

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



## Model

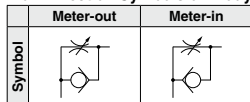
Model		Port size	Seal method	Applicable tubing O.D.														
Elbow type	Universal type			Metric size						Inch size								
AS12□1FG-M5	AS13□1FG-M5	M5 x 0.8	Gasket seal	2 Note 2	3.2	4	6	8	10	12	16	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"	
AS12□1FG-U10/32	AS13□1FG-U10/32	10-32UNF		● Note 3	●	●	●						●	●	●			
AS22□1FG-□01	AS23□1FG-□01	R NPT	Sealant Note 1)						● Note 3									
AS22□1FG-□02	AS23□1FG-□02			1/8														
AS32□1FG-□02	AS33□1FG-□02			1/4	● Note 3	●	●	●						● Note 3	●	●	●	
AS32□1FG-□03	AS33□1FG-□03			1/4														
AS32□1FG-□03	AS33□1FG-□03	3/8																
AS42□1FG-□04	AS43□1FG-□04	1/2																
AS22□1FG-G01	AS23□1FG-G01	G	Face seal		●	●	●	●	● Note 3								●	
AS22□1FG-G02	AS23□1FG-G02			1/8	● Note 3	●	●	●	●									
AS32□1FG-G02	AS33□1FG-G02			1/4														
AS32□1FG-G03	AS33□1FG-G03			1/4														
AS32□1FG-G03	AS33□1FG-G03			3/8														
AS42□1FG-G04	AS43□1FG-G04			1/2														

Note 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 pages 464 and 465 for details.)

## Flow Rate and Sonic Conductance

Model	AS12□1FG-M5 AS13□1FG-M5		AS22□1FG-□01 AS23□1FG-□01		AS22□1FG-□02 AS23□1FG-□02			AS32□1FG AS33□1FG		AS42□1FG AS43□1FG					
	Metric size	ø2 ø4 ø6	ø3.2 ø4 ø6	ø6 ø8 ø10	ø3.2	ø4	ø6	ø8 ø10	ø6	ø8	ø10 ø12	ø10	ø12 ø16		
Tubing O.D.	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 <sup>3</sup> /sbar)	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	0.4	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		

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.

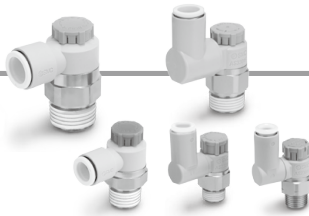
## ⚠ Caution

Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions, pages 543 to 546 for Flow Control Equipment Precautions, and pages 573 to 575 for Specific Product Precautions.

# AS-FG Series



## How to Order



**Body size**

1	M5 x 0.8 10-32UNF
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**Port size**

M5	M5 x 0.8
U10/32	10-32UNF

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

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

Note 1) For selecting applicable tubing O.D., refer to the "Model" on page 667. The color of the release button is white (metric, inch).  
Note 2) Use ø1/8" tube.

**Body size 1**

**Body size 2/3/4**

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

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.

**Thread type**

Nil	R
N	NPT
G	G

**Made to Order**  
Refer to page 678 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 <small>Note 3)</small>	
23	ø3.2 <small>Note 2)</small>	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 667. 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.

**Port size**

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

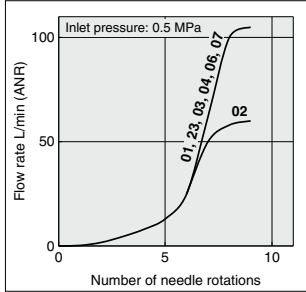


**Made to Order**  
(For details, refer to page 678.)

Symbol	Specifications
-X12	Lubricant: Vaseline
-X21	Grease-free (Seal: Fluorine-coated) + Restrictor (Without check valve)
-X214	Restrictor (Without check valve)
10-	Clean Series

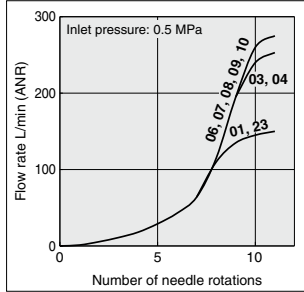
**Needle Valve/Flow Rate Characteristics**

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

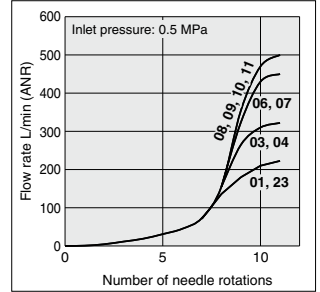


Note) -U10/32 has the same specification as M5.

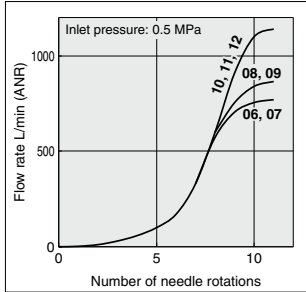
**AS2201FG-01, AS2211FG-01  
AS2301FG-01, AS2311FG-01**



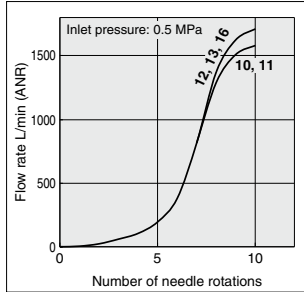
**AS2201FG-02, AS2211FG-02  
AS2301FG-02, AS2311FG-02**



**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.

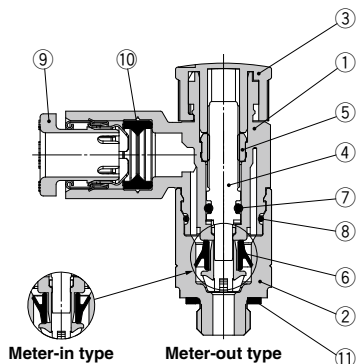
- AS-F
- TMH
- ASD
- AS
- AS-FE
- KE
- AS-FG
- AS-FP
- AS-FM
- AS-D
- AS-T
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASR
- ASQ

# AS-FG Series

## Construction

### Elbow type

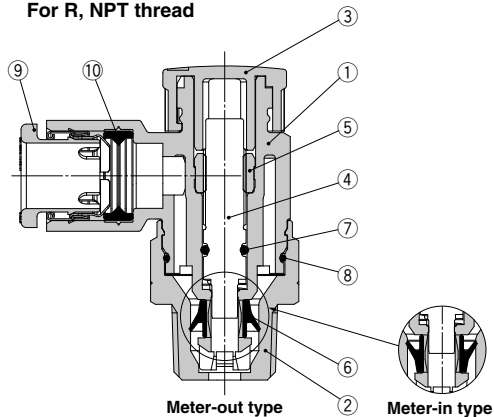
Seal method: Gasket seal  
For M5, 10-32UNF



Meter-in type

Meter-out type

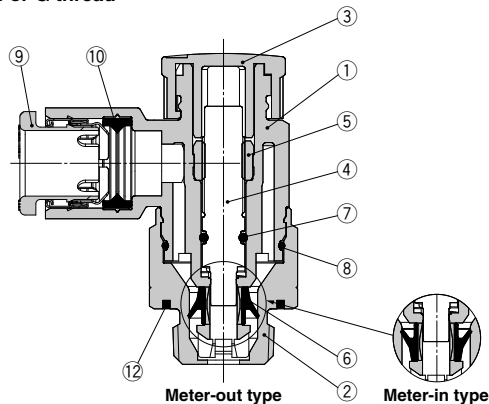
Seal method: Sealant  
For R, NPT thread



Meter-out type

Meter-in type

Seal method: Face seal  
For G thread



Meter-out type

Meter-in type

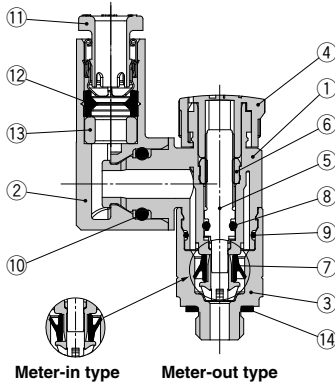
### Component Parts

No.	Description	Material	Note
1	Body A	PBT	
2	Body B	Stainless steel	
3	Knob	POM	
4	Needle	PBT	
5	Needle guide	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	

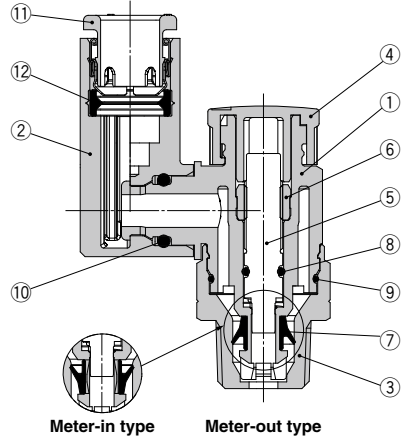
## Construction

### Universal type

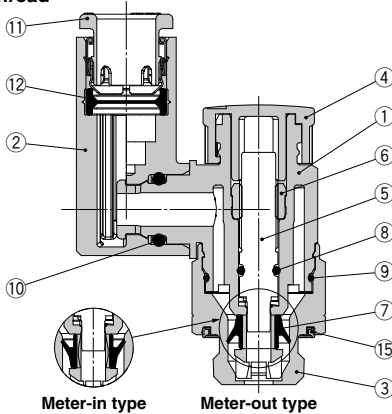
Seal method: Gasket seal  
For M5, 10-32UNF



Seal method: Sealant  
For R, NPT thread



Seal method: Face seal  
For G thread



### Component Parts

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

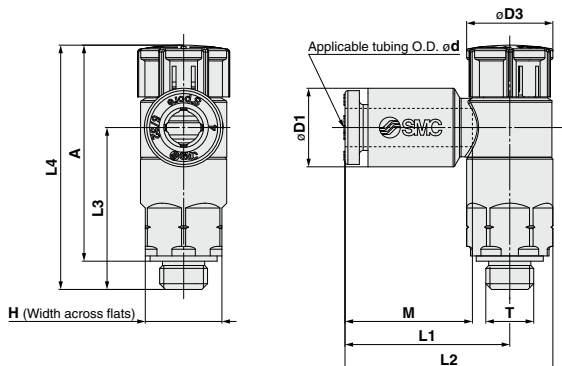
Note) Spacer is included only for the applicable tubing O.D.  $\phi 3.2$  and  $\phi 1/8$ ".

AS-F
TMH
ASD
AS
AS-FE
KE
AS-FG
AS-FP
AS-FM
AS-D
AS-T
ASP
ASN
AQ
ASV
AK
VCHC
ASR
ASQ

# AS-FG Series 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														
AS12□1FG-M5-23A	3.2			7.2										
AS12□1FG-U10/32-23A														
AS12□1FG-M5-04A	4			8.2										
AS12□1FG-U10/32-04A														
AS12□1FG-M5-06A	6	10.4	18.6	23.1	16.5	13.3	6							
AS12□1FG-U10/32-06A														

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																		
AS12□1FG-M5-03A	5/32"			8.2														
AS12□1FG-U10/32-03A																		
AS12□1FG-M5-07A	1/4"			11.2											18.6	23.1	16.5	6
AS12□1FG-U10/32-07A																		

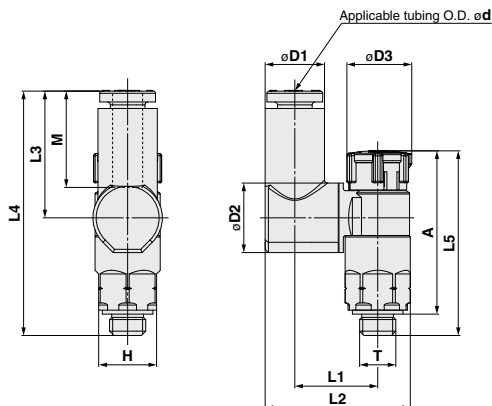
Note 1) Reference dimensions

Note 2) Reference dimensions of threads after installation



**Dimensions/ Universal type**

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



**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			8.2			11.5	20.1								
AS13□1FG-U10/32-04A				11.5												
AS13□1FG-M5-06A	6			10.4			21.2	20.4	36.6							
AS13□1FG-U10/32-06A		21.2														

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"			8.2			11.5	20.1								
AS13□1FG-U10/32-03A				11.5												
AS13□1FG-M5-07A	1/4"			11.2			21.6	20.2	36.5							
AS13□1FG-U10/32-07A		21.6														

Note 1) Reference dimensions

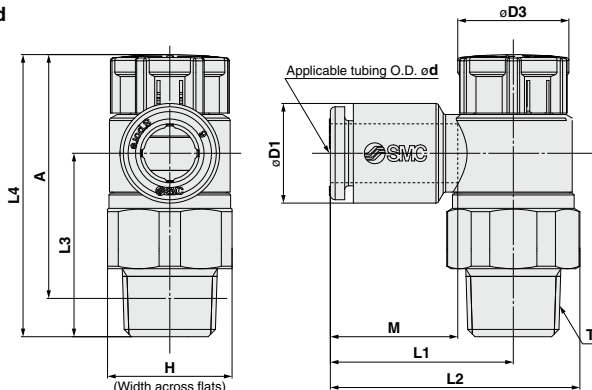
Note 2) Reference dimensions of threads after installation

- AS-F
- TMH
- ASD
- AS
- AS-FE
- KE
- AS-FG
- AS-FP
- AS-FM
- AS-D
- AS-T
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASR
- ASQ

# AS-FG Series 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	15.9	25.3	32.4									15.6	12 (11)
AS22□1FG-02-23(S)A	3.2	1/4	17 (17.5)	7.2	13	20.9	30.2 (30.3)	22.6	36.6	35	31.1	29.5	13.3	17 (18)	
AS22□1FG-02-04(S)A	4			8.2										17 (18)	
AS22□1FG-02-06(S)A	6			10.4										18 (19)	
AS22□1FG-02-08(S)A	8			13.2										19 (20)	
AS22□1FG-02-10(S)A	10	15.9	15.9	26.9	36.2 (36.3)									15.6	19 (20)
AS32□1FG-02-06(S)A	6	1/4	19	10.4	16.6	21.8	32.1	36.4	50	48.4	44.5	42.9	13.3	40 (40)	
AS32□1FG-02-08(S)A	8			13.2										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 (31)	
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-04-14(S)A	14			20.9										54 (54)	
AS42□1FG-04-16(S)A	16			23.8										55 (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 (18)	
AS22□1FG-02-07(S)A	1/4"			11.2										19 (19)	
AS22□1FG-02-09(S)A	5/16"			13.2										20 (20)	
AS22□1FG-02-11(S)A	3/8"	15.5	15.5	26.4	35.7 (35.8)									15.6	19 (20)
AS32□1FG-02-07(S)A	1/4"	1/4	19	11.2	16.6	21.8	32.1	36.4	50	48.4	44.5	42.9	13.3	40 (40)	
AS32□1FG-02-09(S)A	5/16"			13.2										41 (41)	
AS32□1FG-02-11(S)A	3/8"			15.5										42 (42)	
AS32□1FG-03-07(S)A	1/4"			11.2										43 (43)	
AS32□1FG-03-09(S)A	5/16"	3/8	19	13.2	16.6	22.7	33	28.7	42.3	40.7	37.1	35.5	13.3	29 (30)	
AS32□1FG-03-11(S)A	3/8"			15.5										30 (31)	
AS42□1FG-04-11(S)A	3/8"			11.2										31 (31)	
AS42□1FG-04-13(S)A	1/2"			13.2										32 (33)	
AS42□1FG-04-13(S)A	1/2"	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	3/8"			19.3										53 (53)	

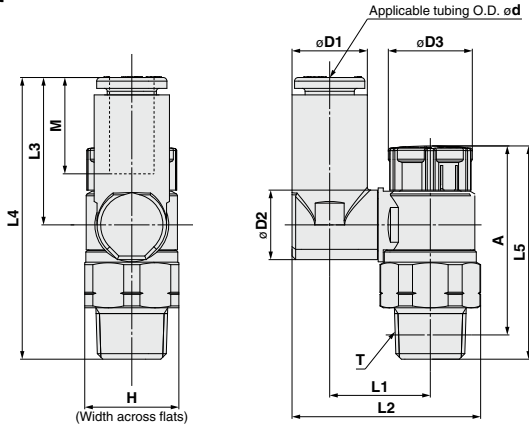
Note 1) Reference dimensions Note 2) Reference dimensions of threads after installation Note 3) The values in ( ) are for NPT thread.





**Dimensions/ Universal type**

Seal method: Sealant  
For R, NPT thread



**Metric Size**

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 Note 1)		A Note 2)		M	Weight			
											Unlocked	Locked	Unlocked	Locked		[g]			
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								20.4	20	10 (10)	
AS23□1FG-01-06(S)A	6			10.4			26.2	20.4								38.8	14.2	12 (11)	
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	13.3	18 (19)			
AS23□1FG-02-04(S)A	4			8.2			16.5	29.9 (30)								17.5	40.1	20 (21)	
AS23□1FG-02-06(S)A	6			11.2			33.8 (33.9)	21.4								43.9	14.2	21 (22)	
AS23□1FG-02-08(S)A	8	1/2	24 (23.8)	13.2	17.4	18	19	34.9 (35)	23.5	46	50.8	49.2	43.7	42.1	15.6	58 (57)			
AS23□1FG-02-10(S)A	10			15.9			20.9	38.1 (38.2)								24.7	47.3	17	62 (61)
AS23□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	23	41.2	26.1	54.8	42.3	40.7	37.1	35.5	15.6	46 (46)			
AS33□1FG-02-10(S)A	10			15.9			23	42.5								28.3	57	17	38 (39)
AS33□1FG-02-12(S)A	12			18.5			20.2	36								21.4	50.1	17	48 (48)
AS33□1FG-03-06(S)A	6	1/2	24 (23.8)	11.2	12.9	16.6	23	41.2	26.1	54.8	42.3	40.7	37.1	35.5	15.6	37 (38)			
AS33□1FG-03-08(S)A	8			13.2			20.2	37.1								23.5	52.2	17	38 (39)
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	3/4	24 (23.8)	18.5	17.4	18.8	25.6	46.4 (46.3)	26.1	61.2	50.8	49.2	43.7	42.1	15.6	58 (57)			
AS43□1FG-04-10(S)A	10			15.9			26.2	48.3 (48.2)								28.3	63.4	17	62 (61)
AS43□1FG-04-12(S)A	12			18.5			21	18.8								25.6	46.4 (46.3)	26.1	61.2

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

**Inch Size**

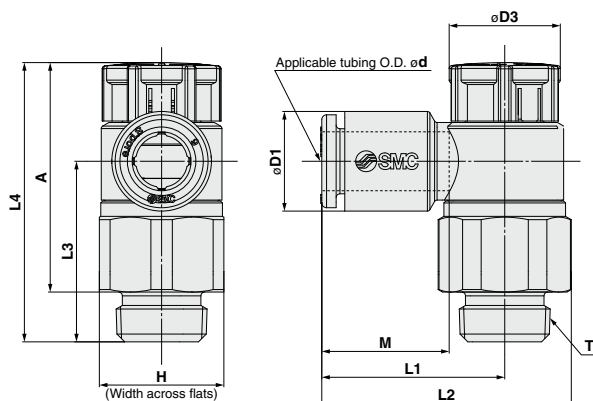
Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 Note 1)		A Note 2)		M	Weight			
											Unlocked	Locked	Unlocked	Locked		[g]			
AS23□1FG-01-01(S)A	1/8"	1/8	13 (12.7)	7.2	9.6	12	13.3	24	17.5	36	30.6	29.2	27.5	26.1	13.3	10 (9)			
AS23□1FG-01-03(S)A	5/32"			8.2			13.9	25.1								20.4	20	10 (10)	
AS23□1FG-01-07(S)A	1/4"			11.2			16.4	29.1								20.2	38.7	11	10
AS23□1FG-01-09(S)A	5/16"	1/4	17 (17.5)	13.2	12.9	13	16.4	30.1	21.5	40	36.6	35	31.1	29.5	13.3	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			33.8 (33.9)	21.4								43.9	20 (21)	14.2	21 (22)
AS23□1FG-02-09(S)A	5/16"	3/8	19	13.2	12.9	16.6	19	34.9 (35)	23.5	46	50.8	49.2	43.7	42.1	15.6	58 (57)			
AS23□1FG-02-11(S)A	3/8"			15.9			20.9	38.1 (38.2)								24.7	47.3	17	62 (61)
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"	3/4	24 (23.8)	13.2	12.9	16.6	23	41.2	26.1	54.8	42.3	40.7	37.1	35.5	15.6	46 (46)			
AS33□1FG-02-11(S)A	3/8"			15.9			23	42.5								28.3	57	17	38 (39)
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"	1/2	24 (23.8)	13.2	12.9	16.6	23	37.1	23.5	52.2	42.3	40.7	37.1	35.5	15.6	42 (43)			
AS33□1FG-03-11(S)A	3/8"			15.9			23	41.2								26.1	54.8	17	62 (61)
AS43□1FG-04-11(S)A	3/8"			18.5			25.6	46.4 (46.3)								26.1	61.2	50.8	49.2
AS43□1FG-04-13(S)A	1/2"	3/4	24 (23.8)	18.5	17.4	18.8	26.2	48.3 (48.2)	28.3	63.4	50.8	49.2	43.7	42.1	17	62 (61)			
AS43□1FG-04-13(S)A	1/2"			21			18.8	25.6								46.4 (46.3)	26.1	61.2	50.8

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

# AS-FG Series For G thread

## Dimensions/ Elbow type

Seal method: Face seal  
For G thread



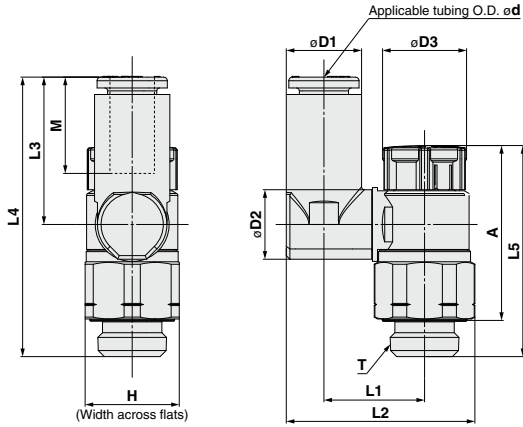
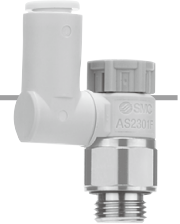
### Metric Size

[mm]

Model	d	T	H	D1	D3	L1	L2	L3	L4		A		M	Weight [g]
									Unlocked	Locked	Unlocked	Locked		
AS22□1FG-G01-23A	3.2	1/8	13	7.2	12	19.1	26.2	18.8	30.3	28.9	24.8	23.4	13.3	10
AS22□1FG-G01-04A	4			8.2										
AS22□1FG-G01-06A	6			10.4										
AS22□1FG-G01-08A	8			13.2										
AS22□1FG-G01-10A	10	15.9	25.3	32.4										
AS22□1FG-G02-23A	3.2	1/4	17	7.2	13	23.4	32.7	22.6	36.6	35	30.1	28.5	13.3	20
AS22□1FG-G02-04A	4			8.2										
AS22□1FG-G02-06A	6			10.4										
AS22□1FG-G02-08A	8			13.2										
AS22□1FG-G02-10A	10	15.9	26.9	36.2										
AS32□1FG-G02-06A	6	1/4	21	10.4	16.6	21.8	33	36.4	50	48.4	43.5	41.9	13.3	50
AS32□1FG-G02-08A	8			13.2										
AS32□1FG-G02-10A	10			15.9										
AS32□1FG-G02-12A	12			18.5										
AS32□1FG-G03-06A	6	3/8	21	10.4	16.6	21.8	33	28.7	42.3	40.7	34.8	33.2	13.3	37
AS32□1FG-G03-08A	8			13.2										
AS32□1FG-G03-10A	10			15.9										
AS32□1FG-G03-12A	12			18.5										
AS42□1FG-G04-10A	10	1/2	27	15.9	18.8	27.4	41.8	36.2	50.8	49.2	41.8	40.2	15.6	69
AS42□1FG-G04-12A	12			18.5										
AS42□1FG-G04-16A	16			23.8										
				34.8										

**Dimensions/ Universal type**

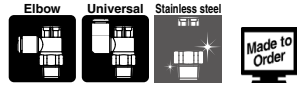
Seal method: Face seal  
For G thread



**Metric Size**

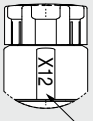
Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5		A		M	Weight [g]
											Unlocked	Locked	Unlocked	Locked		
AS23□1FG-G01-23A	3.2	1/8	13	7.2	9.6	12	13.3	24.0	17.5	35.7	30.3	28.9	24.8	23.4	13.3	10
AS23□1FG-G01-04A	4			8.2			13.9	25.1								10
AS23□1FG-G01-06A	6			10.4	16.4		26.2	20.4	11							
AS23□1FG-G01-08A	8	1/4	17	13.2	10.2	13	16.4	30.1	21.5	39.7	36.6	35	30.1	28.5	14.2	12
AS23□1FG-G02-04A	4			8.2	16.5		29.9	17.5	40.1	21						
AS23□1FG-G02-06A	6			10.4	19		33.8	21.4	43.9	13.3						
AS23□1FG-G02-08A	8	13.2	20.9	34.9	23.5	46.0	14.2	24								
AS23□1FG-G02-10A	10	15.9	20.9	38.1	24.7	47.3	15.6	25								
AS33□1FG-G02-06A	6	1/4	21	10.4	12.9	16.6	20.2	36.6	21.4	57.8	50	48.4	43.5	41.9	13.3	51
AS33□1FG-G02-08A	8			13.2			38.0	23.5	59.9	14.2					52	
AS33□1FG-G02-10A	10			15.9	42.2		26.1	58.0	15.6	55						
AS33□1FG-G02-12A	12	18.5	23	43.5	28.3	59.9	17	57								
AS33□1FG-G03-06A	6	3/8	21	10.4	12.9	16.6	20.2	36.6	21.4	50.1	42.3	40.7	34.8	33.2	13.3	40
AS33□1FG-G03-08A	8			13.2			38.0	23.5	52.2	14.2					41	
AS33□1FG-G03-10A	10			15.9	42.2		26.1	50.3	15.6	44						
AS33□1FG-G03-12A	12	18.5	23	43.5	28.3	52.2	17	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

- AS-F
- TMH
- ASD
- AS
- AS-FE
- KE
- AS-FG
- AS-FP
- AS-FM
- AS-D
- AS-T
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASR
- ASQ



## 1 Lubricant: Vaseline

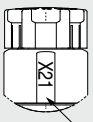
**-X12**



Example) AS2201FG-01-04SA-X12

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

**-X21**



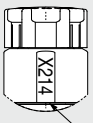
Example) AS2201FG-01-04SA-X21

Note 1) Not particle-free

Note 2) This product is a restrictor without a check valve (no control direction). Be aware that all part numbers are for a meter-out type; there is no part number for a meter-in type.

## 3 Restrictor (Without check valve)

**-X214**

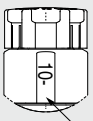


Example) AS2201FG-01-04SA-X214

Note) This product is a restrictor without a check valve (no control direction). Be aware that all part numbers are for a meter-out type; there is no part number for a meter-in type.

## 4 Clean Series

**10-**



Example) 10-AS2201FG-01-04SA

Note 1) Fluorine grease is used.

Note 2) The cleanliness class (ISO class) is 5.

Note 3) Excluding G thread type.



# AS Series Specific Product Precautions 1

Be sure to read this before handling the products.

Refer to back page 50 for Safety Instructions and pages 543 to 546 for Flow Control Equipment Precautions.

## 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

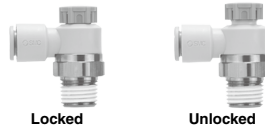
### Warning

#### 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.



#### 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. For handling One-touch fittings, refer to the Fittings and Tubing Precautions on pages 13 to 17.

#### 11. Tubing O.D. ø2

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

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

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

AS-F

TMH

ASD

AS

AS-FE

KE

AS-FG

AS-FP

AS-FM

AS-D

AS-T

ASP

ASN

AQ

ASV

AK

VCHC

ASR  
ASQ



# AS Series Specific Product Precautions 2

Be sure to read this before handling the products.

Refer to back page 50 for Safety Instructions and pages 543 to 546 for Flow Control Equipment Precautions.

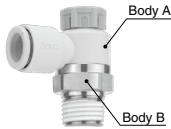
## Mounting

### Warning

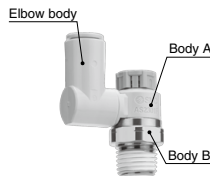
13. Do not use body A and/or elbow body for applications involving continuous rotation.

Body A and the fitting section may be damaged.

#### Elbow



#### Universal



### Caution

#### For M5, 10-32UNF

#### Tightening method

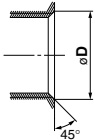
First, tighten it by hand, then give it an additional 1/6 turn to 1/4 turn with a wrench. A reference value for the tightening torque is 1 to 1.5 N·m.

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.

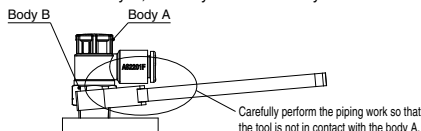


Female thread size	Chamfered dimension $\phi D$ (Recommended value)
M5	5.1 to 5.4
10-32UNF	5.0 to 5.3

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)

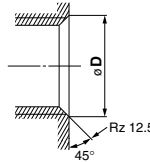
#### Tightening method

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 $\phi D$ (Recommended value)	
	Rc	NPT, NPTF
1/8	10.2 to 10.4	10.5 to 10.7
1/4	13.6 to 13.8	14.1 to 14.3
3/8	17.1 to 17.3	17.4 to 17.6
1/2	21.4 to 21.6	21.7 to 21.9

\* 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

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



# AS Series

## Specific Product Precautions 3

Be sure to read this before handling the products.

Refer to back page 50 for Safety Instructions and pages 543 to 546 for Flow Control Equipment Precautions.

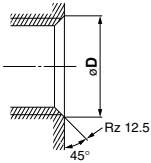
### Mounting

#### ⚠ Caution

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

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

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



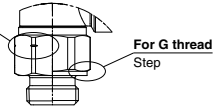
Nominal thread size	Chamfered dimension $\phi D$	
	Min.	Max.
1/8	9.8	10.2
1/4	13.3	13.7
3/8	16.8	17.2
1/2	21.0	21.4

- Use G external threads with G internal threads.

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

For R, NPT thread

R: Without slit  
NPT: With slit



### For Uni Thread

#### Tightening method

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

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

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

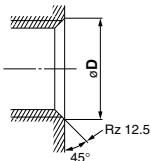
#### Connection Female Thread: G

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

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

#### Chamfered area for female thread

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



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

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

### Piping Threads with Sealant

#### ⚠ Caution

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

### Piping

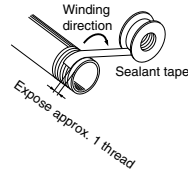
#### ⚠ Caution

- For handling One-touch fittings, refer to the Fittings and Tubing Precautions on pages 13 to 17.
- 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. Winding of sealant tape

When screwing together pipes and fittings, etc., be certain that chips from the pipe threads and sealing material is used, not get inside the pipe. Also, when the sealant tape is do, leave approx. 1 thread ridges exposed at the end of the threads.



AS-F  
TMH  
ASD  
AS  
AS-FE  
KE  
AS-FG  
AS-FP  
AS-FM  
AS-D  
AS-T  
ASP  
ASN  
AQ  
ASV  
AK  
VCHC  
ASR  
ASQ