

# 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  | ● <sup>(2)</sup>       | ●   | ● |   |   |                  |           |      |       | ●     | ●    |       |                                    |      |      |   | 2.5, 4, 6                    |
| AS12□1F-M5     | AS13□1F-M5     | M5 x 0.8  | ● <sup>(2)</sup>       | ●   | ● | ● |   |                  |           |      |       | ●     | ●    | ●     | ●                                  |      |      |   | 6, 10, 16, 20 <sup>(1)</sup> |
| AS12□1F-U10/32 | AS13□1F-U10/32 | 10-32 UNF |                        | ●   | ● | ● |   |                  |           |      |       | ●     | ●    | ●     | ●                                  |      |      |   | 6, 10, 16, 20                |
| AS22□1F-01     | AS23□1F-01     | R 1/8     |                        | ●   | ● | ● | ● | ● <sup>(2)</sup> |           |      |       | ●     | ●    | ●     | ●                                  |      |      |   | 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 specifications)

### Specifications

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

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<br>AS13□1F-M3<br>AS12□1F-M5-02 | AS12□1F-M5<br>AS13□1F-M5 | AS22□1F-01<br>AS23□1F-01       | AS22□1F-02<br>AS23□1F-02         | AS32□1F<br>AS33□1F                        | AS42□1F<br>AS43□1F     |              |     |     |     |     |      |      |
|-----------------------------|---|--------------------------|--------------------------------|----------------------------------|---|------------------------|--------------|-----|-----|-----|-----|------|------|
|                             | Metric size                               | ø2, ø3.2, ø4             | ø3.2, ø4, ø6                   | ø3.2, ø4<br>ø6, ø8, ø10          | ø4<br>ø6<br>ø8, ø10                       | ø6<br>ø8<br>ø10, ø12   | ø10<br>ø12   |     |     |     |     |      |      |
| Tubing O.D.                 | Inch size                                 | ø1/8",<br>ø5/32"         | ø1/8", ø3/16"<br>ø1/4", ø5/32" | ø1/8", ø3/16",<br>ø5/32", ø5/16" | ø5/32", ø3/16"<br>ø1/4", ø5/16",<br>ø3/8" | ø1/4", ø5/16"<br>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 (mm <sup>2</sup> )         | 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

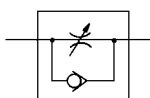
Applicable tubing O.D. ø2



### 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) |
| N   | R                          |
|     | NPT                        |

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

**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.

**Applicable tubing O.D.**

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

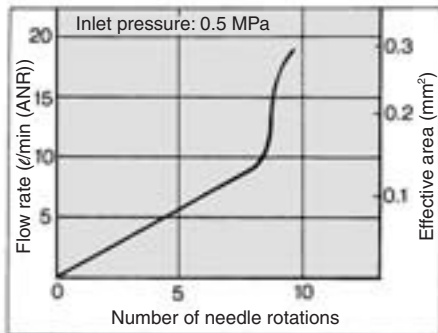
\*Use ø1/8" tube.

**Port size**

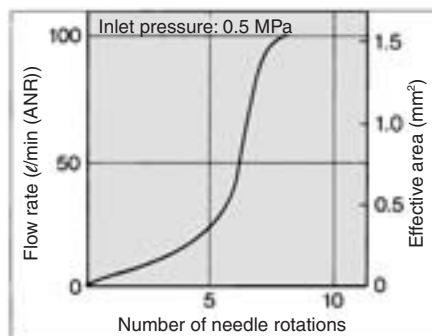
|        |           |
|--------|-----------|
| M3     | M3 x 0.5  |
| M5     | M5 x 0.8  |
| U10/32 | 10-32 UNF |
| 01     | 1/8       |
| 02     | 1/4       |
| 03     | 3/8       |
| 04     | 1/2       |

## Needle Valve/Flow Characteristics

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

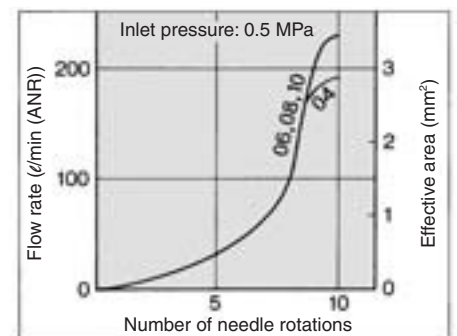


**AS1201F-M5, AS1211F-M5  
AS1301F-M5, AS1311F-M5**

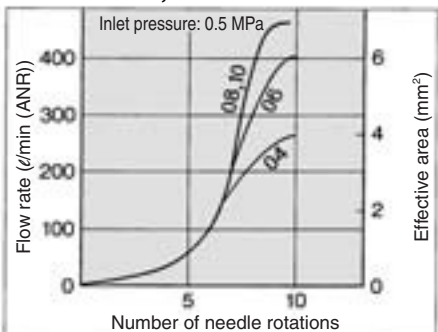


Note) "-U10/32" is the same as "M5".

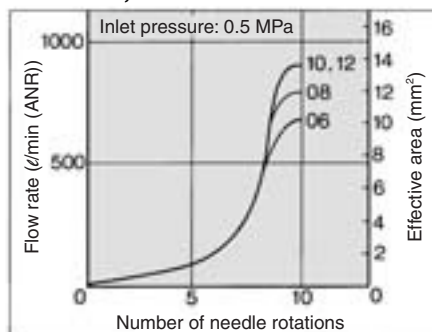
**AS2201F-01, AS2211F-01  
AS2301F-01, AS2311F-01**



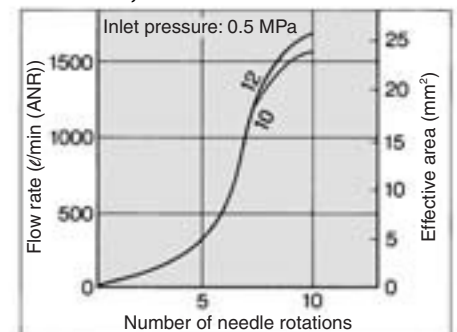
**AS2201F-02, AS2211F-02  
AS2301F-02, AS2311F-02**



**AS3201F, AS3211F  
AS3301F, AS3311F**



**AS4201F, AS4211F  
AS4301F, AS4311F**

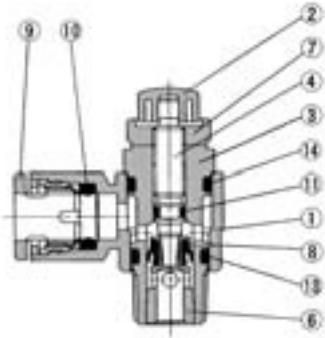


- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR  
ASQ
- KE
- TMH

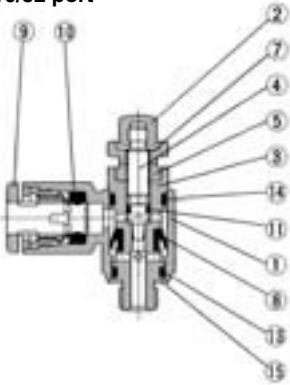
# Series AS

## Construction

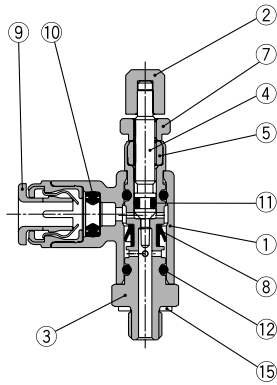
### Elbow type Meter-out type



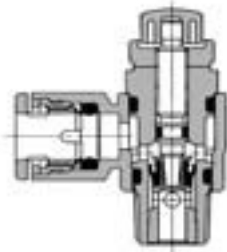
M3 port  
M5 port  
U10/32 port



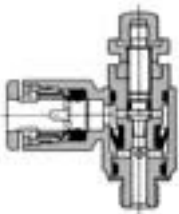
ø2 tubing type



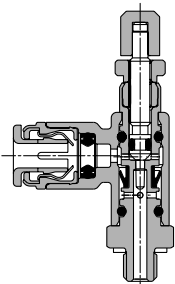
### Meter-in type



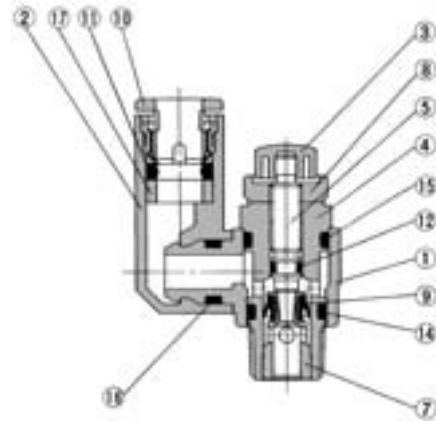
M3 port  
M5 port  
U10/32 port



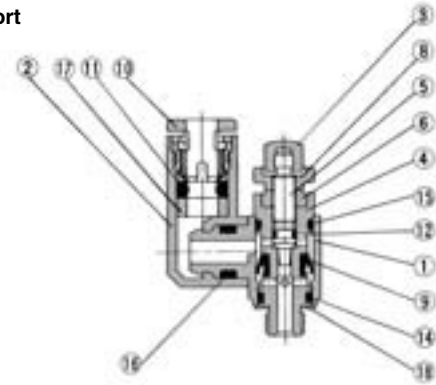
ø2 tubing type



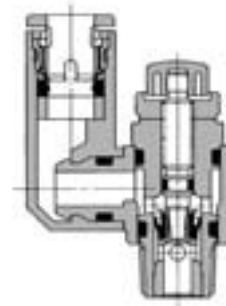
### Universal type Meter-out type



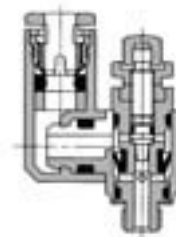
M3 port  
M5 port  
U10/32 port



### Meter-in type



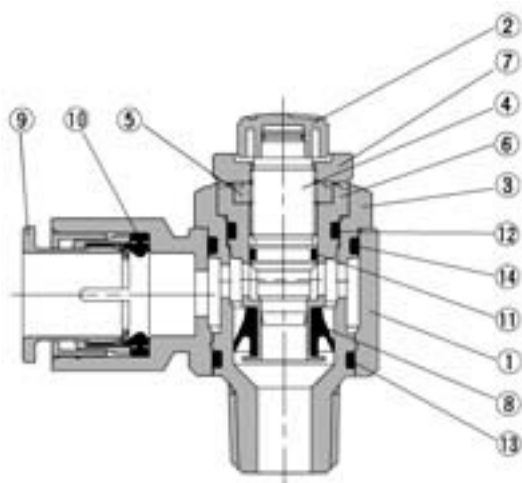
M3 port  
M5 port  
U10/32 port



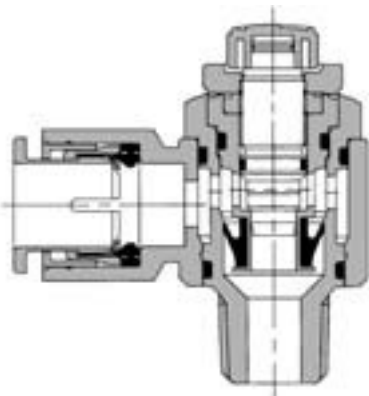
## Construction

### Elbow type

Meter-out type AS3201F-02

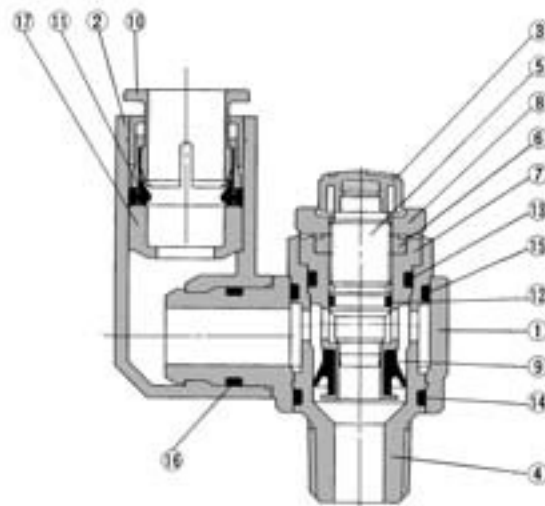


Meter-in type AS3211F-02

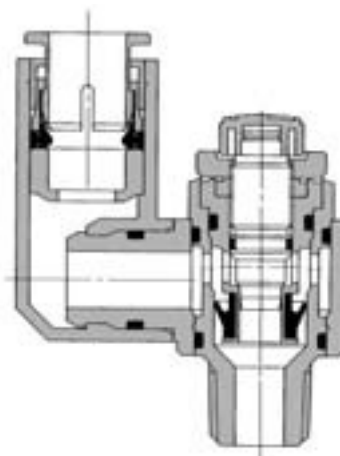


### Universal type

Meter-out type AS3301F-02



Meter-in type AS3311F-02



### Component Parts

| No. | Description  | Material             | Note                                     |
|-----|--------------|----------------------|--|
| 1   | Body A       | PBT                  |  |
| 2   | Handle       | PBT <sup>(1)</sup>   |  |
| 3   | Body B       | Brass <sup>(2)</sup> | Electroless nickel plated                |
| 4   | Needle       | Brass                | Electroless nickel plated                |
| 5   | Needle guide | Brass                | Electroless nickel plated                |
| 6   | Seat ring    | Brass                | <sup>(3)</sup>                           |
| 7   | Lock nut     | Brass <sup>(4)</sup> | Electroless nickel plated <sup>(5)</sup> |
| 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.

### Component Parts

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

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

ASR  
ASQ

KE

TMH







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.

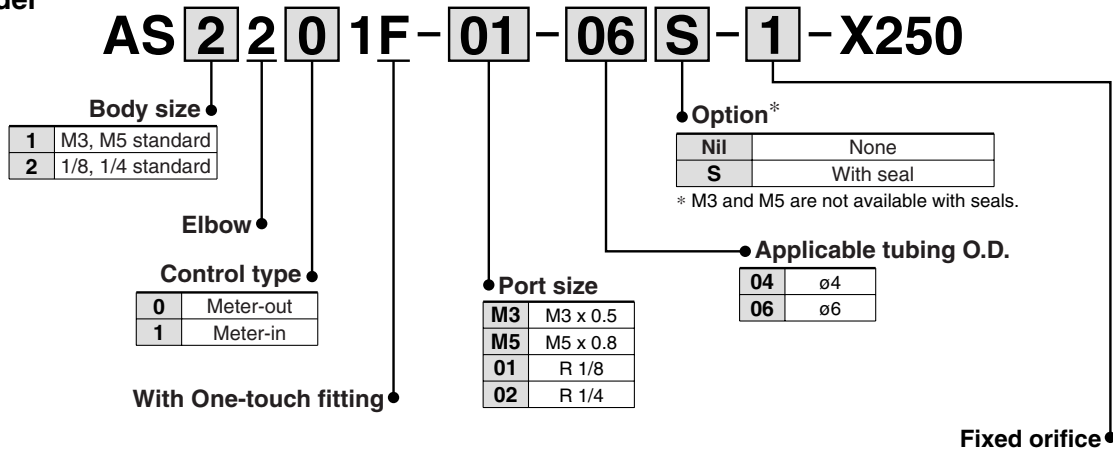
## 3 Throttle Valve (Without Check Valve) X214

Ex.) AS2201F-01-04S-X214

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

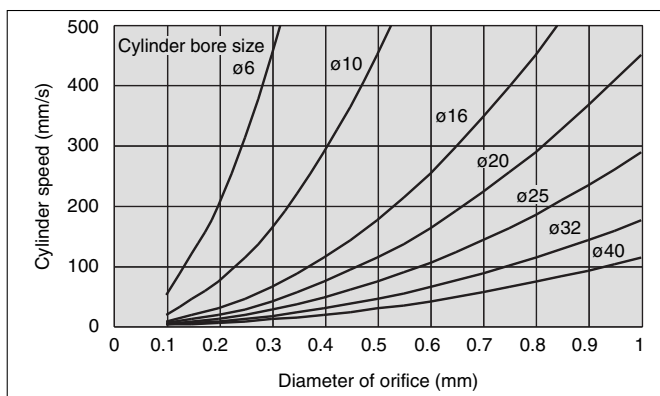
## 4 Fixed Throttle (No needle function) X250

### How to Order



| Symbol | Fixed orifice | Applicable model |                                |                                |               |
|--------|---------------|------------------|--------------------------------|--------------------------------|---------------|
|        |               | AS12□1F-M3-04    | AS12□1F-M5-04<br>AS12□1F-M5-06 | AS22□1F-01-04<br>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

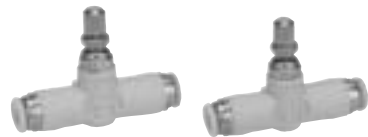
### Number of needle rotations has been increased (8 to 10 turns)

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



### 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 <sup>(1)</sup> |
| 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 <sup>(1)</sup> )                           |
| Max. operating pressure                   | 1 MPa (0.7 MPa <sup>(1)</sup> )                              |
| Min. operating pressure                   | 0.1 MPa  |
| Ambient and fluid temperature             | -5 to 60°C (No freezing)                                     |
| Number of needle rotations                | 10 turns (8 turns <sup>(2)</sup> )                           |
| Applicable tubing material <sup>(3)</sup> | Nylon, Soft nylon, Polyurethane <sup>(4)</sup>               |
| Option                                    | Hexagonal lock nut, Electroless nickel plated <sup>(5)</sup> |

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 (mm <sup>2</sup> ) | 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 |

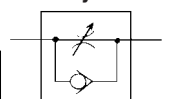
\* If more than one option is required, write option part numbers in the order of "K", "N".

### Applicable tubing O.D.

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

### JIS Symbol

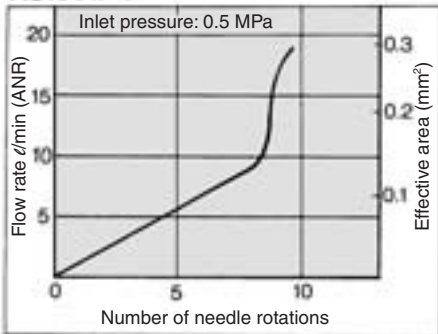


Made to Order  
Refer to page 431 for details.

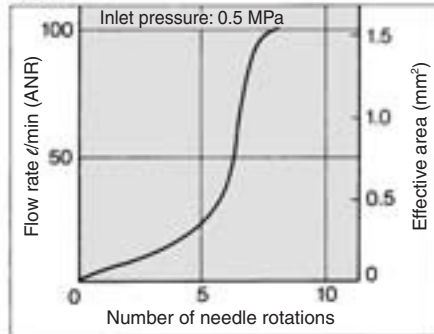


**Needle Valve/Flow Characteristics**

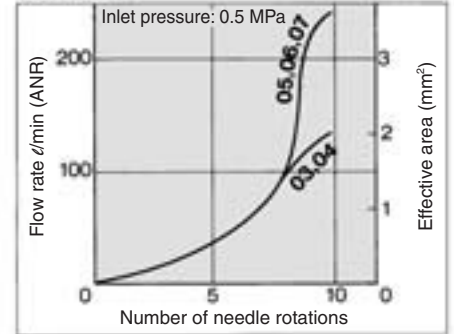
**AS1001F-02**



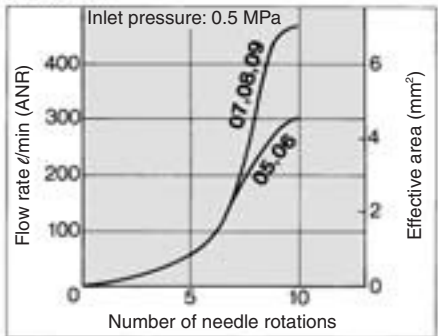
**AS1001F**



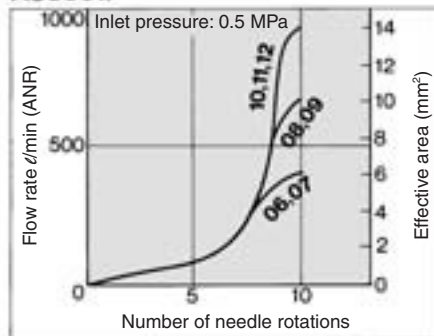
**AS2001F**



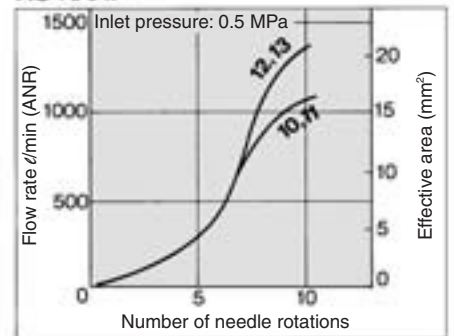
**AS2051F**



**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**



Lubricant: Vaseline

**X12**

Ex.) AS2001F-04-X12

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

**X21**

Ex.) AS2001F-04-X21

Note) Not particle-free

Throttle Valve (Without Check Valve)

**X214**

Ex.) AS2001F-04-X214

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

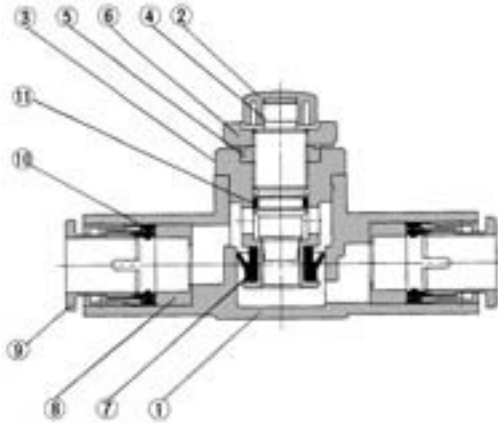
ASR  
ASQ

KE

TMH

# Series AS

## Construction

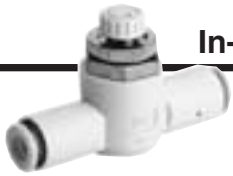


### Component Parts

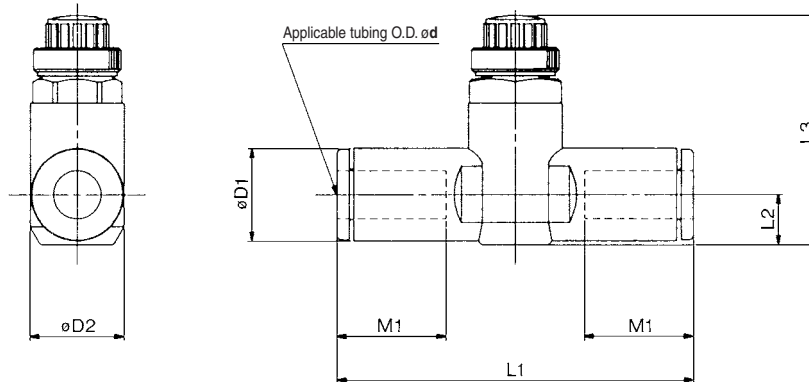
| No. | Description  | Material             | Note                      |
|-----|--------------|----------------------|---------------------------|
| 1   | Body A       | PBT                  |                           |
| 2   | Handle       | PBT <sup>(1)</sup>   |                           |
| 3   | Body B       | Brass                | Electroless nickel plated |
| 4   | Needle       | Brass                | Electroless nickel plated |
| 5   | Needle guide | Brass                | Electroless nickel plated |
| 6   | Lock nut     | Brass <sup>(2)</sup> | 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 <sup>(1)</sup> |      | M1   | Mass (g) |    |
|------------|---------------------------|------|------|------|------|-------------------|------|------|----------|----|
|            |                           |      |      |      |      | Max.              | Min. |      |          |    |
| 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 | 26.5 | 76   | 11   | 41.8              | 36.8 | 22   | 48       |    |
| AS4001F-10 | 10                        | 18.5 |      | 11.3 | 77.7 | 11.3              | 51.1 | 43.6 | 21       | 85 |
| AS4001F-12 | 12                        | 20.9 |      |      | 82.1 | 11.3              | 52.1 | 44.6 | 22       | 89 |

Note 1) Reference dimensions

### Inch Size

| Model      | Applicable tubing O.D. ød | D1   | D2   | L1   | L2   | L3 <sup>(1)</sup> |      | M1   | Mass (g) |
|------------|---------------------------|------|------|------|------|-------------------|------|------|----------|
|            |                           |      |      |      |      | Max.              | Min. |      |          |
| 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 | 13.7 | 16.5     |
| AS1001F-07 | 1/4"                      | 12   |      | 40.7 |      |                   |      |      | 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

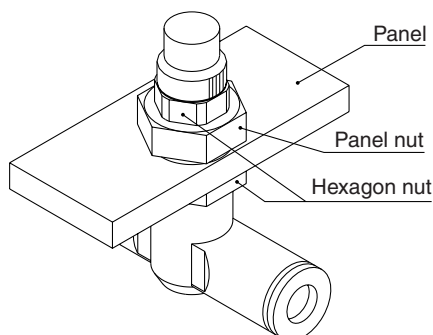
# Speed Controller with One-touch Fittings In-line Type/Panel Mount Type

## Series AS□□□1F-3

Panel mount thickness:  
3.5 mm at the maximum

### Easy installation and removal

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



### 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 <sup>(1)</sup> ) |
| Applicable tubing material <sup>(2)</sup> | 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.)

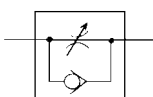
Note 3) Brass parts are all electroless nickel plated.

### Flow Rate and Effective Area

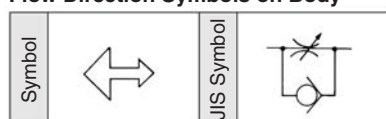
| Model                       | AS1001F                           | AS2001F                      | AS2051F | AS3001F       | AS4001F |               |       |        |          |       |       |
|-----------------------------|-----------------------------------|------------------------------|---------|---------------|---------|---------------|-------|--------|----------|-------|-------|
| 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 (mm <sup>2</sup> ) | 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 435 for details.)

### 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

#### Panel mount type

#### Applicable tubing O.D.

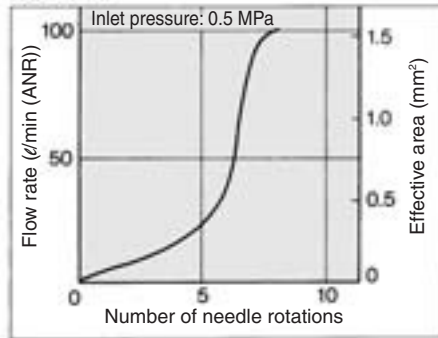
| Metric size | Inch size |
|-------------|-----------|
| 23          | ø3.2*     |
| 04          | ø4        |
| 06          | ø6        |
| 08          | ø8        |
| 10          | ø10       |
| 12          | ø12       |
| 01          | ø1/8"     |
| 03          | ø5/32"    |
| 05          | ø3/16"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

\* Use ø1/8" tube.

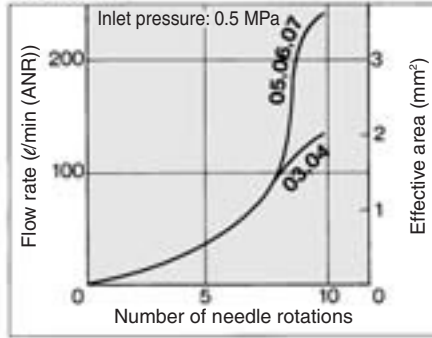
**Made to Order**  
Refer to page 435 for details.

**Needle Valve/Flow Characteristics**

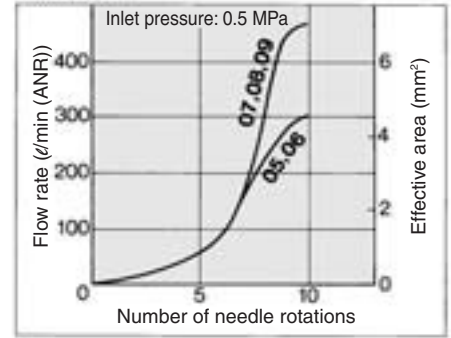
**AS1001F**



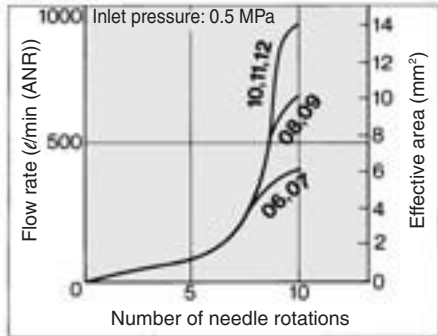
**AS2001F**



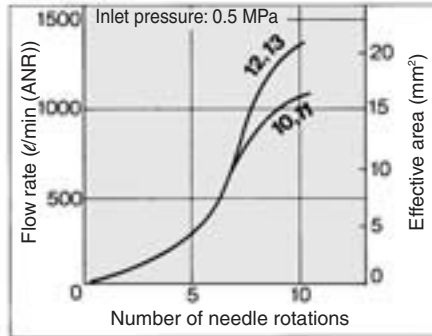
**AS2051F**



**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**



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

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

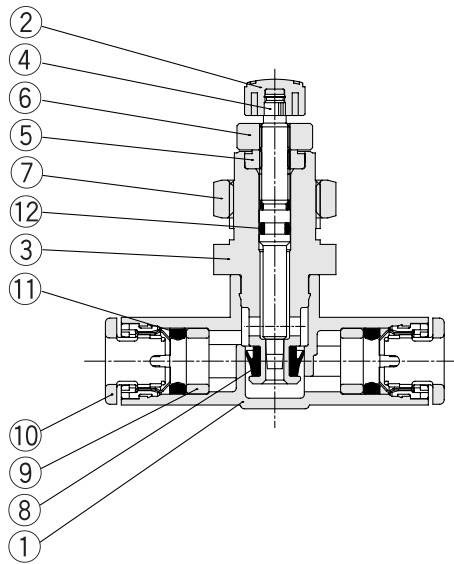
ASR  
ASQ

KE

TMH

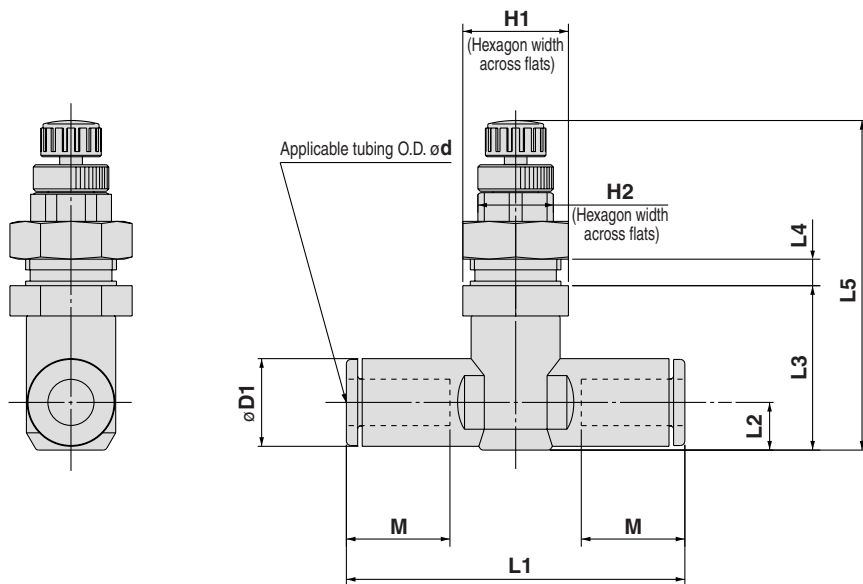
# Series AS□□□1F-3

## 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<br>Max. | L5 <sup>(1)</sup> |      | M    | Panel-out<br>dimensions | Mass<br>(g) |
|--------------|-----|------|----|----|------|------|------|------------|-------------------|------|------|-------------------------|-------------|
|              |     |      |    |    |      |      |      |            | Max.              | Min. |      |                         |             |
| 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 | 14 | 10 | 40.7 | 6.2  | 18.5 | 3.5        | 39.3              | 36.1 | 13.5 | 12.5                    | 20          |
| AS2001F-04-3 | 4   | 9.3  |    |    | 40.7 | 5.2  | 20.7 |            | 48                | 42.5 |      |                         | 28          |
| AS2001F-06-3 | 6   | 11.6 | 17 | 13 | 44.8 | 6.3  | 21.8 | 3.5        | 49.1              | 43.6 | 13.5 | 15.5                    | 29          |
| AS2051F-06-3 | 6   | 12.8 |    |    | 53.2 | 6.7  | 25.7 |            | 54.8              | 48.1 |      |                         | 49          |
| AS2051F-08-3 | 8   | 15.2 | 21 | 16 | 59.8 | 8.1  | 27   | 3.5        | 60.1              | 54.7 | 17   | 18.5                    | 54          |
| AS3001F-06-3 | 6   | 12.8 |    |    | 64.4 | 8.2  | 32.1 |            | 60.9              | 55.5 |      |                         | 88          |
| AS3001F-08-3 | 8   | 15.2 | 27 | 21 | 71.6 | 9.8  | 33.7 | 3.5        | 62.5              | 57.1 | 21   | 24.5                    | 99          |
| AS3001F-12-3 | 12  | 20.9 |    |    | 76   | 11   | 34.9 |            | 63.7              | 58.3 |      |                         | 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 | 11.3 | 36   |            | 70.3              | 62   |      |                         | 171         |

Note 1) Reference dimensions

### Inch Size

| Model        | d     | D1   | H1 | H2 | L1   | L2   | L3   | L4<br>Max. | L5 <sup>(1)</sup> |      | M    | Panel-out<br>dimensions | Mass<br>(g) |
|--------------|-------|------|----|----|------|------|------|------------|-------------------|------|------|-------------------------|-------------|
|              |       |      |    |    |      |      |      |            | Max.              | Min. |      |                         |             |
| 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 | 14 | 10 | 48.7 | 6.2  | 18.5 | 3.5        | 39.3              | 36.1 | 13.5 | 12.5                    | 24          |
| AS1001F-07-3 | 1/4"  | 12   |    |    | 40.7 |      |      |            | 5.2               | 20.7 |      |                         | 48          |
| AS2001F-03-3 | 5/32" | 9.3  | 14 | 10 | 50   | 6.2  | 21.6 | 3.5        | 48.9              | 43.4 | 16.5 | 12.5                    | 34          |
| AS2001F-05-3 | 3/16" | 11.4 |    |    | 52.2 | 7.1  | 22.5 |            | 49.8              | 44.3 |      |                         | 37          |
| AS2001F-07-3 | 1/4"  | 13.2 | 17 | 13 | 52.2 | 6.2  | 25.2 | 3.5        | 53                | 47.6 | 16.5 | 15.5                    | 47          |
| AS2051F-05-3 | 3/16" | 11.4 |    |    | 54.4 | 7.1  | 26   |            | 53.8              | 48.4 |      |                         | 49          |
| AS2051F-07-3 | 1/4"  | 13.2 | 21 | 16 | 59.8 | 8.1  | 27   | 3.5        | 54.8              | 49.4 | 18   | 18.5                    | 54          |
| AS3001F-07-3 | 1/4"  | 13.2 |    |    | 59   | 7.4  | 31.3 |            | 60.1              | 54.7 |      |                         | 84          |
| AS3001F-09-3 | 5/16" | 15.2 | 27 | 21 | 64.4 | 8.2  | 32.1 | 3.5        | 60.9              | 55.5 | 18   | 24.5                    | 88          |
| AS3001F-11-3 | 3/8"  | 17.2 |    |    | 70.8 | 9.5  | 33.3 |            | 62.1              | 56.7 |      |                         | 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 |      |                         | 188         |

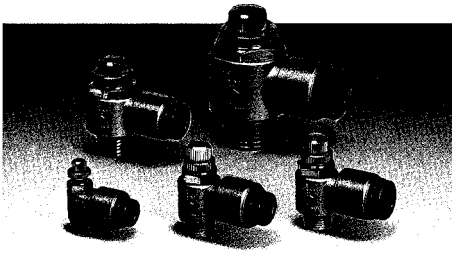
Note 1) Reference dimensions

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

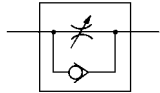
## Series AS

### 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 <sup>(1)</sup> )                         |
| Applicable tubing material    | Nylon, Soft nylon, Polyurethane                            |
| Option                        | Hexagon lock nut, Electroless nickel plated <sup>(2)</sup> |

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    |

**With seal**

**Tube size**

|    |     |
|----|-----|
| 04 | ø4  |
| 06 | ø6  |
| 08 | ø8  |
| 10 | ø10 |
| 12 | ø12 |

**With One-touch fitting**

**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".

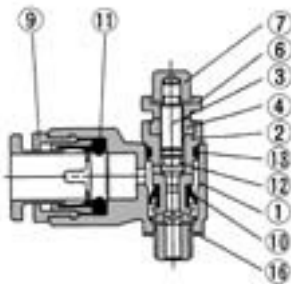
**Made to Order**  
Refer to page 428 for details.

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

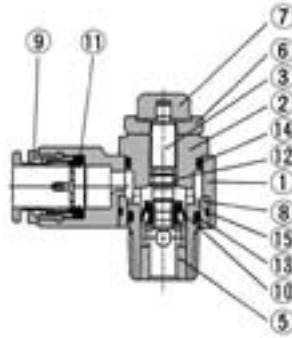
# Series AS

## 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**

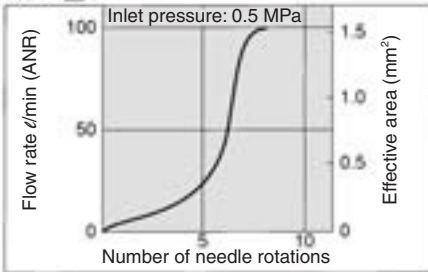
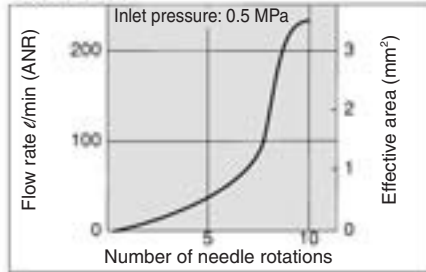
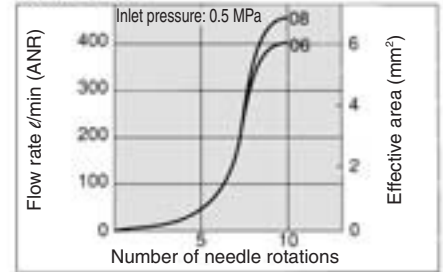
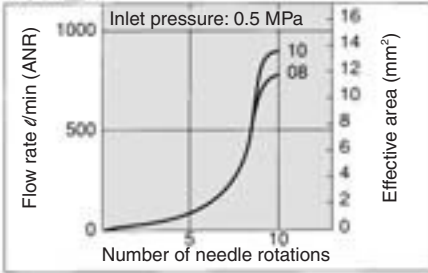
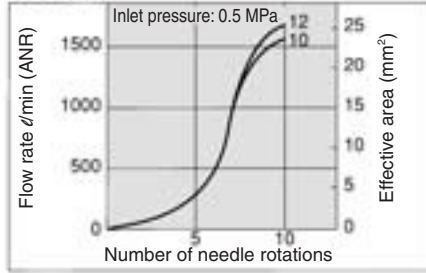
Ex.) AS1201-M5-F04-X214

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

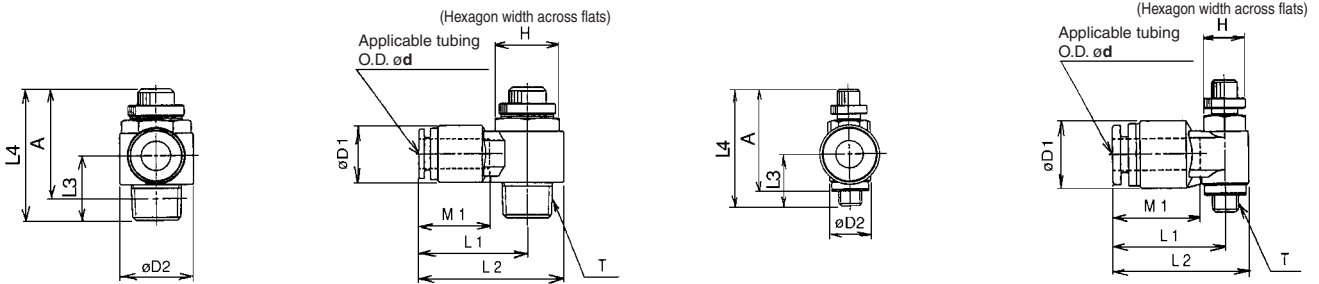
## Flow Rate and Effective Area

| 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 <sup>2</sup> ) | 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<br>O.D. ød | T        | H  | D1   | D2   | L1   | L2   | L3   | L4 <sup>(1)</sup> |      | A <sup>(2)</sup> |      | M1   | Mass<br>(g) |
|----------------|------------------------------|----------|----|------|------|------|------|------|-------------------|------|------------------|------|------|-------------|
|                |                              |          |    |      |      |      |      |      | Max.              | Min. | Max.             | Min. |      |             |
| 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   |      |                   |      |                  |      |      |             |
| 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                            |          |    |      |      |      |      |      |                   |      |                  |      |      |             |
| 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                            |          |    |      |      |      |      |      |                   |      |                  |      |      |             |
| 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 |      |                   |      |                  |      |      |             |
| 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                           |          |    |      |      |      |      |      |                   |      |                  |      |      |             |

Note 1) Reference dimensions

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

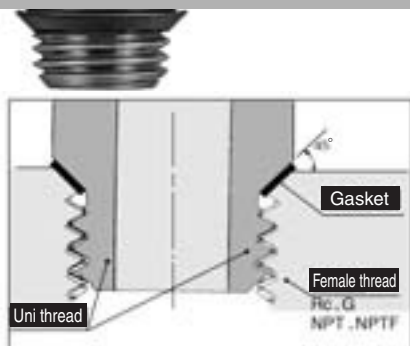
### ⚠ Caution

**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

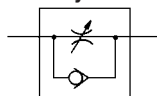
Use of the chamfered surface of the female thread as the seat surface and adoption of gaskets made by laminating NBR on both surfaces of stainless steel plates achieve secure sealing regardless of the difference of diameters due to the female thread type, deviations due to the tolerance, or the size of the chamfered corner.  
(Any standard chamfered female thread can be used.)

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

**The 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<br>Uni thread | Applicable tubing O.D. |   |   |   |    |    |           |       |       |      |       |      |      |   |
|-------------|----------------|---------------------------------|------------------------|---|---|---|----|----|-----------|-------|-------|------|-------|------|------|---|
| Elbow type  | Universal type |                                 | 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" |   |
| 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 <sup>(1)</sup> | Nylon, Soft-nylon, Polyurethane                            |
| Mounting thread                           | Uni-thread   |
| Thread seal                               | Gasket   |
| Option                                    | Hexagon lock nut, Electroless nickel plated <sup>(2)</sup> |

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<br>AS23□IF-U02 |                       | AS22□IF-U02<br>AS23□IF-U02 |       | AS32□IF<br>AS33□IF   |      |       | AS42□IF-U04<br>AS43□IF-U04 |      |      |
|--------------------------------|-----------------------------------|----------------------------|-----------------------|----------------------------|-------|----------------------|------|-------|----------------------------|------|------|
| Tubing O.D.                    | Metric size                       | ø3.2,<br>ø4                | ø6, ø8,<br>ø4         | ø4                         | ø6    | ø8, ø10              | ø6   | ø8    | ø10,<br>ø12                | ø10  | ø12  |
|                                | Inch size                         | 1/8",<br>5/32"             | 3/16", 1/4",<br>5/16" | 5/32"                      | 3/16" | 1/4", 5/16",<br>3/8" | 1/4" | 5/16" | 3/8"                       | 3/8" | 1/2" |
| Controlled flow<br>(Free flow) | Flow rate (l/min (ANR))           | 180                        | 230                   | 260                        | 390   | 460                  | 660  | 790   | 920                        | 1580 | 1710 |
|                                | Effective area (mm <sup>2</sup> ) | 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).

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

ASR

ASQ

KE

TMH

## 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**

**Made to Order**

|      |                 |
|------|-----------------|
| X260 | Antistatic type |
|------|-----------------|

Refer to page 450 for details.

**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 |       | 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"  |

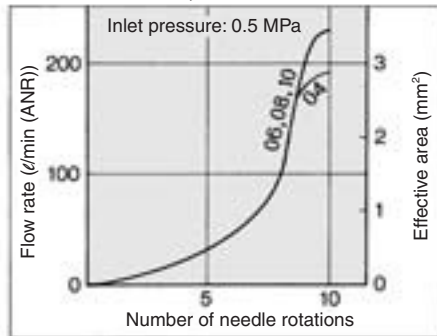
\* Use ø1/8" tube.

**Bore size**

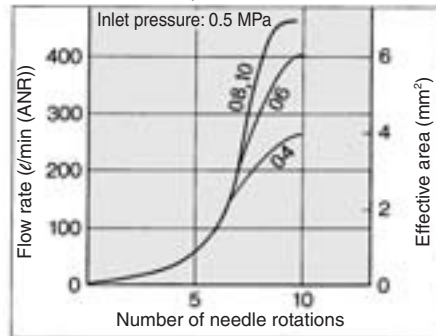
|     |         |
|-----|---------|
| U01 | Uni 1/8 |
| U02 | Uni 1/4 |
| U03 | Uni 3/8 |
| U04 | Uni 1/2 |

## Needle Valve/Flow Characteristics

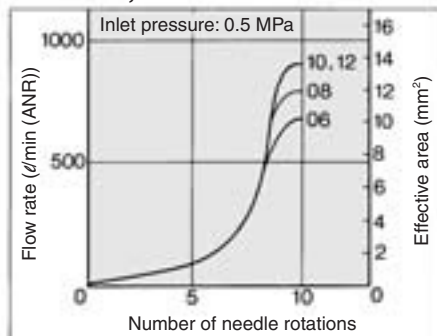
AS2201F-U01, AS2211F-U01  
AS2301F-U01, AS2311F-U01



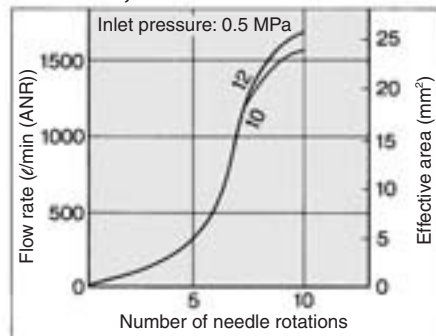
AS2201F-U02, AS2211F-U02  
AS2301F-U02, AS2311F-U02



AS3201F, AS3211F  
AS3301F, AS3311F

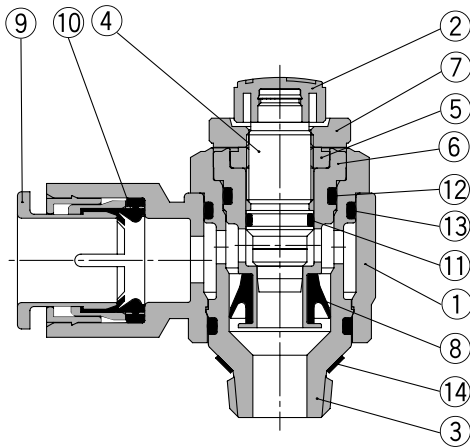


AS4201F, AS4211F  
AS4301F, AS4311F

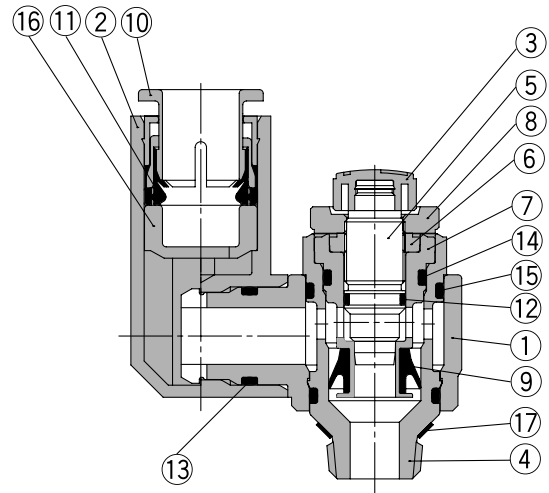


## Construction/Component Parts

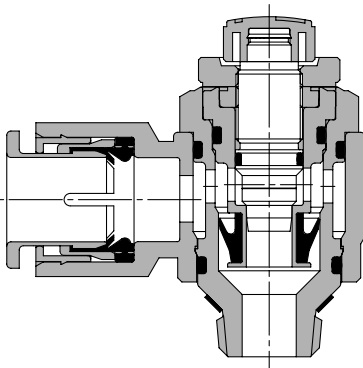
### Elbow type Meter-out type



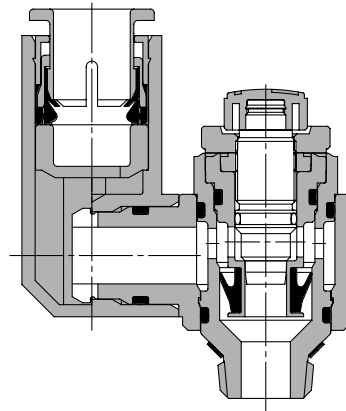
### Universal type Meter-out type



### 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                | <sup>(1)</sup>                           |
| 7   | Lock nut     | Brass <sup>(2)</sup> | Electroless nickel plated <sup>(3)</sup> |
| 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                | <sup>(1)</sup>                           |
| 8   | Lock nut     | Brass <sup>(2)</sup> | Electroless nickel plated <sup>(3)</sup> |
| 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.

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

ASR

ASQ

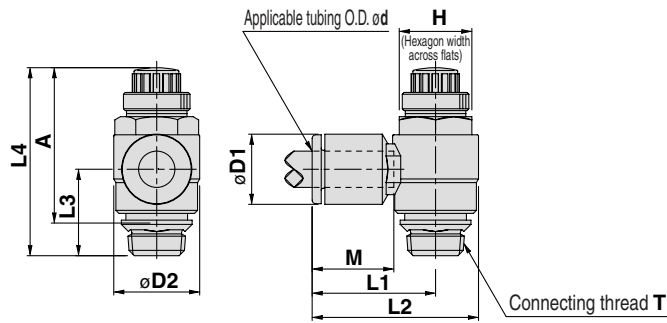
KE

TMH

# Series AS



## Elbow Type/Metric Size



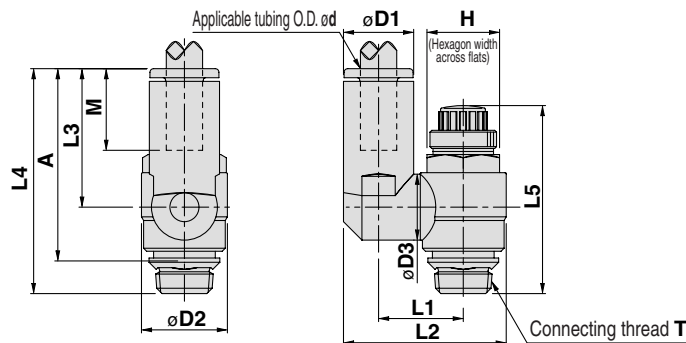
| Model          | Applicable tubing O.D. ød | T<br>Uni thread | H    | øD1  | øD2  | L1   | L2   | L3   | L4 (1) |      | A (2) |      | M    | Mass (g) |
|----------------|---------------------------|-----------------|------|------|------|------|------|------|--------|------|-------|------|------|----------|
|                |                           |                 |      |      |      |      |      |      | Max.   | Min. | Max.  | Min. |      |          |
| 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 |      |        |      |       |      | 17   |          |
| AS22□1F-U01-08 | 8                         |                 |      | 15.2 |      | 25.3 | 32.4 |      |        |      |       |      | 19   |          |
| AS22□1F-U01-10 | 10                        |                 |      | 18.5 |      | 33.1 | 40.2 |      |        |      |       |      | 21.0 |          |
| 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 |      |        |      |       |      | 17   |          |
| AS22□1F-U02-08 | 8                         |                 |      | 15.2 |      | 27.2 | 36.4 |      |        |      |       |      | 18.5 |          |
| AS22□1F-U02-10 | 10                        |                 |      | 18.5 |      | 35.3 | 44.5 |      |        |      |       |      | 19   |          |
| 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 |          |
| AS32□1F-U02-10 | 10                        |                 |      | 18.5 |      | 31.8 | 43.3 |      |        |      |       |      | 21.0 |          |
| AS32□1F-U02-12 | 12                        |                 |      | 20.9 |      | 32.8 | 44.3 |      |        |      |       |      | 22.0 |          |
| 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 |          |
| AS32□1F-U03-10 | 10                        |                 |      | 18.5 |      | 31.8 | 43.3 |      |        |      |       |      | 21.0 |          |
| AS32□1F-U03-12 | 12                        |                 |      | 20.9 |      | 32.8 | 44.3 |      |        |      |       |      | 22.0 |          |
| AS42□1F-U04-10 | 10                        |                 |      | 1/2  |      | 24   | 18.5 |      |        |      |       |      | 28.6 | 33.6     |
| 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



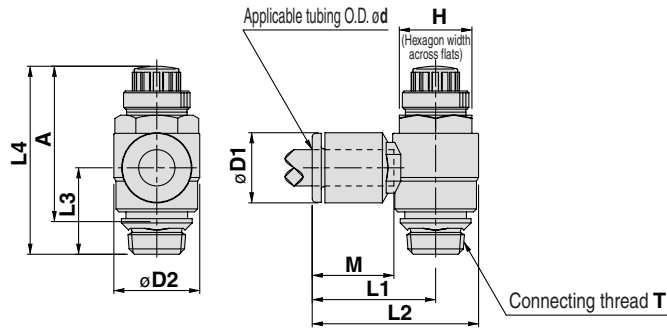
| Model          | Applicable tubing O.D. ød | T<br>Uni thread | H    | øD1  | øD2  | øD3  | L1   | L2   | L3   | L4   | L5 (1) |      | A (2) |      | M    | Mass (g) |      |      |      |      |      |
|----------------|---------------------------|-----------------|------|------|------|------|------|------|------|------|--------|------|-------|------|------|----------|------|------|------|------|------|
|                |                           |                 |      |      |      |      |      |      |      |      | Max.   | Min. | Max.  | Min. |      |          |      |      |      |      |      |
| 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  |      |      |      |      |      |      |        |      |       |      | 14.5 | 27.1     | 20.6 | 34.9 | 17   |      |      |
| AS23□1F-U01-06 | 6                         |                 |      | 11.0 |      |      |      |      |      |      |        |      |       |      | 10.9 | 14.5     | 27.1 | 20.6 | 34.9 | 18   |      |
| AS23□1F-U01-08 | 8                         |                 |      | 15.2 |      |      |      |      |      |      |        |      |       |      | 12.9 | 16.2     | 30.9 | 24.7 | 38.2 | 21   |      |
| AS23□1F-U02-04 | 4                         |                 |      | 1/4  |      |      |      |      |      |      |        |      |       |      | 17   | 8.9      | 18.5 | 9.3  | 15.6 | 29.2 | 18.9 |
| 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 |
| 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



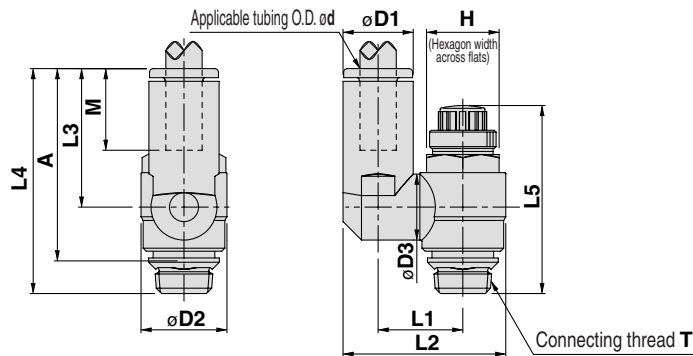
| Model          | Applicable tubing O.D. ød | T Uni thread | H  | øD1  | øD2  | L1   | L2   | L3   | L4 (1) |      | A (2) |      | M    | Mass (g) |
|----------------|---------------------------|--------------|----|------|------|------|------|------|--------|------|-------|------|------|----------|
|                |                           |              |    |      |      |      |      |      | 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     |
| AS22□1F-U01-07 | 1/4"                      |              |    | 13.2 |      | 23.9 | 31.0 |      |        |      |       |      |      | 17.0     |
| AS22□1F-U01-09 | 5/16"                     |              |    | 15.2 |      | 25.3 | 32.4 |      |        |      |       |      |      | 18.5     |
| 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     |
| AS22□1F-U02-07 | 1/4"                      |              |    | 13.2 |      | 25.2 | 34.5 |      |        |      |       |      |      | 17.0     |
| AS22□1F-U02-09 | 5/16"                     |              |    | 15.2 |      | 27.2 | 36.4 |      |        |      |       |      |      | 18.5     |
| AS22□1F-U02-11 | 3/8"                      |              |    | 17.9 |      | 35.3 | 44.5 |      |        |      |       |      |      | 21.0     |
| 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     |
| AS32□1F-U02-11 | 3/8"                      |              |    | 17.9 |      | 31.8 | 43.3 |      |        |      |       |      |      | 21.0     |
| 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     |
| AS32□1F-U03-11 | 3/8"                      |              |    | 17.9 |      | 31.8 | 43.3 |      |        |      |       |      |      | 21.0     |
| 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     |

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 |      |      |      |      |      |      |        |      |       |      |      | 16.5     |
| AS23□1F-U01-07 | 1/4"                      |              |    | 13.2 |      |      |      |      |      |      |        |      |       |      |      | 17.0     |
| AS23□1F-U01-09 | 5/16"                     |              |    | 15.2 |      |      |      |      |      |      |        |      |       |      |      | 18.5     |
| 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 |      |      |      |      |      |      |        |      |       |      |      | 16.5     |
| AS23□1F-U02-07 | 1/4"                      |              |    | 13.2 |      |      |      |      |      |      |        |      |       |      |      | 17.0     |
| AS23□1F-U02-09 | 5/16"                     |              |    | 15.2 |      |      |      |      |      |      |        |      |       |      |      | 18.5     |
| AS23□1F-U02-11 | 3/8"                      |              |    | 17.9 |      |      |      |      |      |      |        |      |       |      |      | 21.0     |
| 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 |      |      |      |      |      |      |        |      |       |      |      | 20.6     |
| AS33□1F-U02-11 | 3/8"                      |              |    | 17.9 |      |      |      |      |      |      |        |      |       |      |      | 22.5     |
| 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 |      |      |      |      |      |      |        |      |       |      |      | 20.6     |
| AS33□1F-U03-11 | 3/8"                      |              |    | 17.9 |      |      |      |      |      |      |        |      |       |      |      | 22.5     |
| 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     |

Note 1) Reference dimensions

Note 2) Reference dimensions of Uni thread after installation.

- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR
- ASQ
- KE
- TMH



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

## Antistatic Type

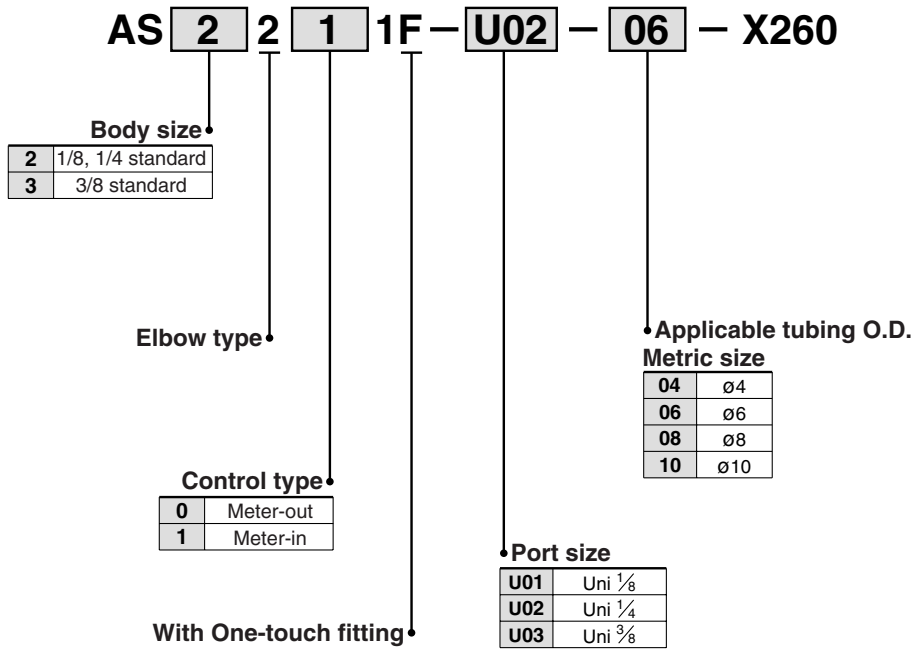
## X260

### 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

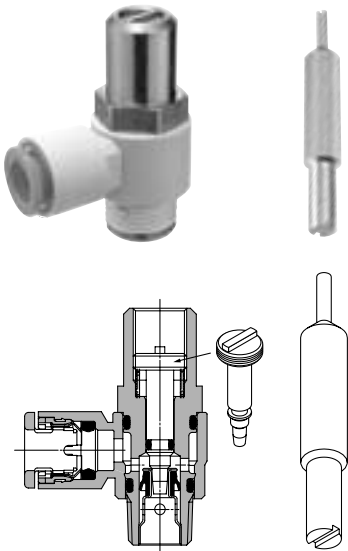
### How to Order



# 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

Elbow type



Universal type



### 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 <sup>(1)</sup> ) |
| Applicable tubing material <sup>(2)</sup> | 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.

### 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   |

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

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.

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

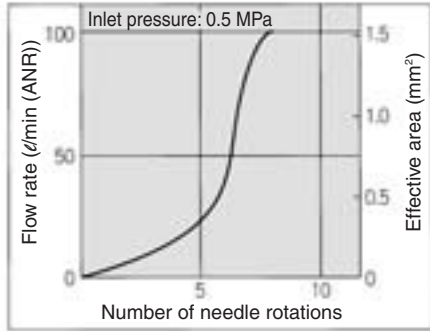
Made to Order  
Refer to page 535 for details.

\* Use ø1/8" tube.

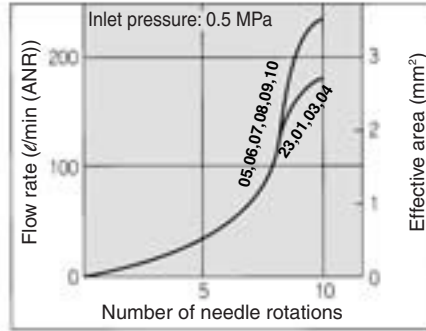
Made to Order  
(Refer to page 535 for details.)

Needle Valve/Flow Characteristics

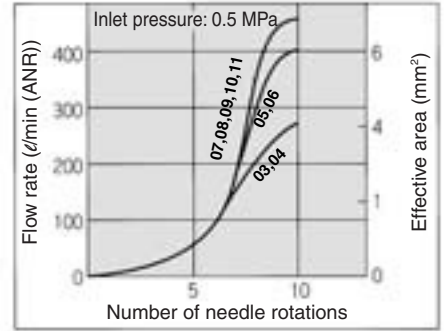
AS12□1F  
AS13□1F



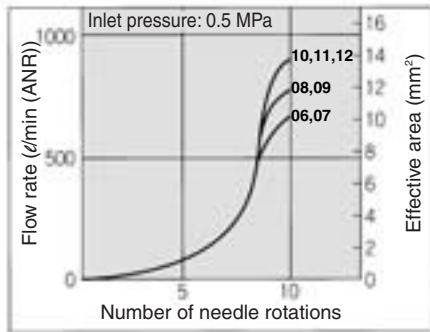
AS22□1F-□01  
AS23□1F-□01



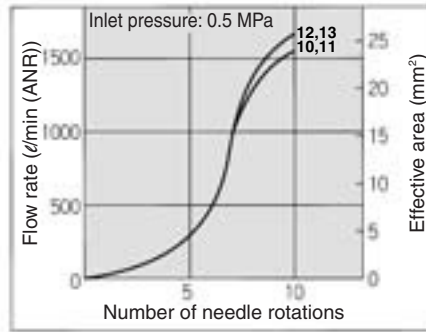
AS22□1F-□02  
AS23□1F-□02



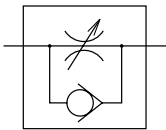
AS32□1F  
AS33□1F



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<br>AS13□1F           | AS22□1F-□01<br>AS23□1F-□01           | AS22□1F-□02<br>AS23□1F-□02           | AS32□1F<br>AS33□1F   | AS42□1F<br>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<br>(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.

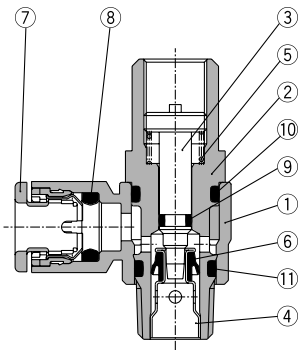
- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR
- ASQ
- KE
- TMH



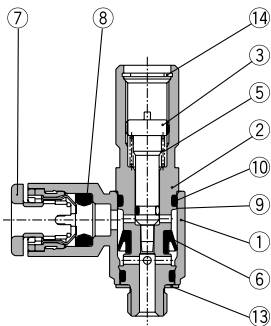
# Series AS□□□1F-T

## Construction

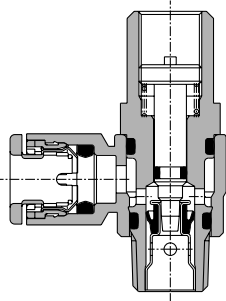
**Elbow type**  
Meter-out type



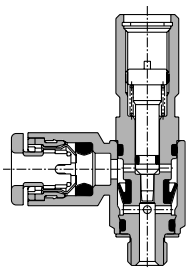
**M5 type**  
U10/32 type



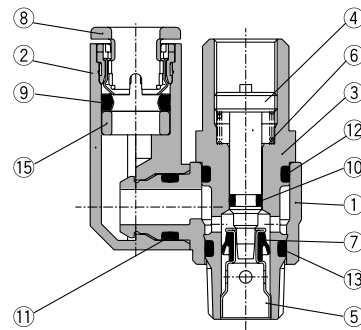
**Meter-in type**



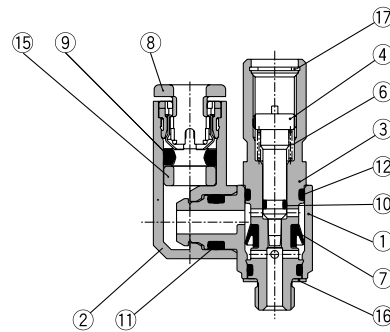
**M5 type**  
U10/32 type



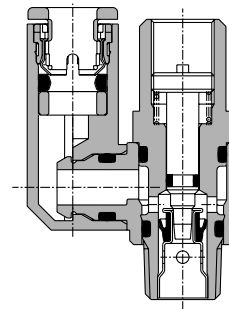
**Universal type**  
Meter-out type



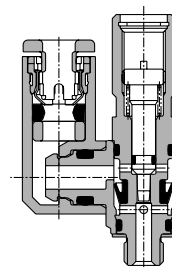
**M5 type**  
U10/32 type



**Meter-in type**



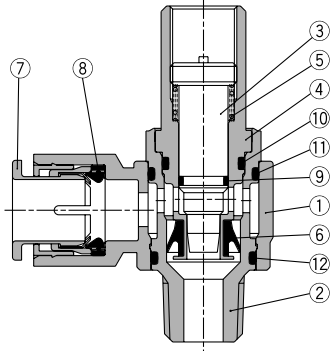
**M5 type**  
U10/32 type



**Construction**

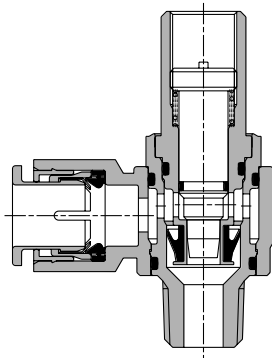
**Elbow type**  
 Meter-out type

**AS3201F-02**



**Meter-in type**

**AS3211F-02**

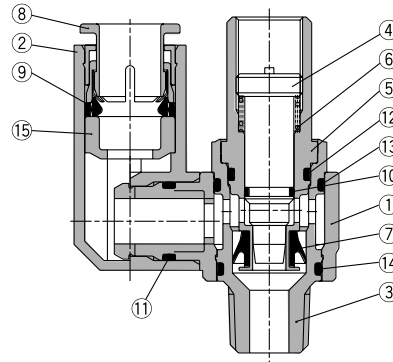


**Component Parts**

| 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           |                           |

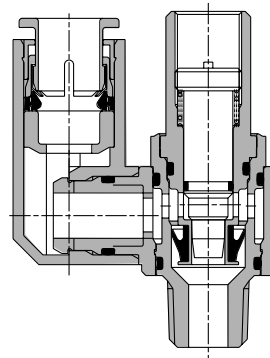
**Universal type**  
 Meter-out type

**AS3301F-02**



**Meter-in type**

**AS3311F-02**



**Component Parts**

| No. | Description                    | Material             | Note                      |
|-----|--------------------------------|----------------------|---------------------------|
| 1   | Body A                         | PBT                  |                           |
| 2   | Elbow body                     | PBT                  |                           |
| 3   | 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           |                           |

- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR
- ASQ
- KE
- TMH



Series **AS□□□1F-T**

# Made to Order Specifications

Please contact SMC for detailed dimensions, specifications and delivery.



Lubricant: Vaseline

**X12**

Ex.) AS1201F-M5-23T-X12

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.

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.

**AS**

**ASP**

**ASN**

**AQ**

**ASV**

**AK**

**VCHC**

**ASS**

**ASR**  
**ASQ**

**KE**

**TMH**

# 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 |

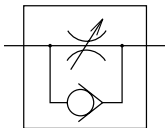
Note 1) In the case of AS1001F type

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

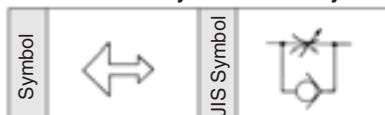
#### JIS Symbol



| 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 (mm <sup>2</sup> ) | 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 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.

### 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.**

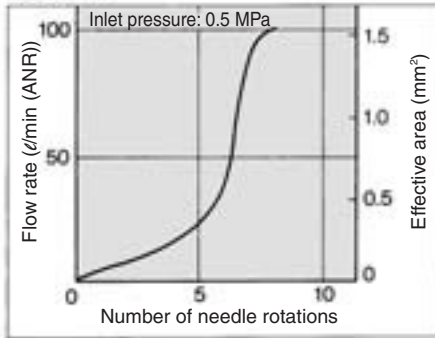
| Metric size | Inch size |
|-------------|-----------|
| 23          | ø3.2 *    |
| 04          | ø4        |
| 06          | ø6        |
| 08          | ø8        |
| 10          | ø10       |
| 12          | ø12       |
| 01          | ø1/8"     |
| 03          | ø5/32"    |
| 05          | ø3/16"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

\* Use ø1/8" tube.

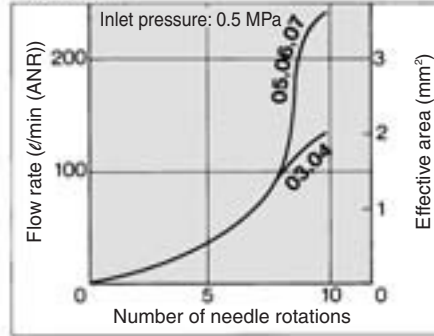
**Made to Order**  
Refer to page 538 for details.

## Needle Valve/Flow Characteristics

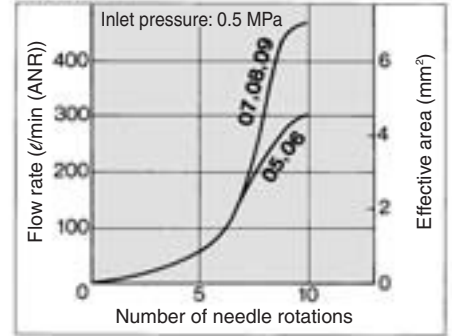
**AS1001F**



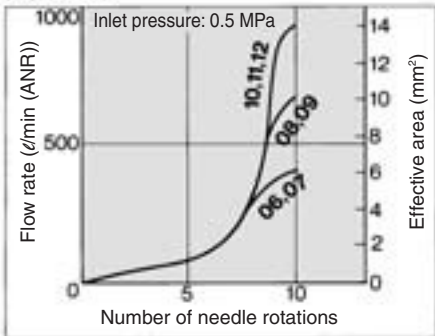
**AS2001F**



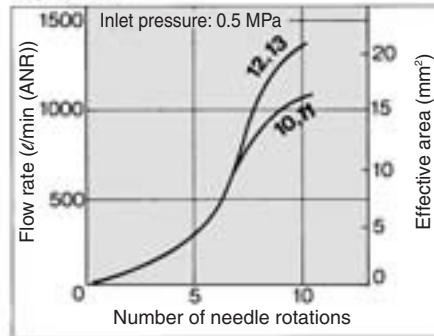
**AS2051F**



**AS3001F**

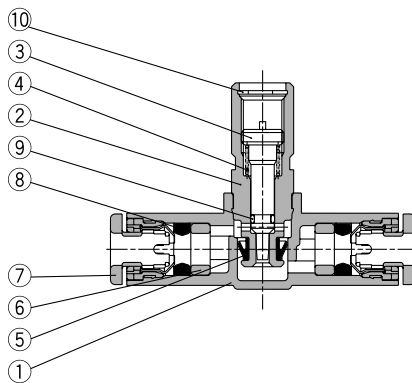


**AS4001F**

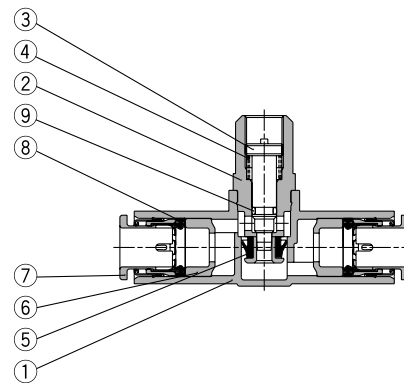


## Construction

**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 |                           |

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

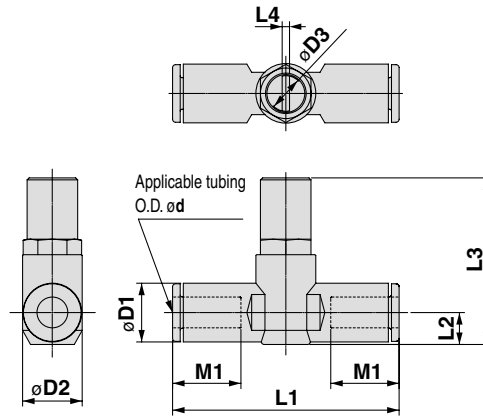
ASR  
ASQ

KE

TMH

# Series AS□□□1F-T

## 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 |     | 13.5 | 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 |     | 13.5 | 9        |
| AS1001F-05T | 3/16" | 11.4 |      |     | 48.7 | 6.2  | 27.7 |     | 13.5 | 14       |
| AS1001F-07T | 1/4"  | 12   | 11.8 | 7   | 40.7 | 5.2  | 31.9 | 1.5 | 12.7 | 15       |
| AS2001F-03T | 5/32" | 9.3  |      |     | 40.7 | 5.2  | 31.9 |     | 12.7 | 15       |
| AS2001F-05T | 3/16" | 11.4 | 11.8 | 7   | 50   | 6.2  | 32.8 | 1.5 | 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 | 19.8 | 9.5 | 59.8 | 8.1  | 36.7 | 1.5 | 18   | 36       |
| AS3001F-07T | 1/4"  | 13.2 |      |     | 59   | 7.4  | 45.2 |     | 17   | 56       |
| AS3001F-09T | 5/16" | 15.2 | 19.8 | 9.5 | 64.4 | 8.2  | 46   | 1.5 | 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

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

**X21**

Ex.) AS1001F-23T-X21

Note 1) Not particle-free

Throttle Valve (Without Check Valve)

**X214**

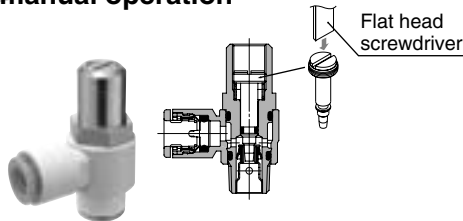
Ex.) AS1001F-23T-X214

# 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



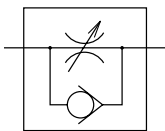
Elbow type



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 <sup>(1)</sup> ) |
| Applicable tubing material <sup>(2)</sup> | 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<br>AS13□1F                          | AS22□1F-□01<br>AS23□1F-□01              | AS22□1F-□02<br>AS23□1F-□02                 | AS32□1F<br>AS33□1F      | AS42□1F<br>AS43□1F |          |     |     |     |     |      |      |
|--------------------------------|---|---|--|-------------------------|--------------------|----------|-----|-----|-----|-----|------|------|
|                                | Tubing O.D.                                 | Metric size<br>ø3.2, ø4, ø6             | ø3.2, ø4, ø6, ø8, ø10                      | ø4, ø6, ø8, ø10         | ø6, ø8, ø10, ø12   | ø10, ø12 |     |     |     |     |      |      |
|                                | Inch size<br>ø1/8", ø5/32"<br>ø3/16", ø1/4" | ø1/8", ø3/16", ø1/4",<br>ø5/32", ø5/16" | ø5/32", ø3/16",<br>ø1/4", ø5/16",<br>ø3/8" | ø1/4", ø5/16",<br>ø3/8" | ø3/8", ø1/2"       |          |     |     |     |     |      |      |
| Controlled flow<br>(Free flow) | Flow rate (l/min (ANR))                     | 100                                     | 180  | 230                     | 260                | 390      | 460 | 660 | 790 | 920 | 1580 | 1710 |
|                                | Effective area (mm <sup>2</sup> )           | 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  |

**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 |
|-------------|-----------|
| 03          | ø1/8"     |
| 04          | ø4        |
| 05          | ø5/32"    |
| 06          | ø6        |
| 07          | ø3/16"    |
| 08          | ø8        |
| 09          | ø5/16"    |
| 10          | ø10       |
| 11          | ø3/8"     |
| 12          | ø12       |
| 13          | ø1/2"     |

**Type adjustable by flat head screwdriver**

**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.

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

**With One-touch fitting**

\* Use ø1/8" tube.

### Made to Order



Lubricant: Vaseline

**X12**

Ex.) AS1201F-M5-23D-X12

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.

Throttle Valve (Without Check Valve)

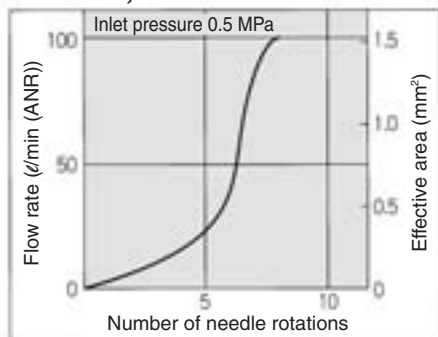
**X214**

Ex.) AS1201F-M5-23D-X214

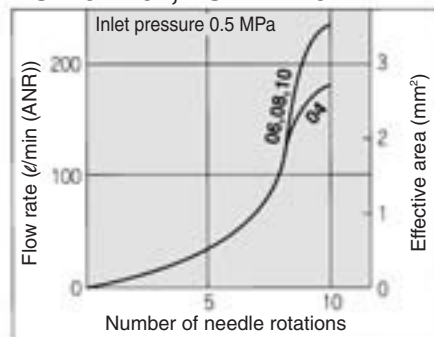
Note) Throttle valve is only compatible with the part no. of the meter-out type.

### Needle Valve/Flow Characteristics

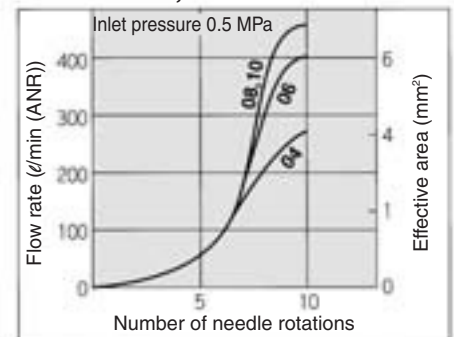
AS1201F, AS1211F



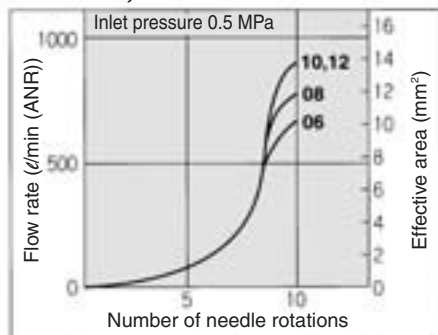
AS2201F-01, AS2211F-01



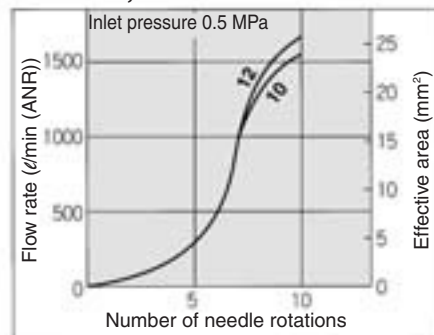
AS2201F-02, AS2211F-02



AS3201F, AS3211F



AS4201F, AS4211F

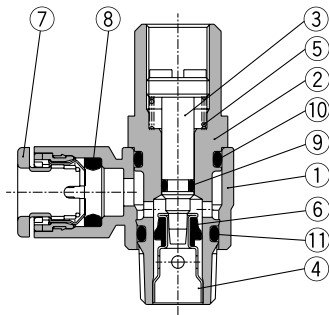


- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR
- ASQ
- KE
- TMH

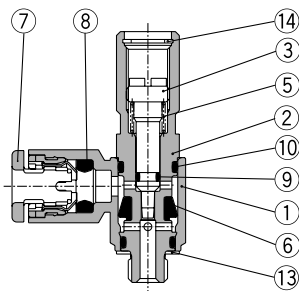
# Series AS□□□1F-D

## Construction

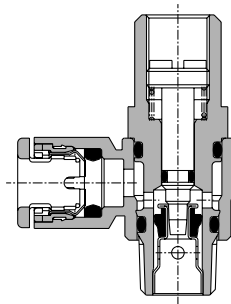
### Elbow type Meter-out type



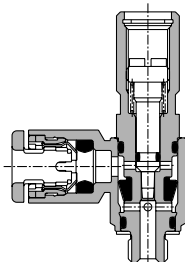
### M5 type U10/32 type



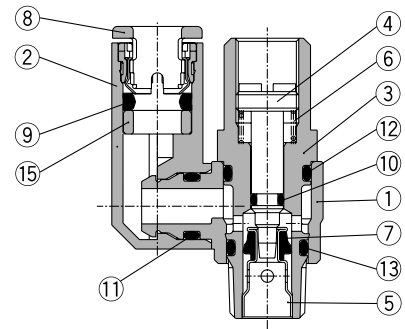
### Meter-in type



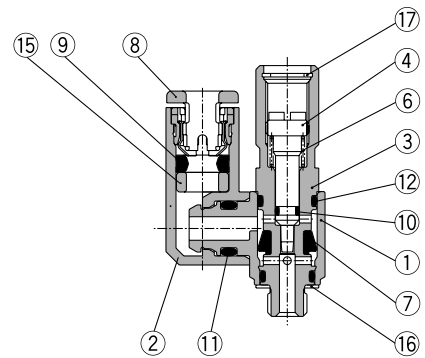
### M5 type U10/32 type



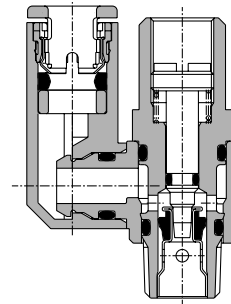
### Universal type Meter-out type



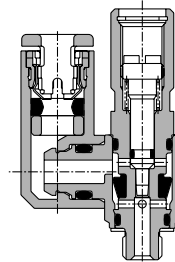
### M5 type U10/32 type



### Meter-in type



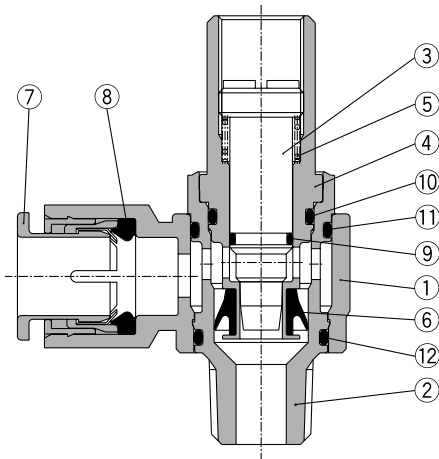
### M5 type U10/32 type



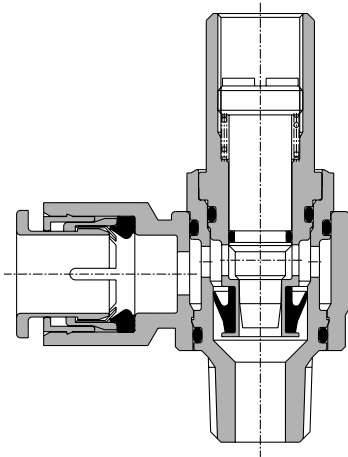
## Construction

### Elbow type

Meter-out AS3201F-02



Meter-in AS3211F-02

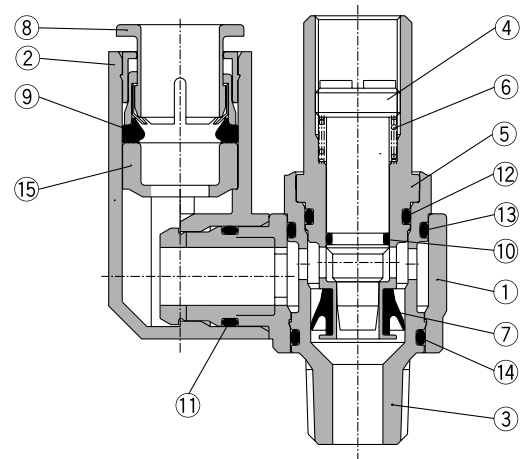


### Component Parts

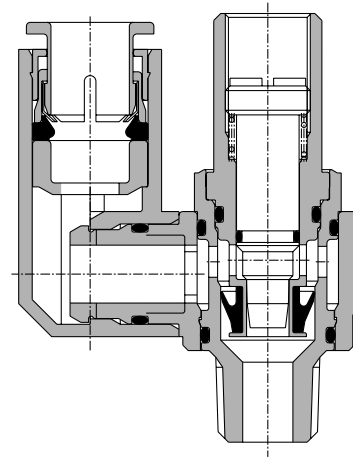
| No. | Description                    | Material             | Note                      |
|-----|--------------------------------|----------------------|---------------------------|
| 1   | Body A                         | PBT                  |                           |
| 2   | Body B                         | 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           |                           |

### Universal type

Meter-out AS3301F-02



Meter-in AS3311F-02



### 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           |                           |

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

ASR  
ASQ

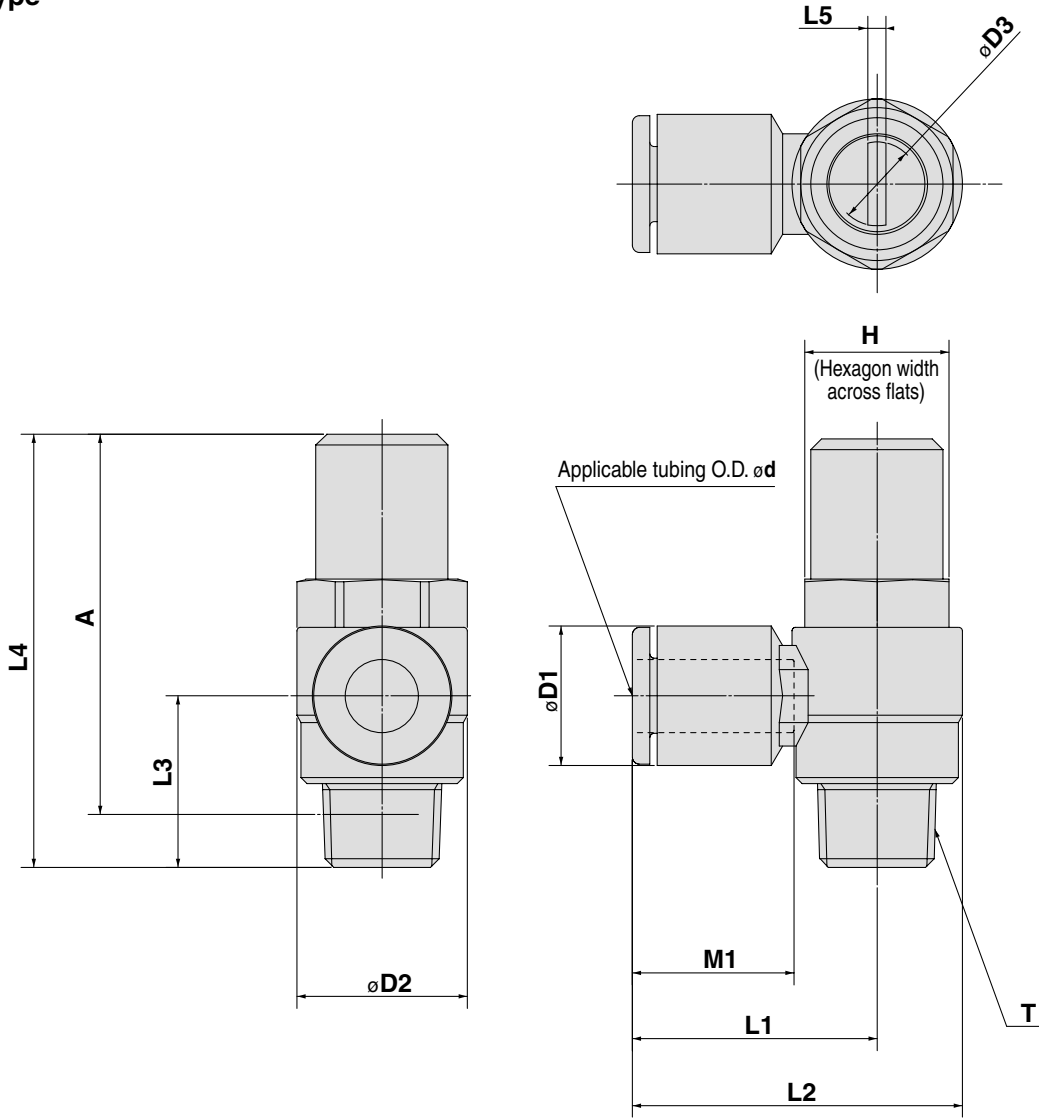
KE

TMH

# Series AS□□□1F-D

## 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  |      |      | 18.1 | 22.9 | 11.7 |      |      |      | 13.5 |          |      |      |    |
| 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  |      |      |      |      |      |      |      |      | 25.3 | 32.4     | 13.5 | 23   |    |
| AS22□1F-01-06SD | 6   |          |      | 11.6 |      |      |      |      |      |      |      |      | 25.3 | 32.4     | 13.5 | 23   |    |
| AS22□1F-01-08SD | 8   |          |      | 15.2 |      |      |      |      |      |      |      |      | 25.3 | 32.4     | 13.5 | 23   |    |
| AS22□1F-01-10SD | 10  |          |      | 18.5 |      |      |      |      |      |      |      |      | 25.3 | 32.4     | 13.5 | 23   |    |
| AS22□1F-02-04SD | 4   |          |      | 10.4 |      |      |      |      |      |      |      |      | 25.2 | 34.4     | 16   | 40   |    |
| AS22□1F-02-06SD | 6   |          |      | 12.8 |      |      |      |      |      |      |      |      | 25.2 | 34.4     | 17   | 40   |    |
| AS22□1F-02-08SD | 8   | 15.2     | 27.2 | 36.4 | 18.5 | 42   |      |      |      |      |      |      |      |          |      |      |    |
| AS22□1F-02-10SD | 10  | 18.5     | 27.2 | 36.4 | 21   | 44   |      |      |      |      |      |      |      |          |      |      |    |
| AS32□1F-02-06SD | 6   | R 1/4    | 17   | 18.5 | 7.2  | 25.2 | 34.4 | 17.7 | 40.2 | 1.2  | 34.7 | 17   | 73   |          |      |      |    |
| AS32□1F-02-08SD | 8   |          |      |      |      |      |      |      |      |      |      | 29.5 |      | 41       | 18.5 | 76   |    |
| AS32□1F-02-10SD | 10  |          |      |      |      |      |      |      |      |      |      | 18.5 |      | 23       | 9.8  | 21   | 80 |
| AS32□1F-02-12SD | 12  |          |      |      |      |      |      |      |      |      |      | 20.9 |      | 32.8     | 44.3 | 22   | 82 |
| AS32□1F-03-06SD | 6   |          |      |      |      |      |      |      |      |      |      | 12.8 |      | 27.8     | 39.3 | 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   | 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.

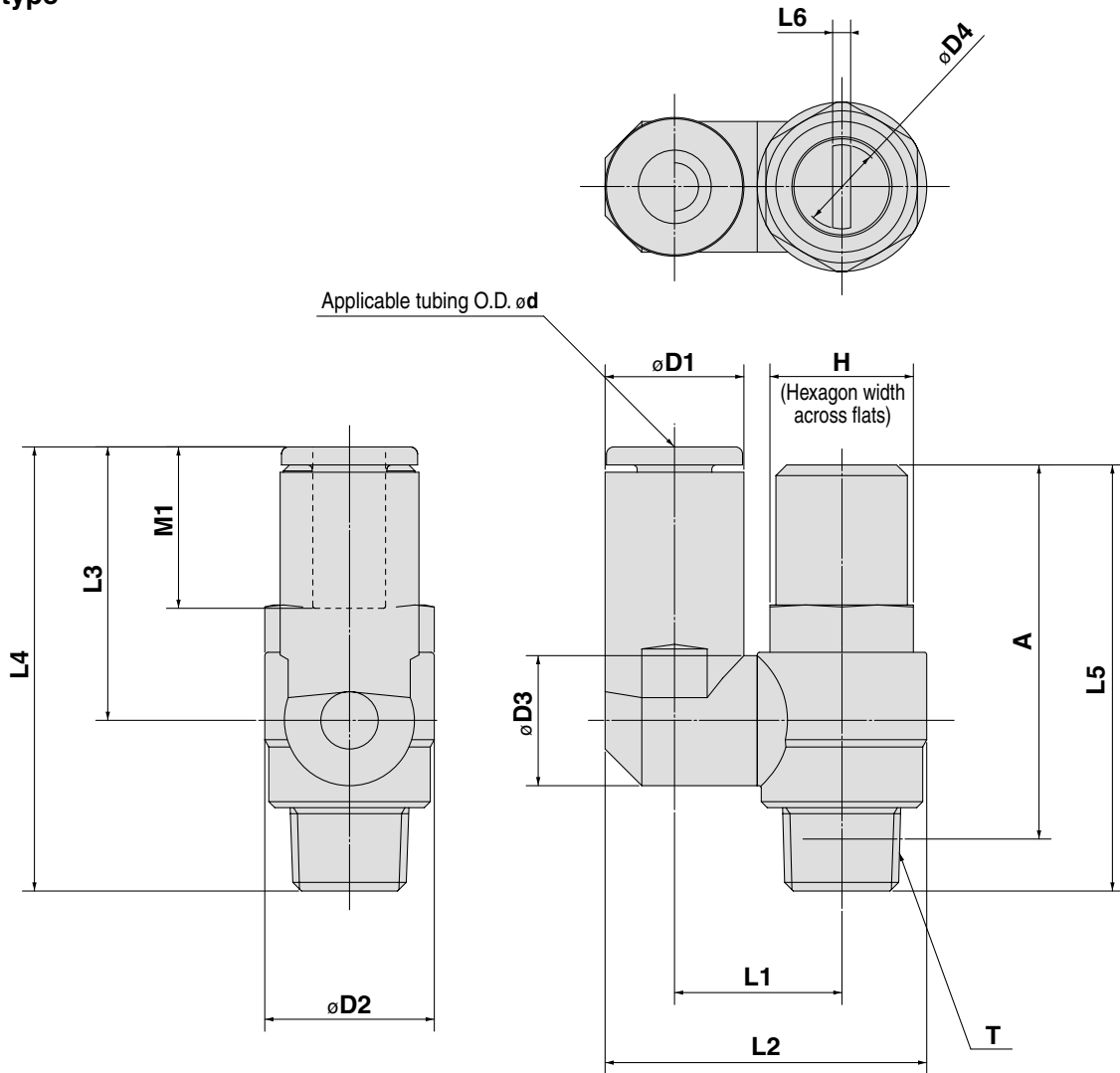
### Inch Size

| 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  |      |      | 21.3    | 26.1 | 11.7 |      |      |      | 16.5 |          |      |      |      |      |      |     |      |      |    |
| 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 | 11.7 | 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  |      |      | 24      | 31.1 |      |      |      |      | 13.4 | 34.7     | 1.2  | 31.6 | 16.5 | 23   |      |     |      |      |    |
| AS22□1F-N01-05SD   | 3/16" |           |      | 13.2 |      |      | 23.9    | 31   |      |      |      |      | 13.4 | 34.7     | 1.2  | 31.6 | 18.5 | 23   |      |     |      |      |    |
| AS22□1F-N01-07SD   | 1/4"  |           |      | 15.2 |      |      | 25.3    | 32.4 |      |      |      |      | 13.4 | 34.7     | 1.2  | 31.6 | 21   | 25   |      |     |      |      |    |
| AS22□1F-N01-09SD   | 5/16" |           |      | 15.2 |      |      | 25.3    | 32.4 |      |      |      |      | 13.4 | 34.7     | 1.2  | 31.6 | 21   | 25   |      |     |      |      |    |
| AS22□1F-N02-03SD   | 5/32" |           |      | 10.4 |      |      | 25.2    | 34.4 |      |      |      |      | 16   | 40       |      |      |      |      |      |     |      |      |    |
| AS22□1F-N02-07SD   | 3/16" |           |      | 12.8 |      |      | 25.2    | 34.4 |      |      |      |      | 17   | 40       |      |      |      |      |      |     |      |      |    |
| AS22□1F-N02-07SD   | 1/4"  | NPT 1/4   | 17.5 | 13.2 | 18.5 | 7.2  | 25.2    | 34.5 | 17.7 | 40.2 | 1.2  | 34.7 | 18.5 | 42       |      |      |      |      |      |     |      |      |    |
| AS22□1F-N02-09SD   | 5/16" |           |      |      |      |      | 15.2    | 27.2 |      |      |      |      | 36.4 | 17.7     | 40.2 | 1.2  | 34.7 | 18.5 | 42   |     |      |      |    |
| AS22□1F-N02-11SD   | 3/8"  |           |      |      |      |      | 18.3    | 35.3 |      |      |      |      | 44.5 | 19.5     | 44   |      |      |      |      |     |      |      |    |
| AS32□1F-N02-07SD   | 1/4"  |           |      |      |      |      | 13.2    | 27.8 |      |      |      |      | 39.3 | 17       | 73   |      |      |      |      |     |      |      |    |
| AS32□1F-N02-09SD   | 5/16" |           |      |      |      |      | NPT 1/4 | 19   |      |      |      |      | 15.2 | 23       | 9.8  | 29.5 | 41   | 21.3 | 54.8 | 1.2 | 49.3 | 18.5 | 76 |
| AS32□1F-N02-11SD   | 3/8"  |           |      |      |      |      |         |      |      |      |      |      |      |          |      | 17.9 | 31.8 | 43.3 | 21   | 80  |      |      |    |
| AS32□1F-N03-07SD   | 1/4"  |           |      |      |      |      |         |      |      |      |      |      |      |          |      | 13.2 | 27.8 | 39.3 | 17   | 73  |      |      |    |
| AS32□1F-N03-09SD   | 5/16" | NPT 3/8   | 19   | 15.2 | 23   | 9.8  | 29.5    | 41   | 19.8 | 52.6 | 1.2  | 47.4 | 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 |          |    | 8.4  |      |      |      | 19.8 | 17.5 | 28.7 |      |      |     |      | 12.7 | 10       |
| AS13□1F-M5-04D  | 4   | M5 x 0.8 | 8  | 9.3  | 9.6  | 9.3  | 4.7  | 10.8 | 20.3 | 21.4 | 20.6 | 31.8 |     | 0.7  | 27.4 | 13.5     |
| AS13□1F-M5-06D  | 6   |          |    | 11.6 |      |      |      |      |      |      |      |      |     |      |      |          |
| AS23□1F-01-23SD | 3.2 |          |    | 8.4  |      | 9.3  |      | 13.1 | 24.4 | 17.5 | 30.9 |      |     |      | 12.7 | 21       |
| AS23□1F-01-04SD | 4   |          |    | 9.3  |      |      | 7.2  |      | 24.9 | 17.5 | 30.9 |      |     |      |      | 22       |
| AS23□1F-01-06SD | 6   | R 1/8    | 12 | 11.6 | 14.2 | 10.9 |      | 14   | 26.9 | 22.9 | 36.3 | 34.7 | 1.2 | 31.6 | 13.5 | 25       |
| AS23□1F-01-08SD | 8   |          |    | 15.2 |      | 12.9 |      | 16.2 | 30.9 | 28.2 | 40.8 |      |     |      | 18.5 | 40       |
| AS23□1F-02-04SD | 4   |          |    | 10.4 |      | 10.9 |      | 16.2 | 30.6 | 21.9 | 39.6 |      |     |      | 16   | 40       |
| AS23□1F-02-06SD | 6   |          |    | 12.8 | 18.5 |      | 7.2  | 18.4 | 34   | 25.2 | 42.1 | 40.2 | 1.2 | 34.7 | 17   | 41       |
| AS23□1F-02-08SD | 8   | R 1/4    | 17 | 15.2 |      | 12.9 |      | 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   |          |    | 12.8 |      | 12.9 |      | 20.6 | 38.5 | 25.2 | 46.5 |      |     |      | 17   | 73       |
| AS33□1F-02-08SD | 8   |          |    | 15.2 | 23   |      | 9.8  |      | 39.7 | 28.2 | 49.5 | 54.8 | 1.2 | 49.3 | 18.5 | 76       |
| AS33□1F-02-10SD | 10  | R 1/4    | 19 | 18.5 |      |      |      | 23   | 43.7 | 32.6 | 53.9 |      |     |      | 21   | 80       |
| AS33□1F-02-12SD | 12  |          |    | 20.9 |      | 16.2 |      | 23   | 44.9 | 34.4 | 55.7 |      |     |      | 22   | 82       |
| AS33□1F-03-06SD | 6   |          |    | 12.8 |      | 12.9 |      | 20.6 | 38.5 | 25.2 | 45   |      |     |      | 17   | 78       |
| AS33□1F-03-08SD | 8   |          |    | 15.2 | 23   |      | 9.8  |      | 39.7 | 28.2 | 48   | 52.6 | 1.2 | 47.4 | 18.5 | 81       |
| AS33□1F-03-10SD | 10  | R 3/8    | 19 | 18.5 |      | 16.2 |      | 23   | 43.7 | 32.6 | 52.4 |      |     |      | 21   | 85       |
| AS33□1F-03-12SD | 12  |          |    | 20.9 |      |      |      | 23   | 44.9 | 34.4 | 54.2 |      |     |      | 22   | 87       |
| AS43□1F-04-10SD | 10  |          |    | 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  | R 1/2    | 24 | 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"  |           |      | 8.4  |     |      |      |      |      |      |      |      |     |      | 12.7 | 10       |
| AS13□1F-U10/32-03D | 5/32" |           |      | 9.3  |     |      |      |      |      |      |      |      |     |      |      |          |
| AS13□1F-U10/32-05D | 3/16" | 10-32 UNF | 8    | 11.4 | 9.6 | 9.3  | 4.7  | 10.8 |      |      |      |      |     | 0.7  | 27.4 | 13.5     |
| AS13□1F-U10/32-07D | 1/4"  |           |      | 12   |     |      |      |      |      |      |      |      |     |      |      |          |
| AS23□1F-N01-01SD   | 1/8"  |           |      | 8.4  |     | 9.3  |      | 13.1 | 24.4 | 17.5 | 30.9 |      |     |      | 12.7 | 21       |
| AS23□1F-N01-03SD   | 5/32" |           |      | 9.3  |     |      |      |      | 24.9 | 17.5 | 30.9 |      |     |      |      | 22       |
| AS23□1F-N01-05SD   | 3/16" | NPT 1/8   | 12.7 | 11.4 | 14  | 10.9 | 7.2  | 14   | 26.8 | 23.9 | 37.3 | 34.7 | 1.2 | 31.6 | 16.5 | 23       |
| AS23□1F-N01-07SD   | 1/4"  |           |      | 13.2 |     | 12.9 |      | 16.2 | 29.9 | 25.6 | 38.2 |      |     |      | 18.5 | 25       |
| AS23□1F-N01-09SD   | 5/16" |           |      | 15.2 |     |      |      |      | 30.9 | 28.2 | 40.8 |      |     |      | 21   | 25       |
| AS23□1F-N02-03SD   | 5/32" |           |      | 10.4 |     | 10.9 |      | 16.2 | 30.6 | 21.9 | 39.6 |      |     |      | 16   | 40       |
| AS23□1F-N02-05SD   | 3/16" |           |      | 11.4 |     |      |      |      | 31.1 | 23.9 | 41.6 |      |     |      | 17   | 41       |
| AS23□1F-N02-07SD   | 1/4"  | NPT 1/4   | 17.5 | 13.2 | 19  | 12.9 | 7.2  | 18.3 | 34.2 | 25.6 | 42.5 | 40.2 | 1.2 | 34.7 | 18.5 | 44       |
| AS23□1F-N02-09SD   | 5/16" |           |      | 15.2 |     | 12.9 |      | 20.2 | 35.2 | 28.2 | 45.1 |      |     |      | 21   | 47       |
| AS23□1F-N02-11SD   | 3/8"  |           |      | 17.9 |     |      |      |      | 38.7 | 31   | 47.9 |      |     |      | 21   | 48       |
| AS33□1F-N02-07SD   | 1/4"  |           |      | 13.2 |     | 12.9 |      | 20.6 | 38.7 | 25.6 | 46.9 |      |     |      | 17   | 73       |
| AS33□1F-N02-09SD   | 5/16" | NPT 1/4   | 19   | 15.2 | 23  | 9.8  |      | 23   | 39.7 | 28.2 | 49.5 | 54.8 | 1.2 | 49.3 | 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"  |           |      | 13.2 |     | 12.9 |      | 20.6 | 38.7 | 25.6 | 45.4 |      |     |      | 17   | 78       |
| AS33□1F-N03-09SD   | 5/16" | NPT 3/8   | 19   | 15.2 | 23  | 9.8  |      | 23   | 39.7 | 28.2 | 48   | 52.6 | 1.2 | 47.4 | 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.

- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR
- ASQ
- KE
- TMH

# 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

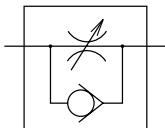
|                                |                                 |
|--------------------------------|---------------------------------|
| Fluid                          | Air                             |
| Proof pressure                 | 1.5 MPa                         |
| Max. operating pressure        | 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  |         |       |
|-----------------------------|-----------------------------------|------------------------------|---------|---------------|---------|---------------|---------|---------|----------|---------|-------|
|                             |                                   | Metric size                  | AS1001F | AS2001F       | AS2051F | AS3001F       | AS3001F | AS3001F | AS4001F  | 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 (mm <sup>2</sup> ) | 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

Type adjustable by flat head screwdriver

Made to Order

Refer to page 521 for details.

Applicable tubing O.D.

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

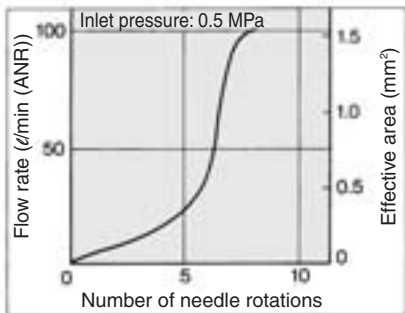
(Refer to page 521 for details.)

### Caution

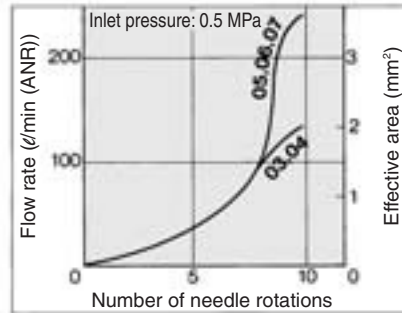
Be sure to read before handling.  
Refer to front matters 58 and 59 for Safety Instructions and pages 412 to 414 for Flow Control Equipment Precautions.

**Needle Valve/Flow Characteristics**

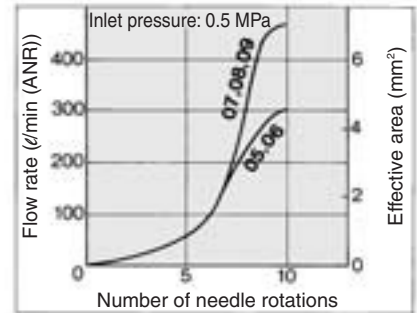
**AS1001F**



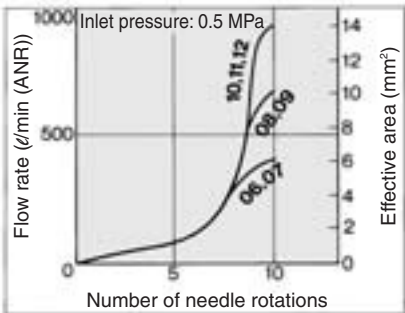
**AS2001F**



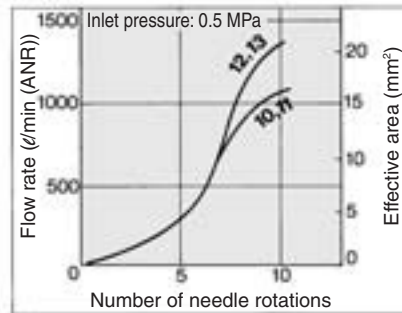
**AS2051F**



**AS3001F**

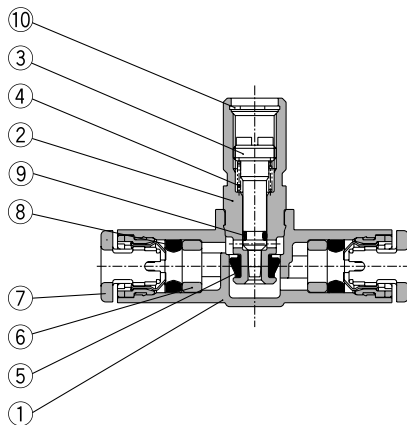


**AS4001F**

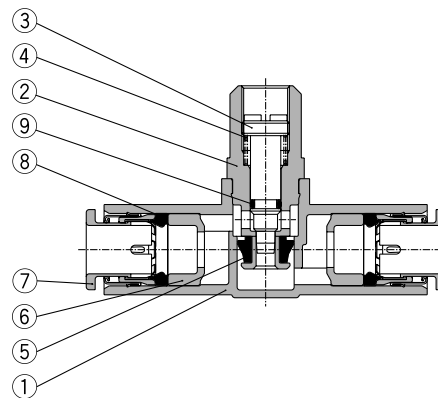


**Construction**

**AS1001F**



**AS2001F to AS4001F**



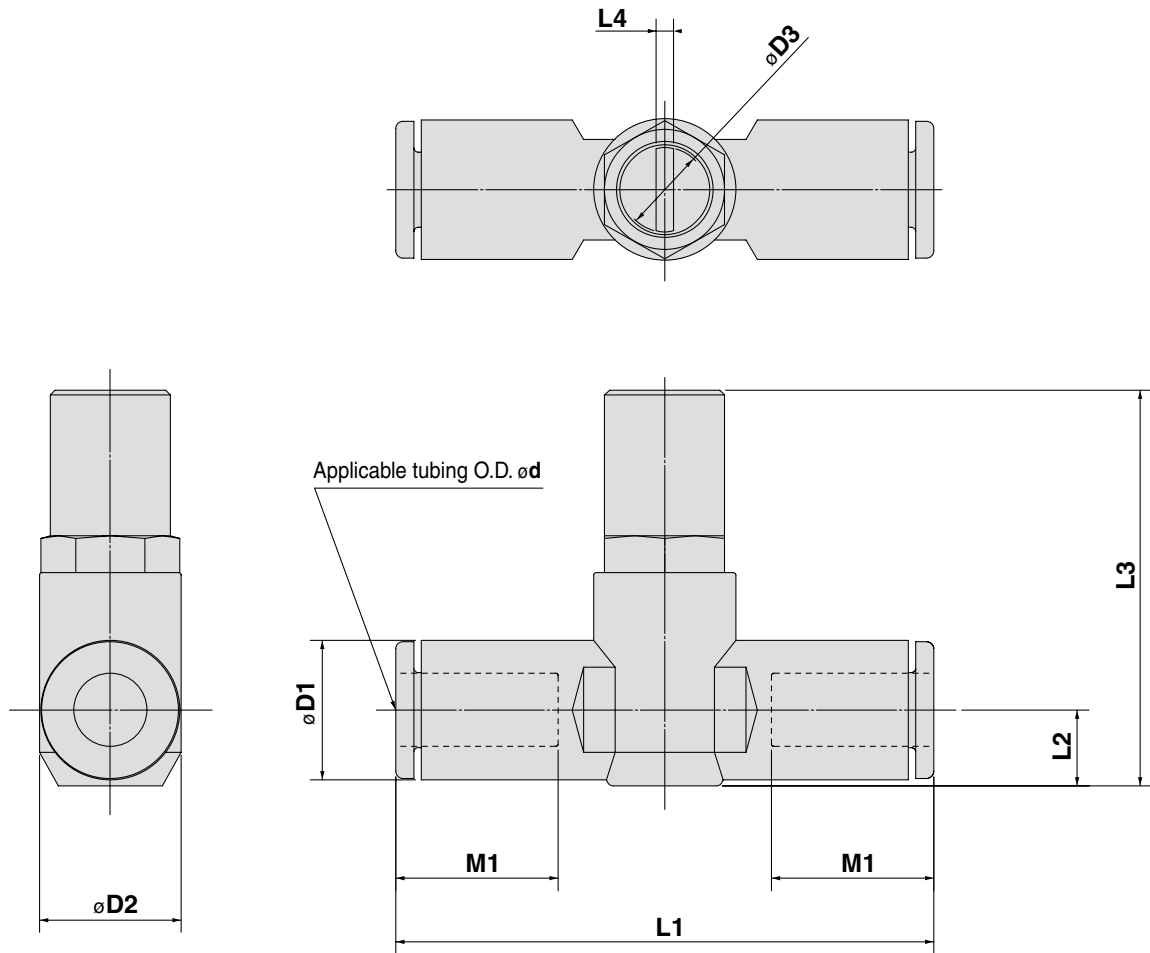
**Component Parts**

| 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 |                           |

- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR  
ASQ
- KE
- TMH

# Series AS□□□1F-D

## 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 | 11.8 | 7.2  | 40.7 | 6.2  | 27.7 | 1.2 | 13.5 | 10       |
| AS2001F-04D | 4   | 9.3  |      |      | 40.7 | 5.2  | 31.9 |     |      | 15       |
| AS2001F-06D | 6   | 11.6 | 14.8 | 7.2  | 44.8 | 6.3  | 33   | 1.2 | 13.5 | 16       |
| AS2051F-06D | 6   | 12.8 |      |      | 53.2 | 6.7  | 35.2 |     |      | 33       |
| AS2051F-08D | 8   | 15.2 | 19.8 | 9.8  | 59.8 | 8.1  | 36.5 | 1.2 | 17   | 36       |
| AS3001F-06D | 6   | 12.8 |      |      | 59   | 7.4  | 45   |     |      | 56       |
| AS3001F-08D | 8   | 15.2 | 10   | 18.5 | 64.4 | 8.2  | 45.8 | 1.2 | 18   | 60       |
| AS3001F-10D | 10  | 18.5 |      |      | 71.6 | 9.8  | 47.3 |     |      | 64       |
| AS3001F-12D | 12  | 20.9 | 26.5 | 12.4 | 76   | 11   | 48.5 | 1.2 | 22   | 68       |
| AS4001F-10D | 10  | 18.5 |      |      | 77.7 | 11.3 | 55.4 |     |      | 121      |
| AS4001F-12D | 12  | 20.9 | 82.1 | 11.3 | 56.4 | 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 | 11.8 | 7.2  | 40.7 | 6.2  | 27.7 | 1.2 | 13.5 | 10       |
| AS1001F-07D | 1/4"  | 12   |      |      | 40.7 | 5.2  | 31.9 |     |      | 15       |
| AS2001F-03D | 5/32" | 9.3  | 14.8 | 7.2  | 44.8 | 6.3  | 33   | 1.2 | 13.5 | 16       |
| AS2001F-05D | 3/16" | 11.4 |      |      | 50   | 6.2  | 32.8 |     |      | 21       |
| AS2001F-07D | 1/4"  | 13.2 | 19.8 | 9.8  | 52.2 | 7.1  | 33.7 | 1.2 | 17   | 19       |
| AS2051F-05D | 3/16" | 11.4 |      |      | 52.2 | 6.2  | 34.9 |     |      | 35       |
| AS2051F-07D | 1/4"  | 13.2 | 26.5 | 12.4 | 54.4 | 7.1  | 35.7 | 1.2 | 17   | 33       |
| AS2051F-09D | 5/16" | 15.2 |      |      | 59.8 | 8.1  | 36.7 |     |      | 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   |     |      | 60       |
| AS3001F-11D | 3/8"  | 17.9 | 26.5 | 12.4 | 70.8 | 9.5  | 47.2 | 1.2 | 21   | 72       |
| AS4001F-11D | 3/8"  | 17.9 |      |      | 76.9 | 10.3 | 55.5 |     |      | 129      |
| AS4001F-13D | 1/2"  | 21.7 | 83.1 | 11.6 | 56.9 | 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

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

**X21**

Ex.) AS1001F-23D-X21

Note 1) Not particle-free

Throttle Valve (Without Check Valve)

**X214**

Ex.) AS1001F-23D-X214

**AS**

**ASP**

**ASN**

**AQ**

**ASV**

**AK**

**VCHC**

**ASS**

**ASR  
ASQ**

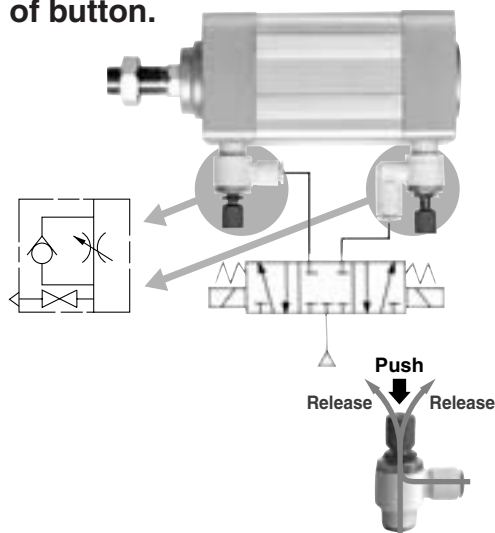
**KE**

**TMH**

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

## Series AS□□□□FE

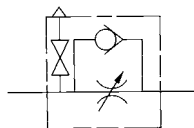
Residual pressure can be easily released with one push of button.



Eye-catching red color release button.



JIS Symbol



Flow Direction Symbols on Body

|            | Meter-out type | Meter-in type |
|------------|----------------|---------------|
| Symbol     |                |               |
| JIS Symbol |                |               |

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

464

### 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                          | ●                           | ●  | ●  | ● <sup>(1)</sup> |     | 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 mm <sup>2</sup>             |
| Applicable tubing material               | Nylon, Soft nylon, Polyurethane |

### Flow Rate and Effective Area

| Model                          |                                   | AS22□1FE-01<br>AS23□1FE-01 |                 | AS22□1FE-02<br>AS23□1FE-02 |     |           | AS32□1FE<br>AS33□1FE |     |            | AS42□1FE<br>AS43□1FE |      |
|--------------------------------|-----------------------------------|----------------------------|-----------------|----------------------------|-----|-----------|----------------------|-----|------------|----------------------|------|
| Tubing O.D.                    | Metric size                       | ø4                         | ø6<br>ø8<br>ø10 | ø4                         | ø6  | ø8<br>ø10 | ø6                   | ø8  | ø10<br>ø12 | ø10                  | ø12  |
| Controlled flow<br>(Free flow) | Flow rate (l/min (ANR))           | 180                        | 230             | 260                        | 390 | 460       | 660                  | 790 | 920        | 1580                 | 1710 |
|                                | Effective area (mm <sup>2</sup> ) | 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 FE - 01 - 06 SK -**

- Body size**

|   |                   |
|---|-------------------|
| 2 | 1/8, 1/4 standard |
| 3 | 3/8 standard      |
| 4 | 1/2 standard      |
- Type**

|   |           |
|---|-----------|
| 2 | Elbow     |
| 3 | Universal |
- Control type**

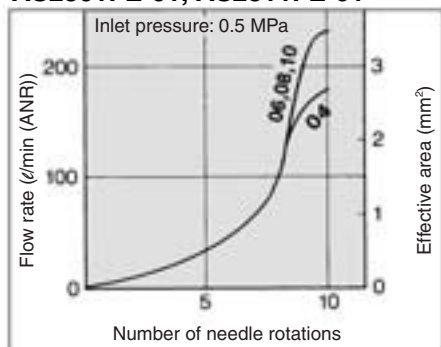
|   |           |
|---|-----------|
| 0 | Meter-out |
| 1 | Meter-in  |
- Port size**

|    |       |
|----|-------|
| 01 | R 1/8 |
| 02 | R 1/4 |
| 03 | R 3/8 |
| 04 | R 1/2 |
- Applicable tubing O.D. (mm)**

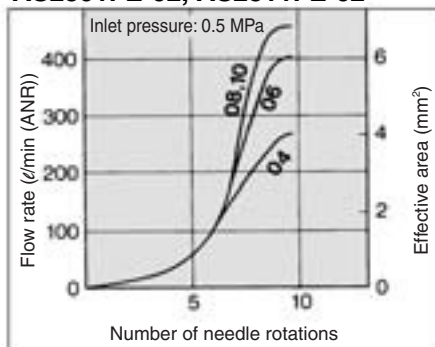
|    |     |
|----|-----|
| 04 | ø4  |
| 06 | ø6  |
| 08 | ø8  |
| 10 | ø10 |
| 12 | ø12 |
- Hexagonal lock nut**
- With seal**
- With residual pressure release valve**
- With One-touch fitting**
- Made to Order**  
Refer to page 465 for details.

### Needle Valve/Flow Characteristics

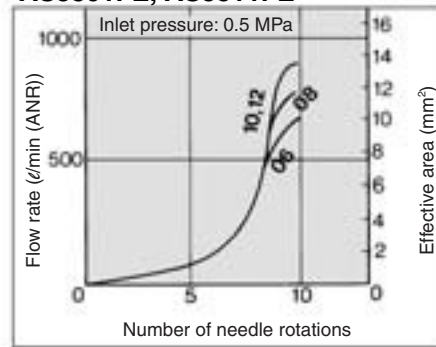
AS2201FE-01, AS2211FE-01  
AS2301FE-01, AS2311FE-01



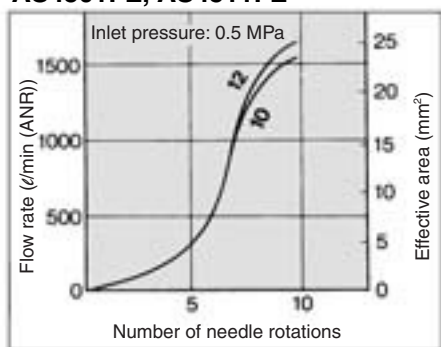
AS2201FE-02, AS2211FE-02  
AS2301FE-02, AS2311FE-02



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**



Lubricant: Vaseline

**X12**

Ex.) AS2201FE-01-04SK-X12

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.

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.

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

ASR  
ASQ

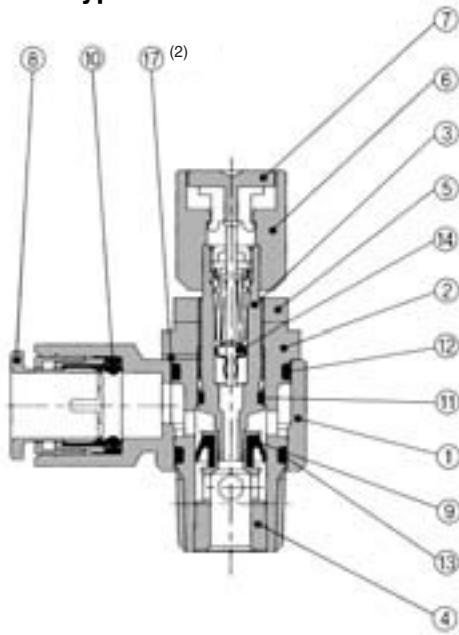
KE

TMH

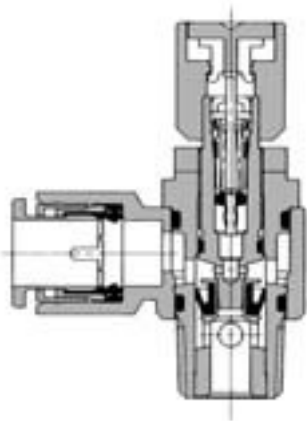
# Series AS□□□□FE

## Construction

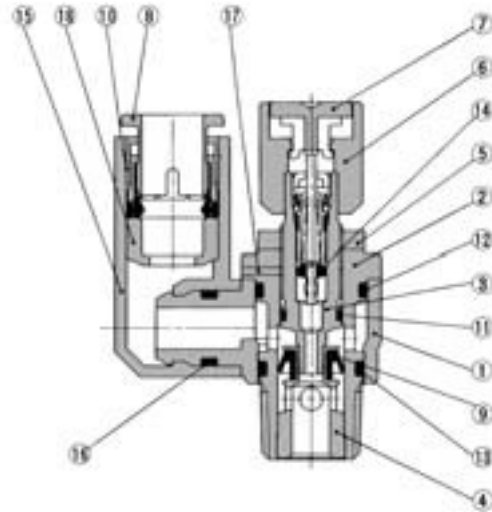
### Elbow type Meter-out type



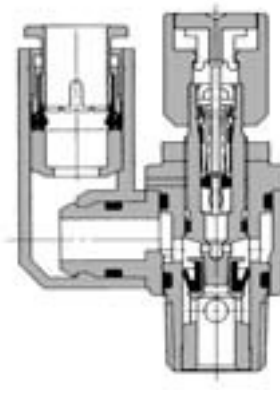
### Meter-in type



### Universal type Meter-out type



### Meter-in type



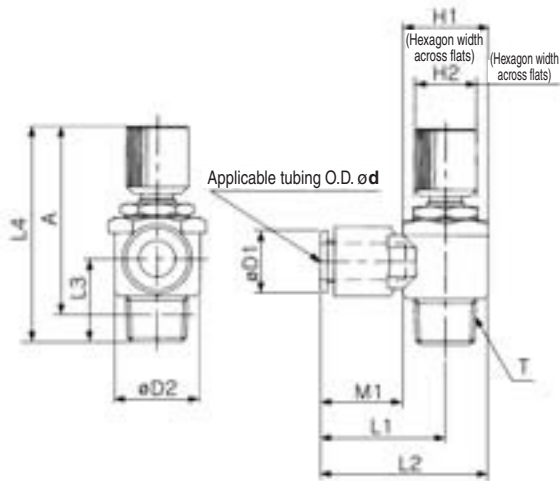
## Component Parts

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

## Dimensions

### Elbow type



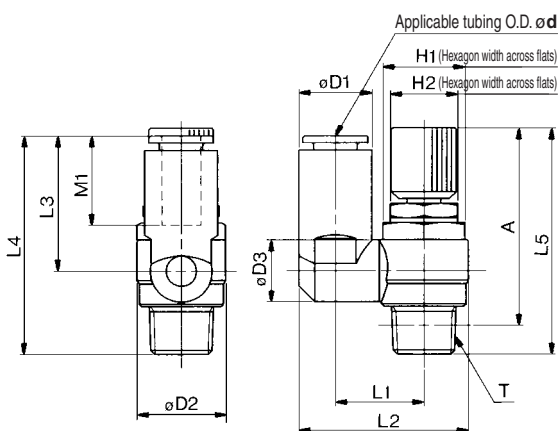
| Model            | Applicable tubing O.D. ød | T     | H1 | H2 | D1   | D2   | L1   | L2   | L3   | L4 (1) |      | A (2) |      | M1   | Mass (g) |
|------------------|---------------------------|-------|----|----|------|------|------|------|------|--------|------|-------|------|------|----------|
|                  |                           |       |    |    |      |      |      |      |      | 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 | 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 |      | 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 |      | 43.7 | 32.6 | 52.4 | 21   | 62   |        |      |       |      |      |          |
| AS33□1FE-03-12SK | 12                        |       |    |    | 20.9 |      | 16.2 | 23   | 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.

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

ASR

ASQ

KE

TMH

# 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.

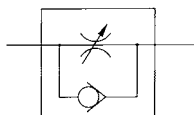


Elbow type



Universal type

JIS Symbol



Flow Direction Symbols on Body

|            | Meter-out type | Meter-in type |
|------------|----------------|---------------|
| Symbol     |                |               |
| JIS Symbol |                |               |

## 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 <sup>(1)</sup> ) |
| Applicable tubing material <sup>(2)</sup> | 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                          | AS22□1FG-□01 | AS22□1FG-□02 | AS32□1FG |     |     | AS42□1FG |     |     |     |      |      |
|-----------------------------|-----------------------------------|--------------|--------------|----------|-----|-----|----------|-----|-----|-----|------|------|
|                             | AS13□1FG                          | AS23□1FG-□01 | AS23□1FG-□02 | AS33□1FG |     |     | AS43□1FG |     |     |     |      |      |
| Tubing O.D.                 | Metric size                       | ø3.2         | ø3.2         | ø6       | ø4  | ø6  | ø8       | ø6  | ø8  | ø10 | ø10  | ø12  |
|                             | Inch size                         | ø4           | ø4           | ø8       |     |     | ø10      |     |     |     |      |      |
|                             |                                   | ø6           |              | ø10      |     |     |          |     |     |     |      |      |
| Controlled flow (Free flow) | Flow rate (ℓ/min (ANR))           | 100          | 180          | 230      | 260 | 390 | 460      | 660 | 790 | 920 | 1580 | 1710 |
|                             | Effective area (mm <sup>2</sup> ) | 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) |
| N   | R                          |
|     | 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       |

**Option**

|     |            |
|-----|------------|
| Nil | None       |
| S   | With seal* |

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

**Applicable tubing O.D.**

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

\* Use ø1/8" tube.

|    |        |
|----|--------|
| 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



**1** Lubricant: Vaseline **X12**

Ex.) AS1201FG-M5-23-X12

**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.

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

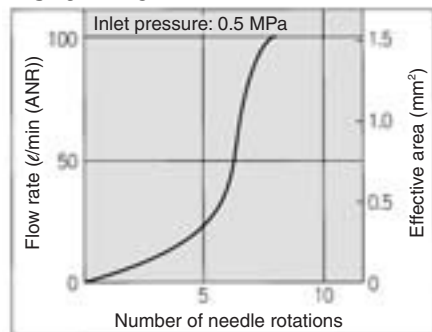
Ex.) AS1201FG-M5-23-X21

Note 1) Not particle-free

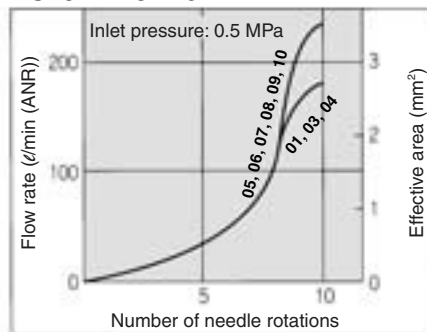
Note 2) Throttle valve is only compatible with the part no. of the meter-out type.

## Needle Valve/Flow Characteristics

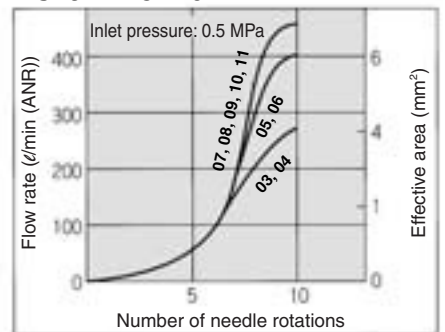
AS12□1FG  
AS13□1FG



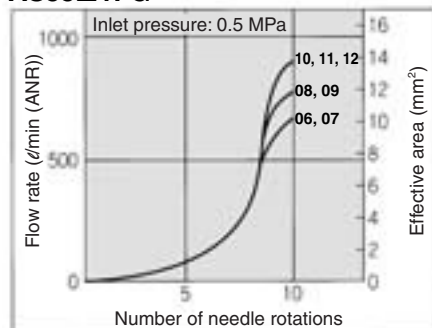
AS22□1FG-□01  
AS23□1FG-□01



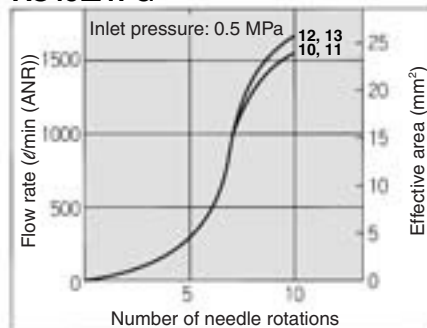
AS22□1FG-□02  
AS23□1FG-□02



AS32□1FG  
AS33□1FG



AS42□1FG  
AS43□1FG



- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR
- ASQ
- KE
- TMH

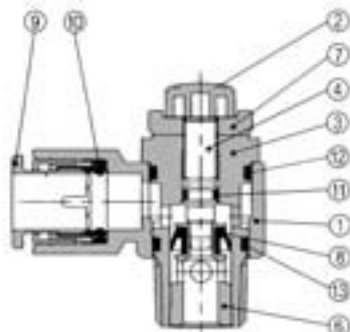
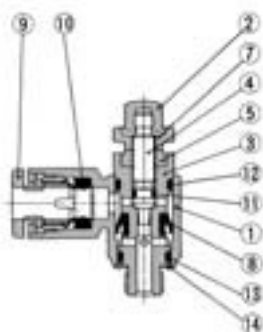
# Series AS-FG

## Construction: Elbow Type

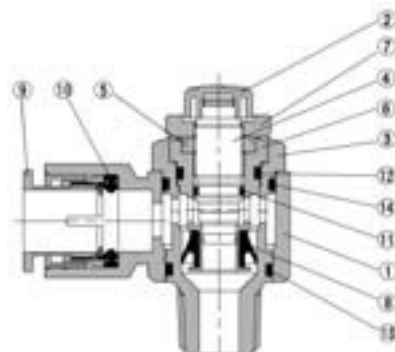
### Meter-out type

M5 type

U10/32 type



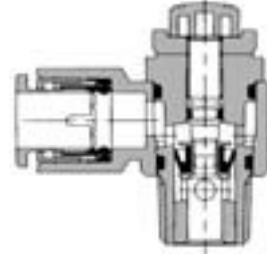
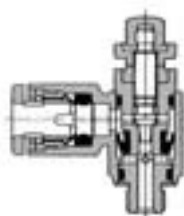
AS3201FG-02



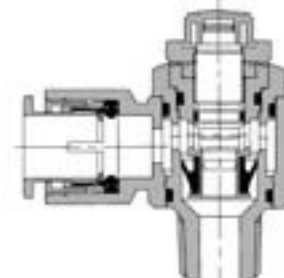
### Meter-in type

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.



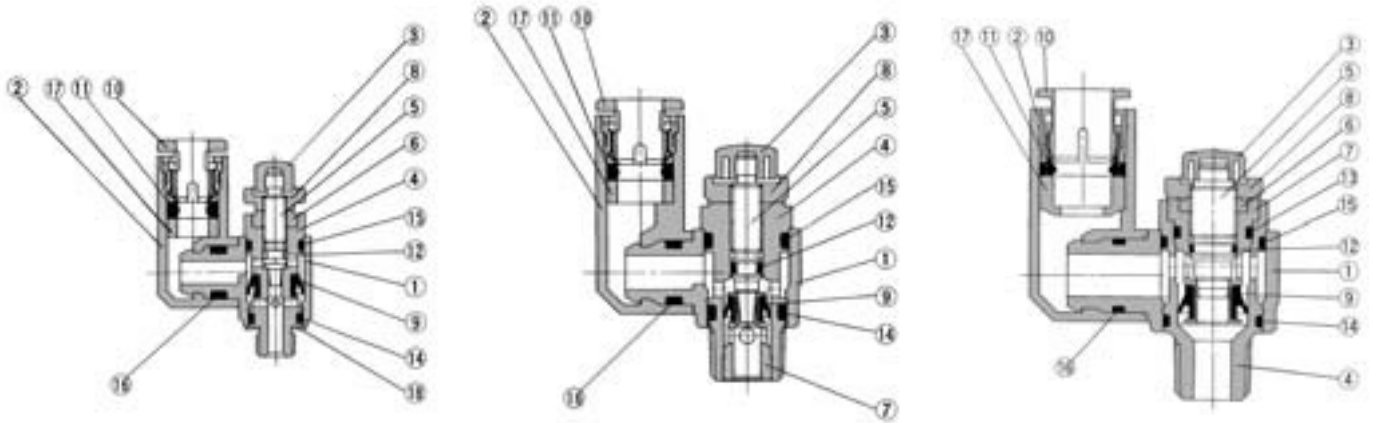
**Construction: Universal Type**

**Meter-out type**

M5 type

U10/32 type

AS3301FG-02

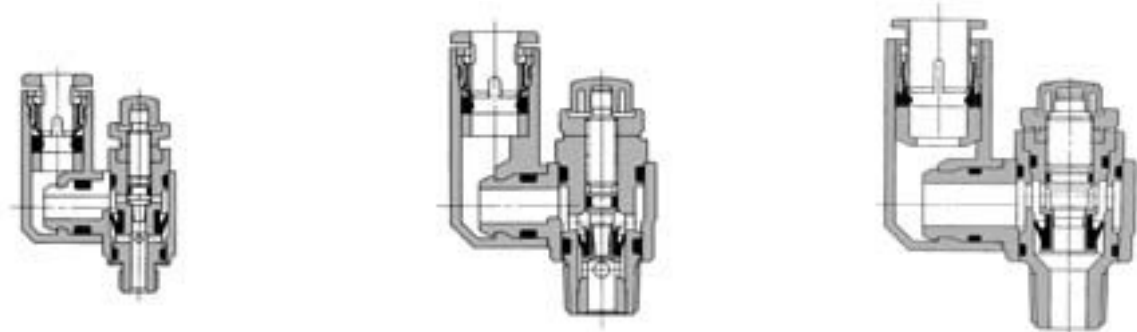


**Meter-in type**

M5 type

U10/32 type

AS3311FG-02



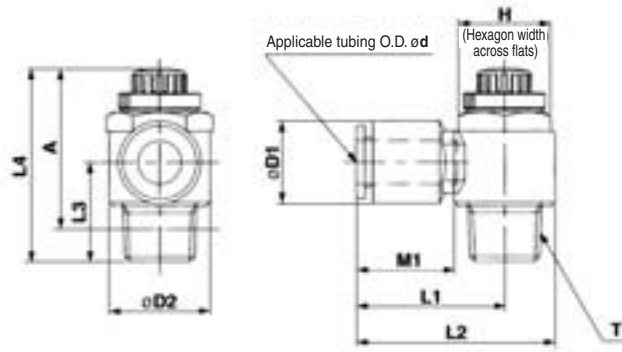
**Component Parts**

| 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 |

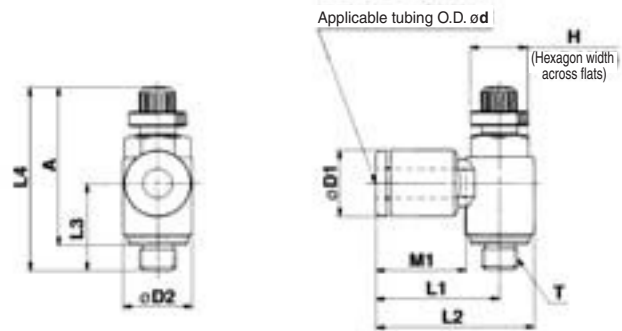
- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR
- ASQ
- KE
- TMH

# Series AS-FG

## Dimensions: Elbow Type



### M5 type U10/32 type



### Metric Size

| Model          | d   | T        | H  | D1   | D2   | L1   | L2   | L3   | L4 <sup>(1)</sup> |      | 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 |      |                   |      |      |      | 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 |      |                   |      |      |      | 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.

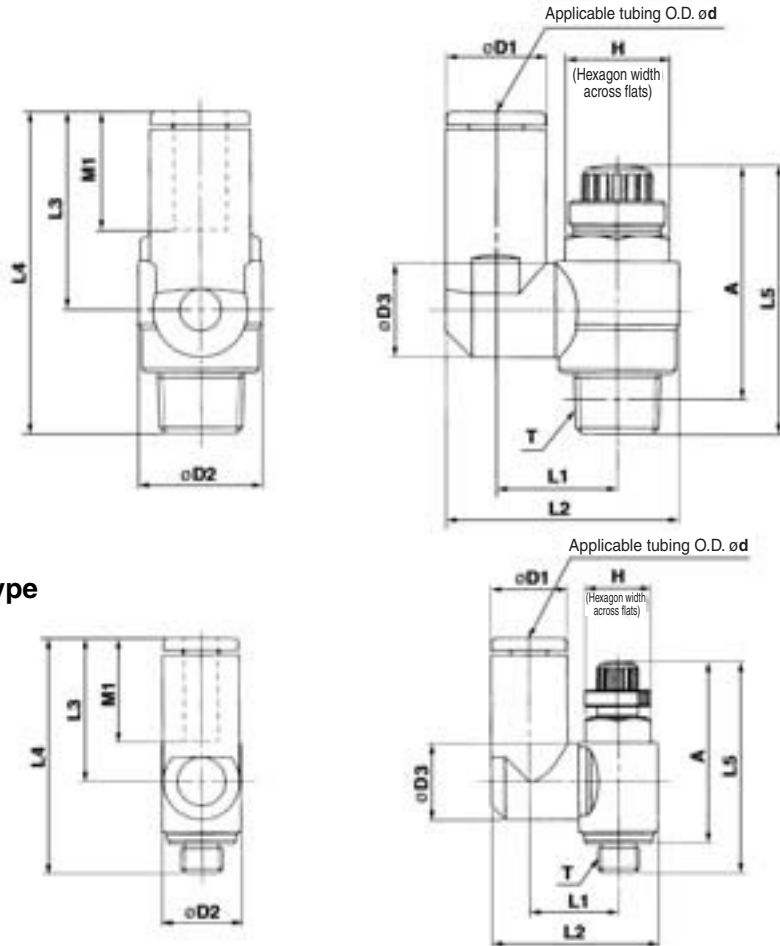
### Inch Size

| Model              | d     | T         | H    | D1   | D2   | L1   | L2   | L3   | L4 <sup>(1)</sup> |      | 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  |      | 21.3 | 26.1 | 11.7 |                   |      |      |      | 16.5 |          |      |
| AS12□1FG-U10/32-05 | 3/16" |           |      | 11.4 |      | 18.3 | 23.1 |      |                   |      |      |      |      |          | 13.5 |
| 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" |           |      | 11.4 |      | 23.1 | 30.2 |      |                   |      |      |      | 13.5 |          | 17   |
| AS22□1FG-N01-05    | 3/16" |           |      | 13.2 |      | 23.9 | 31   |      |                   |      |      |      | 18.5 |          | 19   |
| AS22□1FG-N01-07    | 1/4"  |           |      | 15.2 |      | 25.3 | 32.4 |      |                   |      |      |      | 21   |          | 21   |
| AS22□1FG-N01-09    | 5/16" | 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-N02-03    | 5/32" |           |      | 11.4 |      | 24.9 | 34.2 |      |                   |      |      |      | 17   |          |      |
| AS22□1FG-N02-05    | 3/16" |           |      | 13.2 |      | 25.2 | 34.5 |      |                   |      |      |      | 18.5 |          | 34   |
| AS22□1FG-N02-07    | 1/4"  |           |      | 15.2 |      | 27.2 | 36.4 |      |                   |      |      |      | 21   |          | 36   |
| AS22□1FG-N02-09    | 5/16" | NPT 1/4   | 19   | 17.9 | 23   | 35.3 | 44.5 | 19.5 | 48.3              | 43.3 | 42.8 | 37.8 | 21   | 60       |      |
| AS22□1FG-N02-11    | 3/8"  |           |      | 19.5 |      | 35.3 | 44.5 |      |                   |      |      |      | 21   |          | 67   |
| AS32□1FG-N02-07    | 1/4"  |           |      | 13.2 |      | 27.8 | 39.3 |      |                   |      |      |      | 17   |          | 60   |
| AS32□1FG-N02-09    | 5/16" |           |      | 15.2 |      | 29.5 | 41   |      |                   |      |      |      | 18.5 |          | 63   |
| AS32□1FG-N02-11    | 3/8"  | NPT 3/8   | 19   | 17.9 | 23   | 31.8 | 43.3 | 19.8 | 45.4              | 40.4 | 40.2 | 35.2 | 21   | 100      |      |
| AS32□1FG-N03-07    | 1/4"  |           |      | 19.5 |      | 31.8 | 43.3 |      |                   |      |      |      | 21   |          | 67   |
| AS32□1FG-N03-09    | 5/16" |           |      | 13.2 |      | 27.8 | 39.3 |      |                   |      |      |      | 17   |          | 55   |
| AS32□1FG-N03-11    | 3/8"  |           |      | 15.2 |      | 29.5 | 41   |      |                   |      |      |      | 18.5 |          | 57   |
| 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 <sup>(1)</sup> |      | A*   |      | M1   | Mass (g) |     |
|----------------|-----|----------|-------|------|------|-----|------|------|------|------|-------------------|------|------|------|------|----------|-----|
|                |     |          |       |      |      |     |      |      |      |      | Max.              | Min. | Max. | Min. |      |          |     |
| AS13□1FG-M5-23 | 3.2 |          |       | 8.4  |      |     | 19.8 | 17.5 | 28.7 |      | 28.6              | 28.6 |      |      | 12.7 | 7        |     |
| AS13□1FG-M5-04 | 4   | M5 x 0.8 | 8     | 9.3  | 9.6  | 9.3 | 10.8 | 20.3 |      |      |                   |      |      | 25   | 22.2 |          |     |
| AS13□1FG-M5-06 | 6   |          |       | 11.6 |      |     | 21.4 | 20.6 | 31.8 |      |                   |      |      |      | 13.5 |          |     |
| AS23□1FG-01-23 | 3.2 |          |       | 8.4  |      |     | 9.3  | 13.1 | 24.4 | 17.5 | 30.9              |      |      |      | 12.7 | 17       |     |
| AS23□1FG-01-04 | 4   |          | R 1/8 | 9.3  | 14.2 |     | 10.9 | 14   | 26.9 | 22.9 | 36.3              | 35.2 | 30.2 | 32.1 | 27.1 | 18       |     |
| AS23□1FG-01-06 | 6   |          |       | 11.6 |      |     | 12.9 | 16.2 | 30.9 | 28.2 | 40.8              |      |      |      | 18.5 | 21       |     |
| 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   |          |       | 10.4 |      |     | 10.9 | 16.2 | 30.6 | 21.9 | 39.6              |      |      |      | 16   | 32       |     |
| AS23□1FG-02-06 | 6   |          | R 1/4 | 12.8 | 18.5 |     | 12.9 | 18.3 | 35.2 | 28.2 | 45.1              | 39.9 | 34.9 | 34.4 | 29.4 | 17       | 33  |
| AS23□1FG-02-08 | 8   |          |       | 15.2 |      |     | 12.9 | 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   |          |       | 12.8 |      |     | 12.9 | 20.6 | 38.5 | 25.2 | 46.5              |      |      |      | 17   | 60       |     |
| AS33□1FG-02-08 | 8   |          | R 1/4 | 15.2 | 23   |     | 16.2 | 23   | 39.7 | 28.2 | 49.5              | 48.3 | 43.3 | 42.8 | 37.8 | 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 |      |     | 16.2 | 23   | 44.9 | 34.4 | 55.7              |      |      |      | 22   | 69       |     |
| AS33□1FG-03-06 | 6   |          |       | 12.8 |      |     | 12.9 | 20.6 | 38.5 | 25.2 | 45                |      |      |      | 17   | 56       |     |
| AS33□1FG-03-08 | 8   |          | R 3/8 | 15.2 | 23   |     | 12.9 | 20.6 | 39.7 | 28.2 | 48                | 45.4 | 40.4 | 40   | 35   | 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 |      |     | 16.2 | 23   | 44.9 | 34.4 | 54.2              |      |      |      | 22   | 65       |     |
| AS43□1FG-04-10 | 10  |          |       | 18.5 |      |     | 16.2 | 25.8 | 49.4 | 32.6 | 57.1              |      |      |      | 21   | 104      |     |
| AS43□1FG-04-12 | 12  | R 1/2    | 24    | 20.9 | 28.6 |     | 19.4 | 26.8 | 52   | 36.3 | 60.8              | 56.7 | 49.2 | 49.6 | 42.1 | 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 <sup>(1)</sup> |      | A*   |      | M1   | Mass (g) |     |
|--------------------|-------|-----------|------|------|------|-----|------|------|------|------|-------------------|------|------|------|------|----------|-----|
|                    |       |           |      |      |      |     |      |      |      |      | Max.              | Min. | Max. | Min. |      |          |     |
| AS13□1FG-U10/32-01 | 1/8"  |           |      | 8.4  |      |     | 19.8 | 17.5 | 28.7 |      |                   |      |      |      | 12.7 | 7        |     |
| AS13□1FG-U10/32-03 | 5/32" | 10-32 UNF | 8    | 9.3  | 9.6  | 9.3 | 10.8 | 20.3 |      |      |                   |      |      | 25   | 22.2 |          |     |
| AS13□1FG-U10/32-05 | 3/16" |           |      | 11.4 |      |     | 12   | 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"  |           |      | 8.4  |      |     | 9.3  | 13.1 | 24.4 | 17.5 | 30.9              |      |      |      | 12.7 | 17       |     |
| AS23□1FG-N01-03    | 5/32" |           |      | 9.3  | 14.2 |     | 10.9 | 14   | 24.9 | 21.9 | 36.3              | 35.2 | 30.2 | 32.1 | 27.1 | 18       |     |
| AS23□1FG-N01-05    | 3/16" | NPT 1/8   | 12.7 | 11.4 | 14   |     | 12.9 | 16.2 | 29.9 | 25.6 | 36.3              |      |      |      | 16.5 | 18       |     |
| AS23□1FG-N01-07    | 1/4"  |           |      | 13.2 |      |     | 12.9 | 16.2 | 30.9 | 28.2 | 40.8              |      |      |      | 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" |           |      | 10.4 |      |     | 10.9 | 16.2 | 30.6 | 21.9 | 39.6              |      |      |      | 16   | 32       |     |
| AS23□1FG-N02-05    | 3/16" |           |      | 11.4 |      |     | 10.9 | 16.2 | 31.1 | 23.9 | 42.1              |      |      |      | 17   | 33       |     |
| AS23□1FG-N02-07    | 1/4"  | NPT 1/4   | 17.5 | 13.2 | 19   |     | 12.9 | 16.2 | 34.2 | 25.6 | 45.1              | 39.9 | 34.9 | 34.4 | 29.4 | 18.5     | 36  |
| AS23□1FG-N02-09    | 5/16" |           |      | 15.2 |      |     | 12.9 | 16.2 | 35.2 | 28.2 | 47.9              |      |      |      | 21   | 39       |     |
| AS23□1FG-N02-11    | 3/8"  |           |      | 17.9 |      |     | 16.2 | 23   | 38.7 | 31   | 46.5              |      |      |      | 21   | 40       |     |
| AS33□1FG-N02-07    | 1/4"  |           |      | 13.2 |      |     | 12.9 | 20.6 | 38.7 | 25.6 | 46.9              |      |      |      | 17   | 60       |     |
| AS33□1FG-N02-09    | 5/16" | NPT 1/4   | 19   | 15.2 | 23   |     | 16.2 | 23   | 39.7 | 28.2 | 49.5              | 48.3 | 43.3 | 42.8 | 37.8 | 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"  |           |      | 13.2 |      |     | 12.9 | 20.6 | 38.7 | 25.6 | 45                |      |      |      | 17   | 56       |     |
| AS33□1FG-N03-09    | 5/16" | NPT 3/8   | 19   | 15.2 | 23   |     | 16.2 | 23   | 39.7 | 28.2 | 48                | 45.4 | 40.4 | 40.2 | 35.2 | 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"  |           |      | 17.9 |      |     | 16.2 | 25.8 | 49.4 | 32.6 | 54.4              |      |      |      | 21   | 104      |     |
| AS43□1FG-N04-13    | 1/2"  | NPT 1/2   | 23.8 | 21.7 | 29   |     | 19.4 | 26.8 | 52   | 36.3 | 57.1              | 56.7 | 49.2 | 49.6 | 42.1 | 22       | 106 |

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

- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR
- ASQ
- KE
- TMH

# 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 <sup>(1)</sup> ) |
| Applicable tubing material <sup>(2)</sup> | 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<br>ø4<br>ø6          | ø4       | ø6              | ø6       | ø8              | ø6       | ø8     | ø10<br>ø12 | ø10      | ø12   |
|                             | Inch size                         | ø1/8"<br>ø5/32"<br>ø3/16" | ø5/32"   | ø3/16"<br>ø1/4" | ø3/16"   | ø1/4"<br>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 <sup>2</sup> ) | 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)

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

**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



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

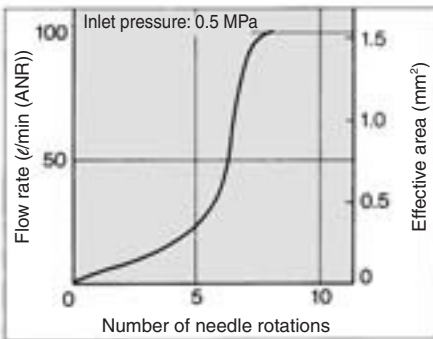
Throttle Valve (Without Check Valve)

**X214**

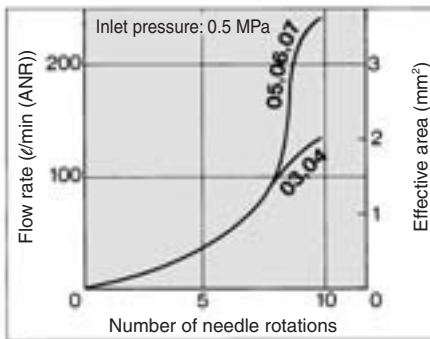
Ex.) AS1001FG-04-X214

### Needle Valve/Flow Characteristics

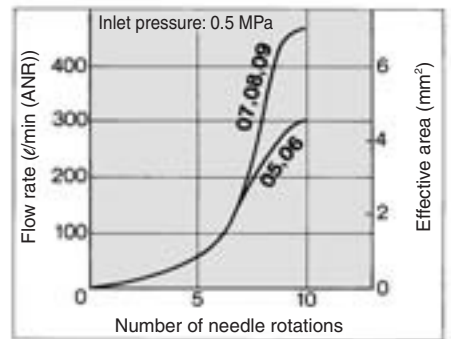
AS1001FG



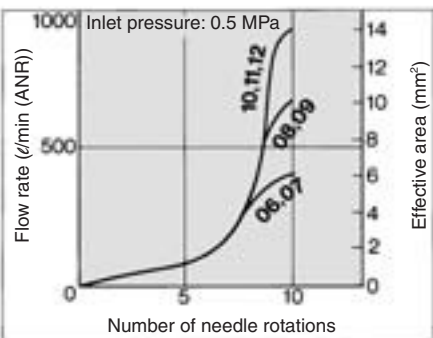
AS2001FG



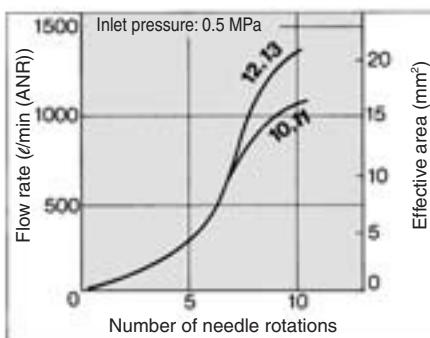
AS2051FG



AS3001FG



AS4001FG



AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

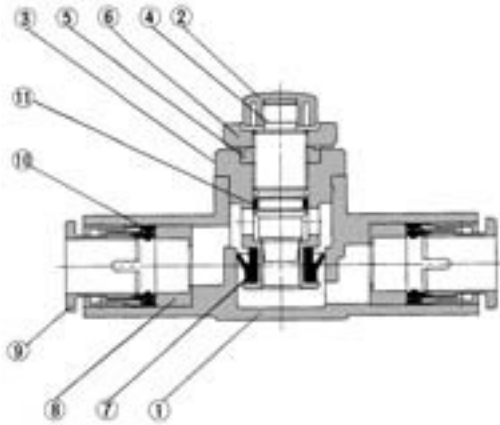
ASR  
ASQ

KE

TMH

# Series AS-FG

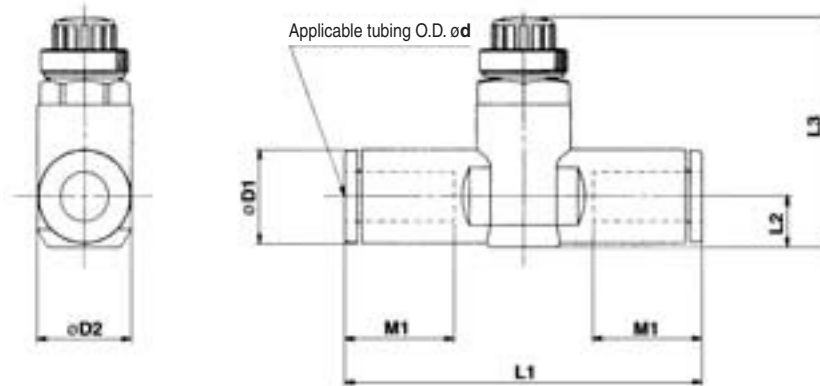
## Construction



### 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 <sup>(1)</sup> |      | 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 |      | 59   | 7.4  | 38.3              | 33.3 |      | 17       | 36 |
| AS3001FG-08 | 8   | 15.2 | 19.8 | 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 |      |      |      | 52.1              | 44.6 |      |          | 22 |

Note 1) Reference dimensions

### Inch Size

| Model       | d     | D1   | D2   | L1   | L2   | L3 <sup>(1)</sup> |      | 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   | 11.8 | 40.7 | 5.2  | 32.6              | 27.6 | 12.7 | 12       |    |
| AS2001FG-03 | 5/32" | 9.3  |      | 50   | 6.2  | 33.6              | 28.6 |      | 16.5     | 18 |
| AS2001FG-05 | 3/16" | 11.4 | 14.8 | 52.2 | 7.1  | 34.5              | 29.5 | 17   | 16       |    |
| AS2001FG-07 | 1/4"  | 13.2 |      | 52.2 | 6.2  | 34.6              | 29.6 |      | 16.5     | 24 |
| AS2051FG-05 | 3/16" | 11.4 |      | 54.4 | 7.1  | 35.5              | 30.5 |      | 17       | 22 |
| AS2051FG-07 | 1/4"  | 13.2 | 19.8 | 59.8 | 8.1  | 32.6              | 27.6 | 18   | 25       |    |
| AS2051FG-09 | 5/16" | 15.2 |      | 59   | 7.4  | 38.3              | 33.3 |      | 17       | 36 |
| AS3001FG-09 | 5/16" | 15.2 | 26.5 | 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 |      | 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)

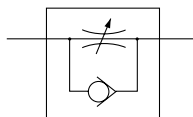
Speed control is easy, and uniform speed control is possible.

## 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 |                |               |

## 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 <sup>(1)</sup> ) |
| Applicable tubing material <sup>(2)</sup> | Nylon, Soft nylon, Polyurethane     |
| Option <sup>(3)</sup>                     | 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<br>AS13□1FM           | AS22□1FM-□01<br>AS23□1FM-□01             | AS22□1FM-□02<br>AS23□1FM-□02               |
|-----------------|-----------------------------------|--------------------------------|--|--|
| Tubing O.D.     | Metric size                       | ø3.2, ø4, ø6                   | ø3.2, ø4<br>ø6, ø8                       | ø4, ø6<br>ø8, ø10                          |
|                 | Inch size                         | ø1/8", ø5/32", ø3/16"<br>ø1/4" | ø1/8", ø5/32"<br>ø3/16", ø1/4"<br>ø5/16" | ø5/32"<br>ø3/16"<br>ø1/4", ø5/16"<br>ø3/8" |
| Controlled flow | Air flow (l/min(ANR))             | 7                              | 12                                       | 38   |
|                 | Effective area (mm <sup>2</sup> ) | 0.1                            | 0.2                                      | 0.6  |
| Free flow       | Flow rate (l/min(ANR))            | 100                            | 180<br>230                               | 260<br>390<br>460                          |
|                 | Effective area (mm <sup>2</sup> ) | 1.5                            | 2.7<br>3.5                               | 4<br>6<br>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.



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

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

## How to Order

**AS 2 2 0 1 FM - [ ] 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) |
| N   | R                          |
|     | NPT                        |

● **Option**

|     |           |
|-----|-----------|
| Nil | None      |
| S   | With seal |

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

● **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" |
|             |        | 11        | ø3/8"  |

\* Use ø1/8" tube.

● **Port size**

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

## 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.

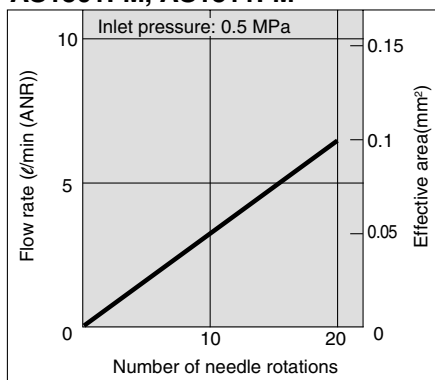
**Throttle Valve (Without Check Valve)** **X214**

Ex.) AS1201FM-M5-23-X214

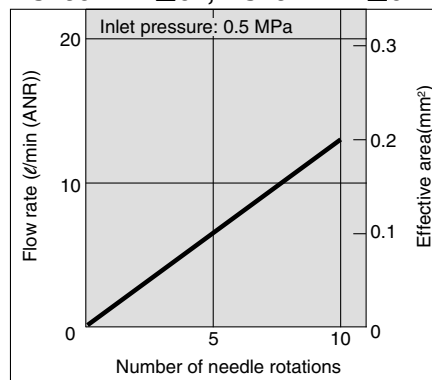
Note) Throttle valve is only compatible with the part no. of the meter-out type.

## Needle Valve/Flow Characteristics

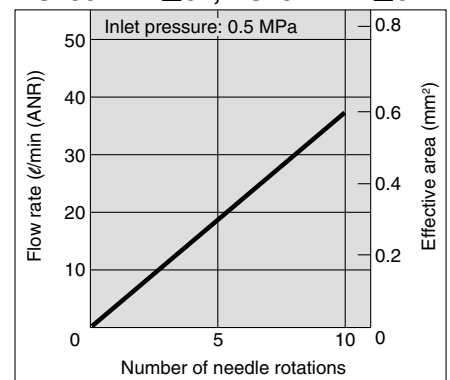
AS1201FM, AS1211FM  
AS1301FM, AS1311FM



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



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



- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR
- ASQ
- KE
- TMH

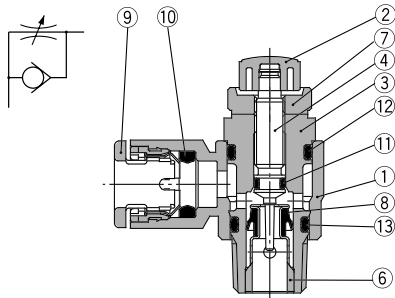


# Series AS-FM

## Construction: Elbow Type

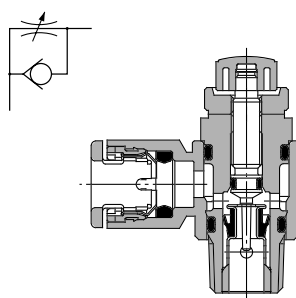
### Meter-out type

JIS Symbol

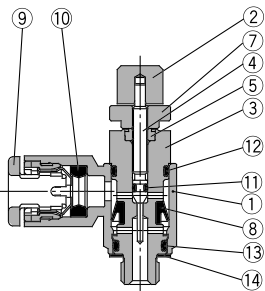


### Meter-in type

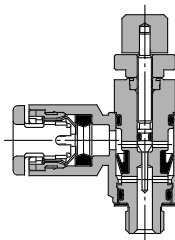
JIS Symbol



### 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 <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     | Brass <sup>(2)</sup> | Electroless nickel plated <sup>(3)</sup> |
| 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.

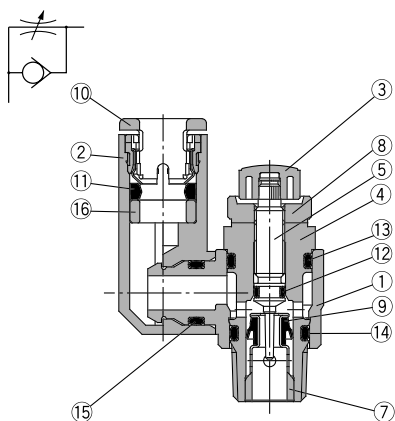
Note 2) AS22□1FM type is made of steel.

Note 3) Meter-in type is black zinc chromate plated.

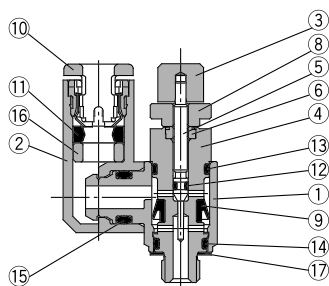
## Construction: Universal Type

### Meter-out type

JIS Symbol

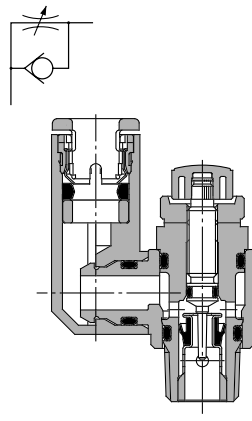


### M5 type U10/32 type

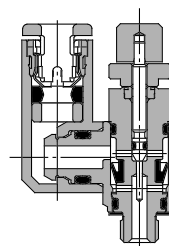


### Meter-in type

JIS Symbol



### 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     | Brass <sup>(2)</sup> | Electroless nickel plated <sup>(3)</sup> |
| 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                             |

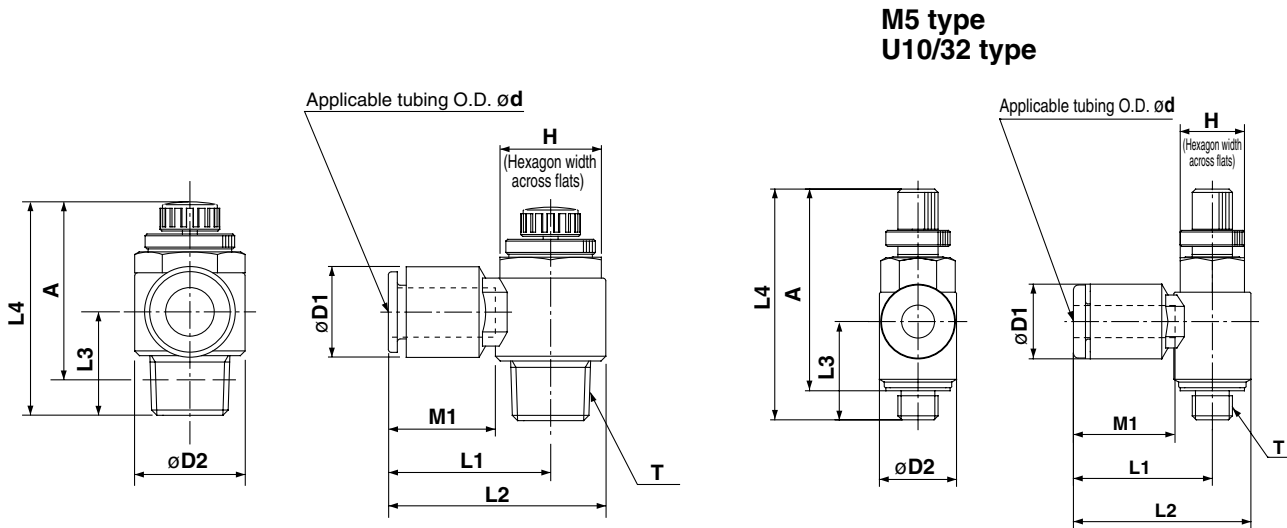
Note 1) M5 and U10/32 types are black zinc chromate plated.

Note 2) AS23□1FM type is made of steel.

Note 3) Meter-in type is black zinc chromate plated.

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

## 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 |      |           |      |          |      |      |          |
| 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 |      |           |      |          |      | 19.5 |          |

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   | 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  |      | 17.3 | 22.1 |      |        |      |       |      |      |          |
| AS12□1FM-U10/32-05 | 3/16" |           |      | 11.4 |      | 21.3 | 26.1 |      |        |      |       |      | 11.7 |          |
| 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 | 17       |
| AS22□1FM-N01-03    | 5/32" |           |      | 13.2 |      | 24   | 31.1 |      |        |      |       |      |      |          |
| AS22□1FM-N01-05    | 3/16" |           |      | 13.2 |      | 23.9 | 31   |      |        |      |       |      |      |          |
| AS22□1FM-N01-07    | 1/4"  |           |      | 15.2 |      | 25.3 | 32.4 |      |        |      |       |      | 13.4 |          |
| AS22□1FM-N01-09    | 5/16" |           |      |      |      |      |      |      |        |      |       |      | 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 |      |        |      |       |      |      |          |
| AS22□1FM-N02-07    | 1/4"  |           |      | 13.2 |      | 25.2 | 34.5 |      |        |      |       |      |      |          |
| AS22□1FM-N02-09    | 5/16" |           |      | 15.2 |      | 27.2 | 36.4 |      |        |      |       |      | 17.7 |          |
| AS22□1FM-N02-11    | 3/8"  |           |      | 18.5 |      | 35.3 | 44.5 | 19.5 |        |      |       |      | 21   | 36       |

Note 1) Reference dimensions

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

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

ASR

ASQ

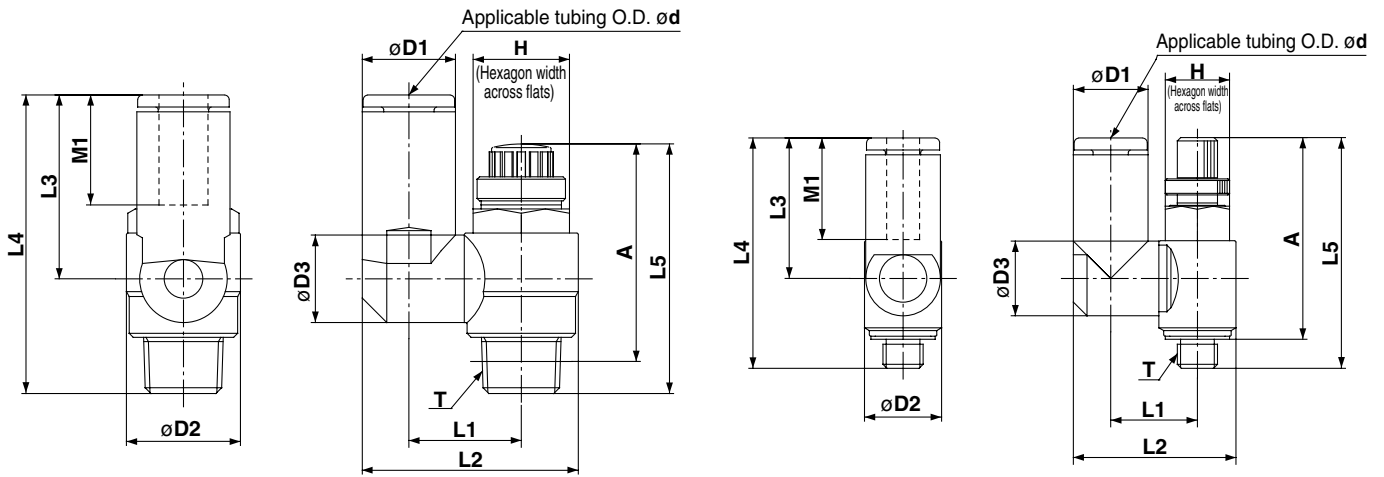
KE

TMH

# Series AS-FM

## 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 | 20.3 | 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 |      |    |
| 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 |      |      |      |      |      |      |        |      |       |      |      |          | 26.9 | 22.9 | 36.3 |      |    |
| AS23□1FM-01-08 | 8   | 15.2     | 12.9 | 16.2 | 30.9 | 28.2 | 40.8 |      |      |      |        |      |       |      | 13.5 | 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 |      |      |      |      |      |      |        |      |       |      | 18.4 |          | 34   | 25.2 | 42.1 | 17   |    |
| AS23□1FM-02-08 | 8   |          |      | 15.2 |      |      |      |      |      |      |        |      |       |      | 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 | 20.3 | 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 |    |
| AS13□1FM-U10/32-07 | 1/4"  | 12        | 21.6 | 20.7 | 31.9 |      |      |      |      |      |        |      |       |      | 16.5 | 8        |      |      |      |    |
| AS23□1FM-N01-01S   | 1/8"  | NPT 1/8   | 12.7 | 8.4  | 14.2 | 10.9 | 14   | 26.8 | 23.9 | 37.3 | 35.2   | 30.2 | 32.1  | 27.1 | 12.7 | 17       |      |      |      |    |
| AS23□1FM-N01-03S   | 5/32" |           |      | 9.3  |      |      |      |      |      |      |        |      |       |      |      |          | 24.9 |      |      |    |
| AS23□1FM-N01-05S   | 3/16" |           |      | 11.4 |      |      |      |      |      |      |        |      |       |      |      |          | 26.8 | 23.9 | 37.3 |    |
| AS23□1FM-N01-07S   | 1/4"  | 13.2      | 29.9 | 25.6 | 38.2 |      |      |      |      |      |        |      |       |      | 16.5 | 19       |      |      |      |    |
| AS23□1FM-N01-09S   | 5/16" | 15.2      | 12.9 | 16.2 | 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 |      |      |      |      |      |      |        |      |       |      | 34.2 |          | 25.6 | 42.5 | 18.5 | 36 |
| AS23□1FM-N02-09S   | 5/16" | 15.2      | 18.3 | 35.2 | 28.2 | 45.1 |      |      |      |      |        |      |       |      | 18.5 | 39       |      |      |      |    |
| AS23□1FM-N02-11S   | 3/8"  | 17.9      | 20.2 | 38.7 | 31   | 47.9 | 21   | 40   |      |      |        |      |       |      | 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 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 <sup>(1)</sup> ) |
| Applicable tubing material <sup>(2)</sup> | Nylon, Soft nylon, Polyurethane     |

Note 1) In the case of AS1001FM type

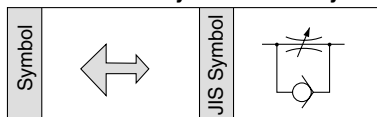
Note 2) Use caution regarding the max. operating pressure when soft nylon or polyurethane tubing is used.

(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

#### 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       |               |
|                 | Effective area (mm <sup>2</sup> ) | 0.1                          | 0.2      |               | 0.6      |               |
| Free flow       | Flow rate (l/min (ANR))           | 100                          | 130      | 230           | 290      | 460           |
|                 | Effective area (mm <sup>2</sup> ) | 1.5                          | 2        | 3.5           | 4.5      | 7             |

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

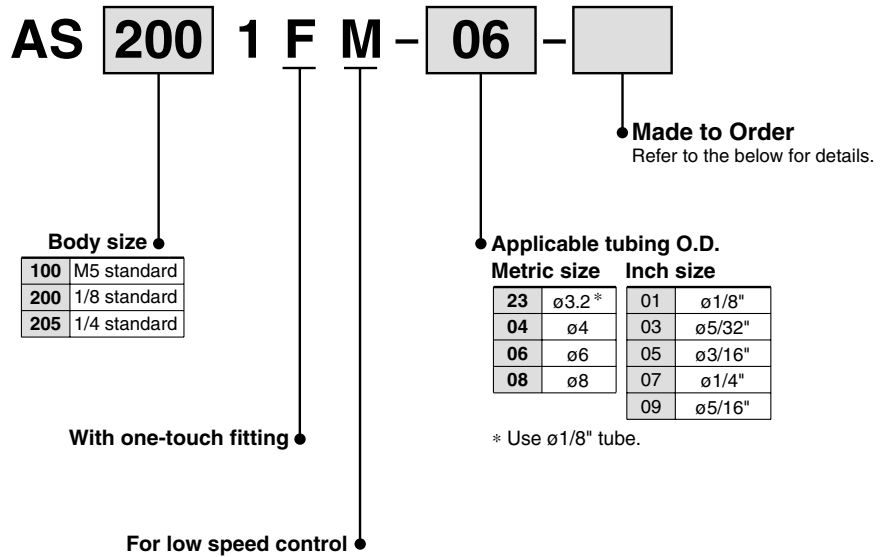
### ⚠ Caution

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.



**Made to Order**  
(Refer to page 503 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

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

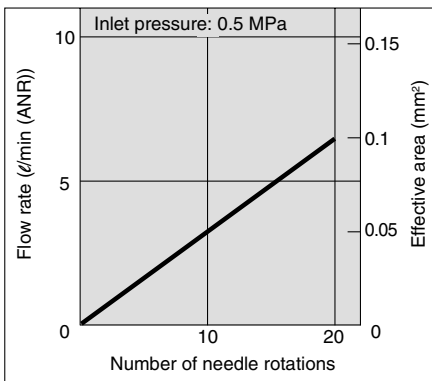
ASR  
ASQ

KE

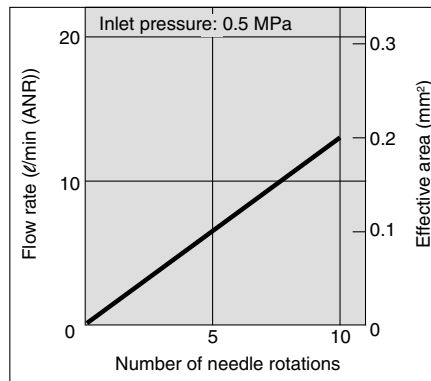
TMH

**Needle Valve/Flow Characteristics**

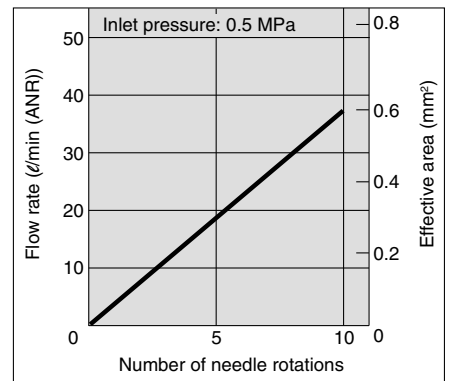
AS1001FM



AS2001FM

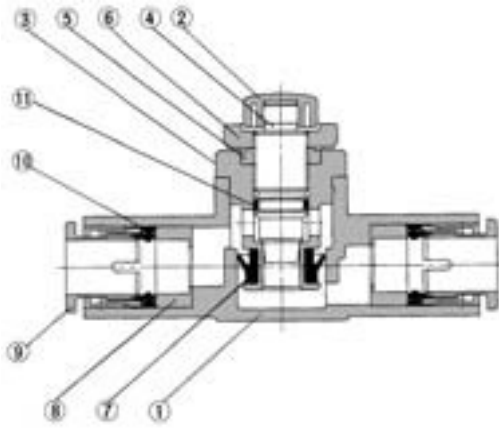


AS2051FM



# Series AS-FM

## Construction



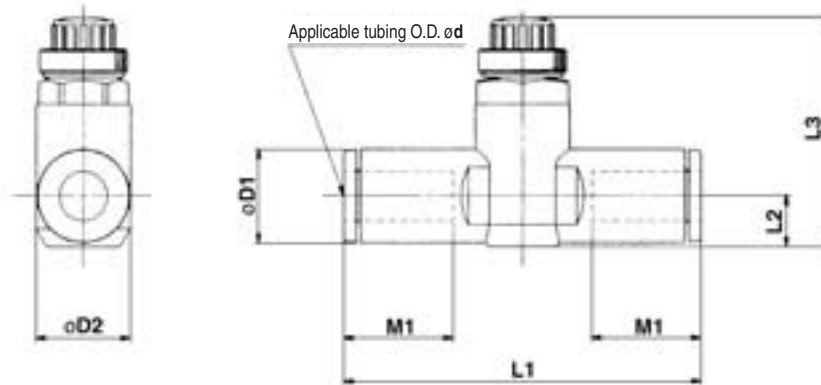
## Component Parts

| No. | Description  | Material             | Note                      |
|-----|--------------|----------------------|---------------------------|
| 1   | Body A       | PBT                  |                           |
| 2   | Handle       | PBT <sup>(1)</sup>   | 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 <sup>(2)</sup> | 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     |
| 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     |
| 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       |

### Inch Size

| Model       | d     | D1   | D2   | L1   | L2  | L3 <sup>(1)</sup> |      | 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 | 14.8 | 52.2 | 7.1 | 34.5              | 29.5 | 17   | 21       |    |
| AS2051FM-05 | 3/16" | 11.4 |      | 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.**

AS

ASP

ASN

AQ

ASV

AK

VCHC

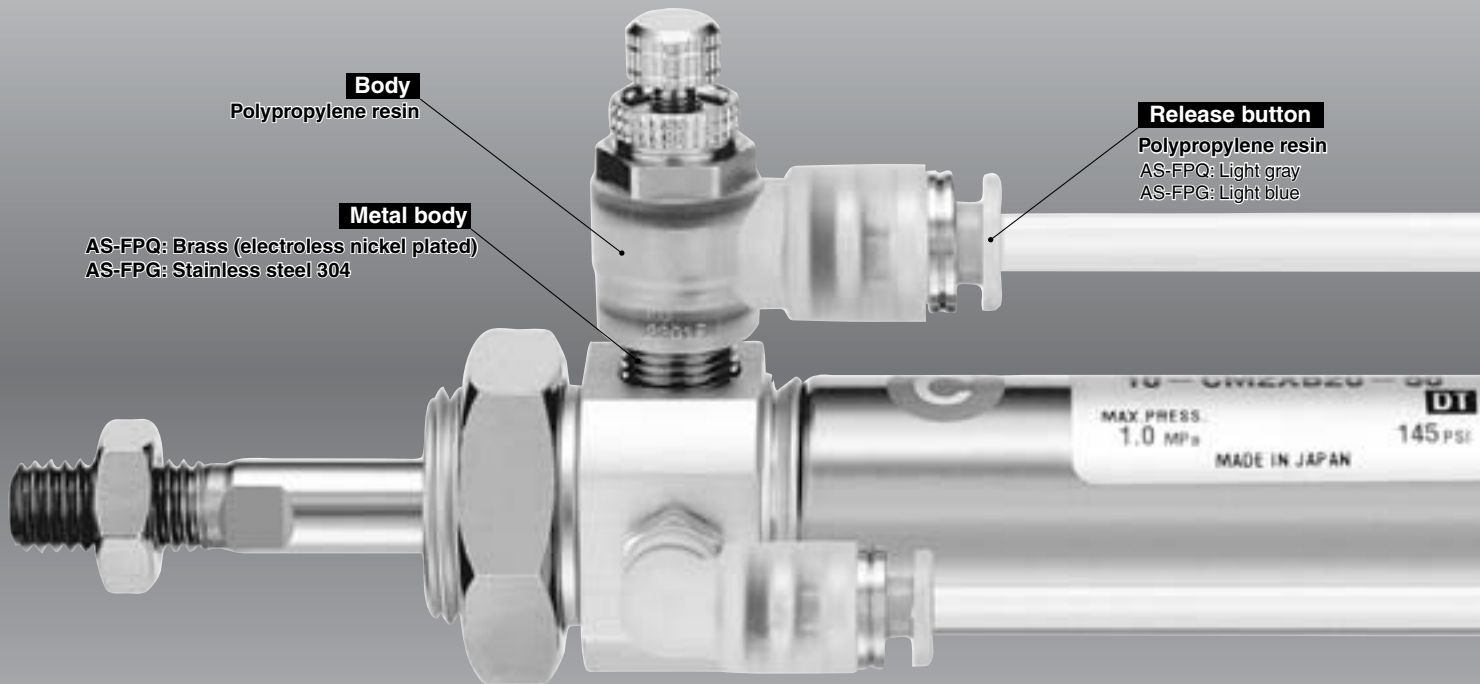
ASS

ASR  
ASQ

KE

TMH

# Low particulate generating speed controllers designed for use in clean rooms



Clean Speed Controller with One-touch Fitting

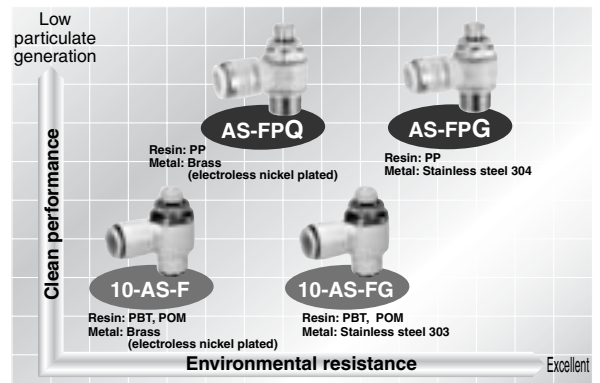
## Series AS-FPQ/FPG



**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

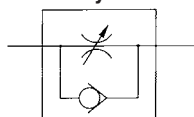


**AS-FPG/Stainless steel 304**

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 pressure 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           | ø10 | ø6           | ø8  | ø10          | ø12  |
| Controlled flow | Flow rate /min (ANR)           | 100          | 180 | 230          | 260 | 390          | 460 | 660          | 790 | 920          | 1580 |
| (free) flow     | Effective area mm <sup>2</sup> | 1.5          | 2.7 | 3.5          | 4   | 6            | 7   | 10           | 12  | 14           | 24   |

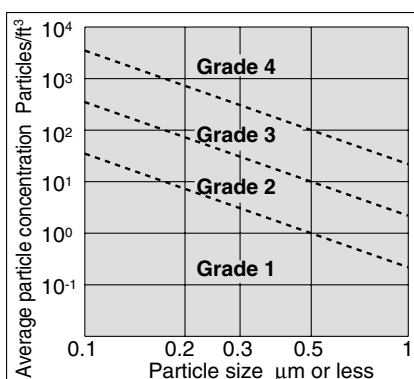
Note) Flow rate values are at a pressure of 0.5MPa, and temperature of 20°C.

## Recommended Applicable Tubing

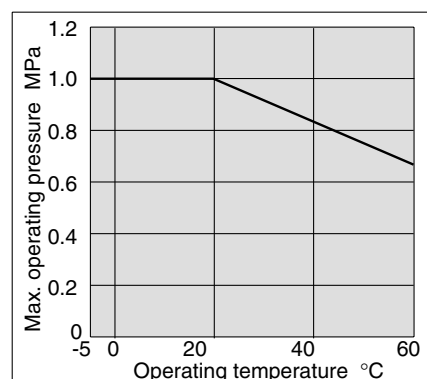
|                 |   |
|-----------------|---|
| Tubing material | Clean series polyurethane tubing: Series 10 |
| Tubing O.D.     | ø4, ø6, ø8, ø10, ø12                        |

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



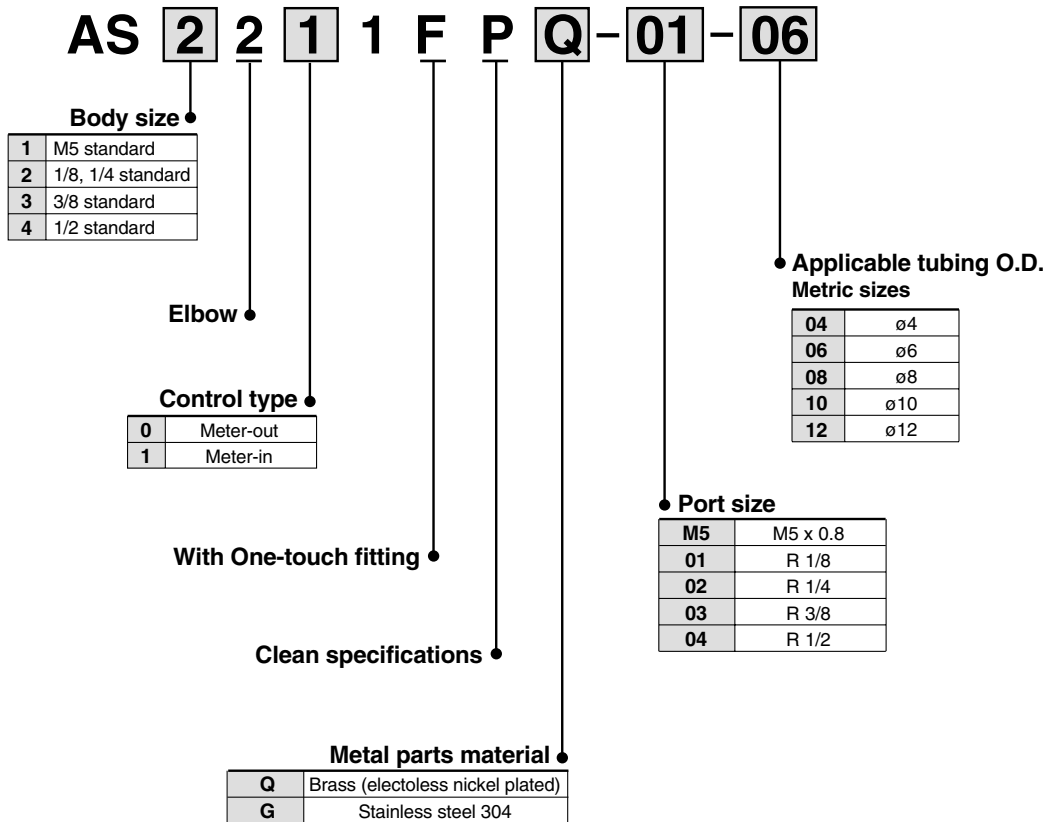
## Relation between Operating Temp. and Max. Operating Pressure



Note) Refer to back page 10 for details.

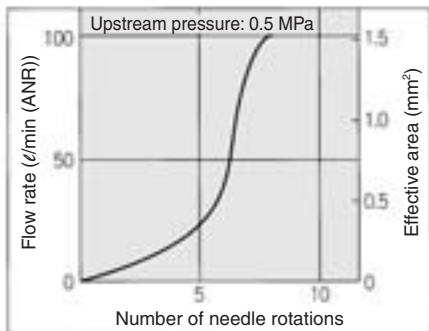
# Series AS-FPQ/FPG

## How to Order

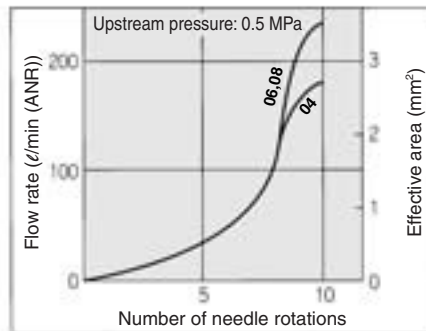


## Needle Valve/Flow Characteristics

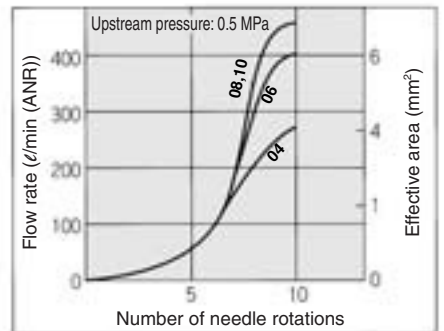
AS12□1FP□-M5



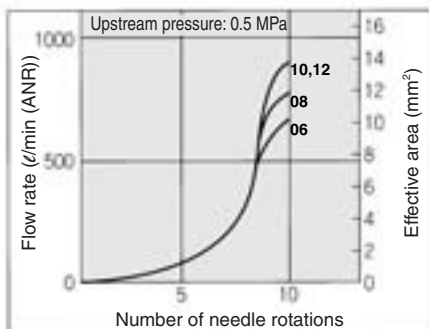
AS22□1FP□-01



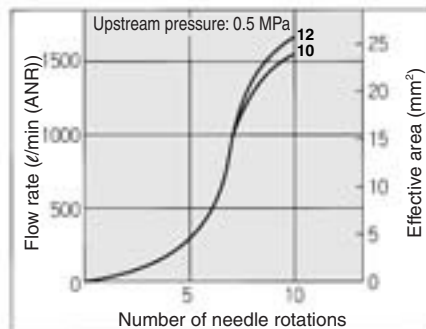
AS22□1FP□-02



AS32□1FP□-03

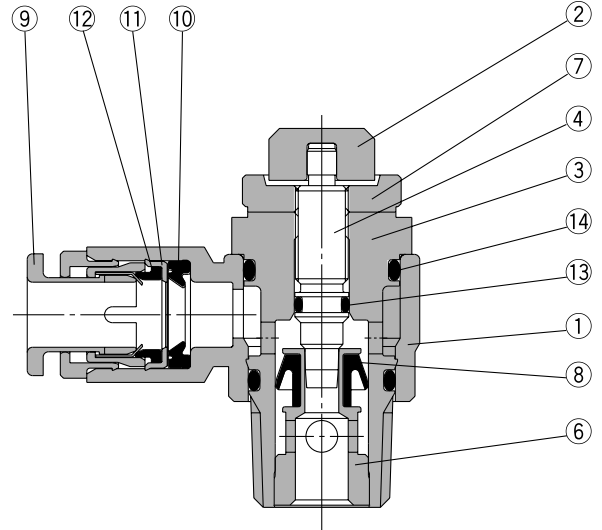
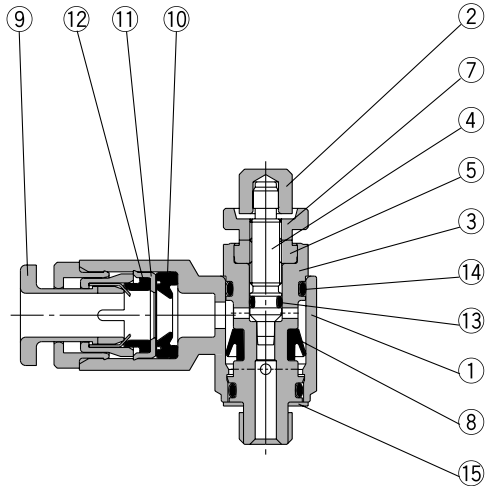


AS42□1FP□-04

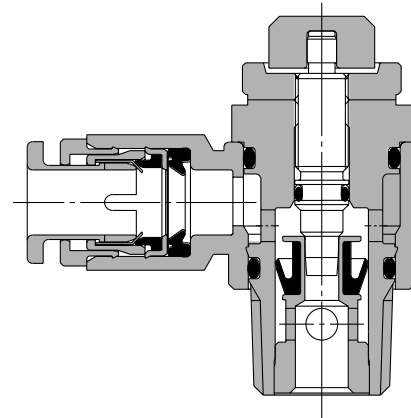
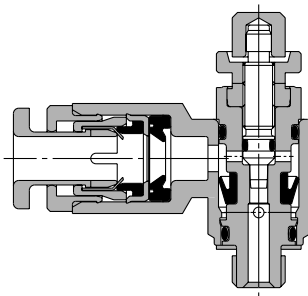


## Construction

### 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<br>Stainless steel 304, Brass | Brass parts are<br>electroless nickel plated | Polypropylene resin<br>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                   |      |

AS

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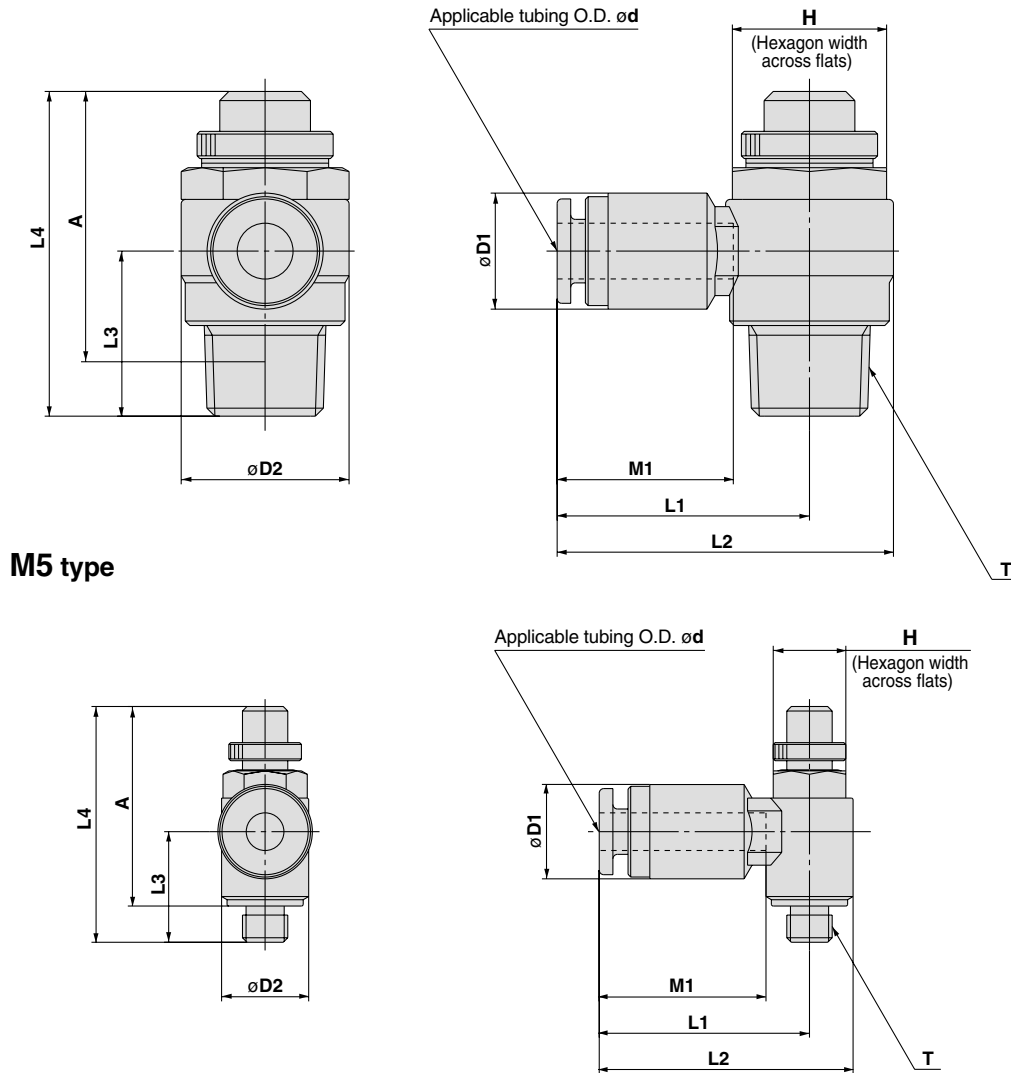
ASR  
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TMH

# Series AS-FPQ/FPG

## Dimensions



| Model           | Tubing O.D. $\phi$ | T        | H  | D1   | D2   | L1   | L2   | L3 <sup>(4)</sup> | L4 <sup>(1)(4)</sup> |      | A <sup>(2)</sup> |      | M1         | Mass (g) <sup>(3)</sup> |        |      |     |     |
|-----------------|--------------------|----------|----|------|------|------|------|-------------------|----------------------|------|------------------|------|------------|-------------------------|--------|------|-----|-----|
|                 |                    |          |    |      |      |      |      |                   | 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              | 35.5                 | 30.5 | 32.4             | 27.4 | 17         | 17                      | 17     |      |     |     |
| AS22□1FP□-01-06 | 6                  |          |    | 12.8 |      | 25.3 | 32.4 |                   |                      |      |                  |      | (14.3)     | (36.4)                  | (31.4) | 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              | 40.3                 | 35.3 | 34.8             | 29.4 | 17         | 33                      | 33     |      |     |     |
| AS22□1FP□-02-06 | 6                  |          |    | 12.8 |      | 26.8 | 36   |                   |                      |      |                  |      | (18.2)     | (40.8)                  | (35.8) | 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              | 45.8                 | 40.8 | 40.6             | 35.6 | 18.5       | 59                      | 55     |      |     |     |
| AS32□1FP□-03-08 | 8                  |          |    | 15.2 |      | 31.9 | 43.4 |                   |                      |      |                  |      | (20.9)     | (46.9)                  | (41.9) | 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              | 57.2                 | 49.7 | 49.9             | 42.4 | 23         | 107                     | 100    |      |     |     |
| AS42□1FP□-04-12 | 12                 |          |    | 20.9 |      | 37.2 | 51.5 |                   |                      |      |                  |      | (25.4)     | (58.1)                  | (50.6) | 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.

AS

ASP

ASN

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VCHC

ASS

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TMH

# 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**

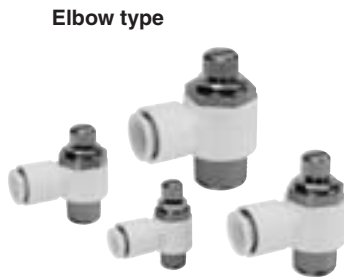
● Metric size  
ø6, ø8, ø10, ø12

**Maximum operating pressure 1 MPa max.**

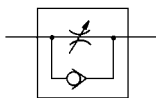
**Applicable tubing materials**  
FR double layer, FR soft nylon

**Retainer prevents accidental loss of needle.**

**Comes standard with seal.**



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 specifications)

### 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 <sup>Note)</sup> | 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 |  |
|-----------------|-----------------------------------|-----|-----|------------|-----|-----|----------|-----|------|---------|--|
|                 | ø6, ø8, ø10                       | ø4  | ø6  | ø8, ø10    | ø6  | ø8  | ø10, ø12 | ø10 | ø12  |         |  |
| Controlled flow | Flow rate l/min (ANR)             | 230 | 260 | 390        | 460 | 660 | 790      | 920 | 1580 | 1710    |  |
| (Free flow)     | Effective area (mm <sup>2</sup> ) | 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.

AS

ASP

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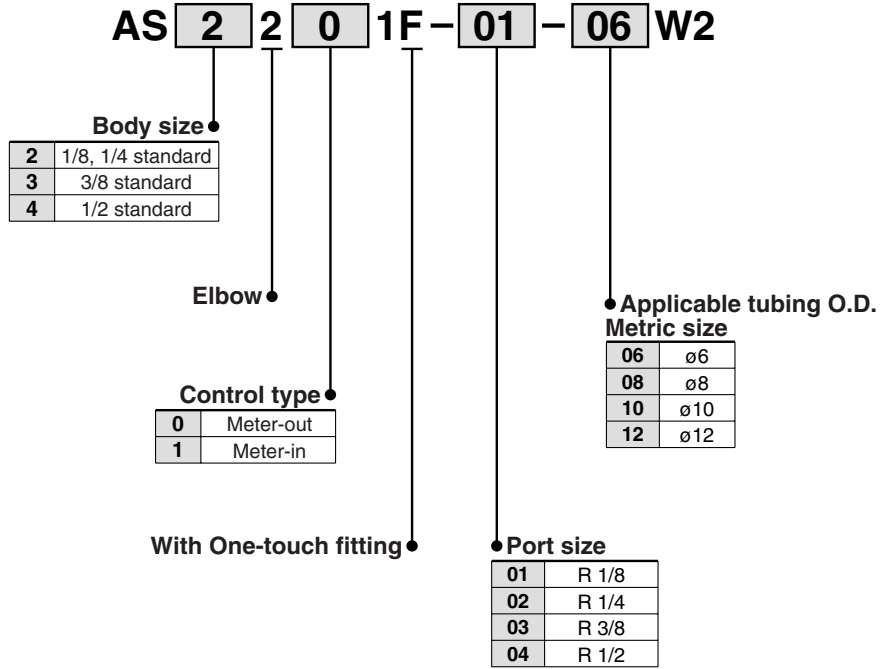
ASS

ASR  
ASQ

KE

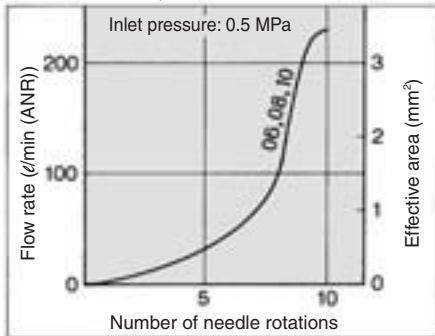
TMH

## How to Order

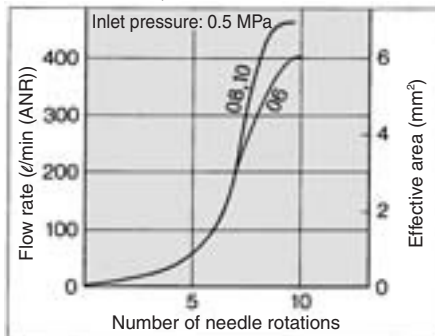


## Needle Valve/Flow Characteristics

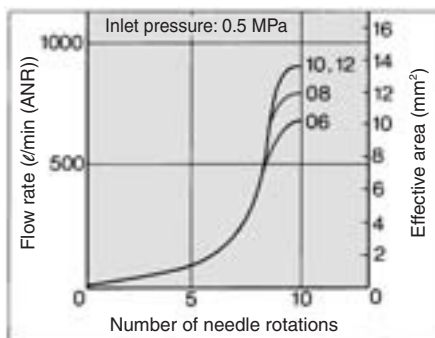
**AS2201F-01, AS2211F-01**



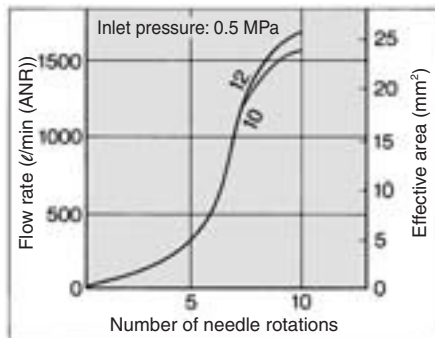
**AS2201F-02, AS2211F-02**



**AS3201F, AS3211F**

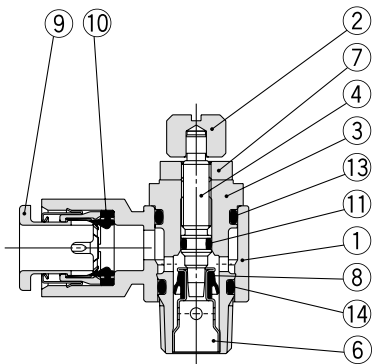


**AS4201F, AS4211F**

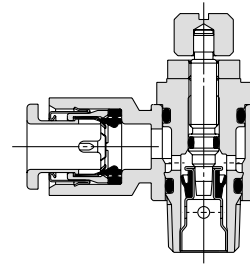


**Construction**

**Meter-out type**

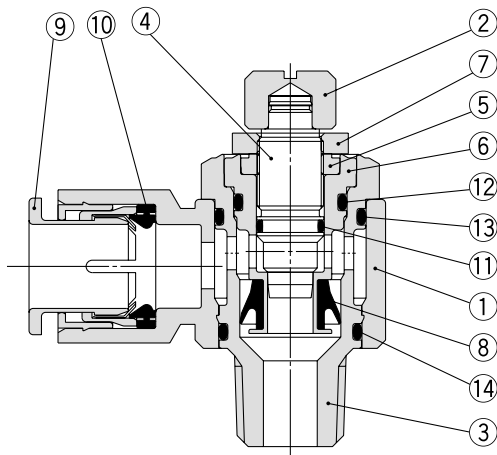


**Meter-in type**

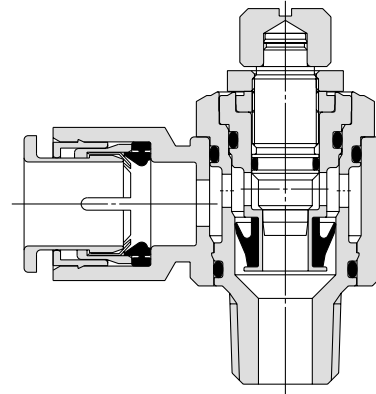


**AS32□1F-02**

**Meter-out type AS3201F-02**



**Meter-in type AS3211F-02**



**Component Parts**

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

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

Note 2) Meter-in type is black zinc chromate plated.

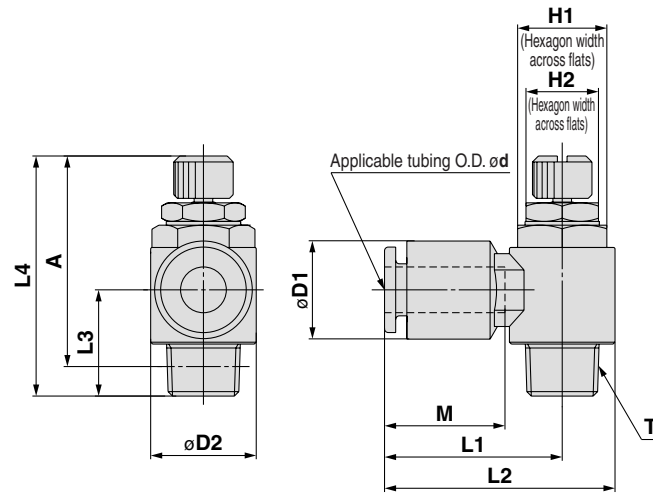
- AS
- ASP
- ASN
- AQ
- ASV
- AK
- VCHC
- ASS
- ASR
- ASQ
- KE
- TMH



# Series AS



## Elbow Type



### Metric Size

| Model           | Applicable tubing<br>O.D. ød | T     | H1 | H2 | D1   | D2   | L1   | L2   | L3   | L4 <sup>(1)</sup> |      | A <sup>(2)</sup> |      | M    | Mass<br>(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          | 23 |
| 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 | 18.5        | 36 |
| AS22□1F-02-10W2 | 10                           |       |    |    | 18.5 |      | 35.3 | 44.5 |      |                   |      |                  |      | 18.3 | 21          | 38 |
| AS32□1F-02-06W2 | 6                            | R 1/4 | 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                           | R 3/8 | 19 | 14 | 20.9 | 23   | 32.8 | 44.3 | 19.8 | 47.4              | 42.4 | 42.4             | 37.4 | 22   | 69          |    |
| AS32□1F-03-06W2 | 6                            |       |    |    | 13.2 |      | 27.8 | 39.3 |      |                   |      |                  |      | 17   | 58          |    |
| AS32□1F-03-08W2 | 8                            |       |    |    | 15.2 |      | 29.5 | 41   |      |                   |      |                  |      | 18.5 | 60          |    |
| AS32□1F-03-10W2 | 10                           | R 3/8 | 19 | 14 | 18.5 | 23   | 31.5 | 43.1 | 19.8 | 47.4              | 42.4 | 42.4             | 37.4 | 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

## In-line Type

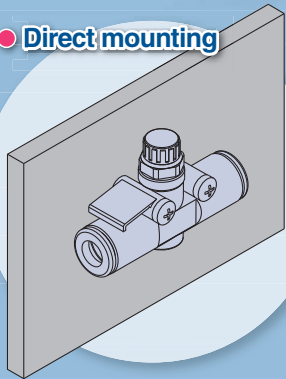
New

RoHS

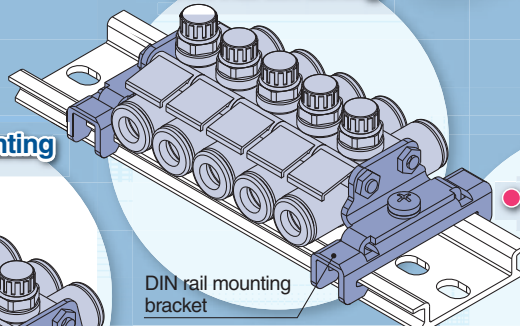


### 4 types of mounting variations

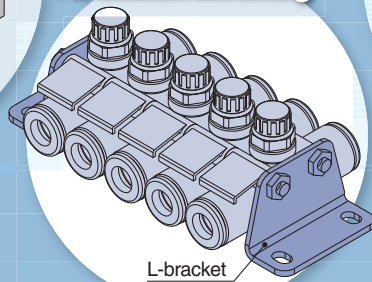
● Direct mounting



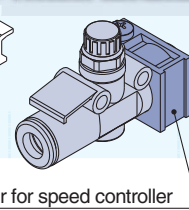
● DIN rail mounting



● L-bracket mounting



● Holder mounting



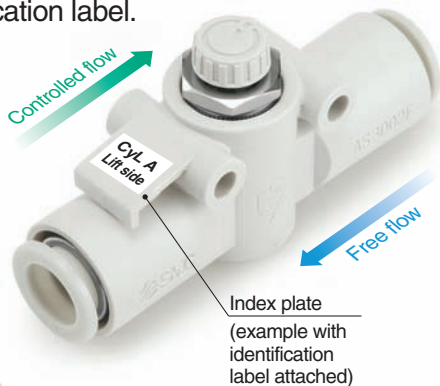
DIN rail mounting bracket

L-bracket

Holder for speed controller

### Index plate

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

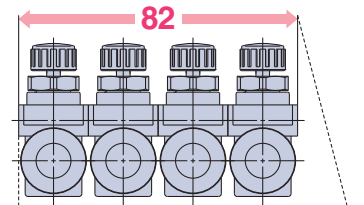


Index plate (example with identification label attached)

### Compact

**NEW**

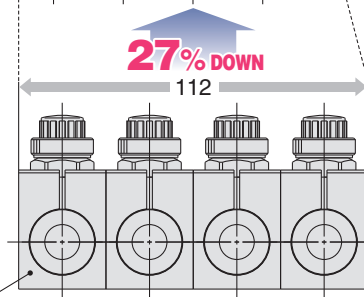
Four AS3002F-10 controllers connected



**27% DOWN**

Conventional

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



Holder

### Lightweight

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

Flow-rate characteristics are equivalent to the conventional product.

Series AS

**SMC**  
CAT.NAS20-215B

# Series AS

## Series

| Series  | Applicable tube O.D. |     |   |   |   |    |           |      |       |      |       | Applicable cylinder bore size |      |                          |                |
|---------|----------------------|-----|---|---|---|----|-----------|------|-------|------|-------|-------------------------------|------|--------------------------|----------------|
|         | Metric size          |     |   |   |   |    | Inch size |      |       |      |       | (inch)                        |      | (mm)                     |                |
|         | 2                    | 3.2 | 4 | 6 | 8 | 10 | 12        | 1/8" | 5/32" | 1/4" | 5/16" | 3/8"                          | 1/2" |                          |                |
| AS1002F | ●                    |     | ● | ● |   |    |           | ●    | ●     | ●    |       |                               |      | 1/4"                     | 2.5, 4, 6      |
| AS2002F |                      | ●   | ● |   |   |    |           | ●    | ●     |      |       |                               |      | 1/4", 3/8", 5/8", 3/4"   | 6, 10, 16, 20  |
| 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)<br>152 psi <small>Note 1)</small> (1.05 MPa <small>Note 1)</small> ) |
| Max. operating pressure                         | 145 psi (1 MPa)<br>102 psi <small>Note 1)</small> (0.7 MPa <small>Note 1)</small> )    |
| 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 <small>Note 2)</small> | Nylon, Soft nylon, Polyurethane  |

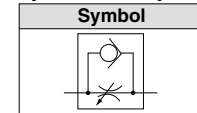
Note 1) In case of AS1002F-02  
 Note 2) Use caution at the max. operating pressure when using soft nylon or polyurethane tubing.  
 (Refer to pages 371 and 372 of Best Pneumatics Vol. 6)  
 Note 3) Brass parts are all electroless nickel plated.

## Flow Rate and Flow Coefficient

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

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

## Flow Direction Symbol on Body



## How to Order



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    |

| Metric size | Inch size |
|-------------|-----------|
| 02          | ø1/8"     |
| 23          | ø3.2*     |
| 04          | ø4"       |
| 06          | ø6"       |
| 08          | ø8"       |
| 10          | ø10"      |
| 12          | ø12"      |



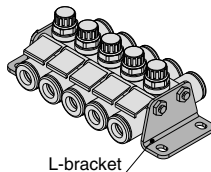
| Lock nut option |                  |
|-----------------|------------------|
| Nil             | Hexagon lock nut |
| J               | Round lock nut   |

With one-touch fittings

## Options

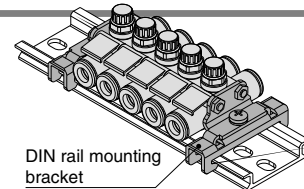
### L-bracket

| 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 |
|------------|------------|------------|------------|-------------|
| AS1002F-02 | AS-31B     | AS-32B     | AS-33B     | AS-34B      |
| AS1002F-23 | AS-32B     | AS-34B     | AS-33B     | AS-36B      |
| AS1002F-04 |            |            | AS-35B     | AS-37B      |
| AS1002F-06 |            |            | AS-36B     | AS-38B      |
| AS1002F-07 |            |            | AS-35B     | AS-37B      |
| AS2002F-04 | AS-32B     | AS-34B     | AS-35B     | AS-37B      |
| AS2002F-06 |            |            | AS-36B     | AS-38B      |
| AS2002F-07 | AS-41B     | AS-42B     | AS-44B     | AS-45B      |
| 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-43B     | AS-45B     | AS-47B     | AS-48B      |
| AS3002F-12 |            |            |            |             |
| AS3002F-10 |            |            |            |             |
| AS4002F-10 | AS-43B     | AS-45B     | AS-47B     | AS-48B      |
| AS4002F-11 |            |            |            |             |
| AS4002F-12 |            |            |            |             |
| AS4002F-13 |            |            |            |             |

### Details of threaded stud kit for manifold

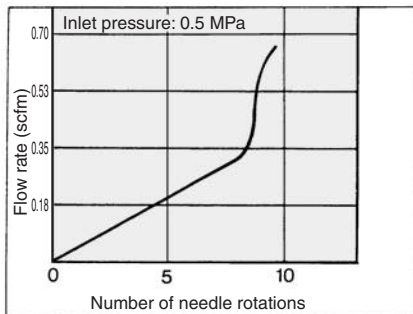
| Part no. | Threaded stud |      | Accessories |             |      |    |   |    |
|----------|---------------|------|-------------|-------------|------|----|---|----|
|          | Length (mm)   | pcs. | Hexagon nut | Flat washer | pcs. |    |   |    |
| AS-31B   | 38            | 2    | M3          | 4           | M3   |    |   |    |
| 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 |
| 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.

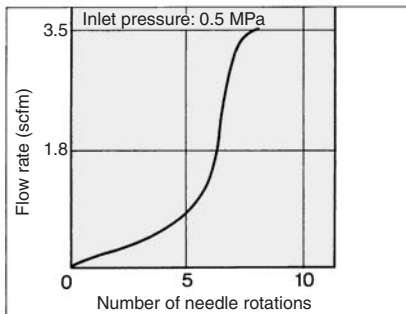
Ex.) AS2002F-04 When connecting 4 pcs. and mounting L-brackets on both sides  
 • Speed controller AS2002F-04 ..... 4 pcs.  
 • L-bracket AS-20L ..... 2 pcs.  
 • Threaded stud kit for manifold AS-32B ..... 1 pc.

### Needle Valve/Flow-rate Characteristics

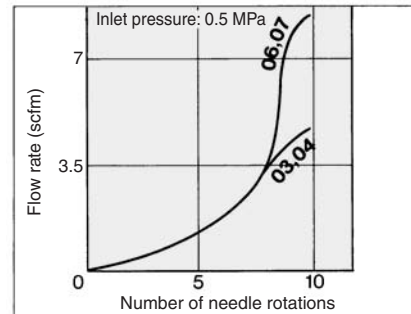
**AS1002F-02**



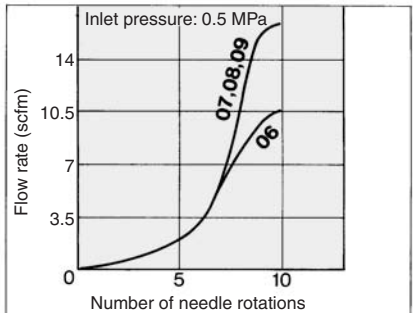
**AS1002F**



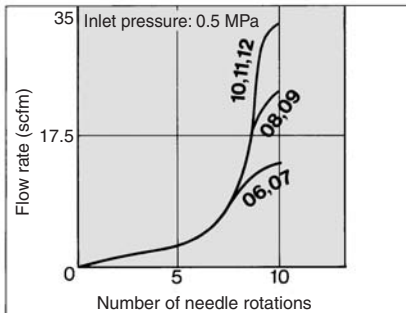
**AS2002F**



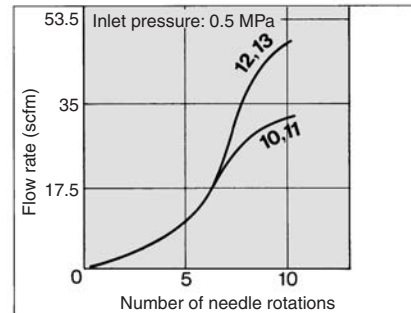
**AS2052F**



**AS3002F**

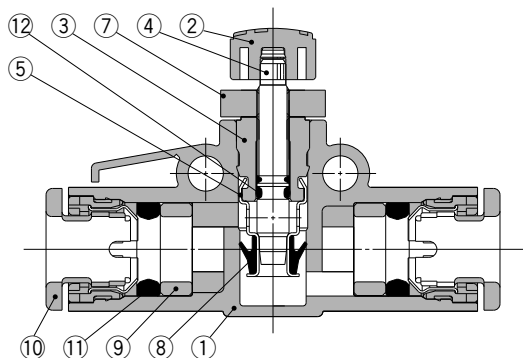


**AS4002F**

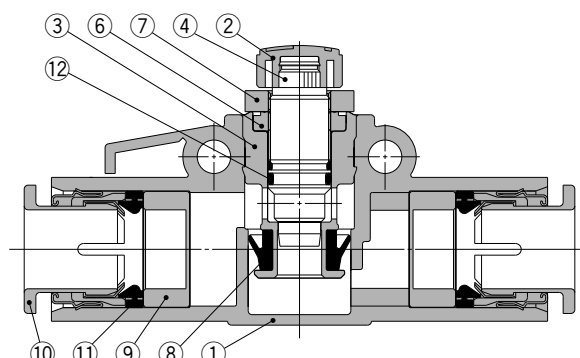


### Construction

**AS1002F, AS2002F, AS2052F**



**AS1002F-02, AS3002F, AS4002F**



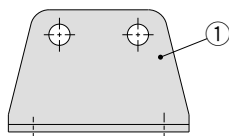
#### Component Parts

| 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 <sup>Note)</sup> |                |
| 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.

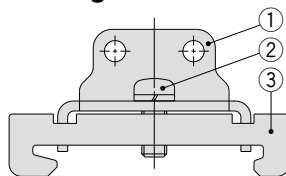
#### L-bracket



#### Component Part

| No. | Description | Material    |
|-----|-------------|-------------|
| 1   | Bracket     | Steel strip |

#### DIN rail mounting bracket



#### Component Parts

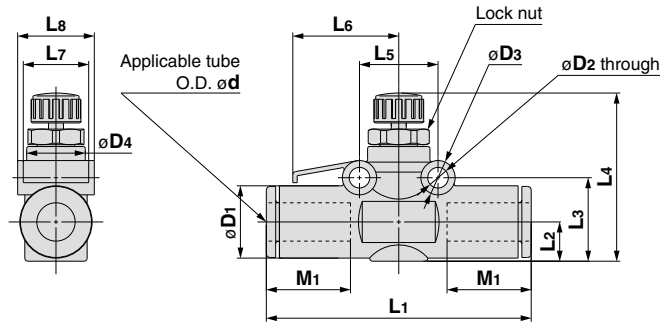
| No. | Description                     | Material    |
|-----|---------------------------------|-------------|
| 1   | Bracket                         | Steel strip |
| 2   | Cross recessed round head screw | Steel wire  |
| 3   | Clasp                           | Steel strip |

#### ⚠ Caution

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

# Series AS

## Dimensions



### Metric Size

Unit: mm

| Model      | Applicable tube O.D. ød | D1   | D2  | D3  | D4   | L1   | L2   | L3   | L4 (Note) |      | L5   | L6   | L7   | L8   | M1   | Weight (g) |
|------------|-------------------------|------|-----|-----|------|------|------|------|-----------|------|------|------|------|------|------|------------|
|            |                         |      |     |     |      |      |      |      | MAX.      | MIN. |      |      |      |      |      |            |
| 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 |      | 6.5        |
| AS1002F-06 | 6                       | 11.6 |     |     |      | 39.5 | 6.1  | 12.8 | 25.5      | 22.7 |      |      |      | 12.3 |      | 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 | 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 | 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 | 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) |      | L5   | L6   | L7   | L8   | M1   | Weight (g) |
|------------|-------------------------|------|-----|-----|------|------|------|------|-----------|------|------|------|------|------|------|------------|
|            |                         |      |     |     |      |      |      |      | MAX.      | MIN. |      |      |      |      |      |            |
| 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 |      | 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 | 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 | 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 |     |     |      | 76.9 | 10.3 | 22.7 | 51.6      | 44.1 |      |      |      |      | 21   | 86         |
| AS4002F-13 | 1/2"                    | 21.7 | 4.3 | 8   | 25   | 81.3 | 11.3 | 23.7 | 52.6      | 45.1 | 28   | 33   | 14   | 26.2 | 22   | 95         |

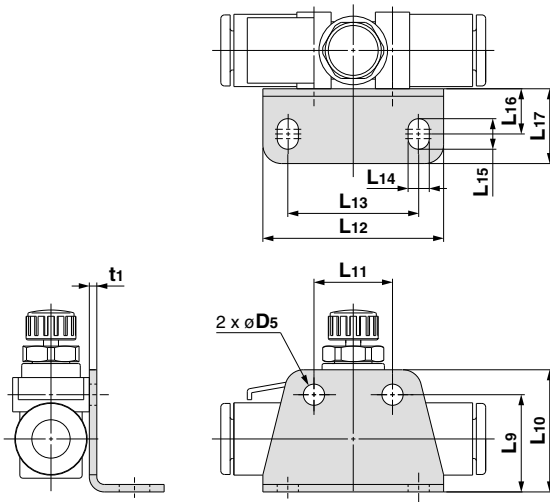
Note) Reference dimensions

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                                |

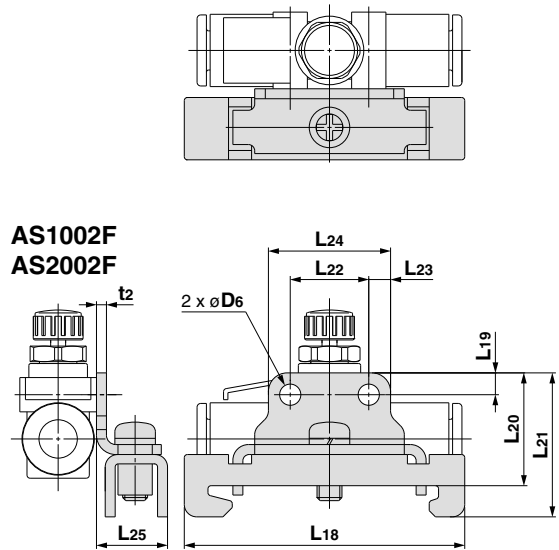
**L-bracket**

Bracket on a single side



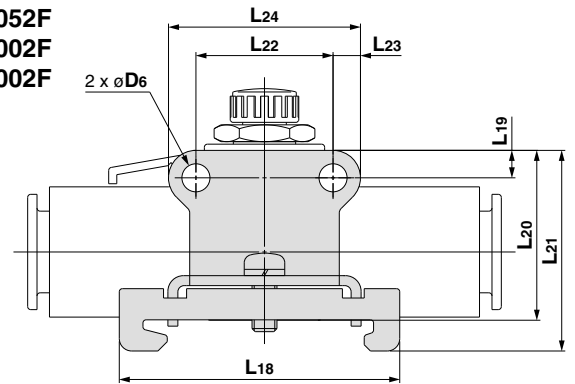
**DIN rail mounting bracket**

Bracket on a single side



**AS1002F**  
**AS2002F**

**AS2052F**  
**AS3002F**  
**AS4002F**



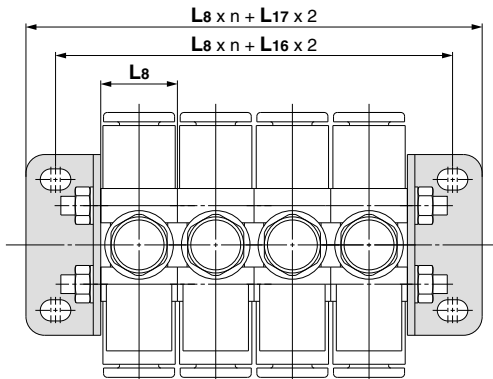
Unit: mm

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

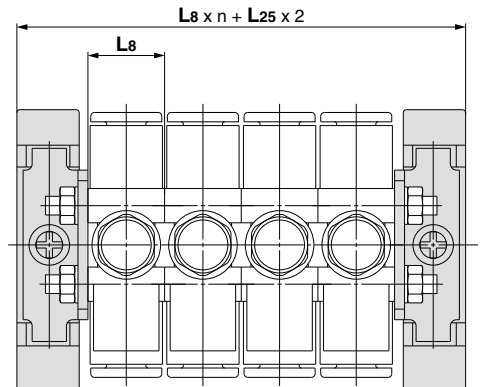
Unit: mm

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

**Brackets on both sides**



**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.

\*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

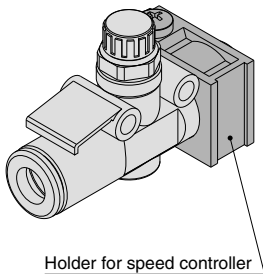
## Series *TMH*

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

Possible to hold a single controller.



### ● Holder mounting



Holder for speed controller

### 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<br>(Nominal x Length) | Piece |
|----------------|----------------|----------------------------|-------|
| Metric size    | Inch size      | M3 x 15                    | 1     |
| <b>TMH-23J</b> | <b>TMH-01J</b> |                            |       |
| <b>TMH-04J</b> | <b>TMH-03J</b> |                            |       |
| <b>TMH-06J</b> | <b>TMH-07J</b> |                            |       |
| <b>TMH-06</b>  | <b>TMH-07</b>  |                            |       |
| <b>TMH-08</b>  | <b>TMH-09</b>  |                            |       |
| <b>TMH-10</b>  | —              | M4 x 25                    |       |
| <b>TMH-12</b>  | <b>TMH-13</b>  | M4 x 35                    |       |

### Series

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

#### Metric Size

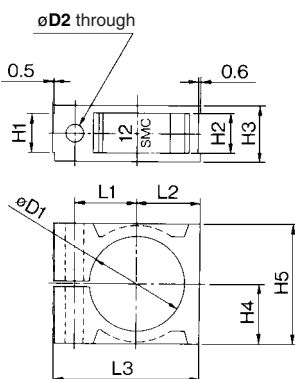
| Applicable series | Tube size      | Applicable tube |                |               |               |                                |           |
|-------------------|----------------|-----------------|----------------|---------------|---------------|--------------------------------|-----------|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

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

#### Inch Size

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

### Dimensions





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


Unit: mm

## 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](http://www.smcusa.com)  
**SMC Pneumatics (Canada) Ltd.** [www.pneumatics.ca](http://www.pneumatics.ca)  
**(800) SMC.SMC1 (762-7621)**  
**e-mail: [sales@smcusa.com](mailto:sales@smcusa.com)**  
**For International inquiries: [www.smcworld.com](http://www.smcworld.com)**



# Speed Controller with One-touch Fitting/Elbow Type

Reduces labor time!

New

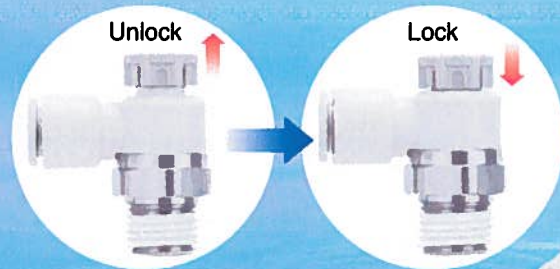
RoHS

Easy to use

Push-lock type

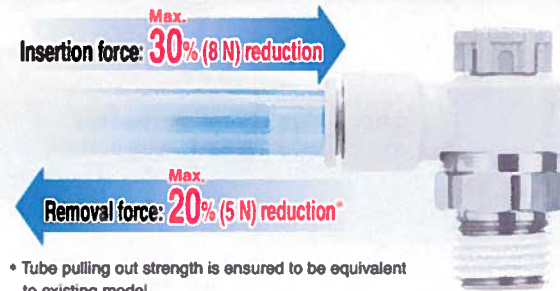
Larger handle

• Easy to lock

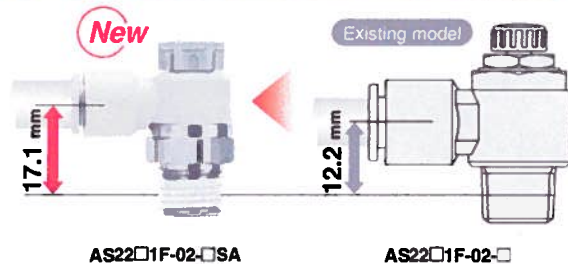


| Body size | oD (mm)              |
|-----------|----------------------|
| 1         | 9                    |
| 2         | 11.6 (Port size 1/8) |
|           | 12.6 (Port size 1/4) |
| 3         | 15.6                 |
| 4         | 17.6                 |

Improved tube insertion/removal



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



Series AS

SMC  
CAT.ES20-220A

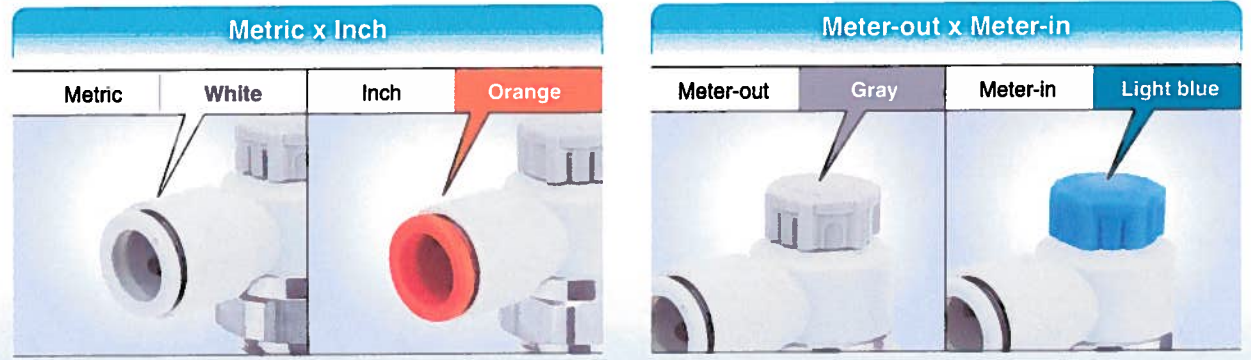
### Series Variations

| 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 | •                      | •   | • | • |   |    |           |    |      |       | •    | •                          | •     |      |      |  |
|           | 10-32 UNF |             | •                      | •   | • | • |   |    |           |    |      |       | •    | •                          | •     |      |      |  |
| 2         | R, 1/8    | Sealant*1   | •                      | •   | • | • | • | •  |           |    |      |       | •    | •                          | •     | •    |      |  |
|           |           |             | •                      | •   | • | • | • | •  | •         |    |      |       | •    | •                          | •     | •    | •    |  |
| 3         | NPT, 3/8  | Sealant*1   |                        |     | • | • | • | •  | •         |    |      |       |      | •                          | •     | •    |      |  |
| 4         | 1/2       |             |                        |     |   |   |   | •  | •         | •  |      |       |      |                            | •     | •    |      |  |

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

⊙ Electroless nickel plated type is standard.

### Easy identification of product type



# 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<br>NPT  | 1/8         |                        | ●   | ● | ● | ● | ●  |           |    |      |       | ●    | ●     | ●    | ●    |   |   |
| 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.

## Specifications

### Flow Direction Symbols on Body

|                   | Meter-out type | Meter-in type |
|-------------------|----------------|---------------|
| Indication symbol |                |               |

|                               |  |
|-------------------------------|--|
| 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

### ⚠ 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.

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

# Series AS

## How to Order



Body size 1

Body size 2/3/4

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.

AS 1 2 0 1 F - M5 - 06 A

AS 2 2 0 1 F - 01 - 06 S A

Body size

|   |                       |
|---|-----------------------|
| 1 | M5 x 0.8<br>10-32 UNF |
| 2 | 1/8, 1/4              |
| 3 | 3/8                   |
| 4 | 1/2                   |

Thread type

|     |     |
|-----|-----|
| NII | R   |
| N   | NPT |

Port size

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

Seal method

|     |                 |
|-----|-----------------|
| NII | Without sealant |
| S   | With sealant    |

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

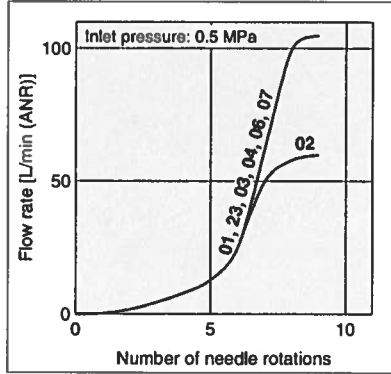
Applicable tubing O.D. (Note 1)

| 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.

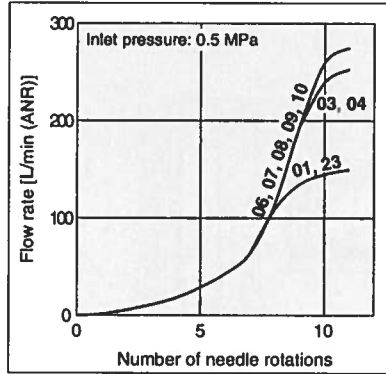
**Needle Valve/Flow-rate Characteristics**

**AS1201F-M5, AS1211F-M5**

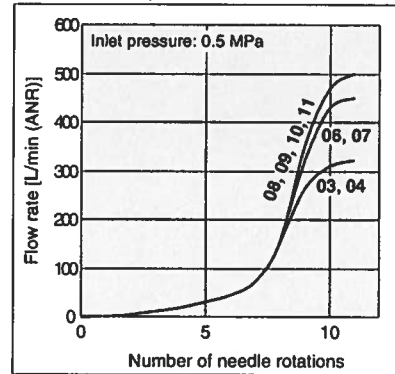


Note) -U10/32 has the same specification as M5.

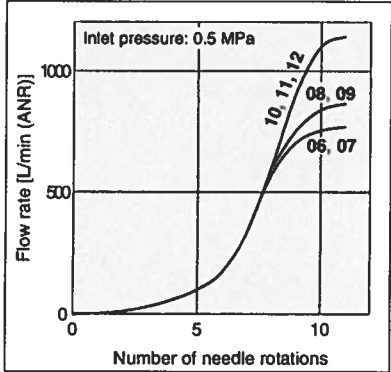
**AS2201F-01, AS2211F-01**



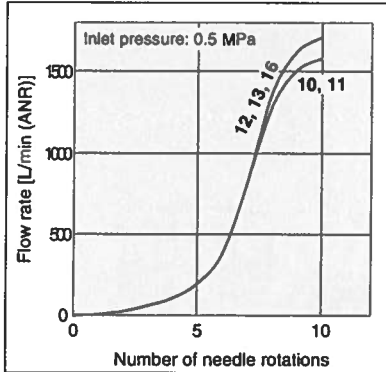
**AS2201F-02, AS2211F-02**



**AS3201F-03, AS3211F-03**



**AS4201F-04, AS4211F-04**

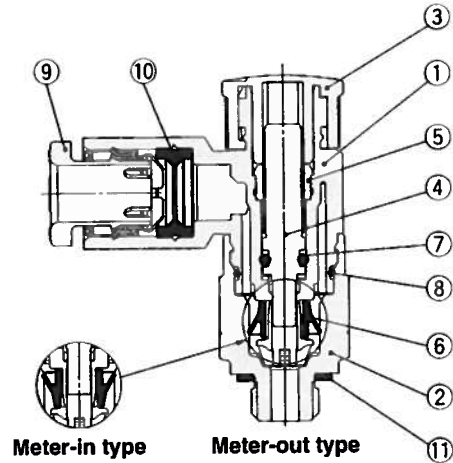


Note) The numbers above the flow-rate characteristic curves in the charts show the tubing diameter as defined by the product number.

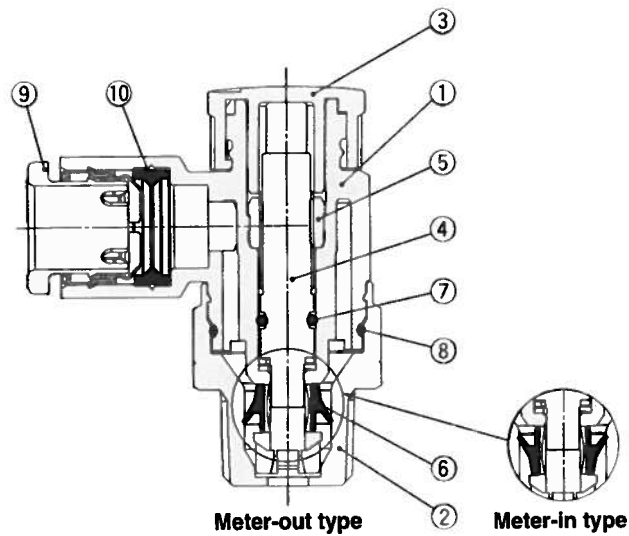
# Series AS

## Construction

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



Seal method: Sealant  
Thread type: R, NPT



### Component Parts

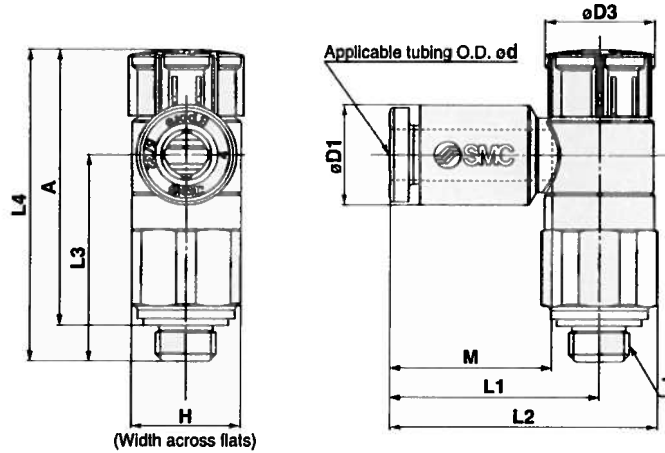
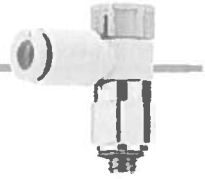
| No. | Description  | Material            | Note                      |
|-----|--------------|---------------------|---------------------------|
| 1   | Body A       | PBT                 |                           |
| 2   | Body B       | Brass               | Electroless nickel plated |
| 3   | Handle       | 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 |                           |

Speed Controller with One-touch Fitting  
Elbow Type **Series AS**

Thread type: M5, 10-32 UNF

**Dimensions**

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



**Metric size**

| 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<br>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 |     |                       |   | 7.2  |    |      |      |      |            |      |           |      |      |            |      |      |   |
| AS12□1F-M5-23A     | 3.2 |                       |   | 8.2  |    |      |      |      |            |      |           |      |      |            |      |      |   |
| AS12□1F-U10/32-23A |     |                       |   | 10.4 |    |      |      |      |            |      |           |      |      |            |      |      |   |
| AS12□1F-M5-04A     | 4   |                       |   | 18.6 |    |      |      |      |            |      |           |      |      |            | 23.4 | 16.5 | 6 |
| AS12□1F-U10/32-04A | 6   |                       |   |      |    |      |      |      |            |      |           |      |      |            |      |      |   |
| AS12□1F-M5-06A     |     |                       |   |      |    |      |      |      |            |      |           |      |      |            |      |      |   |
| AS12□1F-U10/32-06A |     |                       |   |      |    |      |      |      |            |      |           |      |      |            |      |      |   |

Note 1) Reference dimensions

Note 2) Reference dimensions after installation of thread

**Inch size**

| 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<br>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 |       |                       |   | 8.2  |    |      |    |      |            |      |           |      |      |            |      |      |   |
| AS12□1F-M5-03A     | 5/32" |                       |   | 11.2 |    |      |    |      |            |      |           |      |      |            |      |      |   |
| AS12□1F-U10/32-03A |       |                       |   | 18.6 |    |      |    |      |            |      |           |      |      |            | 23.4 | 16.5 | 6 |
| AS12□1F-M5-07A     | 1/4"  |                       |   |      |    |      |    |      |            |      |           |      |      |            |      |      |   |
| AS12□1F-U10/32-07A |       |                       |   |      |    |      |    |      |            |      |           |      |      |            |      |      |   |

Note 1) Reference dimensions

Note 2) Reference dimensions after installation of thread

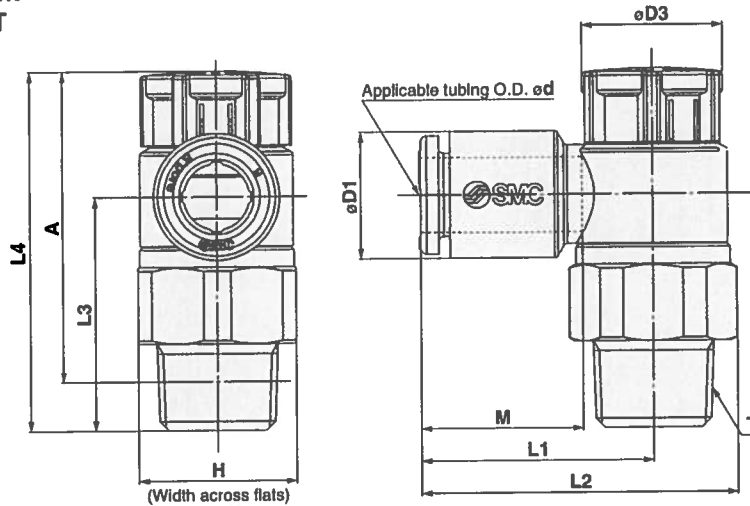
# Series AS

Thread type: R, NPT

## 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<br>(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   |     |              | 10.4 |      |             |             |      |            |      |           |      |      | 10 (9)      |
| AS22□1F-01-06(S)A | 6   |     |              | 13.2 |      |             |             |      |            |      |           |      |      | 14.2        |
| AS22□1F-01-08(S)A | 8   |     |              | 15.9 |      |             |             |      |            |      |           |      |      | 15.6        |
| AS22□1F-01-10(S)A | 10  |     |              | 25.3 |      |             |             |      |            |      |           |      |      | 32.3 (32.2) |
| AS22□1F-02-23(S)A | 3.2 | 1/4 | 17<br>(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  |      |             |             |      |            |      |           |      |      | 19 (20)     |
| AS22□1F-02-06(S)A | 6   |     |              | 10.4 |      |             |             |      |            |      |           |      |      | 20 (21)     |
| AS22□1F-02-08(S)A | 8   |     |              | 13.2 |      |             |             |      |            |      |           |      |      | 21 (22)     |
| AS22□1F-02-10(S)A | 10  |     |              | 15.9 |      |             |             |      |            |      |           |      |      | 22 (23)     |
| AS32□1F-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 |      |             |             |      |            |      |           |      |      | 32 (33)     |
| AS32□1F-03-10(S)A | 10  |     |              | 15.9 |      |             |             |      |            |      |           |      |      | 33 (34)     |
| AS32□1F-03-12(S)A | 12  |     |              | 18.5 |      |             |             |      |            |      |           |      |      | 34 (35)     |
| AS42□1F-04-10(S)A | 10  |     |              | 27.4 |      |             |             |      |            |      |           |      |      | 40.3 (40.2) |
| AS42□1F-04-12(S)A | 12  | 1/2 | 24<br>(23.8) | 18.5 | 17.6 | 30.8        | 43.7 (43.6) | 35.1 | 50.8       | 49.2 | 43.7      | 42.1 | 17   | 56 (55)     |
| AS42□1F-04-16(S)A | 16  |     |              | 23.8 |      | 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<br>(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" |     |              | 11.2 |      |      |           |      |            |      |           |      |      | 10 (9)       |      |      |      |             |      |      |         |
| AS22□1F-01-07(S)A | 1/4"  |     |              | 13.2 |      |      |           |      |            |      |           |      |      | 14.2         |      |      |      |             |      |      |         |
| AS22□1F-01-09(S)A | 5/16" |     |              | 15.5 |      |      |           |      |            |      |           |      |      | 15.6         |      |      |      |             |      |      |         |
| AS22□1F-01-11(S)A | 3/8"  |     |              | 27.4 |      |      |           |      |            |      |           |      |      | 40.3 (40.2)  | 36.2 | 50.8 | 49.2 | 43.7        | 42.1 | 15.6 | 54 (53) |
| AS22□1F-02-01(S)A | 1/8"  | 1/4 | 17<br>(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 |      |      |           |      |            |      |           |      |      | 20 (20)      |      |      |      |             |      |      |         |
| AS22□1F-02-09(S)A | 5/16" |     |              | 13.2 |      |      |           |      |            |      |           |      |      | 21 (21)      |      |      |      |             |      |      |         |
| AS22□1F-02-11(S)A | 3/8"  |     |              | 15.5 |      |      |           |      |            |      |           |      |      | 22 (22)      |      |      |      |             |      |      |         |
| 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 |      |      |           |      |            |      |           |      |      | 32 (33)      |      |      |      |             |      |      |         |
| AS32□1F-03-11(S)A | 3/8"  |     |              | 15.5 |      |      |           |      |            |      |           |      |      | 33 (34)      |      |      |      |             |      |      |         |
| AS42□1F-04-11(S)A | 3/8"  |     |              | 27.4 |      |      |           |      |            |      |           |      |      | 40.3 (40.2)  | 36.2 | 50.8 | 49.2 | 43.7        | 42.1 | 15.6 | 54 (53) |
| AS42□1F-04-13(S)A | 1/2"  |     |              | 1/2  |      |      |           |      |            |      |           |      |      | 24<br>(23.8) | 19.3 | 17.6 | 30.9 | 43.8 (43.7) | 34.7 | 50.8 | 49.2    |

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.

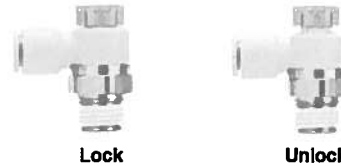
When installing the products, follow the listed proper torque.

## 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.



#### 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

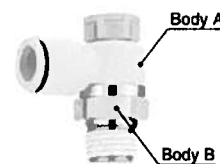
Tubing other than that from SMC cannot be used, because it may result in inability to connect the tube, air leakage after connecting the tube or disconnection of the tube.

#### 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

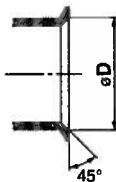
First, tighten it by hand, then give it an additional 1/6 turn to 1/4 turn with a wrench. A reference value for the tightening torque is 1 to 1.5 N·m.

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 φD (Recommended value) |
|--------------------|--|
| M 5                | 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) |
|-----------|--|
| M 5       | 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, R 1/8             | 7 to 9                         |
| NPT, R 1/4             | 12 to 14                       |
| NPT, R 3/8             | 22 to 24                       |
| NPT, R 1/2             | 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.

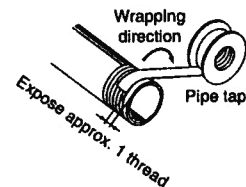
##### 2. Preparation before piping

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 1 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

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<http://www.smcworld.com>  
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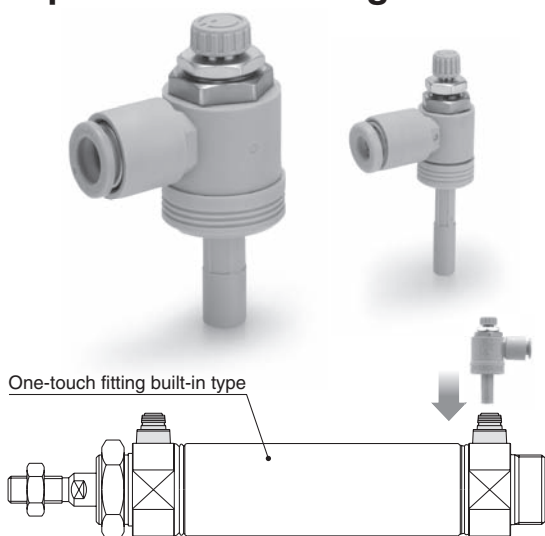
Specifications are subject to change without prior notice and any obligation on the part of the manufacturer.

D-SZ

1st printing QV printing QV 8150SZ Printed in Japan.

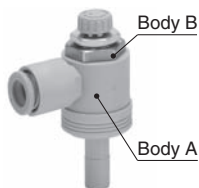
## Speed Controller with One-touch Fitting Plug-in Type Series AS□□□□P

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



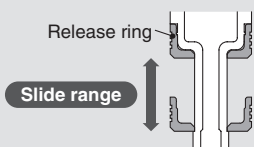
### Warning

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

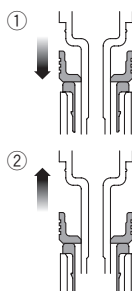


### Caution Release from One-touch fitting

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



- Slide down the release ring, and push the release bushing to the end.
- Bring up the body, while holding it down.
- Take 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

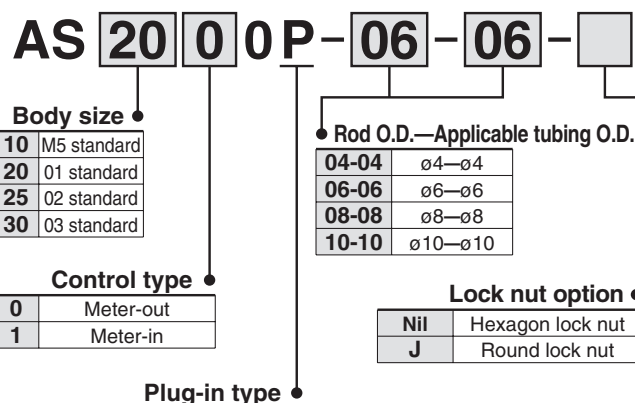
|                               |                                 |
|-------------------------------|---------------------------------|
| Fluid                         | Air                             |
| Proof pressure                | 1.5 MPa                         |
| Max. operating pressure       | 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                              | Flow rate [L/min (ANR)]                      | 100     | 130     | 230     | 290     | 660  | 920  |
|  | Sonic conductance [dm <sup>3</sup> /(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     | 0.2  | 0.2  |
|  | Free flow                                    | 0.25    | 0.25    | 0.25    | 0.25    | 0.25 | 0.25 |

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

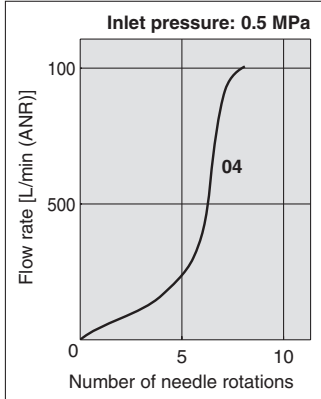
### How to Order



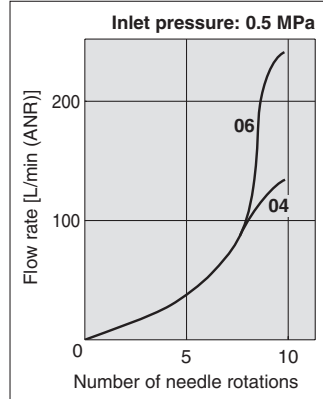
# Series AS□□□□P

## Needle Valve/Flow-rate Characteristics

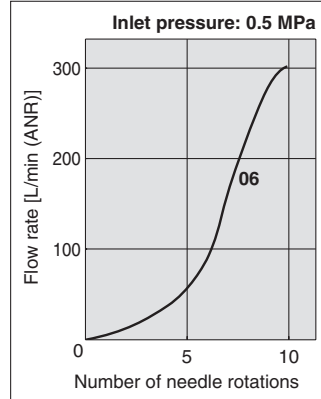
AS10□0P-04-04



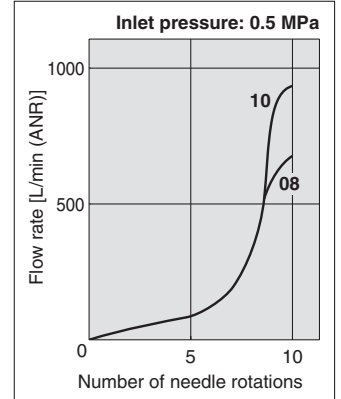
AS20□0P-□-□



AS25□0P-06-06



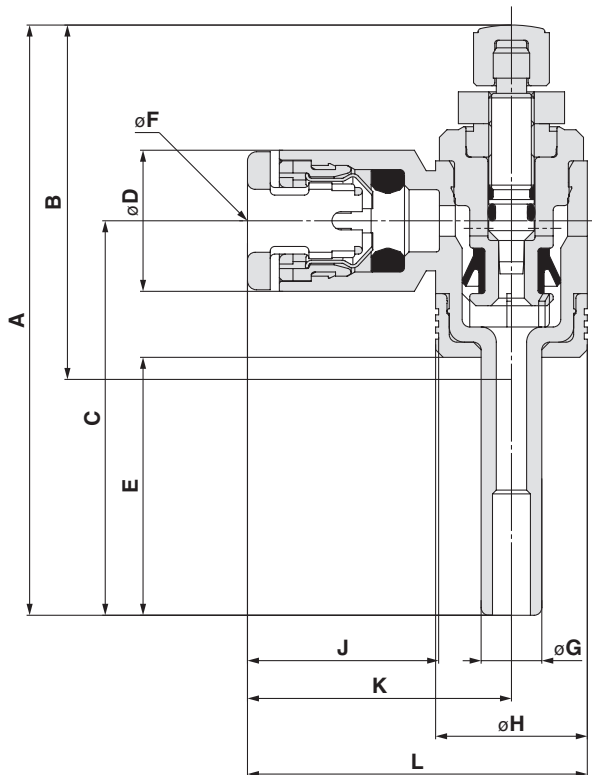
AS30□0P-□-□



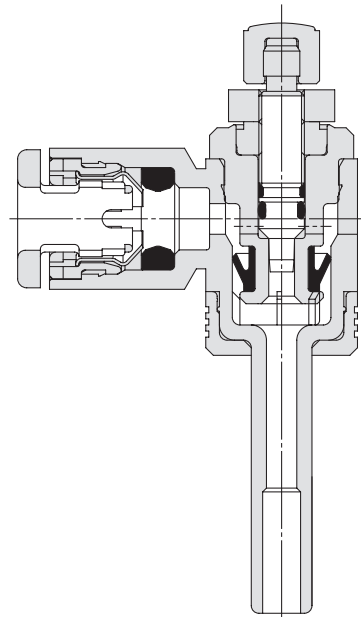
Note) The numbers above the flow-rate characteristic curves in the charts show the tubing diameter as defined by the product number.

## 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

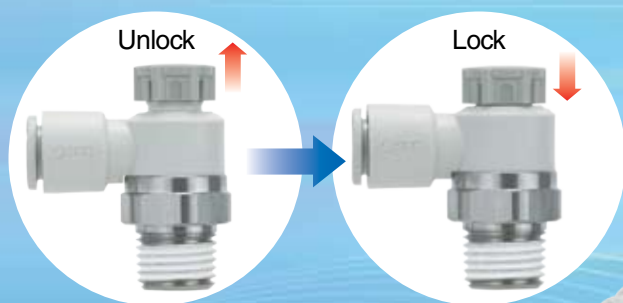
RoHS

Easy to use

Push-lock type

Larger handle

- Easy to lock



| 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                 |



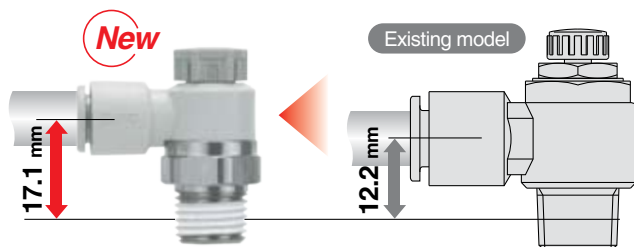
Improved tube insertion/removal

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

Removal force: **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

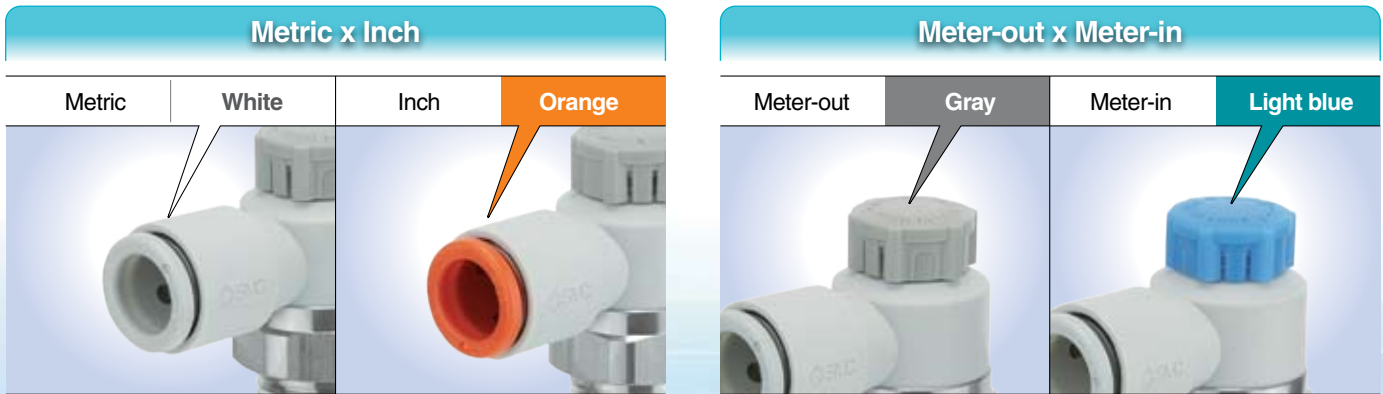
### Series Variations

| 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" |  |
|  | 1         | M5 x 0.8               | ●                      |     |   |   |   |    |           |    |      |       |      |       | Nylon (Series T, TIA)<br>Soft nylon (Series TS, TLS)<br>Polyurethane (Series T, TIU) |
|  |           | 10-32 UNF              | ●                      |     |   |   |   |    |           |    |      |       |      |       |  |
|  | 2         | 1/8                    | ●                      |     |   |   |   |    |           |    |      |       |      |       |  |
|  |           | 1/4                    | ●                      |     |   |   |   |    |           |    |      |       |      |       |  |
|  | 3         | 3/8                    | ●                      |     |   |   |   |    |           |    |      |       |      |       |  |
|  |           | 1/2                    | ●                      |     |   |   |   |    |           |    |      |       |      |       |  |
| 4  |           | ● ● ● <b>New</b> ● ● ● |                        |     |   |   |   |    |           |    |      |       |      |       |  |

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

⊙ Electroless nickel plated type is standard.

### Easy identification of product type



# 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<br>NPT  | 1/8         |                        | ●   | ● | ● | ● | ●  |           |    |      |       | ●    | ●     | ●    | ●    |   |   |
| 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.

## Specifications

### Flow Direction Symbols on Body

|                   | Meter-out type | Meter-in type |
|-------------------|----------------|---------------|
| Indication symbol |                |               |

|                               |  |
|-------------------------------|--|
| 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.)

## Flow Rate and Sonic Conductance

### ⚠ 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.

| Model   | AS12□1F-M5      | AS22□1F-01                    | AS22□1F-02      | AS32□1F-03      | AS42□1F-04                              |                          |                 |            |            |            |            |            |            |     |
|---|-----------------|-------------------------------|-----------------|-----------------|---|--------------------------|-----------------|------------|------------|------------|------------|------------|------------|-----|
| Tubing O.D.   | Metric size     | ø2<br>ø3.2<br>ø4<br>ø6        | ø3.2<br>ø4      | ø6<br>ø8<br>ø10 | ø4<br>ø6<br>ø8<br>ø10                   | ø6<br>ø8<br>ø10<br>ø12   | ø10<br>ø12      | ø10<br>ø12 | ø10<br>ø12 | ø10<br>ø12 | ø10<br>ø12 | ø10<br>ø12 | ø10<br>ø12 |     |
|   | Inch size       | —<br>ø1/8"<br>ø1/4"<br>ø5/32" | ø1/8"<br>ø5/32" | ø1/4"<br>ø5/16" | ø5/32"<br>—<br>ø1/4"<br>ø5/16"<br>ø3/8" | ø1/4"<br>ø5/16"<br>ø3/8" | ø1/4"<br>ø5/16" | ø3/8"      | ø3/8"      | ø3/8"      | ø3/8"      | ø3/8"      | ø1/2"      |     |
| C values:<br>Sonic<br>conductance<br>dm <sup>3</sup> /(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:<br>Critical<br>pressure<br>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.



# Series AS

## How to Order



Port size

|        |           |
|--------|-----------|
| M5     | M5 x 0.8  |
| U10/32 | 10-32 UNF |

Applicable tubing O.D. <sup>Note 1)</sup>

| Metric size |                         | Inch size |        |
|-------------|-------------------------|-----------|--------|
| 02          | ø2                      | 01        | ø1/8"  |
| 23          | ø3.2 <sup>Note 2)</sup> | 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

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<br>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 |

Push-lock type

Seal method

|     |                 |
|-----|-----------------|
| Nil | Without sealant |
| S   | With sealant    |

Elbow

Control type <sup>Note)</sup>

|   |           |
|---|-----------|
| 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

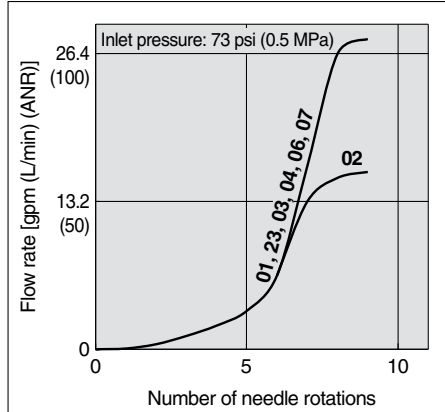
Applicable tubing O.D. <sup>Note 1)</sup>

| Metric size |                         | Inch size |        |
|-------------|-------------------------|-----------|--------|
| 23          | ø3.2 <sup>Note 2)</sup> | 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.

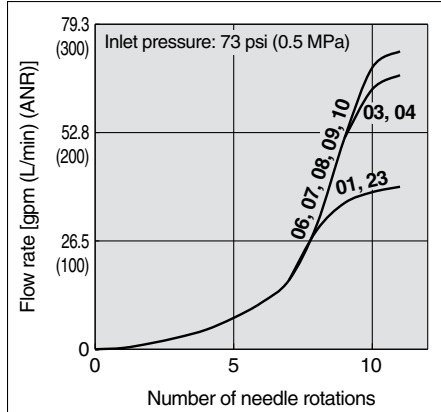
**Needle Valve/Flow-rate Characteristics**

**AS1201F-M5, AS1211F-M5**

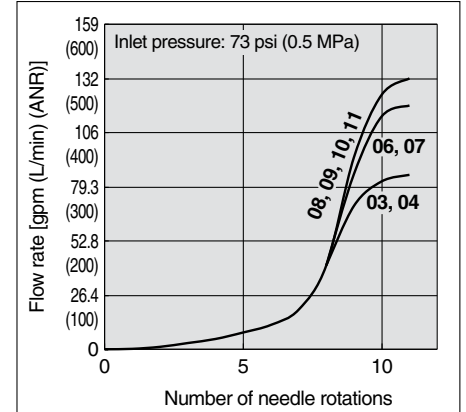


Note) -U10/32 has the same specification as M5.

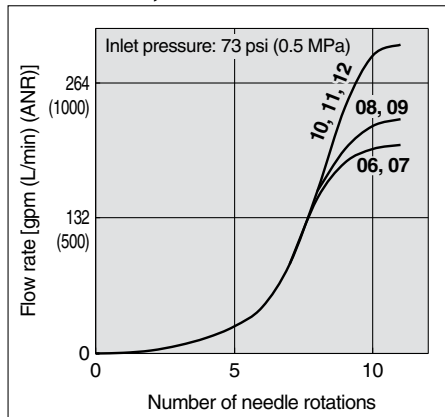
**AS2201F-01, AS2211F-01**



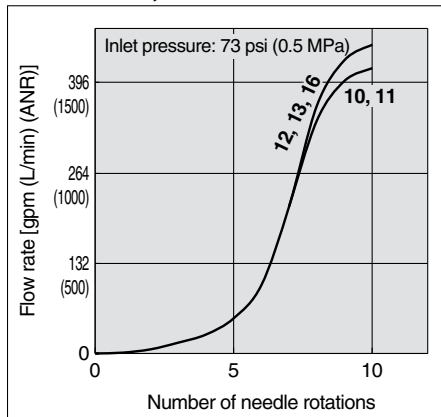
**AS2201F-02, AS2211F-02**



**AS3201F-03, AS3211F-03**



**AS4201F-04, AS4211F-04**

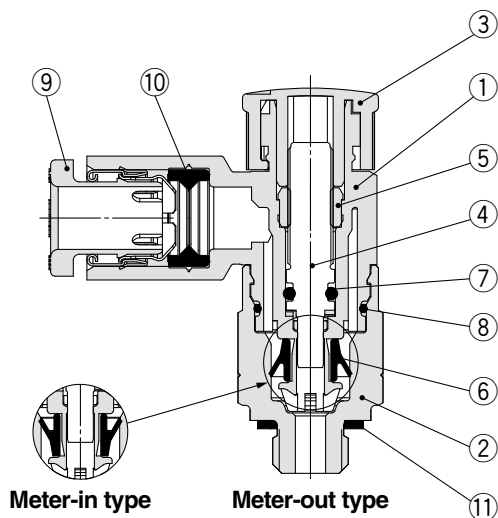


Note) The numbers above the flow-rate characteristic curves in the charts show the tubing diameter as defined by the product number.

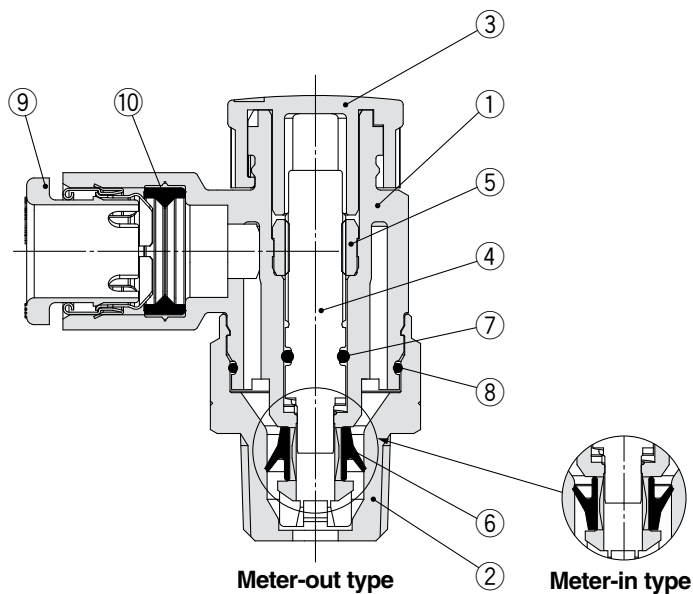
# Series AS

## Construction

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



Seal method: Sealant  
Thread type: R, NPT



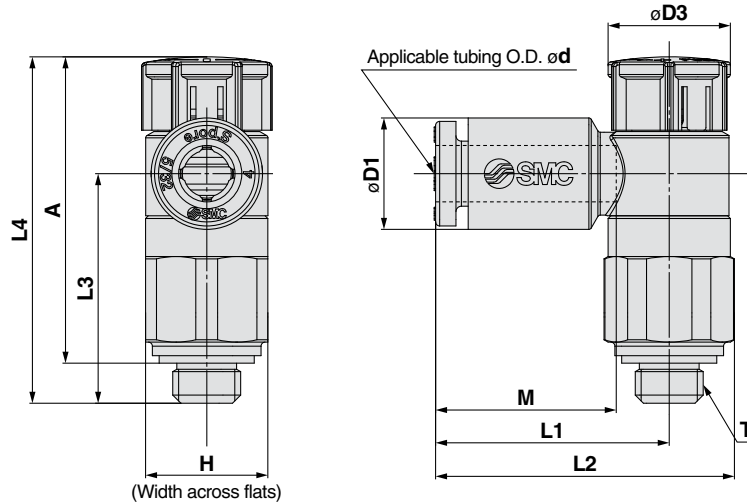
## Component Parts

| 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

| 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<br>10-32 UNF | 9 | 5.8 | 9  | 15.8 | 20.6 | 16.9 | 26.5       | 25.4 | 23.5      | 22.4 | 13.3 | 5          |  |  |  |  |  |  |  |  |  |
| AS12□1F-U10/32-02A |     |                       |   |     |    |      |      |      |            |      |           |      |      |            |  |  |  |  |  |  |  |  |  |
| AS12□1F-M5-23A     | 3.2 |                       |   | 7.2 |    |      |      |      |            |      |           |      |      |            |  |  |  |  |  |  |  |  |  |
| 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

| 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<br>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

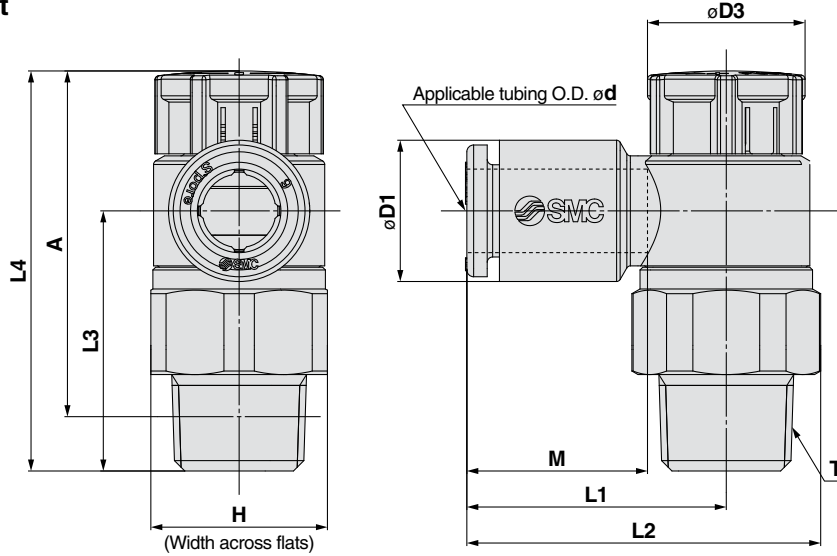
# Series AS

Thread type: R, NPT

## 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<br>(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   |     |              | 10.4 |      |      |             |      |            |      |           |      |      | 22.4       | 29.4 (29.3) | 14.2 | 11 (10) |
| AS22□1F-01-06(S)A | 6   |     |              | 13.2 |      |      |             |      |            |      |           |      |      | 25.3       | 32.3 (32.2) | 15.6 | 12 (11) |
| AS22□1F-01-08(S)A | 8   |     |              | 15.9 |      |      |             |      |            |      |           |      |      |            |             |      |         |
| AS22□1F-01-10(S)A | 10  |     |              | 15.9 |      |      |             |      |            |      |           |      |      |            |             |      |         |
| AS22□1F-02-23(S)A | 3.2 | 1/4 | 17<br>(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   |     |              | 10.4 |      |      |             |      |            |      |           |      |      | 23.4       | 32.5 (32.8) | 14.2 | 19 (20) |
| AS22□1F-02-06(S)A | 6   |     |              | 13.2 |      |      |             |      |            |      |           |      |      | 23.9       | 33 (33.3)   | 15.6 | 20 (21) |
| AS22□1F-02-08(S)A | 8   |     |              | 15.9 |      |      |             |      |            |      |           |      |      | 26.9       | 36 (36.3)   |      |         |
| AS22□1F-02-10(S)A | 10  |     |              | 15.9 |      |      |             |      |            |      |           |      |      |            |             |      |         |
| 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          | 15.6 | 32 (33) |
| AS32□1F-03-12(S)A | 12  |     |              | 18.5 |      |      |             |      |            |      |           |      |      | 29.7       | 40          | 17   | 34 (35) |
| AS42□1F-04-10(S)A | 10  | 1/2 | 24<br>(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) | 17   | 56 (55) |
| AS42□1F-04-16(S)A | 16  |     |              | 23.8 |      |      |             |      |            |      |           |      |      | 34.8       | 47.7 (47.6) | 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<br>(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" |     |              | 11.2 |      |      |             |      |            |      |           |      |      | 20.8       | 27.8 (27.7) | 10 (9) |         |
| AS22□1F-01-07(S)A | 1/4"  |     |              | 13.2 |      |      |             |      |            |      |           |      |      | 22.4       | 29.4 (29.3) | 14.2   | 11 (10) |
| AS22□1F-01-09(S)A | 5/16" |     |              | 15.5 |      |      |             |      |            |      |           |      |      | 26.4       | 35.5 (35.8) | 15.6   | 20 (21) |
| AS22□1F-02-01(S)A | 1/8"  | 1/4 | 17<br>(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" |     |              | 11.2 |      |      |             |      |            |      |           |      |      | 23.4       | 32.5 (32.8) | 14.2   | 19 (19) |
| AS22□1F-02-07(S)A | 1/4"  |     |              | 13.2 |      |      |             |      |            |      |           |      |      | 23.9       | 33 (33.3)   | 15.6   | 20 (20) |
| AS22□1F-02-09(S)A | 5/16" |     |              | 15.5 |      |      |             |      |            |      |           |      |      | 26.4       | 35.5 (35.8) | 15.6   | 20 (21) |
| AS22□1F-02-11(S)A | 3/8"  |     |              |      |      |      |             |      |            |      |           |      |      |            |             |        |         |
| 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          | 15.6   | 32 (33) |
| AS42□1F-04-11(S)A | 3/8"  | 1/2 | 24<br>(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) | 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.

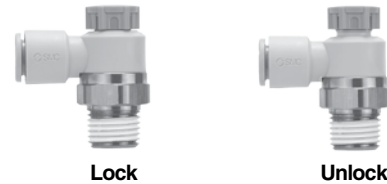
When installing the products, follow the listed proper torque.

## 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.



#### 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. $\phi 2$

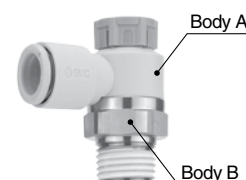
Tubing other than that from SMC cannot be used, because it may result in inability to connect the tube, air leakage after connecting the tube or disconnection of the tube.

#### 12. To install/remove the 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

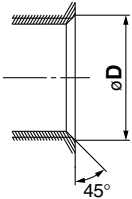
First, tighten it by hand, then give it an additional 1/6 turn to 1/4 turn with a wrench. A reference value for the tightening torque is 1 to 1.5 N·m.

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 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

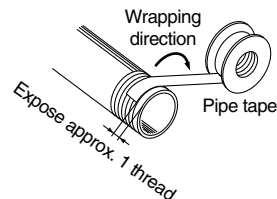
### ⚠ Caution

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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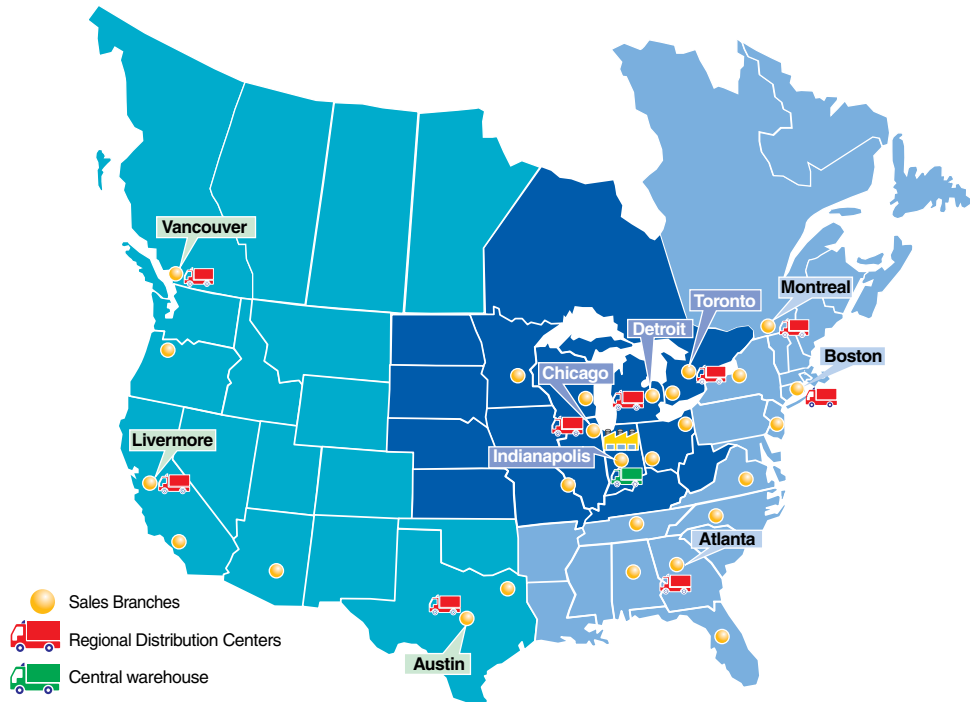
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