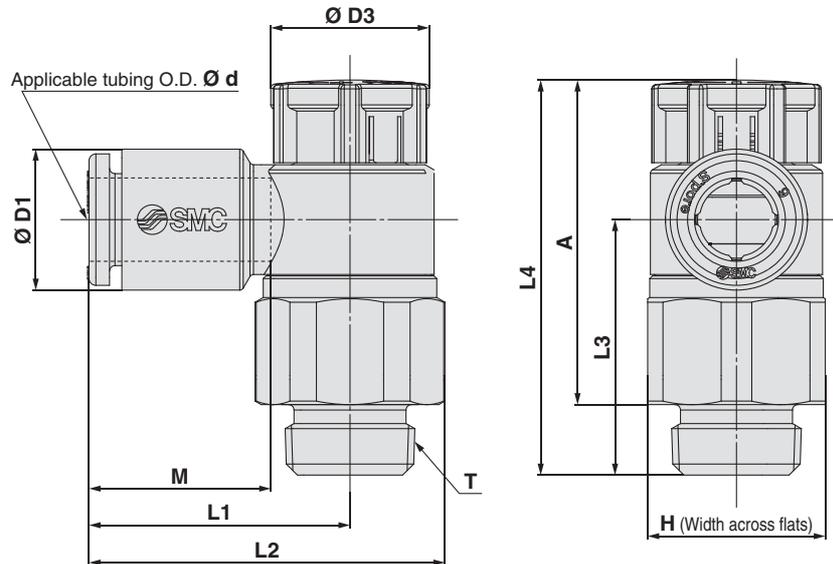
Sealant/Gasket seal  
AS-FG AS

Face seal

Gasket seal  
Uni-AS

## Dimensions/ Elbow type

Seal method: Face seal  
For R, NPT thread



### Metric Size

Model	d	T	H	D1	D3	L1	L2	L3	L4		A		M	Weight [g]
									Unlocked	Locked	Unlocked	Locked		
AS22□1F-01-23PA	3.2	1/8	13 (12.7)	7.2	12	19.1	26.2	18.8	30.3	28.9	25.1 (24.9)	23.7 (23.5)	13.3	10 (9)
AS22□1F-01-04PA	4													
AS22□1F-01-06PA	6													
AS22□1F-01-08PA	8													
AS22□1F-01-10PA	10													
AS22□1F-02-23PA	3.2	1/4	17 (17.5)	7.2	13	20.9	30.2 (30.3)	22.6	36.6	35	29 (28.5)	27.4 (26.9)	13.3	19 (19)
AS22□1F-02-04PA	4			8.2		32.7 (32.8)	19 (20)							
AS22□1F-02-06PA	6			10.4		33.2 (33.3)	20 (21)							
AS22□1F-02-08PA	8			13.2		36.2 (36.3)	21 (22)							
AS22□1F-02-10PA	10			15.9		37.9 (38.3)	22 (23)							
AS32□1F-03-06PA	6	3/8	21 (21.7)	10.4	16.6	21.8	33 (33.4)	28.7	42.3	40.7	34.7 (34.2)	33.1 (32.6)	13.3	37 (39)
AS32□1F-03-08PA	8			13.2		33.9 (34.3)	38 (40)							
AS32□1F-03-10PA	10			15.9		37.9 (38.3)	39 (41)							
AS32□1F-03-12PA	12			18.5		40.9 (41.3)	41 (42)							
AS42□1F-04-10PA	10			15.9		41.8 (42.6)	42 (43)							
AS42□1F-04-12PA	12	1/2	27 (28.6)	18.5	18.8	27.4	45.2 (46)	36.2	50.8	49.2	40.4	38.8	15.6	66 (72)
						30.8	45.2 (46)	35.1					17	68 (74)

Note) The values in ( ) are for NPT thread.

### Inch Size

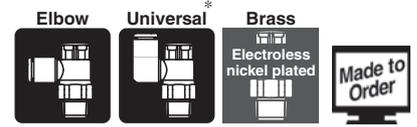
Model	d	T	H	D1	D3	L1	L2	L3	L4		A		M	Weight [g]	
									Unlocked	Locked	Unlocked	Locked			
AS22□1F-01-01PA	1/8"	1/8	13 (12.7)	7.2	12	19.1	26.2	18.8	30.3	28.9	25.1 (24.9)	23.7 (23.5)	13.3	10 (9)	
AS22□1F-01-03PA	5/32"			11.2										27.9	10 (10)
AS22□1F-01-07PA	1/4"			13.2										29.5	11 (11)
AS22□1F-01-09PA	5/16"			15.9										32.7 (32.8)	12 (12)
AS22□1F-02-01PA	1/8"	1/4	17 (17.5)	7.2	13	20.9	30.2 (30.3)	22.6	36.6	35	29 (28.5)	27.4 (26.9)	13.3	19 (19)	
AS22□1F-02-03PA	5/32"			8.2		32.7 (32.8)	19 (20)								
AS22□1F-02-07PA	1/4"			11.2		33.2 (33.3)	20 (21)								
AS22□1F-02-09PA	5/16"			13.2		36.2 (36.3)	21 (22)								
AS22□1F-02-11PA	3/8"			15.5		37.9 (38.3)	22 (23)								
AS32□1F-03-07PA	1/4"	3/8	21 (21.7)	11.2	16.6	21.8	33 (33.4)	28.7	42.3	40.7	34.7 (34.2)	33.1 (32.6)	13.3	38 (39)	
AS32□1F-03-09PA	5/16"			13.2		33.9 (34.3)	38 (40)								
AS32□1F-03-11PA	3/8"			15.5		37.9 (38.3)	39 (41)								
AS42□1F-04-11PA	3/8"			15.9		41.8 (42.6)	42 (43)								
AS42□1F-04-13PA	1/2"	1/2	27 (28.6)	19.3	18.8	27.4	45.3 (46.1)	34.7	50.8	49.2	40.4	38.8	15.6	66 (72)	
						30.9	45.3 (46.1)	34.7					17	68 (74)	

Note) The values in ( ) are for NPT thread.

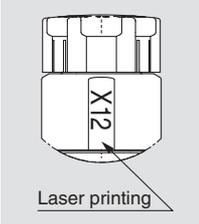
# Series AS

## Made to Order

Please contact SMC for detailed dimensions, specifications and delivery.

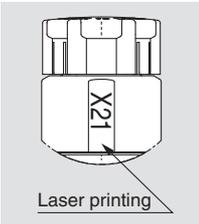


### 1 Lubricant: Vaseline -X12



Example) AS2201F-G01-04A-X12

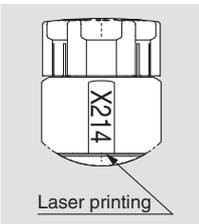
### 2 Grease-free (Seal: Fluorine-coated) + Restrictor (Without check valve) -X21



Example) AS2201F-G01-04A-X21

- Note 1) Not particle-free
- Note 2) The restrictor is only compatible with the part number of the meter-out type.
- Note 3) Only the needle and O-ring are fluorine-coated.

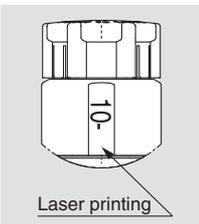
### 3 Restrictor (Without check valve) -X214



Example) AS2201F-G01-04A-X214

- Note) The restrictor is only compatible with the part number of the meter-out type.

### 4 Clean Series 10-



Example) 10-AS2201F-G01-04A

- Note 1) Fluorine grease is used.
- Note 2) The particulate generation grade is 3.
- Note 3) Excluding G thread type.

Sealant/Gasket seal AS-FG AS

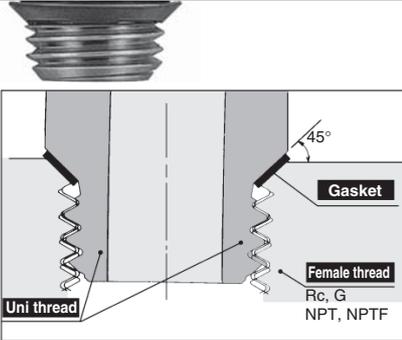
Face seal

Gasket seal Uni-AS

# Speed Controller with Uni One-touch Fitting Series AS



New-stand male threads for piping that reduces the screw-in time by 1/3.



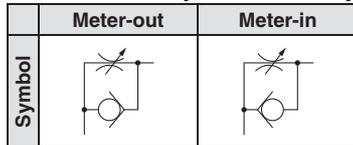
## Shape of Uni thread ridge

Use of the chamfered surface of the female thread as the seat surface and adoption of gaskets made by laminating NBR on both surfaces of stainless steel plates achieve secure sealing regardless of the difference of diameters due to the female thread type, deviations due to the tolerance, or the size of the chamfered corner. (Any standard chamfered female thread can be used.)

**A ridge shape has been created as a Uni thread for common applications for Rc, G, NPT and NPTF.**

**The gasket seal method drastically cuts piping work-hours.**

## Flow Direction Symbols on Body



## Caution

**Be sure to read this before handling. Refer to the back cover for Safety Instructions. For Flow Control Equipment Precautions, refer to "Handling Precautions for SMC Products" and the Operation Manual.**

## Model

Model		Uni thread size	Applicable tubing O.D.												
Elbow type	Universal type		Metric size					Inch size							
			3.2	4	6	8	10	12	16	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"
AS22□1F-U01	AS23□1F-U01	1/8	●	●	●	●	● <sup>Note)</sup>			●	●	●	●		
AS22□1F-U02	AS23□1F-U02	1/4	● <sup>Note)</sup>	●	●	●	●			● <sup>Note)</sup>	●	●	●	●	
AS32□1F-U02	AS33□1F-U02	1/4			●	●	●	●				●	●	●	
AS32□1F-U03	AS33□1F-U03	3/8			●	●	●	●				●	●	●	
AS42□1F-U04	AS43□1F-U04	1/2					●	●	● <sup>Note)</sup>					●	●

Note) Universal type is not available.

## 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 <sup>Note)</sup>

Note) Use caution at the max. operating pressure when using soft nylon or polyurethane tubing. (Refer to the WEB catalogue for details.)

## Flow Rate and Sonic Conductance

Model		AS22□1F-U01 AS23□1F-U01			AS22□1F-U02 AS23□1F-U02			AS32□1F AS33□1F			AS42□1F AS43□1F		
Tubing O.D.	Metric size	∅ 3.2	∅ 4	∅ 6 ∅ 8 ∅ 10	∅ 3.2	∅ 4	∅ 6	∅ 8 ∅ 10	∅ 6	∅ 8	∅ 10 ∅ 12	∅ 10	∅ 12 ∅ 16
	Inch size	∅ 1/8"	∅ 5/32"	∅ 1/4" ∅ 5/16"	∅ 1/8"	∅ 5/32"	—	∅ 1/4" ∅ 5/16" ∅ 3/8"	∅ 1/4"	∅ 5/16"	∅ 3/8"	∅ 3/8"	∅ 1/2"
C values: Sonic conductance dm <sup>3</sup> /(s·bar)	Free flow	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	0.4	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	0.2		0.3	0.3		0.4		0.4		0.3	0.3	
	Controlled flow	0.2		0.3	0.3			0.3			0.3		

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

# Speed Controller with Uni One-touch Fitting *Series AS*



## How to Order

**AS 2 2 0 1 F - U01 - 06 A**

**Body size**

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

**Type**

2	Elbow
3	Universal

**Control type**

0	Meter-out
1	Meter-in

\* Meter-out and meter-in types can be visually identified by colour of the knob.  
Meter-out: Grey  
Meter-in: Light blue

**With One-touch fitting**

**Port size**

U01	Uni 1/8
U02	Uni 1/4
U03	Uni 3/8
U04	Uni 1/2

**Push-lock type**

**Applicable tubing O.D.** Note 1)

**Metric size**

Tubing O.D.	Tubing O.D.
23	Ø 3.2 <small>Note 2)</small>
04	Ø 4
06	Ø 6
08	Ø 8
10	Ø 10
12	Ø 12
16	Ø 16

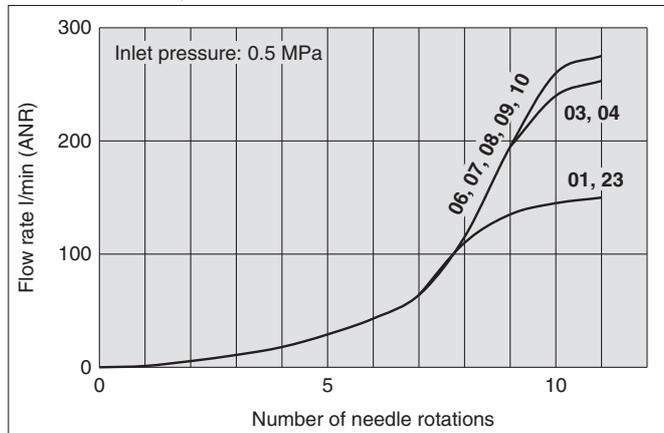
**Inch size**

Tubing O.D.	Tubing O.D.
01	Ø 1/8"
03	Ø 5/32"
07	Ø 1/4"
09	Ø 5/16"
11	Ø 3/8"
13	Ø 1/2"

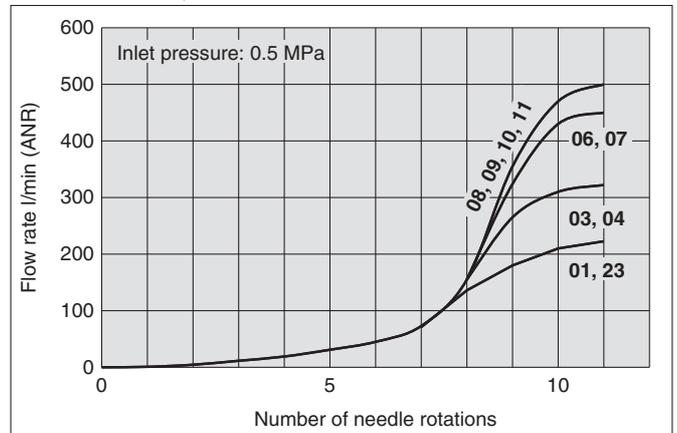
Note 1) For selecting applicable tubing O.D., refer to the "Model" on page 37. Metric size and inch size types can be visually identified by colour of the release button.  
Metric size: Light grey  
Inch size: Orange  
Note 2) Use Ø 1/8" tube.

## Needle Valve/Flow-rate Characteristics

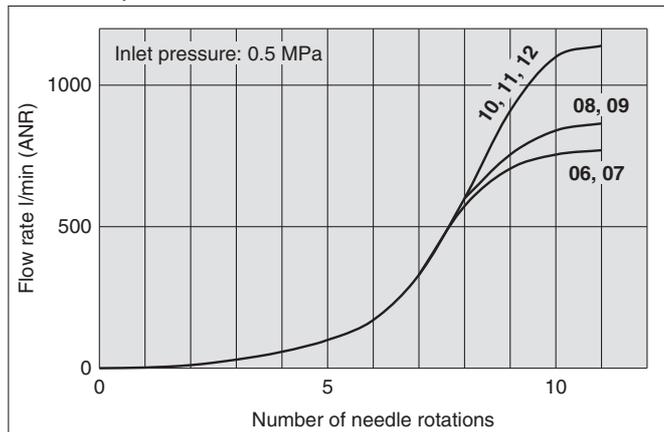
AS2201F-U01, AS2211F-U01  
AS2301F-U01, AS2311F-U01



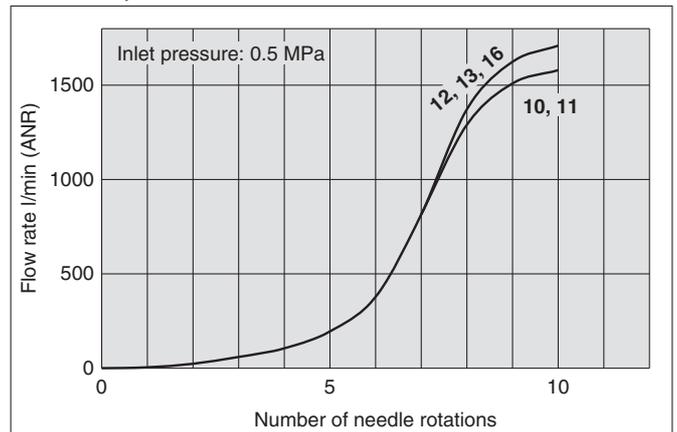
AS2201F-U02, AS2211F-U02  
AS2301F-U02, AS2311F-U02



AS3201F, AS3211F  
AS3301F, AS3311F



AS4201F, AS4211F  
AS4301F, AS4311F



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

Sealant/Gasket seal  
**AS-FG**  
**AS**

Face seal

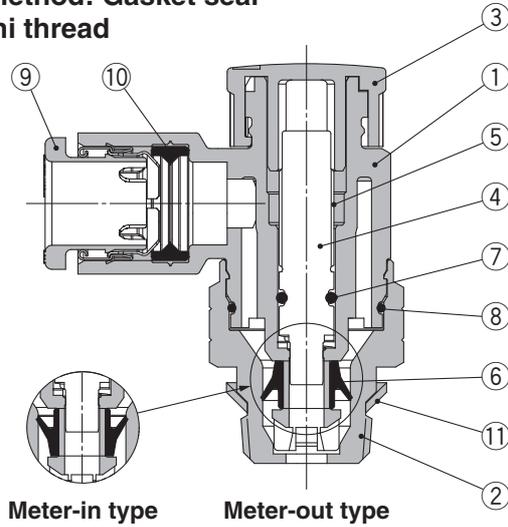
Gasket seal  
**Uni-AS**

# Series AS

## Construction

### Elbow type

Seal method: Gasket seal  
For Uni thread

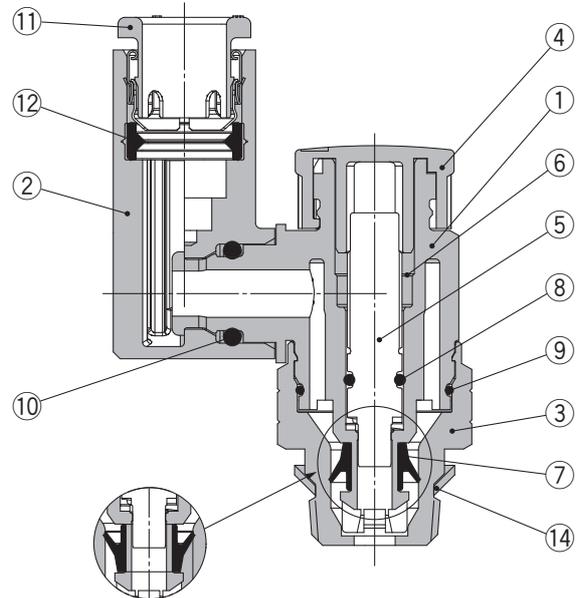
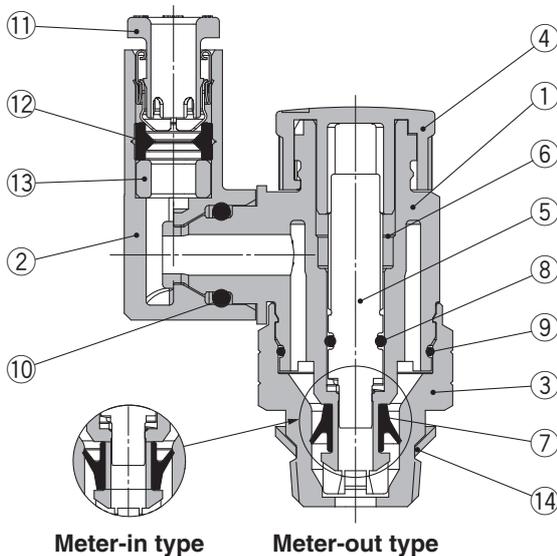


### Component Parts

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

### Universal type

Seal method: Gasket seal  
For Uni thread

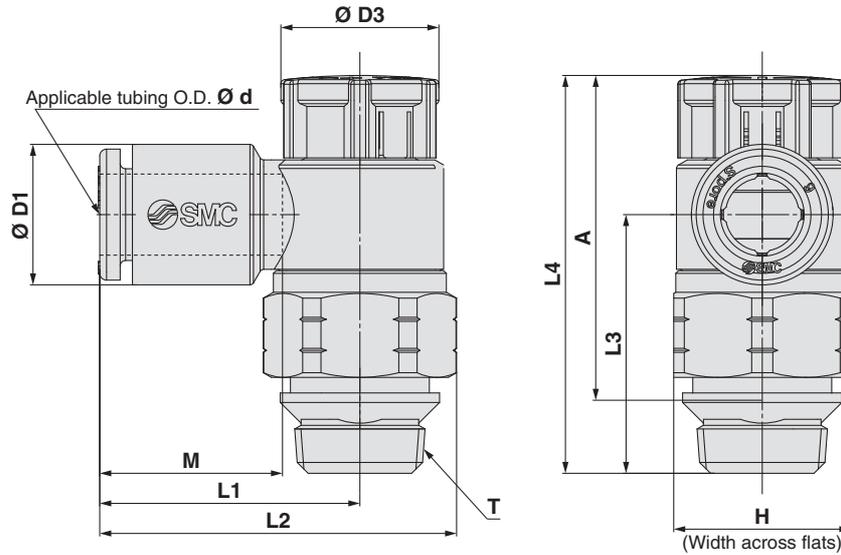


### Component Parts

No.	Description	Material	Note
1	Body A	PBT	
2	Elbow body	PBT	
3	Body B	Brass	Electroless nickel plating
4	Knob	POM	
5	Needle	PBT	
6	Needle guide	Brass	Electroless nickel plating
7	U-seal	HNBR	
8	O-ring	NBR	
9	O-ring	NBR	
10	O-ring	NBR	
11	Cassette	—	
12	Seal	NBR	
13	Spacer <sup>Note)</sup>	—	
14	Gasket	NBR/Stainless steel	

Note) Used only for the AS22□1F-U01-23A.

## Dimensions/ Elbow type



Sealant/Gasket seal  
**AS-FG**

Face seal

Gasket seal  
**Uni-AS**

### Metric Size

Model	d	T Uni thread	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight [g]			
									Unlocked	Locked	Unlocked	Locked					
AS22□1F-U01-23A	3.2	1/8	13	7.2	12	19.1	26.2	19.1	30.6	29.2	25.8	24.4	13.3	9			
AS22□1F-U01-04A	4			8.2													
AS22□1F-U01-06A	6			10.4													
AS22□1F-U01-08A	8			13.2											22.4	29.5	
AS22□1F-U01-10A	10			15.9											25.3	32.4	
AS22□1F-U02-23A	3.2	1/4	17	7.2	13	20.9	30.2	22.6	36.6	35	30.2	28.6	13.3	17			
AS22□1F-U02-04A	4			8.2													
AS22□1F-U02-06A	6			10.4													
AS22□1F-U02-08A	8			13.2											23.9	33.2	
AS22□1F-U02-10A	10			15.9											26.9	36.2	
AS32□1F-U02-06A	6	1/4	19	10.4	16.6	21.8	32.1	36.4	50	48.4	43.6	42	13.3	39			
AS32□1F-U02-08A	8			13.2											22.7	33	
AS32□1F-U02-10A	10			15.9											26.7	37	35.7
AS32□1F-U02-12A	12			18.5											29.7	40	34.5
AS32□1F-U03-06A	6			3/8											19	10.4	16.6
AS32□1F-U03-08A	8	13.2	22.7		33												
AS32□1F-U03-10A	10	15.9	26.7		37	28											
AS32□1F-U03-12A	12	18.5	29.7		40	26.8											
AS42□1F-U04-10A	10	1/2	24		15.9	18.8	27.4	40.3	36.2	50.8	49.2	42.2	40.6	15.6		52	
AS42□1F-U04-12A	12			18.5	30.8										43.7		35.1
AS42□1F-U04-16A	16			23.8	34.8										47.7		32.7

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

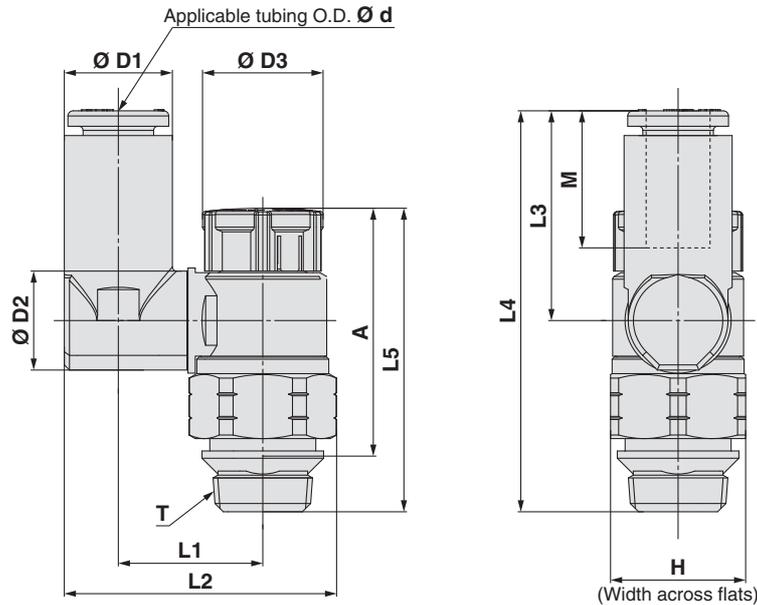
### Inch Size

Model	d	T Uni thread	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight [g]			
									Unlocked	Locked	Unlocked	Locked					
AS22□1F-U01-01A	1/8"	1/8	13	7.2	12	19.1	26.2	19.1	30.6	29.2	25.8	24.4	13.3	9			
AS22□1F-U01-03A	5/32"			8.2													
AS22□1F-U01-07A	1/4"			11.2											20.8	27.9	
AS22□1F-U01-09A	5/16"			13.2											22.4	29.5	
AS22□1F-U02-01A	1/8"	1/4	17	7.2	13	20.9	30.2	22.6	36.6	35	30.2	28.6	13.3	17			
AS22□1F-U02-03A	5/32"			8.2													
AS22□1F-U02-07A	1/4"			11.2											23.4	32.7	
AS22□1F-U02-09A	5/16"			13.2											23.9	33.2	
AS22□1F-U02-11A	3/8"			15.5											26.4	35.7	
AS32□1F-U02-07A	1/4"	1/4	19	11.2	16.6	21.8	32.1	36.4	50	48.4	43.6	42	13.3	39			
AS32□1F-U02-09A	5/16"			13.2											22.7	33	
AS32□1F-U02-11A	3/8"			15.5											26.7	37	35.9
AS32□1F-U03-07A	1/4"			11.2											21.8	32.1	28.7
AS32□1F-U03-09A	5/16"	3/8	19	13.2	16.6	22.7	33	28.7	42.3	40.7	35.9	34.3	13.3	39			
AS32□1F-U03-11A	3/8"			15.5											26.7	37	28.2
AS42□1F-U04-11A	3/8"			1/2											24	15.5	18.8
AS42□1F-U04-13A	1/2"	19.3	30.9		43.8	34.7											

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

# Series AS

## Dimensions/ Universal type



### Metric Size

Model	d	T Uni thread	H	D1	D2	D3	L1	L2	L3	L4	L5 <sup>Note 1)</sup>		A <sup>Note 2)</sup>		M	Weight [g]	
											Unlocked	Locked	Unlocked	Locked			
AS23□1F-U01-23A	3.2	1/8	13	7.2	9.6	12	13.3	24	17.5	36	30.6	29.2	25.8	24.4	13.3	9	
AS23□1F-U01-04A	4			8.2			13.9	25.1								10	
AS23□1F-U01-06A	6			10.4			26.2	20.4								38.8	11
AS23□1F-U01-08A	8			13.2			30.1	21.5								40	12
AS23□1F-U02-04A	4	1/4	17	8.2	12.9	13	16.5	29.9	17.5	40.1	36.6	35	30.2	28.6	13.3	18	
AS23□1F-U02-06A	6			11.2			19	33.8	21.4	43.9						19	
AS23□1F-U02-08A	8			13.2			34.9	23.5	46	20							
AS23□1F-U02-10A	10			15.9			38.1	24.7	47.3	21							
AS33□1F-U02-06A	6	1/4	19	11.2	12.9	16.6	20.2	36	21.4	57.8	50	48.4	43.6	42	13.3	31	
AS33□1F-U02-08A	8			13.2			37.1	23.5	59.9	14.2							
AS33□1F-U02-10A	10			15.9			41.2	26.1	62.5	15.6							
AS33□1F-U02-12A	12			18.5			42.5	28.3	64.7	17							
AS33□1F-U03-06A	6	3/8	19	11.2	12.9	16.6	20.2	36	21.4	50.1	42.3	40.7	35.9	34.3	13.3	31	
AS33□1F-U03-08A	8			13.2			37.1	23.5	52.2	14.2							
AS33□1F-U03-10A	10			15.9			41.2	26.1	54.8	15.6							
AS33□1F-U03-12A	12			18.5			42.5	28.3	57	17							
AS43□1F-U04-10A	10	1/2	24	15.9	17.4	18.8	25.6	46.4	26.1	61.2	50.8	49.2	42.2	40.6	15.6	54	
AS43□1F-U04-12A	12			18.5	21		26.2	48.3	28.3	63.4						17	56

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

### Inch Size

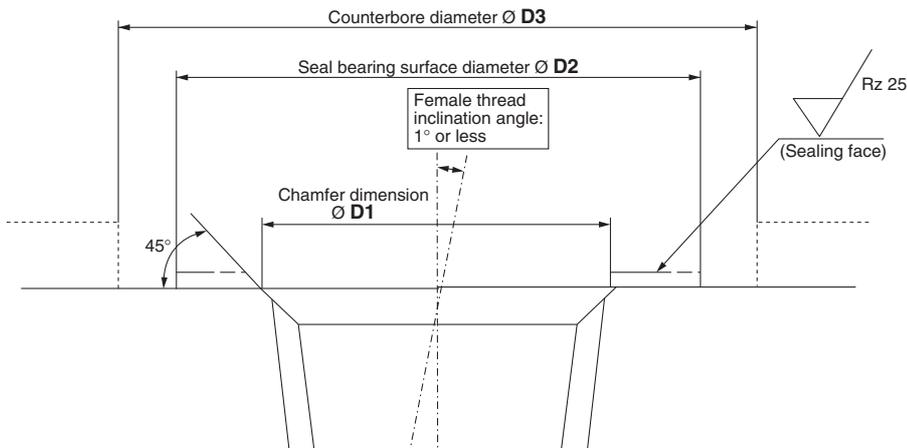
Model	d	T Uni thread	H	D1	D2	D3	L1	L2	L3	L4	L5 <sup>Note 1)</sup>		A <sup>Note 2)</sup>		M	Weight [g]	
											Unlocked	Locked	Unlocked	Locked			
AS23□1F-U01-01A	1/8"	1/8	13	7.2	9.6	12	13.3	24	17.5	36	30.6	29.2	25.8	24.4	13.3	9	
AS23□1F-U01-03A	5/32"			8.2			13.9	25.1								10	
AS23□1F-U01-07A	1/4"			11.2			29.1	20.2								38.7	11
AS23□1F-U01-09A	5/16"			13.2			30.1	21.5								40	12
AS23□1F-U02-03A	5/32"	1/4	17	8.2	12.9	13	16.5	29.9	17.5	40.1	36.6	35	30.2	28.6	13.3	17	
AS23□1F-U02-07A	1/4"			11.2			19	33.8	21.4	43.9						13.3	
AS23□1F-U02-09A	5/16"			13.2			34.9	23.5	46	14.2							
AS23□1F-U02-11A	3/8"			15.9			38.1	24.7	47.3	15.6							
AS33□1F-U02-07A	1/4"	3/8	19	11.2	12.9	16.6	20.2	36	21.4	57.8	50	48.4	43.6	42	13.3	31	
AS33□1F-U02-09A	5/16"			13.2			37.1	23.5	59.9	14.2							
AS33□1F-U02-11A	3/8"			15.9			41.2	26.1	62.5	15.6							
AS33□1F-U03-07A	1/4"			18.5			42.5	28.3	64.7	17							
AS33□1F-U03-09A	5/16"	3/8	19	11.2	12.9	16.6	20.2	36	21.4	50.1	42.3	40.7	35.9	34.3	13.3	31	
AS33□1F-U03-11A	3/8"			13.2			37.1	23.5	52.2	14.2							
AS43□1F-U04-11A	3/8"			15.9			41.2	26.1	54.8	15.6							
AS43□1F-U04-13A	1/2"			18.5			42.5	28.3	63.4	17							

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

# Prior to Use

## Female Thread Conditions Applicable to Face Seal

1. Surface roughness of bearing surface: Rz 25 or less
2. Chamfer dimension:  $\varnothing$  D1, Seal bearing surface diameter:  $\varnothing$  D2 (Refer to the table below.)
3. Female thread inclination angle:  $1^\circ$  or less
4. Counterbore diameter when the female thread is counterbored.:  $\varnothing$  D3
  - Models with width across flats: Body width across flats x 1.1 or more
  - Models other than hexagon (Hexagon socket head male connector etc.): Body dimensions + 0.2 mm or more
  - \* The width across flats and the body dimensions differ depending on the model even when the same thread size is used. Refer to the dimensions in the catalogue.
5. If oil content or sealant is sticking to the female thread, this may cause damage of the product. Remove it before piping.



**Table 1**

Connection thread size	Chamfer dimension $\varnothing$ D1 mm	Seal bearing surface diameter $\varnothing$ D2 mm
R1/8	10.2 to 10.4	12 or more
R1/4	13.6 to 13.8	17 or more
R3/8	17.1 to 17.3	21 or more
R1/2	21.4 to 21.6	27 or more
NPT1/16	8.2 to 8.4	11.11 or more
NPT1/8	10.5 to 10.7	12.7 or more
NPT1/4	14.1 to 14.3	17.46 or more
NPT3/8	17.4 to 17.6	22 or more
NPT1/2	21.7 to 21.9	28.7 or more
G1/8	10.2 to 10.6	12 or more
G1/4	13.6 to 14.0	17 or more
G3/8	17.1 to 17.5	21 or more
G1/2	21.4 to 21.8	27 or more

### **⚠ Precautions**

For products that do not satisfy the female thread conditions shown above and the piping with a piping pitch narrower than the product dimension, use the conventional sealant type.

- \* The rubber parts of the face seal cannot be replaced.
- \* The rubber parts of the face seal may fall off by the air blow and they cannot be mounted again. Be careful not to perform the air blow.



# Series AS Specific Product Precautions 1

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For Flow Control Equipment Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual.

## Design and Selection

### ⚠ Warning

#### 1. Check the specifications.

The products in this catalogue 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 catalogue 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 knob down to lock, confirm that it is locked.

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



Locked

Unlocked

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

The products in this catalogue 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 knob.

It can cause idle rotation of the knob 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 counter-clockwise, 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 in the Best Pneumatics No. 6 catalogue for handling One-touch fittings.

#### 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 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.



# Series AS

## Specific Product Precautions 2

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For Flow Control Equipment Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual.

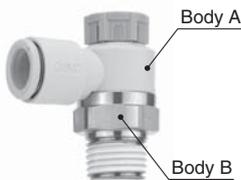
### Mounting

#### Warning

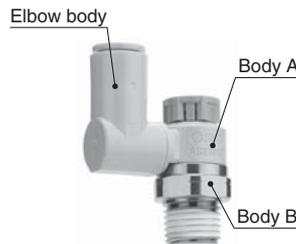
13. Do not use body A and/or elbow body for applications involving continuous rotation.

Body A and the fitting section may be damaged.

##### Elbow



##### Universal



#### Caution

For M5, 10-32UNF

##### Tightening method

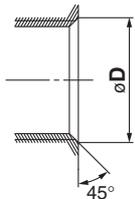
First, tighten it by hand, then give it an additional 1/6 turn to 1/4 turn with a wrench. A reference value for the tightening torque is 1 to 1.5 N·m.

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.

##### Chamfered area for female thread

1. Conforming to ISO 16030 (air pressure fluid dynamics – connection – ports and stud ends), the chamfered dimensions shown in the table below are recommended.

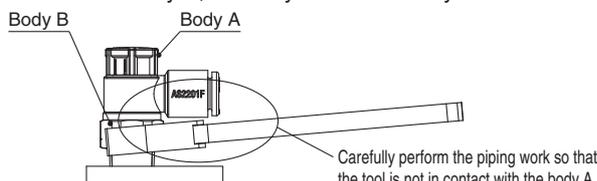


Female thread size	Chamfered dimension ØD (Recommended value)
M5	5.1 to 5.4
10-32UNF	5.0 to 5.3

2. 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 knob.

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

3. When performing the piping work, turn the tightening tool in the horizontal direction to the hexagon across flats of the body B so that any moment is not applied to the body A. If the tool is in contact with the body A, this may cause the body B to come off.



#### Caution

For R, NPT Thread (With sealant)

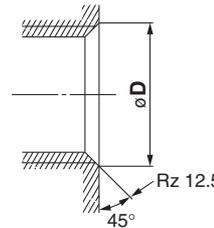
##### Tightening method

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, R 1/8	3 to 5
NPT, R 1/4	8 to 12
NPT, R 3/8	15 to 20
NPT, R 1/2	20 to 25

##### Chamfered area for female thread

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



Connection thread size	Chamfered dimension ØD (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

\* For Uni thread, Rz 12.5 is necessary for sealing at the chamfered part.

#### For R, NPT, G Thread (Face seal type)

##### Tightening method

First, tighten the threaded portion by hand, then use a proper wrench, which could be suitable for the width across flats of the hexagon body, to tighten it further at a wrench tightening angle shown in the table below. For a tightening torque guide, refer to the table below. Check the dimensions of each product for the hexagon width across flats.

1. Tighten fittings with face seal using the proper tightening torques in the table below.

Connection thread size (R, NPT, G)	Proper tightening torque [N·m]
1/16, 1/8	3 to 5
1/4	8 to 12
3/8	15 to 20
1/2	20 to 25

2. Insufficient tightening may cause seal failure, or loosen the threads.

3. Reuse

- 1) Normally, fittings with face seal can be reused 6 to 10 times.
- 2) The seal ring cannot be replaced.



# Series AS

## Specific Product Precautions 3

Be sure to read this before handling. Refer to the back cover for Safety Instructions. For Flow Control Equipment Precautions, refer to “Handling Precautions for SMC Products” and the Operation Manual.

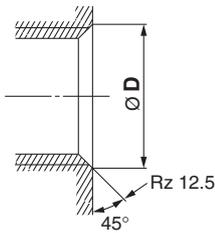
### Mounting

#### ⚠ Caution

#### For R, NPT, G Thread (Face seal type)

#### Chamfered area for female thread (Recommended value)

- Conforming to ISO 16030-2001, the chamfered dimensions shown in the table below are recommended. By chamfering as shown in the table below, machining of threads is easier and effective for burr prevention.

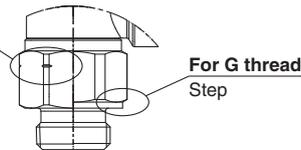


Nominal thread size	Chamfered dimension $\varnothing D$	
	Min.	Max.
1/8	9.8	10.2
1/4	13.3	13.7
3/8	16.8	17.2
1/2	21.0	21.4

- Use G external threads with G internal threads.

#### How to distinguish between G, R and NPT threads

For R, NPT thread  
R: Without slit  
NPT: With slit



#### For Uni Thread

#### Tightening method

- First, tighten the threaded portion by hand, then use a proper wrench, which could be suitable for the width across flats of the hexagon body, to tighten it further at a wrench tightening angle shown in the table below. For a tightening torque guide, refer to the table below.

#### Connection Female Thread: Rc, NPT, NPTF

Uni thread size	Wrench tightening angle after hand-tightening [deg]	Tightening torque [N·m]
1/8	30 to 60	3 to 5
1/4	30 to 60	8 to 12
3/8	15 to 45	14 to 16
1/2	15 to 30	20 to 22

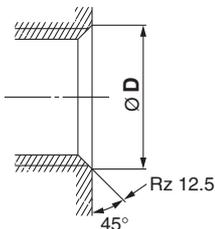
#### Connection Female Thread: G

Uni thread size	Wrench tightening angle after hand-tightening [deg]	Tightening torque [N·m]
1/8	30 to 45	3 to 4
1/4	15 to 30	4 to 5
3/8	15 to 30	8 to 9
1/2	15 to 30	14 to 15

- The gasket can be reused up to 6 to 10 times.

#### Chamfered area for female thread

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



Connection thread size	Chamfered dimension $\varnothing D$ (Recommended value)		
	G	Rc	NPT, NPTF
1/8	10.2 to 10.6	10.2 to 10.4	10.5 to 10.7
1/4	13.6 to 14.0	13.6 to 13.8	14.1 to 14.3
3/8	17.1 to 17.5	17.1 to 17.3	17.4 to 17.6
1/2	21.4 to 21.8	21.4 to 21.6	21.7 to 21.9

\* For Uni thread, Rz 12.5 is necessary for sealing at the chamfered part.

### Piping Threads with Sealant

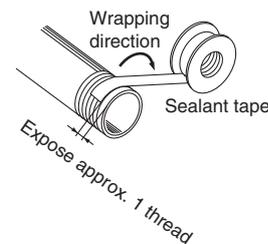
#### ⚠ Caution

- If the fitting is tightened with excessive torque, a large amount of sealant will seep out. Remove the excess sealant.
- Insufficient tightening may loosen the threads, or cause air leakage.
- Reuse
  - Normally, fittings with sealant can be reused 2 to 3 times.
  - To prevent air leakage through the sealant, remove any loose sealant stuck to the fitting by blowing air over the threaded portion.
  - 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.
- Once the fitting has been tightened, backing it out to its original position often causes the sealant to become defective. Air leakage will occur.
- Use R external threads with Rc internal threads and NPT external threads with NPT internal threads.

### Piping

#### ⚠ Caution

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

## 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 catalogue 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.

## 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.

## Caution

- SMC products are not intended for use as instruments for legal metrology.**  
Measurement instruments that SMC manufactures or sells have not been qualified by type approval tests relevant to the metrology (measurement) laws of each country. Therefore, SMC products cannot be used for business or certification ordained by the metrology (measurement) laws of each country.

## Safety Instructions

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

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Hungary	☎ +36 23511390	www.smc.hu	office@smc.hu	Switzerland	☎ +41 (0)523963131	www.smc.ch	info@smc.ch
Ireland	☎ +353 (0)14039000	www.smcpnematics.ie	sales@smcpneumatics.ie	Turkey	☎ +90 212 489 0 440	www.smcpnomatik.com.tr	info@smcpnomatik.com.tr
Italy	☎ +39 0292711	www.smcitalia.it	mailbox@smcitalia.it	UK	☎ +44 (0)845 121 5122	www.smcpnematics.co.uk	sales@smcpneumatics.co.uk
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