

Speed Controller with One-touch Fittings

Series AS

Elbow Style, Universal Style

RoHS

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 style permits 360° piping swivel.

Application to inch size tubing

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

Operating pressure 1MPa max.

Accepts

Nylon, Soft nylon and Polyurethane tubing.

Retainer prevents accidental loss of needle

Optional: 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 easier control at lower speed.

Model

Elbow	Universal	Port size	Applicable tube 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	●	●	●							●	●							2.5, 4, 6
AS12□1F-M5	AS13□1F-M5	M5	●	●	●	●						●	●							6, 10, 16, 20
AS12□1F-U10/32	AS13□1F-U10/32	10-32UNF	●	●	●							●	●							6, 10, 16, 20
AS22□1F-01	AS23□1F-01	R(PT)1/8		●	●	●	●	●*				●	●	●	●	●				20, 25, 32
AS22□1F-02	AS23□1F-02	R(PT)1/4			●	●	●	●				●	●	●	●	●				20, 25, 32, 40
AS32□1F-02	AS33□1F-02	R(PT)1/4				●	●	●	●					●	●	●				40, 50, 63
AS32□1F-03	AS33□1F-03	R(PT)3/8					●	●	●	●					●	●	●			40, 50, 63
AS42□1F-04	AS43□1F-04	R(PT)1/2							●	●							●	●		63, 80, 100

Note 1) *Only elbow style.

Note 2) Distinction between meter-out/meter-in types by appearance.

They are distinguished by the lock nut. The lock nut on the meter-out type is zinc chromated, while the meter-in type is black zinc chromate plated.

Note 3) ●: Brass parts are electroless nickel plated, provided as standard (N specifications).

Note 4) AS12□1F-M5-02 applicable cylinder bore sizes are 2.5, 4, 6.

Specifications

Proof pressure	1.5MPa
Max. operating pressure	1MPa
Min. operating pressure	0.1MPa
Ambient and fluid temperature	-5 to 60°C (No freezing)
Number of needle rotations	10 turns (8 turns ⁽¹⁾)
Applicable tubes ⁽²⁾	Nylon, Soft nylon, Polyurethane
Option	Sealant ⁽³⁾ , Hexagon lock nut, Electroless nickel plated ⁽⁴⁾

Note 1) AS12□1F-M5, AS12□1F-U10/32

AS13□1F-M5, AS13□1F-U10/32

Note 2) Pay attention to the maximum operating pressure when soft nylon or Polyurethane is used. (Refer to p.7-146 and 7-147 in "Best Pneumatics" for further information.)

Note 3) Nickel plated AS12□1F and AS13□1F are standard, not equipped with a seal.

Note 4) Brass parts are all electroless nickel plated.

Air Flow/Effective Area

Model	AS12□1F-M3 AS13□1F-M3 AS12□1F-M5-02	AS12□1F-M5 AS13□1F-M5	AS22□1F-01		AS22□1F-02		AS23□1F-01		AS23□1F-02		AS32□1F		AS33□1F		AS42□1F		AS43□1F	
			AS23□1F-01	AS23□1F-01	AS23□1F-02	AS23□1F-02	AS33□1F	AS33□1F	AS43□1F	AS43□1F								
Tube 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", 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 (Free) flow	Air (l/min)(ANR)	20	100	180	230	260	390	460	660	790	920	1580	1710					
	Eff. area (mm ²)	0.3	1.5	2.7	3.5	4	6	7	10	12	14	24	26					

Notes) Supply pressure: 0.5MPa, Temperature: 20°C.
U10/32 has the same specification as M5.

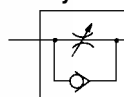
Elbow style



Universal style



JIS Symbol



Indication of air flow direction on body

	Meter-out	Meter-in
Symbol		
JIS Symbol		

Series AS



EMC-AS_2-3_1F-01A-UK

With One-touch Fittings: Elbow/Universal Style **Series AS**

How to Order

AS 2 2 1 1F — **01** — **06** **S** — —

Body size

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

Style

2	Elbow
3	Universal

Control

0	Meter out
1	Meter in

With One-touch fittings

Thread

—	Meter thread (M3, M5)
—	Unified thread (10-32UNF)
N	R(PT)
N	NPT

Port size

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

Lock nut option

—	Hexagon lock nut
J	Round lock nut

Option

—	None
S	With sealant
N	Electroless nickel plating

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

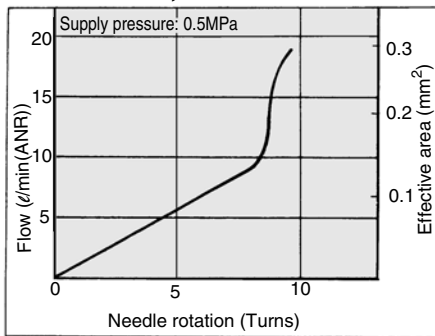
Applicable tube O.D.

Millimeter		Inch	
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"

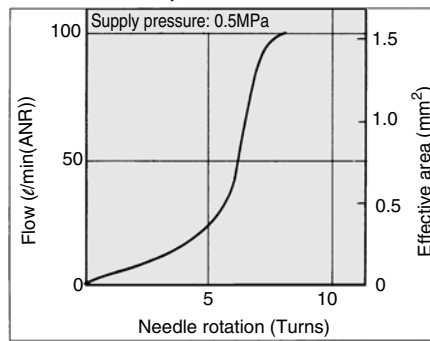
*ø1/8" tube should be used.

Needle Valve/Flow Characteristics

**AS1201F-M3, AS1211F-M3
AS1301F-M3, AS1311F-M3**

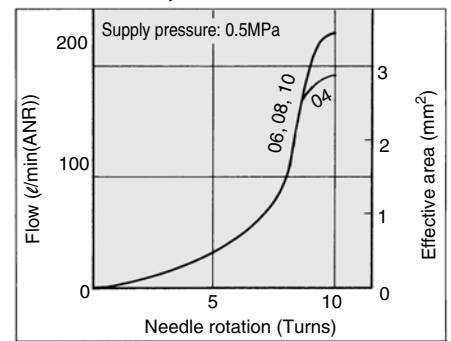


**AS1201F-M5, AS1211F-M5
AS1301F-M5, AS1311F-M5**

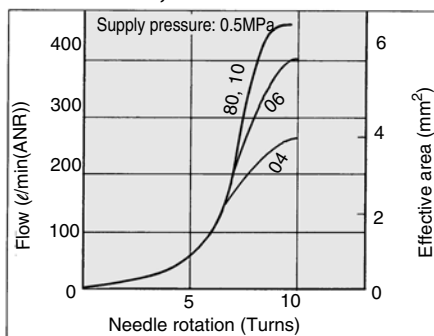


Note: "-U10/32" is the same as "M5".

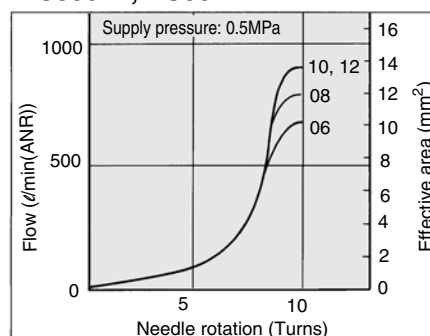
**AS2201F-01, AS2211F-01
AS2301F-01, AS2311F-01**



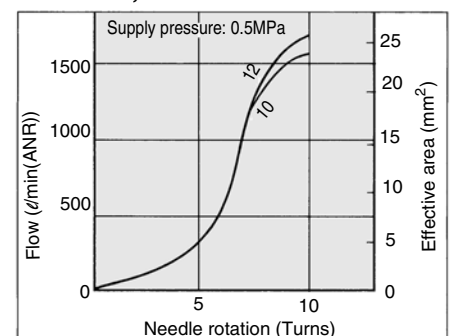
**AS2201F-02, AS2211F-02
AS2301F-02, AS2311F-02**



**AS3201F, AS3211F
AS3301F, AS3311F**



**AS4201F, AS4211F
AS4301F, AS4311F**



Series AS

Made to Order

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.

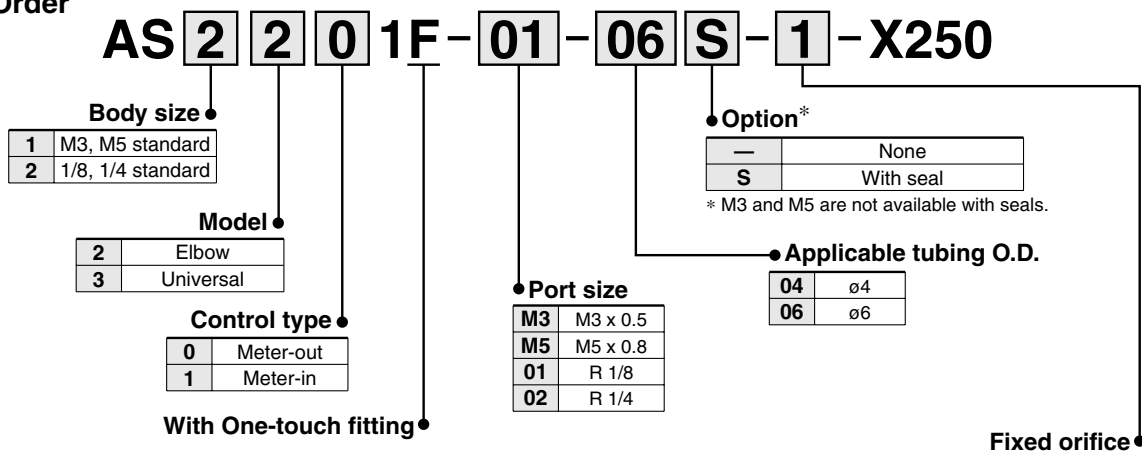
3 Throttle Valve (Without Check Valve) **X214**

Ex.) AS2201F-01-04S-X214

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

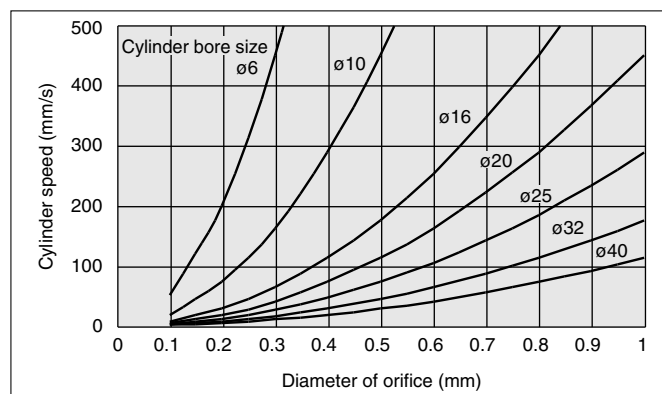
4 Fixed Throttle (No needle function) **X250**

How to Order



Symbol	Fixed orifice	Applicable model			
		AS12□1F-M3-04	AS1□□1F-M5-04 AS12□1F-M5-06	AS2□□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	●	●	●	●

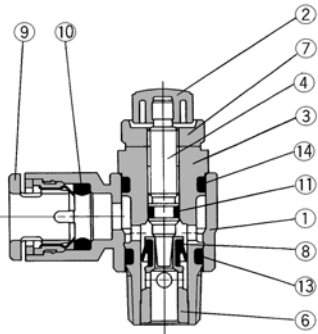
The graph below shows the relationship between orifices for each cylinder bore and cylinder speed. Please refer to it during selection. The cylinder speeds on the graph are theoretical values. Actual values may differ depending on the piping conditions or sliding friction, so please use this graph as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



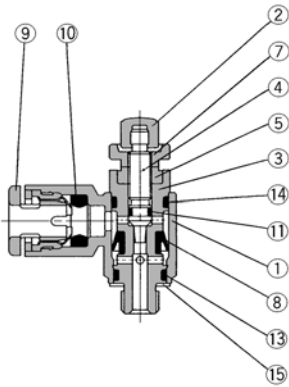
With One-touch Fittings: Elbow/Universal Style *Series AS*

Construction

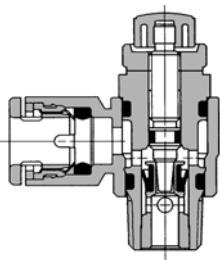
**Elbow style
Meter-out**



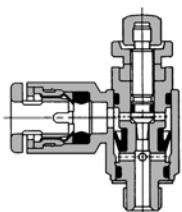
**M3 port
M5 port
U10/32 port**



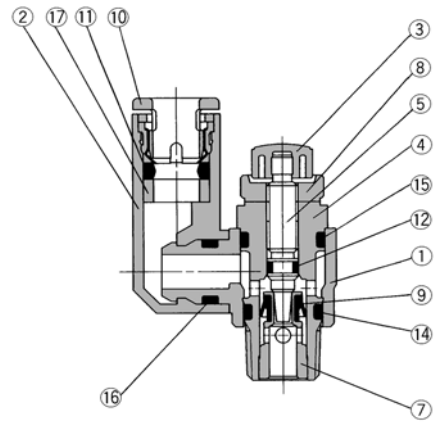
Meter-in



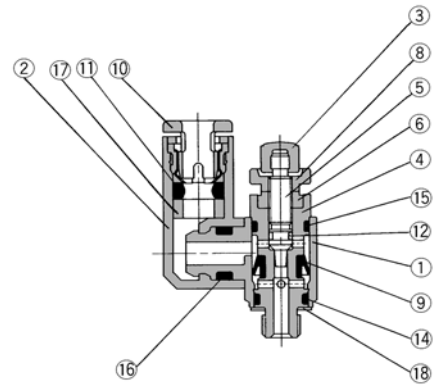
**M3 port
M5 port
U10/32 port**



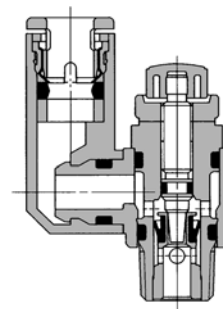
**Universal style
Meter-out**



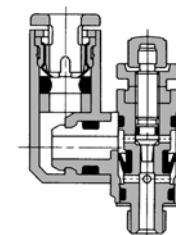
**M3 port
M5 port
U10/32 port**



Meter-in



**M3 port
M5 port
U10/32 port**

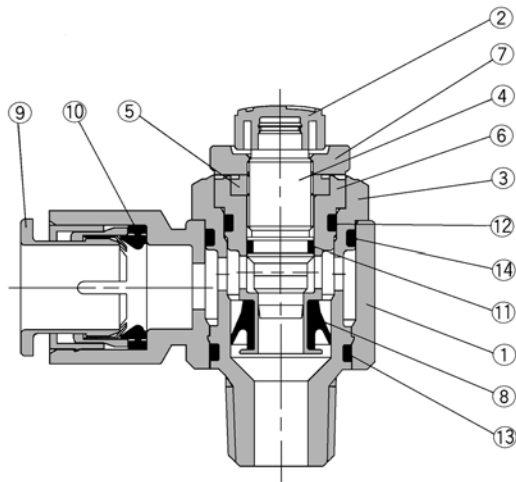


Series AS

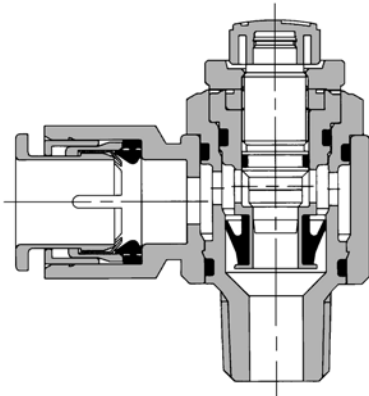
Construction

Elbow style

Meter-out AS3201F-02



Meter-in 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	See Note 3
⑦	Lock nut	Steel	Zinc chromated ⁽⁴⁾
⑧	U-packing	HNBR	
⑨	Cassette	POM, Stainless steel	
⑩	Packing	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.

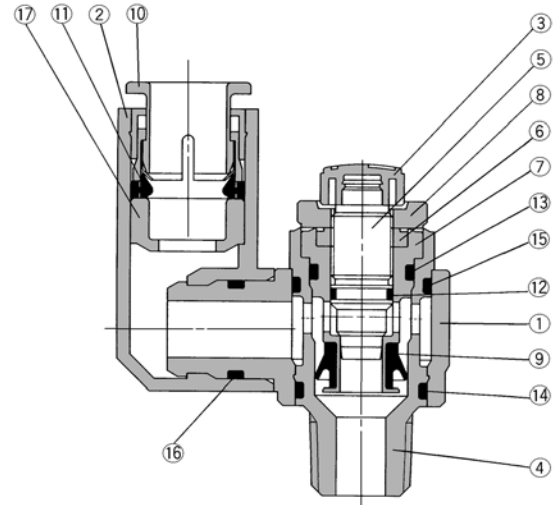
Note 2) AS12□1F-M3: Stainless

Note 3) AS22□1F, AS32□1F-02: Electroless nickel plated

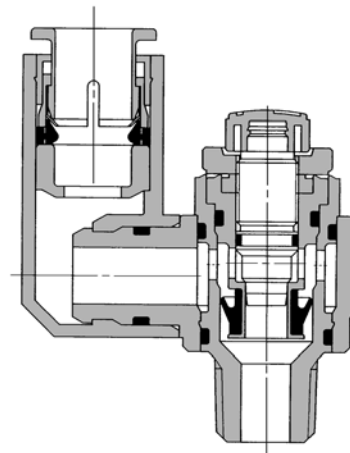
Note 4) Meter-in type: Black zinc chromated

Universal style

Meter-out AS3301F-02



Meter-in 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	See Note 2
⑧	Lock nut	Steel	Zinc chromated ⁽³⁾
⑨	U-packing	HNBR	
⑩	Cassette	POM, Stainless steel	
⑪	Packing	NBR	
⑫	O ring	NBR	
⑬	O ring	NBR	
⑭	O ring	NBR	
⑮	O ring	NBR	
⑯	O ring	NBR	
⑰	Spacer	POM	
⑱	Gasket	NBR, Stainless steel	

Note 1) AS13□1F-M3: Stainless

Note 2) AS23□1F, AS33□1F-02: Electroless nickel plated

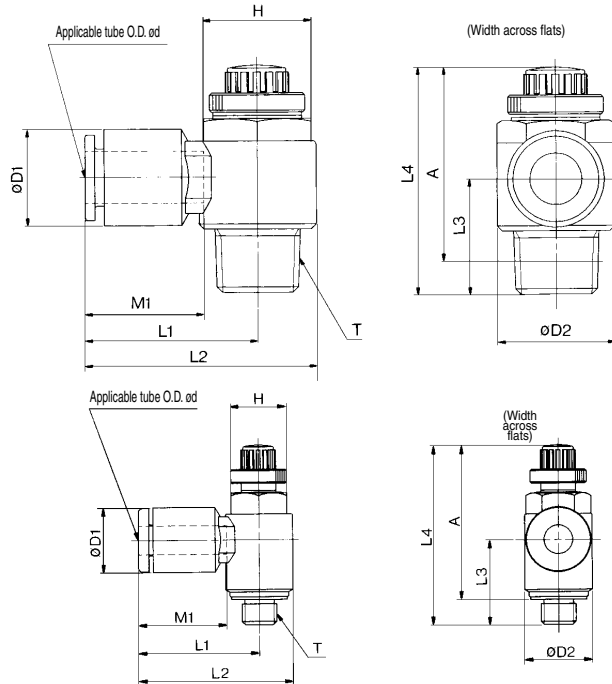
Note 3) Meter-in type: Black zinc chromated

With One-touch Fittings: Elbow/Universal Style *Series AS*



Elbow Style

M3 port
M5 port
U10/32 port



Metric

Model	Tube O.D. d	T	H ⁽¹⁾	D1	D2	L1	L2	L3	L4		A ⁽²⁾		M1	Weight (g)
									MAX.	MIN.	MAX.	MIN.		
AS12□1F-M3-02	2	M3	5.5	6	5.2	11.4	—	11	26.8	24.3	24.3	21.8	8.8	2.4
AS12□1F-M3-02		M5	7	—	—	—	—	11.5	27.3	24.8	—	—	—	3
AS12□1F-M3-23	3.2	M3	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				9.3										
AS12□1F-M5-23	3.2	M5	8.4	9.6	17.3	22.1	12.3	28.6	25.8	25	22.2	13.5	12.7	7
AS12□1F-U10/32-23														
AS12□1F-M5-04	4	M5	9.3	9.6	17.3	22.1	12.3	28.6	25.8	25	22.2	13.5	12.7	7
AS12□1F-U10/32-04														
AS12□1F-M5-06	6	M5	11.6	18.1	22.9	11.7	13.5	13.5	13.5	13.5	13.5	13.5	13.5	13.5
AS12□1F-U10/32-06														
AS22□1F-01-23	3.2	R(PT) 1/8	12 (12.7)	9.3	20.4	27.5	13.4	35.2	30.2	32.1	27.1	12.7	16	
AS22□1F-01-04				9.3	20.4	27.5								17
AS22□1F-01-06	6	R(PT) 1/8	12 (12.7)	11.6	14.2	20.4	27.5	13.4	35.2	30.2	32.1	27.1	13.5	17
AS22□1F-01-08				15.2	25.3	32.4	18.5							
AS22□1F-01-10	10	18.5	33.1	40.2	14.1	21	21	21	21	21	21	21	21	21
AS22□1F-02-04	4	R(PT) 1/4	17 (17.5)	10.4	25.2	34.4	17.7	39.9	34.9	34.4	29.4	16	32	
AS22□1F-02-06				12.8	25.2	34.4								17
AS22□1F-02-08	8	R(PT) 1/4	17 (17.5)	15.2	27.2	36.4	19.5	39.9	34.9	34.4	29.4	18.5	34	
AS22□1F-02-10				18.5	33.9	43.2								21
AS22□1F-02-06	6	R(PT) 1/4	17 (17.5)	12.8	27.8	39.3	19.5	39.9	34.9	34.4	29.4	17	60	
AS32□1F-02-08				15.2	29.5	41								21
AS32□1F-02-10	10	R(PT) 3/8	23	18.5	31.8	43.3	21.3	48.3	43.3	42.8	37.8	21	67	
AS32□1F-02-12				20.9	32.8	44.3								22
AS32□1F-03-06	6	R(PT) 3/8	23	12.8	27.8	39.3	19.8	45.4	40.4	40.2	35.2	17	55	
AS32□1F-03-08				15.2	29.5	41								18.5
AS32□1F-03-10	10	R(PT) 3/8	23	18.5	31.8	43.3	21.3	48.3	43.3	42.8	37.8	21	59	
AS32□1F-03-12				20.9	32.8	44.3								22
AS42□1F-04-10	10	R(PT) 1/2	24 (23.8)	18.5	33.6	47.9	24.5	56.7	49.2	49.6	42.1	21	100	
AS42□1F-04-12				20.9	34.6	48.9								22

Note 1) () are the dimensions of NPT thread.
Note 2) Reference thread dimensions after being screwed in.

Inch

Model	Tube O.D. d	T	H ⁽¹⁾	D1	D2	L1	L2	L3	L4		A ⁽²⁾		M1	Weight (g)
									MAX.	MIN.	MAX.	MIN.		
AS12□1F-M3-01	1/8"	M3	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	—	—	—	—	—	—	—	—	—	—
AS12□1F-M5-01	1/8"	M5	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	8	9.3	9.6	17.3	22.1	12.3	28.6	25.8	25	22.2	12.7	7
AS12□1F-U10/32-03	5/32"			10-32UNF	—	—	—	—	—	—	—	—	—	—
AS22□1F-01-01	1/8"	1/8	12 (12.7)	9.3	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								16
AS22□1F-01-05	3/16"	1/8	12 (12.7)	11.4	14.2	23.1	30.2	13.4	35.2	30.2	32.1	27.1	16.5	17
AS22□1F-01-07	1/4"			13.2	23.9	31	18.5	19						
AS22□1F-01-09	5/16"	1/8	12 (12.7)	15.2	25.3	32.4	14.1	13.4	35.2	30.2	32.1	27.1	21	21
AS22□1F-02-03	5/32"			10.4	25.2	34.4	16	32						
AS22□1F-02-05	3/16"	1/4	17 (17.5)	11.4	24.9	34.2	17.7	13.4	39.9	34.9	34.4	29.4	17	34
AS22□1F-02-07	1/4"			13.2	18.5	25.2	34.5	17.7	39.9	34.9	34.4	29.4	18.5	34
AS22□1F-02-09	5/16"	1/4	17 (17.5)	15.2	27.2	36.4	19.5	13.4	39.9	34.9	34.4	29.4	21	36
AS22□1F-02-11	3/8"			17.9	33.9	43.2	21	36						
AS32□1F-02-07	1/4"	1/4	19	13.2	27.8	39.3	19.5	39.9	34.9	34.4	29.4	17	60	
AS32□1F-02-09	5/16"			15.2	29.5	41								21
AS32□1F-02-11	3/8"	1/4	19	17.9	31.8	43.3	19.8	45.4	40.4	40.2	35.2	21	67	
AS32□1F-03-07	1/4"			13.2	27.8	39.3								17
AS32□1F-03-09	5/16"	3/8	19	15.2	29.5	41	19.8	45.4	40.4	40.2	35.2	18.5	57	
AS32□1F-03-11	3/8"			17.9	31.8	43.3								21
AS42□1F-04-11	3/8"	1/2	24 (23.8)	17.9	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

Note 1) () are the dimensions of NPT thread.
Note 2) Reference thread dimensions after being screwed in.

Elbow Style

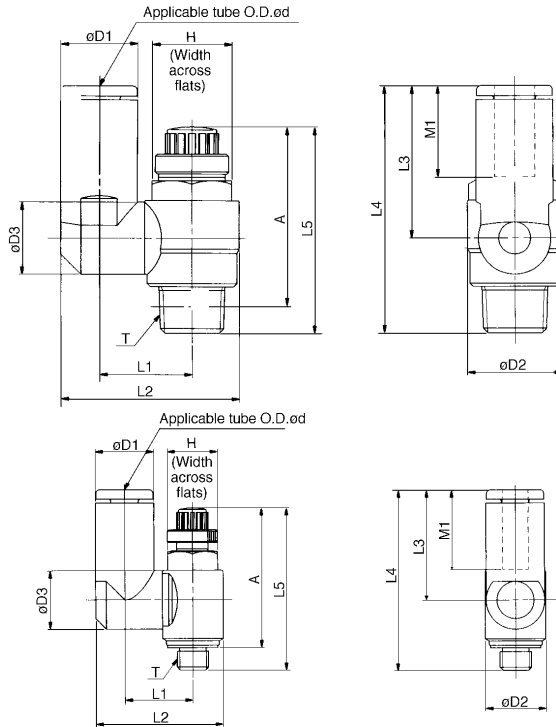
File	Model	Port size	Detail No.										
			Tube O.D.										
			3.2	4	6	8	10	12	—	—			
SAS21F1N	AS12□1F-M3-□	M3	#1	#2	—	—	—	—	—	—	—	—	—
	AS12□1F-M5-□	M5	#3	#4	#5	—	—	—	—	—	—	—	—
	AS22□1F-01-□S	R(PT)1/8	#6	#7	#8	#9	#10	—	—	—	—	—	—
	AS22□1F-02-□S	R(PT)1/4	—	#11	#12	#13	#14	—	—	—	—	—	—
	AS32□1F-03-□S	R(PT)3/8	—	—	#15	#16	#17	#18	—	—	—	—	—
	AS42□1F-04-□S	R(PT)1/2	—	—	—	—	#19	#20	—	—	—	—	—

Series AS



Universal Style

M3 port
M5 port
U10/32 port



Metric

Model	d	T	H ⁽¹⁾	D1	D2	D3	L1	L2	L3	L4	L5		A ⁽²⁾		M1	Weight (g)	
											MAX.	MIN.	MAX.	MIN.			
AS13□1F-M3-23	3.2			8.4												4	
AS13□1F-M3-04	4	M3	5.5	8.4 9.3	7.2	7.2	10.1	17.9 18.3	17.6 17.9	28.3 28.6		26.6	24.1	24	21.5	12.7	5
AS13□1F-M5-23	3.2	M5	8	8.4				19.8								12.7	
AS13□1F-U10/32-23		10-32UNF							17.5	28.7							
AS13□1F-M5-04	4	M5	8	9.3	9.6	9.3	10.8	20.3				28.6	25.8	25	22.2	7	
AS13□1F-U10/32-04		10-32UNF															
AS13□1F-M5-06	6	M5	8	11.6				21.4	20.6	31.8						13.5	
AS13□1F-U10/32-06		10-32UNF															
AS23□1F-01-23	3.2		12	8.4				24.4								12.7	17
AS23□1F-01-04	4	1/8		9.3	14.2	9.3	13.1	24.9	17.5	30.9		35.2	30.2	32.1	27.1	18.5	21
AS23□1F-01-06	6		12	11.6												13.5	17
AS23□1F-01-08	8			15.2													18.5
AS23□1F-01-09	8		12	11.6												13.5	21
AS23□1F-01-04	4			15.2													18.5
AS23□1F-02-08	8		17	10.4												16	32
AS23□1F-02-06	6			12.8													17
AS23□1F-02-08	8		17	15.2												18.5	36
AS23□1F-02-10	10			18.5													21
AS33□1F-02-06	6		17	12.8												17	60
AS33□1F-02-08	8			15.2													18.5
AS33□1F-02-10	10		17	18.5												21	67
AS33□1F-02-12	12			20.9													22
AS33□1F-03-06	6		19	12.8												17	56
AS33□1F-03-08	8			15.2													18.5
AS33□1F-03-10	10		19	18.5												21	63
AS33□1F-03-12	12			20.9													22
AS43□1F-04-10	10	1/2	24	18.5	16.2	25.8	49.4	32.6	57.1							21	104
AS43□1F-04-12	12		(23.8)	21.7	28.6	19.4	26.8	52	36.3	60.8		56.7	49.2	49.6	42.1	22	106

Note 1) () are the dimensions of NPT thread
Note 2) Reference thread dimensions after being screwed in

Inch

Model	Tube O.D. d	T	H ⁽¹⁾	D1	D2	D3	L1	L2	L3	L4	L5		A ⁽²⁾		M1	Weight (g)	
											MAX.	MIN.	MAX.	MIN.			
AS13□1F-M3-01	1/8"	M3	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	8	8.4				19.8									
AS13□1F-U10/32-01	1/8"	10-32UNF							17.5	28.7							
AS13□1F-M5-03	5/32"	M5	8	9.3				20.3				28.6	25.8	25	22.2	7	
AS13□1F-U10/32-03	5/32"	10-32UNF															
AS23□1F-01-01	1/8"		12	8.4				24.4								12.7	17
AS23□1F-01-03	5/32"			9.3					17.5	30.9		35.2	30.2	32.1	27.1	16.5	18
AS23□1F-01-05	3/16"	1/8	12	11.6	14.2	10.9	14	26.8	23.9	30.9						17	19
AS23□1F-01-07	1/4"			13.2					29.9	25.6	36.3						18.5
AS23□1F-01-09	5/16"		12	15.2												18.5	21
AS23□1F-02-03	5/32"			10.4					30.9	28.2	40.8						16
AS23□1F-02-05	3/16"		17	11.6												16.5	33
AS23□1F-02-07	1/4"			13.2	18.5				42.1								17
AS23□1F-02-09	5/16"		17	15.2												18.5	39
AS23□1F-02-11	3/8"	1/4		18.5					47.4								21
AS33□1F-02-07	1/4"		19	13.2												17	60
AS33□1F-02-09	5/16"			15.2	23	12.9	20.6	39.7	28.2	54.4	48.8	43.8	42.8	37.8	18.5	63	
AS33□1F-02-11	3/8"		19	18.5												21	69
AS33□1F-03-07	1/4"			13.2					45							17	56
AS33□1F-03-09	5/16"	3/8	19	15.2	23	12.9	20.6	39.7	28.2	48	45.4	40.4	40.2	35.2	18.5	59	
AS33□1F-03-11	3/8"			18.5					52.4							21	65
AS43□1F-04-11	3/8"	1/2	24	18.5	16.2	25.8	49.4	32.6	54.4							21	104
AS43□1F-04-13	1/2"		(23.8)	21.7	28.6	19.4	26.8	52	36.3	57.1		56.7	49.2	49.6	42.1	22	106




Note 1) () are the dimensions of NPT thread
Note 2) Reference thread dimensions after being screwed in

Universal Style

File	Model	Port size	Detail No.							
			Tube O.D.							
			3.2	4	6	8	10	12		
SAS31F1N	AS13 □1F-M3-□	M3	#1	#2	—	—	—	—	—	—
	AS13 □1F-M5-□	M5	#3	#4	#5	—	—	—	—	—
	AS23 □1F-01-□S	R(PT)1/8	#6	#7	#8	#9	—	—	—	—
	AS23 □1F-02-□S	R(PT)1/4	—	#10	#11	#12	#13	—	—	—
	AS33 □1F-03-□S	R(PT)3/8	—	—	#14	#15	#16	#17	—	—
	AS43 □1F-04-□S	R(PT)1/2	—	—	—	—	#18	#19	—	—

Safety Instructions

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

-  **Caution:** **Caution** indicates a hazard with a low level of risk which, if not avoided, could result in minor or moderate injury.
-  **Warning:** **Warning** indicates a hazard with a medium level of risk which, if not avoided, could result in death or serious injury.
-  **Danger:** **Danger** indicates a hazard with a high level of risk which, if not avoided, will result in death or serious injury.

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

Warning

1. The compatibility of the product is the responsibility of the person who designs the equipment or decides its specifications.

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

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

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

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

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

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

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

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

Compliance Requirements

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

Caution

SMC products are not intended for use as instruments for legal metrology.

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

Safety Instructions

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

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