

# Speed Controller with One-touch Fitting Elbow Type/Universal Type

## Series AS

RoHS

### Minimizes installation time and cost

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

### Tube swivels 360°

Universal 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

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 zinc chromated, while the meter-in type is black zinc chromate plated.

Note 4) ●: Brass parts are 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 <sup>(5)</sup> , Round lock nut <sup>(6)</sup> , Electroless nickel plated |

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 |       |                 |          |       |       |
|--------------------------------|-----------------------------------|-------------------------------------------|--------------------------------|--------------------------|--------------------------|--|--------------------|--------|-------------------------|--------------------|-------|-----------------|----------|-------|-------|
| Tubing<br>O.D.                 | Metric size                       | ø2, ø3.2, ø4                              | ø3.2, ø4, ø6                   | ø3.2, ø4                 | ø6, ø8, ø10              |  | ø4                 | ø6     | ø8, ø10                 |                    | ø6    | ø8              | ø10, ø12 | ø10   | ø12   |
|                                | Inch size                         | ø1/8",<br>ø5/32"                          | ø1/8", ø3/16"<br>ø1/4", ø5/32" | ø1/8",<br>ø5/32"         | ø3/16", ø1/4",<br>ø5/16" |  | ø5/32"             | ø3/16" | 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)             | 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    |

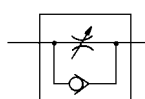
Note 1) Flow rate values are measured at 0.5 MPa and 20°C.

Note 2) U10/32 has the same specification as M5.



### Universal type

### JIS Symbol



### Flow Direction Symbols on Body

|                   | Meter-out type | Meter-in type |
|-------------------|----------------|---------------|
| Indication symbol |                |               |
| 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 1 F - 01 - 06 S - -**

**Body size**

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

**Type**

|   |           |
|---|-----------|
| 2 | Elbow     |
| 3 | Universal |

**Control type**

|   |           |
|---|-----------|
| 0 | Meter-out |
| 1 | Meter-in  |

**With One-touch fitting**

**Thread type**

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

**Port size**

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

**Lock nut option**

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

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

**Option**

|     |                           |
|-----|---------------------------|
| Nil | None                      |
| S   | With seal                 |
| N   | Electroless nickel plated |

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

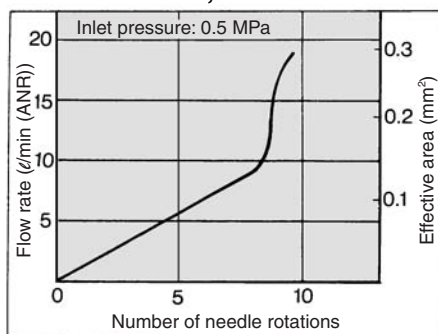
**Applicable tubing O.D.** (Note)

| 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"     |

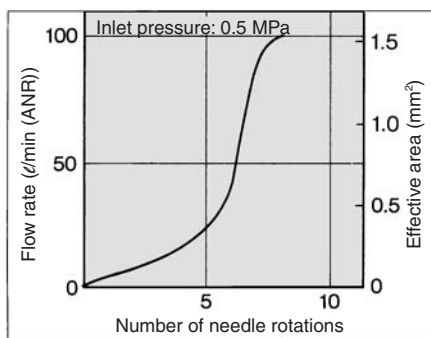
Note) For applicable tubing O.D. selection, refer to the Model on page 416.  
\*Use ø1/8" tube.

## Needle Valve/Flow Characteristics

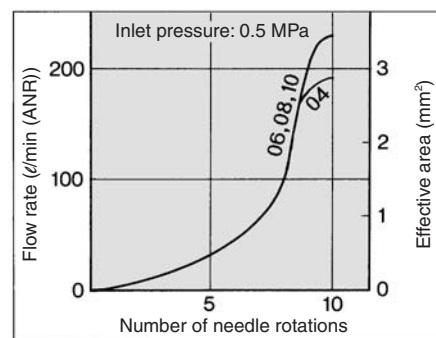
AS1201F-M3, AS1211F-M3  
AS1301F-M3, AS1311F-M3  
AS1201F-M5-02, AS1211F-M5-02



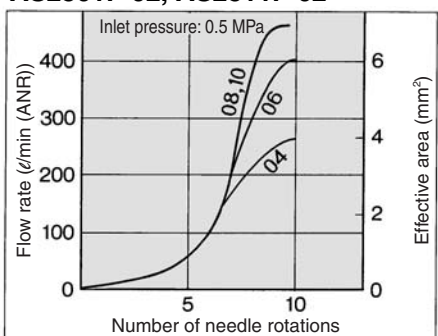
AS1201F-M5, AS1211F-M5  
AS1301F-M5, AS1311F-M5



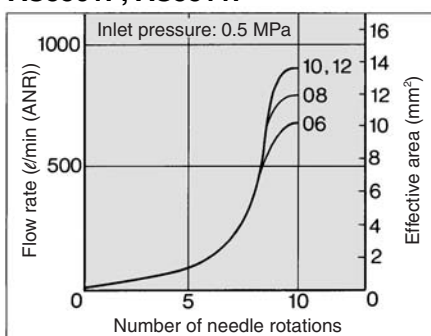
AS2201F-01, AS2211F-01  
AS2301F-01, AS2311F-01



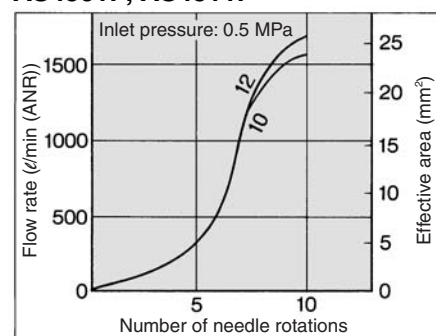
AS2201F-02, AS2211F-02  
AS2301F-02, AS2311F-02



AS3201F, AS3211F  
AS3301F, AS3311F



AS4201F, AS4211F  
AS4301F, AS4311F

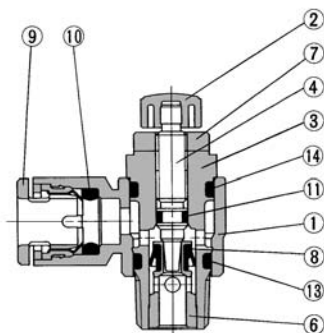


Note) "U10/32" is the same as "M5".

## Construction

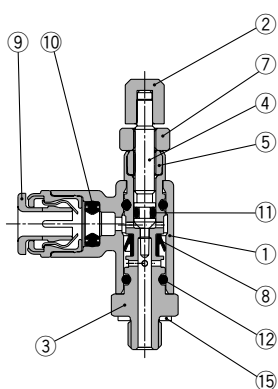
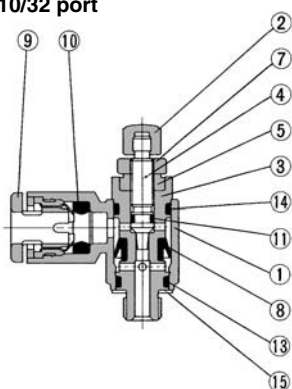
### Elbow type

Meter-out type

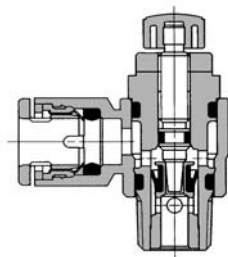


M3 port  
M5 port  
U10/32 port

ø2 tubing type

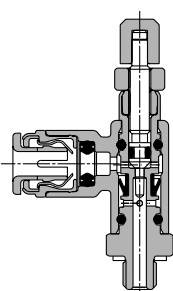
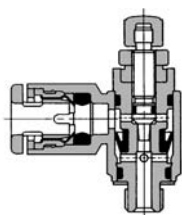


Meter-in type



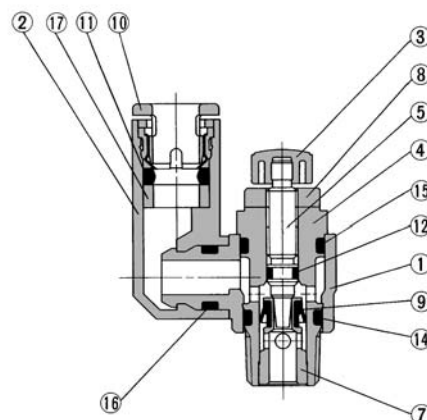
M3 port  
M5 port  
U10/32 port

ø2 tubing type

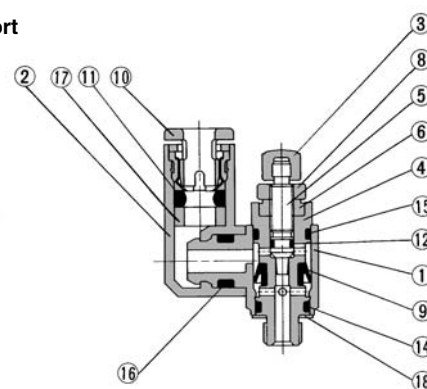


### Universal type

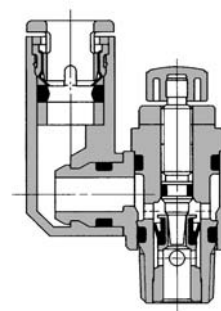
Meter-out type



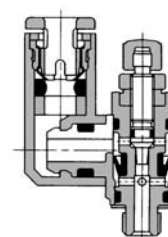
M3 port  
M5 port  
U10/32 port



Meter-in type



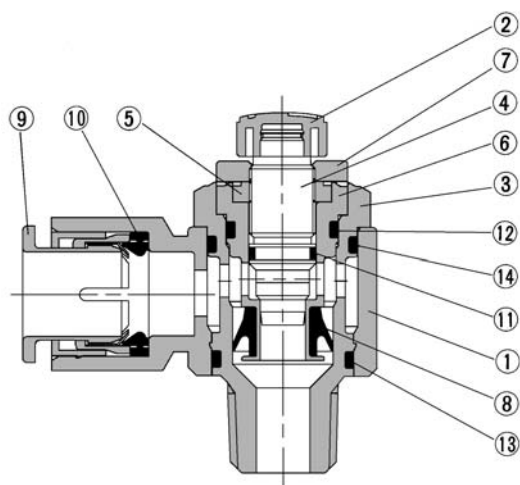
M3 port  
M5 port  
U10/32 port



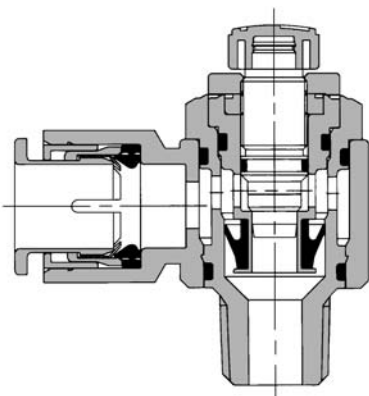
## Construction

### Elbow type

Meter-out type AS3201F-02



Meter-in type AS3211F-02



### Component Parts

| No. | Description  | Material             | Note                          |
|-----|--------------|----------------------|-------------------------------|
| 1   | Body A       | PBT                  |                               |
| 2   | Handle       | PBT <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     | Steel                | Zinc chromated <sup>(4)</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.

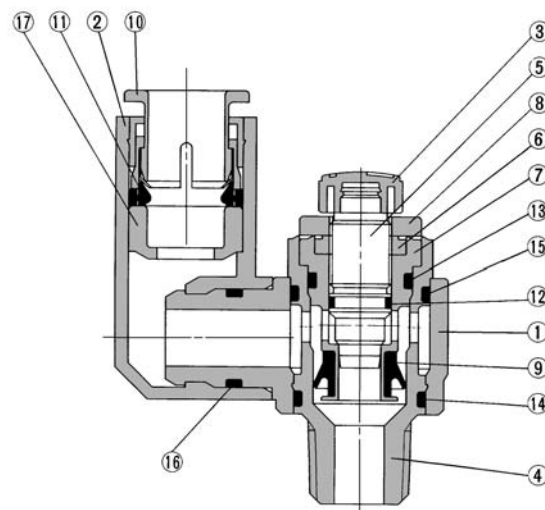
Note 2) AS12□1F-M3 is made of stainless steel.

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

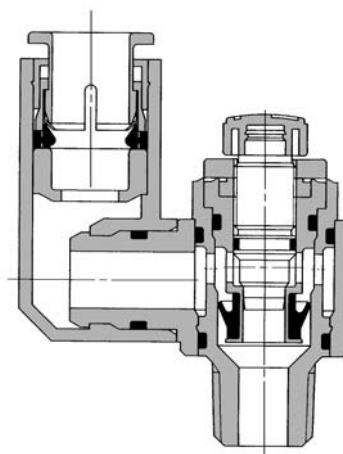
Note 4) Meter-in type is black zinc chromate plated.

### Universal type

Meter-out type AS3301F-02



Meter-in type AS3311F-02



### Component Parts

| No. | Description  | Material             | Note                          |
|-----|--------------|----------------------|-------------------------------|
| 1   | Body A       | PBT                  |                               |
| 2   | Elbow body   | PBT                  |                               |
| 3   | Handle       | PBT                  |                               |
| 4   | Body B       | Brass <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     | Steel                | Zinc chromated <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  | 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) Meter-in type is black zinc chromate plated.

AS

ASP

ASN

AQ

ASV

AK

VCHC

ASS

ASR  
ASQ

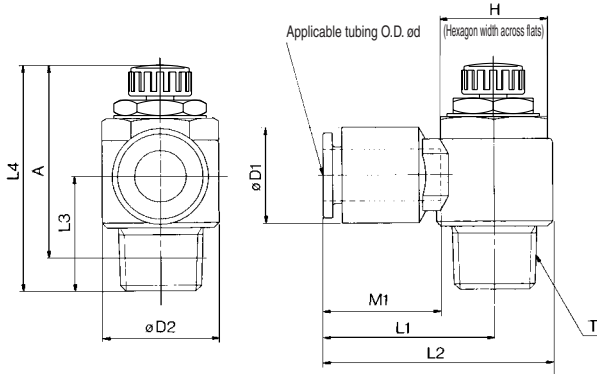
KE

TMH

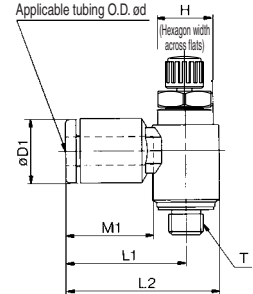
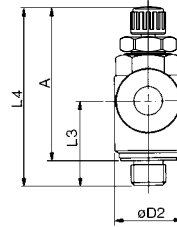
# Series AS



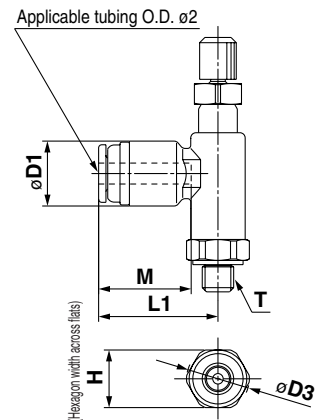
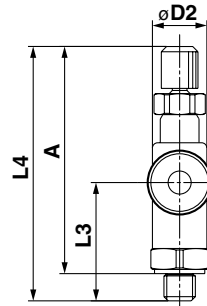
## Elbow Type



## M3 port M5 port U10/32 port



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



## Metric Size

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

Note 1) ( ) are the dimensions of NPT thread.

Note 2) Reference thread dimensions after installation.

Note 3) Reference dimensions

## Inch Size

| Model             | Applicable tubing O.D. ød | T        | H <sup>(1)</sup> | D1   | D2   | L1   | L2   | L3   | L4 <sup>(3)</sup> | A <sup>(2)</sup> | M1   | Mass (g) |
|-------------------|---------------------------|----------|------------------|------|------|------|------|------|-------------------|------------------|------|----------|
| AS12□1F-M3-01     | 1/8"                      | M3 x 0.5 | 5.5              | 8.4  | 7.2  | 16.1 | 19.7 | 10.5 | 26.6              | 24.1             | 24   | 2.4      |
| AS12□1F-M3-03     | 5/32"                     | M3 x 0.5 | 5.5              | 9.3  | 7.2  | 16.1 | 19.7 | 10   | 26.6              | 24.1             | 24   | 3        |
| AS12□1F-M5-01     | 1/8"                      | M5 x 0.8 | 7                | 8.4  | 7.2  | 17.3 | 22.1 | 12.3 | 28.6              | 25.8             | 25   | 7        |
| AS12□1F-U10/32-01 | 1/8"                      | 10-32UNF | 7                | 8.4  | 7.2  | 17.3 | 22.1 | 12.3 | 28.6              | 25.8             | 25   | 7        |
| AS12□1F-M5-03     | 5/32"                     | M5 x 0.8 | 7                | 9.3  | 7.2  | 17.3 | 22.1 | 12.3 | 28.6              | 25.8             | 25   | 7        |
| AS12□1F-U10/32-03 | 5/32"                     | 10-32UNF | 7                | 9.3  | 7.2  | 17.3 | 22.1 | 12.3 | 28.6              | 25.8             | 25   | 7        |
| AS12□1F-M5-05     | 3/16"                     | M5 x 0.8 | 11.4             | 11.4 | 11.4 | 21.3 | 26.1 | 11.7 | 28.6              | 25.8             | 25   | 16.5     |
| AS12□1F-U10/32-05 | 3/16"                     | 10-32UNF | 11.4             | 11.4 | 11.4 | 21.3 | 26.1 | 11.7 | 28.6              | 25.8             | 25   | 16.5     |
| AS12□1F-M5-07     | 1/4"                      | M5 x 0.8 | 12               | 12   | 12   | 18.3 | 23.1 | 11.7 | 28.6              | 25.8             | 25   | 13.5     |
| AS12□1F-U10/32-07 | 1/4"                      | 10-32UNF | 12               | 12   | 12   | 18.3 | 23.1 | 11.7 | 28.6              | 25.8             | 25   | 13.5     |
| AS22□1F-01-01     | 1/8"                      | 1/8      | 12               | 9.3  | 14.2 | 20.4 | 27.5 | 13.4 | 35.2              | 30.2             | 27.1 | 16       |
| AS22□1F-01-03     | 5/32"                     | 1/8      | 12               | 9.3  | 14.2 | 20.4 | 27.5 | 13.4 | 35.2              | 30.2             | 27.1 | 17       |
| AS22□1F-01-05     | 3/16"                     | 1/8      | 12               | 11.4 | 14.2 | 23.1 | 30.2 | 13.4 | 35.2              | 30.2             | 27.1 | 16.5     |
| AS22□1F-01-07     | 1/4"                      | 1/8      | 12               | 13.2 | 14.2 | 23.9 | 31   | 13.4 | 35.2              | 30.2             | 27.1 | 18.5     |
| AS22□1F-01-09     | 5/16"                     | 1/8      | 12               | 15.2 | 14.2 | 25.3 | 32.4 | 14.1 | 35.2              | 30.2             | 27.1 | 21       |
| AS22□1F-02-03     | 5/32"                     | 1/4      | 17               | 10.4 | 18.5 | 25.2 | 34.4 | 17.7 | 39.9              | 34.9             | 29.4 | 32       |
| AS22□1F-02-05     | 3/16"                     | 1/4      | 17               | 11.4 | 18.5 | 24.9 | 34.2 | 17.7 | 39.9              | 34.9             | 29.4 | 34       |
| AS22□1F-02-07     | 1/4"                      | 1/4      | 17               | 13.2 | 18.5 | 27.2 | 36.4 | 19.5 | 39.9              | 34.9             | 29.4 | 36       |
| AS22□1F-02-09     | 5/16"                     | 1/4      | 17               | 15.2 | 18.5 | 27.2 | 36.4 | 19.5 | 39.9              | 34.9             | 29.4 | 36       |
| AS22□1F-02-11     | 3/8"                      | 1/4      | 17               | 17.9 | 18.5 | 35.3 | 44.5 | 19.5 | 39.9              | 34.9             | 29.4 | 36       |
| AS32□1F-02-07     | 1/4"                      | 3/8      | 19               | 13.2 | 23   | 27.8 | 39.3 | 19.8 | 45.4              | 40.4             | 35.2 | 60       |
| AS32□1F-02-09     | 5/16"                     | 3/8      | 19               | 15.2 | 23   | 29.5 | 41   | 19.8 | 45.4              | 40.4             | 35.2 | 63       |
| AS32□1F-02-11     | 3/8"                      | 3/8      | 19               | 17.9 | 23   | 31.8 | 43.3 | 19.8 | 45.4              | 40.4             | 35.2 | 67       |
| AS32□1F-03-07     | 1/4"                      | 3/8      | 19               | 13.2 | 23   | 27.8 | 39.3 | 19.8 | 45.4              | 40.4             | 35.2 | 55       |
| AS32□1F-03-09     | 5/16"                     | 3/8      | 19               | 15.2 | 23   | 29.5 | 41   | 19.8 | 45.4              | 40.4             | 35.2 | 57       |
| AS32□1F-03-11     | 3/8"                      | 3/8      | 19               | 17.9 | 23   | 31.8 | 43.3 | 19.8 | 45.4              | 40.4             | 35.2 | 59       |
| AS42□1F-04-11     | 3/8"                      | 1/2      | 24               | 17.9 | 28.6 | 33.6 | 47.9 | 24.5 | 56.7              | 49.2             | 42.1 | 100      |
| AS42□1F-04-13     | 1/2"                      | 1/2      | 24               | 21.7 | 28.6 | 35.2 | 49.5 | 24.5 | 56.7              | 49.2             | 42.1 | 101      |

Note 1) ( ) are the dimensions of NPT thread.

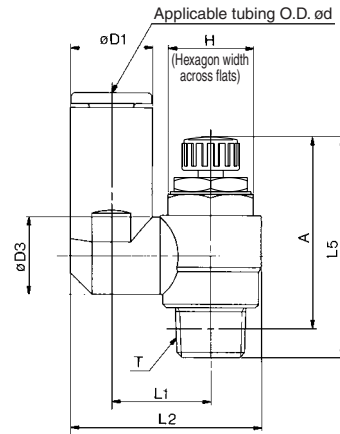
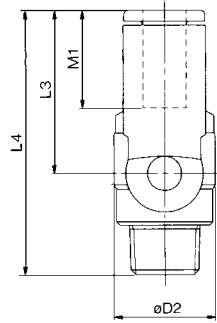
Note 2) Reference thread dimensions after installation.

Note 3) Reference dimensions

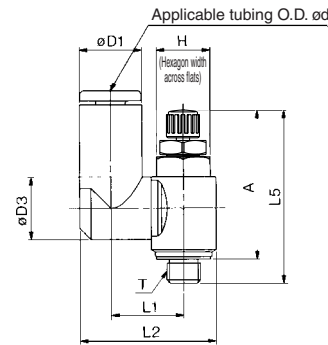
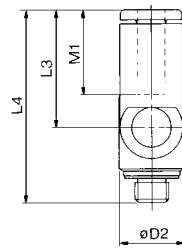
# Speed Controller with One-touch Fitting Elbow Type/Universal Type **Series AS**



**Universal Type**



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



## Metric Size

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

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

## Inch Size

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

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

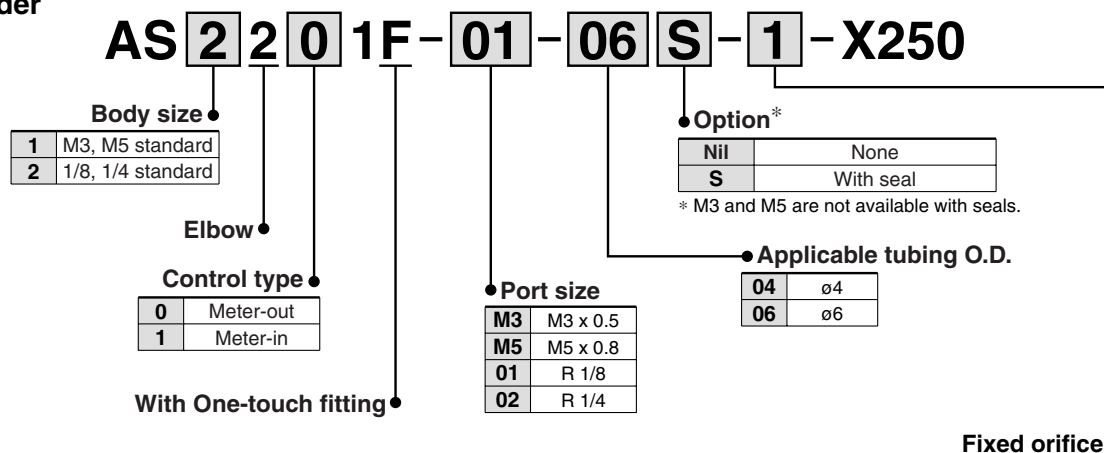
Ex.) AS2201F-01-04S-X214

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.

