

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

## AS-FM Series

RoHS

### Suitable for low speed control at 10 to 50 mm/sec

Since the sonic conductance 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

Sonic conductance of free flow is the same as that of standard model.

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

### Applicable tubing: Inch sizes standardized

Inch sizes are now available for all models.



### 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)
Applicable tubing material <sup>(1)</sup>	Nylon, Soft nylon, Polyurethane
Option <sup>(2)</sup>	With seal, Round lock nut

Note 1) Use caution regarding the max. operating pressure when soft nylon or polyurethane, or soft polyurethane tubing is used.

(Refer to pages 464 and 465 for details.)

Note 2) M5 and 10-32UNF type ports are not available with seal.

Note 3) Brass parts are all electroless nickel plated. The lock nut of the meter-out type is zinc chromate plated (the round lock nut is electroless nickel plated), then, the handle of the M5 type and the lock nut of the meter-in type are black zinc chromate plated.

### Flow Rate and Sonic Conductance

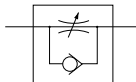
Model		AS12□1FM AS13□1FM	AS22□1FM-□01 AS23□1FM-□01	AS22□1FM-□02 AS23□1FM-□02
Tubing O.D.	Metric size	ø3.2,ø4,ø6	ø3.2,ø4 ø6,ø8	ø4 ø6 ø8,ø10
	Inch size	ø1/8",ø5/32",ø3/16",ø1/4"	ø1/8",ø5/32" ø3/16",ø1/4" ø5/16"	ø5/32" ø3/16" ø1/4",ø5/16" ø3/8"
Controlled flow	Air flow (L/min(ANR))	7	12	38
	Sonic conductance dm <sup>3</sup> /(s·bar)	0.02	0.04	0.12
	Critical pressure ratio	0.2	0.25	0.3
Free flow	Flow rate (L/min(ANR))	100	180 230	260 390 460
	Sonic conductance dm <sup>3</sup> /(s·bar)	0.3	0.54 0.7	0.8 1.2 1.4
	Critical pressure ratio	0.4	0.2	0.3

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

### ⚠ Caution

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

### Symbol



### Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Indication symbol		
Symbol		

Made to Order  
Made to Order  
(Refer to page 717 for details.)

**How to Order**

**AS 2 2 0 1 F M - [ ] 01 - 06 [ ] - [ ] - [ ]**

**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)
N	R
	NPT

**Port size**

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

**Option**

Nil	None
S	With seal

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

**Lock nut option**

Nil	Hexagon lock nut
J	Round lock nut

**Made to Order**  
Refer to the below for details.

**Option**

**Applicable tubing O.D.** (Note)  
 Note) For applicable tubing O.D. selection, refer to the Model on page 716.

Metric size	Inch size
23	03.2 "
04	04
06	06
08	08
10	10
01	01/8"
03	05/32"
05	03/16"
07	01/4"
09	05/16"
11	03/8"

\* Use 01/8" tube.

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

**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**

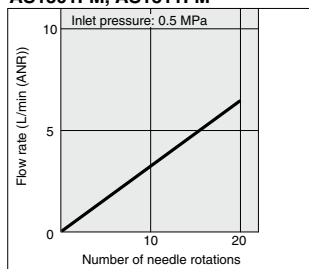
Ex.) AS1201FM-M5-23-X214

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

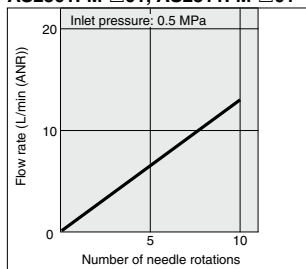
**Needle Valve/Flow Rate Characteristics**

Note) The flow rate characteristics are representative values.

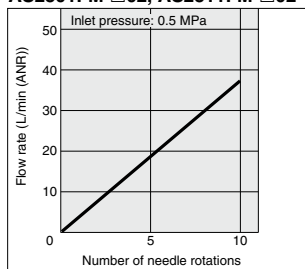
AS1201FM, AS1211FM  
 AS1301FM, AS1311FM



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



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

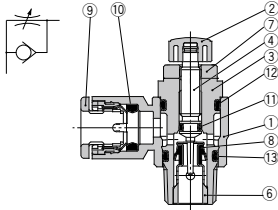


# AS-FM Series

## Construction: Elbow Type

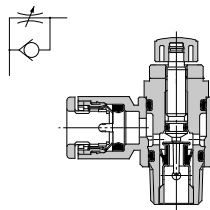
### Meter-out type

Symbol

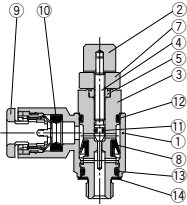


### Meter-in type

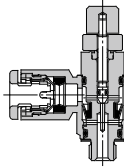
Symbol



### 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 <sup>(1)</sup>
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	Steel <sup>(2)</sup>	Meter-out   Zinc chromate plated <sup>(3)</sup> Meter-in   Black zinc chromate plated
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

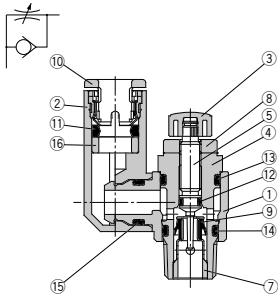
Note 1) M5 and U10/32 types are black zinc chromate plated.  
Note 2) The material of the lock nut option-J (round type) is brass. However, note that only the AS2□1FM uses steel.

Note 3) The surface treatment of the lock nut option-J (round type) is electroless nickel plated.

## Construction: Universal Type

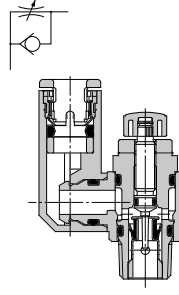
### Meter-out type

Symbol

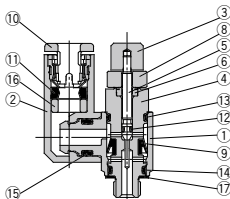


### Meter-in type

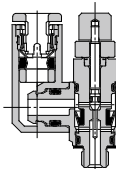
Symbol



### 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 <sup>(1)</sup>
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	Steel <sup>(2)</sup>	Meter-out   Zinc chromate plated <sup>(3)</sup> Meter-in   Black zinc chromate plated
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

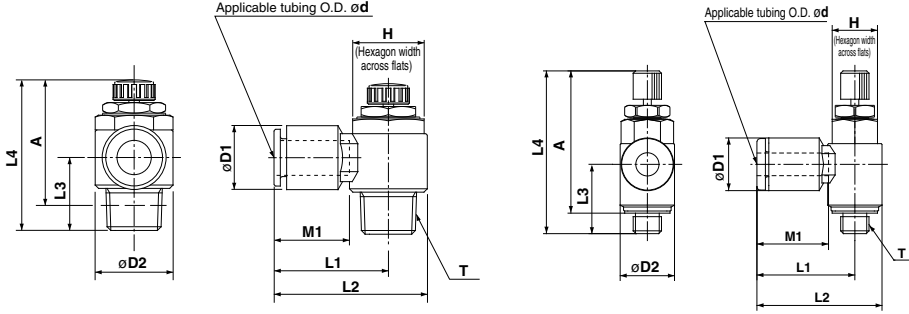
Note 1) M5 and U10/32 types are black zinc chromate plated.  
Note 2) The material of the lock nut option-J (round type) is brass. However, note that only the AS2□1FM uses steel.

Note 3) The surface treatment of the lock nut option-J (round type) is electroless nickel plated.

# Speed Controller for Low Speed Operation with One-touch Fitting Elbow Type/Universal Type (Resin Body) **AS-FM Series**

## Dimensions: Elbow Type

### M5 type U10/32 type



### Metric Size

Model	d	T	H	D1	D2	L1	L2	L3	L4 (1)(2)		A (1)(2)		M1	Weight (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							
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							
AS22□1FM-01-08	8			15.2		25.3	32.4							
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							
AS22□1FM-02-08	8			15.2		27.2	36.4							
AS22□1FM-02-10	10			18.5		35.3	44.5							

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	Weight (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		17.3	22.1							
AS12□1FM-U10/32-05	3/16"			11.4		18.3	23.1							
AS12□1FM-U10/32-07	1/4"			12		18.3	23.1							
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"			9.3		20.4	27.5							
AS22□1FM-N01-05	3/16"			13.2		24	31.1							
AS22□1FM-N01-07	1/4"			13.2		23.9	31							
AS22□1FM-N01-09	5/16"			15.2		25.3	32.4	13.4					18.5	19
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							
AS22□1FM-N02-07	1/4"			13.2		25.2	34.5							
AS22□1FM-N02-09	5/16"			15.2		27.2	36.4							
AS22□1FM-N02-11	3/8"			18.5		35.3	44.5	18.3					18.5	36

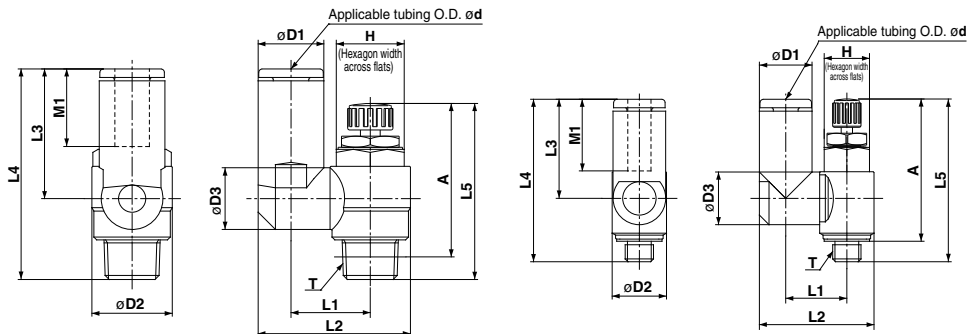
Note 1) Reference dimensions

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

# AS-FM Series

## Dimensions: Universal Type

### M5 type



### Metric Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4	L5 (1)		A (2)		M1	Weight (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	20.3							
AS13□1FM-M5-06	6			11.6				21.4	20.6	31.8						
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	24.9							
AS23□1FM-01-06	6			11.6				26.9	22.9	36.3						
AS23□1FM-01-08	8			15.2				30.9	28.2	40.8						
AS23□1FM-02-04	4			10.4				30.6	21.9	39.6						
AS23□1FM-02-06	6	12.8	34	25.2	42.1	39.9	34.9	34.4	29.4	16	33					
AS23□1FM-02-08	8	15.2	35.2	28.2	45.1					17						
AS23□1FM-02-10	10	18.5	38.7	31	47.9					18.5		21	36	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	Weight (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	20.3								
AS13□1FM-U10/32-05	3/16"			11.4				21.3	23.3	34.5							
AS13□1FM-U10/32-07	1/4"	12	21.6	20.7	31.9	35.2	30.2	32.1	27.1	16.5	8						
AS23□1FM-N01-01S	1/8"	8.4	9.3	13.1	24.4					17.5		30.9	12.7				
AS23□1FM-N01-05S	5/32"	9.3	24.9	24.9	30.9					24.9		30.9	18.5				
AS23□1FM-N01-03S	3/16"	11.4	14.2	10.9	14	26.8	23.9	37.3	16.5	18							
AS23□1FM-N01-07S	1/4"	13.2	12.9	16.2	29.9	25.6	38.2	17	19								
AS23□1FM-N01-09S	5/16"	15.2	30.9	28.2	40.8	30.9	28.2	40.8	18.5		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					16.5		33
AS23□1FM-N02-07S	1/4"			13.2				34.2	25.6	42.5					17		36
AS23□1FM-N02-09S	5/16"			15.2				35.2	28.2	45.1					18.5		39
AS23□1FM-N02-11S	3/8"			17.9				38.7	31	47.9					21		40

Note 1) Reference dimensions

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

# Speed Controller for Low Speed Operation Standard Type (Metal Body)

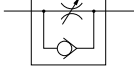
# AS-M Series

RoHS

## Model/Specifications



Symbol



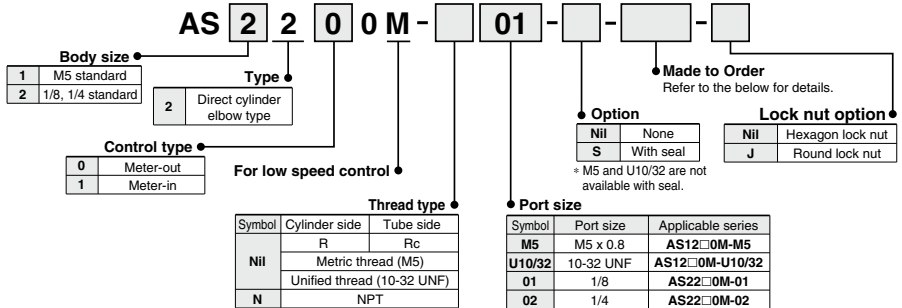
Model		AS12□0M		AS22□0M-□01		AS22□0M-□02	
Port size	Cylinder side	M5 x 0.8	10-32 UNF	R 1/8	NPT 1/8	R 1/4	NPT 1/4
	Tubing side			Rc 1/8		Rc 1/4	
Fluid		Air					
Proof pressure		1.5 MPa					
Max. operating pressure		1.0 MPa					
Min. operating pressure		0.1 MPa					
Ambient and fluid temperature		-5 to 60°C (No freezing)					
Option		Round lock nut		With seal, Round lock nut			
Weight (g)		11.5		36		74	
Controlled flow	Flow rate (L/min (ANR))	7		12		38	
	Sonic conductance dm <sup>3</sup> /(s·bar)	0.02		0.04		0.12	
	Critical pressure ratio	0.2		0.25		0.3	
Free flow	Flow rate (L/min (ANR))	105		280		420	
	Sonic conductance dm <sup>3</sup> /(s·bar)	0.32		0.86		1.3	
	Critical pressure ratio	0.4		0.2		0.3	

Note 1) Flow rate values are measured at 0.5 MPa and 20°C.

Note 2) Meter-out and meter-in types can be visually differentiated by the lock nut. Meter-out type is electroless nickel plated (the round lock nut is electroless nickel plated), while meter-in type is black zinc chromate plated.

Note 3) Brass parts are all electroless nickel plated. The handle is black zinc chromate plated.

## How to Order



## Made to Order

Made to Order

Lubricant: Vaseline

**X12**

Ex.) AS2200M-01-X12

Grease-free (Seal: Fluorine Coated) +  
Throttle Valve (Without Check Valve)

**X21**

Ex.) AS2200M-01-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.) AS2200M-01-X214

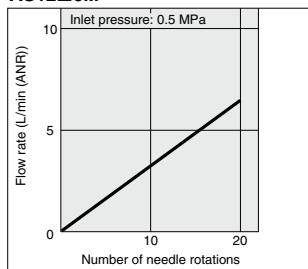
Note) Throttle valve is only compatible with the part no. of the meter-out type.

# AS-M Series

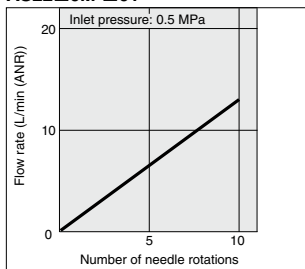
## Needle Valve/Flow Rate Characteristics

Note) The flow rate characteristics are representative values.

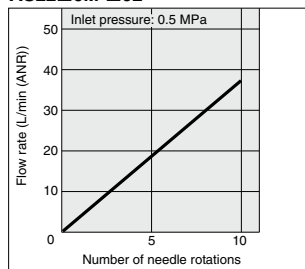
AS12□0M



AS22□0M-□01



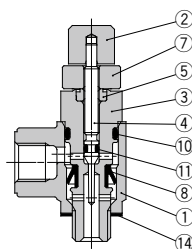
AS22□0M-□02



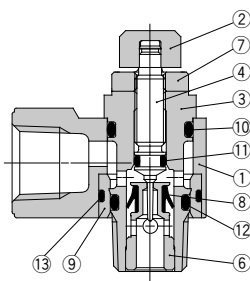
## Construction

### Meter-out type

AS1200M

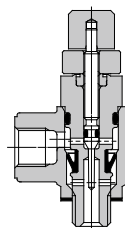


AS2200M

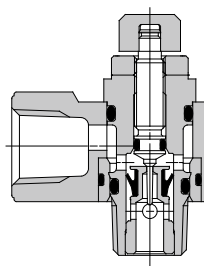


### Meter-in type

AS1210M



AS2210M



### Component Parts

No.	Description	Material	Note
1	Body A	Zinc alloy	Chromate treated
2	Handle	Brass	Black zinc chromate 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	Electroless nickel plated
7	Lock nut	Steel <sup>(1)</sup>	Meter-out Zinc chromate plated <sup>(2)</sup> Meter-in Black zinc chromate plated
8	U seal	HNBR	
9	Bushing	PBT	
10	O-ring	NBR	
11	O-ring	NBR	
12	O-ring	NBR	
13	O-ring	NBR	
14	Gasket	NBR/Stainless steel	

Note 1) The material of the lock nut option-J (round type) is brass. However, note that only the AS22□0M uses steel.

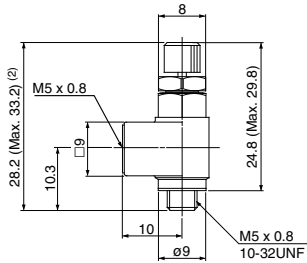
Note 2) The surface treatment of the lock nut option-J (round type) is electroless nickel plated.

### Caution

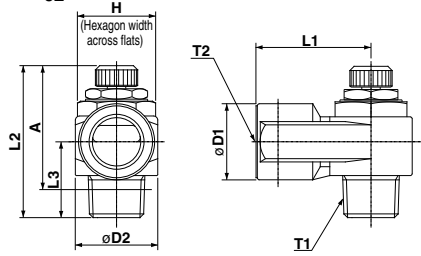
Be sure to read this before handling the products. Refer to back page 50 for Safety Instructions and pages 543 to 546 for Flow Control Equipment Precautions.

## Dimensions

AS12□0M



AS22□0M-□<sup>01</sup><sub>02</sub>



### Dimensions

Model	T1	T2	H	L1	L2 (1)		L3	D1	D2	A (2)	
					Max.	Min.				Max.	Min.
AS12□0M-M5	M5 x 0.8		8	10	33.2	28.2	10.3	9	9	29.8	24.8
AS12□0M-U10/32	10-32 UNF										
AS22□0M-01	R 1/8	Rc 1/8	12	18	35.5	30.5	13.2	14.3	14.6	32.4	27.4
AS22□0M-N01	NPT 1/8										
AS22□0M-02	R 1/4	Rc 1/4	17	27.2	39.4	35.4	17.5	18	19.5	34.9	29.9
AS22□0M-N02	NPT 1/4										

Note 1) Reference dimensions

Note 2) Dimensions of R and NPT threads after installation.

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



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

## AS-FM Series



### Model

Model	Applicable tubing O.D.								
	Metric size				Inch size				
	3.2	4	6	8	1/8"	5/32"	3/16"	1/4"	5/16"
AS1001FM	●	●	●		●	●	●	●	
AS2001FM		●	●			●	●	●	
AS2051FM			●	●			●	●	●

### 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 <sup>(1)</sup>	Nylon, Soft nylon, Polyurethane

Note 1) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used.

(Refer to pages 464 and 465 for details.)

Note 2) Brass parts are all electroless nickel plated. The handle of the M5 type is black zinc chromate plated.

### Flow Rate and Sonic Conductance

#### Flow Direction Symbols on Body



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	
	Sonic conductance dm <sup>3</sup> /(s bar)	0.02	0.04		0.12	
	Critical pressure ratio	0.2	0.2		0.2	
Free flow	Flow rate (L/min (ANR))	100	130	230	290	460
	Sonic conductance dm <sup>3</sup> /(s bar)	0.3	0.4	0.7	0.9	1.4
	Critical pressure ratio	0.25				

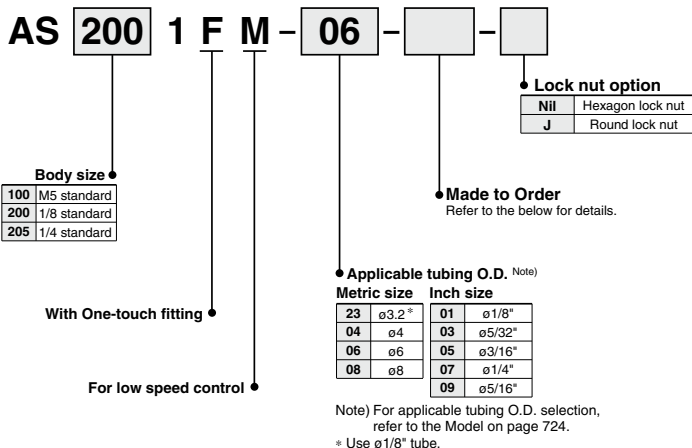
Note) Flow rate values are measured at 0.5 MPa and 20°C.

### Caution

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

**Made to Order**  
(Refer to page 725 for details.)

### How 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)

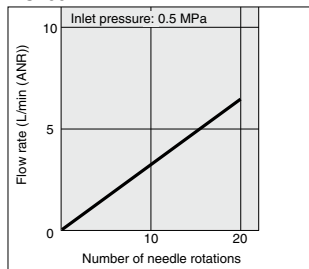
**X214**

Ex.) AS2001FM-04-X214

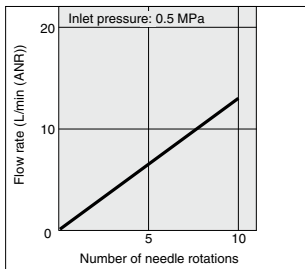
### Needle Valve/Flow Rate Characteristics

Note) The flow rate characteristics are representative values.

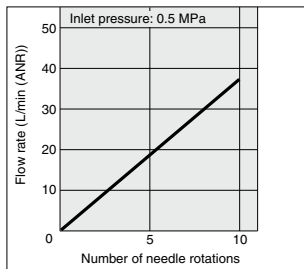
AS1001FM



AS2001FM



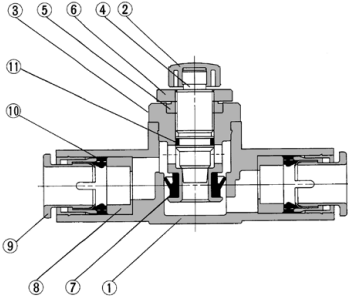
AS2051FM



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

# AS-FM Series

## Construction



## Component Parts

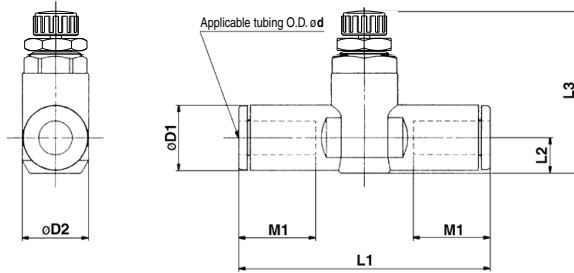
No.	Description	Material	Note
1	Body A	PBT	
2	Handle	PBT (1)	Black
3	Body B	Brass	Electroless nickel plated
4	Needle	Brass	Electroless nickel plated
5	Needle guide	Brass	Electroless nickel plated
6	Lock nut	Steel (3)	Zinc chromated (2)
7	U seal	HNBR	
8	Spacer	—	
9	Cassette	—	
10	Seal	NBR	
11	O-ring	NBR	

Note 1) AS1001FM type is made of brass (black zinc chromate plated).

Note 2) The round lock nut is electroless nickel plated.

Note 3) For round lock nut, only the AS1001FM uses brass.

## Dimensions



### Metric Size

Model	d	D1	D2	L1	L2	L3		M1	Weight (g)
						Max.	Min.		
AS1001FM-23	3.2	8.4	10.5	38	4.5	27.7	24.9	12.7	6
AS1001FM-04	4	9.3		39.2	5.2	28.5	25.5	7	7
AS1001FM-06	6	11.6	12.3	40.7	6.2	29.8	26.6	13.7	8
AS2001FM-04	4	9.3		40.7	5.2	32.6	27.6	12.7	12
AS2001FM-06	6	11.6	15.5	44.8	6.3	33.7	28.7	13.7	13
AS2051FM-06	6	12.8		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	Weight (g)
						Max.	Min.		
AS1001FM-01	1/8"	8.4	10.5	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	7
AS1001FM-05	3/16"	11.4	12.3	48.7	6.2	27.7	24.7	16.5	8
AS1001FM-07	1/4"	12		40.7	5.2	32.6	29.6	12.7	12
AS2001FM-03	5/32"	9.3	15.5	40.7	6.2	33.6	28.6	16.5	18
AS2001FM-05	3/16"	11.4		52.2	7.1	34.5	29.5	17	21
AS2001FM-07	1/4"	13.2	15.5	52.2	6.2	34.6	29.6	16.5	24
AS2051FM-05	3/16"	11.4		54.4	7.1	35.5	30.5	17	26
AS2051FM-07	1/4"	13.2		59.8	8.1	36.5	31.5	18	31
AS2051FM-09	5/16"	15.2							

Note 1) Reference dimensions

# Dual Speed Controller for Low Speed Operation with One-touch Fitting

# ASD-FM Series



Two flow control valves and check valves integrated.

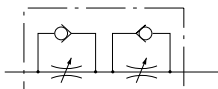
Prevention of a stick-slip phenomenon, and speed control of a single acting cylinder.

Stable speed control is achievable even with load fluctuations.

Low speed control for small bore cylinders.



Symbol



### Flow Direction Symbols on Body

	Meter-out type	Meter-in type
Indication symbol		
Symbol		

### Model

Model	Applicable tubing									
	Metric size				Inch size					
	4	6	8	10	1/8"	5/32"	3/16"	1/4"	5/16"	3/8"
ASD230FM-M5	●	●								
ASD330FM-01		●	●							
ASD430FM-02		●	●	●						
ASD230FM-U10/32					●	●	●			
ASD330FM-N01							●	●	●	
ASD430FM-N02								●	●	●

### 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 <sup>(1)</sup>	Nylon, Soft nylon, Polyurethane

Note 1) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used.

(Refer to pages 464 to 465 for details.)

Note 2) Brass parts are all electroless nickel plated. The lock nut of the meter-out type is zinc chromate plated (the round lock nut is electroless nickel plated), then, the handle of the M5 type and the lock nut of the meter-in type are black zinc chromate plated.

### Flow Rate and Sonic Conductance

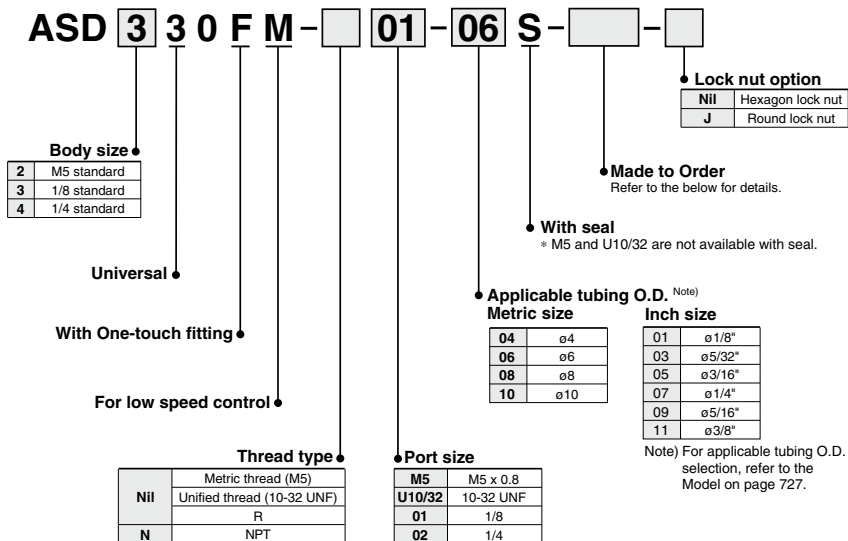
Tubing O.D.	Model	ASD230FM	ASD330FM	ASD430FM	
	Metric size	ø4,ø6	ø6,ø8	ø6	ø8,ø10
	Inch size	ø1/8",ø5/32" ø3/16",ø1/4"	ø3/16",ø1/4"	—	ø1/4",ø5/16" ø3/8"
Controlled flow	Flow rate (L/min(ANR))	7	12	38	
	Sonic conductance dm <sup>3</sup> /(s·bar)	0.02	0.04	0.12	
	Critical pressure ratio	0.25	0.2	0.2	
Free flow	Flow rate (L/min(ANR))	7	12	38	
	Sonic conductance dm <sup>3</sup> /(s·bar)	0.02	0.04	0.12	
	Critical pressure ratio	0.3	0.15	0.15	

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

**Made to Order**  
(Refer to page 728 for details.)

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

## How to Order



## Made to Order



Lubricant: Vaseline

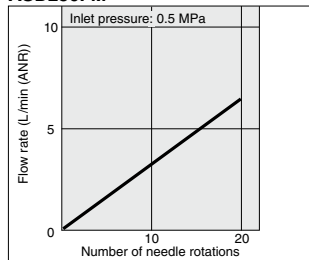
**X12**

Ex.) ASD230FM-M5-X12

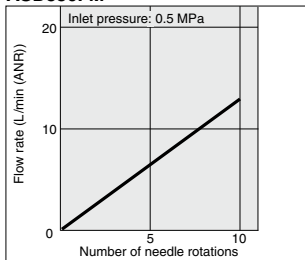
## Needle Valve/Flow Rate Characteristics

(Note) The flow rate characteristics are representative values.

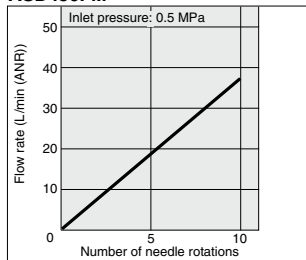
**ASD230FM**



**ASD330FM**

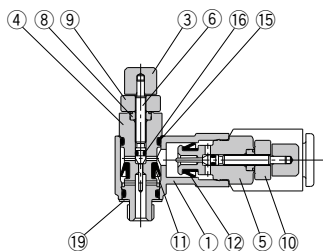
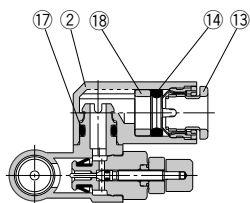


**ASD430FM**

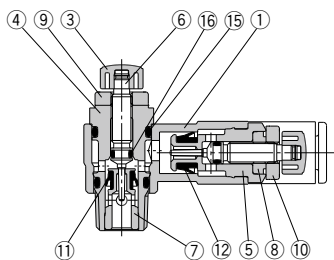
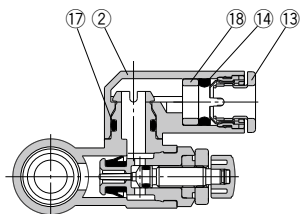


## Construction

### ASD230FM



### ASD330FM/430FM



### Component Parts

No.	Description	Material	Note
1	Body A	PBT	
2	Elbow body	PBT	
3	Handle	PBT <sup>(1)</sup>	Black
4	Body B	Brass	Electroless nickel plated
5	Body B	Brass	Electroless nickel plated
6	Needle	Brass	Electroless nickel plated
7	Seat ring	Brass	Electroless nickel plated
8	Needle guide	Brass	Electroless nickel plated
9	Lock nut	Steel <sup>(2)</sup>	Zinc chromated <sup>(3)</sup>
10	Lock nut	Steel <sup>(2)</sup>	Black zinc chromated

### Component Parts

No.	Description	Material	Note
11	U seal	HNBR	
12	U seal	HNBR	
13	Cassette	—	
14	Seal	NBR	
15	O-ring	NBR	
16	O-ring	NBR	
17	O-ring	NBR	
18	Spacer	—	
19	Gasket	NBR, Stainless steel	M5 type only

Note 1) ASD230FM type is made of brass (black zinc chromate plated).  
 Note 2) The material of the lock nut option-J (round type) is brass. However, note that only the ASD330FM and ASD430FM use steel.

Note 3) The surface treatment of the lock nut option-J (round type) is electroless nickel plated.

AS-F

TMH

ASD

AS

AS-FE

KE

AS-FG

AS-FP

AS-FM

AS-D

AS-T

ASP

ASN

AQ

ASV

AK

VCHC

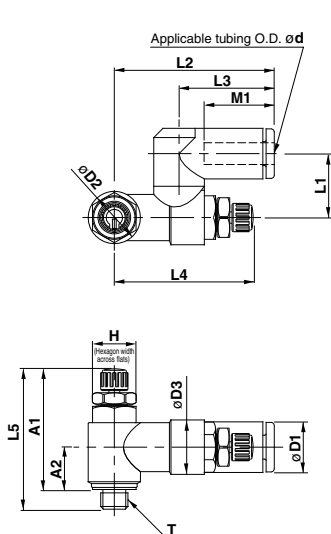
ASR

ASQ

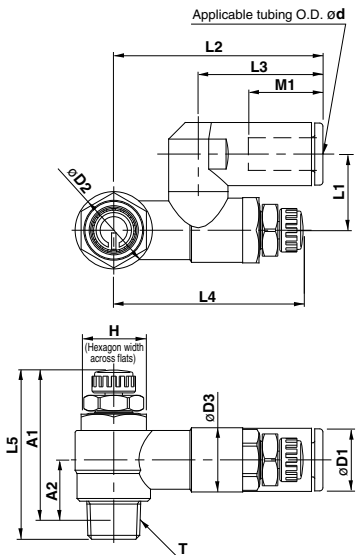
# ASD-FM Series

## Dimensions: Metric Size

### ASD230FM



### ASD330FM/430FM



## Metric Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4		L5 <sup>(1)</sup>		A1 <sup>(2)</sup>		A2 <sup>(2)</sup>	M1	Weight (g)
										Max.	Min.	Max.	Min.	Max.	Min.			
ASD230FM-M5-04	4	M5 x 0.8	8	9.3	9.6	10	11.7	29.4	17.5	34.6	29.6	33.8	28.8	30.1	25.1	7.8	12.9	12
ASD230FM-M5-06	6			11.6				20.6	13.7								13	
ASD330FM-01-06S	6	R 1/8	12	11.6	14.2	11.8	14	38.5	22.9	39.6	34.6	35.2	30.2	32.1	27.1	10.6	13.7	29
ASD330FM-01-08S	8			15.2				28.2	18.5								31	
ASD430FM-02-06S	6	R 1/4	17	12.8	18.5	15	18	43.5	25.2	41.8	36.8	39.9	34.9	34.4	29.4	11	17	53
ASD430FM-02-08S	8			15.2				28.2	18.5								55	
ASD430FM-02-10S	10			18.5			19.7	49.3	31								21	58

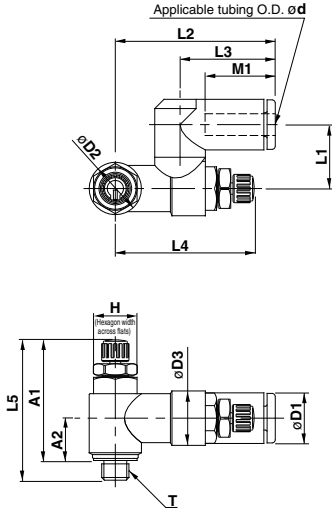
Note 1) Reference dimensions

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

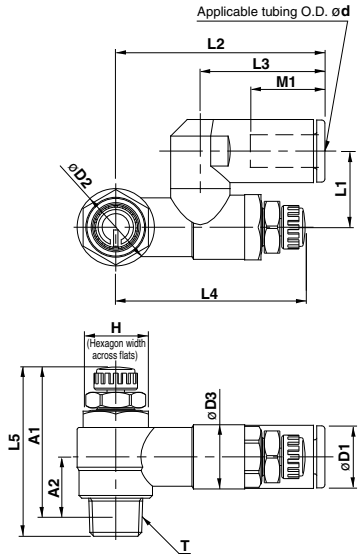
# Dual Speed Controller for Low Speed Operation with One-touch Fitting **ASD-FM Series**

## Dimensions: Inch Size

### ASD230FM



### ASD330FM/430FM



## Inch Size

Model	d	T	H	D1	D2	D3	L1	L2	L3	L4		L5 <sup>(1)</sup>		A1 <sup>(2)</sup>		A2 <sup>(2)</sup>	M1	Weight (g)
										Max.	Min.	Max.	Min.	Max.	Min.			
ASD230FM-U10/32-01	1/8"	10-32 UNF	8	8.4	9.6	10	11.7	29.4	17.5	34.6	29.6	33.8	28.8	30.1	25.1	7.8	12.9	12
ASD230FM-U10/32-03	5/32"			9.3													13	
ASD230FM-U10/32-05	3/16"			11.4													16.5	
ASD330FM-U10/32-07	1/4"			12				32.6	20.7								13.5	15
ASD330FM-N01-05S	3/16"			11.4			14	39.5	23.9	39.6	34.6						16.5	30
ASD330FM-N01-07S	1/4"	NPT 1/8	12.7	13.2	14.2	11.8	15.8	42.2	25.6	38.9	33.9	35.2	30.2	32	27	10.6	17	31
ASD330FM-N01-09S	5/16"			15.2				44.8	28.2								18.5	
ASD430FM-N02-07S	1/4"			13.2				43.9	25.6								17	
ASD430FM-N02-09S	5/16"	NPT 1/4	17.5	15.2	18.5	15	18	46.5	28.2	41.7	36.7	39.9	34.9	34.6	29.6	11	18.5	55
ASD430FM-N02-11S	3/8"			18.5				49.3	32.6								21	

Note 1) Reference dimensions

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

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





# ASD-FM Series Specific Product Precautions

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

## Design/Selection

### ⚠ Caution

#### 1. Single acting cylinder

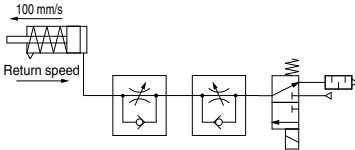
When controlling a single acting cylinder, the cylinder's return speed will differ depending on the operating conditions. Operate after confirming the maximum return speeds shown in the table below.

Speed Controller	Cylinder	Solenoid valve	Tubing	Silencer	Max. return speed (mm/s)		
					10	20	30
ASD230FM	CJ2	SYJ500	TU0604 1 m	AN110-01	ø6		
					ø10		
					ø16		
					Cylinder size		
ASD330FM	CM2	SYJ700	TU0604 1 m	AN110-01	ø20		
					ø25		
					ø32		
					Cylinder size		

<Operating conditions>

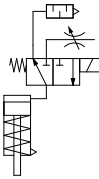
- Cylinder extension speed: 100 mm/s
- Meter-out needle fully open

\* Values are measured at 0.5 MPa and 20°C.



(Reference) Recommended circuit for high return speed

When low extension speed and high return speed are desired, the following circuit using 3-port is recommended.



Note) Use AS-FM series with -X214 for the throttle valve.