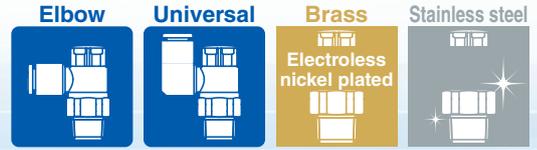


Speed Controller with One-touch Fitting

Reduces labor time!

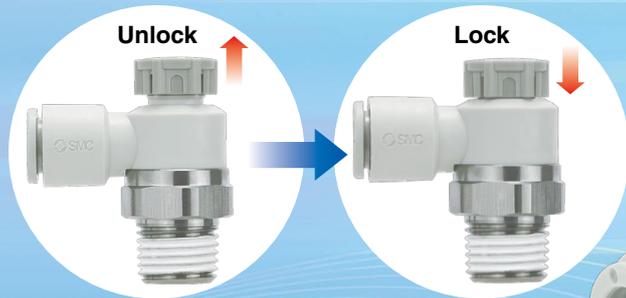
RoHS **New**



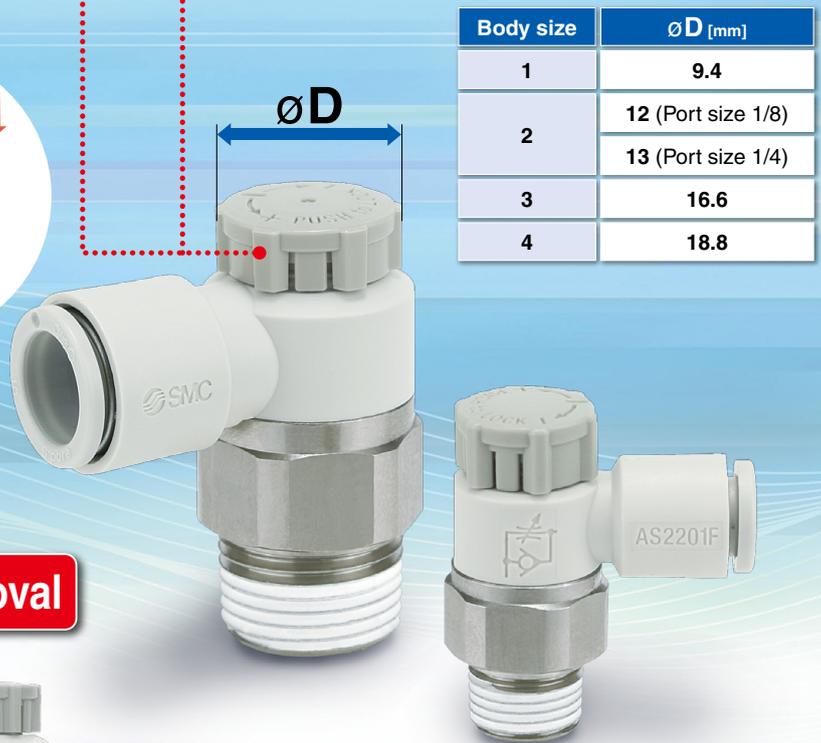
Easy to use

Push-lock type

• Easy to lock



Larger knob

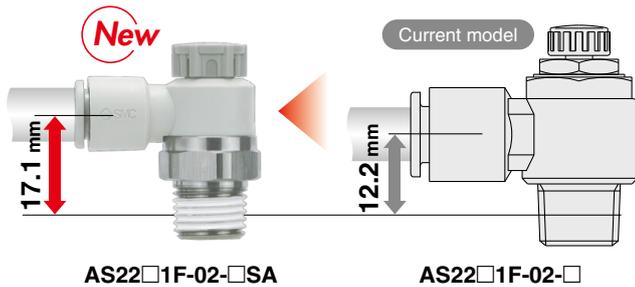


Body size	ØD [mm]
1	9.4
2	12 (Port size 1/8)
	13 (Port size 1/4)
3	16.6
4	18.8

Improved tube insertion/removal



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

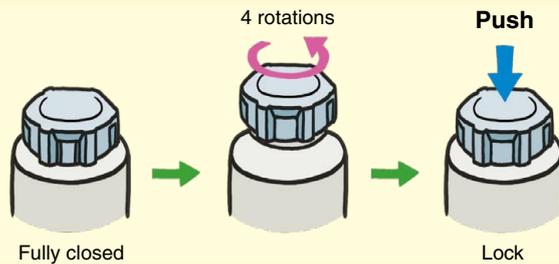


	Elbow	Universal	Brass Electroless nickel plated	Stainless steel
Sealant/Gasket seal M/UNF/R/NPT	P.5	P.5	P.5	P.14
Face seal R/NPT/G New	P.27	P.27	P.27	P.14
		* Only G thread		* Only G thread
Gasket seal	P.35	P.35	P.35	
Uni				

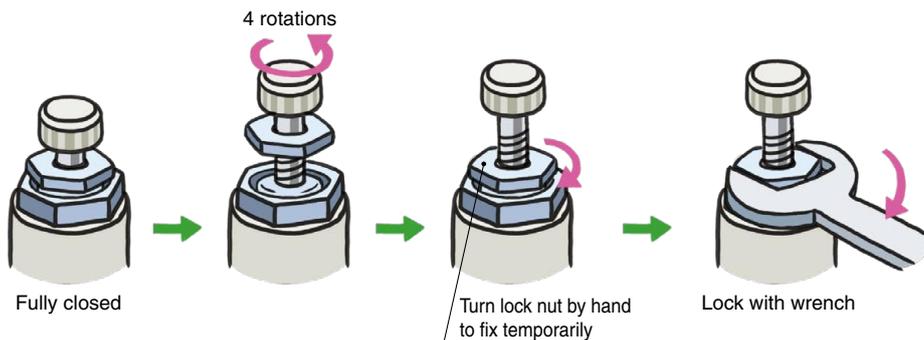
Series **AS**

Easy tool-less one push-lock

Push-lock type



Current model



Easy to turn large knob

Push-lock type

Actual size

ø9.4 mm



ø12 mm
(Port size 1/8)



ø13 mm
(Port size 1/4)



ø16.6 mm



ø18.8 mm



Easy to turn large knob
Easy to make fine adjustments



Current model

ø5 mm



ø8 mm



ø10 mm



ø11 mm



ø14 mm



Hard to hold small knob
Hard to make fine adjustments

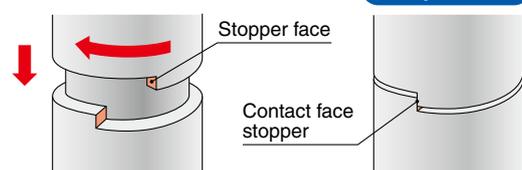


Flow rate reproducibility



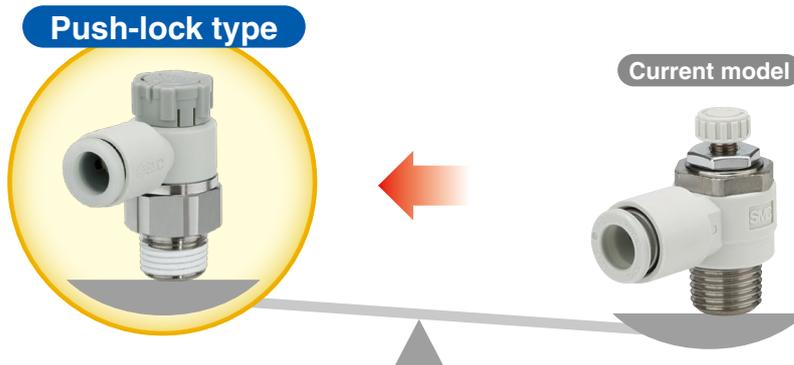
Improved reproducibility of flow rate

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

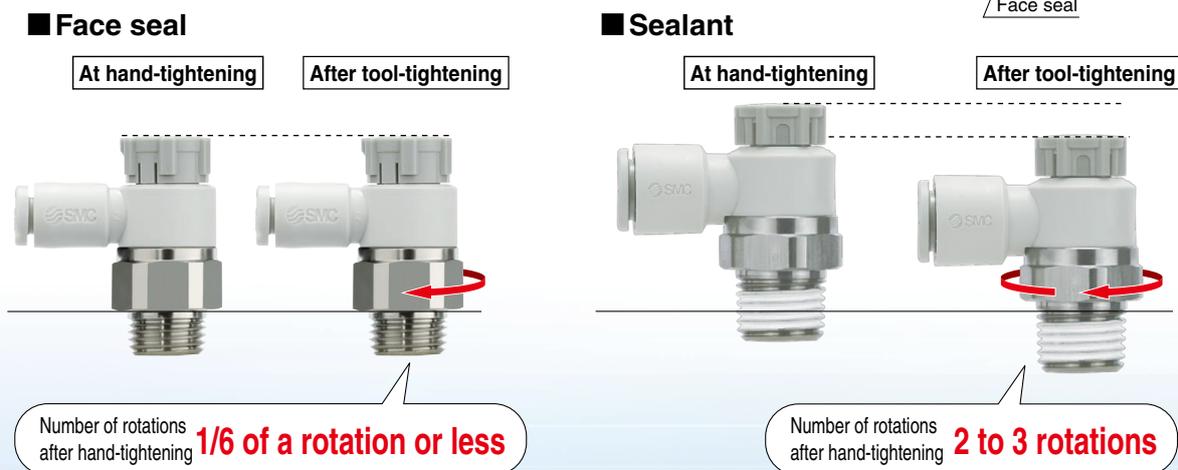


Tubing O.D.	Thread	Part no.	Weight
ø6	1/4	AS22□1F-02-06A	18 g
ø12	1/2	AS42□1F-04-12A	56 g

Tubing O.D.	Thread	Part no.	Weight
ø6	1/4	AS22□1F-02-06	32 g
ø12	1/2	AS42□1F-04-12	101 g

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

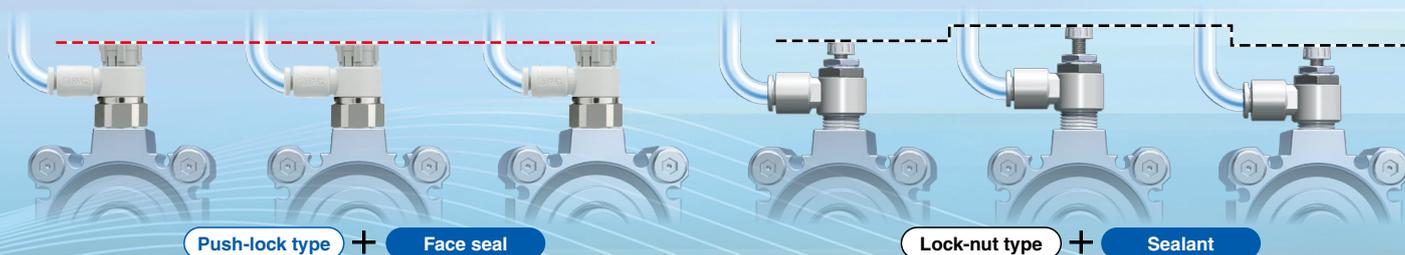
Repeated re-piping some 6 to 10 times is possible due to use of elastic sealant on seating.

Sealant

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

Uniform height

Uneven heights due to thread and needle variations



Series Variations

⊙ Electroless nickel plating type is standardized. ⊙ Stainless steel type is standardized. ⊙ G thread (Face seal) is standardized.

Seal method	Body size	Port size	Applicable tubing O.D.										Metal parts material	Applicable tubing material	Page					
			Metric size						Inch size											
			2	3.2	4	6	8	10	12	16	1/8"	5/32"				1/4"	5/16"	3/8"	1/2"	
 Gasket seal	1	M5 x 0.8	⊙ ^{*2}	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	-Brass/ Steel wire	Nylon (Series T, TIA)	P.5 (Brass/ Steel wire)
		10-32UNF	⊙ ^{*2}	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
 Sealant ^{*1}	2	R 1/8	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	-Stainless steel	Soft nylon (Series TS, TISA)	P.14 (Stainless steel)
		R 1/4	⊙ ^{*2}	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
	NPT	1/4	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
		3/8	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
 Face seal	2	G 1/8	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
		G 1/4	⊙ ^{*2}	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
	3	G 1/4	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
		G 3/8	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
	4	1/2	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
		1/2	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
	2	R 1/8	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
		R 1/4	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙			
3	NPT 3/8	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙				
	NPT 1/2	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙				
 Gasket seal	2	Uni 1/8	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	-Brass/ Steel wire	Polyurethane (Series T, TIUB)	P.27	
		Uni 1/4	⊙ ^{*2}	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙				
	3	Uni 1/4	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙				⊙
		Uni 3/8	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙				⊙
4	Uni 1/2	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙				
	Uni 1/2	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙				

*1 "Without sealant" type can be selected as a standard option. *2 Universal type is not available.

Easy identification of product type

Series	Release button color			
	Meter-out	Meter-in	Metric	Inch
 Brass	Gray	Light blue	Light gray	Orange
 Stainless steel	Gray	Light blue	White	White



Push-lock Series Variations

Refer to the **WEB catalog** for details.



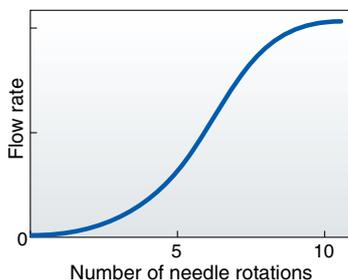
Speed Controller with Indicator / Series AS-FS

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

Indicator window



Numerical indication of knob rotation



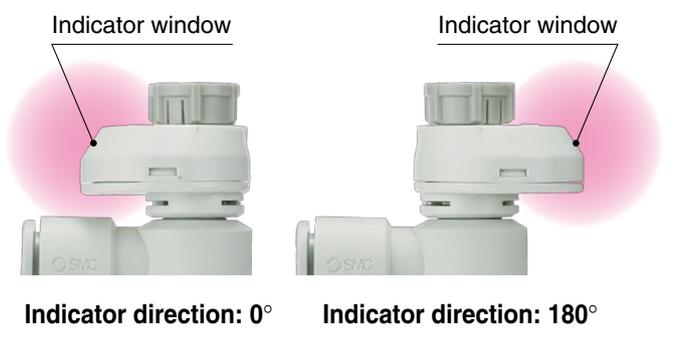
Body size 1

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

Body size 2 or larger

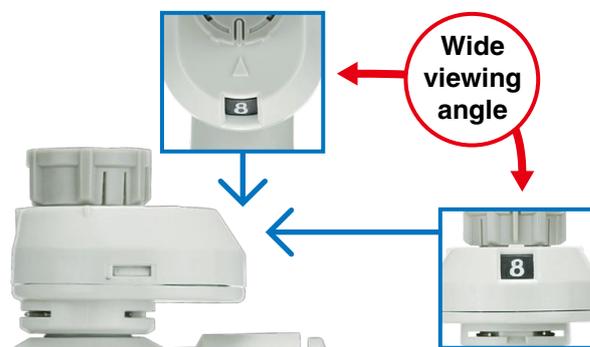
Indicator window	Number of needle rotations
1	1
2	2
⋮	⋮
⋮	⋮
10	10

Two indicator window directions available



Indicator direction: 0°

Indicator direction: 180°

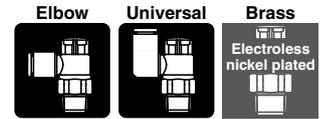


Body size	Port size	Applicable tubing O.D.	
		Metric size	Inch size
1 to 4	M5 to 1/2"	ø2 to ø16	ø1/8" to ø1/2"



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 ^{Note 2)}	3.2	4	6	8	10	12	16	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"		
AS12□1F-M5□	AS13□1F-M5□	M5 x 0.8	Gasket seal	● ^{Note 3)}	●	●	●						●	●	●				
AS12□1F-U10/32□	AS13□1F-U10/32□	10-32UNF	Gasket seal	● ^{Note 3)}	●	●	●						●	●	●				
AS22□1F-□01	AS23□1F-□01	R NPT	Sealant ^{Note 1)}		●	●	●	●	● ^{Note 3)}				●	●	●	●			
AS22□1F-□02	AS23□1F-□02			1/8		● ^{Note 3)}	●	●	●	●				● ^{Note 3)}	●	●	●	●	
AS32□1F-□02	AS33□1F-□02			1/4				●	●	●	●					●	●	●	
AS32□1F-□03	AS33□1F-□03			1/4				●	●	●	●					●	●	●	
AS42□1F-□04	AS43□1F-□04			3/8				●	●	●	●					●	●	●	
		1/2						●	●	● ^{Note 3)}						●	●		

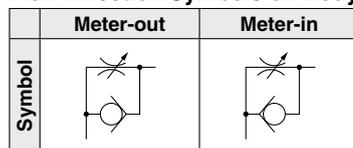
Note 1) "Without sealant" type can be selected as a standard option.

Note 2) Only polyurethane tubing is applicable for ø2.

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 ^{Note)} , FEP, PFA

Note) Use caution at the max. operating pressure when using soft nylon or polyurethane tubing. (Refer to the WEB catalog or the Best Pneumatics No. 6 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 on SMC website, <http://www.smcworld.com>

Flow Rate and Sonic Conductance

Model	AS12□1F-M5□ AS13□1F-M5□		AS22□1F-□01 ^{Note 3)} AS23□1F-□01 ^{Note 3)}			AS22□1F-□02 AS23□1F-□02			AS32□1F AS33□1F			AS42□1F AS43□1F		
	Metric size	ø2	ø3.2	ø4	ø6	ø3.2	ø4	ø6	ø8	ø10	ø6	ø8	ø10	ø12
Tubing O.D.	Inch size	—	ø1/8" ø1/4" ø5/32"	ø1/8"	ø5/32" ø5/16"	ø1/8"	ø5/32"	—	ø1/4" ø5/16" ø3/8"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
	C values: Sonic conductance dm ³ /(s·bar)	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
b values: Critical pressure ratio	Free 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
	Controlled flow	0.3	0.4	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3
	Controlled flow	0.2		0.2	0.3	0.3			0.3			0.3		

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

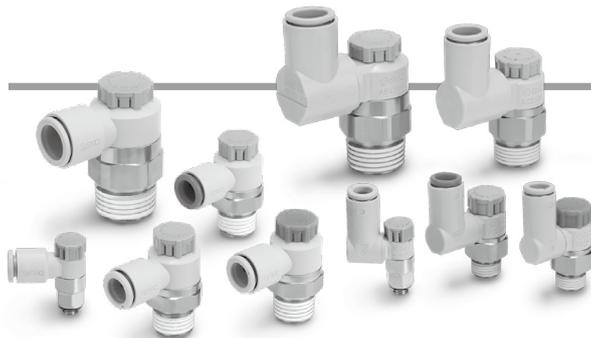
Note 2) C and b values are for controlled flow with the needle fully open and free flow with the needle fully closed.

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. ^{Note 1)}

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

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

Metric size: Light gray
Inch size: Orange

Note 2) Use ø1/8" tube.

Width across flats (H)

E	8 mm
Nil	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 ^{Note)}

0	Meter-out
1	Meter-in

Note) Meter-out and meter-in types can be visually identified by color of the knob.

Meter-out: Gray
Meter-in: Light blue

Thread type

Nil	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

Nil	Without sealant
S	With sealant

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

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

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

Note 2) Use ø1/8" tube.

Sealant/Gasket seal
AS-FG

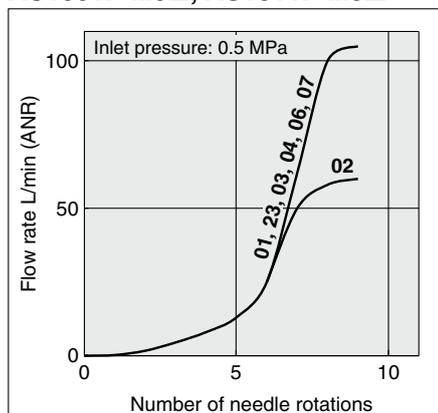
Face seal

Gasket seal
Uni-AS

Series AS

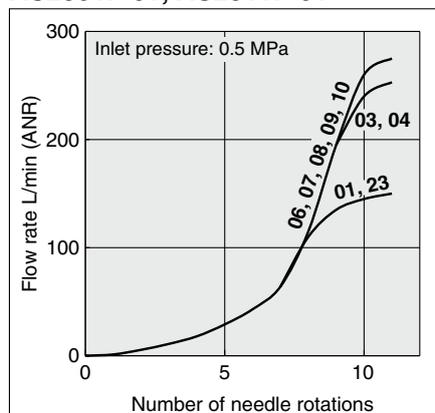
Needle Valve/Flow-rate Characteristics

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

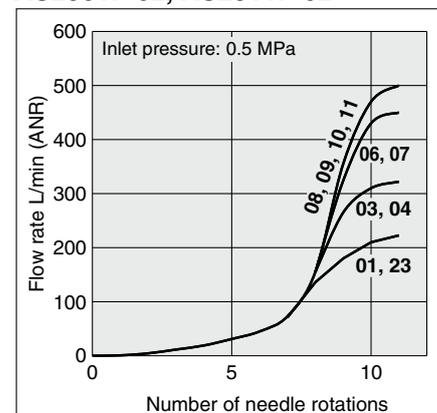


Note) -U10/32 has the same specification as M5.

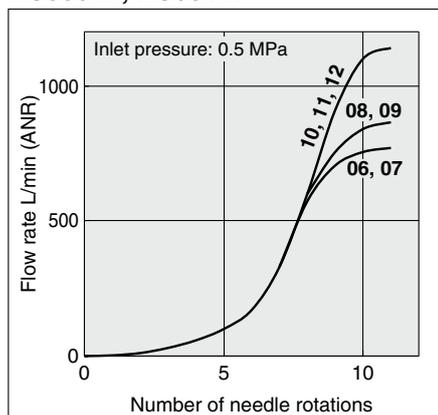
AS2201F-01, AS2211F-01
AS2301F-01, AS2311F-01



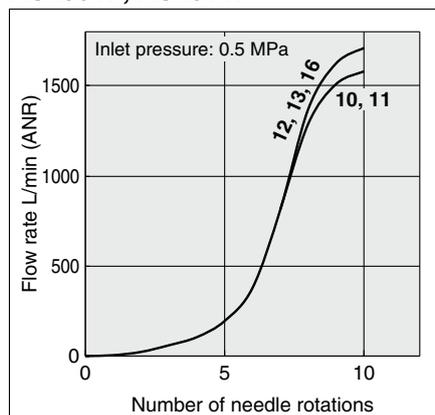
AS2201F-02, AS2211F-02
AS2301F-02, AS2311F-02



AS3201F, AS3211F
AS3301F, AS3311F



AS4201F, AS4211F
AS4301F, AS4311F

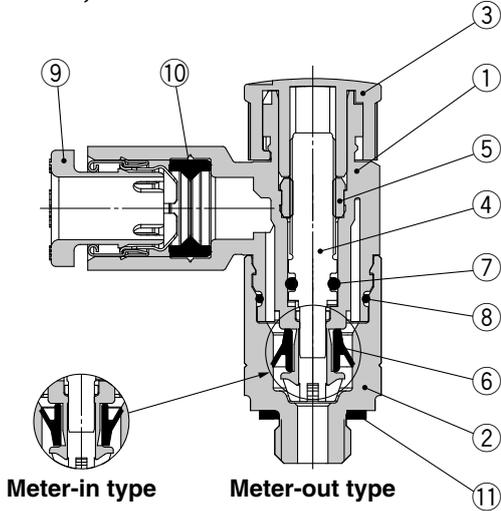


Note) The numbers above the flow-rate characteristic curves in the charts show the applicable tubing outside diameter as defined by the product number.

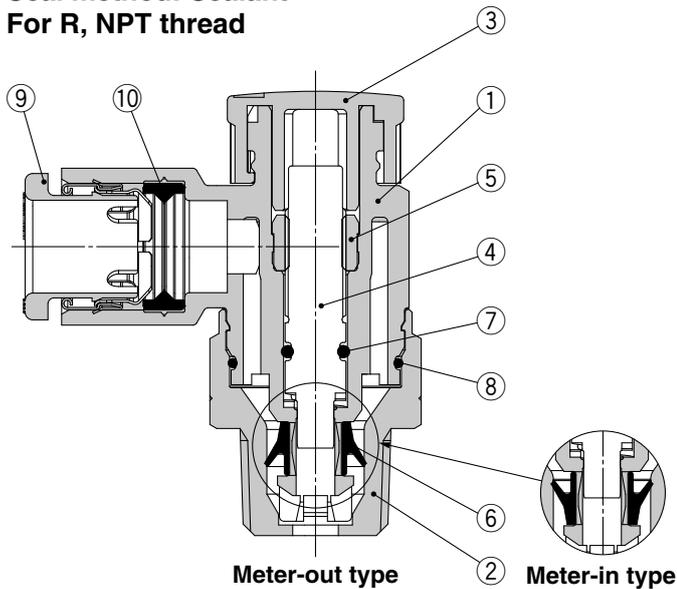
Construction

Elbow type

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



Seal method: Sealant
For R, NPT thread

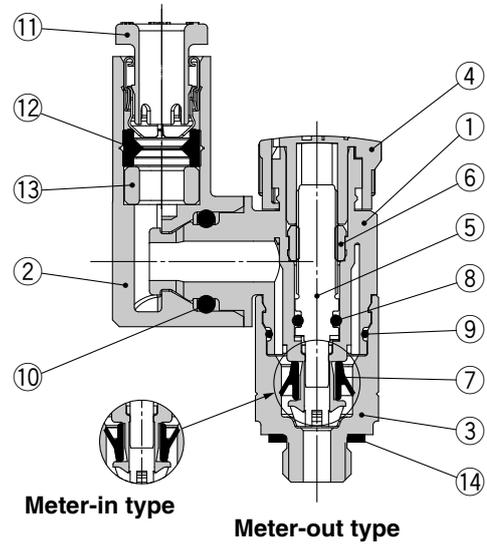


Component Parts

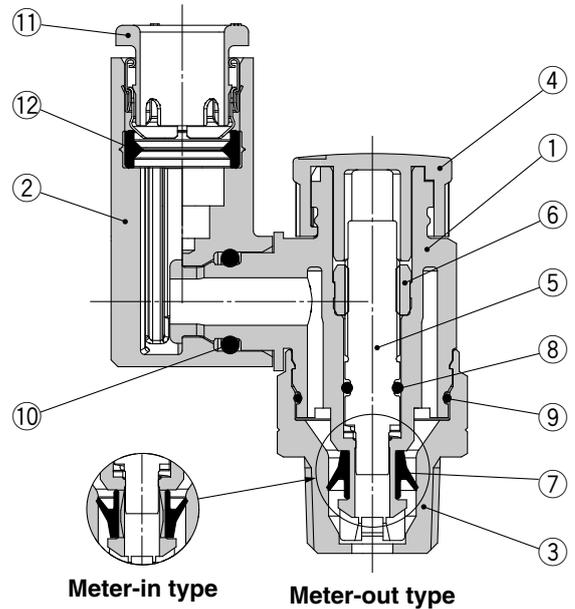
No.	Description	Material	Note
1	Body A	PBT	
2	Body B	Brass	Electroless nickel plating
3	Knob	POM	
4	Needle	PBT	
5	Needle guide	Brass	Electroless nickel plating
6	U-seal	HNBR	
7	O-ring	NBR	
8	O-ring	NBR	
9	Cassette	—	
10	Seal	NBR	
11	Gasket	NBR/Stainless steel	

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 ^{Note)}	PBT	
14	Gasket	NBR/Stainless steel	

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

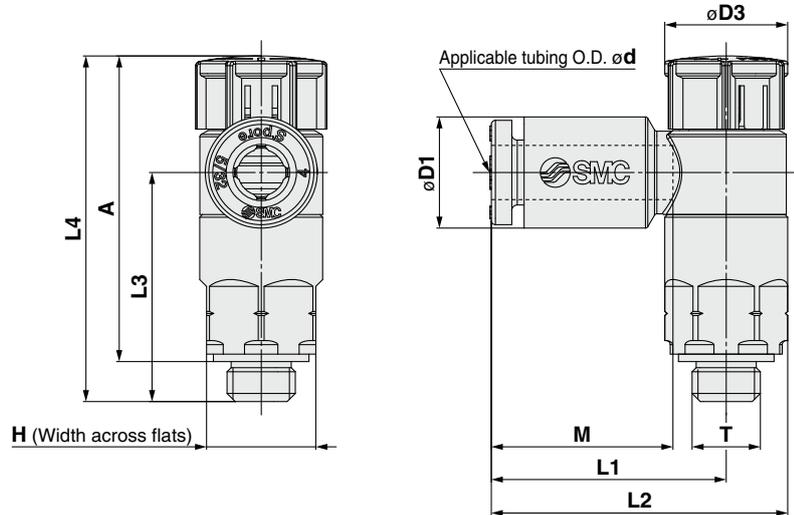
Sealant/Gasket seal
AS-FG
AS

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 <small>Note 1)</small>		A <small>Note 2)</small>		M	Weight [g]	
									Unlocked	Locked	Unlocked	Locked			
AS12□1F-M5E-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□1F-U10/32E-02A				7.2		17.2	21.7								
AS12□1F-M5E-23A	3.2			8.2		18.6	23.1								16.5
AS12□1F-U10/32E-23A				10.4		18.6	23.1								16.5
AS12□1F-M5E-04A	4			10.4		18.6	23.1								16.5
AS12□1F-U10/32E-04A	6			10.4		18.6	23.1								16.5
AS12□1F-M5E-06A	6	10.4	18.6	23.1	16.5										
AS12□1F-U10/32E-06A	6	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□1F-M5E-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□1F-U10/32E-01A				8.2											18.6	23.1	16.5
AS12□1F-M5E-03A	5/32"			11.2											18.6	23.1	16.5
AS12□1F-U10/32E-03A				11.2											18.6	23.1	16.5
AS12□1F-M5E-07A	1/4"			11.2											18.6	23.1	16.5
AS12□1F-U10/32E-07A				11.2											18.6	23.1	16.5

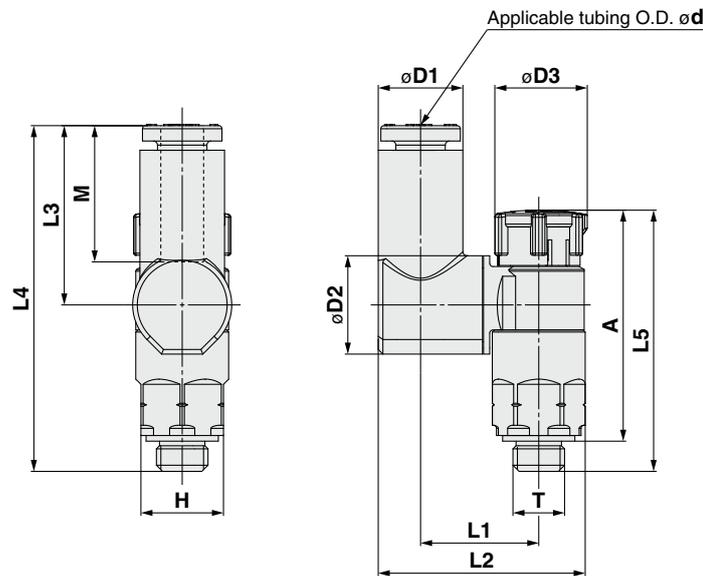
Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

Dimensions/ **Universal type**

Seal method: Gasket seal

For M5, 10-32UNF



Sealant/Gasket seal
AS-FG

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□1F-M5E-23A	3.2	M5 x 0.8 10/32UNF	8	7.2	9.6	9.4	11.6	19.4	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1F-U10/32E-23A																
AS13□1F-M5E-04A	8.2															
AS13□1F-U10/32E-04A	11.5															
AS13□1F-M5E-06A	10.4															
AS13□1F-U10/32E-06A	6															

Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

Inch Size

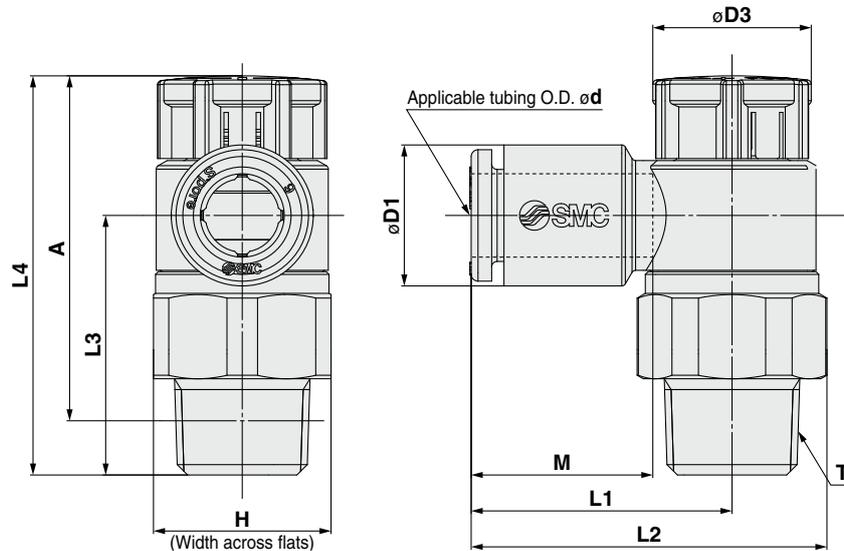
Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 Note 1)		A Note 2)		M	Weight [g]
											Unlocked	Locked	Unlocked	Locked		
AS13□1F-M5E-01A	1/8"	M5 x 0.8 10/32UNF	8	7.2	9.6	9.4	11.6	19.4	17.5	33.8	26.5	25.4	23.5	22.4	13.3	6
AS13□1F-U10/32E-01A																
AS13□1F-M5E-03A	8.2															
AS13□1F-U10/32E-03A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

Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

Dimensions/ Elbow type

Seal method: Sealant
For R, NPT thread



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		
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			8.2										10 (9)
AS22□1F-01-06(S)A	6			10.4										11 (10)
AS22□1F-01-08(S)A	8			13.2										12 (11)
AS22□1F-01-10(S)A	10			15.9										15.6
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			8.2										19 (20)
AS22□1F-02-06(S)A	6			10.4										20 (21)
AS22□1F-02-08(S)A	8			13.2										21 (22)
AS22□1F-02-10(S)A	10			15.9										22 (23)
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			13.2										41 (41)
AS32□1F-02-10(S)A	10			15.9										42 (42)
AS32□1F-02-12(S)A	12			18.5										43 (43)
AS32□1F-03-06(S)A	6			10.4										13.3
AS32□1F-03-08(S)A	8	3/8	19	13.2	16.6	22.7	33	28.7	42.3	40.7	37.1	35.5	13.3	31 (32)
AS32□1F-03-10(S)A	10			15.9										14.2
AS32□1F-03-12(S)A	12			18.5										15.6
AS42□1F-04-10(S)A	10			15.9										17
AS42□1F-04-12(S)A	12			18.5										18.8
AS42□1F-04-16(S)A	16	23.8	34.8	47.7 (47.6)	32.7	50.8	49.2	43.7	42.1	20.6	60 (59)			

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

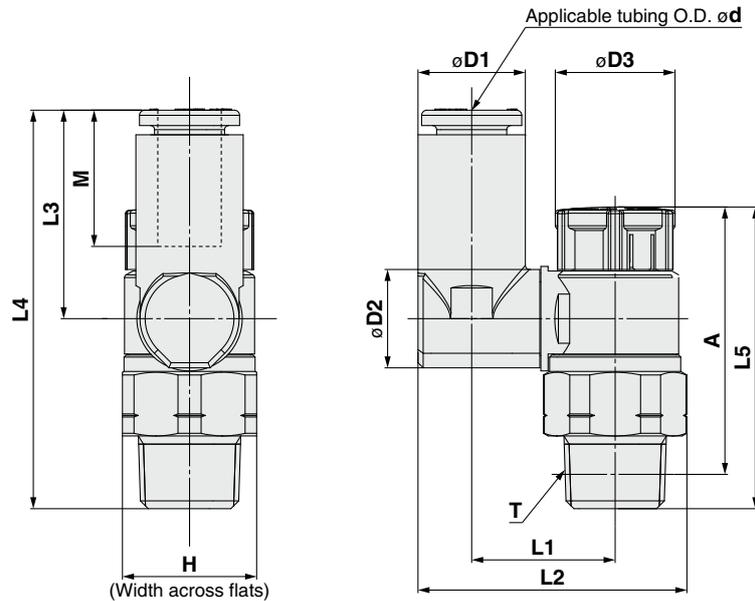
Inch Size

Model	d	T	H	D1	D3	L1	L2	L3	L4 <small>Note 1)</small>		A <small>Note 2)</small>		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"			8.2										10 (9)
AS22□1F-01-07(S)A	1/4"			11.2										11 (10)
AS22□1F-01-09(S)A	5/16"			13.2										12 (11)
AS22□1F-02-01(S)A	1/8"			7.2										15.6
AS22□1F-02-03(S)A	5/32"	1/4	17 (17.5)	8.2	13	20.9	30.2 (30.3)	22.6	36.6	35	31.1	29.5	13.3	18 (19)
AS22□1F-02-07(S)A	1/4"			11.2										19 (19)
AS22□1F-02-09(S)A	5/16"			13.2										20 (21)
AS22□1F-02-11(S)A	3/8"			15.5										21 (22)
AS32□1F-02-07(S)A	1/4"			11.2										22 (23)
AS32□1F-02-09(S)A	5/16"	1/4	19	13.2	16.6	21.8	32.1	36.4	50	48.4	44.5	42.9	13.3	40 (40)
AS32□1F-02-11(S)A	3/8"			15.5										41 (41)
AS32□1F-03-07(S)A	1/4"			11.2										14.2
AS32□1F-03-09(S)A	5/16"			13.2										15.6
AS32□1F-03-11(S)A	3/8"			15.5										17
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										30.9

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 (10)		
AS23□1F-01-06(S)A	6			10.4			16.4	26.2								12 (12)		
AS23□1F-01-08(S)A	8	1/4	17 (17.5)	13.2	12.9	13	16.4	30.1	21.5	40	36.6	35	31.1	29.5	14.2	12 (12)		
AS23□1F-02-04(S)A	4			8.2			16.5	29.9 (30)							17.5	40.1	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	1/4	17 (17.5)	13.2	12.9	13	19	34.9 (35)	23.5	46	36.6	35	31.1	29.5	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
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	3/8	19	18.5	17.4	23	23	42.5	28.3	64.7	42.3	40.7	37.1	35.5	17	48 (48)		
AS33□1F-03-06(S)A	6			11.2			20.2	36							21.4	50.1	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	3/8	19	15.9	17.4	16.6	23	41.2	26.1	54.8	42.3	40.7	37.1	35.5	15.6	38 (39)		
AS33□1F-03-12(S)A	12			18.5			23	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)
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

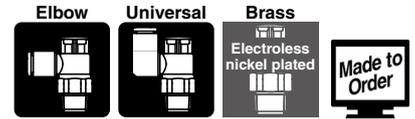
Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 Note 1)		A Note 2)		M	Weight [g]		
											Unlocked	Locked	Unlocked	Locked				
AS23□1F-01-01(S)A	1/8"	1/8	13 (12.7)	7.2	9.6	12	13.3	24	17.5	36	30.6	29.2	27.5	26.1	13.3	10 (10)		
AS23□1F-01-03(S)A	5/32"			8.2			13.9	25.1								11 (10)		
AS23□1F-01-07(S)A	1/4"			11.2			16.4	29.1								20.2	38.7	14.2
AS23□1F-01-09(S)A	5/16"	1/4	17 (17.5)	13.2	10.2	13	16.4	30.1	21.5	40	36.6	35	31.1	29.5	14.2	12 (12)		
AS23□1F-02-03(S)A	5/32"			8.2			16.5	29.9 (30)							17.5	40.1	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"	1/4	17 (17.5)	13.2	12.9	13	19	34.9 (35)	23.5	46	36.6	35	31.1	29.5	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"			11.2			20.2	36							21.4	57.8	13.3	42 (42)
AS33□1F-02-09(S)A	5/16"	3/8	19	13.2	12.9	16.6	20.2	37.1	23.5	59.9	50	48.4	44.5	42.9	14.2	43 (43)		
AS33□1F-02-11(S)A	3/8"			15.9			23	41.2							26.1	62.5	15.6	46 (46)
AS33□1F-03-07(S)A	1/4"			11.2			23	41.2							26.1	54.8	13.3	34 (35)
AS33□1F-03-09(S)A	5/16"	3/8	19	13.2	12.9	16.6	20.2	37.1	23.5	52.2	42.3	40.7	37.1	35.5	14.2	35 (36)		
AS33□1F-03-11(S)A	3/8"			15.9			23	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)
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

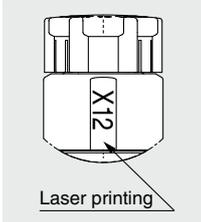
Made to Order

Please contact SMC for detailed dimensions, specifications and delivery.



1 Lubricant: Vaseline

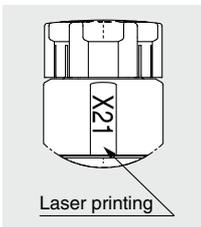
-X12



Example) AS2201F-01-04SA-X12

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

-X21



Example) AS2201F-01-04SA-X21

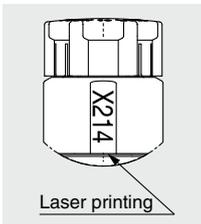
Note 1) Not particle-free

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

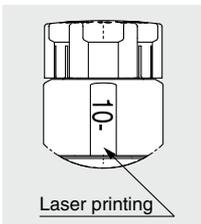


Example) AS2201F-01-04SA-X214

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

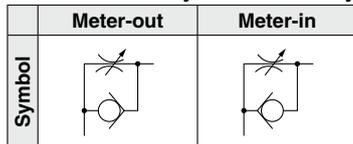
Model		Port size	Seal method	Applicable tubing O.D.																
Elbow type	Universal type			Metric size						Inch size										
				2 ^{Note 2)}	3.2	4	6	8	10	12	16	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"			
AS12□1FG-M5	AS13□1FG-M5	M5 x 0.8	Gasket seal	● ^{Note 3)}	●	●	●						●	●	●					
AS12□1FG-U10/32	AS13□1FG-U10/32	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			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			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 ø2.

Note 3) Universal type is not available.

Flow Direction Symbols on Body



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 ^{Note)} , FEP, PFA

Note) Use caution at the max. operating pressure when using soft nylon or polyurethane tubing. (Refer to the **WEB catalog** or the Best Pneumatics No. 6 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 on SMC website, <http://www.smcworld.com>

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					
	ø2	ø3.2 ø4 ø6	ø3.2	ø4	ø6	ø8 ø10	ø3.2	ø4	ø6	ø8 ø10	ø6	ø8	ø10 ø12	ø10	ø12 ø16
Tubing O.D.	Metric size	ø2	ø3.2	ø4	ø6	ø8	ø10	ø3.2	ø4	ø6	ø8	ø10	ø10	ø12	ø16
	Inch size	—	ø1/8" ø1/4" ø5/32"	ø1/8"	ø5/32"	ø1/4" ø5/16"	ø1/8"	ø5/32"	—	ø1/4" ø5/16" ø3/8"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
C values: Sonic conductance dm ³ /(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	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	0.3

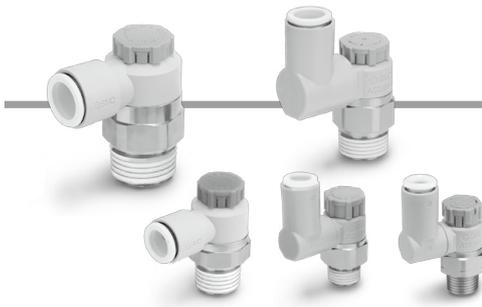
Note 1) 10-32UNF has the same specification as M5.

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. ^{Note 1)}

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

Note 1) For selecting applicable tubing O.D., refer to the "Model" on page 14. The color of the release button is white (metric, inch).

Note 2) Use ø1/8" 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 ^{Note)} ●

0	Meter-out
1	Meter-in

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

Stainless steel type (Stainless steel 303) ●

Note 1) The material can be visually identified by color of the release button.
Stainless steel type: White

Note 2) White is also used for inch size.

● Made to Order
Refer to page 25 for details.

● Push-lock type

Seal method ●

Nil	Without sealant
S	With sealant

Note) Face seal method is used for the G thread type.

Select "Nil/Without sealant."
Example) AS2201FG-G01-06A

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

Metric size		Inch size ^{Note 3)}	
23	ø3.2 ^{Note 2)}	01	ø1/8"
04	ø4	03	ø5/32"
06	ø6	07	ø1/4"
08	ø8	09	ø5/16"
10	ø10	11	ø3/8"
12	ø12	13	ø1/2"
16	ø16		

Note 1) For selecting applicable tubing O.D., refer to the "Model" on page 14. The color of the release button is white (metric, inch).

Note 2) Use ø1/8" tube.

Note 3) Only the metric size is available for the G thread type.

Thread type ●

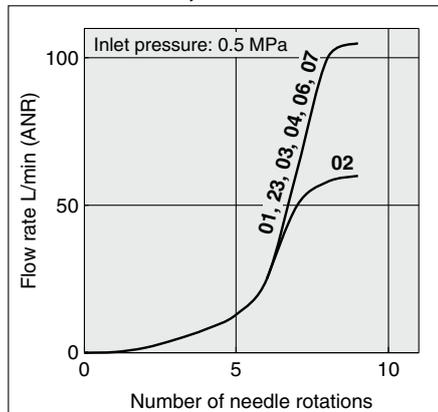
Nil	R
N	NPT
G	G

Port size ●

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

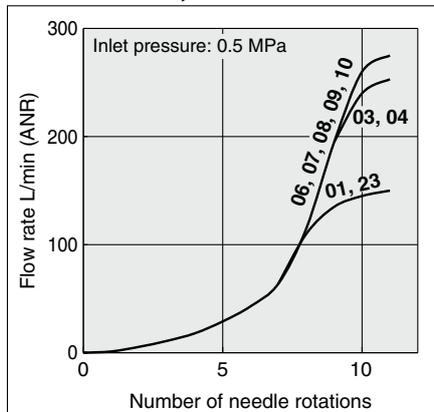
Needle Valve/Flow-rate Characteristics

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

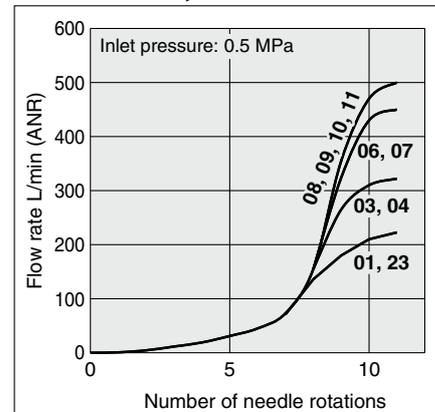


Note) -U10/32 has the same specification as M5.

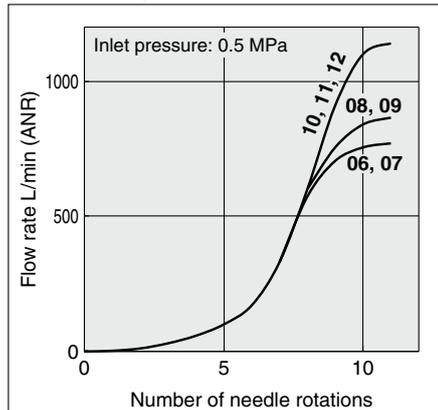
**AS2201FG-01, AS2211FG-01
AS2301FG-01, AS2311FG-01**



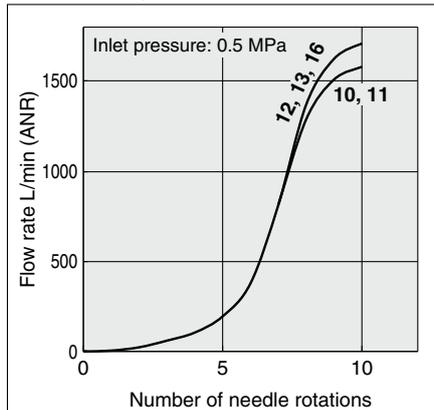
**AS2201FG-02, AS2211FG-02
AS2301FG-02, AS2311FG-02**



**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.

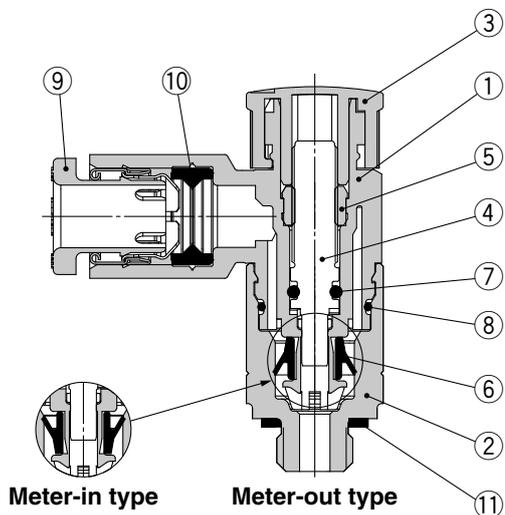
Sealant/Gasket seal	AS
Face seal	AS-FG
Gasket seal	Uni-AS

Series AS-FG

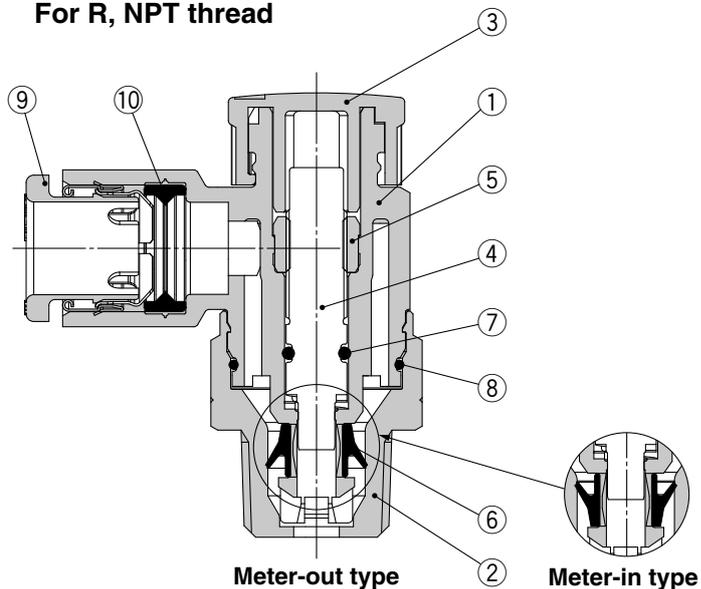
Construction

Elbow type

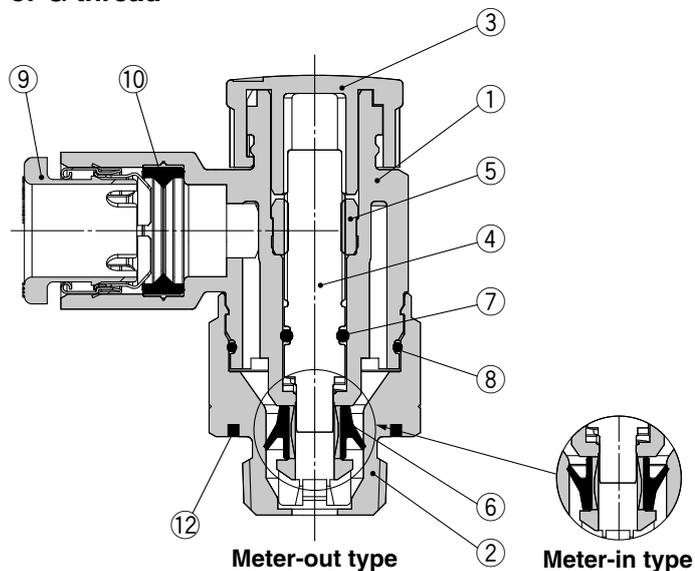
Seal method: Gasket seal
For M5, 10-32UNF



Seal method: Sealant
For R, NPT thread



Seal method: Face seal
For G thread



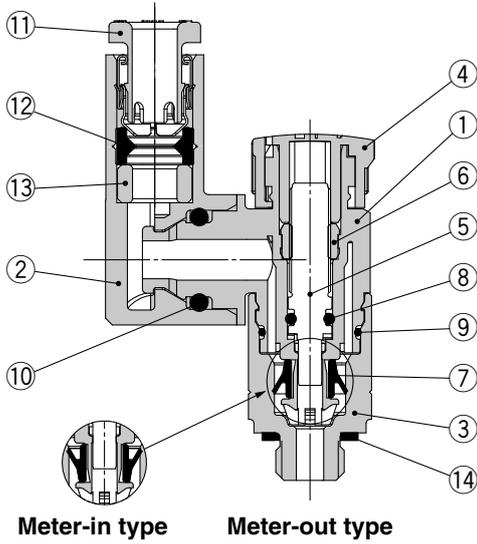
Component Parts

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	

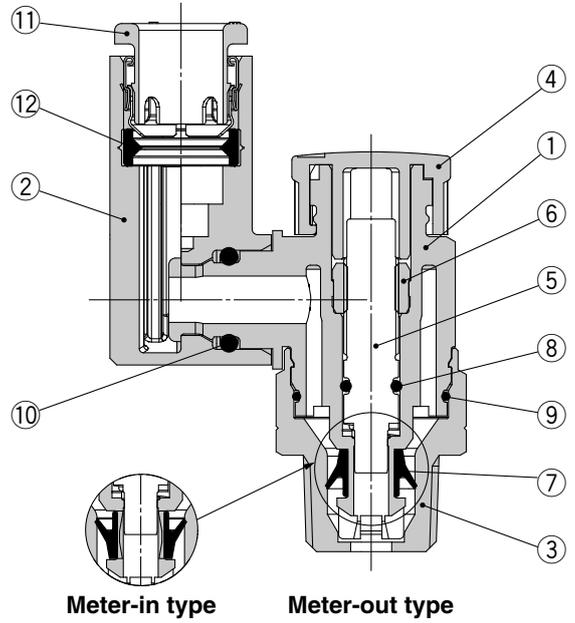
Construction

Universal type

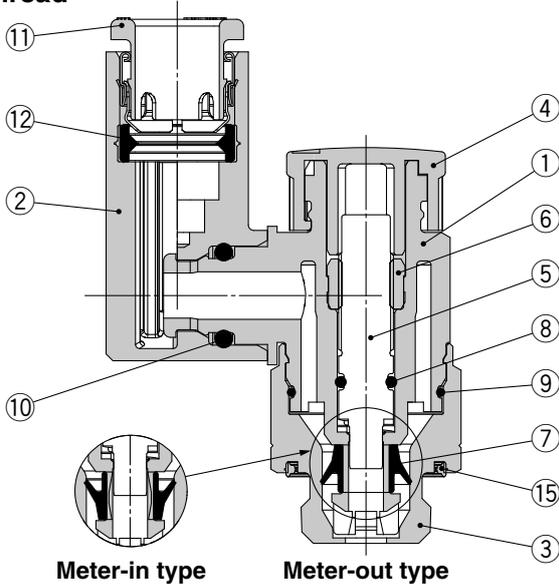
Seal method: Gasket seal
For M5, 10-32UNF



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

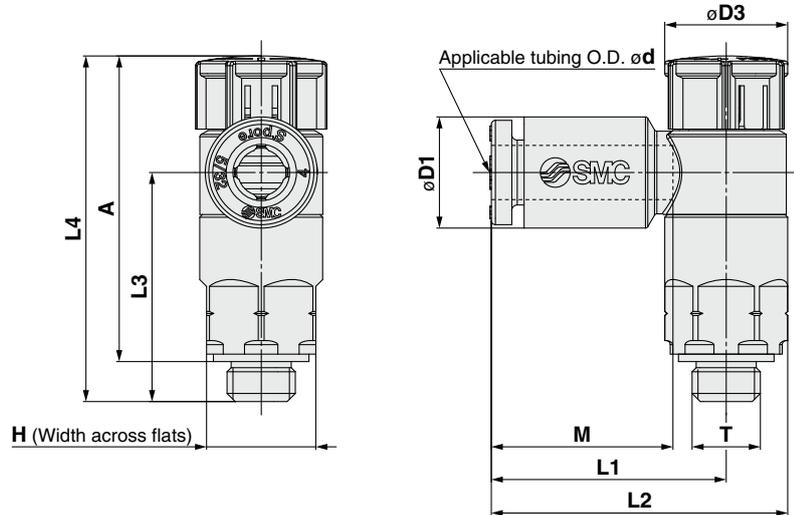
No.	Description	Material	Note
1	Body A	PBT	
2	Elbow body	PBT	
3	Body B	Stainless steel	
4	Knob	POM	
5	Needle	PBT	
6	Needle guide	Stainless steel	
7	U-seal	HNBR	
8	O-ring	NBR	
9	O-ring	NBR	
10	O-ring	NBR	
11	Cassette	—	
12	Seal	NBR	
13	Spacer ^{Note)}	PBT	
14	Gasket	NBR/Stainless steel	
15	Seal	NBR	

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

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	6			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	6	10.4	18.6	23.1	16.5										

Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation

Inch Size

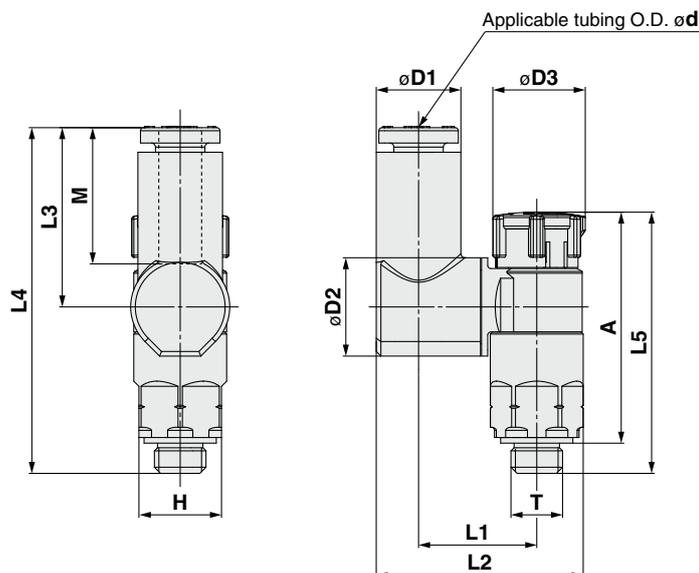
Model	d	T	H	D1	D3	L1	L2	L3	L4 <small>Note 1)</small>		A <small>Note 2)</small>		M	Weight [g]	
									Unlocked	Locked	Unlocked	Locked			
AS12□1FG-M5-01A	1/8"	M5 x 0.8 10/32UNF	8	7.2	9.4	17.2	21.7	16.9	26.5	25.4	23.5	22.4	13.3	5	
AS12□1FG-U10/32-01A				8.2		18.6	23.1								16.5
AS12□1FG-M5-03A	5/32"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

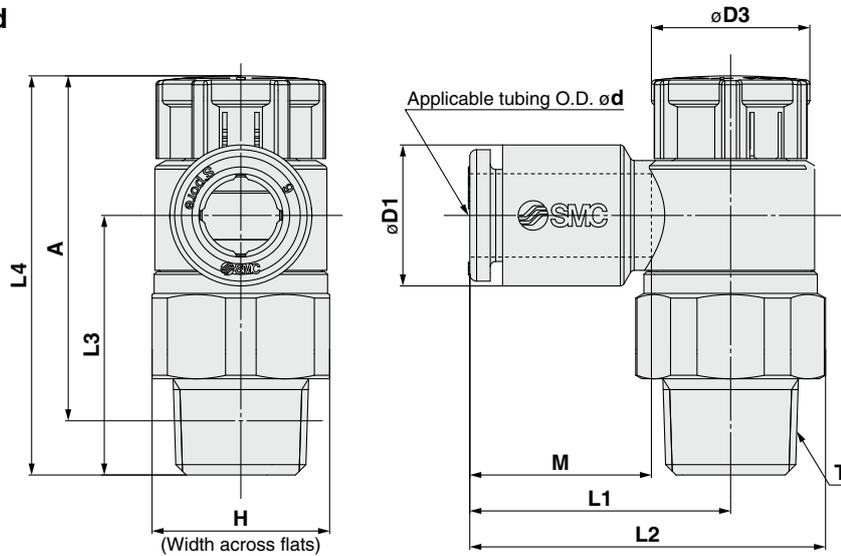
Note 1) Reference dimensions

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 <small>Note 1)</small>		A <small>Note 1)</small>		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			8.2										10 (9)
AS22□1FG-01-06(S)A	6			10.4										11 (10)
AS22□1FG-01-08(S)A	8			13.2										12 (11)
AS22□1FG-01-10(S)A	10			15.9		25.3	32.4							
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										18 (19)
AS22□1FG-02-06(S)A	6			10.4										19 (20)
AS22□1FG-02-08(S)A	8			13.2										20 (21)
AS22□1FG-02-10(S)A	10			15.9		26.9	36.2 (36.3)							
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										41 (41)
AS32□1FG-02-10(S)A	10			15.9										42 (42)
AS32□1FG-02-12(S)A	12			18.5										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										30 (31)
AS32□1FG-03-10(S)A	10			15.9										31 (32)
AS32□1FG-03-12(S)A	12			18.5										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										53 (53)
AS42□1FG-04-16(S)A	16			23.8										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 <small>Note 1)</small>		A <small>Note 2)</small>		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"			8.2										10 (9)
AS22□1FG-01-07(S)A	1/4"			11.2										11 (10)
AS22□1FG-01-09(S)A	5/16"			13.2										12 (11)
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										18 (19)
AS22□1FG-02-07(S)A	1/4"			11.2										19 (20)
AS22□1FG-02-09(S)A	5/16"			13.2										20 (21)
AS22□1FG-02-11(S)A	3/8"			15.5		26.4	35.7 (35.8)							
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										41 (41)
AS32□1FG-02-11(S)A	3/8"			15.5										42 (42)
AS32□1FG-02-13(S)A	7/16"			18.5										43 (43)
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										30 (31)
AS32□1FG-03-11(S)A	3/8"			15.5										31 (32)
AS32□1FG-03-13(S)A	7/16"			18.5										32 (33)
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										53 (53)

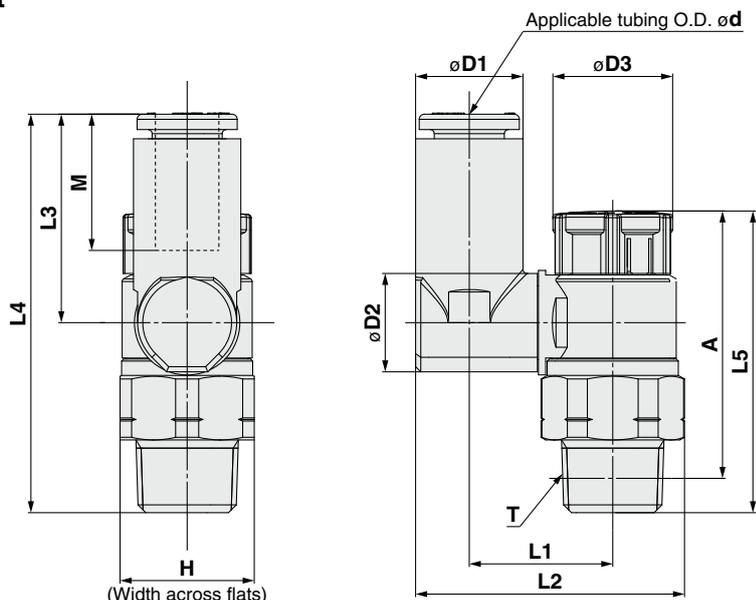
Note 1) Reference dimensions Note 2) Reference dimensions of threads after installation Note 3) The values in () are for NPT thread.

Speed Controller with One-touch Fitting
Stainless Steel Type For R, NPT thread

Series AS-FG

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		
AS23□1FG-01-08(S)A	8	1/4	17 (17.5)	13.2	12.9	13	16.4	30.1	21.5	40	36.6	35	31.1	29.5	14.2	12 (11)		
AS23□1FG-02-04(S)A	4			8.2			16.5	29.9 (30)							17.5	40.1	18 (19)	
AS23□1FG-02-06(S)A	6			11.2			19	33.8 (33.9)							21.4	43.9	20 (21)	
AS23□1FG-02-08(S)A	8	1/2	24 (23.8)	13.2	17.4	16.6	20.9	34.9 (35)	23.5	46	50	48.4	44.5	42.9	14.2	21 (22)		
AS23□1FG-02-10(S)A	10			15.9			20.9	38.1 (38.2)							24.7	47.3	23 (23)	
AS33□1FG-02-06(S)A	6			11.2			20.2	36							21.4	57.8	13.3	42 (42)
AS33□1FG-02-08(S)A	8	3/8	19	13.2	12.9	16.6	20.2	37.1	23.5	59.9	42.3	40.7	37.1	35.5	14.2	43 (43)		
AS33□1FG-02-10(S)A	10			15.9			23	41.2							26.1	62.5	15.6	46 (46)
AS33□1FG-02-12(S)A	12			18.5			23	42.5							28.3	64.7	17	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			20.2	37.1							23.5	52.2	14.2	33 (34)
AS33□1FG-03-10(S)A	10			15.9			23	41.2							26.1	54.8	15.6	37 (38)
AS33□1FG-03-12(S)A	12	1/2	24 (23.8)	18.5	17.4	18.8	25.6	42.5	28.3	57	50.8	49.2	43.7	42.1	17	38 (39)		
AS43□1FG-04-10(S)A	10			15.9			25.6	46.4 (46.3)							26.1	61.2	15.6	58 (57)
AS43□1FG-04-12(S)A	12			18.5			26.2	48.3 (48.2)							28.3	63.4	17	62 (61)

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

Inch Size

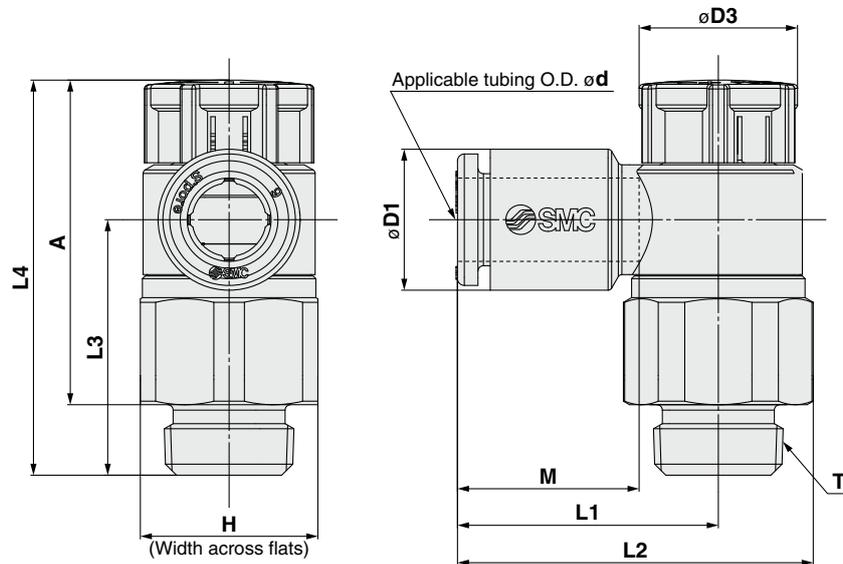
Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 Note 1)		A Note 2)		M	Weight [g]		
											Unlocked	Locked	Unlocked	Locked				
AS23□1FG-01-01(S)A	1/8"	1/8	13 (12.7)	7.2	9.6	12	13.3	24	17.5	36	30.6	29.2	27.5	26.1	13.3	10 (9)		
AS23□1FG-01-03(S)A	5/32"			8.2			13.9	25.1								10 (10)		
AS23□1FG-01-07(S)A	1/4"			11.2			29.1	20.2								38.7		
AS23□1FG-01-09(S)A	5/16"	1/4	17 (17.5)	13.2	10.2	16.4	16.4	30.1	21.5	40	36.6	35	31.1	29.5	14.2	12 (11)		
AS23□1FG-02-03(S)A	5/32"			8.2			16.5	29.9 (30)							17.5	40.1	18 (19)	
AS23□1FG-02-07(S)A	1/4"			11.2			19	33.8 (33.9)							21.4	43.9	20 (21)	
AS23□1FG-02-09(S)A	5/16"	3/8	19	13.2	12.9	13	20.9	34.9 (35)	23.5	46	50	48.4	44.5	42.9	14.2	21 (22)		
AS23□1FG-02-11(S)A	3/8"			15.9			20.9	38.1 (38.2)							24.7	47.3	15.6	23 (23)
AS33□1FG-02-07(S)A	1/4"			11.2			20.2	36							21.4	57.8	13.3	42 (42)
AS33□1FG-02-09(S)A	5/16"	3/8	19	13.2	12.9	16.6	20.2	37.1	23.5	59.9	42.3	40.7	37.1	35.5	14.2	43 (43)		
AS33□1FG-02-11(S)A	3/8"			15.9			23	41.2							26.1	62.5	15.6	46 (46)
AS33□1FG-03-07(S)A	1/4"			11.2			20.2	36							21.4	50.1	13.3	32 (33)
AS33□1FG-03-09(S)A	5/16"	3/8	19	13.2	12.9	16.6	20.2	37.1	23.5	52.2	42.3	40.7	37.1	35.5	14.2	33 (34)		
AS33□1FG-03-11(S)A	3/8"			15.9			23	41.2							26.1	54.8	15.6	37 (38)
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)
AS43□1FG-04-13(S)A	1/2"	18.5	26.2		48.3 (48.2)	28.3		63.4	17	61 (60)								

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

Series AS-FG For G thread

Dimensions/ Elbow type

Seal method: Face seal
For G thread

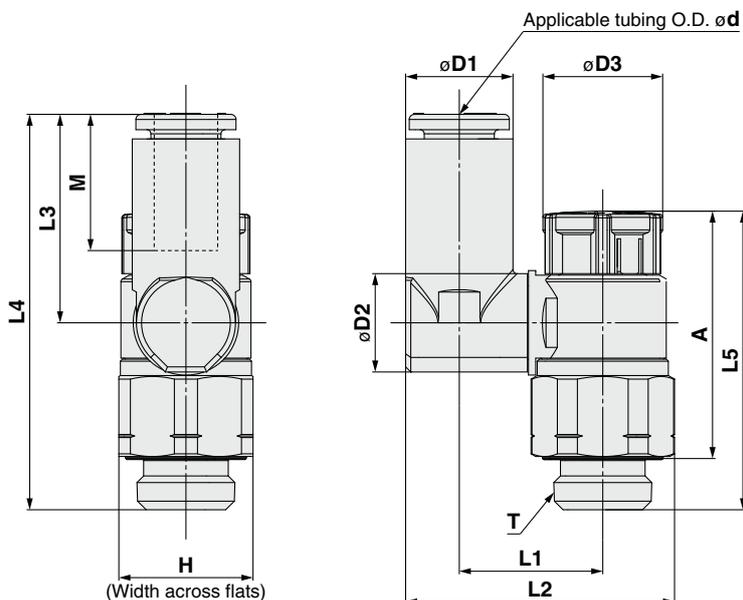


Metric Size

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										
		49.2	32.7											

Dimensions/ Universal type

Seal method: Face seal
For G thread



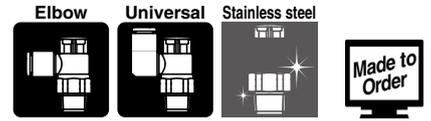
Sealant/Gasket seal
AS-FG
AS

Face seal

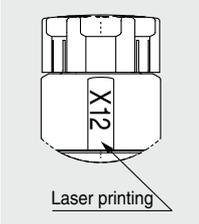
Gasket seal
Uni-AS

Metric Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5		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												10
AS23□1FG-G01-06A	6			10.4												11
AS23□1FG-G01-08A	8			13.2												12
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												23
AS23□1FG-G02-08A	8			13.2												24
AS23□1FG-G02-10A	10			15.9												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												52
AS33□1FG-G02-10A	10			15.9												55
AS33□1FG-G02-12A	12			18.5												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												41
AS33□1FG-G03-10A	10			15.9												44
AS33□1FG-G03-12A	12			18.5												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					17	79

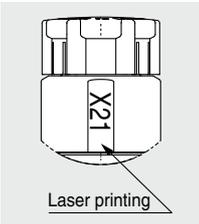


1 Lubricant: Vaseline -X12



Example) AS2201FG-01-04SA-X12

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

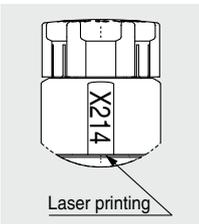


Example) AS2201FG-01-04SA-X21

Note 1) Not particle-free

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

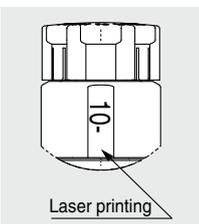
3 Restrictor (Without check valve) -X214



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.

Gasket seal

Uni-AS

Face seal

Sealant/Gasket seal

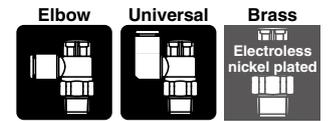
AS-FG AS

Speed Controller with One-touch Fitting

Face Seal

Elbow Type/Universal Type

Series AS



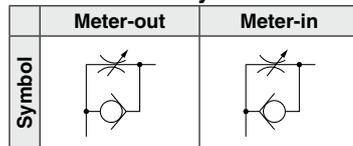
Model

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 catalog or the Best Pneumatics No. 6 for details.)

Flow Rate and Sonic Conductance

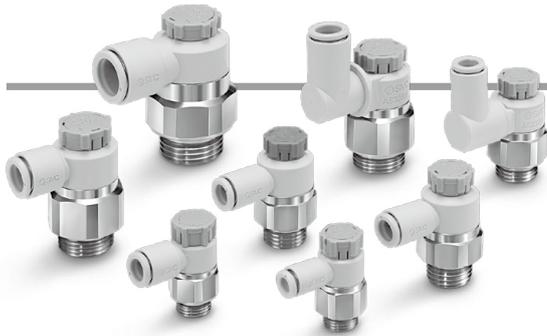
Caution

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 on SMC website, <http://www.smcworld.com>

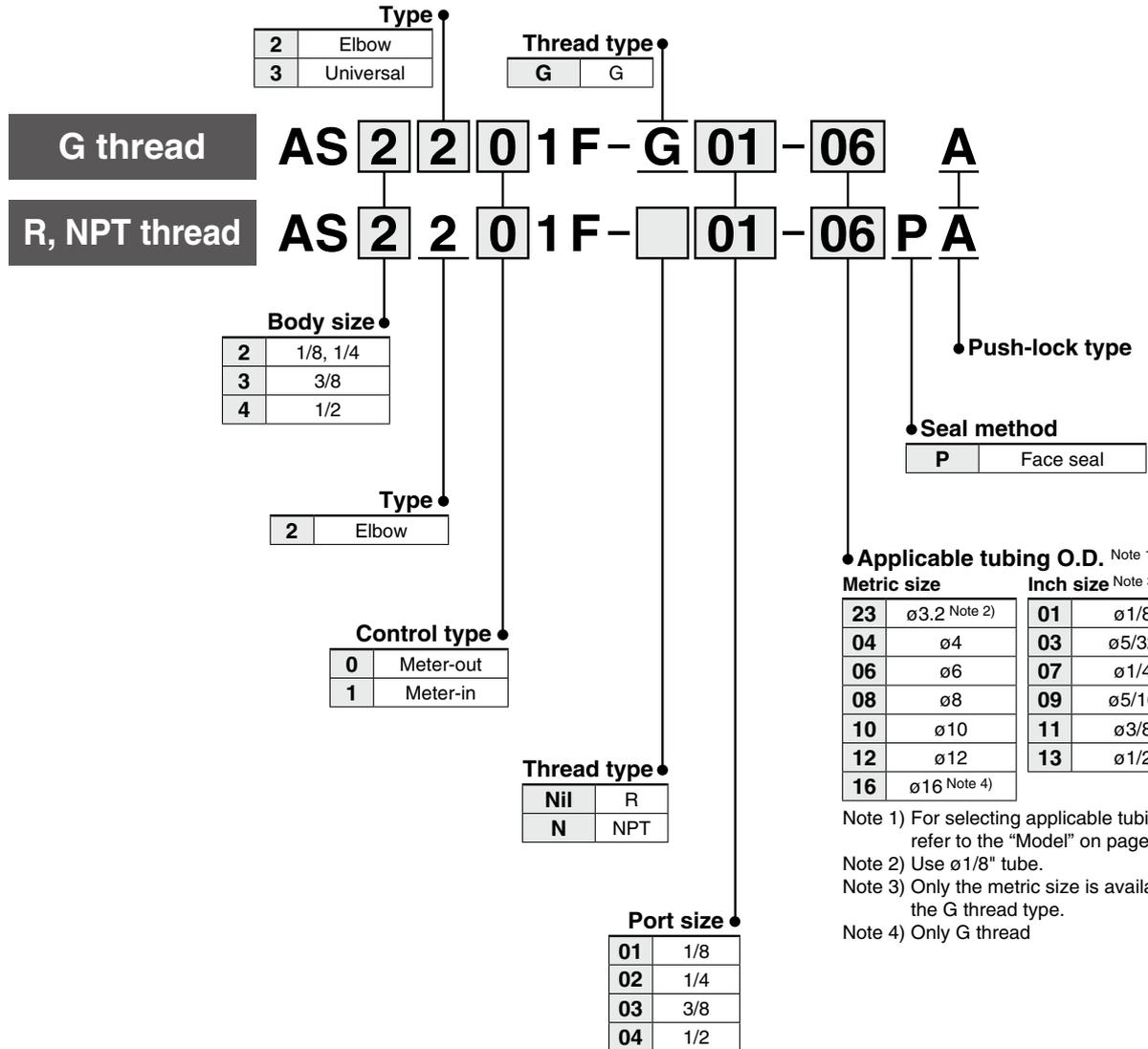
Model	AS2□□1F-G01 AS22□1F-01-□PA			AS2□□1F-G02 AS22□1F-02-□PA				AS3□□1F-G02/03 AS32□1F-03-□PA			AS4□□1F-G04 AS42□1F-04-□PA			
	Metric size	ø3.2	ø4	ø6	ø8	ø10	ø3.2	ø4	ø6	ø8	ø10	ø12	ø10	ø12
Tubing O.D.	Note 2) Inch size	ø1/8"	ø5/32"	ø1/4" ø5/16"	ø1/8"	ø5/32"	—	ø1/4" ø5/16" ø3/8"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø3/8"	ø1/2"
	C values: Sonic conductance dm ³ /(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
b values: Critical pressure ratio	Controlled flow	0.4	0.7	0.8	0.6	0.9	1.3		2.1	2.4	3.3	4.4	4.9	
	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 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



• Applicable tubing O.D. Note 1)

Metric size	Inch size	Note 3)	
23	ø3.2	Note 2)	
04	ø4	01	ø1/8"
06	ø6	03	ø5/32"
08	ø8	07	ø1/4"
10	ø10	09	ø5/16"
12	ø12	11	ø3/8"
16	ø16	13	ø1/2"

Note 1) For selecting applicable tubing O.D., refer to the "Model" on page 27.

Note 2) Use ø1/8" tube.

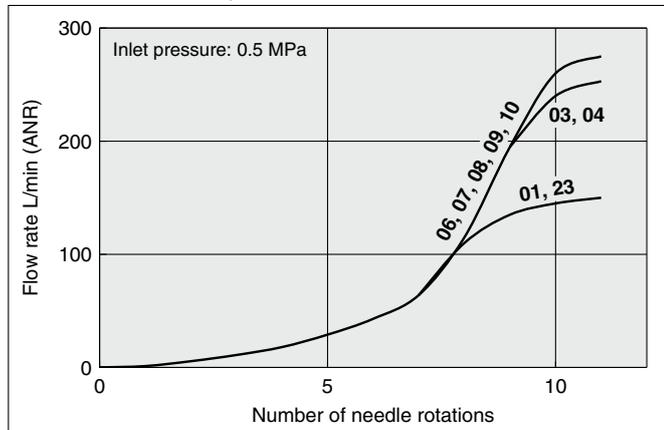
Note 3) Only the metric size is available for the G thread type.

Note 4) Only G thread

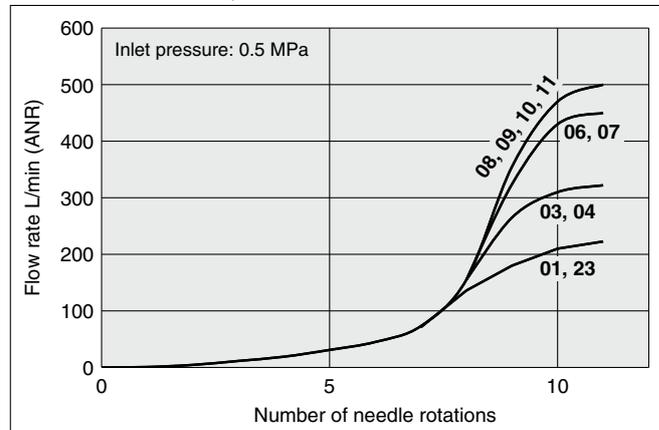
Series AS

Needle Valve/Flow-rate Characteristics

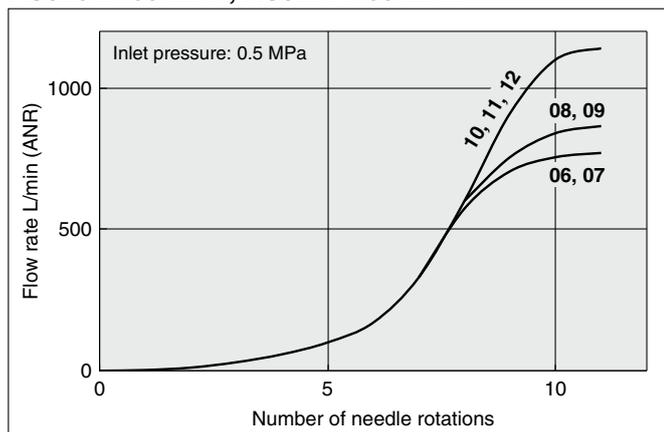
AS2201F-G01-□, AS2211F-G01-□
 AS2301F-G01-□, AS2311F-G01-□
 AS2201F-01-□PA, AS2211F-01-□PA



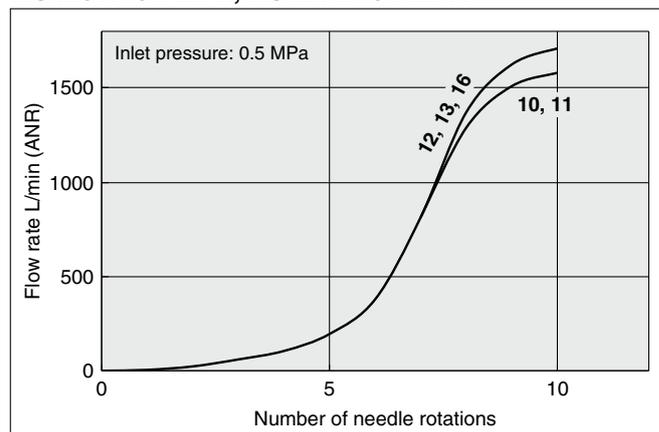
AS2201F-G02-□, AS2211F-G02-□
 AS2301F-G02-□, AS2311F-G02-□
 AS2201F-02-□PA, AS2211F-02-□PA



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

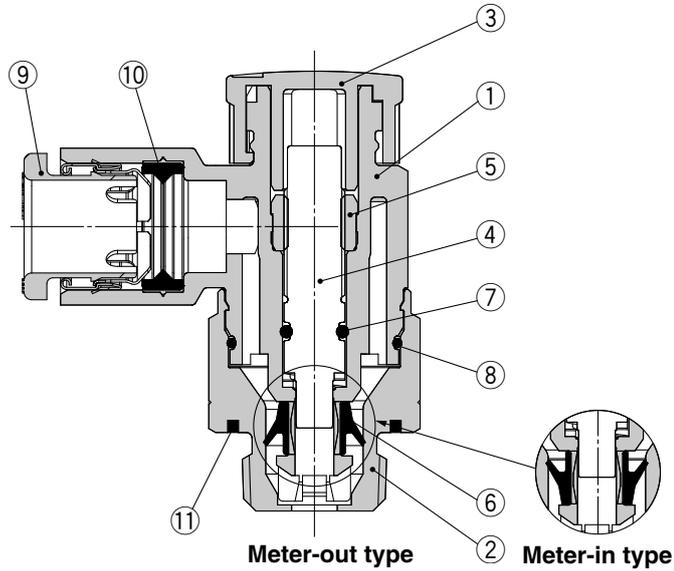


Note) The numbers above the flow-rate characteristic curves in the charts show the applicable tubing outside diameter as defined by the product number.

Construction

Elbow type

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

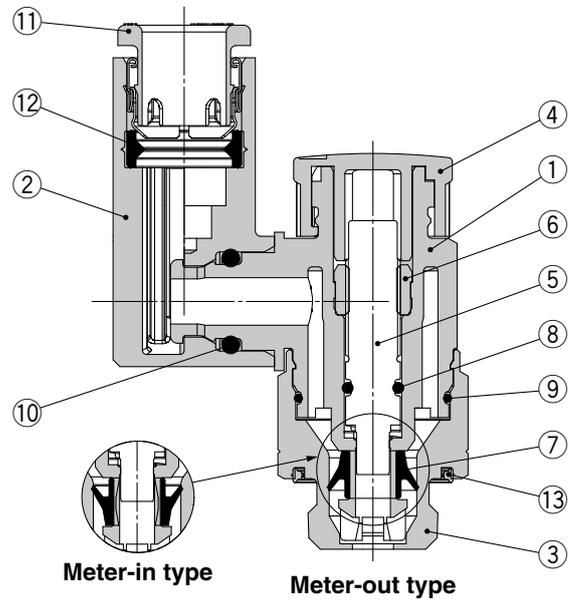


Component Parts

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	

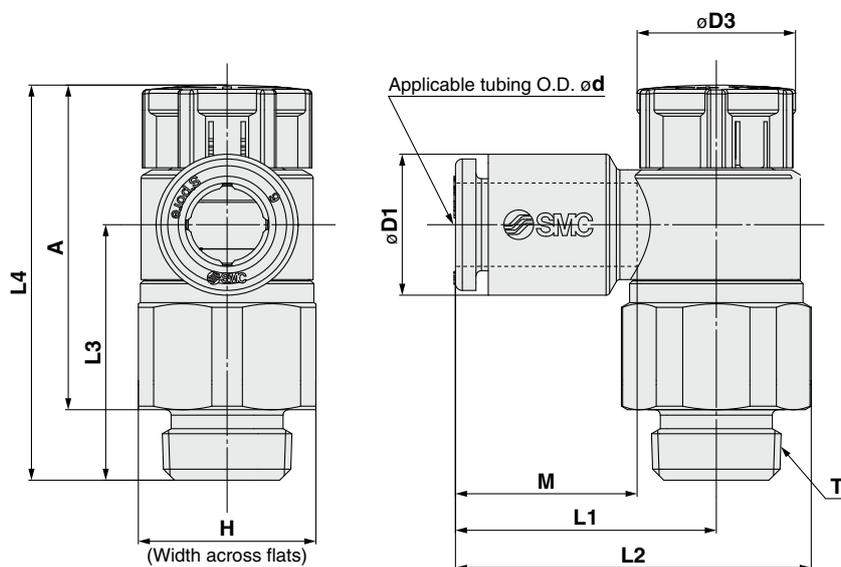
Sealant/Gasket seal
AS-FG
AS

Face seal

Gasket seal
Uni-AS

Dimensions/ Elbow type

Seal method: Face seal
For G thread



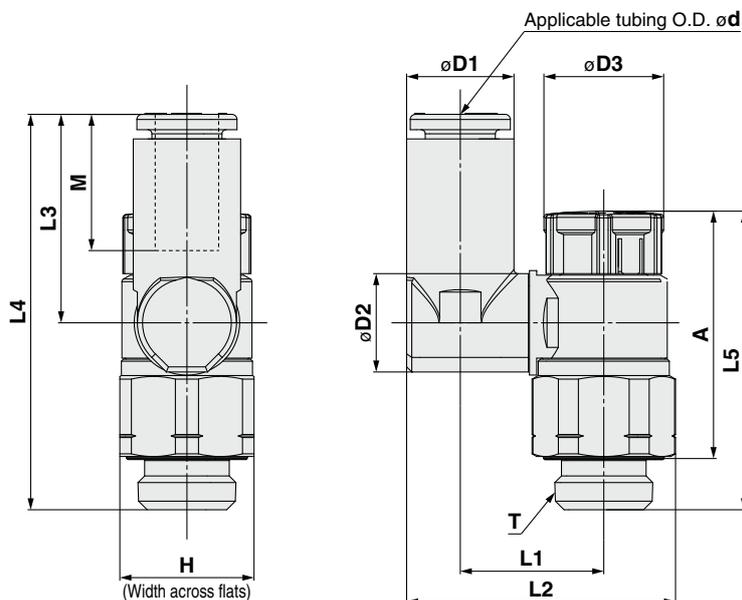
Metric Size

[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										
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										
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										
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



Sealant/Gasket seal
AS-FG
AS

Face seal

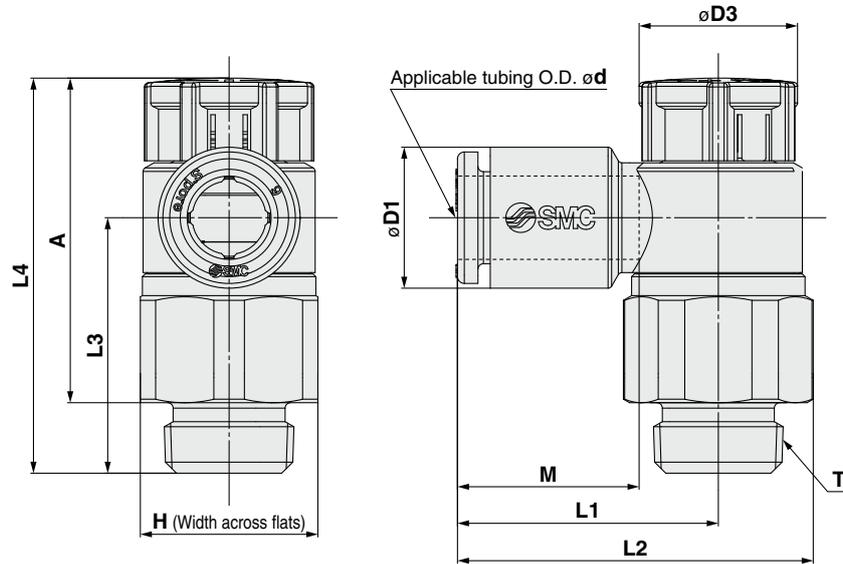
Gasket seal
Uni-AS

Metric Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5		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												11						
AS23□1F-G01-06A	6			10.4												11						
AS23□1F-G01-08A	8			13.2												10.2	14.2	12				
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												24						
AS23□1F-G02-08A	8			13.2												25						
AS23□1F-G02-10A	10			15.9												26						
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												52						
AS33□1F-G02-10A	10			15.9												55						
AS33□1F-G02-12A	12			18.5												17.4	23	43.5	28.3	59.9	17	57
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												42						
AS33□1F-G03-10A	10			15.9												17.4	23	42.2	26.1	50.3	15.6	46
AS33□1F-G03-12A	12			18.5												52.2	17	43.5	28.3	52.2	17	47
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	82					

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	1/4	17 (17.5)	10.4	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	3/8	21 (21.7)	15.9	16.6	26.9	36.2 (36.3)	28.7	42.3	40.7	34.7 (34.2)	33.1 (32.6)	13.3	37 (39)
AS32□1F-03-06PA	6			10.4		33 (33.4)	38 (40)							
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	1/2	27 (28.6)	18.5	18.8	29.7	40.9 (41.3)	26.8	50.8	49.2	40.4	38.8	15.6	41 (42)
AS42□1F-04-10PA	10			15.9		41.8 (42.6)	66 (72)							
AS42□1F-04-12PA	12			18.5		45.2 (46)	68 (74)							
				30.8										

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

Inch Size

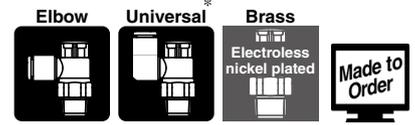
Model	d	T	H	D1	D3	L1	L2	L3	L4		A		M	Weight [g]		
									Unlocked	Locked	Unlocked	Locked				
AS22□1F-01-01PA	1/8"	1/8	13 (12.7)	7.2	12	19.1	26.2	18.8	30.3	28.9	25.1 (24.9)	23.7 (23.5)	13.3	10 (9)		
AS22□1F-01-03PA	5/32"															
AS22□1F-01-07PA	1/4"			11.2											27.9	10 (10)
AS22□1F-01-09PA	5/16"			13.2											29.5	11 (11)
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"	3/8	21 (21.7)	15.5	16.6	26.4	35.7 (35.8)	28.7	42.3	40.7	34.7 (34.2)	33.1 (32.6)	13.3	38 (39)		
AS32□1F-03-07PA	1/4"			11.2		33 (33.4)	38 (40)									
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 (40)									
AS42□1F-04-11PA	3/8"	1/2	27 (28.6)	15.5	18.8	27.4	41.8 (42.6)	36.2	50.8	49.2	40.4	38.8	15.6	66 (72)		
AS42□1F-04-13PA	1/2"			19.3		45.3 (46.1)	34.7	68 (74)								

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

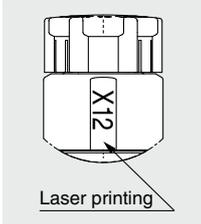
Series AS

Made to Order

Please contact SMC for detailed dimensions, specifications and delivery.

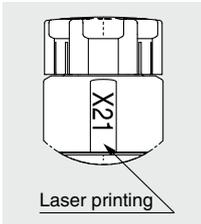


1 Lubricant: Vaseline -X12



Example) AS2201F-G01-04A-X12

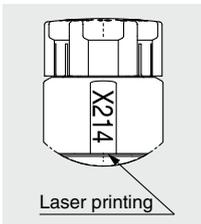
2 Grease-free (Seal: Fluorine-coated) + Restrictor (Without check valve) -X21



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.

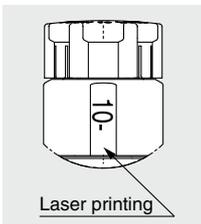
3 Restrictor (Without check valve) -X214



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

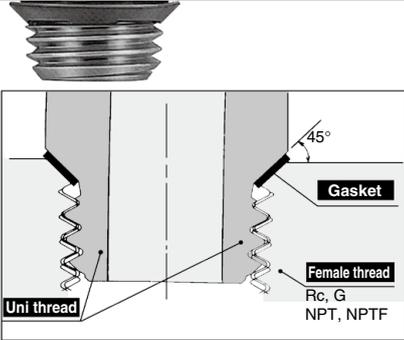
Face seal

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.



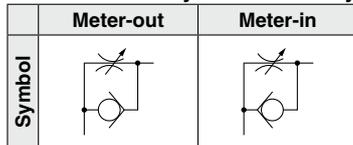
Shape of Uni thread ridge

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 on SMC website, <http://www.smcworld.com>

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	●	●	●	●	● ^{Note)}			●	●	●	●		
AS22□1F-U02	AS23□1F-U02	1/4	● ^{Note)}	●	●	●	●			● ^{Note)}	●	●	●	●	
AS32□1F-U02	AS33□1F-U02	1/4			●	●	●	●				●	●	●	
AS32□1F-U03	AS33□1F-U03	3/8			●	●	●	●				●	●	●	
AS42□1F-U04	AS43□1F-U04	1/2					●	●	● ^{Note)}					●	●

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 ^{Note)}

Note) Use caution at the max. operating pressure when using soft nylon or polyurethane tubing. (Refer to the WEB catalog or the Best Pneumatics No. 6 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	ø3.2	ø4	ø6 ø8 ø10	ø3.2	ø4	ø6	ø8 ø10	ø6	ø8	ø10 ø12	ø10	ø12 ø16
	Inch size	ø1/8"	ø5/32"	ø1/4" ø5/16"	ø1/8"	ø5/32"	—	ø1/4" ø5/16" ø3/8"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
C values: Sonic conductance dm ³ /(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 color of the knob.
 Meter-out: Gray
 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.	
23	ø3.2 <small>Note 2)</small>
04	ø4
06	ø6
08	ø8
10	ø10
12	ø12
16	ø16

Inch size

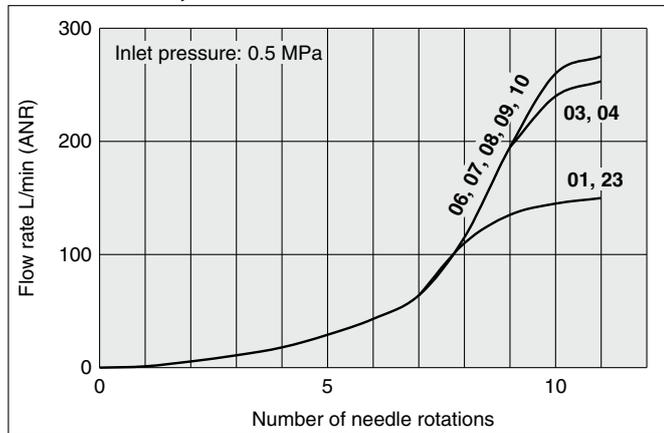
Tubing O.D.	
01	ø1/8"
03	ø5/32"
07	ø1/4"
09	ø5/16"
11	ø3/8"
13	ø1/2"

Note 1) For selecting applicable tubing O.D., refer to the "Model" on page 35. Metric size and inch size types can be visually identified by color of the release button.
 Metric size: Light gray
 Inch size: Orange

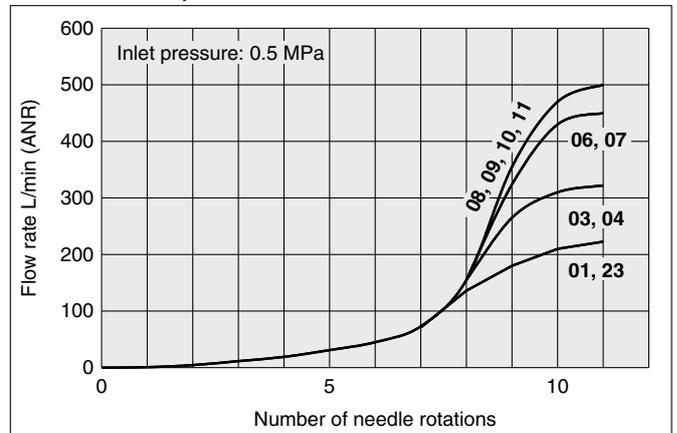
Note 2) Use ø1/8" tube.

Needle Valve/Flow-rate Characteristics

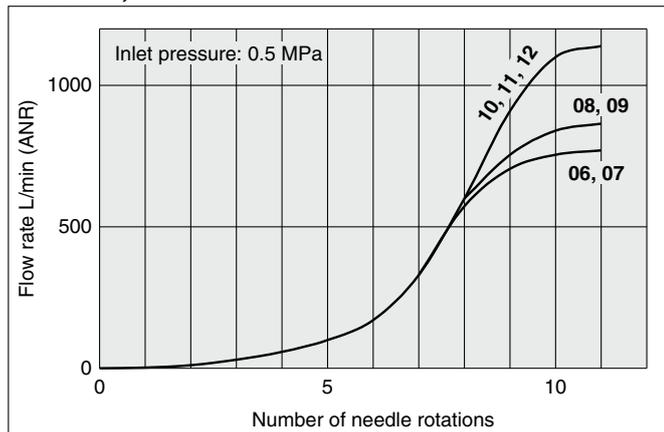
**AS2201F-U01, AS2211F-U01
 AS2301F-U01, AS2311F-U01**



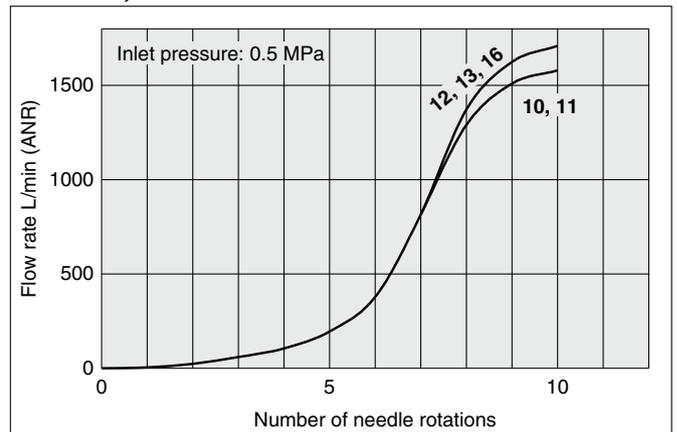
**AS2201F-U02, AS2211F-U02
 AS2301F-U02, AS2311F-U02**



**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.

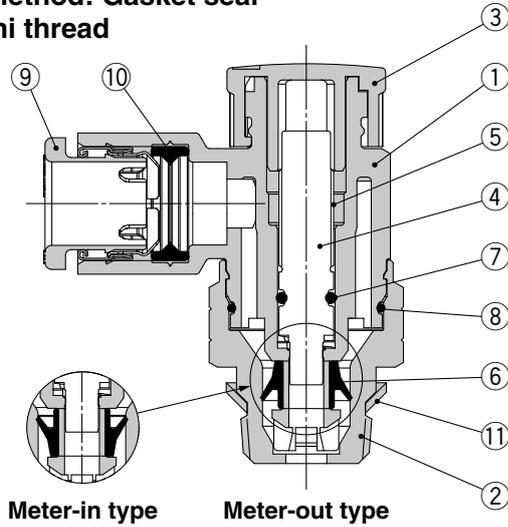
Sealant/Gasket seal AS-FG AS
 Face seal
 Gasket seal Uni-AS

Series AS

Construction

Elbow type

Seal method: Gasket seal
For Uni thread

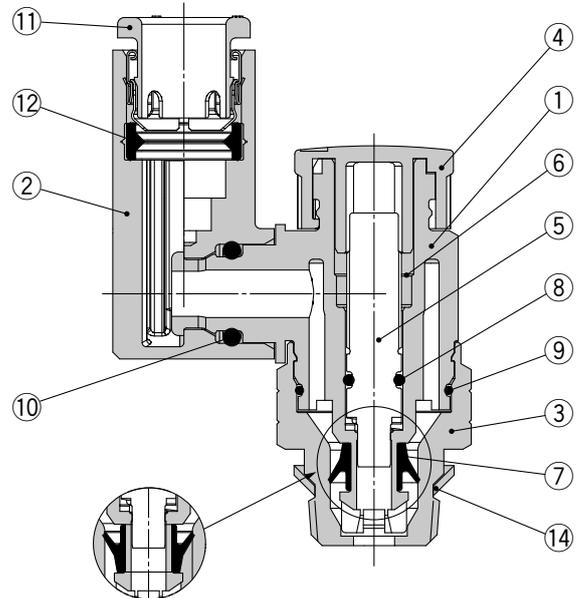
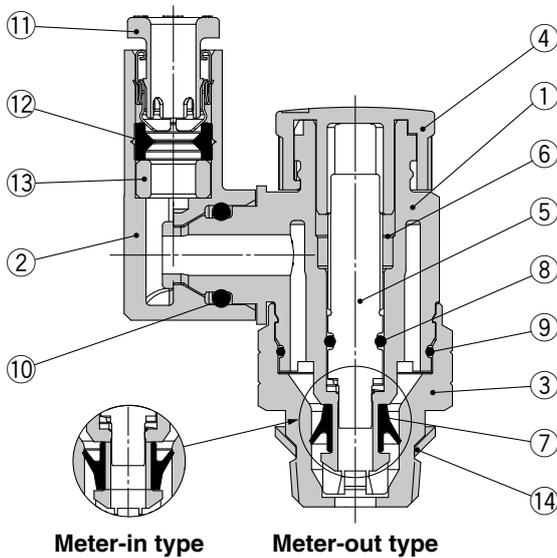


Component Parts

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

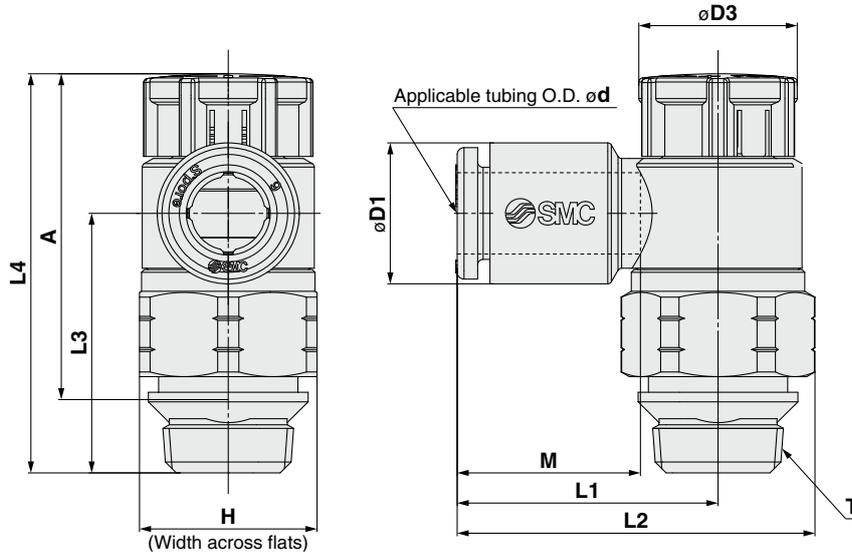


Component Parts

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 ^{Note)}	—	
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																						
AS22□1F-U01-10A	10			15.9																						
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																						
AS22□1F-U02-10A	10			15.9																						
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																						
AS32□1F-U02-10A	10			15.9																						
AS32□1F-U02-12A	12			18.5																						
AS32□1F-U03-06A	6			10.4																						
AS32□1F-U03-08A	8	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-U03-10A	10			15.9																						
AS32□1F-U03-12A	12			18.5																						
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										
AS42□1F-U04-16A	16	23.8																								

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

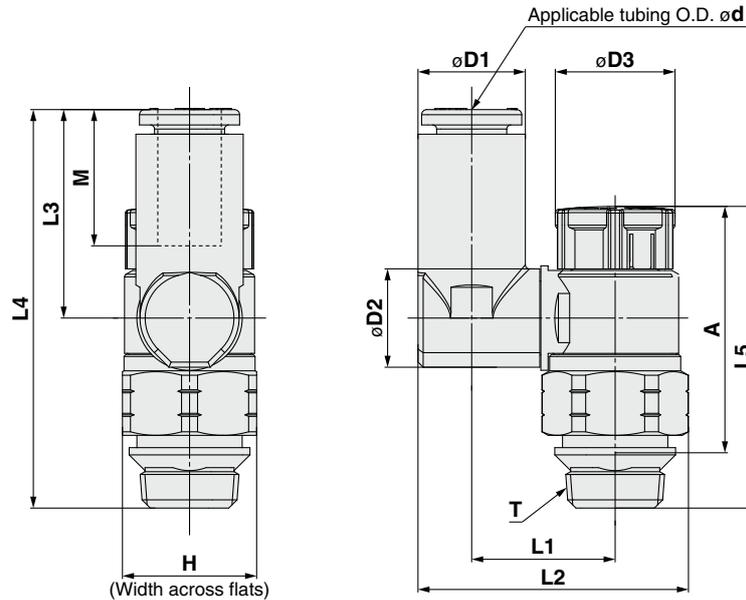
Inch Size

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										
AS22□1F-U01-09A	5/16"			13.2										
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										
AS22□1F-U02-09A	5/16"			13.2										
AS22□1F-U02-11A	3/8"			15.5										
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										
AS32□1F-U02-11A	3/8"			15.5										
AS32□1F-U03-07A	1/4"			11.2										
AS32□1F-U03-09A	5/16"			13.2										
AS32□1F-U03-11A	3/8"	3/8	19	15.5	16.6	26.7	37	28.2	42.3	40.7	35.9	34.3	15.6	40
AS42□1F-U04-11A	3/8"			15.5										
AS42□1F-U04-13A	1/2"			19.3										

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 ^{Note 1)}		A ^{Note 2)}		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			10.2	21.5		40						
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			12.9	23.5	46	14.2						
AS23□1F-U02-10A	10			15.9			20.9	38.1	24.7	47.3						15.6
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			23	37.1	23.5	59.9						14.2
AS33□1F-U02-10A	10			15.9			17.4	41.2	26.1	62.5						15.6
AS33□1F-U02-12A	12			18.5			20.2	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			23	37.1	23.5	52.2						14.2
AS33□1F-U03-10A	10			15.9			17.4	41.2	26.1	54.8						15.6
AS33□1F-U03-12A	12			18.5			20.2	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

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 ^{Note 1)}		A ^{Note 2)}		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			16.4	29.1		20.2						38.7	11
AS23□1F-U01-09A	5/16"			13.2			10.2	30.1		21.5						40	
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			12.9	23.5	46	14.2							
AS23□1F-U02-11A	3/8"			15.9			20.9	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			23	37.1	23.5	59.9						14.2	
AS33□1F-U02-11A	3/8"			15.9			17.4	41.2	26.1	62.5						15.6	
AS33□1F-U02-13A	7/16"			18.5			20.2	42.5	28.3	64.7						17	
AS33□1F-U03-07A	1/4"	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-U03-09A	5/16"			13.2			23	37.1	23.5	52.2						14.2	
AS33□1F-U03-11A	3/8"			15.9			17.4	41.2	26.1	54.8						15.6	
AS33□1F-U03-13A	7/16"			18.5			20.2	42.5	28.3	57						17	
AS43□1F-U04-11A	3/8"	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-U04-13A	1/2"			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

Prior to Use

Female Thread Conditions Applicable to Face Seal

1. Surface roughness of bearing surface: Rz 25 or less
2. Chamfer dimension: $\phi D1$, Seal bearing surface diameter: $\phi D2$ (Refer to the table below.)
3. Female thread inclination angle: 1° or less
4. Counterbore diameter when the female thread is counterbored.: $\phi D3$
 - 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 catalog.
5. If oil content or sealant is sticking to the female thread, this may cause damage of the product. Remove it before piping.

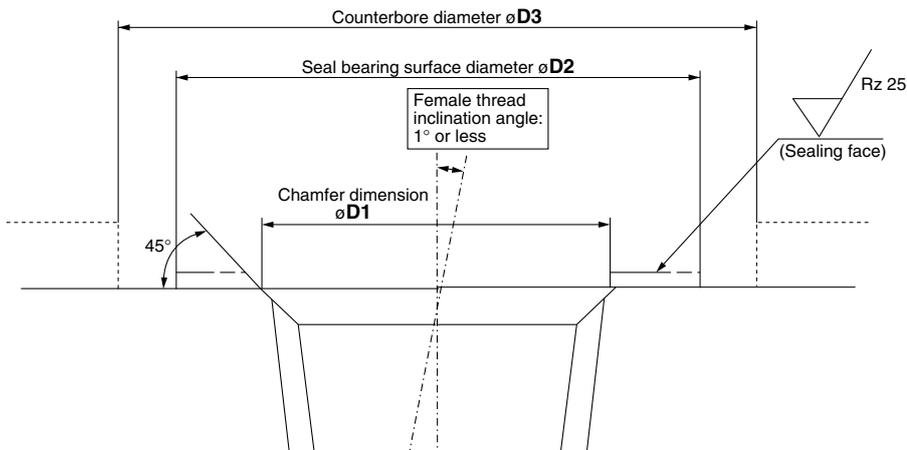


Table 1

Connection thread size	Chamfer dimension $\phi D1$ mm	Seal bearing surface diameter $\phi D2$ 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 on SMC website, <http://www.smcworld.com>

Design and Selection

Warning

1. Check the specifications.

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

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

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

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

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

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

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

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

It may cause human injury and/or an accident.

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

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

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

The speed controller's controlled flow values are with the needle fully open and free flow with the needle fully closed.

6. Check if PTFE can be used in application.

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

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

7. Speed controller is designed to control the speed of the actuator.

When it is used for adjusting the flow rate of the air blow, use a restrictor without check valve function (X214 or X21).

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.

Mounting

Warning

3. Tighten threads with the proper tightening torque.

When installing the products, follow the listed proper torque.

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

6. Do not use tools such as pliers to rotate the 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 catalog for handling One-touch fittings.

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

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 on SMC website, <http://www.smcworld.com>

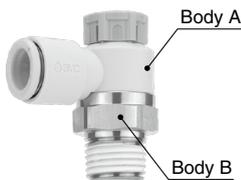
Mounting

Warning

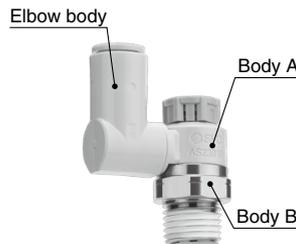
13. Do not use body A and/or elbow body for applications involving continuous rotation.

Body A and the fitting section may be damaged.

Elbow



Universal



Caution

For M5, 10-32UNF

Tightening method

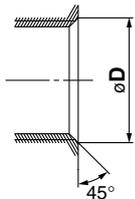
First, tighten it by hand, then give it an additional 1/6 turn to 1/4 turn with a wrench. A reference value for the tightening torque is 1 to 1.5 N·m.

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.

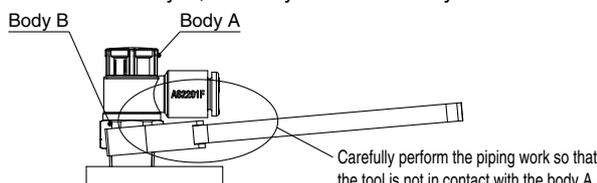


Female thread size	Chamfered dimension øD (Recommended value)
M5	5.1 to 5.4
10-32UNF	5.0 to 5.3

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)

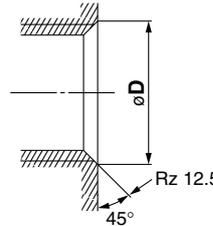
Tightening method

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, R1/8	3 to 5
NPT, R1/4	8 to 12
NPT, R3/8	15 to 20
NPT, R1/2	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 on SMC website, <http://www.smcworld.com>

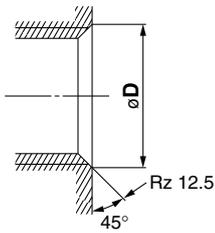
Mounting

⚠ Caution

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

Chamfered area for female thread (Recommended value)

1. 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.

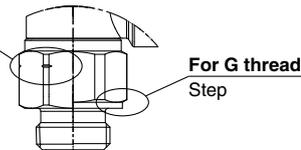


Nominal thread size	Chamfered dimension ϕD	
	Min.	Max.
1/8	9.8	10.2
1/4	13.3	13.7
3/8	16.8	17.2
1/2	21.0	21.4

2. 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

1. 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

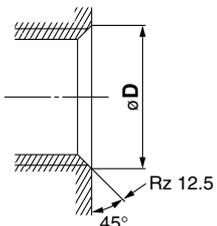
Connection Female Thread: G

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

2. 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 ϕD (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

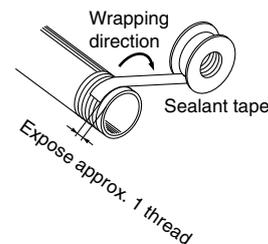
⚠ Caution

1. If the fitting is tightened with excessive torque, a large amount of sealant will seep out. Remove the excess sealant.
2. Insufficient tightening may loosen the threads, or cause air leakage.
3. Reuse
 - 1) Normally, fittings with sealant can be reused 2 to 3 times.
 - 2) To prevent air leakage through the sealant, remove any loose sealant stuck to the fitting by blowing air over the threaded portion.
 - 3) If the sealant no longer provides effective sealing, wrap sealing tape over the sealant before reusing. Do not use the sealant in any form other than a tape type.
4. Once the fitting has been tightened, backing it out to its original position often causes the sealant to become defective. Air leakage will occur.
5. Use R external threads with Rc internal threads and NPT external threads with NPT internal threads.

Piping

⚠ Caution

1. Refer to the Fittings & Tubing Precautions in the Best Pneumatics No. 6 catalog for handling One-touch fittings.
2. Preparation before piping
Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.
3. Wrapping of 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 catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.

The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.

1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

4. Contact SMC beforehand and take special consideration of safety measures if the product is to be used in any of the following conditions.

1. Conditions and environments outside of the given specifications, or use outdoors or in a place exposed to direct sunlight.
2. Installation on equipment in conjunction with atomic energy, railways, air navigation, space, shipping, vehicles, military, medical treatment, combustion and recreation, or equipment in contact with food and beverages, emergency stop circuits, clutch and brake circuits in press applications, safety equipment or other applications unsuitable for the standard specifications described in the product catalog.
3. An application which could have negative effects on people, property, or animals requiring special safety analysis.
4. Use in an interlock circuit, which requires the provision of double interlock for possible failure by using a mechanical protective function, and periodical checks to confirm proper operation.

Caution

1. The product is provided for use in manufacturing industries.

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

Limited warranty and Disclaimer/ Compliance Requirements

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

Read and accept them before using the product.

Limited warranty and Disclaimer

1. The warranty period of the product is 1 year in service or 1.5 years after the product is delivered, whichever is first.*2)
Also, the product may have specified durability, running distance or replacement parts. Please consult your nearest sales branch.
2. For any failure or damage reported within the warranty period which is clearly our responsibility, a replacement product or necessary parts will be provided.
This limited warranty applies only to our product independently, and not to any other damage incurred due to the failure of the product.
3. Prior to using SMC products, please read and understand the warranty terms and disclaimers noted in the specified catalog for the particular products.

*2) Vacuum pads are excluded from this 1 year warranty.

A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

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

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.

Revision history

Edition B * Not available

Edition C * Universal type added.

* Needle guide material changed.

* Width across flats (8 mm) added to the AS12□1F-M5, U10/32.

* Knob size changed.

* Number of pages increased from 20 to 36

SU

Edition D * Face seal (R, NPT thread) added.

* Number of pages increased from 36 to 48

TS

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