Speed Controller with One-touch Fitting
Elbow Type/Universal Type
Series AS

Minimizes installation time and cost
Reduces the mounting height and enables compact machinery design. Effective area is larger than the former model.

Tube swivels 360°
Universal type permits 360° piping swivel.

ø2 size added to applicable tubing sizes
- **Metric size** (Release button: White color)
  ø2, ø3.2, ø4, ø6, ø8, ø10, ø12
- **Inch size** (Release button: Orange color)
  ø1/8", ø5/32", ø3/16", ø1/4", ø5/16", ø3/8", ø1/2"

Maximum operating pressure 1 MPa max.

Applicable tubing materials
Nylon, soft nylon, and polyurethane tubing are applicable.

Retainer prevents accidental loss of needle.

Option
Hexagonal lock nut, Nickel plated option

Number of needle rotations has been increased (8 to 10 turns)
The increased number of needle rotations (8 to 10 turns) permits easy control at low speeds.

Model

Elbow type	Universal type	Port size	Applicable tubing O.D.														Applicable cylinder bore size (mm)
			Metric size							Inch size							
			2	3.2	4	6	8	10	12	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	
AS12□1F-M3	**AS13□1F-M3**	M3 x 0.5	◉(2)	◉	◉					◉	◉						2.5, 4, 6
AS12□1F-M5	**AS13□1F-M5**	M5 x 0.8	◉(2)	◉	◉	◉				◉	◉	◉	◉				6, 10, 16, 20 (1)
AS12□1F-U10/32	**AS13□1F-U10/32**	10-32 UNF		◉	◉	◉				◉	◉	◉	◉				6, 10, 16, 20
AS22□1F-01	**AS23□1F-01**	R 1/8		◉	◉	◉	◉	◉(2)		◉	◉	●	◉	◉			20, 25, 32
AS22□1F-02	**AS23□1F-02**	R 1/4			◉	◉	◉	◉			◉	●	◉	◉	●		20, 25, 32, 40
AS32□1F-02	**AS33□1F-02**	R 1/4				◉	◉	◉	◉				◉	◉	●		40, 50, 63
AS32□1F-03	**AS33□1F-03**	R 3/8				●	●	●	●				●	●	●		40, 50, 63
AS42□1F-04	**AS43□1F-04**	R 1/2						●	●						●	●	63, 80, 100

Note 1) AS12□1F-M5-02 applicable cylinder bore sizes are 2.5, 4, 6.
Note 2) Elbow type only
Note 3) Meter-out and meter-in types can be visually differentiated by the lock nut. The lock nut on the meter-out type is electroless nickel plated, while the meter-in type is black zinc chromate plated.
Note 4) ◉ Marking is electroless nickel plated, provided as standard. (N specificaitons)

Specifications

Fluid	Air
Proof pressure	1.5 MPa (1.05 MPa (1))
Max. operating pressure	1 MPa (0.7 MPa (1))
Mini. operating pressure	0.1 MPa
Ambient and fluid temperature	–5 to 60°C (No freezing)
Number of needle rotations	10 turns (8 turns (2))
Applicable tubing material (3)	Nylon, Soft nylon, Polyurethane (4)
Option	With seal, Hexagon lock nut (5), Electroless nickel plated (6)

Note 1) In case of AS12□1F-M3-02, AS12□1F-M5-02
Note 2) In case of AS12□1F-M5 and AS12□1F-U10/32 types.
In case of AS13□1F-M5 and AS13□1F-U10/32
AS12□1F-M5-02: 10 turns.
Note 3) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used. (Refer to pages 371 and 372 for details.)
Note 4) In case of AS12□1F-M3-02 and AS12□1F-M5-02, polyurethane only.
Note 5) M3, M5, 10-32UNF type ports are not available with seals.
Note 6) Brass parts are all electroless nickel plated.

Flow Rate and Effective Area

Model		AS12□1F-M3 AS13□1F-M3 AS12□1F-M5-02	AS12□1F-M5 AS13□1F-M5	AS22□1F-01 AS23□1F-01		AS22□1F-02 AS23□1F-02			AS32□1F AS33□1F			AS42□1F AS43□1F	
Tubing O.D.	Metric size	ø2, ø3.2, ø4	ø3.2, ø4, ø6	ø3.2, ø4	ø6, ø8, ø10	ø4	ø6	ø8, ø10	ø6	ø8	ø10, ø12	ø10	ø12
	Inch size	ø1/8", ø5/32"	ø1/8", ø3/16" ø1/4", ø5/32"	ø1/8", ø5/32"	ø3/16", ø1/4", ø5/16"	ø5/32"	ø3/16"	ø1/4", ø5/16", ø3/8"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
Controlled flow (Free flow)	Flow rate ℓ/min (ANR)	20	100	180	230	260	390	460	660	790	920	1580	1710
	Effective area (mm²)	0.3	1.5	2.7	3.5	4	6	7	10	12	14	24	26

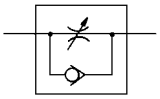
Note 1) Flow rate values are measured at 0.5 MPa and 20°C.
Note 2) U10/32 has the same specification as M5.

Elbow type

Applicable tubing O.D. ø2

Universal type

JIS Symbol



Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Symbol		
JIS Symbol		

⚠Caution

Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.

Made to Order
(Refer to page 422 for details.)

How to Order

AS [2] [2] [0] **1F** – [ ] [01] – [06] [S] – [ ]

Body size

1	M3, M5 standard
2	1/8, 1/4 standard
3	3/8 standard
4	1/2 standard

Type

2	Elbow
3	Universal

Control type

0	Meter-out
1	Meter-in

With One-touch fitting

Thread type

Nil	Metric thread (M3, M5)
	Unified thread (10-32 UNF)
	R
N	NPT

Port size

M3	M3 x 0.5
M5	M5 x 0.8
U10/32	10-32 UNF
01	1/8
02	1/4
03	3/8
04	1/2

Applicable tubing O.D.

Metric size		Inch size	
02	ø2	01	ø1/8"
23	ø3.2*	03	ø5/32"
04	ø4	05	ø3/16"
06	ø6	07	ø1/4"
08	ø8	09	ø5/16"
10	ø10	11	ø3/8"
12	ø12	13	ø1/2"

*Use ø1/8" tube.

Option

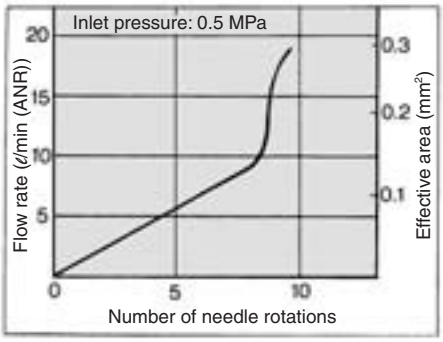
Nil	None
S	With seal
K	Hexagonal lock nut
N	Electroless nickel plated

*1 If more than one option is required, write option part numbers in the order of "S", "K", "N".
*2 M3, M5, and U10/32 are not available with seals.

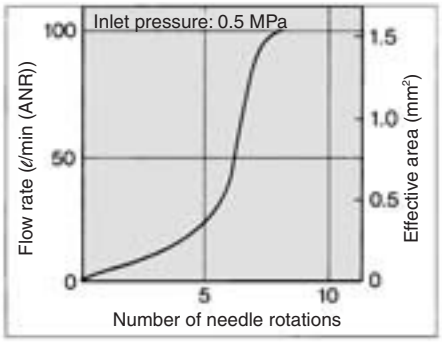
Made to Order
(Refer to page 422 for details.)

Needle Valve/Flow Characteristics

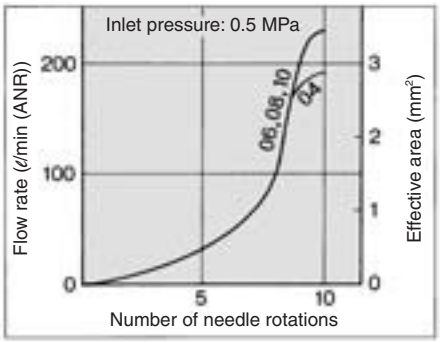
AS1201F-M3, AS1211F-M3
AS1301F-M3, AS1311F-M3
AS1201F-M5-02, AS1211F-M5-02



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

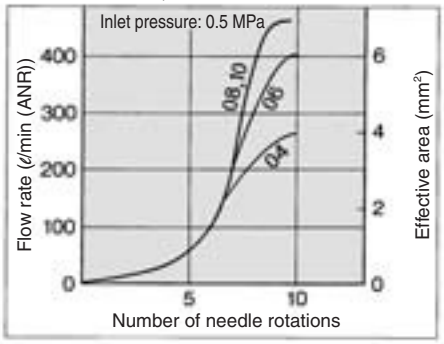


AS2201F-01, AS2211F-01
AS2301F-01, AS2311F-01

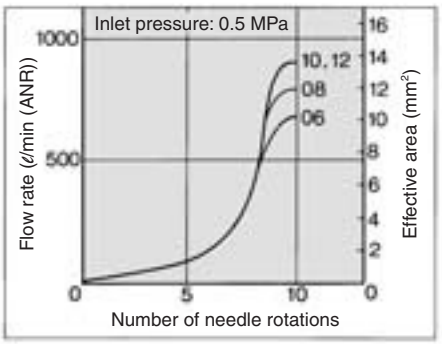


Note) "-U10/32" is the same as "M5".

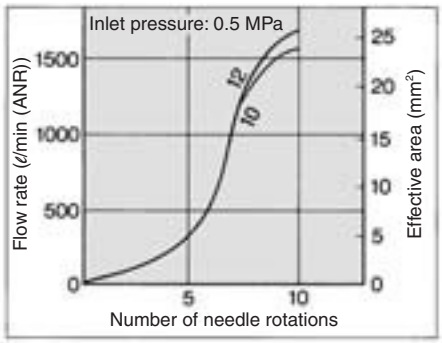
AS2201F-02, AS2211F-02
AS2301F-02, AS2311F-02



AS3201F, AS3211F
AS3301F, AS3311F



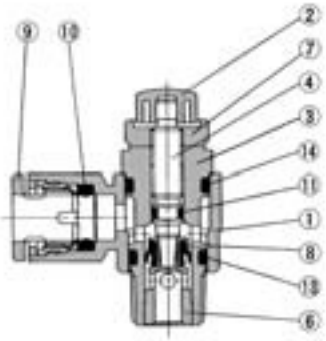
AS4201F, AS4211F
AS4301F, AS4311F



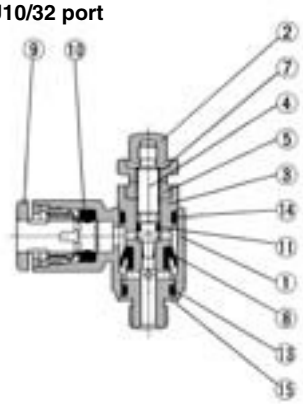
Construction

Elbow type

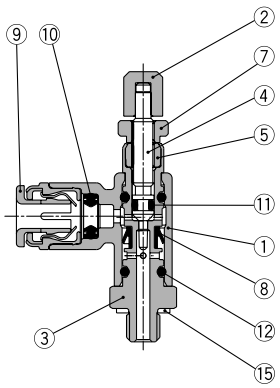
Meter-out type



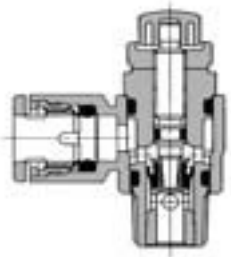
M3 port
M5 port
U10/32 port



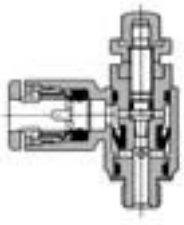
ø2 tubing type



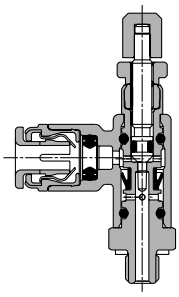
Meter-in type



M3 port
M5 port
U10/32 port

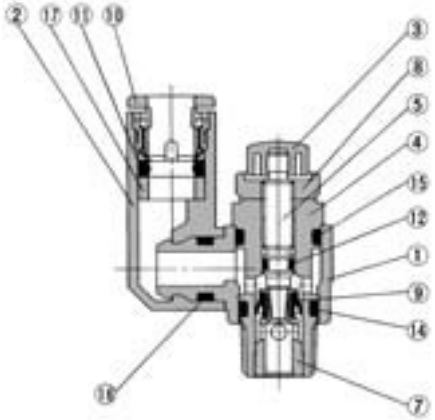


ø2 tubing type

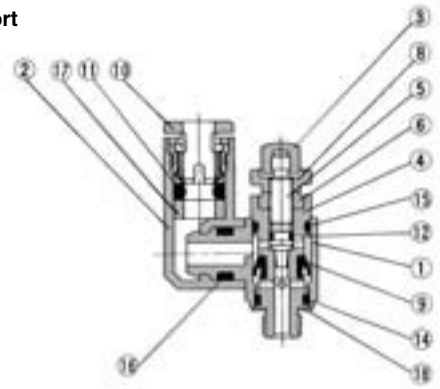


Universal type

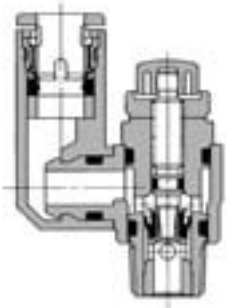
Meter-out type



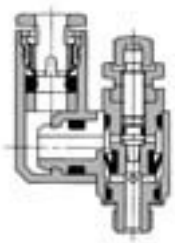
M3 port
M5 port
U10/32 port



Meter-in type



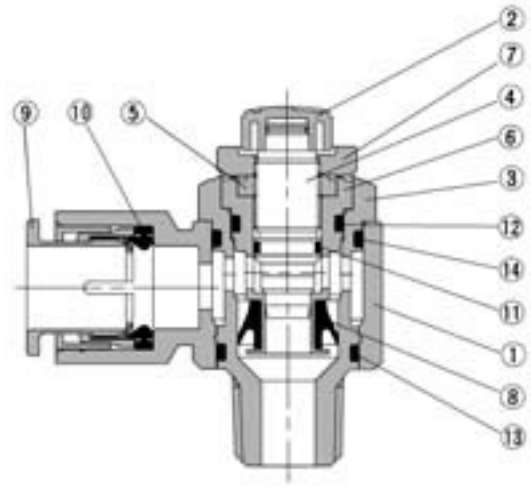
M3 port
M5 port
U10/32 port



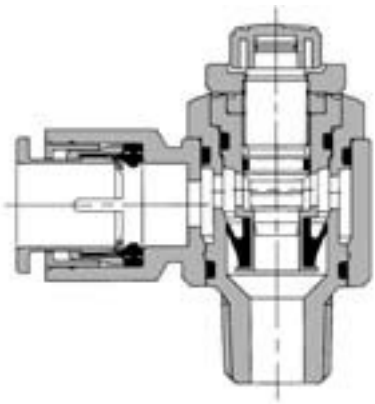
Construction

Elbow type

Meter-out type AS3201F-02



Meter-in type AS3211F-02



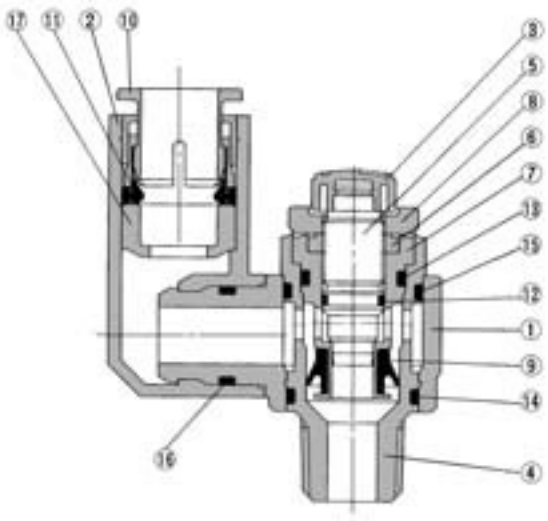
Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Handle**	PBT (1)	
3	**Body B**	Brass (2)	Electroless nickel plated
4	**Needle**	Brass	Electroless nickel plated
5	**Needle guide**	Brass	Electroless nickel plated
6	**Seat ring**	Brass	(3)
7	**Lock nut**	Brass (4)	Electroless nickel plated (5)
8	**U-packing**	HNBR	
9	**Cassette**	—	
10	**Seal**	NBR	
11	**O-ring**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**O-ring**	NBR	
15	**Gasket**	NBR, Stainless steel	

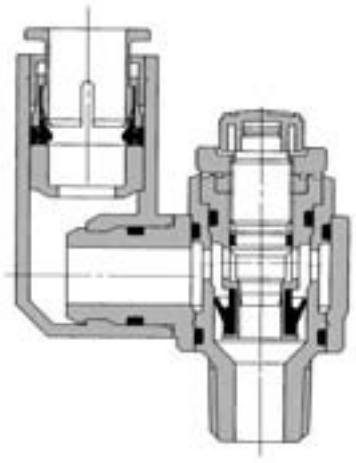
Note 1) AS12□1F-M3-02 and AS12□1F-M5-02 are made of electroless nickel plated brass.
Note 2) AS12□1F-M3 is made of stainless steel.
Note 3) AS22□1F, AS32□1F-02: Electroless nickel plated.
Note 4) AS2□□1F type is made of steel.
Note 5) Meter-in type is black zinc chromate plated.

Universal type

Meter-out type AS3301F-02



Meter-in type AS3311F-02



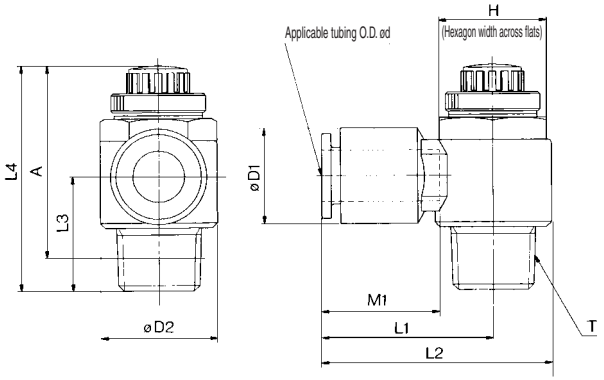
Component Parts

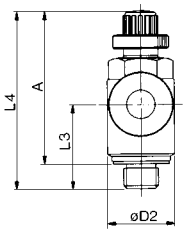
No.	Description	Material	Note
1	**Body A**	PBT	
2	**Elbow body**	PBT	
3	**Handle**	PBT	
4	**Body B**	Brass (1)	Electroless nickel plated
5	**Needle**	Brass	Electroless nickel plated
6	**Needle guide**	Brass	Electroless nickel plated
7	**Seat ring**	Brass	(2)
8	**Lock nut**	Brass (3)	Electroless nickel plated (4)
9	**U seal**	HNBR	
10	**Cassette**	—	
11	**Seal**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**O-ring**	NBR	
15	**O-ring**	NBR	
16	**O-ring**	NBR	
17	**Spacer**	—	
18	**Gasket**	NBR, Stainless steel	

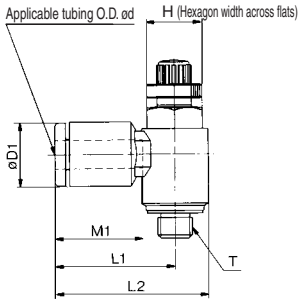
Note 1) AS13□1F-M3 is made of stainless steel.
Note 2) AS23□1F, AS33□1F-02: Electroless nickel plated.
Note 3) AS2□□1F type is made of steel.
Note 4) Meter-in type is black zinc chromate plated.

Elbow Type

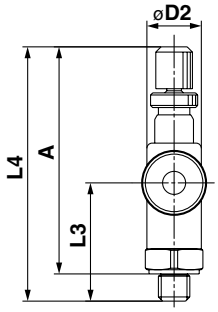
M3 port
M5 port
U10/32 port

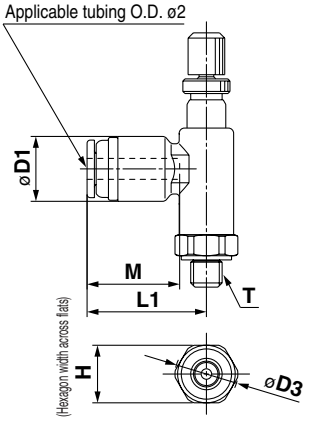






ø2 tubing type
AS12□1F-M3-02
AS12□1F-M5-02





Metric Size

Model	Applicable tubing O.D. ød	T	H (1)	D1	D2	D3	L1	L2	L3	L4 (3) Max.	L4 (3) Min.	A (2) Max.	A (2) Min.	M1	Mass (g)
AS12□1F-M3-02	2	M3 x 0.5	5.5	6	5.2	6	11.4	—	11	26.8	24.3	24.3	21.8	8.8	2.4
AS12□1F-M5-02		M5 x 0.8	7			7.5			11.5	27.3	24.8				3
AS12□1F-M3-23	3.2	M3 x 0.5	5.5	8.4	7.2	—	16.1	19.7	10.5	26.6	24.1	24	21.5	12.7	4
AS12□1F-M3-04	4			9.3					10						
AS12□1F-M5-23	3.2	M5 x 0.8	8	8.4	9.6	—	17.3	22.1	12.3	28.6	25.8	25	22.2	12.7	7
AS12□1F-U10/32-23		10-32UNF													
AS12□1F-M5-04	4	M5 x 0.8		9.3			17.3	22.1							
AS12□1F-U10/32-04		10-32UNF													
AS12□1F-M5-06	6	M5 x 0.8		11.6			18.1	22.9	11.7					13.5	
AS12□1F-U10/32-06		10-32UNF													
AS22□1F-01-23	3.2	1/8	12 (12.7)	9.3	14.2	—	20.4	27.5	13.4	35.2	30.2	32.1	27.1	12.7	16
AS22□1F-01-04	4			9.3			20.4	27.5							17
AS22□1F-01-06	6			11.6			20.4	27.5						13.5	
AS22□1F-01-08	8			15.2			25.3	32.4						18.5	19
AS22□1F-01-10	10			18.5			32.1	39.2	14.1					21	21
AS22□1F-02-04	4	1/4	17 (17.5)	10.4	18.5	—	25.2	34.4	17.7	39.9	34.9	34.4	29.4	16	32
AS22□1F-02-06	6			12.8			25.2	34.4						17	
AS22□1F-02-08	8			15.2			27.2	36.4						18.5	34
AS22□1F-02-10	10			18.5			35.3	44.5	19.5					21	36
AS32□1F-02-06	6		19	12.8	23	—	27.8	39.3	21.3	48.3	43.3	42.8	37.8	17	60
AS32□1F-02-08	8			15.2			29.5	41						18.5	63
AS32□1F-02-10	10			18.5			31.8	43.3						21	67
AS32□1F-02-12	12			20.9			32.8	44.3						22	69
AS32□1F-03-06	6	3/8		12.8	23		27.8	39.3	19.8	45.4	40.4	40.2	35.2	17	55
AS32□1F-03-08	8			15.2			29.5	41						18.5	57
AS32□1F-03-10	10			18.5			31.8	43.3						21	59
AS32□1F-03-12	12			20.9			32.8	44.3						22	61
AS42□1F-04-10	10	1/2	24 (23.8)	18.5	28.6	—	33.6	47.9	24.5	56.7	49.2	49.6	42.1	21	100
AS42□1F-04-12	12			20.9			34.6	48.9						22	101

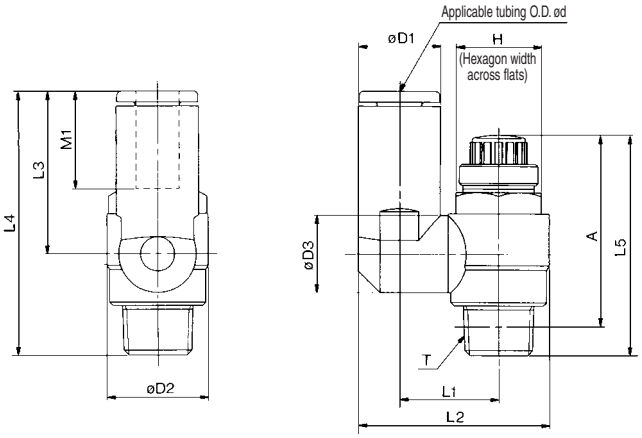
Note 1) ( ) are the dimensions of NPT thread.
Note 2) Reference thread dimensions after installation.
Note 3) Reference dimensions

Inch Size

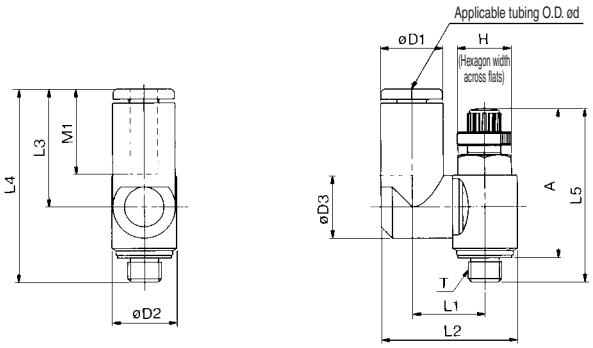
Model	Applicable tubing O.D. ød	T	H (1)	D1	D2	L1	L2	L3	L4 (3) Max.	L4 (3) Min.	A (2) Max.	A (2) Min.	M1	Mass (g)
AS12□1F-M3-01	1/8"	M3 x 0.5	5.5	8.4	7.2	16.1	19.7	10.5	26.6	24.1	24	21.5	12.7	4
AS12□1F-M3-03	5/32"			9.3				10						
AS12□1F-M5-01	1/8"	M5 x 0.8	8	8.4	9.6	17.3	22.1	12.3	28.6	25.8	25	22.2	12.7	7
AS12□1F-U10/32-01	1/8"	10-32UNF												
AS12□1F-M5-03	5/32"	M5 x 0.8		9.3		17.3	22.1							
AS12□1F-U10/32-03	5/32"	10-32UNF												
AS12□1F-M5-05	3/16"	M5 x 0.8	8	11.4	9.6	21.3	26.1	11.7	28.6	25.8	25	22.2	16.5	7
AS12□1F-U10/32-05	3/16"	10-32UNF												
AS12□1F-M5-07	1/4"	M5 x 0.8		12		18.3	23.1						13.5	7
AS12□1F-U10/32-07	1/4"	10-32UNF												
AS22□1F-01-01	1/8"	1/8	12 (12.7)	9.3	14.2	20.4	27.5	13.4	35.2	30.2	32.1	27.1	12.7	16
AS22□1F-01-03	5/32"			9.3		20.4	27.5							17
AS22□1F-01-05	3/16"			11.4		23.1	30.2						16.5	17
AS22□1F-01-07	1/4"			13.2		23.9	31						18.5	19
AS22□1F-01-09	5/16"			15.2		25.3	32.4	14.1					21	21
AS22□1F-02-03	5/32"	1/4	17 (17.5)	10.4	18.5	25.2	34.4	17.7	39.9	34.9	34.4	29.4	16	32
AS22□1F-02-05	3/16"			11.4		24.9	34.2						17	
AS22□1F-02-07	1/4"			13.2		25.2	34.5						18.5	34
AS22□1F-02-09	5/16"			15.2		27.2	36.4	19.5					21	36
AS22□1F-02-11	3/8"			17.9		35.3	44.5						21	36
AS32□1F-02-07	1/4"	19		13.2	23	27.8	39.3	21.3	48.3	43.3	42.8	37.8	17	60
AS32□1F-02-09	5/16"			15.2		29.5	41						18.5	63
AS32□1F-02-11	3/8"			17.9		31.8	43.3						21	67
AS32□1F-03-07	1/4"	3/8		13.2	23	27.8	39.3	19.8	45.4	40.4	40.2	35.2	17	55
AS32□1F-03-09	5/16"			15.2		29.5	41						18.5	57
AS32□1F-03-11	3/8"			17.9		31.8	43.3						21	59
AS42□1F-04-11	3/8"	1/2	24 (23.8)	17.9	28.6	33.6	47.9	24.5	56.7	49.2	49.6	42.1	21	100
AS42□1F-04-13	1/2"			21.7		35.2	49.5						22	101

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

Universal Type



M3 port
M5 port
U10/32 port



Metric Size

Model	Applicable tubing O.D. ød	T	H (1)	D1	D2	D3	L1	L2	L3	L4	L5 (3) Max.	L5 (3) Min.	A (2) Max.	A (2) Min.	M1	Mass (g)
AS13□1F-M3-23	3.2	M3 x 0.5	5.5	8.4	7.2	7.2	10.1	17.9	17.6	28.3	26.6	24.1	24	21.5	12.7	4
AS13□1F-M3-04	4			9.3				18.3	17.9	28.6						5
AS13□1F-M5-23	3.2	M5 x 0.8	8	8.4	9.6	9.3	10.8	19.8	17.5	28.7	28.6	25.8	25	22.2	12.7	7
AS13□1F-U10/32-23		10-32UNF														
AS13□1F-M5-04	4	M5 x 0.8		9.3				20.3								
AS13□1F-U10/32-04		10-32UNF														
AS13□1F-M5-06	6	M5 x 0.8		11.6				21.4	20.6	31.8					13.5	
AS13□1F-U10/32-06		10-32UNF														
AS23□1F-01-23	3.2	1/8	12 (12.7)	8.4	14.2	9.3	13.1	24.4	17.5	30.9	35.2	30.2	32.1	27.1	12.7	17
AS23□1F-01-04	4			9.3				24.9								18
AS23□1F-01-06	6			11.6		10.9	14	26.9	22.9	36.3					13.5	
AS23□1F-01-08	8			15.2		12.9	16.2	30.9	28.2	40.8					18.5	21
AS23□1F-02-04	4	1/4	17 (17.5)	10.4	18.5	10.9	16.2	30.6	21.9	39.6	39.9	34.9	34.4	29.4	16	32
AS23□1F-02-06	6			12.8		12.9	18.4	34	25.2	42.1					17	33
AS23□1F-02-08	8			15.2		12.9	18.3	35.2	28.2	45.1					18.5	36
AS23□1F-02-10	10			18.5			20.2	38.7	31	47.9					21	40
AS33□1F-02-06	6		19	12.8	23	12.9	20.6	38.5	25.2	46.5	48.3	43.3	42.8	37.8	17	60
AS33□1F-02-08	8			15.2		12.9	20.6	39.7	28.2	49.5					18.5	63
AS33□1F-02-10	10			18.5		16.2	23	43.7	32.6	53.9					21	67
AS33□1F-02-12	12			20.9			23	44.9	34.4	55.7					22	69
AS33□1F-03-06	6	3/8		12.8	23	12.9	20.6	38.5	25.2	45	45.4	40.4	40	35	17	56
AS33□1F-03-08	8			15.2		12.9	20.6	39.7	28.2	48					18.5	59
AS33□1F-03-10	10			18.5		16.2	23	43.7	32.6	52.4					21	63
AS33□1F-03-12	12			20.9			23	44.9	34.4	54.2					22	65
AS43□1F-04-10	10	1/2	24 (23.8)	18.5	28.6	16.2	25.8	49.4	32.6	57.1	56.7	49.2	49.6	42.1	21	104
AS43□1F-04-12	12			21.7		19.4	26.8	52	36.3	60.8					22	106

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

Inch Size

Model	Applicable tubing O.D. ød	T	H (1)	D1	D2	D3	L1	L2	L3	L4	L5 (3) Max.	L5 (3) Min.	A (2) Max.	A (2) Min.	M1	Mass (g)
AS13□1F-M3-01	1/8"	M3 x 0.5	5.5	8.4	7.2	7.2	10.1	17.9	17.6	28.3	26.6	24.1	24	21.5	12.7	4
AS13□1F-M3-03	5/32"			9.3				18.3	17.9	28.6						5
AS13□1F-M5-01	1/8"	M5 x 0.8	8	8.4	9.6	9.3	10.8	19.8	17.5	28.7	28.6	25.8	25	22.2	12.7	7
AS13□1F-U10/32-01	1/8"	10-32UNF														
AS13□1F-M5-03	5/32"	M5 x 0.8		9.3				20.3								
AS13□1F-U10/32-03	5/32"	10-32UNF														
AS13□1F-M5-05	3/16"	M5 x 0.8	8	11.4	9.6	9.3	10.8	21.3	23.3	34.5	28.6	25.8	25	22.2	16.5	8
AS13□1F-U10/32-05	3/16"	10-32UNF														
AS13□1F-M5-07	1/4"	M5 x 0.8		12				21.6	20.7	31.9					13.7	
AS13□1F-U10/32-07	1/4"	10-32UNF														
AS23□1F-01-01	1/8"	1/8	12 (12.7)	8.4	14.2	9.3	13.1	24.4	17.5	30.9	35.2	30.2	32.1	27.1	12.7	17
AS23□1F-01-03	5/32"			9.3				24.9								18
AS23□1F-01-05	3/16"			11.6		10.9	14	26.8	23.9	37.3					16.5	
AS23□1F-01-07	1/4"			13.2		12.9	16.2	29.9	25.6	38.2					17	19
AS23□1F-01-09	5/16"			15.2		12.9	16.2	30.9	28.2	40.8					18.5	21
AS23□1F-02-03	5/32"	1/4	17 (17.5)	10.4	18.5	10.9	16.2	30.6	21.9	39.6	39.9	34.9	34.4	29.4	16	32
AS23□1F-02-05	3/16"			11.6		10.9	16.2	31.1	23.9	42.1					16.5	33
AS23□1F-02-07	1/4"			13.2		12.9	18.3	34.2	25.6	45.1					17	36
AS23□1F-02-09	5/16"			15.2			18.3	35.2	28.2	47.9					18.5	39
AS23□1F-02-11	3/8"			18.5			20.2	38.7	31	46.5					21	40
AS33□1F-02-07	1/4"	19		13.2	23	12.9	20.6	38.7	25.6	46.9	48.3	43.3	42.8	37.8	17	60
AS33□1F-02-09	5/16"			15.2		12.9	20.6	39.7	28.2	49.5					18.5	63
AS33□1F-02-11	3/8"			18.5		16.2	23	43.7	32.6	53.9					21	69
AS33□1F-03-07	1/4"	3/8		13.2	23	12.9	20.6	38.7	25.6	45.4	45.4	40.4	40.2	35.2	17	56
AS33□1F-03-09	5/16"			15.2		12.9	20.6	39.7	28.2	48					18.5	59
AS33□1F-03-11	3/8"			18.5		16.2	23	43.7	32.6	52.4					21	65
AS43□1F-04-11	3/8"	1/2	24 (23.8)	18.5	28.6	16.2	25.8	49.4	32.6	57.1	56.7	49.2	49.6	42.1	21	104
AS43□1F-04-13	1/2"			21.7		19.4	26.8	52	36.3	60.8					22	106

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

Made to Order Specifications:

Please contact SMC for detailed dimensions, specifications, and delivery.

1 Lubricant: Vaseline — X12

Ex.) AS2201F-01-04S-X12

2 Grease-free (Seal: Fluorine Coating) + Throttle Valve (Without Check Valve) — X21

Ex.) AS2201F-01-04S-X21

Note 1) Not particle-free
Note 2) Throttle valve is only compatible with the part no. of the meter-out type.

3 Throttle Valve (Without Check Valve) — X214

Ex.) AS2201F-01-04S-X214

Note) Throttle valve is only compatible with the part no. of the meter-out type.

4 Fixed Throttle (No needle function) — X250

How to Order

AS 2 2 0 1F – 01 – 06 S – 1 – X250

Body size

1	M3, M5 standard
2	1/8, 1/4 standard

Elbow

Control type

0	Meter-out
1	Meter-in

With One-touch fitting

Port size

M3	M3 x 0.5
M5	M5 x 0.8
01	R 1/8
02	R 1/4

Applicable tubing O.D.

04	ø4
06	ø6

Option*

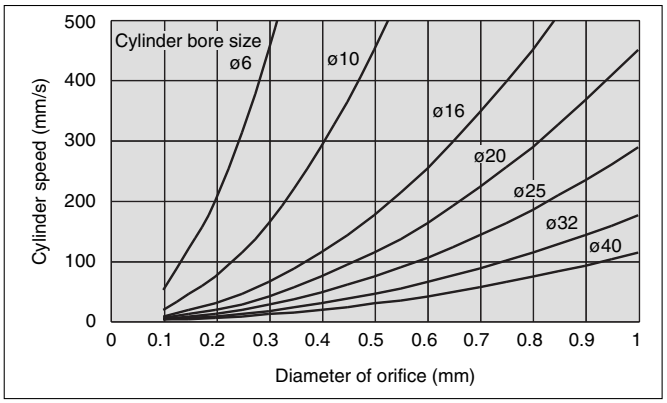
Nil	None
S	With seal

* M3 and M5 are not available with seals.

Fixed orifice

Symbol	Fixed orifice	Applicable model			
		AS12□1F-M3-04	AS12□1F-M5-04 AS12□1F-M5-06	AS22□1F-01-04 AS22□1F-01-06	AS22□1F-02-06
1	ø0.1	○	○	○	○
2	ø0.2	○	○	○	○
3	ø0.3	○	○	○	○
4	ø0.4	○	○	○	○
5	ø0.5	○	○	○	○
6	ø0.6	○	○	○	○
7	ø0.7	○	○	○	○
8	ø0.8	○	○	○	○
9	ø0.9		○	○	○
10	ø1.0		○	○	○

The graph below shows the relationship between orifices for each cylinder bore and cylinder speed. Please refer to it during selection. The cylinder speeds on the graph are theoretical values. Actual values may differ depending on the piping conditions or sliding friction, so please use this graph as a guideline only.



Speed Controller with One-touch Fittings In-line Type

Series AS

Minimizes installation time and cost

Reduce the mounting height and enables compact machinery design. Effective area is larger than the former model.

ø2 size added to applicable tubing sizes

- **Metric size** (Release button: White color)
  ø2, ø3.2, ø4, ø6, ø8, ø10, ø12
- **Inch size** (Release button: Orange color)
  ø1/8", ø5/32", ø3/16", ø1/4", ø5/16", ø3/8", ø1/2"

Maximum operating pressure
1 MPa max.

Applicable tubing materials
Nylon, soft nylon, and polyurethane tubing are applicable.

Retainer prevents accidental loss of needle.

Option
Hexagonal lock nut,
Nickel plated option

Number of needle rotations has been increased
(8 to 10 turns)
The increased number of needle rotations (8 to 10 turns) permits easy control at low speeds.

In-line type

Applicable tubing O.D. ø2

Made to Order
(Refer to page 431 for details.)

Flow Direction Symbols on Body

Symbol	JIS Symbol
⇔	

Model

Model	Applicable tubing O.D.													Applicable cylinder bore size (mm)
	Metric size							Inch size						
	2	3.2	4	6	8	10	12	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	
AS1001F	◉	◉	◉	◉				◉	◉	●	◉				6, 10, 16, 20 (1)
AS2001F			◉	◉					◉	●	◉				20, 25, 32
AS2051F				◉	◉					●	◉	◉			20, 25, 32, 40
AS3001F				◉	◉	◉	◉				◉	◉	●		40, 50, 63
AS4001F						◉	◉						●	●	63, 80, 100

Note 1) AS1001F-02 applicable cylinder bore sizes are 2.5, 4, 6.
Note 2) ◉Marking is electroless nickel plated, provided as standard. (N specifications)

Specifications

Fluid	Air
Proof pressure	1.5 MPa (1.05 MPa (1))
Max. operating pressure	1 MPa (0.7 MPa (1))
Min. operating pressure	0.1 MPa
Ambient and fluid temperature	–5 to 60°C (No freezing)
Number of needle rotations	10 turns (8 turns (2))
Applicable tubing material (3)	Nylon, Soft nylon, Polyurethane (4)
Option	Hexagonal lock nut, Electroless nickel plated (5)

Note 1) In case of AS1001F-02
Note 2) In case of AS1001F type. AS1001F-02: 10 turns.
Note 3) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used. (Refer to pages 371 and 372 for details.)
Note 4) In case of AS1001F-02, polyurethane only.
Note 5) Brass parts are all electroless nickel plated.

Flow Rate and Effective Area

Model		AS1001F		AS2001F		AS2051F		AS3001F			AS4001F	
Tubing O.D.	Metric size	ø2	ø3.2, ø4, ø6	ø4	ø6	ø6	ø8	ø6	ø8	ø10, ø12	ø10	ø12
	Inch size	—	ø1/8", ø5/32" ø3/16", ø1/4"	ø5/32"	ø3/16", ø1/4"	ø3/16"	ø1/4", ø5/16"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
Controlled flow (Free flow)	Air flow ℓ/min (ANR)	20	100	130	230	290	460	420	660	920	1050	1390
	Effective area (mm²)	0.3	1.5	2	3.5	4.5	7	6.5	10	14	16	21

Note) Flow rate values are measured at 0.5 MPa and 20°C.

How to Order

AS 400 1F – 12 [ ] – [ ]

Body size

100	M5 standard
200	1/8 standard
205	1/4 standard
300	3/8 standard
400	1/2 standard

With One-touch fittings

Option*

Nil	None
K	Hexagonal lock nut
N	Electroless nickel plated

* If more than one option is required, write option part numbers in the order of "K", "N".

Applicable tubing O.D.

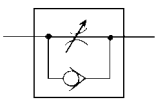
Metric size	
02	ø2
23	ø3.2*
04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

Inch size	
01	ø1/8"
03	ø5/32"
05	ø3/16"
07	ø1/4"
09	ø5/16"
11	ø3/8"
13	ø1/2"

* Use ø1/8" tube.

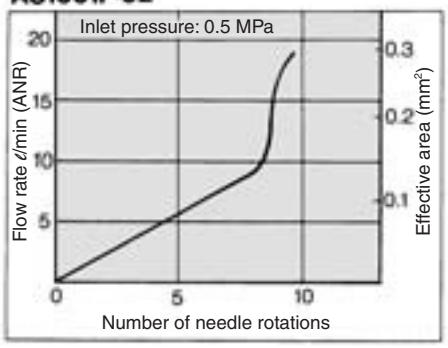
Made to Order
Refer to page 431 for details.

JIS Symbol

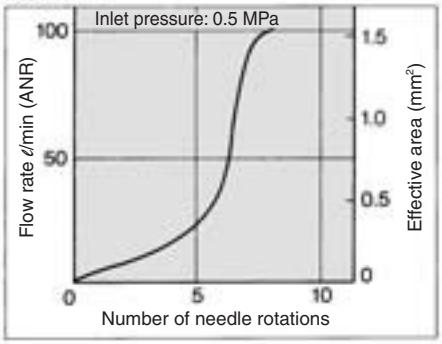


Needle Valve/Flow Characteristics

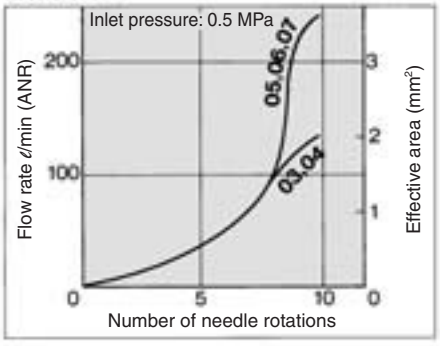
AS1001F-02



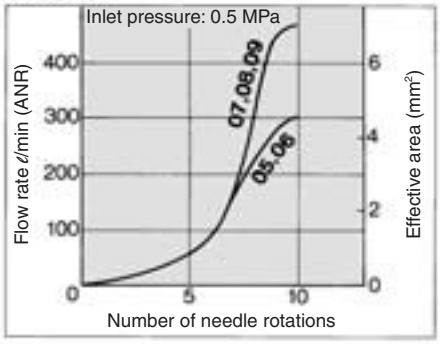
AS1001F



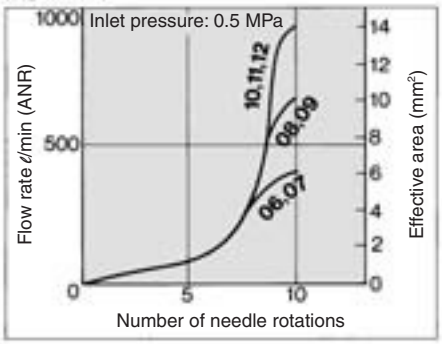
AS2001F



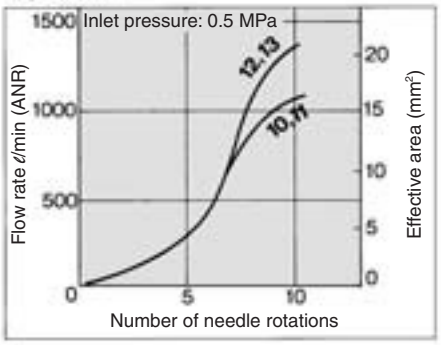
AS2051F



AS3001F



AS4001F



⚠Caution

Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.

Made to Order

Made to Order

Lubricant: Vaseline **X12**

Ex.) AS2001F-04-X12

Throttle Valve (Without Check Valve) **X214**

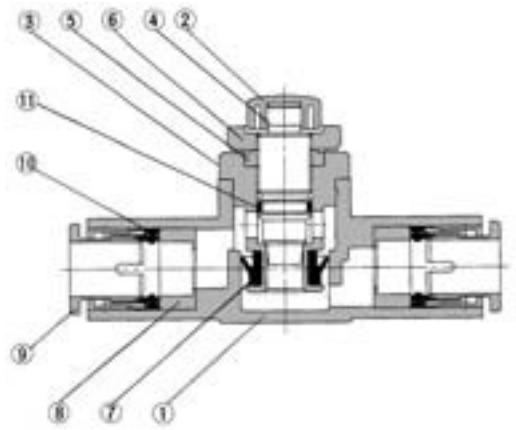
Ex.) AS2001F-04-X214

Grease-free (Seal: Fluorine Coating) + Throttle Valve (Without Check Valve) **X21**

Ex.) AS2001F-04-X21

Note) Not particle-free

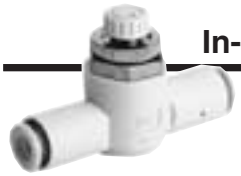
Construction



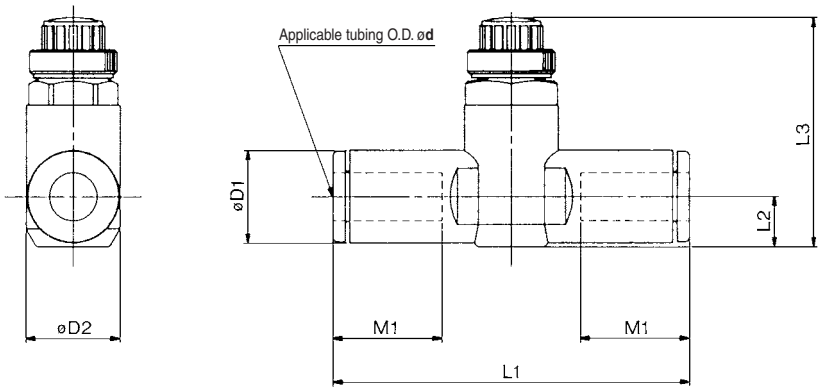
Component Parts

No.	Description	Material	Note
1	Body A	PBT	
2	Handle	PBT (1)	
3	Body B	Brass	Electroless nickel plated
4	Needle	Brass	Electroless nickel plated
5	Needle guide	Brass	Electroless nickel plated
6	Lock nut	Brass (2)	Electroless nickel plated
7	U seal	HNBR	
8	Spacer	—	
9	Cassette	—	
10	Packing	NBR	
11	O-ring	NBR	

Note 1) AS1001F-02 is made of electroless nickel plated brass.
Note 2) AS□□1F type is made of steel.



In-line Type



Metric Size

Model	Applicable tubing O.D. ød	D1	D2	L1	L2	L3 (1) Max.	L3 (1) Min.	M1	Mass (g)
AS1001F-02	2	6	6	25.4	3.4	20.9	18.4	8.8	3
AS1001F-23	3.2	8.4	10	38.0	4.5	23.5	20.7	12.7	6
AS1001F-04	4	9.3		39.2	5.2	24.2	21.4		7
AS1001F-06	6	11.6		40.7	6.2	25.2	22.4	13.5	8
AS2001F-04	4	9.3	11.8	40.7	5.2	32.6	27.6	12.7	12
AS2001F-06	6	11.6		44.8	6.3	33.7	28.7	13.5	13
AS2051F-06	6	12.8	14.8	53.2	6.7	35.2	30.2	17	22
AS2051F-08	8	15.2		59.8	8.1	36.5	31.5	18	25
AS3001F-06	6	12.8	19.8	59	7.4	38.3	33.3	17	36
AS3001F-08	8	15.2		64.4	8.2	39.1	34.1	18	40
AS3001F-10	10	18.5		71.6	9.8	40.6	35.6	21	44
AS3001F-12	12	20.9		76	11	41.8	36.8	22	48
AS4001F-10	10	18.5	26.5	77.7	11.3	51.1	43.6	21	85
AS4001F-12	12	20.9		82.1		52.1	44.6	22	89

Note 1) Reference dimensions

Inch Size

Model	Applicable tubing O.D. ød	D1	D2	L1	L2	L3 (1) Max.	L3 (1) Min.	M1	Mass (g)
AS1001F-01	1/8"	8.4	10	38	4.5	23.5	20.7	12.7	6
AS1001F-03	5/32"	9.3		39.2	5.2	24.2	21.4		7
AS1001F-05	3/16"	11.4	10	48.7	6.2	25.2	22.4	16.5	12
AS1001F-07	1/4"	12		40.7				13.7	9
AS2001F-03	5/32"	9.3	11.8	40.7	5.2	32.6	27.6	12.7	12
AS2001F-05	3/16"	11.4		50	6.2	33.6	28.6	16.5	18
AS2001F-07	1/4"	13.2		52.2	7.1	34.5	29.5	17	16
AS2051F-05	3/16"	11.4	14.8	52.2	6.2	34.6	29.6	16.5	24
AS2051F-07	1/4"	13.2		54.4	7.1	35.5	30.5	17	22
AS2051F-09	5/16"	15.2		59.8	8.1	36.5	31.5	18	25
AS3001F-07	1/4"	13.2	19.8	59	7.4	38.3	33.3	17	36
AS3001F-09	5/16"	15.2		64.4	8.2	39.1	34.1	18	40
AS3001F-11	3/8"	17.9		70.8	9.5	40.3	35.3	21	52
AS4001F-11	3/8"	17.9	26.5	76.9	10.3	51	43.5	21	93
AS4001F-13	1/2"	21.7		83.1	11.6	52.4	44.9	22	106

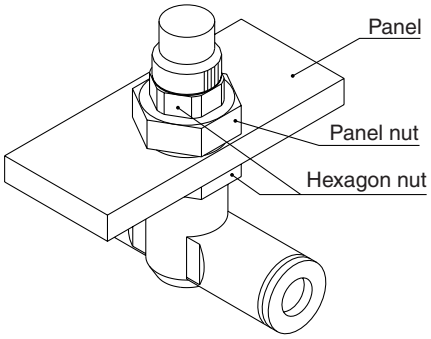
Note 1) Reference dimensions

Speed Controller with One-touch Fittings
In-line Type/Panel Mount Type
Series AS□□□1F-3

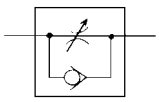
Panel mount thickness: 3.5 mm at the maximum

Easy installation and removal

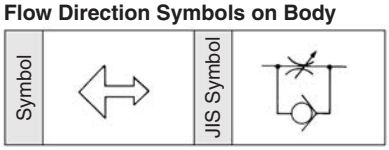
Installment of hexagon nuts on panel nuts up and down in two locations enables user to mount or remove it depending upon the situation.



JIS Symbol



Flow Direction Symbols on Body



Made to Order
(Refer to page 435 for details.)

Model

Model	Applicable tubing O.D.												Applicable cylinder bore size (mm)
	Metric size						Inch size						
	3.2	4	6	8	10	12	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	
AS1001F	●	●	●				●	●	●	●				6, 10, 16, 20
AS2001F		●	●					●	●	●				20, 25, 32
AS2051F			●	●					●	●	●			20, 25, 32, 40
AS3001F			●	●	●	●				●	●	●		40, 50, 63
AS4001F					●	●						●	●	63, 80, 100

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)
Number of needle rotations	10 turns (8 turns (1))
Applicable tubing material (2)	Nylon, Soft nylon, Polyurethane

Note 1) In the case of AS1001F type
Note 2) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used. (Refer to pages 371 and 372 for details.)
Note 3) Brass parts are all electroless nickel plated.

Flow Rate and Effective Area

Model		AS1001F	AS2001F		AS2051F		AS3001F			AS4001F	
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø4	ø6	ø6	ø8	ø6	ø8	ø10, ø12	ø10	ø12
	Inch size	ø1/8", ø5/32" ø3/16", ø1/4"	ø5/32"	ø3/16", ø1/4"	ø3/16"	ø1/4", ø5/16"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
Controlled flow (Free flow)	Flow rate (ℓ/min(ANR)	100	130	230	290	460	420	660	920	1050	1390
	Effective area (mm²)	1.5	2	3.5	4.5	7	6.5	10	14	16	21

Note) Flow rate values are measured at 0.5 MPa and 20°C.

How to Order

AS 200 1 F – 06 – 3 – ☐

Body size

100	M5 standard
200	1/8 standard
205	1/4 standard
300	3/8 standard
400	1/2 standard

With One-touch fittings

Applicable tubing O.D.

Metric size		Inch size	
23	ø3.2*	**01**	ø1/8"
04	ø4	**03**	ø5/32"
06	ø6	**05**	ø3/16"
08	ø8	**07**	ø1/4"
10	ø10	**09**	ø5/16"
12	ø12	**11**	ø3/8"
		13	ø1/2"

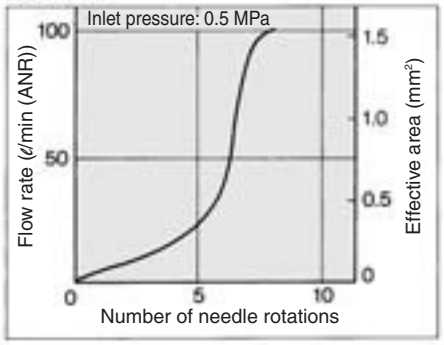
* Use ø1/8" tube.

Panel mount type

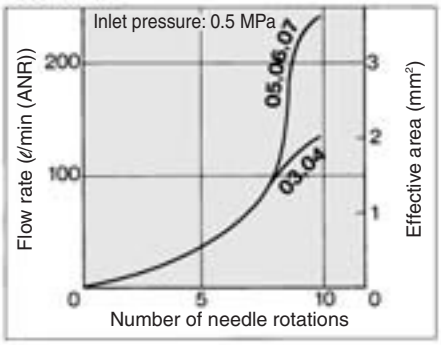
Made to Order
Refer to page 435 for details.

Needle Valve/Flow Characteristics

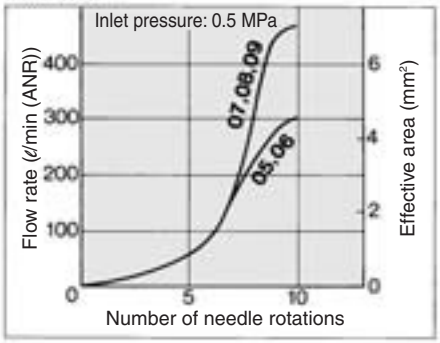
AS1001F



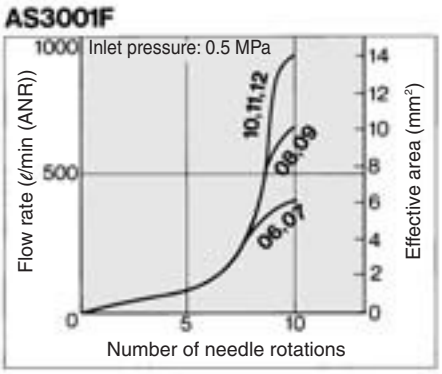
AS2001F



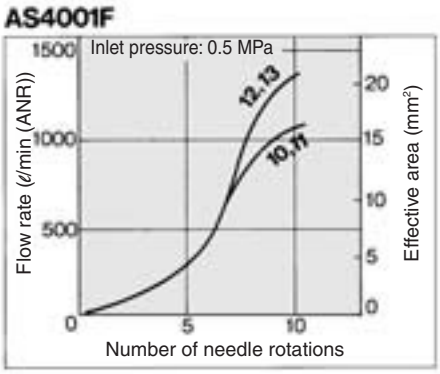
AS2051F



AS3001F



AS4001F



⚠Caution

Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.

Made to Order

Made to Order

Lubricant: Vaseline **X12**

Ex.) AS2001F-04-3-X12

Grease-free (Seal: Fluorine Coating) + Throttle Valve (Without Check Valve) **X21**

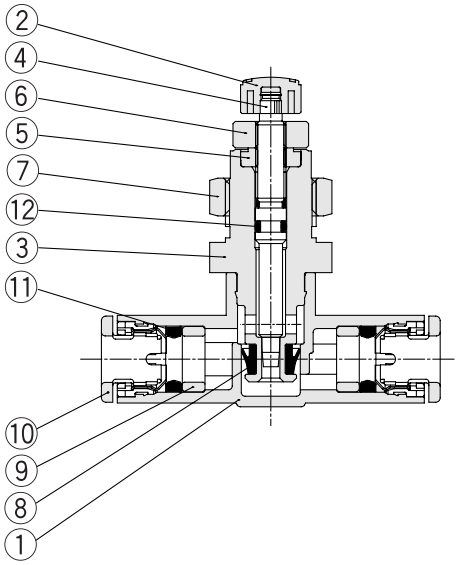
Ex.) AS2001F-04-3-X21

Note) Not particle-free

Throttle Valve (Without Check Valve) **X214**

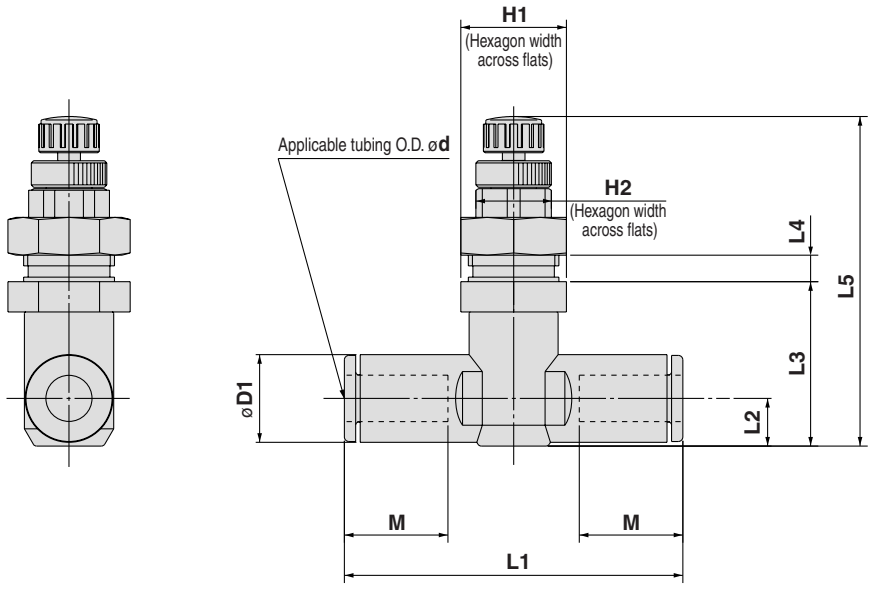
Ex.) AS2001F-04-3-X214

Construction



No.	Description	Material	Note
1	Body A	PBT	
2	Handle	PBT	
3	Body B	Brass	Electroless nickel plated
4	Needle	Brass	Electroless nickel plated
5	Needle guide	Brass	Electroless nickel plated
6	Lock nut	Brass	Electroless nickel plated
7	Panel nut	Brass	Electroless nickel plated
8	U seal	HNBR	
9	Spacer	—	
10	Cassette	—	
11	Packing	NBR	
12	O-ring	NBR	

Dimensions



Metric Size

Model	d	D1	H1	H2	L1	L2	L3	L4 Max.	L5 (1) Max.	L5 (1) Min.	M	Panel-cut dimensions	Mass (g)
AS1001F-23-3	3.2	8.4	12	8	38	4.5	16.8	3.5	37.6	34.4	12.7	10.5	18
AS1001F-04-3	4	9.3			39.2	5.2	17.4		38.2	35			19
AS1001F-06-3	6	11.6			40.7	6.2	18.5		39.3	36.1	13.5		20
AS2001F-04-3	4	9.3	14	10	40.7	5.2	20.7	3.5	48	42.5	12.7	12.5	28
AS2001F-06-3	6	11.6			44.8	6.3	21.8		49.1	43.6	13.5		29
AS2051F-06-3	6	12.8	17	13	53.2	6.7	25.7	3.5	53.5	48.1	17	15.5	49
AS2051F-08-3	8	15.2			59.8	8.1	27		54.8	49.4	18		54
AS3001F-06-3	6	12.8	21	16	59	7.4	31.3	3.5	60.1	54.7	17	18.5	85
AS3001F-08-3	8	15.2			64.4	8.2	32.1		60.9	55.5	18		88
AS3001F-10-3	10	18.5			71.6	9.8	33.7		62.5	57.1	21		99
AS3001F-12-3	12	20.9			76	11	34.9		63.7	58.3	22		100
AS4001F-10-3	10	18.5	27	21	77.7	11.3	35	3.5	69.3	61	21	24.5	167
AS4001F-12-3	12	20.9			82.1		36		70.3	62	22		171

Note 1) Reference dimensions

Inch Size

Model	d	D1	H1	H2	L1	L2	L3	L4 Max.	L5 (1) Max.	L5 (1) Min.	M	Panel-cut dimensions	Mass (g)
AS1001F-01-3	1/8"	8.4	12	8	38	4.5	16.8	3.5	37.6	34.4	12.7	10.5	18
AS1001F-03-3	5/32"	9.3			39.2	5.2	17.4		38.2	35			19
AS1001F-05-3	3/16"	11.4			48.7	6.2	18.5		39.3	36.1	16.5		24
AS1001F-07-3	1/4"	12			40.7						13.7		21
AS2001F-03-3	5/32"	9.3	14	10	40.7	5.2	20.7	3.5	48	42.5	12.7	12.5	28
AS2001F-05-3	3/16"	11.4			50	6.2	21.6		48.9	43.4	16.5		34
AS2001F-07-3	1/4"	13.2			52.2	7.1	22.5		49.8	44.3	17		37
AS2051F-05-3	3/16"	11.4	17	13	52.2	6.2	25.2	3.5	53	47.6	16.5	15.5	47
AS2051F-07-3	1/4"	13.2			54.4	7.1	26		53.8	48.4	17		49
AS2051F-09-3	5/16"	15.2			59.8	8.1	27		54.8	49.4	18		54
AS3001F-07-3	1/4"	13.2	21	16	59	7.4	31.3	3.5	60.1	54.7	17	18.5	84
AS3001F-09-3	5/16"	15.2			64.4	8.2	32.1		60.9	55.5	18		88
AS3001F-11-3	3/8"	17.2			70.8	9.5	33.3		62.1	56.7	21		95
AS4001F-11-3	3/8"	17.9	27	21	76.9	10.3	34.9	3.5	69.2	60.9	21	24.5	175
AS4001F-13-3	1/2"	21.7			83.1	11.6	36.3		70.6	62.3	22		188

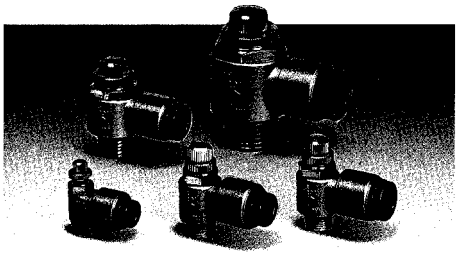
Note 1) Reference dimensions

Speed Controller with One-touch Fitting Elbow Type (Metal Body)

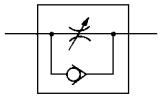
Series AS

Speed controller with One-touch fittings for metal body specifications

- Uses flame resistant resin as standard. (UL standard V-0)



JIS Symbol



Made to Order
(Refer to page 428 for details.)

Model

Model	Port size	Applicable tubing O.D.					Applicable cylinder bore size (mm)
		4	6	8	10	12	
AS12□1-M5	M5 x 0.8	◉	◉				6, 10, 16, 20
AS22□1-01	R 1/8		◉	◉			20, 25, 32
AS22□1-02	R 1/4		◉	◉			20, 25, 32, 40
AS32□1-03	R 3/8			●	●		40, 50, 63
AS42□1-04	R 1/2				●	●	63, 80, 100

Note) ◉ marking is electroless nickel plated, provided as standard. (N specifications)

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)
Number of needle rotations	10 turns (8 turns (1))
Applicable tubing material	Nylon, Soft nylon, Polyurethane
Option	Hexagon lock nut, Electroless nickel plated (2)

Meter-out and meter-in types can be visually differentiated by the lock nut.
The lock nut on the meter-out type is electroless nickel plated while the meter-in type is black zinc chromate plated.
Note 1) M5 size
Note 2) Brass parts are all electroless nickel plated.

How to Order

AS 3 2 0 1 – 03 – F 06 S [ ] – [ ]

Speed controller

Body size

1	M5 standard
2	01, 02 standard
3	03 standard
4	04 standard

Elbow

Control method

0	Meter-out
1	Meter-in

Thread size

M5	M5 x 0.8
01	R 1/8
02	R 1/4
03	R 3/8
04	R 1/2

Note 1) M5 size: S (with seal) is not necessary.

With One-touch fitting

Tube size

04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

With seal

Option

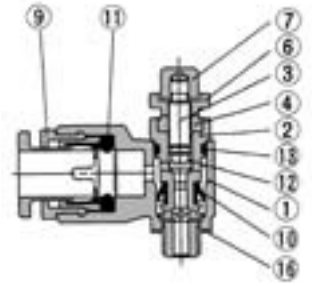
Nil	None
K	Hexagon lock nut
N	Electroless nickel plated

* If more than one option is required, write option part numbers in the order of "K", "N".

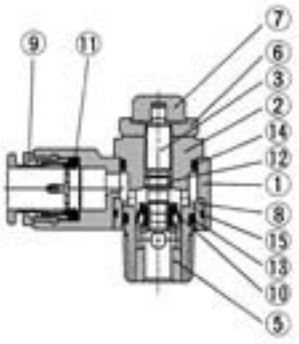
Made to Order
Refer to page 428 for details.

Construction

AS1201-M5



AS2201/3201/4201



Component Parts

No.	Description	Material	Note
1	**Body A**	Zinc alloy	Chromate plated
2	**Body B**	Brass	Electroless nickel plated
3	**Needle**	Brass	Electroless nickel plated
4	**Needle guide**	Brass	Electroless nickel plated only with M5
5	**Seat ring**	Brass	(1)
6	**Lock nut**	Brass (2)	Electroless nickel plated (3)
7	**Handle**	Brass	Electroless nickel plated
8	**Bushing**	PBT	
9	**Cassette**	PBT/Stainless steel	
10	**U-packing**	HNBR	
11	**Seal**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**O-ring**	NBR	
15	**O-ring**	NBR	
16	**Gasket**	NBR/Stainless steel	M5 port only

Note 1) "AS22□1": Electroless nickel plated
Note 2) "AS22□1": Steel
Note 3) Meter-in type: Black zinc chromated

Made to Order

1 Lubricant: Vaseline — X12

Ex.) AS1201-M5-F04-X12

2 Grease-free (Seal: Fluorine Coating) + Throttle Valve (Without Check Valve) — X21

Ex.) AS1201-M5-F04-X21

Note 1) Not particle-free
Note 2) Throttle valve is only compatible with the part no. of the meter-out type.

3 Throttle Valve (Without Check Valve) — X214

Ex.) AS1201-M5-F04-X214

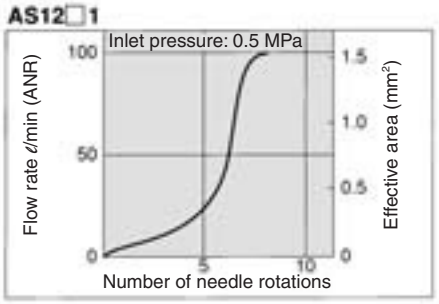
Note) Throttle valve is only compatible with the part no. of the meter-out type.

Flow Rate and Effective Area

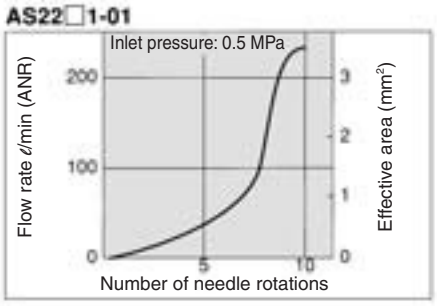
Model		AS12□1-M5	AS22□1-01	AS22□1-02		AS32□1-03		AS42□1-04	
Tubing O.D.		ø4, ø6	ø6, ø8	ø6	ø8	ø8	ø10	ø10	ø12
Controlled (Free) flow	Flow rate (ℓ/min (ANR))	100	230	390	460	790	920	1580	1710
	Effective area (mm^2)	1.5	3.5	6	7	12	14	24	26

Needle Valve/Flow Characteristics

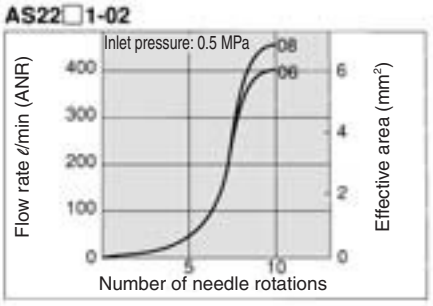
AS12□1



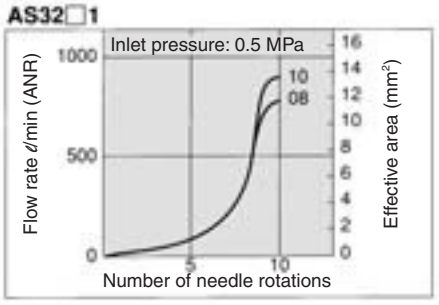
AS22□1-01



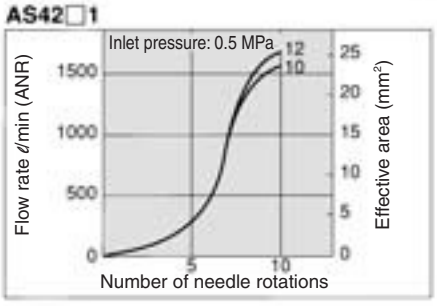
AS22□1-02



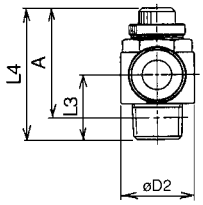
AS32□1

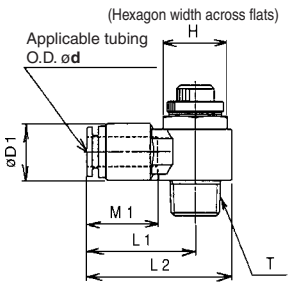


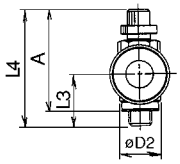
AS42□1

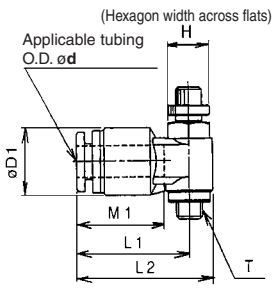


Dimensions









Model	Applicable tubing O.D. ød	T	H	D1	D2	L1	L2	L3	L4 (1) Max.	L4 (1) Min.	A (2) Max.	A (2) Min.	M1	Mass (g)
AS12□1-M5-F04	4	M5 x 0.8	8	13	9	21	25.5	11.2	28.3	25.5	25	22.2	16	13
AS12□1-M5-F06	6					21.5	26						17	13
AS22□1-01-F06S	6	R 1/8	12	15.5	14.6	26.6	33.9	13.8	35.5	30.5	32.4	27.4	17	34
AS22□1-01-F08S	8												18.5	31
AS22□1-02-F06S	6	R 1/4	17	15.5	19.5	28.7	38.5	17.2	40.3	35.3	34.8	29.8	17	56
AS22□1-02-F08S	8												18.5	52
AS32□1-03-F08S	8	R 3/8	19	18.2	24.3	32.7	44.9	19	45.8	40.8	40.6	35.6	18.5	93
AS32□1-03-F10S	10					33.3	45.5						21	88
AS42□1-04-F10S	10	R 1/2	24	22.3	28.5	36.1	50.4	24.6	54.7	49.7	47.4	42.4	21	154
AS42□1-04-F12S	12												22	146

Note 1) Reference dimensions
Note 2) Reference dimensions of thread M5, R after installation.

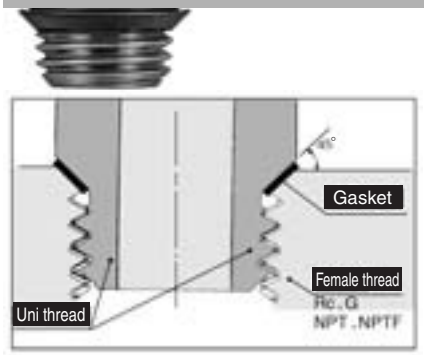
⚠Caution

**Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.**

Speed Controller with Uni One-touch Fitting

Series AS

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



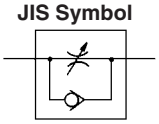
Shape of Uni thread ridge

Use of the chamfered surface of the famale 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.)

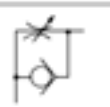
A ridge shape has been created as a Uni thread for common applications for Rc, G, NPT and NPTF.

The male thread for piping drastically cuts piping man-hours.

JIS Symbol



Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Symbol		
JIS Symbol		

Model

Model		Connection thread Uni thread	Applicable tubing O.D.											
			Metric size						Inch size					
Elbow type	Universal type		3.2	4	6	8	10	12	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"
AS22□IF-U01	**AS23□IF-U01**	1/8	◉	◉	◉	◉	◉※		◉	◉	●	◉	◉		
AS22□IF-U02	**AS23□IF-U02**	1/4		●	●	●	●			●	●	●	●	●	
AS32□IF-U02	**AS33□IF-U02**	1/4			◉	◉	◉	◉				◉	◉	●	
AS32□IF-U03	**AS33□IF-U03**	3/8			●	●	●	●				●	●	●	
AS42□IF-U04	**AS43□IF-U04**	1/2					●	●						●	●

Note 1) ∗ Elbow type only
Note 2) □ indicates the control type ("0" for meter-out and "1" for meter-in).
Note 3) Meter-out and meter-in types can be visually differentiated by the lock nut.
The lock nut on the meter-out type is electroless nickel plated, while that on the meter-in type is black zinc chromate plated.
Note 4) Models marked with "◉" are nickel plated as standard.

Specifications

Fluid	Air
Max. operating pressure	1 MPa
Min. operating pressure	0.1 MPa
Proof pressure	1.5 MPa
Ambient and fluid temperature	–5 to 60°C (No freezing)
Number of needle rotations	10 turns
Applicable tubing material (1)	Nylon, Soft-nylon, Polyurethane
Mounting thread	Uni-thread
Thread seal	Gasket
Option	Hexagon lock nut, Electroless nickel plated (2)

Note 1) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used. (Refer to pages 371 and 372 for details.)
Note 2) Brass parts are all electroless nickel plated.

Flow Rate and Effective Area

Model		AS22□IF-U01 AS23□IF-U02		AS22□IF-U02 AS23□IF-U02			AS32□IF AS33□IF			AS42□IF-U04 AS43□IF-U04	
Tubing O.D.	Metric size	ø3.2, ø4	ø6, ø8, ø4	ø4	ø6	ø8, ø10	ø6	ø8	ø10, ø12	ø10	ø12
	Inch size	1/8", 5/32"	3/16", 1/4", 5/16"	5/32"	3/16"	1/4", 5/16", 3/8"	1/4"	5/16"	3/8"	3/8"	1/2"
Controlled flow (Free flow)	Flow rate (ℓ/min (ANR))	180	230	260	390	460	660	790	920	1580	1710
	Effective area (mm^2)	2.7	3.7	4	6	7	10	12	14	24	26

Note 1) Flow rate values are measured at 0.5 MPa and 20°C.
Note 2) □ indicates the control type ("0" for meter-out and "1" for meter-in).

How to Order

AS [2] [2] [1] 1F – [U02] – [06] [ ] – [ ]

Body size

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

Type

2	Elbow
3	Universal

Control type

0	Meter-out
1	Meter-in

With One-touch fitting

Bore size

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

Applicable tubing O.D.

Metric size		Inch size	
23	ø3.2*	01	1/8"
04	ø4	03	5/32"
06	ø6	05	3/16"
08	ø8	07	1/4"
10	ø10	09	5/16"
12	ø12	11	3/8"
		13	1/2"

* Use ø1/8" tube.

Option*

Nil	None
K	Hexagonal lock nut
N	Electroless nickel plated

* If more than one option is required, write option part numbers in the order of "K", "N".

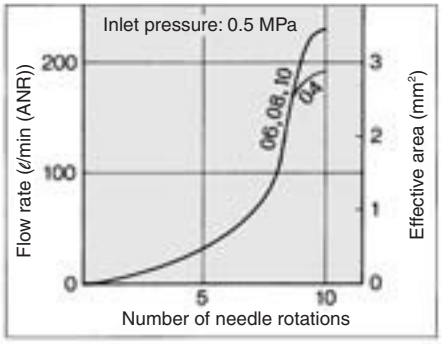
Made to Order

X260	Antistatic type

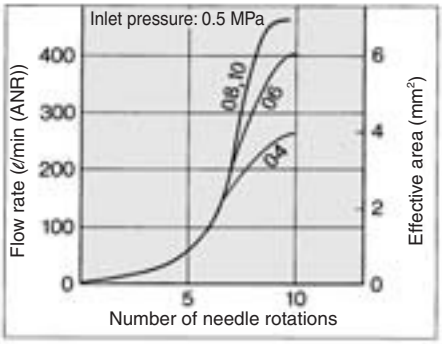
Refer to page 450 for details.

Needle Valve/Flow Characteristics

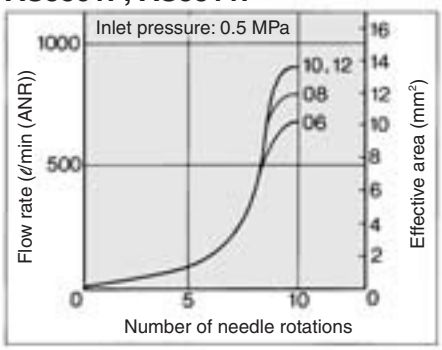
AS2201F-U01, AS2211F-U01
AS2301F-U01, AS2311F-U01



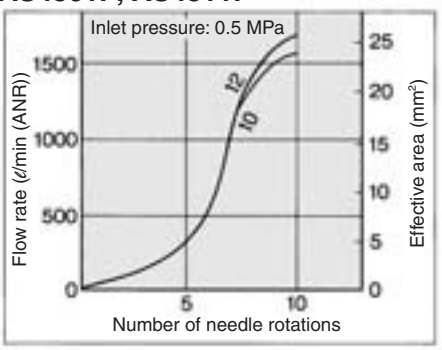
AS2201F-U02, AS2211F-U02
AS2301F-U02, AS2311F-U02



AS3201F, AS3211F
AS3301F, AS3311F

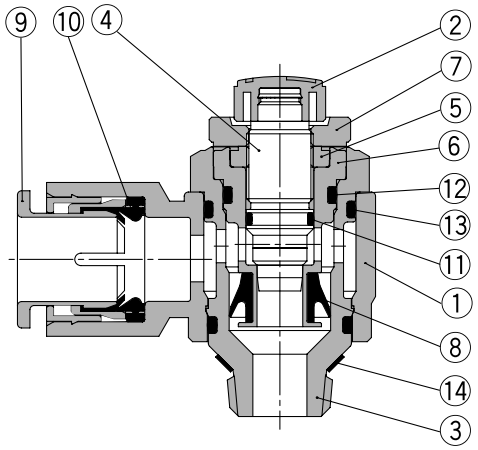


AS4201F, AS4211F
AS4301F, AS4311F

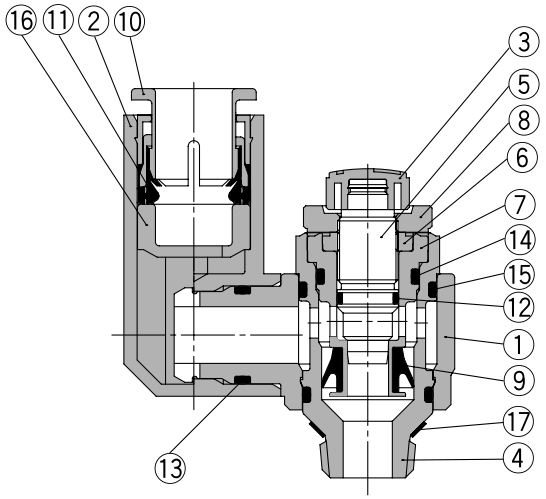


Construction/Component Parts

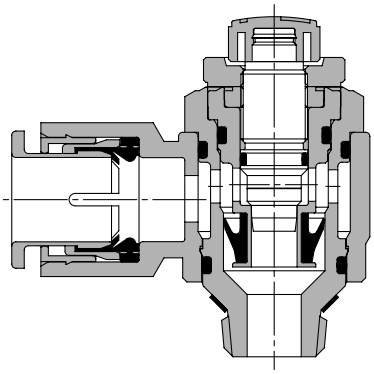
Elbow type
Meter-out type



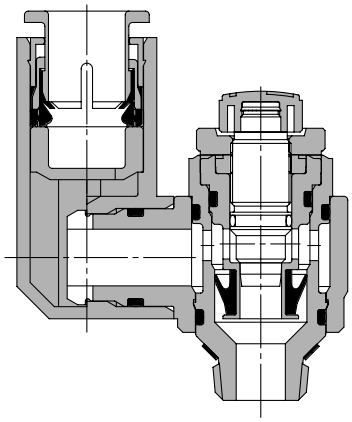
Universal type
Meter-out type



Meter-in type



Meter-in type



Component Parts: Elbow Type

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Handle**	PBT	
3	**Body B**	Brass	Electroless nickel plated
4	**Needle**	Brass	Electroless nickel plated
5	**Needle guide**	Brass	Electroless nickel plated
6	**Seat ring**	Brass	(1)
7	**Lock nut**	Brass (2)	Electroless nickel plated (3)
8	**U seal**	HNBR	
9	**Cassette**	—	
10	**Seal**	NBR	
11	**O-ring**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**Gasket**	NBR, Stainless steel	

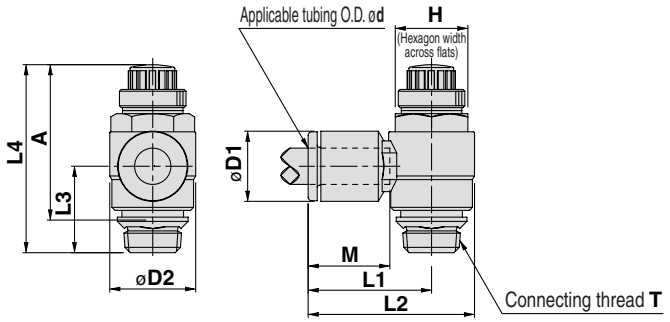
Note 1) Only AS22□1F-U01 and AS32□1F-U02 are electroless nickel plated.
Note 2) AS22□1F type is made of steel.
Note 3) Meter-in type is black zinc chromate plated.

Component Parts: Universal Type

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Elbow body**	PBT	
3	**Handle**	PBT	
4	**Body B**	Brass	Electroless nickel plated
5	**Needle**	Brass	Electroless nickel plated
6	**Needle guide**	Brass	Electroless nickel plated
7	**Seat ring**	Brass	(1)
8	**Lock nut**	Brass (2)	Electroless nickel plated (3)
9	**U seal**	HNBR	
10	**Cassette**	—	
11	**Seal**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**O-ring**	NBR	
15	**O-ring**	NBR	
16	**Spacer**	—	
17	**Gasket**	NBR, Stainless steel	

Note 1) Only AS22□1F-U01 and AS32□1F-U02 are electroless nickel plated.
Note 2) AS22□1F type is made of steel.
Note 3) Meter-in type is black zinc chromate plated.

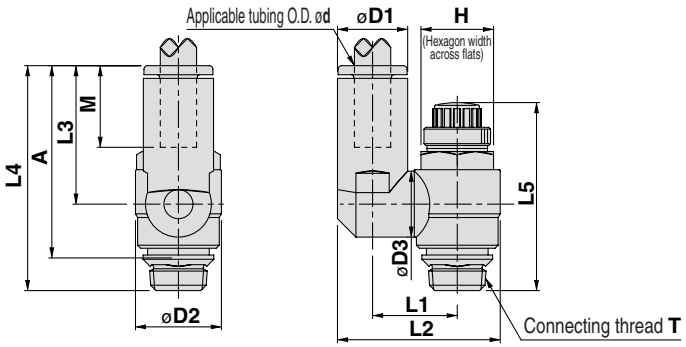
Elbow Type/Metric Size



Model	Applicable tubing O.D. ød	T Uni thread	H	øD1	øD2	L1	L2	L3	L4 (1) Max.	L4 (1) Min.	A (2) Max.	A (2) Min.	M	Mass (g)
AS22□1F-U01-23	3.2	1/8	12	7.8	14.2	20.8	27.9	14.3	36.1	31.1	30.5	25.5	14.5	17
AS22□1F-U01-04	4			8.9		21.1	28.2							17
AS22□1F-U01-06	6			11.0		22.5	29.6						15.5	17
AS22□1F-U01-08	8			15.2		25.3	32.4						18.5	19
AS22□1F-U01-10	10			18.5		33.1	40.2	15.0					21.0	21
AS22□1F-U02-04	4	1/4	17	8.9	18.5	23.3	32.5	17.2	39.4	34.4	32.0	26.6	14.5	32
AS22□1F-U02-06	6			11.0		23.9	33.1						15.5	32
AS22□1F-U02-08	8			15.2		27.2	36.4						18.5	34
AS22□1F-U02-10	10			18.5		35.3	44.5	19					21.0	36
AS32□1F-U02-06	6	1/4	19	11.0	23.0	26.4	37.9	20.3	45.9	40.9	38.1	33.1	15.5	53
AS32□1F-U02-08	8			15.2		29.5	41.0						18.5	55
AS32□1F-U02-10	10			18.5		31.8	43.3						21.0	57
AS32□1F-U02-12	12			20.9		32.8	44.3						22.0	59
AS32□1F-U03-06	6	3/8	19	11.0	23.0	26.4	37.9	19.4	45.0	40.0	37.6	32.6	15.5	53
AS32□1F-U03-08	8			15.2		29.5	41.0						18.5	55
AS32□1F-U03-10	10			18.5		31.8	43.3						21.0	57
AS32□1F-U03-12	12			20.9		32.8	44.3						22.0	59
AS42□1F-U04-10	10	1/2	24	18.5	28.6	33.6	47.9	22.4	54.6	47.1	44.5	37.0	21.0	94
AS42□1F-U04-12	12			20.9		34.6	48.9						22.0	95

Note 1) Reference dimensions
Note 2) Reference dimensions of Uni thread after installation.

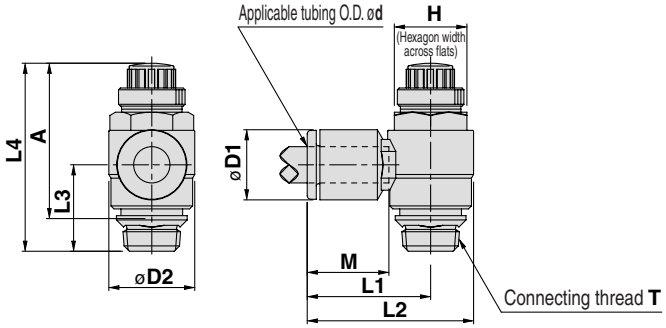
Universal Type/Metric Size



Model	Applicable tubing O.D. ød	T Uni thread	H	øD1	øD2	øD3	L1	L2	L3	L4	L5 (1) Max.	L5 (1) Min.	A (2) Max.	A (2) Min.	M	Mass (g)
AS23□1F-U01-23	3.2	1/8	12	7.8	14.2	9.3	13.4	24.8	18.9	33.2	36.1	31.1	30.5	25.5	14.5	17
AS23□1F-U01-04	4			8.9												17
AS23□1F-U01-06	6			11.0		10.9	14.5	27.1	20.6	34.9					15.5	18
AS23□1F-U01-08	8			15.2		12.9	16.2	30.9	24.7	38.2					18.5	21
AS23□1F-U02-04	4	1/4	17	8.9	18.5	9.3	15.6	29.2	18.9	36.1	39.4	34.4	32.0	26.6	14.5	32
AS23□1F-U02-06	6			11.0		10.9	16.7	31.4	20.6	37.8					15.5	33
AS23□1F-U02-08	8			15.2		12.9	18.3	35.2	24.4	40.8					18.5	36
AS23□1F-U02-10	10			18.5			19.6	38.1	26.8	43.2					21.0	40
AS33□1F-U02-06	6	1/4	19	11.0	23.0	10.9	18.9	35.9	20.6	42.5	45.9	40.9	38.1	33.1	15.5	54
AS33□1F-U02-08	8			15.2		12.9	20.6	39.7	24.4	43.7					18.5	57
AS33□1F-U02-10	10			18.5		16.2	22.5	43.3	28.3	48.6					21.0	61
AS33□1F-U02-12	12			20.9			23.5	45.5	29.3	49.6					22.0	63
AS33□1F-U03-06	6	3/8	19	11.0	23.0	10.9	18.9	35.9	20.6	41.6	45.0	40.0	37.6	32.6	15.5	54
AS33□1F-U03-08	8			15.2		12.9	20.6	39.7	24.4	42.8					18.5	57
AS33□1F-U03-10	10			18.5		16.2	22.5	43.3	28.3	47.7					21.0	61
AS33□1F-U03-12	12			20.9			23.5	45.5	29.3	48.7					22.0	63
AS43□1F-U04-10	10	1/2	24	18.5	28.6	16.2	25.3	48.9	28.3	50.7	54.6	47.1	44.5	37.0	21.0	98
AS43□1F-U04-12	12			20.9		19.4	26.8	51.6	30.8	53.2					22.0	100

Note 1) Reference dimensions
Note 2) Reference dimensions of Uni thread after installation.

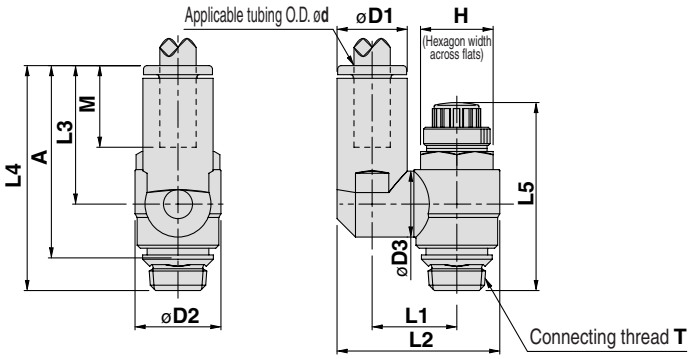
Elbow Type/Inch Size



Model	Applicable tubing O.D. ød	T Uni thread	H	øD1	øD2	L1	L2	L3	L4 (1)		A (2)		M	Mass (g)
									Max.	Min.	Max.	Min.		
AS22□1F-U01-01	1/8"	1/8	12	7.8	14.2	20.8	27.9	14.3	36.1	31.1	30.5	25.5	14.5	17
AS22□1F-U01-03	5/32"			8.9		21.1	28.2							17
AS22□1F-U01-05	3/16"			11.4		23.1	30.2						16.5	18
AS22□1F-U01-07	1/4"			13.2		23.9	31.0						17.0	19
AS22□1F-U01-09	5/16"			15.2		25.3	32.4						18.5	19
AS22□1F-U02-03	5/32"	1/4	17	8.9	18.5	23.3	32.5	17.2	39.4	34.4	32.0	26.6	14.5	32
AS22□1F-U02-05	3/16"			11.4		24.9	34.2						16.5	33
AS22□1F-U02-07	1/4"			13.2		25.2	34.5						17.0	33
AS22□1F-U02-09	5/16"			15.2		27.2	36.4						18.5	34
AS22□1F-U02-11	3/8"			17.9		35.3	44.5	19					21.0	36
AS32□1F-U02-07	1/4"	1/4	19	13.2	23.0	27.8	39.3	20.3	45.9	40.9	38.1	33.1	17.0	54
AS32□1F-U02-09	5/16"			15.2		29.5	41.0						18.5	55
AS32□1F-U02-11	3/8"			17.9		31.8	43.3						21.0	57
AS32□1F-U03-07	1/4"	3/8	19	13.2	23.0	27.8	39.3	19.4	45.0	40.0	37.6	32.6	17.0	54
AS32□1F-U03-09	5/16"			15.2		29.5	41.0						18.5	55
AS32□1F-U03-11	3/8"			17.9		31.8	43.3						21.0	57
AS42□1F-U04-11	3/8"	1/2	24	17.9	18.6	33.6	47.9	22.4	54.6	47.1	44.5	37.0	21.0	94
AS42□1F-U04-13	1/2"			21.4		35.2	49.5						22.0	96

Note 1) Reference dimensions
Note 2) Reference dimensions of Uni thread after installation.

Universal Type/Inch Size



Model	Applicable tubing O.D. ød	T Uni thread	H	øD1	øD2	øD3	L1	L2	L3	L4	L5 (1)		A (2)		M	Mass (g)
											Max.	Min.	Max.	Min.		
AS23□1F-U01-01	1/8"	1/8	12	7.8	14.2	9.3	13.4	24.8	18.9	33.2	36.1	31.1	30.5	25.5	14.5	17
AS23□1F-U01-03	5/32"			8.9												17
AS23□1F-U01-05	3/16"			11.4		10.3	14.2	27.0	21.5	35.9					16.5	19
AS23□1F-U01-07	1/4"			13.2		11.4	15.2	28.9	22.3	36.3					17.0	20
AS23□1F-U01-09	5/16"			15.2		12.9	16.2	30.9	24.7	38.2					18.5	21
AS23□1F-U02-03	5/32"	1/4	17	8.9	18.5	9.3	15.6	29.2	18.9	36.1	39.4	34.4	32.0	26.6	14.5	32
AS23□1F-U02-05	3/16"			11.4		10.3	16.4	31.1	21.5	38.8					16.5	34
AS23□1F-U02-07	1/4"			13.2		11.4	17.4	33.2	22.3	39.5					17.0	34
AS23□1F-U02-09	5/16"			15.2		12.9	18.3	35.2	24.4	40.8					18.5	36
AS23□1F-U02-11	3/8"			17.9			19.6	38.1	26.8	43.2					29.4	39
AS33□1F-U02-07	1/4"	1/4	19	13.2	23.0	11.4	19.6	37.7	22.3	44.2	45.9	40.9	38.1	33.1	17.0	56
AS33□1F-U02-09	5/16"			15.2		12.9	20.6	39.7	24.4	43.7					18.5	57
AS33□1F-U02-11	3/8"			17.9		16.2	22.5	42.9	28.3	48.6					21.0	61
AS33□1F-U03-07	1/4"	3/8	19	13.2	23.0	11.4	19.6	37.7	22.3	43.3	45.0	40.0	37.6	32.6	17.0	56
AS33□1F-U03-09	5/16"			15.2		12.9	20.6	39.7	24.4	42.8					18.5	57
AS33□1F-U03-11	3/8"			17.9		16.2	22.5	42.9	28.3	47.7					21.0	61
AS43□1F-U04-11	3/8"	1/2	24	17.9	28.6	16.2	25.3	48.6	28.3	50.7	54.6	47.1	44.5	37.0	21.1	97
AS43□1F-U04-13	1/2"			21.7		19.4	26.8	52.5	30.8	53.2					22.0	100

Note 1) Reference dimensions
Note 2) Reference dimensions of Uni thread after installation.

Made to Order Specifications

Please contact SMC for detailed dimensions, specifications, and delivery.

Antistatic Type — X260

Model

Model	Applicable tubing O.D.			
	Metric size			
	4	6	8	10
AS22□1F-U01	●	●	●	●
AS22□1F-U02	●	●	●	●
AS32□1F-U03		●	●	

Note 1) Electroless nickel plated

How to Order

AS 2 2 1 1F – U02 – 06 – X260

Body size

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

Elbow type

Control type

0	Meter-out
1	Meter-in

With One-touch fitting

Port size

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

Applicable tubing O.D.
Metric size

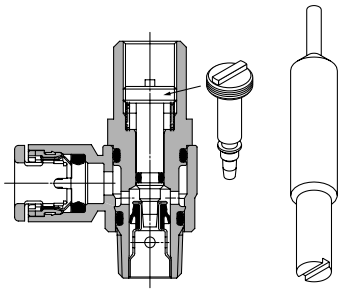
04	ø4
06	ø6
08	ø8
10	ø10

Tamper Proof Speed Controller with One-touch Fitting Elbow Type/Universal Type

Series AS□□□1F-T

Able to adjust flow by a special tool

Prevention of an unnecessary manual operation



Special tool
Part number: AS-T-1

Model

Elbow type	Universal type	Port size	Applicable tubing O.D.												Applicable cylinder bore size (mm)
			Metric size						Inch size						
			3.2	4	6	8	10	12	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	
AS12□1F-M5	AS13□1F-M5	M5 x 0.8	●	●	●											6, 10, 16, 20
AS22□1F-01	AS23□1F-01	R 1/8	●	●	●	●	●*									20, 25, 32
AS22□1F-02	AS23□1F-02	R 1/4		●	●	●	●									20, 25, 32, 40
AS32□1F-02	AS33□1F-02	R 1/4			●	●	●	●								40, 50, 63
AS32□1F-03	AS33□1F-03	R 3/8			●	●	●	●								40, 50, 63
AS42□1F-04	AS43□1F-04	R 1/2					●	●								63, 80, 100
AS12□1F-U10/32	AS13□1F-U10/32	10-32 UNF							●	●	●	●				6, 10, 16, 20
AS22□1F-N01	AS23□1F-N01	NPT 1/8							●	●	●	●	●			20, 25, 32
AS22□1F-N02	AS23□1F-N02	NPT 1/4								●	●	●	●	●		20, 25, 32, 40
AS32□1F-N02	AS33□1F-N02	NPT 1/4										●	●	●		40, 50, 63
AS32□1F-N03	AS33□1F-N03	NPT 3/8										●	●	●		40, 50, 63
AS42□1F-N04	AS43□1F-N04	NPT 1/2												●	●	63, 80, 100

Note 1) * Elbow type only
Note 2) Meter-out and meter-in types can be visually differentiated by the flow direction symbol on the resin 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)
Number of needle rotations	10 turns (8 turns (1))
Applicable tubing material (2)	Nylon, Soft nylon, Polyurethane

Note 1) In the case of AS12□1F-M5 and AS12□1F-U10/32 types AS13□1F-M5, AS13□1F-U10/32
Note 2) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used. (Refer to pages 371 and 372 for details.)
Note 3) Brass parts are all electroless nickel plated, provided as standard.

Elbow type

Universal type

How to Order

AS [2] [2] [1] 1 F – [01] – [06] S T – [ ]

Body size

1	M5 standard
2	1/8, 1/4 standard
3	3/8 standard
4	1/2 standard

Type

2	Elbow
3	Universal

Control

0	Meter-out
1	Meter-in

With One-touch fitting

Port size

M5	M5 x 0.8
01	R 1/8
02	R 1/4
03	R 3/8
04	R 1/2
U10/32	10-32 UNF
N01	NPT 1/8
N02	NPT 1/4
N03	NPT 3/8
N04	NPT 1/2

Applicable tubing O.D.

Metric size	
23	ø3.2*
04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

Inch size	
01	ø1/8"
03	ø5/32"
05	ø3/16"
07	ø1/4"
09	ø5/16"
11	ø3/8"
13	ø1/2"

* Use ø1/8" tube.

With seal
Note) In case that connecting port is either M5 or 10-32 UNF thread, it is not available with seal. With gasket is provided as standard.

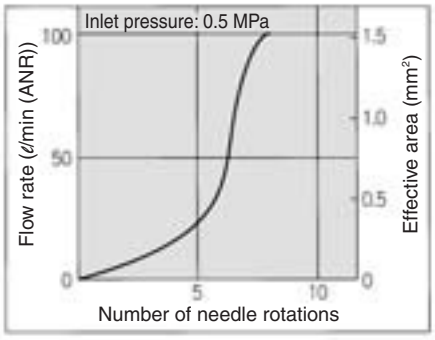
Tamper proof
Speed Controller requires a special tool for flow adjustment. Order separately with part number, AS-T-1.

Made to Order
Refer to page 535 for details.

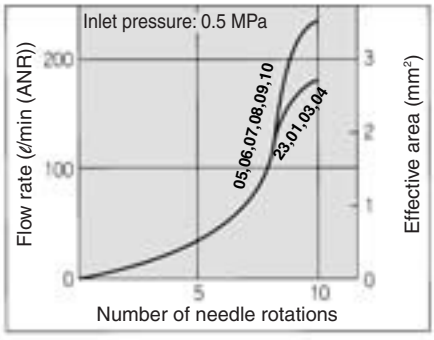
Made to Order
(Refer to page 535 for details.)

Needle Valve/Flow Characteristics

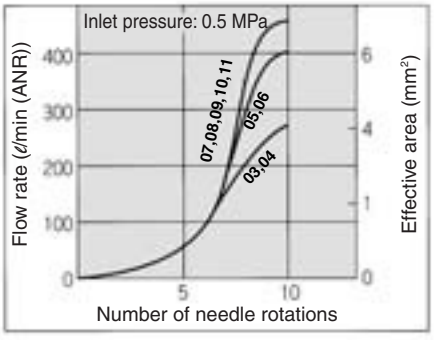
AS12□1F
AS13□1F



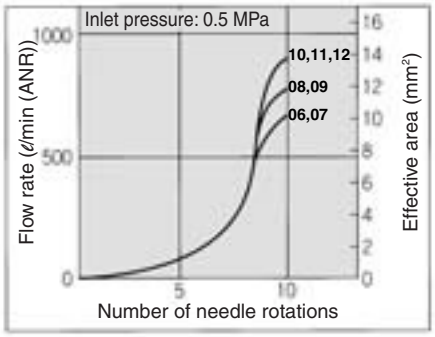
AS22□1F-□01
AS23□1F-□01



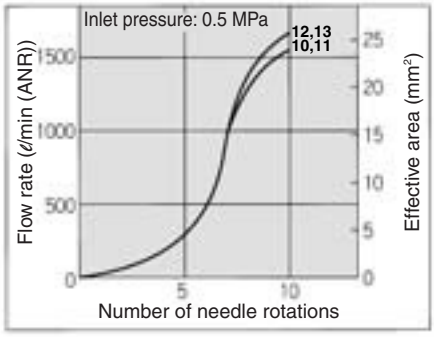
AS22□1F-□02
AS23□1F-□02



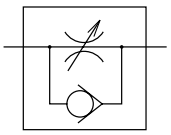
AS32□1F
AS33□1F



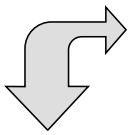
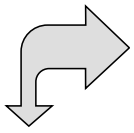
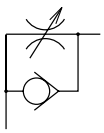
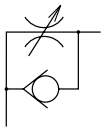
AS42□1F
AS43□1F



JIS Symbol



Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Symbol		
JIS Symbol		

⚠Caution

**Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.**

Flow Rate and Effective Area

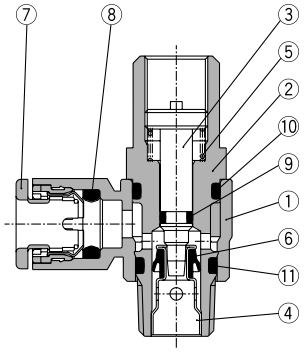
Model		AS12□1F AS13□1F	AS22□1F-□01 AS23□1F-□01		AS22□1F-□02 AS23□1F-□02			AS32□1F AS33□1F			AS42□1F AS43□1F	
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø3.2, ø4	ø6, ø8, ø10	ø4	ø6	ø8, ø10	ø6	ø8	ø10, ø12	ø10	ø12
	Inch size	ø1/8", ø5/32" ø3/16", ø1/4"	ø1/8", ø5/32"	ø3/16", ø1/4", ø5/16"	ø5/32"	ø3/16"	ø1/4", ø5/16", ø3/8"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
Controlled flow (Free flow)	Flow rate (ℓ/min (ANR))	100	180	230	260	390	460	660	790	920	1580	1710
	Effective area (mm²)	1.5	2.7	3.5	4	6	7	10	12	14	24	26

Note) Flow rate values are at a pressure of 0.5 MPa and a temperature of 20°C.

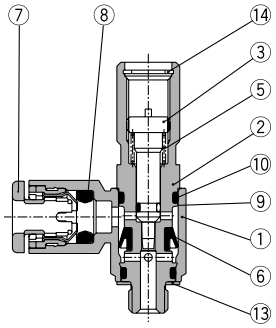
Construction

Elbow type

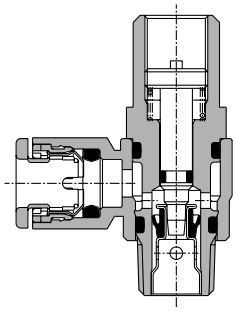
Meter-out type



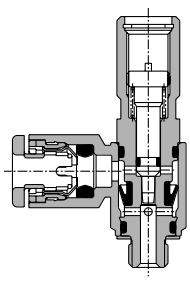
M5 type
U10/32 type



Meter-in type

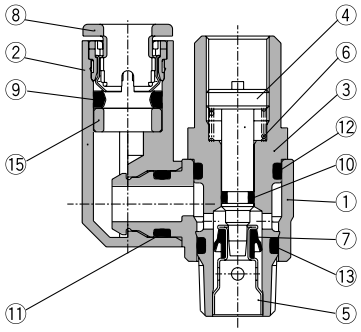


M5 type
U10/32 type

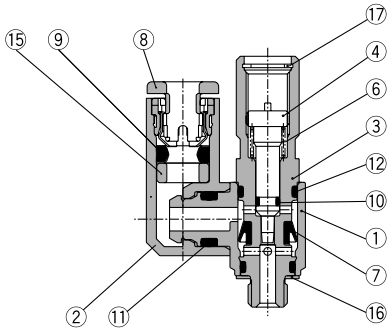


Universal type

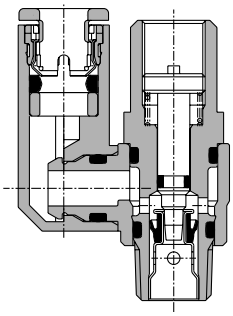
Meter-out type



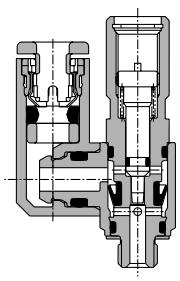
M5 type
U10/32 type



Meter-in type



M5 type
U10/32 type

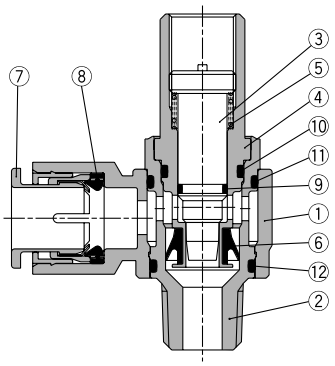


Construction

Elbow type

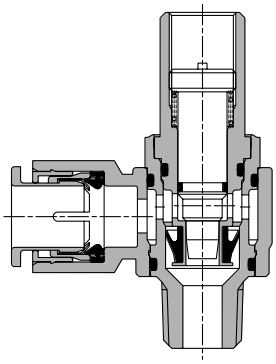
Meter-out type

AS3201F-02



Meter-in type

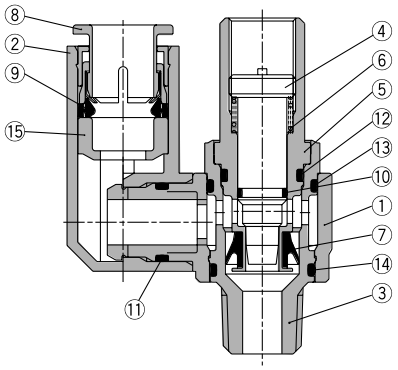
AS3211F-02



Universal type

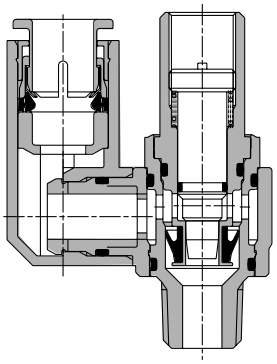
Meter-out type

AS3301F-02



Meter-in type

AS3311F-02



Component Parts

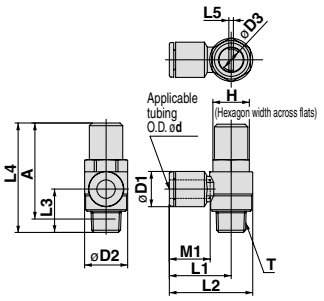
No.	Description	Material	Note
1	**Body A**	PBT	
2	**Body B**	Brass	Electroless nickel plated
3	**Needle**	Brass	Electroless nickel plated
4	**Seat ring**	Brass	Electroless nickel plated
5	**Spring**	Steel wire	
6	**U seal**	HNBR	
7	**Cassette**	—	
8	**Seal**	NBR	
9	**O-ring**	NBR	
10	**O-ring**	NBR	
11	**O-ring**	NBR	
12	**O-ring**	NBR	
13	**Gasket**	NBR, Stainless steel	
14	**Retaining ring for hole type C**	Tool steel	

Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Elbow body**	PBT	
3	**Body B**	Brass	Electroless nickel plated
4	**Needle**	Brass	Electroless nickel plated
5	**Seat ring**	Brass	Electroless nickel plated
6	**Spring**	Steel wire	
7	**U seal**	HNBR	
8	**Cassette**	—	
9	**Seal**	NBR	
10	**O-ring**	NBR	
11	**O-ring**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**O-ring**	NBR	
15	**Spacer**	—	
16	**Gasket**	NBR, Stainless steel	
17	**Retaining ring for hole type C**	Tool steel	

Construction

Elbow type



Metric Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5	A*	M1	Mass (g)
AS12□1F-M5-23T	3.2	M5 x 0.8	8	8.4	9.6	4.5	17.3	22.1	12.3	31	0.7	27.4	12.7	10
AS12□1F-M5-04T	4			9.3										
AS12□1F-M5-06T	6			11.6			18.1	22.9	11.7				13.5	
AS22□1F-01-23ST	3.2	R 1/8	12	8.4	14.2	7	20.4	27.5	13.4	34.7	1.5	31.6	12.7	20
AS22□1F-01-04ST	4			9.3										21
AS22□1F-01-06ST	6			11.6									13.5	
AS22□1F-01-08ST	8			15.2			25.3	32.4					18.5	23
AS22□1F-01-10ST	10			18.5			33.1	40.2	14.1				21	25
AS22□1F-02-04ST	4	R 1/4	17	10.4	18.5	7	25.2	34.4	17.7	40.2	1.5	34.7	16	40
AS22□1F-02-06ST	6			12.8									17	
AS22□1F-02-08ST	8			15.2			27.2	36.4					18.5	42
AS22□1F-02-10ST	10			18.5			35.3	44.5	19.5				21	44
AS32□1F-02-06ST	6	R 1/4	19	12.8	23	9.5	27.8	39.3	21.3	54.8	1.5	49.3	17	73
AS32□1F-02-08ST	8			15.2			29.5	41					18.5	76
AS32□1F-02-10ST	10			18.5			31.8	43.3					21	80
AS32□1F-02-12ST	12			20.9			32.8	44.3					22	82
AS32□1F-03-06ST	6	R 3/8	19	12.8	23	9.5	27.8	39.3	19.8	52.6	1.5	47.4	17	77
AS32□1F-03-08ST	8			15.2			29.5	41					18.5	79
AS32□1F-03-10ST	10			18.5			31.8	43.3					21	81
AS32□1F-03-12ST	12			20.9			32.8	44.3					22	83
AS42□1F-04-10ST	10	R 1/2	24	18.5	28.6	12	33.6	47.9	24.5	62.9	1.5	55.8	21	141
AS42□1F-04-12ST	12			20.9			34.6	48.9					22	142

* Reference dimensions of M5 x 0.8, R threads after installation.

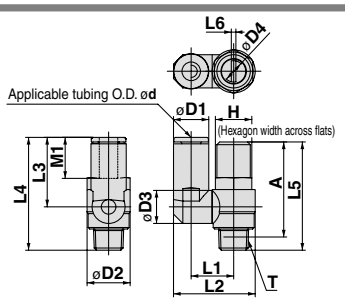
Inch Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5	A*	M1	Mass (g)
AS12□1F-U10/32-01T	1/8"	10-32 UNF	8	8.4	9.6	4.5	17.3	22.1	12.3	31	0.7	27.4	12.7	10
AS12□1F-U10/32-03T	5/32"			9.3										
AS12□1F-U10/32-05T	3/16"			11.4			21.3	26.1	11.7				16.5	
AS12□1F-U10/32-07T	1/4"			12			18.3	23.1					13.5	
AS22□1F-N01-01ST	1/8"	NPT 1/8	12.7	8.4	14.2	7	20.4	27.5	13.4	34.7	1.5	31.6	12.7	20
AS22□1F-N01-03ST	5/32"			9.3										21
AS22□1F-N01-05ST	3/16"			13.2			24	31.1					16.5	
AS22□1F-N01-07ST	1/4"			13.2			23.9	31					18.5	23
AS22□1F-N01-09ST	5/16"			15.2			25.3	32.4					21	25
AS22□1F-N02-03ST	5/32"	NPT 1/4	17.5	10.4	18.5	7	25.2	34.4	17.7	40.2	1.5	34.7	16	40
AS22□1F-N02-05ST	3/16"			12.8			25.2	34.5					17	
AS22□1F-N02-07ST	1/4"			13.2			25.2	34.5					18.5	42
AS22□1F-N02-09ST	5/16"			15.2			27.2	36.4					21	44
AS22□1F-N02-11ST	3/8"			18.5			35.3	44.5	19.5					
AS32□1F-N02-07ST	1/4"	NPT 1/4	19	13.2	23	9.5	27.8	39.3	21.3	54.8	1.5	49.3	17	73
AS32□1F-N02-09ST	5/16"			15.2			29.5	41					18.5	76
AS32□1F-N02-11ST	3/8"			17.9			31.8	43.3					21	80
AS32□1F-N03-07ST	1/4"	NPT 3/8	19	13.2	23	9.5	27.8	39.3	19.8	52.6	1.5	47.4	17	77
AS32□1F-N03-09ST	5/16"			15.2			29.5	41					18.5	79
AS32□1F-N03-11ST	3/8"			17.9			31.8	43.3					21	81
AS42□1F-N04-11ST	3/8"	NPT 1/2	23.8	17.9	28.6	12	33.6	47.9	24.5	62.9	1.5	55.8	21	141
AS42□1F-N04-13ST	1/2"			21.7			35.2	49.5					22	142

* Reference dimensions of 10-32 UNF and NPT threads after installation.

Dimensions

Universal type



Metric Size

Model	d	T	H	D1	D2	D3	D4	L1	L2	L3	L4	L5	L6	A*	M1	Mass (g)
AS13□1F-M5-23T	3.2	M5 x 0.8	8	8.4	9.6	9.3	4.5	10.8	19.8	17.5	28.7	31	0.7	27.4	12.7	10
AS13□1F-M5-04T	4			9.3					20.3							
AS13□1F-M5-06T	6			11.6					21.4	20.6	31.8				13.5	
AS23□1F-01-23ST	3.2	R 1/8	12	8.4	14.2	9.3	7	13.1	24.4	17.5	30.9	34.7	1.5	31.6	12.7	21
AS23□1F-01-04ST	4			9.3					24.9							22
AS23□1F-01-06ST	6			11.6		10.9		14	26.9	22.9	36.3				13.5	
AS23□1F-01-08ST	8			15.2		12.9		16.2	30.9	28.2	40.8				18.5	25
AS23□1F-02-04ST	4	R 1/4	17	10.4	18.5	10.9	7	16.2	30.6	21.9	39.6	40.2	1.5	34.7	16	40
AS23□1F-02-06ST	6			12.8		12.9		18.4	34	25.2	42.1				17	41
AS23□1F-02-08ST	8			15.2				18.3	35.2	28.2	45.1				18.5	44
AS23□1F-02-10ST	10			18.5				20.2	38.7	31	47.9				21	48
AS33□1F-02-06ST	6	R 1/4	19	12.8	23	12.9	9.5	20.6	38.5	25.2	46.5	54.8	1.5	49.3	17	73
AS33□1F-02-08ST	8			15.2					39.7	28.2	49.5				18.5	76
AS33□1F-02-10ST	10			18.5		16.2		23	43.7	32.6	53.9				21	80
AS33□1F-02-12ST	12			20.9					44.9	34.4	55.7				22	82
AS33□1F-03-06ST	6	R 3/8	19	12.8	23	12.9	9.5	20.6	38.5	25.2	45	52.6	1.5	47.4	17	78
AS33□1F-03-08ST	8			15.2					39.7	28.2	48				18.5	81
AS33□1F-03-10ST	10			18.5		16.2		23	43.7	32.6	52.4				21	85
AS33□1F-03-12ST	12			20.9					44.9	34.4	54.2				22	87
AS43□1F-04-10ST	10	R 1/2	24	18.5	28.6	16.2	12	25.8	49.4	32.6	57.1	62.9	1.5	55.8	21	145
AS43□1F-04-12ST	12			20.9		19.4		26.8	52	36.3	60.8				22	147

* Reference dimensions of M5 x 0.8, R threads after installation.

Inch Size

Model	d	T	H	D1	D2	D3	D4	L1	L2	L3	L4	L5	L6	A*	M1	Mass (g)
AS13□1F-U10/32-01T	1/8"	10-32 UNF	8	8.4	9.6	9.3	4.5	10.8	19.8	17.5	28.7	31	0.7	27.4	12.7	10
AS13□1F-U10/32-03T	5/32"			9.3					20.3							
AS13□1F-U10/32-05T	3/16"			11.4					21.3	23.3	34.5				16.5	11
AS13□1F-U10/32-07T	1/4"			12					21.6	20.7	31.9				13.7	
AS23□1F-N01-01ST	1/8"	NPT 1/8	12.7	8.4	14	9.3	7	13.1	24.4	17.5	30.9	34.7	1.5	31.6	12.7	21
AS23□1F-N01-03ST	5/32"			9.3					24.9							22
AS23□1F-N01-05ST	3/16"			11.4		10.9		14	26.8	23.9	37.3				16.5	
AS23□1F-N01-07ST	1/4"			13.2		12.9		16.2	29.9	25.6	38.2				18.5	23
AS23□1F-N01-09ST	5/16"			15.2					30.9	28.2	40.8				21	25
AS23□1F-N02-03ST	5/32"	NPT 1/4	17.5	10.4	19	10.9	7	16.2	30.6	21.9	39.6	40.2	1.5	34.7	16	40
AS23□1F-N02-05ST	3/16"			11.4					31.1	23.9	41.6				17	41
AS23□1F-N02-07ST	1/4"			13.2		12.9		18.3	34.2	25.6	42.5				18.5	44
AS23□1F-N02-09ST	5/16"			15.2					35.2	28.2	45.1				21	47
AS23□1F-N02-11ST	3/8"			17.9				20.2	38.7	31	47.9					48
AS33□1F-N02-07ST	1/4"	NPT 1/4	19	13.2	23	12.9	9.5	20.6	38.7	25.6	46.9	54.8	1.5	49.3	17	73
AS33□1F-N02-09ST	5/16"			15.2					39.7	28.2	49.5				18.5	76
AS33□1F-N02-11ST	3/8"			17.9		16.2		23	43.7	32.6	53.9				21	82
AS33□1F-N03-07ST	1/4"	NPT 3/8	19	13.2	23	12.9	9.5	20.6	38.7	25.6	45.4	52.6	1.5	47.4	17	78
AS33□1F-N03-09ST	5/16"			15.2					39.7	28.2	48				18.5	81
AS33□1F-N03-11ST	3/8"			17.9		16.2		23	43.7	32.6	52.4				21	87
AS43□1F-N04-11ST	3/8"	NPT 1/2	23.8	17.9	29	16.2	12	25.8	49.4	32.6	57.1	62.9	1.5	55.8	21	145
AS43□1F-N04-13ST	1/2"			21.7		19.4		26.8	52	36.3	60.8				22	147

* Reference dimensions of 10-32 UNF and NPT threads after installation.

Made to Order Specifications

Please contact SMC for detailed dimensions, specifications and delivery.

Lubricant: Vaseline — X12

Ex.) AS1201F-M5-23T-X12

Throttle Valve (Without Check Valve) — X214

Ex.) AS1201F-M5-23T-X214

Note) Throttle valve is only compatible with the product no. of the meter-out type.

Grease-free (Seal: Fluorine coated) + Throttle Valve (Without Check Valve) — X21

Ex.) AS1201F-M5-23T-X21

Note 1) Not particle-free
Note 2) Throttle valve is only compatible with the part no. of the meter-out type.

Tamper Proof Speed Controller with One-touch Fittings In-line Type

Series AS□□□1F-T

Model

Model	Applicable tubing O.D.												Applicable cylinder bore size (mm)
	Metric size						Inch size						
	3.2	4	6	8	10	12	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	
AS1001F	●	●	●				●	●	●	●				6, 10, 16, 20
AS2001F		●	●					●	●	●				20, 25, 32
AS2051F			●	●					●	●	●			20, 25, 32, 40
AS3001F			●	●	●	●				●	●	●		40, 50, 63
AS4001F					●	●						●	●	63, 80, 100

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)
Number of needle rotations	10 turns (8 turns (1))
Applicable tubing material (2)	Nylon, Soft nylon, Polyurethane

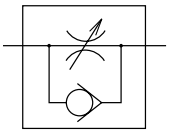
Note 1) In the case of AS1001F type
Note 2) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used. (Refer to pages 371 and 372 for details.)
Note 3) Brass parts are all electroless nickel plated.

Flow Rate and Effective Area

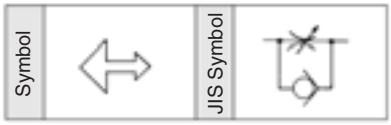
Model		AS1001F	AS2001F		AS2051F		AS3001F			AS4001F	
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø4	ø6	ø6	ø8	ø6	ø8	ø10, ø12	ø10	ø12
	Inch size	ø1/8", ø5/32" ø3/16", ø1/4"	ø5/32"	ø3/16", ø1/4"	ø3/16"	ø1/4", ø5/16"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
Controlled flow (Free flow)	Flow rate (ℓ/min (ANR))	100	130	230	290	460	420	660	920	1050	1390
	Effective area (mm²)	1.5	2	3.5	4.5	7	6.5	10	14	16	21

Note) Flow rate values are measured at 0.5 MPa and 20°C.

JIS Symbol



Flow Direction Symbols on Body



Made to Order
(Refer to page 538 for details.)

How to Order

AS 200 1F – 06 T – ☐

Body size

100	M5 standard
200	1/8 standard
205	1/4 standard
300	3/8 standard
400	1/2 standard

With One-touch fittings

Tamper proof
Note) Speed controller requires a special tool for flow adjustment. Order separately with part number, AS-T-1.

Applicable tubing O.D.

Metric size		Inch size	
23	ø3.2 *	**01**	ø1/8"
04	ø4	**03**	ø5/32"
06	ø6	**05**	ø3/16"
08	ø8	**07**	ø1/4"
10	ø10	**09**	ø5/16"
12	ø12	**11**	ø3/8"
		13	ø1/2"

* Use ø1/8" tube.

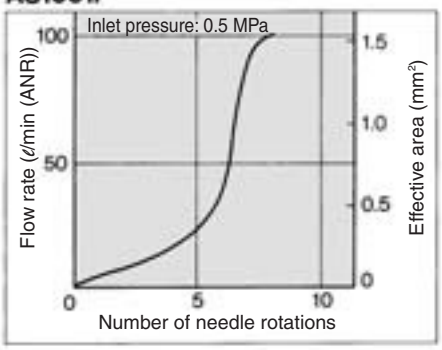
Made to Order
Refer to page 538 for details.

⚠Caution

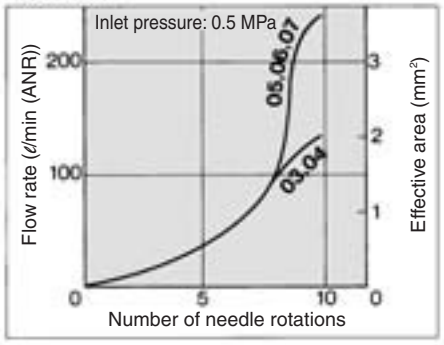
Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.

Needle Valve/Flow Characteristics

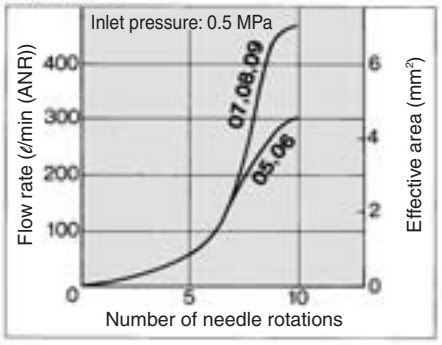
AS1001F



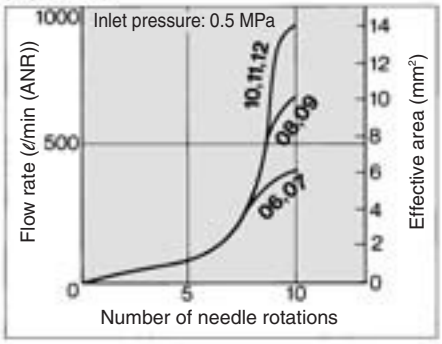
AS2001F



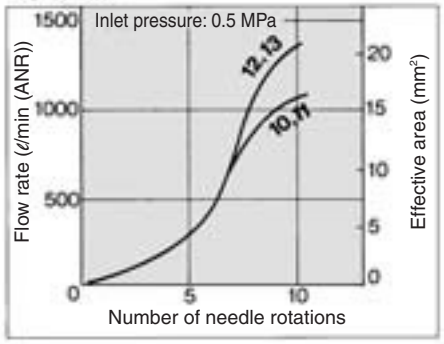
AS2051F



AS3001F

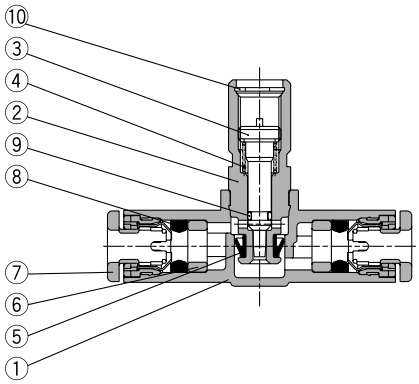


AS4001F

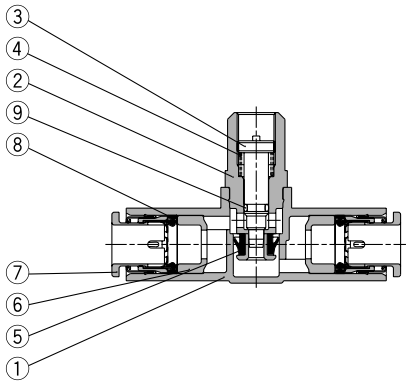


Construction

AS1001F



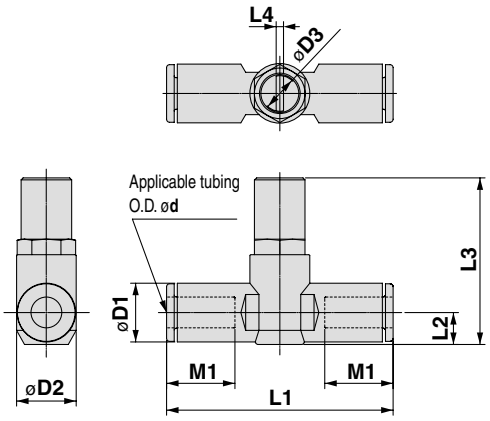
AS2001F to AS4001F



Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Body B**	Brass	Electroless nickel plated
3	**Needle**	Brass	Electroless nickel plated
4	**Spring**	Steel wire	
5	**U seal**	HNBR	
6	**Spacer**	—	
7	**Cassette**	—	
8	**Seal**	NBR	
9	**O-ring**	NBR	
10	**Retaining ring for hole type C**	Tool steel	

Dimensions



Metric Size

Model	d	D1	D2	D3	L1	L2	L3	L4	M1	Mass (g)
AS1001F-23T	3.2	8.4	10	4.5	38	4.5	26	0.7	12.7	8
AS1001F-04T	4	9.3			39.2	5.2	26.6			9
AS1001F-06T	6	11.6			40.7	6.2	27.7		13.5	10
AS2001F-04T	4	9.3	11.8	7	40.7	5.2	31.9	1.5	12.7	15
AS2001F-06T	6	11.6			44.8	6.3	33		13.5	16
AS2051F-06T	6	12.8	14.8	7	53.2	6.7	35.2	1.5	17	33
AS2051F-08T	8	15.2			59.8	8.1	36.5		18	36
AS3001F-06T	6	12.8	19.8	9.5	59	7.4	45	1.5	17	56
AS3001F-08T	8	15.2			64.4	8.2	45.8		18	60
AS3001F-10T	10	18.5			71.6	9.8	47.3		21	64
AS3001F-12T	12	20.9			76	11	48.5		22	68
AS4001F-10T	10	18.5	26.5	12	77.7	11.3	55.4	1.5	21	121
AS4001F-12T	12	20.9			82.1		56.4		22	125

Inch Size

Model	d	D1	D2	D3	L1	L2	L3	L4	M1	Mass (g)
AS1001F-01T	1/8"	8.4	10	4.5	38	4.5	26	0.7	12.7	8
AS1001F-03T	5/32"	9.3			39.2	5.2	26.6			9
AS1001F-05T	3/16"	11.4			48.7	6.2	27.7		16.5	14
AS1001F-07T	1/4"	12			40.7				13.7	11
AS2001F-03T	5/32"	9.3	11.8	7	40.7	5.2	31.9	1.5	12.7	15
AS2001F-05T	3/16"	11.4			50	6.2	32.8		16.5	21
AS2001F-07T	1/4"	13.2			52.2	7.1	33.7		17	19
AS2051F-05T	3/16"	11.4	14.8	7	52.2	6.2	34.9	1.5	16.5	35
AS2051F-07T	1/4"	13.2			54.4	7.1	35.7		17	33
AS2051F-09T	5/16"	15.2			59.8	8.1	36.7		18	36
AS3001F-07T	1/4"	13.2	19.8	9.5	59	7.4	45.2	1.5	17	56
AS3001F-09T	5/16"	15.2			64.4	8.2	46		18	60
AS3001F-11T	3/8"	17.9			70.8	9.5	47.2		21	72
AS4001F-11T	3/8"	17.9	26.5	12	76.9	10.3	55.5	1.5	21	129
AS4001F-13T	1/2"	21.7			83.1	11.6	56.9		22	142

Made to Order

Lubricant: Vaseline **X12**

Ex.) AS1001F-23T-X12

Throttle Valve (Without Check Valve) **X214**

Ex.) AS1001F-23T-X214

Grease-free (Seal: Fluorine coated) + Throttle Valve (Without Check Valve) **X21**

Ex.) AS1001F-23T-X21

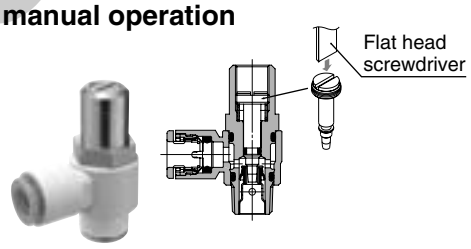
Note 1) Not particle-free

Speed Controller Adjustable by Flat Head Screwdriver with One-touch Fitting Elbow Type/Universal Type

Series AS□□□1F-D

Flow adjustable by flat head screwdriver

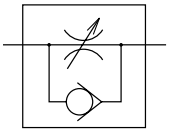
Prevention of an unnecessary manual operation



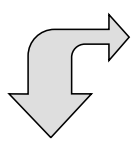
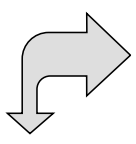
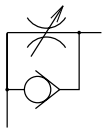
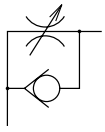
Elbow type

Universal type

JIS Symbol



Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Symbol		
JIS Symbol		

Made to Order
(Refer to page 513 for details.)

Model

Elbow type	Universal type	Port size	Applicable tubing O.D.												Applicable cylinder bore size (mm)
			Metric size						Inch size						
			3.2	4	6	8	10	12	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	
AS12□1F-M5	**AS13□1F-M5**	M5 x 0.8	●	●	●											6, 10, 16, 20
AS22□1F-01	**AS23□1F-01**	R 1/8	●	●	●	●	●*									20, 25, 32
AS22□1F-02	**AS23□1F-02**	R 1/4		●	●	●	●									20, 25, 32, 40
AS32□1F-02	**AS33□1F-02**	R 1/4			●	●	●	●								40, 50, 63
AS32□1F-03	**AS33□1F-03**	R 3/8			●	●	●	●								40, 50, 63
AS42□1F-04	**AS43□1F-04**	R 1/2					●	●								63, 80, 100
AS12□1F-U10/32	**AS13□1F-U10/32**	10-32 UNF							●	●	●	●				6, 10, 16, 20
AS22□1F-N01	**AS23□1F-N01**	NPT 1/8							●	●	●	●	●			20, 25, 32
AS22□1F-N02	**AS23□1F-N02**	NPT 1/4								●	●	●	●	●		20, 25, 32, 40
AS32□1F-N02	**AS33□1F-N02**	NPT 1/4										●	●	●		40, 50, 63
AS32□1F-N03	**AS33□1F-N03**	NPT 3/8										●	●	●		40, 50, 63
AS42□1F-N04	**AS43□1F-N04**	NPT 1/2												●	●	63, 80, 100

Note 1) * Elbow type only
Note 2) Meter-out and meter-in types can be visually differentiated by the flow direction symbol on the resin 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)
Number of needle rotations	10 turns (8 turns (1))
Applicable tubing material (2)	Nylon, Soft nylon, Polyurethane

Note 1) In the case of AS12□1F-M5 and AS12□1F-U10/32 types
In the case of AS13□1F-M5 and AS13□1F-U10/32 types
Note 2) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used. (Refer to pages 371 and 372 for details.)
Note 3) Brass parts are all electroless nickel plated, provided as standard.

Flow Rate and Effective Area

Model		AS12□1F AS13□1F	AS22□1F-□01 AS23□1F-□01		AS22□1F-□02 AS23□1F-□02			AS32□1F AS33□1F			AS42□1F AS43□1F	
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø3.2, ø4	ø6, ø8, ø10	ø4	ø6	ø8, ø10	ø6	ø8	ø10, ø12	ø10	ø12
	Inch size	ø1/8", ø5/32" ø3/16", ø1/4"	ø1/8", ø5/32"	ø3/16", ø1/4", ø5/16"	ø5/32"	ø3/16"	ø1/4", ø5/16", ø3/8"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
Controlled flow (Free flow)	Flow rate (ℓ/min (ANR))	100	180	230	260	390	460	660	790	920	1580	1710
	Effective area (mm²)	1.5	2.7	3.5	4	6	7	10	12	14	24	26

Note) Flow rate values are measured at 0.5 MPa and 20°C.

How to Order

AS 2 2 1 1 F – 01 – 06 S D – ☐

Body size

1	M5 standard
2	1/8, 1/4 standard
3	3/8 standard
4	1/2 standard

Type

2	Elbow
3	Universal

Control

0	Meter-out
1	Meter-in

With One-touch fitting

Port size

M5	M5 x 0.8
01	R 1/8
02	R 1/4
03	R 3/8
04	R 1/2
U10/32	10-32 UNF
N01	NPT 1/8
N02	NPT 1/4
N03	NPT 3/8
N04	NPT 1/2

Applicable tubing O.D.

Metric size		Inch size	
23	ø3.2 *	01	ø1/8"
04	ø4	03	ø5/32"
06	ø6	05	ø3/16"
08	ø8	07	ø1/4"
10	ø10	09	ø5/16"
12	ø12	11	ø3/8"
		13	ø1/2"

* Use ø1/8" tube.

With seal
Note) In the case that port size is either M5 or 10-32 UNF thread, it is not available with seal. Gasket is provided as standard.

Type adjustable by flat head screwdriver

Made to Order
Refer to the below for details.

Made to Order

Made to Order

Lubricant: Vaseline — X12

Ex.) AS1201F-M5-23D-X12

Throttle Valve (Without Check Valve) — X214

Ex.) AS1201F-M5-23D-X214

Note) Throttle valve is only compatible with the part no. of the meter-out type.

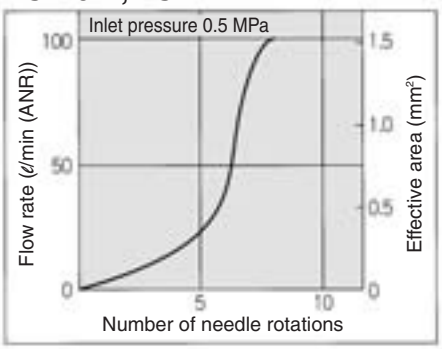
Grease-free (Seal: Fluorine Coating) + Throttle Valve (Without Check Valve) — X21

Ex.) AS1201F-M5-23D-X21

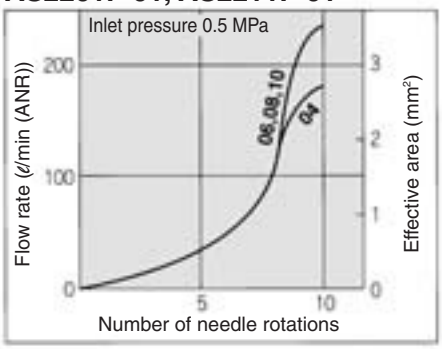
Note 1) Not particle-free
Note 2) Throttle valve is only compatible with the part no. of the meter-out type.

Needle Valve/Flow Characteristics

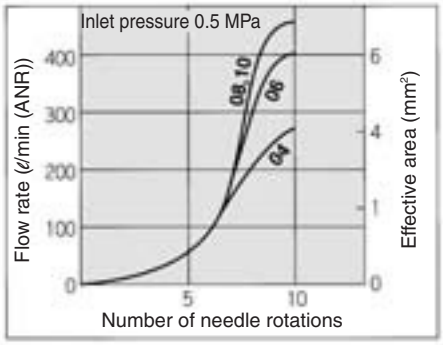
AS1201F, AS1211F



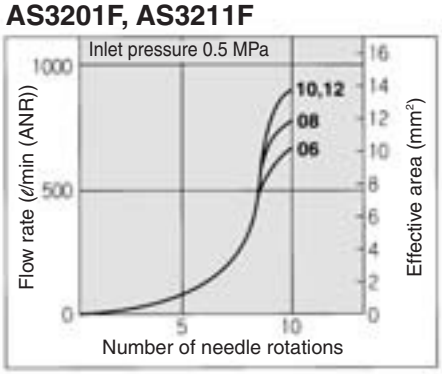
AS2201F-01, AS2211F-01



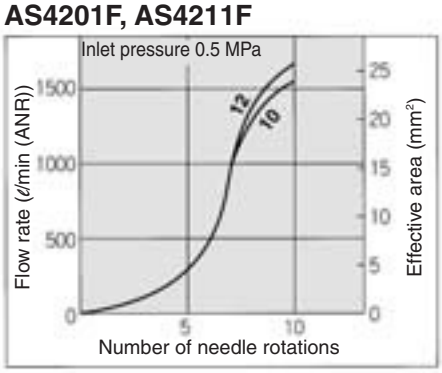
AS2201F-02, AS2211F-02



AS3201F, AS3211F



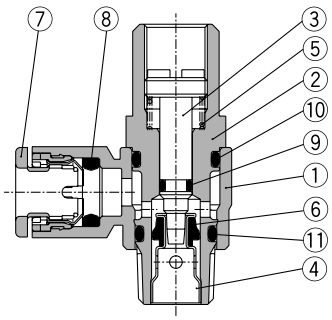
AS4201F, AS4211F



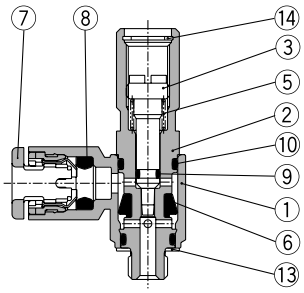
Construction

Elbow type

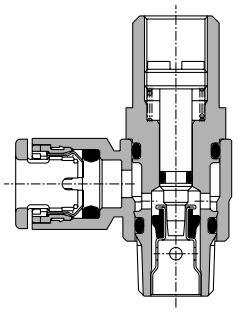
Meter-out type



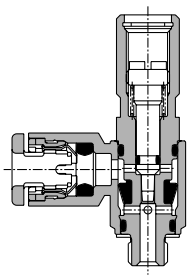
M5 type
U10/32 type



Meter-in type

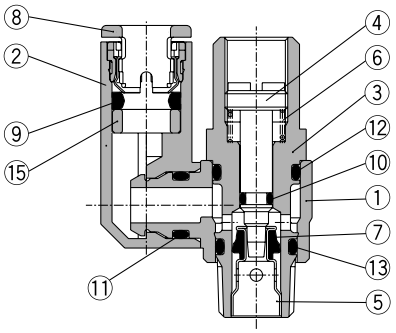


M5 type
U10/32 type

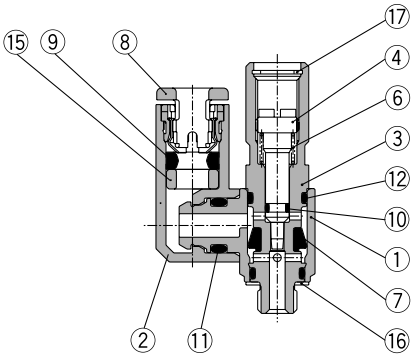


Universal type

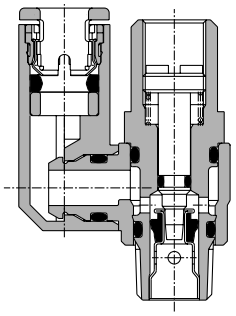
Meter-out type



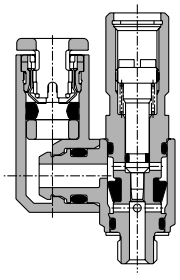
M5 type
U10/32 type



Meter-in type



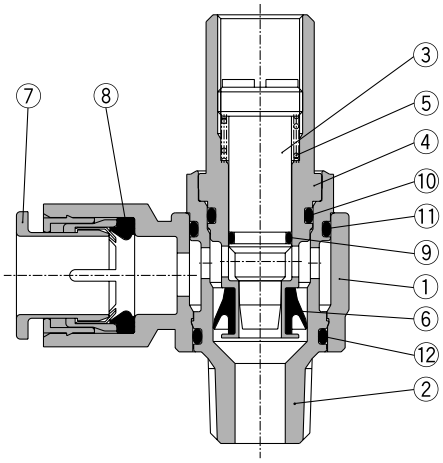
M5 type
U10/32 type



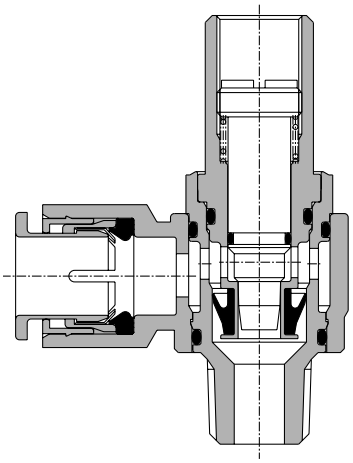
Construction

Elbow type

Meter-out AS3201F-02

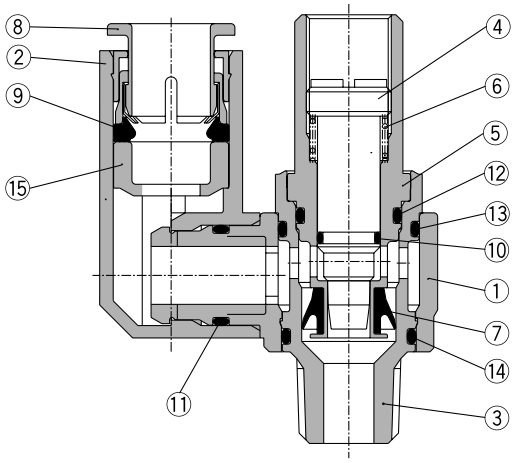


Meter-in AS3211F-02

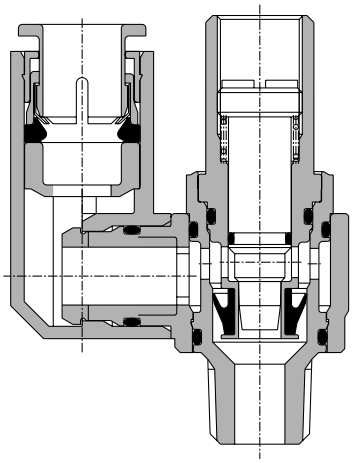


Universal type

Meter-out AS3301F-02



Meter-in AS3311F-02



Component Parts

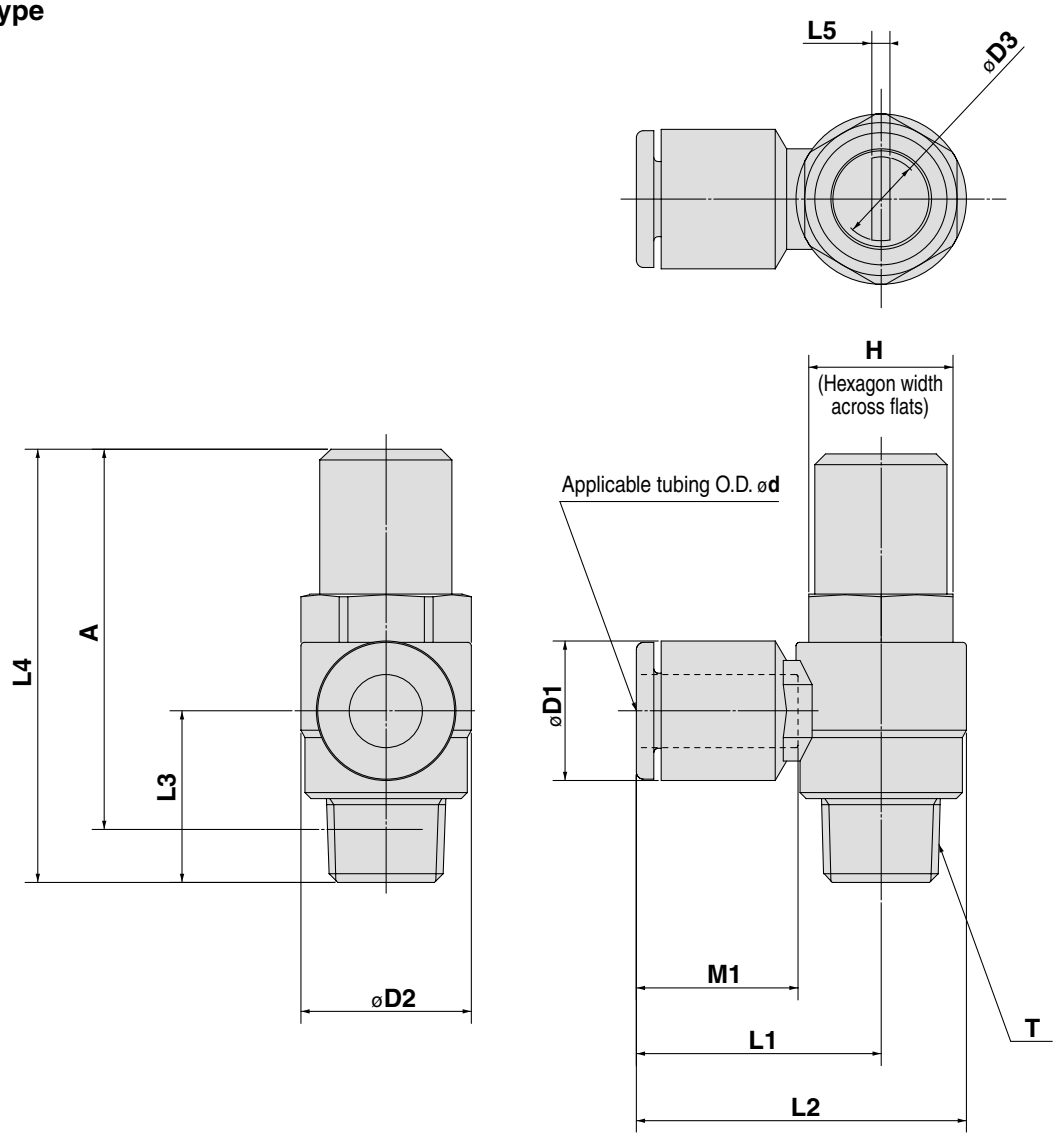
No.	Description	Material	Note
1	**Body A**	PBT	
2	**Body B**	Brass	Electroless nickel plated
3	**Needle**	Brass	Electroless nickel plated
4	**Seat ring**	Brass	Electroless nickel plated
5	**Spring**	Steel wire	
6	**U seal**	HNBR	
7	**Cassette**	—	
8	**Seal**	NBR	
9	**O-ring**	NBR	
10	**O-ring**	NBR	
11	**O-ring**	NBR	
12	**O-ring**	POM	
13	**Gasket**	NBR, Stainless steel	
14	**Retaining ring for hole type C**	Tool steel	

Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Elbow body**	PBT	
3	**Body B**	Brass	Electroless nickel plated
4	**Needle**	Brass	Electroless nickel plated
5	**Seat ring**	Brass	Electroless nickel plated
6	**Spring**	Steel wire	
7	**U seal**	HNBR	
8	**Cassette**	—	
9	**Seal**	NBR	
10	**O-ring**	NBR	
11	**O-ring**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**O-ring**	NBR	
15	**Spacer**	—	
16	**Gasket**	NBR, Stainless steel	
17	**Retaining ring for hole type C**	Tool steel	

Dimensions

Elbow type



Metric Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5	A*	M1	Mass (g)
AS12□1F-M5-23D	3.2	M5 x 0.8	8	8.4	9.6	4.7	17.3	22.1	12.3	31	0.7	27.4	12.7	10
AS12□1F-M5-04D	4			9.3										
AS12□1F-M5-06D	6			11.6			18.1	22.9	11.7				13.5	
AS22□1F-01-23SD	3.2	R 1/8	12	8.4	14.2	7.2	20.4	27.5	13.4	34.7	1.2	31.6	12.7	20
AS22□1F-01-04SD	4			9.3										21
AS22□1F-01-06SD	6			11.6									13.5	
AS22□1F-01-08SD	8			15.2			25.3	32.4					18.5	23
AS22□1F-01-10SD	10			18.5			35.3	44.5	14.1				21	25
AS22□1F-02-04SD	4	R 1/4	17	10.4	18.5	7.2	25.2	34.4	17.7	40.2	1.2	34.7	16	40
AS22□1F-02-06SD	6			12.8									17	
AS22□1F-02-08SD	8			15.2			27.2	36.4					18.5	42
AS22□1F-02-10SD	10			18.5			35.3	44.5	19.5				21	44
AS32□1F-02-06SD	6	R 1/4	19	12.8	23	9.8	27.8	39.3	21.3	54.8	1.2	49.3	17	73
AS32□1F-02-08SD	8			15.2			29.5	41					18.5	76
AS32□1F-02-10SD	10			18.5			31.8	43.3					21	80
AS32□1F-02-12SD	12			20.9			32.8	44.3					22	82
AS32□1F-03-06SD	6	R 3/8	19	12.8	23	9.8	27.8	39.3	19.8	52.6	1.2	47.4	17	77
AS32□1F-03-08SD	8			15.2			29.5	41					18.5	79
AS32□1F-03-10SD	10			18.5			31.8	43.3					21	81
AS32□1F-03-12SD	12			20.9			32.8	44.3					22	83
AS42□1F-04-10SD	10	R 1/2	24	18.5	28.6	12.4	33.6	47.9	24.5	62.9	1.2	55.8	21	141
AS42□1F-04-12SD	12			20.9			34.6	48.9					22	142

* Reference dimensions of M5 x 0.8, R threads after installation.

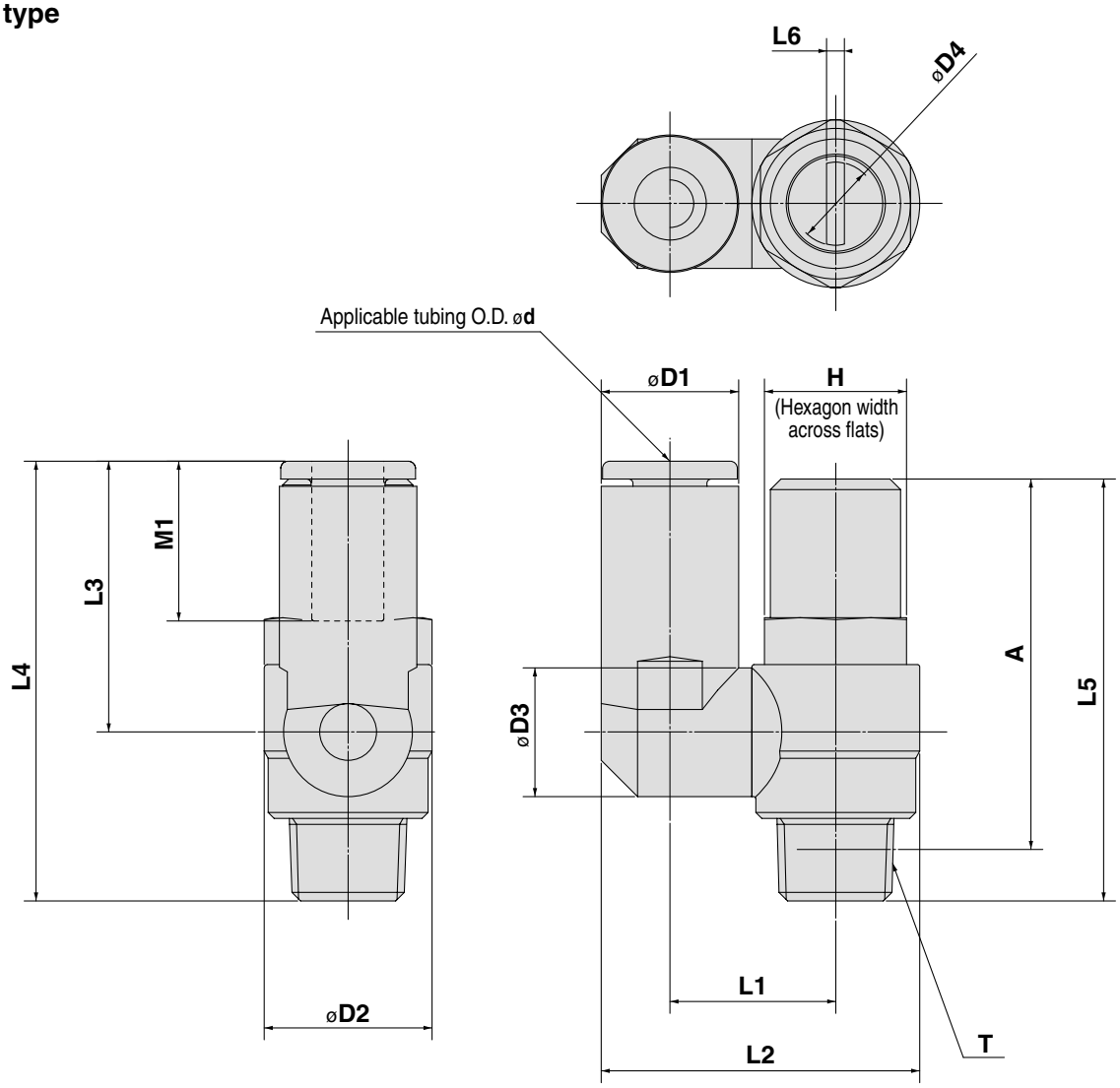
Inch Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5	A*	M1	Mass (g)
AS12□1F-U10/32-01D	1/8"	10-32 UNF	8	8.4	9.6	4.7	17.3	22.1	12.3	31	0.7	27.4	12.7	10
AS12□1F-U10/32-03D	5/32"			9.3										
AS12□1F-U10/32-05D	3/16"			11.4			21.3	26.1	11.7				16.5	
AS12□1F-U10/32-07D	1/4"			12			18.3	23.1					13.5	
AS22□1F-N01-01SD	1/8"	NPT 1/8	12.7	8.4	14.2	7.2	20.4	27.5	13.4	34.7	1.2	31.6	12.7	20
AS22□1F-N01-03SD	5/32"			9.3										21
AS22□1F-N01-05SD	3/16"			13.2			24	31.1					16.5	
AS22□1F-N01-07SD	1/4"			13.2			23.9	31					18.5	23
AS22□1F-N01-09SD	5/16"			15.2			25.3	32.4					21	25
AS22□1F-N02-03SD	5/32"	NPT 1/4	17.5	10.4	18.5	7.2	25.2	34.4	17.7	40.2	1.2	34.7	16	40
AS22□1F-N02-07SD	3/16"			12.8			25.2	34.5					17	
AS22□1F-N02-07SD	1/4"			13.2			25.2	34.5					18.5	42
AS22□1F-N02-09SD	5/16"			15.2			27.2	36.4					21	44
AS22□1F-N02-11SD	3/8"			18.3			35.3	44.5	19.5					
AS32□1F-N02-07SD	1/4"	NPT 1/4	19	13.2	23	9.8	27.8	39.3	21.3	54.8	1.2	49.3	17	73
AS32□1F-N02-09SD	5/16"			15.2			29.5	41					18.5	76
AS32□1F-N02-11SD	3/8"			17.9			31.8	43.3					21	80
AS32□1F-N03-07SD	1/4"	NPT 3/8	19	13.2	23	9.8	27.8	39.3	19.8	52.6	1.2	47.4	17	77
AS32□1F-N03-09SD	5/16"			15.2			29.5	41					18.5	79
AS32□1F-N03-11SD	3/8"			17.9			31.8	43.3					21	81
AS42□1F-N04-11SD	3/8"	NPT 1/2	23.8	17.9	28.6	12.4	33.6	47.9	24.5	62.9	1.2	55.8	21	141
AS42□1F-N04-13SD	1/2"			21.7			35.2	49.5					22	142

* Reference dimensions of 10-32 UNF and NPT threads after installation.

Dimensions

Universal type



Metric Size

Model	d	T	H	D1	D2	D3	D4	L1	L2	L3	L4	L5	L6	A*	M1	Mass (g)
AS13□1F-M5-23D	3.2	M5 x 0.8	8	8.4	9.6	9.3	4.7	10.8	19.8	17.5	28.7	31	0.7	27.4	12.7	10
AS13□1F-M5-04D	4			9.3					20.3							
AS13□1F-M5-06D	6			11.6					21.4	20.6	31.8				13.5	
AS23□1F-01-23SD	3.2	R 1/8	12	8.4	14.2	9.3	7.2	13.1	24.4	17.5	30.9	34.7	1.2	31.6	12.7	21
AS23□1F-01-04SD	4			9.3					24.9							22
AS23□1F-01-06SD	6			11.6		10.9		14	26.9	22.9	36.3				13.5	
AS23□1F-01-08SD	8			15.2		12.9		16.2	30.9	28.2	40.8				18.5	25
AS23□1F-02-04SD	4	R 1/4	17	10.4	18.5	10.9	7.2	16.2	30.6	21.9	39.6	40.2	1.2	34.7	16	40
AS23□1F-02-06SD	6			12.8		12.9		18.4	34	25.2	42.1				17	41
AS23□1F-02-08SD	8			15.2				18.3	35.2	28.2	45.1				18.5	44
AS23□1F-02-10SD	10			18.5				20.2	38.7	31	47.9				21	48
AS33□1F-02-06SD	6	R 1/4	19	12.8	23	12.9	9.8	20.6	38.5	25.2	46.5	54.8	1.2	49.3	17	73
AS33□1F-02-08SD	8			15.2					39.7	28.2	49.5				18.5	76
AS33□1F-02-10SD	10			18.5		16.2		23	43.7	32.6	53.9				21	80
AS33□1F-02-12SD	12			20.9					44.9	34.4	55.7				22	82
AS33□1F-03-06SD	6	R 3/8	19	12.8	23	12.9	9.8	20.6	38.5	25.2	45	52.6	1.2	47.4	17	78
AS33□1F-03-08SD	8			15.2					39.7	28.2	48				18.5	81
AS33□1F-03-10SD	10			18.5		16.2		23	43.7	32.6	52.4				21	85
AS33□1F-03-12SD	12			20.9					44.9	34.4	54.2				22	87
AS43□1F-04-10SD	10	R 1/2	24	18.5	28.6	16.2	12.4	25.8	49.4	32.6	57.1	62.9	1.2	55.8	21	145
AS43□1F-04-12SD	12			20.9		19.4		26.8	52	36.3	60.8				22	147

* Reference dimensions of M5 x 0.8, R threads after installation.

Inch Size

Model	d	T	H	D1	D2	D3	D4	L1	L2	L3	L4	L5	L6	A*	M1	Mass (g)
AS13□1F-U10/32-01D	1/8"	10-32 UNF	8	8.4	9.6	9.3	4.7	10.8	19.8	17.5	28.7	31	0.7	37.4	12.7	10
AS13□1F-U10/32-03D	5/32"			9.3					20.3							
AS13□1F-U10/32-05D	3/16"			11.4					21.3	23.3	34.5				16.5	11
AS13□1F-U10/32-07D	1/4"			12					21.6	20.7	31.9				13.7	
AS23□1F-N01-01SD	1/8"	NPT 1/8	12.7	8.4	14	9.3	7.2	13.1	24.4	17.5	30.9	34.7	1.2	31.6	12.7	21
AS23□1F-N01-03SD	5/32"			9.3					24.9							22
AS23□1F-N01-05SD	3/16"			11.4		10.9		14	26.8	23.9	37.3				16.5	
AS23□1F-N01-07SD	1/4"			13.2		12.9		16.2	29.9	25.6	38.2				18.5	23
AS23□1F-N01-09SD	5/16"			15.2					30.9	28.2	40.8				21	25
AS23□1F-N02-03SD	5/32"	NPT 1/4	17.5	10.4	19	10.9	7.2	16.2	30.6	21.9	39.6	40.2	1.2	34.7	16	40
AS23□1F-N02-05SD	3/16"			11.4					31.1	23.9	41.6				17	41
AS23□1F-N02-07SD	1/4"			13.2		12.9		18.3	34.2	25.6	42.5				18.5	44
AS23□1F-N02-09SD	5/16"			15.2					35.2	28.2	45.1				21	47
AS23□1F-N02-11SD	3/8"			17.9				20.2	38.7	31	47.9					48
AS33□1F-N02-07SD	1/4"	NPT 1/4	19	13.2	23	12.9	9.8	20.6	38.7	25.6	46.9	54.8	1.2	49.3	17	73
AS33□1F-N02-09SD	5/16"			15.2					39.7	28.2	49.5				18.5	76
AS33□1F-N02-11SD	3/8"			17.9		16.2		23	43.7	32.6	53.9				21	82
AS33□1F-N03-07SD	1/4"	NPT 3/8	19	13.2	23	12.9	9.8	20.6	38.7	25.6	45.4	52.6	1.2	47.4	17	78
AS33□1F-N03-09SD	5/16"			15.2					39.7	28.2	48				18.5	81
AS33□1F-N03-11SD	3/8"			17.9		16.2		23	43.7	32.6	52.4				21	87
AS43□1F-N04-11SD	3/8"	NPT 1/2	23.8	17.9	29	16.2	12.4	25.8	49.4	32.6	57.1	62.9	1.2	55.8	21	145
AS43□1F-N04-13SD	1/2"			21.7		19.4		26.8	52	36.3	60.8				22	147

* Reference dimensions of 10-32 UNF and NPT threads after installation.

Speed Controller Adjustable by Flat Head Screwdriver with One-touch Fittings In-line Type

Series AS□□□1F-D

Model

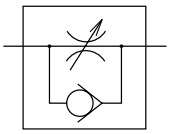
Model	Applicable tubing O.D.												Applicable cylinder bore size (mm)
	Metric size						Inch size						
	3.2	4	6	8	10	12	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	
AS1001F	●	●	●				●	●	●	●				6, 10, 16, 20
AS2001F		●	●					●	●	●				20, 25, 32
AS2051F			●	●					●	●	●			20, 25, 32, 40
AS3001F			●	●	●	●				●	●	●		40, 50, 63
AS4001F					●	●						●	●	63, 80, 100

Specifications

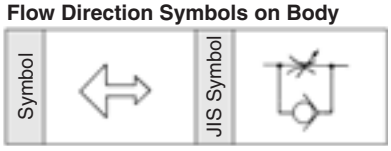
Fluid	Air
Proof pressure	1.5 MPa
Max. operating pressure	1 MPa
Min. operating pressure	0.1 MPa
Ambient and fluid temperature	–5 to 60°C (No freezing)
Number of needle rotations	10 turns (8 turns (1))
Applicable tubing material (2)	Nylon, Soft nylon, Polyurethane

Note 1) In the case of AS1001F type
Note 2) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used. (Refer to pages 371 and 372 for details.)
Note 3) Brass parts are all electroless nickel plated.

JIS Symbol



Flow Direction Symbols on Body



Flow Rate and Effective Area

Model		AS1001F	AS2001F		AS2051F		AS3001F			AS4001F	
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø4	ø6	ø6	ø8	ø6	ø8	ø10, ø12	ø10	ø12
	Inch size	ø1/8", ø5/32" ø3/16", ø1/4"	ø5/32"	ø3/16", ø1/4"	ø3/16"	ø1/4", ø5/16"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
Controlled flow (Free flow)	Flow rate (ℓ/min (ANR))	100	130	230	290	460	420	660	920	1050	1390
	Effective area (mm²)	1.5	2	3.5	4.5	7	6.5	10	14	16	21

Note) Flow rate values are measured at 0.5 MPa and 20°C

How to Order

AS 200 1F — 06 D — [ ]

Body size

100	M5 standard
200	1/8 standard
205	1/4 standard
300	3/8 standard
400	1/2 standard

With One-touch fittings

Applicable tubing O.D.

Metric size		Inch size	
23	ø3.2 *	**01**	ø1/8"
04	ø4	**03**	ø5/32"
06	ø6	**05**	ø3/16"
08	ø8	**07**	ø1/4"
10	ø10	**09**	ø5/16"
12	ø12	**11**	ø3/8"
		13	ø 1/2"

* Use ø1/8" tube.

Type adjustable by flat head screwdriver

Made to Order
Refer to page 521 for details.

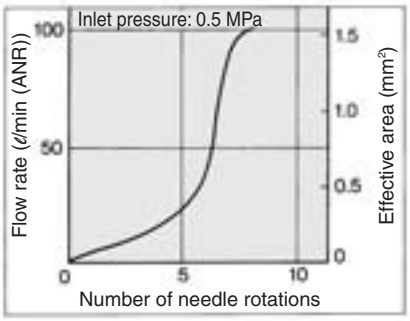
Made to Order
(Refer to page 521 for details.)

⚠Caution

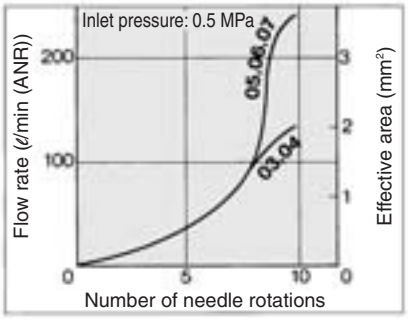
Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.

Needle Valve/Flow Characteristics

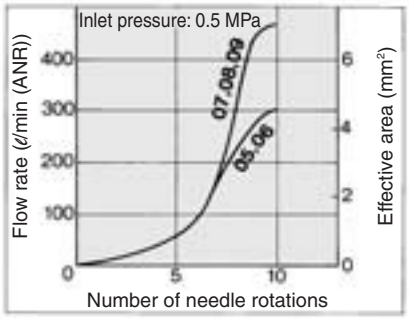
AS1001F



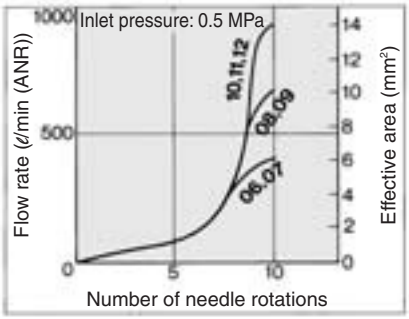
AS2001F



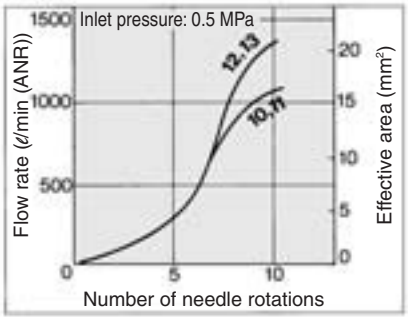
AS2051F



AS3001F

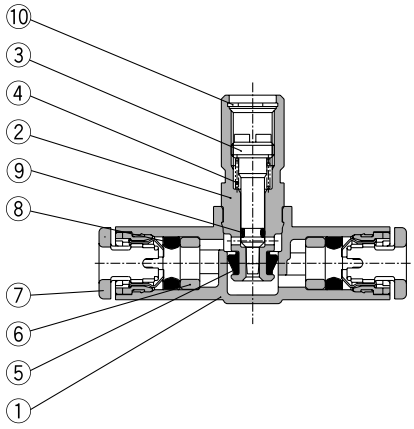


AS4001F

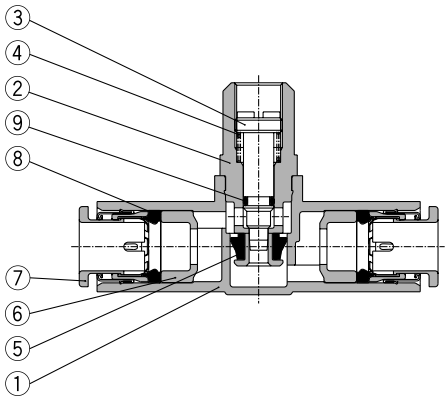


Construction

AS1001F



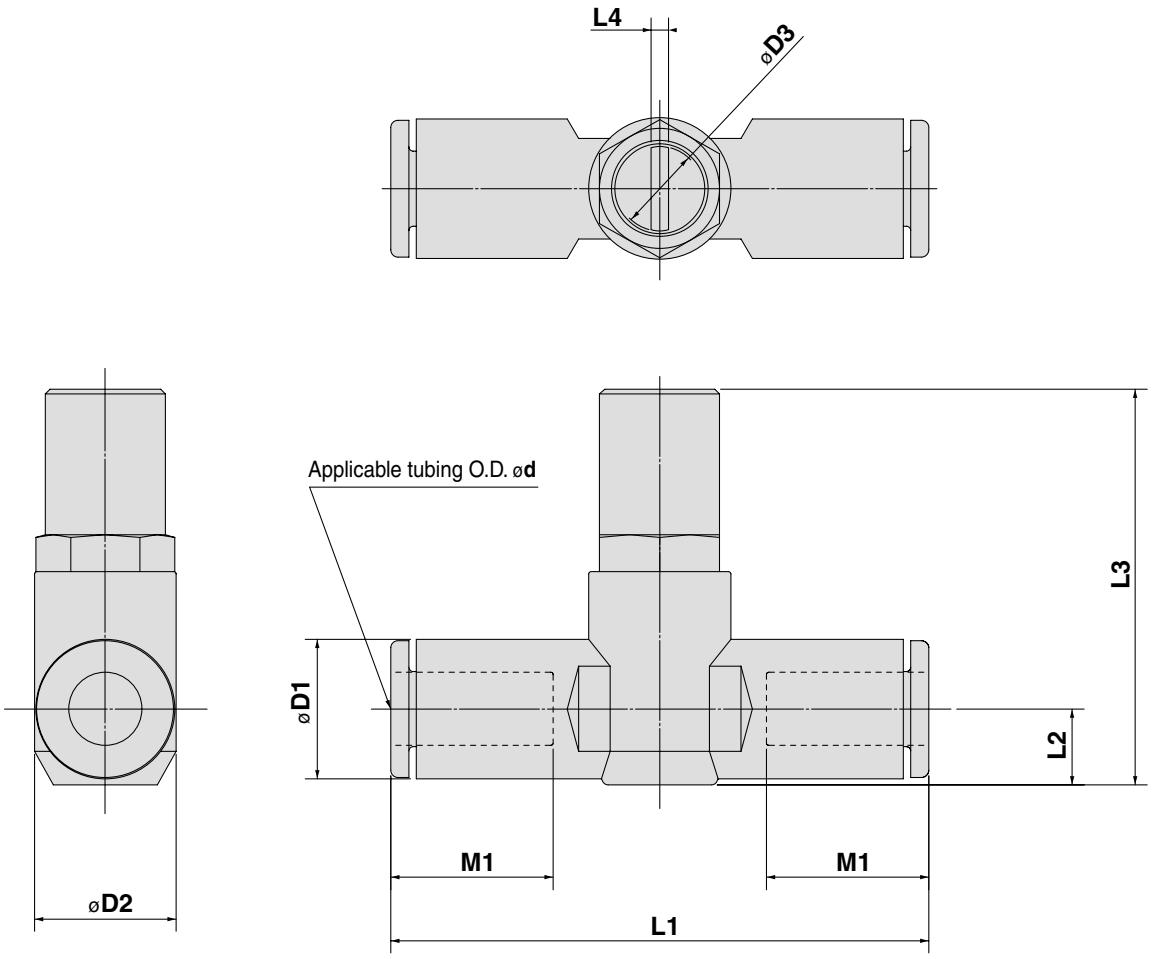
AS2001F to AS4001F



Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Body B**	Brass	Electroless nickel plated
3	**Needle**	Brass	Electroless nickel plated
4	**Spring**	Steel wire	
5	**U seal**	HNBR	
6	**Spacer**	—	
7	**Cassette**	—	
8	**Seal**	NBR	
9	**O-ring**	NBR	
10	**Retaining ring for hole type C**	Tool steel	

Dimensions



Metric Size

Model	d	D1	D2	D3	L1	L2	L3	L4	M1	Mass (g)
AS1001F-23D	3.2	8.4	10	4.7	38	4.5	26	0.7	12.7	8
AS1001F-04D	4	9.3			39.2	5.2	26.6			9
AS1001F-06D	6	11.6			40.7	6.2	27.7		13.5	10
AS2001F-04D	4	9.3	11.8	7.2	40.7	5.2	31.9	1.2	12.7	15
AS2001F-06D	6	11.6			44.8	6.3	33		13.5	16
AS2051F-06D	6	12.8	14.8	7.2	53.2	6.7	35.2	1.2	17	33
AS2051F-08D	8	15.2			59.8	8.1	36.5		18	36
AS3001F-06D	6	12.8	19.8	9.8	59	7.4	45	1.2	17	56
AS3001F-08D	8	15.2			64.4	8.2	45.8		18	60
AS3001F-10D	10	18.5			71.6	9.8	47.3		21	64
AS3001F-12D	12	20.9			76	11	48.5		22	68
AS4001F-10D	10	18.5	26.5	12.4	77.7	11.3	55.4	1.2	21	121
AS4001F-12D	12	20.9			82.1		56.4		22	125

Inch Size

Model	d	D1	D2	D3	L1	L2	L3	L4	M1	Mass (g)
AS1001F-01D	1/8"	8.4	10	4.7	38	4.5	26	0.7	12.7	8
AS1001F-03D	5/32"	9.3			39.2	5.2	26.6			9
AS1001F-05D	3/16"	11.4			48.7	6.2	27.7		16.5	14
AS1001F-07D	1/4"	12			40.7				13.7	11
AS2001F-03D	5/32"	9.3	11.8	7.2	40.7	5.2	31.9	1.2	12.7	15
AS2001F-05D	3/16"	11.4			50	6.2	32.8		16.5	21
AS2001F-07D	1/4"	13.2			52.2	7.1	33.7		17	19
AS2051F-05D	3/16"	11.4	14.8	7.2	52.2	6.2	34.9	1.2	16.5	35
AS2051F-07D	1/4"	13.2			54.4	7.1	35.7		17	33
AS2051F-09D	5/16"	15.2			59.8	8.1	36.7		18	36
AS3001F-07D	1/4"	13.2	19.8	9.8	59	7.4	45.2	1.2	17	56
AS3001F-09D	5/16"	15.2			64.4	8.2	46		18	60
AS3001F-11D	3/8"	17.9			70.8	9.5	47.2		21	72
AS4001F-11D	3/8"	17.9	26.5	12.4	76.9	10.3	55.5	1.2	21	129
AS4001F-13D	1/2"	21.7			83.1	11.6	56.9		22	142

Series *AS□□□1F-D*

Made to Order Specifications

Please contact SMC for detailed dimensions, specifications and delivery.

Lubricant: Vaseline **X12**

Ex.) AS1001F-23D-X12

Throttle Valve (Without Check Valve) **X214**

Ex.) AS1001F-23D-X214

Grease-free (Seal: Fluorine coated) + Throttle Valve (Without Check Valve) **X21**

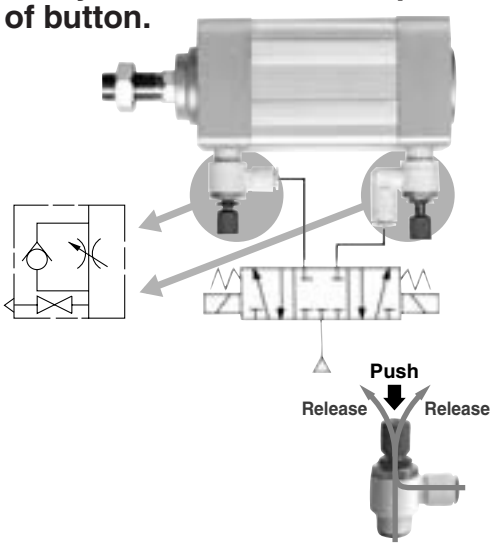
Ex.) AS1001F-23D-X21

Note 1) Not particle-free

Speed Controller with Residual Pressure Release Valve with One-touch Fitting

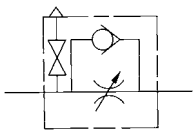
Series AS□□□□FE

Residual pressure can be easily released with one push of button.

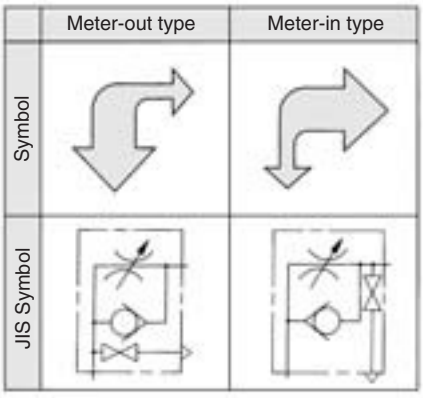


Eye-catching red color release button.

JIS Symbol



Flow Direction Symbols on Body



Model

Elbow type	Universal type	Port size in the cylinder side	Applicable tubing O.D. (mm)					Applicable cylinder bore size (mm)
			ø4	ø6	ø8	ø10	ø12	
AS22□1FE-01	AS23□1FE-01	R 1/8	●	●	●	●(1)		20, 25, 32
AS22□1FE-02	AS23□1FE-02	R 1/4	●	●	●	●		20, 25, 32, 40
AS32□1FE-03	AS33□1FE-03	R 3/8		●	●	●	●	40, 50, 63
AS42□1FE-04	AS43□1FE-04	R 1/2				●	●	63, 80, 100

Note 1) Elbow type only
Note 2) Distinction between meter-out/meter-in types by appearance
Those are distinguished by the lock nut. The meter-out type is electroless nickel plated, while the meter-in type is black zinc chromate plated.

Specifications

Fluid	Air
Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa
Min. operating pressure	0.1 MPa
Ambient and fluid temperature	–5 to 60°C (No freezing)
Number of needle rotations	10 turns
Effective area of residual exhaust valve	0.8 mm²
Applicable tubing material	Nylon, Soft nylon, Polyurethane

Flow Rate and Effective Area

Model		AS22□1FE-01 AS23□1FE-01		AS22□1FE-02 AS23□1FE-02			AS32□1FE AS33□1FE			AS42□1FE AS43□1FE	
Tubing O.D.	Metric size	ø4	ø6 ø8 ø10	ø4	ø6	ø8 ø10	ø6	ø8	ø10 ø12	ø10	ø12
Controlled flow (Free flow)	Flow rate (ℓ/min (ANR))	180	230	260	390	460	660	790	920	1580	1710
	Effective area (mm²)	2.7	3.5	4	6	7	10	12	14	24	26

Note) Flow rate values are measured at 0.5 MPa and 20°C.

How to Order

AS 2 2 1 1 F E – 01 – 06 S K – ☐

Body size

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

Type

2	Elbow
3	Universal

Control type

0	Meter-out
1	Meter-in

With One-touch fitting

With residual pressure release valve

Port size

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

Applicable tubing O.D. (mm)

04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

With seal

Hexagonal lock nut

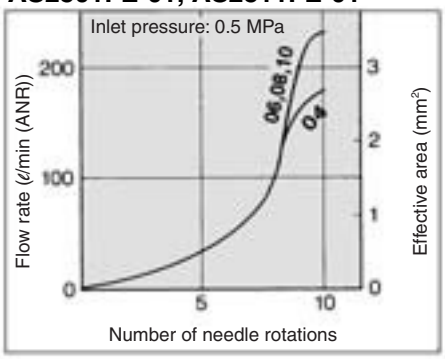
Made to Order
Refer to page 465 for details.

Made to Order
(Refer to page 465 for details.)

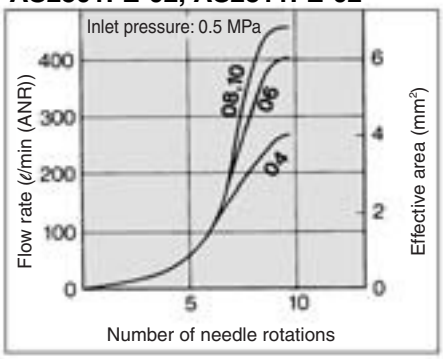
SMC

Needle Valve/Flow Characteristics

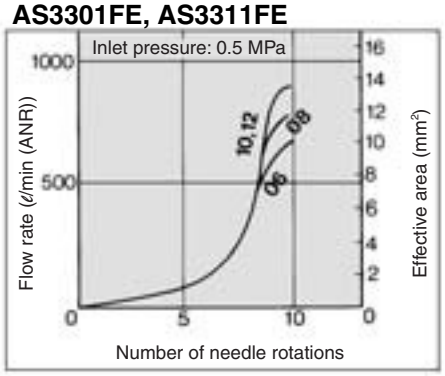
AS2201FE-01, AS2211FE-01
AS2301FE-01, AS2311FE-01



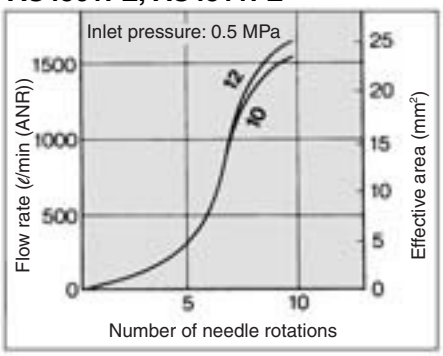
AS2201FE-02, AS2211FE-02
AS2301FE-02, AS2311FE-02



AS3201FE, AS3211FE
AS3301FE, AS3311FE



AS4201FE, AS4211FE
AS4301FE, AS4311FE



⚠Caution

Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.

Made to Order

Made to Order

Lubricant: Vaseline **X12**

Ex.) AS2201FE-01-04SK-X12

Throttle Valve (Without Check Valve) **X214**

Ex.) AS2201FE-01-04SK-X214

Note) Throttle valve is only compatible with the part no. of the meter-out type.

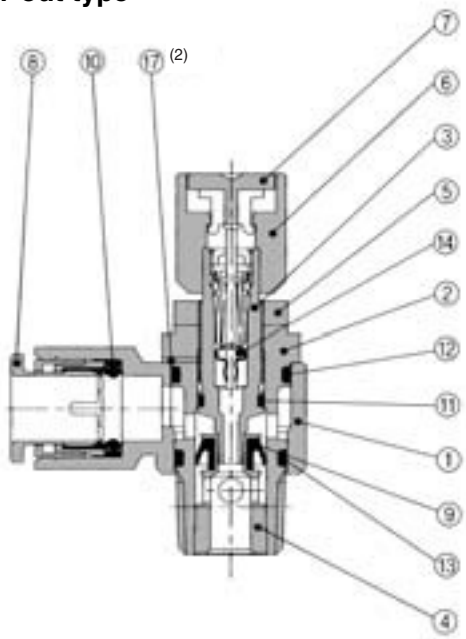
Grease-free (Seal: Fluorine Coating) + Throttle Valve (Without Check Valve) **X21**

Ex.) AS2201FE-01-04SK-X21

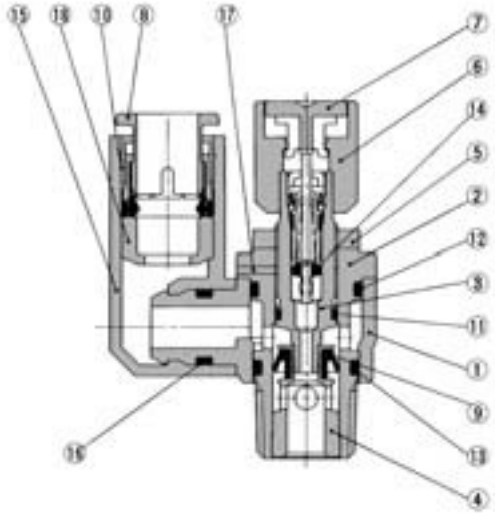
Note 1) Not particle-free
Note 2) Throttle valve is only compatible with the part no. of the meter-out type.

Construction

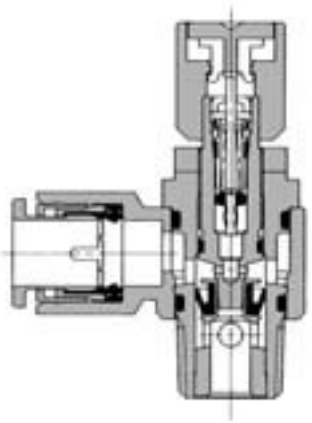
Elbow type
Meter-out type



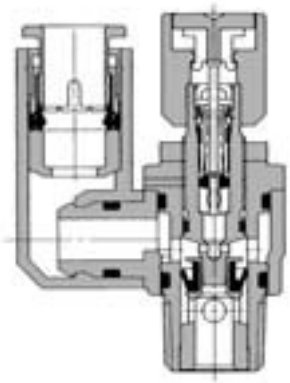
Universal type
Meter-out type



Meter-in type



Meter-in type



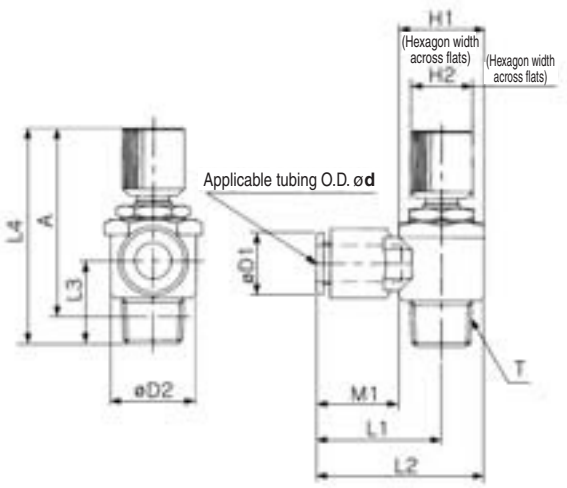
Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	White
2	**Body B**	Brass	Electroless nickel plated
3	**Needle**	Brass	Electroless nickel plated
4	**Seat ring**	Brass	(1)
5	**Lock nut**	Brass	Electroless nickel plated (2)
6	**Handle**	Aluminum alloy	Red painted
7	**Push button**	POM	Red
8	**Cassette**	—	
9	**U seal**	HNBR	
10	**Seal**	NBR	
11	**O-ring**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**Valve core**	—	
15	**Elbow body**	PBT	
16	**O-ring**	NBR	
17	**Accidental release prevention screw**	Stainless steel	AS2□□1FE-01 (3)
18	**Spacer**	—	

Note 1) AS2□□1FE type is electroless nickel plated.
Note 2) Meter-in type is black zinc chromate plated.
Note 3) Only for AS2□□1FE-01.

Dimensions

Elbow type

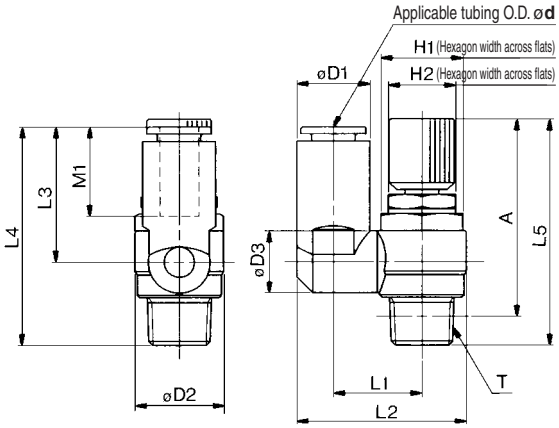


Model	Applicable tubing O.D. ød	T	H1	H2	D1	D2	L1	L2	L3	L4 (1)		A (2)		M1	Mass (g)
										Max.	Min.	Max.	Min.		
AS22□1FE-01-04SK	4	R 1/8	12	12	9.3	14.2	20.4	27.5	13.4	53	48	49.9	44.9	12.7	26
AS22□1FE-01-06SK	6				11.6		20.4	27.5						13.5	27
AS22□1FE-01-08SK	8				15.2		25.3	32.4						18.5	29
AS22□1FE-01-10SK	10				18.5		33.1	40.2	14.1					21	31
AS22□1FE-02-04SK	4	R 1/4	17	14	10.4	18.5	25.2	34.4	17.7	51.7	46.7	46.2	41.2	16	36
AS22□1FE-02-06SK	6				12.8		25.2	34.4						17	37
AS22□1FE-02-08SK	8				15.2		27.2	36.4						18.5	39
AS22□1FE-02-10SK	10				18.5		35.3	44.5	19.5					21	42
AS32□1FE-03-06SK	6	R 3/8	19	14	12.8	23	27.8	39.3	19.8	56.7	51.7	51.5	46.5	16	57
AS32□1FE-03-08SK	8				15.2		29.5	41						18.5	60
AS32□1FE-03-10SK	10				18.5		31.8	43.3						21	62
AS32□1FE-03-12SK	12				20.9		32.8	44.3						22	64
AS42□1FE-04-10SK	10	R 1/2	24	17	18.5	28.6	33.6	47.9	24.5	63.8	58.8	56.5	51.5	21	103
AS42□1FE-04-12SK	12				20.9		34.6	48.9						22	105

Note 1) Reference dimensions
Note 2) Reference dimensions of R thread after installation.

Dimensions

Universal type



Model	Applicable tubing O.D. ød	T	H1	H2	D1	D2	D3	L1	L2	L3	L4	L5 (1)		A (2)		M1	Mass (g)
												Max.	Min.	Max.	Min.		
AS23□1FE-01-04SK	4	R 1/8	12	12	9.3	14.2	9.3	13.1	24.9	17.5	30.9	53	48	49.9	44.9	12.7	26
AS23□1FE-01-06SK	6				11.6		10.9	14	26.9	22.9	36.3					13.5	27
AS23□1FE-01-08SK	8				15.2		12.9	16.2	30.9	28.2	40.8					18.5	29
AS23□1FE-02-04SK	4	R 1/4	14	14	10.4	18.5	10.9	16.2	30.6	21.9	39.6	51.7	46.7	46.2	41.2	16	36
AS23□1FE-02-06SK	6				12.8		12.9	18.4	34	25.2	42.1					17	37
AS23□1FE-02-08SK	8				15.2			18.3	35.2	28.2	45.1					18.5	39
AS23□1FE-02-10SK	10				18.5			20.2	38.7	31	47.9					21	42
AS33□1FE-03-06SK	6	R 3/8	19	14	12.8	23	12.9	20.6	38.5	25.2	45	56.7	51.7	51.5	46.5	17	57
AS33□1FE-03-08SK	8				15.2				39.7	28.2	48					18.5	60
AS33□1FE-03-10SK	10				18.5		16.2	23	43.7	32.6	52.4					21	62
AS33□1FE-03-12SK	12				20.9				44.9	34.4	54.2					22	64
AS43□1FE-04-10SK	10	R 1/2	24	17	18.5	28.6	16.2	25.8	49.4	32.6	57.1	63.8	58.8	56.5	51.5	21	103
AS43□1FE-04-12SK	12				21.7		19.4	26.8	52	36.3	60.8					22	105

Note 1) Reference dimensions
Note 2) Reference dimensions of R thread after installation.

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

Stainless specifications for use in corrosive environments. Stainless steel 303 used for metal parts.

Suitable for use on CRT lines where copper ions can cause damage, for washing food processing equipment where there is exposure to water and salt water, etc., and in clean rooms where dust from discoloration and rusting of copper materials is unacceptable.

Light colors to match equipment

White resin parts are used for bodies and release buttons.

Threads with and without seal are available as standard.

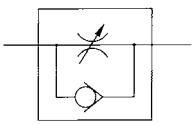
Applicable tubing: Inch sizes standardized

Inch sizes are now available for all models.

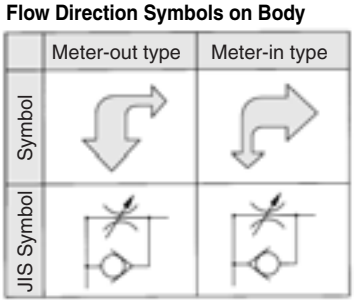
Elbow type

Universal type

JIS Symbol



Flow Direction Symbols on Body



Model

Elbow type	Universal type	Port size	Applicable tubing O.D.												Applicable cylinder bore size (mm)
			Metric size						Inch size						
			3.2	4	6	8	10	12	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	
AS12□1FG-M5	AS13□1FG-M5	M5 x 0.8	●	●	●											6, 10, 16, 20
AS22□1FG-01	AS23□1FG-01	R 1/8	●	●	●	●	●*									20, 25, 32
AS22□1FG-02	AS23□1FG-02	R 1/4		●	●	●	●									20, 25, 32, 40
AS32□1FG-02	AS33□1FG-02	R 1/4			●	●	●	●								40, 50, 63
AS32□1FG-03	AS33□1FG-03	R 3/8			●	●	●	●								40, 50, 63
AS42□1FG-04	AS43□1FG-04	R 1/2					●	●								63, 80, 100
AS12□1FG-U10/32	AS13□1FG-U10/32	10-32 UNF							●	●	●	●				6, 10, 16, 20
AS22□1FG-N01	AS23□1FG-N01	NPT 1/8							●	●	●	●	●			20, 25, 32
AS22□1FG-N02	AS23□1FG-N02	NPT 1/4								●	●	●	●	●		20, 25, 32, 40
AS32□1FG-N02	AS33□1FG-N02	NPT 1/4										●	●	●		40, 50, 63
AS32□1FG-N03	AS33□1FG-N03	NPT 3/8										●	●	●		40, 50, 63
AS42□1FG-N04	AS43□1FG-N04	NPT 1/2												●	●	63, 80, 100

Note 1) Meter-out and meter-in types can be visually differentiated by the flow direction symbol on the resin body.
Note 2) * Elbow type only

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)
Number of needle rotations	10 turns (8 turns (1))
Applicable tubing material (2)	Nylon, Soft nylon, Polyurethane

Note 1) In the case of AS12□1FG and AS13□1FG
Note 2) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used.
(Refer to pages 371 and 372 for details.)

Flow Rate and Effective Area

Model		AS12□1FG AS13□1FG	AS22□1FG-□01 AS23□1FG-□01		AS22□1FG-□02 AS23□1FG-□02			AS32□1FG AS33□1FG			AS42□1FG AS43□1FG	
Tubing O.D.	Metric size	ø3.2 ø4 ø6	ø3.2 ø4	ø6 ø8 ø10	ø4	ø6	ø8 ø10	ø6	ø8	ø10 ø12	ø10	ø12
	Inch size	ø1/8" ø5/32" ø3/16" ø1/4"	ø1/8" ø5/32"	ø3/16" ø1/4" ø5/16"	ø5/32"	ø3/16"	ø1/4" ø5/16" ø3/8"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
Controlled flow (Free flow)	Flow rate (ℓ/min (ANR))	100	180	230	260	390	460	660	790	920	1580	1710
	Effective area (mm²)	1.5	2.7	3.5	4	6	7	10	12	14	12	26

Note) Flow rate values are measured at 0.5 MPa and 20°C.

Made to Order
(Refer to page 473 for details.)

How to Order

AS 2 3 0 1 F G – □ 01 – 06 □ – □

Body size

1	M5 standard
2	1/8, 1/4 standard
3	3/8 standard
4	1/2 standard

Control type

0	Meter-out
1	Meter-in

Type

2	Elbow
3	Universal

With One-touch fitting

Stainless steel specifications (SUS303)

Thread type

Nil	Metric thread (M5)
	Unified thread (10-32 UNF)
	R
N	NPT

Port size

M5	M5 x 0.8
U10/32	10-32 UNF
01	1/8
02	1/4
03	3/8
04	1/2

Applicable tubing O.D.

Metric size

23	ø3.2 *
04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

* Use ø1/8" tube.

Inch size

01	ø1/8"
03	ø5/32"
05	ø3/16"
07	ø1/4"
09	ø5/16"
11	ø3/8"
13	ø1/2"

Option

Nil	None
S	With seal*

* M5 and U10/32 are not available with seal.

Made to Order
(Refer to the below for details.)

Made to Order

1 Lubricant: Vaseline **X12**

Ex.) AS1201FG-M5-23-X12

2 Grease-free (Seal: Fluorine Coating) + Throttle Valve (Without Check Valve) **X21**

Ex.) AS1201FG-M5-23-X21

Note 1) Not particle-free
Note 2) Throttle valve is only compatible with the part no. of the meter-out type.

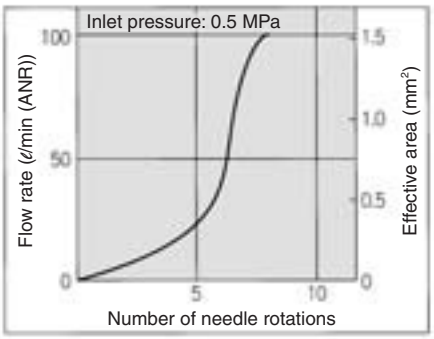
3 Throttle Valve (Without Check Valve) **X214**

Ex.) AS1201FG-M5-23-X214

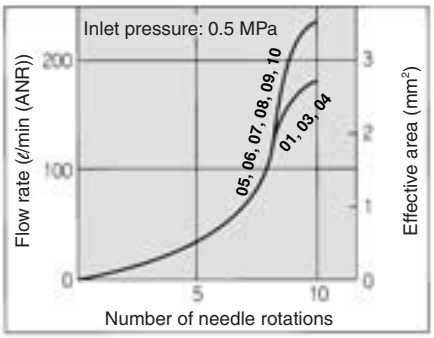
Note) Throttle valve is only compatible with the part no. of the meter-out type.

Needle Valve/Flow Characteristics

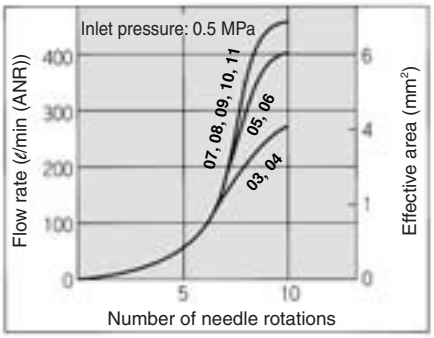
AS12□1FG
AS13□1FG



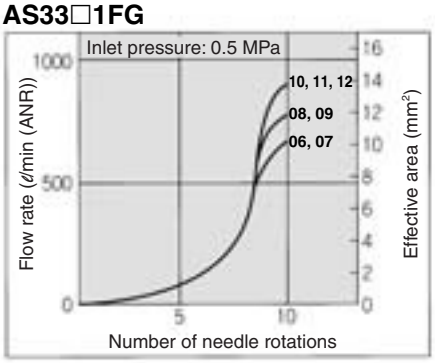
AS22□1FG-□01
AS23□1FG-□01



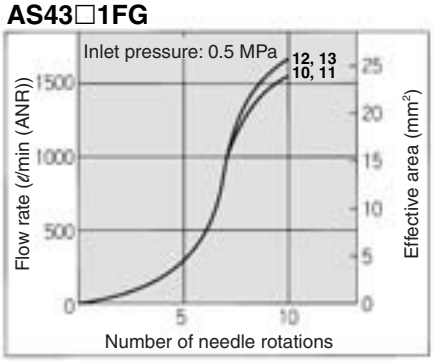
AS22□1FG-□02
AS23□1FG-□02



AS32□1FG
AS33□1FG



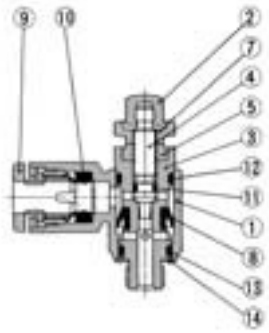
AS42□1FG
AS43□1FG

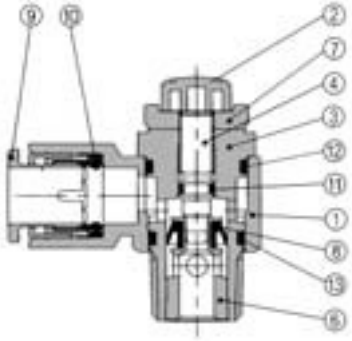


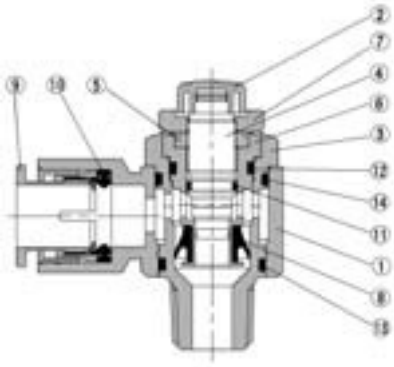
Construction: Elbow Type

Meter-out type
M5 type
U10/32 type

AS3201FG-02

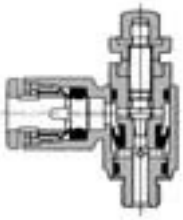


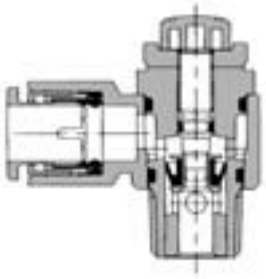


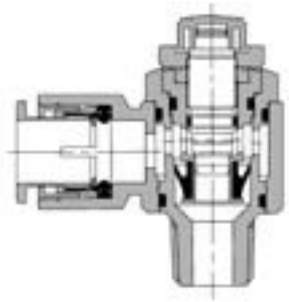


Meter-in type
M5 type
U10/32 type

AS3211FG-02







Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Handle**	PBT	
3	**Body B**	Stainless steel 303	
4	**Needle**	Stainless steel 303	
5	**Needle guide**	Stainless steel 303	
6	**Seat ring**	Stainless steel 303	
7	**Lock nut**	Stainless steel 303	
8	**U seal**	HNBR	
9	**Cassette**	—	
10	**Seal**	NBR	
11	**O-ring**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**O-ring**	NBR	
15	**Gasket**	NBR, Stainless steel	M5 type only

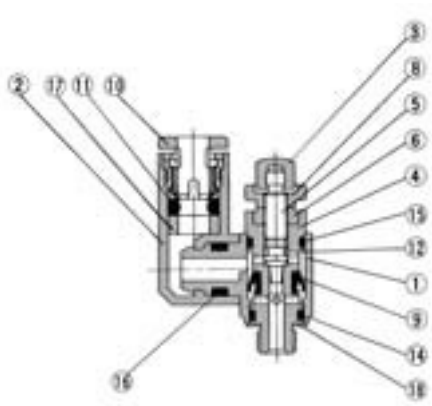
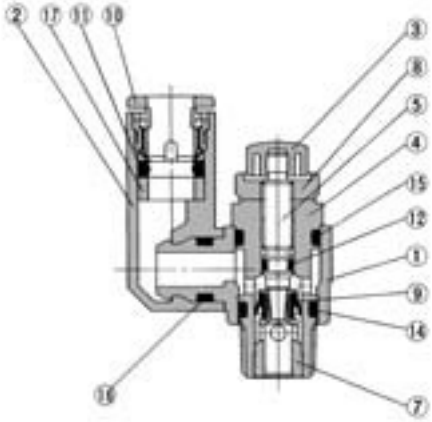
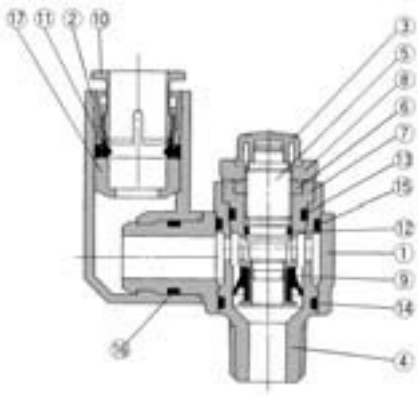
⚠Caution

Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.

Construction: Universal Type

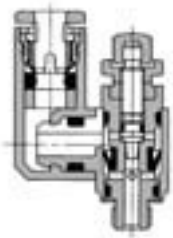
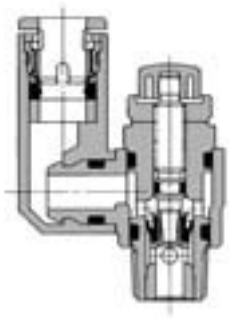
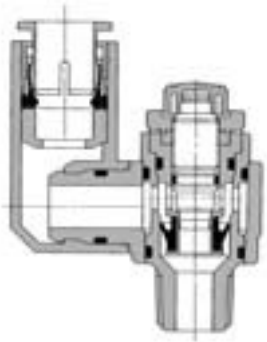
Meter-out type
M5 type
U10/32 type

AS3301FG-02

Meter-in type
M5 type
U10/32 type

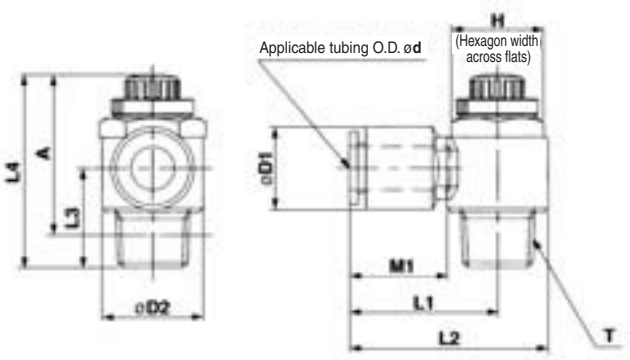
AS3311FG-02

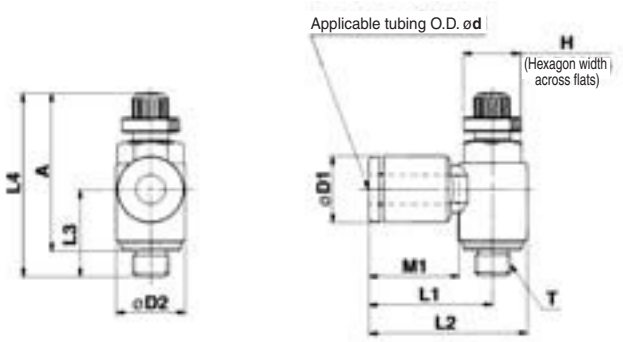
Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Elbow body**	PBT	
3	**Handle**	PBT	
4	**Body B**	Stainless steel 303	
5	**Needle**	Stainless steel 303	
6	**Needle guide**	Stainless steel 303	
7	**Seat ring**	Stainless steel 303	
8	**Lock nut**	Stainless steel 303	
9	**U seal**	HNBR	
10	**Cassette**	—	
11	**Seal**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**O-ring**	NBR	
15	**O-ring**	NBR	
16	**O-ring**	NBR	
17	**Spacer**	—	
18	**Gasket**	NBR, Stainless steel	M5 type only

Dimensions: Elbow Type



M5 type
U10/32 type



Metric Size

Model	d	T	H	D1	D2	L1	L2	L3	L4 (1)		A*		M1	Mass (g)
									Max.	Min.	Max.	Min.		
AS12□1FG-M5-23	3.2	M5 x 0.8	8	8.4	9.6	17.3	22.1	12.3	28.6	25.8	25	22.2	12.7	7
AS12□1FG-M5-04	4	M5 x 0.8	8	9.3	9.6	17.3	22.1	12.3	28.6	25.8	25	22.2	12.7	7
AS12□1FG-M5-06	6			11.6		18.1	22.9	11.7					13.5	
AS22□1FG-01-23	3.2	R 1/8	12	9.3	14.2	20.4	27.5	14.3	36.1	31.1	32.1	27.1	12.7	16
AS22□1FG-01-04	4	R 1/8	12	9.3	14.2	20.4	27.5	13.4	35.2	30.2	32.1	27.1	12.7	17
AS22□1FG-01-06	6			11.6		20.4	27.5						13.5	
AS22□1FG-01-08	8			15.2		25.3	32.4						18.5	19
AS22□1FG-01-10	10			18.5		32.1	39.2	14.1					21	21
AS22□1FG-02-04	4	R 1/4	17	10.4	18.5	25.2	34.4	17.7	39.9	34.9	34.4	29.4	16	32
AS22□1FG-02-06	6			12.8		25.2	34.4						17	
AS22□1FG-02-08	8			15.2		27.2	36.4						18.5	34
AS22□1FG-02-10	10			18.5		35.3	44.5	19.5					21	36
AS32□1FG-02-06	6	R 1/4	19	12.8	23	27.8	39.3	21.3	48.3	43.3	42.8	37.8	17	60
AS32□1FG-02-08	8			15.2		29.5	41						18.5	63
AS32□1FG-02-10	10			18.5		31.8	43.3						21	67
AS32□1FG-02-12	12			20.9		32.8	44.3						22	69
AS32□1FG-03-06	6	R 3/8	19	12.8	23	27.8	39.3	19.8	45.4	40.4	40.2	35.2	17	55
AS32□1FG-03-08	8			15.2		29.5	41						18.5	57
AS32□1FG-03-10	10			18.5		31.8	43.3						21	59
AS32□1FG-03-12	12			20.9		32.8	44.3						22	61
AS42□1FG-04-10	10	R 1/2	24	18.5	28.6	33.6	47.9	24.5	56.7	49.2	49.6	42.1	21	100
AS42□1FG-04-12	12			20.9		34.6	48.9						22	101

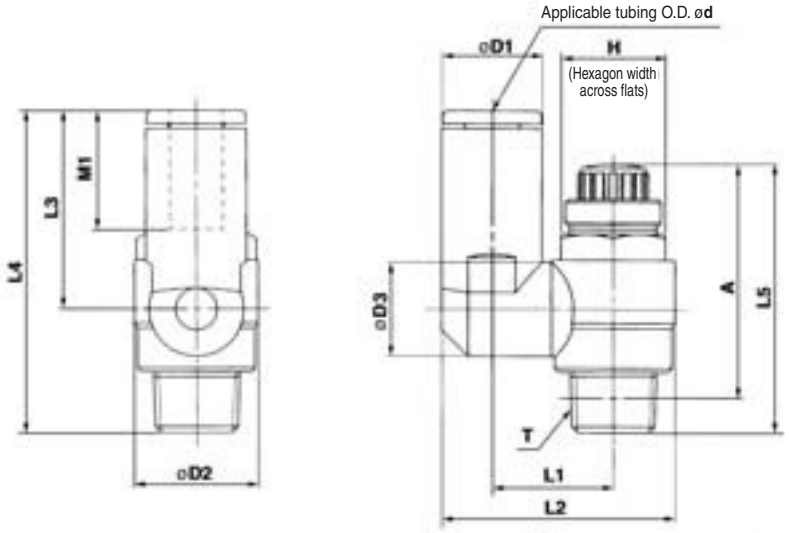
Note 1) Reference dimensions
Note 2) Reference dimensions of M5 x 0.8, R threads after installation.

Inch Size

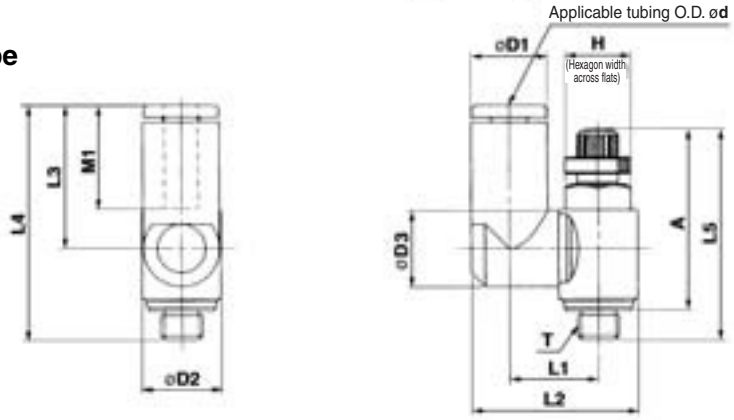
Model	d	T	H	D1	D2	L1	L2	L3	L4 (1)		A*		M1	Mass (g)
									Max.	Min.	Max.	Min.		
AS12□1FG-U10/32-01	1/8"	10-32 UNF	8	8.4	9.6	17.3	22.1	12.3	28.6	25.8	25	22.2	12.7	7
AS12□1FG-U10/32-03	5/32"			9.3										
AS12□1FG-U10/32-05	3/16"			11.4		21.3	26.1	11.7					16.5	
AS12□1FG-U10/32-07	1/4"			12		18.3	23.1						13.5	
AS22□1FG-N01-01	1/8"	NPT 1/8	12.7	9.3	14.2	20.4	27.5	13.4	35.2	30.2	32.1	27.1	12.7	16
AS22□1FG-N01-03	5/32"													17
AS22□1FG-N01-05	3/16"			11.4		23.1	30.2						16.5	
AS22□1FG-N01-07	1/4"			13.2		23.9	31						18.5	19
AS22□1FG-N01-09	5/16"			15.2		25.3	32.4	14.1					21	21
AS22□1FG-N02-03	5/32"	NPT 1/4	17.5	10.4	18.5	25.2	34.4	17.7	39.9	34.9	34.4	29.4	16	32
AS22□1FG-N02-05	3/16"			11.4		24.9	34.2						17	
AS22□1FG-N02-07	1/4"			13.2		25.2	34.5						18.5	34
AS22□1FG-N02-09	5/16"			15.2		27.2	36.4	19.5					21	36
AS22□1FG-N02-11	3/8"			17.9		35.3	44.5							
AS32□1FG-N02-07	1/4"	NPT 1/4	19	13.2	23	27.8	39.3	21.3	48.3	43.3	42.8	37.8	17	60
AS32□1FG-N02-09	5/16"			15.2		29.5	41						18.5	63
AS32□1FG-N02-11	3/8"			17.9		31.8	43.3						21	67
AS32□1FG-N03-07	1/4"	NPT 3/8	19	13.2	23	27.8	39.3	19.8	45.4	40.4	40.2	35.2	17	55
AS32□1FG-N03-09	5/16"			15.2		29.5	41						18.5	57
AS32□1FG-N03-11	3/8"			17.9		31.8	43.3						21	59
AS42□1FG-N04-11	3/8"	NPT 1/2	23.8	17.9	28.6	33.6	47.9	24.5	56.7	49.2	49.6	42.1	21	100
AS42□1FG-N04-13	1/2"			21.7		35.2	49.5						22	101

Note 1) Reference dimensions
Note 2) Reference dimensions of 10-32 UNF and NPT threads after installation.

Dimensions: Universal Type



M5 type
U10/32 type



Metric Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 (1) Max.	L5 (1) Min.	A* Max.	A* Min.	M1	Mass (g)
AS13□1FG-M5-23	3.2	M5 x 0.8	8	8.4	9.6	9.3	10.8	19.8	17.5	28.7	28.6	28.6	25	22.2	12.7	7
AS13□1FG-M5-04	4			9.3				20.3								
AS13□1FG-M5-06	6			11.6				21.4	20.6	31.8					13.5	
AS23□1FG-01-23	3.2	R 1/8	12	8.4	14.2	9.3	13.1	24.4	17.5	30.9	35.2	30.2	32.1	27.1	12.7	17
AS23□1FG-01-04	4			9.3				24.9								18
AS23□1FG-01-06	6			11.6		10.9	14	26.9	22.9	36.3					13.5	
AS23□1FG-01-08	8			15.2		12.9	16.2	30.9	28.2	40.8					18.5	21
AS23□1FG-02-04	4	R 1/4	17	10.4	18.5	10.9	16.2	30.6	21.9	39.6	39.9	34.9	34.4	29.4	16	32
AS23□1FG-02-06	6			12.8		12.9	18.4	34	25.2	42.1					17	33
AS23□1FG-02-08	8			15.2			18.3	35.2	28.2	45.1					18.5	36
AS23□1FG-02-10	10			18.5			20.2	38.7	31	47.9					21	40
AS33□1FG-02-06	6	R 1/4	19	12.8	23	12.9	20.6	38.5	25.2	46.5	48.3	43.3	42.8	37.8	17	60
AS33□1FG-02-08	8			15.2				39.7	28.2	49.5					18.5	63
AS33□1FG-02-10	10			18.5		16.2	23	43.7	32.6	53.9					21	67
AS33□1FG-02-12	12			20.9				44.9	34.4	55.7					22	69
AS33□1FG-03-06	6	R 3/8	19	12.8	23	12.9	20.6	38.5	25.2	45	45.4	40.4	40	35	17	56
AS33□1FG-03-08	8			15.2				39.7	28.2	48					18.5	59
AS33□1FG-03-10	10			18.5		16.2	23	43.7	32.6	52.4					21	63
AS33□1FG-03-12	12			20.9				44.9	34.4	54.2					22	65
AS43□1FG-04-10	10	R 1/2	24	18.5	28.6	16.2	25.8	49.4	32.6	57.1	56.7	49.2	49.6	42.1	21	104
AS43□1FG-04-12	12			20.9		19.4	26.8	52	36.3	60.8					22	105

Note 1) Reference dimensions
Note 2) Reference dimensions of M5 x 0.8, R threads after installation.

Inch Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 (1) Max.	L5 (1) Min.	A* Max.	A* Min.	M1	Mass (g)
AS13□1FG-U10/32-01	1/8"	10-32 UNF	8	8.4	9.6	9.3	10.8	19.8	17.5	28.7	28.6	25.8	25	22.2	12.7	7
AS13□1FG-U10/32-03	5/32"			9.3				20.3								
AS13□1FG-U10/32-05	3/16"			11.4				21.3	23.3	34.5					16.5	8
AS13□1FG-U10/32-07	1/4"			12				21.6	20.7	31.9					13.7	
AS23□1FG-N01-01	1/8"	NPT 1/8	12.7	8.4	14	9.3	13.1	24.4	17.5	30.9	35.2	30.2	32.1	27.1	12.7	17
AS23□1FG-N01-03	5/32"			9.3				24.9								18
AS23□1FG-N01-05	3/16"			11.4		10.9	14	26.8	23.9						16.5	
AS23□1FG-N01-07	1/4"			13.2		12.9	16.2	29.9	25.6	36.3					18.5	19
AS23□1FG-N01-09	5/16"			15.2				30.9	28.2	40.8					21	21
AS23□1FG-N02-03	5/32"	NPT 1/4	17.5	10.4	19	10.9	16.2	30.6	21.9	39.6	39.9	34.9	34.4	29.4	16	32
AS23□1FG-N02-05	3/16"			11.4				31.1	23.9	42.1					17	33
AS23□1FG-N02-07	1/4"			13.2		12.9	18.3	34.2	25.6	45.1					18.5	36
AS23□1FG-N02-09	5/16"			15.2				35.2	28.2	47.9					21	39
AS23□1FG-N02-11	3/8"			17.9			20.2	38.7	31	46.5						40
AS33□1FG-N02-07	1/4"	NPT 1/4	19	13.2	23	12.9	20.6	38.7	25.6	46.9	48.3	43.3	42.8	37.8	17	60
AS33□1FG-N02-09	5/16"			15.2				39.7	28.2	49.5					18.5	63
AS33□1FG-N02-11	3/8"			17.9		16.2	23	43.7	32.6	53.9					21	69
AS33□1FG-N03-07	1/4"	NPT 3/8	19	13.2	23	12.9	20.6	38.7	25.6	45	45.4	40.4	40.2	35.2	17	56
AS33□1FG-N03-09	5/16"			15.2				39.7	28.2	48					18.5	59
AS33□1FG-N03-11	3/8"			17.9		16.2	23	43.7	32.6	52.4					21	65
AS43□1FG-N04-11	3/8"	NPT 1/2	23.8	17.9	29	16.2	25.8	49.4	32.6	54.4	56.7	49.2	49.6	42.1	21	104
AS43□1FG-N04-13	1/2"			21.7		19.4	26.8	52	36.3	57.1					22	106

Note 1) Reference dimensions
Note 2) Reference dimensions of 10-32 UNF and NPT threads after installation.

Speed Controller with One-touch Fittings
Stainless Steel Series
In-line Type
Series AS-FG

Model

Model	Applicable tubing O.D.												Applicable cylinder bore size (mm)
	Metric size						Inch size						
	3.2	4	6	8	10	12	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"	1/2"	
AS1001FG	●	●	●				●	●	●	●				6, 10, 16, 20
AS2001FG		●	●					●	●	●				20, 25, 32
AS2051FG			●	●					●	●	●			20, 25, 32, 40
AS3001FG			●	●	●	●				●	●	●		40, 50, 63
AS4001FG					●	●						●	●	63, 80, 100

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)
Number of needle rotations	10 turns (8 turns (1))
Applicable tubing material (2)	Nylon, Soft nylon, Polyurethane

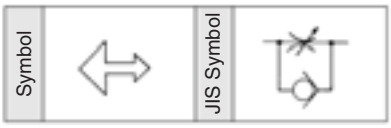
Note 1) In the case of AS1001FG type
Note 2) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used.
(Refer to pages 371 and 372 for details.)

Flow Rate and Effective Area

Model		AS1001FG	AS2001FG		AS2051FG		AS3001FG			AS4001FG	
Tubing O.D.	Metric size	ø3.2 ø4 ø6	ø4	ø6	ø6	ø8	ø6	ø8	ø10 ø12	ø10	ø12
	Inch size	ø1/8" ø5/32" ø3/16"	ø5/32"	ø3/16" ø1/4"	ø3/16"	ø1/4" ø5/16"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
Controlled flow (Free flow)	Flow rate (ℓ/min (ANR))	100	130	230	290	460	420	660	920	1050	1390
	Effective area (mm^2)	1.5	2	3.5	4.5	7	6.5	10	14	16	21

Note) Flow rate values are measured at 0.5 MPa and 20°C.

Flow Direction Symbols on Body



Made to Order
(Refer to page 479 for details.)

How to Order

AS [200] 1 F G – [06] – [ ]

Body size

100	M5 standard
200	1/8 standard
205	1/4 standard
300	3/8 standard
400	1/2 standard

With One-touch fittings

Stainless steel specifications (Stainless steel 303)

Applicable tubing O.D.

Metric size

23	ø3.2 *
04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

* Use ø1/8" tube.

Inch size

01	ø1/8"
03	ø5/32"
05	ø3/16"
07	ø1/4"
09	ø5/16"
11	ø3/8"
13	ø1/2"

Made to Order
(Refer to the below for details.)

Made to Order

Made to Order

Lubricant: Vaseline **X12**

Ex.) AS1001FG-04-**X12**

Grease-free (Seal: Fluorine Coating) + Throttle Valve (Without Check Valve) **X21**

Ex.) AS1001FG-04-**X21**

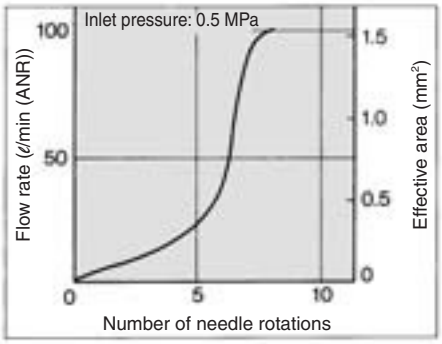
Note) Not particle-free

Throttle Valve (Without Check Valve) **X214**

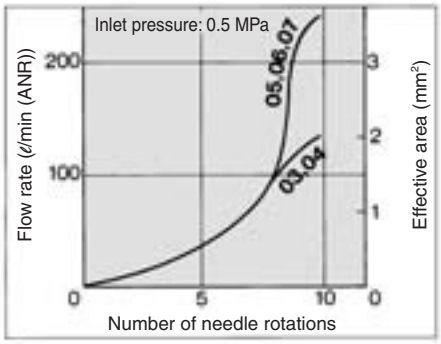
Ex.) AS1001FG-04-**X214**

Needle Valve/Flow Characteristics

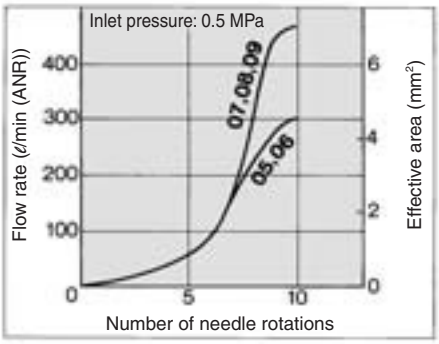
AS1001FG



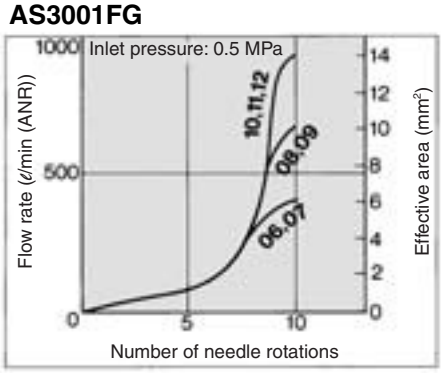
AS2001FG



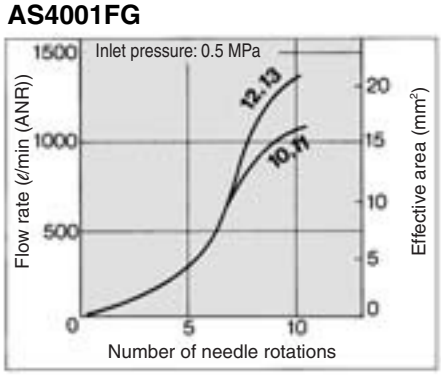
AS2051FG



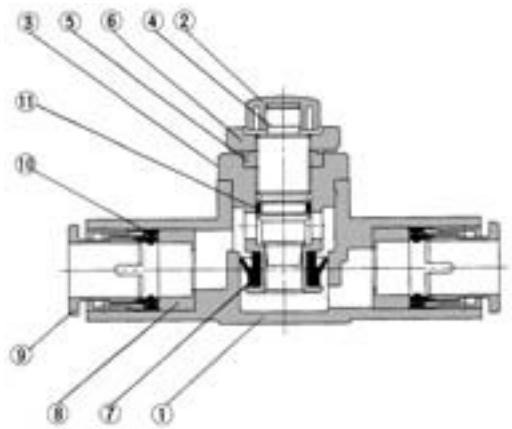
AS3001FG



AS4001FG



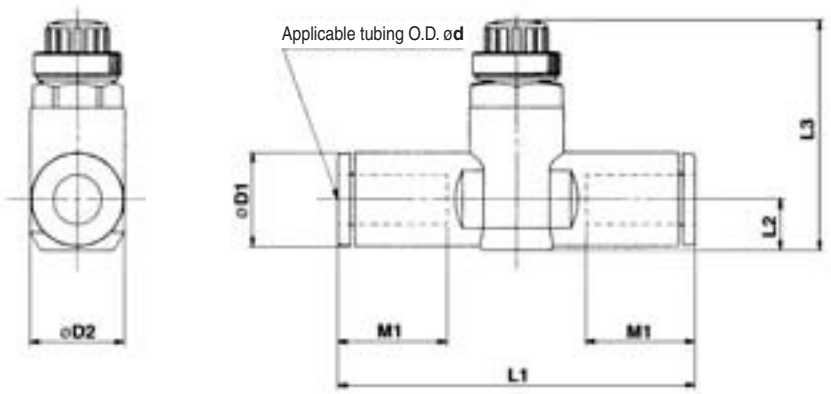
Construction



Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Handle**	PBT	
3	**Body B**	Stainless steel 303	
4	**Needle**	Stainless steel 303	
5	**Needle guide**	Stainless steel 303	
6	**Lock nut**	Stainless steel 303	
7	**U seal**	HNBR	
8	**Spacer**	—	
9	**Cassette**	—	
10	**Seal**	NBR	
11	**O-ring**	NBR	

Dimensions



Metric Size

Model	d	D1	D2	L1	L2	L3 (1)		M1	Mass (g)
						Max.	Min.		
AS1001FG-23	3.2	8.4	10	38	4.5	23.5	20.7	12.7	6
AS1001FG-04	4	9.3		39.2	5.2	24.2	21.4		7
AS1001FG-06	6	11.6		40.7	6.2	25.2	22.4	13.5	8
AS2001FG-04	4	9.3	11.8	40.7	5.2	32.6	27.6	12.7	12
AS2001FG-06	6	11.6		44.8	6.3	33.7	28.7	13.5	13
AS2051FG-06	6	12.8	14.8	53.2	6.7	35.2	30.2	17	22
AS2051FG-08	8	15.2		59.8	8.1	32.6	27.6	18	25
AS3001FG-06	6	12.8	19.8	59	7.4	38.3	33.3	17	36
AS3001FG-08	8	15.2		64.4	8.2	39.1	34.1	18	40
AS3001FG-10	10	18.5		71.6	9.8	40.6	35.6	21	44
AS3001FG-12	12	20.9		76	11	41.8	36.8	22	48
AS4001FG-10	10	18.5	26.5	77.7	11.3	51.1	43.6	21	85
AS4001FG-12	12	20.9		82.1		52.1	44.6	22	89

Note 1) Reference dimensions

Inch Size

Model	d	D1	D2	L1	L2	L3 (1)		M1	Mass (g)
						Max.	Min.		
AS1001FG-01	1/8"	8.4	10	38	4.5	23.5	20.7	12.7	6
AS1001FG-03	5/32"	9.3		39.2	5.2	24.2	21.4		7
AS1001FG-05	3/16"	11.4		48.7	6.2	25.2	22.4	16.5	12
AS1001FG-07	1/4"	12		40.7				13.7	9
AS2001FG-03	5/32"	9.3	11.8	40.7	5.2	32.6	27.6	12.7	12
AS2001FG-05	3/16"	11.4		50	6.2	33.6	28.6	16.5	18
AS2001FG-07	1/4"	13.2		52.2	7.1	34.5	29.5	17	16
AS2051FG-05	3/16"	11.4	14.8	52.2	6.2	34.6	29.6	16.5	24
AS2051FG-07	1/4"	13.2		54.4	7.1	35.5	30.5	17	22
AS2051FG-09	5/16"	15.2		59.8	8.1	32.6	27.6	18	25
AS3001FG-07	1/4"	13.2	19.8	59	7.4	38.3	33.3	17	36
AS3001FG-09	5/16"	15.2		64.4	8.2	39.1	34.1	18	40
AS3001FG-11	3/8"	17.9		70.8	9.5	40.3	35.3	21	52
AS4001FG-11	3/8"	17.9	26.5	76.9	10.3	51	43.5	21	93
AS4001FG-13	1/2"	21.7		83.1	11.6	52.4	44.9	22	106

Note 1) Reference dimensions

Speed Controller for Low Speed Operation with One-touch Fitting Elbow Type/Universal Type (Resin Body)

Series AS-FM

Ideal for low speed control at 10 to 50 mm/sec

Since the effective area of the controlled flow is approximately 1/10 that of the standard model, it is ideal for speed control of low speed cylinders at 10 to 50 mm/sec.
The dual type is particularly suitable for low speed control of small bore cylinders.

Low speed operating stroke and high speed return stroke drive

Effective area of free flow is the same as that of standard model.

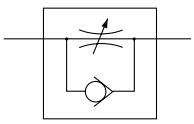
10 needle turns (20 turns for M5 type)

Speed control is easy, and uniform speed control is possible.

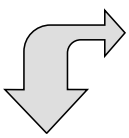
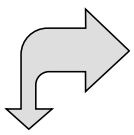
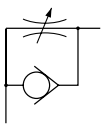
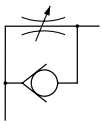
Applicable tubing: Inch sizes standardized

Inch sizes are now available for all models.

JIS Symbol



Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Symbol		
JIS Symbol		

Made to Order
(Refer to page 495 for details.)

Model

Elbow type	Universal type	Port size	Applicable tubing O.D.										
			Metric size					Inch size					
			3.2	4	6	8	10	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"
AS12□1FM-M5	**AS13□1FM-M5**	M5 x 0.8	●	●	●								
AS22□1FM-01	**AS23□1FM-01**	R 1/8	●	●	●	●							
AS22□1FM-02	**AS23□1FM-02**	R 1/4		●	●	●	●						
AS12□1FM-U10/32	**AS13□1FM-U10/32**	10-32 UNF						●	●	●	●		
AS22□1FM-N01	**AS23□1FM-N01**	NPT 1/8						●	●	●	●	●	
AS22□1FM-N02	**AS23□1FM-N02**	NPT 1/4							●	●	●	●	●

Specifications

Fluid	Air
Proof pressure	1.5 MPa
Max. operating pressure	1.0 MPa
Mini. operating pressure	0.1 MPa
Ambient and fluid temperature	–5 to 60°C (No freezing)
Number of needle rotations	10 turns (20 turns (1))
Applicable tubing material (2)	Nylon, Soft nylon, Polyurethane
Option (3)	With seal

Note 1) In the case of AS12□1FM and AS13□1FM types
Note 2) Use caution regarding the max. operating pressure when soft nylon or polyurethane, or soft polyurethane tubing is used.
(Refer to pages 371 and 372 for details.)
Note 3) M5 and 10-32UNF type ports are not available with seal.
Note 4) Brass parts are all electroless nickel plated. The handle of the M5 type and the lock nut of the meter-in type are black zinc chromate plated.

Flow Rate and Effective Area

Model		AS12□1FM AS13□1FM	AS22□1FM-□01 AS23□1FM-□01		AS22□1FM-□02 AS23□1FM-□02		
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø3.2, ø4	ø6, ø8	ø4	ø6	ø8, ø10
	Inch size	ø1/8", ø5/32", ø3/16" ø1/4"	ø1/8", ø5/32"	ø3/16", ø1/4" ø5/16"	ø5/32"	ø3/16"	ø1/4", ø5/16" ø3/8"
Controlled flow	Air flow (ℓ/min(ANR))	7	12		38		
	Effective area (mm²)	0.1	0.2		0.6		
Free flow	Flow rate (ℓ/min(ANR))	100	180	230	260	390	460
	Effective area (mm²)	1.5	2.7	3.5	4	6	7

Note) Flow rate values are measured at 0.5 MPa and 20°C.

⚠Caution

**Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.**

How to Order

AS 2 2 0 1 F M – □ 01 – 06 □ – □

Made to Order
Refer to the below for details.

Body size

1	M5 standard
2	1/8, 1/4 standard

Type

2	Elbow
3	Universal

Control type

0	Meter-out
1	Meter-in

With One-touch fitting

For low speed control

Thread type

Nil	Metric thread (M5)
	Unified thread (10-32 UNF)
	R
N	NPT

Port size

M5	M5 x 0.8
U10/32	10-32 UNF
01	1/8
02	1/4

Applicable tubing O.D.

Metric size

23	ø3.2 *
04	ø4
06	ø6
08	ø8
10	ø10

* Use ø1/8" tube.

Inch size

01	ø1/8"
03	ø5/32"
05	ø3/16"
07	ø1/4"
09	ø5/16"
11	ø3/8"

Option

Nil	None
S	With seal

* M5 and U10/32 are not available with seal.

Made to Order

Lubricant: Vaseline **X12**

Ex.) AS1201FM-M5-23-X12

Grease-free (Seal: Fluorine coated) + Throttle Valve (Without Check Valve) **X21**

Ex.) AS1201FM-M5-23-X21

Note 1) Not particle-free
Note 2) Throttle valve is only compatible with the part no. of the meter-out type.

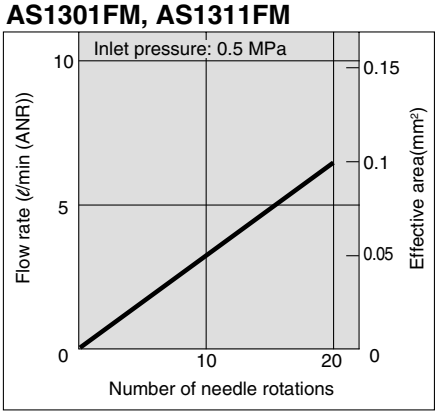
Throttle Valve (Without Check Valve) **X214**

Ex.) AS1201FM-M5-23-X214

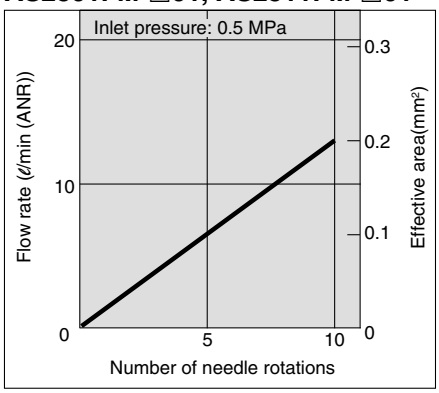
Note) Throttle valve is only compatible with the part no. of the meter-out type.

Needle Valve/Flow Characteristics

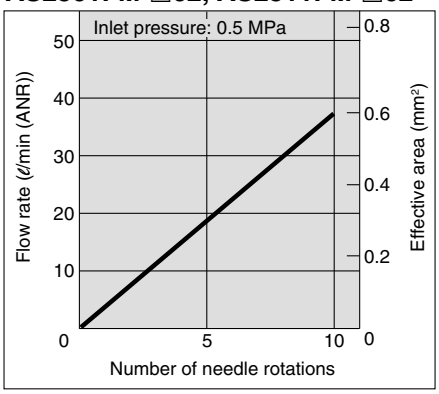
AS1201FM, AS1211FM
AS1301FM, AS1311FM



AS2201FM-□01, AS2211FM-□01
AS2301FM-□01, AS2311FM-□01



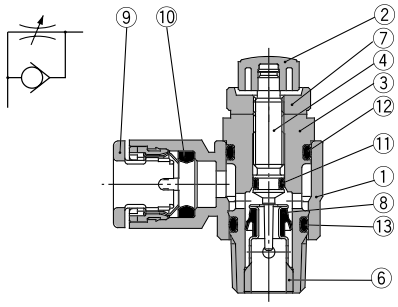
AS2201FM-□02, AS2211FM-□02
AS2301FM-□02, AS2311FM-□02



Construction: Elbow Type

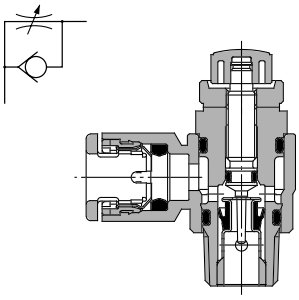
Meter-out type

JIS Symbol

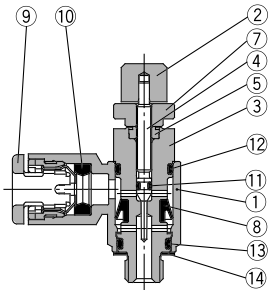


Meter-in type

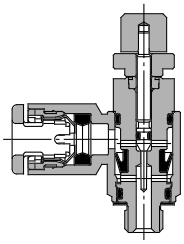
JIS Symbol



M5 type
U10/32 type



M5 type
U10/32 type



Component Parts

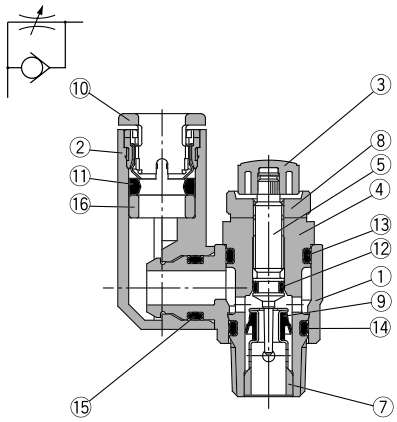
No.	Description	Material	Note
1	**Body A**	PBT	White
2	**Handle**	PBT	Black (1)
3	**Body B**	Brass	Electroless nickel plated
4	**Needle**	Brass	Electroless nickel plated
5	**Needle guide**	Brass	Electroless nickel plated, M5 type only
6	**Seat ring**	Brass	Electroless nickel plated
7	**Lock nut**	Brass (2)	Electroless nickel plated (3)
8	**U seal**	HNBR	
9	**Cassette**	—	
10	**Seal**	NBR	
11	**O-ring**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**Gasket**	NBR, Stainless steel	M5 type only

Note 1) M5 and U10/32 types are black zinc chromate plated.
Note 2) AS22□1FM type is made of steel.
Note 3) Meter-in type is black zinc chromate plated.

Construction: Universal Type

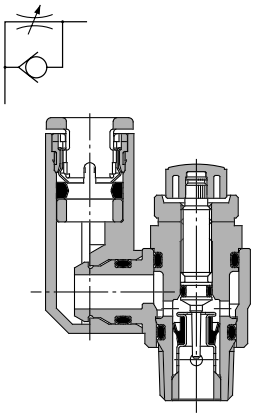
Meter-out type

JIS Symbol

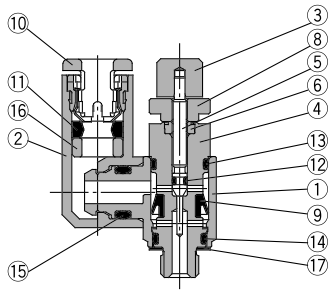


Meter-in type

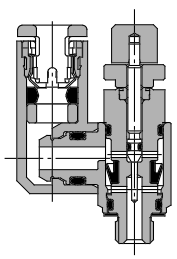
JIS Symbol



M5 type
U10/32 type



M5 type
U10/32 type

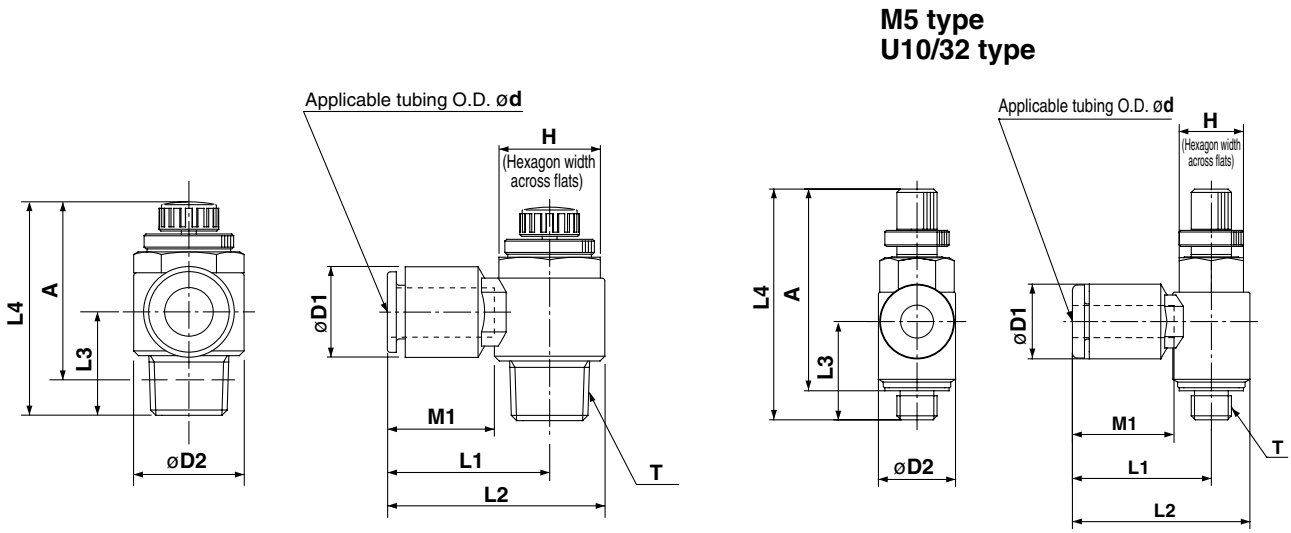


Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	White
2	**Elbow body**	PBT	White
3	**Handle**	PBT	Black (1)
4	**Body B**	Brass	Electroless nickel plated
5	**Needle**	Brass	Electroless nickel plated
6	**Needle guide**	Brass	Electroless nickel plated, M5 type only
7	**Seat ring**	Brass	Electroless nickel plated
8	**Lock nut**	Brass (2)	Electroless nickel plated (3)
9	**U seal**	HNBR	
10	**Cassette**	—	
11	**Seal**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**O-ring**	NBR	
15	**O-ring**	NBR	
16	**Spacer**	—	
17	**Gasket**	NBR, Stainless steel	M5 type only

Note1) M5 and U10/32 types are black zinc chromate plated.
Note2) AS23□1FM type is made of steel.
Note3) Meter-in type is black zinc chromate plated.

Dimensions: Elbow Type



Metric Size

Model	d	T	H	D1	D2	L1	L2	L3	L4 (1) (2)		A (1) (2)		M1	Mass (g)
									Max.	Min.	Max.	Min.		
AS12□1FM-M5-23	3.2	M5 x 0.8	8	8.4	9.6	17.3	22.1	12.3	33.8	28.8	30.1	25.1	12.7	7
AS12□1FM-M5-04	4			9.3		17.3	22.1							
AS12□1FM-M5-06	6			11.6		18.1	22.9	11.7					13.5	
AS22□1FM-01-23	3.2	R 1/8	12	9.3	14.2	20.4	27.5	13.4	35.2	30.2	32.1	27.1	12.7	17
AS22□1FM-01-04	4			9.3		20.4	27.5							
AS22□1FM-01-06	6			11.6		20.4	27.5						13.5	
AS22□1FM-01-08	8			15.2		25.3	32.4						18.5	19
AS22□1FM-02-04	4	R 1/4	17	10.4	18.5	25.2	34.4	17.7	39.9	34.9	34.4	29.4	16	32
AS22□1FM-02-06	6			12.8		25.2	34.4						17	
AS22□1FM-02-08	8			15.2		27.2	36.4						18.5	34
AS22□1FM-02-10	10			18.5		35.3	44.5	19.5					21.0	36

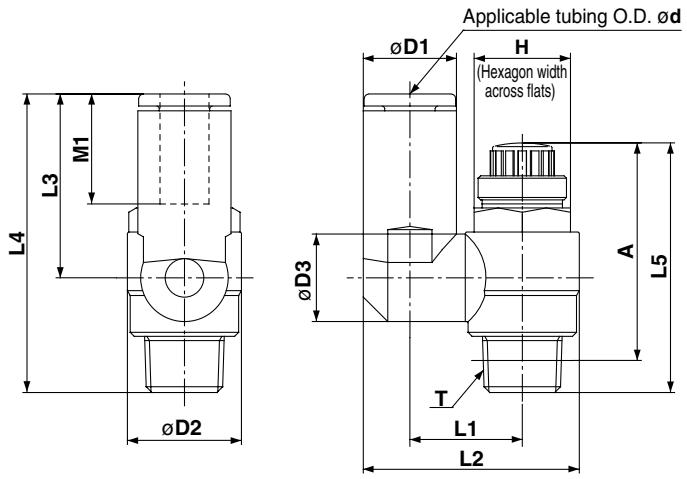
Note 1) Reference dimensions
Note 2) Reference dimensions of M5 and R threads after installation.

Inch Size

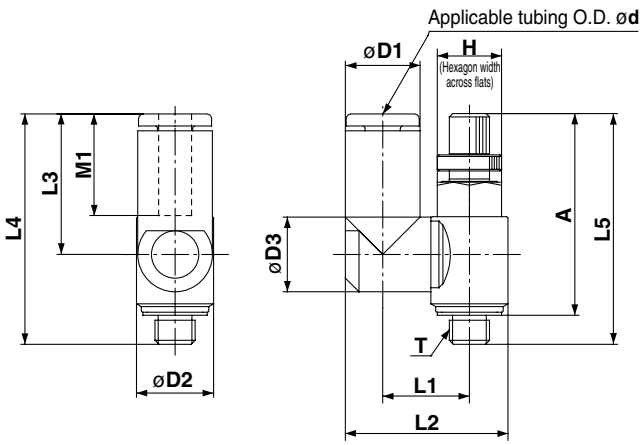
Model	d	T	H	D1	D2	L1	L2	L3	L4 (1)		A (2)		M1	Mass (g)
									Max.	Min.	Max.	Min.		
AS12□1FM-U10/32-01	1/8"	10-32 UNF	8	8.4	9.6	17.3	22.1	12.3	33.8	28.8	30.1	25.1	12.7	7
AS12□1FM-U10/32-03	5/32"			9.3										
AS12□1FM-U10/32-05	3/16"			11.4		21.3	26.1	11.7					16.5	
AS12□1FM-U10/32-07	1/4"			12		18.3	23.1						13.5	
AS22□1FM-N01-01	1/8"	NPT 1/8	12.7	9.3	14.2	20.4	27.5	13.4	35.2	30.2	32.1	27.1	12.7	16
AS22□1FM-N01-03	5/32"													17
AS22□1FM-N01-05	3/16"			13.2		24	31.1						16.5	
AS22□1FM-N01-07	1/4"			13.2		23.9	31						18.5	19
AS22□1FM-N01-09	5/16"			15.2		25.3	32.4	13.4					21	21
AS22□1FM-N02-03	5/32"	NPT 1/4	17.5	10.4	18.5	25.2	34.4	17.7	39.9	34.9	34.4	29.4	16	32
AS22□1FM-N02-05	3/16"			12.8		25.2	34.5						17	
AS22□1FM-N02-07	1/4"			13.2		25.2	34.5						18.5	34
AS22□1FM-N02-09	5/16"			15.2		27.2	36.4	17.7					21	36
AS22□1FM-N02-11	3/8"			18.5		35.3	44.5	19.5						

Note 1) Reference dimensions
Note 2) Reference dimensions of 10-32 UNF and NPT threads after installation.

Dimensions: Universal Type



M5 type



Metric Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 (1)		A (2)		M1	Mass (g)
											Max.	Min.	Max.	Min.		
AS13□1FM-M5-23	3.2	M5 x 0.8	8	8.4	9.6	9.3	10.8	19.8	17.5	28.7	33.8	28.8	30.1	25.1	12.7	8
AS13□1FM-M5-04	4			9.3				20.3								
AS13□1FM-M5-06	6			11.6				21.4	20.6	31.8					13.5	
AS23□1FM-01-23	3.2	R 1/8	12	8.4	14.2	9.3	13.1	24.4	17.5	30.9	35.2	30.2	32.1	27.1	12.7	17
AS23□1FM-01-04	4			9.3				24.9								
AS23□1FM-01-06	6			11.6		10.9	14	26.9	22.9	36.3					13.5	18
AS23□1FM-01-08	8			15.2		12.9	16.2	30.9	28.2	40.8					18.5	21
AS23□1FM-02-04	4	R 1/4	17	10.4	18.5	10.9	16.2	30.6	21.9	39.6	39.9	34.9	34.4	29.4	16	33
AS23□1FM-02-06	6			12.8		12.9	18.4	34	25.2	42.1					17	
AS23□1FM-02-08	8			15.2		12.9	18.3	35.2	28.2	45.1					18.5	36
AS23□1FM-02-10	10			18.5			20.2	38.7	31	47.9					21	40

Note 1) Reference dimensions
Note 2) Reference dimensions of M5 and R threads after installation.

Inch Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 (1)		A (2)		M1	Mass (g)
											Max.	Min.	Max.	Min.		
AS13□1FM-U10/32-01	1/8"	10-32 UNF	8	8.4	9.6	9.3	10.8	19.8	17.5	28.7	33.8	28.8	30.1	25.1	12.7	7
AS13□1FM-U10/32-03	5/32"			9.3				20.3								
AS13□1FM-U10/32-05	3/16"			11.4				21.3	23.3	34.5					16.5	8
AS13□1FM-U10/32-07	1/4"			12				21.6	20.7	31.9					13.7	
AS23□1FM-N01-01S	1/8"	NPT 1/8	12.7	8.4	14.2	9.3	13.1	24.4	17.5	30.9	35.2	30.2	32.1	27.1	12.7	17
AS23□1FM-N01-03S	5/32"			9.3				24.9								18
AS23□1FM-N01-05S	3/16"			11.4		10.9	14	26.8	23.9	37.3					16.5	
AS23□1FM-N01-07S	1/4"			13.2		12.9	16.2	29.9	25.6	38.2					18.5	19
AS23□1FM-N01-09S	5/16"			15.2				30.9	28.2	40.8					21	21
AS23□1FM-N02-03S	5/32"	NPT 1/4	17.5	10.4	18.5	10.9	16.2	30.6	21.9	39.6	39.9	34.9	34.4	29.4	16	32
AS23□1FM-N02-05S	3/16"			11.4				31.1	23.9	41.6					17	33
AS23□1FM-N02-07S	1/4"			13.2		12.9	18.3	34.2	25.6	42.5					18.5	36
AS23□1FM-N02-09S	5/16"			15.2				35.2	28.2	45.1					21	39
AS23□1FM-N02-11S	3/8"			17.9			20.2	38.7	31	47.9						40

Note 1) Reference dimensions
Note 2) Reference dimensions of 10-32 UNF and NPT threads after installation.

Speed Controller for Low Speed Operation with One-touch Fitting In-line Type

Series AS-FM

Model

Model	Applicable tubing O.D.									Applicable cylinder bore size (mm)
	Metric size				Inch size					
	3.2	4	6	8	1/8"	5/32"	3/16"	1/4"	5/16"	
AS1001FM	●	●	●		●	●	●	●		6, 10, 16, 20
AS2001FM		●	●			●	●	●		20, 25, 32
AS2051FM			●	●			●	●	●	20, 25, 32, 40

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)
Number of needle rotations	10 turns (20 turns (1))
Applicable tubing material (2)	Nylon, Soft nylon, Polyurethane

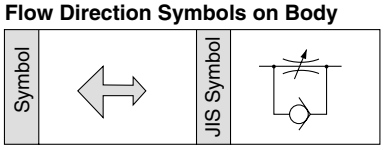
Note 1) In the case of AS1001FM type
Note 2) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used.
(Refer to pages 371 and 372 for details.)
Note 3) Brass parts are all electroless nickel plated. The handle of the M5 type is black zinc chromate plated.

Flow Rate and Effective Area

Model		AS1001FM	AS2001FM		AS2051FM	
Tubing O.D.	Metric size	ø3.2, ø4, ø6	ø4	ø6	ø6	ø8
	Inch size	ø1/8", ø5/32", ø3/16", ø1/4"	ø5/32"	ø3/16", ø1/4"	ø3/16"	ø1/4", ø5/16"
Controlled flow	Flow rate (ℓ/min (ANR))	7	12		38	
	Effective area (mm^2)	0.1	0.2		0.6	
Free flow	Flow rate(ℓ/min (ANR))	100	130	230	290	460
	Effective area (mm^2)	1.5	2	3.5	4.5	7

Note) Flow rate values are measured at 0.5 MPa and 20°C.

Flow Direction Symbols on Body



Made to Order
(Refer to page 503 for details.)

⚠Caution

**Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.**

How to Order

AS [200] **1** **F** **M** – [06] – [ ]

Made to Order
Refer to the below for details.

Body size

100	M5 standard
200	1/8 standard
205	1/4 standard

With one-touch fitting

For low speed control

Applicable tubing O.D.

Metric size		Inch size	
23	ø3.2*	01	ø1/8"
04	ø4	03	ø5/32"
06	ø6	05	ø3/16"
08	ø8	07	ø1/4"
		09	ø5/16"

* Use ø1/8" tube.

Made to Order

Made to Order

Lubricant: Vaseline **X12**

Ex.) AS2001FM-04-X12

Grease-free (Seal: Fluorine coated) + Throttle Valve (Without Check Valve) **X21**

Ex.) AS2001FM-04-X21

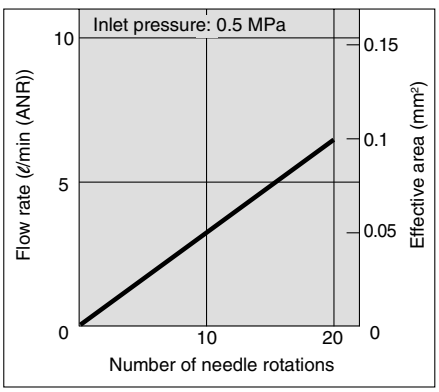
Note 1) Not particle-free

Throttle Valve (Without Check Valve) **X214**

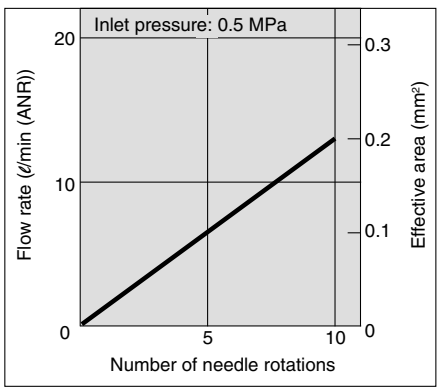
Ex.) AS2001FM-04-X214

Needle Valve/Flow Characteristics

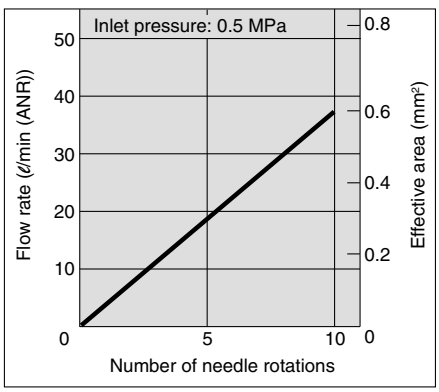
AS1001FM



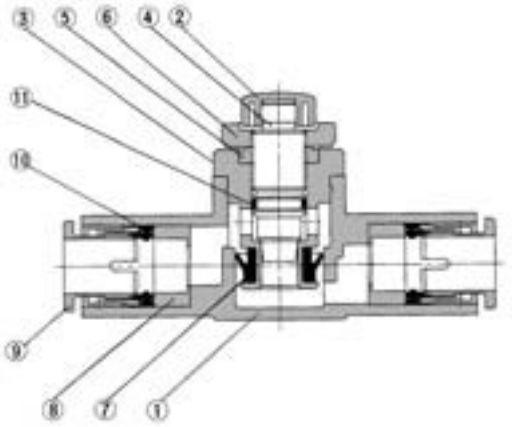
AS2001FM



AS2051FM



Construction

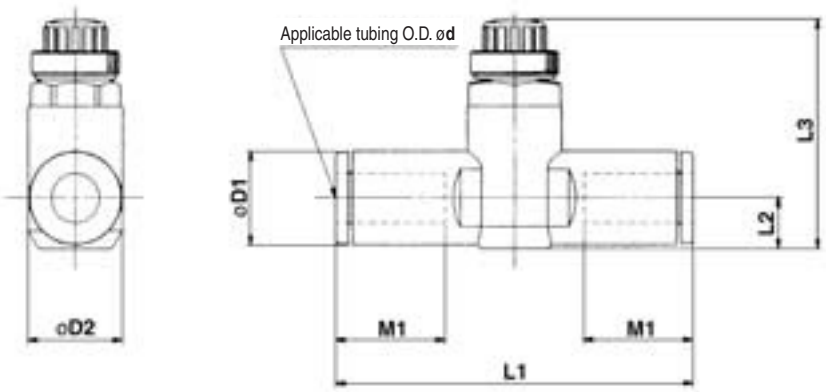


Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Handle**	PBT (1)	Black
3	**Body B**	Brass	Electroless nickel plated
4	**Needle**	Brass	Electroless nickel plated
5	**Needle guide**	Brass	Electroless nickel plated
6	**Lock nut**	Brass (2)	Electroless nickel plated
7	**U seal**	HNBR	
8	**Spacer**	—	
9	**Cassette**	—	
10	**Seal**	NBR	
11	**O-ring**	NBR	

Note 1) AS1001FM type is made of brass (black zinc chromate plated).
Note 2) AS20□1FM type is made of steel.

Dimensions



Metric Size

Model	d	D1	D2	L1	L2	L3		M1	Mass (g)
						Max.	Min.		
AS1001FM-23	3.2	8.4	10	38	4.5	27.7	24.9	12.7	6
AS1001FM-04	4	9.3		39.2	5.2	28.5	25.5		7
AS1001FM-06	6	11.6		40.7	6.2	29.8	26.6	13.7	8
AS2001FM-04	4	9.3	11.8	40.7	5.2	32.6	27.6	12.7	12
AS2001FM-06	6	11.6		44.8	6.3	33.7	28.7	13.7	13
AS2051FM-06	6	12.8	14.8	53.2	6.7	35.2	30.2	17	26
AS2051FM-08	8	15.2		59.8	8.1	36.5	31.5	18	31

Inch Size

Model	d	D1	D2	L1	L2	L3 (1)		M1	Mass (g)
						Max.	Min.		
AS1001FM-01	1/8"	8.4	10	38	4.5	27.7	24.9	12.7	6
AS1001FM-03	5/32"	9.3		39.2	5.2	28.5	25.5		7
AS1001FM-05	3/16"	11.4		48.7	6.2	27.7	24.7	16.5	8
AS1001FM-07	1/4"	12		40.7				13.7	9
AS2001FM-03	5/32"	9.3	11.8	40.7	5.2	32.6	29.6	12.7	12
AS2001FM-05	3/16"	11.4		50	6.2	33.6	28.6	16.5	18
AS2001FM-07	1/4"	13.2		52.2	7.1	34.5	29.5	17	21
AS2051FM-05	3/16"	11.4	14.8	52.2	6.2	34.6	29.6	16.5	24
AS2051FM-07	1/4"	13.2		54.4	7.1	35.5	30.5	17	26
AS2051FM-09	5/16"	15.2		59.8	8.1	36.5	31.5	18	31

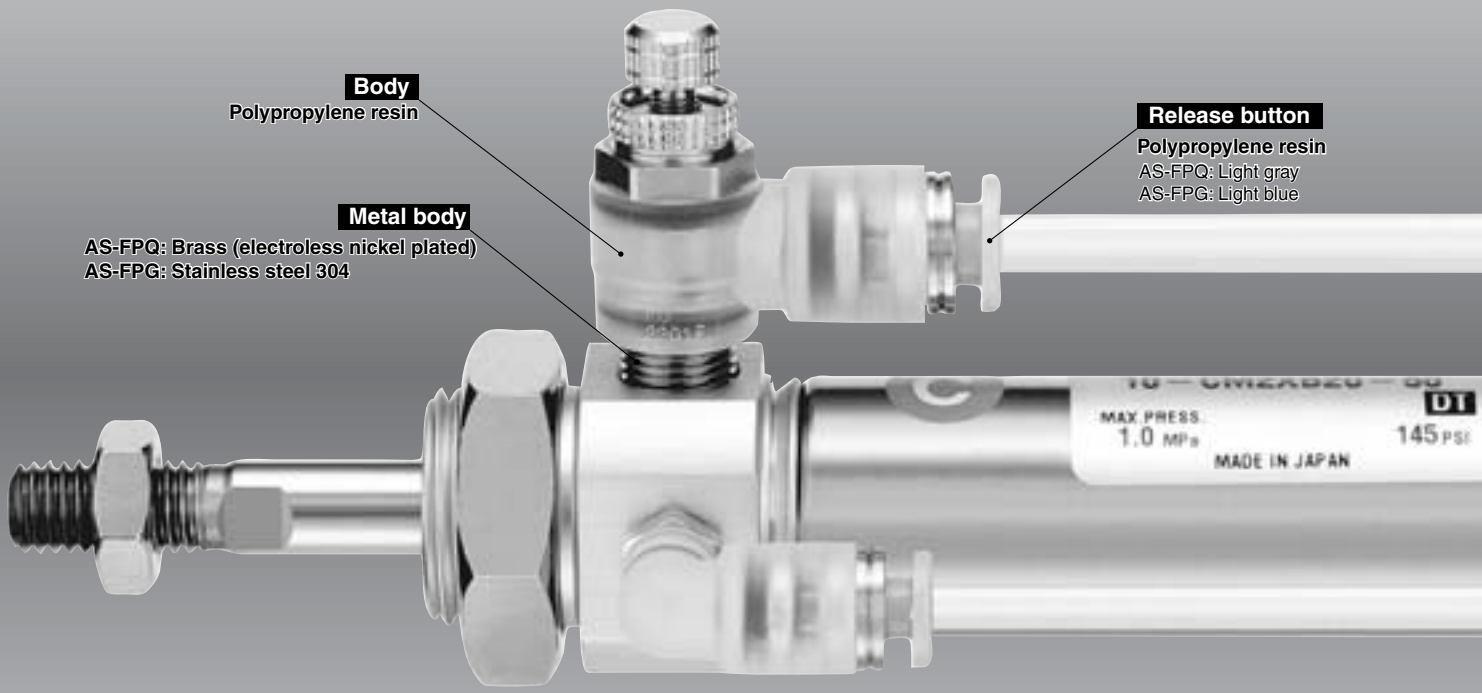
Note 1) Reference dimensions

Clean Speed Controller with One-touch Fitting

Series AS-FPQ/AS-FPG

AS-FPQ: Brass (electroless nickel plated) and
AS-FPG: Stainless steel 304 are now available as a series.

Low particulate generating speed controllers designed for use in clean rooms



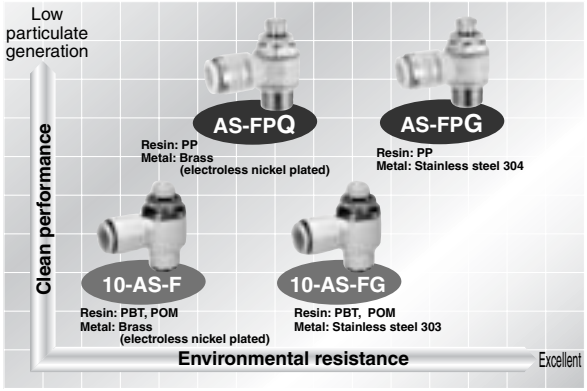
Clean Speed Controller with One-touch Fitting

Series AS-FPQ/FPG

***Series* AS-FPQ**
Brass (electroless nickel plated)

***Series* AS-FPG**
Stainless steel 304

Elbow type	Port size	Applicable tube O.D. (mm)					Applicable cylinder bore size (mm)
		4	6	8	10	12	
AS12□1FP□-M5	M5 x 0.8	●	●	●			6, 10, 16, 20
AS22□1FP□-01	R 1/8		●	●	●		20, 25, 32
AS22□1FP□-02	R 1/4		●	●	●		20, 25, 32, 40
AS32□1FP□-03	R 3/8			●	●	●	40, 50, 63
AS42□1FP□-04	R 1/2			●	●	●	63, 80, 100



Clean Speed Controller with One-touch Fitting Elbow Type

Series AS-FPQ/FPG

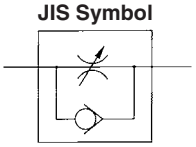
AS-FPQ/Brass (electroless nickel plated)

Release button color: Light gray

AS-FPG/Stainless steel 304

Release button color: Light blue

JIS Symbol



Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Symbol		
JIS Symbol		

Model

Elbow type	Port size	Applicable tubing O.D. (mm)					Applicable cylinder bore size (mm)
		4	6	8	10	12	
AS12□1FP□-M5	M5 x 0.8	●	●				6, 10, 16, 20
AS22□1FP□-01	R 1/8	●	●	●			20, 25, 32
AS22□1FP□-02	R 1/4	●	●	●	●		20, 25, 32, 40
AS32□1FP□-03	R 3/8		●	●	●	●	40, 50, 63
AS42□1FP□-04	R 1/2				●	●	63, 80, 100

Specifications

Fluid	Air
Particulate generation grade	Grade 1 (1)
Proof pressure (20°C)	1.5 MPa (2)
Maximum operating pressure (20°C)	1 MPa (3)
Minimum operating pressure	0.1 MPa
Ambient and fluid temperature	–5 to 60°C (No freezing)
Number of needle rotations	10 rotations (8 rotations (4))
Oil	Fluorine-based grease

Note 1) Refer to particulate generation grade classifications.
Note 2) Proof pressure is 1.5 times higher than maximum operating pressure.
Note 3) The value of the maximum operating preasure is at a temperature of 20°C. In other cases, refer to "Relationship between Operating Temperature and Max. Operating Pressure" below.
Note 4) For AS12□1FP□

Flow Rate and Effective Area

Model		AS12□1FP□-M5	AS22□1FP□-01		AS22□1FP□-02			AS32□1FP□-03			AS42□1FP□-04	
Tubing O.D.	Metric sizes	ø4 ø6	ø4	ø6 ø8	ø4	ø6	ø8 ø10	ø6	ø8	ø10 ø12	ø10	ø12
Controlled (free) flow	Flow rate ℓ/min (ANR)	100	180	230	260	390	460	660	790	920	1580	1710
	Effective area mm²	1.5	2.7	3.5	4	6	7	10	12	14	24	26

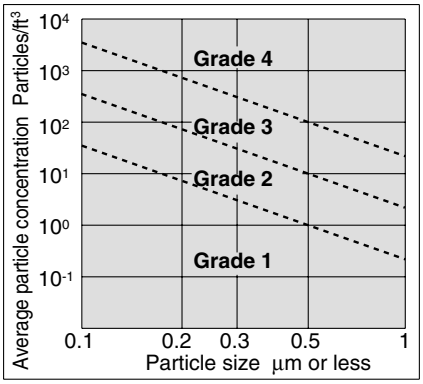
Note) Flow rate values are at a pressure of 0.5MPa, and temperature of 20°C.

Recommended Applicable Tubing

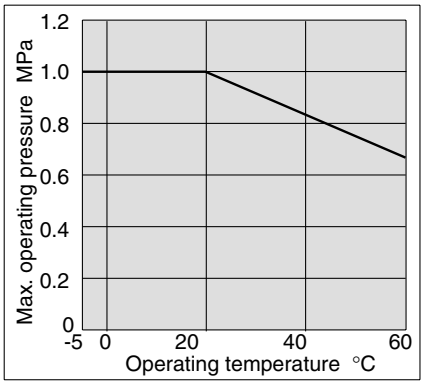
Tubing material	Clean series polyurethane tubing: Series 10
Tubing O.D.	ø4, ø6, ø8, ø10, ø12

Polyurethane tubing: Series TU, Nylon tubing: Series T and Soft nylon tubing: Series TS can also be used. However, the degree of clean performance will decline.

Particulate Generation Grade Classifications



Relation between Operating Temp. and Max. Operating Pressure



Note) Refer to back page 10 for details.

How to Order

AS 2 2 1 1 F P Q – 01 – 06

Body size

1	M5 standard
2	1/8, 1/4 standard
3	3/8 standard
4	1/2 standard

Elbow

Control type

0	Meter-out
1	Meter-in

With One-touch fitting

Clean specifications

Metal parts material

Q	Brass (electoless nickel plated)
G	Stainless steel 304

Port size

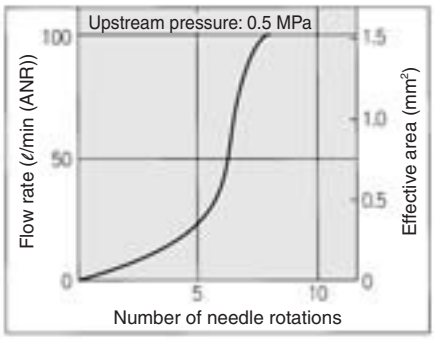
M5	M5 x 0.8
01	R 1/8
02	R 1/4
03	R 3/8
04	R 1/2

Applicable tubing O.D.
Metric sizes

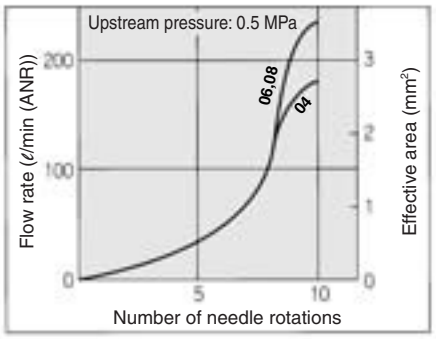
04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

Needle Valve/Flow Characteristics

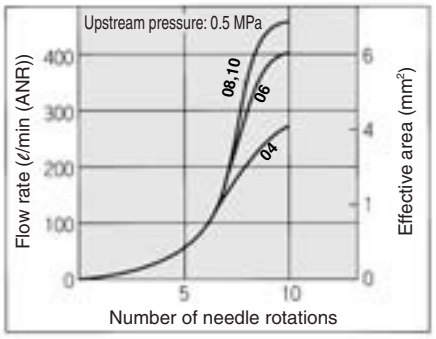
AS12□1FP□-M5



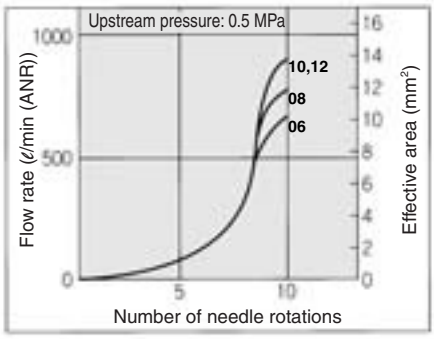
AS22□1FP□-01



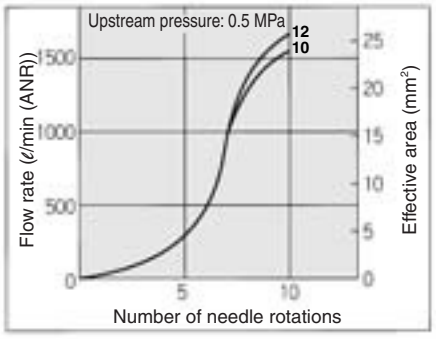
AS22□1FP□-02



AS32□1FP□-03

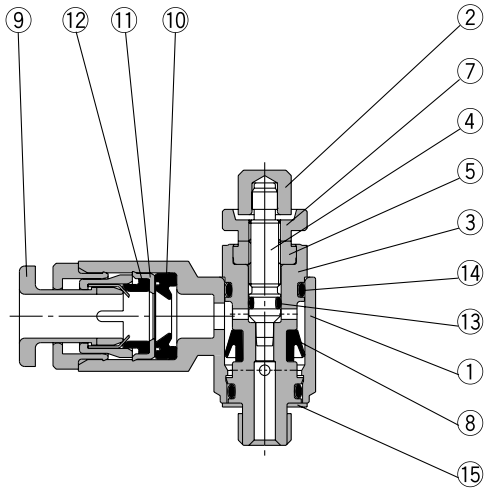


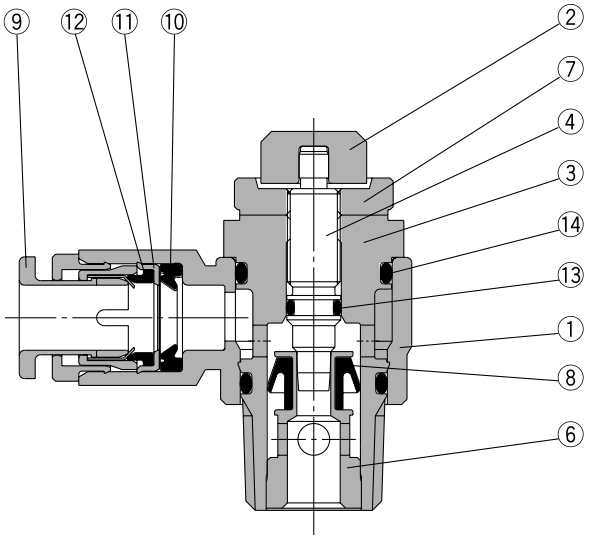
AS42□1FP□-04



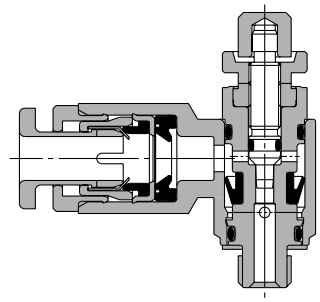
Construction

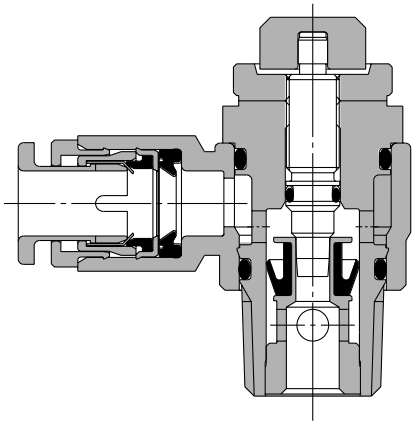
Meter-out type
M5 type





Meter-in type
M5 type

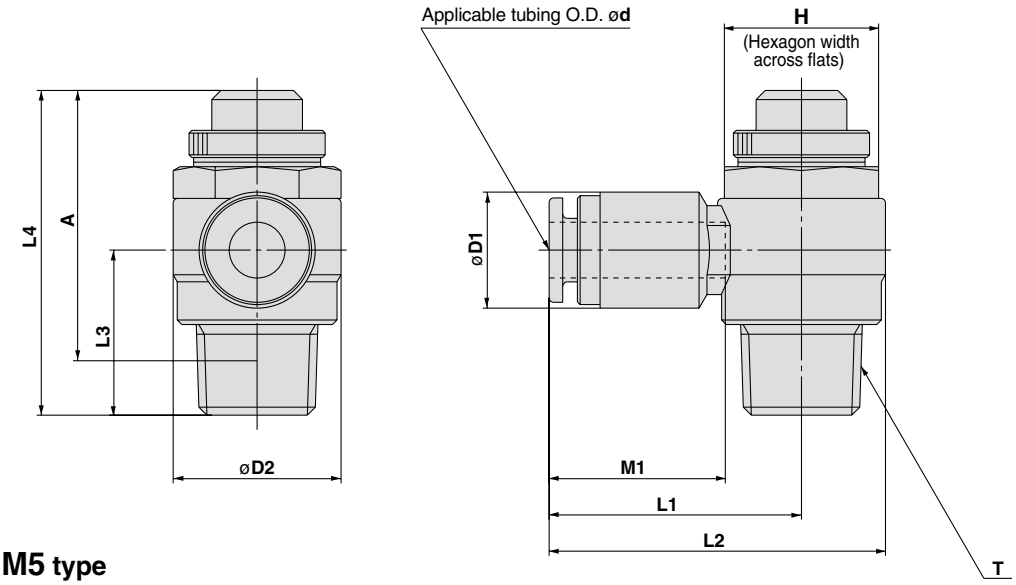




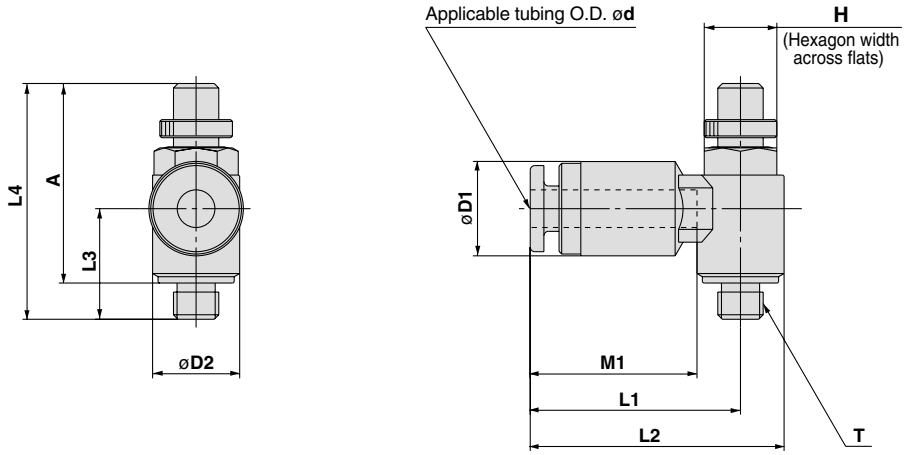
Component Parts

No.	Description	AS□□□1FPQ		AS□□□1FPG	
		Material	Note	Material	Note
1	**Body A**	Polypropylene resin		Polypropylene resin	
2	**Knob**	Brass	Electroless nickel plated	Stainless steel 304	
3	**Body B**	Brass	Electroless nickel plated	Stainless steel 304	
4	**Needle**	Brass	Electroless nickel plated	Stainless steel 304	
5	**Needle guide**	Brass	Electroless nickel plated	Stainless steel 304	
6	**Seat ring**	Brass	Electroless nickel plated	Stainless steel 304	
7	**Lock nut**	Brass	Electroless nickel plated	Stainless steel 304	
8	**U seal**	HNBR		HNBR	
9	**Cassette**	Polypropylene resin Stainless steel 304, Brass	Brass parts are electroless nickel plated	Polypropylene resin Stainless steel 304	
10	**Seal**	NBR		NBR	
11	**Stopper**	Stainless steel 304		Stainless steel 304	
12	**Cushion**	NBR		NBR	
13	**O-ring**	NBR		NBR	
14	**O-ring**	NBR		NBR	
15	**Gasket**	NBR, Stainless steel 304		NBR, Stainless steel 304	

Dimensions



M5 type



Model	Tubing O.D. d	T	H	D1	D2	L1	L2	L3 (4)	L4 (1) (4)		A (2)		M1	Mass (g) (3)	
									Max.	Min.	Max.	Min.		1*	2*
AS12□1FP□-M5-04	4	M5 x 0.8	8	10.4	9.6	22.2	27	12.2	28.8	26	25.2	22.4	17	7	7
AS12□1FP□-M5-06	6			12.8		23.2	28	(12.2)	(28.8)	(26)			18.5	8	8
AS22□1FP□-01-04	4	R 1/8	12	10.4	14.2	24.3	31.4	13.4 (14.3)	35.5 (36.4)	30.5 (31.4)	32.4	27.4	17	17	17
AS22□1FP□-01-06	6			12.8		25.3	32.4						18.5	18	18
AS22□1FP□-01-08	8			15.2		27.5	34.6						20.5	20	20
AS22□1FP□-02-04	4	R 1/4	17	10.4	18.5	26.8	36	17.7 (18.2)	40.3 (40.8)	35.3 (35.8)	34.8	29.4	17	33	33
AS22□1FP□-02-06	6			12.8		26.8	36						18.5	33	33
AS22□1FP□-02-08	8			15.2		29.4	38.6						20.5	35	35
AS22□1FP□-02-10	10			18.5		37.3	46.5	18.3 (18.8)					23	38	38
AS32□1FP□-03-06	6	R 3/8	19	12.8	23	29.4	40.9	19.8 (20.9)	45.8 (46.9)	40.8 (41.9)	40.6	35.6	18.5	59	55
AS32□1FP□-03-08	8			15.2		31.9	43.4						20.5	61	57
AS32□1FP□-03-10	10			18.5		33.6	45.1						23	63	59
AS32□1FP□-03-12	12			20.9		34.8	46.3						24	65	61
AS42□1FP□-04-10	10	R 1/2	24	18.5	28.6	35.6	49.9	24.5 (25.4)	57.2 (58.1)	49.7 (50.6)	49.9	42.4	23	107	100
AS42□1FP□-04-12	12			20.9		37.2	51.5						24	109	102

Note 1) Reference dimensions
Note 2) Reference dimension for threads after installation
Note 3) 1* is the weight for type AS□2□1FPQ (brass + electroless nickel plated), 2* is the weight for type AS□2□1FPG (Stainless steel 304).
Note 4) Dimensions of AS□2□1FPQ, ( ): AS□2□1FPG

Series AS-FPQ/FPG
Specific Product Precautions

Be sure to read before handling. Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.

Handling

⚠Caution

1. **Store away from direct sunlight at 40°C or less.**
2. **Open the inner package of the double packaging in a clean room or other clean environment.**

Piping

⚠Caution

1. **Be sure to use sealant tape or liquid gasket at the taper thread part. Using without sealant tape or liquid gasket can cause air leakage.**

Flame Resistant (Equivalent to UL-94 Standard V-0) Speed Controller with One-touch Fittings Elbow Type

Series AS

Minimizes installation time and cost

Tube swivels 360°

Application to inch size tubing
● **Metric size**
ø6, ø8, ø10, ø12

Maximum operating pressure
1 MPa max.

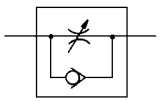
Applicable tubing materials
FR double layer, FR soft nylon

Retainer prevents accidental loss of needle.

Comes standard with seal.

Elbow type

JIS Symbol



Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Symbol		
JIS Symbol		

Model

Elbow type	Port size	Applicable tubing O.D. (mm)				Applicable cylinder bore size (mm)
		6	8	10	12	
AS22□1F-01-□W2	R 1/8	◉	◉	◉		20, 25, 32
AS22□1F-02-□W2	R 1/4	◉	◉	◉		20, 25, 32, 40
AS32□1F-02-□W2	R 1/4	◉	◉	◉	◉	40, 50, 63
AS32□1F-03-□W2	R 3/8	●	●	●	●	40, 50, 63
AS42□1F-04-□W2	R 1/2			●	●	63, 80, 100

Note 1) Meter-out and meter-in types can be visually differentiated by the lock nut.
The lock nut on the meter-out type is electroless nickel plated, while the meter-in type is black zinc chromate plated.
Note 2) ◉Marking is electroless nickel plated, provided as standard. (N specificaitons)

Specifications

Fluid	Air
Proof pressure	1.5 MPa
Max. operating pressure	1 MPa
Mini. operating pressure	0.1 MPa
Ambient and fluid temperature	–5 to 60°C (No freezing)
Number of needle rotations	10 turns
Applicable tubing material Note)	FR double layer, FR soft nylon

Note) Use caution regarding the max. tubing operating pressure.
(Refer to pages 379 and 380 for details.)

Flow Rate and Effective Area

Model		AS22□1F-01	AS22□1F-02			AS32□1F			AS42□1F	
Tubing O.D. (mm)		ø6, ø8, ø10	ø4	ø6	ø8, ø10	ø6	ø8	ø10, ø12	ø10	ø12
Controlled flow (Free flow)	Flow rate ℓ/min (ANR)	230	260	390	460	660	790	920	1580	1710
	Effective area (mm^2)	3.5	4	6	7	10	12	14	24	26

Note) Flow rate values are measured at 0.5 MPa and 20°C.

⚠Caution

Be sure to read before handling.
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.

How to Order

AS 2 2 0 1F – 01 – 06 W2

Body size

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

Elbow

Control type

0	Meter-out
1	Meter-in

With One-touch fitting

Port size

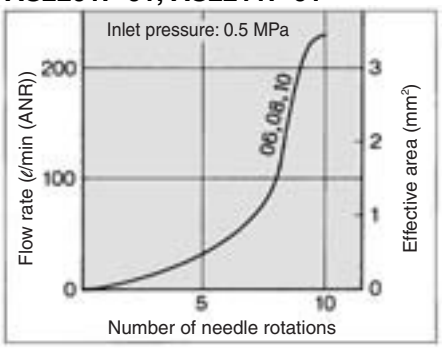
01	R 1/8
02	R 1/4
03	R 3/8
04	R 1/2

Applicable tubing O.D.
Metric size

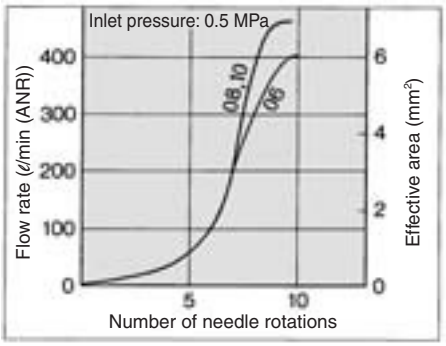
06	ø6
08	ø8
10	ø10
12	ø12

Needle Valve/Flow Characteristics

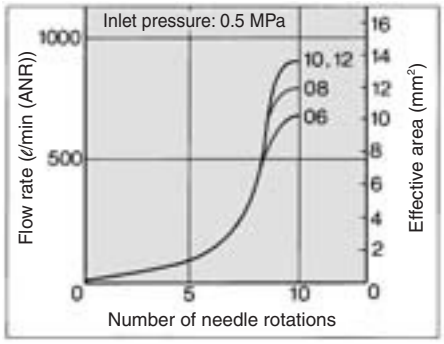
AS2201F-01, AS2211F-01



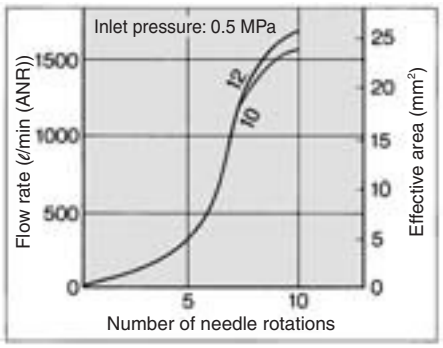
AS2201F-02, AS2211F-02



AS3201F, AS3211F

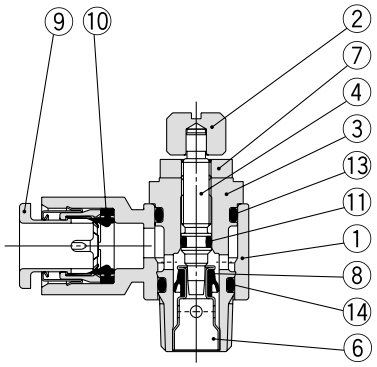


AS4201F, AS4211F

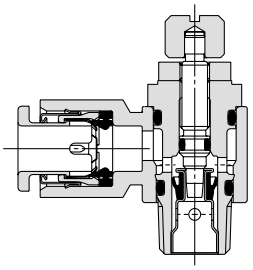


Construction

Meter-out type

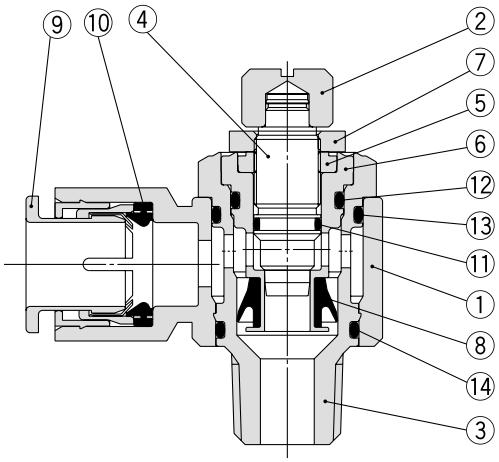


Meter-in type

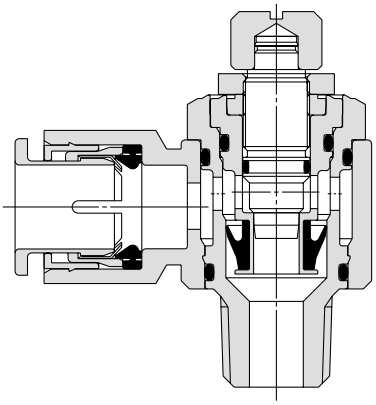


AS32□1F-02

Meter-out type AS3201F-02



Meter-in type AS3211F-02

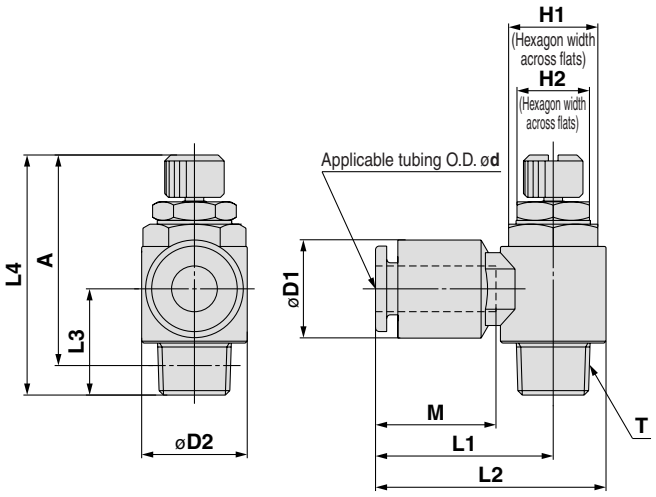


Component Parts

No.	Description	Material	Note
1	**Body A**	Flame-resistant PBT	
2	**Handle**	Brass	Electroless nickel plated
3	**Body B**	Brass	Electroless nickel plated
4	**Needle**	Brass	Electroless nickel plated
5	**Needle guide**	Brass	Electroless nickel plated
6	**Seat ring**	Brass	(1)
7	**Lock nut**	Brass	Electroless nickel plated (2)
8	**U-packing**	HNBR	
9	**Cassette**	—	
10	**Seal**	NBR	
11	**O-ring**	NBR	
12	**O-ring**	NBR	
13	**O-ring**	NBR	
14	**O-ring**	NBR	

Note 1) AS22□1F, AS32□1F-02: Electroless nickel plated.
Note 2) Meter-in type is black zinc chromate plated.

Elbow Type



Metric Size

Model	Applicable tubing O.D. ød	T	H1	H2	D1	D2	L1	L2	L3	L4 (1)		A (2)		M	Mass (g)
										Max.	Min.	Max.	Min.		
AS22□1F-01-06W2	6	R 1/8	12	10	13.2	14.2	23.9	31	13.4	36.4	31.4	33.3	28.3	17	19
AS22□1F-01-08W2	8				15.2		25.3	32.4						18.5	21
AS22□1F-01-10W2	10				18.5		32.1	39.2	15.2					21	23
AS22□1F-02-06W2	6	R 1/4	17	12	13.2	18.5	25.2	34.4	17.7	41.1	36.1	35.6	30.6	17	34
AS22□1F-02-08W2	8				15.2		27.2	36.4						18.5	36
AS22□1F-02-10W2	10				18.5		35.3	44.5	18.3					21	38
AS32□1F-02-06W2	6		19	14	13.2	23	27.8	39.3	21.3	49.9	44.9	44.4	39.4	17	63
AS32□1F-02-08W2	8				15.2		29.5	41						18.5	65
AS32□1F-02-10W2	10				18.5		31.5	43.1						21	67
AS32□1F-02-12W2	12				20.9		32.8	44.3						22	69
AS32□1F-03-06W2	6	R 3/8			13.2		27.8	39.3	19.8	47.4	42.4	42.4	37.4	17	58
AS32□1F-03-08W2	8				15.2		29.5	41						18.5	60
AS32□1F-03-10W2	10				18.5		31.5	43.1						21	62
AS32□1F-03-12W2	12				20.9		32.8	44.3						22	64
AS42□1F-04-10W2	10	R 1/2	24	17	18.5	28.6	33.6	47.9	24.5	58.7	51.2	51.4	43.9	21	101
AS42□1F-04-12W2	12				20.9		35.2	49.5						22	107

Note 1) Reference dimensions
Note 2) Reference thread dimensions after installation.

Speed Controller with One-touch Fittings

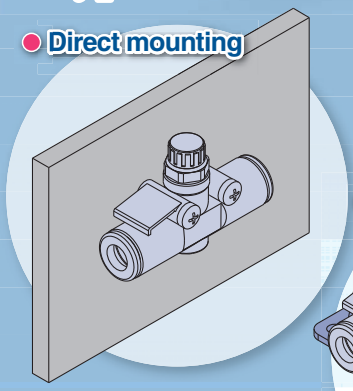
New

RoHS

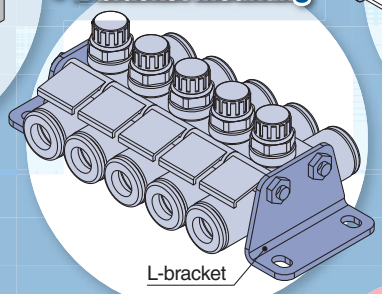
In-line Type

4 types of mounting variations

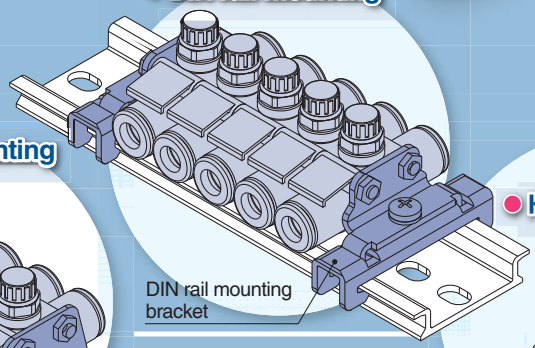
- Direct mounting



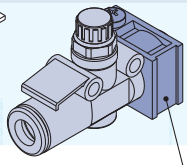
- L-bracket mounting



- DIN rail mounting

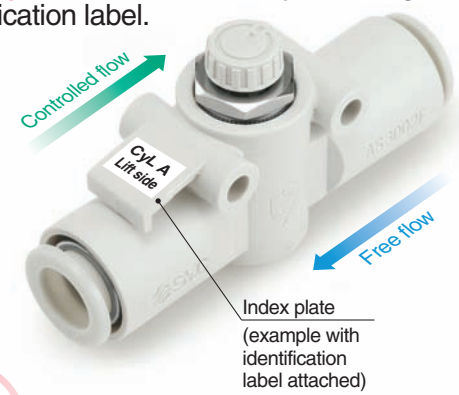


- Holder mounting



Index plate

It is possible to **identify the product when multiple controllers are mounted** and **identify the flow direction** by attaching an identification label.



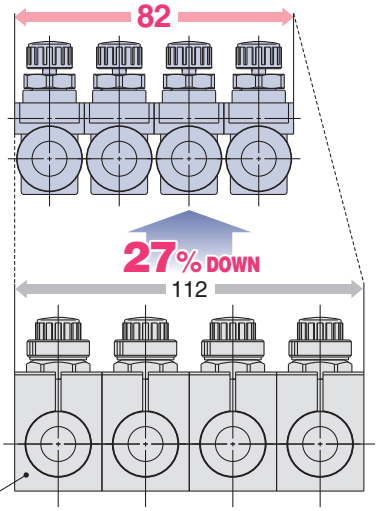
Lightweight

Reduced by **30%** compared with the conventional product (AS2002F-04)

Compact

NEW

Four AS3002F-10 controllers connected



Conventional

Four AS3001F-10 controllers connected with holders (TMH-10)

Flow-rate characteristics are equivalent to the conventional product.

Series AS

SMC

CAT.NAS20-215B

Series

Series	Applicable tube O.D.													Applicable cylinder bore size	
	Metric size							Inch size							
	2	3.2	4	6	8	10	12	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"	(inch)	(mm)
AS1002F	◉													1/4"	2.5, 4, 6
		◉	◉	◉				◉	◉	◉				1/4", 3/8", 5/8", 3/4"	6, 10, 16, 20
AS2002F			◉	◉					◉	◉				3/4", 1", 1 1/4"	20, 25, 32
AS2052F				◉	◉					◉	◉			3/4", 1", 1 1/4", 1 1/2"	20, 25, 32, 40
AS3002F				◉	◉	◉	◉			◉	◉	◉		1 1/2", 2", 2 1/2"	40, 50, 63
AS4002F						◉	◉					◉	◉	2 1/2", 3 1/4", 4"	63, 80, 100

Specifications

Fluid	Air
Proof pressure	218 psi (1.5 MPa) 152 psi Note 1) (1.05 MPa Note 1))
Max. operating pressure	145 psi (1 MPa) 102 psi Note 1) (0.7 MPa Note 1))
Min. operating pressure	15 psi (0.1 MPa)
Ambient and fluid temperature	23 to 140°F (–5 to 60°C) (No freezing)
Applicable tube material Note 2)	Nylon, Soft nylon, Polyurethane

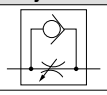
Note 1) In case of AS1002F-02
Note 2) Use caution at the max. operating pressure when using soft nylon or polyurethane tubing. (Refer to pages 371 and 372 of Best Pneumatics Vol. 6)
Note 3) Brass parts are all electroless nickel plated.

Flow Rate and Flow Coefficient

Series		AS1002F		AS2002F		AS2052F		AS3002F			AS4002F	
Tube O.D.	Metric size	ø2	ø3.2, ø4, ø6	ø4	ø6	ø6	ø8	ø6	ø8	ø10, ø12	ø10	ø12
	Inch size	—	ø1/8", ø5/32" ø1/4"	ø5/32"	ø1/4"	—	ø1/4" ø5/16"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
Controlled flow (Free flow)	Flow rate (scfm)	0.7	3.5	4.6	8.1	10.2	16.3	13.8	23.3	32.5	32.5	55.8
	Cv	0.02	0.08	0.11	0.19	0.25	0.39	0.33	0.56	0.78	0.78	1.33

Note) Flow rate values are measured at 73 psi and 70°F.

Flow Direction Symbol on Body

Symbol


How to Order

RoHS

AS 400 2F – 12 – [ ] – [ ]

Body size

100	M3, M5 standard
200	1/8 standard
205	1/4 standard
300	3/8 standard
400	1/2 standard

With one-touch fittings

Applicable tube O.D.

Metric size	
02	ø2
23	ø3.2*
04	ø4
06	ø6
08	ø8
10	ø10
12	ø12

Inch size	
01	ø1/8"
03	ø5/32"
07	ø1/4"
09	ø5/16"
11	ø3/8"
13	ø1/2"

* Use ø1/8" tube.

Made to Order

Lock nut option

Nil	Hexagon lock nut
J	Round lock nut

Made to Order

Made to Order

Lubricant: Vaseline **-X12**

Ex.) AS2002F-04-X12

Grease-free (Sealant: Fluoro coated) + Restrictor (Without Check Valve) **-X21**

Ex.) AS2002F-04-X21

Note) Not particle-free

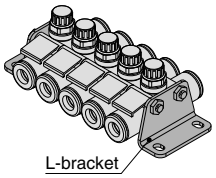
Restrictor (Without Check Valve) **-X214**

Ex.) AS2002F-04-X214

Options

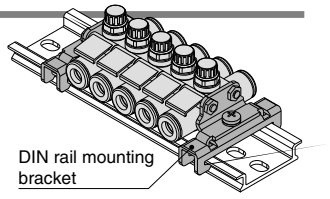
L-bracket

Part no.	Applicable series
AS-12L	AS1002F-02
AS-10L	AS1002F
AS-20L	AS2002F
AS-25L	AS2052F
AS-30L	AS3002F
AS-40L	AS4002F



DIN rail mounting bracket

Part no.	Applicable series
AS-10D	AS1002F
AS-20D	AS2002F
AS-25D	AS2052F
AS-30D	AS3002F
AS-40D	AS4002F



* Bracket for AS1002F-02 is not available.
* Prepare DIN rail by user.

Part no. list of threaded stud kit for manifold

Model		4 stations	6 stations	8 stations	10 stations
Metric size	Inch size				
AS1002F-02	—	AS-31B	AS-32B	AS-33B	AS-34B
AS1002F-23	**AS1002F-01**	AS-32B	AS-33B	AS-34B	AS-36B
AS1002F-04	**AS1002F-03**			AS-35B	
AS1002F-06	—		AS-34B	AS-36B	AS-37B
—	**AS1002F-07**				AS-38B
AS2002F-04	**AS2002F-03**	AS-32B	AS-34B	AS-35B	AS-37B
AS2002F-06	—			AS-36B	
—	**AS2002F-07**				AS-38B
AS2052F-06	—	AS-41B	AS-42B	AS-44B	AS-45B
—	**AS2052F-07**				
AS2052F-08	**AS2052F-09**				
AS3002F-06	—	AS-42B	AS-44B	AS-45B	AS-47B
—	**AS3002F-07**				
AS3002F-08	**AS3002F-09**				
AS3002F-10	—				
—	**AS3002F-11**			AS-46B	
AS3002F-12	—				
AS4002F-10	—	AS-43B	AS-45B	AS-47B	AS-48B
—	**AS4002F-11**				
AS4002F-12	—				
—	**AS4002F-13**				

Details of threaded stud kit for manifold

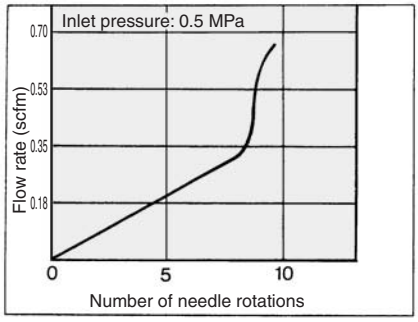
Part no.	Threaded stud		Accessories			
	Length (mm)	pcs.	Hexagon nut	pcs.	Flat washer	pcs.
AS-31B	38	2	M3	4	M3	4
AS-32B	62	2				
AS-33B	72	2				
AS-34B	90	2				
AS-35B	104	2				
AS-36B	114	2				
AS-37B	135	2				
AS-38B	140	2				
AS-41B	78	2	M4	4	M4	4
AS-42B	111	2				
AS-43B	119	2				
AS-44B	147	2				
AS-45B	179	2				
AS-46B	191	2				
AS-47B	236	2				
AS-48B	277	2				

* Precautions when options are ordered
Threaded studs for manifold are not included when L-bracket and DIN rail mounting bracket are ordered. Please order them according to the number of stations.

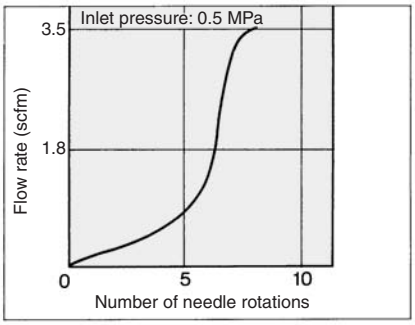
Ex.) AS2002F-04 **When connecting 4 pcs. and mounting L-brackets on both sides**
- Speed controller **AS2002F-04** ·····4 pcs.
- L-bracket **AS-20L** ·····2 pcs.
- Threaded stud kit for manifold **AS-32B** ·····1 pc.

Needle Valve/Flow-rate Characteristics

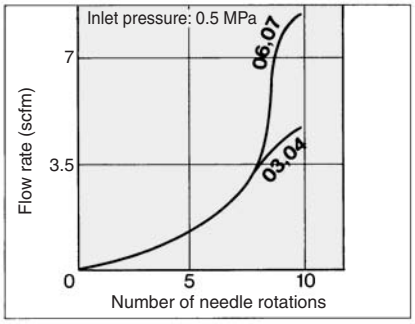
AS1002F-02



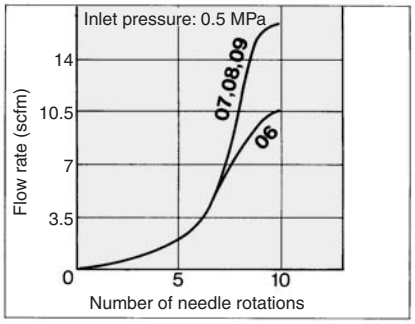
AS1002F



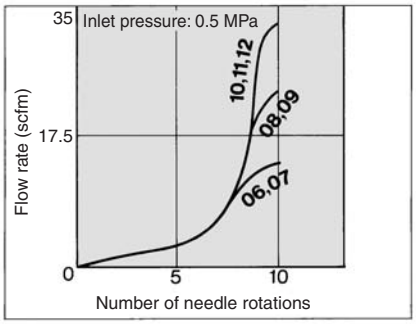
AS2002F



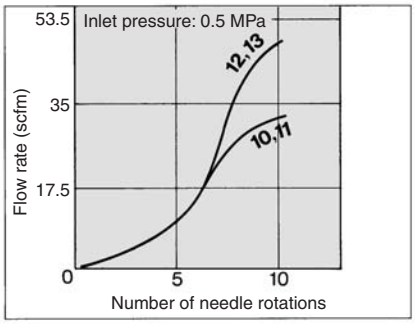
AS2052F



AS3002F

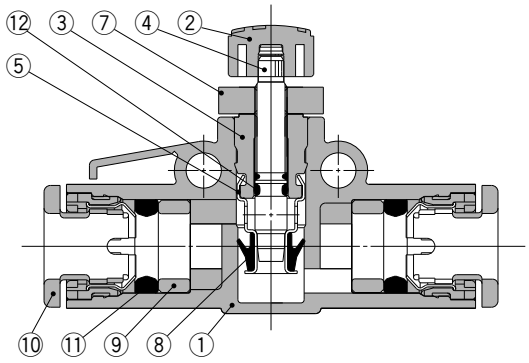


AS4002F

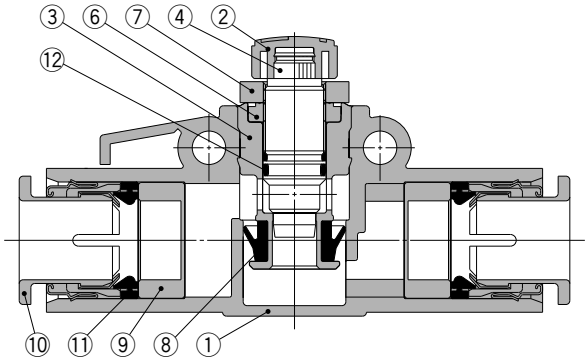


Construction

AS1002F, AS2002F, AS2052F



AS1002F-02, AS3002F, AS4002F



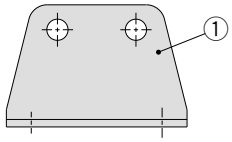
Component Parts

No.	Description	Material	Note
1	**Body A**	PBT	
2	**Handle**	PBT	
3	**Body B**	Brass	Electroless nickel plated
4	**Needle**	Brass	Electroless nickel plated
5	**Seat ring**	Brass	Electroless nickel plated
6	**Needle guide**	Brass	Electroless nickel plated

No.	Description	Material	Note
7	**Lock nut**	Steel wire	Zinc chromated
8	**U-seal**	HNBR	
9	**Spacer**	POM Note)	
10	**Cassette**	—	
11	**Seal**	NBR	
12	**O-ring**	NBR	

Note) AS2052F, AS3002F, AS4002F are made of PBT. AS3002F-11, AS4002F-11, AS4002F-13 are made of electroless nickel plated brass.

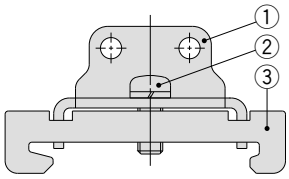
L-bracket



Component Part

No.	Description	Material
1	**Bracket**	Steel strip

DIN rail mounting bracket



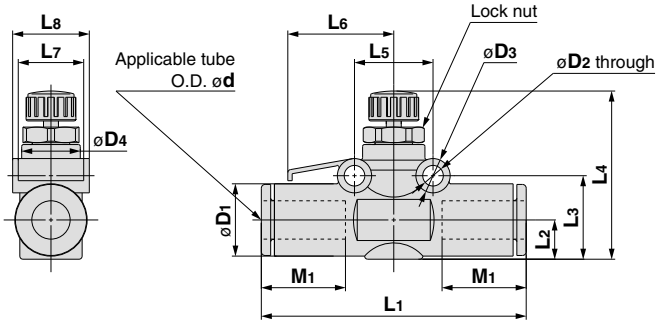
Component Parts

No.	Description	Material
1	**Bracket**	Steel strip
2	**Cross recessed round head screw**	Steel wire
3	**Clasp**	Steel strip

⚠Caution

Be sure to read before handling. Refer to back cover for Safety Instructions and Best Pneumatics Vol. 6 for Flow Control Equipment Precautions.

Dimensions



Metric Size

Unit: mm

Model	Applicable tube O.D. ød	D1	D2	D3	D4	L1	L2	L3	L4 Note) MAX.	L4 Note) MIN.	L5	L6	L7	L8	M1	Weight (g)
AS1002F-02	2	6	3.2	5	6	25.4	3.4	7.9	20.9	18.4	11	9.8	5	6.7	8.8	3
AS1002F-23	3.2	8.4	3.3	5.5	9.1	36	4.4	11.1	23.8	21	11	15.4	8.8	9.8	12.7	5
AS1002F-04	4	9.3				37	5.1	11.8	24.5	21.7				10.1		5.5
AS1002F-06	6	11.6				39.5	6.1	12.8	25.5	22.7				12.3	13.5	6.5
AS2002F-04	4	9.3	3.3	5.5	10	40.7	5.2	12.3	28.9	25.4	12.6	17	10.5	11.5	12.7	8.5
AS2002F-06	6	11.6				42.5	6.3	13.4	30	26.5				12.3	13.5	9.5
AS2052F-06	6	12.8	4.3	7.8	14	53.2	6.7	16.3	33.2	28.2	17	22.8	12	15.7	17	19
AS2052F-08	8	15.2				57.2	8	17.6	34.5	29.5				16.1	18	22
AS3002F-06	6	13.2	4.3	8	19.3	59	7.4	19.3	38.6	33.6	22	25	12	20.5	17	36
AS3002F-08	8	15.2				65	8.2	20.1	39.4	34.4					18	38
AS3002F-10	10	18.5				70.8	9.8	21.7	41	36					21	42
AS3002F-12	12	20.9				76	10.9	22.8	42.1	37.1				22.1	22	44
AS4002F-10	10	18.5	4.3	8	25	76.9	10.3	22.7	51.6	44.1	28	33	14	26.2	21	76
AS4002F-12	12	21.7				81.3	11.3	23.7	52.6	45.1					22	82

Note) Reference dimensions

Inch Size

Unit: mm

Model	Applicable tube O.D. ød	D1	D2	D3	D4	L1	L2	L3	L4 Note) MAX.	L4 Note) MIN.	L5	L6	L7	L8	M1	Weight (g)
AS1002F-01	1/8"	8.4	3.3	5.5	9.1	36	4.5	11.2	23.8	21	11	15.4	8.8	9.8	12.7	5
AS1002F-03	5/32"	9.3				37	5.2	11.9	24.5	21.7				10.1		5.5
AS1002F-07	1/4"	12				39.5	6.1	12.8	25.5	22.7				12.8	13.7	6.5
AS2002F-03	5/32"	9.3	3.3	5.5	10	40.7	5.2	12.3	28.9	25.4	12.6	17	10.5	11.5	12.7	8.5
AS2002F-07	1/4"	12				42.6	6.5	13.6	30.2	26.7				12.8	13.7	9.5
AS2052F-07	1/4"	13.2	4.3	7.8	14	53.4	6.9	16.5	33.4	28.4	17	22.8	12	15.7	17	19
AS2052F-09	5/16"	15.2				57.2	8	17.6	34.5	29.5				16.1	18	22
AS3002F-07	1/4"	13.2	4.3	8	19.3	59	7.4	19.3	38.6	33.6	22	25	12	20.5	17	35
AS3002F-09	5/16"	15.2				65	8.2	20.1	39.4	34.4					18	38
AS3002F-11	3/8"	18.5				69.8	9.8	21.7	41	36					21	52
AS4002F-11	3/8"	18.5	4.3	8	25	76.9	10.3	22.7	51.6	44.1	28	33	14	26.2	21	86
AS4002F-13	1/2"	21.7				81.3	11.3	23.7	52.6	45.1					22	95

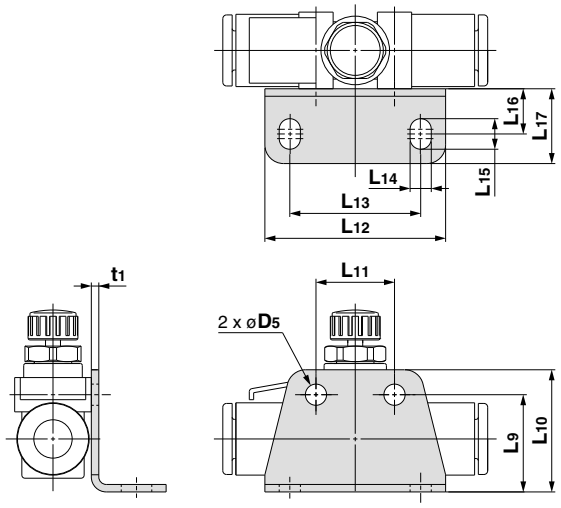
Note) Reference dimensions

It is possible to tighten the lock nut (hexagon) manually.
If the nut needs to be fixed more firmly, retighten it with a tool. When using a tool, the nut needs to be tightened to the recommended tightening torque shown in the table.
As a guide, it should be tightened by 15 to 30° with a tool after tightening it manually.
Be careful not to damage the lock nut by applying too much torque.

Series	Proper tightening torque (ft·lb)
AS1002F-02	0.05
AS1002F	0.15
AS2002F	0.22
AS2052F	0.74
AS3002F	1.5
AS4002F	3

L-bracket

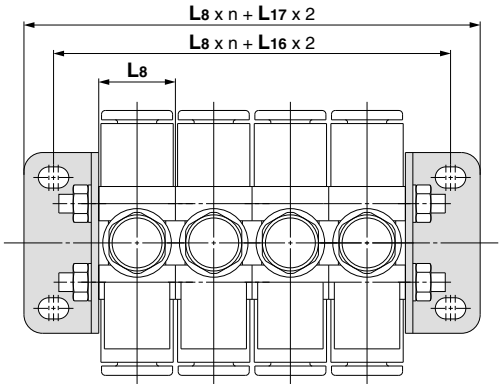
Bracket on a single side



Unit: mm

Part no.	Applicable series	D5	L9	L10	L11	L12	L13	L14	L15	L16	L17	t1
AS-12L	AS1002F-02	3.4	9.9	13.4	11	27.5	19.5	3.4	4.9	7.3	12	1
AS-10L	AS1002F		14.8	18.3								
AS-20L	AS2002F		15.6	19.6	12.6	29	21	4.5	6.5	9.5	15.5	1.2
AS-25L	AS2052F		19.6	24.6	17	38	28					
AS-30L	AS3002F	4.5	24.8	29.8	22	43	33					1.4
AS-40L	AS4002F		25.7	30.7	28	49	39					

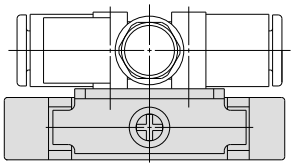
Brackets on both sides



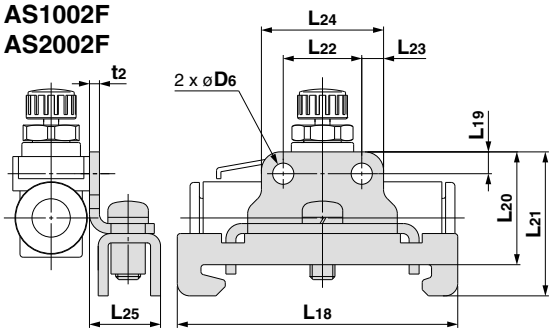
∗1 Refer to page 3 for L8.
∗2 The above figure shows the manifold with controllers connected using two L-brackets and a threaded stud kit for manifold. Refer to page 1 for threaded stud kits for manifold.

DIN rail mounting bracket

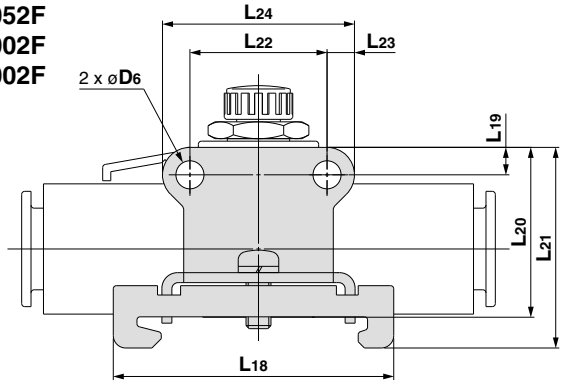
Bracket on a single side



AS1002F
AS2002F



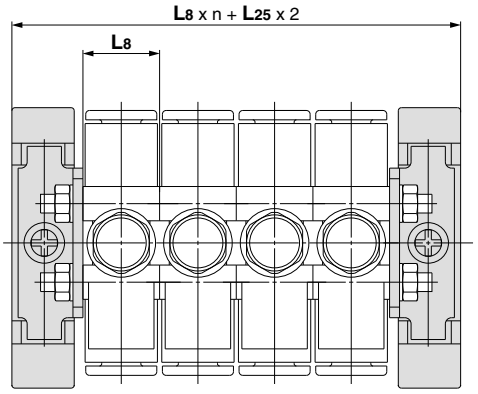
AS2052F
AS3002F
AS4002F



Unit: mm

Part no.	Applicable series	D6	L18	L19	L20	L21	L22	L23	L24	L25	t2
AS-10D	AS1002F	3.4	45	3.5	18.2	23.2	11	3.5	18	11.2	1.6
AS-20D	AS2002F				18.6	23.6	12.6		19.6		
AS-25D	AS2052F				22	27	17		25.8		
AS-30D	AS3002F	4.5		4.4	27.2	32.2	22	4.4	30.8		
AS-40D	AS4002F				28.1	33.1	28		36.8		

Brackets on both sides

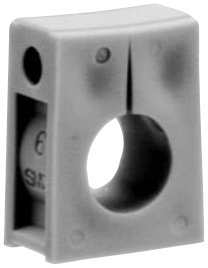


∗1 Refer to page 3 for L8.
∗2 The above figure shows the manifold with controllers connected using two DIN rail mounting brackets and a threaded stud kit for manifold. Refer to page 1 for threaded stud kits for manifold.

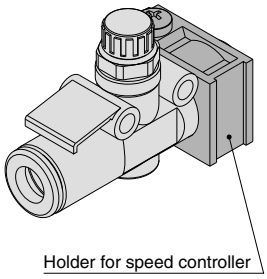
Holder for Speed Controller
Series TMH

A holder for securing a speed controller with one-touch fittings (In-line type)

Possible to hold a single controller.



● **Holder mounting**



Specifications

Ambient temperature	–4 to 140°F (–20 to 60°C)
Material	Polypropylene
Color	White

Accessory: Cross Recessed Round Head Screw for Mounting

Model		Size (Nominal x Length)	Piece
Metric size	Inch size		
TMH-23J	**TMH-01J**	M3 x 15	1
TMH-04J	**TMH-03J**		
TMH-06J	**TMH-07J**	M3 x 20	
TMH-06	**TMH-07**	M4 x 25	
TMH-08	**TMH-09**		
TMH-10	—	M4 x 35	
TMH-12	**TMH-13**		

Series

Select the applicable holder/TMH for each speed controller from the below table.

Metric Size

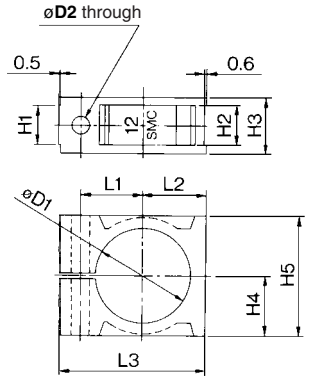
Tube size / Applicable series	Applicable tube					
	23	04	06	08	10	12
	ø3.2	ø4	ø6	ø8	ø10	ø12
AS1002F	**TMH-23J**	**TMH-04J**	**TMH-06J**			
AS2002F						
AS2052F			**TMH-06**	**TMH-08**		
AS3002F			**TMH-07**		**TMH-10**	**TMH-12**
AS4002F						**TMH-13**

Note) The applicable TMH for AS1002F-02 is not available.

Inch Size

Tube size / Applicable series	Applicable tube					
	01	03	07	09	11	13
	ø1/8"	ø5/32"	ø1/4"	ø5/16"	ø3/8"	ø1/2"
AS1002F	**TMH-01J**	**TMH-03J**	**TMH-07J**			
AS2002F						
AS2052F			**TMH-07**	**TMH-09**		
AS3002F					**TMH-10**	
AS4002F						**TMH-13**

Dimensions



Unit: mm

Model		øD1	øD2	H1	H2	H3	H4	H5	L1	L2	L3	Symbol
Metric size	Inch size											
TMH-23J	**TMH-01J**	8.5	3.3	4.5	4.6	7.5	6	12	7.2	6.6	18	1/8J
TMH-04J	**TMH-03J**	9.4										4 5/32J
TMH-06J	—	11.7	3.3	6.3	6.4	9.3	7.7	15.4	8.5	8.3	21	6J
—	**TMH-07J**	12.1										1/4J
TMH-06	—	13.1	4.3	7.1	7.2	11.1	10	20	11	10.6	26.5	6
—	**TMH-07**	13.5										1/4
TMH-08	**TMH-09**	15.5										8 5/16
TMH-10	—	18.8	4.3	9.5	9.6	13.5	14	28	14.2	14.6	34	10
TMH-12	—	21.2										12
—	**TMH-13**	22										1/2

⚠ 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), American National Standards Institute (ANSI)*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.
ANSI / (NFPA) T2.25.1 R2: Pneumatic fluid power - Systems standard for industrial machinery.
NFPA (Fluid) T2.24.1 R1: Hydraulic fluid power - Systems standard for stationary industrial machinery.
NF PA 79: Electrical Standard for Industrial Machinery.
ANSI / RIA / ISO 10218 -1: Robots for Industrial Environment - Safety Requirements - Part 1 - Robot.
etc.

⚠ Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.
Since the product specified here is used under various operating conditions, its compatibility with specific equipment must be decided by the person who designs the equipment or decides its specifications based on necessary analysis and test results. The expected performance and safety assurance of the equipment will be the responsibility of the person who has determined its compatibility with the product. This person should also continuously review all specifications of the product referring to its latest catalog information, with a view to giving due consideration to any possibility of equipment failure when configuring the equipment.

2. Only personnel with appropriate training should operate machinery and equipment.
The product specified here may become unsafe if handled incorrectly. The assembly, operation and maintenance of machines or equipment including our products must be performed by an operator who is appropriately trained and experienced.

3. Do not service or attempt to remove product and machinery/equipment until safety is confirmed.
1. The inspection and maintenance of machinery/equipment should only be performed after measures to prevent falling or runaway of the driven objects have been confirmed.
2. When the product is to be removed, confirm that the safety measures as mentioned above are implemented and the power from any appropriate source is cut, and read and understand the specific product precautions of all relevant products carefully.
3. Before machinery/equipment is restarted, take measures to prevent unexpected operation and malfunction.

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

⚠ Caution

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

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements". Read and accept them before using the product.

Limited warranty and Disclaimer

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

***2) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

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

Revision history

Edition B	* Addition of round lock nut to lock nut option.	OZ

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

SMC Corporation of America
10100 SMC Blvd., Noblesville, IN 46060 **www.smcusa.com**
SMC Pneumatics (Canada) Ltd. www.pneumatics.ca
(800) SMC.SMC1 (762-7621)
e-mail: sales@smcusa.com
For International inquires: www.smcworld.com

Speed Controller with One-touch Fitting/Elbow Type

New

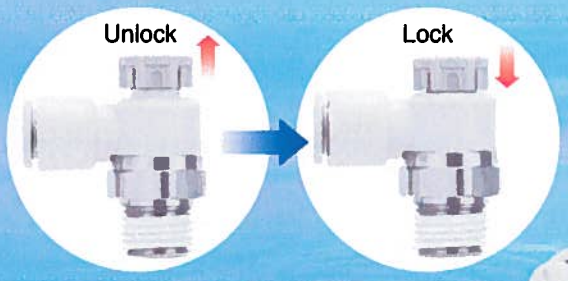
RoHS

Reduces labor time!

Easy to use

Push-lock type

- Easy to lock



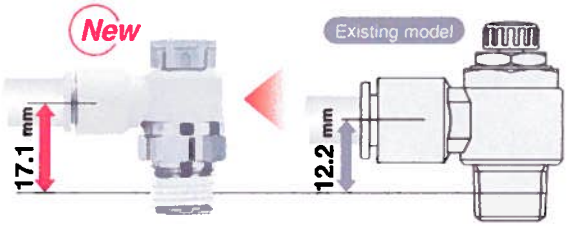
Larger handle

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

Improved tube insertion/removal

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

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



AS22□1F-02-□SA

AS22□1F-02-□

Series AS

SMC

CAT.ES20-220A

Series Variations

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

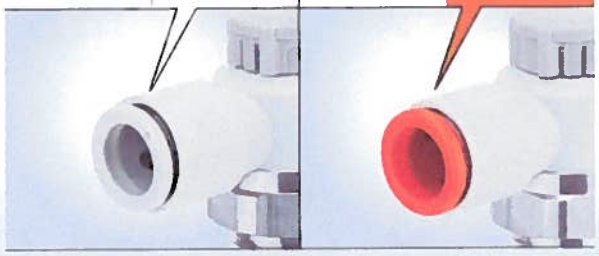
*1 Non-sealant type can be selected as a standard option.

◎Electroless nickel plated type is standard.

Easy identification of product type

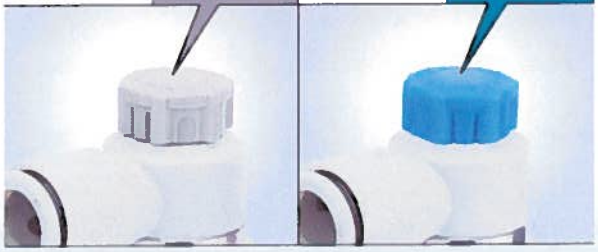
Metric x Inch

Metric	White	Inch	Orange



Meter-out x Meter-in

Meter-out	Gray	Meter-in	Light blue



Speed Controller with One-touch Fitting
Elbow Type
Series AS

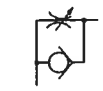
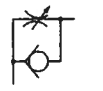
RoHS

Model

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

Note 1) Non-sealant type can be selected as a standard option.
Note 2) Only polyurethane tubing is applicable for ø2.

Flow Direction Symbols on Body

	Meter-out type	Meter-In type
Indication symbol		

Specifications

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

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

Flow Rate and Sonic Conductance

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

Note 1) 10-32 UNF has the same specification as M5.
Note 2) C values and b values for controlled flow direction are with the needle fully open, the values for free flow direction are with the needle fully closed.

⚠ Caution

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

How to Order

Applicable tubing O.D. Note 1)

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

Note 1) For selecting applicable tubing O.D., refer to Series Variations (Features 1). For metric size and inch size types can be visually identified by color of the release button.
Metric size: White
Inch size: Orange
Note 2) Use ø1/8" tubing.

Port size

M5	M5 x 0.8
U10/32	10-32 UNF

Body size 1: **AS 1 2 0 1 F - M5 - 06 A**

Body size 2/3/4: **AS 2 2 0 1 F - □ 01 - 06 S A**

Body size

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

Thread type

Nil	R
N	NPT

Push-lock type

Port size

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

Seal method

Nil	Without sealant
S	With sealant

Elbow

Control type Note)

0	Meter-out
1	Meter-in

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

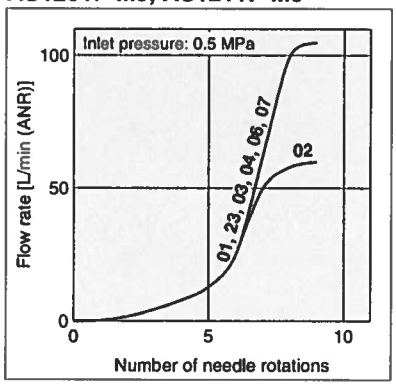
Applicable tubing O.D. Note 1)

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

Note 1) For selecting applicable tubing O.D., refer to Series Variations (Features 1).
Note 2) Use ø1/8" tubing.

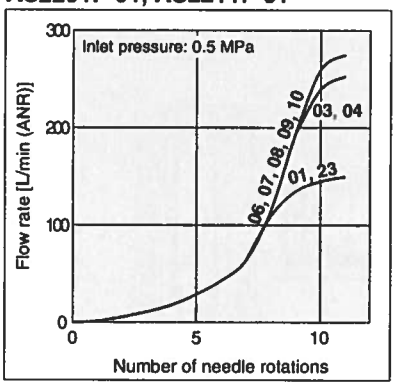
Needle Valve/Flow-rate Characteristics

AS1201F-M5, AS1211F-M5

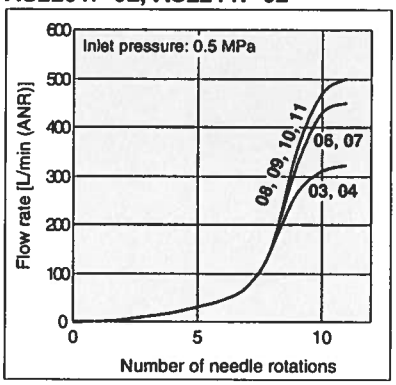


Note) -U10/32 has the same specification as M5.

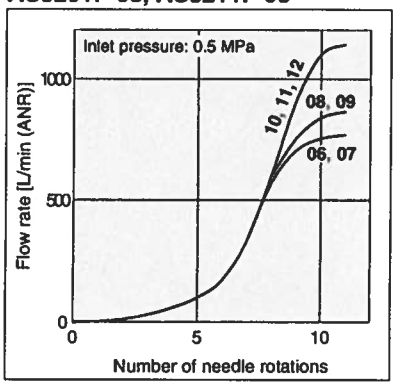
AS2201F-01, AS2211F-01



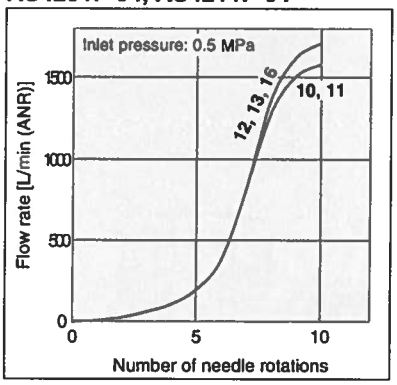
AS2201F-02, AS2211F-02



AS3201F-03, AS3211F-03



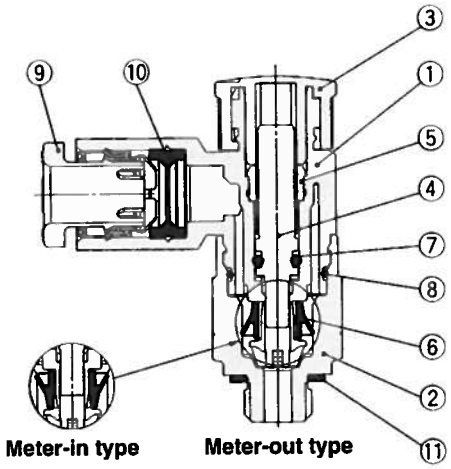
AS4201F-04, AS4211F-04



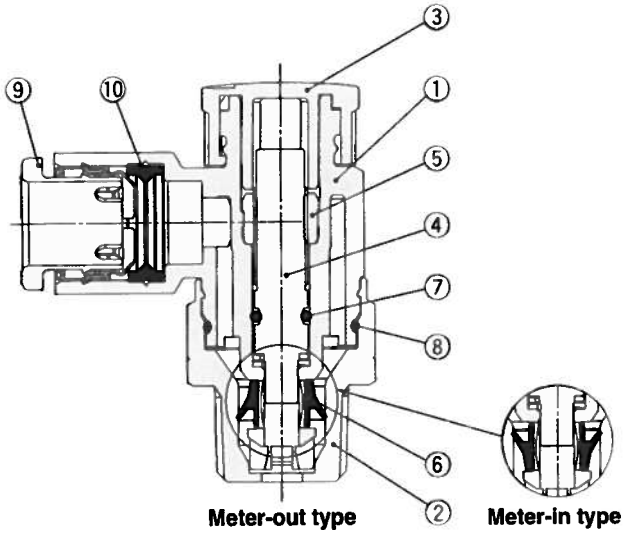
Note) The numbers above the flow-rate characteristic curves in the charts show the tubing diameter as defined by the product number.

Construction

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



Seal method: Sealant
Thread type: R, NPT

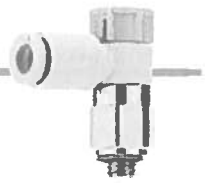


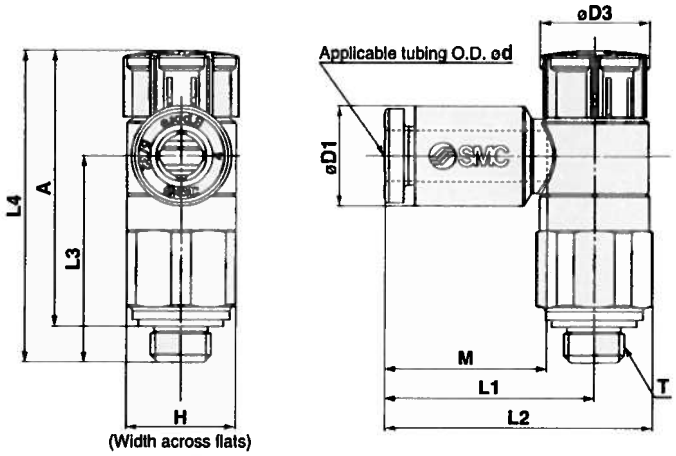
Component Parts

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

Dimensions

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





Metric size

(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight (g)
									Unlock	Lock	Unlock	Lock		
AS12□1F-M5-02A	2	M5 x 0.8 10-32 UNF	9	5.8	9	15.8	20.6	16.9	26.5	25.4	23.5	22.4	11.9	5
AS12□1F-U10/32-02A														
AS12□1F-M5-23A	3.2			7.2		17.2	22						13.3	
AS12□1F-U10/32-23A														
AS12□1F-M5-04A	4			8.2										
AS12□1F-U10/32-04A														
AS12□1F-M5-06A	6			10.4		18.6	23.4	16.5						6
AS12□1F-U10/32-06A														

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

Inch size

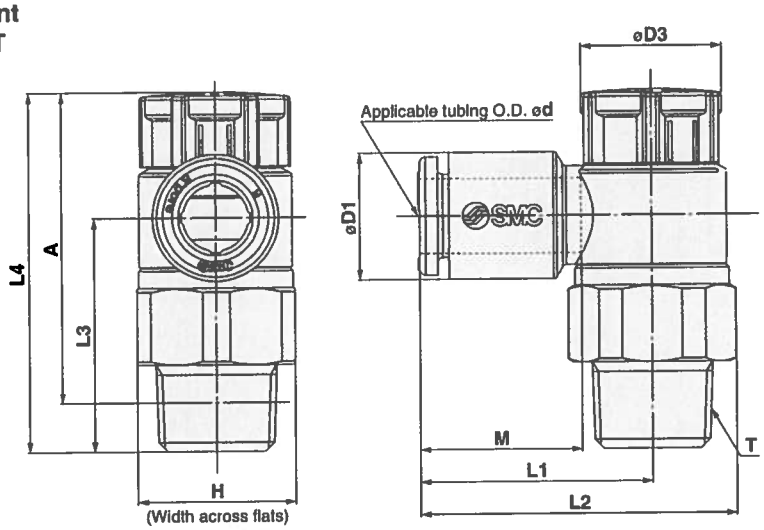
(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight (g)
									Unlock	Lock	Unlock	Lock		
AS12□1F-M5-01A	1/8"	M5 x 0.8 10-32 UNF	9	7.2	9	17.2	22	16.9	26.5	25.4	23.5	22.4	13.3	5
AS12□1F-U10/32-01A														
AS12□1F-M5-03A	5/32"			8.2										
AS12□1F-U10/32-03A														
AS12□1F-M5-07A	1/4"			11.2		18.6	23.4	16.5						6
AS12□1F-U10/32-07A														

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

Dimensions

Seal method: Sealant
Thread type: R, NPT



Metric size

(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1) Unlock	L4 Note 1) Lock	A Note 2) Unlock	A Note 2) Lock	M	Weight (g)
AS22□1F-01-23(S)A	3.2	1/8	13 (12.7)	7.2	11.6	19.1	26.1 (26)	19.1	30.6	29.2	27.5	26.1	13.3	9 (9)
AS22□1F-01-04(S)A	4			8.2										10 (9)
AS22□1F-01-06(S)A	6			10.4										
AS22□1F-01-08(S)A	8			13.2		22.4	29.4 (29.3)						14.2	11 (10)
AS22□1F-01-10(S)A	10			15.9		25.3	32.3 (32.2)						15.6	12 (11)
AS22□1F-02-23(S)A	3.2	1/4	17 (17.5)	7.2	12.6	20.9	30 (30.3)	22.6	36.6	35	31.1	29.5	13.3	18 (19)
AS22□1F-02-04(S)A	4			8.2										
AS22□1F-02-06(S)A	6			10.4		23.4	32.5 (32.8)							
AS22□1F-02-08(S)A	8			13.2		23.9	33 (33.3)						14.2	19 (20)
AS22□1F-02-10(S)A	10			15.9		26.9	36 (36.3)						15.6	20 (21)
AS32□1F-03-06(S)A	6	3/8	19	10.4	15.6	21.8	32.1	28.7	42.3	40.7	37.1	35.5	13.3	31 (32)
AS32□1F-03-08(S)A	8			13.2		22.7	33						14.2	
AS32□1F-03-10(S)A	10			15.9		26.7	37	28					15.6	32 (33)
AS32□1F-03-12(S)A	12			18.5		29.7	40	26.8					17	34 (35)
AS42□1F-04-10(S)A	10	1/2	24 (23.8)	15.9	17.6	27.4	40.3 (40.2)	36.2	50.8	49.2	43.7	42.1	15.6	54 (53)
AS42□1F-04-12(S)A	12			18.5		30.8	43.7 (43.6)	35.1					17	56 (55)
AS42□1F-04-16(S)A	16			23.8		34.8	47.7 (47.6)	32.7					20.6	60 (59)

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

Inch size

(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1) Unlock	L4 Note 1) Lock	A Note 2) Unlock	A Note 2) Lock	M	Weight (g)
AS22□1F-01-01(S)A	1/8"	1/8	13 (12.7)	7.2	11.6	19.1	26.1 (26)	19.1	30.6	29.2	27.5	26.1	13.3	9 (9)
AS22□1F-01-03(S)A	5/32"			8.2										10 (9)
AS22□1F-01-07(S)A	1/4"			11.2		20.8	27.8 (27.7)							
AS22□1F-01-09(S)A	5/16"			13.2		22.4	29.4 (29.3)						14.2	11 (10)
AS22□1F-02-01(S)A	1/8"	1/4	17 (17.5)	7.2	12.6	20.9	30 (30.3)	22.6	36.6	35	31.1	29.5	13.3	18 (19)
AS22□1F-02-03(S)A	5/32"			8.2										19 (19)
AS22□1F-02-07(S)A	1/4"			11.2		23.4	32.5 (32.8)							
AS22□1F-02-09(S)A	5/16"			13.2		23.9	33 (33.3)						14.2	19 (20)
AS22□1F-02-11(S)A	3/8"			15.5		26.4	35.5 (35.8)						15.6	20 (21)
AS32□1F-03-07(S)A	1/4"	3/8	19	11.2	15.6	21.8	32.1	28.7	42.3	40.7	37.1	35.5	13.3	31 (32)
AS32□1F-03-09(S)A	5/16"			13.2		22.7	33						14.2	
AS32□1F-03-11(S)A	3/8"			15.5		26.7	37	28.2					15.6	32 (33)
AS42□1F-04-11(S)A	3/8"	1/2	24 (23.8)	15.5	17.6	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	43.8 (43.7)	34.7					17	56 (55)

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

Series AS
Specific Product Precautions 1

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

Design/Selection

⚠Warning

1. Check the specifications.

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

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

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

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

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

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

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

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

It may cause human injury and/or an accident.

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

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

5. Sonic conductance (C) and critical pressure ratio (b) values for products are representative values. For controlled flow direction values the needle is fully open. For free flow direction values the needle is fully closed.

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

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

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

Mounting

⚠Warning

1. Operation manual

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

2. Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance.

3. Tighten threads with the proper tightening torque.

When installing the products, follow the listed proper torque.

Mounting

⚠Warning

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

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

Lock Unlock

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

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

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

It can cause idle rotation of the handle or damage.

7. Verify the air flow direction.

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

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

Loose needle valves may cause unexpected sudden actuator lurching.

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

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

It can cause damage or air leakage.

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

11. Tubing O.D. ø2

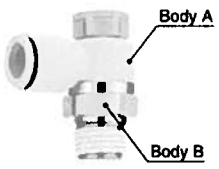
Tubing other than that from SMC cannot be used, because it may result in inability to connect the tube, air leakage after connecting the tube or disconnection of the tube.

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

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

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

Body A and the fitting section may be damaged.



Series AS
Specific Product Precautions 2

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

Mounting

⚠Caution

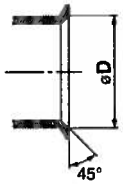
1. Tightening of M5 and 10-32 UNF threads

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

Note) Excessive tightening may damage the thread portion or deform the gasket and cause air leakage.
If the screw is too shallowly screwed in, it may come loose or air may leak.

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

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



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

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

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

Piping Threads with Sealant

⚠Caution

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

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

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

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

4. Reuse

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

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

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

Piping

⚠Caution

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

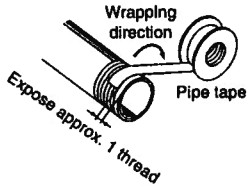
2. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

3. Wrapping of pipe tape

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

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



⚠ Safety Instructions

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

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

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

⚠ Warning

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

⚠ Caution

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

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

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

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

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

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

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

Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.
D-SZ
1st printing QV printing QV 8150SZ Printed in Japan.

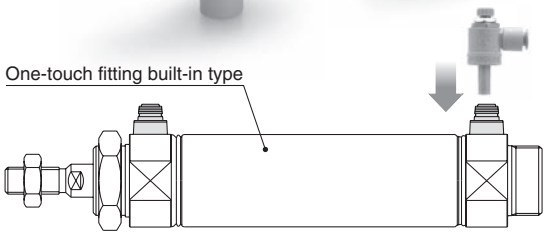
SMC Information

SMC Corporation
Akihabara UDX 15F,
4-14-1, Sotokanda, Chiyoda-ku,
Tokyo 101-0021, JAPAN
http://www.smcworld.com

12-E590
D-SZ Printing QY 8150SZ

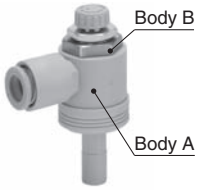
Speed Controller with One-touch Fitting Plug-in Type
Series AS□□□□P

- **Can be mounted directly to the One-touch fitting!**
- **No need for tools, reducing time required for mounting.**



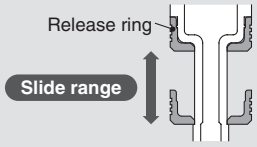
⚠Warning

1. Do not use the body A in a continuously rotating place.
It may damage the body A or fittings.



⚠Caution Release from One-touch fitting

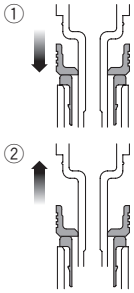
The release ring slides up and down and does not come off from the body A with the drop prevention function.



①Slide down the release ring, and push the release bushing to the end.

②Bring up the body, while holding it down.

③Take the finger off the release ring and remove the speed controller from the One-touch fitting.



Model

Model		Rod and applicable tubing O.D.			
Meter-out type	Meter-in type	ø4	ø6	ø8	ø10
AS1000P-04-04	AS1010P-04-04	●	—	—	—
AS2000P-04-04	AS2010P-04-04	●	—	—	—
AS2000P-06-06	AS2010P-06-06	—	●	—	—
AS2500P-06-06	AS2510P-06-06	—	●	—	—
AS3000P-08-08	AS3010P-08-08	—	—	●	—
AS3000P-10-10	AS3010P-10-10	—	—	—	●

<Visual identification between meter-out and meter-in types>
The lock nut provides identification. The lock nut of the meter-out type is zinc chromated (The round lock nut is electroless nickel plated), and the one of the meter-in type is black zinc chromated.

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

Flow Rate and Sonic Conductance

Model		AS10□0P	AS20□0P		AS25□0P	AS30□0P	
Rod and applicable tubing O.D. (Metric size)		ø4	ø4	ø6	ø6	ø8	ø10
Controlled flow Free flow	Flow rate [L/min (ANR)]	100	130	230	290	660	920
	Sonic conductance [dm³/(s·bar)]	0.28	0.36	0.64	0.8	1.8	2.6
Critical pressure ratio	Controlled flow	0.2	0.2		0.2	0.2	
	Free flow	0.25	0.25		0.25	0.25	

Note) Flow rate values are measured at 0.5 MPa and 20°C.

How to Order

AS 20 0 0 P – 06 – 06 – □

Body size

10	M5 standard
20	01 standard
25	02 standard
30	03 standard

Control type

0	Meter-out
1	Meter-in

Plug-in type

Rod O.D.—Applicable tubing O.D.

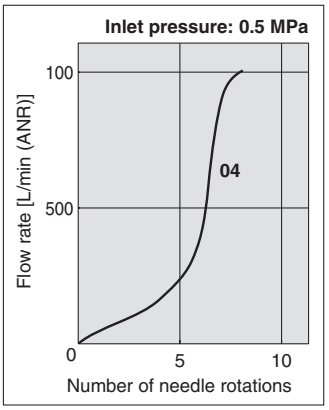
04-04	ø4—ø4
06-06	ø6—ø6
08-08	ø8—ø8
10-10	ø10—ø10

Lock nut option

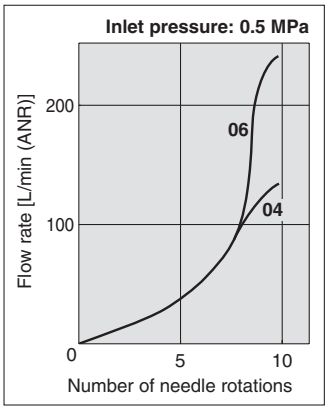
Nil	Hexagon lock nut
J	Round lock nut

Needle Valve/Flow-rate Characteristics

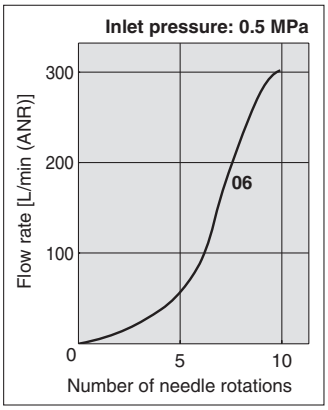
AS10□0P-04-04



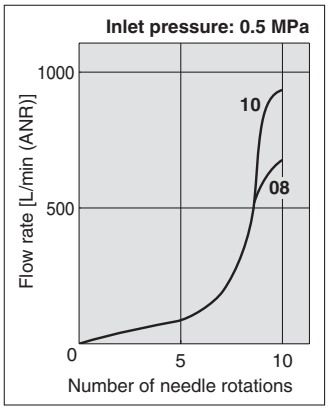
AS20□0P-□-□



AS25□0P-06-06



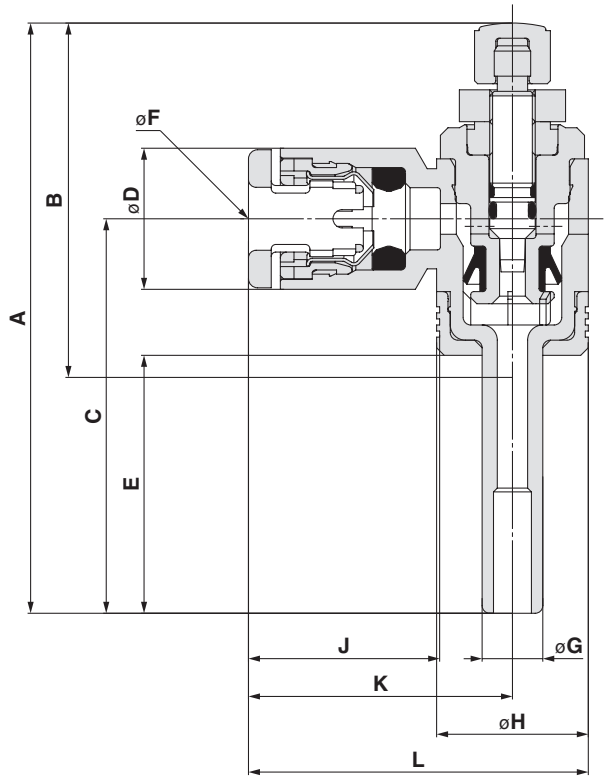
AS30□0P-□-□



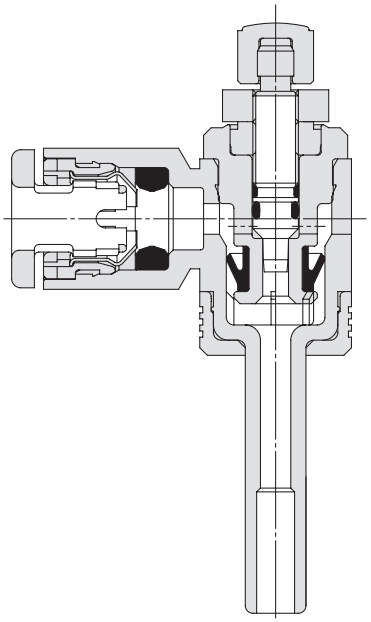
Note) The numbers above the flow-rate characteristic curves in the charts show the tubing diameter as defined by the product number.

Dimensions

Meter-out type



Meter-in type



Model	A		B		C	øD	E	øF	øG	øH	J	K	L
	MIN.	MAX.	MIN.	MAX.									
AS10□0P-04-04	38.9	41.7	23.9	26.7	26	9.3	17	4	4	10	12.7	17.4	22.4
AS20□0P-04-04	46.4	51.4	31.4	36.4	30	9.3	17.1	4	4	13.6	12.7	18.9	25.7
AS20□0P-06-06	47.3	52.3	31.3	36.3	30	11.6	18	6	6	13.6	13.5	19.9	26.7
AS25□0P-06-06	49.6	54.6	33.6	38.6	32	12.8	18	6	6	17	16.8	24.1	32.6
AS30□0P-08-08	55.5	60.5	37	42	36	15.2	19	8	8	22	18.5	27	38
AS30□0P-10-10	58.5	63.5	37.5	42.5	39	18.5	22	10	10	22	21	30.5	41.5

Speed Controller with One-touch Fitting/Elbow Type

New

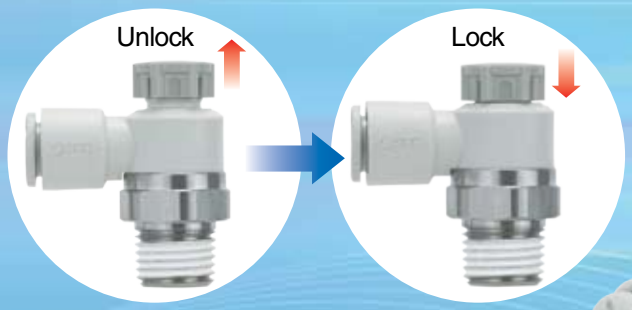
RoHS

Reduces labor time!

Easy to use

Push-lock type

- Easy to lock

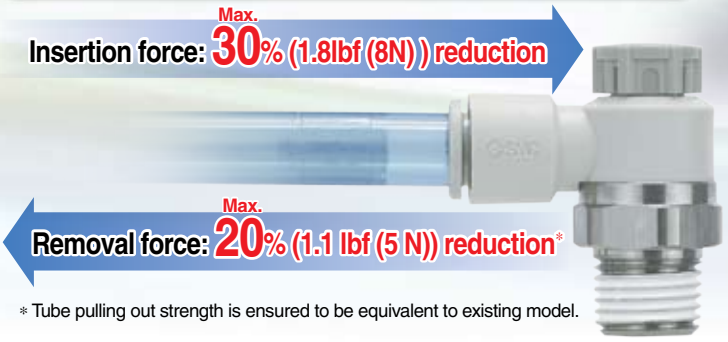


Larger handle

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

Improved tube insertion/removal

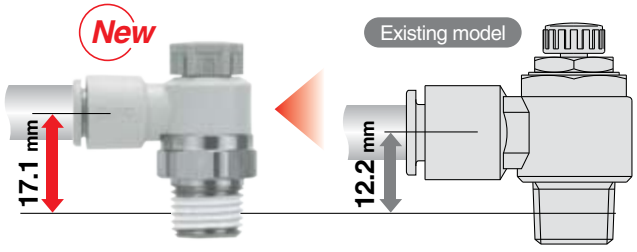
Max. **30**% (1.8lbf (8N)) reduction



Max. **20**% (1.1 lbf (5 N)) reduction*

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

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



AS22□1F-02-□SA

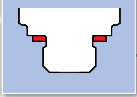
AS22□1F-02-□

Series AS

SMC

CAT.NAS20-220A

Series Variations

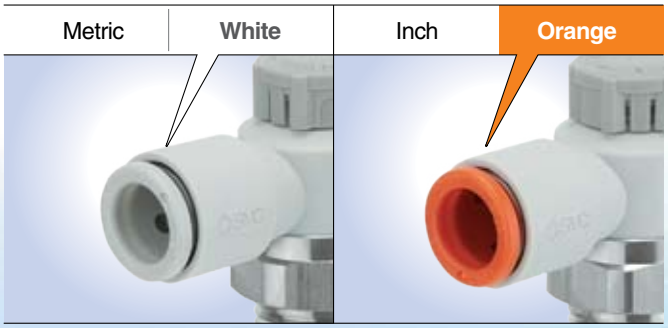
	Body size	Port size		Seal method	Applicable tubing O.D.													Applicable tubing material
					Metric size								Inch size					
					2	3.2	4	6	8	10	12	16	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"	
	1	M5 x 0.8		Gasket seal 	●	●	●	●					●	●	●				Nylon (Series T, TIA) Soft nylon (Series TS, TLS) Polyurethane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

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

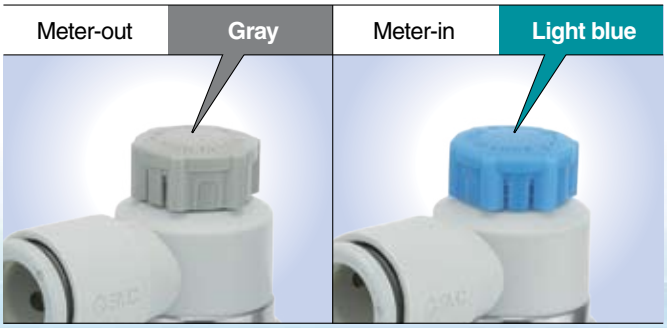
◎ Electroless nickel plated type is standard.

Easy identification of product type

Metric x Inch



Meter-out x Meter-in



Speed Controller with One-touch Fitting
Elbow Type
Series AS

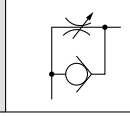
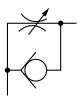
RoHS

Model

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

Note 1) Non-sealant type can be selected as a standard option.
Note 2) Only polyurethane tubing is applicable for ø2.

Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Indication symbol		

Specifications

Fluid	Air
Proof pressure	218 psi (1.5 MPa)
Max. operating pressure	145 psi (1 MPa)
Min. operating pressure	14.5 psi (0.1 MPa)
Ambient and fluid temperature	23 to 140°F (–5 to 60°C) (No freezing)
Applicable tubing material	Nylon, Soft nylon, Polyurethane Note)

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

⚠ Caution

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

Flow Rate and Sonic Conductance

Model		AS12□1F-M5		AS22□1F-01			AS22□1F-02			AS32□1F-03			AS42□1F-04	
Tubing O.D.	Metric size	ø2	ø3.2 ø4 ø6	ø3.2	ø4	ø6 ø8 ø10	ø4	ø6	ø8 ø10	ø6	ø8	ø10 ø12	ø10	ø12 ø16
	Inch size	—	ø1/8" ø1/4" ø5/32"	ø1/8"	ø5/32"	ø1/4" ø5/16"	ø5/32"	—	ø1/4" ø5/16" ø3/8"	ø1/4"	ø5/16"	ø3/8"	ø3/8"	ø1/2"
C values: Sonic conductance $dm^3/(s \cdot bar)$	Free flow	0.2	0.3	0.4	0.6	0.6	1.0	1.3	1.5	1.6	1.7	2.5	4.4	4.8
	Controlled flow	0.2	0.3	0.4	0.7	0.8	0.9	1.3		2.1	2.4	3.3	4.4	4.9
b values: Critical pressure ratio	Free flow	0.3		0.2		0.3	0.3	0.4		0.4		0.3	0.3	
	Controlled flow	0.2	0.4	0.2		0.3	0.3			0.3			0.3	

Note 1) 10-32 UNF has the same specification as M5.
Note 2) C values and b values for controlled flow direction are with the needle fully open, the values for free flow direction are with the needle fully closed.

How to Order

Body size 1 **AS 1 2 0 1 F – M5 – 06 A**

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

Port size

M5	M5 x 0.8
U10/32	10-32 UNF

Applicable tubing O.D. Note 1)

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

Note 1) For selecting applicable tubing O.D., refer to Series Variations (Features 1). For metric size and inch size types can be visually identified by color of the release button.
Metric size: White
Inch size: Orange
Note 2) Use ø1/8" tubing.

Body size

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

Thread type

Nil	R
N	NPT

Port size

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

Elbow

Control type Note)

0	Meter-out
1	Meter-in

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

Push-lock type

Seal method

Nil	Without sealant
S	With sealant

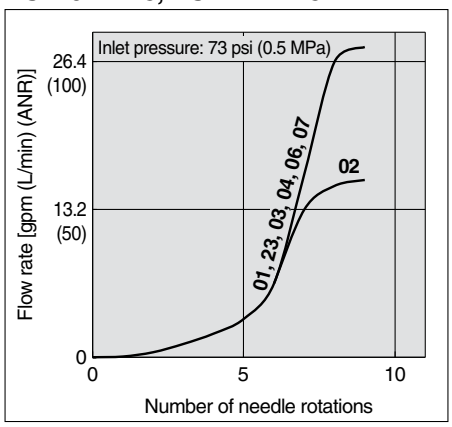
Applicable tubing O.D. Note 1)

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

Note 1) For selecting applicable tubing O.D., refer to Series Variations (Features 1).
Note 2) Use ø1/8" tubing.

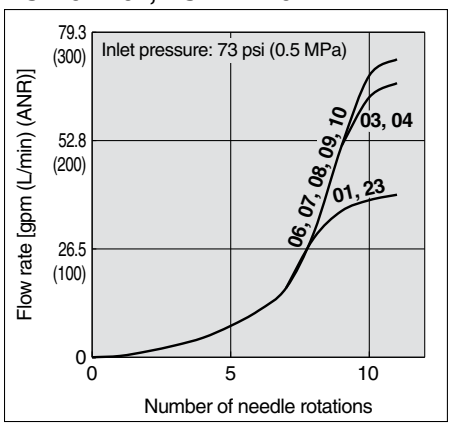
Needle Valve/Flow-rate Characteristics

AS1201F-M5, AS1211F-M5

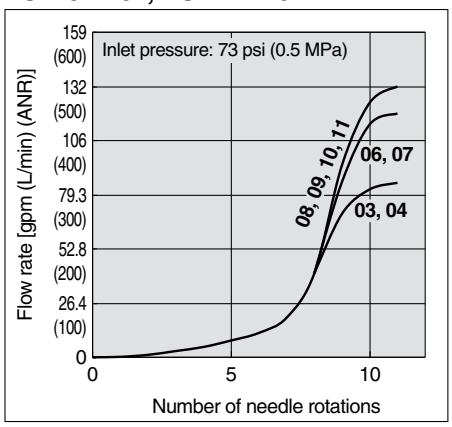


Note) -U10/32 has the same specification as M5.

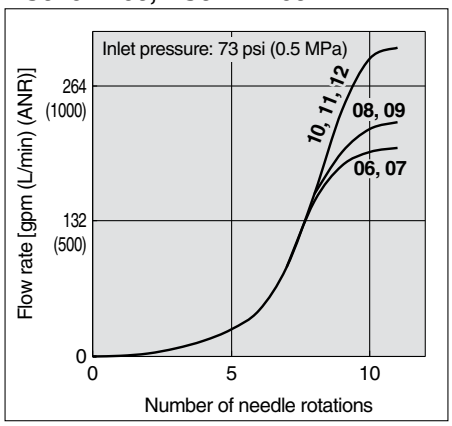
AS2201F-01, AS2211F-01



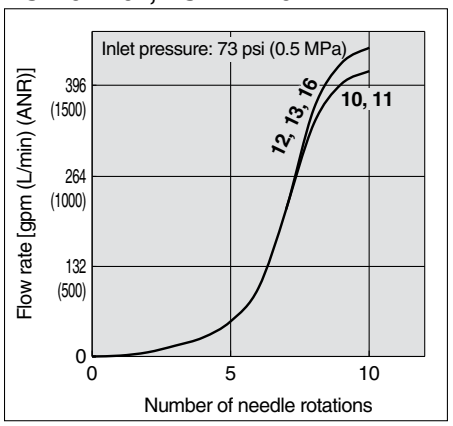
AS2201F-02, AS2211F-02



AS3201F-03, AS3211F-03



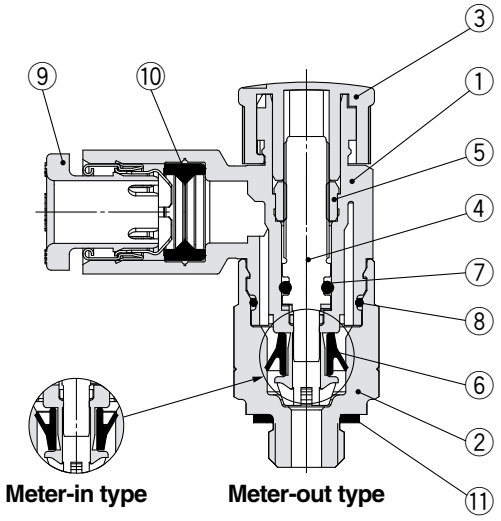
AS4201F-04, AS4211F-04



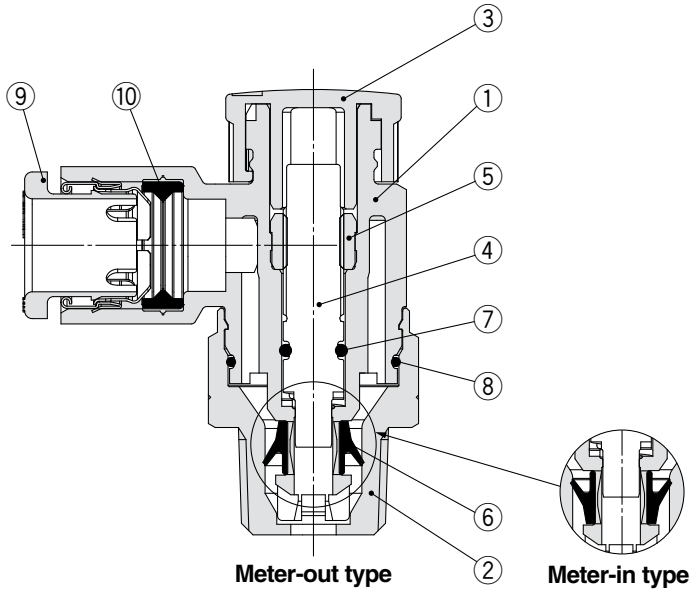
Note) The numbers above the flow-rate characteristic curves in the charts show the tubing diameter as defined by the product number.

Construction

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



Seal method: Sealant
Thread type: R, NPT

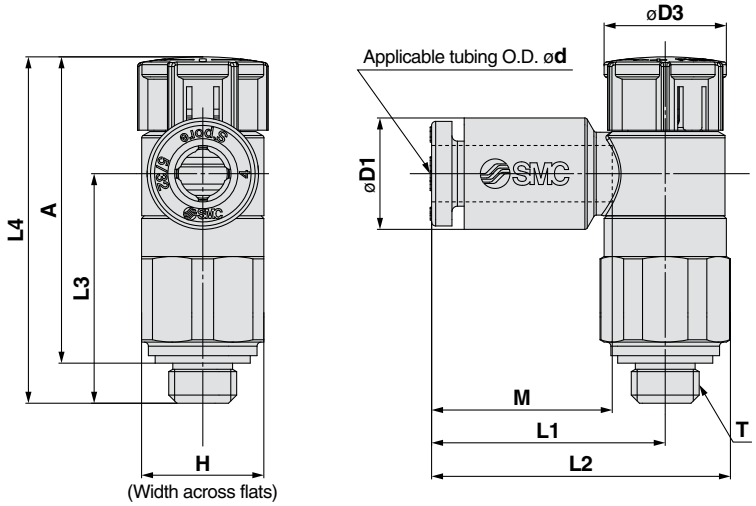


Component Parts

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

Dimensions

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



Metric size

(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight (g)
									Unlock	Lock	Unlock	Lock		
AS12□1F-M5-02A	2	M5 x 0.8 10-32 UNF	9	5.8	9	15.8	20.6	16.9	26.5	25.4	23.5	22.4	11.9	5
AS12□1F-U10/32-02A														
AS12□1F-M5-23A	3.2			7.2		17.2	22						13.3	
AS12□1F-U10/32-23A														
AS12□1F-M5-04A	4			8.2										
AS12□1F-U10/32-04A														
AS12□1F-M5-06A	6			10.4		18.6	23.4	16.5						6
AS12□1F-U10/32-06A														

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

Inch size

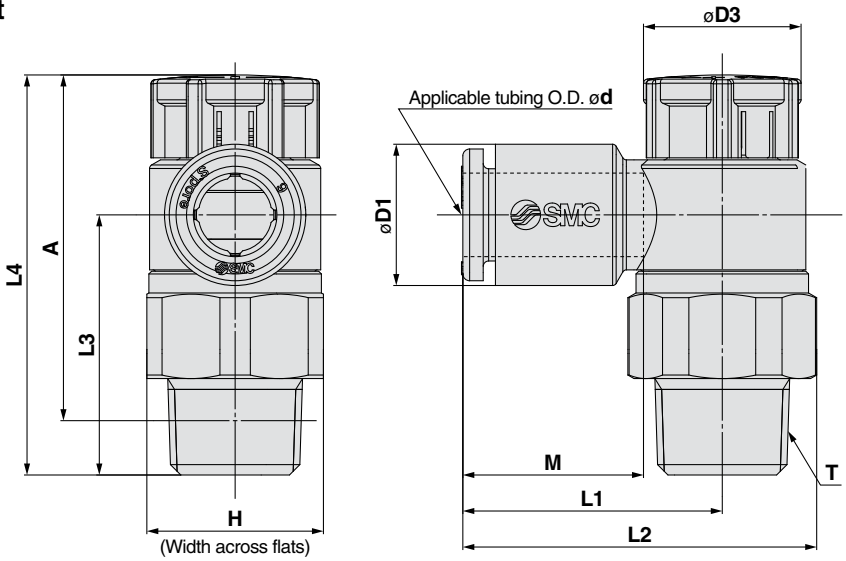
(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight (g)
									Unlock	Lock	Unlock	Lock		
AS12□1F-M5-01A	1/8"	M5 x 0.8 10-32 UNF	9	7.2	9	17.2	22	16.9	26.5	25.4	23.5	22.4	13.3	5
AS12□1F-U10/32-01A														
AS12□1F-M5-03A	5/32"			8.2										
AS12□1F-U10/32-03A														
AS12□1F-M5-07A	1/4"			11.2		18.6	23.4	16.5						6
AS12□1F-U10/32-07A														

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

Dimensions

Seal method: Sealant
Thread type: R, NPT



Metric size

(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight (g)
									Unlock	Lock	Unlock	Lock		
AS22□1F-01-23(S)A	3.2	1/8	13 (12.7)	7.2	11.6	19.1	26.1 (26)	19.1	30.6	29.2	27.5	26.1	13.3	9 (9)
AS22□1F-01-04(S)A	4			8.2										
AS22□1F-01-06(S)A	6			10.4										10 (9)
AS22□1F-01-08(S)A	8			13.2		22.4	29.4 (29.3)						14.2	11 (10)
AS22□1F-01-10(S)A	10			15.9		25.3	32.3 (32.2)						15.6	12 (11)
AS22□1F-02-23(S)A	3.2	1/4	17 (17.5)	7.2	12.6	20.9	30 (30.3)	22.6	36.6	35	31.1	29.5	13.3	18 (19)
AS22□1F-02-04(S)A	4			8.2										
AS22□1F-02-06(S)A	6			10.4		23.4	32.5 (32.8)							
AS22□1F-02-08(S)A	8			13.2		23.9	33 (33.3)						14.2	19 (20)
AS22□1F-02-10(S)A	10			15.9		26.9	36 (36.3)						15.6	20 (21)
AS32□1F-03-06(S)A	6	3/8	19	10.4	15.6	21.8	32.1	28.7	42.3	40.7	37.1	35.5	13.3	31 (32)
AS32□1F-03-08(S)A	8			13.2		22.7	33						14.2	
AS32□1F-03-10(S)A	10			15.9		26.7	37	28					15.6	32 (33)
AS32□1F-03-12(S)A	12			18.5		29.7	40	26.8					17	34 (35)
AS42□1F-04-10(S)A	10	1/2	24 (23.8)	15.9	17.6	27.4	40.3 (40.2)	36.2	50.8	49.2	43.7	42.1	15.6	54 (53)
AS42□1F-04-12(S)A	12			18.5		30.8	43.7 (43.6)	35.1					17	56 (55)
AS42□1F-04-16(S)A	16			23.8		34.8	47.7 (47.6)	32.7					20.6	60 (59)

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

Inch size

(mm)

Model	d	T	H	D1	D3	L1	L2	L3	L4 Note 1)		A Note 2)		M	Weight (g)
									Unlock	Lock	Unlock	Lock		
AS22□1F-01-01(S)A	1/8"	1/8	13 (12.7)	7.2	11.6	19.1	26.1 (26)	19.1	30.6	29.2	27.5	26.1	13.3	9 (9)
AS22□1F-01-03(S)A	5/32"			8.2										
AS22□1F-01-07(S)A	1/4"			11.2		20.8	27.8 (27.7)							10 (9)
AS22□1F-01-09(S)A	5/16"			13.2		22.4	29.4 (29.3)						14.2	11 (10)
AS22□1F-02-01(S)A	1/8"	1/4	17 (17.5)	7.2	12.6	20.9	30 (30.3)	22.6	36.6	35	31.1	29.5	13.3	18 (19)
AS22□1F-02-03(S)A	5/32"			8.2										
AS22□1F-02-07(S)A	1/4"			11.2		23.4	32.5 (32.8)							19 (19)
AS22□1F-02-09(S)A	5/16"			13.2		23.9	33 (33.3)						14.2	19 (20)
AS22□1F-02-11(S)A	3/8"			15.5		26.4	35.5 (35.8)						15.6	20 (21)
AS32□1F-03-07(S)A	1/4"	3/8	19	11.2	15.6	21.8	32.1	28.7	42.3	40.7	37.1	35.5	13.3	31 (32)
AS32□1F-03-09(S)A	5/16"			13.2		22.7	33						14.2	
AS32□1F-03-11(S)A	3/8"			15.5		26.7	37	28.2					15.6	32 (33)
AS42□1F-04-11(S)A	3/8"	1/2	24 (23.8)	15.5	17.6	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	43.8 (43.7)	34.7					17	56 (55)

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

Series AS
Specific Product Precautions 1

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

Design/Selection

⚠Warning

1. Check the specifications.

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

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

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

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

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

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

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

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

It may cause human injury and/or an accident.

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

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

5. Sonic conductance (C) and critical pressure ratio (b) values for products are representative values.
For controlled flow direction values the needle is fully open. For free flow direction values the needle is fully closed.

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

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

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

Mounting

⚠Warning

1. Operation manual

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

2. Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance.

3. Tighten threads with the proper tightening torque.

When installing the products, follow the listed proper torque.

Mounting

⚠Warning

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

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

Lock

Unlock

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

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

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

It can cause idle rotation of the handle or damage.

7. Verify the air flow direction.

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

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

Loose needle valves may cause unexpected sudden actuator lurching.

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

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

It can cause damage or air leakage.

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

11. Tubing O.D. ø2

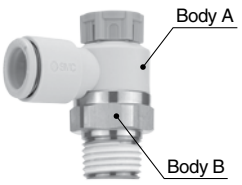
Tubing other than that from SMC cannot be used, because it may result in inability to connect the tube, air leakage after connecting the tube or disconnection of the tube.

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

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

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

Body A and the fitting section may be damaged.



Series AS
Specific Product Precautions 2

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

Mounting

⚠Caution

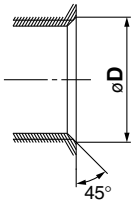
1. Tightening of M5 and 10-32 UNF threads

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

Note) Excessive tightening may damage the thread portion or deform the gasket and cause air leakage.
If the screw is too shallowly screwed in, it may come loose or air may leak.

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

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



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

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

Body size	Maximum allowable adjusting torque lbf ft (N·m)
M5	0.037 (0.05)
1/8	0.051 (0.07)
1/4	0.118 (0.16)
3/8	0.148 (0.2)
1/2	0.295 (0.4)

Piping Threads with Sealant

⚠Caution

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

Connection thread size	Proper tightening torque lbf·ft (N·m)
NPT, R1/8	5.2 to 6.6 (7 to 9)
NPT, R1/4	8.9 to 10.3 (12 to 14)
NPT, R3/8	16.2 to 17.7 (22 to 24)
NPT, R1/2	20.7 to 22.1 (28 to 30)

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

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

4. Reuse

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

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

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

Piping

⚠Caution

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

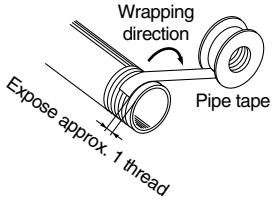
2. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

3. Wrapping of pipe tape

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

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



⚠ Safety Instructions

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

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

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

⚠ Warning

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

⚠ Caution

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

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

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

***2) Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

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

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

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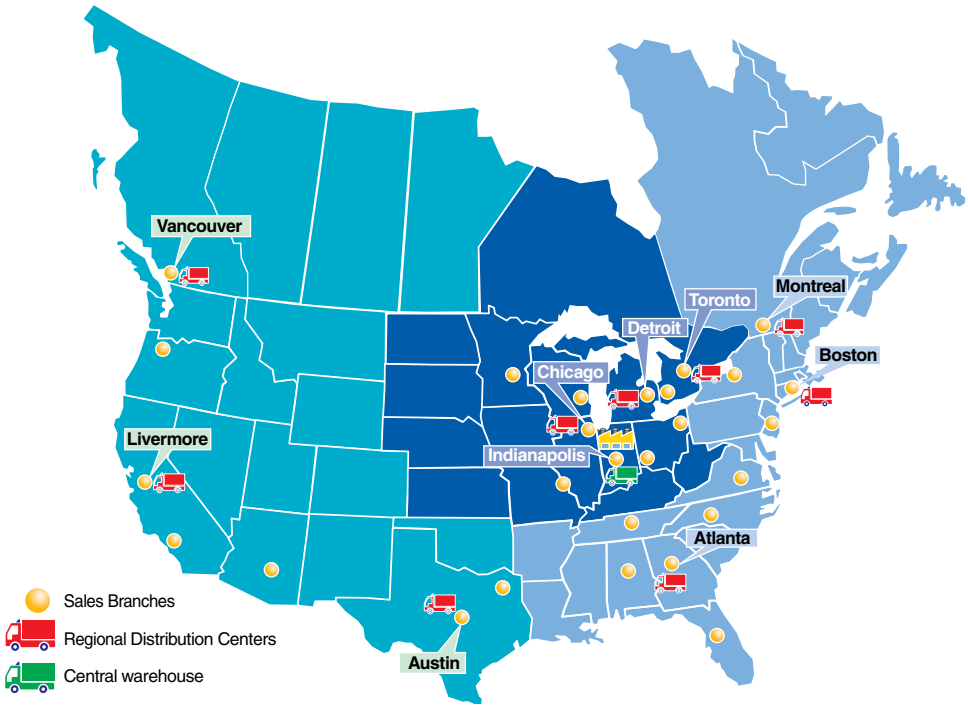

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www.smcusa.com
SMC Pneumatics (Canada) Ltd.
www.smcpneumatics.ca

(800) SMC.SMC1 (762-7621)
e-mail: sales@smcusa.com
For International inquiries: www.smcworld.com

QW-PR-5M

Speed Controller with Indicator New

RoHS

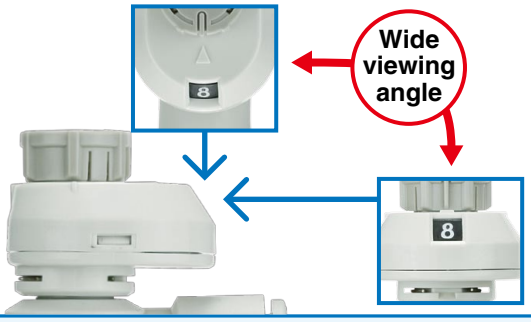
Numerical indication of handle rotation for flow rate reduces flow setting time and setting errors!

Indicator window

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

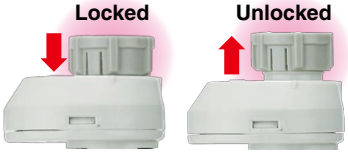
Two indicator window directions available

Indicator direction: 0°　　Indicator direction: 180°

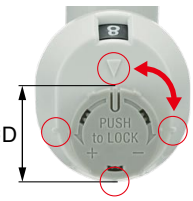


Larger push-lock type handle

Easy to lock



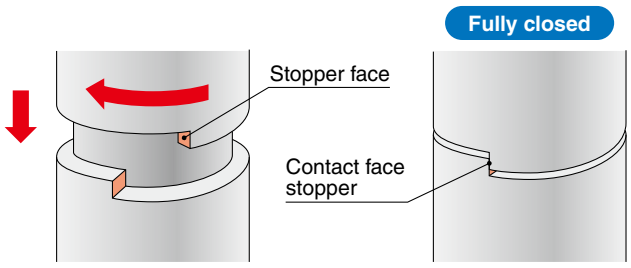
Easy to operate with the larger handle and marking every 90° mark



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

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

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

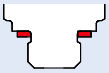


Series AS-FS

SMC

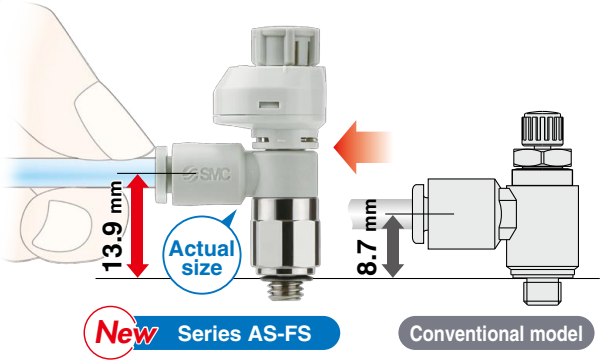
CAT.ES20-229A

◎Series Variations

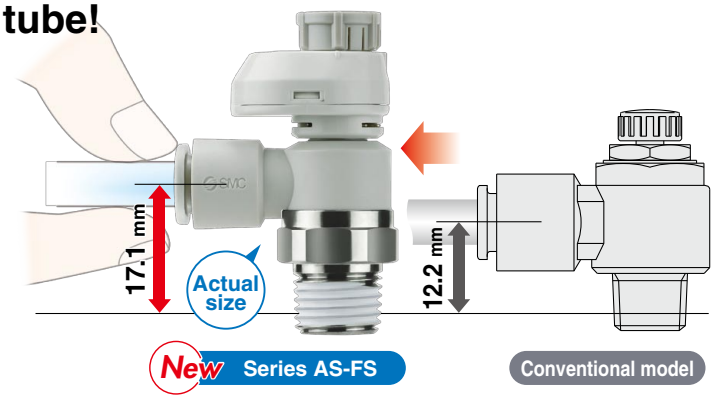
	Seal method	Body size	Port size		Applicable tubing O.D.												Applicable tubing material
					Metric size								Inch size				
					2	3.2	4	6	8	10	12	16	1/8"	5/32"	1/4"	5/16"	3/8"	1/2"	
	Gasket seal 	1	M5 x 0.8		●	●	●	●					●	●	●				Nylon (Series T, TIA) Soft nylon (Series TS, TISA) Polyurethane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

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

◎Easier to insert and remove the tube!

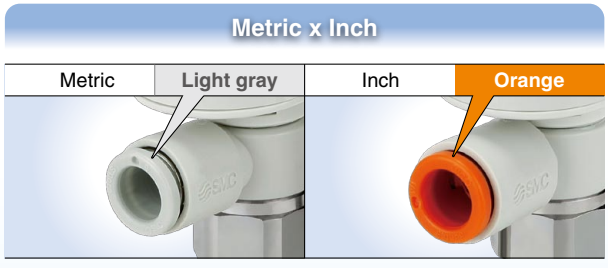


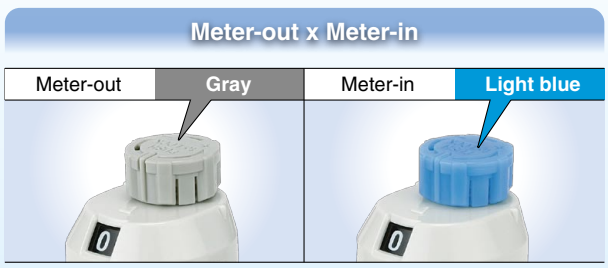
Tubing diameter	Thread	Part no.	Part no.
ø4	M5	AS12□1FS-M5-04A	AS12□1F-M5-04



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

◎Easy identification of product type





◎Electroless nickel plating type is standardized.

Speed Controller with Indicator
Elbow Type
Series AS-FS

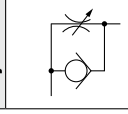
RoHS

Model

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

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

Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Symbol		

Specifications

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

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

⚠ Caution

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

Flow Rate and Sonic Conductance

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

Note 1) 10-32UNF has the same specification as M5.
Note 2) C and b values are for controlled flow with the needle fully open and free flow with the needle fully closed.

How to Order

Body size 1 AS 1 2 0 1F S ☐ – M5 – 06

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

Body size

1	M5 x 0.8 10-32UNF

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 Note 2)	03	ø5/32"
04	ø4	07	ø1/4"
06	ø6		

Note 1) For selecting applicable tubing O.D., refer to Series Variations (Features 1). Metric size and inch size types can be visually identified by color of the release button.
Metric size: Light gray
Inch size: Orange
Note 2) Use ø1/8" tube.

Body size

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

Elbow

With indicator

Control type Note)

0	Meter-out
1	Meter-in

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

Indicator direction

Nil	0°	
1	180°	

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

Thread type

Nil	R
N	NPT

Port size

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

Applicable tubing O.D. Note 1)

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

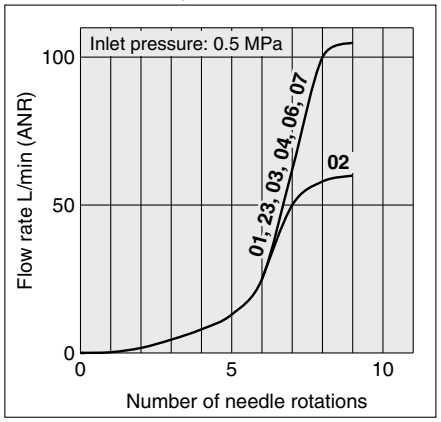
Note 1) For selecting applicable tubing O.D., refer to Series Variations (Features 1).
Note 2) Use ø1/8" tube.

Seal method

Nil	Without sealant
S	With sealant

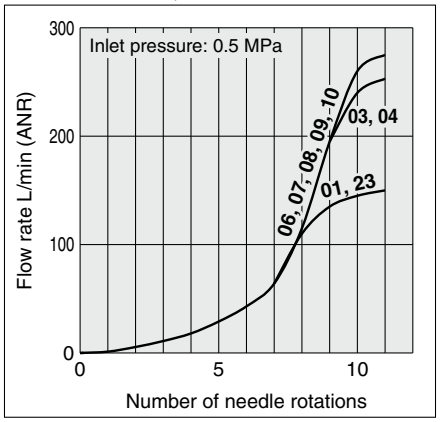
Needle Valve/Flow-rate Characteristics

AS1201FS-M5, AS1211FS-M5

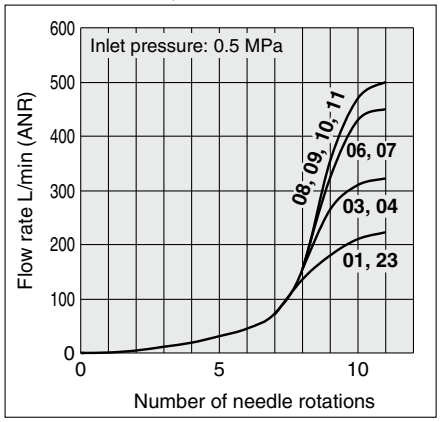


Note) -U10/32 has the same specification as M5.

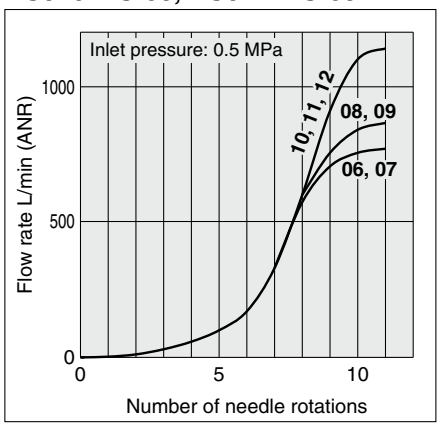
AS2201FS-01, AS2211FS-01



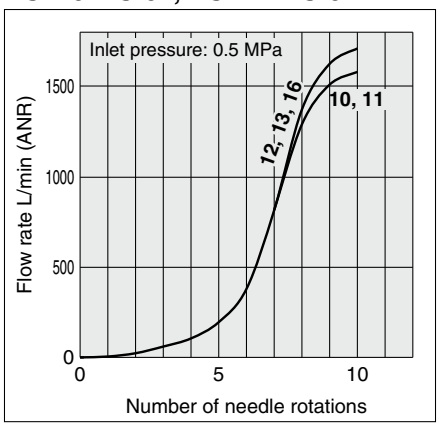
AS2201FS-02, AS2211FS-02



AS3201FS-03, AS3211FS-03



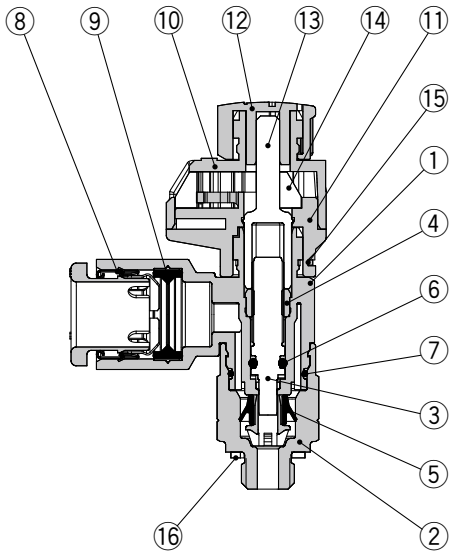
AS4201FS-04, AS4211FS-04



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

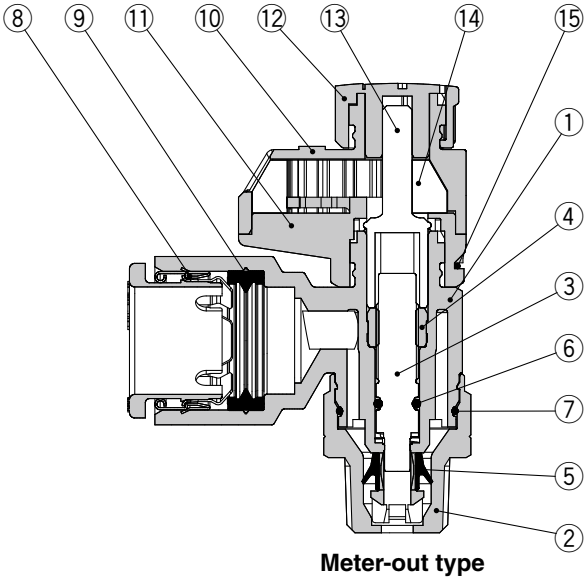
Construction

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



Meter-out type

Seal method: Sealant
Thread type: R, NPT



Meter-out type

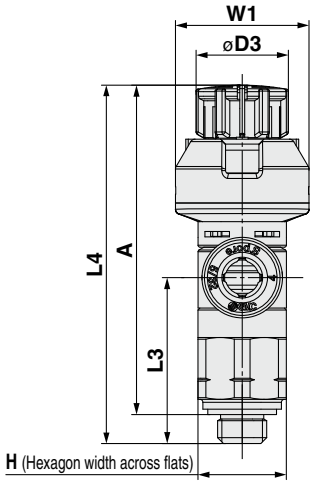
Component Parts

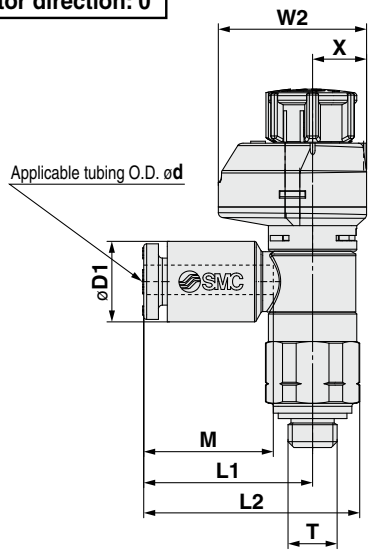
No.	Description	Material	Note
1	**Body A**	PBT	
2	**Body B**	Brass	Electroless nickel plating
3	**Needle**	PBT	
4	**Needle guide**	Steel wire	Zinc chromated
5	**U seal**	HNBR	
6	**O-ring**	NBR	
7	**O-ring**	NBR	
8	**Cassette**	—	
9	**Seal**	NBR	
10	**Bonnet A**	POM	
11	**Bonnet B**	POM	
12	**Handle**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

Dimensions

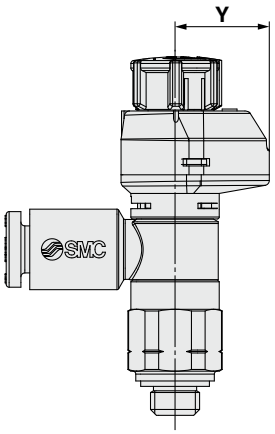
Seal method: Gasket seal
Thread type: M5, 10-32UNF

Indicator direction: 0°





Indicator direction: 180°



Metric Size

(mm)

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

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

Inch Size

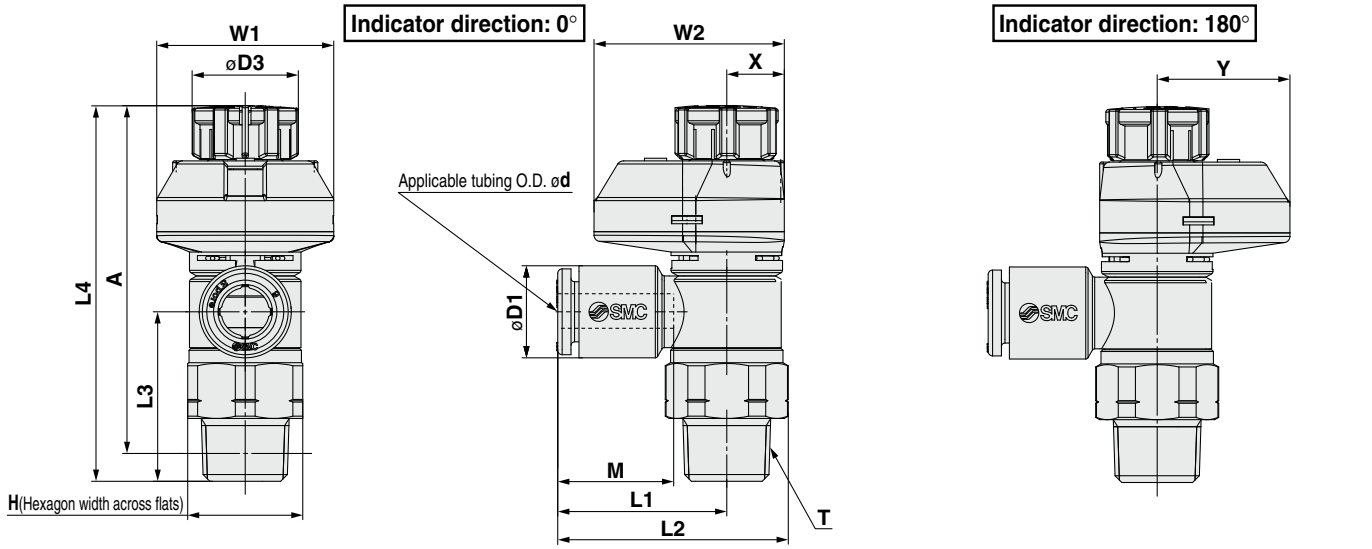
(mm)

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

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

Dimensions

Seal method: Sealant
Thread type: R, NPT



Metric Size (mm)

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

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

Inch Size (mm)

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

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

Series AS-FS
Specific Product Precautions 1

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

Design/Selection

⚠ Warning

1. Check the specifications.

The products in this catalog are designed to be used in compressed air systems (including vacuum) only.
If the products are used in an environment where pressure or temperature is out of the specified range, damage and/or malfunction may result. Do not use under such conditions. (Refer to the specifications.)
Please contact SMC when using a fluid other than compressed air (including vacuum).
We do not guarantee against any damage if the product is used outside of the specification range.

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

A certain amount of leakage is allowed in the product's specifications.
Tightening the needle to reduce leakage to zero may result in equipment damage.

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

It may cause human injury and/or an accident.

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

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

5. Sonic conductance (C) and critical pressure ratio (b) values for products are representative values.
The speed controller's controlled flow values are with the needle fully open and free flow with the needle fully closed.

6. Check if PTFE can be used in application.

PTFE powder (Polytetrafluoroethylene resin) is included in the seal material for piping taper thread of male thread type. Confirm that the use of it will not cause any adverse effect on the system.
Please contact SMC if the Material Safety Data Sheet (MSDS) is required.

Mounting

⚠ Warning

1. Operation manual

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

2. Ensure sufficient space for maintenance activities.

When installing the products, allow access for maintenance.

3. Tighten threads with the proper tightening torque.

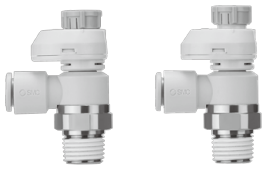
When installing the products, follow the listed proper torque.

Mounting

⚠ Warning

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

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



Locked Unlocked

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

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

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

It can cause idle rotation of the handle or damage.

7. Verify the air flow direction.

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

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

Loose needle valves may cause unexpected sudden actuator lurching.
When a needle valve is turned clockwise, it is closed and actuator speed decreases. When a needle valve is turned counterclockwise, it is open and actuator speed increases.

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

It can cause damage or air leakage.

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

11. Tubing O.D. ø2

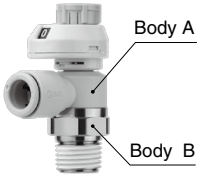
Tubing other than that from SMC cannot be used, because it may result in inability to connect the tube, air leakage after connecting the tube or disconnection of the tube.

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

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

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

Body A and the fitting section may be damaged.



Series AS-FS
Specific Product Precautions 2

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

Mounting

⚠ Caution

1. Tightening of M5 and 10-32UNF threads

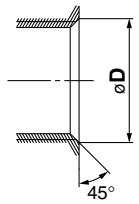
First, tighten it by hand, then give it an additional 1/6 turn to 1/4 turn with a wrench. A reference value for the tightening torque is 1 to 1.5 N·m.

Note) Excessive tightening may damage the thread portion or deform the gasket and cause air leakage.
If the screw is too shallowly screwed in, it may come loose or air may leak.

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

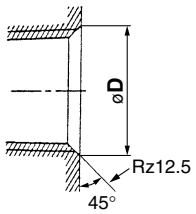
Confirming to ISO 16030 (air pressure fluid dynamics – connection – ports and stud ends), the chamfer dimensions shown below are recommended.

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



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

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



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

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

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

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

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

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

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

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

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

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

Piping Threads with Sealant

⚠ Caution

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

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

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

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

4. Reuse

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

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

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

Piping

⚠ Caution

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

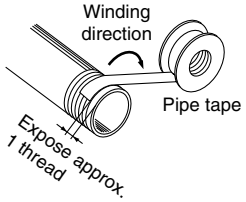
2. Preparation before piping

Before piping is connected, it should be thoroughly blown out with air (flushing) or washed to remove chips, cutting oil and other debris from inside the pipe.

3. Wrapping of pipe tape

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

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



⚠ Safety Instructions

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

⚠ Caution: **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.

⚠ Warning: **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.

⚠ Danger : **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

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

⚠ Warning

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

⚠ Caution

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

Limited warranty and Disclaimer/ Compliance Requirements

The product used is subject to the following "Limited warranty and Disclaimer" and "Compliance Requirements".
Read and accept them before using the product.

Limited warranty and Disclaimer

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

*2) **Vacuum pads are excluded from this 1 year warranty.**
A vacuum pad is a consumable part, so it is warranted for a year after it is delivered.
Also, even within the warranty period, the wear of a product due to the use of the vacuum pad or failure due to the deterioration of rubber material are not covered by the limited warranty.

Compliance Requirements

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

⚠ Safety Instructions | Be sure to read "Handling Precautions for SMC Products" (M-E03-3) before using.

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

D-G

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